Models:

**100 Series** (Models 108, 112, 114, 116, 118, 120, 122, 126, CFAB190, CFAB270, CFAB320, CFAB370, CFAB400, CFAB460, CFAB511, CFAB601)

**1100 Series** (Models 1108, 1112, 1114, 1116, 1118, 1120, 1122, 1126, CFAB190, CFAB270, CFAB320, CFAB370, CFAB400, CFAB460, CFAB510, CFAB511, CFAB601)

**1200 Series** (Models 1214, 1216, 1218, 1220, 1222, 1226, C2120A, C2122A, C2125A, C2130A, C2132A, C2140A)

**1200S Series** (Models 1214S, 1218S, 1220S, 1222S, 1226S, CF2141, CF2181, CF500H, CF2221, CF650M)

**2300 Series** (Models 2314, 2318, 2320, 2322, 2326, CF3142, CF3182, CF3202, CF3222, CF3262)

**2400 Series** (Models 2420, 2426, CF1000H, CF1300M)

**3400 Series** (Models 3414, 3418, 3420, 3422, 3426, CF4143, CF4183, CF4203, CF4223, CF4263)

**3600 Series** (Models 3620, 3626, CF1500H, CF2000M)

**X-Stream** Configuration - Uses same model numbers (and components) as listed above. The only difference is that the fans are pointed in different directions.
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1. Introduction

Dryer Operation

Thank you for choosing a GSI/FFI Vision Series Grain Dryers. These units are among the finest grain dryers ever built; designed to give the excellent operating performance and reliable service for many years.

This manual describes the installation and operation for all standard production model dryers. These dryers are available with liquid propane or natural gas fuel supply, 1 phase 230 volt, 3 phase 230 volt, 460 volt, or 575 volt (60 Hz) electrical power.

Our foremost concern is your safety and the safety of others associated with this equipment. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems which may be encountered by the operator and other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards and precautions exist, and to inform all personnel associated with the equipment or in the area. Safety precautions may be required from the personnel. Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation where SERIOUS INJURY or DEATH may occur.

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 installations are made.

Operating Precautions

READ THESE INSTRUCTIONS BEFORE INSTALLATION AND OPERATION
SAVE FOR FUTURE REFERENCE

1. Read and understand the operating manual before attempting to operate the unit.
2. Keep ALL guards, safety decals, and safety devices in place. NEVER operate dryer while guards are removed.
3. Keep visitors, children and untrained personnel away from dryer at all times.
4. NEVER attempt to operate the dryer by jumping or otherwise bypassing any safety devices on the unit.
5. Always set the main power supply disconnect switch to OFF and lock it in the OFF position using a padlock before performing any service or maintenance work on the dryer or the auxiliary conveyor equipment.
6. Before attempting to remove and reinstall the fan blade, make certain to read recommended procedure listed within the SERVICING section on Page 82 of the manual.
7. Keep the dryer and wet holding equipment CLEAN. DO NOT allow fine material to accumulate.
8. Set pressure regulator to avoid excessive gas pressure applied to a burner during ignition and when burner is in operation. See Page 49 for operating gas pressures. DO NOT exceed maximum recommended drying temperatures.
9. DO NOT operate the dryer if any gas leak is detected. Shutdown and repair before further operation.
10. Clean grain is safer and easier to dry. Fine materials can be highly combustible, and it also requires removal of extra moisture.
11. Use CAUTION in working around high speed fans, gas burners, augers and auxiliary conveyors which can START AUTOMATICALLY.
Operating Precautions (Continued)

12. Make sure that capacities of auxiliary conveyors are matched to dryer metering capacities.

13. **DO NOT** operate in an area where combustible material will be drawn into the fan.

14. The operating and safety recommendations in this manual pertain to the common cereal grains as indicated. When drying any other grain or products, consult the factory for additional recommendations.

15. Routinely check for any developing gas plumbing leaks. Check LP vaporizer for contact with burner vanes.

Use Caution in the Operation of this Equipment

This dryer is designed and manufactured with operator safety in mind. However, the very nature of a grain dryer having a gas burner, high voltage electrical equipment and high speed rotating parts, presents hazards to personnel which cannot be completely safeguarded against without interfering with the efficient operation of the dryer and reasonable access to its components.

Use extreme caution in working around high speed fans, gas-fired heaters, augers and auxiliary conveyors, which may start without warning when the dryer is operating on automatic control.

**CAUTION**

*Keep the dryer clean. Do not allow fine material to accumulate in the plenum chamber or surrounding the outside of the dryer.*

Continued safe, dependable operation of automatic equipment depends, to a great degree, upon the owner. For a safe and dependable drying system, follow the recommendations within the Owner’s Manual and make it a practice to regularly inspect the unit for any developing problems or unsafe conditions.

Take special note of the *Operating Precautions on Page 6* before attempting to operate the dryer.
2. Safety

Safety Guidelines

This manual contains information that is important for you, the owner/operator, to know and understand. This information relates to protecting **personal safety** and **preventing equipment problems**. It is the responsibility of the owner/operator to inform anyone operating or working in the area of this equipment of these safety guidelines. To help you recognize this information, we use the symbols that are defined below. Please read the manual and pay attention to these sections. Failure to read this manual and its safety instructions is a misuse of the equipment and may lead to serious injury or death.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION**, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**NOTICE** is used to address practices not related to personal injury.

**WARNING! BE ALERT!**

Personnel operating or working around electric fans should read this manual. This manual must be delivered with the equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.
Emergency Stop Switch

The Emergency Stop switch is located on the upper control box door. Pushing the Emergency Stop switch will interrupt the control power and stop all dryer functions.

**WARNING**

*Pushing the Emergency Stop switch does not interrupt the main power to the upper control box panel.*
3. Decals

GSI Group recommends contacting the local power company, and having a representative survey the installation so the wiring is compatible with their system, and adequate power is supplied to the unit. Safety decals should be read and understood by all people in the grain handling area.

If a decal is damaged or is missing, contact:

**GSI Decals**  
1004 E. Illinois St.  
Assumption, IL. 62510  
Phone: 1-217-226-4421

A free replacement will be sent to you.

---

**Decal: DC-1948**

Decal DC-1948 is located in two (2) places on the fan/heater control box. One on the lid and one on the front of the fan/heater control box. Another location for this decal is inside the upper control box for the dryer.

---

**Decal: DC-1943**

Decal DC-1943 has two (2) locations. One inside the fan/heater control box and another on the dryer upper control box door next to the main power disconnect.
Decal: DC-1945

Decal DC-1945 is located on the bottom auger belt guard and the front bearing plate (which is visible when the bottom auger guard is removed). An alternate location would be at the rear of the dryer for portable dryers equipped with the **Front Discharge Option**.

Decal: DC-1947

Decal DC-1947 has several different locations. Two (2) are located on the front end panel below the fan/heater. Two (2) are located on the rear end panel below the rear access door. Two (2) are located on the auger discharge box (one on the outside top and one on the inside of the flapper lid next to the discharge mercury switch). One more of these decals is located inside the plenum on the rear plenum closure door just inside the rear access door.

Decal: DC-1944

Decal DC-1944 is located on the bottom auger belt guard and the front bearing plate (which is visible when the bottom auger guard is removed). An alternate location would be at the rear of the dryer for portable dryers equipped with the **Front Discharge Option**. Another location for decal DC-1944 is on the top of the auger belt guard (one on the belt guard cover and one on the inside belt guard body visible when the belt guard cover is removed).
3. Decals

Decal DC-1946

Decal DC-1946 is located on the rear plenum access door (inside and outside).

Decal DC-1959

Decal DC-1959 is located on the fan/heater access door.

Decal DC-1950

Decal DC-1950 is located on each of the meter roll access doors.
3. Decals

**WARNING**

**WARNING**
Restez éloigné de la lame tournante. La lame peut se mettre en marche automatiquement. Peut causer de sérieuses blessures. Vérouillez le courant avant l’entretien.

**CAUTION**
Follow Hitch Pin Safety Instructions to avoid equipment damage or personal injury.

**ATTENTION**
Suivez les instructions de sécurité pour la goupille d’attelage pour éviter des dommages matériels ou des blessures corporelles.

**HITCH PIN SAFETY INSTRUCTIONS**
- Hitch pin must be securely fastened and no less than 3/4 inches (19 mm) in diameter
- Hitch must be positioned 16 to 17 inches (41 to 43 cm) above road surface
- Maximum speed when towing is 45 mph (72 km/h)

**CAUTION**
Follow Towing Safety Instructions to avoid equipment damage or personal injury.

**ATTENTION**
Suivez les consignes de sécurité de remorquage pour éviter des dommages matériels ou des blessures corporelles.

**TOWING SAFETY INSTRUCTIONS**
- Dryer must be towed empty and in accordance with state and provincial regulations
- Hub temperature must not exceed 150 F (65.6 C)
- Tire lug must be tightened to 90 ft-lbs
- Tire pressure must be between 55 and 60 PSI cold
- Check after 50 miles (81 km) and every 200 miles (322 km)

Decal: DC-1949
Decal DC-1949 is located on the fan/heater access door.

Decal: DC-1954
Decal DC-1954 is located on the hitch tongue.

Decal: DC-1956
Decal DC-1956 is located on the hitch tongue.
4. Installation

Transporting/Single Fan

The dryer is available with an optional transport kit for transporting the unit by truck or tractor. Make certain to observe the following safety precautions.

1. Recommended towing hitch height is 14”-17”. *(See Figure 4A.)*

![Figure 4A Use a 14”-17” Towing Hitch Height and a Safety Chain](image)

2. Hitch bolt must be at least 3/4” in diameter and securely fastened with a locking nut, so it will not come out during travel and the hitch will not bend. *(See Figure 4B.)*

3. Be sure to minimize vertical hitch play with washers. *(See Figure 4B.)*

![Figure 4B A 3/4” Hitch Bolt and Washers Fastened with a Locking Nut at the Bottom of the Hitch](image)

4. Always use a safety chain. *(See Figure 4A.)*

5. Dryer must be towed empty and in accordance with applicable state or provincial regulations.
   
   **NOTE:** *NEVER tow dryer with grain or any other material inside of it.*

6. Recommended tire pressure is 55-60 PSI (cold).

7. Maximum towing speed is 45 miles per hour or the speed limit, whichever is lower.

8. After the first 50 miles and every 200 miles thereafter, check the following:
   
   a. Dryer wheel hub and spindle temperature immediately after stopping. Temperature should not exceed 150°F. It may be hot to touch, but not melting lubricant.
   
   b. Wheel lug nuts. They are factory torqued at 115 to 120 ft. lbs. Retighten, if required.
Location of the Dryer

When considering the exact location of the dryer, also consider the wet grain supply and dry grain discharge, as well as the location of storage bins and other grain handling equipment. Do not install the dryer inside a building or in any other area where not allowed by electrical codes, fuel installation regulations and/or insurance requirements. Maintain a minimum distance of at least 3’ from other structures, otherwise air flow problems may occur. Do not operate in an area where combustible materials can be drawn into the fans or where load and unload augers can come in contact with power lines.

Foundation

A reinforced concrete pad or similar permanent foundation is recommended for dryer stability. See Pages 22 and 23 for details.

Supporting the Dryer

The wheels are to be used for transporting the dryer only when empty. Before loading any grain into the dryer, the frame of the unit on each side must be supported. Place concrete blocks on each side, every 6’ of the frame, as well as at the hitch mount location with the hitch removed. The blocks must be able to support the dryer as well as the additional weight of the grain when full. Use shims to provide uniform, level support for all blocks. The dryer should be at least 16” off the pad to allow for clean out and the use of auxiliary grain handling equipment. The hitch tongue should be removed, but the hitch assembly and the fan support must be left on during operation; they are not part of the transport tie down assembly.

NOTE: Use a minimum of one support per each 6’ of basket length on each side.

Anchor Points

Anchor points may be cast into the concrete slab or the dryer may be tied down by cables and turnbuckles to anchors installed at the edge of the slab. This helps prevent overturn or lateral movement by wind or other forces.

Wet/Dry Grain

Wet Grain Supply

A wet grain holding bin provides gravity flow to the dryer or loading conveyor. This conveyor may be electrically connected to the power circuit provided in the main control box. Initially, the dryer will fill completely. During drying, the top auger will start and stop as required depending upon the dry grain discharge rate and grain shrinkage to maintain the dryer fill. If the dryer does not fill within the pre-set time on the out of grain timer (See Vision Manual for instructions on setting this timer), the dryer will shutdown.

Dry Grain Removal

The dry grain is normally discharged out of the rear end of the dryer. Front discharge is an optional feature. A take away system needs to be provided to remove grain from the drying system. This conveyor may be electrically connected to the power circuit provided in the main control box.
4. Installation

**Electrical Power Supply**

**Power Supply**

An adequate power supply and proper wiring are important factors for maximum performance and long life of the dryer. Electrical service must be adequate to prevent low voltage damage to motors and control circuits. *(See Chapter 5 on Pages 24-36.)* Power supply for 1 phase models must include a neutral wire.

**Transformers and Wiring Voltage Drop**

Advise the service representative of the local power supplier that an additional load will be placed on the line. Check the KVA rating of transformers, considering total horsepower (HP) load. The power supply wiring, main switch equipment and transformers must provide adequate motor starting and operating voltage. Voltage drop during motor starting should not exceed 14% of normal voltage. After motor is running at full speed, it should be within 8% of normal voltage. Check electrical load information *(See Chapter 5 on Pages 24-36)* for HP ratings and maximum amp loads.

**Power Supply Disconnect**

All dryers are equipped with a power disconnect switch in the power box to permit total power shutdown before opening the power box door, as required for inspection and service. The power disconnect switch is located on the power box door for quick shutdown.

**Machine to Earth Grounding**

*A Machine to Earth Ground Rod* must be installed at the dryer. Place the ground rod that comes standard within 8' of the dryer and attach it to the dryer control panel with at least a #6 solid, bare, copper ground wire and the clamp provided. The grounding rod located at the power pole will not provide adequate grounding for the dryer. Proper grounding will provide additional safety in case of any short and will ensure long life of all circuit boards, the SCR drive and the ignition system. The ground rod must be in accordance with local requirements.

All wiring to be done in accordance with the Canadian Electrical Code.
Proper Installation of Ground Rod

The rod should not be driven into dry ground. Follow these instructions for proper installation.

1. Dig a hole large enough to hold one to two (2) gallons of water.
2. Fill hole with water.
3. Insert rod through water and “jab” it into the ground.
4. Continue “jabbing” the rod up and down. This allows the water to work its way into the ground, allowing it to be completely inserted into the ground. This method of installation also assures good contact with the surrounding soil, thereby making a proper ground.
5. Connect the bare, copper ground wire to the rod with the proper clamp.
6. Connect ground wire to control panel with the ground lug provided in the control box.
7. Ground wire must not have any breaks or splices. Do not use insulated wire for grounding applications.

Connecting Auxiliary Conveyors

The auxiliary load and auxiliary unload augers or conveyors can be wired directly to the dryer. Electrical load information in Chapter 5 on Pages 24-36 shows the maximum horsepower and amps of auxiliaries that can be wired to the dryer. If an auxiliary motor is larger than recommended, it must be powered from a source outside the dryer and must use a separate contactor and overload protection device for each motor. However, the operation of the auxiliaries can be performed by the control panel.
4. Installation

Fuel

Liquid Propane (LP)

Liquid Draw

The dryers have internal vaporizers and are designed to operate on liquid draw from the supply tank. The tank should be 1000 gallons or larger and should not have a regulator mounted to it. The connection to the dryer should be with a flexible hose designed for LP gas, See Chart on Page 19 for proper size. Consult your LP gas dealer for proper fittings, connection hose and safety controls required to meet local standards and to conform with National Fire Protection Association standards. The piping train on the dryer includes strainer, pressure relief valve, electronic safety shut off valve (on some models) and a pressure regulator between the vaporizer and burner.

Ammonia Tanks

Do not use tanks which have previously been used for ammonia or fertilizer solutions. These substances are extremely corrosive and will damage fuel supply and burner parts.

Oil or Water in Tanks

With liquid draw from the supply tank, any water or oil present in the tank may freeze in the pipe train or controls causing damage. To make sure the tank is free of moisture, it can be purged with methanol. Avoid tanks which may contain an accumulation of oil or heavy hydrocarbon from long use on a vapor withdrawal system.

Figure 4D Grain dryer connected to a liquid propane tank.

“The equipment shall be installed in accordance with the current INSTALLATION CODES FOR GAS BURNING APPLIANCES AND EQUIPMENT, CAN/CGA-B149.1 and CAN/CGA-B149.2, or applicable provincial regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.”
### Fuel System Specifications and Recommendations (LP) Liquid Propane

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<th>Dryer Model #</th>
<th>Maximum Heat Capacity BTU Per Hour</th>
<th>Maximum Fuel Flow Gals Per Hour</th>
<th>Fuel Line Size*</th>
<th>Heater Orifice Drill Size</th>
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</tbody>
</table>

* The minimum size of the fuel line for distances of 30.48 m (100').
4. Installation

Natural Gas (NG)

Gas Volume and Pressure

The dryer is designed to operate on natural gas having a heat value of approximately 1000 BTU per cubic foot. The dryer is equipped with a natural gas supply pipe system connected to the heater solenoid valves. A regulated pressure of 10 PSI must be provided at the connection to the dryer, with gas available in sufficient volume to maintain the operating pressure.

