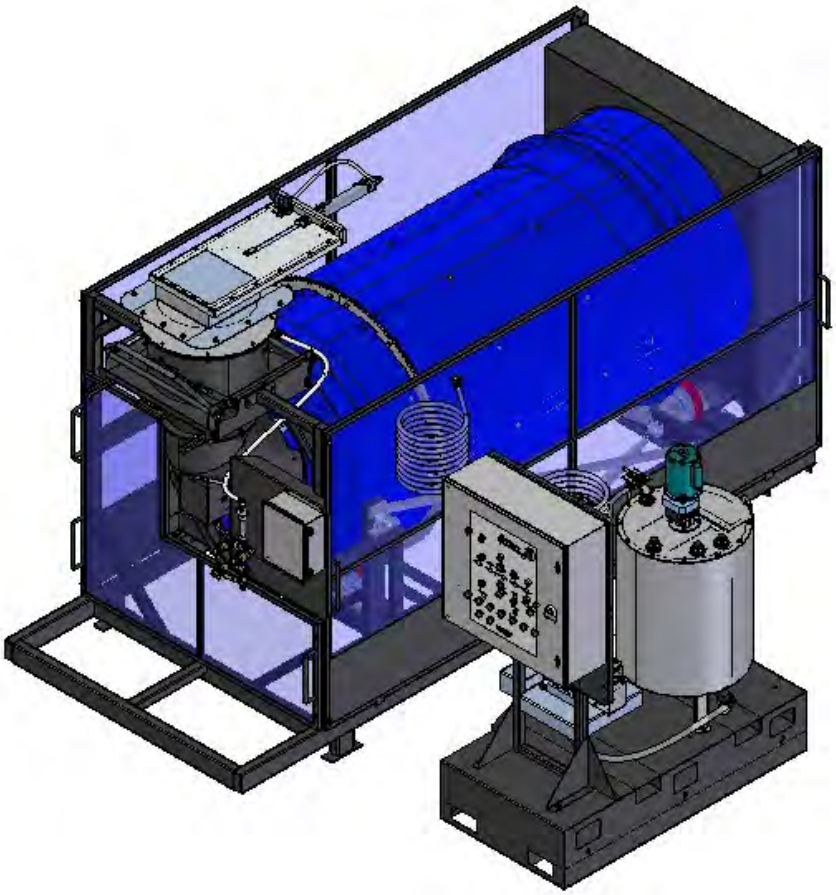
LP4000 SEED TREATER



Operator's Manual



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INTRODUCTION

Thank you for choosing USC, LLC for your equipment needs. We appreciate your business and will work diligently to ensure that you are satisfied with your choice.

OVERVIEW

The purpose of this manual is to provide you with the basic information needed to operate and maintain the LP4000. It does not hold USC, LLC liable for any accidents or injuries that may occur.

OPERATOR RESPONSIBILITIES

As the purchaser/owner/operator of this equipment and control system, you have an obligation to install, operate, and maintain the equipment in a manner that minimizes the exposure of people in your care to any potential hazards inherent in using this equipment. It is critical that the owner of this equipment:

- Has a clear and documented understanding of the process this machine is being used in and of any resulting hazards or special requirements arising from this specific application.
- Allow only properly trained and instructed personnel to install, operate, or service this equipment.
- Maintain a comprehensive safety program involving all who work with this machine and other associated process equipment.
- Establish clear areas of staff responsibility (e.g. operation, setup, sanitation, maintenance, and repairs).
- Provide all personnel with necessary safety equipment.
- Periodically inspect the equipment to insure that the doors, covers, guards, and safety devices are in place and functioning, that all safety instructions and warning labels are intact and legible, and that the equipment is in good working order.
- In addition to the operating instructions, observe and enforce the applicable legal and other binding regulations, national and local codes.

As the person with the most to gain or loose from working safely, it is important that you work responsibly and stay alert. By following a few simple rules, you can prevent an accident that could injure or kill you or a co-worker.

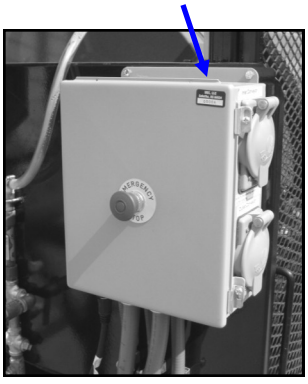
- Do not operate, clean, or service this equipment until you have read and understood the contents of this manual. If you do not understand the information in this manual, bring it to the attention of your supervisor, or call your local USC dealer for assistance.
- Any operator who is known or suspected to be under the influence of alcohol or drugs should not be allowed to operate the equipment.
- Understand and follow the safety practices required by your employer and this manual.
- **PAY ATTENTION** to what you and other personnel are doing and how these activities may affect your safety.
- **Failure to follow these instructions may result in serious personal injury or death.**

RECEIVING YOUR EQUIPMENT

As soon as the equipment is received, it should be carefully inspected to make certain that it has sustained no damage during shipment and that all items listed on the packing list are accounted for. If there is any damage or shortages, the purchaser must immediately notify your USC dealer. Ownership passes to purchaser when the unit leaves the USC, LLC. premises. The purchaser is responsible for unloading and mounting all components of the equipment.

Document the serial number of the machine for future reference. Below are pictures showing where the serial numbers are located.

Treater Serial Number



Pump Skid Serial Number

TREATER SERIAL NUMBER:_____

PUMP SKID SERIAL NUMBER:_____

Table of Contents

SAFETY INSTRUCTIONS

SECTION A

Every year accidents in the work place maim, kill, and injure people. Although it may be impossible to prevent all accidents, with the right combination of training, operating practices, safety devices, and operator vigilance, the number of accidents can be significantly reduced. The purpose of this section is to educate equipment users about hazards, unsafe practices, and recommended hazard avoidance techniques.

SAFETY WORDS AND SYMBOLS

It is very important that operators and maintenance personnel understand the words and symbols that are used to communicate safety information. Safety words, their meaning and format, have been standardized for U.S. manufacturers and published by the American National Standards Institute (ANSI). The European Community (E.C.) has adopted a different format based on the International Standards Organization (I.S.O.) and applicable machinery directives. Both formats are presented below. Graphic symbols are not standardized, but most manufacturers will use some variation of the ones seen in this manual.

Indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury.

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

Indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury and/or property damage.

Provides additional information that the operator needs to be aware of to avoid a potentially hazardous situation.

Mandatory Lockout Power Symbol. Disconnect, lockout, and tagout electrical and other energy sources before inspecting, cleaning, or performing maintenance on this panel.

International Safety Alert Symbol. The exclamation point (!) surrounded by a yellow triangle indicates that an injury hazard exists. However, it does not indicate the seriousness of potential injury. The exclamation point (!) is also used with the DANGER, WARNING, and CAUTION symbols so the potential injury is indicated.

Electrocution Hazard Symbol. This symbol indicates that an electrocution hazard exists. Serious injury or death could result from contacting high voltage.

International Electrocution Hazard. This symbol indicates that an electrocution hazard exists. Serious injury or death could result from contacting high voltage.

Mandatory Read Manual Action Symbol. (I.S.O. format) This symbol instructs personnel to read the Operators Manual before servicing or operating the equipment.

Mandatory Read Manual Action Symbol. This symbol instructs personnel to read the Operators Manual before servicing or operating the equipment.

Notice is used to notify people of important installation, operation, or maintenance information which is not hazard related.

LOCKOUT / TAGOUT PROCEDURES

Lockout/Tagout is the placement of a lock/tag on an energy isolating device in accordance with an established procedure. When taking equipment out of service to perform maintenance or repair work, always follow the lockout/tagout procedures as outlined in ANSI Z344.1 and/or OSHA Standard 1910.147. This standard "requires employers to establish a program and utilize procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices and to otherwise disable machines or equipment to prevent unexpected energizing, start-up, or release of stored energy in order to prevent injury to employees."

EMERGENCY STOP

There is one Emergency Stop push buttons located on the LX Series Seed Treater, which is located on the main control. Actuators of emergency stop shall be colored RED. The background immediately around the device actuator shall be colored YELLOW. The actuator pushbutton-operated device shall be of the palm or mushroom head type.

CONTROLLED STOP

This is the stopping of machine motion by reducing the electrical command signal to 0 (zero) once the stop signal has been recognized.

HAZARD REVIEW

Electrocution Hazard

Electrocution accidents are most likely to occur during maintenance of the electrical system or when working on or near exposed high voltage wiring. This hazard does not exist when the electrical power has been disconnected, properly locked, and tagged out.

Automatic Start Hazard

This seed treating system is usually controlled by an automated system and may start without warning. Failure to properly disconnect, lockout, and tagout all energy sources of remotely controlled equipment creates a very hazardous situation and could cause injury or even death. PLEASE STAY CLEAR AND BE ALERT.

YOU are responsible for the **SAFE** operation and maintenance of your USC, LLC Seed Treating System. **YOU** must ensure that you and anyone else who is going to operate, maintain, or work around the Seed Treating System be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alert you to good safety practices that should be adhered to while operating the Seed Treating System.

Remember, **YOU** are the key to safety. Good safety practices not only protect you, but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- LP4000 Seed Treater owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter per OSHA (Occupational Safety and Health Administration) regulation 1928.57.
- The most important safety device on this equipment is a **SAFE** operator. It is the operator's responsibility to read and understand **ALL** Safety and Operating instructions in the manual and to follow them. All accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- Think SAFETY! Work SAFELY!

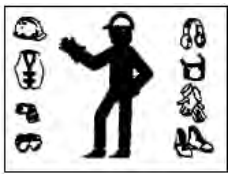
GENERAL SAFETY

1. Read and understand the Operator's Manual and all safety signs before operating, maintaining, adjusting or unplugging the LP4000 Seed Treater.

2. Only trained persons shall operate the seed treater. An untrained operator is not qualified to operate the machine.
3. Have a first-aid kit available for use should the need arise, and know how to use it.

4. Provide a fire extinguisher for use in case of an accident. Store in a highly visible place.

5. Do not allow children, spectators or bystanders within hazard area of machine.
6. Wear appropriate protective gear. This includes but is not limited to:



   - A hard hat
   - Protective shoes with slip resistant soles
   - Protective goggles
   - Heavy gloves
   - Hearing protection
   - Respirator or filter mask

7. Place all controls in neutral or off, stop motor, and wait for all moving parts to stop. Then disable power source before servicing, adjusting, repairing, or unplugging.

8. Review safety related items annually with all personnel who will be operating or maintaining the LP4000 Seed Treater.

OPERATING SAFETY:

1. Read and understand the Operator's Manual and all safety signs before using.
2. Disconnect and disable electrical supply completely and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Clear the area of bystanders, especially children, before starting.
4. Be familiar with the machine hazard area. If anyone enters hazard area, shut down machine immediately. Clear the area before restarting.
5. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
6. Stay away from overhead obstructions and power lines during operation and transporting. Electrocution can occur without direct contact.
7. Do not operate machine when any guards are removed.
8. Inspect welds and repair if needed.

PLACEMENT SAFETY

1. Move only with the appropriate equipment
2. Stay away from overhead power lines when moving Seed Treating System. Electrocution can occur without direct contact.
3. Be familiar with machine hazard area. If anyone enters hazard areas, shut down machine immediately. Clear the area before restarting.
4. Operate the Seed Treater on level ground free of debris. Anchor the Seed Treater to prevent tipping or upending.

Before placement of the Seed Treater, be sure that ground is reasonably level. The Seed Treater may topple or work improperly if the ground is too uneven, damaging the equipment and/or causing personal injury.

MAINTENANCE SAFETY

1. Review the Operator's Manual and all safety items before working with, maintaining or operating the Seed Treating System.
2. Place all controls in neutral or off, stop motors, disable power source, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Follow good shop practices:

   Keep service area clean and dry.
   Be sure electrical outlets and tools are properly grounded.
   Use adequate light for the job at hand.
4. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
5. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments.
6. Before resuming work, install and secure all guards when maintenance work is completed.
7. Keep safety signs clean. Replace any sign that is damaged or not clearly visible.

SAFETY SIGNS

1. Keep safety signs clean and legible at all times.
2. Replace safety signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety signs are available from your Authorized Dealer.

How to Install Safety Signs:

- Be sure that the installation area is clean and dry.
- Be sure temperature is above 50°F (10°C).
- Decide on the exact position before you remove the backing paper.
- Remove the smallest portion of the split backing paper.
- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

Located on the USC equipment you will find safety labels. Always be sure to read and follow all directions on the labels.

Guards provided with USC Seed treater are to remain in place during operation.

SECTION B INSTALLATION

DANGER

HIGH VOLTAGE ~ Always disconnect the power source before working on or near the control panel or lead wires.

DANGER

HIGH VOLTAGE ~ Use insulated tools when making adjustments while the controls are under power.

NOTICE

Permanent installation may require additional electrical cords, liquid hose, and air lines, since each installation is unique.

SET-UP

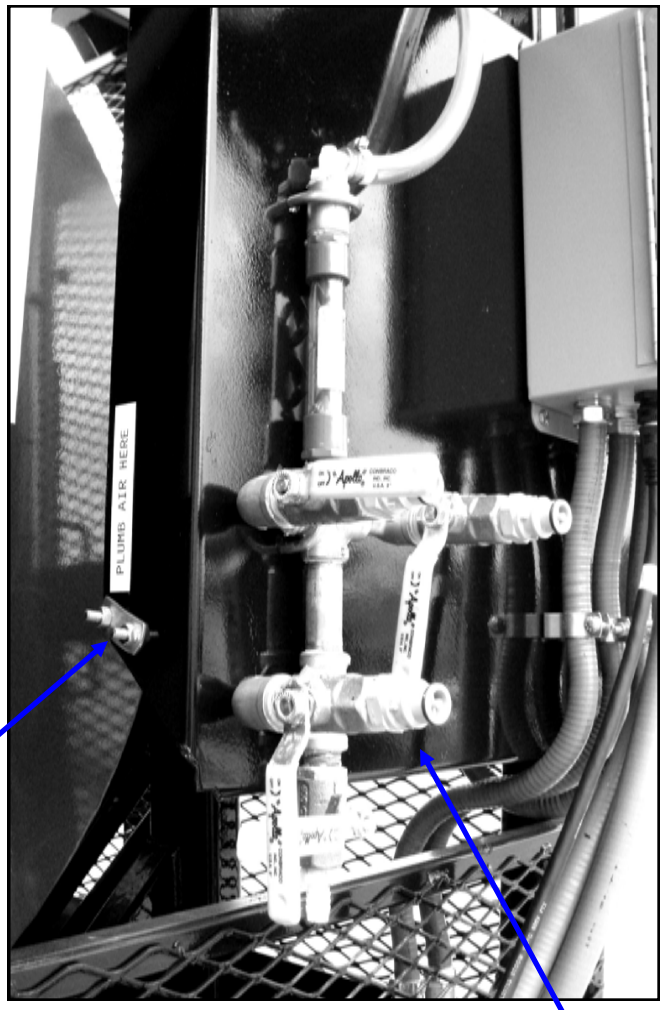
The following steps outline the initial set-up of your USC LP4000 Seed Treater:

1. Clear the area of bystanders, especially small children, before moving.
2. Be sure there is enough clearance from overhead obstructions and power lines or other equipment to move the machine into its working position.
3. Using a forklift, place the seed treater in the desired position on a level surface.

NOTICE USC highly recommends that the seed treater be set up inside a building or any covered structure to protect the machine from weathering.

