

## Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage!



### General Safety Information

Only qualified personnel should install this unit. Personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards. Other considerations may be required if high winds or seismic activity are present. If more information is needed, contact a licensed professional engineer before moving forward.

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC), the National Fire Protection Agency (NFPA), where applicable.
2. The rotation of the propeller is critical. It must be free to rotate without striking or rubbing any stationary objects.
3. Motor must be securely and adequately grounded.
4. Do not spin fan propeller faster than the maximum cataloged fan rpm. Adjustments to fan speed with Variable Frequency Drives (VFD) may affect motor load. If the fan RPM is changed, the motor current should be checked to make sure it is not exceeding the motor nameplate amps.
5. Do not allow the power cable to kink or come in contact with oil, grease, hot surfaces or chemicals. Replace cable immediately if damaged.
6. Verify that the power source is compatible with the equipment.

#### **DANGER**

Always disconnect power before working on or near a unit. Lock and tag the disconnect switch or breaker to prevent accidental power up.

#### **CAUTION**

When servicing the unit, motor may be hot enough to cause pain or injury. Allow motor to cool before servicing.

#### **CAUTION**

Precaution should be taken in explosive atmospheres.

## Receiving

Upon receiving the product, check the bill of lading to ensure all items were received. Inspect each crate for shipping damage before accepting delivery. Notify the carrier if any damage is noticed. The carrier will make notification on the delivery receipt acknowledging any damage to the product. All damage should be noted on all the copies of the bill of lading which is countersigned by the delivering carrier. A Carrier Inspection Report should be filled out by the carrier upon arrival. If damaged upon arrival, file claim with carrier. Any physical damage to the unit after acceptance is not the responsibility of Greenheck India Pvt. Ltd.

## Unpacking

Verify that all required parts and the correct quantity of each item have been received. If any items are missing, report shortages to your local representative to arrange for obtaining missing parts. Sometimes it is not possible that all items for the unit be shipped together due to availability of transportation and truck space. Confirmation of shipment(s) must be limited to only items on the bill of lading.

## Handling and Lifting

Handle in such a manner as to keep from scratching or chipping the finish. Damaged finish may reduce ability of unit to resist corrosion. Fans should not be lifted by the motor shaft, motor housing, fan impeller or fan accessories, to ensure proper operation, reliability and performance.

Fan model RA is to be lifted using a minimum of four (4) points on the fan housing or attach two suitable chains/straps around the entire fan housing, one near each duct flange. For flange mounted fans, attach suitably sized chains or lifting straps to two locations on the inlet and outlet flanges. The two chains/straps must be lifted at the same rate of speed.

### NOTE

Do not attach straps or lift the fan by the silencer.

## Storage

Units are protected against damage during shipment. If the unit cannot be installed and operated immediately, precautions need to be taken to prevent deterioration of the unit during storage. The user assumes responsibility of the unit and accessories while in storage. The manufacturer will not be responsible for damage during storage. These suggestions are provided solely as a convenience to the user.

**INDOOR** — The ideal environment for the storage of units and accessories is indoors, above grade, in a low humidity atmosphere which is sealed to prevent the entry of blowing dust, rain, or snow. Temperatures should be evenly maintained between 30°F (-1°C) and 110°F (43°C) (wide temperature swings may cause condensation and “sweating” of metal parts). All accessories must be stored indoors in a clean, dry atmosphere.

Remove any accumulations of dirt, water, ice, or snow and wipe dry before moving to indoor storage. To avoid “sweating” of metal parts, allow cold parts to reach room temperature. To dry parts and packages, use a portable electric heater. Leave coverings loose to permit air circulation and to allow for periodic inspection.

The unit should be stored at least 3½ inches (89 mm) off the floor on wooden blocks covered with moisture proof paper or polyethylene sheathing. Aisles between parts and along all walls should be provided to permit air circulation and space for inspection.

