



Marine and Industrial Duty Fan

Installation, Operation and Maintenance Manual



Read and Save Instructions

The purpose of this manual is to aid in the proper installation and operation of fans manufactured by L.C. Eldridge Sales Co., Ltd. These instructions are intended to supplement good general practices and are not intended to cover detailed instruction procedures due to the variety of fans manufactured.

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IOM-004-01

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THIS EQUIPMENT CAN CAUSE SERIOUS BODILY INJURY AND/OR PROPERTY DAMAGE. RESPONSIBLE, QUALIFIED PERSONNEL MUST BE ASSIGNED TO THE INSTALLATION, OPERATION, AND MAINTENANCE OF THIS EQUIPMENT. BEFORE OPERATING THIS EQUIPMENT, THOROUGHLY READ THIS MANUAL AND ALL INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS. DO NOT INSTALL, USE, OR OPERATE THIS EQUIPMENT UNTIL THIS MANUAL HAS BEEN READ.

INTRODUCTION

The purpose of this manual is to aid in the proper installation, operation, and maintenance of equipment manufactured by L.C. Eldridge Sales Co., Ltd. ("Eldridge"). These instructions are intended to supplement industry standards and commercially reasonable and prudent general practices with specific recommendations to maximize the performance of the equipment and minimize the unexpected downtime for repairs.

We believe that safety must be a foremost consideration. Therefore, handling, installation, and maintenance must always be performed by experienced and trained personnel who are aware of the hazards associated with rotating equipment.

SHIPMENT AND RECEIVING

Reasonable efforts are made to ensure that all equipment shipped by Eldridge is accounted for in good condition and has been prepared for shipment in accordance with the requirements of Eldridge and the freight company. Upon receipt of shipment, check first to ensure that all items on the bill of lading/freight receipt have been received. Then, determine whether any damage has occurred in transit by a careful and diligent inspection. If any of the items called for in the bill of lading/freight receipt are missing or damaged, contact the freight company immediately and file a claim. Depending upon the particular circumstances, and at Eldridge's sole option, Eldridge may assist in collecting claims for loss or damage, and may make arrangements for repair or replacement. Claims of shortages or errors or other basis for rejection must be made within five (5) days after delivery.

EQUIPMENT INFORMATION PACKAGE

For each piece of equipment sold, Eldridge provides the Buyer with an information package that contains the following:

1. **Test Report** – This is the record that Eldridge has tested the equipment prior to shipment and that it meets the required manufacturing and performance standards. Testing only applies to Eldridge Fan equipment.
2. **Equipment Drawings** – drawings and specification for the equipment.
3. **Motor Specifications** – drawings, specifications, performance curves, and electrical schematic provided by the motor manufacturer.
4. **IOM Manual** – A copy of this IOM Manual.

Eldridge recommends that the equipment information package be stored where it can be easily accessed by personnel that will store, handle, install, start up, and maintain the equipment.

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HANDLING AND LIFTING



EQUIPMENT MUST BE HANDLED WITH CARE TO PREVENT DAMAGE OR BODILY INJURY. NEVER LIFT A FAN BY THE MOTOR BASE, PROPELLER, FLANGES, SHAFT, WHEEL, INLET SUPPORT, STACK CAP, OR HOOD.

Where equipment has been provided with lugs or holes for lifting and handling, these must always be used as intended for lifting and handling. Equipment must be handled using nylon straps or well-padded chains and cables, which protect the equipment's coating and housing. Spreader bars should be used when lifting large equipment.

If the equipment is not outfitted with lugs or holes for proper lifting and handling, follow these instructions:

- **Axial** fans should be lifted using straps around the fan housing.
- **Roof ventilators** should be lifted using straps around the fan housing or base only. For hooded units, disassemble the stack from hood before lifting.

STORAGE

If fans are to be stored for less than three months, they must be stored in a clean and dry location to prevent rust and corrosion. Ideal environmental conditions for storage are:

- Temperatures between 50°F and 120°F
- Relative humidity under 60%
- Shock or vibration not to exceed 2 mils maximum

NOTICE: Outdoor storage is NOT recommended. When outdoor storage is necessary, additional protection should be provided to protect the equipment from the elements.

All fans have been packaged or palletized for shipment in the proper orientation for transportation and storage. If it is necessary to unpack or remove a fan from a pallet for storage, the fan should be stored in the orientation that it was palletized.

If fans are stored for any length of time, records should be maintained indicating dates, location, conditions, orientation, and any events that occur to the fan while it is in storage.

