VFD Controlled Centrifugal Fans

Owner’s Parts and Instruction Manual

<table>
<thead>
<tr>
<th>HP</th>
<th>208V-230V (60hz)</th>
<th>460V (60hz)</th>
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<tr>
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Sioux Steel Company
Sioux Falls, South Dakota 57101
800-557-4689

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READ AND SAVE THESE INSTRUCTIONS

GENERAL SAFETY STATEMENTS

Thank you for choosing a Sioux Steel Company product. It is designed to perform and serve you for many years.

It is the goal of Sioux Steel Company to improve our products whenever it is possible and practical to do so. Sioux Steel Company reserves the right to change, improve, and modify products at any time without obligation to make changes, improvements, and modifications on previously sold equipment.

Safety is Sioux Steel Company’s main concern for you and those who are associated with the grain handling equipment. This manual is written to help you understand safe operating procedures, and some of the problems that may be encountered by operator or other personnel.

It is your responsibility as owner/operator to know what requirements, hazards, and precautions exist, and to inform all personnel associated with the equipment. Any alterations to equipment are strictly forbidden. Such alterations may result in serious injury or death and will void any warranty on product.

This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installation is made.

Carefully review this manual and its safety instructions before installing or operating this unit. Failure to read this manual and its safety instructions may lead to serious injury or death. If you do not understand any part of this manual or need assistance, contact your dealer.

Save the manual for future reference by personnel operating or maintaining the unit.

THIS MANUAL DESCRIBES THE OPERATION OF THE CENTRIFUGAL FAN. THIS PRODUCT IS IDEAL FOR THE CONDITIONING OF CORN, SOYBEANS, AND OTHER SELECT GRAINS. ANY OTHER USE IS CONSIDERED A MISUSE OF THE PRODUCT.

Caution:
Fan Units with VFD power supplies are programmed to match the original motor. Any unauthorized changes to the programming, wiring, and motor will void the warranty and possibly create a Safety Hazard.

Danger:
Fan Units with VFD power supplies store electrical energy. The motor circuit attached to the output can cause electrical shock until the stored charge is fully dissipated. Wait the prescribed time period after de-energizing the input power to the fan unit before servicing the motor or control component.
SAFETY

RECOGNIZE THE SAFETY ALERT SYMBOL
The above symbol means “ATTENTION! BE ALERT! YOUR PERSONAL SAFETY IS INVOLVED!” Note this symbol in instructions for important issues concerning your personal safety. Read each message carefully to avoid personal injury or death.

FOLLOW MACHINE SAFETY SIGNS & MESSAGES
Observe safe operating practices. Carefully read this manual and all safety signs on your equipment. Safety signs must be kept in good condition. Replace missing or damaged safety decals or shields. Safety and shields are available free of charge from Sioux Steel Company; 196 ½ E. 6th St., Sioux Falls, SD 57101-1265.

Learn how to use controls and operate equipment. Do not let anyone operate the unit (especially youth) without thorough training of operating and safety procedures.

Make no unauthorized modifications to equipment. Modifications may endanger function and/or safety of the unit. Periodically check all mechanical and electrical components. Keep unit in good working condition.

PRACTICE SAFE MAINTENANCE
Read and understand correct service procedures before operating. Keep area clean and dry to prevent accidents. Machine should never be lubricated, serviced, or adjusted while it is in operation. Hands, feet and clothing must be kept away from all moving parts. Keep all parts in good condition and properly installed. Fix any damage immediately. Qualified service personnel should replace worn or broken parts. Any built-up grease, oil, and debris around machine should be removed.

EMERGENCIES-KNOW WHAT TO DO
A first aid kit should be made readily available. In the event of fire, a fire extinguisher should be at hand. Have emergency numbers near your telephone for doctors, emergency medical squad, ambulance services, hospital, and fire department and also have written directions to your location.

WEAR PROTECTIVE CLOTHING

CLOTHING- Avoid baggy clothes to avoid catching on moving parts.
HEARING PROTECTION- When high noise levels are encountered, ear plugs or muffs should be used.
EYE PROTECTION- Safety glasses should be worn at all times to protect eyes from debris.
GLOVES- Always wear gloves to protect hands from sharp edges.
STEEL TOE SHOES- Appropriate shoes should be worn to protect toes from falling debris.
RESPIRATOR- In order to prevent breathing toxic fumes or dust, a respirator may be needed.
HARD HAT- Appropriate headwear should be worn to protect head from falling debris.
FALL PROTECTION- Appropriate fall protection should be worn when working at elevations greater than six feet (6’)

<table>
<thead>
<tr>
<th>SAFETY ALERT SIGNAL WORDS</th>
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<tbody>
<tr>
<td><strong>Signal Word</strong></td>
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<td>-------------------</td>
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<tr>
<td>DANGER</td>
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<tr>
<td>WARNING</td>
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<tr>
<td>CAUTION</td>
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<tr>
<td>NOTICE</td>
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WARNING: To reduce the risk of fire, electric shock, or injury to persons, observe the following:

1. Use this unit only in the manner intended by the manufacturer. If you have any questions, contact the manufacturer.
2. Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.
3. Installation work and electrical wiring must be done by a qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.

