CINCINNATI FAN

user manual

Arrangement 4 axial fan

Models PMC - CIM - AC

INSTALLATION - OPERATION - MAINTENANCE

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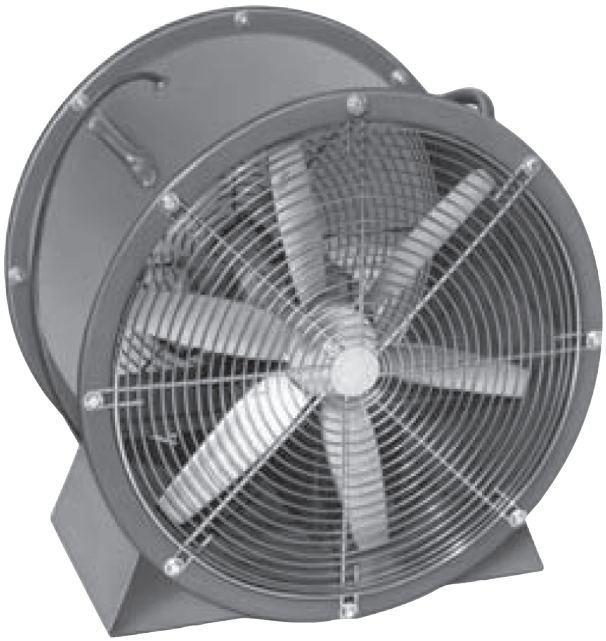
READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT



PMC Axial Fan

Serial Number _____

overview

Note

Read entire manual, including "Initial Unit Startup" before attempting to install and operate this equipment.

Specifications

Serial Number _____ Mfg Date _____

Note: The serial number above is a required reference for ant assistance. It is stamped on the lower nameplate.

Fan Specifications

Model _____ Wheel Size and Type _____

Motor Data: (This section is completed only if the motor was supplied by Cincinnati Fan)

hp _____ RPM _____ Voltage _____ Phase _____

Hz _____ Frame Size _____ Enclosure _____ Efficiency _____

If Motor is EXP, Class(es) and Group(s) are _____

Manufacturer's Model Number _____ CFV Part Number_____

Note

All Cincinnati Fan products are packaged to minimize any damage during shipment. The freight carrier is responsible for delivering all items in their original condition as received from Cincinnati Fan. The individual receiving this equipment is responsible for inspecting this unit for any obvious or concealed damage. If any damage is found, it should be noted on the bill of lading before the freight is accepted and the receiver must file a claim with the freight carrier.

Long Term Storage Notice

If this fan will not be installed and put into operation within 30 days, refer to the **Long Term Storage** section. Failure to follow all applicable long term storage instructions, will void your warranty. This fan should be stored indoors in a clean, dry location.

contents

Note

This manual contains vital information for the proper installation and operation of your blower fan. Carefully read the manual before installation or operation of the blower fan and follow all instructions. Save this manual for future reference.

Note

The following defined terms are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning the life of the product.

⚠ Warning

Indicates presence of a hazard which can cause severe personal injury, death or substantial property damage if ignored.

⚠ Caution

Indicates presence of a hazard which will or can cause personal injury or property damage if ignored.

Note

Indicates special instructions on installation, operation or maintenance which are important but not related to personal injury hazards.

general

Receiving

Unpacking

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

Handling

Handling of the fan 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 fan should be lifted using well-padded chains, cables or lifting straps with spreader bars. Some fan models have lifting eye locations provided in the fan base. **Never** lift the fan by the motor shaft, motor eye bolt, or any other part of the fan assembly that could cause distortion of the fan assembly.

Safety Instructions and Accessories

Safety Instructions:

All installers, operators and maintenance personnel should read AMCA Publication 410-96, *Recommended Safety Practices for Users and Installers of Industrial and Commercial Fans*. This manual is included with the fan.

Sound

Some fans can generate sound that could be hazardous to personnel. It is the responsibility of the user to measure the sound levels of the fan 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 fan can present additional hazards from the suction or pressure created at the fan inlet or discharge.

