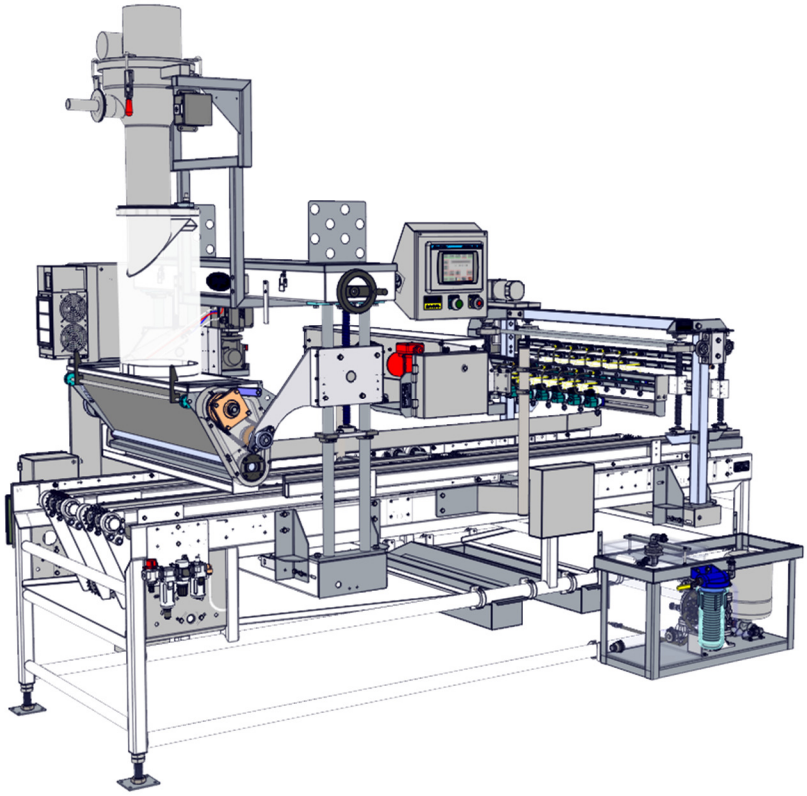
Smart Seeder

MODEL 9840 / 9940

Allen Bradley 600 Plus



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Serial # _____

SAFETY PRECAUTIONS

As Burford® Corp. strives to promote safety in the maintenance and operation of Burford® equipment; we request that the following safety procedures be followed, along with any additional safety procedures set by the customer's in-plant safety officers or local codes.

Read the manual completely before attempting installation or operation of this unit.

This machine may contain programs that are password protected. Contact your supervisor or Burford® Corp. for password.

Incoming electrical power must be properly shielded, routed, and grounded. All safety codes should be followed. Study wiring diagrams before attempting installation.

Disconnect power to equipment before removing any guards or covers. Replace guards or covers before resuming operation of the unit.

Loose clothing, jewelry, and long hair should be considered a safety hazard around mechanical equipment. Ensure that they will not be entangled in the equipment.

Keep clear of moving machine parts. Bodily harm and/or serious injury may result from contact with moving gears, sprockets, chains or pneumatically controlled machine components.

Do not bypass safety switches.

Do not attempt repairs while equipment is running.

Use only original equipment parts designed for safe operation of the equipment.

Only authorized personnel should be allowed to operate or perform maintenance on the unit.

This unit is not wash-down ready. Do not wash the unit or any of its electrical or mechanical components, with any form of high pressure or running liquids.

Caution symbol shows bodily harm may incur if instructions are not followed.

Stop symbol shows important instructions to prevent unit damage or adverse effects.

Info symbol shows useful information to assist in installation and operation of the unit.

DISCLAIMER WARNING

The descriptions and specifications contained in this Service Manual were in effect when this manual was approved for printing. Our policy is one of continuous improvements, and we do hereby reserve the right to discontinue models at any time, or to change specifications, prices, or design without notice and without incurring obligations.

Burford® Corp. expressly disclaims any liability for damages and/or injuries caused because of negligence or misuse of its product. Such negligence or misuse includes, but is not limited to, software/program alteration, removal of guards, faulty wiring due to improper installation, subjecting the unit to wash-down environments or any physical or mechanical changes made to a Burford® unit, by anyone other than a qualified Burford® Technician.

Burford® equipment should only be used for the purpose for which it was sold, and should not be modified in any way without notifying the General Manager of Burford® Corp. in writing of the modification.

The original language for this document is English. Translations to other languages may not be accurate.

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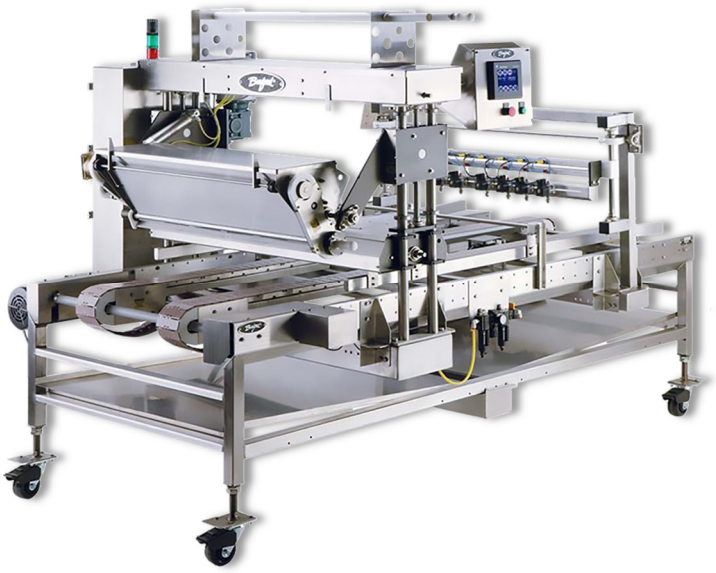
Chapter 1

Introduction

CHAPTER 1: INTRODUCTION



Congratulations on the purchase of your new Burford® Smart Seeder. We are confident that you will enjoy many years of dependable service from your new Topper.

The Burford® Smart Seeder is a proven Burford® design, backed by over 50 years of manufacturing experience. It is the most widely used Topper for high volume topping applications on the market today.

The name Burford® is synonymous with innovation. Since the beginning with the first Twist Tyer machine, Burford® is focused on bringing innovation to the Baking Industry. Our passion is developing equipment that increases productivity and uniformity while decreasing production costs.

The Burford® Smart Seeder delivers labor savings and consistency to your product.

With the one touch setup, the Smart Seeder automatically adjusts its settings to give an exact coverage and seed savings every time.

The Burford® Smart Seeder has been designed to apply poppy, sesame, cracked wheat, bran, almonds, and other similar ingredients that have been factory approved.

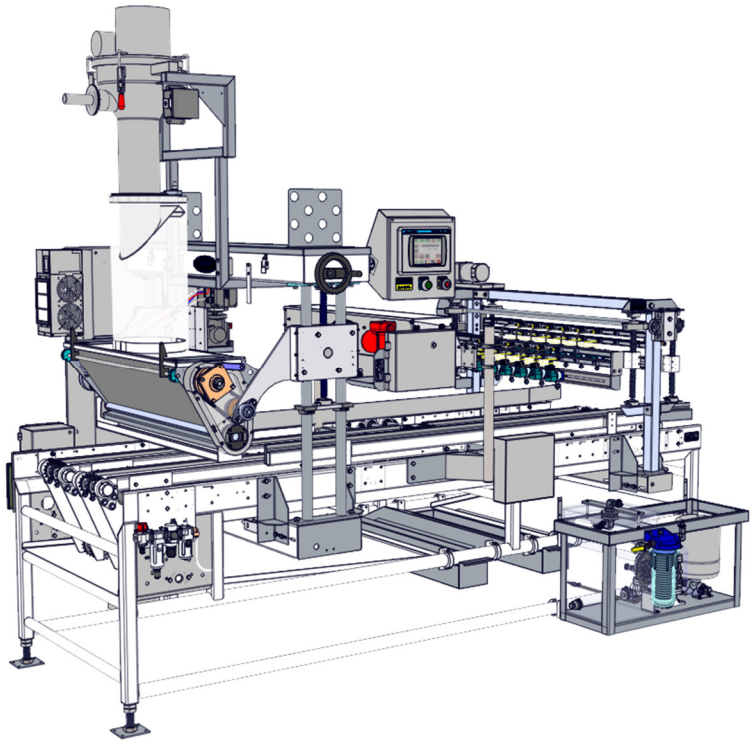
Burford® offers a large lineup of bakery solutions from oilers to shakers. We invite you to visit our website at **www.burford.com** to see the other innovative equipment that we can offer to help your bakery today.

Specifications

ELECTRICAL
110 V_{AC}, 50/60 H_Z, 1 Φ, 15 A
220 V_{AC}, 50/60 H_Z, 1 Φ, 15 A
220 V_{AC}, 50/60 H_Z, 3 Φ, 15 A
380/460 V_{AC}, 50/60 H_Z, 1 Φ, 15 A
380/460 V_{AC}, 50/60 H_Z, 3 Φ, 15 A
AIR REQUIREMENTS
.370 CFM@80 psi maximum
WATER REQUIREMENTS
40 psi @ 30 GPH

Models

MODELS
9840 Product flow moves left to right when viewing from operator's side.
9940 Product flow moves right to left when viewing from operator's side.

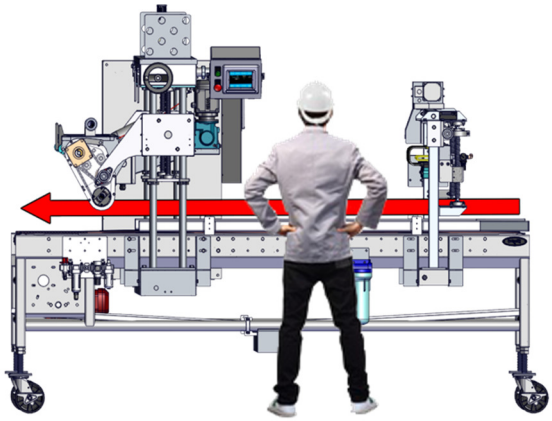


Model 9940 Shown

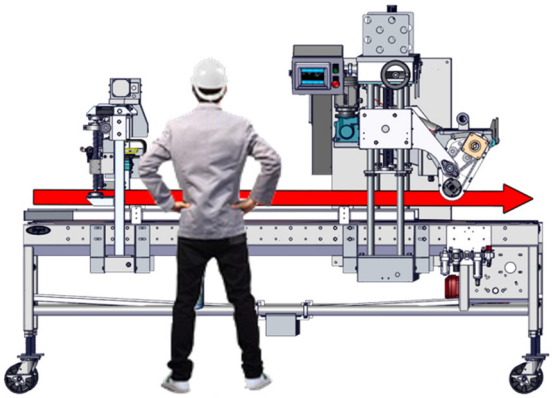
Models

The Burford® Smart Seeder is available in a right-hand model and a left-hand model. The hand decides product flow in relation to the operator controls. The first two numbers in the model show the hand, e.g., 98xx is a right-hand unit, and 99xx is a left-hand unit.

The Smart Seeder is also available in a range of hopper widths to accommodate different pan widths. The last two numbers in the model show the width of the hopper, e.g., xx40 is a 40-inch hopper, and xx50 is a 50-inch hopper. 40-inch is the most common and is what comes standard on the Smart Seeder.