WARNING: To prevent explosion or fire:

1. Carefully review the operator's manual.
2. Clean under floor, as fines may cause a bin fire.
3. Do not use to exhaust hazardous or explosive material and vapors.
4. Disconnect and lock out all power sources before servicing equipment.

WARNING: Keep clear of all moving parts

1. Keep people (ESPECIALLY YOUTH) away from equipment, particularly during operation.
2. Keep away from all moving parts. Entanglement can cause serious injury or death.
3. Keep inlet guard in place and in good working condition.
4. If fan is wired for suction, outlet must be shielded to protect an individual from moving parts.

Failure to follow the above precautions may cause serious injury or death.

CAUTION: To avoid electrocution, all equipment must be properly wired and grounded according to electrical codes. Have unit wired by a qualified electrician.

Have your electrician install a main power disconnect switch capable of being locked only in the OFF position. Mark disconnect clearly as to the equipment it operates. Always LOCK OFF main power disconnect switch whenever equipment is not in use or when servicing the unit.
DANGER: Never enter bin, unless all power is locked off and another person is present. Rotating augers can kill or dismember!

Flowing grain may trap and suffocate. If you enter a bin of flowing grain you can be completely submerged in grain in seconds. Failure to heed may cause serious injury or death.

WARNING: Heater must be electrically interlocked with fan. Never operate heater without airflow. Failure to do so may cause serious injury or death.

CAUTION: To avoid personal injury, frequently inspect all mechanical and electrical components. LOCK OFF all power whenever servicing equipment. Replace and/or repair worn parts. Be sure all electrical wires are in good condition.

DANGER: Disconnect electricity before inspecting or servicing. Lock out all power and have another person present. Always lock off all power and check with voltage meter before servicing. Failure to do so may cause serious injury or death.
SAFETY DECAL LOCATIONS FOR CENTRIFUGAL FAN

Safety decals and shields are mounted whenever possible at the factory. Please check that all decals are in place according to these drawings and in good legible condition. To order replacement decals or shields (NO CHARGE) contact your dealer or Sioux Steel Company, 196 ½ E. 6th St., Sioux Falls, SD 57101-1265. Please specify serial number.

IMPORTANT! The following safety decals should be mounted on your equipment as shown below. (Note: When required, alternate languages are available upon request.) If suggested locations, are not clearly visible, place safety decals in a more suitable area. Never cover up any existing safety decals.

Make sure the location for the decal is free from grease, oil, and dirt. Remove backing from the decal and place in the proper position.

1. Warning – 165232 (Safe Operation Decal)

![WARNING]

**WARNING**

TO AVOID SERIOUS INJURY OR DEATH:
- READ OPERATOR'S MANUAL BEFORE OPERATING AND FOLLOW ALL PRECAUTIONS.
- KEEP SHIELDS AND DECA LS IN PLACE.
- KEEP CLEAR OF ALL MOVING PARTS.
- ALLOW NO CHILDREN OR UNQUALIFIED PERSONS TO Operate EQUIPMENT.
- KNOW HOW TO SHUT OFF POWER QUICKLY.
- KEEP PEOPLE, ESPECIALLY CHILDREN, AWAY FROM UNIT AT ALL TIMES.
- LOCK OUT ALL POWER AND HAVE ANOTHER PERSON PRESENT WHEN Servicing UNIT.
- FAILURE TO FOLLOW WARNINGS MAY RESULT IN SEVERE INJURY OR DEATH.
- CAUTION: DUTIES OF OPERATOR OR PERSONNEL HAVING ACCESS TO DANGEROUS PARTS OF FAN MAY BE HAZARDOUS UNDER SOME CONDITIONS.

2. Caution – 187928 (Use Lifting Lugs)

![NOTICE]

**NOTICE**

IF FORKLIFT IS NOT AVAILABLE, USE LIFTING EYES IN HOUSING TO MOVE FAN. NEVER LIFT ON MOTOR OR OTHER PARTS OF FAN.

3. Warning – 165231 (Disconnect (Electricity/Keep Guards in Place)

![WARNING]

**WARNING**

- Keep Guards and Screens in Place
- Disconnect Electrically Before Inspecting
- Check That Fan Blade is Tight on Shaft
- Failure to heed these warnings may cause serious injury or death

Sioux Steel Company includes all reasonable means for accident prevention except a safe and careful operator.