⚠ Warning

Suction at the fan inlet can draw materials into the fan where they become high velocity projectiles at the discharge and 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.

general

⚠ **Caution**

All personnel coolers and air circulators are shipped with inlet and outlet guards that meet OSHA standards. Never operate a personnel cooler or air circulator without the inlet and outlet guards in place. If these guards become defective or are removed, the power to the motor should be turned off and locked out until the guards have been replaced and inspected by the proper safety personnel.

Temperature

Some fans, fan components and all motors operate at temperatures that could burn someone if they come in contact with them. If this potential hazard could exist in your installation, steps must be taken by the user to protect anyone from coming in contact with this equipment.

Spark Resistance: Per AMCA Standard 99-0401-86 and ISO 13499

⚠ **Warning**

No guarantee of any level of spark resistance is implied by spark resistant construction. It has been demonstrated that aluminum impellers rubbing on rusty steel can cause high intensity sparks. Air stream material and debris or other system factors can also cause sparks.

Safety 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.

⚠ **Caution**

Never start any fan without having all required safety guards properly installed. All fans 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 fan should be immediately turned off and locked out in accordance with OSHA regulations. Power to the fan should Not be turned back on until the required guards have been repaired or replaced.

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

Installation

Vibration

Before any mounting method is selected, the user should be aware of the effects vibration will have on the fan, motor and other parts. Improper fan installation can cause excessive vibration causing premature prop and/or motor bearing failure, that is not covered under warranty.

⚠ Caution

Shut the fan down immediately if there is any sudden increase in vibration.

Mounting Methods

⚠ Caution

On any mounting method, any swivel and/or rotational adjustments should never be made while the fan is running. Turn off the power to the motor first. Any swivel and/or rotational adjustments should be made by loosening the locking bolts or screws by only one turn.

PMC Model Personnel Cooler

The PMC personnel cooler is designed to sit on the floor, or table on smaller models. It should be sitting on a flat, level surface. Any sloped surface could cause the fan to move. Any surface that is not flat could cause excessive vibration which could lead to mechanical failure of the propeller or motor bearings. If this model was ordered with a “Yoke Mount” (not available on 42" models), the yoke base plate can be mounted to a roof truss **with the fan drum hanging down. Do not mount the base plate to a vertical beam. It is your responsibility to make sure the roof beam, or structure, will support the additional weight of the complete fan assembly.** The yoke can be rotated by loosening the set screws in the hub collars. The fan drum can be swiveled up or down by loosening the two “swivel adjustment bolts” in the side of the yoke frame. The degree of rotation and swivel is limited.

Note

If the drum is swiveled inside the frame, be sure to tighten the two bolts after swiveling the drum to the desired position. When rotating the fan on the yoke shaft and/or swiveling the drum within the frame, be careful not to put any strain or pinch the wiring coming out of the drum.

⚠ Caution

The fan should never be operated with the yoke rotation set screws or the drum swivel adjustment bolts loose.

installation

CIM Model Personnel Cooler

This model is designed to sit on the floor. It should be sitting on a flat, level surface. Any slopped surface could cause the fan to move. Any surface that is not flat could cause excessive vibration which could lead to mechanical failure of the propeller or motor bearings. The fan can be rolled around on the two casters by lifting up on the handle and pushing it to where it is needed. The drum can be swiveled up or down, but limited, by loosening the two “swivel adjustment bolts” in the side frame.

Note

If the drum is swiveled inside the frame, be sure to tighten the two bolts after swiveling the drum to the desired position. When swiveling the drum within the frame, be careful not to put any strain or pinch the wiring coming out of the drum.

⚠ Caution

The fan should never be operated with the drum swivel adjustment bolts loose.

AC Model Air Circulator

This model is standard with a yoke mount, but a wall mounting bracket is optional except on the 36" size. If it is ordered as a yoke mount, the yoke should be bolted to a roof truss. **Do not** bolt it to a vertical beam. The fan drum can be swiveled up or down ±40° from center by loosening the two “swivel adjustment bolts” in the side of the yoke frame, as long as it doesn't put any strain on the electrical wire for the motor.

