

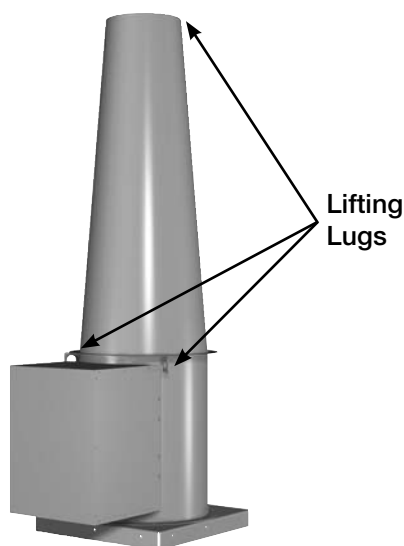
**READ AND SAVE THESE INSTRUCTIONS**

Model Vektor™-H

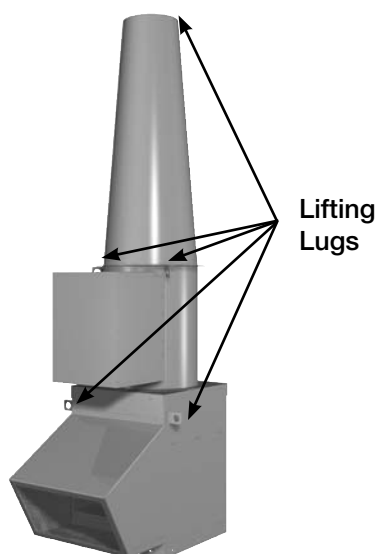
## Installation Operation and Maintenance Manual for Vektor-H Laboratory Exhaust System

**Receiving**

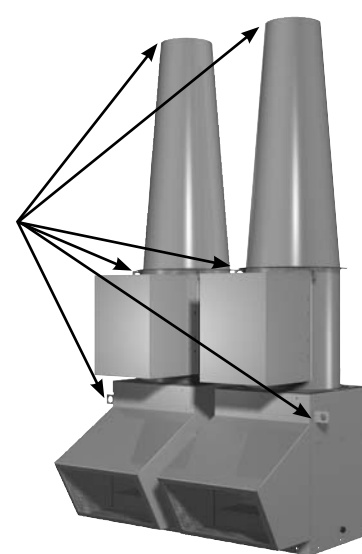
Greenheck model Vektor-H fans are thoroughly inspected, test run at the factory, and shipped on a skid or packaged to minimize damage during shipment. The transportation carrier has the responsibility of delivering all items in their original condition as received from Greenheck. The individual receiving the equipment is responsible for inspecting the unit for obvious or hidden damage and recording any damage on the bill of lading before acceptance of the equipment. All claims (if necessary) shall be filed with the final carrier.



**Single Blower  
System**



**Single Blower System with  
Bypass Air Plenum**



**Multiple Fan System with  
Bypass Air Plenums**

**Handling & Installation**

The Greenheck Vektor-H laboratory exhaust system is shipped in subassembly sections for easy rigging and installation. Depending on the options ordered, the sections can include: Roof Curb, Bypass Air Plenum Assembly, Blower Assembly, Stack Extension, and Discharge Nozzle.

The Vektor-H is designed to be self-supporting and standing (without the use of guy wires) when assembled per the instructions provided within this manual. The roof curb must be securely fastened to the roof structure in accordance with the contract documents. All subassembly sections have lifting lugs as shown.

**NOTE!**

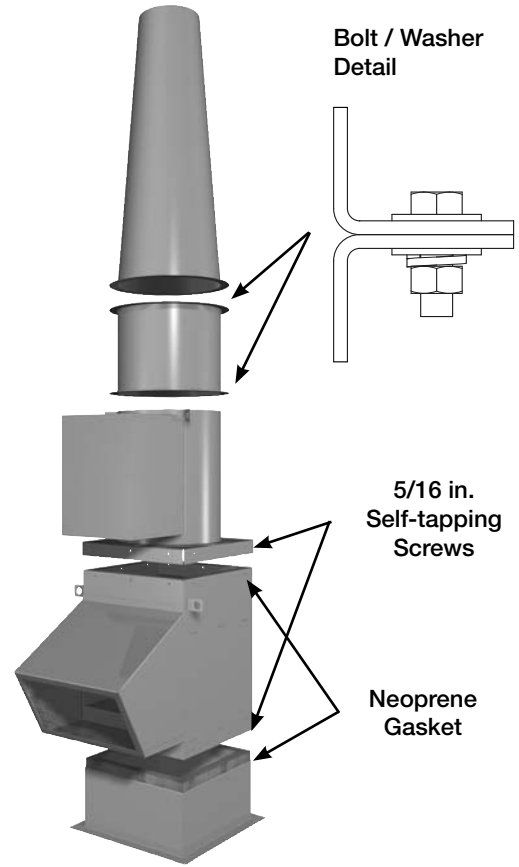
Lifting lugs on each subassembly are designed to handle the weight of the subassembly section only.  
Do not attempt to lift the entire system as a complete assembly.