Sioux Steel Co.
Sioux Falls, SD 57101
1-800-557-4689

PN 165231

4. Rotation – 165287 (Apply as Shown)

![ROTATION]

5. Airflow – 165288 (Apply as Shown)

![AIRFLOW]

6. Voltage – 203689 (Hazardous Voltage)

![DANGER]

**DANGER**

HAZARDOUS VOLTAGE WILL CAUSE SEVERE INJURY OR DEATH
- Do not touch exposed parts of the fan before inspecting or servicing.
SAFETY DECAL LOCATIONS (Cont.)

7. Caution – 165234
   (When Lifting)

8. Caution - 176716
   (Tighten Set Screws)

CAUTION

WHEN LIFTING WITH FORK LIFT
BE CERTAIN TO CHAIN FAN TO FORK LIFT SO THAT
FAN WILL NOT TIP AND DAMAGE FAN.

CAUTION

BEFORE INITIAL OPERATION:
1. TIGHTEN ALL SET SCREWS IN FAN WHEEL.
2. TIGHTEN ALL SET SCREWS IN BEARINGS.
3. REPEAT AFTER 8 HOURS OF OPERATION.
4. REPEAT AGAIN AFTER 2 WEEKS OF OPERATION.

PN 176716
PRE-INSTALLATION REQUIREMENTS

**Foundation**- Use the dimensions shown on the installation section of manual to determine appropriate size of pad and location relationship to other equipment. Pad must be level for proper fan operation. Do not anchor fan to pad, allow fan to “float” on pad. Pad for fan should be poured 2” lower than top of bin foundation.

**Transition**- The transition duct should be of metal construction and allow for minimal resistance as it transfers airflow from fan to the bin plenum. Obstructions at bin plenum entrance should be removed prior to operating fan to avoid restricting airflow.

**Roof Exhaust**- There must be adequate exhaust ventilation to avoid excessive back pressure from building in bin. Serious bin damage could result if this is not followed.

**Power Supply**- For reliable fan operation, adequate power must be supplied for your application. Your power company should be contacted. They need to ensure that their system is sized properly for your particular installation.

**Wire Size**- Voltage drop can occur when undersized wire is used. This will result in motor overheating and shortened motor life. Refer to the chart in the electrical section for your particular application. Refer to the nameplate on your motor for the full load current specifications.

**Service Disconnect**- Each fan motor must be supplied with an independent power circuit, equipped with a fused disconnect switch. Locate this switch near the unit, as the power should be shut off before servicing fan. It is the customer’s responsibility to provide a appropriate fused disconnect, over current, short circuit, ground fault, and motor overload protection. These must be properly sized and connected to allow proper motor operation. Failure to provide these components could cause severe motor damage and void the manufacturer’s warranty.

UNLOADING / MOVING FAN

When unloading or moving fan with a fork lift, it is necessary to have forks fully engaged under fan and then to chain or in some other way tie the fan back to the forklift to prevent the fan from tipping over during transport and being damaged.

When using another method of unloading or moving fan, it is necessary to lift from the lifting eyes (which are the 2 large holes located in the upper top of the housing closest to the motor). No other part on the fan should ever be used for lifting or moving the fan.
1. Remove packaging materials and inspect fan for any shipping damages. Report these at once to the shipper.

2. Check all fasteners and electrical connections that may have loosened during shipment.

3. Rotate the fan wheel. Wheel must rotate freely and not contact the housing or inlet cone.

4. Install floor supports and unload for uniform airflow. The preferred arrangement is 100° between fan and unload. Be sure floor is strong enough to support grain column. If two fans are installed on bin, locate them about one bin sheet apart. Install single thermostat midway and use two-heater relay kit.

5. Pour concrete fan pad as shown above using proper dimensions for your application. All dimensions shown are for Sioux fans and transitions. (For Sioux transition information, see transition assembly manual packed with transition.)

6. Install transition.

7. Set fan equipment on pad.

8. Caulk fan, heater, and transition flanges (as required for your application) with a material rated up to 200° F.

9. Connect fan and heater together (if applicable). Make sure to center.

10. Connect fan (or assembly) to transition in like manner.

11. Secure all flanges with bolts provided.

12. Check that assembly is square with bin. Adjust leveling feet on fan until each supports equal weight. Check that leg beneath motor mount is in firm contact with pad. Make sure to level fan. Tighten lock nuts.

13. Check all joints and seams for air gaps. Any leakage of air will reduce the efficiency of your fan.
FAN CRADLE KIT OPTION (190323) (SHOWN BELOW) AVAILABLE FOR 5-25 HP CENTRIFUGAL FANS FROM SIOUX STEEL. SEE SEPERATE MANUAL 190349 FOR DETAILS.
IMPORTANT ELECTRICAL INSTALLATION INSTRUCTIONS!