4. Anchor the seed treater in position to prevent the machine from moving during operation.
5. Inspect machine thoroughly for screws, bolts, fittings, etc. which may have come loose during shipping.
6. The pump stand should be placed on level ground close to the seed treater.
7. Connect the cords from the seed treater junction box to the main control panel and the 2nd pump stand to the main control panel. The receptacles are found on the bottom of the main control panel. (right)

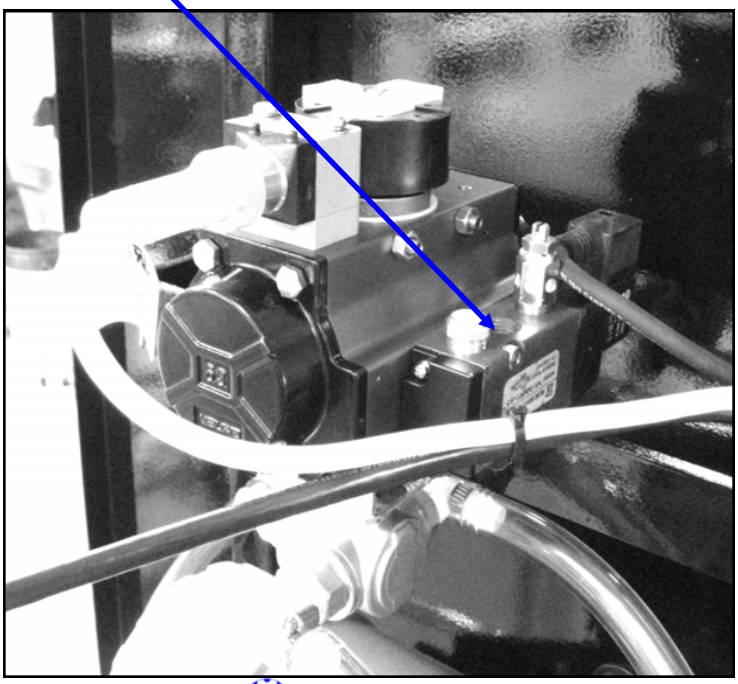
8. Attach the tubing from the pump skid to the atomizer plumbing attachments located on the seed treater (right). Additional tubing can be added or removed to accommodate your set-up.
9. Supply approximately 100 pounds of air pressure to port located just behind the atomizer plumbing attachments (right). This will operate the slide gate above the seed treater.
10. Supply air o the air actuated 3-way valve located on each pump skid behind the control panel. (below)



NOTICE Maximum psi is 125.

Air Supplied Here

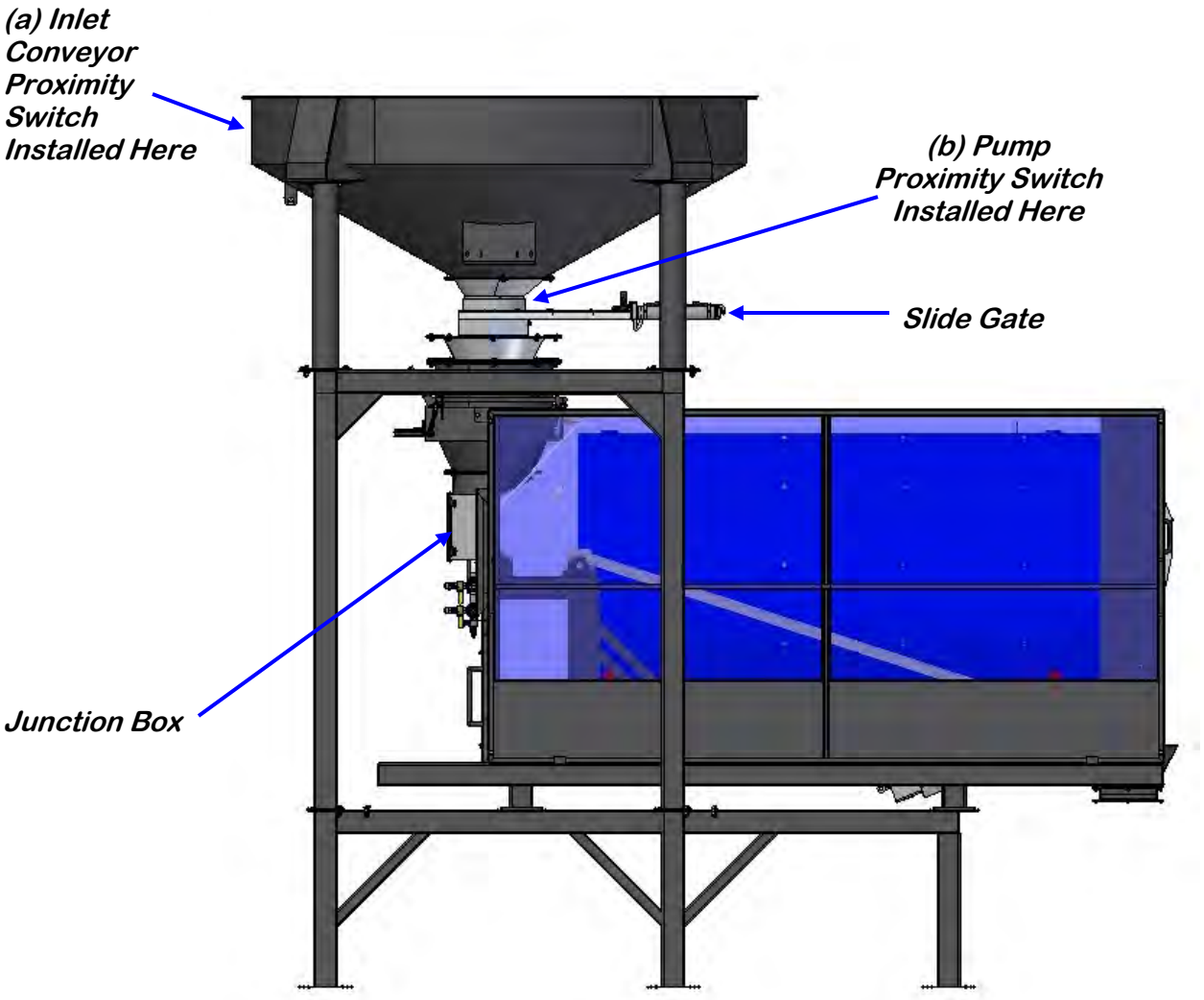
Plumbing to Atomizer



10. The proximity switches which are sent with the treater will need to be installed in the overhead supply hopper. Below is a picture of a LP4000 which includes an overhead hopper that is built by USC. The picture illustrates where the proximity switches need to be mounted.

    a. The proximity switch, which is used to automatically control the inlet conveyor, will need to be mounted near the top of the supply hopper. This proximity switch does not need to be installed if operator chooses not to use a conveyor to feed the supply hopper. The proximity switch will need to be connected to terminals 5051 and 5111 in the junction box located on the seed treater.

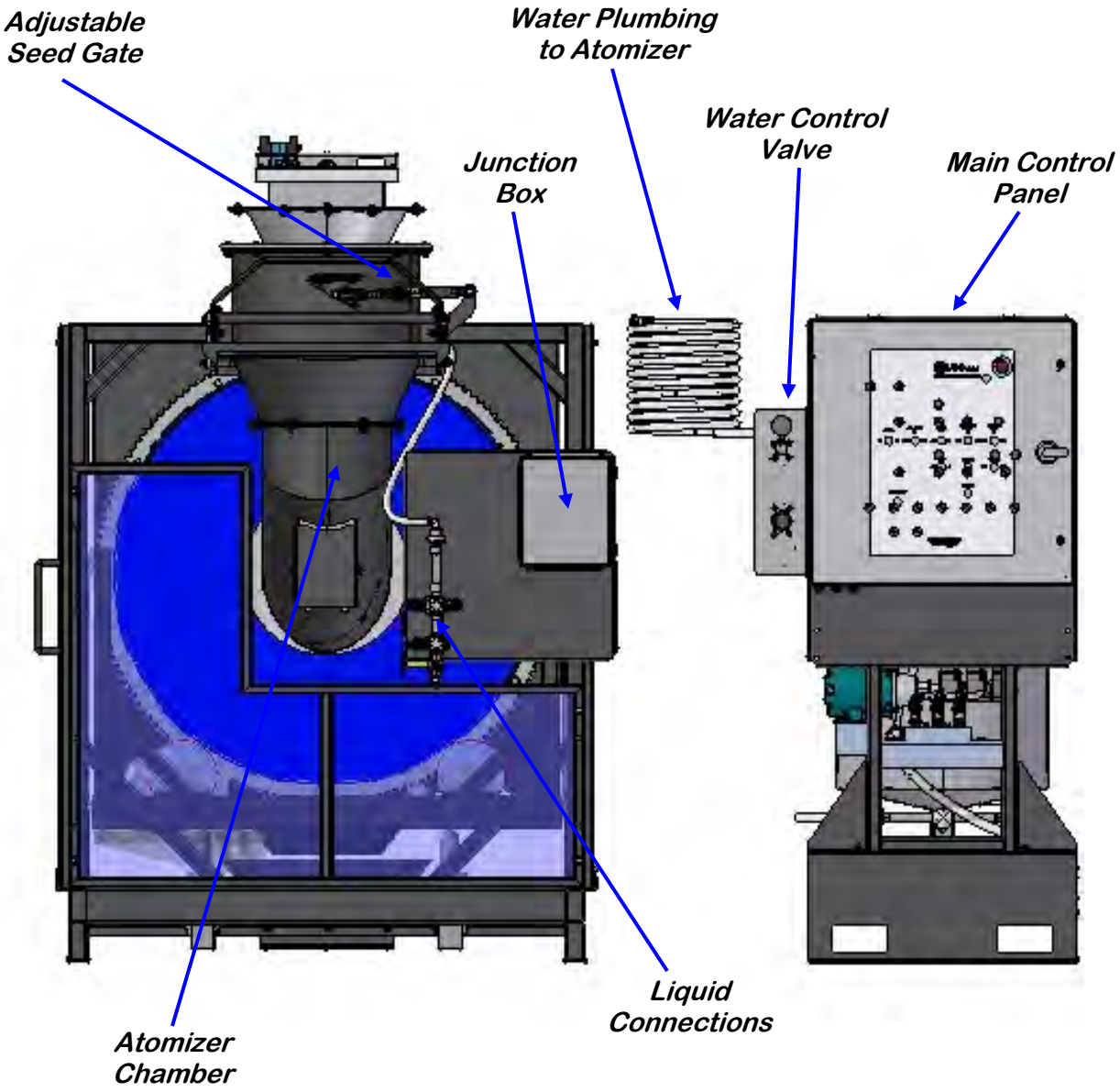
    b. The proximity switch, which is used to automatically control the pumps, will need to be mounted near the bottom of the supply hopper. It will then need to be connected to terminals 5051 and 7071 in the junction box located on the seed treater.



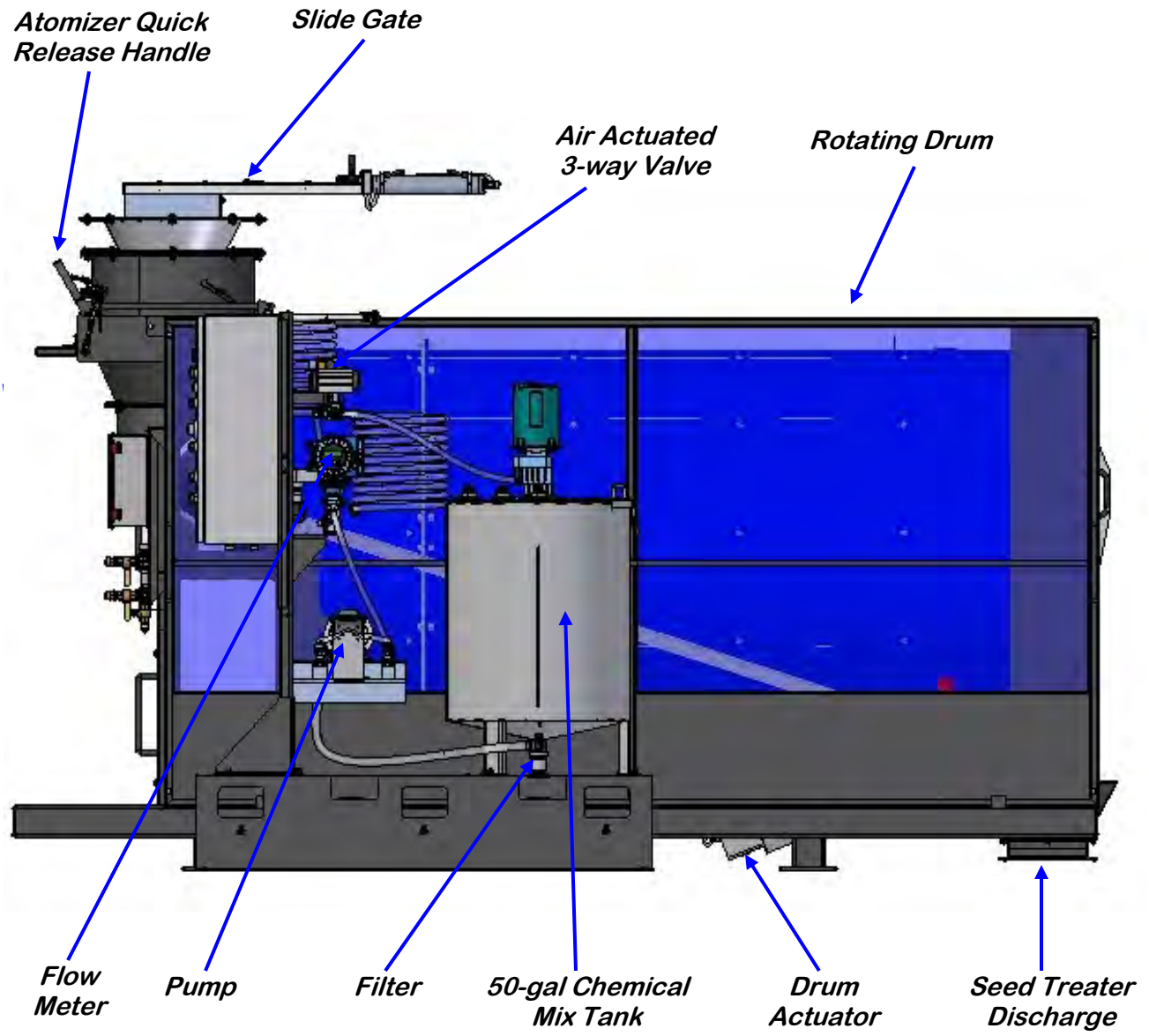
13. Have a certified electrician provide power to the seed treating system. Provide convenient shutdown switches, comply with local electrical codes and ensure that the system is properly grounded and bonded. The USC system must be connected to the same electrical requirements as specified in the main control panel on the power requirement tag, or the electrical schematic shipped with the piece of equipment. This will power the entire USC system.

SECTION C MECHANICAL OPERATION

SYSTEM OVERVIEW



SYSTEM OVERVIEW



SUPPLY HOPPER

The supply hopper is the hopper that sits above the treater and supplies seed to the machine. There are two proximity sensors which mount in the hopper, an upper and lower sensor . The upper sensor, which controls the automatic start and stop of the inlet conveyor, does not need to be installed if using a large enough hopper above the seed treater. The lower sensor, which controls the automatic start and stop of the pump(s), will need to be installed above the slide gate. Refer to the Troubleshooting section for more in-depth information on these switches.

A slide gate is mounted directly above the seed treater. This gate controls when seed passes through the seed treater. An adjustable seed gate is positioned just under the slide gate. This gate controls the seed flow rate of the treater. Calibration of the seed flow gate will need to be done prior to treating seed.

ATOMIZER CHAMBER

The atomizer chamber consists of a patented design which disperses treatment evenly to each seed. A variable speed motor drives the atomizer head. At full speed, the head spins at approximately 1725 RPM's. As treatment is being pumped into the atomizer chamber, it drops into the atomizer head. The centrifugal force of the spinning head causes the treatment to be sprayed out through a screen covering all 360 degrees. Meanwhile, seed drops down out of the supply hopper, down on top of a distribution cone, and down through the atomizer chamber. The distribution cone creates a curtain of seed which wraps around the atomizer head, ensuring that every seed is applied with treatment.

The speed of the atomizer can be adjusted to increase coverage or reduce the amount of build-up.

ROTATING DRUM

The variable speed rotating drum accepts treated seed through the opening on the hopper end. As seed passes through the length of the drum it is tumbled, producing accurate and uniform seed coating. The seed then exits the seed treater out the discharge end of the machine.

The drum height and speed can be manually adjusted to increase seed coverage.

Never allow exposure of persons or clothing to the drive shaft, idler wheels, or the drum during operation. Always have the safety shields in place during operation.

