INSTALLATION & OPERATING INSTRUCTIONS

FOR MODEL:

689A-001A * 30 Hp, 460V, 3 PHASE
689B-001A * 30 Hp, 208/230V, 3 PHASE
689C-001A * 30 Hp, No Controls
689D-001A * 40 Hp, 460V, 3 PHASE
689E-001A * 40 Hp, 208/230V, 3 PHASE
689F-001A * 40 Hp, No Controls
689G-001A * 50 Hp, 460V, 3 PHASE
689H-001A * 50 Hp, 208/230V, 3 PHASE
689I-001A * 50 Hp, No Controls

SHIVVERS MANUFACTURING, INC.
614 W. English Street
Corydon, IA 50060
Ph. (641) 872-1005 ** Fax (641) 872-1593
www.shivvers.com

P-12571
11/14/12
SHIVVERS WARRANTY

Two Year Pro-Rated Warranty:

SHIVVERS' Circu-Lator, Dri-Flo and related equipment and accessories manufactured by SHIVVERS Manufacturing, Inc. are guaranteed under this limited warranty for the first season of harvest operation, regardless of purchase date, when installed in accordance with the applicable installation manuals, and operated as directed in the SHIVVERS "Operator's Safety Manual", the "Circu-lator or Dri-Flo Operating Instructions", the SHIVVERS "CompuDry Command Center Operating Instructions", if so equipped, and other applicable operating manuals. Under this warranty, SHIVVERS will repair or replace such parts as are returned to us and found defective.

During the second season of harvest operation, SHIVVERS will repair or replace at 50% of the retail price, such parts which are returned to us and found defective.

V-Belts are not covered by this warranty.

Electric Motors (including Spreader Motors) are under Warranty of the motor Manufacturers and are not covered by the SHIVVERS Warranty. Warranty for motors must be handled through an authorized motor service center for that Manufacturer.

SHIVVERS makes no Warranty of any kind, expressed or implied, except as stated herein and buyer assumes all risk and liability resulting from the use of products manufactured by SHIVVERS, whether used singly or in combination with other products.

ATTENTION:

Circu-Lator and Dri-Flo will set up flow patterns of grain which exert extra stress on the walls and floor of your bin. Additional floor supports are required for your drying floor. Bin-side wall stiffeners are required. You should consult the bin and floor Manufacturers for their recommendations before using Circu-Lator or Dri-Flo. SHIVVERS will not be responsible for structural failure of your drying floor or bin, or for any loss, damage or injury relating to use of Circu-Lator or Dri-Flo.

For purposes of this Warranty, "Season of Harvest" is defined as the period of time between June 1st and December 31st of a calendar year.
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INTRODUCTION

 COMPLETELY READ THIS MANUAL AND THE OPERATOR’S SAFETY MANUAL (P-10001) BEFORE INSTALLING OR USING THE SHIVVERS CENTRIFUGAL FAN.

This manual is intended for use with a Shivvers DWDI Centrifugal fan connected to a Shivvers Blue Flame II MAX burner. The fan may be used with other manufacturer’s burners, but care should be taken to insure proper hook-up.

The Shivvers DWDI, galvanized, 30 Hp Centrifugal Fan was first put into production in 2009.

The Shivvers DWDI, galvanized, 40 Hp Centrifugal Fan was first put into production in 2011.

The Shivvers DWDI, galvanized, 50 Hp Centrifugal Fan was first put into production in September 2011.
SAFETY INFORMATION

The operator of this equipment must assume responsibility for his own safety and for the safety of those working with him. He must also make sure the equipment was installed properly. Factors that contribute to the overall safety of operation are: proper use, maintenance, and frequent inspection of the equipment. All of these are the operator's responsibility.

If any items covered in this manual are not completely understood, or there is a concern with the safety of the product, contact Shivvers at the address shown on the front cover. Shivvers is genuinely interested in providing the safest practical equipment to our customers. If you have a suggestion which you believe will enhance the safety of this product, please write us and let us know.

Read and understand the Operator's Safety Manual (P-10001), and all applicable operator's manuals, before working on Shivvers equipment.

Read and understand this manual completely before using this equipment.

Take note anytime this safety alert symbol appears. Your safety, and that of persons around you, is at stake.