DANGER: Always disconnect and lock out power before working on or around fan.

This unit should be installed by a qualified electrician in accordance with local, state, and federal electrical codes. Violation of the electrical codes could affect the warranty of the unit.

NOTICE:
When connecting power to a unit, a UL/cUL Type 3R or better connector must be used at the entry point into the electrical enclosure.

1. Verify that the incoming power supply has been deemed adequate by the local power company.
2. Verify that the wiring supplying power to the fan is sized correctly for the distance away from the supply and fan horsepower. (See wiring schematic on page 16 and 17)
3. Verify that the safety disconnect is installed and sized correctly for the fan size.
4. Install a machine to earth ground for each individual fan. See below on this page.
5. Provide manual disconnect on or near bin in clear view from fan. Use properly sized time-delay fuses or time-limit circuit breakers. Use properly sized safety ground wire.
6. The following wires must be supplied to each fan.

Error! Not a valid link.

CAUTION!!!
On VFD fan units provided with 1ph input power. Main 208-230V power connections must be made to L1 and L3. Failure to connect main input power to the proper terminals will cause the internal VFD cooling fans on the heat sink to not operate, which in turn will cause the VFD to overheat and shut down. Repeated over heating of the VFD heat sink will cause premature failure of the VFD and will void warranty!

Conduit Entries to a UL/cUL Type 3R enclosure should be made from the sides or bottom of the enclosure using a UL/cUL Type 3R rated conduit entry. Connect wires as shown (see wiring schematic on pages 16 and 17).

(Cont. on next page)
MACHINE TO EARTH GROUND
It is very important that machine to earth ground rods be installed at the fan. This is true even if there is a ground at the pole 15 feet away. This ground needs to be as close to the fan as possible, but no more than 8 feet away. The ground rods should be connected to the fan control panel according to the chart shown in the electrical diagram (pages 16 and 17) using the chart input ground column, or in accordance with local requirements. The machine to earth ground provides additional safety if there is a short. It also provides the grounding necessary for long life and operation of the solid state circuit boards used on control circuits and the electronic ignition systems.

Proper Installation of the Ground Rod
(Ground rods and wires are not supplied). It is recommended that the rod not be driven into dry ground. The following steps ensure proper rod installation:

1. Dig 2 holes large enough to hold 1 to 2 gallons of water far enough apart depending on the ground resistance in your area.
2. Fill holes with water.
3. Insert 5/8” diameter x 8’ long bare copper rods through water and jab it into the ground.
4. Continue jabbing the rods up and down, the water will work its way down the holes, making it possible to work the rods completely into the ground. This method of installing the rods gives a good conductive bond with the surrounding soil.
5. Continue working rods down until top of rods are 1’ below the surface of the ground.
6. Connect the bare copper ground wires to the rods with the proper ground rod clamps.
7. Connect one bare ground wire to the VFD in the fan control box.
8. Connect the other green ground wire to the grounding block located on din rail.
9. Ground wires must not have any breaks or splices. Insulated wire is not recommended for grounding.
FINAL CHECK

- Check that all safety guards and screens are in place and not damaged. If parts are damaged replace them.
- Check to make certain all decals are visible, legible, and not damaged. If decals are damaged, replace them.
- Check control boxes to make sure they are completely closed and no wiring is exposed.

TEST RUN

When the fan is completely installed, the unit will need to be checked for proper rotation. Provide power to the fan controls and start the fan momentarily. Fan wheel rotation should be in the same direction as rotation decal indicates. If the decal is missing or damaged, note that wheel rotation should be as indicated below. If wheel is rotating in the wrong direction, have a qualified electrician correct wiring.
230VAC/1PH/10-30HP ELECTRICAL SCHEMATIC

SIoux Steel Co.
196 ½ 6th Street
Sioux Falls, SD 57101
1-800-557-4689

Warning!
Disconnect all power to starter prior to servicing

General Notes:
1) Field wiring: Use copper conductors only, rated 75°C or greater.
2) Replace all fuses with same or equivalent type, amperage & voltage ratings.
3) All EQ7 VFD Units must have their branch circuit protection sized per the VFD specifications, not the motor load connected.
4) Motor overload circuit protection provided by the VFD is set based on the FLA ratings shown in the chart for 230V motor loads.