For storage periods exceeding three months, contact Eldridge for special instructions on maintenance and a quotation for extended warranty.

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INSTALLATION



PRIOR TO INSTALLING ANY EQUIPMENT, READ AND OBSERVE ALL OF THE FOLLOWING WARNINGS TO PREVENT DAMAGE TO EQUIPMENT AND BODILY INJURY TO PERSONNEL:

1. **WARNING:** Due to the general nature of its applications, the equipment is available with protective guards and/or other devices for required operating safety as with most installations of rotating machinery. Before operating the 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.
2. **WARNING:** Do not install or operate equipment 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 Eldridge's recommendations and limitations concerning the type of material to be handled by the equipment and its application in special conditions.
3. **WARNING:** All electrical work must be done in accordance with local and/or national electrical codes as applicable. Only qualified electricians who are familiar electrical wiring methods and codes should perform electrical work.
4. **WARNING:** Improper wiring or electrical feed may cause the motor to fail when power is applied.

Thoroughly read the motor specifications provided by the manufacturer before attempting installation. The following are procedures that must be observed for all electrical installations:

- Ensure power is turned off and locked in the **OFF** position at the service entrance.
- Before wiring the motor, check the electrical supply against the requirements on motor nameplate voltage.
- Follow wiring instructions or diagrams on the motor nameplate, junction box, or in the manufacturer's specification documents.
- Be sure to keep all wiring clear of rotating or moving parts.
- Ensure that equipment and components have been properly grounded where static electricity is a concern.
- Place an overload device between the power supply and fan motor with a tolerance of 10% of the full motor load amperage rating including the allowance for the motor service factor.

All equipment installations must be performed in accordance with all legal, regulatory, and other applicable standards and in accordance with commercially reasonable and recognized engineering practices. Additionally, Eldridge requires the following installation guidelines be followed for proper installation of Eldridge's equipment:

1. If the equipment has been stored for a period exceeding three months, contact Eldridge for special start-up procedures following an extended storage period.
2. Turn the wheel or propeller to assure it rotates freely. To minimize any risk of injury when rotating fan blades, use an object such as a wooden dowel to prevent injury. Excessive resistance, scraping, or improper clearance is an indication of damage to the equipment. Contact Eldridge before attempting adjustments or repairs.
3. Check all setscrews and keys. Tighten as necessary.

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4. No initial lubrication is required unless the equipment has been stored for more than three months. Follow any lubrication instructions provided by Eldridge for start-ups after an extended storage period.
5. All mounting bolts must be tightened securely with lock washers and lock nuts.
6. Poured concrete foundations are recommended, wherever practical, for floor-mounted fans. If vibration isolators are required, they should be installed between the fan and the foundation.
7. Equipment mounted off ground level must be rigidly mounted to an appropriately engineered structural platform and be placed as near as possible to or over a solid wall or column. Supports for suspended equipment must be cross-braced for live load support to prevent side sway.
8. The inlet and outlet ducts for axial and centrifugal fans must be independently supported and never supported by the fan flanges. Flexible duct connections are recommended. The independent mounting of stacks and ducts to the fan flanges will ensure that the fan will not be subjected to external forces, which may twist or deform the fan housing, and that the propeller will not strike the housing or cause misalignment of the sheaves and bearings.
9. Roof-mounted fans must be placed with the fan curb panel on the roof curb, leveled, and then anchored to the curb using lag screws, neoprene washers, and flat washers. It is recommended that stacks be independently mounted to the roof with the use of guy wires to prevent side sway. Avoid supporting a stack directly on the fan flange.
10. Particular caution must be exercised when installing fans on metal buildings. Installation on walls or roofs that are not capable of supporting the fan may result in excessive vibration that will damage the equipment. An appropriately engineered framed opening should be designed to support the fans.

Equipment installations for new or redesigned ventilation systems should be performed according to design drawings. A thorough inspection must be performed prior to start-up to ensure correct installation. Contact Eldridge if assistance is needed with installation or prestart-up inspection of the ventilation system.

START-UP

Prior to applying power to the equipment, the **Prestart-up Checklist**, located on the last page of this IOM, should be printed, performed, and signed-off.