![Diagram](image)

**Figure 4E** Grain dryer connected to a natural gas supply tank.

“The equipment shall be installed in accordance with the current INSTALLATION CODES FOR GAS BURNING APPLIANCES AND EQUIPMENT, CAN/CGA-B149.1 and CAN/CGA-B149.2, or applicable provincial regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.”
## Fuel System Specifications and Recommendations (NG) Natural Gas

<table>
<thead>
<tr>
<th>Dryer Model #</th>
<th>Maximum Heat Capacity BTU Per Hour</th>
<th>Maximum Fuel Flow Cubic Feet Per Hour</th>
<th>Fuel Line Size*</th>
<th>Heater Orifice Drill Size</th>
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<tr>
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<tr>
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* The minimum size of the fuel line for distances of 30.48 m (100').
4. Installation

Single Fan Foundation

Foundation cross section

6 x 6 Reinforcing mesh wire

Grade level

9' 6" 3"
1'-6"
3" 6"
15"
12'-0"

#4 (1/2") Reinforcing bar

Rear view

Tie down dryer with three (3) turnbuckles per side. Bend turnbuckle eyes. Attach turnbuckle to frame using existing holes. Anchor to pad with 1/2" x 6" or 5/8" x 6" anchor bolt.

Side view

Front discharge option

2 x 6 Board

8" x 8" x 16" Concrete blocks

Grade

Top view

These dimensions are valid for any length dryer.

Grain discharge area

Fill hopper location

Gas pipe location

2'-0"

6'-3-1/2"

3'-5"

Electrical service location

2'-10"

2'-6"

4'-0"

4'-8"

Figure 4F
Minimum Bag Mix for Concrete Strength per Model Weight

<table>
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<tr>
<th>Dryer Basket Length</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
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<td>12 x 20</td>
<td>12 x 22</td>
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<td>12 x 28</td>
<td>12 x 30</td>
<td>12 x 32</td>
<td>12 x 36</td>
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<td>5.9</td>
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<td>7.1</td>
<td>7.7</td>
<td>8.3</td>
<td>8.9</td>
<td>9.2</td>
<td>10.1</td>
<td>11.3</td>
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<td>Reinforcing Rods 20&quot; each</td>
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<td>6</td>
<td>7</td>
<td>7</td>
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<td>8</td>
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<td>240</td>
<td>264</td>
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<td>312</td>
<td>336</td>
<td>360</td>
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<td>432</td>
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<td>12</td>
<td>14</td>
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<td>16</td>
<td>18</td>
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<td>18</td>
<td>18</td>
<td>18</td>
<td>22</td>
<td>22</td>
<td>26</td>
<td>30</td>
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<td>Foot of 2 x 6</td>
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<td>20</td>
<td>22</td>
<td>24</td>
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Quantities are approximate and requirements may vary due to site elevations.
Setup times do not include site preparation and pouring concrete pad.

All Stack Dimensions

![Foundation Plan View](image)

![Foundation Cross Section](image)
5. Specifications

FFI Dimensions

Figure 5A

Figure 5B
### Single Module FFI Transport and Installation Dimensions

Values are Valid for Transportation of Stack Modules

<table>
<thead>
<tr>
<th>Dryer Basket</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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<tr>
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<td>Installed Width</td>
<td>Installed Height Wet Bin</td>
<td>Standard Top</td>
<td>Height w/o Wet Bin</td>
<td>Frame Width</td>
<td>Transport Width</td>
<td>Installed Length</td>
<td>Transport Length</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
| 190T (8') | 11' 11" | 8' | 13' | 11' 6" | 10' 3" | 6' 5" | 8' | 17' 2" | 19' 2"
| 270 (12') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 19' 2" | 21' 2"
| 320 (14') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 21' 2" | 23' 2"
| 370 (16') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 23' 2" | 25' 2"
| 400 (18') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 25' 2" | 27' 2"
| 460 (20') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 27' 2" | 29' 2"
| 511 (22') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 29' 2" | 31' 2"
| 601 (26') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 33' 2" | 35' 2"
| 2 Fan CFAB Series Dryers | | | | | | | | |
| 320 (14') | 13' 5" | 8' 8" | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 21' 2" | 23' 2"
| 410 (18') | 13' 5" | 8' 8" | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 25' 2" | 27' 2"
| 510 (22') | 13' 5" | 8' 8" | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 29' 2" | 31' 2"
| 600 (26') | 13' 5" | 8' 8" | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 33' 2" | 35' 2"
| C2100A Series Dryers | | | | | | | | |
| 2120 (14') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 21' 2" | 23' 2"
| 2122 (16') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 23' 2" | 25' 2"
| 2125 (18') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 25' 2" | 27' 2"
| 2130 (20') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 27' 2" | 29' 2"
| 2132 (22') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 29' 2" | 31' 2"
| 2140 (26') | 13' 5" | 8' | 14' 6" | 13' | 11' 9" | 6' 5" | 8' | 33' 2" | 35' 2"
5. Specifications

FFI Specifications

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<tr>
<th>CFAB 190 8'</th>
<th>CFAB 270 12'</th>
<th>CFAB 320 14'</th>
<th>CFAB 370 16'</th>
<th>CFAB 400 18'</th>
<th>CFAB 460 20'</th>
<th>CFAB 511 22'</th>
<th>CFAB 601 26'</th>
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<td>436</td>
<td>509</td>
<td>565</td>
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<td>8&quot; Dia. 2 HP</td>
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<td>Electrical Load (Fans, Top and Bottom Augers²)</td>
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<td>96</td>
<td>100</td>
<td>108</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>1 Phase, 220 Volt</td>
<td>44</td>
<td>52</td>
<td>56</td>
<td>65</td>
<td>95</td>
<td>107</td>
<td>114</td>
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<tr>
<td>3 Phase, 220 Volt</td>
<td>22</td>
<td>26</td>
<td>28</td>
<td>33</td>
<td>46</td>
<td>53</td>
<td>57</td>
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</table>

¹ Actual discharge rate is controlled by meter roll speed adjustment, at 5% to 100% of maximum rate.

² Excludes auxiliary load and unload conveyor equipment.
### 2 Fan CFAB Specifications

<table>
<thead>
<tr>
<th></th>
<th>CFSA 320 14’</th>
<th>CFSA 410 18’</th>
<th>CFSA 510 22’</th>
<th>CFSA 600 26’</th>
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<tr>
<td>Total Holding Capacity (Bushels)</td>
<td>357</td>
<td>459</td>
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<td>735</td>
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<tr>
<td>Grain Column Holding Capacity (Bushels)</td>
<td>300</td>
<td>386</td>
<td>506</td>
<td>598</td>
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<td>Fans</td>
<td>28” 10-13 HP (2)</td>
<td>28” 10-13 HP (2)</td>
<td>36” 15 HP (2)</td>
<td>39” 20 HP (2)</td>
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<tr>
<td>Top Auger</td>
<td>8” Dia. 5 HP</td>
<td>8” Dia. 5 HP</td>
<td>8” Dia. 7.5 HP</td>
<td>8” Dia. 10 HP</td>
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<tr>
<td>Capacity (BHP)</td>
<td>1800</td>
<td>1800</td>
<td>2800</td>
<td>2800</td>
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<tr>
<td>Bottom Auger</td>
<td>8” Dia. 3 HP</td>
<td>8” Dia. 3 HP</td>
<td>8” Dia. 5 HP</td>
<td>8” Dia. 7.5 HP</td>
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<td>Meter Roll Drive</td>
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<td>SCR, 3/4 HP</td>
<td>SCR, 3/4 HP</td>
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<tr>
<td>Capacity - Maximum Rate¹ (BHP)</td>
<td>1960</td>
<td>2520</td>
<td>3080</td>
<td>3640</td>
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#### Electrical Load (Fans, Top and Bottom Augers²)

<table>
<thead>
<tr>
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<th>C2122A 16’</th>
<th>C2125A 18’</th>
<th>C2130A 20’</th>
<th>C2132A 22’</th>
<th>C2140A 26’</th>
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<tbody>
<tr>
<td>1 Phase, 220 Volt</td>
<td>136</td>
<td>156</td>
<td>217</td>
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<tr>
<td>3 Phase, 220 Volt</td>
<td>72</td>
<td>92</td>
<td>127</td>
<td>166</td>
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<td>3 Phase, 440 Volt</td>
<td>36</td>
<td>46</td>
<td>63</td>
<td>83</td>
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¹ Actual discharge rate is controlled by meter roll speed adjustment, at 5% to 100% of maximum rate.

² Excludes auxiliary load and unload conveyor equipment.

### C2100A Specifications

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<tr>
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<th>C2120A 14’</th>
<th>C2122A 16’</th>
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<th>C2130A 20’</th>
<th>C2132A 22’</th>
<th>C2140A 26’</th>
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</thead>
<tbody>
<tr>
<td>Total Holding Capacity (Bushels)</td>
<td>375</td>
<td>436</td>
<td>490</td>
<td>544</td>
<td>599</td>
<td>708</td>
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<tr>
<td>Grain Column Holding Capacity (Bushels)</td>
<td>322</td>
<td>376</td>
<td>415</td>
<td>460</td>
<td>517</td>
<td>600</td>
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<tr>
<td>Fans</td>
<td>28” 10-13 HP/ 28” 10-13 HP</td>
<td>28” 10-13 HP/ 36” 15 HP</td>
<td>28” 10-13 HP/ 36” 15 HP</td>
<td>28” 10-13 HP/ 39” 20 HP</td>
<td>28” 10-13 HP/ 42” 20 HP</td>
<td>28” 10-13 HP/ 42” 25 HP</td>
</tr>
<tr>
<td>Top Auger</td>
<td>8” Dia. 5 HP</td>
<td>8” Dia. 5 HP</td>
<td>8” Dia. 5 HP</td>
<td>8” Dia. 7.5 HP</td>
<td>8” Dia. 7.5 HP</td>
<td>8” Dia. 10 HP</td>
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<tr>
<td>Capacity (BHP)</td>
<td>1800</td>
<td>2800</td>
<td>2800</td>
<td>2800</td>
<td>2800</td>
<td>2800</td>
</tr>
<tr>
<td>Bottom Auger</td>
<td>8” Dia. 3 HP</td>
<td>8” Dia. 3 HP</td>
<td>8” Dia. 3 HP</td>
<td>8” Dia. 5 HP</td>
<td>8” Dia. 5 HP</td>
<td>8” Dia. 7.5 HP</td>
</tr>
<tr>
<td>Capacity - Maximum Rate¹ (BHP)</td>
<td>1960</td>
<td>2240</td>
<td>2520</td>
<td>2800</td>
<td>3080</td>
<td>3640</td>
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#### Electrical Load (Fans, Top and Bottom Augers²)

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<th>C2122A 16’</th>
<th>C2125A 18’</th>
<th>C2130A 20’</th>
<th>C2132A 22’</th>
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<tr>
<td>1 Phase, 220 Volt</td>
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<td>187</td>
<td>187</td>
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<tr>
<td>3 Phase, 220 Volt</td>
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<td>96</td>
<td>96</td>
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<td>3 Phase, 440 Volt</td>
<td>46</td>
<td>48</td>
<td>48</td>
<td>68</td>
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¹ Actual discharge rate is controlled by meter roll speed adjustment, at 5% to 100% of maximum rate.

² Excludes auxiliary load and unload conveyor equipment.
5. Specifications

GSI Dimensions

Figure 5D

Figure 5E
## Single Module GSI Transport and Installation Dimensions

Values are Valid for Transportation of Stack Modules

<table>
<thead>
<tr>
<th>Dryer Basket</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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<tbody>
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<td></td>
<td>Transport Height</td>
<td>Installed Width</td>
<td>Installed Height</td>
<td>Height w/o Wet Bin</td>
<td>Frame Width</td>
<td>Transport Width</td>
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<td>Transport Length</td>
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<td>1108T/108T</td>
<td>13’ 5”</td>
<td>8’</td>
<td>14’ 6”</td>
<td>13’</td>
<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>15’ 2”</td>
</tr>
<tr>
<td>1112/112</td>
<td>13’ 5”</td>
<td>8’</td>
<td>14’ 6”</td>
<td>13’</td>
<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>19’ 2”</td>
</tr>
<tr>
<td>1114/114</td>
<td>13’ 5”</td>
<td>8’</td>
<td>14’ 6”</td>
<td>13’</td>
<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>21’ 2”</td>
</tr>
<tr>
<td>1116/116</td>
<td>13’ 5”</td>
<td>8’</td>
<td>14’ 6”</td>
<td>13’</td>
<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>23’ 2”</td>
</tr>
<tr>
<td>1118/118</td>
<td>13’ 5”</td>
<td>8’</td>
<td>14’ 6”</td>
<td>13’</td>
<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>25’ 2”</td>
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<td>13’</td>
<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>27’ 2”</td>
</tr>
<tr>
<td>1122/122</td>
<td>13’ 5”</td>
<td>8’</td>
<td>14’ 6”</td>
<td>13’</td>
<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>29’ 2”</td>
</tr>
<tr>
<td>1126/126</td>
<td>13’ 5”</td>
<td>8’</td>
<td>14’ 6”</td>
<td>13’</td>
<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>33’ 2”</td>
</tr>
<tr>
<td>1214</td>
<td>13’ 5”</td>
<td>8’</td>
<td>14’ 6”</td>
<td>13’</td>
<td>11’ 9”</td>
<td>6’ 5”</td>
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<td>6’ 5”</td>
<td>8’</td>
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<td>14’ 6”</td>
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<td>6’ 5”</td>
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<td>27’ 2”</td>
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<td>6’ 5”</td>
<td>8’</td>
<td>29’ 2”</td>
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<td>13’</td>
<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>33’ 2”</td>
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<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>25’ 2”</td>
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<td>1220S</td>
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<td>13’</td>
<td>11’ 9”</td>
<td>6’ 5”</td>
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<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>29’ 2”</td>
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<tr>
<td>1226S</td>
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<td>8’ 8”</td>
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<td>11’ 9”</td>
<td>6’ 5”</td>
<td>8’</td>
<td>33’ 2”</td>
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### 1100 Series Dryer Specifications

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<thead>
<tr>
<th></th>
<th>1108T/108</th>
<th>1112/112</th>
<th>1114/114</th>
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<th>1118/118</th>
<th>1120/120</th>
<th>1122/122</th>
<th>1126/126</th>
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</thead>
<tbody>
<tr>
<td>Total Holding Capacity (Bushels)</td>
<td>190</td>
<td>327</td>
<td>381</td>
<td>436</td>
<td>490</td>
<td>544</td>
<td>599</td>
<td>708</td>
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<tr>
<td>Grain Column Holding Capacity (Bushels)</td>
<td>160</td>
<td>282</td>
<td>329</td>
<td>376</td>
<td>423</td>
<td>470</td>
<td>517</td>
<td>611</td>
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<tr>
<td>Fan 36'' 10-13 HP</td>
<td>36'' 15 HP</td>
<td>40'' 15 HP</td>
<td>42'' 20 HP</td>
<td>42'' 25 HP</td>
<td>42'' 30 HP</td>
<td>42'' 40 HP</td>
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<tr>
<td>Fan 36'' 15 HP</td>
<td>36'' 15 HP</td>
<td>40'' 15 HP</td>
<td>42'' 20 HP</td>
<td>42'' 25 HP</td>
<td>42'' 30 HP</td>
<td>42'' 40 HP</td>
<td></td>
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</tr>
<tr>
<td>Top Auger 8'' Dia. 2 HP</td>
<td>8'' Dia. 2 HP</td>
<td>8'' Dia. 5 HP</td>
<td>8'' Dia. 5 HP</td>
<td>8'' Dia. 7-1/2 HP</td>
<td>8'' Dia. 7-1/2 HP</td>
<td>8'' Dia. 10 HP</td>
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</tr>
<tr>
<td>Top Auger 8'' Dia. 2 HP</td>
<td>8'' Dia. 2 HP</td>
<td>8'' Dia. 5 HP</td>
<td>8'' Dia. 5 HP</td>
<td>8'' Dia. 7-1/2 HP</td>
<td>8'' Dia. 7-1/2 HP</td>
<td>8'' Dia. 10 HP</td>
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<td>3800</td>
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<td>3800</td>
<td>3800</td>
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<tr>
<td>Bottom Auger 8'' Dia. 1-1/2 HP</td>
<td>8'' Dia. 3 HP</td>
<td>8'' Dia. 5 HP</td>
<td>8'' Dia. 5 HP</td>
<td>8'' Dia. 7-1/2 HP</td>
<td>8'' Dia. 7-1/2 HP</td>
<td>8'' Dia. 10 HP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottom Auger 8'' Dia. 1-1/2 HP</td>
<td>8'' Dia. 3 HP</td>
<td>8'' Dia. 5 HP</td>
<td>8'' Dia. 5 HP</td>
<td>8'' Dia. 7-1/2 HP</td>
<td>8'' Dia. 7-1/2 HP</td>
<td>8'' Dia. 10 HP</td>
<td></td>
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<tr>
<td>Capacity - Maximum Rate¹ (BHP)</td>
<td>1120</td>
<td>1680</td>
<td>1960</td>
<td>2240</td>
<td>2520</td>
<td>2800</td>
<td>3080</td>
<td>3640</td>
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### Electrical Load (Fans, Top and Bottom Augers²)

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<th>1114/114</th>
<th>1116/116</th>
<th>1118/118</th>
<th>1120/120</th>
<th>1122/122</th>
<th>1126/126</th>
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<tbody>
<tr>
<td>1 Phase, 220 Volt</td>
<td>63</td>
<td>85</td>
<td>98</td>
<td>108</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3 Phase, 220 Volt</td>
<td>42</td>
<td>50</td>
<td>56</td>
<td>65</td>
<td>80</td>
<td>104</td>
<td>114</td>
<td>150</td>
</tr>
<tr>
<td>3 Phase, 440 Volt</td>
<td>21</td>
<td>25</td>
<td>28</td>
<td>33</td>
<td>40</td>
<td>52</td>
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<td>75</td>
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<td>44</td>
<td>49</td>
<td>68</td>
<td>75</td>
<td>88</td>
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¹ Actual discharge rate is controlled by meter roll speed adjustment, at 5% to 100% of maximum rate.