The safety alert symbol will be accompanied by one of three signal words whose definitions are given as:

**DANGER:** Red and white. Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

**WARNING:** Orange and black. Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

**CAUTION:** Yellow and black. Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

See the Operator's Safety Manual (P-10001) for definitions, proper use of safety locks and disconnects, and for proper bin unloading procedures.
SAFETY INFORMATION

Be sure to observe these common sense rules when working with the dryer equipment:

1) All units must be equipped with a main power disconnect switch. This disconnect switch must shut power off to the complete drying system. It must have the capability of being locked into the OFF or OUT position. Disconnect and LOCK OUT this main power disconnect switch before conducting any inspection, maintenance, repair, adjustment, or cleaning of the drying system. When you must have the electrical power on to troubleshoot equipment, do it from a safe distance, and always from outside the bin.

2) Keep the bin entrances locked at all times. To unlock the bin, first lower the Level-Dry (if so equipped), then shut the main power disconnect off. Take the safety lock off the bin entrance and place it on the main power disconnect before opening the bin entrance. Never enter the drying bin unless the Level-Dry (if so equipped), is completely lowered, and all power is disconnected and locked out.

3) Always keep all shields and guards in place. If shields or guards must be removed for inspection or maintenance, replace them before unlocking and turning the power back on.

4) Be sure everyone is clear of all the drying and transferring equipment, and outside of all bins, before unlocking and turning the power on. Some equipment may run upon re-application of power.

5) Make sure that all decals are in place and are easy to read. Do not operate the equipment with missing or illegible decals. If replacements are needed, contact SHIVVERS Incorporated or your dealer.

6) Prior to use, inspect all equipment to insure that it is in good operating condition. Do not operate with missing, damaged, or worn parts. Use only SHIVVERS approved replacement parts.

7) Metal edges can be sharp. Wear protective clothing and handle equipment and parts with care.

8) Keep children and bystanders away from drying and transferring equipment at all times.
9) If going up the bin ladder and/or performing maintenance on the top of the bin, take precautions to prevent accidental falls. When on top of the bin, wear a safety harness or other safety device.

10) At least annually, review all operating and safety manuals with any personnel working with this equipment. Always train new employees before they operate the drying equipment. Insist that they read and understand the operating and safety manuals.
LOCATION OF SAFETY DECALS

P-11146
Located on outside of Control Box, lower left corner

P-10367
Located on outside of Control Box, lower right corner.

ELECTROCUTION HAZARD
To prevent serious injury or death from electrocution:
- Disconnect power before opening box.
- Close cover before operating.
- Keep components in good repair.

WARNING
To prevent serious injury or death:
- Avoid unsafe operation or maintenance.
- Do not operate or work on equipment without reading and understanding the operator’s manual.
- If manuals or decals are missing or difficult to read, contact Shivvers, Inc. Corydon, IA 50060 for replacements.
P-10221
Located on Frame Side (inlet), upper corner by Grill Guard, both sides of fan.

WARNING

ROTATING BLADES AND SUCTION

To prevent serious injury or death:

- Do not operate without fan blade guard in place.
- Disconnect and lock out power source before adjusting or servicing.
- Keep hands, feet, hair, and clothing away from moving parts and suction.
- Close and secure access panels before starting.
OTHER IMPORTANT DECAL LOCATIONS

P-11770
Located on inside of Control Box, left corner (top).

DO NOT turn fan on unless there is at least one foot of grain on the bin floor. Fan air pressure could cause floor or supports to move.

Make sure bin roof vents are open before turning fan on. Air pressure could cause roof damage.

ONE FAN START PER HOUR MAXIMUM.

P-12568
Located on outside of Control Box, below switches.

P-12617
Located on inside of Control Box, left corner (bottom).

P-11639
Located on inside of Control Box, lower right corner.
OTHER IMPORTANT DECAL LOCATIONS

P-8875
Located on top center above Grill Guard (opposite motor)

IMPORTANT
Before each drying season, give bearing 1-2 shots of grease.