<table>
<thead>
<tr>
<th>Wire Size (Awg)</th>
<th>Wire Size (Awg)</th>
<th>Branch C.B. (Amps)</th>
<th>Motor Part#</th>
<th>FLA @ 230V</th>
<th>Hz</th>
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<tbody>
<tr>
<td>Input 4</td>
<td>Output 6</td>
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<td>125</td>
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<td>4/0</td>
<td>3</td>
<td>300</td>
<td>S180576</td>
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</tbody>
</table>
208-230/460VAC/3PH/10-50HP ELECTRICAL SCHEMATIC

SIOUX STEEL CO.
196 ½ 6TH STREET
SIOUX FALLS, SD 57101
1-800-557-4689

WARNING!
DISCONNECT ALL POWER TO STARTER PRIOR TO SERVICING

SEE TABLE BELOW
INCOMING POWER CONNECTIONS
DISC. & CIRCUIT PROTECTION PROVIDED BY ON SITE E.C.
CONNECTIONS TO BE MADE IN ACCORDANCE WITH NEC STANDARDS

SEE TABLE BELOW
TECO VARIABLE TORQUE VFD POWER CONNECTIONS

SEE TABLE BELOW
18AWG. BLACK

18AWG. BLUE

GENERAL NOTES:
1) FIELD WIRING: USE COPPER CONDUCTORS ONLY, RATED 60°C OR GREATER.
2) REPLACE ALL FUSES WITH SAME OR EQUIVALENT TYPE, AMPERAGE & VOLTAGE RATINGS
3) OVERLOADS FOR 230V STARTERS ARE SET BASED ON 230V INCOMING POWER, CONSULT FACTORY IF CONNECTING TO 208V INCOMING POWER

<table>
<thead>
<tr>
<th>WIRE SIZE(Awg.)</th>
<th>WIRE SIZE(Awg.)</th>
<th>BRANCH C.B.(AMPS)</th>
<th>MOTOR PART#</th>
<th>FLA</th>
<th>Hz</th>
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<td>GND</td>
<td>OUTPUT</td>
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<td>20HP(230V)</td>
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<td>25HP(230V)</td>
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<td>30HP(230V)</td>
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<td>50HP(460V)</td>
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<td>75</td>
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OPERATION

After initial installation and also prior to using the unit each season, check the operation to ensure proper functioning, adjustment, and reliability.

FAN START-UP

1. Fan must be properly installed and connected as described in the installation section of this manual. All seams and joints must be sealed.
2. With main power supply turned OFF, rotate the wheel by hand to make sure it turns freely without contacting the housing or inlet cone.
3. Roof vents should be checked for blockage. If blockages are found, remove blockage. Open manway door and top lid door for additional ventilation.
4. Turn ON main power disconnect switch. (All Guards and screens must first be secured in place.)
5. When pressing the START button:
   A. Ensure wheel is rotating in proper direction per decal on housing. Electrician may rewire if direction is incorrect.
   B. Ensure motor amperage is not exceeded by checking the current draw of the motor. Maximum F.L. Amps listed on motor should never be exceeded.

FAN SHUT-DOWN

1. Press the fan STOP button on control box (if equipped).
2. Shut off electrical power at main and at disconnect.
3. Close manway and top lid doors. Cover fan inlet to prevent harmful back-draft air currents from passing through the grain and to avoid grain infestation from rodents and insects.

GRAIN QUALITY

Grain must be kept cool, dry, and insect free to prevent spoilage.

Notice: Please contact your local Cooperative Extension Services for area guidelines.

GRAIN STORAGE

<table>
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<tr>
<th>Recommendations</th>
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<tbody>
<tr>
<td>Season</td>
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<tr>
<td>--------</td>
</tr>
<tr>
<td>Summer</td>
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Notice: For guidelines/methods/recommendations on specific grain type storage, please contact your local Cooperative Extension Services.
MAINTENANCE

KEEP ALL GUARDS AND SCREENS IN PLACE.
DISCONNECT ALL POWER SOURCES
BEFORE DOING ANY REPAIR, MAINTENANCE OR INSPECTIONS!

BEGINNING OF EACH DRYING SEASON:
1. Remove inlet screen. Check for foreign material on fan wheel. With power locked off, turn fan by hand to be sure it rotates freely.
2. VFD power must be turned on for 8 hours and allowed to acclimate if left off over the winter.
3. Lubricate fan motor bearings with high temperature grease as indicated on motor nameplate or motor fact sheet. Do not over grease. Check ventilation openings in motor for any blockage.
4. Check wiring of fan. Look for loose connections, bare wires, or rodent damage. Be sure to check ignition wire and flame sensor wires for any damage.

AFTER DRYING SEASON:
The balance of a centrifugal blade is very critical. Vibration can cause the fan housing to crack. To prevent this, check behind the blade for dirt, dust, or foreign material.
Cover fan inlet to keep out weather, pests, and to prevent “wind milling” which can cause wear on the start switch in single phase motors.

DURING OFF SEASON:
If possible, the power should remain on during the winter to prevent moisture in VFD.
Every six weeks, remove inlet cover and operate fan to redistribute grease in bearings. Let motor warm up enough to force out any accumulated moisture.
Make sure control box cover is in place and secured. Turn off power.