² Excludes auxiliary load and unload conveyor equipment.
### 1200 Series Dryer Specifications

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<th>1222</th>
<th>1226</th>
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<td><strong>Total Holding Capacity (Bushels)</strong></td>
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<td>436</td>
<td>490</td>
<td>544</td>
<td>599</td>
<td>708</td>
</tr>
<tr>
<td><strong>Grain Column Holding Capacity (Bushels)</strong></td>
<td>329</td>
<td>376</td>
<td>423</td>
<td>470</td>
<td>517</td>
<td>611</td>
</tr>
<tr>
<td><strong>Fan</strong></td>
<td>26&quot; 10-13 HP</td>
<td>26&quot; 10-13 HP</td>
<td>26&quot; 10-13 HP</td>
<td>28&quot; 10-13 HP</td>
<td>28&quot; 10-13 HP</td>
<td>28&quot; 10-13 HP</td>
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<td></td>
<td>36&quot; 15 HP</td>
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<td>40&quot; 15 HP</td>
<td>42&quot; 20 HP</td>
<td>42&quot; 25 HP</td>
</tr>
<tr>
<td><strong>Top Auger</strong></td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 7-1/2 HP</td>
<td>8&quot; Dia. 7-1/2 HP</td>
<td>8&quot; Dia. 7-1/2 HP</td>
<td>8&quot; Dia. 10 HP</td>
</tr>
<tr>
<td><strong>Capacity (BHP)</strong></td>
<td>3800</td>
<td>3800</td>
<td>3800</td>
<td>3800</td>
<td>3800</td>
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<tr>
<td><strong>Bottom Auger</strong></td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 7-1/2 HP</td>
<td>8&quot; Dia. 7-1/2 HP</td>
<td>8&quot; Dia. 7-1/2 HP</td>
<td>8&quot; Dia. 10 HP</td>
</tr>
<tr>
<td><strong>Capacity - Maximum Rate</strong>&lt;sup&gt;1&lt;/sup&gt; (BHP)</td>
<td>1960</td>
<td>2240</td>
<td>2520</td>
<td>2800</td>
<td>3080</td>
<td>3640</td>
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1. Actual discharge rate is controlled by meter roll speed adjustment, at 5% to 100% of maximum rate.

### 1200S Series Dryer Specifications

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<tr>
<td><strong>Total Holding Capacity (Bushels)</strong></td>
<td>381</td>
<td>490</td>
<td>544</td>
<td>599</td>
<td>708</td>
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<tr>
<td><strong>Grain Column Holding Capacity (Bushels)</strong></td>
<td>329</td>
<td>423</td>
<td>470</td>
<td>517</td>
<td>611</td>
</tr>
<tr>
<td><strong>Fan</strong></td>
<td>28&quot; 10-13 HP (2)</td>
<td>36&quot; 10-13 HP (2)</td>
<td>36&quot; 15 HP (2)</td>
<td>36&quot; 15 HP (2)</td>
<td>40&quot; 25 HP (2)</td>
</tr>
<tr>
<td><strong>Top Auger</strong></td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 7-1/2 HP</td>
<td>8&quot; Dia. 7-1/2 HP</td>
<td>8&quot; Dia. 10 HP</td>
</tr>
<tr>
<td><strong>Capacity (BHP)</strong></td>
<td>3800</td>
<td>3800</td>
<td>3800</td>
<td>3800</td>
<td>3800</td>
</tr>
<tr>
<td><strong>Bottom Auger</strong></td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 7-1/2 HP</td>
<td>8&quot; Dia. 7-1/2 HP</td>
<td>8&quot; Dia. 10 HP</td>
</tr>
<tr>
<td><strong>Meter Roll Drive</strong></td>
<td>SCR, 3/4 HP</td>
<td>SCR, 3/4 HP</td>
<td>SCR, 3/4 HP</td>
<td>SCR, 3/4 HP</td>
<td>SCR, 3/4 HP</td>
</tr>
<tr>
<td><strong>Capacity - Maximum Rate</strong>&lt;sup&gt;1&lt;/sup&gt; (BHP)</td>
<td>1960</td>
<td>2520</td>
<td>2800</td>
<td>3080</td>
<td>3640</td>
</tr>
</tbody>
</table>

1. Actual discharge rate is controlled by meter roll speed adjustment, at 5% to 100% of maximum rate.

2. Excludes auxiliary load and unload conveyor equipment.
5. Specifications

All Stack Dimensions

Figure 5G Example of Stack Dryer Footprint

Figure 5H Side View - 2 Module Stack Dryer
All Stack Dimensions (Continued)

FIGURE 5I STACK DRYER DIMENSION (SIDE VIEW - 3 MODULE STACK DRYER)

Dryer Installed Length (1, 2 and 3 Module Stacks)

<table>
<thead>
<tr>
<th>Basket Length</th>
<th>Installed Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>23' 10&quot;</td>
</tr>
<tr>
<td>18</td>
<td>27' 10&quot;</td>
</tr>
<tr>
<td>20</td>
<td>29' 10&quot;</td>
</tr>
<tr>
<td>22</td>
<td>31' 10&quot;</td>
</tr>
<tr>
<td>26</td>
<td>35' 10&quot;</td>
</tr>
</tbody>
</table>

Fill box center 9" to center box is 10-1/8" x 18-1/8" x 8-1/4"  
Discharge box center 18" behind dryer box is 12-3/8" x 10-3/4" x 12-1/4"

"X" - Varies with dryer length (See chart below)
5. Specifications

All Stack Dimensions (Continued)

Figure 5J

End View - 2 Module Stack Dryer

End View - 3 Module Stack Dryer
## All Stack Specifications

<table>
<thead>
<tr>
<th></th>
<th>14'</th>
<th>18'</th>
<th>20'</th>
<th>22'</th>
<th>26'</th>
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</thead>
<tbody>
<tr>
<td><strong>Total Holding Capacity (Bushels)</strong></td>
<td>731</td>
<td>940</td>
<td>1044</td>
<td>1149</td>
<td>1304</td>
</tr>
<tr>
<td><strong>Grain Column Holding Capacity (Bushels)</strong></td>
<td>679</td>
<td>873</td>
<td>970</td>
<td>1067</td>
<td>1261</td>
</tr>
<tr>
<td><strong>Fans</strong></td>
<td>28&quot; 10-13 HP</td>
<td>28&quot; 10-13 HP</td>
<td>36&quot; 10-12 HP</td>
<td>36&quot; 10-12 HP</td>
<td>36&quot; 15 HP</td>
</tr>
<tr>
<td></td>
<td>40&quot; 15 HP</td>
<td>40&quot; 15 HP</td>
<td>42&quot; 20 HP</td>
<td>42&quot; 20 HP</td>
<td>42&quot; 25 HP</td>
</tr>
<tr>
<td></td>
<td>42&quot; 25 HP</td>
<td>42&quot; 25 HP</td>
<td>42&quot; 30 HP</td>
<td>42&quot; 30 HP</td>
<td>42&quot; 40 HP</td>
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<tr>
<td><strong>Top Auger</strong></td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
<td>8&quot; Dia. 10 HP</td>
</tr>
<tr>
<td><strong>Capacity (BHP)</strong></td>
<td>3800</td>
<td>3800</td>
<td>3800</td>
<td>3800</td>
<td>3800</td>
</tr>
<tr>
<td><strong>Bottom Auger</strong></td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
<td>8&quot; Dia. 10 HP</td>
</tr>
<tr>
<td><strong>Meter Roll Drive</strong></td>
<td>SCR, 1/3 HP</td>
<td>SCR, 1/3 HP</td>
<td>SCR, 1/3 HP</td>
<td>SCR, 1/3 HP</td>
<td>SCR, 1/3 HP</td>
</tr>
<tr>
<td><strong>Capacity - Maximum Rate¹ (BHP)</strong></td>
<td>1960</td>
<td>2520</td>
<td>2800</td>
<td>3080</td>
<td>3640</td>
</tr>
<tr>
<td><strong>Electrical Load (Fans, Top and Bottom Augers²)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Phase, 220 Volt</td>
<td>226</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>3 Phase, 220 Volt</td>
<td>121</td>
<td>132</td>
<td>182</td>
<td>192</td>
<td>282</td>
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<tr>
<td>3 Phase, 440 Volt</td>
<td>61</td>
<td>66</td>
<td>91</td>
<td>96</td>
<td>141</td>
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<tr>
<td>3 Phase, 575 Volt</td>
<td>49</td>
<td>53</td>
<td>73</td>
<td>77</td>
<td>113</td>
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</tbody>
</table>

¹ Actual discharge rate is controlled by meter roll speed adjustment, at 5% to 100% of maximum rate.
² Excludes auxiliary load and unload conveyor equipment.
5. Specifications

**All Stack Specifications (Continued)**

<table>
<thead>
<tr>
<th>14'</th>
<th>18'</th>
<th>20'</th>
<th>22'</th>
<th>26'</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Holding Capacity (Bushels)</strong></td>
<td>1074</td>
<td>1381</td>
<td>1534</td>
<td>1688</td>
</tr>
<tr>
<td><strong>Grain Column Holding Capacity (Bushels)</strong></td>
<td>1022</td>
<td>1314</td>
<td>1460</td>
<td>1606</td>
</tr>
<tr>
<td><strong>Fans</strong></td>
<td>28&quot; 10-13 HP</td>
<td>36&quot; 10-13 HP</td>
<td>36&quot; 15 HP</td>
<td>36&quot; 15 HP</td>
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<tr>
<td></td>
<td>40&quot; 15 HP</td>
<td>42&quot; 20 HP</td>
<td>42&quot; 25 HP</td>
<td>42&quot; 30 HP</td>
</tr>
<tr>
<td><strong>Top Auger</strong></td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
</tr>
<tr>
<td><strong>Capacity (BHP)</strong></td>
<td>3800</td>
<td>3800</td>
<td>3800</td>
<td>3800</td>
</tr>
<tr>
<td><strong>Bottom Auger</strong></td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
</tr>
<tr>
<td><strong>Meter Roll Drive</strong></td>
<td>SCR, 1/3 HP</td>
<td>SCR, 1/3 HP</td>
<td>SCR, 1/3 HP</td>
<td>SCR, 1/3 HP</td>
</tr>
<tr>
<td><strong>Capacity - Maximum Rate¹ (BHP)</strong></td>
<td>1960</td>
<td>2520</td>
<td>2800</td>
<td>3080</td>
</tr>
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</table>

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<td>1688</td>
</tr>
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<td>1314</td>
<td>1460</td>
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</tr>
<tr>
<td><strong>Fans</strong></td>
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<td>36&quot; 15 HP</td>
<td>36&quot; 15 HP</td>
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<td>42&quot; 20 HP</td>
<td>42&quot; 25 HP</td>
<td>42&quot; 30 HP</td>
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<tr>
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<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
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<tr>
<td><strong>Capacity (BHP)</strong></td>
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<td>3800</td>
<td>3800</td>
<td>3800</td>
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<tr>
<td><strong>Bottom Auger</strong></td>
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<td>8&quot; Dia. 5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
<td>8&quot; Dia. 7.5 HP</td>
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<tr>
<td><strong>Meter Roll Drive</strong></td>
<td>SCR, 1/3 HP</td>
<td>SCR, 1/3 HP</td>
<td>SCR, 1/3 HP</td>
<td>SCR, 1/3 HP</td>
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<tr>
<td><strong>Capacity - Maximum Rate¹ (BHP)</strong></td>
<td>1960</td>
<td>2520</td>
<td>2800</td>
<td>3080</td>
</tr>
</tbody>
</table>

1 Actual discharge rate is controlled by meter roll speed adjustment, at 5% to 100% of maximum rate.

2 Excludes auxiliary load and unload conveyor equipment.

---

**Electrical Load (Fans, Top and Bottom Augers)²**

| 1 Phase, 220 Volt | 304 | - | - | - | - |
| 3 Phase, 220 Volt | 160 | 182 | 246 | 266 | 384 |
| 3 Phase, 440 Volt | 80 | 91 | 123 | 133 | 192 |
| 3 Phase, 575 Volt | 64 | 73 | 98 | 106 | 154 |

---

¹ Actual discharge rate is controlled by meter roll speed adjustment, at 5% to 100% of maximum rate.

² Excludes auxiliary load and unload conveyor equipment.
All Stack Specifications (Continued)

Figure 5K

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
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<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>L</th>
<th>M</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>14’</td>
<td>23'-1-1/2&quot;</td>
<td>2'-2&quot;</td>
<td>14'-0&quot;</td>
<td>4'-8&quot;</td>
<td>16&quot; Min.</td>
<td>11'-2&quot;</td>
<td>4'-9-3/4&quot;</td>
<td>0'-8&quot;</td>
<td>8'-0&quot;</td>
<td>23'-9-1/2&quot;</td>
<td>10'-0&quot;</td>
<td>6'-4&quot;</td>
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<td>27'-1-1/2&quot;</td>
<td>2'-2&quot;</td>
<td>18'-0&quot;</td>
<td>4'-8&quot;</td>
<td>16&quot; Min.</td>
<td>11'-2&quot;</td>
<td>4'-9-3/4&quot;</td>
<td>0'-8&quot;</td>
<td>8'-0&quot;</td>
<td>23'-9-1/2&quot;</td>
<td>10'-0&quot;</td>
<td>6'-4&quot;</td>
</tr>
<tr>
<td>20’</td>
<td>29'-1-1/2&quot;</td>
<td>2'-2&quot;</td>
<td>20'-0&quot;</td>
<td>4'-8&quot;</td>
<td>16&quot; Min.</td>
<td>11'-2&quot;</td>
<td>4'-9-3/4&quot;</td>
<td>0'-8&quot;</td>
<td>8'-0&quot;</td>
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<td>10'-0&quot;</td>
<td>6'-4&quot;</td>
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<td>31'-1-1/2&quot;</td>
<td>2'-2&quot;</td>
<td>22'-0&quot;</td>
<td>4'-8&quot;</td>
<td>16&quot; Min.</td>
<td>11'-2&quot;</td>
<td>4'-9-3/4&quot;</td>
<td>0'-8&quot;</td>
<td>8'-0&quot;</td>
<td>23'-9-1/2&quot;</td>
<td>10'-0&quot;</td>
<td>6'-4&quot;</td>
</tr>
<tr>
<td>26’</td>
<td>35'-1-1/2&quot;</td>
<td>2'-2&quot;</td>
<td>26'-0&quot;</td>
<td>4'-8&quot;</td>
<td>16&quot; Min.</td>
<td>11'-2&quot;</td>
<td>4'-9-3/4&quot;</td>
<td>0'-8&quot;</td>
<td>8'-0&quot;</td>
<td>23'-9-1/2&quot;</td>
<td>10'-0&quot;</td>
<td>6'-4&quot;</td>
</tr>
</tbody>
</table>

1. A 12" thick reinforced concrete foundation and 16" pedestal (min.) are required. See bulletin FL-02-2 for details. 32" Thick pedestal required for heat reclaimer option (see bulletin FL-03-2 for details).

2. Approximate location of standard service platform shown. See bulletin SP-02-2 for details. For information on optional catwalk, see bulletin CATH-01-5.