**NOTE!**  
**Be sure to rig each section separately using the lifting lugs provided.**

**Installation Instructions**

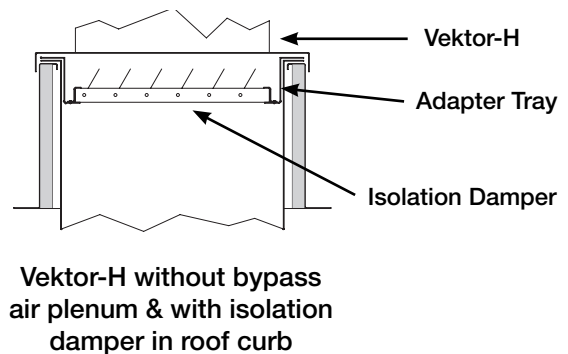
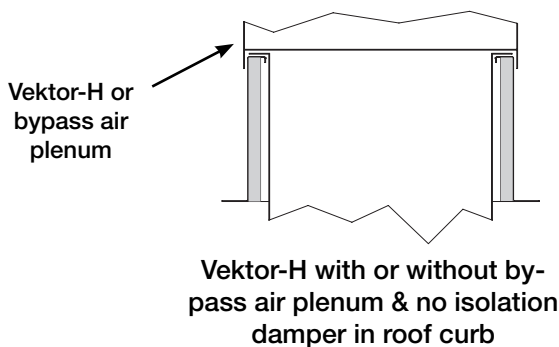
**Note:** When installing each section, be sure to rig each piece separately using the lifting lugs provided.

1. Mount roof curb to roof deck in accordance with local codes.
2. Install 3/16-inch thick x 1/2-inch wide, closed-cell neoprene gasket on the top edge of the curb, adhesive side down (gasket provided). Leave no gaps between gasket sections to ensure tight seal.
3. Place the bypass air plenum (BAP) onto the previously installed gasket and secured roof curb. If a BAP is not provided for the unit, skip to Step 5. Pre-drill pilot holes into the roof curb and attach the BAP to the roof curb using the provided 5/16-inch self-tapping screws. Screw fasteners are to be installed in all pre-punched curb holes.
4. Install 3/16-inch thick x 1/2-inch wide, closed-cell neoprene gasket on the top edge of BAP, adhesive side down (gasket provided). Leave no gaps between gasket sections to ensure a tight seal.
5. Place the curb cap of the fan housing onto the gasket and BAP (onto roof curb if BAP is not provided). Attach the curb cap using the provided 5/16-inch self-tapping screws. If a BAP is not provided, pilot holes must be drilled into the roof curb.
6. Install the final nozzle subassemblies as shown in the submittal drawing. Align flange bolt holes and fasten sections using the 316 stainless steel bolts, washers, and lock washers provided.
7. Follow electrical connection and pre-start-up checks as listed on page 3.



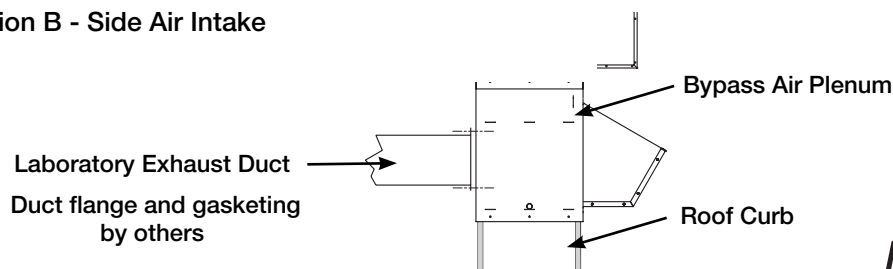
**Duct Connection to Curb**

The end of the customer supplied duct is secured between the roof curb's top edge and the curb cap of either the Vektor-H or bypass air plenum. If an isolation damper is present in the roof curb, the duct is located between the roof curb and the damper adapter tray.