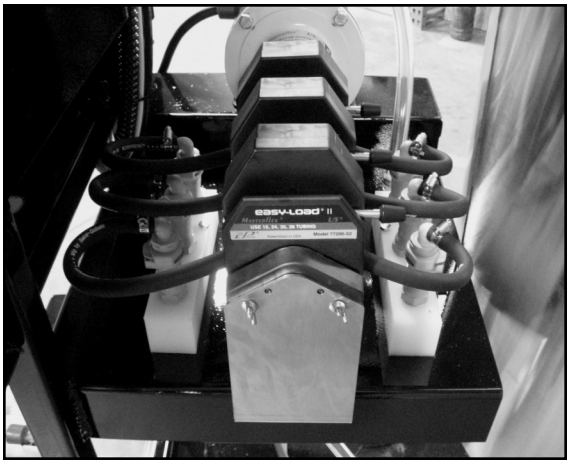
PUMP STAND

The USC LP4000 seed treater is equipped with a pump stand which includes a variable speed peristaltic pump, flow meter, air actuated 3-way valve, and a 50 gallon mix tank. The mix tank utilizes an electric drive liquid agitator to keep chemicals mixed and in suspension. The agitator should be running at all times when chemical is present. The tank is equipped with a shut-off valve, filter, and drain valve.

A variable speed peristaltic pump with three heads is used for chemical metering. The chemical being applied only comes into contact with the inside diameter of the tubing and not the pump. This allows for easy cleanup and maintenance without disassembling the pump.

To open the pump heads, turn lever to the left. Place pump tubing in pump head so it fits inside the notches and above the rollers. Turn lever back to the right to close the pump head, clamping the hose inside the head.

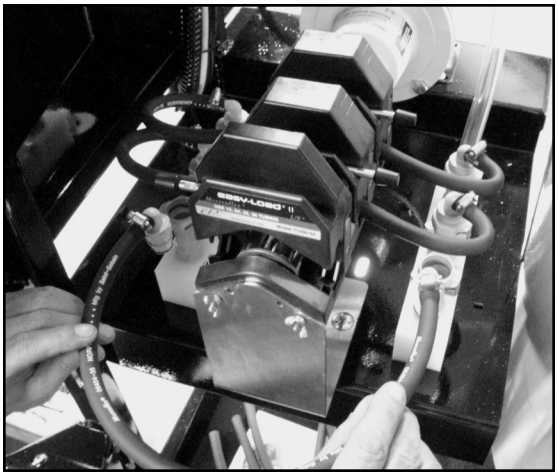
Pump Heads Open

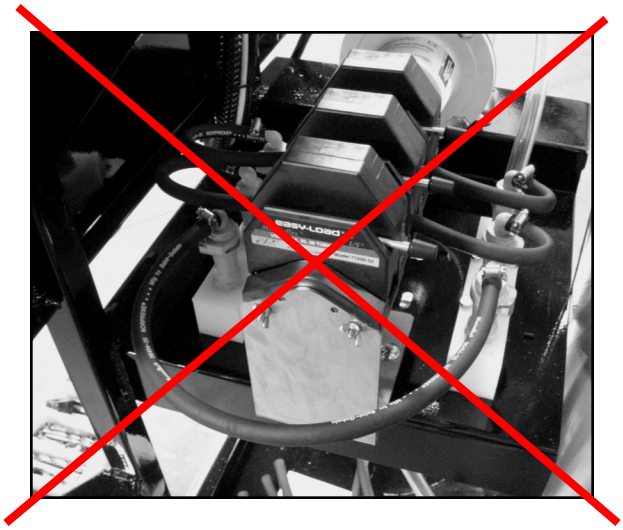


Pump Heads Closed

Wear or fatiguing of the tubing within the pump heads due to compression is normal. When tubing becomes worn or chemical rates begin to slow down, open the pump heads and move the tubing to a different position. If the entire piece of tubing becomes worn, simply replace with a new section of tubing. When storing the seed treater, open the pump head and remove the tubing to prevent any extra compression during the off-season. Worn tubing should be moved to a different position to prevent additional wear.

If a very low rate is needed, a section of tubing can be removed to force the pump motor to run at a higher speed. This allows for a more consistent flow rate. When removing the tubing, uncouple it from the manifold (below left). If the tubing is unclamped from the pump head but left coupled in the manifold (below right), the pump will suck air and cause flow rates to be very inconsistent.





The pump stand is also equipped with a flow meter, which is used to determine the liquid flow rate. The flow meter measures in ounces or milliliters per minute and total ounces or total milliliters.

Proper calibration is critical to achieve a proper granular/chemical mixture.
The liquid pump is controlled by a variable speed motor. An electric 3-way valve helps in calibration by controlling whether treatment is pumped back into the tank or to the atomizer.

Emptying the remaining chemical can be done by reversing the pump back into the mix tank and then draining the liquid into a suitable container. Clean water should be pumped through the flow meter, valves, and mix tank when finished.

Always dispose of chemical or diluted chemical according to your local, state, and federal regulations.

Only you, the operator, can determine the length of time required to completely rinse all chemical residue from the tank and plumbing system.

The liquid system also includes a regulating valve with pressure gauge. This is used to regulate the amount of water being applied to the seed if the pump cannot handle a high rate of treatment.

Electrical Operation

Section D

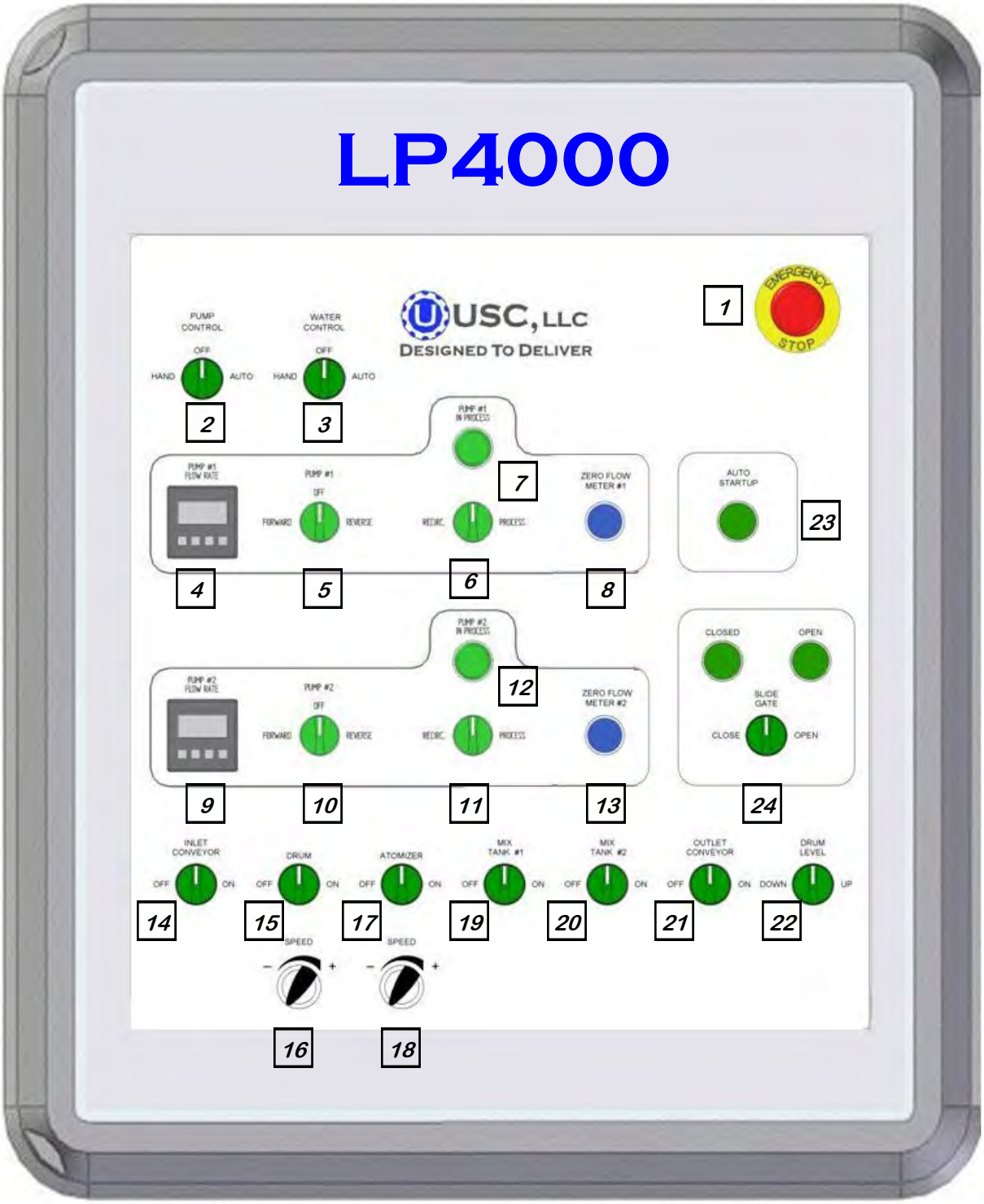
HIGH VOLTAGE ~ Always disconnect the power source before working on or near the control panel or lead wires.

HIGH VOLTAGE ~ Use insulated tools when making adjustments while the controls are under power.

AUTHORIZED PERSONNEL only shall work on the control panel. Never allow anyone who has not read and familiarized themselves with the owner's manual to open or work on the control panel.

This section provides a general overview and description of the operator controls, inside and outside of the main control panel for the LP4000 Seed Treater.

LP4000 MAIN CONTROL PANEL



1. EMERGENCY STOP Button: Disrupts power to the seed treater.

2. PUMP CONTROL Switch: This switch controls both pump #1 and pump #2. This switch must be activated before either pump will operate in forward or reverse.

- When the pump switch is turned to “Hand”, the pump(s) will run only when you have turned the pump(s) switch to forward or reverse, and the speed has been adjusted.
- When the switch is turned to “Auto”, it will only run when the proximity switch located above the slide gate is covered and the atomizer is running. The proximity switch determines when seed is present in the hopper. When the sensor does not detect seed, a timer relay located inside the control panel will automatically shut off the pump(s) a certain period of time after the hopper has emptied. The timer relay located in the control panel is set to Mode “D” and has an adjustable knob with settings from 0-6. Each number represents the number of seconds from the time the hopper empties until the pump shuts off. The time delay allows all seed in the hopper to have an equal amount of treatment applied to it.

3. WATER CONTROL: This switch controls the solenoid valve located on the left side of the control panel.

- When the switch is turned to “Hand”, the solenoid will open, allowing water to flow to the seed treater.
- When the switch is turned to “Auto”, the solenoid will open only when the proximity switch located above the slide gate is covered and the atomizer is running. The proximity switch determines when seed is present in the hopper above the slide gate. When the sensor does not detect seed, a timer relay located inside the control panel will automatically shut off the water a certain period of time after the hopper has emptied. The timer relay located in the control panel is set to Mode “D” and has an adjustable knob with settings from 0 -6. Each number represents the number of seconds from the time the hopper empties until the pump shuts off. The time delay allows all seed in the hopper to have an equal amount of chemical applied to it.

4. PUMP #1 FLOW RATE: Controls and displays the flow rate of pump #1. The setting should be chosen in relation to application rate for the treatment being applied to the seed.

5. PUMP #1 Direction Switch: The switch allows you to change direction between “FORWARD”, “OFF”, or “REVERSE”.

6. PUMP #1 PROCESS / RECIRC Switch: Controls the air actuated 3-way valve that directs pump #1 liquid back into the mix tank (“RECIRCULATE”) or to the atomizer (“PROCESS”).

7. PUMP #1 PROCESS Light: This light illuminates when the Pump #1 is in "PROCESS".

8. ZERO FLOW METER #1 Button: When this button is pushed, the Total Ounces (page 20) displayed on Flow Meter #1 will be reset to zero.

9. PUMP #2 FLOW RATE: Controls and displays the flow rate of pump #2. The setting should be chosen in relation to application rate for the treatment being applied to the seed.

10. PUMP #2 DIRECTION Switch: The switch allows you to change direction between "FORWARD", "OFF", or "REVERSE".

11. PUMP #2 PROCESS / RECIR Switch: Controls the air actuated 3-way valve that directs pump #2 liquid back into the mix tank ("RECIRCULATE") or to the atomizer ("PROCESS").

12. PUMP #2 PROCESS Light: This light illuminates when the Pump #2 is in "PROCESS".

13. ZERO FLOW METER #2 Button: When this button is pushed, the Total Ounces (page 20) displayed on Flow Meter #2 will be reset to zero.

14. INLET CONVEYOR Switch: This switch controls the inlet conveyor in conjunction with a timer relay. When the switch is turned on, the conveyor will run until seed covers the proximity switch mounted near the top of the supply hopper, at which time the conveyor will turn off automatically. The inlet conveyor will remain off until seed has dropped below the sensor. At which time a timer relay will turn the conveyor back on after a certain period of time. The timer relay located inside the control panel is set to Mode "A" and has an adjustable knob with settings from 0-6. Each number represents the number of seconds from the time the sensor is uncovered to when the conveyor will turn back on. The time delay prevents the conveyor from turning on and off too quickly.

15. DRUM Switch: This switch allows the operator to turn the drum on or off.

16. DRUM Speed: Allows the operator to adjust the speed of the drum.

17. ATOMIZER Switch: This switch allows the operator to turn the rotary driven atomizer on or off for primary distribution of product on the seed. This switch must be turned on before the treatment process begins and before the pump(s) will run in "Auto".

18. ATOMIZER Speed: Allows the operator to adjust the speed of the atomizer.

19. MIX TANK #1 Switch: This turns the chemical mixer/agitator on or off to allow for a perfectly mixed application of the chemical to the seed.

20. MIX TANK #2 Switch: This turns the chemical mixer/agitator on or off to allow for a perfectly mixed application of the chemical to the seed.

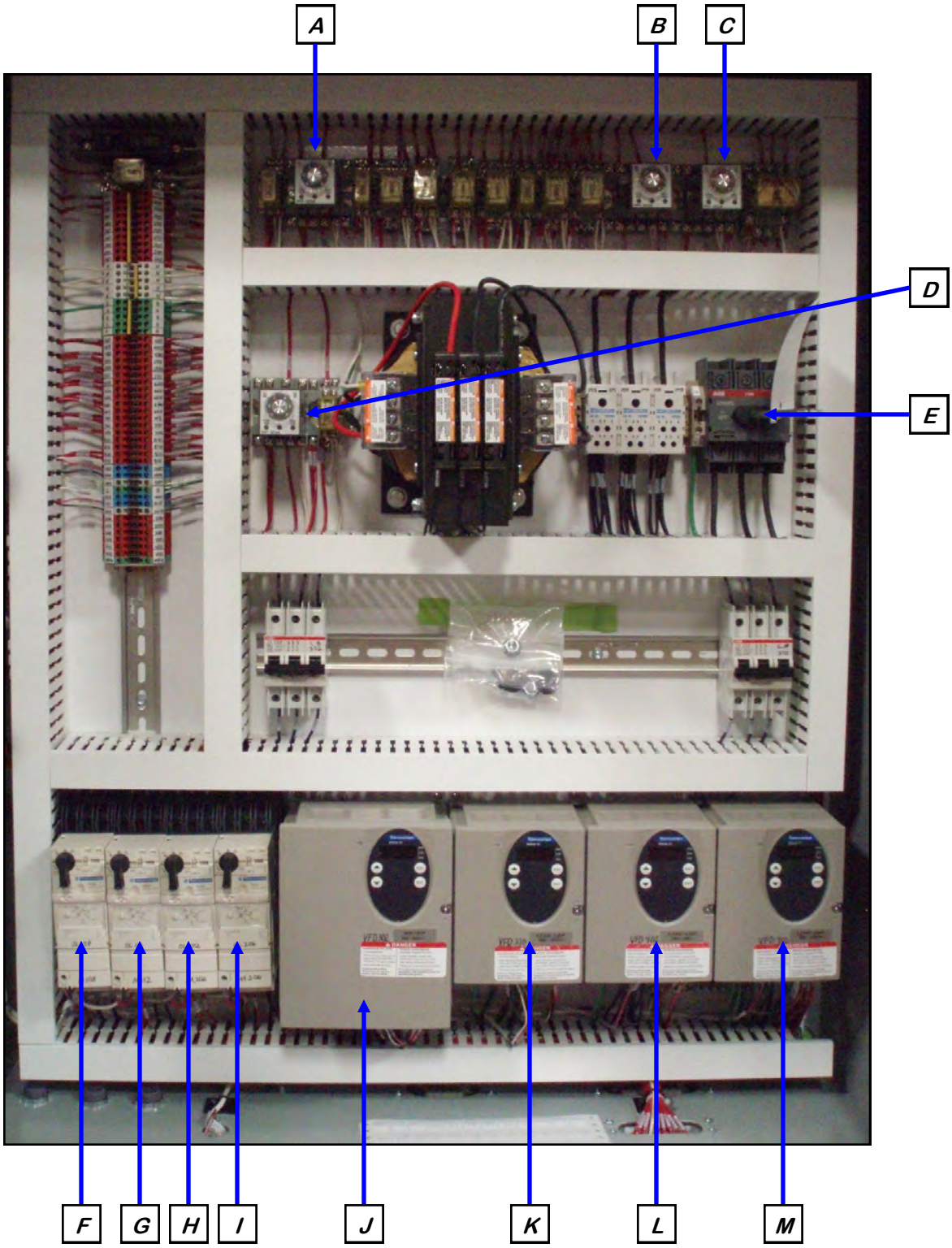
21. OUTLET CONVEYOR Switch: This switch allows the operator to turn the outlet conveyor on or off.