P-12569
Located on fan housing (opposite control box) under grease zerk and on coupler guard by motor

P-8879
Located on top center above Grill Guard, (motor side)
IDENTIFICATION OF PARTS
Shivvers DWDDI 30 Hp Centrifugal Fan

1. A-5236  Impeller, CCW, 30", Weldment, Motor Side
2. A-5237  Impeller, CW, 30", Weldment
3. A-5228  Inlet, 30" CW w/ Diverter
4. A-5238  Inlet, 30" CCW w/ Diverter, Motor Side
5. M-5374  Motor, 30 Hp, 3 Phase
6. A-5235  C-Fan Grill Guard
7. 689-043P Grill Guard Half (2) Motor Side
8. 689-081P Center Bearing Support Arm (3)
9. D-3830  Bearing, 4 Bolt Flange, 2.125" I.D. (2)
10. D-3827  Coupler, 1-7/8" I.D.
11. D-3828  Coupling Sleeve, 2-1/8" I.D.
12. D-3829  Coupling Sleeve, 1-7/8" I.D. Split
13. 689-025P Motor Key, 1/2" Sq X 2" (comes with motor)
14. 689-036P Coupler Guard Half (2)
15. 689-091P Lift Bracket, 30 Hp C-Fan Dual Inlet
16. 689-085A Leveling Foot (5)
17. 689-116A Pressure Gauge Assembly, 0-15" Back Mount, 0-7" Green Zone
18. 689-080P Center Bearing Support (Re-designed to fit in both 30" and 33" wheel housings)
19. 689-039P Shaft, Impeller, 2-1/8" OD X 44-1/2" (was 42-11/32"
20. 689-079P Impeller Key, 1/2" Sq X 4-3/8" (2)
IDENTIFICATION OF PARTS
Shivvers DWDI 40 Hp Centrifugal Fan

1. A-5241 Impeller, CCW, 33", Weldment, Motor Side
2. A-5242 Impeller, CW, 33", Weldment
3. A-5231 Inlet, 33" CW w/ Diverter
4. A-5246 Inlet, 33" CCW w/ Diverter, Motor Side
5. M-5382 Motor, 40 Hp, 3 Phase
6. A-5235 C-Fan Grill Guard
7. 689-043P Grill Guard Half, 40 Hp, Motor Side (2)
8. 689-081P Center Bearing Support Arm (3)
9. D-3830 Bearing, 4 Bolt Flange, 2.125" I.D. (2)
10. D-3827 Coupler, 1-7/8" I.D.
11. D-3828 Coupling Sleeve, 2-1/8" I.D. (2)
12. 689-079P Impeller Key, 1/2" Sq X 4-3/8" (2)
13. 689-099P Motor Key, 1/2" X 3-1/4"
14. 689-110P Coupler Guard Half, 40 Hp (2)
15. 689-117P Lift Bracket, 40 & 50 Hp C-Fan Dual Inlet
16. 689-085A Leveling Foot (5)
17. 689-113A Pressure Gauge Assembly, 0-15" Back Mount, 0-9" Green Zone
18. 689-080P Center Bearing Support (Re-designed to fit in both 30" and 33" wheel housings)
19. 689-039P Shaft, Impeller 2-1/8" OD X 44-1/2"
IDENTIFICATION OF PARTS
Shivvers DWDI 50 Hp Centrifugal Fan

1. A-5244  Impeller, CCW, 33", Weldment, Motor Side
2. A-5245  Impeller, CW, 33", Weldment
3. A-5231  Inlet, 33" CW w/ Diverter
4. A-5246  Inlet, 33" CCW w/ Diverter, Motor Side
5. M-5383  Motor, 50 Hp, 3 Phase
6. A-5235  C-Fan Grill Guard
7. 689-043P Grill Guard Half, 40 Hp, Motor Side (2)
8. 689-081P Center Bearing Support Arm (3)
9. D-3830  Bearing, 4 Bolt Flange, 2.125" I.D. (2)
10. D-3827  Coupler, 1-7/8" I.D.
11. D-3828  Coupling Sleeve, 2-1/8" I.D. (2)
12. 689-079P Impeller Key, 1/2" Sq X 4-3/8" (2)
13. 689-099P Motor Key, 1/2" X 3-1/4"
14. 689-110P Coupler Guard Half, 40 Hp (2)
15. 689-117P Lift Bracket, 40 & 50 Hp C-Fan Dual Inlet
16. 689-085A Leveling Foot (5)
17. 689-113A Pressure Gauge Assembly, 0-15" Back Mount, 0-9" Green Zone
18. 689-080P Center Bearing Support (Re-designed to fit in both 30" and 33" wheel housings)
19. 689-039P Shaft, Impeller 2-1/8" OD X 44-1/2"