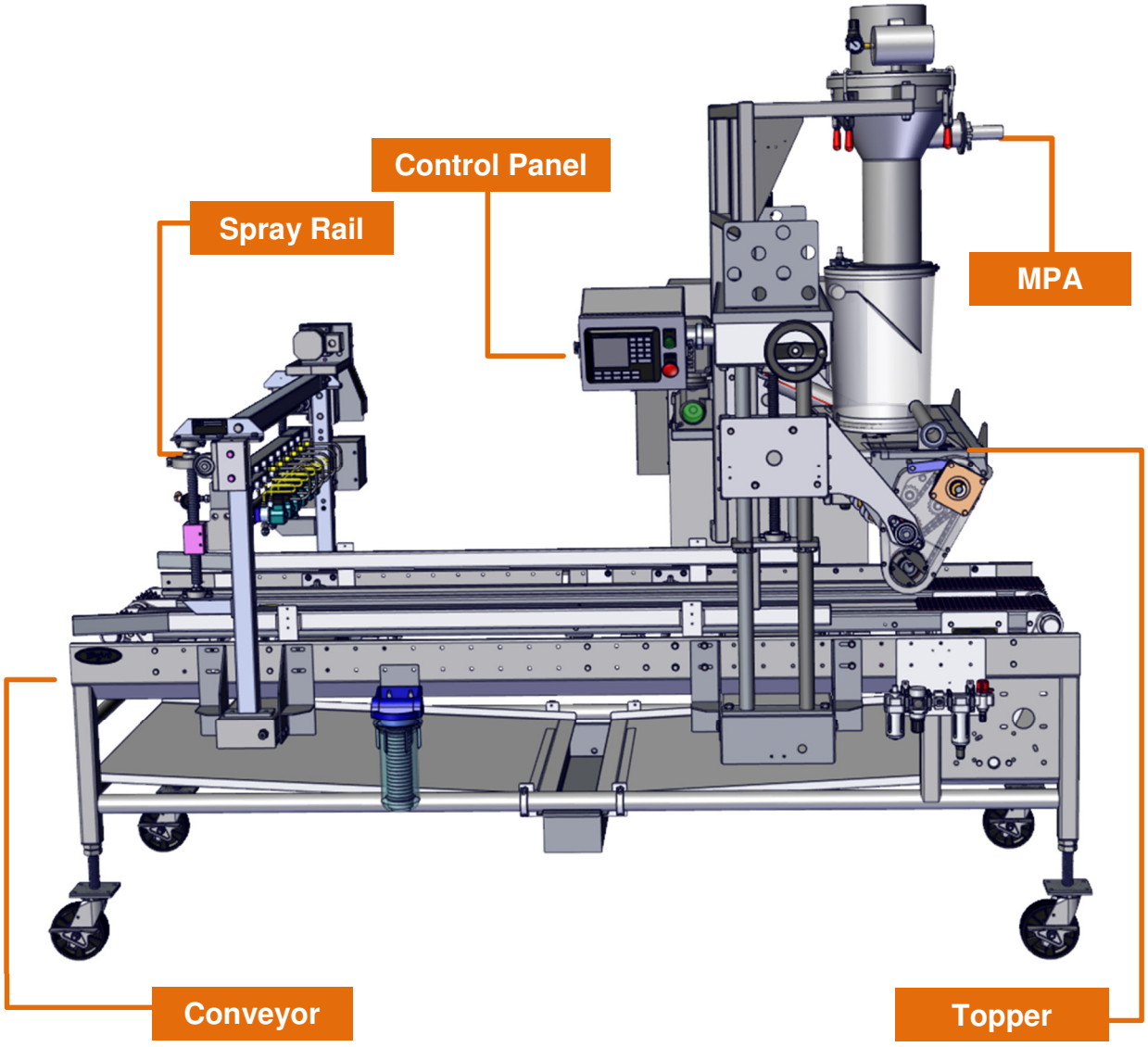


9940 – Left Hand Unit



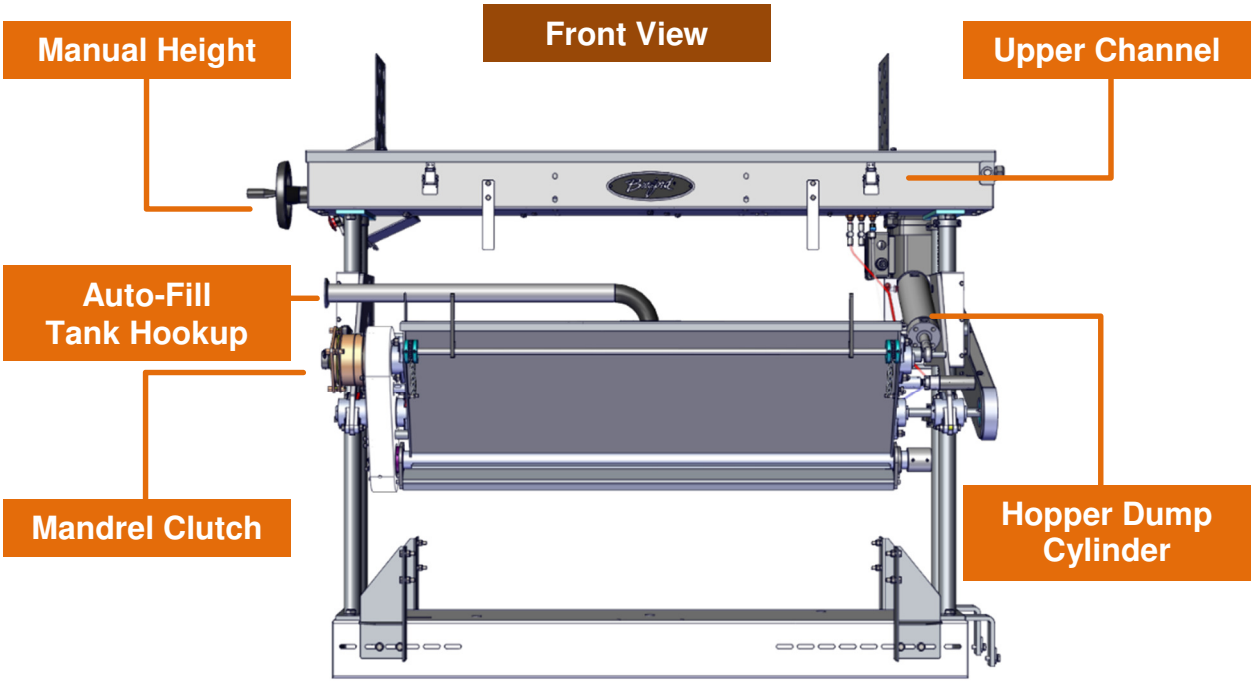
9840 – Right Hand Unit

Basic Identification Topper

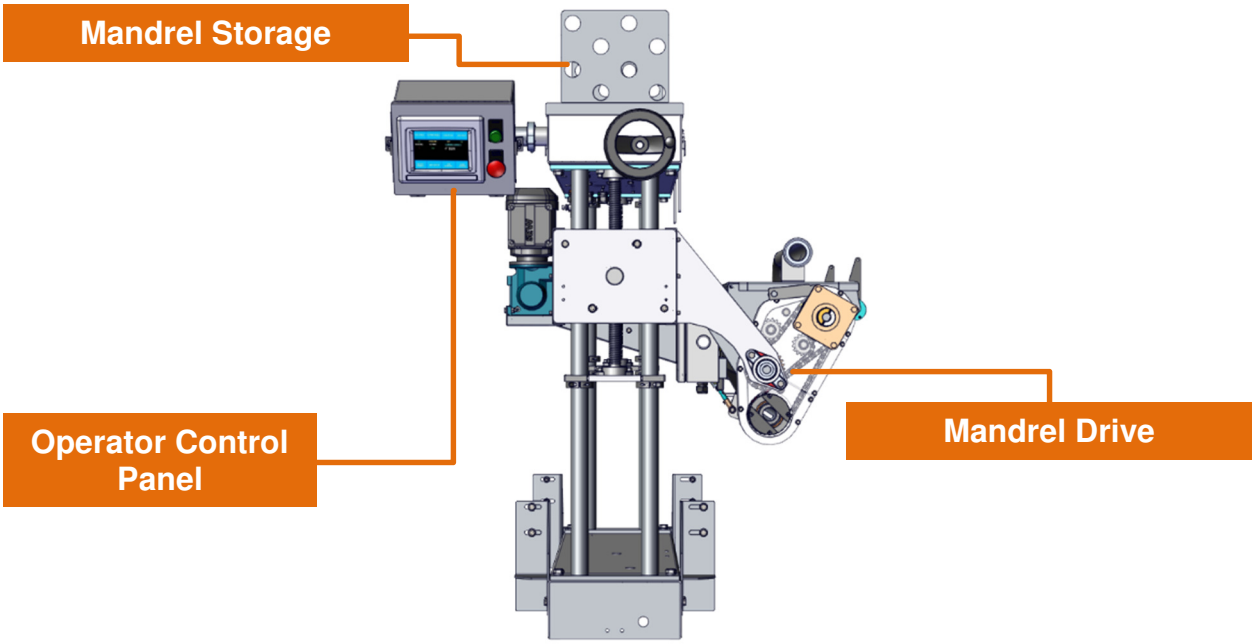


Topper Identification

Front View

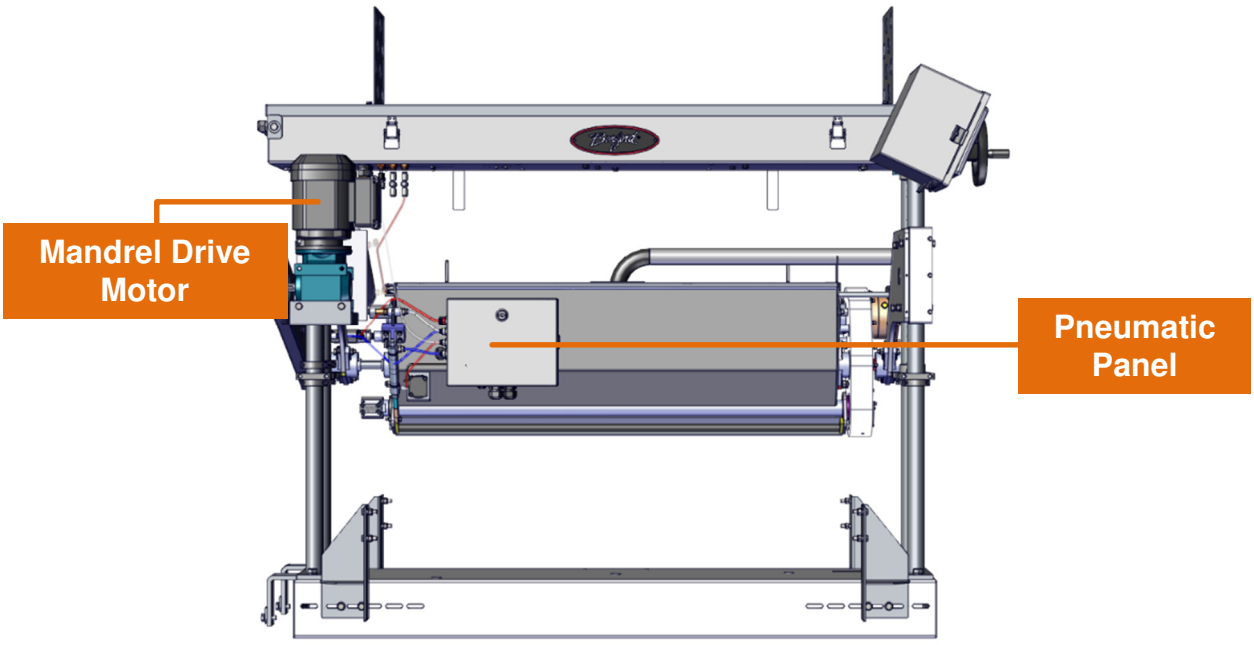


Operator Side View

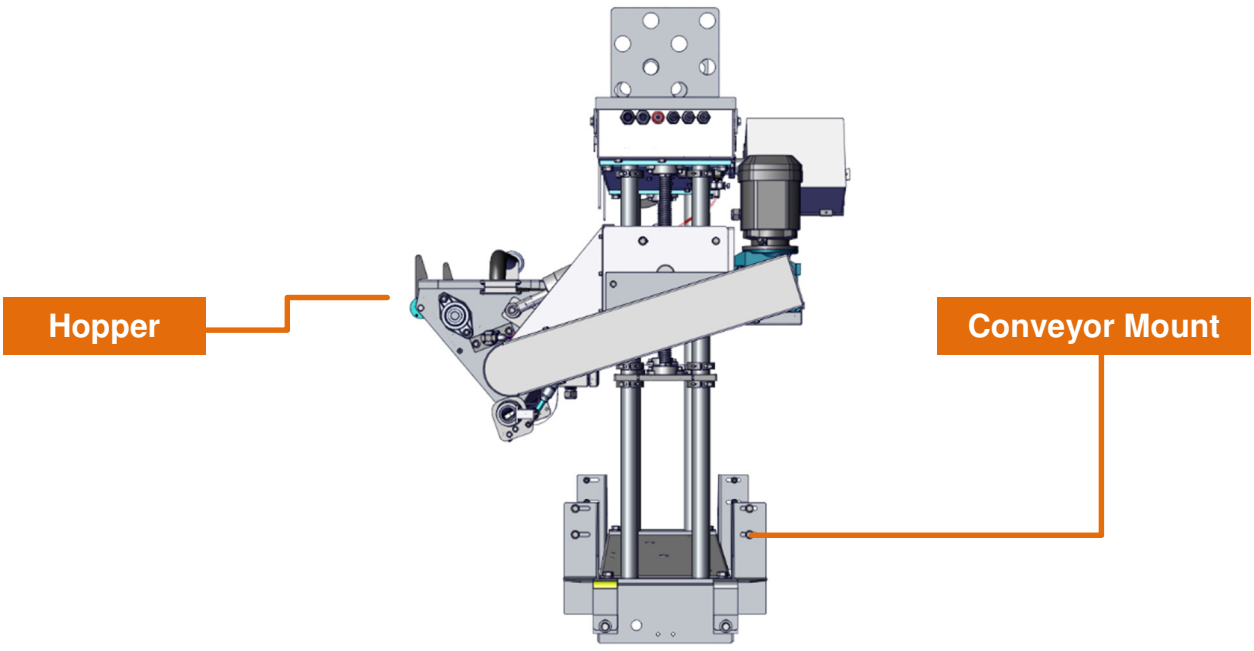


Topper Identification

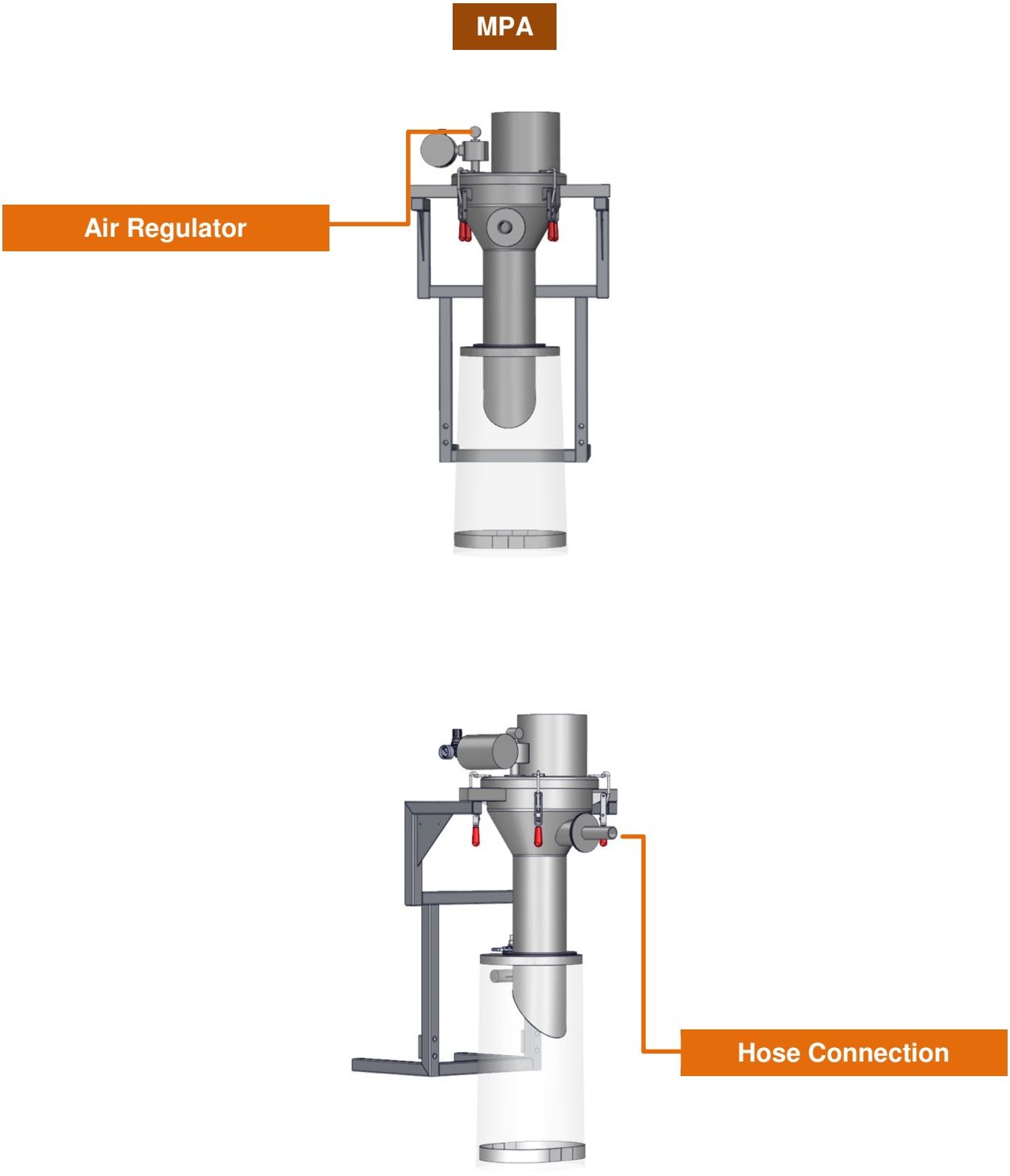
Rear View



Mandrel Drive Side View

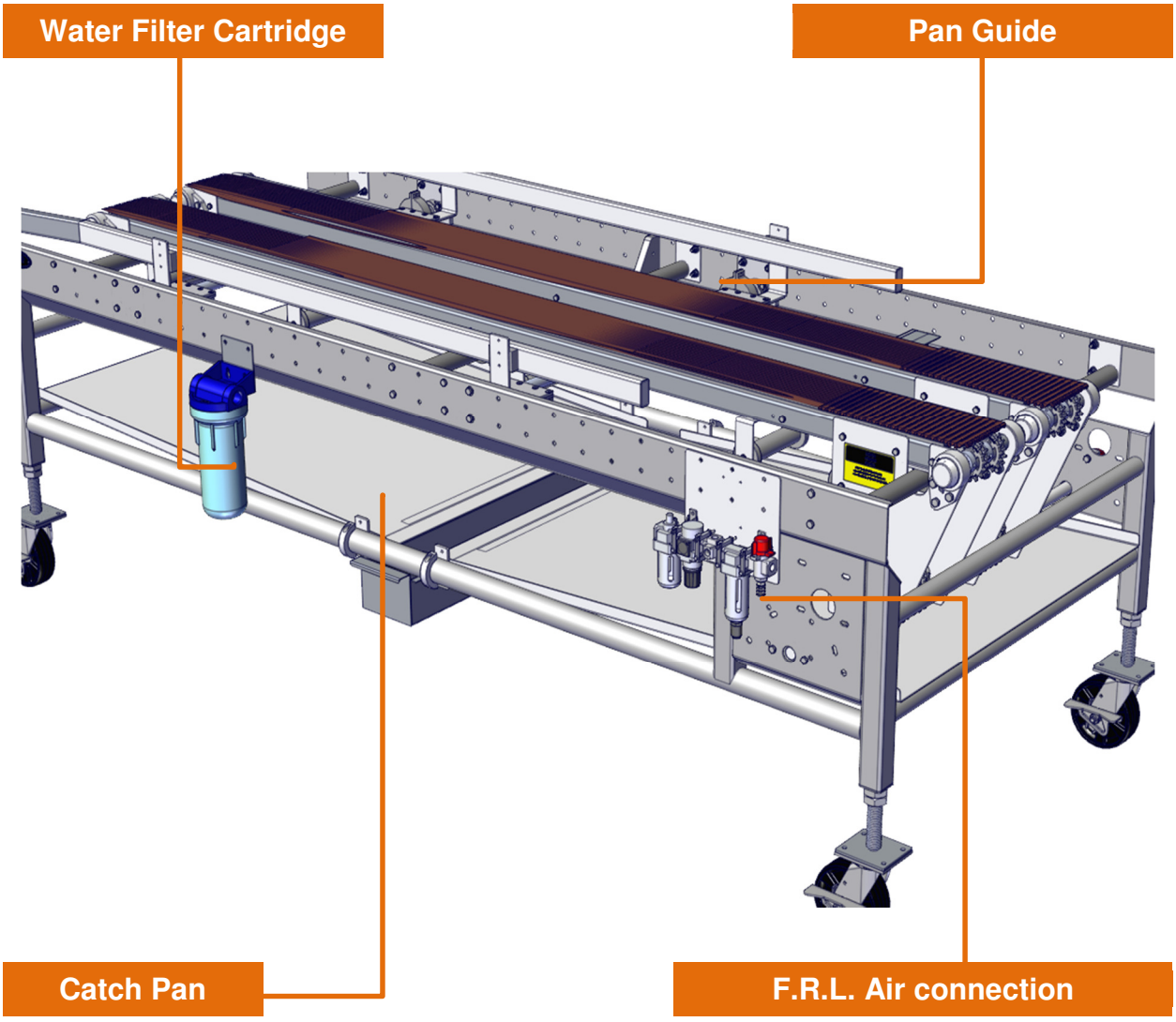


MPA Identification



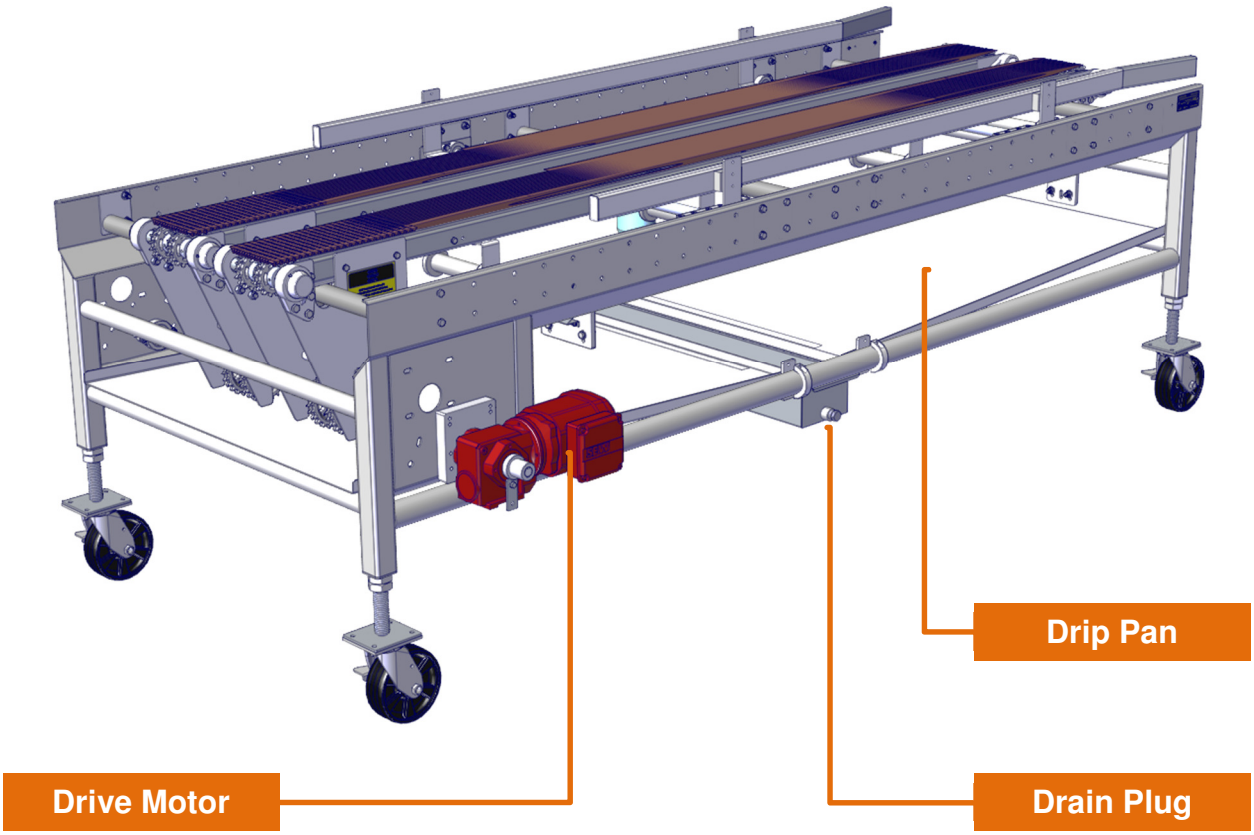
Conveyor Identification

Operator Side View



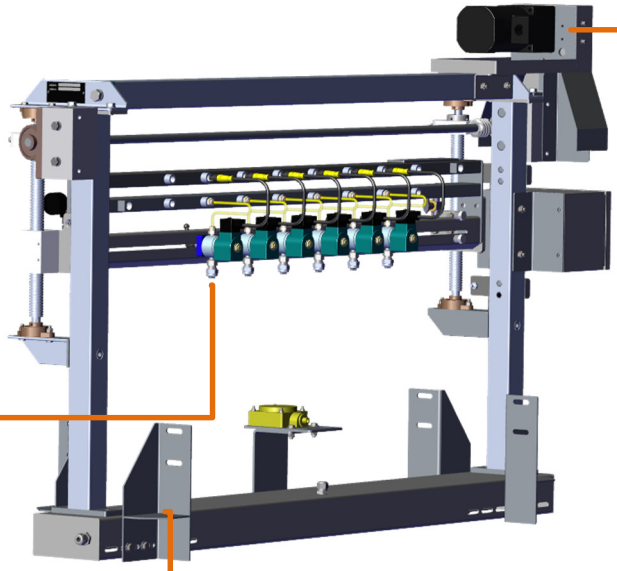
Conveyor Identification

Motor Drive Side View

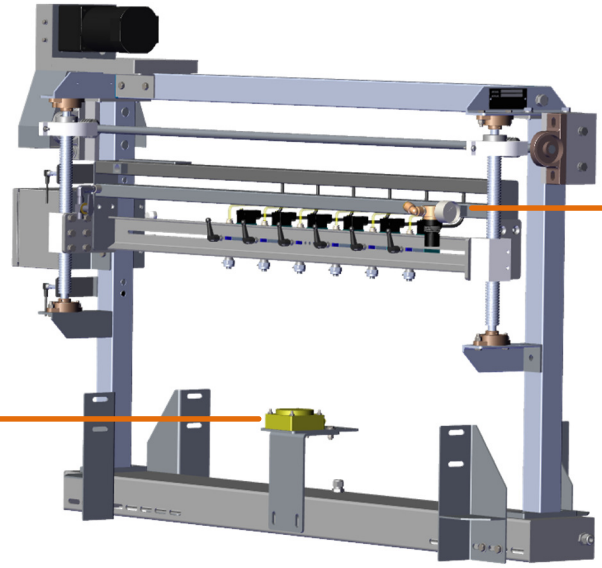


Spray Rail Identification

Upstream View



Downstream View



Chapter 2

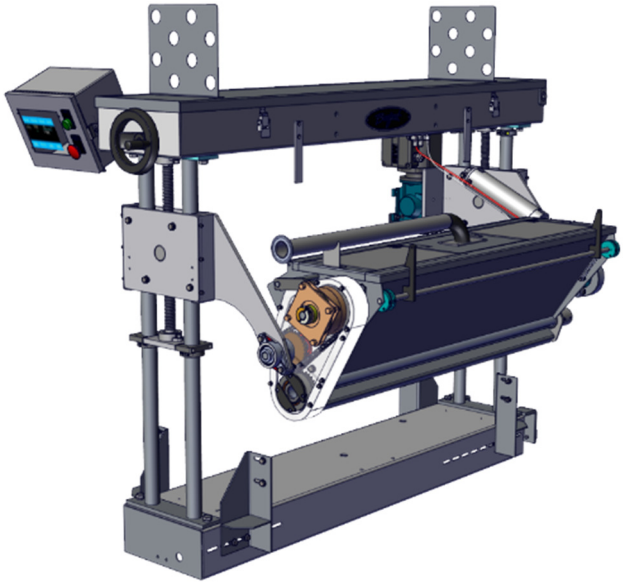
Key Components

CHAPTER 2: KEY COMPONENTS

Below is a list of key components that you must familiarize yourself with to gain a better understanding of how the Topper functions.