22. DRUM LEVEL: This switch allows the operator to manually raise and lower the drum.

23. AUTO STARTUP: This button will activate the seed treating process when the desired pumps and switches are placed in “AUTO”. After this button is pressed the pumps will turn on and automatically send treatment to the atomizer. After a short delay, the slide gate will open and the seed treating process will begin. The atomizer and drum must be running in order for the AUTO STARTUP to work.

24. SLIDE GATE: Opens and closes the Slide Gate. The lights above the switch will indicate wether the gate is open or closed.

LP4000 INSIDE MAIN CONTROL PANEL



A. Inlet Conveyor Delay Restart Timer:
Connected in conjunction with the INLET CONVEYOR switch and the top proximity switch. When seed reaches the top proximity switch, the inlet conveyor will shut-off. When seed falls below the proximity switch, this timer will time down and then restart the conveyor. This timer may not be used when using a large supply hopper above the seed treater. The timer is set to Mode "A".

B. Slide Gate Delay Open Timer: Connected in conjunction with the AUTO STARTUP button and the lower proximity switch. When the AUTO STARTUP button has been pressed, this timer will begin timing down. Once the timer has timed out, the slide gate will open, sending seed down through the atomizer. This timer gives the pump(s) a head start before seed is introduced. The timer is set to Mode "A".

C. Slide Gate Delay Close Timer: Connected in conjunction with the lower proximity switch. After the lower proximity no longer detects seed in the supply hopper, this timer will time down and close the slide gate. This timer allows the supply hopper to completely clean out. The timer is set to Mode "D".

D. Pump & Water Delay Shut-off Timer:
Connected in conjunction with the lower proximity switch, the PUMP CONTROL, and WATER CONTROL switches. After the lower proximity no longer detects seed in the supply hopper, this timer will time down and shut-off the pump(s) and water supply. This timer allows all seed in the supply hopper to have an equal amount of treatment applied to it. The timer is set to Mode "D".

E. Incoming Power Supply: Power is supplied to these terminals in the main control panel.

F. Inlet Conveyor Starter and Overload: Controls power being sent to the Inlet Conveyor.

G. Outet Conveyor Starter and Overload: Controls power being sent to the Outlet Conveyor.

H. Mix Tank #1 Starter and Overload: Controls power being sent to Mix Tank #1.

I. Mix Tank #2 Starter and Overload: Controls power being sent to Mix Tank #2.

J. Drum Motor Variable Frequency Drive (VFD): Controls power and the speed of the drum motor.

K. Atomizer Motor VFD: Controls power and the speed of the atomizer motor.

L. Pump #1 Motor VFD: Controls power and the speed of pump #1 motor.

M. Pump #2 Motor VFD: Controls power and the speed of pump #2 motor.

SECTION E CALIBRATION

Calibration of both the seed flow and liquid portions of the equipment is necessary for accurate treatment of seed.

SEED FLOW CALIBRATION

The following steps illustrate how to calibrate the seed flow for a LP4000 seed treater. A stop watch and a known weight of seed will be needed in the calibration process.

1. Position all equipment so that you are able to run a dry batch of seed through the seed treater and catch it back into a container. This will allow you to easily run the seed through again to recalibrate or begin treating.
2. Set the adjustable seed gate lever at a position that you and your equipment can handle. Refer to page 31 for adjusting the seed gate.
3. Close the slide gate above the seed treater.
4. Fill the supply hopper above the seed treater with at least 50 units or 2500 lbs.
5. Place the drum and any conveyors to the “ON” position.
6. When equipment is in position, open the slide gate. Using the stop watch, begin timing as soon as the seed begins flowing into the drum.

NOTICE The operator can adjust the drum height to find a desired running position.

7. Stop timing after all seed has stoped flowing into the drum.
8. Calculate the seed flow rate: Total Pounds per Minute.

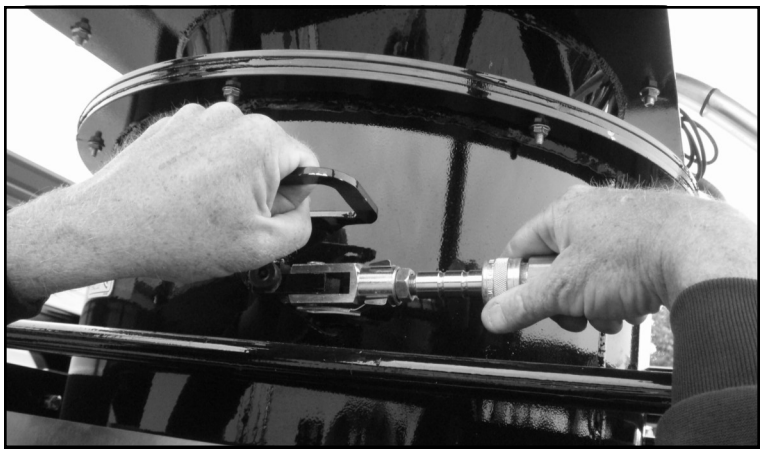
EXAMPLE: 2500 pounds takes 54.5 seconds
2500 pounds / 54.5 seconds = 45.8 pounds/seconds
45.8 x 60 seconds = 2750 lbs/minute
2750 / 100 = 27.5 cwt/min (hundred weight per minute)

NOTICE Different seed sizes and different seed types will tend to flow differently. Be sure to check calibration when changing to a different seed size or seed type.

ADJUSTING THE SEED FLOW GATE

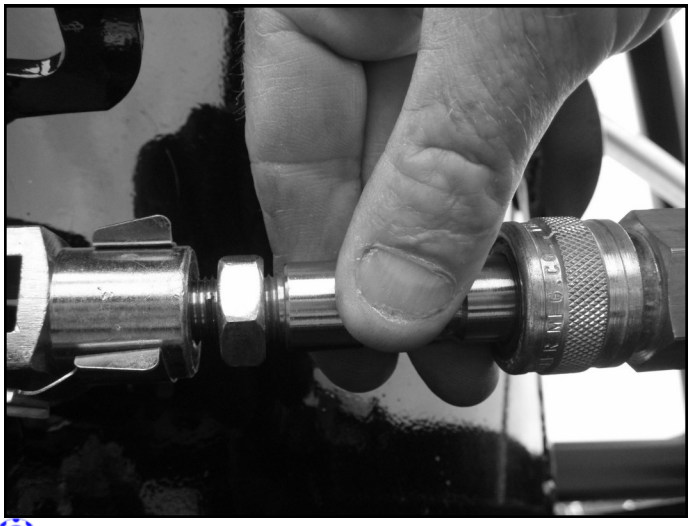
Below are pictures that illustrate how to adjust the opening of the seed flow gate.

The picture to the right illustrates where to hold the gate when adjusting the seed flow rate. Grab the black handle located on the front of the adjustable gate. Using the opposite hand, grab the spring-loaded coupler.



To adjust the seed flow, Move the coupler to a different notch on the adjustment rod. The more notches exposed, means more seed is allowed through the gate.

To fine tune the seed flow rate, loosen the nut on the bottom part of the adjustment rod. The rod can then be threaded in and out for minor seed flow adjustments.



PUMP #1 & #2 CALIBRATION

The following steps illustrate how to calibrate the pumps on an LP4000 seed treater.

1. Lock down the pump tubing in the Pump #1 or Pump #2 pump heads. (page 19)
2. Premix enough liquid for the amount of seed you will be treating and pour into the 50 gallon stainless steel tank. It's always a good practice to mix up 20% extra slurry to help fill all the lines. Turn on the mix tank and allow liquid to mix.
3. Determine the number of ounces needed in one minute.

   EXAMPLE: The seed treatment slurry rate is 5 ounces per cwt.
   Seed Flow Rate = 27.5 cwt/min.
   27.5 x 5 oz./cwt. = 137.5 oz./min.
   137.5 oz. is the rate the pump should be pumping in one minute.

4. Set the Liquid Flow Rate. Using the arrows on the Pump Flow Rate display (below). Increase or decrease the desired flow rate

5. Position the valve on top of the mix tank to "MIX TANK".
6. Turn the pump direction switch to "FORWARD".
7. Turn the "PROCESS/RECIRCULATE/AUTO" switch to "RECIRCULATE".
8. Turn the "PUMP CONTROL" switch to the "HAND" position. Liquid should begin circulating from the bottom of the mix tank, through the pump, through the flow meter, and back into the top of the mix tank. The pump will automatically speed up until the Actual Flow Rate and the Desired Flow Rate match.
9. Let liquid flow for at least 10 minutes to ensure all air has been removed from the liquid lines. This also helps to break-in the pump tubing, which is critical before treating seed to keep the pump speed consistent.
10. Once the flow rate is set you can begin the seed treating process.

WATER CALIBRATION

If a large rate of slurry is being used, the water can be applied separately to keep from refilling the mix tank and to keep from over speeding the pump. Below are instructions on how to calibrate the water flow rate. A measuring cup and stop watch will be needed.

1. Connect a water line to the port located on the side of the main control panel. (right)
2. Determine the number of ounces needed in one minute.

   EXAMPLE: If the seed treatment slurry rate is 10 ounces per cwt and the water for the slurry is 6 ounces per cwt.
   The Seed Flow Rate = 27.5 cwt/min.
   27.5 x 6 oz./cwt. = 165 oz./min.
   165 oz. is the rate of water needed in one minute.

3. Set the regulating valve using the chart on page 34.

   EXAMPLE: If the amount of water needed is 165 oz/min. The a good starting point would be dial setting 115.

4. Position the valve above the metering valve to "CALIBRATE".
5. Hold the measuring pitcher under the calibration hose.
6. Turn the "WATER CONTROL" switch to the "HAND" position. The electric solenoid will open up allowing water to flow into the measuring pitcher. Begin timing for one minute once water begins flowing into the pitcher.

NOTICE 30 Second calibrations can also be done if using a smaller measuring pitcher.

8. After one minute, turn the "WATER CONTROL" switch back to "OFF". Read the side of the measuring pitcher. If not satisfied, adjust regulating valve and try again.

METERING VALVE SETTINGS

Below are two charts that show the potential output in oz./min. and ml./min. of the metering valve

NOTICE ***Numbers are not exact; the output can vary with different water pressures. Only use these numbers as a starting point or for troubleshooting.***

Standard

Dial Setting	OZ./Min	Dial Setting	OZ./Min.
25	1.0	105	156.2
30	2.9	110	161.6
35	6.8	115	164.6
40	11.6	120	167.0
45	18.0	125	168.1
50	28.2	130	170.3
55	37.7	135	172.0
60	51.8	140	174.2
65	68.1	145	175.0
70	84.5	150	175.5
75	99.1	155	176.5
80	113.2	160	177.1
85	128.7	165	177.5
90	139.1	170	178.0
95	147.0	175	179.0
100	152.0	180	179.5

Metric

Dial Setting	ml/min.	Dial Setting	ml/min.
25	30	105	4,620
30	86	110	4,780
35	201	115	4,869
40	343	120	4,940
45	532	125	4,972
50	834	130	5,037
55	1,115	135	5,088
60	1,532	140	5,153
65	2,014	145	5,177
70	2,500	150	5,191
75	2,931	155	5,221
80	3,348	160	5,239
85	3,807	165	5,250
90	4,115	170	5,265
95	4,348	175	5,295
100	4,496	180	5,310

TREATING SEED

1. Prime the line to the atomizer. Turn the atomizer switch to “ON” and turn the “PROCESS/RECIRCULATE/AUTO” switch to “PROCESS”. Next turn the pump direction switch to “FORWARD” and the “PUMP CONTROL” switch to “HAND”. Liquid should begin pumping up to the atomizer. Once liquid reaches into the atomizer, the “PUMP CONTROL” switch can be turned back to “OFF”. If using water separately, the water will also need to be primed to the atomizer.

Do NOT pump liquid into the atomizing chamber when the atomizer is “OFF”.

Additional liquid can be pumped up into the atomizer and into the drum to guarantee coverage of the first seed that passes through the machine.

Once the line to the atomizer has been primed, the “ZERO FLOW METER” button can be pressed. This will allow the operator to check the total number of ounces used in the batch of seed.

3. Close the slide gate above the seed treater.
4. Fill the supply hopper above the seed treater with seed.
5. Turn the switches to “ON” for the Drum, Atomizer, and any Conveyors being used.
6. Next, turn the “PUMP CONTROL”, “WATER CONTROL” switch (if using) and the desired “PROCESS/RECIRCULATE/AUTO” switch to the “AUTO” positions.
7. Press the “AUTO STARTUP” button, the pump will automatically turn on and switch to process. After a short delay, the slide gate will open and begin sending seed down through the seed treater, this will start the seed treating process. Refer to page 28 for time delay information.
8. As the operator is treating, the drum speed, drum height, and atomizer speed, can all be adjusted to increase seed coverage and reduce build-up. The water regulating valve can also be manipulated to increase coverage.
9. Once all the seed has passed out of the supply hopper, the pump will shut off and the slide gate will close after a pre-determined number of seconds. Refer to page 28 for the time delay information.

SECTION F TROUBLESHOOTING

Below is a table describing the most frequent problems and solutions with the USC LP4000 Seed Treater. For further assistance, contact your local USC dealer.

Problem	Possible Cause	Solution
Inlet Conveyor will not turn on.	1. Inlet Conveyor Proximity Switch is activated. 2. Inlet Conveyor Proximity Switch is too sensitive. 3. Overload is tripped. 4. Conveyor is plugged into wrong outlet on seed treater panel.	1. Clean Proximity Switch. 2. Adjust the inlet conveyor Proximity Switch sensitivity by turning the adjustment screw counter-clockwise (page 39) 3. Reset Inlet Conveyor Overload. 4. Check to make sure the inlet conveyor is plugged into the inlet conveyor receptacle.
Pump will not turn off in “AUTO” when seed runs out.	1. Proximity Switch is dirty. 2. Proximity Switch is set too sensitive.	1. Clean Proximity Switch. 2. Adjust the pump Proximity Switch sensitivity by turning adjustment screw counter-clockwise (page 39).
Pump will not turn on in “AUTO”	1. Proximity Switch is not staying covered. 2. Atomizer is not on. 3. Proximity Switch is not sensitive enough.	1. Make sure Proximity Switch is staying covered with seed. 2. Turn on Atomizer. Atomizer must be on to run pump #1 and #2 in Auto. 3. Adjust pump Proximity Switch sensitivity by turning the adjustment screw clockwise (page 39).
Inlet conveyor won’t shut off when hopper is full.	1. Seed is not hitting proximity switch. 2. Proximity Switch is not set sensitive enough. 3. Inlet Conveyor is plugged into wrong receptacle.	1. Make sure seed is hitting Proximity Switch. Reposition Proximity Switch if necessary. 2. Adjust the inlet conveyor Proximity Switch by turning the adjustment screw clock-wise (page 39). 3. Make sure Inlet Conveyor is plugged inlet conveyor receptacle.

