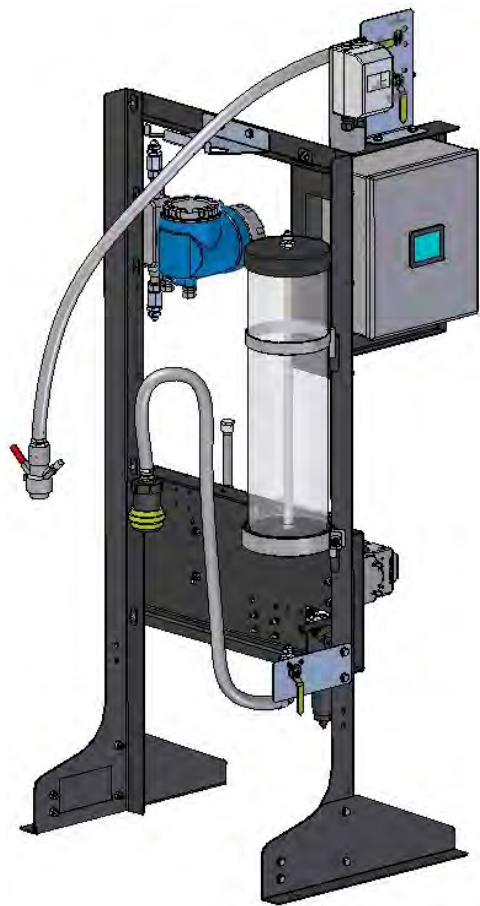
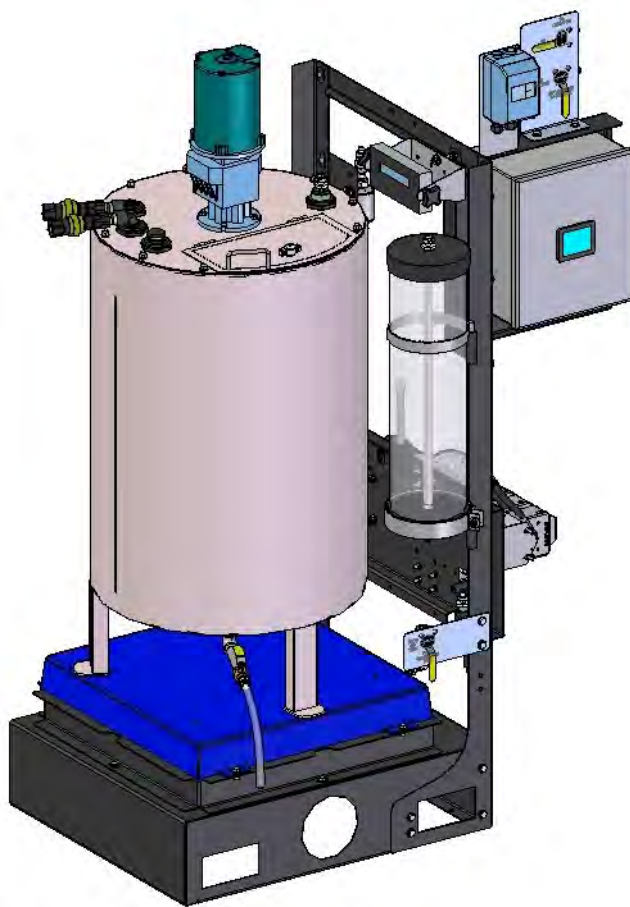


UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

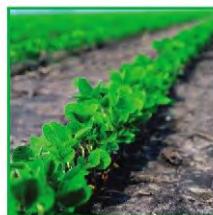
Operators Manual



Software Release: US1PC v1.0.4

Document: TD-09-06-1037

Revision: A



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 Universal Semi-Automated 1 Pump Controller. 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 lose 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.

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

- 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 USC at (785) 431-7900 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 USC, LLC. 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. The serial number is located on the frame next to the pump stand control panel.



SERIAL NUMBER: _____

TABLE OF CONTENTS

<u>Section</u>	<u>Contents</u>	<u>Page #</u>
Section A	Safety Instructions.....	5
Section B	Installation	12
Section C	Mechanical Operation.....	14
	Universal Semi-Automated 1 Pump Controller Overview	14
	Mix Tank and Calibration Tube	16
	Peristaltic Pump Heads and Motor	17
	Flow Meter and Pump Stand Valves	18
Section D	Electrical Operation	20
	Start Up Screen	21
	Main Screen	22
	Settings Screen.....	24
	Pump Configuration Screen	25
	General Configuration Screen	26
	Select Chemical Screen.....	28
	Chemical Edit Screen	29
	Calculator Screen.....	30
	Flow Rate Setup Screens	31
Section E	Calibration	33
	Pump Calibration	33
	Flow Meter Calibration	34
Section F	Troubleshooting.....	35
Section G	Maintenance	36
Section H	Storage.....	38
Section I	Mechanical Drawings	40
Section J	Limited Warranty.....	75

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

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.”

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



The equipment may be 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 equipment . **YOU** must ensure that you and anyone else who is going to operate, maintain, or work around the treater 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 treater.

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.

- Equipment 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 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.



UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

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 Equipment.



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. Electrocutation 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 the treater. 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 treater on level ground free of debris. Anchor the treater to prevent tipping or upending.



Before placement of the pump stand, be sure that ground is reasonably level. The pump stand 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 Equipment .
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. Replacement safety signs are available. Contact USC at (785) 431-7900 .

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.



Part # 09-02-0001



Part # 09-02-0002



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

**SECTION
B**

INSTALLATION



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.



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

PUMP STAND SET - UP

The following steps outline the initial set-up of your USC Universal Semi-Automated 1 Pump Controller :

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 pump stand(s) into its working position.
3. Using a forklift, place the pump stand in the desired position on a level surface.



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

4. Inspect machine thoroughly for screws, bolts, fittings, etc. which may have come loose during shipping.
5. The pump stand(s) should be placed on level ground close to the seed treater.

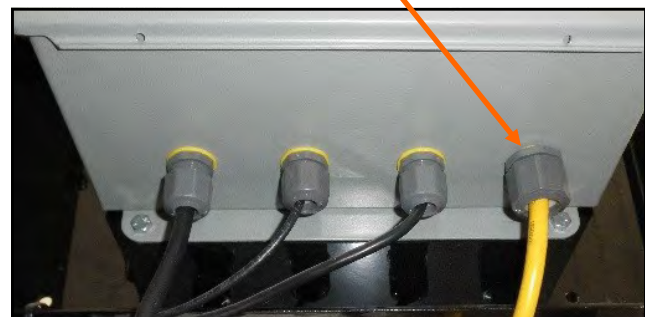
UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER


6. The pump stand is equipped with a 110 volt plug in cable for both the mix motor and the control panel. A standard wall socket is adequate as long as it is 4 amps or greater on the breaker.



7. For LPX, LX and MX treaters, attach the chemical tubing from the pump stand(s) to the atomizer plumbing on the seed treater. (left) For all other treaters additional tubing may be added or removed to accommodate your set-up.

8. For pump stands operating in the AUTO mode, a yellow two wire cable connection is required from the auxiliary port on the pump stand control box to the treater control panel.





Mfg. By: USC, LLC
Max voltage: 115V, 1PH, 60 HZ
Total FLA: 4
Largest Motor FLA: 4
Schematic number: 03-12-0363A
Enclosure rating: UL type 4
Short Circuit Current Rating:
5ka RMS Sym, 600V Max

Fuse	Line	Size	Type
FU102	102	4A	250 volt GAB4

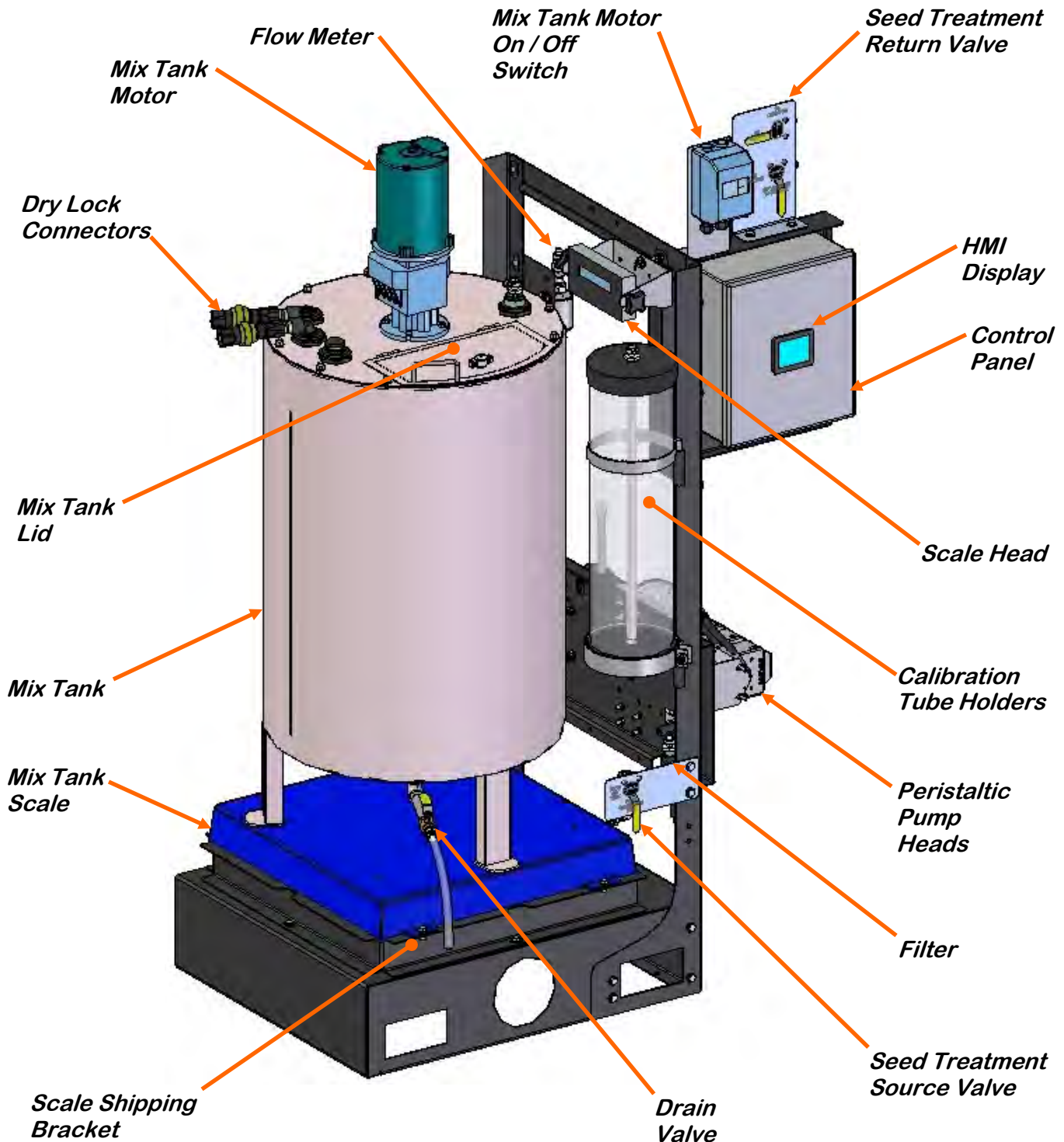
ATTENTION:
USED ONLY ON TREATER EQUIPPED WITH
AUTO RECEPTACLE FOR PUMP CONTROL.
(AUTO SWITCH ONLY WORKS WHEN THIS CORD
IS PLUGGED IN.)

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

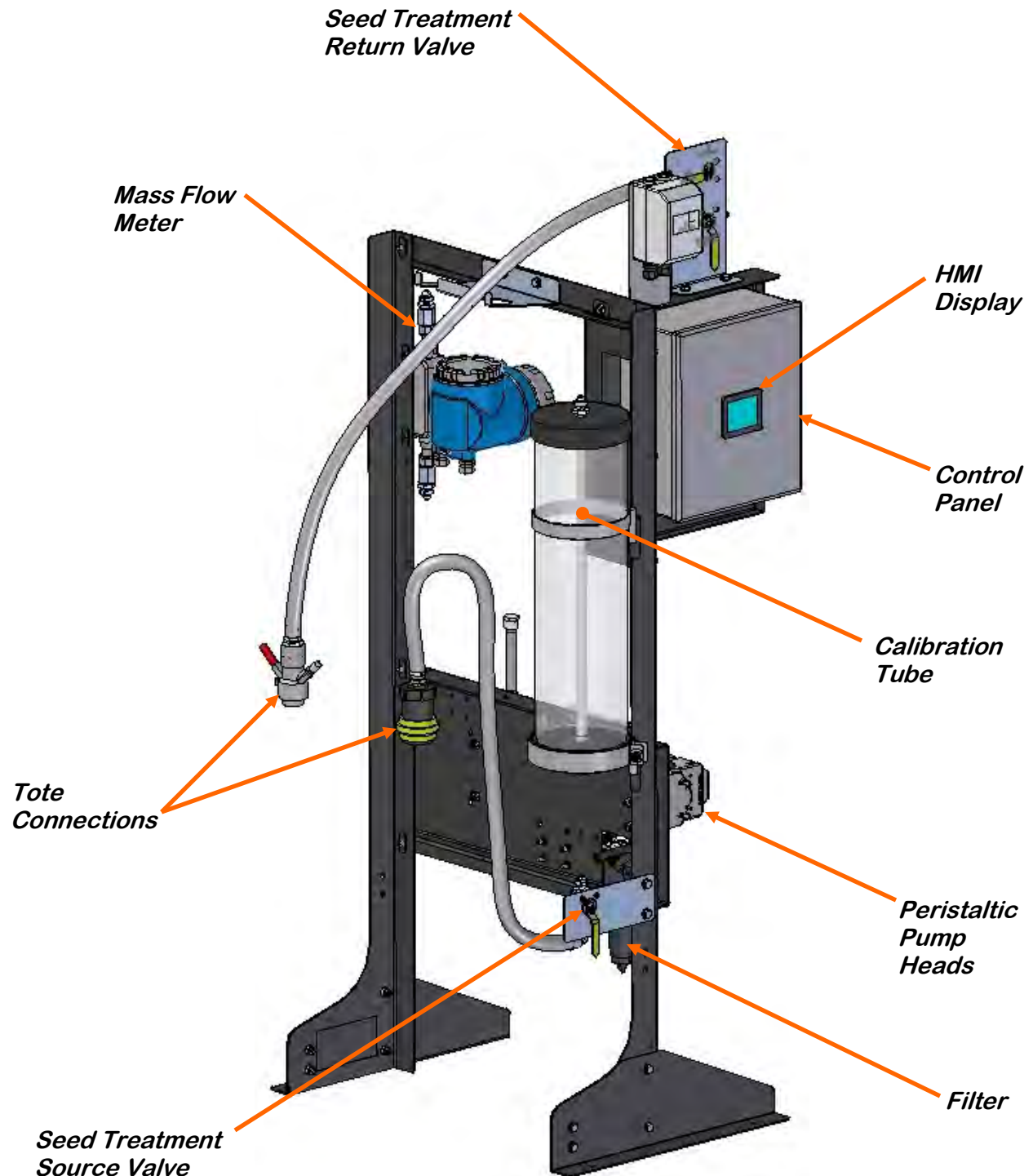
**SECTION
C**

MECHANICAL OPERATION

STANDARD SEMI - AUTOMATED PUMP STAND OVERVIEW



U-TOTE SEMI - AUTOMATED PUMP STAND OVERVIEW



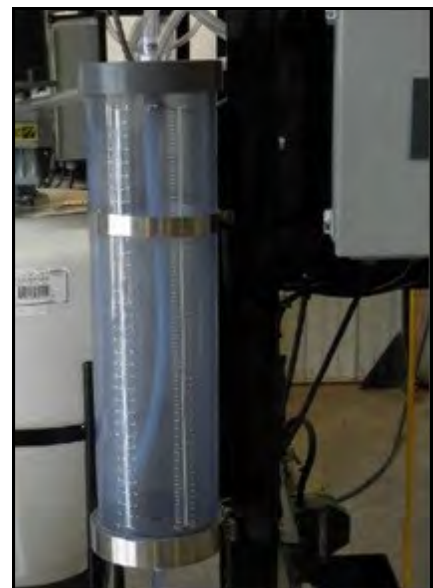
MIX TANK

The pump stand is equipped with a fully modular, touch screen to control the pump stand. This pump stand will include a 30 or 60 gallon stainless steel mix tank. This chemical mix tank will have electric drive agitation that is turned on or off at the pump stand with a manual switch. The agitator should be running at all times when treatment is present in the mix tank to keep the chemical mixed and in a suspended state. The tank is equipped with a shut-off, drain plug, and drain valve located on the bottom. The top of the tank also includes 3 extra ports which the operator can use to direct fill into the tank (see below).



CALIBRATION TUBE

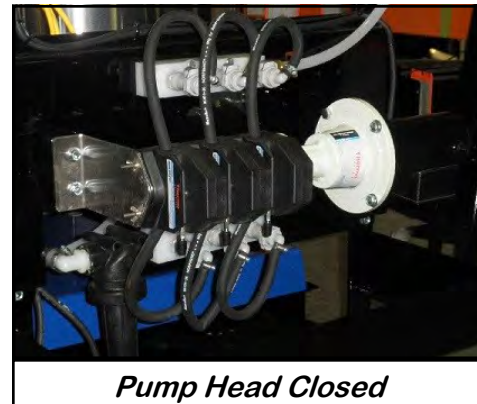
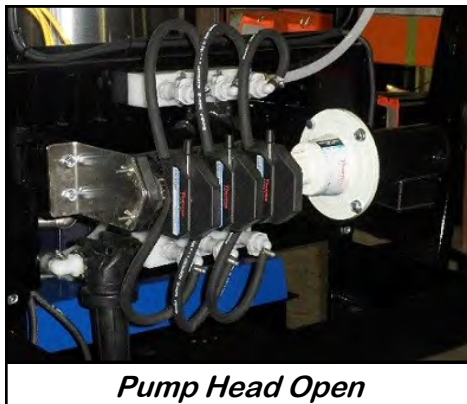
The pump stand is equipped with a calibration tube which is used to check the liquid flow rate. The calibration tube measures in ounces, on a 0-340 scale and millimeters on a 0-10000 scale. Manual valves direct liquid from different areas to keep all liquid contained. This creates a closed chemical system so that the operator can manually check the calibration of the chemical flow rate without handling any of the chemical.



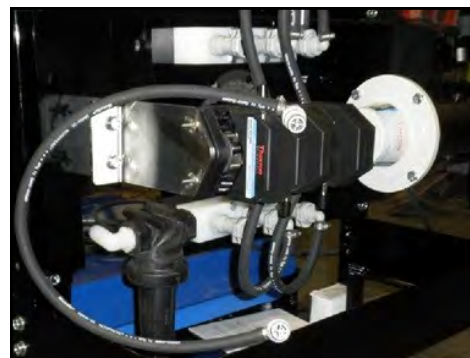
PERISTALTIC PUMP HEADS AND MOTOR

The pump stand utilizes a variable speed pump motor and special norprene pump tubing for liquid metering. The pump comes equipped with either 1, 2 or 3 peristaltic pump heads. Liquid will only come into contact with the inside diameter of the pump tubing and not the pump. This allows for easy cleanup and less maintenance of the pump.

To open the pump head, lift the lever upward. Place the pump tubing inside the pump head so it fits inside the notches and above the rollers. Lower the lever back down to close the pump head, clamping the hose inside the head. Wear or fatiguing of the tubing within the pump head due to compression is normal. When tubing becomes worn or chemical rates begin to slow down, open the pump head and move the tubing to a different position. If the entire piece of tubing becomes worn, simply replace with a new section. When not using the pump stand for several days or when storing, open the pump head and remove the tubing to prevent any extra compression.



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, right). If the tubing is unclamped from the pump head but left coupled in the manifold (below, left), the pump will suck air and cause flow rates to be very inconsistent.

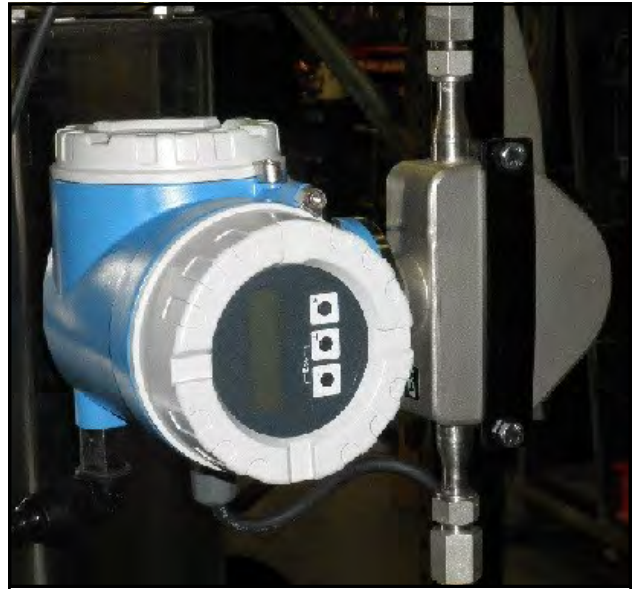


FLOW METER

Each pump stand comes with either a volumetric or mass flow meter. A flow meter is used to perform real-time chemical flow adjustments and monitoring without the operator having to handle the chemical. The flow meter reading will be displayed on the HMI touch screen and can be set to read in oz/min or ml/min.



Volumetric Flow Meter



Mass Flow Meter

PUMP STAND VALVES

Seed Treatment Source Valve: This valve controls where the pump is drawing liquid from. It allows liquid to be pulled from either the bottom of the mix tank or the calibration tube.