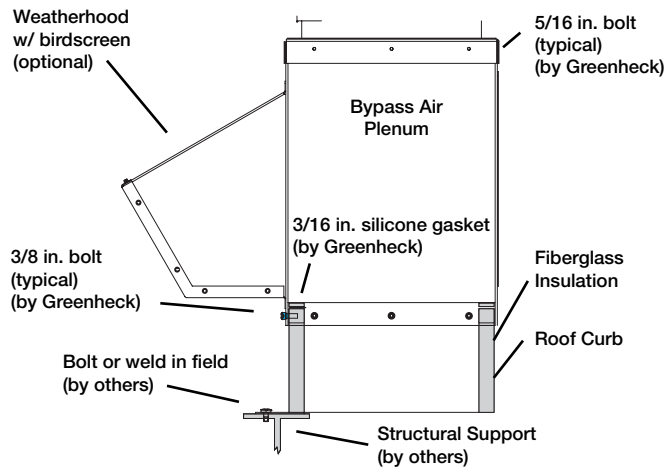
**Duct to Bypass Air Plenum**

Vektor-H with Option B - Side Air Intake

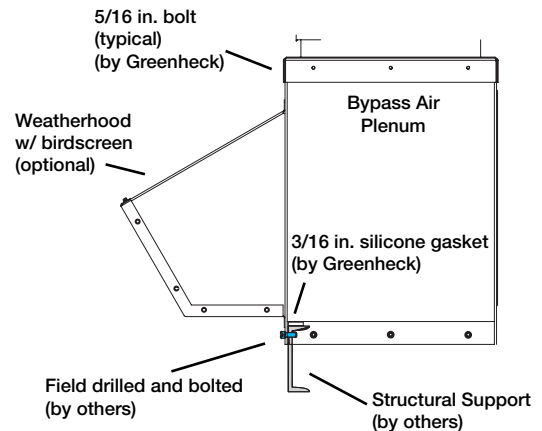


## Vektor Installation

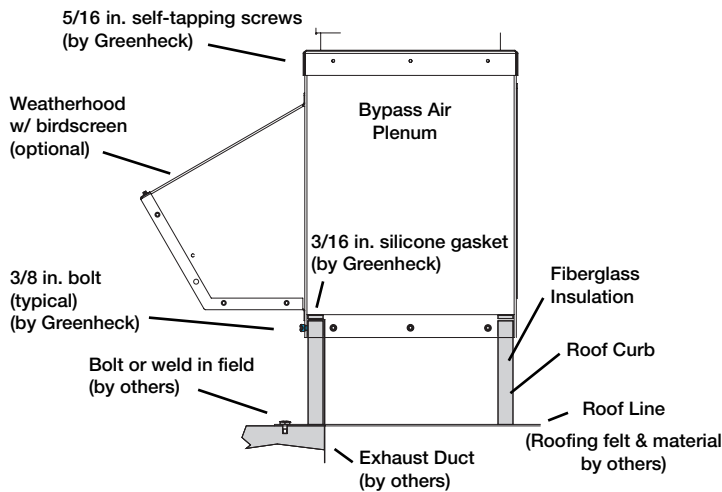
The figures below illustrates four common methods used to install Vektor systems. Methods used to attach a Vektor unit are dependent on local codes, roof construction design and roof construction materials. Consult an architect or structural engineer for proper means of attachment.