Problem	Possible Cause	Solution
Pump is Fluctuating	1. Restriction in tubing. 2. Tubing was not broken-in properly before calibrating. 3. One of the pump tubes is not clamped in the pump head.	1. Flush tubing and check filter for any restrictions. 2. Allow pump to recirculate for 15 minutes before checking calibration. 3. Clamp pump tubing in head or remove from manifolds if not needed.
Seed Calibration is fluctuating	1. Seed treater supply hopper is not staying full. 2. Restriction in the supply hopper. 3. Build-up in the atomizing chamber.	1. Make sure the supply hopper is staying full. May have to close down seed gate in order to have a consistant flow of seed. 2. Check supply hopper for any debris, and remove. 3. Remove atomizing housing and clean out any build-up of material.
Pump will not turn on.	1. VFD is faulted.	1. Check VFD for fault. If faulted, disconnect power, wait 30 seconds, then restore power.
Drum will not turn on.	1. VFD is faulted.	1. Check VFD for fault. If faulted, disconnect power, wait 30 seconds, then restore power.
Atomizer will not turn on.	1. VFD is faulted.	1. Check VFD for fault. If faulted, disconnect power, wait 30 seconds, then restore power.
Certain motors will not turn on.	1. Overload is tripped. 2. Incoming power is incorrect or has been disconnected. 3. Cord has been cut or is disconnected.	1. Reset Overload inside control panel. 2. Test incoming power. 3. Check cord to motor.

Problem	Possible Cause	Solution
Pump will not go into process	1. No air or little air being supplied to the 3-way actuated valve.	1. Check air supply to the 3-way actuated valve located behind the main control panel.
Slide Gate will not open	1. No air or little air being supplied to the slide gate.	1. Check air supply to the slide gate.
Seed Treater will not start in Auto	1. No seed in the supply hopper above the seed treater. 2. Seed is not hitting lower proximity switch. 3. Proximity Switch is not set sensitive enough. 4. Atomizer and drum are not on.	1. Fill the supply hopper with seed. 2. Make sure seed is hitting Proximity Switch. 3. Adjust the lower Proximity Switch by turning the adjustment screw clockwise (page 39). 4. Ensure that the drum and atomizer are running.

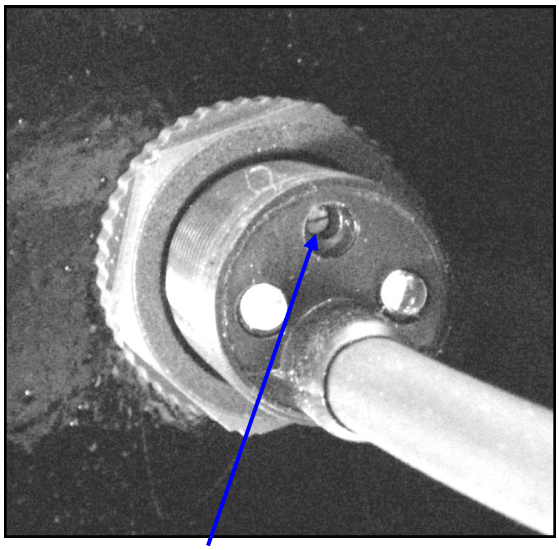
PROXIMITY SWITCH ADJUSTMENT GUIDE

The proximity switches mounted in the supply hopper above the seed treater detect when seed is present.

The top proximity switch is used to automatically shut off the inlet conveyor when the supply hopper is full.

The proximity switch mounted near the bottom of the supply hopper automatically shuts off the pump when all seed has left the hopper. This sensor also allows the seed treater to start after the “Auto Startup” button has been pressed.

Sometimes these proximity switches do not properly work. This can be caused from wear, dust, or even moisture. The first step is to clean the lens of the proximity switch. If this does not solve the problem, the next step would be to adjust the sensitivity of the proximity switch.



Sensitivity Adjustment Screw

Proximity Switch Screwdriver

Using the small screwdriver provided inside the control panel, you can adjust the proximity switch by turning the adjusting screw on the back of the proximity switch.

- Turn Clockwise to make the proximity switch more sensitive.
- Turn Counterclockwise to make the proximity switch less sensitive.

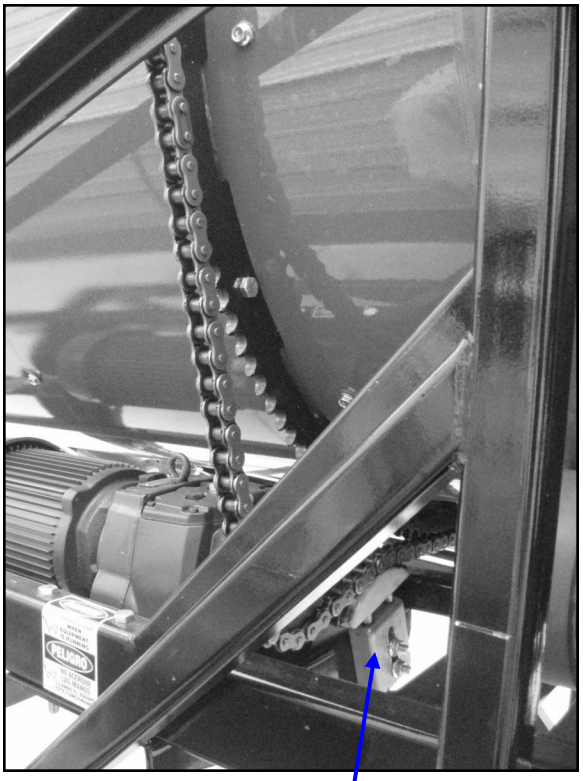
SECTION G MAINTENANCE

Proper maintenance of the USC LP4000 seed treater is critical for peak performance, reliability and accuracy of this system. The following is a guideline for the type of maintenance and servicing that should be performed on this unit. Your environment and uses may require additional maintenance and service beyond this list to assure a reliable and safe unit. The operator of this unit has ultimate responsibility to identify areas of concern and rectify them before they become a hazard or safety issue. There is no substitute for a trained, alert operator.

⚠ DANGER Do not put this unit into operation with any questionably maintained parts. Poor performance or a hazard may occur.

DRIVE AND DRUM

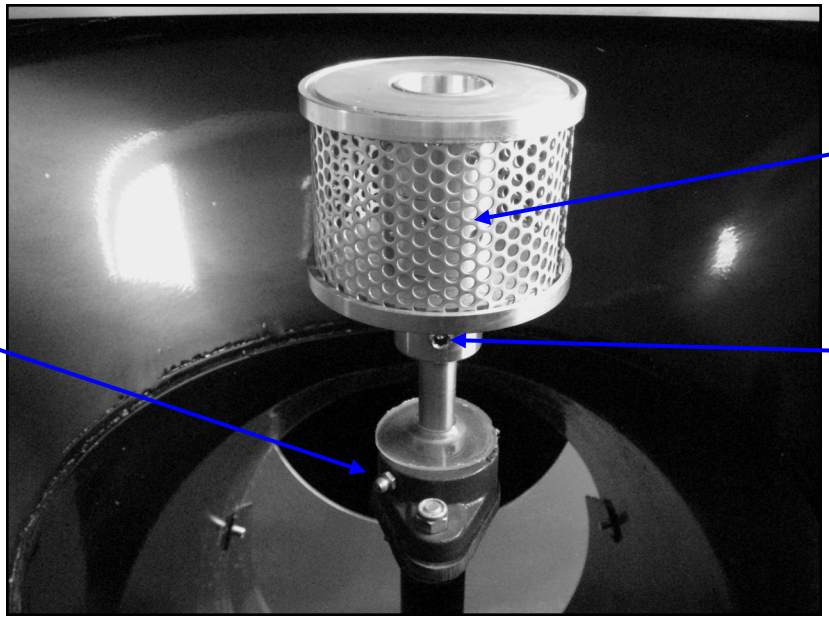
- Inspect all welds and structural components on frame
- Check drum for bends, cracks and damage.
- Inspect drive wheels for unordinary wear, and set screws for tightness.
- Inspect and adjust the Neoprene guide wheels located near back of drum.
- Tighten and lubricate chains.
- Inspect and re-align sprockets.
- Check drum actuators.



Chain Tensioner

ATOMIZER

- Slide back atomizer housing to grease bearing, and clean any build-up. To access inside of atomizer housing: push up on the quick release handle and slide back the atomizer. Below are pictures that illustrate how the atomizer is removed and where the bearings are located.
- Check for any play in the atomizer shaft.
- Make sure the atomizer spins smoothly.
- The atomizer head can be removed for more thorough cleaning. To remove head, loosen set screw located on the bottom section of the head.



MIX TANK

- Check motor.
- Check for any play in the mix tank shaft.
- Check valves, fittings, and plug on bottom of tank.

PUMPS AND PLUMBING

- Check pump in forward and reverse.
- Make sure pump head opens and closes smoothly.
- Inspect tubing and valves.
- Check electric 3-way valve
- Tighten hose clamps and check filter.
- Flush flow meter with clean water.

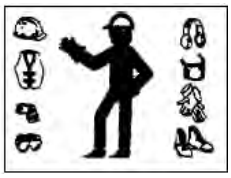
CONTROL PANEL

- Check and tighten wire connections.
- Check starters and overloads.
- Check relays and breakers.
- Check and set the proximity switches.
- Check VFD’s

NOTES

SECTION H STORAGE

When storing the USC LP4000 seed treater for long periods of time, the following procedure must be followed to reduce the chance of rust, corrosion and fatigue of the treater. You can also use these steps when storing the machine for the winter.



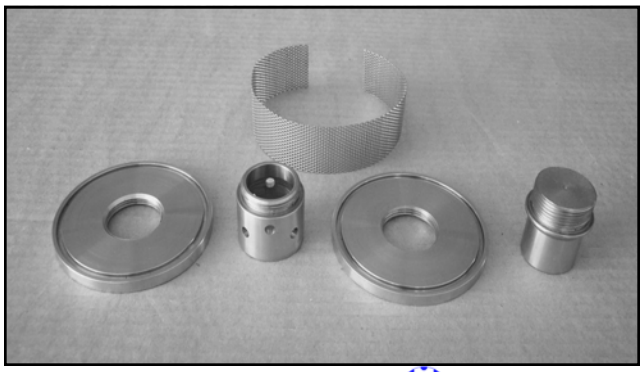
A dust mask and protective rubber gloves should be used when cleaning the machine.

SUPPLY HOPPER

1. Open Slide Gate
2. Disconnect Power
3. Remove any debris or build-up. Compressed air can be used to blow out any foreign material.
4. Wipe off and clean the lens of the proximity switches.
5. Tarp or cover the supply hopper to keep out any dirt or unwanted pests.

ATOMIZER CHAMBER

1. Remove and clean the atomizer housing.
2. Remove the atomizer head and stainless steel plumbing. The atomizer head can be disassembled (below), for easier cleaning. It is threaded together and can simply be unscrewed.
3. Reinstall the atomizer head and plumbing. Grease the bearings and spin the atomizer head a few times to ensure all grease has been worked into the bearings.

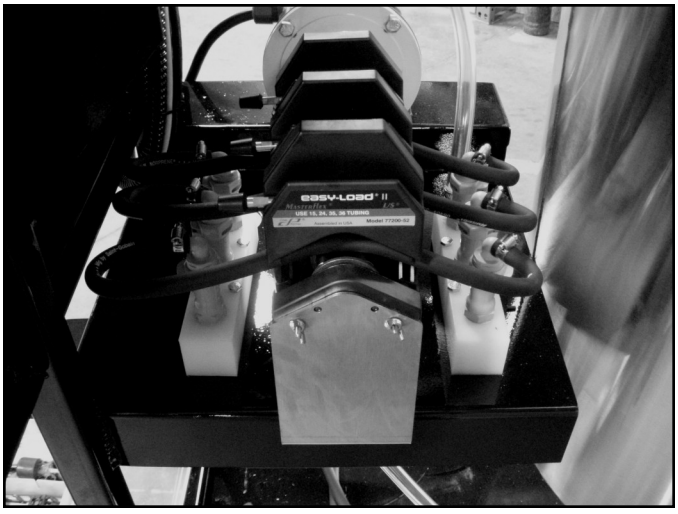


ROTATING DRUM

1. Lubricate the chain to keep from corroding in storage.
2. Lower drum to the lowest position.

LIQUID SYSTEM

1. Make certain the inside of the tank is completely drained of chemical residue and thoroughly flush the inside of the tank with clean water.
2. Remove and clean the filter.
3. Pump clean water through all areas of the plumbing including the mix tank, flow meter, and valves.
4. Open all drain points, valves, and filter to let as much of the liquid drain as possible.
5. If the seed treater will be exposed to possible freezing temperatures, the final flush of the system should be made with an non freezable liquid. Or use compressed air to blow the lines out from any moisture.
6. Release pump head (below) and remove tubing to prevent any unnecessary wear.

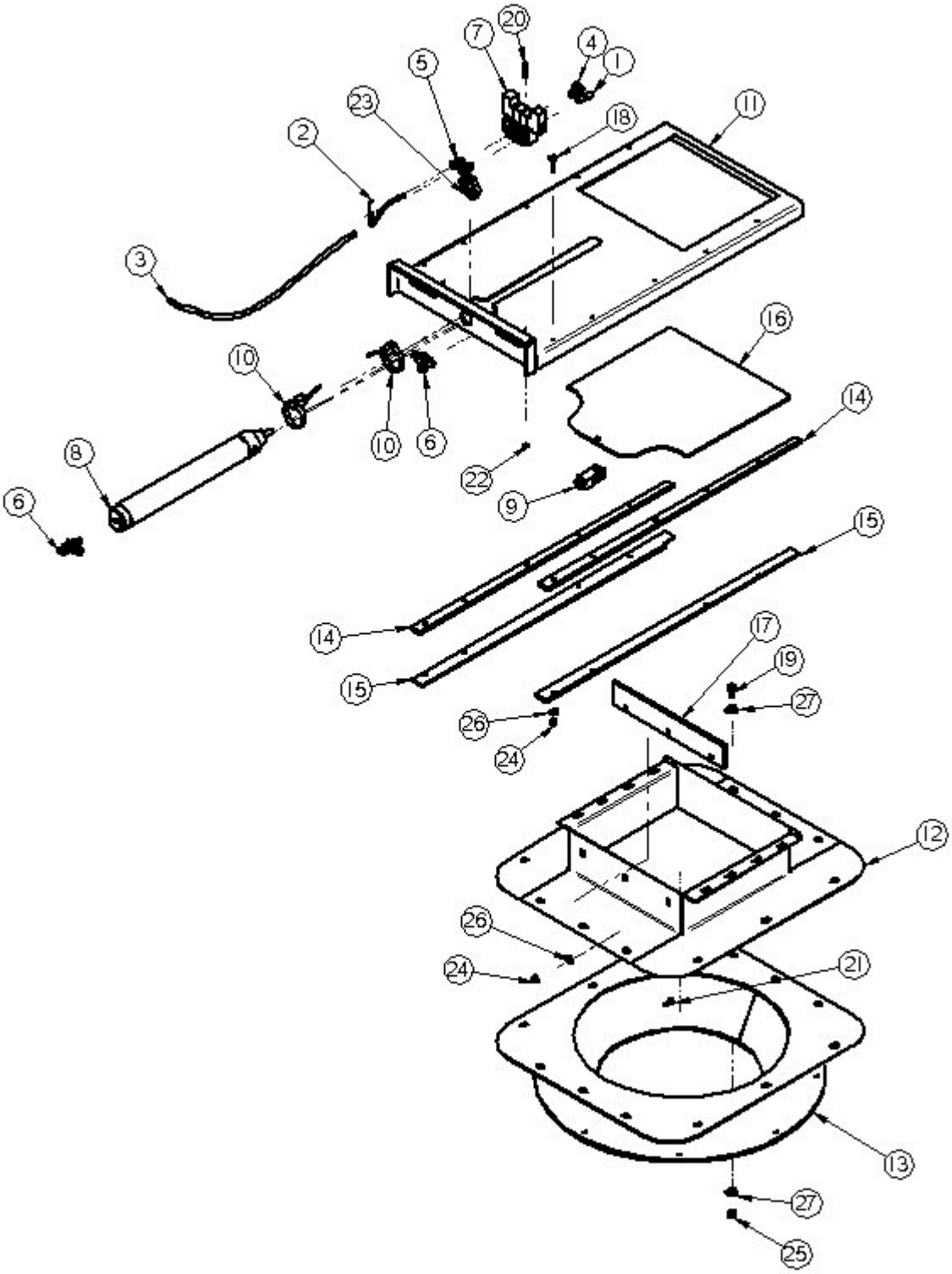


FINAL

1. Store the machine inside a protective building to keep it from being exposed to the weather.
2. Disconnect power to the machine.