After completing the Prestart-up Checklist, the following start-up procedures should be followed:

1. Restore power to the equipment.
2. Momentarily energize the equipment to check the direction of airflow and rotation. Observe the equipment for any unusual vibration or noise, and if detected, re-inspect the equipment following proper safety procedures for your workplace and environment. If damage to the equipment is suspected, contact Eldridge.
3. Apply full power and allow equipment to reach full speed. Observe the equipment for any excessive vibration, unusual noise, or improper power usage. If anything is detected, shut down the equipment immediately and inspect the equipment following proper safety procedures. If damage to the equipment is suspected, contact Eldridge.
4. While the equipment is at full speed, check vibration levels with a vibration analyzer to verify that the vibration is within tolerance of the level recorded on the Test Report provided in the Equipment Information Package.
5. If there are no observable issues and the vibration level is within tolerance, the equipment can be placed into operation with close observation for excessive noise or vibration for the first eight hours of operation. Motor input current and bearing temperatures should be checked to ensure that they do not exceed recommended levels.

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6. After the first eight hours of operation, the equipment should be shut down and inspected following proper safety procedures. All bolts for mounting and connecting to ductwork must be re-tightened securely. Check all setscrews and keys and tighten as necessary.
7. Shut-down and inspection should occur again after the first three months of operation. All bolts for mounting and connecting to ductwork must be re-tightened securely. Check all setscrews and keys and tighten as necessary.

MAINTENANCE



BEFORE PERFORMING ANY MAINTENANCE ON ROTATING EQUIPMENT, FOLLOW PROPER SAFETY PROCEDURES TO ENSURE POWER IS TURNED OFF AND THAT FREE-WHEELING COMPONENTS ARE SECURED IN PLACE.

Eldridge requires the following maintenance procedures to ensure warranty coverage and maximum performance of the equipment with minimal unexpected downtime:

1. Lubricate motors according to the manufacturer's schedule and specifications.
2. Perform periodic equipment inspections on the same schedule as motor manufacturer lubrication requirements. Equipment with motors that do not require lubrication should be inspected at least once per year. Equipment operating in critical areas or in harsh environments should be inspected every three months.
3. The following steps should be performed in all periodic inspections:

Before power has been turned off:

- Observe the equipment for any excessive vibration or noise.
- Check the voltage, frequency, and current to the motor while it is in operation. Compare to motor specifications and if out of tolerance, investigate and correct.

With power off and equipment safe to inspect:

- Inspect the propeller or wheel for any build-up of foreign material or signs of abrasion.
- Check that bolts, setscrews, and keys are in place and have been tightened.
- Manually spin the motor shaft to determine if it spins freely. To minimize any risk of injury when rotating fan blades, use an object such as a wooden dowel to prevent injury.
- Lubricate motor bearings as required.

IDLED EQUIPMENT

If equipment will be idled for more than a 30-day period, Eldridge requires that the following procedures be observed:

1. Maintain environmental conditions as prescribed above for stored equipment.
2. Motor shafts should be rotated every 30 days either manually or by momentarily applying power. To minimize any risk of injury when manually rotating motor shafts, use an object such as a wooden dowel to prevent injury.
3. If there have been repairs or alterations to the electrical service feeding the equipment, it must be checked to make sure that it is still within the motor manufacturer's specifications.
4. If there have been repairs or alterations to ductwork, inspect the interior of the equipment for any foreign material.
5. When equipment is turned on for normal operation, briefly observe it for excessive vibration or noise.

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MOTORS

From experience, Eldridge has learned that motor failure is the number one reason for unexpected down time of rotating equipment. That is why the motors installed in Eldridge's equipment have been selected for their expected performance and durability. Although warranted by Eldridge for 12 months, with proper installation and maintenance, motors may last well beyond the warranty period.

To maximize motor life, Eldridge recommends the following:

1. Keep motors clean and dry. If storing equipment for more than three months prior to installation, contact Eldridge for special procedures for storage and start-up.
2. Ensure that the personnel installing the equipment have read the wiring and electrical service requirements provided on the motor nameplate or in the motor specification documents provided by the manufacturer. Improper wiring or electrical service may cause the motor to fail at start-up.
3. Strictly adhere to lubrication schedules and specifications for motor bearings.
4. Check the correctness of electrical service to the motor as part of a routine program for equipment inspections.
5. If the quality of the air intake to the equipment changes (i.e. temperature, moisture, particles, or chemicals) from what was assumed in selecting the equipment, contact Eldridge for evaluation of the equipment performance under the new conditions.