**OUTDOOR** — Units designed for outdoor applications may be stored outdoors, if absolutely necessary. Roads or aisles for portable cranes and hauling equipment are needed.

The fan should be placed on a level surface to prevent water from leaking into the unit. The unit should be elevated on an adequate number of wooden blocks so that it is above water and snow levels and has enough blocking to prevent it from settling into soft ground. Locate parts far enough apart to permit air circulation, sunlight, and space for periodic inspection. To minimize water accumulation, place all unit parts on blocking supports so that rain water will run off.

Do not wrap parts with plastic film or tarps as these cause condensation of moisture from the air passing through heating and cooling cycles. A covered shelter is preferred.

## INSPECTION AND MAINTENANCE DURING STORAGE —

While in storage, inspect fans once per month. Keep a record of inspection and maintenance performed.

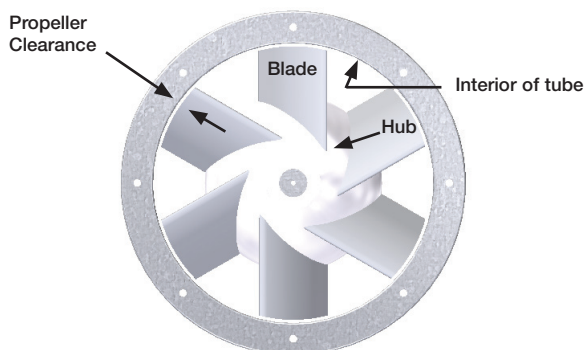
If moisture or dirt accumulations are found on parts, the source should be located and eliminated. At each inspection, rotate the fan propeller by hand ten to fifteen revolutions to distribute lubricant in motor bearings. Every three months, the fan motor should be energized. If paint deterioration begins, consideration should be given to touch-up or repainting. Fans with special coatings may require special techniques for touch-up or repair. Consult factory for details.

Machined parts coated with rust preventive should be restored to good condition promptly if signs of rust occur. Immediately remove the original rust preventive coating with petroleum solvent and clean with lint-free cloths. Polish any remaining rust from surface with crocus cloth or fine emery paper and oil. Do not destroy the continuity of the surfaces. Wipe thoroughly clean with Tectyl® 506 (Ashland Inc.) or the equivalent. For hard to reach internal surfaces or for occasional use, consider using Tectyl® 511M Rust Preventive or WD-40® or the equivalent.

**REMOVING FROM STORAGE** — As units are removed from storage to be installed in their final location, they should be protected and maintained in a similar fashion, until the equipment goes into operation.

Prior to installing the unit and system components, inspect the unit assembly to make sure it is in working order.

1. Check all fasteners on the fan, propeller, motor base, and accessories for tightness.
2. Rotate the fan propeller by hand and assure no parts are rubbing.
3. Ensure proper propeller clearance and alignment around the entire housing. Adjust the motor plate according to achieve this clearance.



Prop Cut Diameter for Std and High Temp			
Outer Tube	Inner Tube	Minimum Tip Clearance for Standard Temp Fan	Minimum Tip Clearance for High Temp Fan
315	225	1.0	3.5
355	225	1.0	3.5
400	225	1.0	3.5
450	225	1.0	4.0
500	225	1.0	4.0
500	325	1.0	4.0