Section I Mechanical Drawings

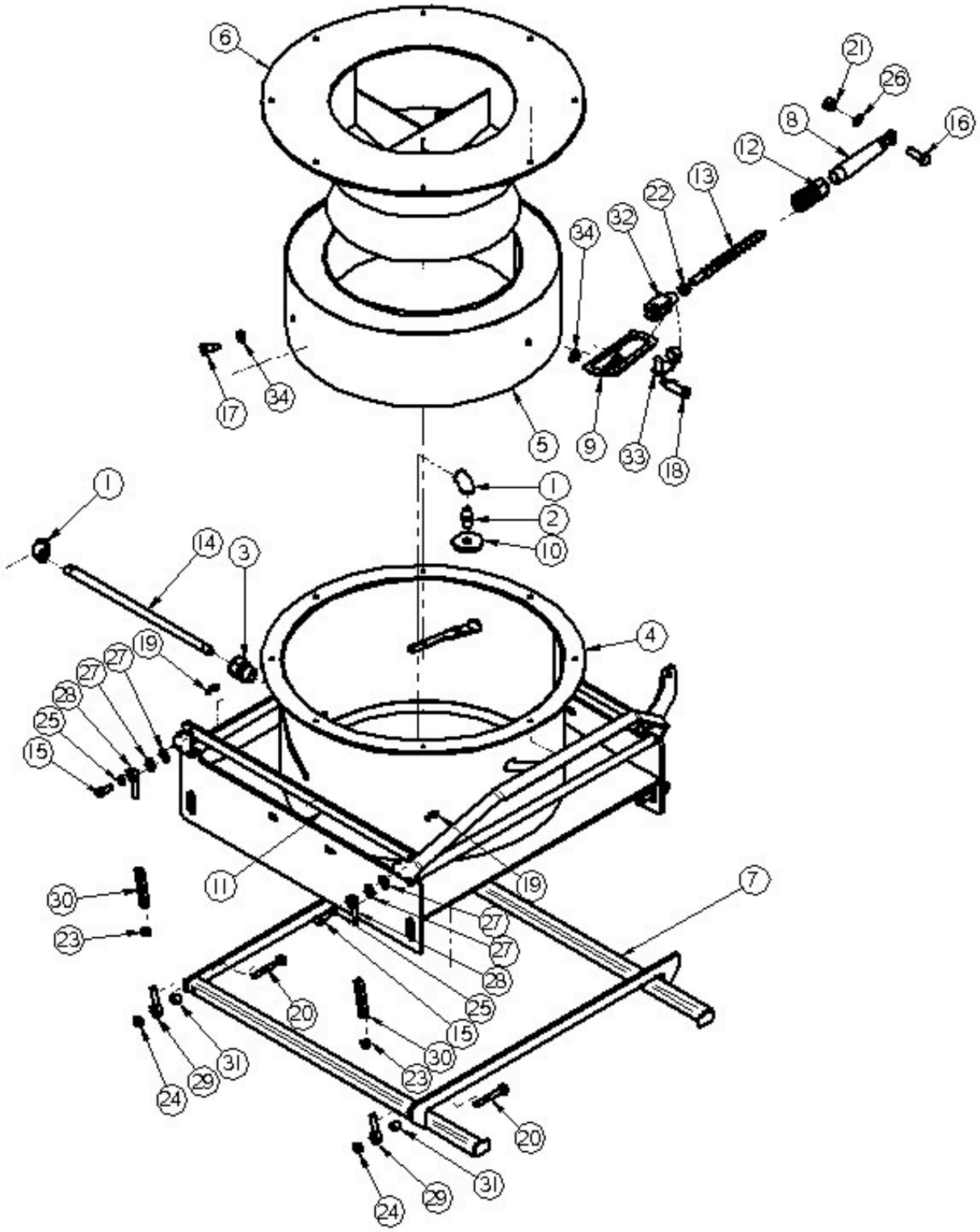
LP4000 Slide Gate



LP4000 Slide Gate Parts List

Item #	PART #	Title	Qty
1	02-02-0050	FLTR EXHAUST BRZ .250 NPT ML	1
2	02-03-0017	.375 PE Tubing 10.00" LG	1
3	02-03-0017	.375 PE Tubing 24.00" LG	1
4	02-16-0014	FTTG PUSH 90 DEG .375OD X .250 NPT	1
5	02-16-0015	FTTG PUSH .375OD X .250 NPT ML	2
6	03-17-0010	VLV NEDL .375OD X .250NPT FQP4	2
7	03-17-0011	VLV SOL MAC VLV 922B-PM-111JC	1
8	03-17-0040	CYLINDER AIR 12" STROKE 2" BORE	1
9	03-17-0041	CLEVIS ASSY BIMBA D-8313-A	1
10	03-17-0043	SW MAG REED MRS-.087-PBL-31	2
11	05-03-0492	WDMT SLIDE GATE TOP	1
12	05-03-0504	WDMT SLIDE GATE BOTTOM W FLANGE	1
13	05-07-0210	TRANSITION SLIDEGATE TO LP4000	1
14	05-10-2589	SLIDE GATE GUIDE UHMW	2
15	05-10-2590	SLIDE GATE BRG UHMW	2
16	05-10-2591	SLIDE GATE SLIDE PLATE	1
17	05-10-2755	PLT SLIDE GATE SEAL	1
18	06-01-0008	BOLT, .250-20 X 1 1/4" UNC ZP GRADE 5	10
19	06-01-0015	BOLT .375-16 X 1.00 ZP GR5	12
20	06-01-0091	SRCW, PAN HD, 10-32 X 1.25 ZP	2
21	06-01-0122	BOLT, CARRIAGE, .250-20x.75 G5 ZP	3
22	06-02-0030	NUT KLOCK 10-32 ZP	2
23	06-02-0064	06-02-0064 BINBA D-508 NUT	1
24	06-03-0001	NUT,LOCK, .250-20 ZP G5 NYLON INSERT	13
25	06-03-0003	NUT NYL LOCK .375-16 ZP GR5	12
26	06-05-0001	WASHER, FLAT .250	13
27	06-05-0004	WSHR FLAT .375 ZP	24

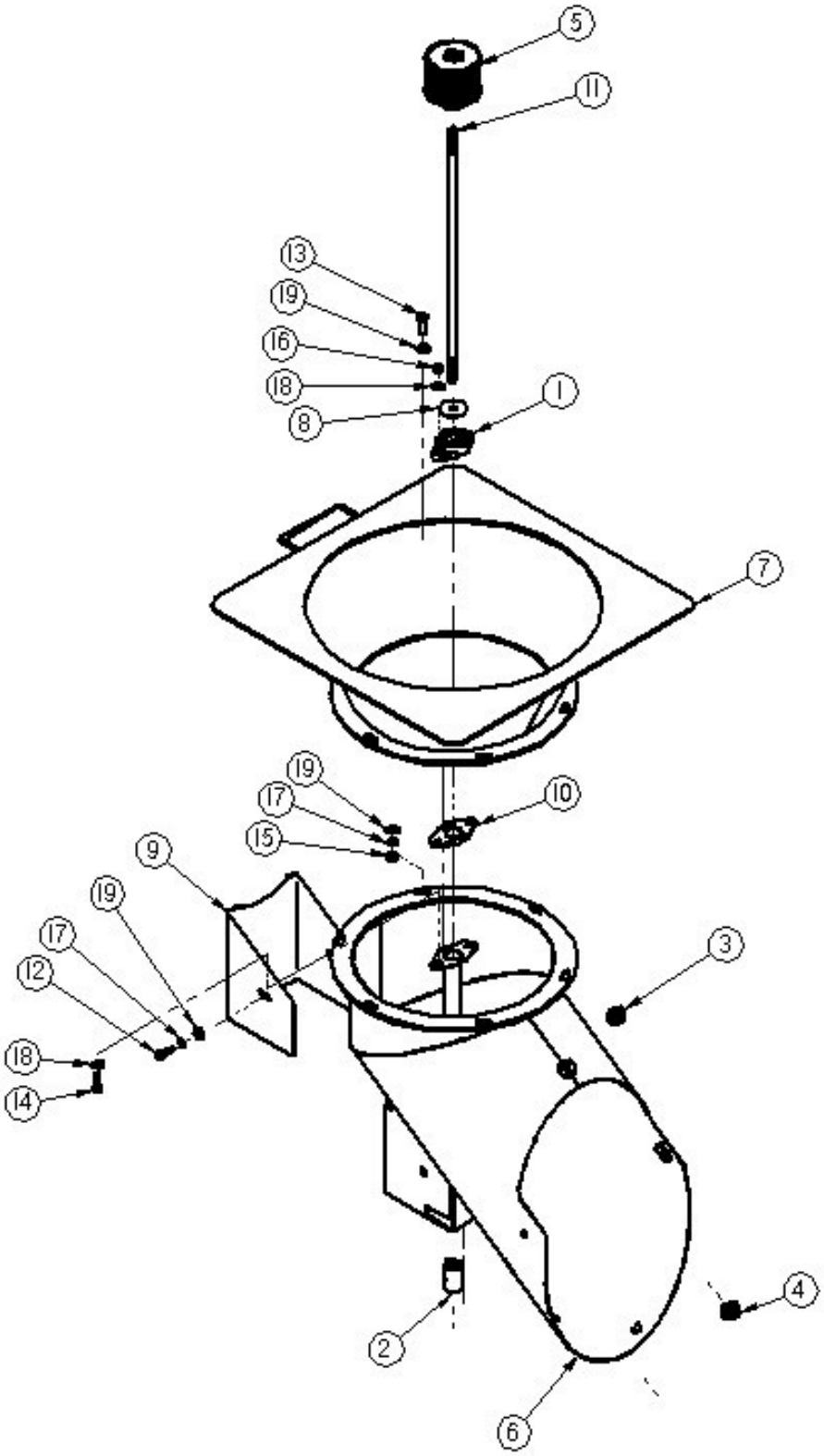
LP4000 Adjustable Seed Gate



LP4000 Adjustable Seed Gate Parts List

Item #	PART #	Title	Qty
1	02-06-0008	FTTG 90 DEG .375NPT FM SS	2
2	02-07-0002	FTTG NIP .375 NPT X 1.50 TBE SS	1
3	03-08-0035	CONN CG BL NYL .750NPT .675-.750 RA	1
4	05-03-0082	WDMT ADJ CHMBR LP4000	1
5	05-03-0083	WDMT FLOW SLV LP4000	1
6	05-03-0084	WDMT, FLOW CONE SECTION LP4000	1
7	05-03-0086	WDMT ATMZR SUPP BRKT LP4000	1
8	05-04-0012	WDMT FLOW SLV ROD END TUBE	1
9	05-04-0037	WDMT ADJ CHMBR PULL	1
10	05-10-0360	DISC STD ATMZR HEAD CVR	1
11	05-10-0608	BRKT ECCENTRIC CONN LP4000	2
12	05-11-0029	CPLG QCK CONNECT MACH	1
13	05-11-0034	ROD FLOW STOP ADJ - 10"	1
14	05-11-0060	ATMZR SUPPLY PIPE LP4000	1
15	06-01-0016	BOLT .375-16 X 1.00 ZP GR5	4
16	06-01-0025	BOLT .500-13 X 1.50 ZP GR5	1
17	06-01-0056	BOLT SHLD .500SHX.375-16X.500 GR5	2
18	06-01-0057	BOLT SHLD .500SHX.375-16X1.50 GR5	1
19	06-01-0081	BOLT SHLD .313SHX.250-20X.375 GR5	4
20	06-01-0116	BOLT .375-16 X 2.75 ZP GR5	4
21	06-02-0004	NUT FULL .500-13 ZP GR5	1
22	06-02-0015	NUT JAM .500-20 ZP GR5	1
23	06-02-0027	NUT FULL .375-24 ZP GR5	4
24	06-03-0003	NUT NYL LOCK .375-16 ZP GR5	4
25	06-04-0003	WSHR LOCK SPLT .375 ZP	4
26	06-04-0004	WSHR LOCK SPLT .500 ZP	1
27	06-05-0004	WSHR FLAT .375 ZP	8
28	06-12-0002	REND .375-24 BALL LH	4
29	06-12-0003	REND .375-24 BALL RH	4
30	06-12-0004	ROD CTNG .375-24 X 3.00 LR RH FM	4
31	06-12-0007	BUSH DRILL.375ID X .625OD X .625	4
32	06-12-0008	CLVS .500-20 X .500	1
33	06-12-0009	PIN CLIP SPRING .500	1
34	06-12-0012	BUSH FLG BRZ .500ID X .625OD X .375	3