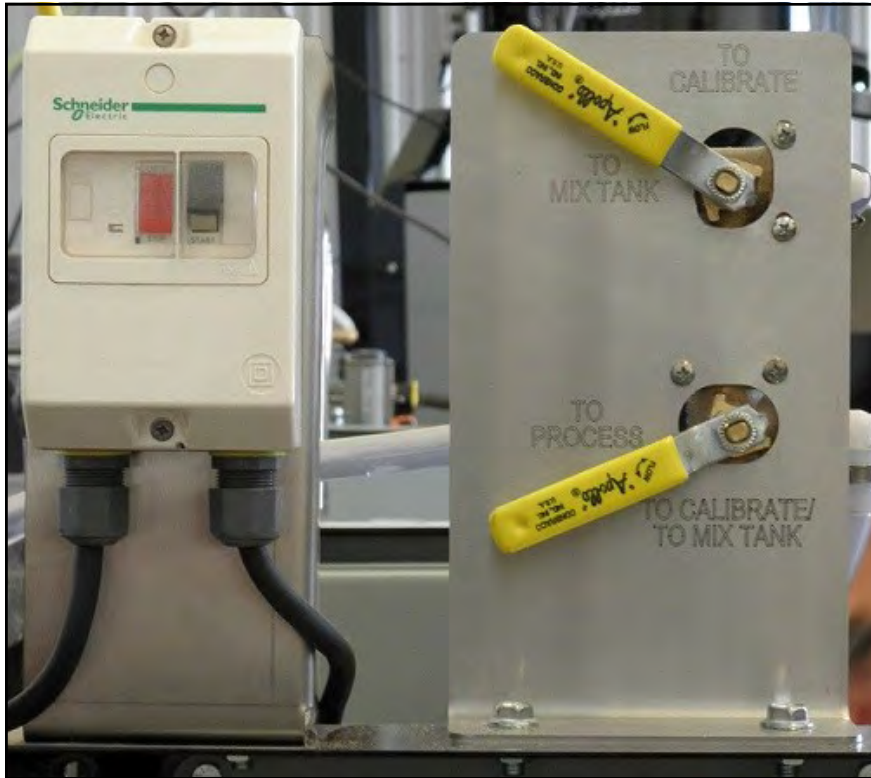


Drawing chemical from the bottom of the Mix Tank



Drawing chemical from the bottom of the Calibration Tube

Seed Treatment and Return Valves: The bottom valve directs the liquid to the top valve or to the seed treater. The top valve directs the liquid coming from the mix tank or calibration tube or back to the calibration tube or mix tank for re-circulation.



Proper calibration of the liquid system is critical to achieve a proper granular/chemical mixture. Use the calibration procedure on page 33 and 34 to determine liquid flow rate.

Emptying the remaining liquid can be done by using the reverse function on the control panel. This will pump liquid back into the mix tank. Then drain the remaining liquid into a suitable container. Clean water should be pumped through the calibration tube and mix tank when finished.

⚠ WARNING

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

NOTICE

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

SECTION
D

ELECTRICAL OPERATION



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.e switch is turned on,

This section provides a general overview and description of the operator controls for the Universal Semi-Automated 1 Pump Controller.

General Panel Descriptions

- The Universal Semi-Automated 1 Pump Controller Panel is a plug connected enclosure that is located on the pump stand frame. This panel connects the pump stand electrical components to the Treater Control Panel. Power to this panel is supplied from a standard 110V plug.

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

The following pages explain the function of the touch screen controls.

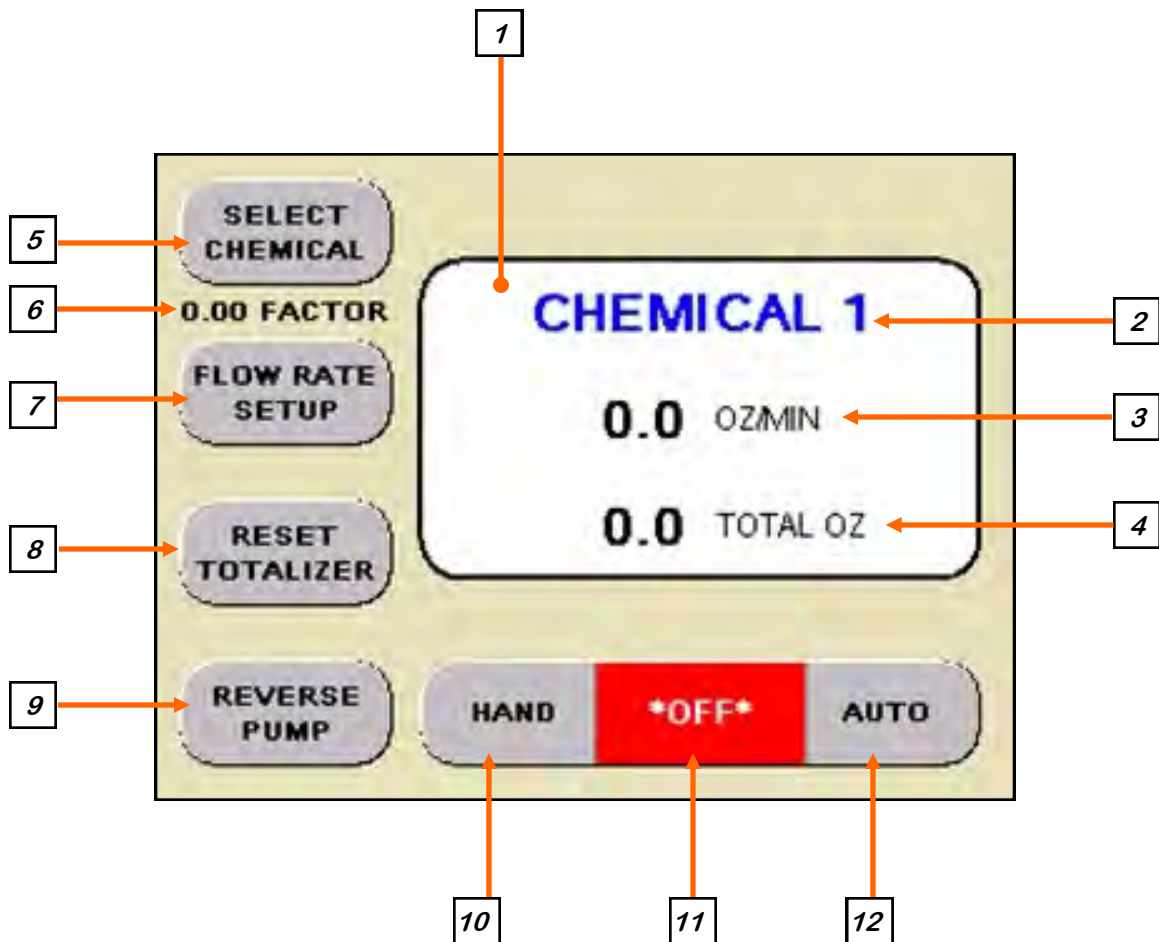
USC START UP SCREEN

While the system is booting up, the pump stand touch screen will display a timer bar at the bottom of the Start Up Screen. Once the timer bar reaches the end it will advance the user to the Main Screen.



MAIN SCREEN

This screen informs the operator which chemical is currently selected, ounces of the chemical being applied per minute and total ounces used. It can also be displayed in metric (see page 25). The buttons on the left side and bottom of the screen allows for control / adjustment of system operations.



Main Screen Button Descriptions

1. CHEMICAL STATUS BOX: Displays the chemical currently selected, flow rate in ounces per minute and total ounces used. The entire box is also a button. When pushed it advances the operator to the Settings screen. (see page 24)

2. CHEMICAL NAME: Displays the name of the chemical that is selected.

3. OUNCES PER MINUTE: Displays the ounces of chemical per minute being applied. It also may be displayed in milliliters.

4. TOTAL OUNCES: Displays in real time the amount of chemical that has been applied.

5. SELECT CHEMICAL BUTTON: Advances the operator to the Select Chemical Screen. (see page 28)

6. FACTOR: Displays the Calibration Factor Multiplier for the currently selected chemical.

7. FLOW RATE SETUP BUTTON: Advances the operator to the Flow Rate Setup screen. (see page 31)

8. RESET TOTALIZER BUTTON: Resets the totalizer to zero.

9. REVERSE PUMP BUTTON: Reverses the pump motor.

NOTICE

Anytime the pump is run in reverse or after the Atomizer is primed the operator must reset the totalizer on the screen before start up. This step is necessary to insure the totalizers accuracy for the run.

10. HAND BUTTON: Turns the pump motor ON and OFF. When this button is active the text increases in size and there is an asterisk before and after the text.

11. OFF BUTTON: Turns the pump motor off. When this button is active the text increases in size and there is an asterisk before and after the text.

12. AUTO BUTTON: This button is used when the pump stand is attached to an auxiliary contact on the treater. This allows the treater to turn the pump on and off at the appropriate time. When this button is active the text increases in size and there is an asterisk before and after the text.

SETTINGS SCREEN

1. TARGET RATE: When this button is pushed a keypad (bottom) will appear on the screen. This allows the operator to set an application target rate in ounces or milliliters per minute. This option is unavailable while FLOW RATE MODE is on any setting other than OFF.

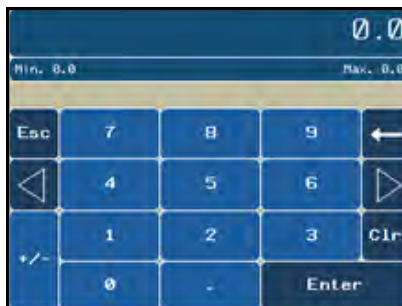
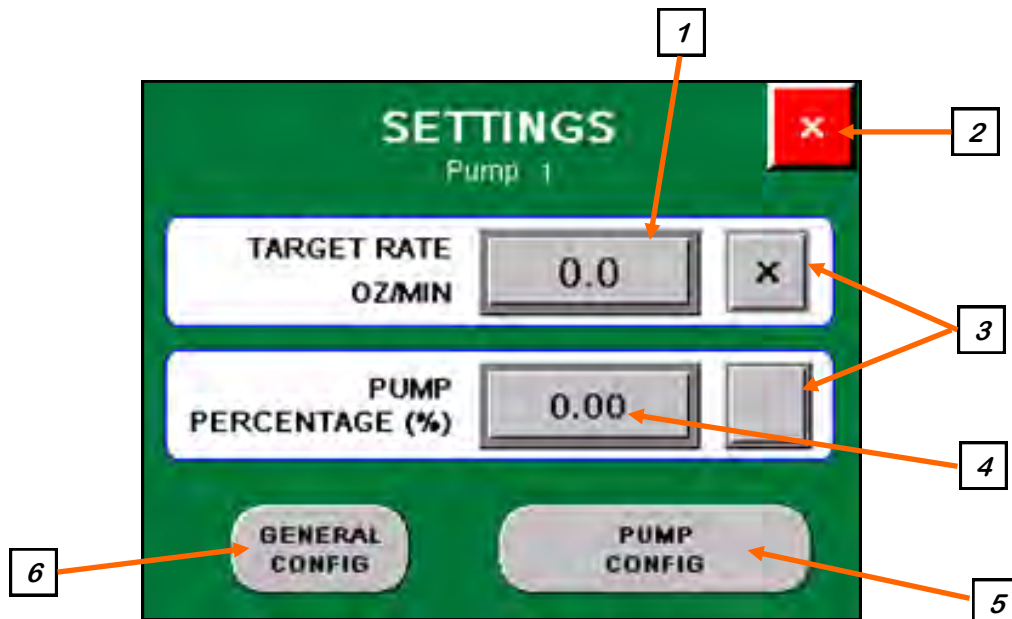
2. SCREEN EXIT: This button is used to exit back to the previous screen. It's functionality is the same throughout the HMI display.

3. APPLICATION METHOD: Pressing one of these two buttons determines what method the operator will use for an application rate. Ounces per minute or pump speed.

4. PUMP PERCENTAGE RATE: When this button is pushed a keypad (bottom) will appear on the screen. This allows the operator to set an application target rate based on pump speed.

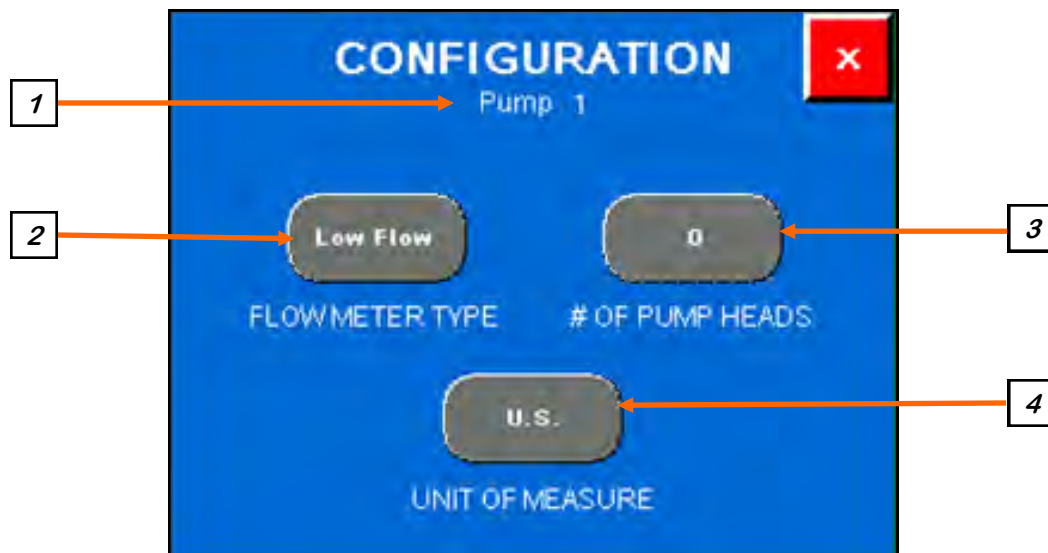
5. PUMP CONFIG: This button takes the operator to the Configuration screen.

6. GENERAL CONFIG: Pressing this button takes the operator to the General Configuration screen.

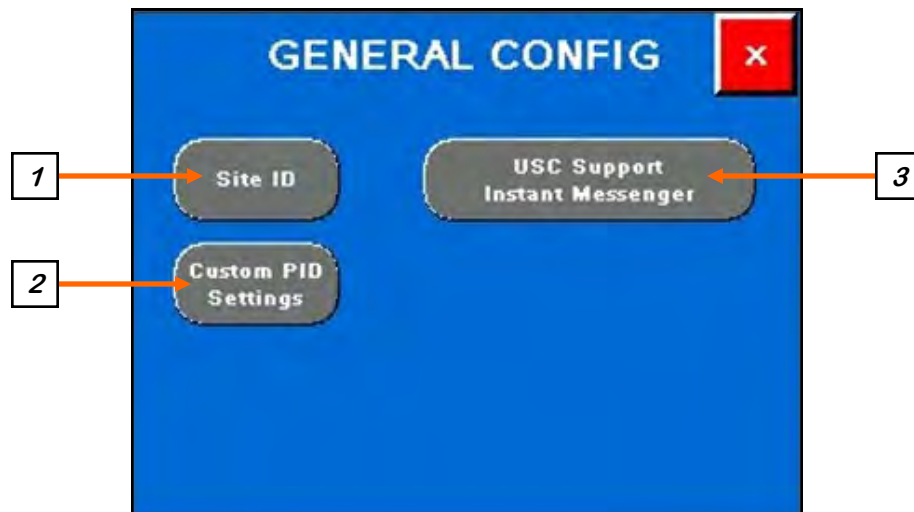


PUMP CONFIGURATION SCREEN

- 1. PUMP DISPLAY:** This displays which pump is being modified.
- 2. FLOW METER TYPE:** Pressing this button toggles the user between Low Flow, Volumetric Flow Meters IFM SM6000, Volumetric Flow Meter SM6001, Mass Flow Meter E&H 80E08 and Custom. This is used to control the PI loops on the pumps. The custom setting is used for non-USC flow meters,
- 3. # OF PUMP HEADS:** Pressing this button toggles the user between 1, 2 and 3 Peristaltic pump heads. Low Flow will only allow 1 pump head when selected.
- 4. UNIT OF MEASURE:** Allows the operator to switch between Standard or Metric units of measurement. Whichever unit of measurement they choose will be used for all of the pumps.



GENERAL CONFIGURATION SCREEN

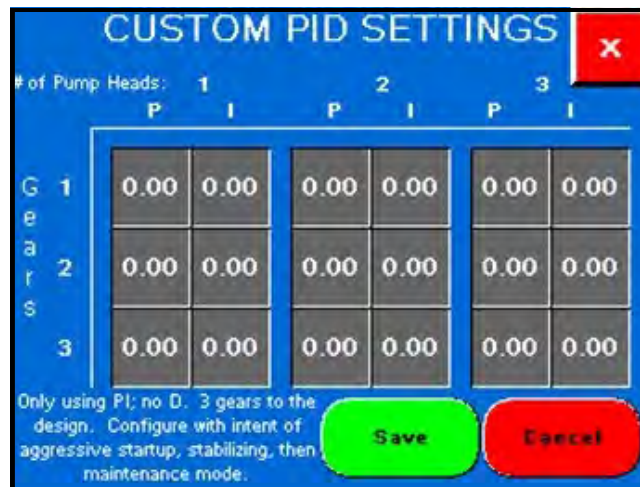


1. SITE ID: Pressing this button brings up the Site Identification screen. Pressing the Site Name field and a keyboard will appear for entering the name of the installation. The Site Description is automatically populated with the description of the current software loaded. This information will be used by USC service personnel to verify the customers installation.



GENERAL CONFIGURATION SCREEN

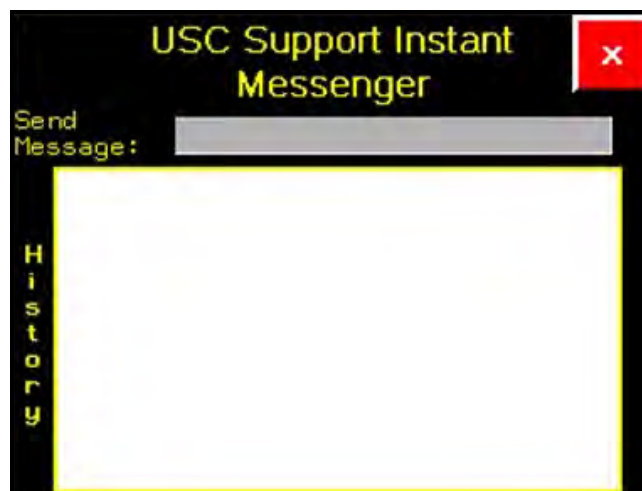
2. CUSTOM PID SETTINGS: Pressing this button takes the operator to this screen allowing them to manually enter custom PID settings for single or multiple head pumps. The system default settings are shown below. This screen is only used when non-USC pumps are being used and even then it may not be necessary to make any changes. If the operator has made changes and wants to return to the default settings, they may change the entry in the first row and the first column to zero, select the red X to exit the screen. This resets the screen to the default settings.



		1		2		3	
		P	I	P	I	P	I
Gears	1	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00

Only using PI; no D. 3 gears to the design. Configure with intent of aggressive startup, stabilizing, then maintenance mode.

3. USC INSTANT MESSENGER: Pressing this button will advance the operator to the Instant Messenger screen. This is used by the technical support staff when a customer calls with a problem. The service technician uses this to remotely connect to the site and verify the site identification information. This connection can only be made by USC. Once the link has been established, it may be used to text information to and from the customer site. This option only functions if the operator has U-Connect light installed on their laptop or U-Connect Pro is connected to the control panel using a Thin Client to make the connection.



USC Support Instant Messenger

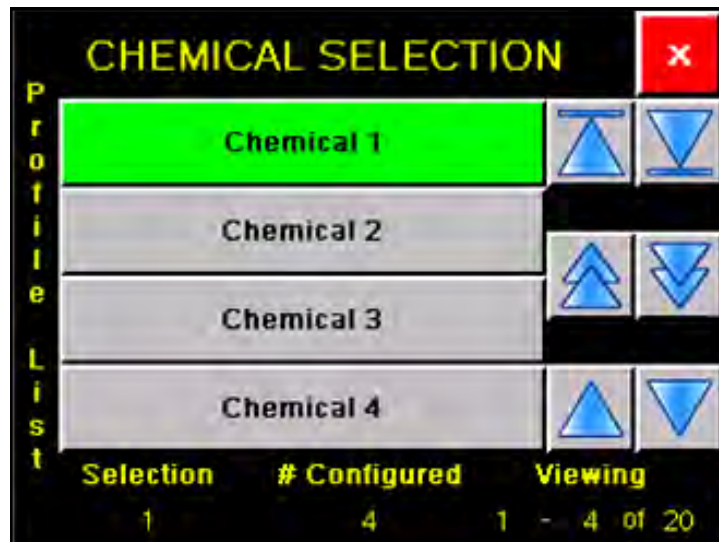
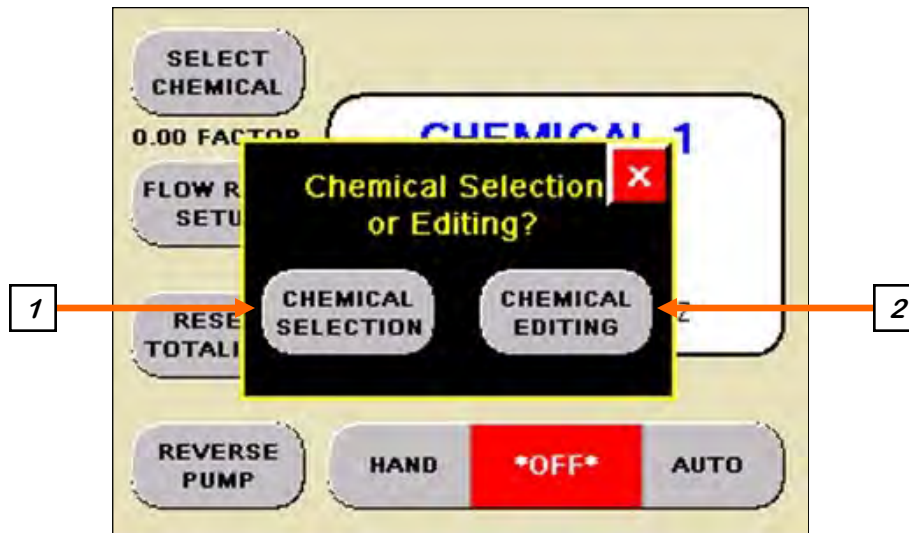
Send Message:

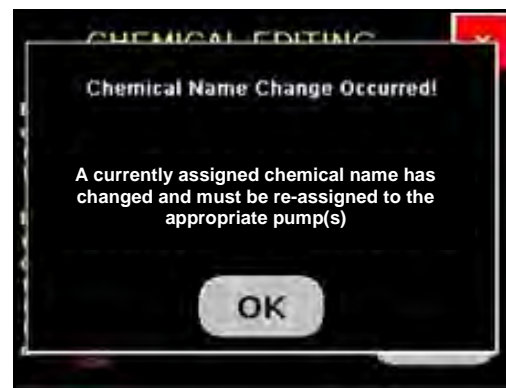
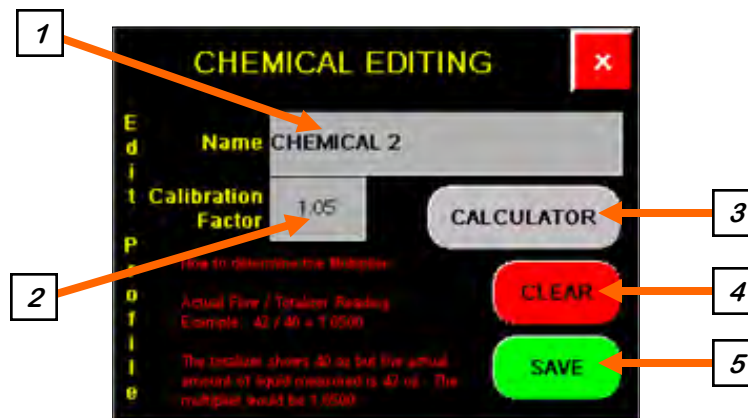
History

SELECT CHEMICAL SCREEN

1. SELECT CHEMICAL: Takes user to Chemical Selection screen (bottom) which allows the operator to select which chemical to apply.