12
1. E-5008-01  Ground Lug (2)
2. E-5100  Switch, MOM, OFF
3. E-5267  Fuse, 5 Amp Slo-Blo
4. E-5287  Switch, DPST, MOM, ON
5. E-5616  Fuseholder
6. E-6264  Appliance Inlet
7. E-6482  Starter, 65A, 120 VAC Coil, 20-100 O.L Range
8. E-6367  Terminal End Plate
9. E-6368  Terminal, Block Section, 4 Conductor (6)
10. P-11601  Decal, 1-12 Terminal Strip
11. P-7286  Decal, "5 AMP / 5AMP"
12. P-7129  Decal, "Ground"
13. P-7128  Decal, "Neutral" Horizontal
14. P-8381  Decal, Bumer Fan OFF - Fan ON
15. E-6484  Auxiliary Contact
16. 118T-001A  Transformer Kit, C-Fan, 460/230V
17. E-6294  Fuse Block
18. E-6295  1-1/2 Amp Fuse (2)
19. E-5222  Transformer, 230-460V, 0.5 KVA
20. P-12568  Decal, One Start Per Hour
IDENTIFICATION OF PARTS

689-059A  Control Box, 3 Phase, C-Fan, 208/230 V, 30 HP
689-114A  Control Box, 3 Phase, C-Fan, 208/230 V, 40 & 50 HP

30 HP
1. E-5008-01  Ground Lug TA-2, #2-12 Wires
2. E-5100  Switch, MOM, OFF
3. E-5267  Fuse, 5 Amp Slo-Blo
4. E-5287  Switch, DPST, MOM, ON
5. E-5616  Fuseholder
6. E-6264  Appliance Inlet
7. E-6523  Contactor, 115A, 120 VAC Coil, 3 Pole
8. E-6367  Terminal End Plate
9. E-6368  Terminal, Block Section, 4 Cond. (6)
10. P-11601  Decal, 1-12 Terminal Strip
11. P-7129  Decal, "Ground"
12. P-7128  Decal, "Neutral" Horizontal
13. P-8381  Decal, Burner Fan OFF - Fan ON
14. P-12568  Decal, One Start Per Hour
15. E-5008-02  Ground Lug TA-250
16. E-6484  Auxiliary Contact
17. E-6295  1-1/2 Amp Fuse (2)
18. E-5222  Transformer, 230-460 V
19. E-6294  Fuse Block
20. E-6524  O.L. Relay Switch, 3 Pole, 20-100 Amp

40 & 50 HP
1. E-5008-01  Ground Lug TA-2, #2-12 Wires
2. E-5100  Switch, MOM, OFF
3. E-5267  Fuse, 5 Amp Slo-Blo
4. E-5287  Switch, DPST, MOM, ON
5. E-5616  Fuseholder
6. E-6264  Appliance Inlet
7. E-6538  Contactor, 150A, 120 VAC Coil, 3 Pole
8. E-6367  Terminal End Plate
9. E-6368  Terminal, Block Section, 4 Cond. (6)
10. P-11601  Decal, 1-12 Terminal Strip
11. P-7266  Decal, "5 AMP / 5AMP"
12. P-7129  Decal, "Ground"
13. P-7128  Decal, "Neutral" Horizontal
14. P-8381  Decal, Burner Fan OFF - Fan ON
15. P-12568  Decal, One Start Per Hour
16. E-5008-02  Ground Lug TA-250
17. E-6484  Auxiliary Contact
18. E-6295  1-1/2 Amp Fuse (2)
19. E-5222  Transformer, 230-460 V
20. E-6294  Fuse Block
21. E-6539  O.L. Relay Switch, 3 Pole, 35-175 Amp

Note: 30 HP Control Box was used on 40 HP Fans until January 2013.
MECHANICAL INSTALLATION

DRYING BIN LAYOUT

A) The horizontal unloader must come out of the bin near the main entrance door.

B) The Compudry Command Center, (or installed controller), must be within line of sight of the bin's main entrance door. The plenum temperature sensing device of the Compudry Command Center (or installed controller) must be at least 12 feet from the nearest burner.

C) There must be a main electrical disconnect switch. This switch must shut off all electrical power to the drying system. It must have the capability of being locked in the OFF position. It must be located near the bin's main entrance and within line of sight of the Compudry Command Center, (or installed controller).

D) The Centrifugal Fan(s) should be located as shown in the following drawings whenever possible. They must be installed as shown for certified performance systems.

E) It is recommended to use only Shivvers entrance collars, transitions, and burners. Follow instructions provided with transitions for their installation. For drying bins with more than one burner, air dampers are required to prevent reverse airflow.