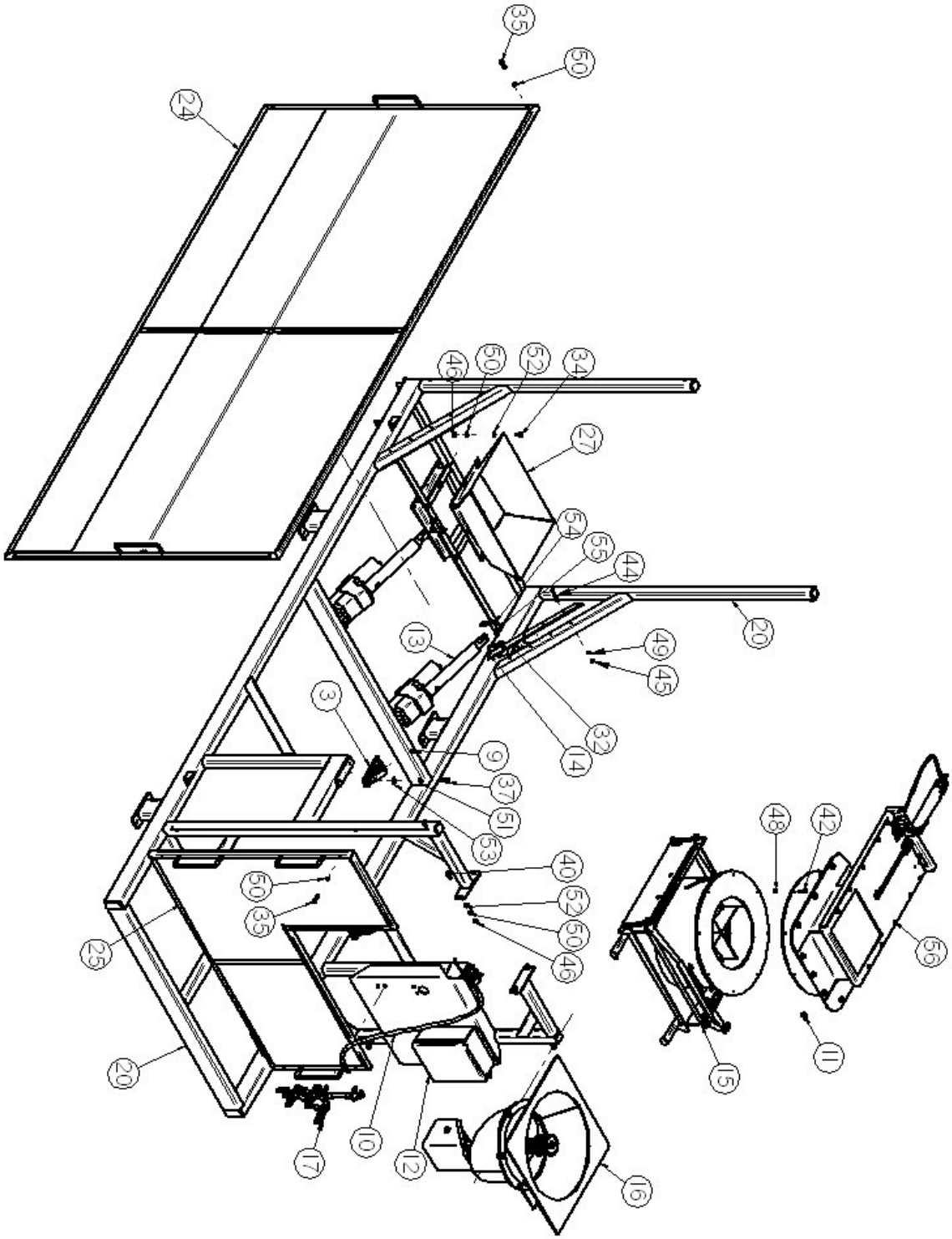
LP4000 Atomizer



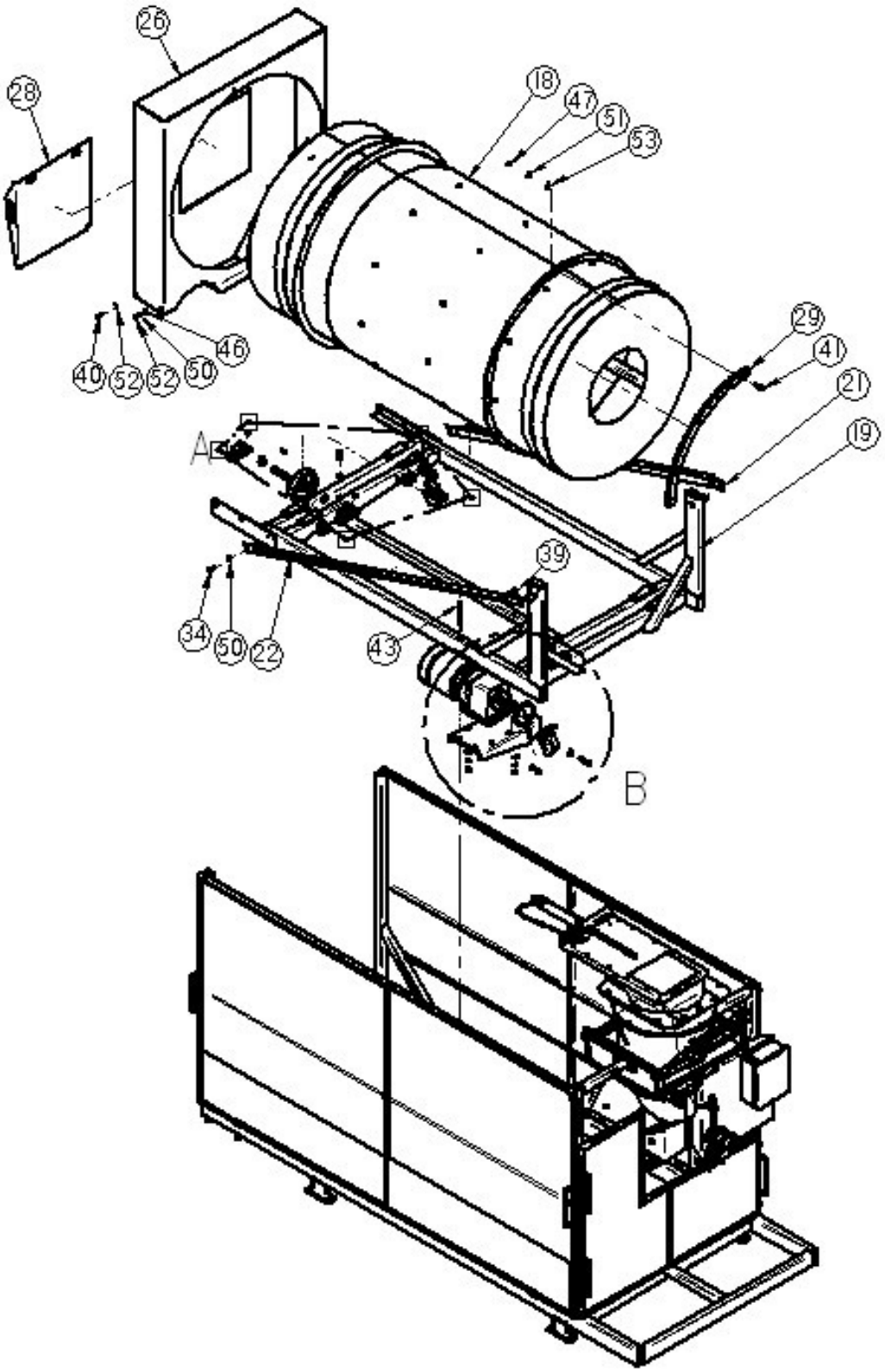
LP4000 Atomizer Parts List

Item #	PART #	Title	Qty
1	01-03-0002	BRG FLG MNT .625ID 3.875 BASE	1
2	01-07-0027	CPLG CLPN .625 X .625 SPLT CS	1
3	02-06-0010	FTTG 90 DEG .500HB X .500NPT ML NYL	1
4	02-08-0007	FTTG STGHT .500HB X .500NPT ML NYL	1
5	04-01-0033	ASSY ATMZR LP4000	1
6	05-03-0085	WDMT, DISCHARGE CHUTE LP4000	1
7	05-03-0087	WDMT ATMZR CONE LP4000	1
8	05-10-0805	DISK ATOMIZER MOTOR	1
9	05-10-0856	CVR ATMZR DRV LP4000	1
10	05-10-2462	SEAL RBBR .625 FLG BRG	1
11	05-11-0046	ATMZR DRV SHAFT LP4000	1
12	06-01-0016	BOLT .375-16 X 1.00 ZP GR5	6
13	06-01-0053	BOLT .375-16 X 1.25 ZP GR5	6
14	06-01-0102	BOLT .313-18 X 1.25 ZP GR5	2
15	06-02-0003	NUT FULL .375-16 ZP GR5	6
16	06-03-0002	NUT NYL LOCK .313-18 ZP GR5	2
17	06-04-0003	WSHR LOCK SPLT .375 ZP	12
18	06-05-0003	WSHR FLAT .313 ZP	4
19	06-05-0004	WSHR FLAT .375 ZP	14

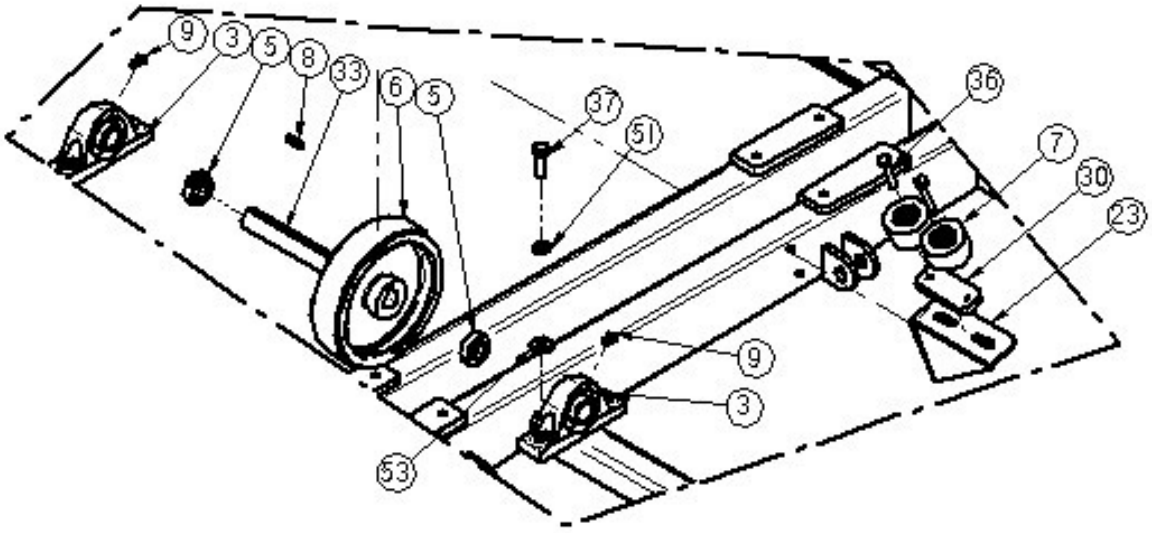
LP4000 Base Frame



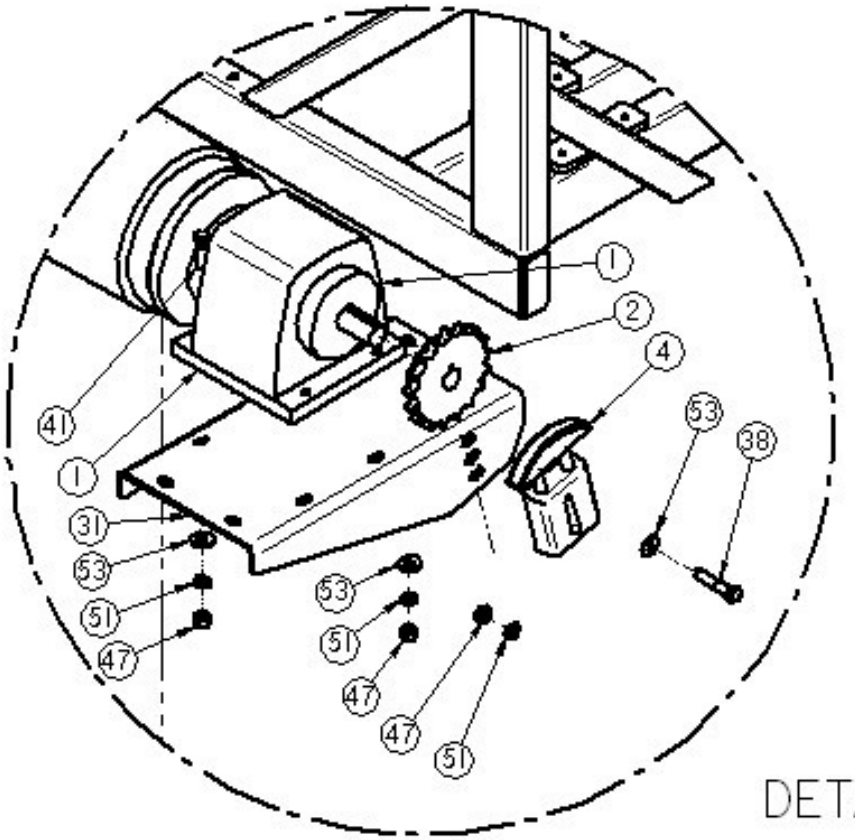
LP4000 Base Frame



LP4000 Base Frame



DETAIL A



DETAIL B

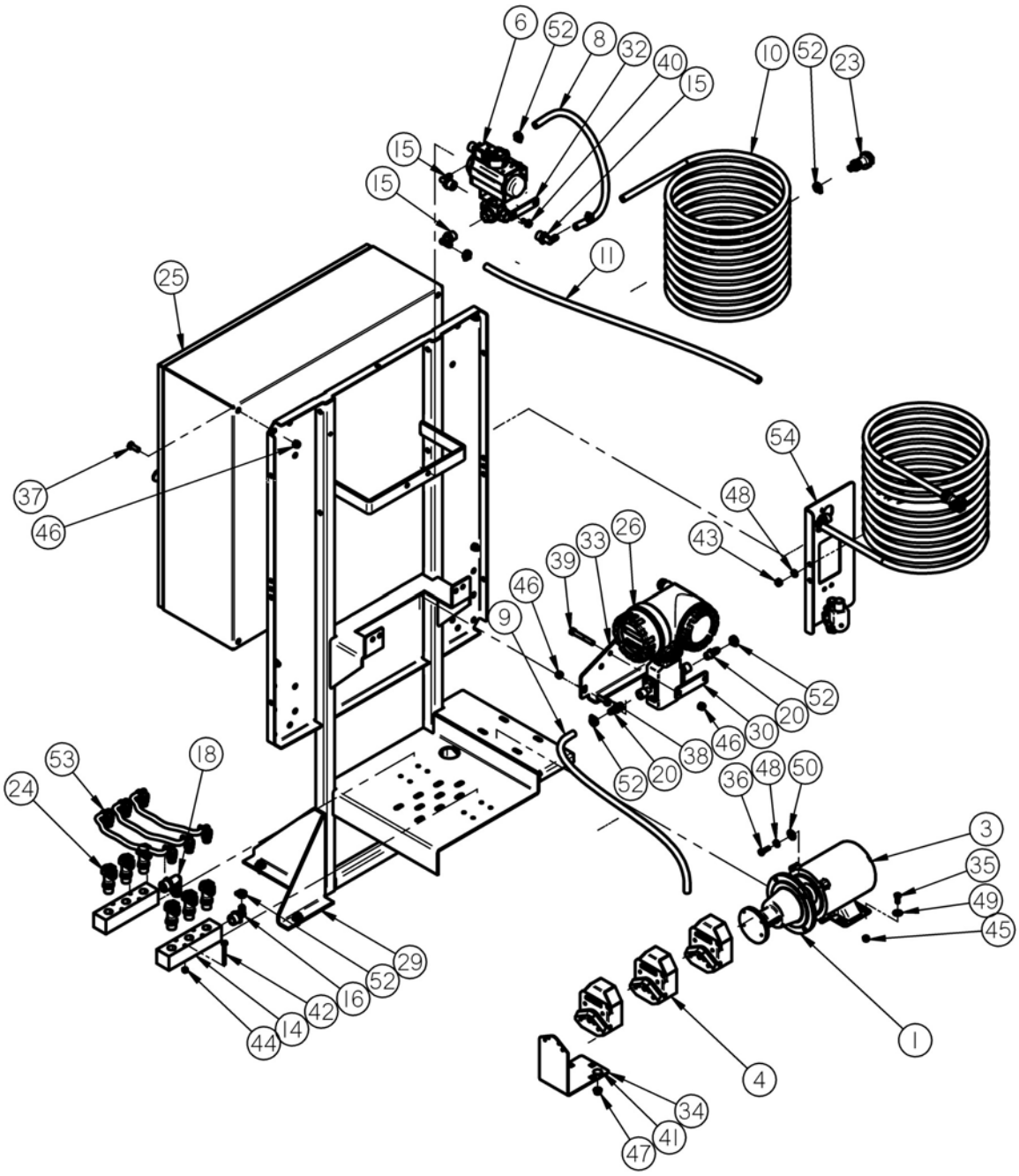
LP4000 Base Frame Parts List

Item #	PART #	Title	Qty
1	01-01-0065	GMTR IL 5HP 181RPM 148T 3PH	1
2	01-02-0048	SPKT 17T 80P 1.250ID	1
3	01-03-0005	BRG PLW 1.125ID STSC	10
4	01-04-0008	TNSNR SPRING LD 80P	1
5	01-05-0011	SHAFT CLR 1.125ID SPLT	8
6	01-06-0003	WHL DRV 8 X 2 X 1.125ID .250KWY	4
7	01-06-0090	WHL GUIDE .375ID X 2.50 X 1.25 NPRN	2
8	01-10-0004	KEY .250 X 1.00 CS	4
9	01-11-0001	FTTG GR5 90 DEG .250-28 NPT	10
10	02-03-0005	0.5" RNT TUBING 47" LG	1
11	02-08-0006	FTTG STGHT .500HB X .375NPT ML NYL	1
12	03-12-0122	PNL CNTL LP4000 TRTR JB #1 230V 3PH	1
13	03-17-0002	SPA-6420-6_0	2
14	03-17-0022	LINEAR POS CABLE JX-420-10-N14-20S-313	1
15	04-01-0008	ADJ CHMBR LP4000	1
16	04-01-0012	ASSY ATMZR LP4000	1
17	04-03-0106	ASSY STTC MXR VLVS MNT PLT LP4000	1
18	05-02-0010	WDMT DRUM LP4000	1
19	05-03-0088	WDMT DRUM FR LP4000	1
20	05-03-0089	WDMT BASE FR LP4000	1
21	05-04-0038	WDMT DRUM FR BRACE RT LP4000	1
22	05-04-0039	WDMT DRUM FR BRACE LT LP4000	1
23	05-04-0040	WDMT GUIDE WHL BRKT LP4000	1
24	05-06-0006	WDMT GRD SIDE LP4000	2
25	05-06-0007	WDMT GRD END LP4000	1
26	05-07-0026	WDMT END CHUTE LP4000	1
27	05-07-0039	WDMT DSCHG CHUTE LP4000	1
28	05-07-0198	ASSY END CHUTE DOOR GALV	1
29	05-10-0640	SPROCKET (1/4 SEC) 164 TOOTH 48" BORE	4
30	05-10-0775	GUIDE WHL BRKT SPCR LP4000	1