2. EDIT BUTTON: This button takes the operator to the Edit Chemical screen.
(see page 29)



CHEMICAL EDITING SCREEN

1. CHEMICAL NAME: When this button is pushed a keypad appears allowing the operator to change the chemical name. (bottom left above) If the chemical name you changed is currently assigned to the pump stand, when you press SAVE a pop up screen will appear asking for verification of the name change. (bottom right above) Press the OK button to complete the change. The operator must return to the pump stand main screen and re-assign it with a new name. To enter a new chemical, select any unused entry from the rolodex, enter a new name and calibration factor, then press save. Once saved, it will be added to the rolodex in alphabetical order.

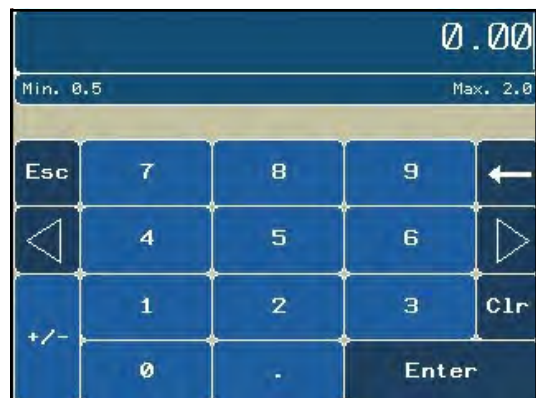
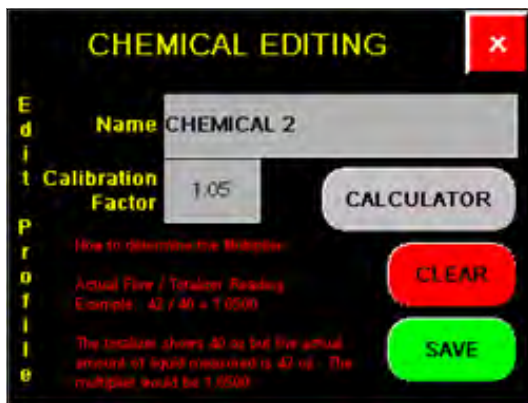
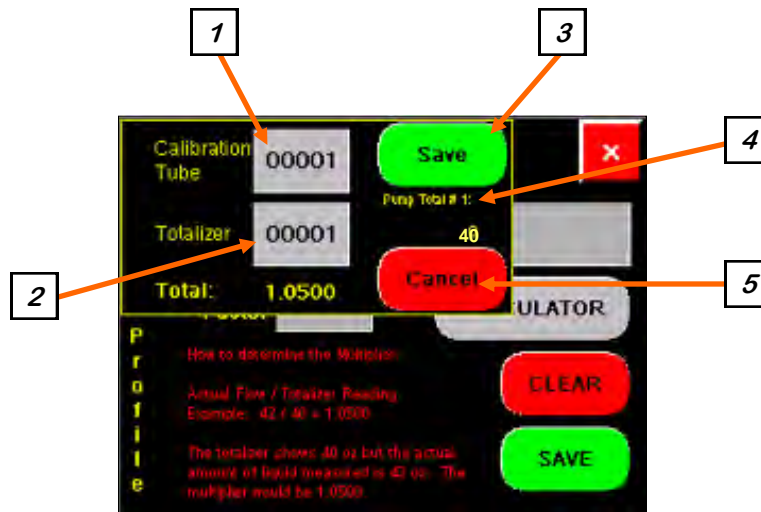
2. CALIBRATION FACTOR: When this button is pushed a numeric keypad appears allowing the operator to enter the (Multiplier) used for Flow Meter Calibration.

3. CALCULATOR Button: This button takes the operator to the Multiplier Calculation screen. (see page 30)

4. CLEAR: This button deletes the name and resets the Calibration Factor to 1.00. After a new name and calibration factor has been entered, press the save button. This is another way to enter a new chemical name in the system.

5. SAVE: Saves any changes to the chemical profile. If the name has been changed for a chemical that is currently assigned to a pump, the pop up screen will appear to remind the operator that they must re-assign a chemical to that pump.

CALCULATOR SCREEN



1. CALIBRATION TUBE: When this button is pushed a numeric keypad appears (bottom right above) allowing the operator to enter the calibration tube reading while performing a flow meter calibration.

2. TOTALIZER: When this button is pushed a numeric keypad appears (bottom right above). Enter the amount that appears for the Pump Total above the CANCEL button.

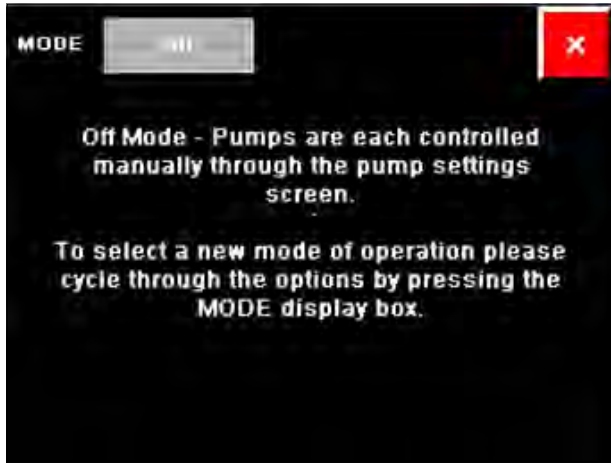
3. SAVE: Saves the information entered, calculates the multiplier and enters the data into the Calibration Factor box (bottom left above). Press SAVE again to finalize the change.

4. PUMP IDENTIFICATION DISPLAY: Displays which pump the pump total was taken from.

5. CANCEL BUTTON: Returns the operator to the Edit Chemical screen. Pressing the CANCEL button before the SAVE button will not change the Multiplier in the Calibration Factor Box on the Chemical Editing screen .

FLOW RATE SETUP SCREENS

This screen allows the operator to cycle through different modes of operation by pressing the MODE display box at the top left of the screen. The different modes are discussed below.



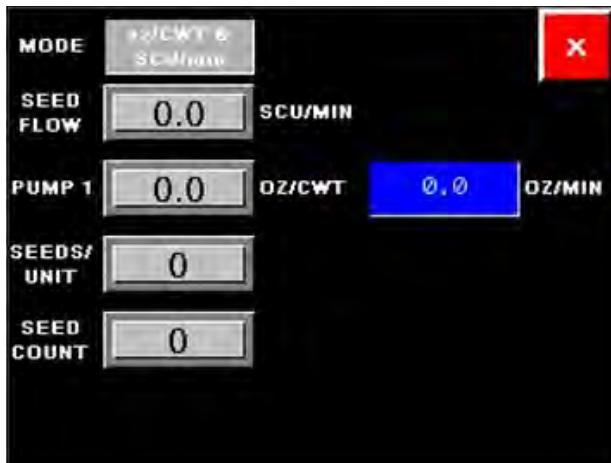
MODE: Off - Allows the user to control the pump through the pump setting screen

MODE: oz / SCU & SCU / min - Allows user to enter the treater seed flow by SCU / min and the oz / SCU for the pump and it will calculate the appropriate oz /min (shown in blue on right side of screen) to be applied.



MODE: oz / SCU & Lbs / min - User will need to enter the seed information in the Seeds / Unit and Seed Count blocks as well as enter the treater seed flow in Lbs / min and oz / SCU for the pump and it will calculate the oz / MIN (shown in blue on right side of screen) to be applied.

FLOW RATE SETUP SCREENS



MODE: oz/CWT & SCU/min

SEED FLOW: 0.0 SCU/MIN

PUMP 1: 0.0 OZ/CWT 0.0 OZ/MIN

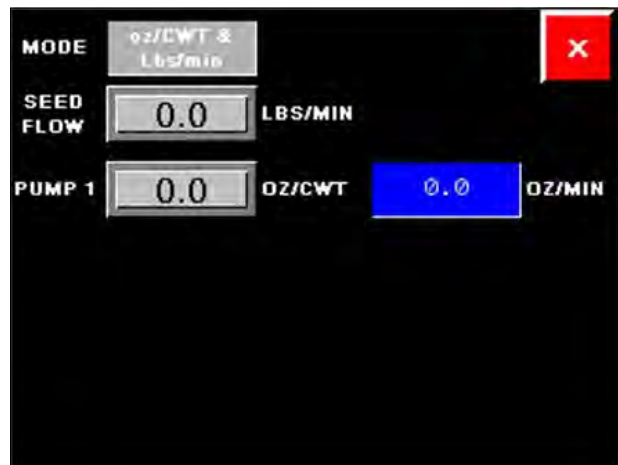
SEEDS/UNIT: 0

SEED COUNT: 0

This screen shows the 'oz/CWT & SCU/min' mode. It includes input fields for 'SEED FLOW' (0.0 SCU/MIN), 'PUMP 1' (0.0 OZ/CWT), and 'SEEDS/UNIT' (0). The 'SEED COUNT' is 0. The calculated flow rate is displayed as 0.0 OZ/MIN in a blue box. A red 'X' button is in the top right corner.

MODE: oz / CWT & SCU / min - User will need to enter the seed information in the Seeds / Unit and Seed Count blocks as well as enter the treater seed flow in SCU / min and oz / CWT to calculate the oz / min (shown in blue on right side of screen) to be applied.

MODE: oz / CWT & Lbs / min – User will enter seed flow in Lbs / MIN and the oz / CWT to calculate the oz / min (shown in blue on right side of screen) to be applied.

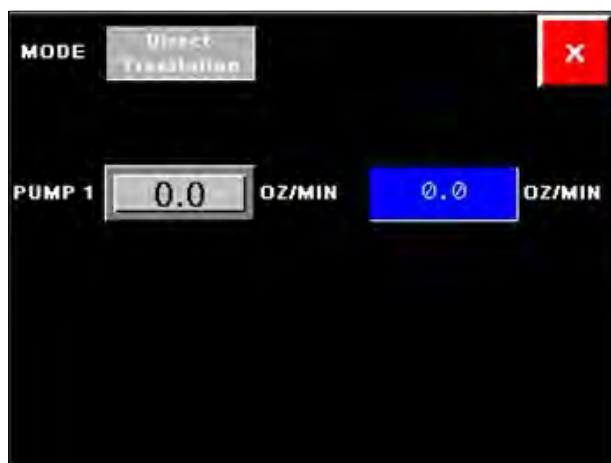


MODE: oz/CWT & Lbs/min

SEED FLOW: 0.0 LBS/MIN

PUMP 1: 0.0 OZ/CWT 0.0 OZ/MIN

This screen shows the 'oz/CWT & Lbs/min' mode. It includes input fields for 'SEED FLOW' (0.0 LBS/MIN) and 'PUMP 1' (0.0 OZ/CWT). The calculated flow rate is displayed as 0.0 OZ/MIN in a blue box. A red 'X' button is in the top right corner.



MODE: Direct Translation

PUMP 1: 0.0 OZ/MIN 0.0 OZ/MIN

This screen shows the 'Direct Translation' mode. It includes an input field for 'PUMP 1' (0.0 OZ/MIN). The calculated flow rate is displayed as 0.0 OZ/MIN in a blue box. A red 'X' button is in the top right corner.

MODE: Direct Translation – Allow user to set pump to oz / min. The rate the user enters will be the rate at which the pump will operate.

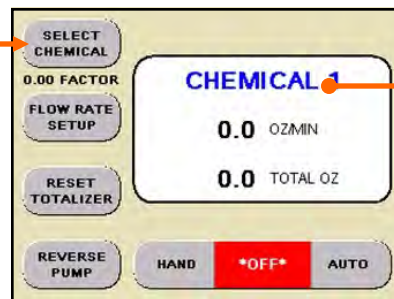
CALIBRATION

SECTION E

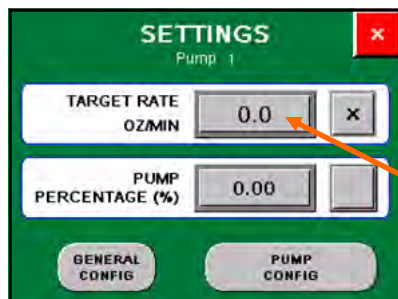
PUMP CALIBRATION

1. Lock down the pump tubing in the pump head. (page 17)
2. Premix enough liquid for the amount of seed you are treating and pour into the chemical mix tank. It's always a good practice to mix up 20% extra slurry to help fill all the lines.
3. From the Main screen press the Chemical Status Box. From the Settings screen enter the number of ounces needed per minute per hundred pounds of seed as the Target Rate. Then, press the EDIT button and verify that the Calibration Factor is set to one. Return to the Main screen and select the Select Chemical button. From the Select Chemical screen choose the type of chemical.
4. Set the return valves to Mix Tank for recirculation. Turn the ON / OFF switch for the mix tank motor to the ON position. Run it for 15 minutes to ensure that the chemical mixture within the mix tank is blended completely and any air is removed from the system.

Select
Chemical

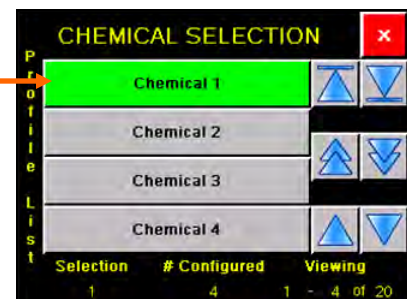


Chemical
Status Box



Enter in
Ounces per
cwt. here

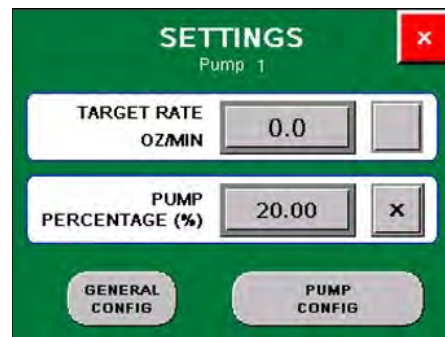
Choose
chemical
name here



FLOW METER CALIBRATION

Due to the composition of some types of chemicals, additional flow meter calibration may be required. It is recommended that, like other calibration devices, the flow meter(s) are checked regularly and calibrated when needed. When calibrating the flow meter(s), each chemical slurry must be checked and adjusted for.

1. To begin the calibration process, fill the appropriate mix tank with the slurry that is going to be used for this calibration.
2. Turn the ON / OFF switch for the mix tank motor to the ON position. From the Main screen select the Chemical Status Box. Enter a value for the Pump Percentage speed (Example 20) and check the box to the right. Return to the Main screen, press the HAND button and ensure that the valves are set to Mix Tank for recirculation. Let the system run in recirculation mode for 15 minutes. This will remove any air from the system.
3. Ensure that the correct chemical has been chosen.
4. Place the bottom return valve to MIX TANK / CALIBRATION TUBE. The valve is located on top of the pump stand (right). Place the top valve to the CALIBRATION TUBE position. Once the liquid in the Calibration Tube reaches zero press HAND or OFF to stop the pump. Press the TOTALIZER button to zero out the Totalizer. Press the HAND button and start the stopwatch simultaneously. Stop the pump when the stopwatch reaches one minute. Note the total ounces of chemical that is in the calibration tube.
5. Push the Calculator button. It is located in the bottom left corner of the Edit Chemical screen. Enter the number of the ounces in the calibration tube box. Between the Save and Cancel button is the number of ounces read by the flow meter. Enter that amount in the Totalizer box and press SAVE. The system automatically calculates and places the amount in the Calibration Factor (Multiplier) box.
6. Repeat the process as necessary and for each different chemical slurry used.



TROUBLESHOOTING**SECTION
F****TROUBLESHOOTING**

Below is a table describing the most frequent problems and solutions with the USC Universal Semi-Automated 1 Pump Controller. For further assistance, contact the USC Service department at (785) 431-7900.

Problem	Possible Cause	Solution
Pump is fluctuating.	<ol style="list-style-type: none"> 1. Restriction in tubing 2. Filter is plugged or missing gasket. 3. Hoses are worn out. 	<ol style="list-style-type: none"> 1. Flush tubing and check filter for any restrictions. 2. Clean filter and check for gasket. 3. Replace hoses.
Pump will not turn off in AUTO when seed runs out.	<ol style="list-style-type: none"> 1. Proximity switch is dirty. 2. Proximity switch is set too sensitive. 	<ol style="list-style-type: none"> 1. Clean proximity switch. 2. Adjust the pump proximity switch sensitivity by turning adjustment screw counter-clockwise.
Pump will not turn on in AUTO.	<ol style="list-style-type: none"> 1. Proximity switch is not staying covered. 2. Proximity switch is not sensitive enough. 3. HMI screen not set to AUTO. 4. Auxiliary cable not hooked up. 	<ol style="list-style-type: none"> 1. Make sure proximity switch is staying covered with seed. 2. Adjust pump proximity switch sensitivity by turning the adjustment screw clockwise. 3. Set HMI screen to AUTO. 4. Attach Auxiliary cable from control box to treater control box.
Mix Motor will not start	<ol style="list-style-type: none"> 1. Power cord not plugged in. 	<ol style="list-style-type: none"> 1. Plug in power cord.

**SECTION
G****MAINTENANCE**

Proper maintenance of the Universal Semi-Automated 1 Pump Controller 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.



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

ELECTRICAL PANEL

- Check and tighten wire connections.
- Check quick connects on bottom of control panel.
- Check to see if starters and/or overloads are tripped.
- Check to see if relays, timers and/or breakers are tripped.
- Check quick connects on end of Auxiliary cord.
- Check and tighten wire connections.
- Check relay and fuse holder.
- Check power cords for cuts or frays and ensure ground is present.

MIX TANK

- Check motor.
- Check for any play in the mix tank shaft.
- Check valves, fittings, and plug on bottom of tanks for leaks.
- Check chemical tubing for abnormal wear.

PUMPS - PLUMBING - FLOW METER

1. Check pump in forward and reverse.
2. Make sure pump heads open and close smoothly.
3. Inspect tubing for uneven wear. Replace pump tubing often to ensure high flow rates can be achieved.
4. Check air actuated 3-Way valve. Clean brass filter if necessary.
5. Make certain the inside of the mix tank is completely drained of chemical residue.
6. Pump clean water through all areas of the plumbing including the mix tank, valves, and flow meter.
7. Remove and clean the filter.
8. Open all drain points, valves, and filter to let as much of the water drain as possible.
9. Disconnect power to the flow meter.
10. If your pump stand is equipped with a volumetric flow meter, remove it from the machine for additional cleaning.

A. Pre - Mix a solution of 90% water and 10% distilled white vinegar.

NOTICE

Only use the vinegar and water solution mixed in these proportions to clean the flow meter. Use of any other cleaners, especially cleaners containing harsh chemicals may permanently damage the sensors and seals inside the flow meter.

- B. Use a size - matched circular brush with soft plastic bristles. Dip the brush in the solution and gently move it up and down in the measuring pipe to avoid damaging the measuring pipe and sensor electrodes.
- C. Re-peat brushing with fresh fluid until measuring pipe is visually clean.
- D. Flush the flow meter inside and out with clean water to remove any of the cleaning solution residue.



**SECTION
H****STORAGE**

When storing the Universal Semi-Automated 1 Pump Controller for long periods of time, the following procedure must be followed to reduce the chance of rust, corrosion and fatigue of the pump stand. You can also use these steps when storing the machine for the winter.