3. For safety cage information, refer to bulletin SC-01-2.
5. Specifications

All Stack Specifications (Continued)

Figure 5L

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E 1</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>N</th>
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</thead>
<tbody>
<tr>
<td>14’</td>
<td>23'-1-1/2&quot;</td>
<td>2'-2&quot;</td>
<td>14'-0&quot;</td>
<td>4'-8&quot;</td>
<td>16&quot; Min.</td>
<td>11'-2&quot;</td>
<td>4'-9-3/4&quot;</td>
<td>0'-8&quot;</td>
<td>8'-0&quot;</td>
<td>3'-0&quot;</td>
<td>23'-9-1/2&quot;</td>
<td>6'-4&quot;</td>
</tr>
<tr>
<td>18’</td>
<td>27'-1-1/2&quot;</td>
<td>2'-2&quot;</td>
<td>18'-0&quot;</td>
<td>4'-8&quot;</td>
<td>16&quot; Min.</td>
<td>11'-2&quot;</td>
<td>4'-9-3/4&quot;</td>
<td>0'-8&quot;</td>
<td>8'-0&quot;</td>
<td>3'-0&quot;</td>
<td>23'-9-1/2&quot;</td>
<td>6'-4&quot;</td>
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<tr>
<td>20’</td>
<td>29'-1-1/2&quot;</td>
<td>2'-2&quot;</td>
<td>20'-0&quot;</td>
<td>4'-8&quot;</td>
<td>16&quot; Min.</td>
<td>11'-2&quot;</td>
<td>4'-9-3/4&quot;</td>
<td>0'-8&quot;</td>
<td>8'-0&quot;</td>
<td>3'-0&quot;</td>
<td>23'-9-1/2&quot;</td>
<td>6'-4&quot;</td>
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<tr>
<td>22’</td>
<td>31'-1-1/2&quot;</td>
<td>2'-2&quot;</td>
<td>22'-0&quot;</td>
<td>4'-8&quot;</td>
<td>16&quot; Min.</td>
<td>11'-2&quot;</td>
<td>4'-9-3/4&quot;</td>
<td>0'-8&quot;</td>
<td>8'-0&quot;</td>
<td>3'-0&quot;</td>
<td>23'-9-1/2&quot;</td>
<td>6'-4&quot;</td>
</tr>
<tr>
<td>26’</td>
<td>35'-1-1/2&quot;</td>
<td>2'-2&quot;</td>
<td>26'-0&quot;</td>
<td>4'-8&quot;</td>
<td>16&quot; Min.</td>
<td>11'-2&quot;</td>
<td>4'-9-3/4&quot;</td>
<td>0'-8&quot;</td>
<td>8'-0&quot;</td>
<td>3'-0&quot;</td>
<td>23'-9-1/2&quot;</td>
<td>6'-4&quot;</td>
</tr>
</tbody>
</table>

1. A 12" thick reinforced concrete foundation and 16" pedestal (min.) are required. See bulletin FL-02-2 for details. 32" Thick pedestal required for heat reclaimer option (see bulletin FL-03-2 for details).

2. Approximate location of standard service platform shown. See bulletin SP-02-2 for details. For information on optional catwalk, see bulletin CATH-01-5.

3. For safety cage information, refer to bulletin SC-01-2.
## Stack Dryer Foundation Specifications

<table>
<thead>
<tr>
<th>Stack Dryer Foundation</th>
<th>14</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basket Length</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete Pad Size (12' x &quot;x&quot;)</td>
<td>12 x 24</td>
<td>12 x 28</td>
<td>12 x 30</td>
<td>12 x 32</td>
<td>12 x 36</td>
</tr>
<tr>
<td>Concrete (Cubic Yards)</td>
<td>20-3/4</td>
<td>24-1/4</td>
<td>26</td>
<td>27-1/2</td>
<td>31</td>
</tr>
<tr>
<td>#4 Rebar (Feet)</td>
<td>900</td>
<td>1060</td>
<td>1140</td>
<td>1220</td>
<td>1400</td>
</tr>
<tr>
<td>Anchors ²</td>
<td>16</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>28</td>
</tr>
</tbody>
</table>

¹ 10" Depth with 36" wide x 36" deep footings along each side.

² #4 Reinforcing rods on 1"-0" centers. Both directions in slab and bottom of footing.

³ Use 3/4" x 9-5/8" minimum anchors with epoxy. GSI part #: Anchor (GTC-0003) epoxy (GTC-0004).

Minimum soil bearing capacity = 2000 PSF.

Concrete specifications:

- Compressive strength at 28 days - 4000 PSI.
- Minimum cement content - 6 sacks/yard.
- Maximum slump - 4" ± 1".
6. Competitor/Dri-Tek Test Firing

Before the dryer is filled, thoroughly inspect the unit and check the operation of the dryer as follows.

Inspect the Metering Rolls

Open all metering roll access doors and inspect each compartment for any bolts, nuts or other foreign material, that may cause possible jamming of the metering rolls.

**CAUTION**

Before attempting to operate the dryer make sure all safety shields are in place, all bottom clean-out and rear access doors are closed and all personnel are clear of the dryer.
## Set Control Switches

<table>
<thead>
<tr>
<th>Switch</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture Control Switch</td>
<td>OFF</td>
</tr>
<tr>
<td>Moisture Control Thermostat</td>
<td>200°F</td>
</tr>
<tr>
<td>Load Switch</td>
<td>OFF</td>
</tr>
<tr>
<td>Unload Switch</td>
<td>OFF</td>
</tr>
<tr>
<td>Fan Switch</td>
<td>OFF</td>
</tr>
<tr>
<td>Burner Switch</td>
<td>OFF</td>
</tr>
<tr>
<td>Out of Grain Timer</td>
<td>1 MINUTE (Reset to 8 Minutes after testing)</td>
</tr>
<tr>
<td>Load Delay</td>
<td>30 SECONDS</td>
</tr>
<tr>
<td>Unload Delay</td>
<td>30 SECONDS</td>
</tr>
<tr>
<td>Metering Roll Speed</td>
<td>LOW AND HIGH SPEED SETTINGS PUT ON ZERO</td>
</tr>
<tr>
<td>Dry Timer</td>
<td>60 MINUTES</td>
</tr>
<tr>
<td>Cool Timer</td>
<td>20 MINUTES</td>
</tr>
<tr>
<td>Unload Timer</td>
<td>10 MINUTES</td>
</tr>
<tr>
<td>Mode Switch</td>
<td>CONTINUOUS FLOW</td>
</tr>
</tbody>
</table>

## Electrical Power

Turn ON the electrical power supply to the dryer. Set all circuit breakers to ON, including the safety disconnect handle mounted on front of the dryer’s power panel.

## Control Power Switch

Turn the Control Power switch to ON. The switch light comes on. “GSI” and the software version will appear. At this point, the controller will lock out all other dryer functions and the dryer will perform its safety circuit check. If a fault is found, the cause will be displayed on the LCD. If all safeties are safe, the controller will supply power to the electronic fuel shut off valve (if so equipped). Press the Start button to initialize the computer.

## Power Start Button

Push the Start button and all the toggle switches on the control panel will be activated. This initializes the load, fan, burner, unload and metering rolls individually.

## Fuel Check

If using LP gas, make sure the tank has plenty of fuel and that the TANK DOES NOT HAVE A PRESSURE REGULATOR MOUNTED TO IT. If using natural gas, make sure an adequate supply is available.

If using LP gas, slowly open the main fuel supply valve at the tank. If using natural gas, turn ON the valve along the supply line. Then, open the manual shut off valve on the dryer to allow fuel flow to the dryer. Inspect all gas lines and connections for possible leaks. ANY GAS LEAKS NEED TO BE FIXED IMMEDIATELY.
6. Competitor/Dri-Tek Test Firing

Load Auger

With the grain supply shut off, quickly bump the Load Auger switch to MANUAL and see if the load auger rotates clockwise, as viewed from the drive end, or counterclockwise if the dryer is a front load model. If the wet grain supply auxiliary is wired to the dryer it should also rotate in the correct direction at this time. Turn the Load Auger switch to the AUTO position. The top auger and wet grain supply auxiliary should run for one minute and then the dryer will shutdown leaving the safety shutdown message (out of grain) displayed. Press the Dryer Power Stop button to reset the panel, then press the Start button to resume operation.

1 Speed Operation

To check 1 Speed operation, place the Unload switch in the 1 Speed setting. Turn the high speed metering roll dial up until the metering rolls start rotating. The bottom auger should rotate counterclockwise, as viewed from the drive end. The metering roll drive motor should rotate clockwise, as viewed from the drive end of the gearbox. If the dry grain take away auxiliary is wired to the dryer, it should start and rotate in the proper direction.

Metering Roll Operation

To check the metering roll operation, turn high speed knob clockwise. The metering roll speed should increase. Turning the knob counterclockwise will decrease the speed. Turn ON the Moisture Control switch. If the grain temperature setpoint is set above the outside temperature, the system will switch to Low Speed if working correctly. Make sure the drive chain tension is properly adjusted and all sections of the metering rolls rotate. Turn the Unload switch OFF after these checks are complete. The bottom auger will continue to run for 30 seconds after the switch is turned OFF to allow for clean out.
Fan Switch

Bump the Fan switch and observe the fan rotation. The fan should run counterclockwise. Sometimes on 3 phase models all motors on the dryer will run backwards. They can easily be reversed by interchanging two of three power supply wires. Reverse the two (2) outside wires, L1 and L3 and leave the middle one in the same position.

**NOTE:** If the dryer is empty, the burner does not operate. The fans cannot create enough static pressure to engage the Air switch. You will receive a “no airflow” message. To start the dryer when it is low on grain, the Airflow switches must be turned OFF. Switching Dip Switch number eight (#8), on the back of the computer control board, to ON turns the Air Switch OFF.

| WARNING | Dip switch number eight (#8) must be turned back to the OFF position after this test is complete or no air testing will occur. |

Burner Safety

To check the burner safety function, make sure the main gas valve is OFF. Turn the Fan switch ON and allow the fan to start. Then, turn the Heater switch ON. The dryer will shutdown after 20 seconds. The safety message, “loss of flame” will appear.

Burner Test Fire

The following test should be done with grain in the dryer. If no grain is present, set approximate pressure settings and fine tune when grain arrives. Test fire the burner by starting the fan and then turn the Burner switch to ON with the fuel supply turned ON. The heater should ignite after a short purge delay of approximately 10 seconds. Gas pressure should be shown on the gauge. At this time, set the high-fire and low-fire pressure settings. Use the pressure regulator ([See Figure 6D on Page 44](#)) for high-fire and the needle valve located in the side of the cycle solenoid (low-fire) valve ([See Figure 6D on Page 44](#)) for low-fire. The burner should cycle between high-fire and low-fire, approximately 2 or 3 times per minute.

Approximate settings should be:

<table>
<thead>
<tr>
<th>LP Gas</th>
<th>Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Fire 6-15 lbs.</td>
<td>High-Fire 6-10 lbs.</td>
</tr>
<tr>
<td>Low-Fire 2-6 lbs.</td>
<td>Low-Fire 1-3 lbs.</td>
</tr>
</tbody>
</table>

If the burner remains on high-fire and does not cycle, increase the regulator setting, in order to reach the thermostat setting. If the burner remains in low-fire and does not cycle, slightly decrease gas pressure with the low-fire solenoid needle valve. If the gas pressure is decreased too much, a popping or fluttering sound will be heard. Be sure to adjust the low pressure needle valve anytime the high pressure regulator is adjusted.
6. Competitor/Dri-Tek Test Firing

**Figure 6D Liquid Propane (LP) Pipe Train**

**Figure 6E Natural Gas (NG) Pipe Train**
Staged Batch Check

The following test must be done with grain in the dryer or with the Air switch turned OFF as noted in the Fan switch section on Page 43. To check the staged batch operation, turn the Control Power switch to the ON position. Open the main fuel supply valve at the tank on an LP dryer or open the valve in the fuel supply line on a natural gas dryer. Turn the Drying Mode switch to the staged batch position. Turn ON the electric shut off valve to allow fuel flow to the dryer. Turn the Load switch to AUTO, the Unload switch to 1 Speed and the fan and burner to ON. Push the Dryer Power Start button and the controller will sequentially start all dryer components in their proper order. If any switches are not in their correct position for staged batch operation, the dryer will indicate improper switch position and will not start until the switches are in the proper position. After starting, all batch timers will time down in sequence. When the unload cycle is complete, the timers will automatically reset to their original settings and start the dryer timer again.

NOTE: If the dryer is empty, the burner does not operate. The fans cannot create enough static pressure to engage the Air switch. You will receive a “no airflow” message. To start the dryer when it is low on grain, the Airflow switches must be turned OFF. Switching Dip Switch number eight (#8), on the back of the computer control board, to ON turns the Air Switch OFF.

WARNING

Dip switch number eight (#8) must be turned back to the OFF position after this test is complete or no air testing will occur.

Stopping Dryer Operation

To stop operation of the dryer, push the Dryer Power Stop button. The fan, burner and all augers will stop immediately.

Dryer Shutdown

To shutdown the dryer, first close the fuel supply valve at the tank or valve along the fuel line. If the burner is operating, let the dryer run out of fuel and it will shutdown automatically due to loss of flame. Close the fuel valve at the dryer and press the Dryer Power Stop button. Turn OFF the safety disconnect handle on the front of the power box and turn OFF the main power to the dryer.

Emergency

In case of emergency, push the Emergency Stop button located at the bottom of the upper control box. (See Page 9.)
7. Vision Test Firing

Dryer Pre-Season Checks

Before staring the drying for the first time in a drying season, perform the following checks. If any of the checks fail to produce the stated result, the customer should consult the dealer.

Do not attempt to use the dryer unless all the pre-start checks have been successfully completed.

*WARNING* Before attempting to operate the dryer, make sure all safety shields are in place, all bottoms are cleaned out and rear access doors are closed and all personnel are clear of the dryer.

Inspect the Metering Rolls

Open all metering roll access doors and inspect each compartment for any bolts, nuts or other foreign material that may cause possible jamming of the metering rolls.

Check Control Panel Switches

Before applying electrical power to the dryer, be sure that all switches on the dryer control panel are in the OFF position.

Electrical Power

Turn ON the electrical power supply to the dryer, set all circuit breakers to ON, including the safety disconnect handle mounted on front of the dryer power panel.

Control Power Switch

Turn the Control Power switch to ON. At this point, the controller will lock out all other dryer functions. Once the Boot Screen appears, touch the Start button and the dryer will perform a safety circuit check. If a fault is found, the cause will be displayed on the main screen. If all are safe, the controller will supply power to the electronic fuel shut off valve (maxon), if so equipped and the Start switch will illuminate, indicating that the dryer is ready to be started.

Start Switch

Push the Start switch and all the selector switches on the control panel will be activated.

Fuel Check

If using LP gas, make sure the tank has plenty of fuel and that the tank does not have a regulator mounted on the liquid line. Slowly open the main fuel supply valve at the tank. Then, open the manual shut off valve on the dryer to allow fuel flow to the dryer.

If using natural gas, make sure an adequate supply is available. Turn ON the valve along the supply line. Then, open the manual shut off valve. Inspect all gas lines and connections for possible leaks.

*WARNING* Any gas leaks must be fixed immediately.
Load Auger

With the grain supply shut off, quickly flip the Load Auger switch to MANUAL and see if the load auger rotates clockwise as viewed from the drive end, or counterclockwise if the dryer is a front load model. If the wet grain supply auxiliary is wired to the dryer, it should also rotate in the correct direction at this time.

Turn the Load Auger switch to the AUTO position. The top auger and wet grain supply auxiliary should run for 8 minutes. The dryer will then shutdown and the safety shutdown message: Out of grain will display. Press the Stop button to reset the panel, then press the Start button.

Unload Auto Operation

To check Auto operation, place the Unload switch in the AUTO position. Push then turn the meter roll dial to a setting of 500 and touch ACCEPT/EXIT to start the meter roll rotation. The bottom auger should rotate counterclockwise as viewed from the drive end. The meter roll drive motor should rotate clockwise as viewed from the drive end of the gearbox. If the dry grain take away auxiliary is wired to the dryer, it should start and rotate in the proper direction.

Unload Manual Operation

To check Manual operation, move the Unload switch in the MANUAL position. Push then turn the meter roll dial to a setting of 500 and touch ACCEPT/EXIT to start the meter roll rotation. The bottom auger should rotate counterclockwise as viewed from the drive end. The meter roll drive motor should rotate clockwise as viewed from the drive end of the gearbox. If the dry grain take away auxiliary is wired to the dryer, it should start and rotate in the proper direction.

Meter Roll Operation

Meter Roll Operation 4" (GSI)

When the meter rolls are set to maximum (1000), the meter roll speed should be 17.5 RPM for 8" (20 cm) discharge augers. Make sure the drive chain tension is properly adjusted and all sections of the meter rolls rotate. Turn the Unload switch OFF after these checks are complete. The bottom auger will continue to run for 60 seconds (the default clean out delay setting) after the switch is turned OFF to allow for clean out.