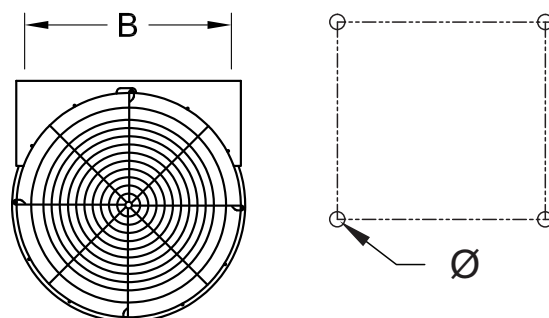
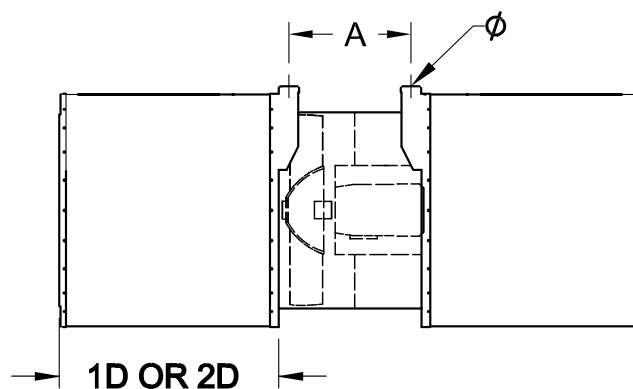
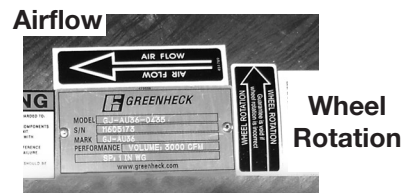
## Installation

The component parts of the fan assembly, including silencers, must be fully aligned before being bolted together so that no stress is placed on the equipment. After components are fully aligned, all bolts can be tightened in an alternating pattern.

The examples shown below is installed using standard mounting brackets. Before beginning installation, reference the airflow direction as indicated by the direction decal attached to the fan.

### Decals

This is the label for a model GJ-AU.



Mounting Pattern			
Unit Size	A	B	$\phi$
315-225	341	300	10
355-225	341	326	10
400-225	341	350	12
450-225	341	440	12
500-225	321	520	12
500-325	321	520	12

All dimensions are in millimeters.

## Mounting

The fan should be mounted either rigidly or through the use of vibration isolators. If vibration isolators are used, consideration should be given to ensure the safety of the installation. One method of ensuring safety is through the use of a drop rod that would ‘catch’ the fan if the isolator were to fail during normal operation or due to the excessive heat of a fire.

## Silencer Installation

The fan and silencers are shipped disassembled in order to prevent freight damage. Required quantity of bolts are provided for installation of silencer on fan. Ensure that the silencer is centered on the fan housing before tightening the bolts.

## Unit Start-Up and Operation

### Electrical Installation

Particular attention should be given when connecting power to the unit. The power cable should be installed to meet local requirements for high temperature operation. The power cable should be capable of meeting, as a minimum, the time and temperature applications which the fan is capable of.

Before electrical connections are made, the supply voltage, phase and ampere capacity must be checked for compatibility with the fan motor. In addition, the supply wiring must be properly fused and conform to local and national electrical codes.

The supply wires are then connected to an **optional** safety disconnect switch, to the **optional** wiring pigtail, or directly to the motor junction box.

### Pre-Start-Up Checks

1. Check all fasteners for tightness. Fasteners may come loose during transit or handling at the jobsite. This includes motor bolts, mounting brackets, and bushing bolts attaching the propeller to the motor shaft.
2. Ensure no debris, tools, or rubbish is near the fan inlet which might get pulled into the fan.
3. Propeller rotation should be in the same direction as the rotation decal affixed to the unit. For 3-phase installations, fan rotation can be reversed by simply interchanging any two of the three electrical leads.
4. Lead the power supply wires into the terminal box on the outside of the fan.
5. Ensure the wiring configuration is connected as per the wiring diagram on the motor.
6. Securely connect the motor ground wire and building ground wire to the ground connection post in the fan terminal box.



## Field Performance Adjustments

The performance of a GJ fan can be adjusted through the use of a Variable Frequency Drive (VFD) or adjusting the fan pitch.

### NOTE

Any change— increase or decrease—in fan speed (RPM) or blade pitch can represent a substantial increase in power required from the motor.

Check motor load amperage and compare to nameplate rating when changing the fan speed or blade pitch.