If the optional wall mount bracket is ordered, for sizes 15" to 30", the wall bracket can be bolted (or welded) to a vertical beam. If the wall mount bracket is used, it **must** be mounted so the fan is on top of the wall bracket, **not hanging down**. The fan drum can be swiveled up or down ±40° from center and rotated 360°as long as it doesn't put any strain on the electrical wiring for the motor.

Note

If the drum is swiveled inside the frame, be sure to tighten the two bolts after swiveling the drum to the desired position. When rotating the fan on the wall bracket and/or swiveling the drum within the frame, be careful not to put any strain or pinch the wiring coming out of the drum.

⚠ Caution

The fan should never be operated with the wall bracket rotation bolt or the drum swivel adjustment bolts loose.

installation

Set Screw and Taper-Lock Bushing Torque Values

All propeller set screws are tightened to the proper torque prior to shipment. Some propellers may have taper-lock hubs and split, taper-lock bushings to secure the propeller to the motor shaft.

Note

Check all set screw or taper-lock bushing torques. Forces encountered during shipment, handling, rigging and temperature can affect factory settings. For correct torque values, see Tables 1 and 2.

Table 1

Diameter and Number of Threads/Inch	Hex Wrench Size (across flats)	Required Torque in·lbf
1/4-20	1/8"	65
5/16-18	5/32"	165
3/8-16	3/16"	228
7/16-14	7/32"	348
1/2-13	1/4"	504
5/8-11	5/16"	1104

Table 2

Taper-Lock Busing Size	Required Torque in·lbf
H	95
B	192
P	192
Q	350
R	350

⚠ Caution

Set screws should never be used more than once. If the set screws are loosened, they must be replaced. Use only knurled, cup-point, set screws with a nylon locking patch.

installation

Electrical

Air Circulator Pre-Wired Motor

All sizes with 1 Phase, Open Drip Proof (ODP) motors up to 1 hp, come pre-wired for 115 Volt, 1 Phase, 60 Hertz and include a 9 foot cord and 3 prong grounded plug. All 3 Phase motors or units with TEFC or EXP motors must be wired by others.

Personnel Cooler Pre-Wired Motor

Personnel Coolers come with a wiring pigtail that is pre-wired to the motor and extends to the outside of the drum, but no plug at the end of the pigtail. A voltage sticker, on the outside of the fan drum, indicates the voltage the motor is pre-wired for. The pigtail should be connected to a starter selected to meet National Electric Code (NEC) standards. The starter should be mounted to the outside of the fan drum by the purchaser or user. A General Purpose, NEMA 1, fused, manual starter is available as an option from Cincinnati Fan. It is mounted to the fan and wired from the motor to the starter only. **Due to varying code restrictions and operational locations, Cincinnati Fan will not pre-wire any Explosion Proof (EXP) motors. Any additional wiring required to operate this fan should be installed by a licensed electrician**.

Disconnect Switch

All fan motors should have an independent disconnect switch located in close visual proximity to turn off the electrical-service to the fan motor. **Disconnects must be locked out in accordance with OSHA "lock out-tag out" procedures any time inspection or maintenance is being performed on the fan and/or motor assembly. The "lock out-tag out" procedure should be performed by a licensed electrician or authorized personnel**. All disconnects should be sized in accordance with the latest NEC codes (National Electric Codes) and any local codes and should be installed only by a licensed electrician. "Slow blow" or "time delay" fuses or breakers should be used since the initial start-up time for the fan motor, although rare, can be up to 10 seconds.

Motor

⚠ **Warning**

All wiring connections, inspection and maintenance of any motor must be performed by a licensed electrician in accordance with the motor manufacturers recommendations, all electrical codes and OSHA regulations. Failure to properly install, make wiring connections, inspect or perform any maintenance to a motor can result in motor failure, property damage, explosion, electrical shock and death.

installation

1. **Do Not connect or operate a motor without reading the motor manufacturers instructions supplied with the motor.** 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 manufacturers instructions.
2. **Cleaning:** Cleaning should be limited to exterior surfaces only. Follow motor manufacturers 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 manufacturers recommendations. Lubrication frequency depends on the motor horsepower, speed and service. **Be sure** you use compatible grease and **Do not** over grease.
4. **Location:** All Personnel Coolers come standard with Totally Enclosed (TEFC or TENV) motors. Explosion Proof (EXP) motors are available. All Air Circulators come standard with Open Drip Proof (ODP) motors. TEFC or EXP motors are available. All standard ODP, TEFC (or TENV) and EXP motors are suitable in a clean, dry airstream below 104° F (40°C). If the airstream will be wet, dirty or reach temperatures above 104°F (40°C), a completely different type of motor should be used. Consult our local Cincinnati Fan sales office for your area for proper fan/motor selection assistance.