Meter Roll Operation 7" (FFI)

To check the meter roll operation turn the knob clockwise and the meter roll speed should increase. Turning the knob counterclockwise will decrease the speed. When the meter rolls are set to maximum (1000), the meter roll speed should be 4.3 RPM for 8" (20 cm) discharge augers. Make sure the drive chain tension is properly adjusted and all sections of the meter rolls rotate. Turn the Unload switch OFF after these checks are complete. The bottom auger will continue to run for 60 seconds (default clean out delay setting) after the switch is turned OFF to allow for clean out.

NOTE: Due to the nature of the DC drive motor used on the meter rolls, it is possible for the brushes inside the motor to become corroded if the dryer has not been operated for several months. This will cause the meter rolls not to function. To fix this problem, use a rubber mallet or a piece of wood to tap the DC drive motor. The shock is usually sufficient to re-start the motor and metering rolls. You should not have any more problems with this during the rest of the drying season.
7. Vision Test Firing

Fan Switches

Briefly turn each Fan switch to ON and observe the fan rotation. The fan should run counterclockwise. Sometimes on 3 phase models, all motors run backwards. They can easily be reversed by interchanging two of the three power supply wires. Reverse the two (2) outside wires, L1 and L3 and leave the middle one in the same position.

NOTE: The bottom fan on the dryer is always referred to as fan 1.

Burner Safety

To check the burner safety function, first make sure the main gas valve is OFF. Turn the Fan switch ON and allow the fan to start. Turn the Heater switch ON for that fan. The dryer will shutdown after 20 seconds. The safety message, “Ignition Failure Fan #” will appear. Reset the dryer and repeat for the other fan/heater(s).

Burner Test Fire

To perform this test, the dryer must be full of grain, otherwise the air switch will need to be disabled, if the dryer is empty. To disable, touch the Setup button at the bottom of the Default Operation Screen. When the Setup Screen appears touch the Diagnostics button to display the system diagnostics. To disable the air switch select the Disable Testing button in the air switch box of the System Diagnostics Screen. The vision computer will then display a prompt asking if you wish to disable the air switch. Choose yes to continue. Once the air switches are disable the Fan switches on the switch panel will illuminate and the fan/heaters on the display animation will change to blue indicating that “airflow” is simulated.

There is only a 5 minutes period after the dryer is turned ON that the air switches can be disabled. After that time the Air switches cannot be disabled and any Air switches that are disabled will return to the enabled state causing an airflow shutdown if the dryer is empty. To restart the 5 minutes testing period the dryer must be shutdown and restarted. The 5 minutes testing period starts when the Control Power switch is turned ON.

Test fire each burner by starting the fan. Turn on the fuel supply then, turn the Burner switch to ON and the burner should ignite after a short purge delay of approximately 10 seconds. Gas pressure should be shown on the gauge. At this time adjust the plenum setpoint to 200°F (93°C), causing the burner to operate on high-fire. Observe the gas pressure on the gauge and lower the plenum setpoint until it causes the burner to cycle into low-fire. When the plenum temperature setpoint is met, the gas pressure should show a noticeable drop, indicating that the cycle solenoid is closed and the burner is being supplied with less gas through the cycle solenoid bypass port. At this time set the high-fire and low-fire pressure settings. Use the pressure regulator for high-fire and the adjustment screw on the cycle solenoid for low-fire. The computer should cycle the burners between high and low, approximately 1 to 3 times per minute.

Use only the amount of pressure required to obtain the desired temperature.

WARNING

All power should be switched OFF and locked out before attempting to reverse the connections.
Approximate setting should be:

<table>
<thead>
<tr>
<th>LP Gas</th>
<th>Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Fire 6-15 PSI (41-102 kPa)</td>
<td>High-Fire 6-10 PSI (41-69 kPa)</td>
</tr>
<tr>
<td>Low-Fire 2-6 PSI (14-41 kPa)</td>
<td>Low-Fire 1-3 PSI (7-20 kPa)</td>
</tr>
</tbody>
</table>

If the burner remains on high-fire and does not cycle, increase the regulator setting, in order to reach the plenum setpoint. If the burner remains in low-fire and does not cycle, slightly decrease gas pressure with the low-fire adjustment screw on the cycle solenoid. If the gas pressure is decreased too much, a popping or fluttering sound will be heard. This popping and fluttering should not be allowed to continue, or damage to the burner will occur. Be sure to adjust the low pressure needle valve anytime the high pressure regulator is adjusted. Repeat the test for each fan/heater unit.

Figure 7A Liquid Propane (LP) Pipe Train
7. Vision Test Firing

Dryer Shutdown

To shutdown the dryer:

1. Close the fuel supply valve at the tank or valve along the fuel line.
2. If the burner is operating, let the dryer run out of fuel and it will shutdown automatically due to loss of flame.
3. Close the fuel valve at the dryer and press the Stop button.
4. Turn OFF the control power.
5. Turn OFF the safety disconnect handle on the front of the power box and turn OFF the main power to the dryer.

Emergency

In case of emergency, push the Emergency Stop button. This will interrupt power to the control panel and the fan; burner and all augers will stop immediately.
Continuous Flow Operation

Standard electrical safety practices and codes should be used when working with a dryer. Refer to the National Electric Code standard handbook by the National Fire Protection Association. A qualified electrician should make all wiring installations.

WARNING

Always disconnect and lock out power before working on or around dryer.

Full Start-Up Check

This start-up procedure assumes the following:

1. You have read and understand the DRYER OPERATION AND SERVICE MANUAL.
2. You have taken special note of all SAFETY PRECAUTIONS.
3. All safety shields are in place.
4. All meter roll access doors have been opened and all foreign objects have been removed.
5. A pre start-up check has been performed.
6. All motors have been checked for proper rotation.
7. All heaters have been test fired.
8. The fuel has been turned ON at the tank.
9. The electric power has been turned ON.
10. The main disconnect switch on the dryer is ON.
11. There is wet grain in the wet holding bin.
12. The incoming grain moisture is known.
13. Dry grain take away equipment is in place.
14. Grain is going to the proper bin.
15. All switches have been set to the OFF position.
16. The Load Tilt switch box is installed with the side stamped up, in the UP position.

Filling the Dryer

1. Turn the Control Power switch to ON.
2. Turn the Drying Mode switch to CONTINUOUS FLOW.
3. Make sure the Fan, Burner and Unload switches are in the OFF position.
5. Turn the Load Auger switch to the MANUAL position to fill the dryer. The load auger should start and run until the dryer is full, then shut off automatically. (If the switch is set to the AUTO position, the dryer will shutdown each time the out of grain timer times out and will have to be restarted.)
6. When the dryer has filled, turn the Load Auger switch to the AUTO position.


8. Competitor Dryer Operation

Staged Batch Operation

1. Turn the Control Power switch to ON.

2. With load, unload, fan and burner turned OFF, turn the Drying Mode switch to continuous then push the Dryer Power Start switch to arm the safety circuit. Turn the Load switch to ON and fill the dryer with grain. The load auger will stop when full if the Load Tilt Switch is installed and set properly.

3. Turn the Drying Mode switch to staged batch.

4. Open the main fuel supply valve on the tank if using LP gas, or the valve in the fuel supply line if using natural gas. Open the manual shut off valve to allow fuel flow to the dryer.

5. Set switches to the following settings:

<table>
<thead>
<tr>
<th>Load</th>
<th>AUTO (For timed shutdown when out of grain. ON will shut off auger when full, but will not shut dryer down when out of grain.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan</td>
<td>AUTO (To stop during unloading. ON to continue cooling during unloading.)</td>
</tr>
<tr>
<td>Heater</td>
<td>AUTO (For dry and cool. ON for all heat.)</td>
</tr>
<tr>
<td>Unload</td>
<td>1 Speed</td>
</tr>
</tbody>
</table>

**Fan/Heater Switch Settings**

<table>
<thead>
<tr>
<th>Fan Setting</th>
<th>Heater Setting</th>
<th>Fan Function</th>
<th>Heater Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO</td>
<td>AUTO</td>
<td>Fans stay ON during dry and cool cycle only</td>
<td>Burners stay ON during dry timer cycle only</td>
</tr>
<tr>
<td>AUTO</td>
<td>ON</td>
<td>Fans stay ON during dry and cool cycle only</td>
<td>Burners stay ON during dry and cool</td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>Fans are ON continuously</td>
<td>Burners are ON continuously</td>
</tr>
<tr>
<td>ON</td>
<td>AUTO</td>
<td>Fans are ON continuously</td>
<td>Burners shutdown at the end of the dry cycle</td>
</tr>
</tbody>
</table>

At the end of the dry cycle in staged batch, the fans and heaters will continue running if the MOISTURE CONTROL is “ON”, until the preset temperature on the moisture control thermostat is reached.

6. Make sure the Load Auger switch is set to AUTO. In both the AUTO and MANUAL position, the Grain Level switch will automatically keep the dryer full of grain. In the AUTO position, the dryer will shutdown after the preset time period on the out of grain timer, or if the grain flow to the dryer is interrupted.

7. To properly set the correct dry, cool and unload time for various moisture content grains, refer chart to PNEG-1650/PNEG-1651.

8. To start the drying operation, push the Dryer Power Start button. The controller will start all the dryer components in their proper order. If any of the selected switches are improperly positioned for staged batch drying, the display will indicate the proper switch position and will not allow the dryer to operate until the position of the switch is corrected.

9. The fan will start and airflow is checked.

10. After purging for approximately 10 seconds the heater will fire. For information concerning heater adjustment, see the dryer pre-start checks on Page 40.
11. If the dryer is being operated in all heat, move the Fan switch to the ON position. In this position, the fan will run continuously during the dry, cool and unload stages of the staged batch operation. If the dryer is being operated in the dry and cool mode, the preferred position for the Fan switch is the ON position, so the fan will run continuously and continue to cool the grain during the unload operation. If desired, the fan can be turned OFF during the unload cycle of the dry-cool-unload sequence by turning the Fan switch to AUTO.

12. If the dryer is being operated in all heat, move the Heater switch to ON. The burner will operate whenever the fan is operating. If the dryer is being used in dry and cool, turn the Heater switch to AUTO and the burner will automatically shutdown during the cooling and unloading cycles.

13. The bottom auger and metering rolls will start automatically during the unload cycle of the dry-cool-unload mode, along with any grain handling equipment that is wired to the dryer. The speed at which the metering rolls operate during the unload cycle is adjusted by using the high speed metering roll knob. Turning the dial clockwise will increase the grain discharge rate and turning it counterclockwise will decrease the discharge rate.

14. When the last batch is done and the dryer is out of grain, turn the Drying Mode switch to continuous. Turn the Load, Unload, Fan/Heater switches OFF and push the Dryer Power Start switch to arm the safety circuit. Run the fan/heater manually for 6 minutes per point of moisture to be removed. Turn the burner OFF to cool the grain for 30 minutes. Turn OFF the fan and manually unload the dryer by turning the Unload switch to 1 Speed and setting the meter rolls as fast as the unload equipment will allow.

15. To control the length of the dry cycle using only the dry time setting programmed into the system, turn the MOISTURE CONTROL setting to OFF. To use the automatic moisture control so that the dry time is determined, not only by the dry time setting, but also by the moisture content of the drying grain, turn the Moisture Control switch to ON.

16. To shutdown the dryer, close the fuel supply valve at the fuel tank or fuel source. If the burner is operating, let the dryer run out of fuel, causing an automatic shutdown due to a loss of flame. Close the fuel valve at the dryer and press the Dryer Power Stop button. Turn OFF the dryer’s main circuit breaker located on the front of the power panel. Turn OFF the main power supply to the dryer.

17. In case of an emergency, press the Dryer Power Stop button. The burner, fan and all augers will stop immediately.

**Starting the Dryer**

This start-up procedure is for a cold start on wet grain for continuous flow operation.

1. Turn ON the LP gas tank and any other manual gas valve at this time. Set the MAXON or FAST ACTION HAND VALVE, if so equipped, on the incoming fuel line to the ON position.

2. Make sure the Moisture Control switch is in the OFF position.

3. Turn the Fan switch to the ON position.

4. Adjust the Air Pressure switch if necessary.

5. Turn the Heater switch to the ON position. The heater will purge for about 10 seconds then ignite. If flame is detected the dryer will run, if not, a “loss of flame” error will occur. If this happens, check gas supply and all valves in the fuel line to make sure they are ON and attempt again.
8. Competitor Dryer Operation

Adjusting the Temperature

1. Press the Program (Temperatures) button until the “carrot” is above the timer to be modified.

2. Use the UP and DOWN arrow keys to change the present temperature to the desired setting. The new temperature is automatically accepted.

3. Keep pressing the Program (Temperatures) button until the carrot disappears or press the Mode Select button once to exit.

4. On LP and NG gas models, adjust the PRESSURE REGULATOR (high-fire) on the burner fuel line, so that burner will reach the thermostat setting and switch to low-fire.

The approximate settings should be:

<table>
<thead>
<tr>
<th>LP Gas</th>
<th>Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Fire 6-15 lbs.</td>
<td>High-Fire 6-10 lbs.</td>
</tr>
<tr>
<td>Low-Fire 2-6 lbs.</td>
<td>Low-Fire 1-3 lbs.</td>
</tr>
</tbody>
</table>

Do not set the low-fire pressure so low that a popping or fluttering sound is heard in the heater. If popping or fluttering sound are heard, increase the pressure until the sound goes away.

On LP and NG gas models adjust the needle valve on the cycle solenoid (low-fire valve) so that the burner maintains flame then switches back to high-fire.

5. Adjust the burner pressure so that the burner CYCLES 2 to 3 times per minute (approximately 15 to 20 seconds on HIGH and approximately 5-8 seconds on LOW). Increasing the gas pressure with the gas regulator increases the cycling rate and lowering it decreases the rate. This is the primary way to change the cycling rate.

Decreasing the low pressure setting with the needle valve will also increase the rate while increasing that pressure will decrease the rate.

6. On LP gas models adjust the vaporizer so the fuel pipes going to the burner from the regulator are warm to the touch (not hot and cold).

The vaporizer can be adjusted two (2) ways. First, by loosening the bolt in the hinging mechanism and swinging it to a hotter or cooler position. Second, by loosening the two (2) bolts in the hinge pipe and sliding the vaporizer in or out to a cooler or hotter position. Either one or both methods may need to be used to get the vaporizer to the proper temperature, but the first almost always gives adequate adjustment. Natural gas does not use a vaporizer.
Full Heat Continuous Flow Operation

1. Refer to PNEG-1650/PNEG-1651 DRYER START-UP. (CONTINUOUS FLOW METER ROLL SETTINGS - FULL HEAT.) There are settings for initial moisture, moisture removed, approximate dry time, 1 Speed, 2 Speed low and 2 Speed high. Select the line that indicates the initial moisture. These are the settings referred to throughout this start-up procedure.

2. Make sure the Unload switch is OFF.

3. Make sure the Moisture Control switch is OFF.

4. If the dryer is stopped, press the Start switch to lock in the control circuit.

5. Turn the Fan and Burner switches to the “ON” position to run fans and burners. Be sure to adjust the plenum temperature to 180°F for all burners. Run the fans and burners for about 10% longer than the approximate dry time (refer to PNEG-1650/PNEG-1651) for the incoming moisture. **Example:** Ten points removal from the chart is 54 minutes, plus 5.4 minutes (10%) equals 59.4 minutes (round up to 60).

6. Increase the drying temperature to a maximum of 210°F (corn) for single fan dryers. For multiple fan dryers adjust the top burner to a maximum of 230°F (corn) and stage the temperature of the lower burners down 30° per burner. **Example:** 3 fan dryer Top burner: 230°, Middle burner: 200°, Bottom burner: 170°.

7. After the initial fan and burner run time, set the Unload switch to “1 Speed” and set the high speed meter roll potentiometer to the setting for 1 Speed (refer to PNEG-1650/PNEG-1651). Meter rolls should start and grain will begin to flow from discharge of dryer. Run time for this step should be the same as from **Step 5** above. DO NOT TO ADJUST THE DRYER DURING THIS PERIOD. The grain discharging towards the end of this period will be over dried, but it is necessary so that the corn moisture is staged properly and evenly in the dryer.

8. Turn the Moisture Control switch to “ON”. Set the moisture control (grain) temperature to 100°F.

9. Turn the Unload switch to “2 Speed”. Find the “2 Speed High” and “2 Speed Low” meter roll settings (refer to PNEG-1650/PNEG-1651) and set meter roll potentiometers accordingly. Allow the dryer to run for the time established in **Step 5** and then sample the grain. If the dryer has been cycling regularly from high to low and the grain is not coming out to moisture desired, then adjust the moisture control (grain) temperature up or down 5° per point of moisture. Example: Moisture control is set to 100°, desired moisture is 15%, sampled moisture is 17%. Adjust moisture control to 110°. EVERY TIME AN ADJUSTMENT IS MADE IT IS IMPERATIVE THAT THE DRYER IS ALLOWED TO RUN FOR THE ESTABLISHED TIME IN ORDER FOR CHANGES TO TAKE AFFECT. Repeat this process as necessary until desired moisture content is being discharged from dryer.