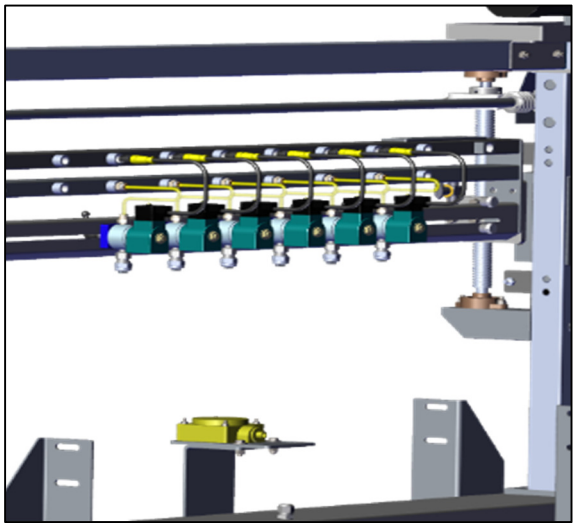
■ Topper

The Topper applies the topping onto the product. The topping is stored in the hopper and dispensed via the mandrel. The height is adjustable for a wide variety of products.



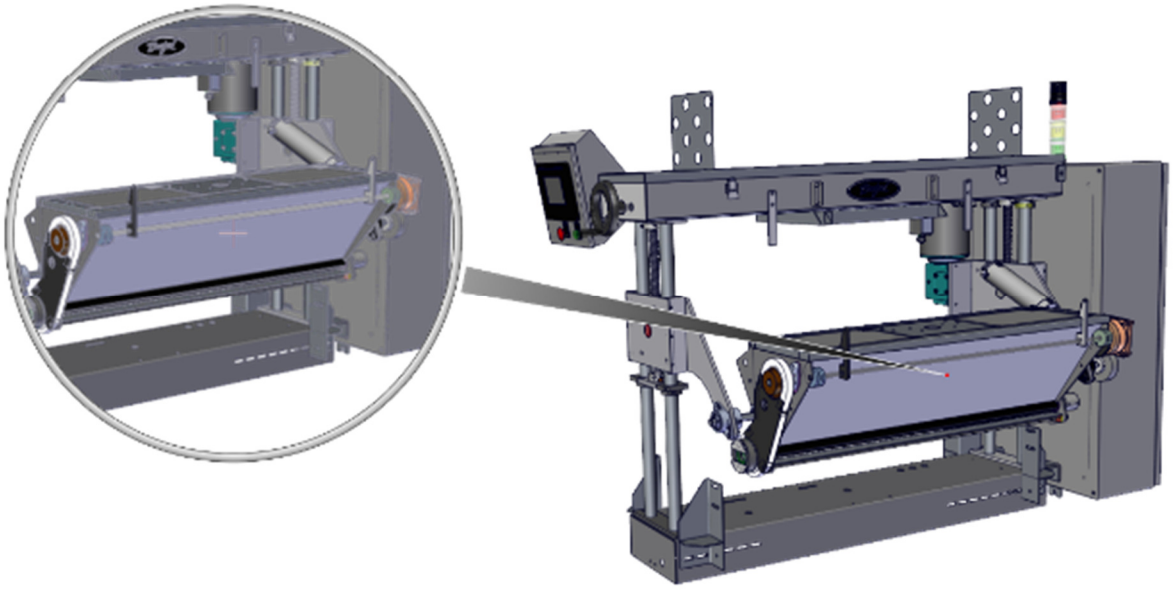
■ Water Spray

The Water Spray valves deposits water onto the product. When the water meets the dough, the dough becomes ‘sticky’ and adheres the topping to the product. The spray rail height is adjustable to achieve varying results.



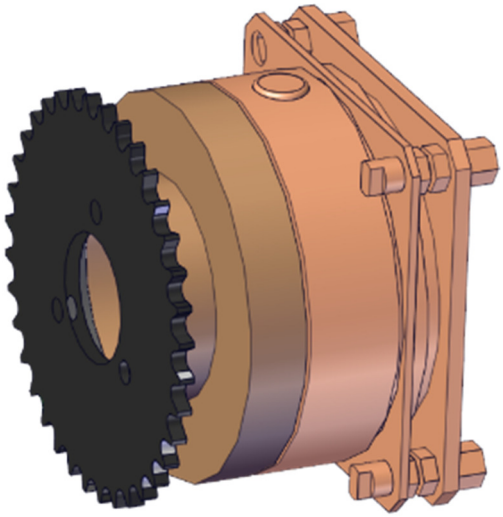
Hopper

The Hopper stores the topping to be dispensed unto the product. The mandrel rotates when activated and dispenses the topping. The Hopper houses the optional agitator and vibrators.



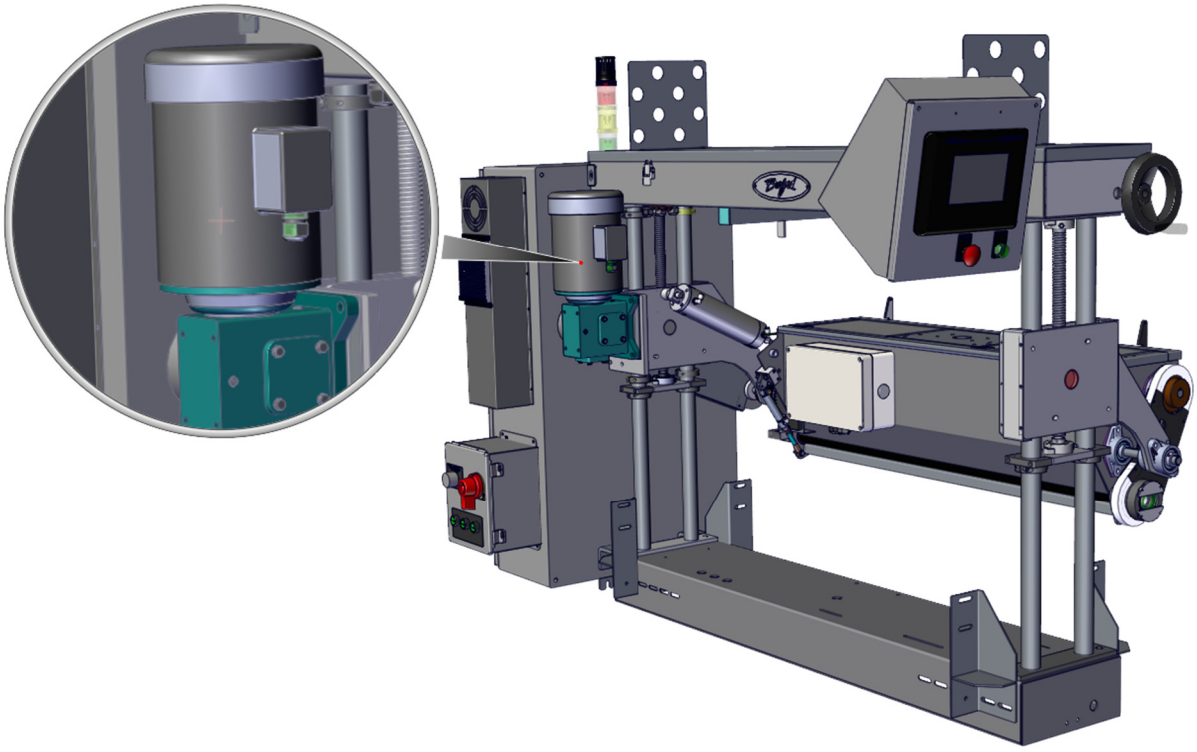
Clutch

The Clutch engages the mandrel drive to the motor drive system. When triggered by the product sensor, the Clutch will engage the mandrel resulting in the mandrel rotating and dispensing product. When the product sensor is no longer triggered, the clutch will disengage.



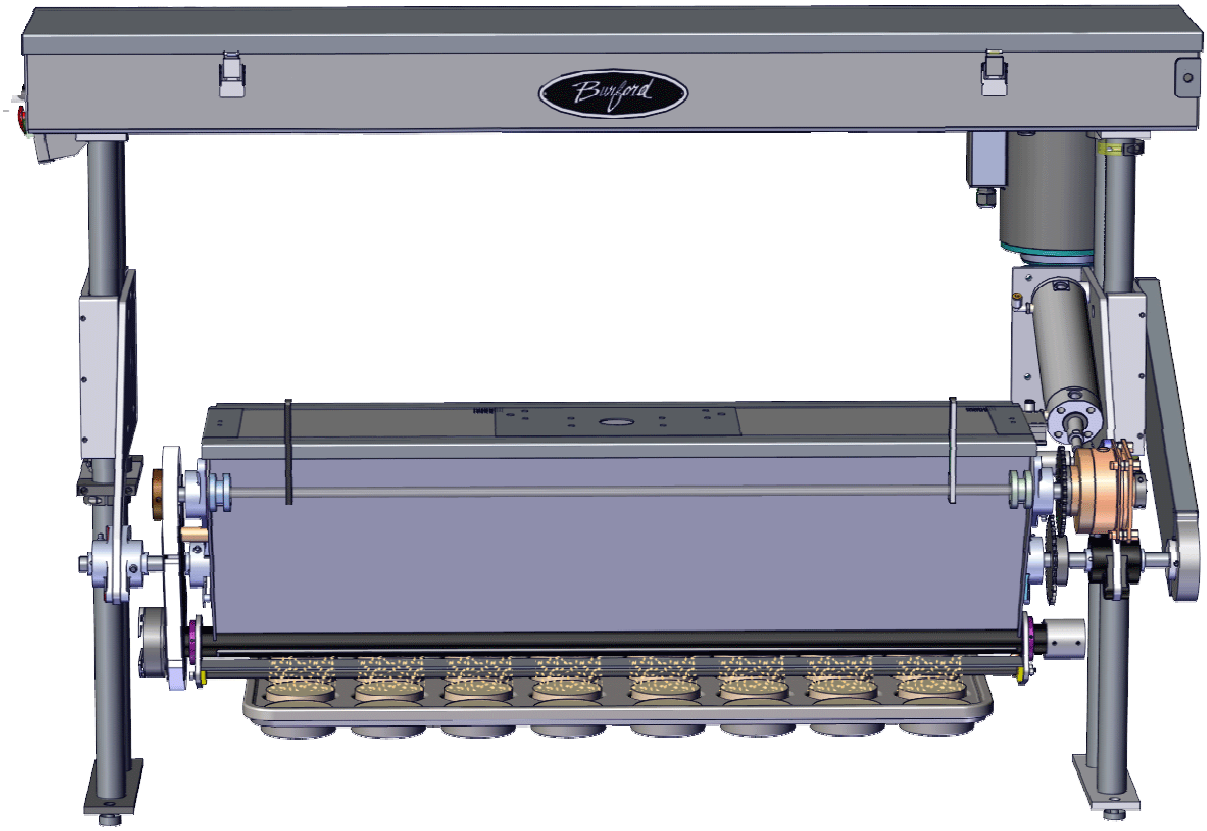
Mandrel Drive Motor

The Mandrel Drive Motor rotates when the unit is enabled. When the Product Sensor is triggered, a clutch is engaged that connects the mandrel to the drive motor. The speed of the drive is in direct relation the amount of topping dispensed.



Mandrel

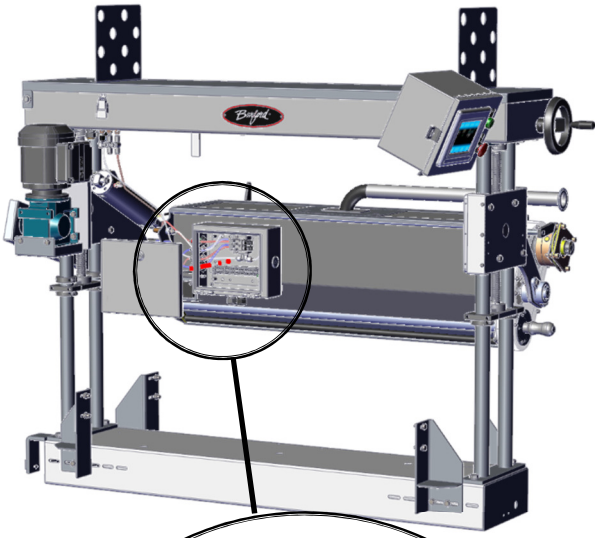
The mandrel rotates and applies the topping unto your product. It is specifically designed for your pan width and type of topping used. When the product sensor senses product the mandrel will rotate, dispensing toppings on your product.



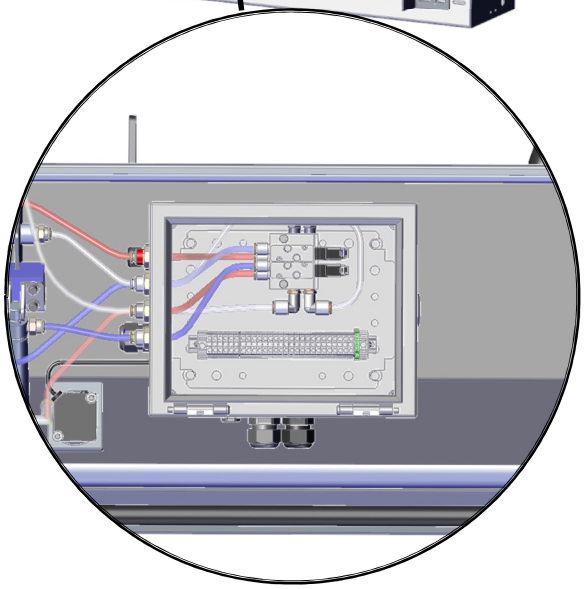
Air Controls

The Topper is equipped with a hopper dump cylinder, an optional agitator, and an optional vibrator. Compressed air controls these components. Some of the pneumatic lines going to these items have flow control valves that regulate the amount of air pressure. The flow control valves are adjusted to obtain the desired effect. The flow controls valve is found either in the upper channel, the pneumatic box mounted on the hopper, or the solenoid mount above the mandrel motor.

The Pneumatic Box is found on the backside of the hopper. Remove cover to gain access to the panel.



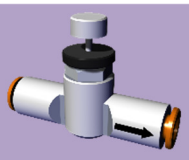
Inside the Pneumatic Box are the solenoids that control the Deflector Cylinder and Agitator. The output pressure can be controlled by the flow controls found on the solenoid.



The Agitator has two flow control valves found on the solenoid. One is for the extend cycle and the other for the retract cycle. Adjust the flow valves to control the amount of airflow to the Agitator cylinder. The Vibrator has only one flow control valve.

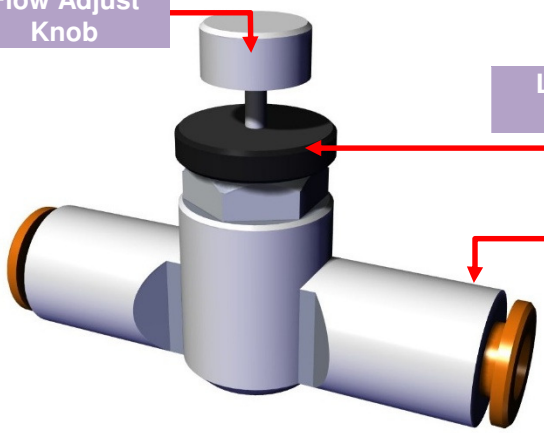
Air Flow Controls

The Hopper Dump is regulated by the two Air Flow Control valves found on the pneumatic panel. The speed should be set for the desired rate, but to avoid premature wear or damage, they should be adjusted so that the hopper assembly will travel smoothly through a dump cycle, not hitting too hard or too fast in any direction.



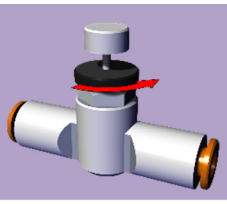
Did you know that Flow Control Valves must be installed in a direction of air flow travel to function properly? An arrow on the valve will show the correct installation.

Flow Control Valve

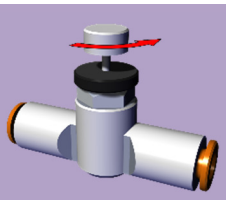


Adjustment

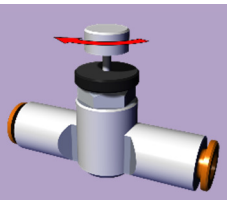
Release the locking dial by turning it anti-clockwise. This will allow the adjustment knob to turn freely.



Rotate the adjustment knob until desired flow is achieved.

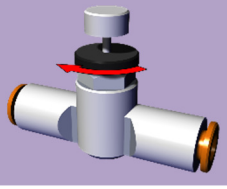


Clockwise to decrease flow.



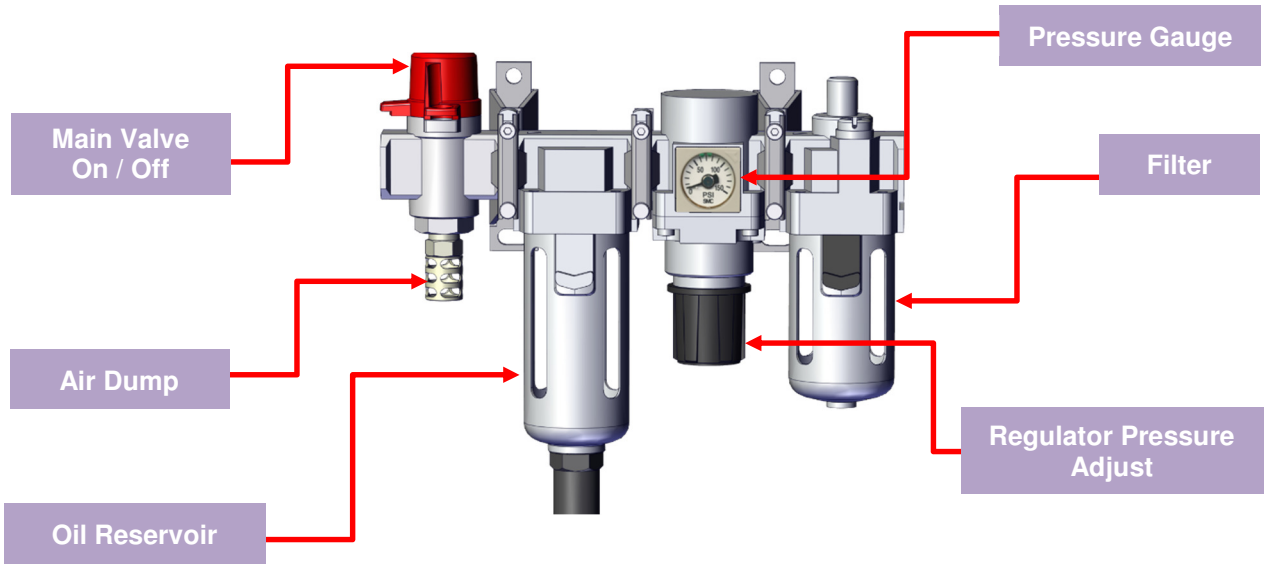
Anti-clockwise to increase flow.