   On any models, in sizes 12" and 15" with an EXP motor, the motor conduit box will not fit on the motor inside the fan drum. It is removed from the motor, shipped loose with the fan, and will require the purchaser or user to install it on the outside of the drum. The purchaser and/or user will also be required to supply all required electrical components and complete the electrical connections from the motor to the outside conduit box. **This assembly process should only be performed by a licensed electrician**.
5. **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 manufacturers 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 fan rotation.

6. **Motors with Thermal Overload Protection:** If a motor is equipped with thermal overloads, the thermal overload must be wired per the wiring schematic to be operable. There are three types of thermal overloads:

   Automatic: These will automatically shut the motor down if the internal temperature exceeds the design limits.

⚠ **Caution**

Make sure you lock out the power to the motor before inspecting any motor with automatic thermals, when the thermals cool down, they will allow the motor to automatically start up again, unless you have locked out the power to the motor.

   Manual: These motors will have a button on them. If the motor overheats, it will shut down. After you have inspected the motor and eliminated the over-heating problem, you will need to "reset" it by pushing the button. Lock out the power Before inspecting the motor.

   Thermostats: This type of thermal is a temperature sensing device **only**. If the motor overheats, the thermostats will open or close (depending on the type) and send a "signal" to the electrical box. **They will not turn the motor off**. These are pilot circuit devices that must be connected to the magnetic starter circuit.

7. **Explosion Proof Motors:** No motor is explosion proof. Explosion proof motors are designed so if there is an explosion **within** the motor, the explosion will be **contained inside** the motor and not allowed to get out to the atmosphere. All explosion proof motors must be selected based on the atmosphere and/or the environment the motor will be operating in. Explosion proof motors are designed, rated, and labeled for their operating conditions based on Classes, Groups and T Codes. The Class, Group and T Code of an EXP motor MUST be selected based on the atmosphere and/or environmental conditions the motor will be operating in. Consult the NEC (National Electric Code) and the NFPA (National Fire Protection Association) for the proper EXP motor Class, Group and T Code required for your specific application and location..

⚠ **Warning**

If an explosion proof motor is used in an area containing volatile liquids, gases, fumes or dust for which the motor was not designed to operate in, an explosion and/or fire may occur.

Note

All EXP motors have some type of thermal overload as required by UL (Underwriters Laboratories).

All EXP motors are required to have the UL and CSA (Canadian Standards Association) listing numbers on the motor name plate or on a separate plate attached to the motor. The Class, Group and T Code the motor is designed for must also be listed.

8. **Normal Motor Operating Temperatures:** 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).

Maximum Fan Speed and Motor Speed Controllers:

If you will be using any type of motor speed controller with this fan, do not exceed the maximum safe fan speed. Installing and using a speed control device requires special training and certification as required by the speed control manufacturer. See the manufacturers instructions for proper use, installation and wiring connections for the maximum speed settings. It may be necessary to "block out" some speeds to eliminate a resonant vibration problem. The maximum safe fan speed is shown on the data sheet shipped with the fan. If you have lost the data sheet, contact Cincinnati Fan or the sales office for your area. You must have the serial number from the fan name plate for us to determine the maximum safe fan speed.

Cincinnati Fan will only extend the motor manufacturers warranty, when used with a speed controlling device, if the motor has the words **"Inverter Duty"** marked on the motor name plate. If the motor does not have "Inverter Duty" marked on the motor name plate, and you have a motor failure, you will be required to contact the motor manufacturer for any service or warranty claims.