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

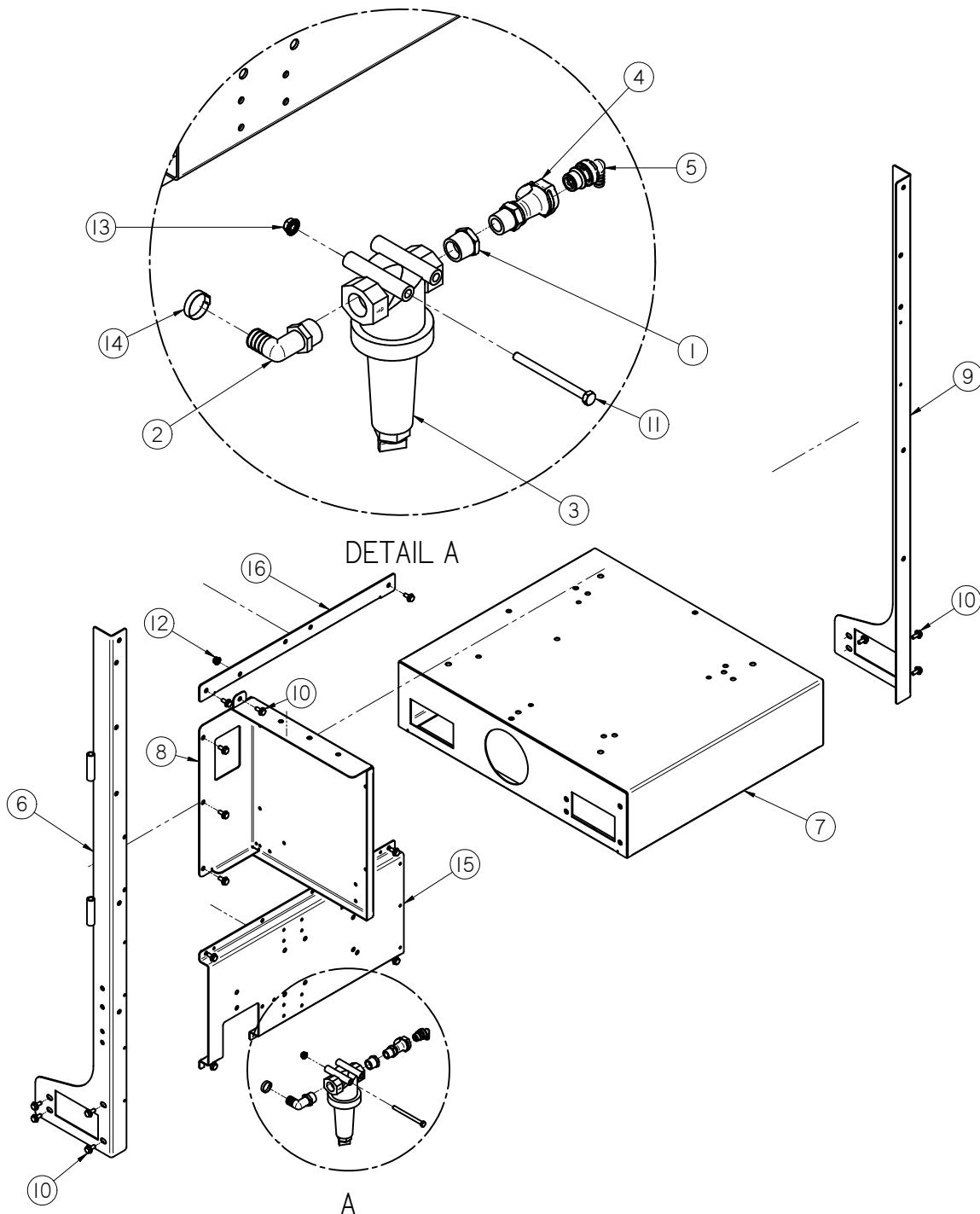
1. Make certain the inside of the tank is completely drained of chemical residue and thoroughly flush the inside of the tank with clean water.
2. Remove and clean the filter.
3. Pump clean water through all areas of the plumbing including the mix tank, flow meter, and valves. It may be necessary to move the position of the air actuated 3-way valve from recirc to process in order to clean the chemical lines that run to the seed treater.
4. Open all drain points, valves, and filter to let as much of the liquid drain as possible.
5. If the pump stand will be exposed to possible freezing temperatures, the final flush of the system should be made with a non freezable liquid. Or use compressed air to blow the lines out from any moisture.
6. Open pump heads and remove tubing to prevent any unnecessary wear (see page 18).
7. Remove the flow meter from the pump stand and store in a location with the following conditions:
 - A. Ambient temperature of 50 to 80 degrees Fahrenheit.
 - B. Protection from direct sunlight to avoid unacceptable high surface temperatures.
 - C. Where moisture does not collect in or on the flow meter. This will help prevent fungus or bacteria infestation which can damage the liner.
 - D. Cover all openings.
 - E. Store in a manner so that the inlet and outlet are as much in an up and down position as possible.

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

NOTES:

SECTION
I**MECHANICAL DRAWINGS**

The following pages show the parts of the Commercial Pump Stand. Please have the part number ready when ordering parts.

BASE FRAME ASSEMBLY - 1 PUMP HEAD (05-03-1155)

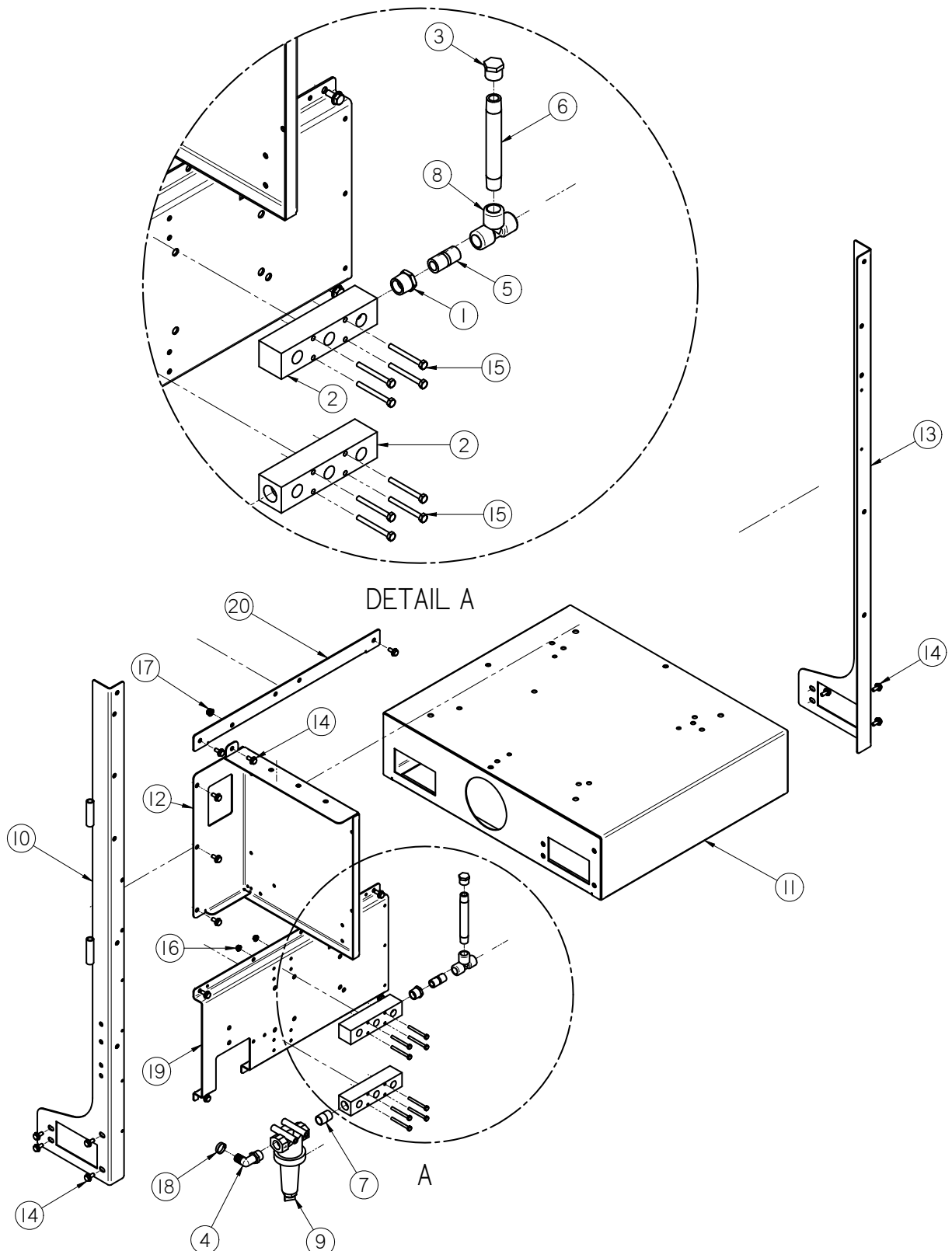
UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

BASE FRAME ASSEMBLY - 1 PUMP HEAD (05-03-1155)

Item #	Part #	Description	Qty
1	02-04-0024	BUSH .750-14 NPT .500-14 NPT BP	1
2	02-06-0015	BARB, .750-14 NPT X .750 90DEG WP	1
3	02-12-0011	FLTR TEE PPE .750 NPT 16 MESH BANJO	1
4	02-15-0016	FTTG CPLG .500 NPT QCK DISC BODY	1
5	02-15-0022	FTTG CPLG .375 HB X 90 QCK DISC INSERT	1
6	05-03-1052	WDMT SMALL PUMPSTAND LH UPRIGHT	1
7	05-03-1053	WDMT SMALL PUMPSTAND BASE BOX	1
8	05-03-1064	WDMT PANEL MNT PUMPSTD	1
9	05-03-1074	WDMT SMALL PUMPSTAND RH UPRIGHT	1
10	06-01-0124	BOLT, FLG .375-16 UNC ZP GRADE 5; 3/4" LG	18
11	06-01-0248	BOLT, .3125-18 UNC ZP G5; 4.00" LG	2
12	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	1
13	06-03-0019	NUT LOCK FLG .3125-18 ZP GR5	2
14	06-07-0030	HOSE CLAMP ONE EAR 1.004-1.126	1
15	102200	BRKT PUMP ALL HEADS PUMPSTD	1
16	10220E	PLT XBEAM SUPP VLV PUMPSTD	1

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

BASE FRAME ASSEMBLY - 2 OR 3 PUMPHEADS (05-03-1066)

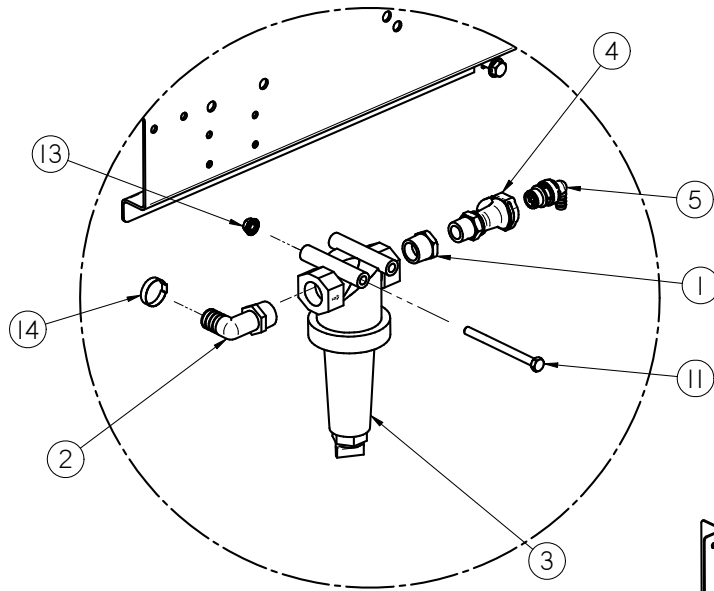


UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

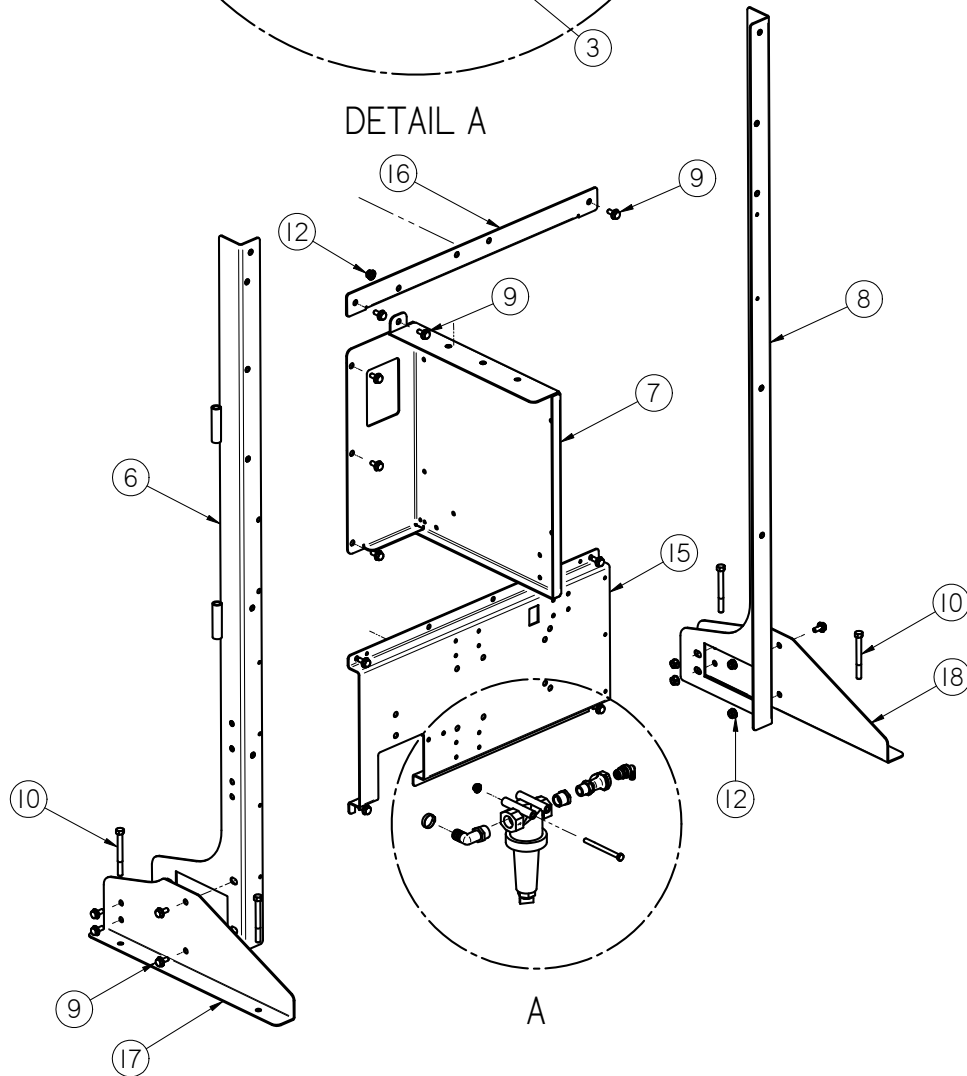
BASE FRAME ASSEMBLY - 2 OR 3 PUMPHEADS (05-03-1066)

Item #	Part #	Description	Qty
1	02-04-0008	BUSHING .750-14 NPT, REDUCER .500-14 NPT	1
2	02-05-0043	FTTG MANIFOLD UHMW 1 IN 3 OUT	2
3	02-05-0086	FTTG END CAP .500 NPT BP	1
4	02-06-0015	FTTG 90 DEG .750HB X .750NPT ML NYL	1
5	02-07-0009	FTTG NIP .500 NPT X 1.75 TBE BLK	1
6	02-07-0060	FTTG NIP .500 NPT X 6.00 TBE PVC	1
7	02-07-0070	FTTG NIP .750 NPT X 1.50 TBE SS	1
8	02-09-0005	FTTG TEE .500 NPT PPE	1
9	02-12-0011	FLTR TEE PPE .750 NPT 16 MESH BANJO	1
10	05-03-1052	WDMT SMALL PUMPSTAND LH UPRIGHT	1
11	05-03-1053	WDMT SMALL PUMPSTAND BASE BOX	1
12	05-03-1064	WDMT PANEL MNT PUMPSTD	1
13	05-03-1074	WDMT SMALL PUMPSTAND RH UPRIGHT	1
14	06-01-0124	BOLT, FLG .375-16 UNC ZP GRADE 5; 3/4" LG	18
15	06-01-0192	BOLT .250-20 X 2.50 ZP GR5	8
16	06-03-0013	NUT,LOCK, FLG .250-20 ZP SERRATED	8
17	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	1
18	06-07-0030	HOSE CLAMP ONE EAR 1.004-1.126	1
19	102200	BRKT PUMP ALL HEADS PUMPSTD	1
20	10220E	PLT XBEAM SUPP VLV PUMPSTD	1

U-TOTE FLOOR MOUNT FRAME ASSEMBLY - 1 PUMPHEAD (05-03-1376)



DETAIL A

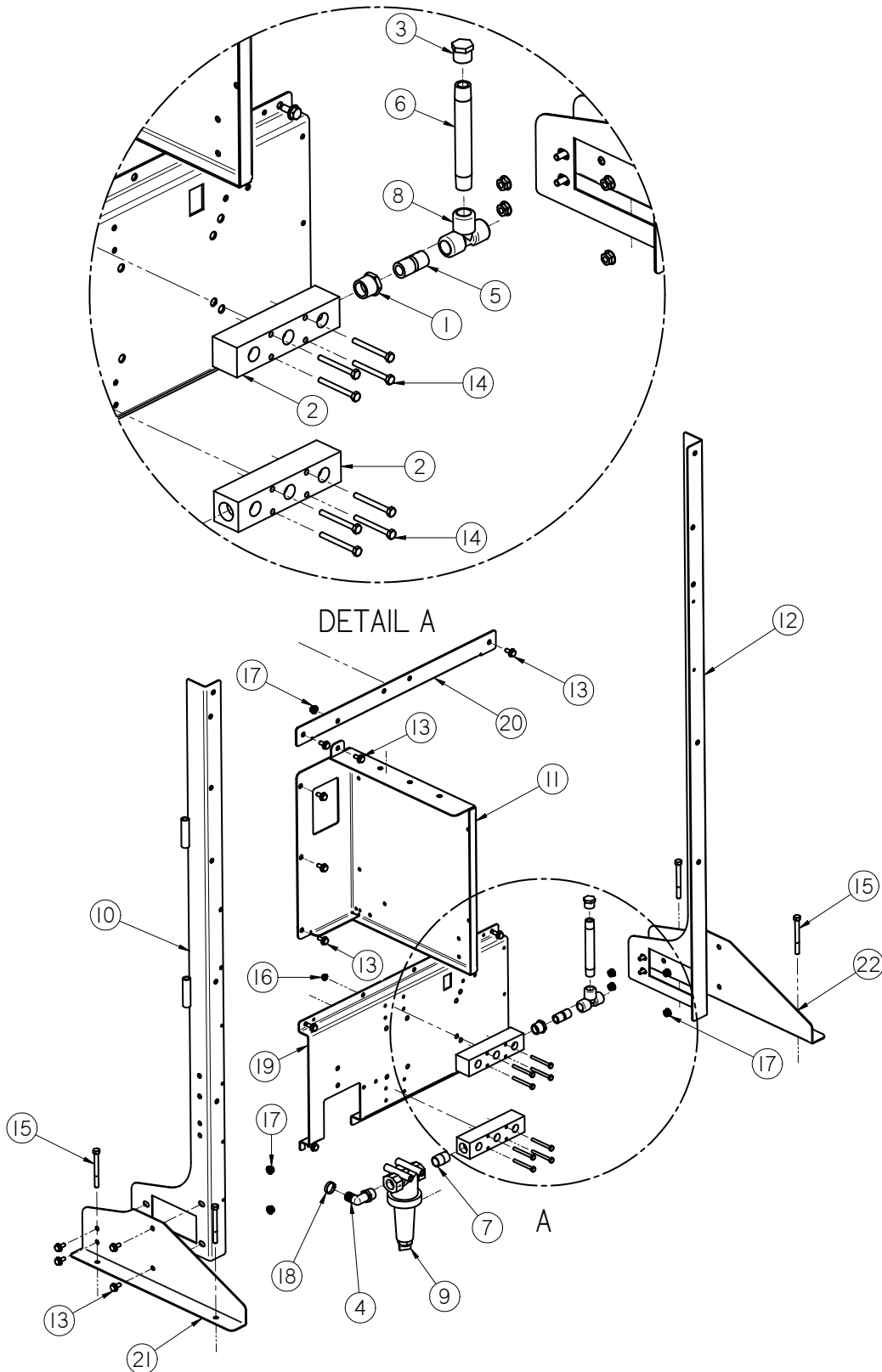


UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

U-TOTE FLOOR MOUNT FRAME ASSEMBLY - 1 PUMPHEAD (05-03-1376)

Item #	Part #	Description	Qty
1	02-04-0024	BUSH .750-14 NPT .500-14 NPT BP	1
2	02-06-0015	BARB, .750-14 NPT X .750 90DEG WP	1
3	02-12-0011	FLTR TEE PPE .750 NPT 16 MESH BANJO	1
4	02-15-0016	FTTG CPLG .500 NPT QCK DISC BODY	1
5	02-15-0022	FTTG CPLG .375 HB X 90 QCK DISC INSERT	1
6	05-03-1052	WDMT SMALL PUMPSTAND LH UPRIGHT	1
7	05-03-1064	WDMT PANEL MNT PUMPSTD	1
8	05-03-1074	WDMT SMALL PUMPSTAND RH UPRIGHT	1
9	06-01-0124	BOLT, FLG .375-16 UNC ZP GRADE 5; 3/4" LG	18
10	06-01-0220	BOLT .375-16 X 3.75 CONCRETE ZP	4
11	06-01-0248	BOLT, .3125-18 UNC ZP G5; 4.00" LG	2
12	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	9
13	06-03-0019	NUT LOCK FLG .3125-18 ZP GR5	2
14	06-07-0030	HOSE CLAMP ONE EAR 1.004-1.126	1
15	102200	BRKT PUMP ALL HEADS PUMPSTD	1
16	10220E	PLT XBEAM SUPP VLV PUMPSTD	1
17	102F03	PLT FOOT PAD FLR MNT BASE LH	1
18	102F04	PLT FOOT PAD FLR MNT BASE RH	1

U-TOTE FLOOR MOUNT FRAME ASSEMBLY - 2 OR 3 PUMPHEADS (05-03-1377)