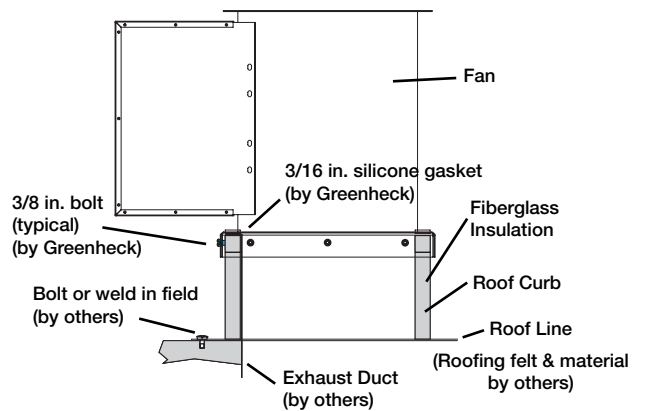
**Fan, Plenum, and Curb to Structural Steel**



**Fan and Plenum (no Curb) to Channel Base**



**Fan, Plenum, and Curb to Roof Deck**

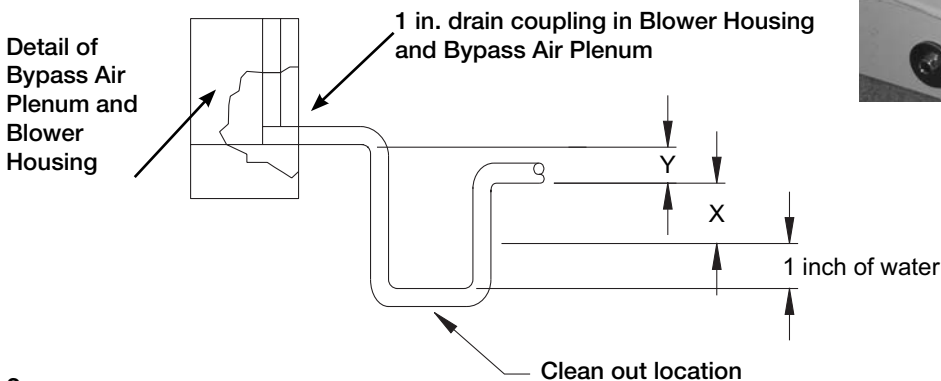


**Fan and Curb (no Plenum) to Roof Deck**

## Plenum Drainage Piping / Trap Detail (By Others)

There are multiple locations for pipe connections, one on each plenum section and another on each tubular fan housing. Each drain should be properly connected to a drainage system to ensure proper disposal of any water or condensate that may occur.

- Installed piping to have a downward angle to allow for drainage
- Fill trap to recommended level before start-up



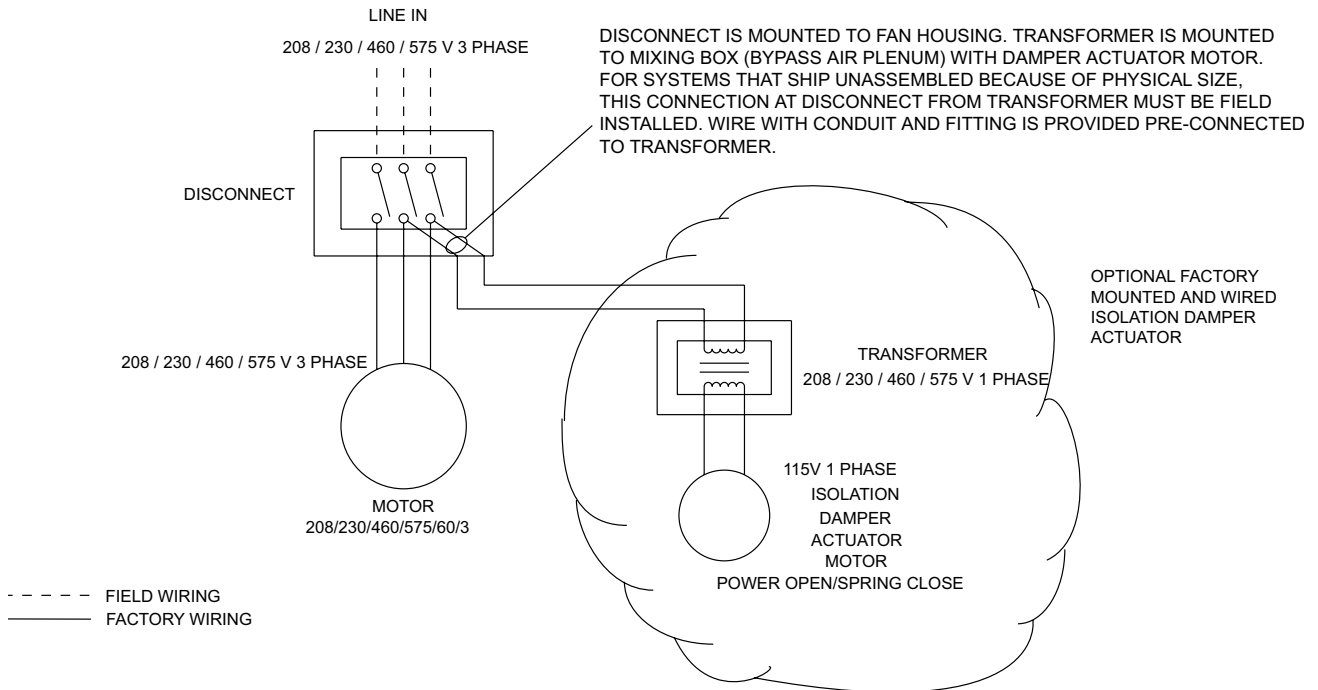
Y Dim  $\geq$  System Pressure  
X Dim  $\geq$  1/2 System Pressure