VFD FILTER:
It is recommended that the VFD control box fan filter be changed every 6 months. Replacement filter part number is S203674. Please contact your dealer or Sioux Steel to order replacement filter.

ATTENTION: Sioux cannot warrant any roof damages due to excessive vacuum or internal pressure caused by operating fans. Adequate ventilation should be provided for all powered air systems. Sioux does not recommend the use of downward flow systems (suction). Severe roof structural damage can result from any blockage of air passages.
To prevent structural damage to bin roof, roof vents and discharge louver must be free of ice or other obstructions before starting aeration fans. Operation of aeration fans during certain adverse weather conditions can cause icing of roof vents and/or discharge louver, which may result in roof failure.
Operating fan with bin empty may dislodge floor supports and cause floor to fail when bin is filled.
FAN WHEEL REMOVAL AND INSTALLATION

Lock out all power before starting this process. Distance from venturi inner edge to fan wheel back plate affects air inlet and motor load. This distance must be maintained. See Wheel to Inlet Cone Standard Clearance chart on the page 23 for the proper distance for your fan size.

REMOVAL
1. Remove screen guard and venturi.
2. Loosen wheel set screws.
3. Support wheel adequately to keep wheel from falling, then slide wheel off motor shaft.
4. Retain key from motor shaft.

INSTALLATION
1. Elevate wheel to motor shaft. Make sure key is in motor shaft.
2. Align wheel to motor shaft and key.
3. Slide wheel over motor shaft to proper depth (see page 23).
4. Tighten socket set screws using appropriate torque values shown below.
   - 10-15 HP: 21 ft/lbs (16 ft/lbs for square head set screws)
   - 20 HP: 50 ft/lbs (38 ft/lbs for square head set screws)
   - 25-50HP: 97 ft/lbs (73 ft/lbs for square head set screws)
5. Reattach screen guard and venturi. (Note: adjust venturi so that it does not rub on wheel when rotated.)

CAUTION! KEEP AWAY FROM MOVING FAN WHEEL!

FAN MOTOR REMOVAL AND INSTALLATION

In the event of motor failure, remove the motor as described below, and take it to the nearest service center. An authorized service center is the only place that can provide possible motor warranty. Motor service and repair at other places will be at owner’s expense.

If the service center determines motor failure is caused by faulty material or workmanship within the warranty period, repair will be covered under the warranty. Motor failure caused by external sources will result in a charge to the owner for repair.

Replace motor with OEM replacement to assure proper VFD parameter settings.

REMOVAL
1. Make certain power is shut off and locked out.
2. **CAUTION:** Allow 30 minutes minimum for VFD bus discharge and/or check Bus Charge Lamp before working on motor.
3. Remove wheel as shown in previous section.
4. Disconnect the motor leads from motor. Identify wires using tags for reassembly later.
5. Remove motor mount bolts and hardware. Note the correct set of holes the bolts were removed from.
6. Remove motor.

INSTALLATION
1. Set motor on base and align on proper set of holes.
2. Reinstall bolts and hardware into their previous locations. Tighten when properly oriented.
3. Reconnect motor leads to motor noting their previous locations.
4. Reinstall wheel as shown in previous section.
TROUBLESHOOTING GUIDE

CAUTION
THE PROCEDURES OUTLINE BELOW ARE FOR USE BY ONLY QUALIFIED PERSONNEL

To check line voltage:

**Single Phase**: Line voltage should be present between terminals L1 and L3. If voltmeter does not indicate proper voltage, check power supply.

**Three Phase**: Check line voltage between terminals L1 & L2, L1 & L3, L2 & L3. If voltmeter does not indicate proper voltage, check power supply.

**VFD DOES NOT ENERGIZE**

1. Verify circuit breaker is in the on position.
2. Confirm you have proper power supplied to the VFD and that the Service Disconnect fuses are not blown.
3. If you have confirmed that the proper power is being supplied insure that the proper terminal connections have been made.
4. If item 2 and item 3 are correct and the drive will still not energize please consult factory.