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VIBRATION AND NOISE

Eldridge equipment has been tested prior to shipment to measure vibration and motor. The actual test levels are included on the Test Report provided in the Equipment Information Package. If at any time measured levels appear to exceed the required levels, the equipment must be shut down and inspected immediately. The following is a troubleshooting chart for problems that may result in excessive vibration or noise:

EXCESSIVE CONDITION	POTENTIAL CAUSE
Vibration	Propeller, wheel, or sheaves loose on shaft Worn, corroded, or out-of-balance wheel or propeller Accumulation of material on wheel or propeller Bent motor shaft Weak mounting base Fan mounting bolts loose Loose or worn bearings Walls or roofs not structured sufficiently to support equipment Curb not flat and level Failed vibration isolators Failed or inadequate duct supports
Noise	Propeller, wheel, or sheaves loose on shaft Worn, corroded, or out-of-balance wheel or propeller Accumulation of material on wheel or propeller Bent motor shaft Bearings require lubrication Foreign material in the equipment airstream Electrical noise Open access panels Holes or gaps in ductwork

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EQUIPMENT PERFORMANCE

Properly installed equipment should meet the performance requirements for airflow in the ventilation system. If there is an issue with airflow, consult the troubleshooting chart below.

CONDITION	POTENTIAL CAUSE
Equipment Does Not Operate	Wrong voltage Electricity turned off Not wired properly Tripped breakers or blown fuses Failed overload protector
Low Airflow	Restricted fan inlet or outlet Filters, screens, or coils are restricted, dirty, or clogged Propeller or wheel not secured to motor shaft Open access panels Holes, gaps, or obstructions in ductwork
High Airflow	Filters not in place Grills, registers, louvers, or dampers not installed

If the ventilation system has been thoroughly inspected and airflow problems still exist, contact Eldridge for a computerized fluid flow system analysis of the ventilation system.

SPARE PARTS

Generally, Eldridge does not recommend stocking spare parts if a regular program of inspection and maintenance is established and followed. However, in mission critical situations where equipment run time is critical to overall operations and/or the equipment is located remotely, we recommend considering the need to stock spare parts.

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LIMITED WARRANTY

Eldridge is proud of its ventilation equipment and stands behind its superior design and construction with a (12) twelve-month limited operational warranty. This warranty begins when the equipment is placed in service, not to exceed (18) eighteen months from the date of shipment from the factory. If for any reason related to workmanship or materials, and under normal use and service, any equipment or subcomponent should fail during the warranty period, Eldridge will repair or replace the equipment or subcomponent at no cost to the Buyer. This limited warranty explicitly excludes any Eldridge goods which have failed as a result of faulty installation or abuse by Buyer, or incorrect electrical connections or alterations, made by others, or use under abnormal operating conditions or misapplication of the goods.

WARRANTY SERVICE – Any warranty service request should be directed to:

L.C. Eldridge Sales Co., Ltd.
23035 Elkana Deane Ln
Katy, TX 77449
Phone: +1 844-780-7200 Email:
info@eldridgefan.com

A warranty service request should be made immediately, but no later than 14 days from the date of failure or discovery of failure. To process a warranty claim, Eldridge will require:

- (1) Copy of the Eldridge invoice for the equipment,
- (2) Date of failure or discovery of failure,
- (3) Brief description of the failure event, and
- (4) Photos of the equipment name plate and area of failure.

To prevent the possibility of warranty denial the following conditions must be met: A customer requesting warranty coverage must have written consent from Eldridge before attempting to remove or repair equipment. A customer must also submit the request for warranty coverage in a timely manner. Failure to comply with these conditions may, at Eldridge's sole discretion, result in denial of warranty service.

The foregoing shall constitute Eldridge's sole and exclusive warranty 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 limited warranty described above. **ELDRIDGE HEREBY EXPRESSLY DISCLAIMS AND EXCLUDES ANY AND ALL OTHER REPRESENTATIONS AND WARRANTIES, WHETHER WRITTEN OR ORAL, WHETHER EXPRESS OR IMPLIED, WHETHER ARISING BY CONTRACT, AT LAW, IN EQUITY, BY STRICT LIABILITY OR OTHERWISE, WITH RESPECT TO THE GOODS AND SERVICES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY AGAINST DEFECTS IN DESIGN, MATERIALS AND WORKMANSHIP, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, ANY WARRANTY OF GOOD TITLE, AND ANY WARRANTY AGAINST INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY, INCLUDING, WITHOUT LIMITATION, ANY PATENTS, TRADEMARKS, OR COPYRIGHTS.**

LIMITATION OF LIABILITY –

The exclusive remedy of Buyer in the event of nonconforming goods is the repair or replacement, at Eldridge's sole option, of such nonconforming goods. Eldridge's obligation for any breach of warranty is limited to repairing or replacing, at its option, without cost to Buyer, at its factory, any goods which shall, within such a warranty period, be returned to it with transportation charges prepaid, and which its examination shall disclose to its satisfaction to have been defective.