Lock the valve by turning the Locking Dial clockwise until firmly seated.

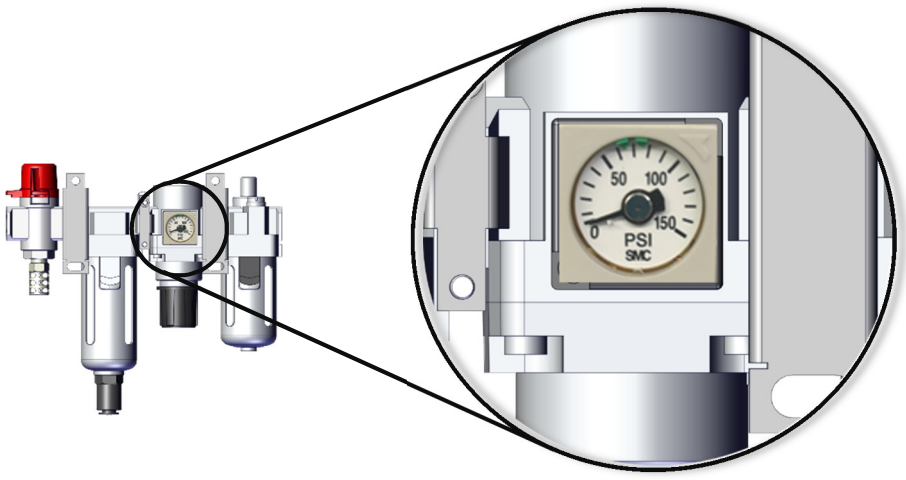


F.R.L. Description

F.R.L. Burford® Part # C00404



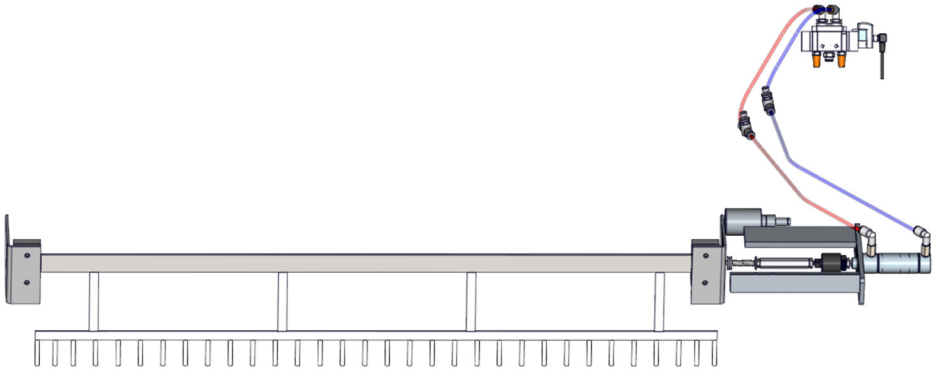
A pressure gauge shows the output pressure of the F.R.L. The normal operating pressure is 60 psi.



Pneumatic oil must be kept in the Oil Reservoir always. Burford® recommends Parker Pneumatic Oil F442. Check Reservoir weekly.

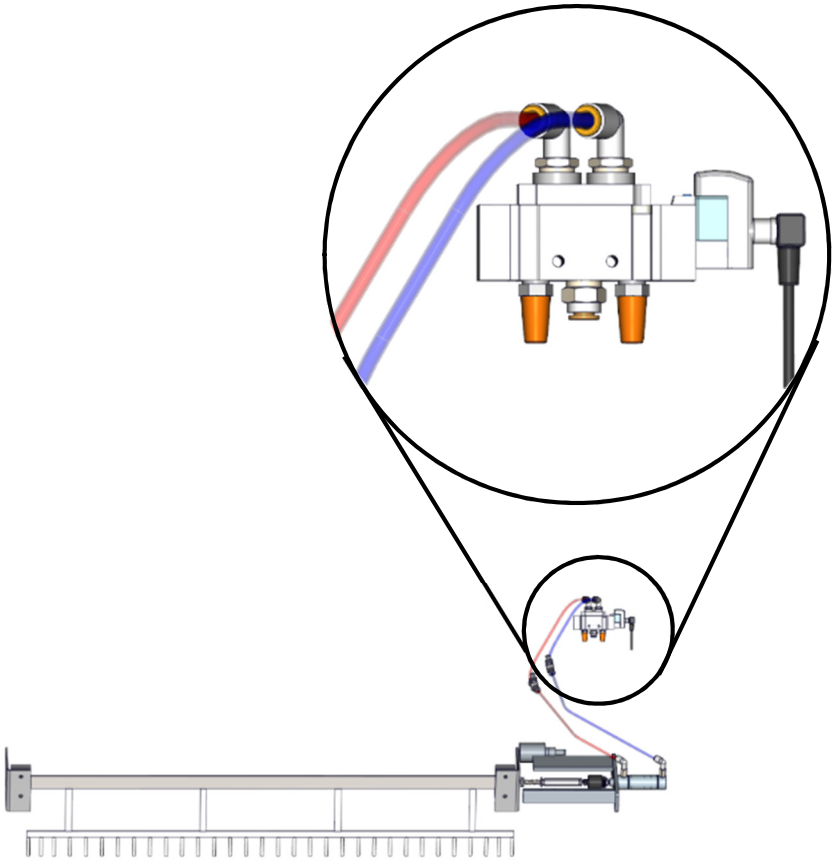
Agitator

The agitator is a rake device that reciprocates in the hopper to keep the topping loose during operations. When the mandrel is rotating, the agitator will reciprocate back and forth. This is to prevent any bridging from occurring. Bridging occurs when the toppings in the hopper forms a cavity around the mandrel, preventing product being dispensed.



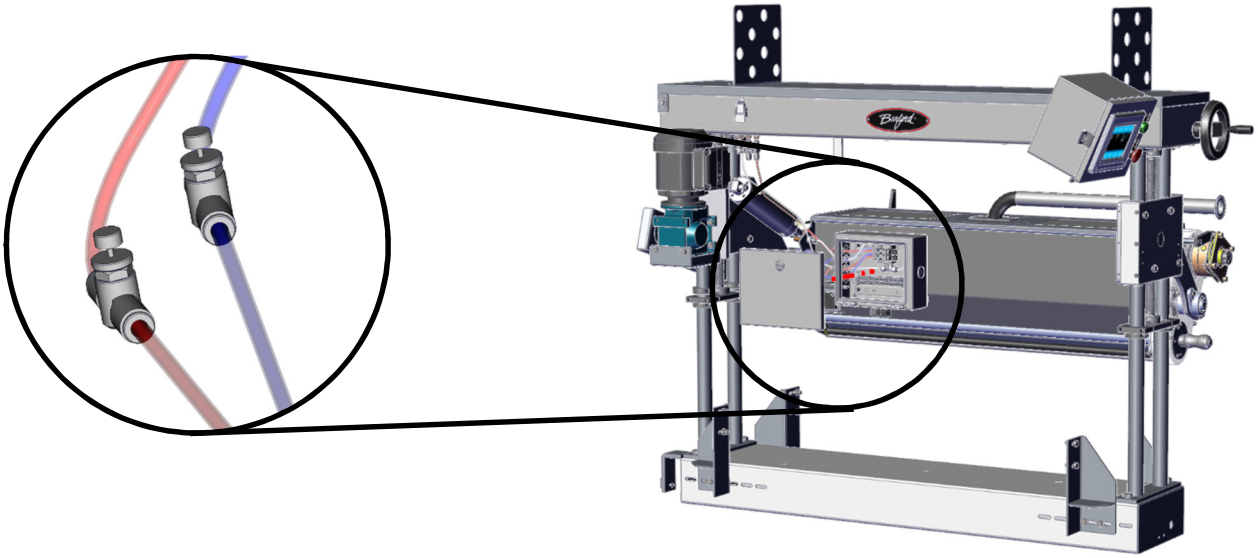
Agitator Solenoid

The air cylinder controls the agitator. When product is detected, the agitator will be enabled. The solenoid has two outputs: extend and retract. A timer in the PLC will toggle the solenoid between supplying air to extend or retract when the agitator is enabled.



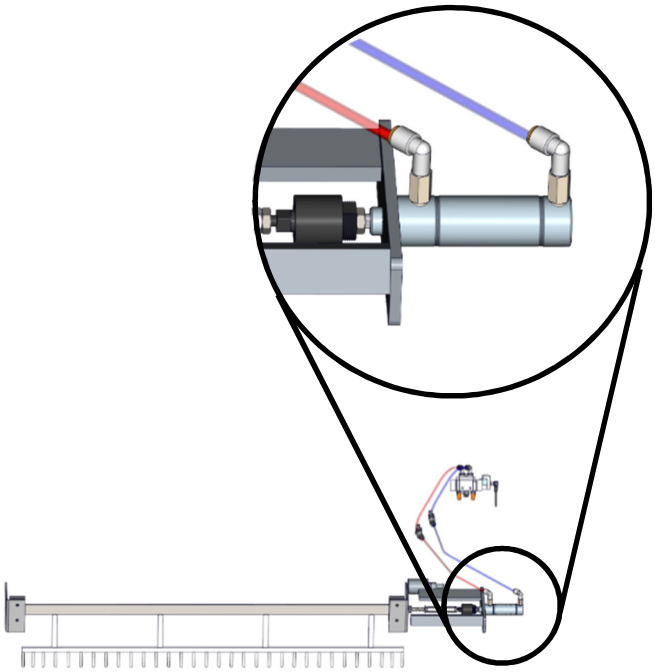
Agitator Flow Controls

There are two flow valves on the solenoids to control the agitator rake found in the pneumatic box attached to the hopper. One is for extend and the other to retract. The flow valves should be set for smooth operation. Hopper damage may result if agitator action is excessive.



Agitator Cylinder

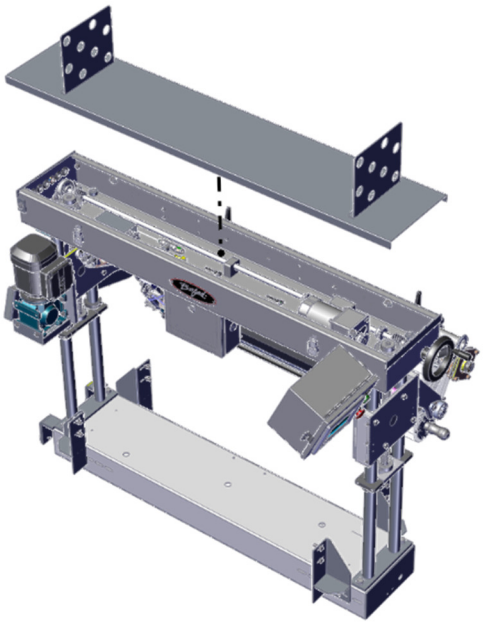
An air cylinder gives the movement for the agitator. By regulating the flow valves, you control the amount of air pressure going to the cylinder.

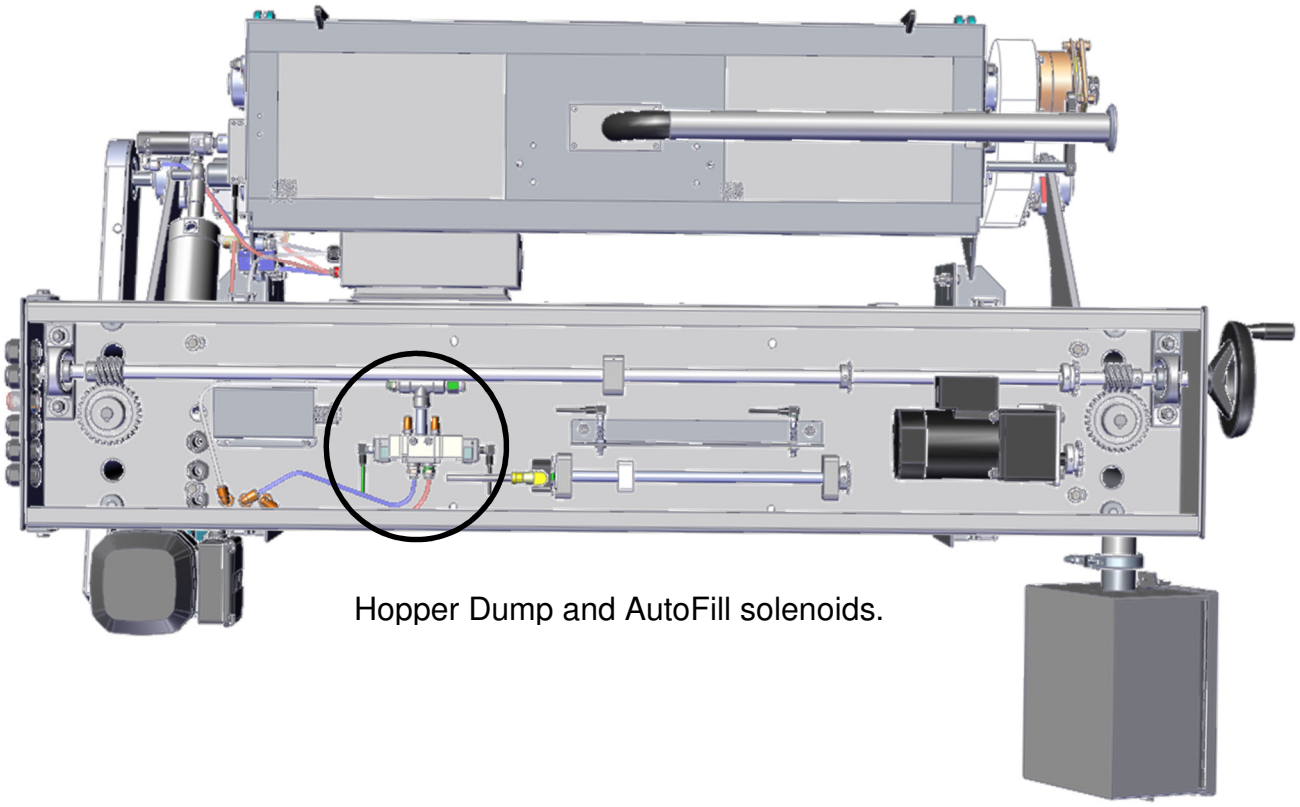


Upper Channel

Above the hopper is the Upper channel. The Upper Channel's lid can be removed by unlatching the four latches.

The Upper Channel houses the height automation controls and the air solenoids for the Dump and Optional AutoFill / MPA.

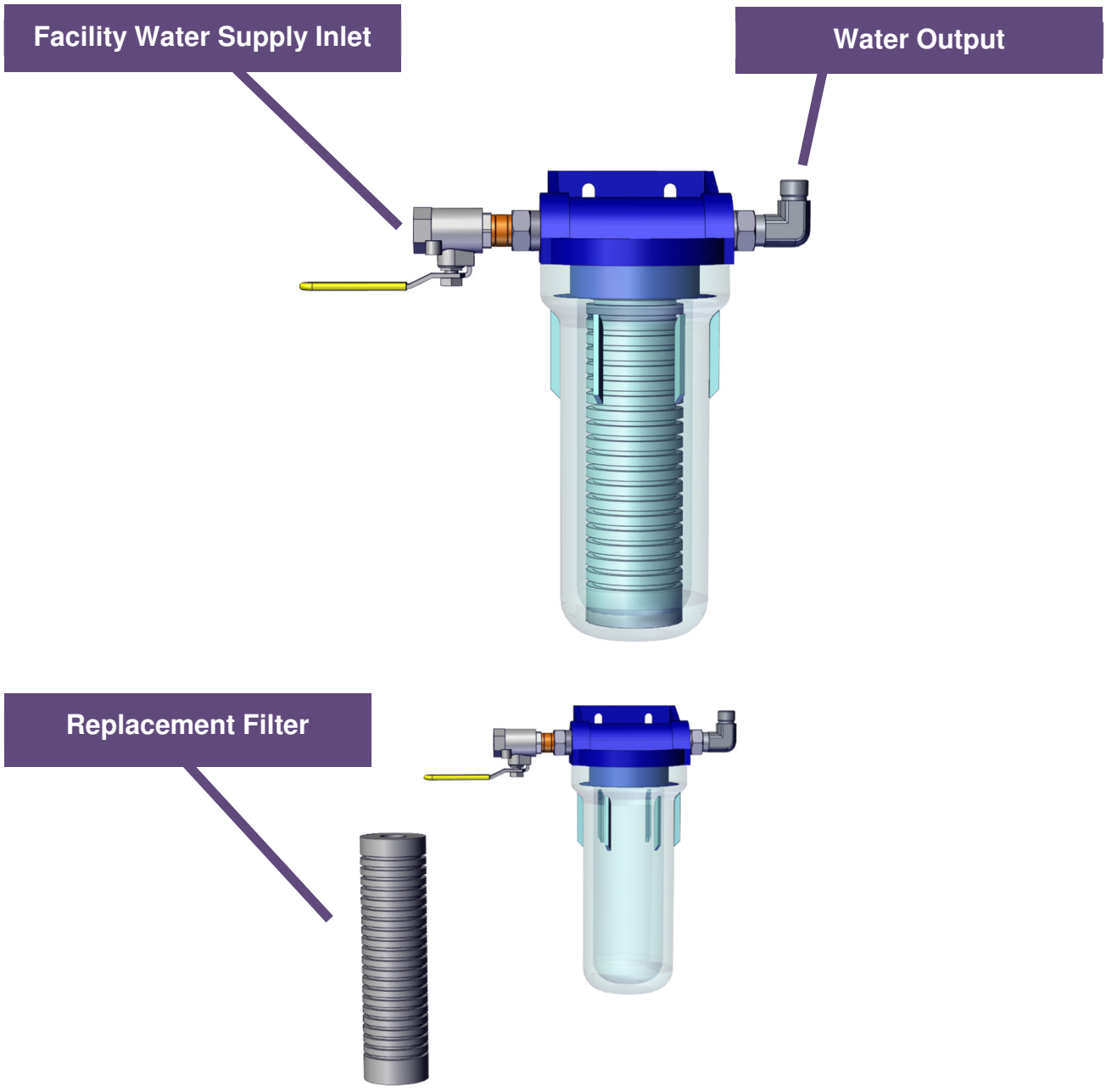




Hopper Dump and AutoFill solenoids.