\*Dimension of X and Y are inches

## Electrical Connections

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. If the unit is supplied with a safety disconnect switch, ensure proper wiring to the fan motor. Be sure the disconnect is switched to the “OFF” position before connecting supply wires. If no disconnect is supplied, ensure the supply wire is not live before connection. Supply wires are then connected to the optional safety disconnect switch (if supplied) or motor.

## Motor - Disconnect Wiring / Isolation Damper Wiring Diagram



## Applications with Variable Frequency Drive (VFD)

For Vektor systems with single-point, three-phase wiring per blower, the isolation damper actuator will be powered via a step-down transformer, which is wired to the fan disconnect, as shown in the diagram above.

If fan flow (motor speed) is to be controlled using a variable frequency drive with this wiring, the reduced voltage and frequency supplied to the fan will cause control problems with the isolation damper actuator.

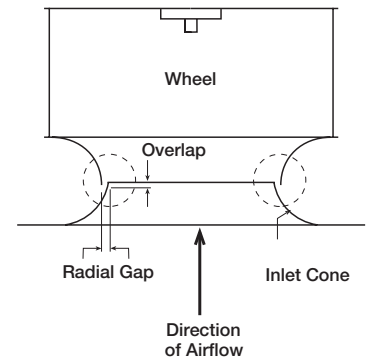
When a project’s Vektor control sequence requires the use of a VFD, it is suggested that the control contractor supply the isolation damper actuator voltage — independent of the power supplied to the Vektor fan motor.

## Pre-Start-Up Checks

1. Check all fasteners for tightness.
2. The wheel should be aligned as shown. Although the wheel position is preset and the unit is test run at the factory, movement may occur during shipment.

The radial gap should be consistent at all locations between the centrifugal wheel and the inlet cone. Centering may be accomplished by loosening the inlet cone bolts and repositioning the inlet cone.

To obtain the optimum performance, the centrifugal wheel must overlap the inlet cone. Adjustments can be made by loosening the set screws in the wheel and moving the wheel to the desired position.



3. Wheel 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. For single phase installations, follow the wiring diagram located on the motor.
4. Adjustable motor pulleys are preset at the factory for the specified fan RPM. Fan speed can be increased by closing or decreased by opening the adjustable pulley. Two or three groove variable pitch pulleys must be adjusted an equal number of turns open or closed.

**Note: Any increase in fan speed represents a substantial increase in horsepower required from the motor. Always check motor load amperage and compare to nameplate rating when changing fan speed.**

## Maintenance

### WARNING

**DISCONNECT ALL ELECTRICAL POWER TO THE FAN AND SECURE TO THE "OFF" POSITION PRIOR TO INSPECTION OR SERVICING. FAILURE TO COMPLY WITH THIS SAFETY PRECAUTION COULD RESULT IN SERIOUS INJURY OR DEATH.**

Once the fan has been put into operation, a periodic maintenance program should be set up to preserve the reliability and performance of the fan. Items to be included in this program are:

- **BEARINGS**
- **BELTS**
- **FASTENERS**
- **SET SCREWS**
- **MOTORS**
- **REMOVAL OF DUST/DIRT**

## Bearings

Bearings are the most critical moving part of the fan and should be inspected at periodic intervals. Locking collars and set screws, in addition to fasteners attaching the bearing to the bearing plate, must be checked for tightness. In a clean environment with temperatures above 32° F and below 200° F, fan shaft bearings with grease fittings should be lubricated semi-annually using a high quality lithium based grease. If unusual environmental conditions exist such as temperatures below 32° F or above 200° F, moisture or contaminants, more frequent lubrication is required.