TO THE EXTENT THE ABOVE LIMITATION OF LIABILITY FOR BREACH OF WARRANTY IS NOT APPLICABLE, THE LIABILITY OF ELDRIDGE ON ANY CLAIM OF ANY KIND SHALL IN NO CASE EXCEED THE PRICE ALLOCABLE TO THE GOODS OR SERVICES WHICH GAVE RISE TO THE CLAIM AND SHALL TERMINATE WHEN THE WARRANTY PERIOD EXPIRES. THIS LIMITATION OF LIABILITY APPLIES TO ALL CLAIMS OF ANY KIND, INCLUDING NEGLIGENCE, AND FOR ANY LOSS OR DAMAGE ARISING OUT OF OR CONNECTED WITH OR RESULTING FROM THE SALE

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AND PURCHASE OF THE GOODS OR SERVICES 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, INSTALLATION, INSPECTION REPAIR, OPERATION, OR USE OF ANY GOODS OR SERVICES COVERED BY THIS IOM MANUAL AND/OR THE ELDRIDGE TERMS AND CONDITIONS OF SALE. Eldridge neither assumes nor authorizes any person to assume for it any other liability in connection with the sale of its goods or services.

NOTWITHSTANDING ANYTHING ELSE CONTAINED HEREIN TO THE CONTRARY, IN NO EVENT WILL: (A) ELDRIDGE BE LIABLE TO BUYER FOR ANY CIRCUMSTANTIAL, CONSEQUENTIAL, CONTINGENT, EXEMPLARY, INCIDENTAL, INDIRECT, LIQUIDATED, MATERIAL, PUNITIVE, SPECIAL, SPECULATIVE, OR OTHER DAMAGES, INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOST PROFITS, SALES OR REVENUES, COST OF REPLACEMENT GOODS OR SUBSTITUTE EQUIPMENT, LOST BUSINESS OR BUSINESS INTERRUPTIONS, LOSS OF USE OF THE EQUIPMENT OR ANY ASSOCIATED EQUIPMENT, COST OF SUBSTITUTE EQUIPMENT, FACILITIES, OR SERVICES, REMOVAL OR RE-INSTALLMENT OF EQUIPMENT, OR CLAIMS OF CUSTOMERS OF THE BUYER FOR SUCH DAMAGES OR ATTORNEYS' FEES OR COURT COSTS ARISING IN ANY MANNER PURSUANT TO OR IN CONNECTION WITH THE GOODS OR THE SERVICES (EVEN IF ELDRIDGE IS MADE AWARE OF THE POTENTIAL FOR SUCH DAMAGES); AND (B) ELDRIDGE'S TOTAL LIABILITY RELATED TO ANY GOOD OR SERVICE EXCEED THE PURCHASE PRICE OF SUCH GOOD OR SERVICE.

THE LIMITATION OF LIABILITY PROVISIONS CONTAINED HEREIN SHALL BE ENFORCEABLE REGARDLESS OF WHETHER THE LIABILITY IS BASED ON ANY PAST, PRESENT OR FUTURE ACTS, CLAIMS OR LEGAL REQUIREMENTS (INCLUDING ANY PAST, PRESENT OR FUTURE OCCUPATIONAL SAFETY AND HEALTH LAW, OR PRODUCTS LIABILITY OR OTHER LEGAL REQUIREMENT), AND REGARDLESS OF WHETHER ANY PERSON ALLEGES OR PROVES THE SOLE, CONCURRENT, CONTRIBUTORY, OR COMPARATIVE NEGLIGENCE OF ELDRIDGE OR ANY OTHER PARTY OR THE CONCURRENT STRICT LIABILITY IMPOSED THEREON.

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PRESTART-UP CHECKLIST

1. If equipment has been stored for more than three months prior to installation, confirm that special storage and start-up procedures have been obtained from Eldridge and performed.
2. The ventilation system has been inspected for proper installation according to the design drawings.
3. The equipment has been installed according to the airflow and rotation arrows on the equipment to match the design drawings.
4. Ductwork and equipment interiors have been inspected to ensure that they are free of foreign materials.
5. Wheel or propeller rotates freely.
6. Motor wiring is properly connected to power source.
7. Equipment has been properly grounded.
8. Access doors to equipment and ductwork have been secured.
9. Safety guards are in place and properly secured.
10. Appropriate safety warning labels have been placed on the ventilation system.

Model No.: _____

Location: _____

Date: _____

By: _____