10. After the run time in **Step 9**, the moisture control and the meter roll speeds can be adjusted if required. Each time an adjustment to the moisture control is made, it will take approximately the time as shown in the example in **Step 5** to see the results of this adjustment.
8. Competitor Dryer Operation

Adjusting the Moisture Control

1. 5° on the moisture control will change the output moisture by about 1%. **Example:** With 100° set, the result is 16% corn but 17% corn is desired. Reduce the moisture control setpoint temperature by 5° to 95°. This should change the moisture out to about 17%. If you want the corn to come out dryer, raise the temperature on the moisture control setpoint.

2. Four (4) sensors are averaged together for sensing moisture control temperature, one on each side of the dryer in the front and one on each side of the dryer in the back. They are located about 1/3 of the way up the grain column from the bottom and in from the side about 4”.

3. Grain temperatures can be monitored by pressing the Mode Select button.

4. The moisture control should stay on HIGH about 50% to 90% of the time. There is a broad range that will work. It should switch from low to high and back again to maintain the desired moisture. A control that does not switch will not maintain an evenly dried grain moisture when the incoming wet grain moisture varies.

5. If the Metering Roll switches to LOW and stays there for long periods of time, both the high and low speed potentiometers should be slowed down 2% (20 points) and monitored for further adjustment.

6. If the Metering Roll switches to HIGH and stays on HIGH more then 90% of the time, increase the speed on both potentiometers 2% (20 points) and monitor for further adjustment.

7. When adjusting the METER ROLL SPEEDS it is better not to change the speed more than 20 points (2%) at a time.

8. Anytime a change is made, wait the approximate dry time for that moisture grain from the chart (refer to PNEG-1650/PNEG-1651) before checking the grain moisture level and making another change if necessary.

Dryer Start-Up and Operation Full Heat Drying

Full Heat Operation

With this type of drying, the grain is discharged hot, with no cooling. Drying capacity is substantially higher with full heat than the dry and cool process.

Final Moisture

The cooling process usually removes 1% to 3% moisture, so hot shelled corn is removed from the dryer at about 17% moisture if the final desired moisture content is 15%.

Drying Temperatures

Shelled Corn

For shelled corn with an initial moisture content of 25%-30%, the recommended maximum drying temperature is 220°F-240°F (104°C-116°C) for the top fan and 170°F-190°F (77°C-88°C) for the bottom fan.

Small Grain

For drying small grain (wheat, oats, milo), 150°F (66°C) is suggested.

Soybeans

Drying temperatures are critical in drying rice and soybeans. A temperature of 130°F (54°C) is recommended to keep grain temperature low.

Drying Efficiency

The general rule for obtaining the highest drying efficiency is to use the highest possible drying temperatures that does not adversely affect grain quality.

Dryer Shutdown

Cooling Hot Grain

If the dryer is to be shutdown while filled with grain, it is recommended that hot grain be cooled for 10 to 15 minutes, especially in cold weather, to prevent water vapor condensation and possible freezing of such condensate following shutdown.

Initial Setup Parameters

Turn the Control Power switch to ON. When the Boot Screen appears, select the Start button. The computer will run a quick check of the system network, after which the Default Operation Screen will appear.

Timer and Delay Settings

To set the timers, select the button at the bottom of the Default Operation Screen. The “Select Timers to Modify” Screen will appear. See instructions in Vision Manual to set the timer and delays.

Setting the Temperatures

To adjust the temperature setpoints, touch the \( \text{Temp} \) button at the bottom of Default Operation Screen. The “Select Temperature Setpoint to Modify” Screen will be displayed. See Vision Manual for instructions on how to set the temperatures.

Start-Up

Start-Up Procedure

At the beginning of each harvest and before filling the dryer with grain, make sure to inspect the dryer for rodent damage, proper belt and chain tension and missing or damaged safety shields. Test operate the dryer using the pre-start check procedures on Page 46.

1. Before attempting to operate the dryer, make sure that all safety shields are in place, all plenum bottom closure panel doors are closed, all rear access doors are closed and all personnel are clear of the grain dryer and grain handling machinery.

2. Turn all selector switches on the control panel to the OFF position.

3. Turn ON the electrical power supply to the dryer and move the safety disconnect handle mounted on the dryer’s upper power box to ON.

4. Turn the Control Power switch to ON. The switch will illuminate. The control computer will boot up. At this point the controller will lock out all other dryer functions. Once the Boot Screen appears, touch the Start button and the dryer will perform its safety circuit checks. If a fault is found, the cause will be displayed on the display screen (touch screen). If all safeties do not detect a problem, the controller will allow the electronic fuel shut off valve (maxon) to be manually opened, if so equipped. The dryer is ready to be started.

5. Move the Load Auger switch to MANUAL and push the Start switch. The top auger will immediately start and the Load Auger switch will illuminate. If additional loading equipment is wired to the dryer it will also start immediately.

6. When the dryer is full of grain, the top auger will stop automatically and any auxiliary loading equipment wired to the dryer will also stop.

The dryer is now ready to begin drying grain. There are two (2) moisture control options to use in dryer operation. The variable MR Speed option is not recommended for single module dryers.

1. Regulation of Grain Temperature on Page 59.

2. Regulation of Moisture: 5 MR SP on Page 66.

3. Regulation of Moisture: Variable MR SP (not recommended for single module dryers).
Continuous Flow Drying Mode Using Regulation of Grain Temperature

Full Heat Continuous Flow Operation

This section begins with **Step 7** and it is assumed that **Step 1** through **Step 6** in the start-up procedure described on **Page 58** have been completed. For this operation procedure we will say that incoming grain moisture content is 25% and ten points of moisture removal is our goal.

7. Touch the Setup button at the bottom of the Default Operation Screen. Once the “Select Hardware Setup Parameter to Modify” Screen is displayed, touch the Drying Mode button. When the “Drying Mode Selection” window appears, touch the Continuous Flow button to select continuous flow drying mode. Then, touch the Accept/Exit button and return to the “Select Hardware Setup Parameter to Modify” Screen. Touch the M/C Setup button. When the “Moisture Control Selection” window appears, select the REGULATION OF GRAIN TEMPERATURE moisture control option. Do not select the 5 Speed option yet, as this will be explained later. Touch the Accept/Exit buttons and return to the Default Operation Screen.

![Figure 9A](image)

8. Make sure the Unload switch is OFF.

9. Open the main fuel supply valve on the tank if using LP gas, or the valve in the fuel supply line if using natural gas. Open the manual shut off valve to allow fuel flow to the dryer.

10. The dryer should be filled with grain. Turn the Load Auger switch to the AUTO position. In both the AUTO and MANUAL positions, the Dryer Grain Level switch will automatically keep the dryer full of grain. In the AUTO position, the dryer will shutdown after a preset time period using the out of grain timer.

11. Turn each Fan switch to ON. The fan will start and the switch will illuminate when air pressure is detected.

12. Start each burner by turning the Heater switch ON. After purging for approximately 10 seconds, the burner will fire and the Heater switch will illuminate. This indicates that the flame sensing circuit is sensing burner flame. For information concerning burner adjustment, see the dryer pre-start check section on **Page 46** of this manual. Set the plenum temperature setpoints to 180°F.

13. Refer to PNEG-1650/PNEG-1651 for the full heat chart settings that correspond to the model of dryer. Note the settings for initial moisture, moisture removed, approximate dry time, 1 Speed, 2 Speed low and 2 Speed high. Select the line that has the initial starting moisture. These are the settings that will be referred to during this start-up procedure.

14. Run the fans and burners for approximately 10% longer than the estimated dry time for the incoming moisture. **Example:** Ten points removal is approximately 54 minutes. -10% of 54 minutes is 5.4 minutes, so run the fan/heaters approximately 59-60 minutes.

15. After the time in **Step 14** turn the Unload Auger switch to MANUAL and set the meter roll speed, (manual speed). Remember that Manual is a true manual operation, with no moisture control. The meter rolls will run at the speed that you select using the meter roll speed encoder. To do this, press on the meter roll adjustment knob. When the “Modify Meter Roll Setpoints” window appears turn the meter roll adjustment knob until the speed indicator is set to the speed suggested for 1 Speed, then touch the Accept/Exit button to set this value into the computer. Grain should begin to run at this time. Run time for this is about 10% longer than the (approximate drying time) required for the moisture you are trying to dry. This allows the moisture in the dryer to reach an even gradient top to bottom without having any highs or lows in it. It will however, over dry some of the grain.

16. Increase the drying temperature to 190°F for single fans or for multiple fan dryers, set the heat chambers 30° to 60° apart. Hottest at the top and the coolest at the bottom. See setting the temperatures in Vision Manual.

17. **DO NOT ADJUST THE DRYER FOR MOISTURE DURING THIS PROCESS OR THE DRYER WILL ESTABLISH HIGH AND LOW SWINGS IN THE MOISTURE CONTROL. IT WILL TAKE SEVERAL HOURS TO WORK OUT.**

18. After the run time in **Step 15**, set the moisture control. Turn the Unload switch to AUTO. Press the meter roll adjustment knob. When the “Modify Meter Roll Setpoints” window appears, check that 2 Speed is selected. Set the low speed by pushing the meter roll speed adjustment knob until the low speed indicator is red and then turn the knob to the desired low speed setting. When low speed is set, push the meter roll adjustment knob until the high speed indicator is red, then turn knob to the desired high speed setting. Set the high and low speed settings (as close as possible) to the values given in the drying time tables. Touch the Accept/Exit button and return to the Default Operation Screen. **IMPORTANT:** *The high speed setting must be a higher value than the low speed.*
19. With the Unload Auger switch in the AUTO position, the moisture control is active. Select the M/C button at the bottom of the Default Operation Screen. When the “Modify Temperature Setpoint” window appears, set the temperature to approximately 105°F. Let the dryer run on these settings before adjusting moisture or meter roll settings. These settings will not dry the grain exactly as desired, but they will serve as a good starting point. A slightly different moisture at the bottom of the storage bin is not usually a problem as long as full floor aeration is present.

20. After the run time in Step 19, adjust the moisture control and the meter roll speeds if required. Each time the moisture control is adjusted, it will take approximately the amount time shown in the drying charts to see the results of this adjustment. For every 5° change in temperature, moisture will changed by one point.

Dry and Cool Continuous Flow Operation

This section begins with Step 7 and it is assumed that Step 1 through Step 6 in the start-up procedures described on Page 58 have been completed. For this operation procedure we will say that incoming grain moisture content is 25% and ten points of moisture removal is our goal.

7. Touch the Setup button at the bottom of the Default Operation Screen. Once the “Select Hardware Setup Parameter to Modify” Screen is displayed, touch the Drying Mode button. When the “Drying Mode Selection” window appears, touch the Continuous Flow button to select continuous flow drying mode. Then, touch the Accept/Exit button and return to the “Select Hardware Setup Parameter to Modify” Screen. Touch the M/C Setup button. When the “Moisture Control Selection” window appears, select the REGULATION OF GRAIN TEMPERATURE moisture control option. Do not select the 5 Speed option yet, as this will be explained later. Touch the Accept/Exit button and return to the Default Operation Screen.

8. Make sure the Unload switch is OFF.

9. Open the main fuel supply valve on the tank if using LP gas, or open the fuel supply line if using natural gas. Open the manual shut off valve to allow fuel flow to the dryer.

10. The dryer should be filled with grain. Turn the Load Auger switch to the AUTO position. In both the AUTO and MANUAL positions, the Dryer Grain Level switch will automatically keep the dryer full of grain. In the AUTO position, the dryer will shutdown after a preset time period on the out of grain timer.

11. Turn each Fan switch to ON. The fan will start and the switch will illuminate when air pressure is detected.

12. Start each burner by turning the Heater switch to ON. After purging for approximately 10 seconds, the burner will fire and the Heater switch will illuminate. This indicates that the flame sensing circuit is sensing burner flame. For information concerning burner adjustment, see the dryer pre-start checks section on Page 46 of this manual. Set the plenum temperature setpoints to 180°F.

13. Refer to PNEG-1650/PNEG-1651 for the dry and cool chart settings that correspond to the model of dryer being used. Note the settings for initial moisture, moisture removed, approximate dry time, 1 Speed, 2 Speed low and 2 Speed high. Select the line that has the initial starting moisture. These are the settings that will be referred to during this start-up procedure.
14. Run the bottom fan (to be used for cooling later) and heater(s) for, approximately 20 minutes. This will start the bottom drying, so it can cool before discharging grain.

15. Run the fans and burners for approximately 10% longer than the estimated dry time for the incoming moisture. Example: Ten points removal is approximately 60 minutes. -10% of 60 minutes is 6 minutes, so run the fan/heaters approximately 66 minutes.

16. Twenty minutes before the required drying time is finished, turn the bottom heater OFF but let the fan run and cool this section. Set the upper plenum thermostats to the recommended temperature (190°F-230°F).

17. Turn the Unload Auger switch to MANUAL and set the meter roll speed (manual speed). Remember that Manual is a true manual operation, with no moisture control. The meter rolls will run at the speed that you select using the meter roll speed encoder. To do this, press the meter roll adjustment knob. When the “Modify Meter Roll Setpoints” window appears, turn the meter roll adjustment knob until the speed indicator is set to the speed suggested for 1 Speed. Grain should begin to run at this time. Run time for this is about 10% longer than the (approximate drying time) required for the moisture you are trying to dry. This allows the moisture in the dryer to reach an even gradient top to bottom without any highs or lows in it. It will however, slightly over dry some of the grain.

18. DO NOT ADJUST THE DRYER FOR MOISTURE DURING THIS PROCESS OR IT WILL ESTABLISH HIGH AND LOW SWINGS IN THE MOISTURE AND IT WILL TAKE SEVERAL HOURS TO RESOLVE.

19. After the run time in Step 17, set the moisture control. Turn the Unload switch to AUTO. Push the meter roll adjustment knob. When the “Modify Meter Roll Setpoints” window appears, check that 2 Speed is selected. Set the low speed by pushing the meter roll speed adjustment knob until the low speed indicator turns red and then turning the knob to the desired low speed settings. When low speed is set, push the meter roll adjustment knob until the high speed indicator turns red, then turn knob to the desired high speed setting. Set the high and low speed settings (as close as possible) to the values given in the drying time tables. Touch the Accept/Exit button and return to the Default Operation Screen. IMPORTANT: The high speed setting must be a higher value than the low speed setting.
20. With the Unload Auger switch in the AUTO position, the moisture control is active. Press the M/C button at the bottom of the Default Operation Screen. When the “Modify Temperature Setpoint” window appears, set the upper temperature to about 130°F. Let the dryer run on these settings for at least 30-40 minutes before making further adjustments to the moisture control or meter roll settings. While these settings do not achieve grain moisture exactly as desired, they will serve as a good starting point for adjusting the settings to reach the desired results. A slightly different moisture at the bottom of the storage bin is not usually a problem if full floor aeration is present.

21. After the run time in Step 20, adjust the moisture control and the meter roll speeds if required. Each time an adjustment is made to the moisture control, it will take approximately the amount time shown in PNEG-1650/PNEG-1651 to see the results of this adjustment. For every 5° change in temperature, moisture will change by one point.

So far only the 2 Speed meter roll option has been discussed. The 2 Speed meter roll option works well if the grain entering the dryer has nearly the same moisture content. However, if the moisture content of the grain entering the dryer varies greatly, then the 5 Speed option may be more beneficial. The 5 Speed option allows the user to set an inner and outer limit for the high and low meter roll settings as well as an inner and outer limit for the moisture control temperature setting. When setting up the 5 Speed meter roll option try to set it so that the dryer operates inside the inner limits as much as possible and use the outer limit setting for extreme cases of incoming moisture content.

To enable the 5 Speed option, press the Setup button at the bottom of the Default Operation Screen. When the Select “Select Hardware Setup Parameter to Modify” Screen appears, select the M/C Setup button. When the “Moisture Control Selection” Screen appears, touch the Enable 5 SPD Temperature button. Note that the 5 Speed box is checked.

Figure 9H

Touch the 5 SPD Setup button to display the bracketed 5 Speed Moisture Control Setup Screen.

Figure 9I

To set the inner or outer limits, press the Select button until the desired limit is highlighted with a red square. The offset for that limit may now be adjusted by touching the INC (Increase) or DEC (Decrease) buttons.

If you are unsure as to what values to set for the inner and outer limits, press the Select Defaults buttons and use this as a starting point. Further adjustments can be made at a later time as the 5 Speed meter roll option becomes more familiar.
Continuous Flow Drying Mode Using Regulation of Moisture: 5 MR SP

Full Heat Continuous Flow Operation

This section begins with Step 7 and it is assumed that Step 1 through Step 6 in the start-up procedure described on Page 58 have been completed. For this operation procedure we will say that incoming grain moisture content is 25% and ten points of moisture removal is our goal.

7. Touch the Setup button at the bottom of the Default Operation Screen. Once the “Select Hardware Setup Parameter to Modify” Screen is displayed, touch the Drying Mode button. When the “Drying Mode Selection” window appears, touch the Continuous Flow button to select continuous flow drying mode. Then, touch the Accept/Exit button and return to the “Select Hardware Setup Parameter to Modify” Screen.