Water Filter

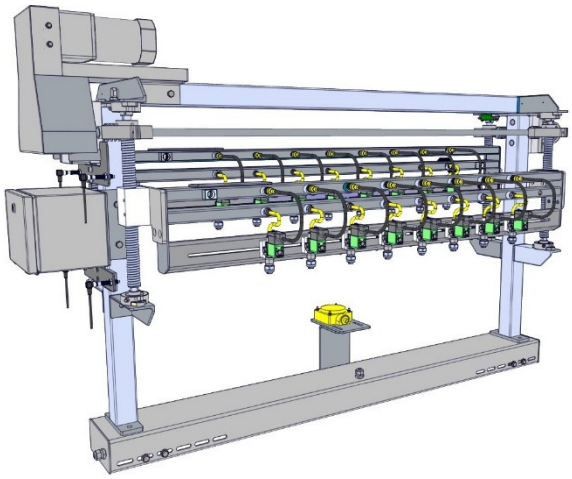
The Water Filter removes any contaminations from the water source. The filter supplied is rated at 10 microns. Replacement is recommended every 4 weeks but may differ depending upon the quality of the source water supply.



Order your replacement filters from Burford®. Call 1-877-Burford (1-877-287-3673) Today. Part Number: C00578

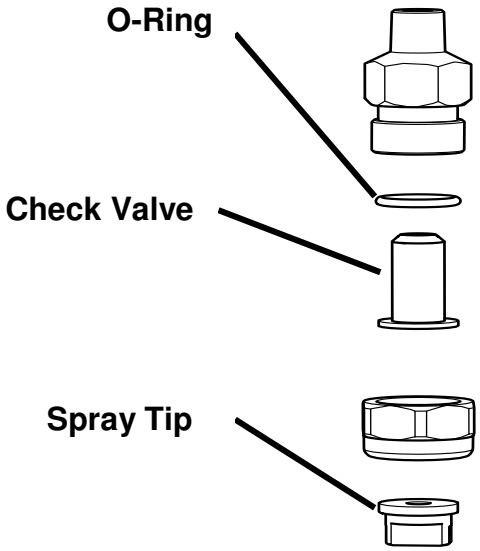
Spray Rail

The Spray Rail has components to ensure a desirable coverage of water on the product.



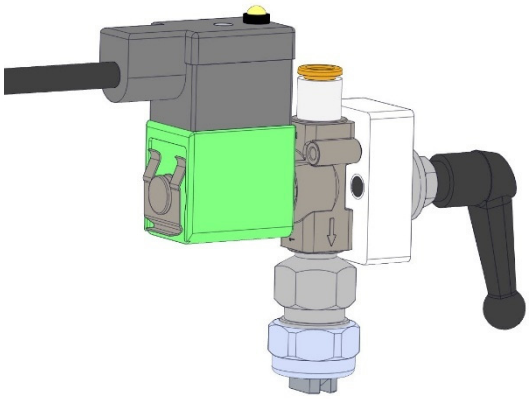
Spray Tip

The Spray Tip has the components to ensure a desirable spray. A check valve may be present that is used to close the valve once the pressure reaches a minimum pressure. This prevents dripping and air getting into the hydraulic system. An O Ring gasket seals the spray nozzle and prevents any leaking. A tip is then used to direct the water into a fan with an orifice size and angle specific for your needs. Different orifice sizes and fan angles are available to meet a wide range of applications.



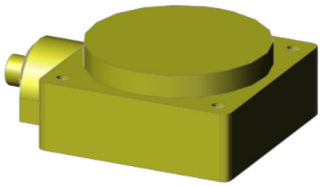
Electronic Valve

The Electronic Valve is controlled by the pan sensor and actuates for the set of time that the sensor is triggered. The unit has two types of electronic valves: spray and split.



Product Sensor

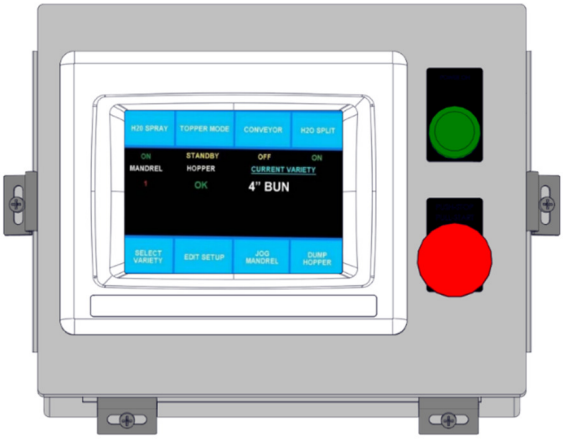
The 80mm proximity sensor is to detect product for the water spray / split.



The CMOS Laser sensor is used to trigger the seeder. The sensor transmits a laser that reads when a pan passes through the beam. The sensor notifies the PLC that the laser has been broken. The laser sensitivity can be adjusted. Refer to the instructions at the back of this manual for more information.

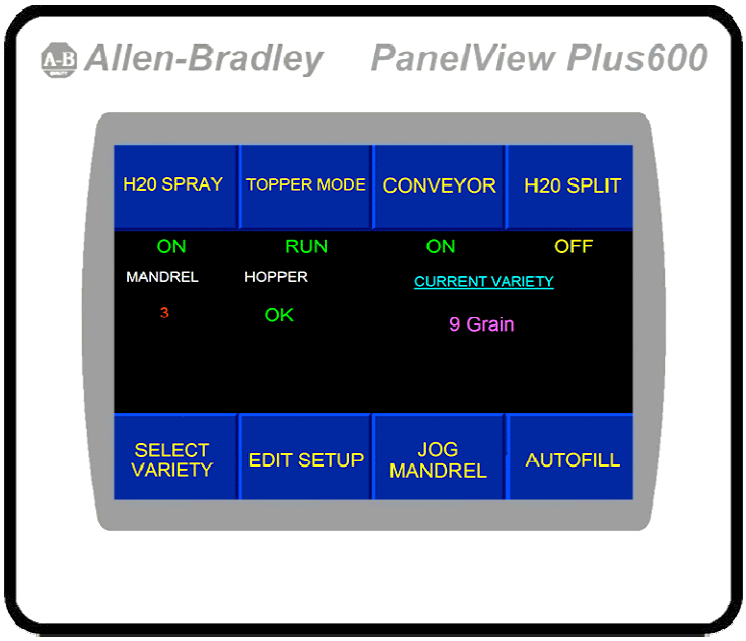
Operator Control Panel

The control panel has the Operator Interface, the E-Stop, and the power ON indicator light.



HMI

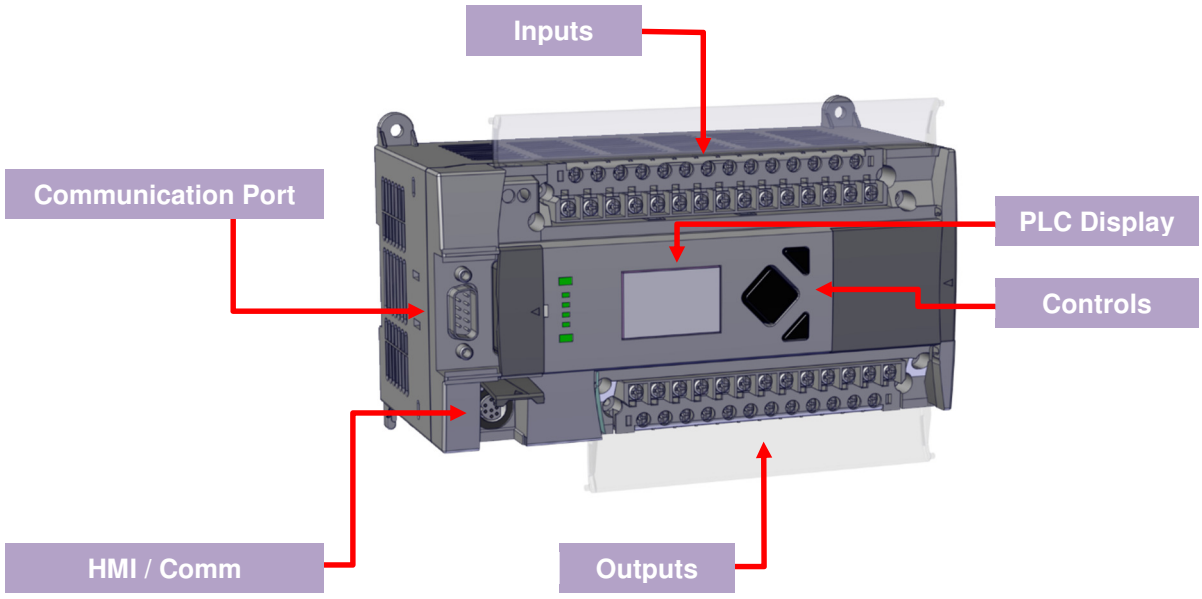
The HMI, (Human Machine Interface), is where the interactions between the unit and software occur. It allows the operator to input parameters that controls the unit. The unit is available with two types of display, the Allen Bradley 600 Plus and the Allen Bradley 700 plus.

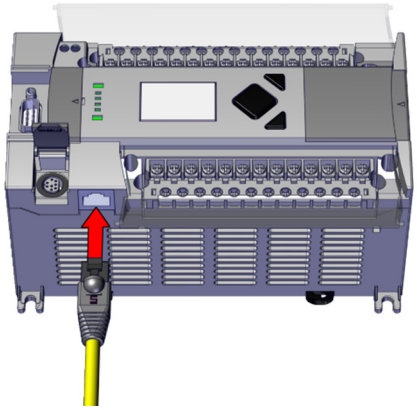


Allen Bradley 600 Plus Shown

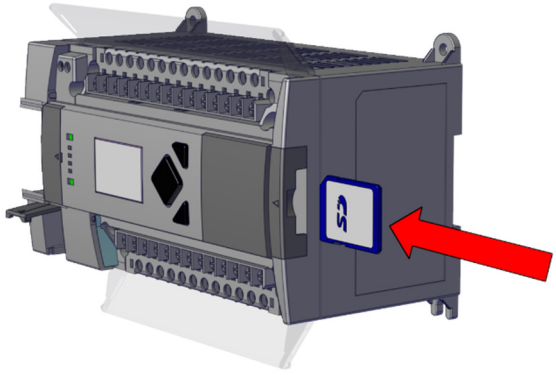
PLC

The PLC (Programmable Logic Controller) is a digital computer used for the automation of the unit. The PLC has proprietary Burford® software that executes the operations of the unit. The unit comes standard with the Allen Bradley 1400 PLC.





Ethernet
HMI / Comm



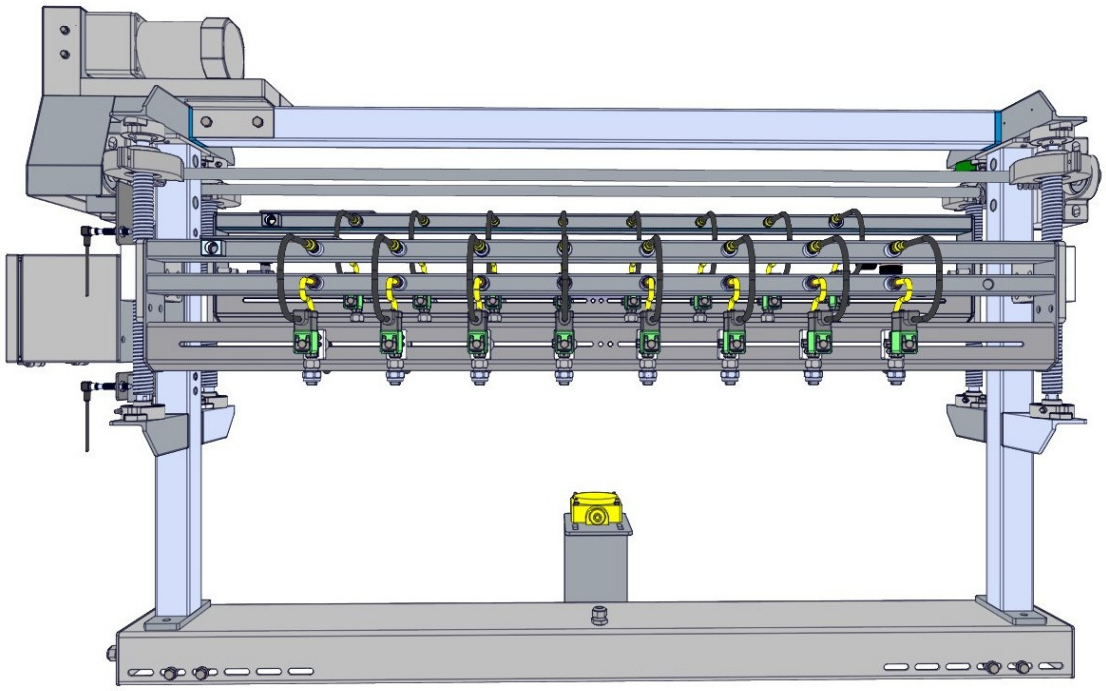
SD Card Slot

Optional Key Components

The following Key Components are items that may be bought as an upgrade with the Burford® Smart Seeder. Your unit may or may not have these items on it. Contact Burford® for further information.

Split / Spray Rail

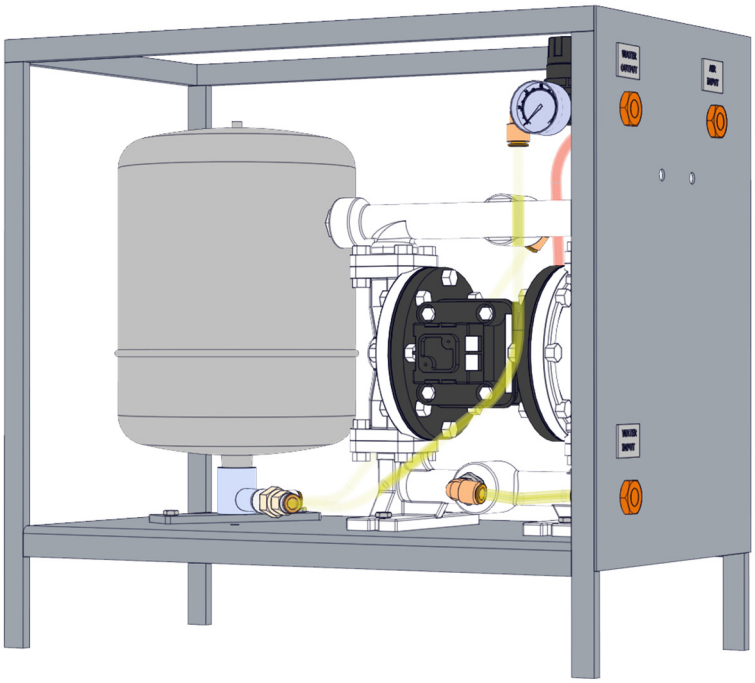
The Smart Seeder is available with an optional water splitter. With the optional splitter, the spray and split valves are installed on one automated rail. The splitter is controlled through the Seeder's HMI.



Order your Optional Components from Burford®. Call 1-877-Burford (1-877-287-3673) or email Sales@Burford.com today.

Booster Pump (Optional)

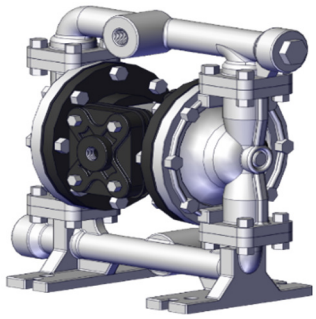
The Booster Pump has the necessary components to ensure uniform water pressure during the split sequence. It includes an air regulator, the water filter, pump, and accumulator. These components work in unison to deliver consistent water pressure during the split sequence.



It is vital that there are not any water pressure fluctuations during the split sequence. Any variations in water pressure may cause undesirable splits in the final product.

Diaphragm Pump (Part of Optional Booster)

The Diaphragm Pump is a positive displacement pump that uses a reciprocating rubber diaphragm and valves on either side to pump the water into the hydraulic system. The pump is powered by a supply of air and pressure can be controlled by the air regulator feeding the pump. The Output pressure of the pump is a 1:1 ratio of the input air pressure.



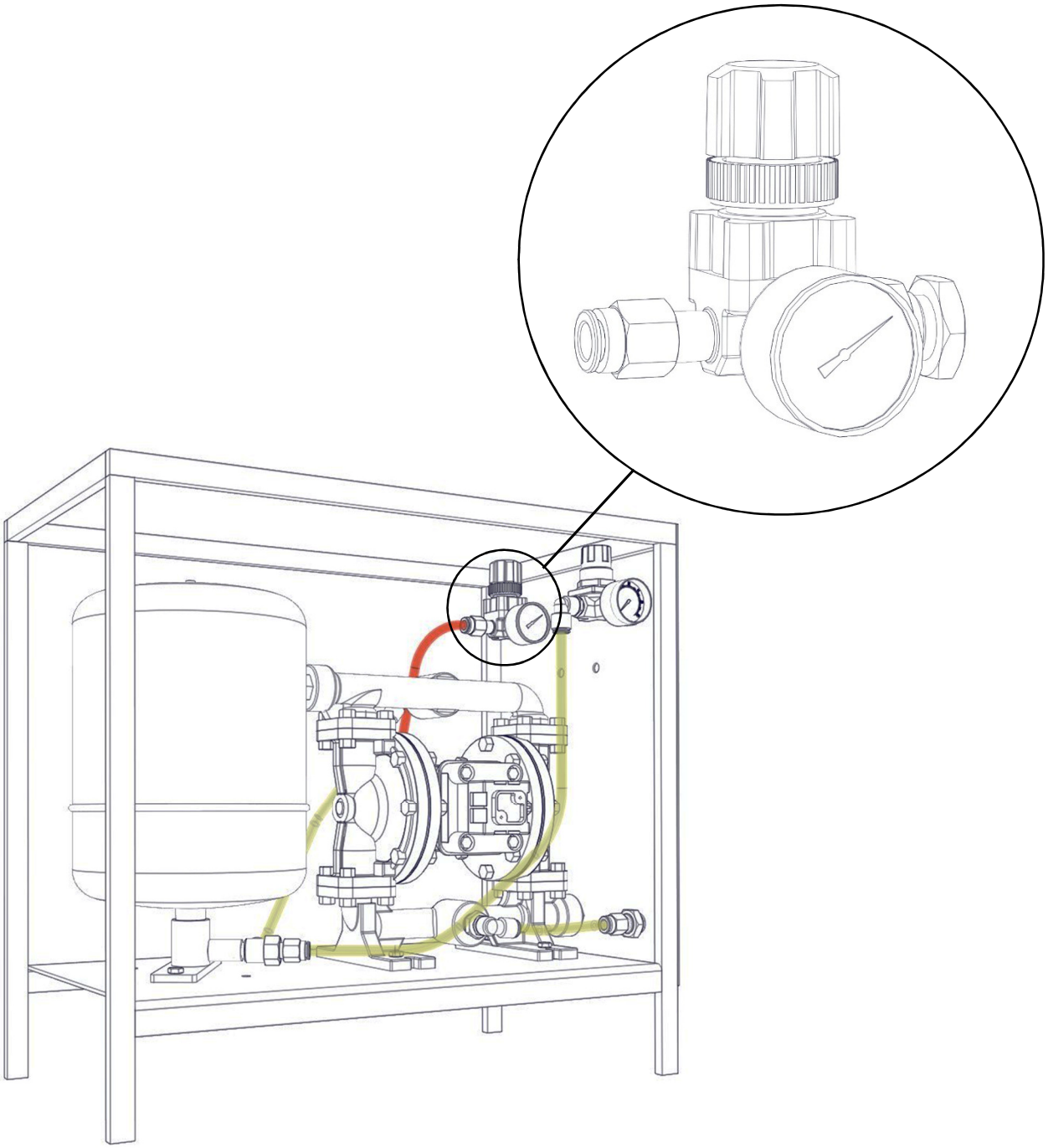
The Accumulator is a pressure storage reservoir in which the fluid is held under pressure by an internal bladder filled with compressed gas kept at a constant pressure, also known as a hydro-pneumatic accumulator. The use of an accumulator allows the hydraulic system to respond more quickly to a temporary demand and to smooth out any pulsations that may be present in the system. The internal bladder must be kept at 80% psi of the running pressure. A standard Schrader valve is used to fill the bladder. Compressed air may be used to fill bladder.