F) Keep the floor space in front of the entrance collar as free of obstructions as possible. Concrete blocks are not recommended for floor supports. They block too much airflow. Floor supports should be at least 15" tall. Shorter supports do not allow even heat under the floor.

G) Concrete pads for Shivvers Centrifugal Fans, transitions, and burners should be 13 feet long by 8 feet wide. This size pad should accommodate fans up to 50 Hp. Note that the pad is not centered on the entrance collar. It is offset to the fan motor side. The pad may be made smaller if you carefully measure your transition, burner and fan, and offset the pad to the motor side of the fan. Pads should be flush and level with the top of the bin concrete. Place footers under the pads and use re-rod to keep the pads from cracking and moving.
MECHANICAL INSTALLATION

SUGGESTED SHIVERS DUAL INLET
C-FAN / HEATER FOUNDATION LAYOUT

TO CENTER OF BIN

94"  47"

13"

8" Min. Cross Section

Flush with BIN PAD or below by no more than 1"

3FT

5FT

10FT  13FT

12" Below Frost Line

Re-Bar to Suit Customer

8FT

Note: The above drawing is what we suggest as a Foundation for your new Shivers Dual Inlet Centrifugal Fan and Heater combination. We also suggest the foundation(s) of the Fan/Heater(s) extend below the Frost Line.

We leave details about the configuration of the foundations up to the discretion of the Customer and/or his Dealer. Every effort needs to be made to minimize Shifting, Eroding, and Cracks.
MECHANICAL INSTALLATION

1750 RPM Centrifugal Fan Dimensions - 30 Hp
MECHANICAL INSTALLATION

1750 RPM Centrifugal Fan Dimensions - 40 Hp
MECHANICAL INSTALLATION

1750 RPM Centrifugal Fan Dimensions - 50 Hp

Dimensions:
- Width: 65 1/4"
- Length: 142 11/16"
- Height: 85 7/8"
- Diameter: 37 3/4"
Shivvers Circulator 1-Fan Layout

CLEANOUT DOOR
HORIZONTAL UNLOADER
MACHINE MOTOR DISCONNECT SWITCH
BIN ENTRANCE
COMPUDRY COMMAND CENTER/MAIN DISCONNECT (WITH AN UNOBSSTRUCTED VIEW OF ENTRANCE)

8" TYPICAL

8FT (NOTE OFFSET)
3FT
13FT
5FT
Shivvers Circulator 2-Fan Layout
(twin sweep) *

* 3 sweep Circulator layout may be different. Consult Factory.
Shivvers Circulator 3-Fan Layout
(twin sweep) *

3FT
13FT
3FT
13FT

8FT (NOTE OFFSET)
5FT

Cleansout Door (3)

Horizontal Unloader

Machine Motor Disconnect Switch

Bin Entrance

Compudy Command Center/Main Disconnect (with an unobstructed view of entrance)

* 3 sweep Circulator layout may be different. Consult Factory.
MECHANICAL INSTALLATION

C-FAN

1) Install entrance collar, transition, and burner according to instructions supplied with each of them.

2) Put fan up to burner. Adjust leveling legs for a good fit to burner.

3) Bolt fan to burner using hardware from 691-042A Hardware Sack, located with the Transition Assembly and Hardware. Caulk any air gaps.

4) Lock (5) leveling legs in place.
5) Locate the static pressure gauge in the C-Fan control box. If your fan was delivered without controls, the pressure gauge will be wired inside the fan in a burlap bag. Install the static pressure gauge to the elbow on the left of the motor side, as shown below.

Static Pressure Gauge Assembly
689-116A 0-15" Gauge w/ 0-7"
Green Zone (for 30 Hp Fans)
or
689-113A 0-15" Gauge w/ 0-9"
Green Zone (for 40 and 50 Hp Fans)
ELECTRICAL INSTALLATION

ALL ELECTRICAL WIRING SHALL BE INSTALLED IN COMPLIANCE WITH THE LATEST EDITION OF THE ANSI/NFPA STANDARD 70, NATIONAL ELECTRICAL CODE, AS A MINIMUM REQUIREMENT, AND IN COMPLIANCE WITH LOCAL WIRING CODES AS APPLICABLE.

WIRING MUST BE DONE BY A COMPETENT ELECTRICIAN. A LICENSED ELECTRICIAN IS RECOMMENDED, AND MUST BE USED WHEN REQUIRED BY LOCAL OR STATE STATUTES.

⚠️ DANGER

Disconnect and lock out all power before wiring.