Pre-Startup and Post-Startup Check (Check blocks as each step is completed. Retain for you records)

Note

Failure to complete and document all the following Pre-Startup checks, Post-Startup checks and Vibration checks, could void all warranties.

Pre-Startup Check completed by: _____ Date _____

Eight Hour Post-Startup Check completed by: _____ Date _____

Three-Day Post-Startup Check completed by: _____ Date _____

Make sure power to the motor is locked out before starting pre-start or post-start checks.

1 ☐ ☐ ☐ Remove the inlet and outlet guards.

2 ☐ ☐ ☐ Carefully check the propeller by spinning it by hand to ensure it rotates freely.

3 ☐ ☐ ☐ Check the propeller set screws to make sure they are tight per **Table 1**.

4 ☐ ☐ ☐ If the propeller has a taper-lock bushing, make sure the bolts are tightened per **Table 2**.

5 ☐ ☐ ☐ Make certain there is no foreign material in the fan or duct work that can become a projectile.

6 ☐ ☐ ☐ Check the bolts that secure the motor onto the fan motor base late to make sure they are tight.

7 ☐ ☐ ☐ Ensure all electrical power components are properly sized and matched for your electrical system.

8 ☐ ☐ ☐ Record the Full Load Amps listed on the motor nameplate. You will need to refer to this later

Low Voltage Amps: _____

High Voltage Amps: _____

9 ☐ ☐ ☐ Complete any necessary wiring to power the motor. This should be completed by a licensed electrician.

10 ☐ ☐ ☐ Reinstall the guards on both ends of the fan.

11 ☐ ☐ ☐ Apply power to the motor momentarily (i.e. “bump start”) to check the propeller rotation. It should turn in the direction as indicated by the rotation arrow on the outside of the fan drum. If the fan is rotating in the wrong direction, reconnect the motor leads per the motor manufacturers wiring schematic. The fan rotation must match the rotation indicated by the rotation arrow on the outside of the drum. After reconnecting the leads, repeat this step.

Pre-Startup Check completed by: _____ Date _____

Eight Hour Post-Startup Check completed by: _____ Date _____

Three-Day Post-Startup Check completed by: _____ Date _____

12 ☐ ☐ ☐ Apply power to the motor and let it come up to full speed. Then, turn off the power. Look and listen for any unusual noise or mechanical abnormality while the propeller is still spinning. If any are noticed, lock out the power, wait for the propeller to come to a complete stop, locate the cause and correct it.

13 ☐ ☐ ☐ Unlock power and start the fan.

14 ☐ ☐ ☐ Measure, record and keep the following motor data for future reference and comparison: (**Single phase motors will only have L1 and L2 leads**)

Amperage draw on each motor lead: L1 _____ L2 _____ L3 _____

(Running amps **should not** exceed the motor name plate amps for the voltage being operated on). **Compare these amp readings to the Full Load Amps you recorded in Step 6.**

Voltage coming to motor leads: L1_____ L2_____ L3_____

(Should be about the same input voltage on all leads)

Vibration

All propellers are balanced to comply with ANSI S2.19, G6.3. However, rough handling in shipment and/or erection, weak and/or non-rigid foundations, and misalignment may cause a vibration problem after installation. After installation, the vibration levels should be checked by personnel experienced with vibration analysis and equipment.

maintenance

Routine Inspection and Maintenance

Periodic inspection of all the fan parts is the key to good maintenance and trouble-free operation. The frequency of inspections must be determined by the user and is dependent upon the severity of the application. **But**, it should **never** exceed a 12 month period. The user should prepare an inspection and maintenance schedule and make sure it is adhered to.

⚠ Caution

Before starting any inspection or maintenance, be sure fan is turned off, power is locked out and the propeller has been carefully secured to prevent wind milling. If the operating conditions of the fan are to be changed (speed, pressure, temperature, etc.) consult Cincinnati Fan or our sales office in your territory to determine if the unit will operate safely at the new conditions.

Hardware

All fan hardware should be checked to make sure it is tight. All set screws or taper-lock bushing bolts should be tightened to the torque values shown in **Table 1** and **Table 2**.

Note

If any set screws have become loose, they must be replaced. Never use set screws more than once. Replace with knurled, cup-point set screws with a nylon locking patch.