Dampener must be charged before use. Verify proper pressure before operations.

Example: If running pressure is 100 psi then the accumulator should be filled to 80 psi.

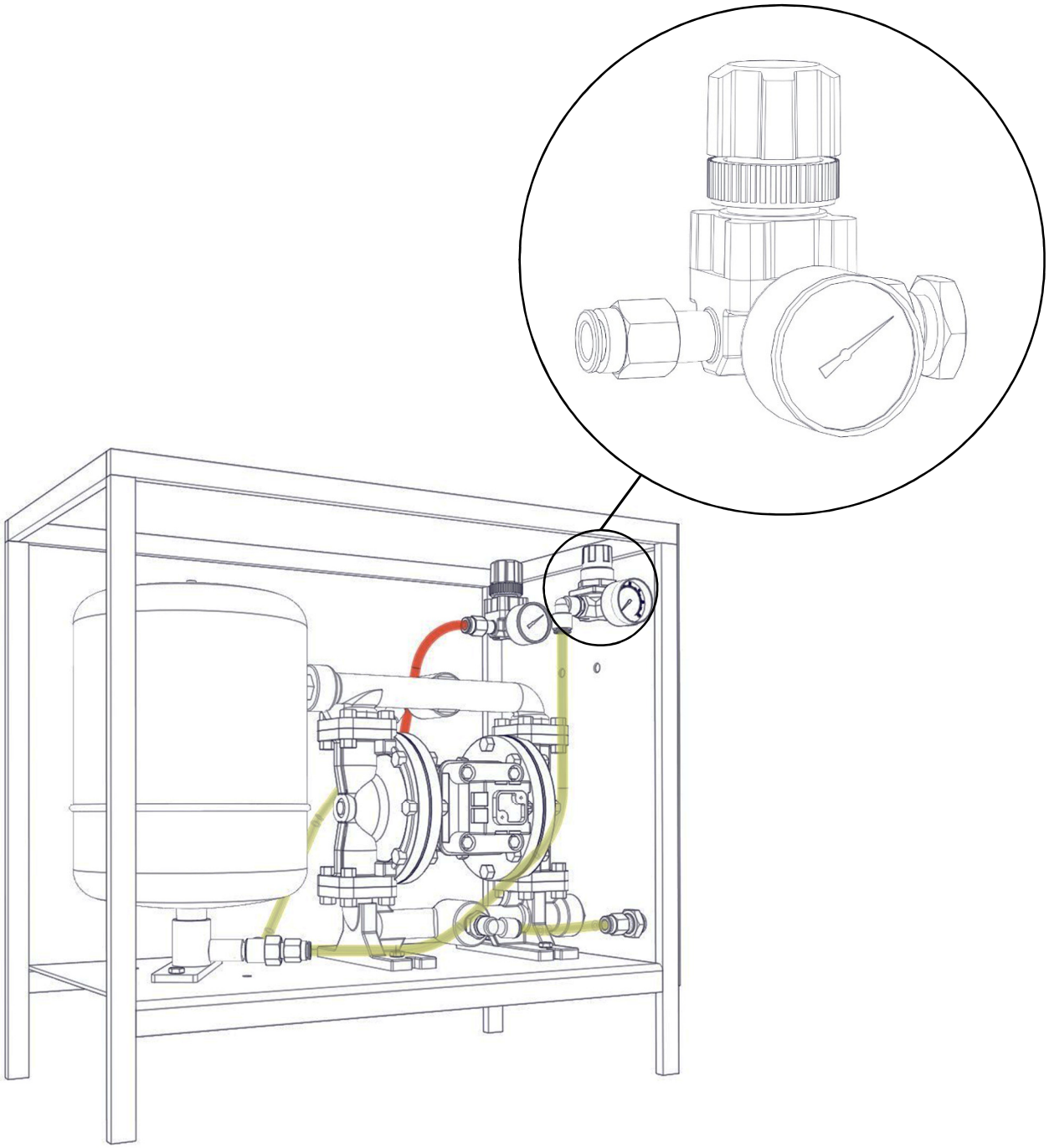
Pump Air Regulator (Optional Booster Pump)

The Booster Pump Air Regulator controls the pressure of the air working the diaphragm pump. The air pressure is at a 1:1 ratio of the output water pressure of the pump. The air pressure should be set at 20% above the max operating pressure of the water pressure.



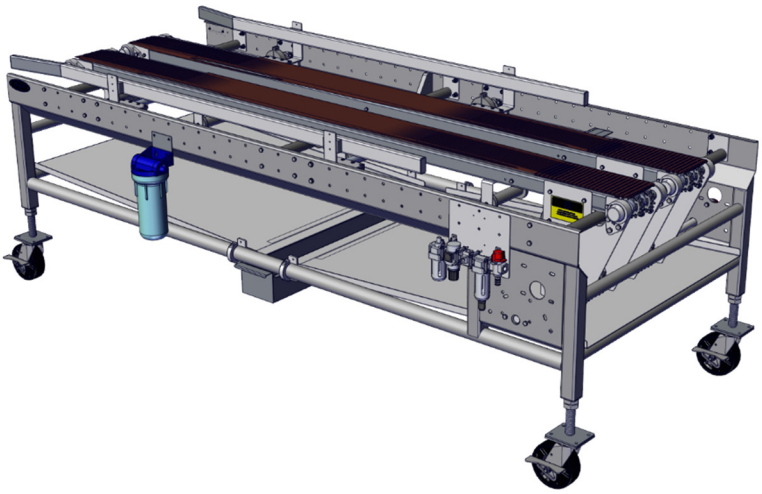
Output Water Pressure Regulator (Optional Booster Pump)

The Pump Output Water Pressure Regulator controls the amount of water pressure supplied to the split nozzles. The amount of water pressure from the split tips decide the depth of the split into the product. Variations in dough will need adjustments to be made to the water pressure to receive the desire splits.

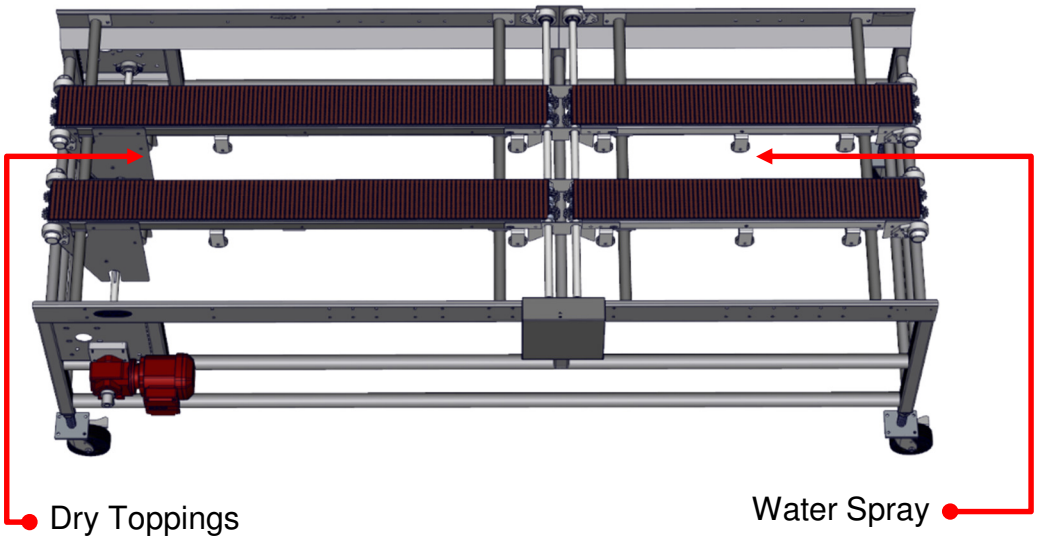


Conveyor

An optional conveyor is available for your Smart Seeder. The conveyer transfers product through the unit so toppings can be applied. Burford® conveyors feature a drip pan collection system that increases the sanitation of the unit. A split, wet / dry conveyor is also available to keep the topping waste separate from the water drainage.



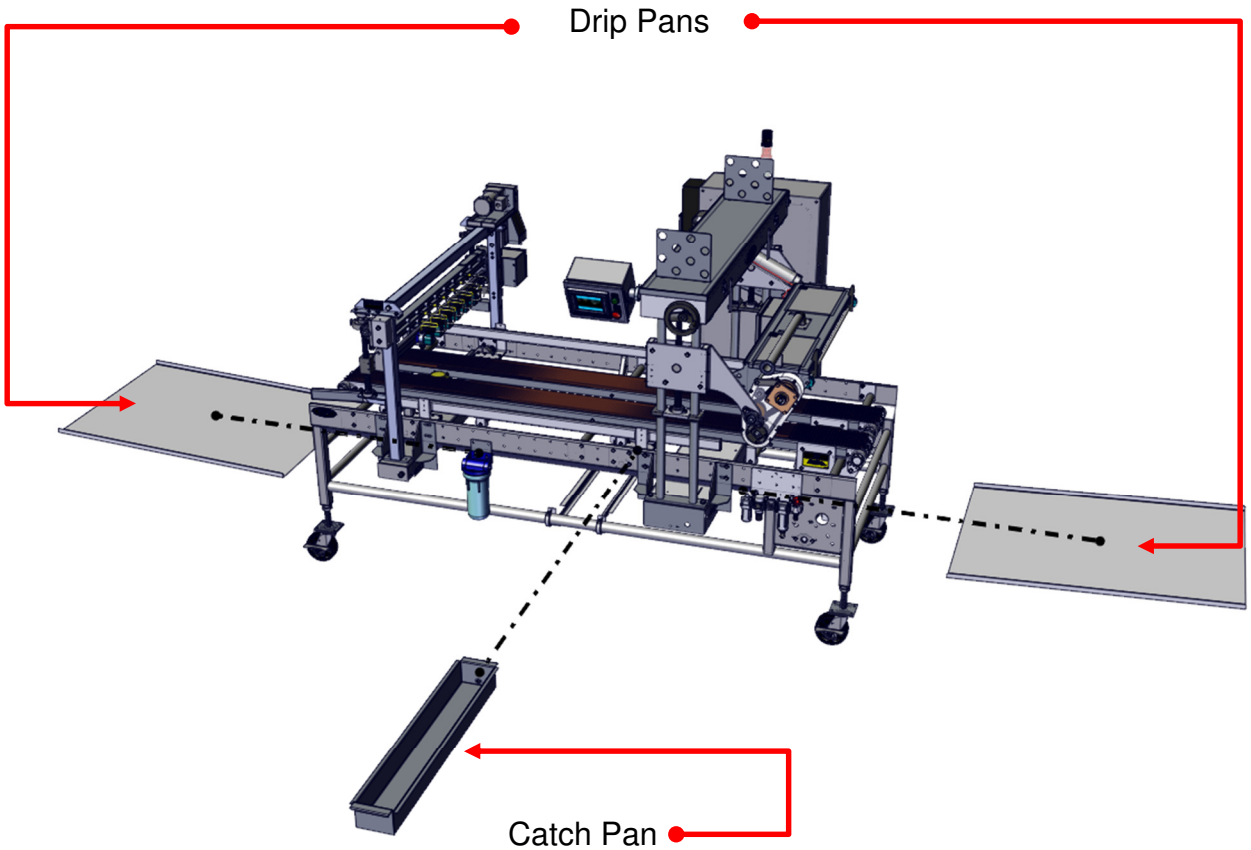
Standard Conveyor



Split Wet / Dry Conveyor

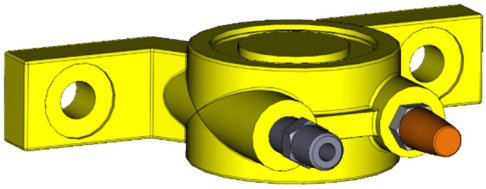
Conveyor Drip Pans

The conveyor system features two drip pans and a catch pan to collect any seed droppings. They are easily removable for cleaning at a different location. The catch pan has a removable plug that can plumbed into a drainage system if needed.



Vibrator

An optional Vibrator is available. The vibrators are found on the rear of the hopper. Activated by the Topper Pan Sensor, the Vibrator will enable with the agitator rake to assure uniform topping application and to prevent bridging.



Multi-Purpose Tank

If a MPA was ordered with your unit, then you received a portable tank. Connect the hose from the tank to the Auto Fill System found above the Topper.

Auto-Fill Systems

The Auto-Fill Systems are designed to run with the Burford® Topper and Conveyor System. The operator can connect the transfer hose to one of multiple product hoppers. This allows the operator to change to a different topping with least effort.

Burford® offers two types of Auto-Fill systems: the MPA (Multi-Purpose Auto-fill), and the HS series. The MPA allows for the transfer of a wide range of toppings. The HS series is compatible with only seeds.

The MPA incorporates a vacuum assembly housed in the unit for product transfer from the tank to the hopper.

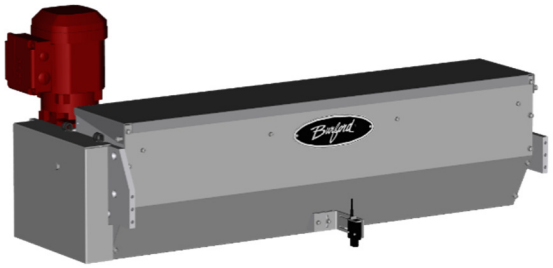
The HS series relies on compressed air to create a vacuum using the Venturi effect. The model number after HS shows the storage capacity of the tank in U.S. pounds. The HS series is available in 300lbs and 500lbs capacity. An optional Dryer is available on the HS series to keep the seed free from moisture.

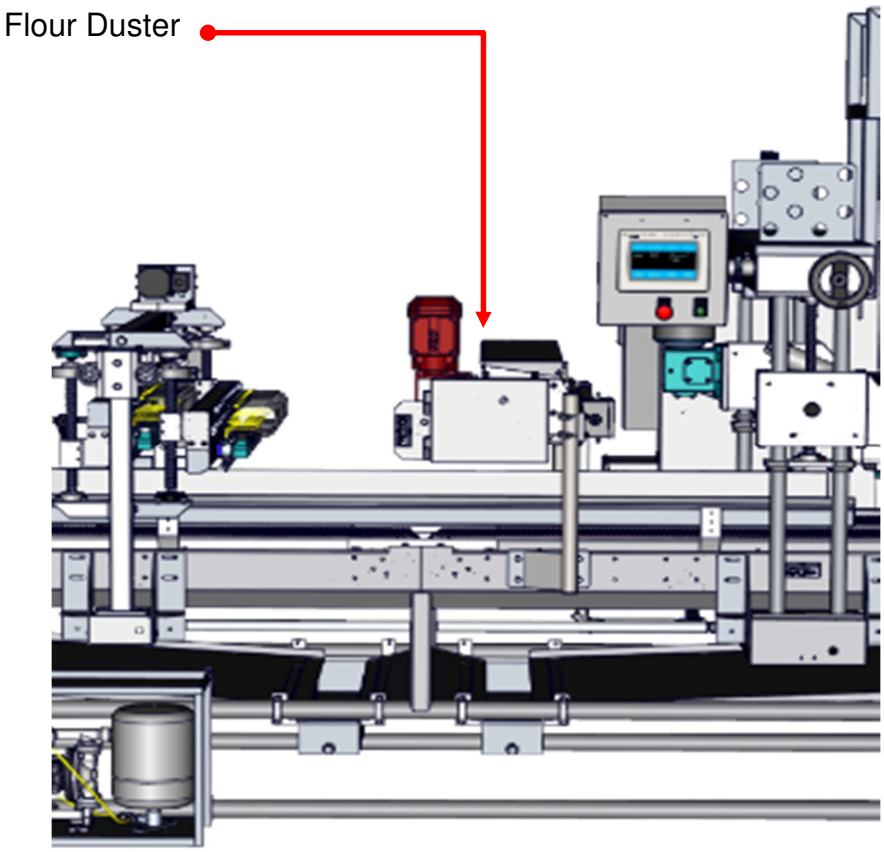
MPA System

HS-300 System with Optional Dryer

Flour Duster

The Flour Duster applies flour to the top of your product. An optional, integrated Flour Duster may be bought with your Smart Seeder. A stand-alone unit is also available that can be easily installed unto your existing conveyor system. Contact Burford® for more information.





TYPICAL FLOUR DUSTER PLACEMENT INTEGRATED INTO SMART SEEDER

Chapter 3

Installation

CHAPTER 3: INSTALLATION

Your Smart Seeder is fully assembled when it arrives at your facility.

The area chosen should not allow product to stop under the Topper.

The area around the Topper installation site should be clear of any obstructions and the Topper shall not be installed in such a way as to create a safety hazard, or block a normal passageway. Clearance must conform to all local safety codes.

Installation site should have ample clearance on the operator control side to allow:

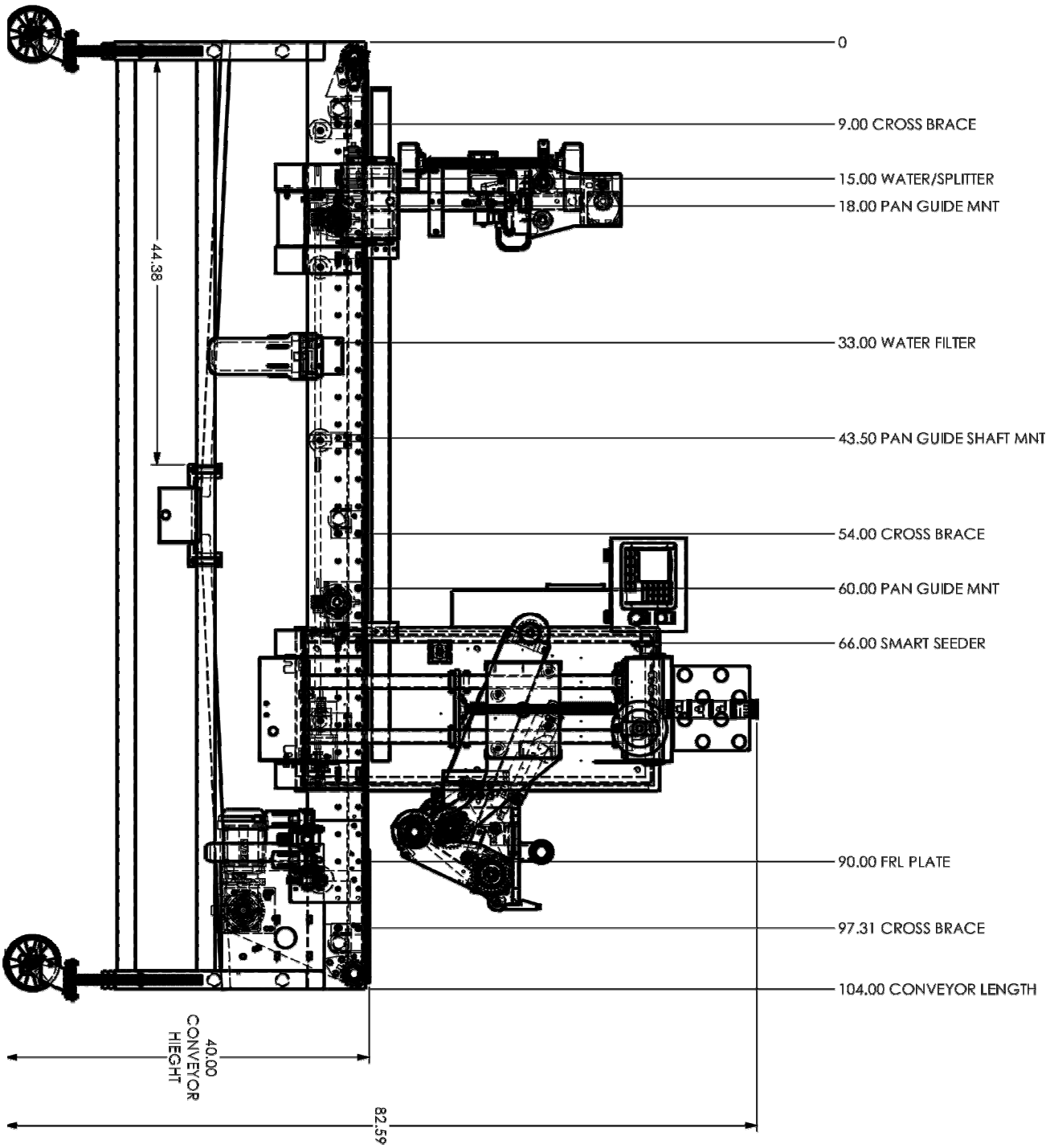
- Easy access
- Removal of Mandrel
- Normal maintenance

Consideration must be made for the possibility of product storage near installation site.