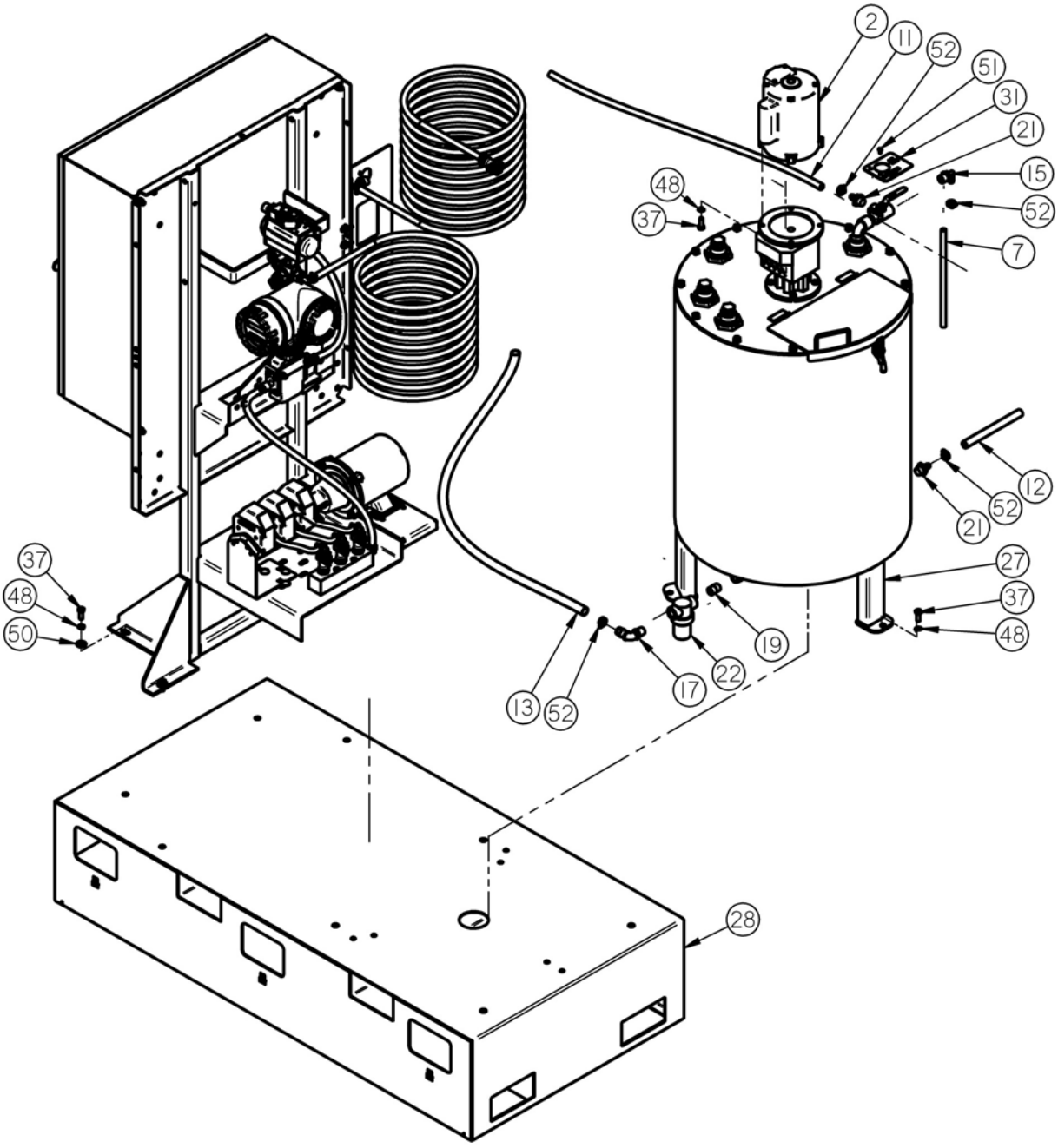
LP4000 Base Frame Parts List

Item #	PART #	Title	Qty
31	05-10-0807	DRUM DRV MTR MNT PLT LP4000	1
32	05-10-1553	PLT DRUM FR GUIDE LP4000	2
33	05-11-0048	DRUM IDLER SHAFT LP4000	4
34	06-01-0016	BOLT .375-16 X 1.00 ZP GR5	12
35	06-01-0018	BOLT .375-16 X 1.50 ZP GR5	16
36	06-01-0020	BOLT .375-16 X 2.00 ZP GR5	2
37	06-01-0025	BOLT .500-13 X 1.50 ZP GR5	20
38	06-01-0028	BOLT .500-13 X 2.50 ZP GR5	2
39	06-01-0029	BOLT .500-13 X 3.25 ZP GR5	2
40	06-01-0053	BOLT .375-16 X 1.25 ZP GR5	8
41	06-01-0054	BOLT .500-13 X 1.75 ZP GR5	20
42	06-01-0102	BOLT .313-18 X 1.25 ZP GR5	8
43	06-01-0106	BOLT .500-13 X 5.50 ZP GR5	2
44	06-01-0196	BOLT .250-20 X 2.50 ZP GR5	8
45	06-02-0001	NUT FULL .250-20 ZP GR5	8
46	06-02-0003	NUT FULL .375-16 ZP GR5	16
47	06-02-0004	NUT FULL .500-13 ZP GR5	26
48	06-03-0002	NUT NYL LOCK .313-18 ZP GR5	8
49	06-04-0001	WSHR LOCK SPLT .250 ZP	8
50	06-04-0003	WSHR LOCK SPLT .375 ZP	36
51	06-04-0004	WSHR LOCK SPLT .500 ZP	46
52	06-05-0004	WSHR FLAT .375 ZP	20
53	06-05-0005	WSHR FLAT .500 ZP	46
54	06-09-0002	PIN CLIP HITCH 3.063 SIZE 9 ZP	4
55	06-09-0008	PIN CLVS .750 X 3.00 PLN	4
56	12-04-0009	SLIDE GATE TRTR HOPP W FLANGE	1

LP4000 Pump Stand



LP4000 Pump Stand



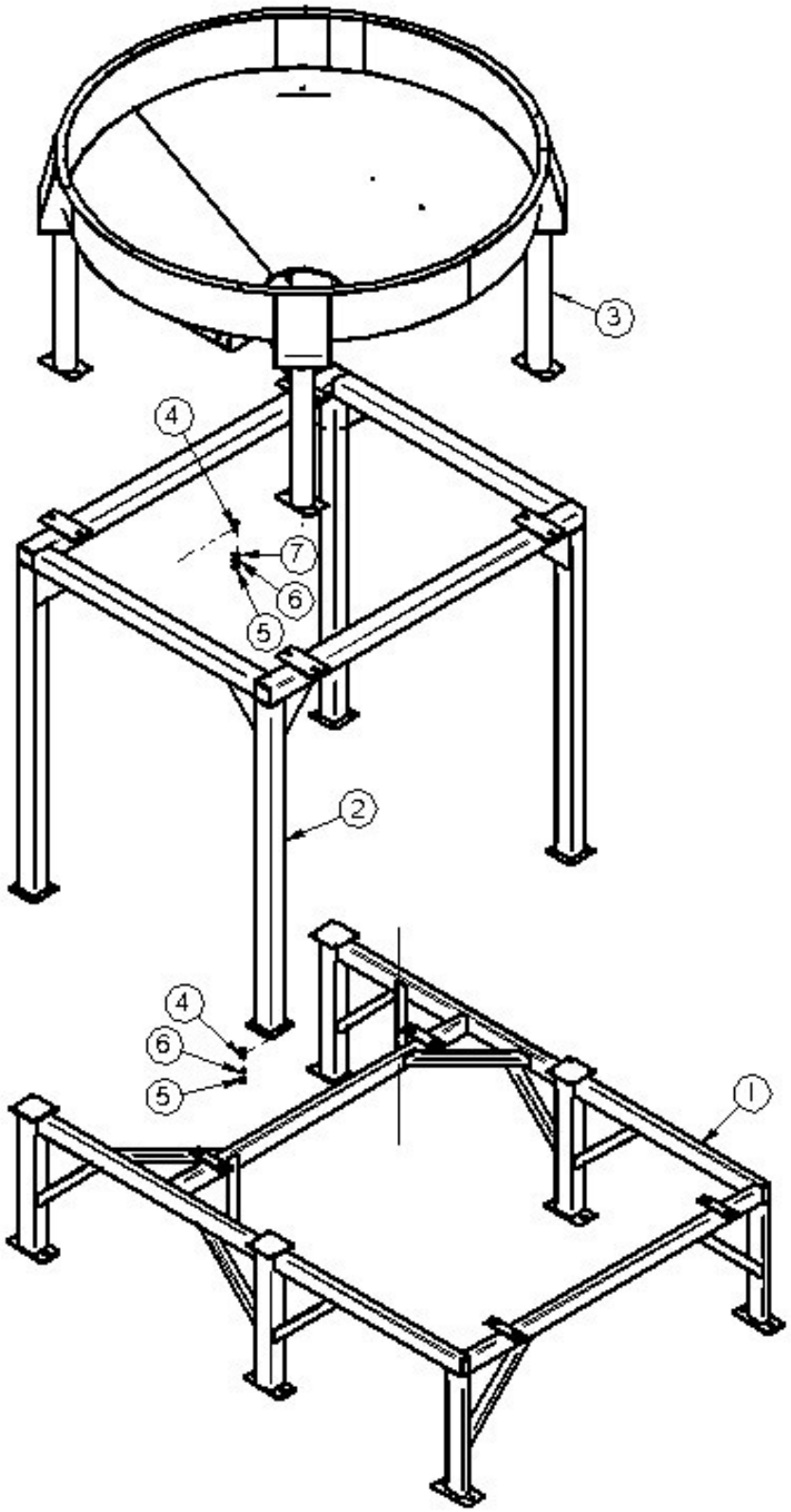
LP4000 Pump Stand Parts List

Item #	PART #	Title	Qty
1	01-01-0066	SPEED REDUCER, 3.7 TO 1	1
2	01-01-0080	MTR .33HP 1725RPM 56C 1PH TEFC	1
3	01-01-0111	MTR .33 HP 1725 RPM S56C 3PH TENV*	1
4	02-01-0005	PUMP HEAD PRST MF LS 115V 600RPM	3
5	02-01-0033	PUMP 3 MF HARDWARE SS - LS HEAD	1
6	02-02-0035	VALVE .500NPT 3WAY AIR ACTUATED	1
7	02-03-0005	0.5" RNT TUBING 12" LG	1
8	02-03-0005	0.5" RNT TUBING 22" LG	1
9	02-03-0005	0.5" RNT TUBING 27" LG	1
10	02-03-0005	0.5" RNT TUBING 300" LONG	1
11	02-03-0005	0.5" RNT TUBING 32" LG	1
12	02-03-0005	1009F0 12" LG	1
13	02-03-0006	0.75" RNT TUBING 45" LG	1
14	02-05-0043	FTTG MANIFOLD UHMW 1 IN 3 OUT	2
15	02-06-0010	FTTG 90 DEG .500HB X .500NPT ML NYL	4
16	02-06-0011	FTTG 90 DEG .750HB X .500NPT ML NYL	1
17	02-06-0013	1/2-14 NPT, 3/4 BARB, 90 DEG. BP	1
18	02-06-0015	BARB, .750-14 NPT X .750 90DEG WP	1
19	02-07-0054	.500 Closed Nipple 4882K13	1
20	02-08-0006	FTTG STGHT .500HB X .375NPT ML NYL	2
21	02-08-0007	FTTG STGHT .500HB X .500NPT ML NYL	2
22	02-12-0002	FLTR TEE PPE .500 NPT 40 MESH LRG	1
23	02-15-0013	FTTG CPLG .500 HB QCK DISC BODY	1
24	02-15-0016	FTTG CPLG .500 NPT QCK DISC BODY	6
25	03-12-0028	PNL CNTL MNL ST LP4000 230V 3PH	1
26	03-18-0007	ASSY FLMT PROMAG 53H DN W/MODBUS	1
27	04-03-0099	50 GAL CHEM TNK 3 INLET	1

LP4000 Pump Stand Parts List

Item #	PART #	Title	Qty
28	05-03-0338	WDMT,27&50GAL SC MNT BASE	1
29	05-03-0600	WDMT MX PUMP PNL FRM	1
30	05-10-2038	BRKT FLMT MNT PROMAG 53H	1
31	05-10-2080	LBL TRTR MIX TANK	1
32	05-10-2608	PLT AIR VLV CLMP	1
33	05-10-2682	BRKT FLMT MNT PROMAG 53H LX PUMP	1
34	05-10-2908	LS MF PUMP HEAD SUPT	1
35	06-01-0010	BOLT .313-18 X .750 ZP GR5	4
36	06-01-0012	BOLT .313-18 X 1.00 ZP GR5	4
37	06-01-0016	BOLT .375-16 X 1.00 ZP GR5	17
38	06-01-0053	BOLT .375-16 X 1.25 ZP GR5	2
39	06-01-0116	BOLT .375-16 X 2.75 ZP GR5	2
40	06-01-0138	BOLT, FLG .315-18 UNC ZP GRADE 5; 3/4" LG	2
41	06-01-0153	BOLT CRG .375-16X.750 ZP SHORT NECK	3
42	06-01-0192	BOLT .250-20 X 2.50 ZP GR5	8
43	06-02-0003	NUT FULL .375-16 ZP GR5	2
44	06-03-0001	NUT,LOCK, .250-20 ZP G5 NYLON INSERT	8
45	06-03-0002	NUT NYL LOCK .313-18 ZP GR5	4
46	06-03-0003	NUT NYL LOCK .375-16 ZP GR5	8
47	06-03-0014	NUT,LOCK, FLG .375-16 ZP SERRATTED	3
48	06-04-0003	WSHR LOCK SPLT .375 ZP	17
49	06-05-0003	WSHR FLAT .313 ZP	4
50	06-05-0004	WSHR FLAT .375 ZP	8
51	06-06-0029	SCRW MACH 10-24 X .375 PHLP PHD ZP	2
52	06-07-0006	CLMP HOSE .500 TO .906 X .313W ZP	12
53	13-05-0135	HOSE MX2500 MF TYPE	3
54	13-05-0159	ASSY LP4000 WTR SOLENIOD W/ MNT PLT	1

LP4000 Supply Hopper Stand



LP4000 Supply Hopper Stand Parts List

Item #	PART #	Title	Qty
1	05-03-0118	WDMT,HOPPER EXT./LP4000 FRAME	1
2	05-03-0119	WDMT,HOPPER EXT	1
3	05-07-0035B	ASSY 80 UNIT SHORT W/ACTR LP4000 FR	1
4	06-01-0025	BOLT .500-13 X 1.50 ZP GR5	24
5	06-02-0004	NUT FULL .500-13 ZP GR5	24
6	06-04-0004	WSHR LOCK SPLT .500 ZP	24
7	06-05-0005	WSHR FLAT .500 ZP	8

LIMITED WARRANTY

USC, LLC, (Manufacturer) warrants its seed treating equipment as follows:

1. **Limited Warranty:** Manufacturer warrants that the Products sold hereunder will be free from defects in material and workmanship for a period of 12 months from date of shipment. If the Products do not conform to this Limited Warranty during the warranty period, Buyer shall notify Manufacturer in writing of the claimed defects and demonstrate to Manufacturer satisfaction that said defects are covered by this Limited Warranty. If the defects are properly reported to Manufacturer within the warranty period, and the defects are of such type and nature as to be covered by this warranty, Manufacturer shall, at its expense, furnish replacement Products or, at Manufacturer's option, replacement parts for the defective products. Shipping and installation of the replacement Products or replacement parts shall be at the Buyer's expense.

2. **Other Limits:** THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Manufacturer does not warrant against damages or defects arising from improper installation (where installation is by persons other than Manufacturer), against defects in products or components not manufactured by Manufacturer, or against damages resulting from such non-Manufacturer made products or components. Manufacturer passes on to the Buyer the warranty it received (if any) from the maker of such non-Manufacturer made products or components. This warranty also does not apply to Products upon which repairs and/or modifications have been effected or attempted by persons other than pursuant to written authorization by Manufacturer. Manufacturer does not warrant against casualties or damages resulting from misuse and/or abuse of product(s), acts of nature, effects of weather, including effects of weather due to outside storage, accidents, or damages incurred during transportation by common carrier.

3. **Exclusive Obligation:** THIS WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of Manufacturer shall be to repair or replace the defective Products in the manner and for the period provided above. Manufacturer shall not have any other obligation with respect to the Products or any part thereof, whether based on contract, tort, strict liability or otherwise. Under no circumstances, whether based on this Limited Warranty or otherwise, shall Manufacturer be liable for incidental, special, or consequential damages.

4. **Other Statements:** Manufacturer's employees or representatives' oral or other written statements do not constitute warranties, shall not be relied upon by Buyer, and are not a part of the contract for sale or this limited warranty.

5. **Return Policy:** Approval is required prior to returning goods to USC, LLC. A restocking fee will apply.

6. **Entire Obligation:** This Limited Warranty states the entire obligation of Manufacturer with respect to the Products. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

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