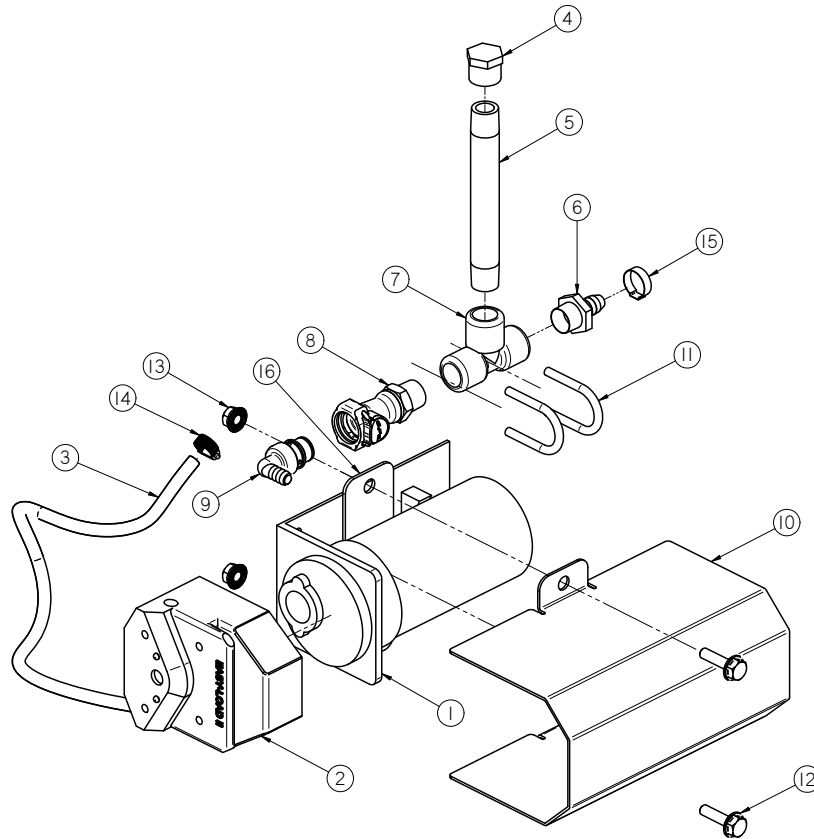


U-TOTE FLOOR MOUNT FRAME ASSEMBLY - 2 OR 3 PUMPHEADS (05-03-1377)

Item #	Part #	Description	Qty
1	02-04-0008	BUSHING .750-14 NPT, REDUCER .500-14 NPT	1
2	02-05-0043	FTTG MANIFOLD UHMW 1 IN 3 OUT	2
3	02-05-0086	FTTG END CAP .500 NPT BP	1
4	02-06-0015	FTTG 90 DEG .750HB X .750NPT ML NYL	1
5	02-07-0009	FTTG NIP .500 NPT X 1.75 TBE BLK	1
6	02-07-0060	FTTG NIP .500 NPT X 6.00 TBE PVC	1
7	02-07-0070	FTTG NIP .750 NPT X 1.50 TBE SS	1
8	02-09-0005	F TTG TEE .500 NPT PPE	1
9	02-12-0011	FLTR TEE PPE .750 NPT 16 MESH BANJO	1
10	05-03-1052	WDMT SMALL PUMPSTAND LH UPRIGHT	1
11	05-03-1064	WDMT PANEL MNT PUMPSTD	1
12	05-03-1074	WDMT SMALL PUMPSTAND RH UPRIGHT	1
13	06-01-0124	BOLT, FLG .375-16 UNC ZP GRADE 5; 3/4" LG	18
14	06-01-0192	BOLT .250-20 X 2.50 ZP GR5	8
15	06-01-0220	BOLT .375-16 X 3.75 CONCRETE ZP	4
16	06-03-0013	NUT,LOCK, FLG .250-20 ZP SERRATED	8
17	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	9
18	06-07-0030	HOSE CLAMP ONE EAR 1.004-1.126	1
19	102200	BRKT PUMP ALL HEADS PUMPSTD	1
20	10220E	PLT XBEAM SUPP VLV PUMPSTD	1
21	102F03	PLT FOOT PAD FLR MNT BASE LH	1
22	102F04	PLT FOOT PAD FLR MNT BASE RH	1

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

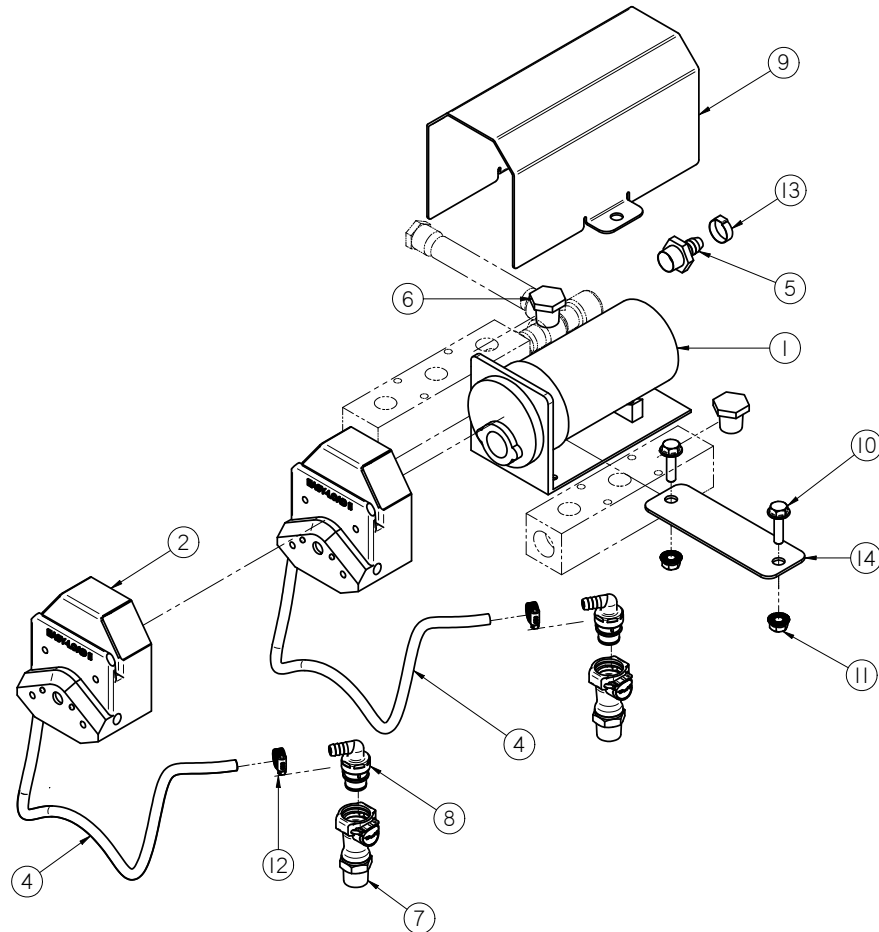
PERISTALTIC PUMP HEAD & MOTOR ASSEMBLY - SINGLE HEAD (13-04-0105)



Item #	Part #	Description	Qty
1	01-01-0010	MTR .1HP 6-600RPM 90VDC	1
2	02-01-0005	PUMP HEAD PRST MF LS 115V 600RPM	1
3	02-03-0001	TUBE MASTERFLEX PUMPHEAD	4
4	02-05-0086	FTTG END CAP .500 NPT BP	1
5	02-07-0060	FTTG NIP .500 NPT X 6.00 TBE PVC	1
6	02-08-0007	FTTG STGHT .500HB X .500NPT ML NYL	1
7	02-09-0005	FTTG TEE .500 NPT PPE	1
8	02-15-0016	FTTG CPLG .500 NPT QCK DISC BODY	1
9	02-15-0022	FTTG CPLG .375 HB X 90 QCK DISC INSERT	1
10	05-06-0101	WDMT PUMP MTR COVER	1
11	06-01-0120	U BOLT 1/4-20 1-1/8 INSIDE 2" LG	2
12	06-01-0189	BOLT, FLG .375-16 UNC ZP GRADE 5; 1-1/4" LG	2
13	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	2
14	06-07-0005	CLMP HOSE .219 TO .625 X .313W ZP	2
15	06-07-0029	HOSE CLAMP ONE EAR, .716-.827	1
16	102276	BRKT PUMP MOUNT PUMPSTD	1

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

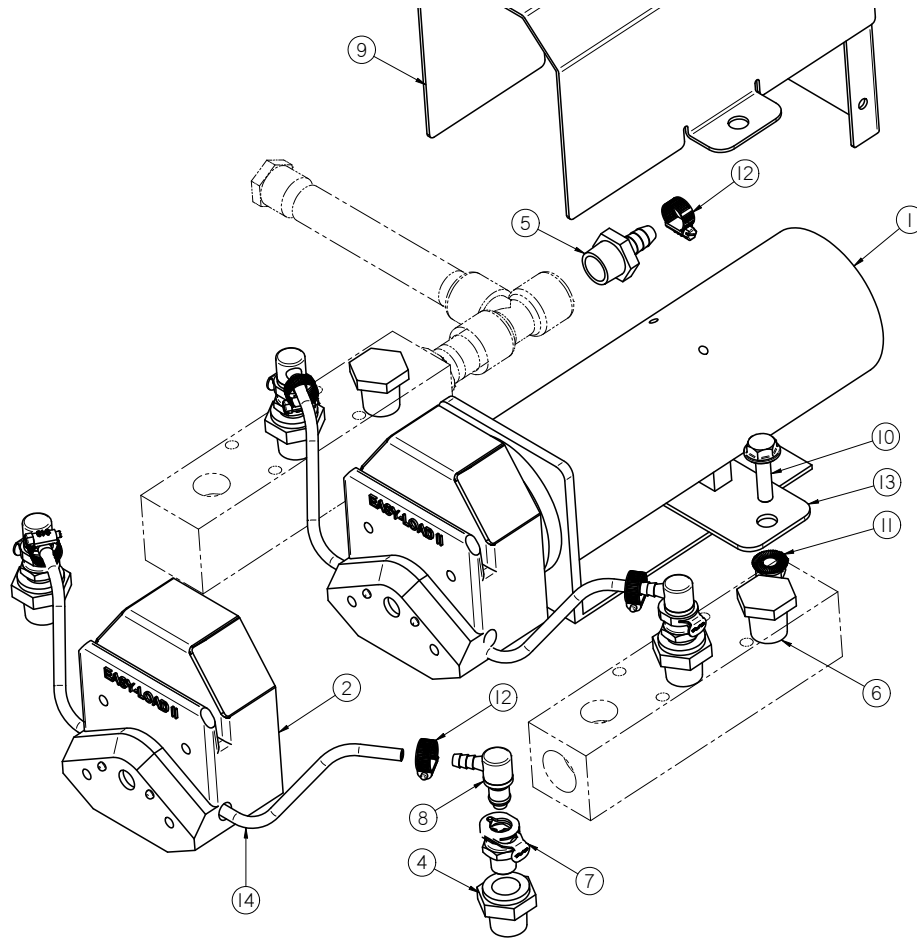
PERISTALTIC PUMP HEAD & MOTOR ASSEMBLY - DUAL HEAD (13-04-0104)



Item #	Part #	Description	Qty
1	01-01-0010	MTR .1HP 6-600RPM 90VDC	1
2	02-01-0005	PUMP HEAD PRST MF LS 115V 600RPM	2
3	02-01-0013	PUMP DUAL MF HARDWARE SS - LS HEAD	1
4	02-03-0001	TUBE MASTERFLEX PUMPHEAD	5
5	02-08-0007	FTTG STGHT .500HB X .500NPT ML NYL	1
6	02-14-0002	FTTG PLUG HH .500 NPT PPE BLK*	2
7	02-15-0016	FTTG CPLG .500 NPT QCK DISC BODY	4
8	02-15-0022	FTTG CPLG .375 HB X 90 QCK DISC INSERT	4
9	05-06-0101	WDMT PUMP MTR COVER	1
10	06-01-0189	BOLT, FLG .375-16 UNC ZP GRADE 5; 1-1/4" LG	2
11	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	2
12	06-07-0005	CLMP HOSE .219 TO .625 X .313W ZP	4
13	06-07-0029	HOSE CLAMP ONE EAR, .716-.827	1
14	102276	BRKT PUMP MOUNT PUMPSTD	1

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

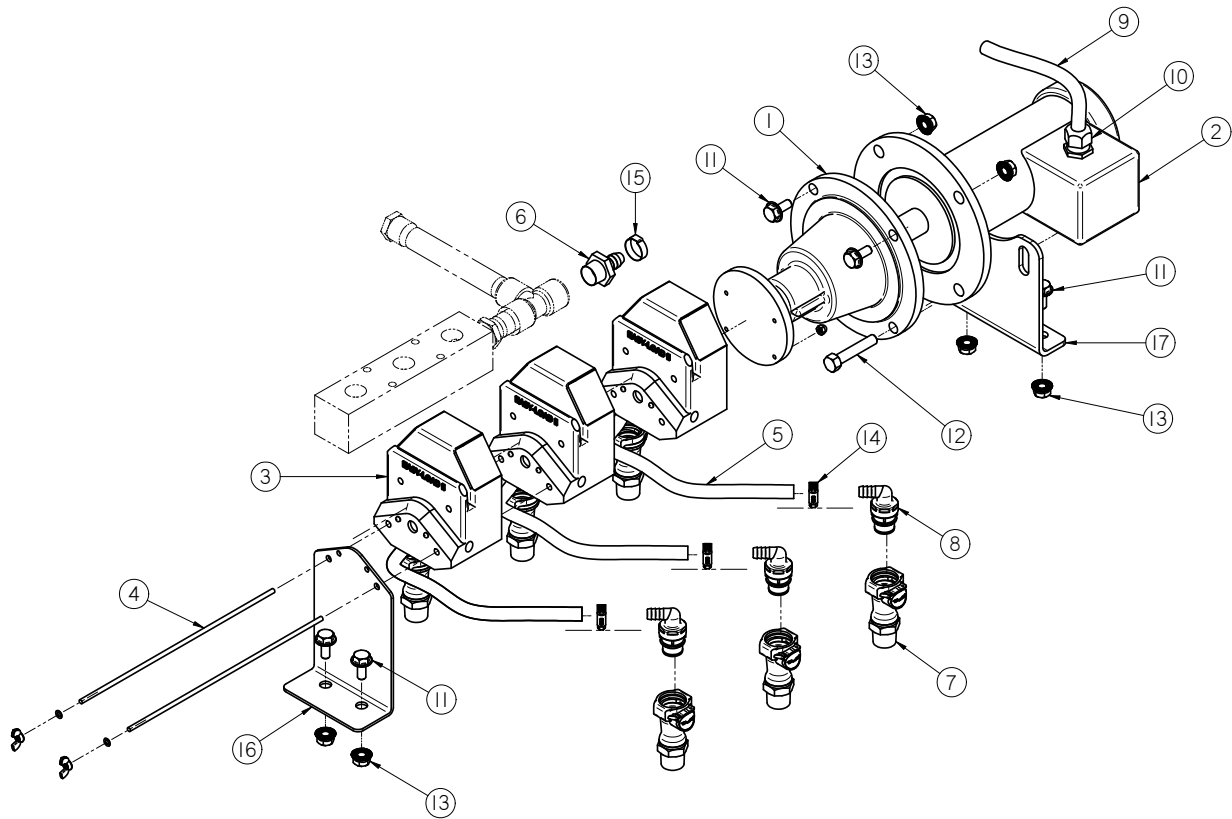
PERISTALTIC PUMP HEAD & MOTOR ASSEMBLY - LOW FLOW (13-04-0197)



Item #	Part #	Description	Qty
1	01-01-0207	MOTOR MASTERFLEX 1-100 RPM 90VDC	1
2	02-01-0005	PUMP HEAD PRST MF LS 115V 600RPM	2
3	02-01-0013	PUMP DUAL MF HARDWARE SS - LS HEAD	1
4	02-04-0001	FTTG BUSH .500NPT X.250NPT BP	4
5	02-08-0005	FTTG STGHT .375HB X .500NPT ML NYL	1
6	02-14-0002	FTTG PLUG HH .500 NPT PPE BLK*	2
7	02-15-0026	.25NPT POLY BODY SOVLV .25NOM	4
8	02-15-0027	.25HB 90DEG POLY INS STTRU .25NOM	4
9	05-06-0101	WDMT PUMP MTR COVER	1
10	06-01-0189	BOLT, FLG .375-16 UNC ZP GRADE 5; 1-1/4" LG	2
11	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	2
12	06-07-0005	CLMP HOSE .219 TO .625 X .313W ZP	5
13	102276	BRKT PUMP MOUNT PUMPSTD	1
14	103AAE	TUBE MASTERFLEX PUMPHEAD	4

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

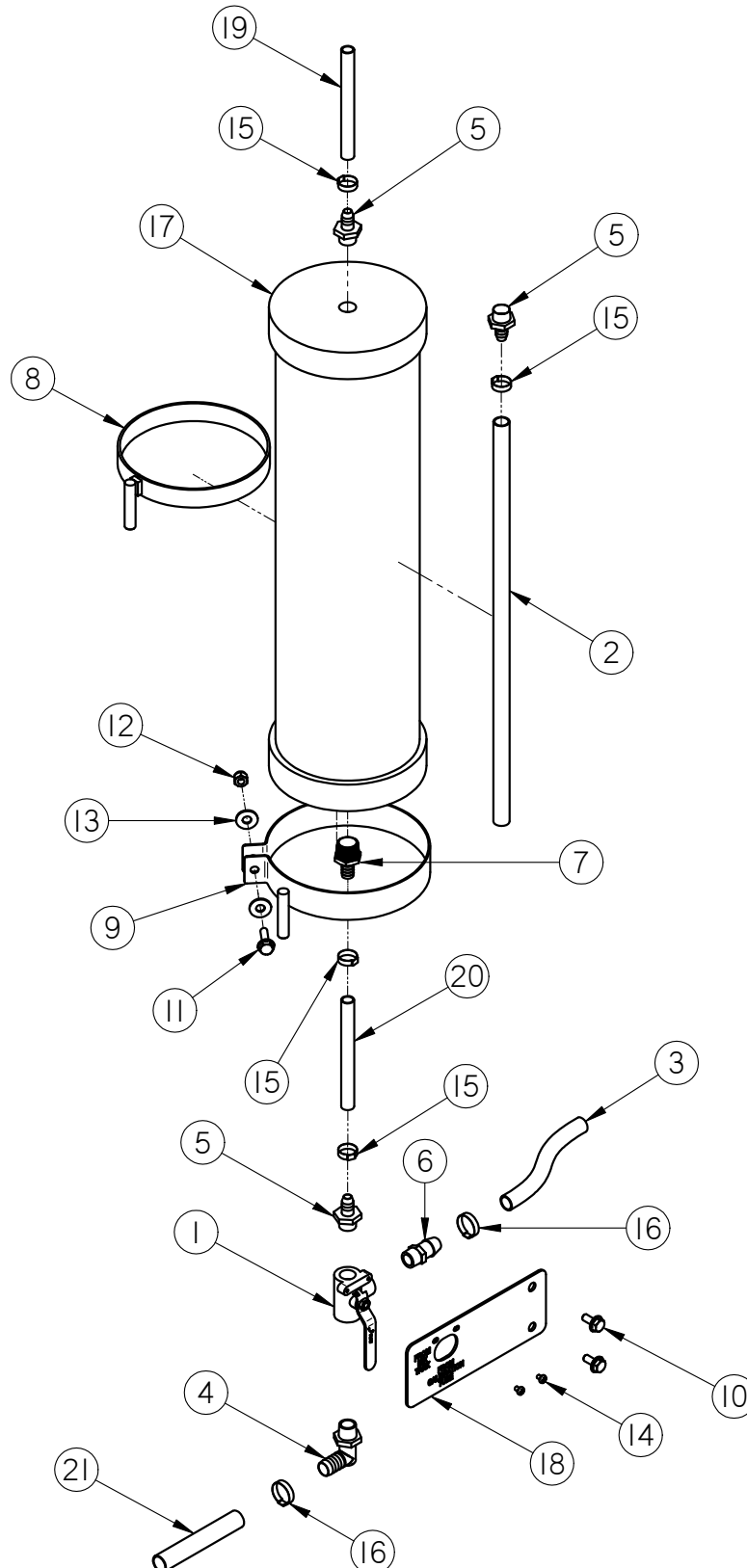
PERISTALTIC PUMP HEAD & MOTOR ASSEMBLY - TRIPLE HEAD (13-04-0103)



Item #	Part #	Description	Qty
1	01-01-0066	SPEED REDUCER, 3.7 TO 1	1
2	01-01-0160	MTR .25HP 2500 RPM 34 90VDC	1
3	02-01-0005	PUMP HEAD PRST MF LS 115V 600RPM	3
4	02-01-0033	PUMP 3 MF HARDWARE SS - LS HEAD	1
5	02-03-0001	HOSE MF .375 NPRN BLK - LS35 .31 ID	6
6	02-08-0007	FTTG STGHT .500HB X .500NPT ML NYL	1
7	02-15-0016	FTTG CPLG .500 NPT QCK DISC BODY	6
8	02-15-0022	FTTG CPLG .375 HB X 90 QCK DISC INSERT	6
9	03-07-0013	CORDSEO143 (KD) 14/3 SEO WIRE CORD	1
10	03-08-0064	CONN CG PLASTIC 0.5NPT .200-.472	1
11	06-01-0124	BOLT, FLG .375-16 UNC ZP GRADE 5; 3/4" LG	6
12	06-01-0137	BOLT .375-16 X 2.00 ZP GR5 FULL THRD	2
13	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	8
14	06-07-0005	CLMP HOSE .219 TO .625 X .313W ZP	6
15	06-07-0029	HOSE CLAMP ONE EAR, .716-.827	1
16	102213	BRKT 3PUMPHEAD MNT PUMPSTD	1
17	102214	BRKT 3HEAD MOTOR MNT PUMPSTD	1