Installation Outline

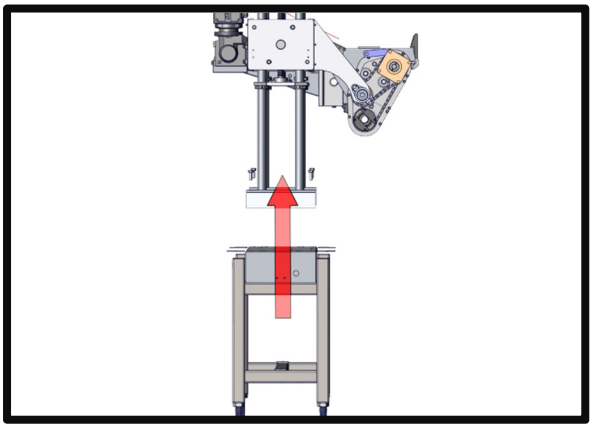
- Choose a proper location
- Level conveyor with existing conveyor system
- Lock castors
- Connect to utilities

Installation on an Existing Conveyor

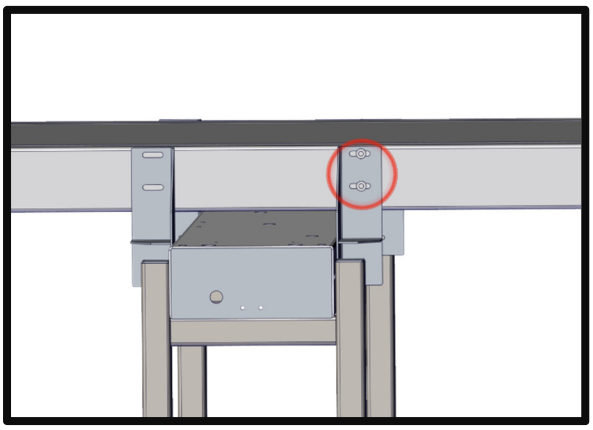


Installation on Existing Conveyor System, continued

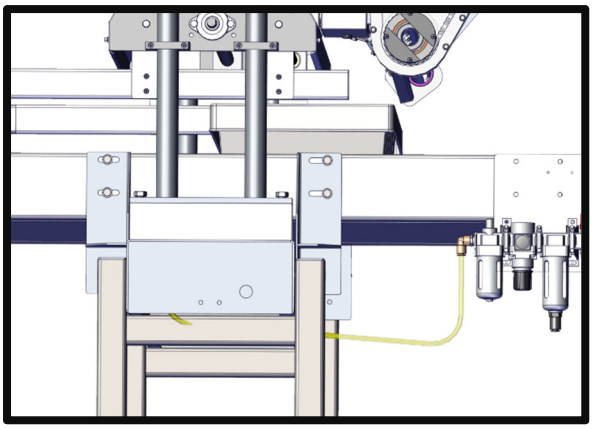
Mark air hoses (shown in bottom picture) and disconnect from filter-regulator-lubricator. Separate upper and lower assemblies. This will allow the upper and lower assemblies to be mounted as separate units.



Bolt the four mounting brackets on the sides of the lower cross frame into the corresponding mounting holes. If the exact distance cannot be obtained, then spacers, between the brackets and the conveyor frame should be used.

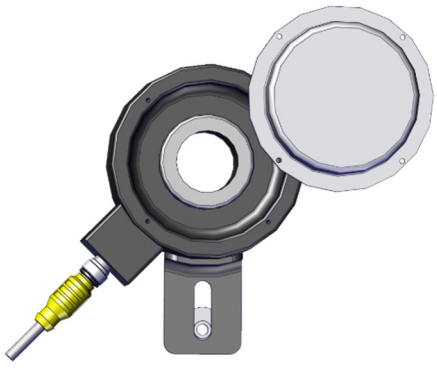


Carefully route air hoses through lower assembly and reconnect to Filter-regulator-lubricator. Align upper assembly and mount to lower assembly.



Installation on Existing Conveyor System, continued

- Install conveyor encoder.
- Loosen all the setscrews securing the desired conveyor shaft to bearings and conveyor belt sprockets.
- Carefully slide shaft until enough clearance is gained to mount encoder.
- Slide encoder onto conveyor shaft and orientate cable connector as desired, then mark and drill a ¼" hole to secure the anti-rotation flex mount to the conveyor wall.
- Attach communication cable to encoder and conveniently route cable back to seeder enclosure. Consult supplied wiring diagram for wire termination information.



Burford® recommends that a new conveyor shaft be made that is 1-1/2" longer than the existing conveyor shaft. This will allow the encoder to be mounted on the outside of the conveyor frame, simplifying future encoder maintenance.

Installation on a Burford® Conveyor

Remove Topper from Mount

1. The unit may be mounted on castors for portability.

2. Locate an area that is clear of obstructions. The area chosen should not allow the product to stop, turn, or back-up. A supply of compressed air and power needs to be available at installation site.

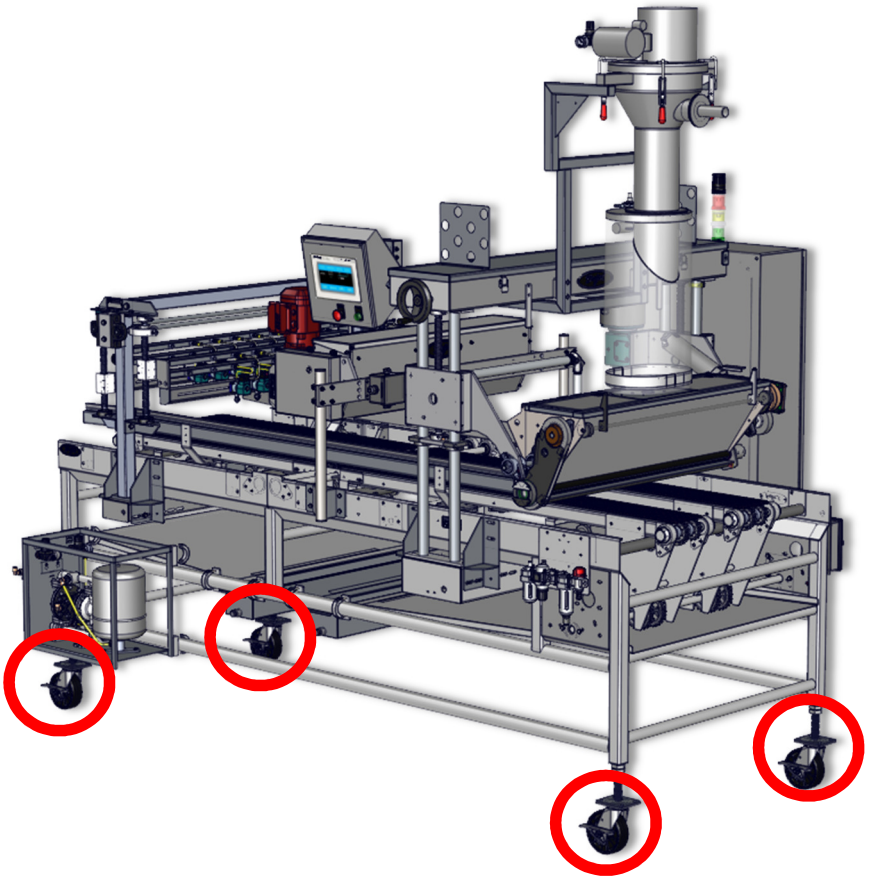
3. Roll the unit into place.

4. Level both the upstream and downstream conveyor with your existing conveyor system. The transfers to and from the Burford® conveyor must be smooth so it will not damage the product during transfer.

Verify top clearance for hopper

Castors

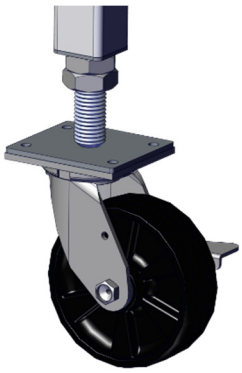
The Unit may still be on the Castors for portability if permanent castors are installed, or the unit can be permanently fixed to the floor. When the unit is in operation, the Castors must be locked to prevent movement.



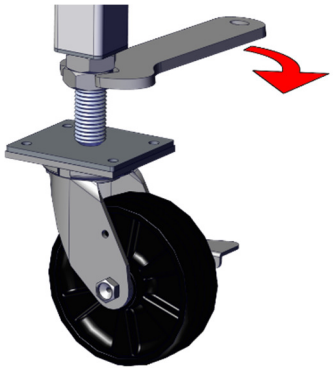
Level Conveyor

The unit will need to be level during operations to function properly. The support legs are adjustable. Match the height of your existing conveyor system to that of the Burford® conveyor. There are four leg supports with castors. The castors are mounted to a threaded shaft rod. The threaded shaft rod is able to extend and retract approximately 6” of travel within the leg support.

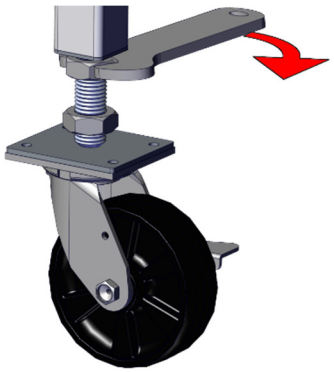
Locate the Castor strut that needs adjustment.



Loosen the bottom jam nut and bring the nut down on the shaft.

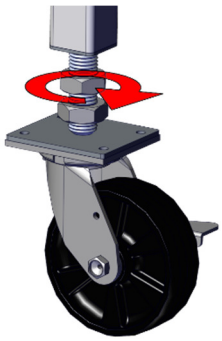


Loosen the top jam nut.

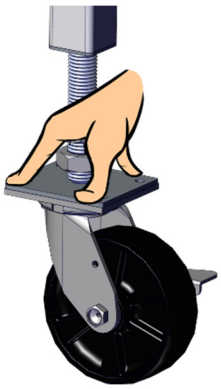


Level Conveyor, continued

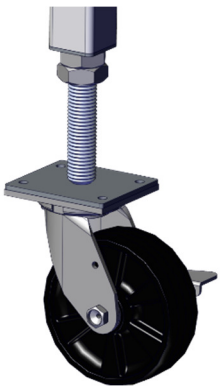
With the nuts loosened, turn the shaft.



You may use your hand on the castor mount to aid in turning the shaft. Loosen the shaft from the frame to raise the unit. Tighten the shaft from the frame to lower the unit.



After the desired height is achieved, secure the shaft by first tightening the top jam nut to the frame then tighten the bottom jam nut to the top jam nut. This will lock the shaft.

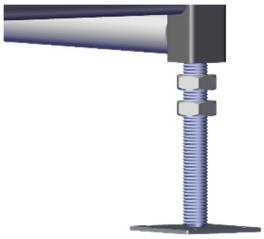


Permanent Installation

The unit may be permanently fixed to the floor.

Remove all the temporary castors.

Loosen the jam nuts.



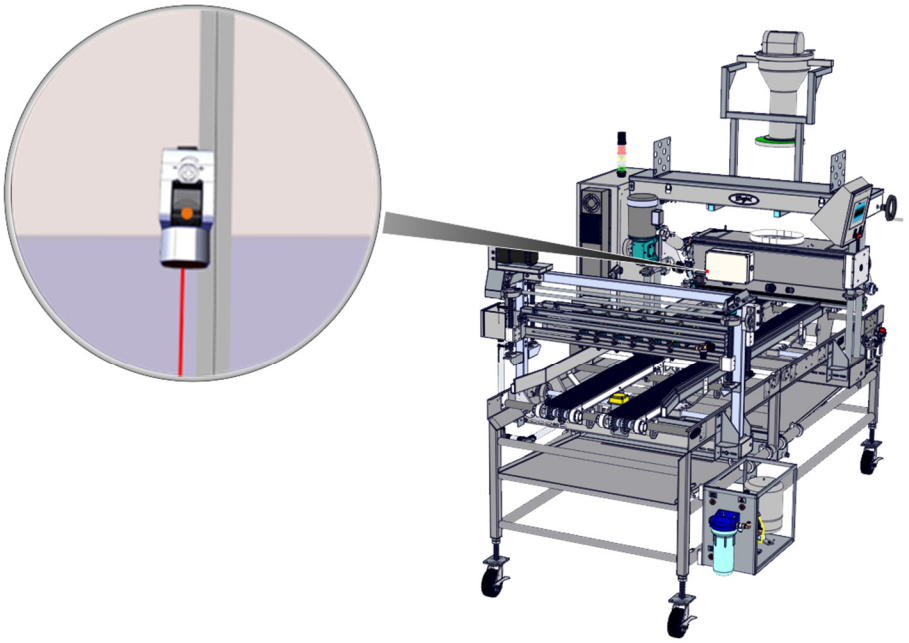
Rotate Tread Shaft to adjust height.

When level with existing conveyor system tighten the jam nuts.

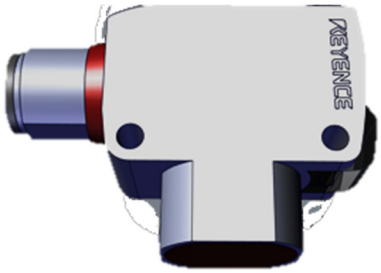
Drill holes matching the bolt pattern of the castor mount and secure with concrete anchors.

Product Sensor Setup

The Product sensor for the seeder may need to be properly adjusted before operations of the Smart Seeder.

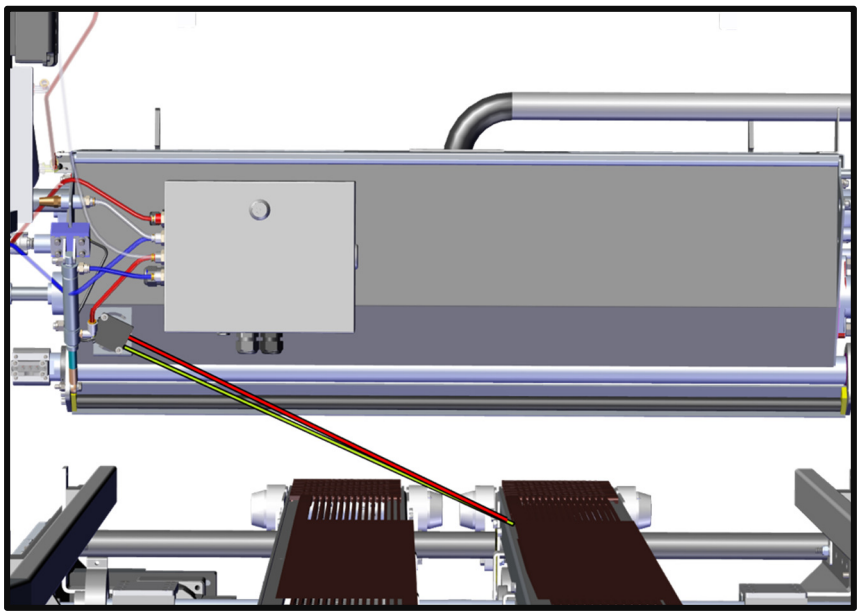


The bracket that the sensor is mounted on is slotted. This allows the sensor to be rotated for alignment purposes. The sensor transmits a light beam to a reflector. The reflector “reflects” the beam back to the sensor. When a pan passes through the beam, the sensor no longer receives the light beam reflected from the reflector and signals the PLC that a pan is present. It is critical that when a pan is not present the beam is able to reflect to the sensor.

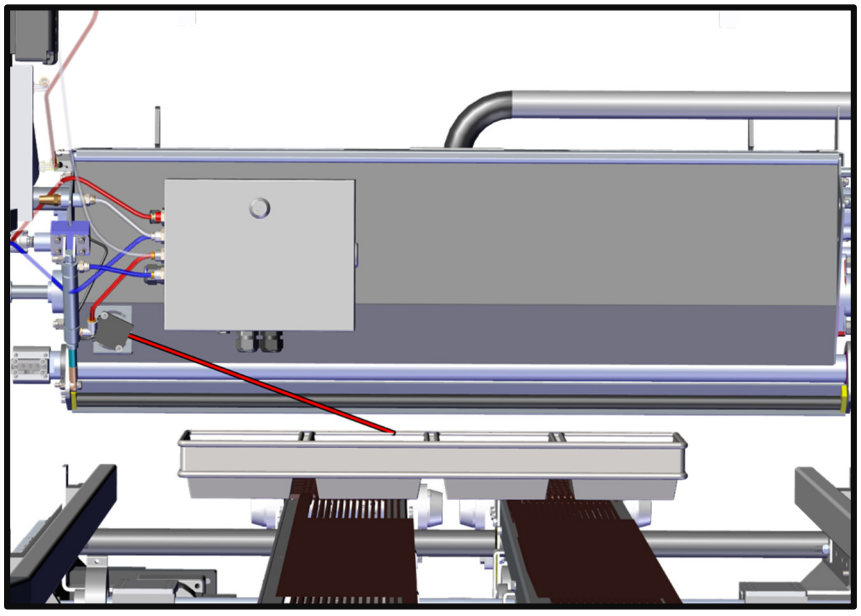


Reflector Product Sensor Setup

A reflector is found on the inside of the conveyor track. The sensor transmits a light beam to a reflector that returns the beam back to the sensor when not blocked.

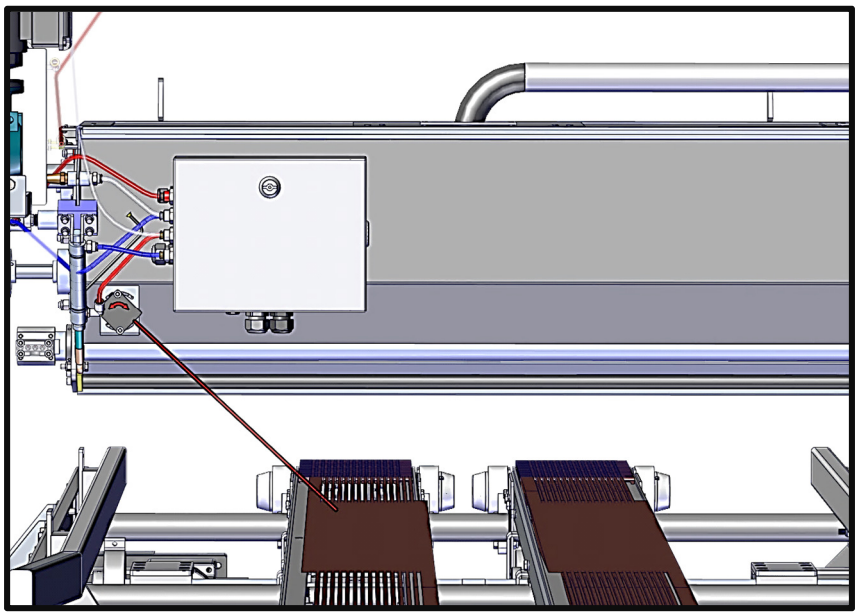


A passing pan disrupts the beam to the reflector, preventing the sensor from receiving the reflected beam. When the sensor does not receive the reflected beam, a signal is sent to the PLC indicating that a pan is present.