INCOMING POWER HOOKUP

1) The 30, 40, and 50 Hp Centrifugal fans are built for 208-230, or 460 volt three phase input. They use 115 Volt control voltage. A 0.5 kVA control voltage transformer is installed for the control voltage.

2) A circuit breaker must be installed in line with the incoming power to the C-Fan control box. The circuit breaker should break all lines if an overload occurs on any single line. An inverse time delay circuit breaker is recommended to handle the motor inrush current while starting the fan. The breaker can be up to 2.5 times the motor nameplate full load amps. Aluminum wire is not recommended, but if used, the wire size must be increased. If the distance from the power company transformer, or the C-Fan circuit breaker, is greater than 100 feet, it may be necessary to increase the wire sizes.

3) An access hole is provided in the control box for the incoming wiring conduit. If the conduit is attached to the bin wall, keep it at least 3 feet above the foundation to keep the ambient temperature lower. If the bin side wall will be covered with insulating foam, make sure the electrical conduit is not under the foam. When running the conduit from the bin wall to the C-Fan, make sure it does not interfere with air damper operation. Make sure it does not block access through the transition lid. Make sure it does not touch the entrance collar or transition as these can get hot.
ELECTRICAL INSTALLATION

It is recommended to use a flexible conduit to the C-Fan. Leave enough flex in the conduit so the Fan can be moved to allow servicing or replacement of the burner.

### 30 Hp C-FAN INCOMING POWER WIRING

<table>
<thead>
<tr>
<th>VOLTAGE</th>
<th>PHASE</th>
<th>MAX FULL LOAD AMPS</th>
<th>MIN. BREAKER SIZE</th>
<th>MAX. BREAKER SIZE</th>
<th>MIN. COPPER WIRE SIZE</th>
<th>RECOMMENDED CONDUIT SIZE</th>
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<tbody>
<tr>
<td>208V</td>
<td>3</td>
<td>88</td>
<td>175</td>
<td>225</td>
<td>2 AWG</td>
<td>1-1/2 INCH</td>
</tr>
<tr>
<td>230V</td>
<td>3</td>
<td>79</td>
<td>150</td>
<td>200</td>
<td>3 AWG</td>
<td>1-1/2 INCH</td>
</tr>
<tr>
<td>460V</td>
<td>3</td>
<td>40</td>
<td>70</td>
<td>100</td>
<td>8 AWG</td>
<td>1 INCH</td>
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### 40 Hp C-FAN INCOMING POWER WIRING

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<th>VOLTAGE</th>
<th>PHASE</th>
<th>MAX FULL LOAD AMPS</th>
<th>MIN. BREAKER SIZE</th>
<th>MAX. BREAKER SIZE</th>
<th>MIN. COPPER WIRE SIZE</th>
<th>RECOMMENDED CONDUIT SIZE</th>
</tr>
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<tbody>
<tr>
<td>208V</td>
<td>3</td>
<td>114</td>
<td>200</td>
<td>300</td>
<td>1/0 AWG</td>
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<tr>
<td>230V</td>
<td>3</td>
<td>104</td>
<td>200</td>
<td>250</td>
<td>1 AWG</td>
<td>1-1/2 INCH</td>
</tr>
<tr>
<td>460V</td>
<td>3</td>
<td>52</td>
<td>100</td>
<td>150</td>
<td>6 AWG</td>
<td>1 INCH</td>
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### 50 Hp C-FAN INCOMING POWER WIRING

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<th>VOLTAGE</th>
<th>PHASE</th>
<th>MAX FULL LOAD AMPS</th>
<th>MIN. BREAKER SIZE</th>
<th>MAX. BREAKER SIZE</th>
<th>MIN. COPPER WIRE SIZE</th>
<th>RECOMMENDED CONDUIT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>208V</td>
<td>3</td>
<td>143</td>
<td>300</td>
<td>350</td>
<td>3/0 AWG</td>
<td>2 INCH</td>
</tr>
<tr>
<td>230V</td>
<td>3</td>
<td>130</td>
<td>250</td>
<td>350</td>
<td>2/0 AWG</td>
<td>2 INCH</td>
</tr>
<tr>
<td>460V</td>
<td>3</td>
<td>65</td>
<td>125</td>
<td>175</td>
<td>4 AWG</td>
<td>1-1/4 INCH</td>
</tr>
</tbody>
</table>
4) It is necessary to have an incoming ground wire (marked green) with the incoming power leads. Consult the National Electrical Code, Table 250.122, for minimum size of the equipment grounding conductor. It should be connected to earth ground at the breaker panel and at the grounding terminal in the C-Fan control box.