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

CALIBRATION TUBE ASSEMBLY (13-04-0106)



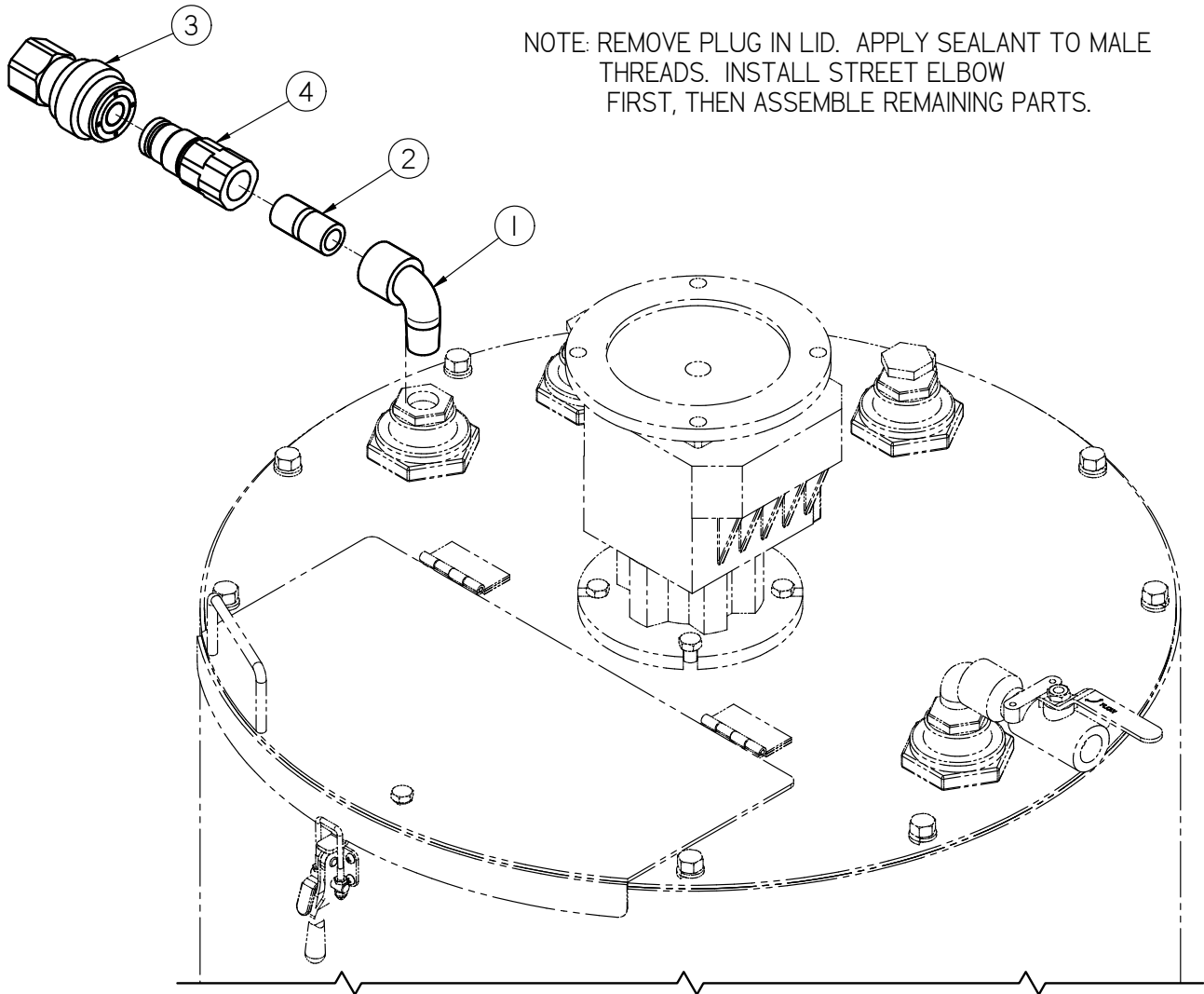
UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

CALIBRATION TUBE ASSEMBLY (13-04-0106)

Item #	Part #	Description	Qty
1	02-02-0007	VLV BALL .500 NPT 3WAY BRSS	1
2	02-03-0005	TUBE,CALIBRATION TUBE INSIDE	1
3	02-03-0006	HOSE RNT .750 CLEAR	1
4	02-06-0014	FTTG 90 DEG .750HB X .500NPT ML NYL	1
5	02-08-0007	FTTG STGHT .500HB X .500NPT ML NYL	3
6	02-08-0011	FTTG STGHT .750HB X .500NPT ML*	1
7	02-08-0021	FTTG STGHT .500 HB X .750NPT WP	1
8	05-08-0006	WDMT,INOC.BRK,SM	1
9	05-08-0007	WDMT,BRK,INOC LG	1
10	06-01-0124	BOLT, FLG .375-16 UNC ZP GRADE 5; 3/4" LG	2
11	06-01-0189	BOLT, FLG .375-16 UNC ZP GRADE 5; 1-1/4" LG	1
12	06-03-0003	NUT NYL LOCK .375-16 ZP GR5	1
13	06-05-0004	WSHR FLAT .375 ZP	2
14	06-06-0008	SCRW MACH 10-24 X .250 PHLP PHD ZP	2
15	06-07-0029	HOSE CLAMP ONE EAR, .716-.827	4
16	06-07-0030	HOSE CLAMP ONE EAR 1.004-1.126	2
17	07-02-0006	CALIBRATION TUBE,10K ML - 2005	1
18	102290	PLT LABEL SOURCE PUMPSTD	1
19	102A39	CAL TUBE TO CNTLS	1
20	102A3A	CAL TUBE TO FRAME	1
21	102C9E	FRAME TO TANK	1

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

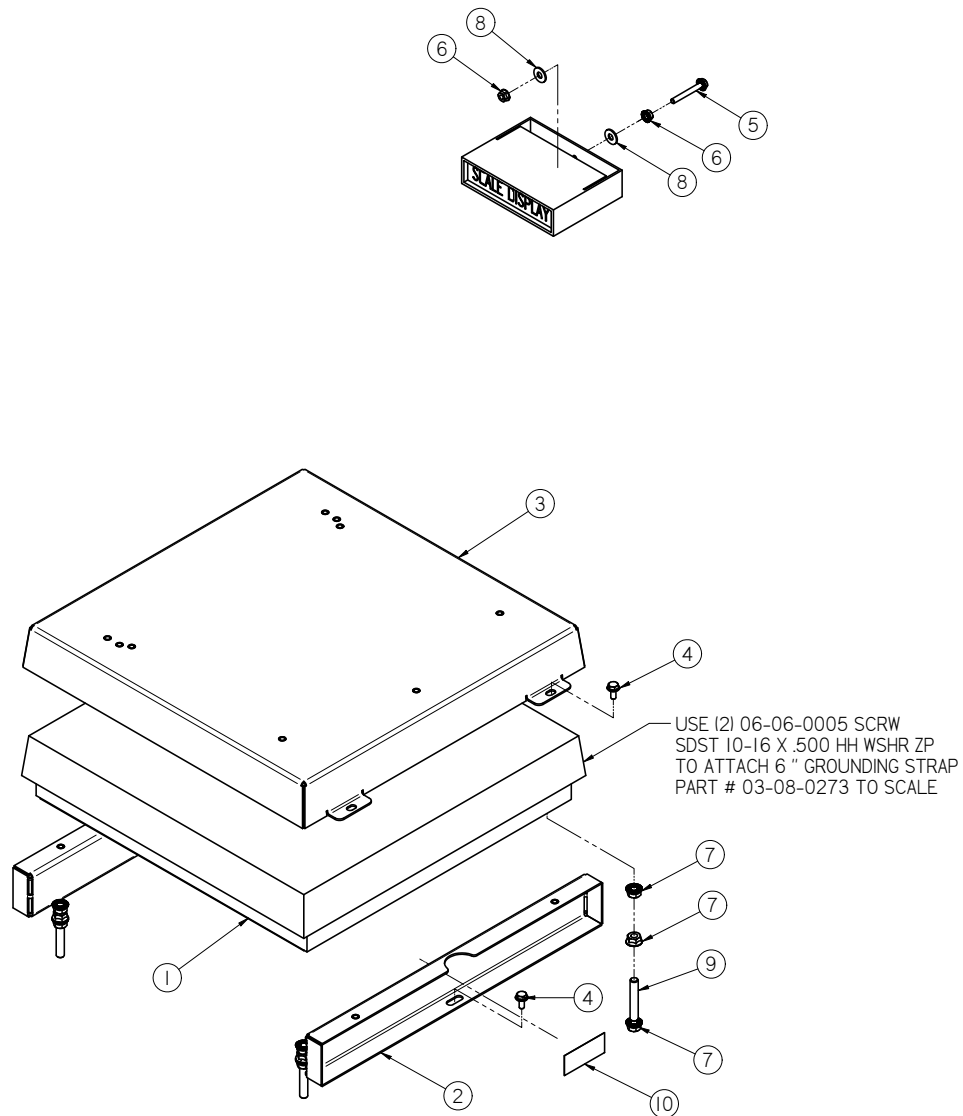
MIX TANK DRY LOCK FITTINGS (13-10-0017)



Item #	Part #	Description	Qty
1	02-06-0017	1/2-14 NPT,SL 90 DEG. BP	1
2	02-07-0009	FTTG NIP .500 NPT X 1.75 TBE BLK	1
3	02-15-0035	FTTG CPLG 0.50 NPT FM PARKER POLY	1
4	02-15-0036	FTTG CPLG 0.50 NPT ML PARKER POLY	1

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

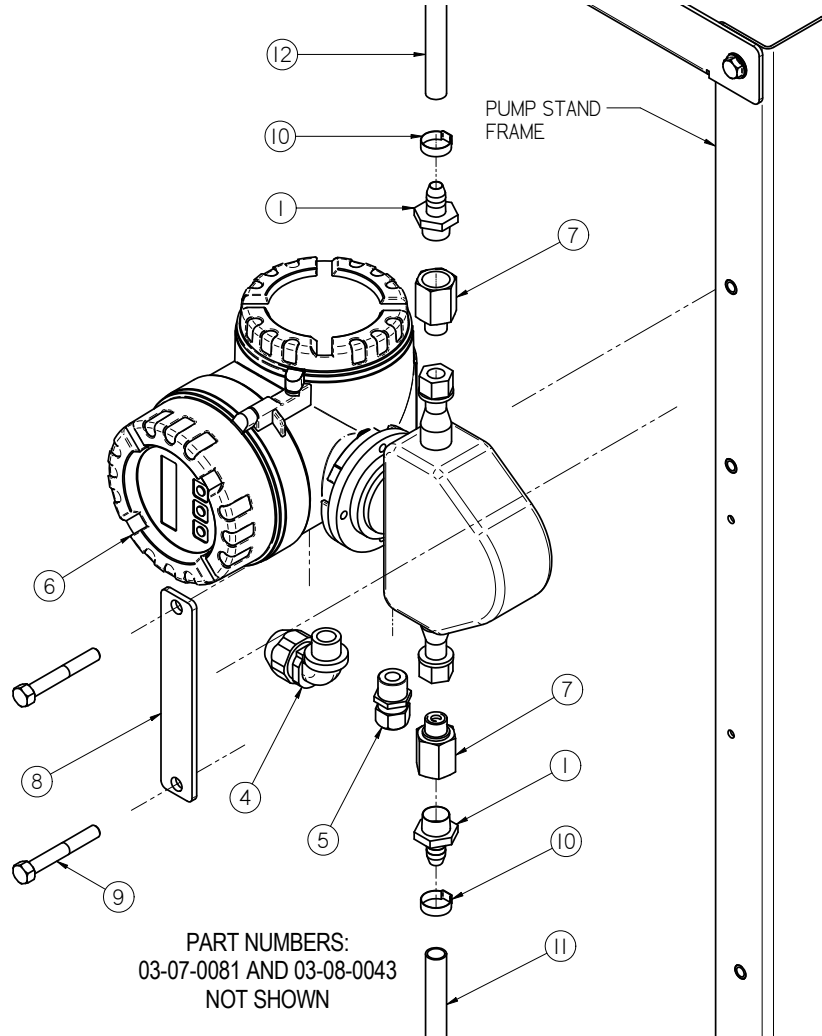
SCALE ASSEMBLY (05-03-1069)



Item #	Part #	Description	Qty
1	03-19-0055	SCL CARDINAL EB-1024 24 X 24 X 1000	1
2	05-03-1072	ASSY SPACER PUMPSTD	1
3	05-03-1073	WDMT SCALE LID PUMPSTD	1
4	06-01-0124	BOLT, FLG .375-16 UNC ZP GRADE 5; 3/4" LG	6
5	06-01-0204	BOLT FLG .375-16 X 2.50 ZP GR5 FTH	1
6	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	2
7	06-03-0015	NUT LOCK FLG .500-13 ZP GR5	12
8	06-05-0004	WSHR FLAT .375 ZP	2
9	06-14-0018	STUD .500-13 ZP X 3.00	4
10	09-02-0020	LBL ATWRK ATT SCALE BRKT	2

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

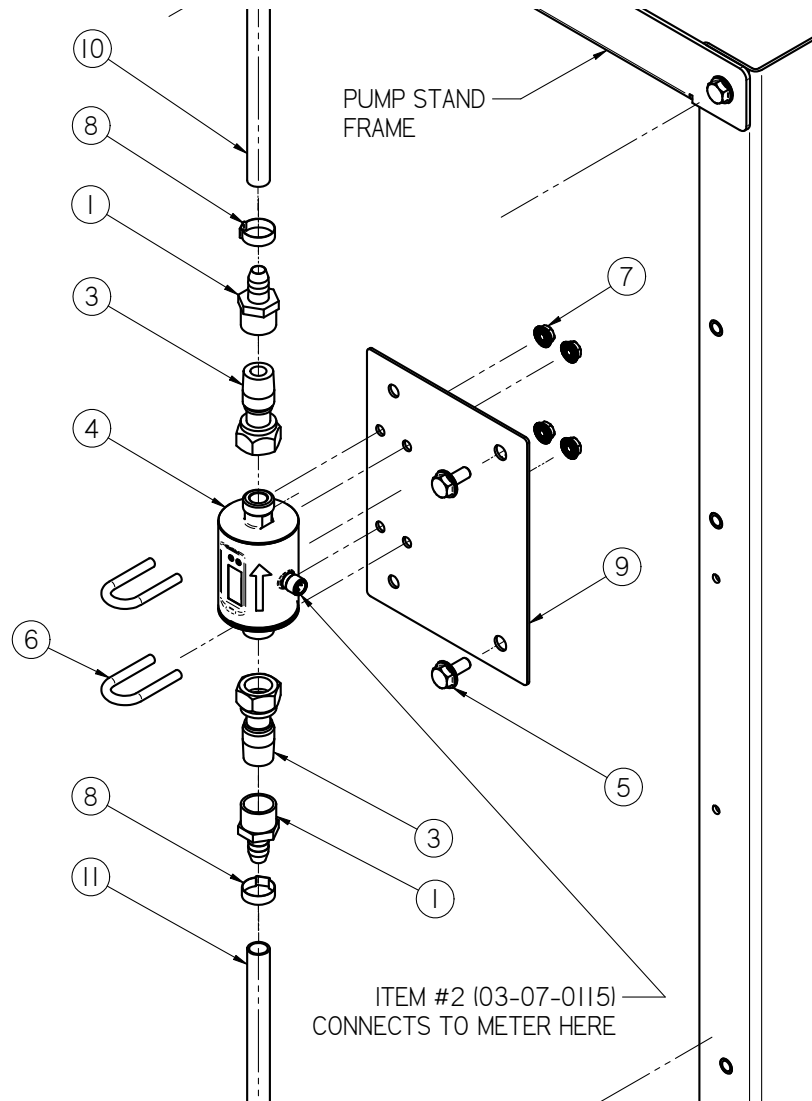
MASS FLOW METER ASSEMBLY (05-03-1067)



Item #	Part #	Description	Qty
1	02-08-0007	FTTG STGHT .500HB X .500NPT ML NYL	2
2	03-07-0081	CORD 3COND 18AWG SJ00W 300V	1
3	03-08-0043	CNDT .500 NM FLX	1
4	03-08-0044	CNDT .500 FTTG NM 90DEG NM	1
5	03-08-0064	CONN CG PLASTIC 0.5NPT .200-.472	1
6	03-18-0019	FLMT PROMASS 80E08 DN8	1
7	03-18-0021	FTTG ADPTR 1/2" VC0 X 1/2" FPT E+H	2
8	05-10-3413	BRACKET FLMT CLAMP E&H 83E	1
9	06-01-0116	BOLT .375-16 X 2.75 ZP GR5	2
10	06-07-0029	HOSE CLAMP ONE EAR, .716-.827	2
11	1022AE	MASS FLMT TO PUMPS	1
12	102342	MASS FLMT TO CNTLS	1

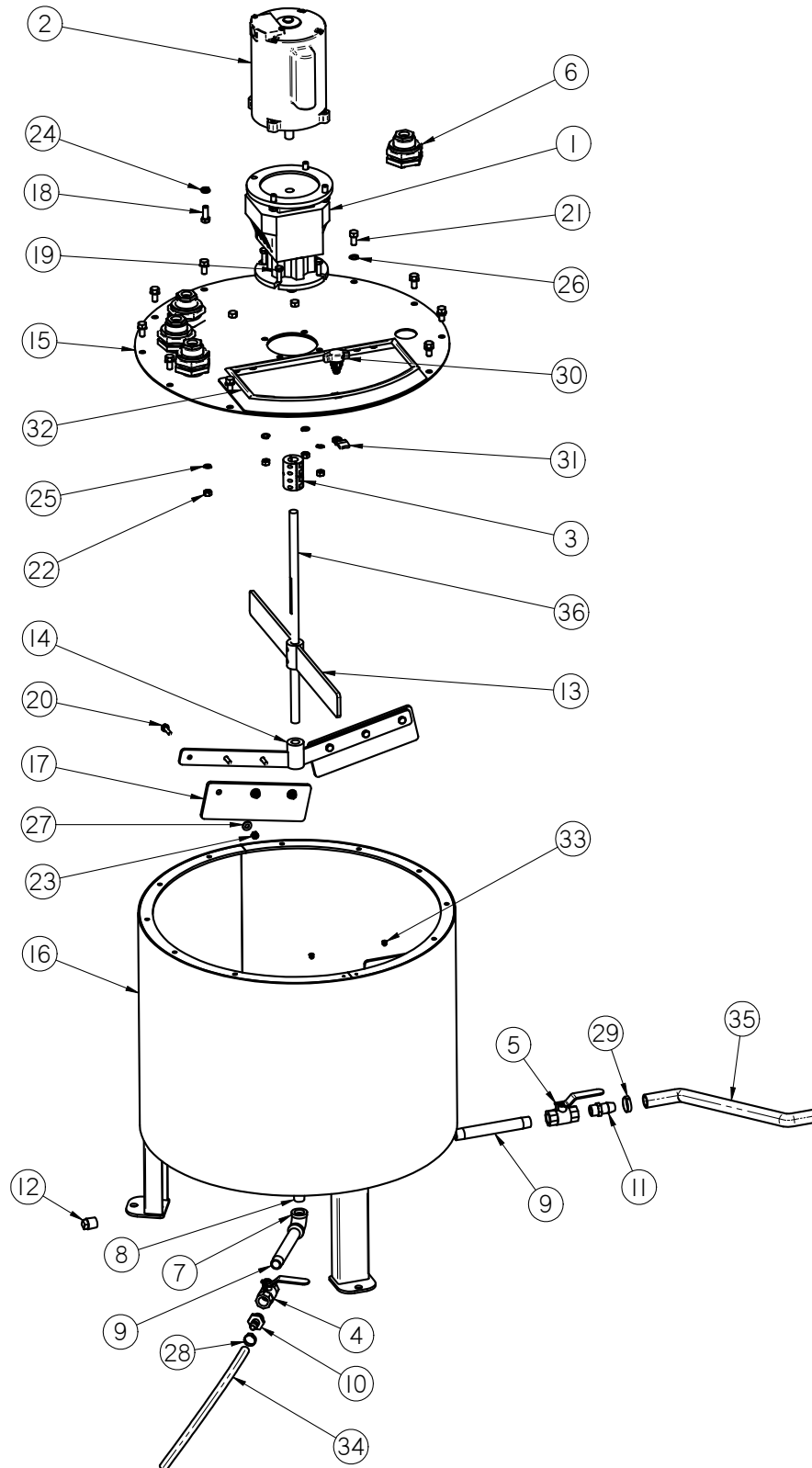
UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

VOLUMETRIC FLOW METER ASSEMBLY (05-03-1181)



Item #	Part #	Description	Qty
1	02-08-0026	FTTG STGHT .500HB X .500NPT FM NYL	2
2	03-07-0115	CORD MOLDED M12 IFM EVC001	1
3	03-18-0020	FTTG ADPTR G1/2 TO 1/2NPT ML IFM	2
4	03-18-0025	FLMT IFM EFECTOR SM6000 AE 1/2 IN	1
5	06-01-0124	BOLT, FLG .375-16 UNC ZP GRADE 5; 3/4" LG	2
6	06-01-0199	BOLT U .313-18 X 1.00 X .375 ZP GR5	2
7	06-03-0013	NUT,LOCK, FLG .250-20 ZP SERRATTED	4
8	06-07-0029	HOSE CLAMP ONE EAR, .716-.827	2
9	1029CF	BRKT MNT	1
10	102A3B	VOL FLMT TO CNTLS	1
11	102A3C	VOL FLMT TO PUMPS	1

STAINLESS STEEL MIX TANK ASSEMBLY - 30 GALLON (04-03-0180)