Motor Bearing Lubrication

Most smaller motors have sealed bearings that never require relubrication for the life of the motor. For any motors with grease fittings, consult the motor manufacturers recommendations with reference to the lubrication frequency and the type of grease that should be used.

Do not over grease the motor bearings. Generally, 1-2 shots should be enough. Use a hand operated grease gun at no more than 40 psi. If possible, **carefully** lubricate the motor bearings while the motor is running.

Propeller Balancing

All propellers are balanced at the factory. It is not uncommon that additional “trim balancing” is required after the fan is assembled. Trim balancing of the fan assembly, in the field, is typically always necessary for all replacement propellers.

Airstream material or chemicals can cause abrasion or corrosion of fan parts. This wear is generally uneven and, over time, will lead to the propeller becoming unbalanced causing excessive vibration. When that happens, the propeller

must be rebalanced or replaced. The other airstream components should also be inspected for wear or structural damage and cleaned or replaced if necessary. **After cleaning any propeller, it should be balanced**.

There are two ways to balance a propeller:

Add balancing weights for fabricated aluminum, steel or stainless steel propellers:

Balance weights should be rigidly attached to the propeller at a location that will not interfere with the fan housing nor disrupt air flow. They should (if at all possible) be welded to the propeller. When trim balancing the propeller, on the fan shaft, be sure to ground the welder directly to the propeller. Otherwise, the welding current will likely pass through the fan shaft and damage the fan and/or motor bearings.

Grinding off material for cast aluminum propellers:

When grinding on the propeller to remove material, be very careful not to grind too much in one area. That could affect the structural integrity of the propeller.

Vibration

As mentioned previously in this manual, excessive vibration can cause premature motor and/or fan bearing failure that could lead to catastrophic failure of the fan. After performing any routine maintenance, vibration readings should be taken. New readings should be taken (maximum every 12 months) and compared to the readings previously recorded. If any major differences are present, the cause should be determined and corrected before the fan is put back into operation.

The most common causes of vibration problems are:

- Propeller unbalance
- Motor imbalance
- Mechanical looseness
- Foundation stiffness,not flat or not level

Safety Equipment and Accessories

It is the user's responsibility to make sure that any safety guards required by company, local, state and OSHA regulations are properly attached and fully functional at all times. If any guards become defective or non-functional at any time, the power to the fan **must** be turned off and locked-out until complete repairs and/or replacements have been made, installed and inspected by authorized personnel.

maintenance

Any accessories used in conjunction with the fan should also be inspected to make sure they are functioning within their intended limits and design specifications. The manufacturers maintenance manuals should be referred to for correct maintenance procedures.

Safety Cables: For any models of Personnel Coolers or Air Circulators that will be mounted **above** the floor, a safety cable or chain should be securely connected between the fan and the mounting structure. This will limit how far the fan could fall or drop should the mounting hardware come loose.

⚠ Warning

This safety feature must be installed by the user to prevent property damage, severe personal injury or death.

In some locations, it is required by local or state agencies. The cable or chain should **not** be any longer than needed to operate the fan properly and it should be strong enough to support a minimum of two times the total weight of the fan assembly.

⚠ Caution

Do not connect any safety cable or chain to the fan drum guard on either end of the fan. Do not connect any safety cable or chain to an area near the propeller where it could become tangled in the propeller.

Replacement Parts

Under normal conditions, you should not need any spare or replacement parts for at least 24 months after shipment from Cincinnati Fan. That does not include any wear due to abrasion, corrosion, excessive temperatures, abuse, misuse, accident or any severe conditions the fan was not designed for.

- If this fan is vital to any process that could cost you lost revenue, we strongly recommend that you keep a fan propeller and motor at your location.
- If this fan is vital for the safety of any people and/or animals, we strongly recommend that you keep a complete fan/motor assembly, as originally ordered, at your location.

To order parts or complete units, contact us for the name of our sales office in your area or locate them on our website at **cincinnatifan.com.**

Note

The fan serial number from the fan name plate is required to identify parts correctly.

maintenance

Troubleshooting

Potential problems and causes listed below are in no order of importance or priority. The causes are only a list of the most common items to check to correct a problem. If you find the cause of a problem, **do not** assume it is the **only** cause of that problem. Different problems can have the same causes.