8. Touch the M/C Setup button. When the “Moisture Control Selection” window appears select the REGULATION OF MOISTURE: 5 SP MR moisture control option. The 5 SP MR cannot be disabled when operating in this moisture control mode.

Figure 9J

9. Press the 5 SPD Setup button. When the bracketed 5 Speed moisture control setup is displayed touch the Select Defaults button. Select the Accept/Exit button to save these settings in the computer and return to the Default Operation Screen.
10. Make sure the Unload switch is OFF.

11. Open the main fuel supply valve on the tank if using LP gas, or the valve in the fuel supply line if using natural gas. Open the manual shut off valve to allow fuel flow to the dryer.

12. The dryer should be filled with grain. Turn the Load Auger switch to the AUTO position. In both the AUTO and MANUAL positions, the Dryer Grain Level switch will automatically keep the dryer full of grain. In the AUTO position, the dryer will shutdown after a preset time period according to the out of grain timer.

13. Turn each Fan switch to ON. The fan will start and the switch will illuminate when air pressure is detected.

14. Start each burner by turning the Heater switch ON. After purging for approximately 10 seconds, the burner will fire and the Heater switch will illuminate. This indicates that the flame sensing circuit is sensing burner flame. For information concerning burner adjustment, see the dryer pre-starts checks on Page 46 of this manual. Set the plenum temperature setpoints to 180°F.

15. Look in PNEG-1650/PNEG-1651 for the full heat chart settings that correspond to the model of dryer being used. Note the settings for initial moisture, moisture removed, approximate dry time, 1 Speed, 2 Speed low and 2 Speed high. Select the line that has the initial starting moisture. These are the settings that we will be referred to during this start-up procedure.

16. Run the fans and burners for approximate 10% longer than the estimate dry time for the incoming moisture. **Example:** Ten points removal is approximately 54 minutes. -10% of 54 minutes is 5.4 minutes, so run the fan/heaters approximately 59-60 minutes.
17. After the time in Step 16 on Page 67, turn the Unload Auger switch to MANUAL and set the meter roll speed (manual speed). Remember that manual is a true Manual operation with no moisture control. The meter rolls will run at the speed selected using the meter roll speed encoder. To do this, press the meter roll adjustment knob. When the “Modify Meter Roll Setpoints” window appears, turn the meter roll adjustment knob until the speed indicator is set to the speed suggested for 1 Speed. Grain should begin to run at this time. Run time for this is approximately 10% longer than the (approximate drying time) required for the target moisture. This allows the moisture in the dryer to reach an even gradient top to bottom without having any highs or lows in it. It will however, slightly over dry some of the grain.

18. After the run time in Step 17, test the moisture content. Test at least three (3) samples and average the readings for accuracy. Having determined the average discharge moisture, calibrate the incoming and outgoing moisture sensors on the dryer. To do this, press the Setup button again and return to the “Select Hardware Setup Parameter to Modify” Screen. Press the M/C Setup button and then press the Calibrate Moisture Sensors button. The “Moisture Sensor Calibration” window will appear. Follow the example below to adjust the dryer to the moisture tester.

Example: The moisture tester gives an average moisture of 17%, but the moisture sensor on the dryer reads 18.3%. Calibrate the dryer’s moisture sensor (-1.3%), thereby adjusting the dryer’s moisture screen read 17%, matching the moisture tester. Once the calibration offset has been entered for the moisture sensors touch the Accept/Next button.
19. Once the discharged grain has reached the desired moisture content, turn the Unload switch to AUTO.

20. With Unload Auger switch is in the AUTO position, the Moisture Control is active. Touch the M/C button at the bottom right of the Default Operation Screen. When the Moisture Setpoint window appears, set the moisture setpoint to the output moisture desired. Let the dryer run on these settings before trying to adjust moisture or meter roll settings.

21. The dryer will immediately switch to the 5 Speed moisture control. If you press the meter roll knob, you will now notice that there is one meter roll speed to adjust.

How the Moisture Control Works

The controller continuously monitors the moisture coming in and out of the dryer, as well as the column grain temperature at the end of the drying section. However, the control action is based on the sensor at the outlet of the dryer. If the moisture coming out of the dryer is not at the target, the controller will speed up or slow down the unload accordingly. How the meter rolls react depends on the setpoint and the actual moisture coming out of the dryer. As long as the outgoing moisture is three-tenths above or below the setpoint, the meter rolls run on the middle speed. Once the moisture begins to drift from the setpoint by over three-tenths either above or below the setpoint, the speed will automatically switch between middle and low, or middle and high speed. This is a very fast response and will bring grain back towards the setpoint quickly.

The manual speed setting is responsible for the first pass of drying because the controller does not yet have enough information about the grain in the dryer. Set the manual unloading speed as close as it should be for the grain currently in the dryer before switching to moisture control mode. The manual speed setting does not need to be adjusted after the moisture control is activated.
10. Vision/Competitor Illustrations

Supply Line (LP Shown)

Figure 10A
28" and 36" LP Fan/Heater Pipe Train

Use D03-0783 pipe sealant at all pipe thread connections.

Figure 10B
40" and 42" LP Fan/Heater Pipe Train

Figure 10C

Use D03-0783 pipe sealant at all pipe thread connections.
LP Vaporizer Coil Adjustment

Loosen this bolt to adjust the vaporizer coil.

Figure 10D

NG Fan/Heater Pipe Train

Use D03-0783 pipe sealant at all pipe thread connections.

Section A-A

Valve, 1" NPT full port, lever, CSA, brass

Figure 10E
10. Vision/Competitor Illustrations

Competitor Fan/Heater Control Box

![Competitor Fan/Heater Control Box](image)

- Competitor strip and relays
- Motor terminal block
- Fenwal flame detection board
- 1 Phase capacitor

Figure 10F

Vision Fan/Heater Control Box

![Vision Fan/Heater Control Box](image)

- Vision fan/heater board
- Fan motor overload
- Fan motor contactor
- Fenwal flame detection board

Figure 10G
10. Vision/Competitor Illustrations

Top Auger Drive

Check top auger drive belt tension after several hours of initial operation. Check periodically thereafter.

Discharge Safety Switch

Metering roll speed sensor
(See Figure 10J on Page 76.)

Discharge safety shut off switch

Discharge box

Figure 10H

Figure 10I
10. Vision/Competitor Illustrations

Meter Roll Speed Sensor

Figure 10J
Vision Upper Control Box

- Load, unload and auxiliary motor overloads and contactors
- Load, unload and auxiliary motor circuit breakers
- Fan motor circuit breakers
- Power distribution block
- Dryer network I/O board
- Terminal strip
- SCR Transformer
- Grounding strip
- SCR Contactor and circuit breakers
- SCR Circuit board

Figure 10K
Vision Control Panel (Rear)

- Display I/O board
- Moisture control printer module (optional)
- Control panel switches

Figure 10L
Vision Lower Control Box (Back Panel)

Figure 10M

12 Volt power supply 5 Volt power supply Moisture control board
10. Vision/Competitor Illustrations

Competitor Lower Control Box

Figure 10N

Competitor Rear Control Panel

Figure 10O
Competitor Upper Control Box

- Load, unload and auxiliary motor overloads and contactors
- Circuit breakers
- Power distribution block
- Terminal strip
- Transformer
- Relay
- SCR Circuit board
- SCR Contactor and circuit breakers
- Ground lug

Figure 10P
11. Service

Before starting any repairs or maintenance on the dryer, observe the following safety steps:

1. Isolate the whole system from the electrical supply by switching OFF the power isolator and locking it.

2. Isolate the dryer from the gas supply by shutting OFF the main gas valve. (If necessary, lock the valve.)

3. Keep the keys in your possession.

4. Augers and their drives may be under some degree of tension. Avoid touching these parts with the hands until you are sure that they are free.

5. Do not reconnect the power supply until all work is completed and all guards are correctly refitted.

Seasonal Inspection/Service

The dryer is made of weather-resistant material and is designed to require minimum service. However, each season we recommend the following items be checked before the unit is used and any damaged or questionable parts replaced. These checks will help eliminate possible failures and assure dependable operation of the equipment.

1. Shut off electrical power. Open the power box to control inspect for moisture, rodent damage or accumulated foreign material. Remove any foreign material present. Inspect and tighten any loose terminal connections. Replace any damaged or deteriorated wiring.

2. Check each blade for freedom of rotation and uniform tip clearance. They should also be inspected for dirt and grain dust, especially inside the hub. Any additional weight can seriously affect the balance and result in harmful vibrations and a short bearing life.

3. Check each blade for free play. Any side play is an indication of defective motor bearings, which should be replaced to prevent a complete motor failure. Make sure motor mount bolts are tight.

4. Motor bearings should be lubricated periodically, depending on operating conditions. Under normal usage it is desirable to have the motor cleaned, checked and bearings repacked by an authorized service station every two to three seasons. If the unit is operated continuously through most of the year, this service should be performed each year.

5. Remove and clean the gas line strainers. Make certain gas valves are closed and that gas is purged from the system before attempting to disassemble anything.

6. Inspect the collector plate at the top of the burner casting and the burner cup for any accumulation of foreign material and clean if required. Foreign material in the burner cup or casting will not burn out and will impair burner operation.

7. If required, inspect the ignitor plugs and clean the electrodes. Use an ignition point file to remove carbon and rust between the electrode surfaces. The ignitor gap should be about 1/4" (3 mm).

8. Inspect flame sensors for possible damage or poor connections. Flame sensor wires must be in good condition.

9. Inspect and manually rotate the top auger paddle assembly. The paddle unit must rotate freely without any indication of sticking or binding.

10. Inspect the top auger and bottom auger drive lines for proper adjustment and condition. Readjust line tension as required.
11. Operate dryer clean out levers and check the clean out hatch mechanism for proper operation. With the hatch open, inspect and remove any accumulation of dirt, fines and foreign material from the bottom auger trough area.

**NOTE:** Do not allow high moisture material to collect within the trough area. It may adversely affect metal parts.

Dryers with 7" meter rolls will need the meter roll pans dumped or cleared. Remove the hair pin and push the lever upward to tilt the pans as shown. This allows any grain on the pans to dump into the unload auger.

![Figure 11A](image)

12. Inspect the entire dryer for loose, worn or damaged parts. Include check of auger flighting, metering rolls and other internal parts. Check that temperature sensors within the air plenum chamber are secured within insulated clamps and do not chafe on other metal parts.

13. Make sure all dryer guards and warning decals are securely installed. Ensure that guards do not interfere with moving parts. If guards or warning decals are missing, contact the dealer for a free replacement.

14. Test fire the dryer several weeks ahead of the drying season. Check for possible gas leaks. *(See Page 48.)*

**NOTE:** If on site bearing lubrication is to be performed, see lubrication instructions for ball bearing motors. To keep motor bearings properly lubricated and dispel any accumulation of moisture within the windings, the fan and auger motors should be operated for 15 to 30 minutes each month.
11. Service

Lubrication Procedure

If the motors are equipped with an alemite fitting, clean the tip of the fitting and grease with a grease gun. Use 1 or 2 full strokes on motors in NEMA 215 frame and smaller. Use 2 to 3 strokes on NEMA 254 through NEMA 365 frame. Use 3 to 4 strokes on NEMA 404 frames and larger. On motors having drain plugs, remove drain plugs and operate motor for 20 minutes before replacing drain plug. On motors equipped with slotted head grease screw, remove screw and apply grease tube to hole. Insert 5 cm to 8 cm length of grease string into each hole on motors in NEMA frame and smaller. Insert 8 cm to 13 cm length on larger motors. On motors having grease drain plugs, remove plug and operate motor for 20 minutes before replacing drain plug.

NOTE: All of the auger and metering roll bearings are lifetime lubricated and do not require service lubrication.

### Suggested Lubrication Schedules*

<table>
<thead>
<tr>
<th>Hours of Service per Year</th>
<th>HP Range</th>
<th>Kw Range</th>
<th>Suggested Lube Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000</td>
<td>1/8 to 7-1/2</td>
<td>0.1 to 5.6</td>
<td>5 Years</td>
</tr>
<tr>
<td></td>
<td>10 to 40</td>
<td>7.5 to 29.8</td>
<td>3 Years</td>
</tr>
<tr>
<td></td>
<td>50 to 150</td>
<td>37.3 to 111.9</td>
<td>1 Year</td>
</tr>
<tr>
<td>Continuous Normal Applications</td>
<td>1/8 to 7-1/2</td>
<td>0.1 to 5.6</td>
<td>1 Year</td>
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<tr>
<td></td>
<td>10 to 40</td>
<td>7.5 to 29.8</td>
<td>3 Years</td>
</tr>
<tr>
<td></td>
<td>50 to 150</td>
<td>37.3 to 111.9</td>
<td>9 Years</td>
</tr>
<tr>
<td>Seasonal Service (Motor is idle for 6 months or more)</td>
<td>All</td>
<td>All</td>
<td>1 Year - Beginning of season</td>
</tr>
<tr>
<td>Continuous high ambient temperatures, dirty or moist locations, high vibrations or when shaft gets hot</td>
<td>1/8 to 40</td>
<td>0.1 to 29.8</td>
<td>6 Months</td>
</tr>
<tr>
<td></td>
<td>50 to 150</td>
<td>37.3 to 111.9</td>
<td>3 Months</td>
</tr>
</tbody>
</table>

* The bearings have been lubricated at the factory, thus no lubrication should be added before start-up.

### Suggested Lubricants

<table>
<thead>
<tr>
<th>Insulation Class</th>
<th>Consistency</th>
<th>Type</th>
<th>Grease</th>
<th>Frame Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>A and B</td>
<td>Medium</td>
<td>Polyurea</td>
<td>Shell Dolium R</td>
<td>215T and Smaller</td>
</tr>
<tr>
<td>A and B</td>
<td>Medium</td>
<td>Polyurea</td>
<td>Shell Dolium R</td>
<td>254 and Larger</td>
</tr>
<tr>
<td>F and H</td>
<td>Medium</td>
<td>Polyurea</td>
<td>Shell Dolium R</td>
<td>All</td>
</tr>
</tbody>
</table>

### Fan Blade Removal and Installation

DANGER

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

The fan blade is secured to the motor shaft by the use of a taper-lock bushing, motor shaft key and cap screws. The size, quantity and torque of cap screws required will depend on the model of the fan.
Removing the Fan Blade Assembly

1. Lock out and tagout the main power to make sure the dryer cannot be started during servicing.
2. Remove the grill guard.
3. If there is a safety washer present, remove the bolt, lock washer and safety washer.
4. Remove the bolts from the unthreaded holes of the bushing. Do not use these bolts for bushing removal.
5. Using an allen wrench, undo the set screw (if present) and remove the key from the keyway.
6. Install grade 5 or stronger bolts into the threaded holes in the bushing and gradually apply torque to each bolt to loosen the bushing.
7. Remove the bushing and fan blade assembly.

Installing the Fan Blade Assembly

1. Clean the motor shaft, key, bushing and the bore of the hub with a non-residual cleaner, such as brake parts cleaner or electric parts cleaner. It is important that these mating surfaces be clean and dry and no grease or oil is present. The parts must be assembled dry for maximum friction.

2. Insert bolts into bushing holes and ensure the shoulder portion of the bolt is NOT protruding the hole.
3. Install the fan blade assembly onto the motor shaft.
4. Align the keyway in the bushing with the key and slide the bushing onto the motor shaft.
   **NOTE:** Do not use excessive force to drive the bushing onto the shaft.
5. Align bushing and hub keyways with the key. Bushing should be flush with the end of the motor shaft.
6. Loosely install the bolts through the unthreaded holes in the bushing into the threaded holes of the hub.

---

**CAUTION**

Although the taper-lock method of retaining the blade onto the motor shaft is very simple and obvious, it is essential that the following points be read carefully and fully understood, as improper installation can result in serious or fatal injury caused by a loose, fast flying blade.

**THREADING BUSHING HOLES:** The threaded holes within the bushing are provided for disassembly purposes only. Do not attempt to use these holes for re-assembly, as they will not allow the parts to become locked onto the shaft, thereby causing an extremely hazardous operating condition.

**CLEARANCE HOLES:** When re-assembling parts, the cap screws must be installed through the UNTAPPED CLEARANCE HOLES to cause the blade to be pulled forward onto the tapered bushing, thus locking the parts securely onto the motor shaft. Refer to Page 87 (under installation section) for assembly details.

---

**CAUTION**

Do not use any lubricant or thread locking compound during installation. The use of such products will cause improper bolt torque and will crack the fan hub.
11. Service

Installing the Fan Blade Assembly (Continued)

7. Find the applicable torque for the bushing in the chart on Page 87. The bushing type is etched into the face of the bushing.

8. Torque the bushing gradually to evenly seat it inside the hub and onto the motor shaft. Set the torque wrench to 1/3 of the required torque setting and tighten each bolt in a circular pattern three (3) times. Increase the torque setting on the wrench to 2/3 of the required torque and tighten each bolt in a circular pattern three (3) times. Increase the setting on the torque wrench to the final required torque setting and tighten each bolt in a circular pattern three (3) times.