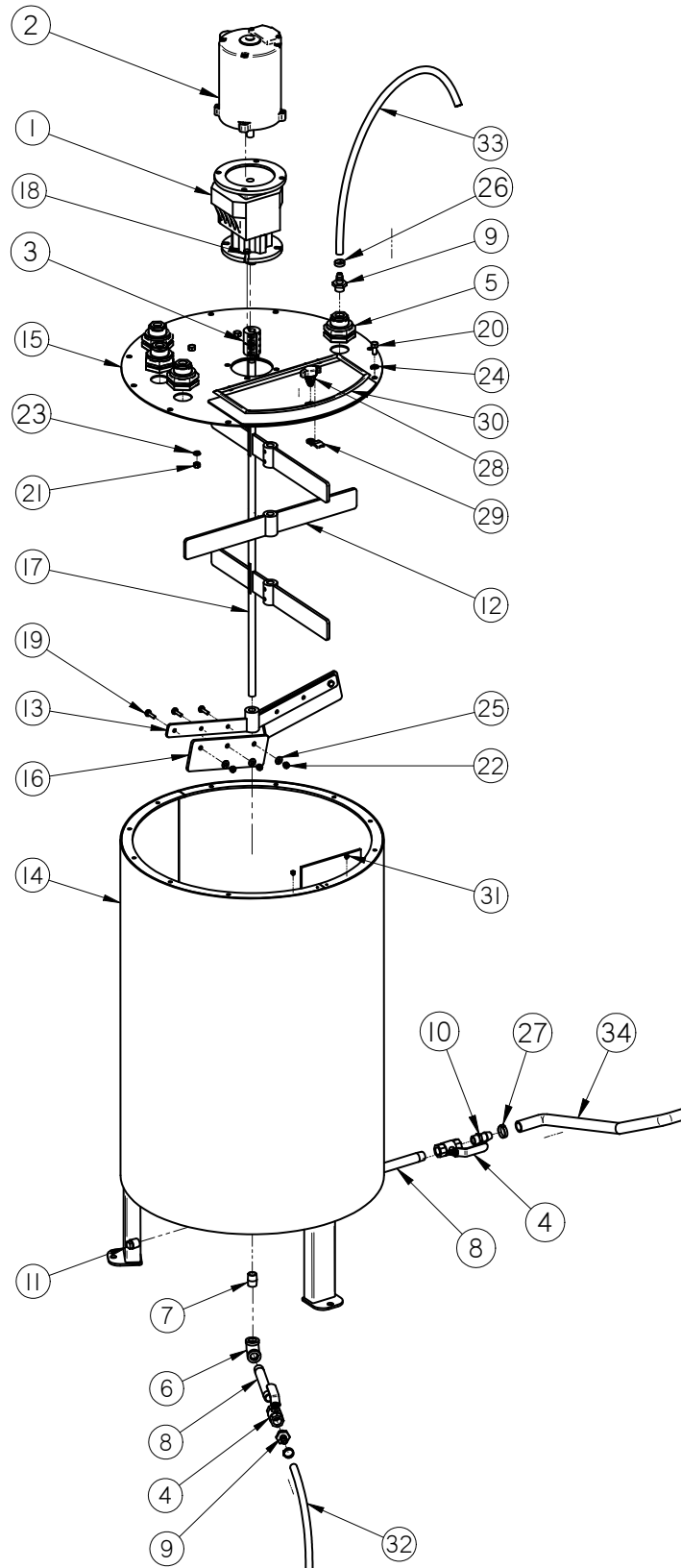


UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

STAINLESS STEEL MIX TANK ASSEMBLY - 30 GALLON (04-03-0180)

Item #	Part #	Description	Qty
1	01-01-0039	GBOX IL 61.8:1 56C OTP 56C INP	1
2	01-01-0080	MTR .33HP 1725RPM 56C 1PH TEFC	1
3	01-07-0015	CPLG CLPN .625 X .750 X 1.50OD SS	1
4	02-02-0006	.500-14 NPT X 2-WAY VALVE	1
5	02-02-0006	VLV BALL .500 NPT 2WAY BRSS	1
6	02-05-0028	FTTG .500 NPT DBL THD PPE BULKHEAD	4
7	02-06-0012	ELBOW, .500-14 NPT, 90 DEG. SS	1
8	02-07-0007	FTTG NIP .500 NPT X 1.125 TBE SS	1
9	02-07-0015	FTTG NIP .500 NPT X 6.00 TBE SS	2
10	02-08-0007	FTTG STGHT .500HB X .500NPT ML NYL	1
11	02-08-0011	1/2-14 NPT, 3/4 BARB, STRAIGHT BP	1
12	02-14-0001	FTTG PLUG SQHD .500 NPT SS	1
13	05-03-0069	WDMT 50GAL MIDDLE STIR ARM	1
14	05-03-0070	WDMT 50GAL LOWER STIR ARM	1
15	05-03-1079	ASSY SS TANK LID 30-60 GAL	1
16	05-03-1384	WDMT BASE 30GAL TANK	1
17	05-10-0878	PDL 50GAL WIPER	2
18	06-01-0016	BOLT .375-16 X 1.00 ZP GR5	4
19	06-01-0083	BOLT .313-18 X 1.00 SS 18-8	4
20	06-01-0051	BOLT .250-20 X 1.00 SS 316	6
21	06-01-0042	BOLT, .375-16 X .750 18-8 SS	10
22	06-02-0017	NUT FULL .313-18 SS 18-8	4
23	06-03-0007	NUT NYL LOCK .250-20 SS 18-8	6
24	06-04-0003	WSHR LOCK SPLT .375 ZP	4
25	06-04-0010	WSHR LOCK SPLT .313 SS 18-8	4
26	06-04-0008	WSHR LOCK SPLT .375 SS 18-8	10
27	06-05-0002	WSHR FLAT .250 X .625OD SS 18-8	6
28	06-07-0029	HOSE CLAMP ONE EAR, .716-.827	1
29	06-07-0030	HOSE CLAMP ONE EAR 1.004-1.126	1
30	06-09-0075	KNOB WING LATCH	1
31	06-09-0076	KNOB WING CAM	1
32	06-10-0001	SEAL RBBR BULBS CHAR .500 X .250	1
33	06-12-0011	RIVET POP .188 X .750 GRIP SS	2
34	1022B2	DRAIN HOSE PUMP STAND	1
35	102C1B	HOSE TANK TO VLV	1
36	102EAC	ROD 30GAL DRV	1

STAINLESS STEEL MIX TANK ASSEMBLY - 60 GALLON (04-03-0173)

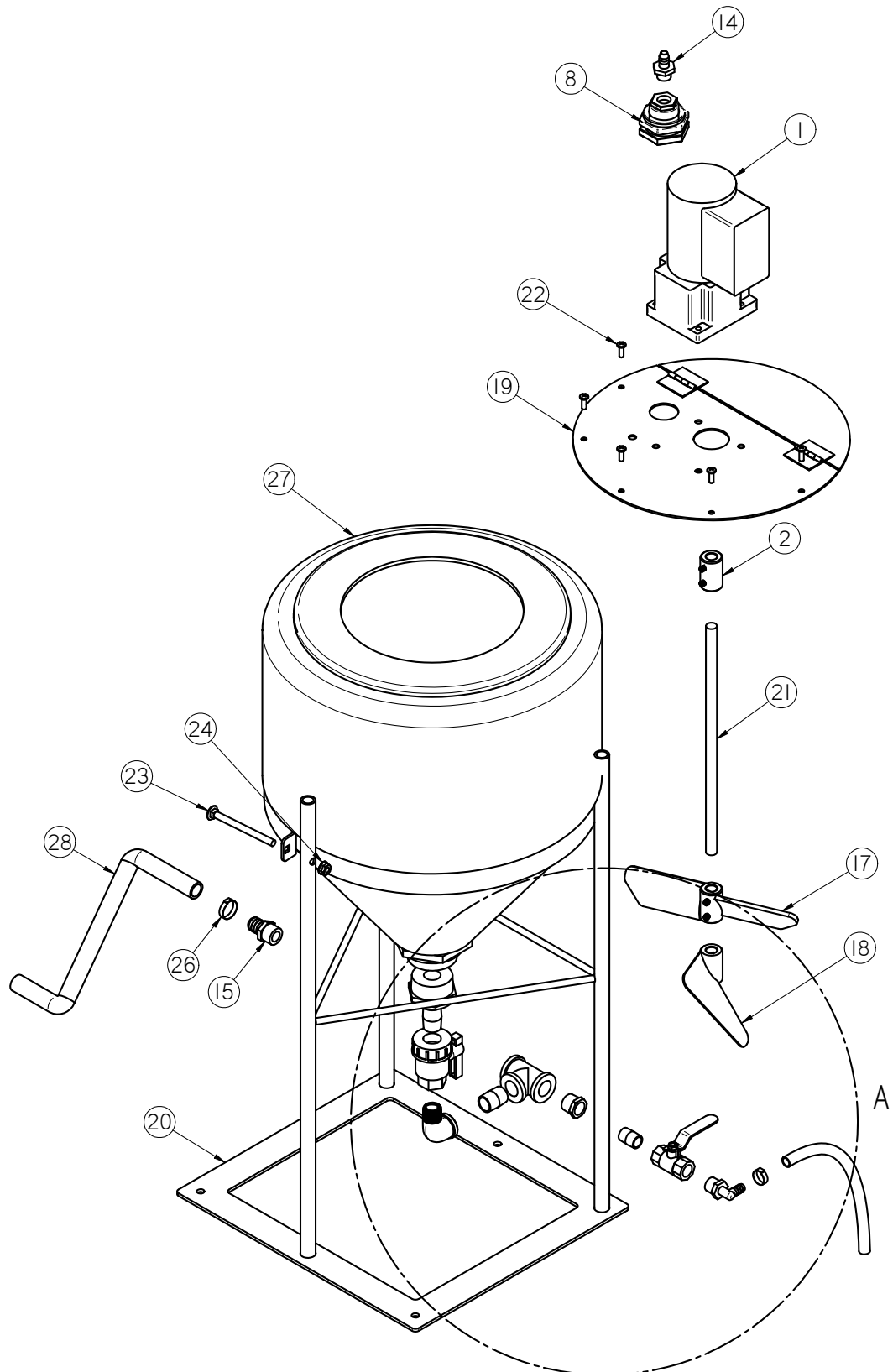


UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

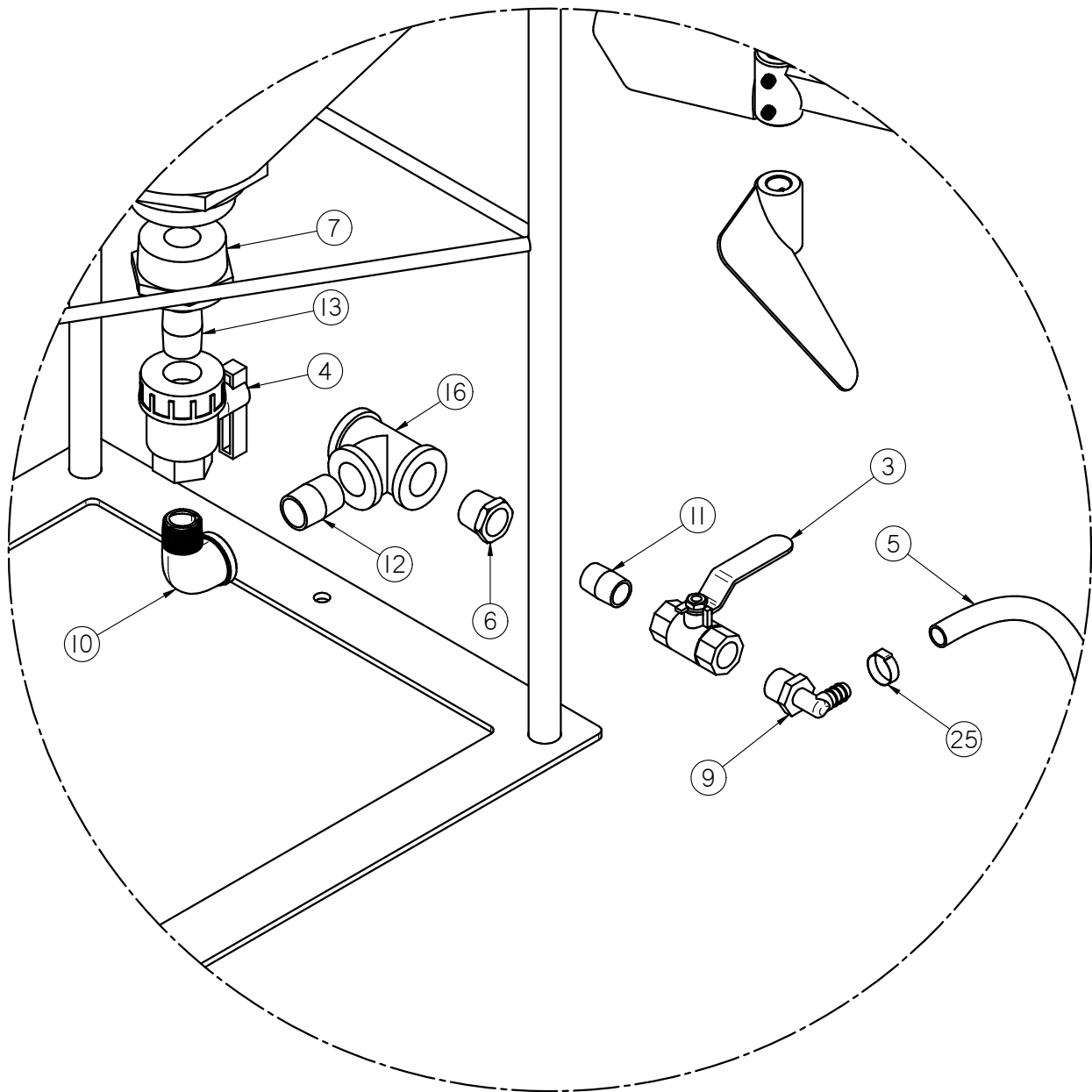
STAINLESS STEEL MIX TANK ASSEMBLY - 60 GALLON (04-03-0173)

Item #	Part #	Description	Qty
1	01-01-0039	GBOX IL 61.8:1 56C OTP 56C INP	1
2	01-01-0080	MTR .33HP 1725RPM 56C 1PH TEFC	1
3	01-07-0015	CPLG CLPN .625 X .750 X 1.50OD SS	1
4	02-02-0006	VLV BALL .500 NPT 2WAY BRSS	2
5	02-05-0028	FTTG .500 NPT DBL THD PPE BULKHEAD	4
6	02-06-0012	ELBOW, .500-14 NPT, 90 DEG. SS	1
7	02-07-0007	FTTG NIP .500 NPT X 1.125 TBE SS	1
8	02-07-0015	FTTG NIP .500 NPT X 6.00 TBE SS	2
9	02-08-0007	FTTG STGHT .500HB X .500NPT ML NYL	2
10	02-08-0011	1/2-14 NPT, 3/4 BARB, STRAIGHT BP	1
11	02-14-0001	FTTG PLUG SQHD .500 NPT SS	1
12	05-03-0069	WDMT 50GAL MIDDLE STIR ARM	3
13	05-03-0070	WDMT 50GAL LOWER STIR ARM	1
14	05-03-1078	WDMT BASE 60GAL TANK	1
15	05-03-1079	ASSY SS TANK LID 30-60 GAL	1
16	05-10-0878	PDL 50GAL WIPER	2
17	05-11-0341	ROD 60GAL DRV	1
18	06-01-0083	BOLT .313-18 X 1.00 SS 18-8	4
19	06-01-00XX	BOLT .250-20 X 1.00 SS 316	6
20	06-01-00XX	BOLT, .375-16 X .750 18-8 SS	11
21	06-02-0017	NUT FULL .313-18 SS 18-8	4
22	06-03-0007	NUT NYL LOCK .250-20 SS 18-8	6
23	06-04-0010	WSHR LOCK SPLT .313 SS 18-8	4
24	06-04-00XX	WSHR LOCK SPLT .375 SS 18-8	11
25	06-05-0002	WSHR FLAT .250 X .625OD SS 18-8	6
26	06-07-0029	HOSE CLAMP ONE EAR, .716-.827	2
27	06-07-0030	HOSE CLAMP ONE EAR 1.004-1.126	1
28	06-09-0075	KNOB WING LATCH	1
29	06-09-0076	KNOB WING CAM	1
30	06-10-0001	SEAL RBBR BULBS CHAR .500 X .250	1
31	06-12-0011	RIVET POP .188 X .750 GRIP SS	2
32	1022B2	DRAIN HOSE PUMP STAND	1
33	1022C0	HOSE SOL VLV TO TANK	1
34	102C1C	HOSE TANK TO VLV	1

15 GALLON POLY TANK ASSEMBLY - WITH AGITATION (04-03-0208)



15 GALLON POLY TANK ASSEMBLY - WITH AGITATION (04-03-0208)



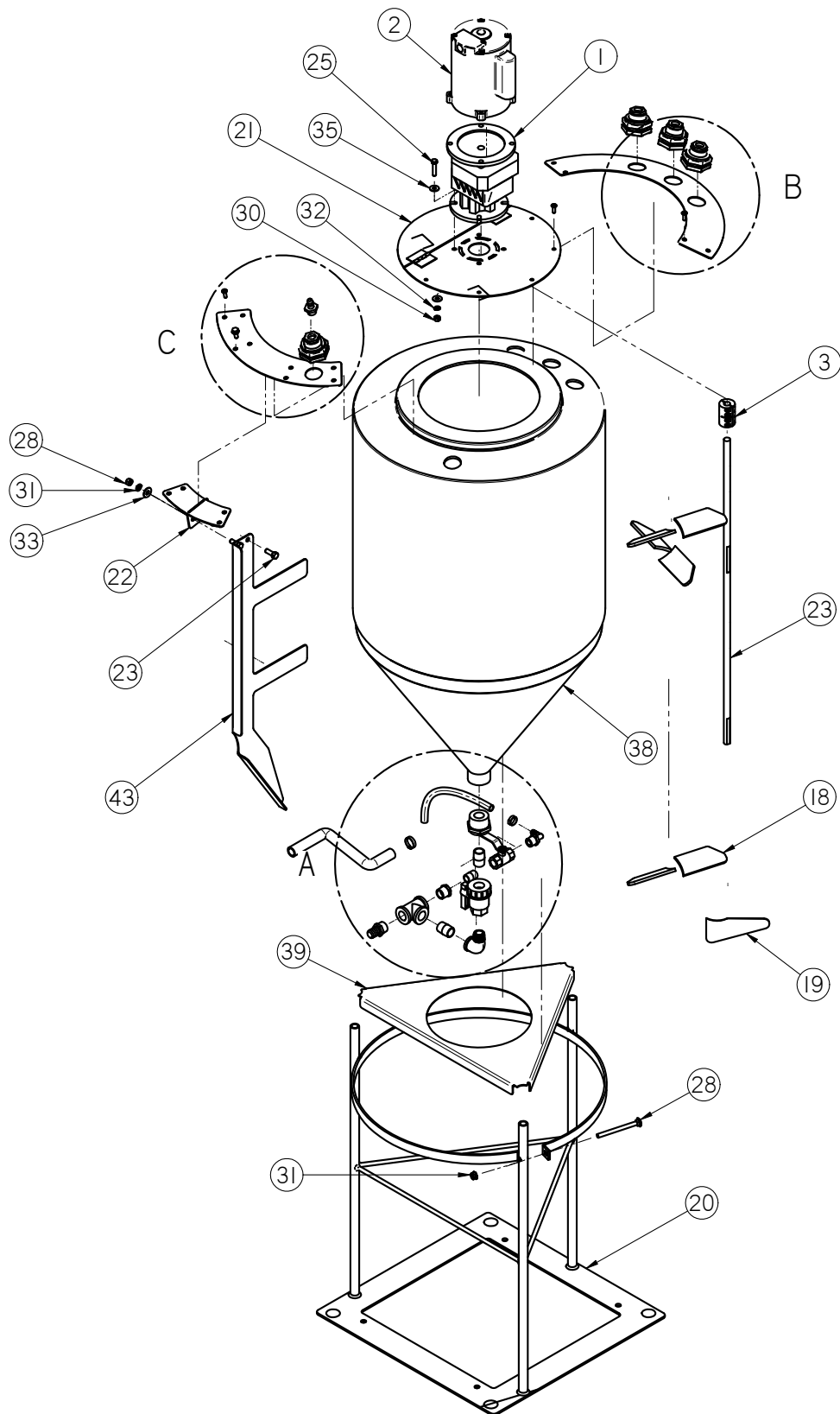
DETAIL A

15 GALLON POLY TANK ASSEMBLY - WITH AGITATION (04-03-0208)

Item #	Part #	Description	Qty
1	01-01-0182	MOTOR .16HP 9075 RPM 1PH	1
2	01-07-0013	CPLG SS .625 SS NO KWW W/ SETSCREWS	1
3	02-02-0006	.500-14 NPT X 2-WAY VALVE	1
4	02-02-0056	VLV BALL .750 NPT FM PLAS	1
5	02-03-0005	DRAIN HOSE PUMP STAND .50	1
6	02-04-0008	BUSHING .750-14 NPT, REDUCER .500-14 NPT	1
7	02-04-0033	FTTG BUSH 2.00NPT X .750NPT PPE	1
8	02-05-0028	FTTG .500 NPT DBL THD PPE BULKHEAD	1
9	02-06-0010	FTTG 90 DEG .500HB X .500NPT ML NYL	1
10	02-06-0068	FTTG 90 DEG STRT .75NPT PPE BLK	1
11	02-07-0007	FTTG NIP .500 NPT X 1.125 TBE SS	1
12	02-07-0025	NIPPLE 3/4" NPT CLOSE 304SS	1
13	02-07-0070	FTTG NIP .750 NPT X 1.50 TBE SS	1
14	02-08-0007	FTTG STGHT .500HB X .500NPT ML NYL	1
15	02-08-0010	3/4-14 NPT TO .750 HB STRAIGHT (NYLON)	1
16	02-09-0008	TEE 3/4 NPT X 3/4 NPT X 3/4 NPT SS	1
17	05-03-1135	WDMT STIR ARM 30GAL POLY	1
18	05-03-1136	WDMT LOWER STIR ARM 30GAL POLY	1
19	05-03-1542	WDMT 15GAL POLY LID WITH AGT	1
20	05-03-1546	WDMT 15 GAL TANK STAND	1
21	05-11-0420	ROD 15GAL DRV	1
22	06-01-0215	SCRW MACH #14 X .750 SS PLASTITE	5
23	06-01-0262	BOLT CRG .375-16 X 4.50 FTH ZP GR5	1
24	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	1
25	06-07-0029	HOSE CLAMP ONE EAR, .716-.827	1
26	06-07-0030	HOSE CLAMP ONE EAR 1.004-1.126	1
27	07-02-0007	TNK 15GAL 60 DEG 2.00 NPT OUT	1
28	102C1F	HOSE TANK TO VLV	1