**VFD FAN DOES NOT START PROPERLY**

1. If the fan VFD is energized but will not activate the motor when the start button is pressed check that the motor connections to the VFD have been installed correctly according to the schematics provided in this manual.
2. Check that there are no Fault conditions in the VFD, which will be displayed on the VFD keypad. The keypad will indicate what the fault condition is. Most common Fault conditions are listed below.
   a. **Motor Overload Tripped** – Check for proper motor wiring and/or faults in the motor
   b. **Voltage or Phase loss to the Inputs** – Check your incoming power for voltage loss or phase loss
   c. **Under Temp./Over Temp.** – Due to the variable temperature ranges and climates, if the fan assembly is not given proper ventilation the temperature of the VFD may exceed the upper or lower threshold of the VFD. **1ph Input Models: Insure input power connections have been made to L1 and L3 on the VFD.** Sioux Steel addresses temperature conditions by installing a panel heater and ventilation fan, but cannot account for large temperature swings or extreme conditions

**FAN MOTOR RUNS BUT WILL NOT CHANGE SPEED**

1. Possibly caused by a faulty selector switch.
   a. Insure that the switch is not physically damaged and that it does change from one position to the next.
   b. To check for a bad contact use a volt meter and place one probe to the common terminal on the VFD terminal and the other probe on the corresponding VFD input terminal (see wiring schematics for details). Once probes are connected activate the selector switch and check voltage readings. You should get 24VDC to the input terminal. If you do not check for loose wire connections. If there are no loose wires consult factory for assistance.

(Cont. next page)
FAN SHUTS OFF, OVERLOAD TRIPPED

1. Check incoming voltage, both with no load and with fan running. If voltage is low, consult Power Company.

2. Amperage readings should be a maximum of 10% above motor nameplate amperage for motors with a 1.15 service factor. Amperage readings should not exceed nameplate amperage on motors with a service factor 1.00. If amperage is too high, loosen set screws on motor shaft and slide fan wheel away from motor. Use Loc-Tite (or similar product) when re-tightening set screws. Tighten keyway set screw first. On fans using the overload, the amperage adjustment dial should be set at the motor full load amperage according to the motor nameplate. All overloads installed at the factory are pre-set to the proper amperage.

WARNING! Increasing the adjustment of this dial could cause motor damage, if an overload were to exist.
## SPECIFICATIONS

### 1750 RPM Fan Dimensions - Inches

<table>
<thead>
<tr>
<th>HP</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<tr>
<td>10</td>
<td>42</td>
<td>50 1/2</td>
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<td>32 5/8</td>
<td>16 11/16</td>
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<td>20</td>
<td>48 1/2</td>
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<td>59 1/2</td>
<td>33 3/4</td>
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<td>21 7/8</td>
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<td>25 1/4</td>
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### Wheel to Inlet Cone Standard Clearance

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<th>40 HP</th>
<th>50 HP</th>
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These dimensions must be maintained within 1/8" when re-assembling wheel and inlet cone. Fan efficiency and/or vibration can occur if dimensions are not adhered to.
DISCHARGE BOLT PATTERN DIMENSIONS

10 TO 40 HP

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<thead>
<tr>
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50 HP FAN DIMENSIONS - INCHES

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</table>
NEW PRODUCT WARRANTY

GRAIN BINS

LIMITED WARRANTY FOR NEW SIOUX STEEL COMPANY PRODUCTS

A. GENERAL PROVISIONS. “Sioux Steel” means Sioux Steel Company, 196 1/2 East Sixth Street, Sioux Falls, South Dakota 57104. The warranties described below are provided by Sioux Steel to the original purchasers of new products purchased from Sioux Steel or from an authorized Sioux Steel Dealer (the “Products”). Under these warranties, Sioux Steel will, at its option, repair or replace at its factory any Product covered under these warranties which is found to be defective in material and workmanship during the applicable warranty term or refund the purchase price paid for the defective Product. Customer will be responsible for labor charges for removing the defective Product and reinstalling the repaired or replacement Product, any premium charge for overtime labor requested of Sioux Steel and shipping charges to and from Sioux Steel’s factory. These warranties are not transferrable.

B. WARRANTY PERIOD. Subject to exclusions and limitations set forth herein, each new Product is warranted for the number of years specified below. Each warranty term begins from the date of purchase regardless of delay in receipt of the Product by Customer due to the time required to process, handle, ship, assemble, construct and install the Product. Customer must retain proof of the date of purchase. Replacement parts for and repairs to the Product will be warranted only for the remainder of the original warranty term. The replacement parts for or repairs to the Product will not extend the warranty term beyond the original warranty term. Products described below include all parts, components and accessories.

<table>
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<th>GRAIN BINS</th>
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<tr>
<td>Farm Use Grain Bins</td>
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<tr>
<td>Commercial Use Grain Bins</td>
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<tr>
<td>Centrifugal Fans, Axial Fans and Axial Heaters</td>
</tr>
<tr>
<td>Bin Accessories, including Bucket Elevators, Conveyors, Cage and Ladder Systems, Catwalks and Towers, Grain Dryers and Peak Walk-Arounds</td>
</tr>
<tr>
<td>New Daay Paddle Bin Sweep</td>
</tr>
<tr>
<td>Daay Power Sweep</td>
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</tbody>
</table>

Exclusions specific to Grain Bins: Damage or loss of any kind from (1) excessive vacuum or internal pressure from the operation of fans in an empty grain bin and from the blockage of air passages for any reason including, but not limited to, the blockage of roof vents and discharge louveres by ice and snow; (2) a failure to properly compact and engineer soils; (3) a failure to properly construct footings and foundations; and (4) exposure to conditions in excess of, or not meeting, as the case may be, the wind and snow load requirements of each grain bin model.