### Adjusting Performance with a Variable Frequency Drive

Before wiring a Variable Frequency Drive (VFD), determine that the motor is compatible with this type of equipment. Connecting a VFD to a non-compatible motor may reduce the life of the motor. Additionally, it is important to properly ground fans being wired with a VFD. For more information on these subjects, refer to Greenheck document “Are Bearing Currents Causing Your Motor Failures?” located at [www.greenheck.com](http://www.greenheck.com). Click on Application Info, then on Product Application Articles, and use the keyword “VFD”. Greenheck is not responsible for improper wiring of a VFD or for potential motor damage as a result of operating a fan over its maximum operating frequency.

## Maintenance

### WARNING

Disconnect and secure to the “Off” position all electrical power to the fan prior to inspection or servicing. Failure to comply with this safety precaution could result in serious injury or death.

Once the unit has been put into operation, a routine maintenance schedule should be set up to accomplish the following:

1. Lubrication of the motor if required.
2. Propeller, housing and bolts on the entire fan should be checked for tightness.
3. Any dirt accumulation on the propeller or in the housing should be removed to prevent unbalance and possible damage.
4. Inspection of fan propeller and housing looking for fatigue, corrosion or wear.

### Motors

Motor maintenance is generally limited to cleaning and lubrication. Cleaning should be limited to exterior surfaces only. Removing dust and grease buildup on the motor housing assists proper motor cooling. Never wash down the motor with high pressure spray.

### CAUTION

Do not allow water or solvents to enter the motor or bearings. Under no circumstances should motors or bearings be sprayed with steam, water or solvents.

Many motors are permanently lubricated for life and require no further lubrication.

Consult fan manufacturer for instructions on the removal or replacement motors.

### Infrequent Use

Infrequent use is defined as a fan that is used less than once per month or is used in emergency situations only.

The fan should be run at least four hours every month to ensure adequate lubrication in the motor bearings. Ideally this would be two hours every other week.

### Fasteners and Set Screws

A periodic inspection should include checking all fasteners and bolts for tightness. Particular attention should be paid to the bushing attaching the propeller to the motor shaft and the motor to its mounting fixture.

### Removal of Dust and Dirt

Dirt clogs the cooling openings on the motor housing, contaminates bearing lubricant and collects on the propeller causing severe imbalance if left unchecked. The exterior surface of the motor and propeller should be thoroughly cleaned periodically. Use caution and do not allow water or solvents to enter the motor. Under no circumstances should motors be sprayed with steam or water.

## Troubleshooting

Problem	Cause	Corrective Action
Excessive Noise	Propeller Rubbing Housing	Adjust motor plate. Tighten motor plate after centering propeller in housing.
	Bearings	Replace defective bearing(s). Lubricate bearings. Tighten collars and fasteners.
	Propeller Unbalance	Clean all dirt off propeller. Check propeller balance, rebalance in-place if necessary.
Volume Too Low	Fan	Check propeller for correct rotation. Check blade pitch.
Excessive Power Consumption High Horsepower	Fan	Check blade pitch.
Fan Doesn't Operate	Electrical Supply	Check fuses/circuit breakers. Check for switches turned off or disconnected. Check for correct supply voltage.
	Motor	Assure motor is correct horsepower and not tripping overload protector.
Bearings Overheated	Lubrication	Check for excessive or insufficient grease in the bearing.

# Maintenance Log

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## Our Commitment

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*As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.*

Specific Greenheck product warranties are located on [greenheck.com](http://greenheck.com) within the product area tabs and in the Library under Warranties.

Greenheck's High Performance Axial Fan catalog, Model RA, provides additional information describing the equipment, fan performance, available accessories, and specification data.

AMCA Publication 410-96, Safety Practices for Users and Installers of Industrial and Commercial Fans, provides additional safety information. This publication can be obtained from AMCA International, Inc. at [www.amca.org](http://www.amca.org).