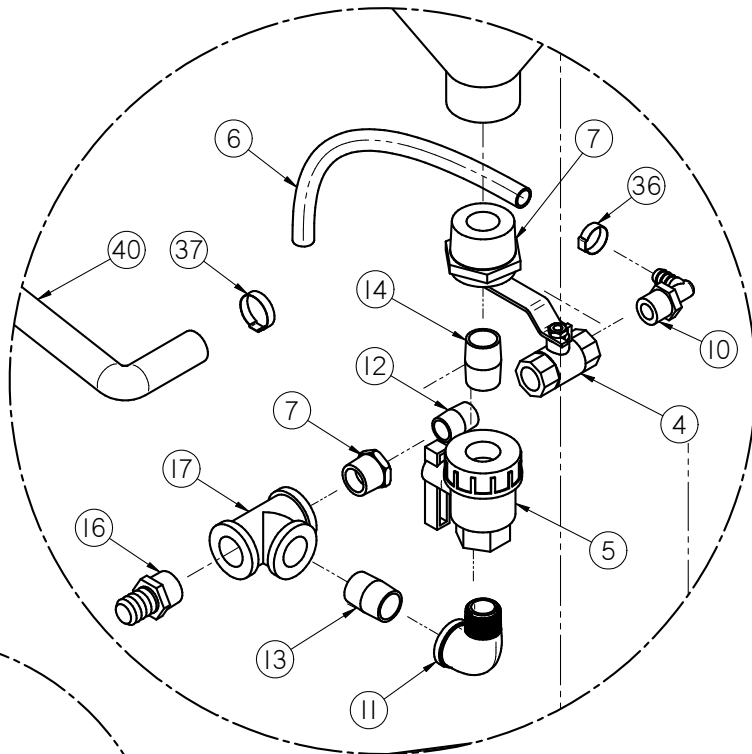
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55 GALLON POLY MIX TANK ASSEMBLY (04-03-0160)

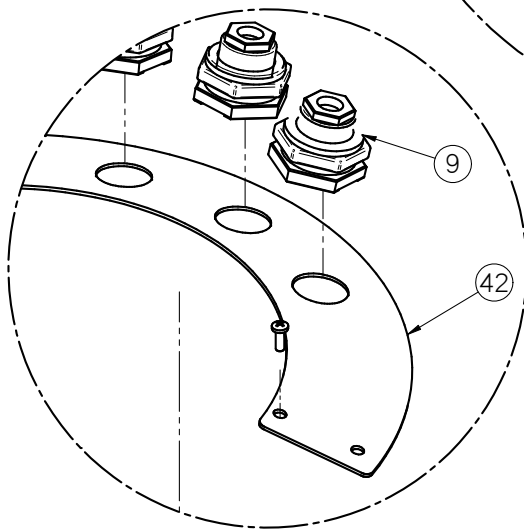


UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

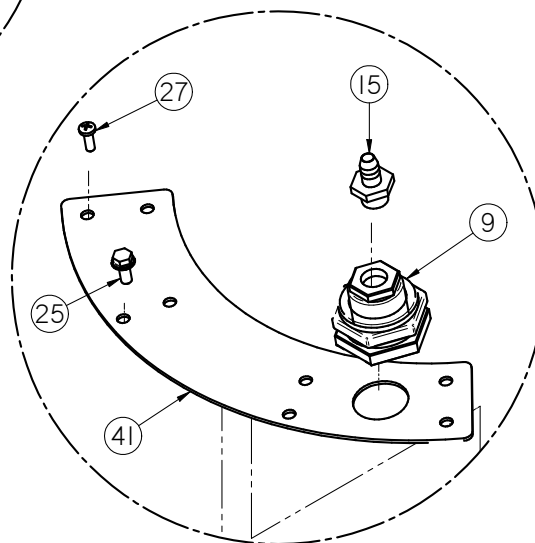
55 GALLON POLY MIX TANK ASSEMBLY (04-03-0160)



DETAIL A



DETAIL B



DETAIL C

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

55 GALLON POLY MIX TANK ASSEMBLY (04-03-0160)

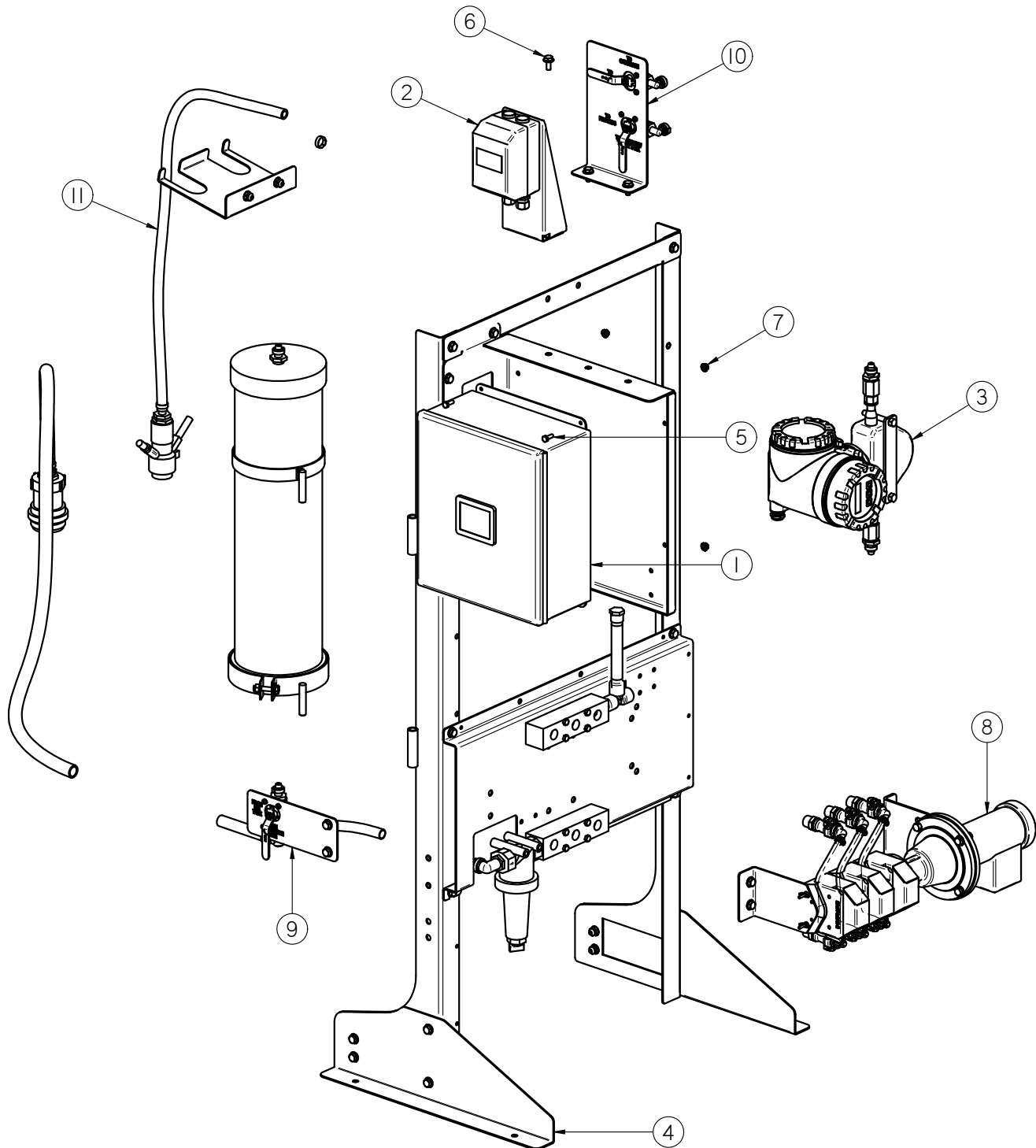
Item #	Part #	Description	Qty
1	01-01-0039	GBOX IL 61.8:1 56C OTP 56C INP	1
2	01-01-0104	MTR .33HP 1725RPM 56C 1PH TENV	1
3	01-07-0015	CPLG CLPN .625 X .750 X 1.50OD SS	1
4	02-02-0006	.500-14 NPT X 2-WAY VALVE	1
5	02-02-0056	VLV BALL .750 NPT FM PLAS	1
6	02-03-0005	DRAIN HOSE PUMP STAND	1
7	02-04-0008	FTTG BUSH .750NPT X .500NPT SS	1
8	02-04-0034	FTTG BUSH 1.50NPT X .750NPT PPE	1
9	02-05-0028	FTTG .500 NPT DBL THD PPE BLKHD	4
10	02-06-0010	FTTG 90 DEG .500HB X .500NPT ML NYL	1
11	02-06-0068	FTTG 90 DEG STRT .75NPT PPE BLK	1
12	02-07-0007	FTTG NIP .500NPTX1.125 TBE SS CLOSE	1
13	02-07-0025	FTTG NIP .750 NPT X 1.375 TBE SS	1
14	02-07-0070	FTTG NIP .750 NPT X 1.50 TBE SS	1
15	02-08-0007	FTTG STGHT .500HB X .500NPT ML NYL	1
16	02-08-0010	FTTG STGHT .750HB X .750NPT ML NYL	1
17	02-09-0008	FTTG TEE .750 NPT FM SS	1
18	05-03-1135	WDMT STIR ARM 30GAL POLY	3
19	05-03-1136	WDMT LOWER STIR ARM 30GAL POLY	1
20	05-03-1298	WDMT TANKSTD 30GAL PUMPSTD	1
21	05-03-1401	WDMT 30GAL POLY LID	1
22	05-03-1481	WDMT ADJ BAFFLE MNT	1
23	05-11-0361	ROD 60GAL DRV	1
24	06-01-0017	BOLT .375-16 X 1.00 SS 18-8	2
25	06-01-0093	BOLT, .312-18 UNC 316 SS; 1 1/2" LG	4
26	06-01-0138	BOLT, FLG .3125-18 UNC ZP GRADE 5; 3/4" LG	4
27	06-01-0215	SCRW MACH #14 X .750 SS PLASTITE	13
28	06-01-0262	BOLT CRG .375-16 X 4.50 FTH ZP GR5	1
29	06-02-0010	NUT, .375-16 UNC 18-8 SS	2
30	06-02-0017	NUT FULL .313-18 SS 18-8	4
31	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	1
32	06-04-0008	WASHER, .375 LOCK 316 SS	2
33	06-04-00XX	WASHER, .3125 LOCK 18-8 SS	4
34	06-05-0009	WASHER, .375 FLAT 316 SS	2
35	06-05-0011	WASHER, .3125 FLAT 18-8 SS	8

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

55 GALLON POLY MIX TANK ASSEMBLY (04-03-0160)

Item #	Part #	Description	Qty
36	06-07-0029	HOSE CLAMP ONE EAR, .716-.827	2
37	06-07-0030	HOSE CLAMP ONE EAR 1.004-1.126	1
38	07-02-0021	TNK 60GAL CONE 1.5 FPT OUTLET FD	1
39	1029BC	BRKT TNK CRADLE 30GAL	1
40	102C1E	HOSE TANK TO VLV	1
41	103055	TANK MNT PLT 30GAL POLY	1
42	103056	BULKHEAD MNT PLT POLY TANK	1
43	1036D1	SIDE BAFFLE ADJ 60GAL POLY	1

U-TOTE SEMI - AUTOMATED PUMP STAND ASSEMBLY



UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

U-TOTE SEMI - AUTOMATED PUMP STAND ASSEMBLY

Item #	Part #	Description	Qty
1	03-12-0363	CONTROL PANEL	1
2	03-13-0027	KIT SW MNL MP .33 HP MTR CHEM TNK	1
3	SEE TABLE 1	FLOW METER	1
4	SEE TABLE 2	ASSY PUMPSTD FRAME BASE	1
5	06-01-0006	BOLT .250-20 X .750 ZP GR5	4
6	06-01-0124	BOLT, FLG .375-16 UNC ZP GRADE 5; 3/4" LG	1
7	06-03-0013	NUT, LOCK, FLG .250-20 ZP SERRATED	4
8	SEE TABLE 3	ASSY, PERISTALTIC PUMP HEAD & MOTOR	1
9	13-04-0106	KIT CAL TUBE ASSY PUMPSTD	1
10	13-04-0109	MAN PUMPSTD CNTRL	1
11	13-05-0359	KIT FTTG U TOTE	1

TABLE 1

Part #	Description
03-18-0019	FLOW METER, PROMASS, 80E08 DN8
05-03-1068	FLOW METER, IMF VOLUMETRIC, SM6001 AE

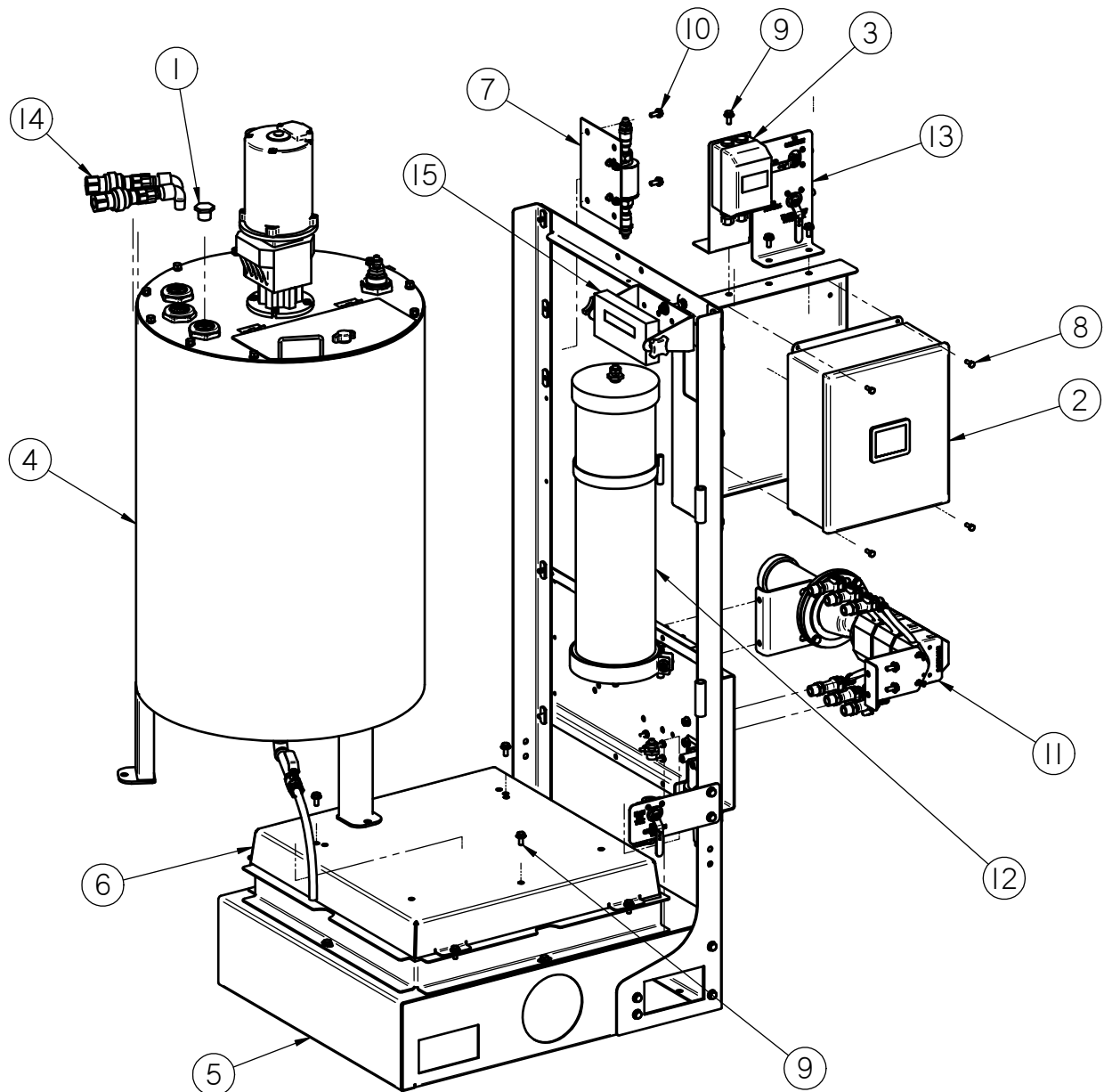
TABLE 2

Part #	Description
05-03-1376	ASSEMBLY, PUMP STAND FRAME, SINGLE HEAD PUMP
05-03-1377	ASSEMBLY, PUMP STAND FRAME, 2 OR 3 HEAD PUMP

TABLE 3

Part #	Description
13-04-0103	3 PERISTALTIC PUMP HEADS , MOTOR
13-04-0104	2 PERISTALTIC PUMP HEADS , MOTOR
13-04-0105	1 PERISTALTIC PUMP HEADS , MOTOR

STANDARD SEMI - AUTOMATED PUMP STAND ASSEMBLY



UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

STANDARD SEMI - AUTOMATED PUMP STAND ASSEMBLY

Item #	Part #	Description	Qty
1	02-14-0014	.750-14 NPT PLUG BP	1
2	03-12-0363	CONTROL PANEL	1
3	03-13-0027	KIT SW MNL MP .33 HP MTR CHEM TNK	1
4	SEE TABLE 1	ASSY, MIX TANK	1
5	SEE TABLE 2	ASSY PUMPSTD FRAME BASE	1
6	05-03-1069	ASSY SCL PUMPSTD	1
7	SEE TABLE 3	FLOW METER	1
8	06-01-0006	BOLT, .250-20 X .75 UNC ZP GRADE 5	4
9	06-01-0124	BOLT, FLG .375-16 UNC ZP GRADE 5; 3/4" LG	4
10	06-01-0138	BOLT, FLG .315-18 UNC ZP GRADE 5; 3/4" LG	2
11	SEE TABLE 4	ASSY, PERISTALTIC PUMP HEAD & MOTOR	1
12	13-04-0106	KIT CAL TUBE ASSY PUMPSTD	1
13	13-04-0109	MAN PUMPSTD CNTRL	1
14	13-10-0017	KIT FTTG CHEM TNK .5NPT PARKER	2
15	PART OF 03-19-0055	SCALE DISPLAY	1

TABLE 1

Part #	Description
04-03-0172	ASSEMBLY, 30 GALLON SS MIX TANK
04-03-0173	ASSEMBLY, 60 GALLON SS MIX TANK
04-03-0208	ASSEMBLY, 15 GALLON POLY MIX TANK
04-03-0160	ASSEMBLY, 55 GALLON POLY MIX TANK

TABLE 2

Part #	Description
05-03-1155	ASSEMBLY, PUMP STAND FRAME, SINGLE HEAD PUMP
05-03-1066	ASSEMBLY, PUMP STAND FRAME, 2 OR 3 HEAD PUMP

UNIVERSAL SEMI-AUTOMATED 1 PUMP CONTROLLER

PUMP STAND ASSEMBLY

TABLE 3	
Part #	Description
03-18-0019	FLOW METER, PROMASS, 80E08 DN8
05-03-1068	FLOW METER, IMF VOLUMETRIC, SM6001 AE

TABLE 4	
Part #	Description
13-04-0103	3 PERISTALTIC PUMP HEADS , MOTOR
13-04-0104	2 PERISTALTIC PUMP HEADS , MOTOR
13-04-0105	1 PERISTALTIC PUMP HEADS , MOTOR

USC LIMITED WARRANTY

SECTION J

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 18 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.

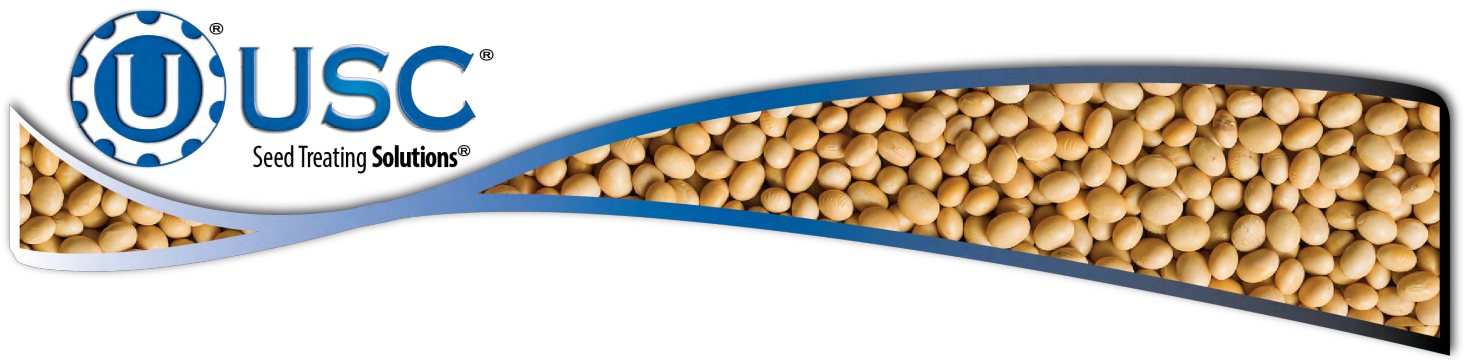
3. **Exclusive Obligation:** THIS WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of Manufacturer shall be to repair or replace the defective Products in the manner and for the period provided above. Manufacturer shall not have any other obligation with respect to the Products or any part thereof, 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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