C. ITEMS COVERED SEPARATELY. The Sioux Steel warranties do not cover any parts, components or materials that are part of the Product, or used in conjunction with the Product, that are not manufactured by Sioux Steel. Such parts, components and materials will be subject to the warranties provided by the manufacturer, if any. Manufacturers of electric motors provide warranty service only through authorized service centers. Service center locations are identified on the World Wide Web at www.baldor.com. Sioux Steel will not be responsible for motor repair or replacement.

D. WHAT IS NOT WARRANTED. Sioux Steel does not warrant and is not responsible for the following: (1) used products; (2) modification or alteration of the Products; (3) Products that have not been properly installed or not installed in accordance with the instruction manual, improper assembly, or improper construction by any persons other than Sioux Steel employees; (4) depreciation, damage or loss caused by the use of parts, components or accessories not provided by Sioux Steel, unauthorized repair, normal wear, lack of necessary maintenance, corrosion of corrosive materials, accidents or acts of nature including lightning, flooding, hail, straight winds and tornadoes; and (5) cosmetic damage or damage that does not hinder the functionality of the Products.

E. LIMITATIONS OF WARRANTIES AND CUSTOMER’S REMEDIES. To the extent permitted by law, neither Sioux Steel, the Dealer nor any person or company affiliated with either of them makes any warranties, representations, conditions or promises express or implied as to the quality, performance or freedom from defects of the Products covered by these warranties other than those set forth herein. THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER SIOUX STEEL, THE DEALER, NOR ANY PERSON OR COMPANY AFFILIATED WITH EITHER OF THEM WILL BE LIABLE FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INCIDENTAL, SPECIAL, EXEMPLARY, CONSEQUENTIAL, LOST PROFITS AND REVENUES, LOST USE OF THE PRODUCTS OR ANY OTHER PROPERTY, BODILY INJURY OR PROPERTY DAMAGE CLAIMS, WHETHER AGAINST ANY PERSON, PERSONAL INJURY, PROPERTY, COMMODOITIES, REMOVAL OR STORAGE COSTS FOR THE PRODUCTS, OTHER EQUIPMENT AND COMMODITIES, DAMAGE TO THE ENVIRONMENT ARISING FROM OR IN ANY MANNER RELATED TO ANY RELEASE OF HAZARDOUS MATERIALS, AND REMEDIATION EXPENSES THEREFORE, WHETHER BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER LEGAL BASIS, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO INSTANCE WILL SIOUX STEEL, THE DEALER OR ANY PERSON OR COMPANY AFFILIATED WITH EITHER OF THEM BE LIABLE TO CUSTOMER OR ANY PERSON IN AN AMOUNT IN EXCESS OF THE PURCHASE PRICE PAID BY CUSTOMER FOR THE PRODUCT.

F. NO DEALER WARRANTY. THE DEALER HAS NO AUTHORITY TO MAKE ANY WARRANTY, REPRESENTATION, CONDITION OR PROMISE ON BEHALF OF SIOUX STEEL, OR TO MODIFY THE TERMS OR LIMITATIONS OF THIS WARRANTY IN ANY WAY.

G. GOVERNING LAW/VEHICLE. These warranties, and all terms set forth herein, are governed by the laws of the State of South Dakota and, where applicable, the laws of the United States of America. Any and all disputes arising from these warranties, the purchase and use of the Products, bodily injury and property damage claims or otherwise must be heard in the South Dakota Circuit Court sitting in Minnehaha County, South Dakota.

H. SECURING WARRANTY SERVICE. In order to receive warranty services, customer must give Sioux Steel written notice of a warranty claim within 30 days of the date of discovery of the defective materials or workmanship, and Customer must complete the following steps:

1. Obtain from Sioux Steel a Return Goods Authorization Number (“RGA Number”) by calling the Customer Service Department at 1-800-557-4689, and providing the following information:
   - An explanation as to why the Product is being returned.
   - The name of the territory representative, Dealer or Sioux Steel salesperson from whom the Product was purchased.
   - The Dealer’s identification number.
   - The invoice number and date of purchase.
   - Customer’s name, phone number, fax number, mailing address and email address.
   - The date that the Product will be returned.

2. Pay the shipping charges to ship the Product to Sioux Steel’s factory, and the return shipping charges.

3. Ship the Product to Sioux Steel at 196 1/2 East Sixth Street, Sioux Falls, South Dakota 57104.