9. If there is a safety washer present, install the washer, lock washer and bolt.

10. Turn the fan blade assembly by hand to make sure there is freedom of movement and uniform clearance around the inlet.

11. Install the grill guard and turn ON the main power source.

12. Operate the fan for 30 minutes.

13. Stop the fan and lock out and tagout the main power to make sure the dryer cannot be started during servicing.

14. Remove the grill guard and re-tighten the bolts in a circular pattern one time at the final required torque setting.

15. Install the grill guard and turn ON the main power source.

Figure 11B Vane Axial Fan

**CAUTION**

Do not exceed the torque specifications listed on the bushing bolt torque chart on Page 87. Exceeding the recommended torque will crack the fan hub.
Installing the Fan Blade Assembly (Continued)

<table>
<thead>
<tr>
<th>Bushing</th>
<th>Bolt Thread</th>
<th>Bolt Torque Foot - Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>JA</td>
<td>10-24</td>
<td>5</td>
</tr>
<tr>
<td>G</td>
<td>1/4&quot;-20</td>
<td>6</td>
</tr>
<tr>
<td>H</td>
<td>1/4&quot;-20</td>
<td>8</td>
</tr>
<tr>
<td>SH</td>
<td>1/4&quot;-20</td>
<td>8</td>
</tr>
<tr>
<td>SD</td>
<td>1/4&quot;-20</td>
<td>9</td>
</tr>
<tr>
<td>SDS</td>
<td>1/4&quot;-20</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bushing</th>
<th>Bolt Thread</th>
<th>Bolt Torque Foot - Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>5/16&quot;-18</td>
<td>13</td>
</tr>
<tr>
<td>SK</td>
<td>5/16&quot;-18</td>
<td>15</td>
</tr>
<tr>
<td>SF</td>
<td>3/8&quot;-16</td>
<td>23</td>
</tr>
<tr>
<td>Q-1</td>
<td>3/8&quot;-16</td>
<td>29</td>
</tr>
<tr>
<td>R-1</td>
<td>3/8&quot;-16</td>
<td>29</td>
</tr>
</tbody>
</table>

**Figure 11C** Cutaway Drawing of Typical Propeller Installation

**Figure 11D** Cap Screw Arrangement for Disassembly

**Figure 11E** Cap Screw Arrangement for Resassembly

<table>
<thead>
<tr>
<th>Ref #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Rotation</td>
</tr>
<tr>
<td>B</td>
<td>Propeller</td>
</tr>
<tr>
<td>C</td>
<td>Taper-Lock Bushing</td>
</tr>
<tr>
<td>D</td>
<td>Cap Screw (Grade 5)</td>
</tr>
<tr>
<td>E</td>
<td>Key</td>
</tr>
<tr>
<td>F</td>
<td>Threaded Holes in Bushing</td>
</tr>
<tr>
<td>G</td>
<td>Cap screws installed into threaded holes to force propeller off bushing.</td>
</tr>
<tr>
<td>H</td>
<td>Cap screws installed through clearance holes of bushing. (See text on Page 87 for proper torque.)</td>
</tr>
</tbody>
</table>
11. Service

Fan Motor Removal and Installation

In the event of motor failure, remove the motor as described and take it to the nearest service station. An authorized service station 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 station 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.

1. Make certain power is shut off and locked out. Remove fan guard and blade.
2. Remove cover from fan/heater control box and disconnect the motor lead wires from within the box.
   
   **NOTE:** Tag or otherwise identify wires for ease of reassembly.
3. Remove motor mount bolts. If there are shims between the motor and its base, note their location so they can be properly installed during reassembly.
4. Disconnect the upper end of the motor conduit, then carefully pull the wires through the hole in the fan/heater housing. Remove motor from the fan/heater unit with the conduit still attached. If motor requires service, take it to an authorized service station.
5. To reinstall motor, slide onto motor base plate and replace shims (if required) between motor base and plate. Reinstall motor mount bolts and washers, but do not fully tighten at this time.
6. Reinstall conduit and wires through hole in fan/heater housing and carefully connect all electrical wiring.
7. Adjust position of motor by temporarily mounting the fan blade on the motor shaft. Rotate the fan blade by hand, making the necessary adjustments, so the tip clearance between blade and housing is uniform. If required, remove the fan blade and fully tighten all four (4) motor mount bolts.
   
   **NOTE:** Make sure to install and tighten the blade in accordance with previous instructions.

Heater Parts Removal and Installation

Most of the heater parts can be removed by simply identifying any attached wiring and then disconnecting the obvious mounting parts.

1. **Flame Sensor:** Disconnect the wire connector and unscrew the flame sensor out of its mounting bracket.
2. **Gas Solenoid Valve Coil(s):** Unsnap either the plastic cap, or the metal clip on the gas valve and slide the housing and coil off the valve stem and body. Do not energize the coil when it is removed, as the coil may become damaged due to excessive current flow.
3. **Regulator and Gas Solenoid Valve(s):** The gas regulator and solenoid valve(s) are directional and must be connected as indicated by the markings near the port openings. Make sure gas is shut off and purged from the system before removing parts.
   
   **NOTE:** When installing a liquid gas solenoid valve on LP models, do not over tighten the connection into the inlet side, as the inlet orifice may become partially blocked.
4. **Main Gas Orifice**: With fuel shut off and gas purged from system, proceed as follows:
   a. Disconnect the plumbing support brackets from the pipe train.
   b. Disconnect gas solenoid valve coils. Be sure to mark their original locations.
   c. Lift pipe (with orifice, solenoid valve and other parts attached), straight up and remove from fan/heater housing. Orifice and other parts can now be removed from pipe train, if desired.

5. **Reassemble**: To reassemble parts, reverse the disassembly procedure and check the following:
   a. Make sure all parts are thoroughly cleaned and open.
   b. Use a dependable brand of high temperature pipe caulkling compound when assembling gas connections. Apply only a light coating onto male threaded end of fittings.
   c. Solenoid valves and gas regulations are directional and must be properly installed. Do not attempt to connect gas solenoid valves by applying force to the valve core stem as it may ruin the unit.
   d. Make sure all electrical wires are properly connected. Refer to wiring diagrams on Pages 91-109.

**Metering Roll Servicing**

This dryer is equipped with an SCR metering roll drive assembly. The metering rolls are driven by a separate DC type electric motor. The speed of the motor is variable and is controlled by an electric SCR control within the main control box.

**Main Controls**

1. **SCR Speed Control 4" (GSI)**: The metering roll speed pots on the front of the control box regulate the speed of the DC motor which drives the metering rolls. The scale of adjustment is from 0 to 999 which represents the flow of grain past the metering rolls as a percent of the maximum grain discharge rate for the dryer.

   **NOTE:** *When the control is set to the maximum discharge rate (999), the metering roll speed should be 17.5 RPM for 8" discharge auger.*

2. **SCR Speed Control 7" (FFI)**: The metering roll speed pots on the front of the control box regulate the speed of the DC motor which drives the metering rolls. The scale of adjustment is from 0 to 999 which represents the flow of grain past the metering rolls as a percent of the maximum grain discharge rate for the dryer.

   **NOTE:** *When the control is set to the maximum discharge rate (999), the metering roll speed should be 4.3 RPM for 8" discharge auger.*

3. **DC Electric Motor**: The direct current (DC) motor provides the drive for the metering roll and is located on the front left hand side of standard model dryers. The output shaft of the motor is connected directly to the gearbox assembly. The DC motor requires no operational adjustment as it is completely controlled from the control box.

4. **Speed Reducer Gearbox**: The direct drive gearbox provides the required speed reduction and transmits power to the metering rolls through a drive chain arrangement. The gearbox does not require adjustment. The drive chain should also be periodically lubricated and tightened as necessary.
11. Service

4. **Unload Auger Time Delay**: The delay controls the bottom auger system and causes the unload auger (and any connected auxiliary unloading conveyors) to continue operating for a programmed amount of time, even after the metering rolls stop. This feature permits the clean out of grain within the unloading equipment at the end of all discharge cycles.

5. If a foreign object becomes lodged in the metering rolls and jams the system, the unloading auger will stay in motion. However, the metering roll drive will stop and the DC motor should stall out. The vision control system will shutdown the dryer after a 2 minutes period.

To determine if the metering problem is from blockage, perform the following test with the power OFF. Remove the drive chain by loosening the motor mounting bolts. Place a pipe wrench on the hub of the roller chain sprocket on the left hand metering roll at the drive end of the dryer. Apply up to 100 ft. lbs. of force and attempt to rotate the roll toward the inside of the dryer. If the metering roll will turn, then repeat for the right hand side. If the metering roll will turn, it can be assumed that no blockage exists and the problem is from some other cause. Check for a break in the power train, chain, drive key, pin, etc.

![CAUTION]

Keep hands away from sprocket teeth to avoid injury from chain backlash, as a result of torsion build up in the system caused by the jam.

**How to Clear a Jammed Meter Roll (All Power “OFF”)**

Place a pipe wrench on the hub of the sprocket of the jammed metering roll and turn the roll. First, backward and then, forward several times in an attempt to dislodge the object and clear it through the roll. If this is not successful, have an assistant turn the metering roll and attempt to locate the jam by sound. Shutdown the fan/heater and eliminate any other noise when making this check. Once the location is determined, the roll can be reached from inside the plenum by opening the access door for the column that has the jam and loosening the two (2) nuts holding the metering roll slide gate high enough to reach in and remove the object causing the jam.
12. Competitor/Dri-Tek Schematics and Wiring Diagrams

Competitor/Dri-Tek Single Fan Wiring to Control Box
12. Competitor/Dri-Tek Schematics and Wiring Diagrams

Competitor/Dri-Tek Lower Switch Panel Wiring
Competitor/Dri-Tek Lower Switch Panel Wiring (Continued)
Competitor/Dri-Tek Lower Back Panel Wiring
Competitor/Dri-Tek Lower Back Panel Wiring (Continued)
12. Competitor/Dri-Tek Schematics and Wiring Diagrams

Competitor/Dri-Tek Upper Control Panel Wiring for Canadian Export
Competitor/Dri-Tek Upper Control Panel Wiring for Canadian Export (Continued)
Competitor/Dri-Tek Upper Control Panel Wiring for Canadian Export (Continued)
Competitor/Dri-Tek Upper Control Panel Wiring for Canadian Export 220 Volt 1 Phase and 3 Phase
12. Competitor/Dri-Tek Schematics and Wiring Diagrams

Competitor/Dri-Tek Upper Control Panel Wiring for Canadian Export 380, 440, 575 Volt
12. Competitor/Dri-Tek Schematics and Wiring Diagrams

Competitor/Dri-Tek Control Schematic
12. Competitor/Dri-Tek Schematics and Wiring Diagrams

Competitor/Dri-Tek 220 VAC 1 Phase Power Schematic
12. Competitor/Dri-Tek Schematics and Wiring Diagrams

Competitor/Dri-Tek 220 VAC 3 Phase Power Schematic
12. Competitor/Dri-Tek Schematics and Wiring Diagrams

Competitor/Dri-Tek 440 VAC 3 Phase Power Schematic
Competitor/Dri-Tek 575 VAC 3 Phase Power Schematic
Front Panel
13. Vision Schematics and Wiring Diagrams

Front Panel (Continued)
Front Panel (Continued)
Front Panel (Continued)
Front Panel (Continued)
Front Panel (Continued)
13. Vision Schematics and Wiring Diagrams

Front Panel (Continued)
13. Vision Schematics and Wiring Diagrams

Front Panel (Continued)
13. Vision Schematics and Wiring Diagrams

Front Panel (Continued)
Front Panel (Continued)

6 FAN VISION & DRYTEK+
LOWER CONTROL BOX
12 VDC NEGATIVE TO LAMP X2

COLOR LEGEND

- GRAY/WHITE STRIPE
- RED
- BLUE
- BROWN
- YELLOW
- PURPLE
- ORANGE
- GREY
- WHITE
- BLACK
- WHITE/BLACK STRIPE
6 FAN VISION & DRYTEK+
LOWER CONTROL BOX
LAMP 12VDC HOOKUP

COLOR LEGEND
- GRAY/YELLOW STRIPE
- RED
- BLUE
- BROWN
- YELLOW
- PURPLE
- ORANGE
- GREY
- WHITE
- BLACK
- WHITE/BLACK STRIPE
6 FAN VISION & DRYTEK+ LOWER CONTROL BOX 12VDC WIRING TO SWITCHES

COLOR LEGEND

- GRN/YLW STRIPE
- RED
- BLUE
- BROWN
- YELLOW
- PURPLE
- ORANGE
- GREY
- WHITE
- BLACK
- WHITE/BLACK STRIPE
13. Vision Schematics and Wiring Diagrams

Front Panel (Continued)

6 FAN VISION & DRYTEK+
LOWER CONTROL BOX
SWITCH INPUT WIRING

COLOR LEGEND

- - GRAY/WHITE STRIPE
- RED
- BLUE
- BROWN
- YELLOW
- PURPLE
- ORANGE
- GREY
- WHITE
- BLACK
- WHITE/BLACK STRIPE
Front Panel (Continued)
13. Vision Schematics and Wiring Diagrams

Front Panel (Continued)
13. Vision Schematics and Wiring Diagrams

Front Panel (Continued)
Upper Control Box (Continued)
220 VAC 3 Phase
440 VAC 3 Phase
575 VAC 3 Phase
13. Vision Schematics and Wiring Diagrams

Ladder Diagram
Ladder Diagram (Continued)
GSI Group, LLC Limited Warranty

The GSI Group, LLC ("GSI") warrants products which it manufactures to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months after sale to the original end-user or if a foreign sale, 14 months from arrival at port of discharge, whichever is earlier. The end-user’s sole remedy (and GSI’s only obligation) is to repair or replace, at GSI’s option and expense, products that in GSI’s judgment, contain a material defect in materials or workmanship. Expenses incurred by or on behalf of the end-user without prior written authorization from the GSI Warranty Group shall be the sole responsibility of the end-user.

Warranty Extensions:

The Limited Warranty period is extended for the following products:

<table>
<thead>
<tr>
<th>Product</th>
<th>Warranty Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP Fans and Flooring</td>
<td></td>
</tr>
<tr>
<td>Performer Series Direct Drive Fan Motor</td>
<td>3 Years</td>
</tr>
<tr>
<td>All Fiberglass Housings</td>
<td>Lifetime</td>
</tr>
<tr>
<td>All Fiberglass Propellers</td>
<td>Lifetime</td>
</tr>
<tr>
<td>AP and Cumberland</td>
<td></td>
</tr>
<tr>
<td>Flex-Flo/Pan Feeding System Motors</td>
<td>2 Years</td>
</tr>
<tr>
<td>Cumberland Feeding/Watering Systems</td>
<td></td>
</tr>
<tr>
<td>Feeder System Pan Assemblies</td>
<td>5 Years **</td>
</tr>
<tr>
<td>Feed Tubes (1-3/4&quot; and 2.00&quot;)</td>
<td>10 Years *</td>
</tr>
<tr>
<td>Centerless Augers</td>
<td>10 Years *</td>
</tr>
<tr>
<td>Watering Nipples</td>
<td>10 Years *</td>
</tr>
<tr>
<td>Grain Systems</td>
<td></td>
</tr>
<tr>
<td>Grain Bin Structural Design</td>
<td>5 Years</td>
</tr>
<tr>
<td>Grain Systems Farm Fans Zimmerman</td>
<td></td>
</tr>
<tr>
<td>Portable and Tower Dryers</td>
<td>2 Years</td>
</tr>
<tr>
<td>Portable and Tower Dryer Frames and Internal Infrastructure †</td>
<td>5 Years</td>
</tr>
</tbody>
</table>

GSI further warrants that the portable and tower dryer frame and basket, excluding all auger and auger drive components, shall be free from defects in materials for a period of time beginning on the twelfth (12th) month from the date of purchase and continuing until the sixtieth (60th) month from the date of purchase (extended warranty period). During the extended warranty period, GSI will replace the frame or basket components that prove to be defective under normal conditions of use without charge, excluding the labor, transportation, and/or shipping costs incurred in the performance of this extended warranty.

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH ABOVE. SPECIFICALLY, GSI MAKES NO FURTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) PRODUCT MANUFACTURED OR SOLD BY GSI OR (II) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

GSI shall not be liable for any direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. The sole and exclusive remedy is set forth in the Limited Warranty, which shall not exceed the amount paid for the product purchased. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor.

GSI assumes no responsibility for claims resulting from construction defects or unauthorized modifications to products which it manufactured. Modifications to products not specifically delineated in the manual accompanying the equipment at initial sale will void the Limited Warranty.

This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained. This Limited Warranty extends solely to products manufactured by GSI.

Prior to installation, the end-user has the responsibility to comply with federal, state and local codes which apply to the location and installation of products manufactured or sold by GSI.
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 installations are made.