5) The incoming power leads are connected to the top of the motor starter in the C-Fan control box.

If fan is purchased without controls, follow the installation instructions which came with the control panel.

The C-Fan 6 pole terminal strip is a spring cage clamp type. The following diagram shows how to properly connect the wires. Make sure the wire is lined up to go straight into the terminal before pressing on the spring.
ELECTRICAL INSTALLATION

An outlet is provided in the bottom of the C-Fan Control Box for supplying 115VAC to a Shivvers Blue Flame II MAXX Burner. It will only have power when the C-Fan is running.
ELECTRICAL INSTALLATION

CONTROL WIRING:
For Fan Interrupt or Shutdown, remove the jumper between terminals #3 and #4 in the fan control panel. Connect a normally closed, non-powered, circuit to terminals #3 and #4. When the circuit opens, even briefly, the fan will shut down. The fan will need to be manually re-started.

ELECTRONIC MOTOR OVERLOAD SWITCH
Dip switches are shipped set for CLASS 20 trip delay. If overload trips on motor startup, change to CLASS 30.

FLA Current Dial set for motor full load amps. Lift clear plastic cover from bottom to change settings.

Check to make sure the FLA current dial is set for motor full load amps. Make sure the Red Reset button is pointing to "M" for Manual Reset.
After Approx. 2011

Check to make sure the DIP switches are set for Manual Reset.
1) Once the wiring is completed, make sure the burner is unplugged from the C-Fan. Make sure everyone is out of the grain bin and are safely away from all drying equipment, then unlock the main power. Lock the bin entrances shut, then turn on the main power.

2) Measure the control voltage from Neutral (Terminal #1) to the 5 Amp fuse. It should be between 110 and 125 volts AC. If it is not, disconnect and lock out the power, and recheck the wiring.

3) Make sure there is at least one foot of grain on the bin floor. Fan air pressure could cause floor or supports to move. Make sure bin roof vents are open before turning fan on. Air pressure could cause roof damage.

4) Press the fan start switch. The fan should start. If the fan starter overload kicks out before the fan gets up to speed, it may be necessary to change the dip switches to class 30 Delay. If that doesn’t work, change back to class 20 delay and turn off the phase imbalance switch.

5) Press the fan off switch. The fan should slow down and stop.

6) Check for proper rotation of the fan. Looking into the fan venturi on the motor side, rotation should be clockwise. Air should be blowing into the bin. Both sides of the fan should be drawing in air.

7) Plug the burner into the outlet on the bottom of the C-Fan Control Box. Re-start the fan and test the burner, following instructions provided with it.

8) Disconnect and lock out the main power.
OPERATION

TO OPERATE

1) Make sure the fan blade is not turning backwards.

2) Make sure there is at least one foot of grain on the bin floor. Fan air pressure could cause the floor supports to move. Make sure bin roof vents are open before turning fan on. Air pressure could cause roof damage. Press the Fan ON momentary switch.

3) The fan should start and come up to full speed. The burner will now have power. Fan static pressure gauge maximum and the burner maximum may be different. Operation of system above 8" static pressure for the 30 Hp fan will reduce or stop grain drying capacity. Operation of system above 10" static pressure for the 40 Hp or 50 Hp fan will reduce or stop grain drying capacity.

TO STOP

1) Turn off the burner, or turn off the gas and allow the gas in the lines to burn out. (See burner manual for more instructions.)

2) Press the Fan OFF momentary switch. The fan should coast down and stop.

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*DO NOT* turn fan on unless there is at least one foot of grain on the bin floor. Fan air pressure could cause floor or supports to move. Make sure bin roof vents are open before turning fan on. Air pressure could cause roof damage.

ONE FAN START PER HOUR MAXIMUM.

The decal shows "ONE FAN START PER HOUR MAXIMUM." This is a very conservative recommendation as far as the fan motor is concerned. The motor itself can be started at least 4 times per hour. The actual limiting factor may be the switch gear feeding the control. The bottom of the decal can be cut off if the statement is deemed too restrictive.
MAINTENANCE

\[\text{DANGER}\]
Disconnect and lock out all power before opening any control boxes or removing any shields. Make sure everyone is clear of all drying equipment before restoring power.