With the unit running, add grease very slowly with a manual grease gun until a slight bead of grease forms at the seal. Be careful not to unseat the seal by over lubricating or using excessive pressure. Bearings without grease fittings are lubricated for life.

## Belts

Premature belt failures are frequently caused by improper belt tension (either too tight or too loose) or misaligned pulleys. The proper tension for operating a V-belt is the lowest tension at which the belts will not slip at peak load conditions. For initial tensioning, the proper belt deflection half-way between pulley centers is 1/64 inch for each inch of belt span. For example, if the belt span is 64 inches, the belt deflection should be one inch using moderate thumb pressure at midpoint of the drive.

Check belt tension two times during the first 24 hours of operation and periodically thereafter. To adjust belt tension, simply loosen four fasteners (two on each side of the motor plate) and slide the motor plate away from the fan shaft until proper belt tension is attained. On some fans, fasteners attaching the motor to the motor plate must be loosened in order to adjust the belt.

It is very important that the drive pulleys remain in proper alignment after adjustments are made. Misalignment of pulleys will result in premature belt wear, noise, vibration and power loss.

## Fasteners and Set Screws

A periodic inspection should include checking all fasteners and set screws for tightness. Particular attention should be paid to set screws attaching the propeller to the shaft and the shaft to the bearings. Loose bearing set screws will lead to premature failure of the fan shaft.

## Motors

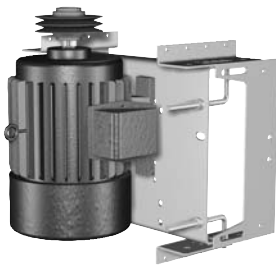
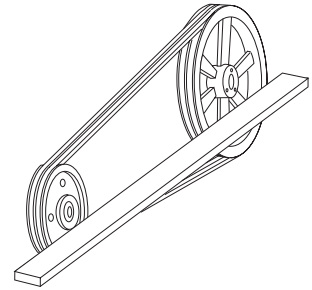
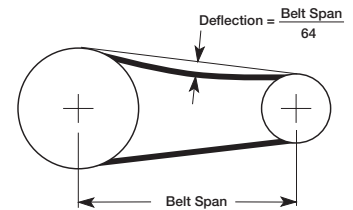
Many fractional horsepower motors installed on the smaller fans are lubricated for life and require no further attention. Motors supplied with grease fittings should be greased according to directions printed on the motor.

## Removal of Dust and Dirt

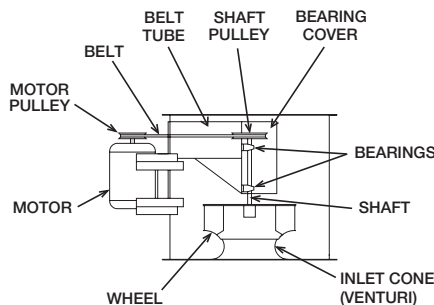
Dirt clogs cooling openings on the motor housing, contaminates bearing lubricant, and collects on the impeller causing severe imbalance if left unchecked. The exterior surface of the motor and impeller should be thoroughly cleaned periodically. Use caution and do not allow water or solvents to enter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

## Exhaust Fans Part List

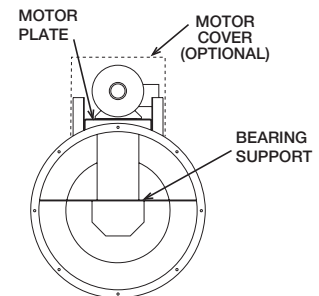
Each fan bears a manufacturer's nameplate with model number and serial number embossed. This information in addition to the parts list shown, will assist the local Greenheck representative and the factory in providing service and replacement parts.



### Side View



### Top View



## Our Warranty

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Motors are warranted by the motor manufacturer for a period one year. Should motors furnished by Greenheck prove defective during this period, they should be returned to the nearest authorized motor service station. Greenheck will not be responsible for any removal or installation costs.

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