⚠ Warning

Troubleshooting should only be performed by trained personnel. Any potential electrical problems should only be checked by a licensed electrician. All safety rules, regulations and procedures must be followed.

Trouble	Cause
Excessive Vibration	Loose mounting bolts, propeller set screws or taper-lock hubs
	Worn or corroded propeller
	Accumulation of foreign material on propeller
	Bent motor shaft
	Worn motor bearings
	Motor out of balance
	Inadequate structural support
	Foundation not flat and level
Airflow (CFM) Too Low	Propeller turning in wrong direction (rotation)
	Motor speed (RPM) to low
	Dampers or valves not adjusted properly
	Leaks or obstructions
	Inlet and/or discharge guards are clogged
Airflow (CFM) Too High	Motor speed (RPM) to high
Motor Overheating	Voltage supplied to motor is too high or too low
	Motor speed (RPM) too high or defective motor
	Air density higher than expected
	Motor wired incorrectly and/or loose wiring connections
	Cooling fan cover on back of motor is clogged (fan cooled motors)
	Note – a normal motor will operate at 174°F
Excessive Noise	Propeller rubbing inside of housing
	Worn or corroded propeller
	Accumulation of foreign material on propeller
	Loose mounting bolts, set screws or taper-lock hubs
	Bent motor shaft
	Worn motor bearings
	Motor out of balance
	Motor bearings need lubrication
	Vibration originating elsewhere in system
	Inadequate or faulty design of blower support structure
Fan Doesn't Operate	Motor wired incorrectly or loose wiring connections
	Incorrect voltage supply
	Defective fuses or circuit breakers
	Power turned of elsewhere
	Defective motor

Long Term Storage

Storage exceeding 30 days after receipt of equipment.

Note

Failure to adhere to these instructions voids all warranties in their entirety.

- Storage site selection:
  - Level, well-drained, firm surface, in clean, dry and warm location. Minimum temperature of 50°F (10°C).
  - Isolated from possibility of physical damage from construction vehicles, erection equipment, etc.
  - Accessible for periodical inspection and maintenance.
- The fan should be supported under each corner of its base to allow it to "breathe". Supports (2 x 4s, timbers, or railroad ties) should be placed diagonally under each corner.
- If the equipment is to be stored for more than three (3) months, the entire fan assembly must be loosely covered with plastic, **but not tightly wrapped.**
- Storage Maintenance:

Note

A periodic inspection and maintenance log, by date and action taken, must be developed and maintained for each fan. See example below. Each item must be checked monthly.

Storage/Maintenance Schedule Log Example	
Action	Date Checked
Reinspect units to insure any protective devices used are functioning properly. Check for scratches in the finish which will allow corrosion or rust to form	
Rotate propeller a minimum of 10 full revolutions to keep the moor bearing grease from separating and drying. **This is a critical step.**	

- General Motor Procedure:

If the motor is not put into service immediately, the motor must be stored in a clean, dry, warm location. Minimum temperature of 50°F. (10°C,). Several precautionary steps must be performed to avoid motor damage during storage.

- Use a "Megger" each month to ensure that integrity of the winding insulation has been maintained. Record the Megger readings. Immediately investigate any significant drop in insulation resistance.

maintenance

- **Do not** lubricate the motor bearings during storage. Motor bearings are packed with grease at the factory. Excessive grease can damage the insulation quality in the motor.
- If the storage location is damp or humid, the motor windings must be protected from moisture. This can be done by applying power to the motor's space heaters, (if available) while the motor is in storage. If the motor does not have space heaters, storing it in a damp or humid location will, very quickly, cause internal corrosion and motor failure which is not warranted.
- Rotate motor shaft a minimum of 10 full turns each month to keep bearing grease from separating and drying out.

Note

For specific storage instructions, for the actual motor and any accessory parts that were supplied, refer to the manufacturer's instructions.