1) Once every month, start the fan to circulate the grease in the motor bearings. Make sure there is at least one foot of grain on the bin floor. Fan air pressure could cause floor or supports to move. Make sure bin roof vents are open before turning fan on. Air pressure could cause roof damage. Follow motor manufacturer's recommendations for re-lubricating motor bearings.

2) Prior to each drying season, grease the two bearings (center bearing in fan and bearing at coupler) with high temp grease (Shivvers Part #C-6188, Chevron Ulti-Plex or equivalent). Make sure the fan blades rotate freely. Make sure the blade is not coated by any foreign material which could unbalance it or block airflow. If blades require cleaning, make sure power is disconnected and locked out first!

3) Prior to each drying season, check to be sure all wiring connections are tight and that the insulation is good. Make sure there isn't any foreign material inside the magnetic motor starter.

4) Maintain a clean operation. Clean up spilled corn, clean out fines under the bin floor (contact Shivvers about clean-out doors), keep all control boxes shut and replace seals if required. Control the rodent population. Control weeds and tall grasses around the C-Fan. They can get sucked in and block airflow or start a fire. They can interfere with damper operation.

5) During the drying season, check the transition dampers for free movement and proper operation.

6) At the end of the season, make sure the main power is disconnected and locked off. There will be fewer problems with lightning damage with all switches and breakers open.

7) Use only factory approved replacement parts.
TROUBLESHOOTING

DANGER Disconnect and lock out all power before opening any control boxes or removing any shields. Make sure everyone is clear of all drying equipment before restoring power.

Only qualified personnel should perform troubleshooting on energized circuits.

All terminal strip numbers refer to the 6 pole terminal strip in the C-Fan control box unless otherwise noted.

C-FAN WILL NOT START

1) Make sure the circuit breaker for the C-Fan is turned on.

2) Press the Reset button on the overload heater. (Do not press the trip button.)

3) Check the 1.5 amp transformer primary fuses.

4) Check 5 amp slow blow fuse.

5) Check for power on terminal #3 with the fan start switch held down. If no power, it could be a bad start switch or stop switch.

6) Check for power on terminal #4 with the fan start switch held down. If there is no power, there is a problem with the fan interrupt. This could be a Gearbox or Grain Hi-Limit problem.

7) If there is power on terminal #1 when the fan start switch is held down, there is an open neutral. Make sure terminal #1 is connected to a neutral.

8) If there is power at the black wire on the fan motor starter coil, and not at the white neutral wire on the starter coil, when holding down the fan start switch, then the starter coil is open and will need to be replaced.
TROUBLESHOOTING

FAN WILL RUN ONLY WHILE START SWITCH IS HELD DOWN
(stops when start switch is released)

1) Defective (open) auxiliary switch on starter.

FAN WILL STOP ONLY WHILE STOP SWITCH IS HELD DOWN
(starts back up when stop switch is released)
(starts when circuit breaker is turned on)

1) Defective (shorted) auxiliary switch on starter.

2) Defective (shorted) fan start switch.

FAN OVERLOAD SWITCH WILL TRIP OUT BEFORE FAN GETS TO SPEED, OR
WHEN ANOTHER FAN IS STARTED

1) Change overload CLASS setting to 30 or shut off phase imbalance DIP switch.

2) Check all power wiring connections.

3) Check wire sizes. It may be necessary to increase size.

4) Check for low incoming voltage, or phase imbalance.
SCHEMATIC

TRANSFORMER KIT 118T-001A

E-6295 FUSE 1.5 AMP
SET JUMPERS ON TRANSFORMER FOR 230 OR 460 INPUT

E-6294 FUSE BLOCK

L1 L2 L3
WILD LEG

CONTACOR

A1 Coil
A2

3 POLE OVERLOAD

N.O.
N.C.
AUX CONTACT E-6484

ON E-5287
OFF E-5100

5 AMP SLO-BLO E-5267
E-5616 FUSEHOLDER

115 VOLT RECEPTACLE E-6264

NEUTRAL

TERMINAL STRIP
PRESS ON TOP WITH SMALL SCREWDRIIVER TO RELEASE WIRE.

REMOVE JUMPER FOR FAN INTERRUPT

Narrow Slot
RECEPTACLE TO HAVE POWER ONLY WHEN FAN IS RUNNING.

M

CENTRIFUGAL FAN CONTROL BOX WIRING
490/230V, 3 PHASE OVERLOAD

GNEARTH