Limited Warranty

Cincinnati Fan and Ventilator Company (Seller) warrants products of its own manufacture, against defects of material and workman-ship under normal use and service for a period of eighteen (18) months from date of shipment or twelve (12) months from date of installation, whichever occurs first. This warranty does not apply to any of Seller's products or any part thereof which has been subject to extraordinary wear and tear, improper installation, accident, abuse, misuse, overloading, negligence or alteration. This warranty does not cover systems or materials not of Seller's manufacture. On products furnished by Seller, but manufactured by others, such as motors, Seller extends the same warranty as Seller received from the manufacturer thereof. Expenses incurred by Purchaser's in repairing or replacing any defective product will not be allowed except where authorized in writing and signed by an officer of the Seller.

The obligation of the Seller under this warranty shall be limited to repairing or replacing F.O.B. the Seller's plant, or allowing credit at Seller's option. **This warranty is expressly in lieu of all other warranties either expressed or implied including the warranties of merchantability and fitness for a particular purpose and of all other obligations and liabilities of the seller. The purchaser acknowledges that no other representations were made to purchaser or relied upon by purchaser with respect to the quality or function of the products herein sold.**

Removal of the Sellers nameplate or any generic fan nameplate containing the fan serial number voids all warranties, either writ-ten or implied. Failure to complete and document all the pre-startup and post startup checks and perform the suggested routine maintenance checks voids all warranties, either written or implied.

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Limitation of Liability

Notice of any claim, including a claim for defect in material or workmanship, must be given to Seller in writing within 30 days after receipt of the equipment or other products. Seller reserves the right to inspect any alleged defect at Purchaser's facility before any claim can be allowed and before adjustment, credit, allowance replacement or return will be authorized. See RETURNS below. Seller's liability with respect to such defects will be limited to the replacement, free of charge, of parts returned at Purchaser's expense F.O.B. Seller's plant and found to be defective by the Seller.

In no event will seller be liable for special, indirect, incidental or consequential damages, whether in contact, tort, negligence, strict liability or otherwise, including without limitation damages for injury to persons or property, lost profits or revenue, lost sales or loss of use of any product sold hereunder. Purchaser's sole and exclusive remedy against seller will be the replacement of defective parts as provided herein or refund of the purchase price for defective products, at seller's sole option. Seller's liability on any claim, whether in contract, tort, negligence, strict liability or otherwise, for any loss or damage arising out of or in connection with purchaser's order or the products or equipment purchased hereunder, shall in no case exceed the purchase price of the equipment giving rise to the claim.

Responsibly

It is the understanding of the Seller that Purchaser and/or User will use this equipment in conjunction with additional equipment or accessories to comply with all Federal, State and local regulations. The Seller assumes no responsibility for the Purchaser's and/or User's compliance with any Federal, State and local regulations.

Returns

Cincinnati Fan & Ventilator Company assumes no responsibility for any material returned to our plant without our permission. An RMA (Return Material Authorization) number must be obtained and clearly shown on the outside of the carton or crate and on a packing slip. Any items returned must be shipped freight prepaid. Failure to comply will result in refusal of the shipment at our receiving department.

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Disclaimer

This manual, and all its content herein, is based on all applicable known material at the time this manual was created. **Any parts of this manual are subject to change at any time and without notice.**

If any statements, diagrams and/or instructions contained herein, for components not manufactured by the Seller, conflict with instructions in the manufacturer's manual (i.e.: motors, bearings, dampers, etc.), the instructions in the manufacturer's manual, for that component take precedent.

Should you want the latest version of this manual, please contact us or our sales office for your area. Or, you can print a current version by going to our website at: **cincinnatifan**.com.

Parts Drawing

Cincinnati Fan manufactures many models and arrangements with special variations. For that reason, the maintenance manuals contained on our website do not include a parts drawing nor the completed blower or fan specifications on page 2.

For the parts drawing of all the standard components and specifications for the specific blower or fan that you have, please contact our local Cincinnati Fan sales office for your area.

You will need to give them the serial number shown on the blower or fan nameplate so they can supply you the correct information.

Click on "Contact a Sales Rep" on our website for the name and contact information for our local sales office in your area.

Axial Fan

USER MANUAL

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