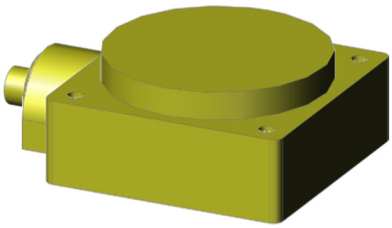
Product Sensor Setup, continued

The image below illustrates the wrong way for sensor setup. The example below would constantly signal the PLC that a pan is present. The sensor must be able to receive back the transmitted beam when a pan is not present and this is carried out by the reflector.

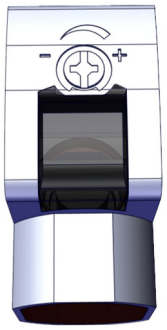


The height of the hopper will affect the path of the beam. When setting the height of the hopper for a variety be mindful of the product sensor path to the reflector. During setup of the hopper height on a variety, verify that the product sensor is making contact the sensor.

In some situations, a photo-reflective may not be suitable. An optional 80mm proximity sensor is available.

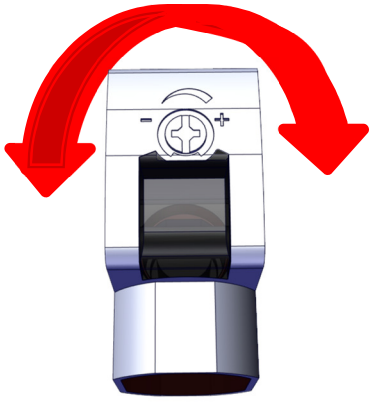


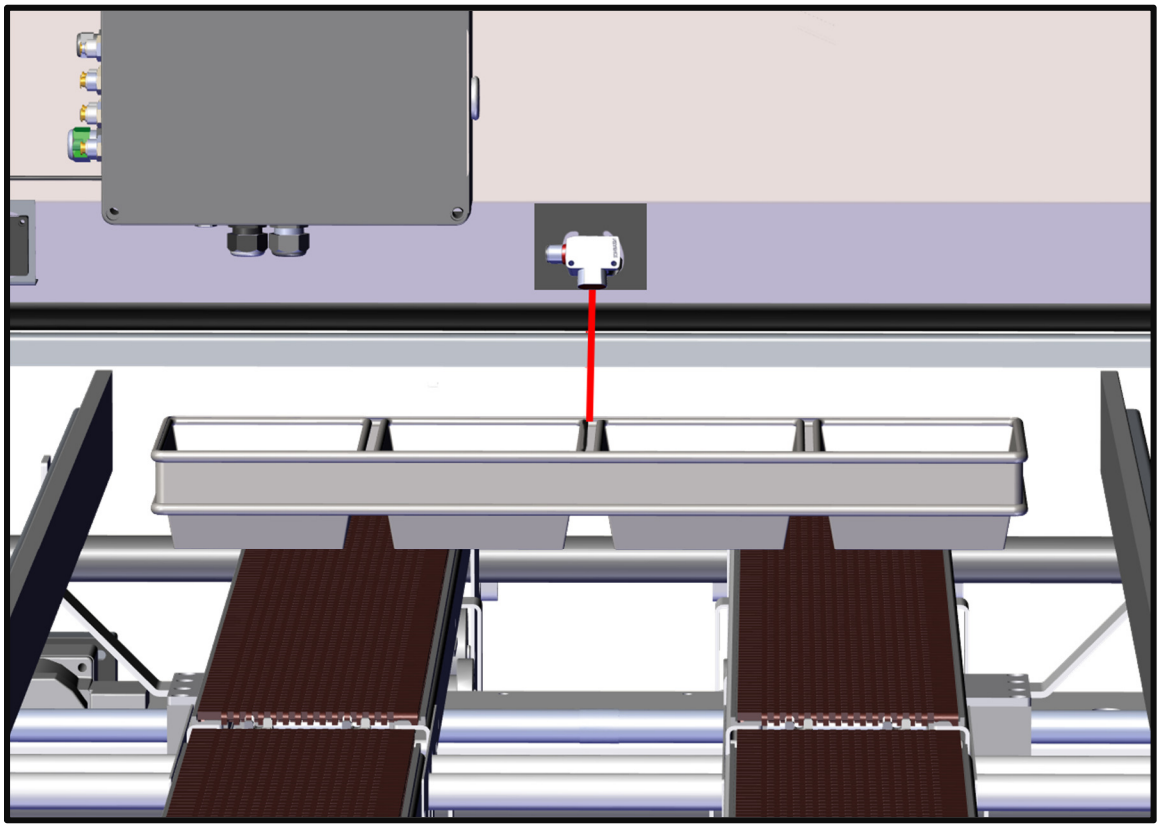
In situations where deflection is difficult, a diffuse reflective sensor may be more environmentally friendly. Detection occurs when the light beam, emitted to the target, is reflected by a target, and received.



Diffuse Reflective Sensor Setup

Place the product pan under the sensor and adjust the sensitivity until sensor is reading the pan.

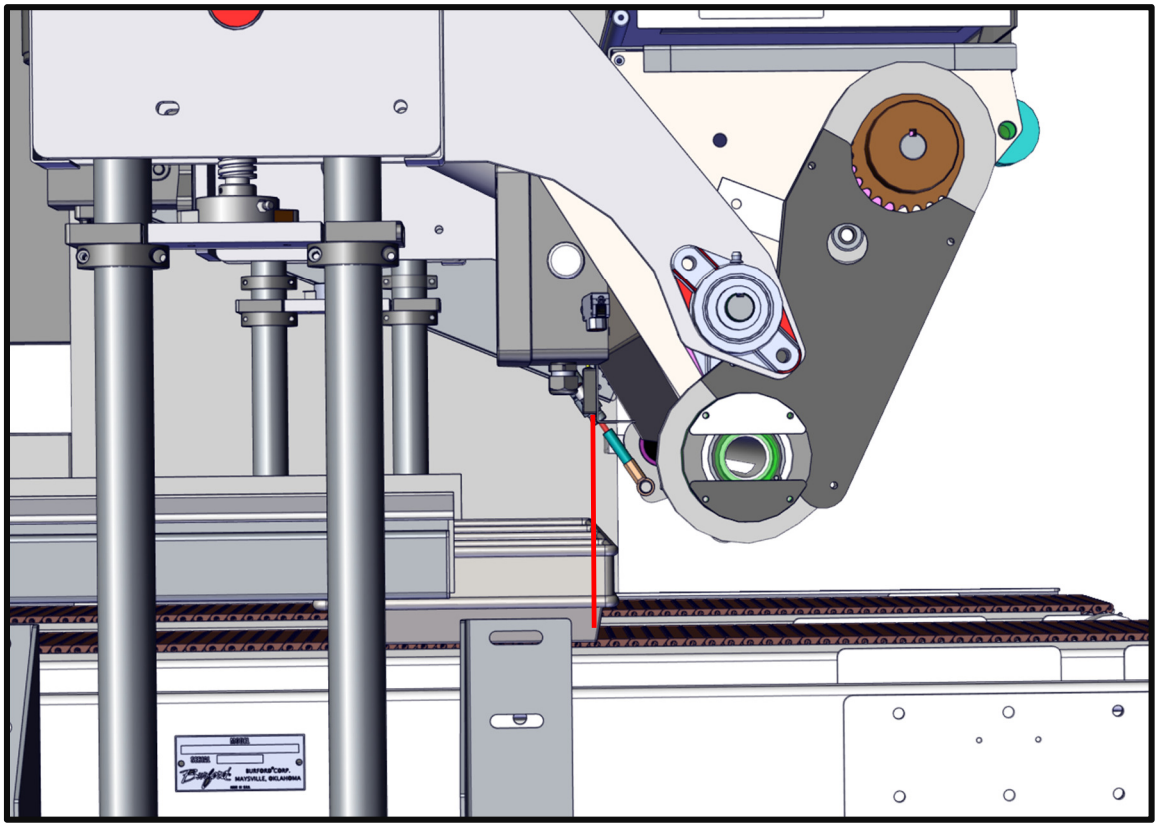


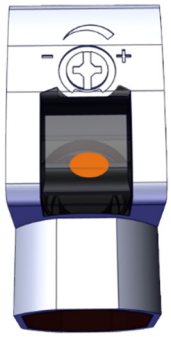


A passing pan disrupts the beam to the reflector, preventing the sensor from receiving the reflected beam. When the sensor does not receive the reflected beam, a signal is sent to the PLC indicating that a pan is present.

Diffuse Reflective Sensor Setup, continued

Test the Sensor setting by running the pan used for the recipe, through the seeder. The sensor light will let the operator know when the sensor is triggered by the pan. If the sensor light blinks, the sensor needs to be adjusted to read a lower depth. More than likely, the sensor is reading the lip of the pan and not the cavity.





Recommended depth setting for the sensor is 4” below the tracks of the conveyor.

Install the Water Spray

The Burford® Water Spray was shipped to you completely assembled. Partial disassembly is needed before the actual mounting. The disassembly of the unit should be done carefully to prevent damage to the unit.

Conveyor Requirements:

1. The conveyor chosen must use pan guides to keep the pans straight when traveling through the unit.

2. The conveyor chosen should not allow the product to stop, turn, or back-up.

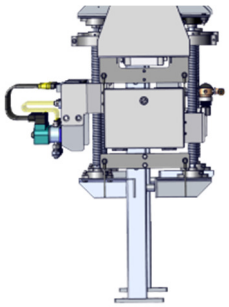
3. Area around the unit installation site should be clear of any obstructions or block a normal passageway. Clearance must conform to all local safety codes.

4. Installation site should have ample clearance on operator control side for easy access and normal maintenance.

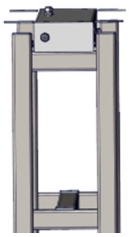
    A. Easy access
    B. Normal maintenance

Unpacking Procedure for Installation on Existing Conveyor

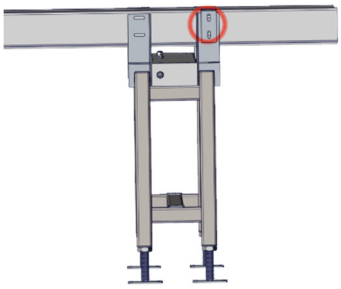
Uncrate the unit and set up right onto the packing crate cushions.



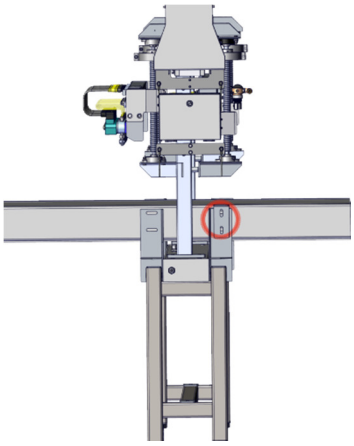
Loosen and remove the bolts that hold the lower cross frame to the uprights and remove pan proximity sensor carefully lay aside. You should now have two separate assemblies of the spray and split.



Measure the conveyor width and then bolt the four mounting brackets on the sides of the lower cross frame into the corresponding mounting holes. If the exact distance cannot be obtained, then spacers, between the brackets and the conveyor frame should be used.



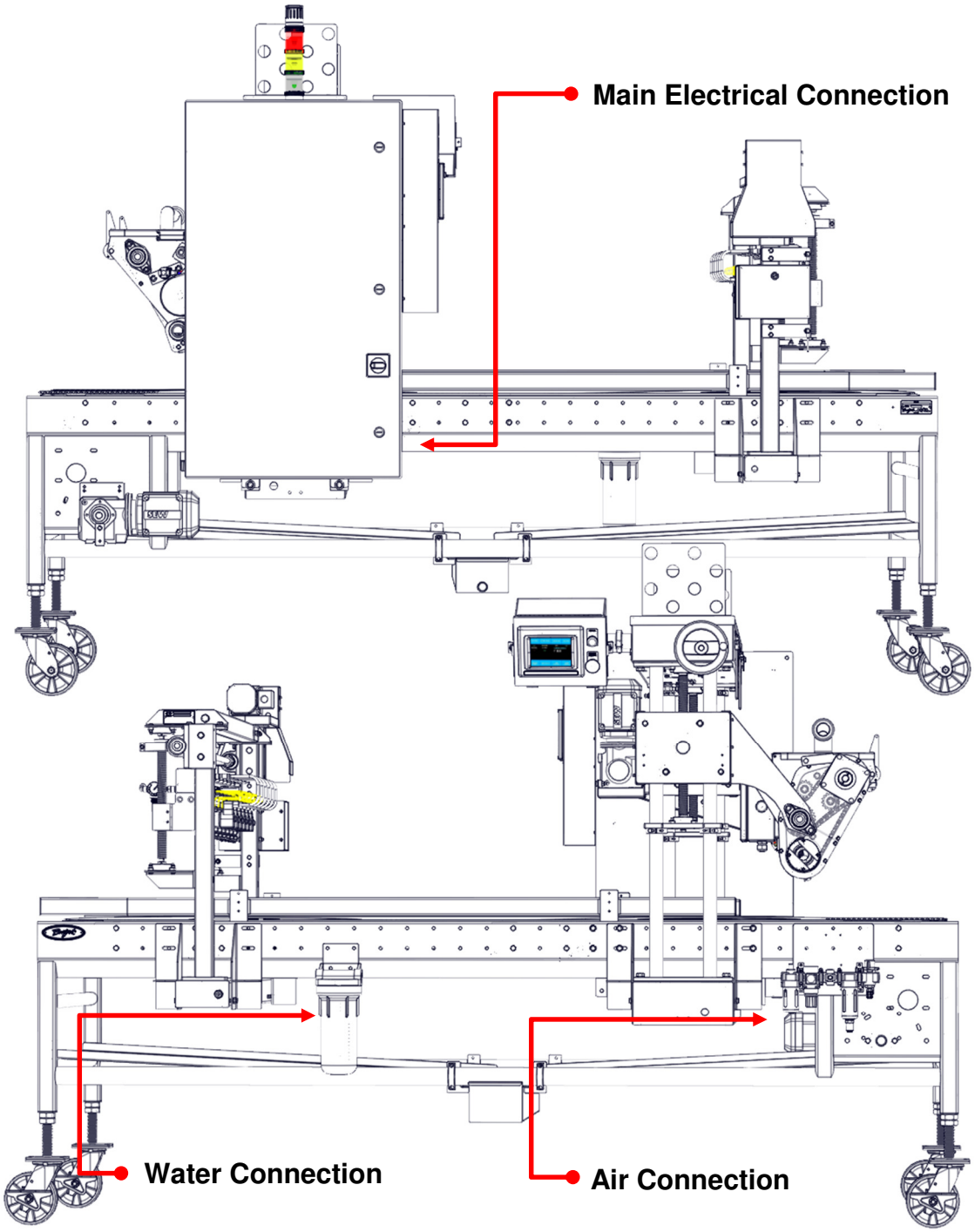
With the mounting brackets in place, slide the lower cross frame under the conveyor and raise upward until the top of the cross frame is ¾" from the bottom of the conveyor frame. Mark and drill the mounting holes into the conveyor frame and mount the unit.



After the lower cross frame is bolted in place, the uprights can now be lowered over the top of the conveyor onto the lower cross frame and bolted on.

Power Connections

Connect power to the unit. A qualified electrician must make all electrical hook-ups using a suitable service with all safety requirements and compliance to local codes being followed. Refer to electrical diagram at the end of the manual for connection details.

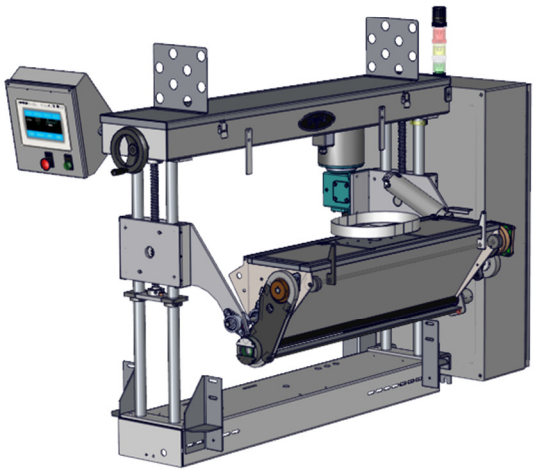


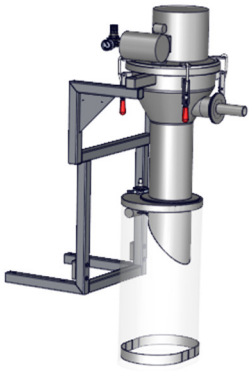
Connect air to the F.R.L. A minimum operating pressure of 60 psi is needed.

MPA Installation

The MPA is removed during shipment to your facility. It will be necessary to install the MPA when the unit arrives.

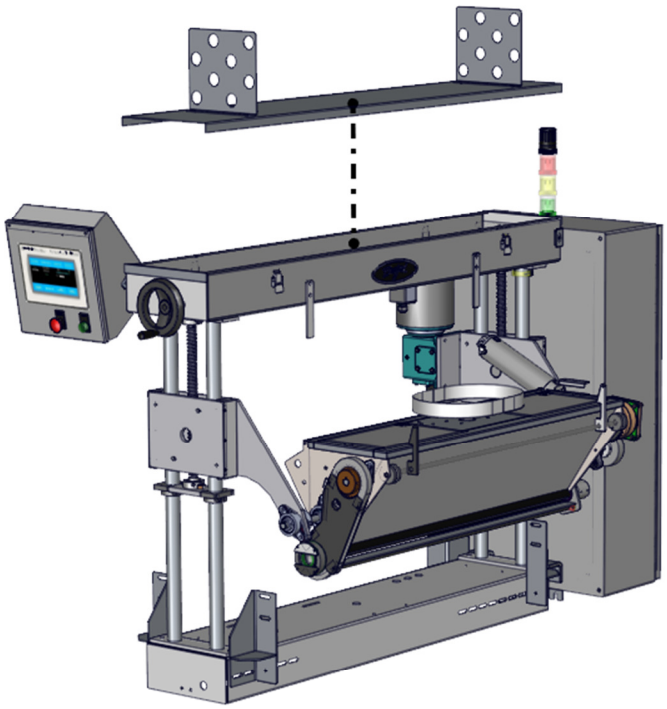
Locate the eight MPA mounting bolts supplied with the unit.

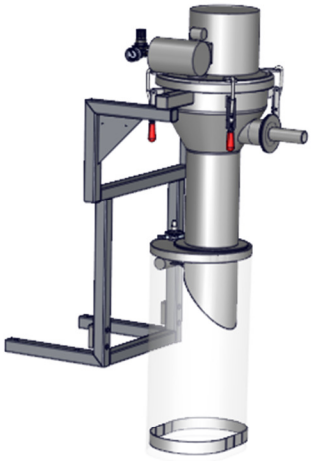




MPA Installation, continued

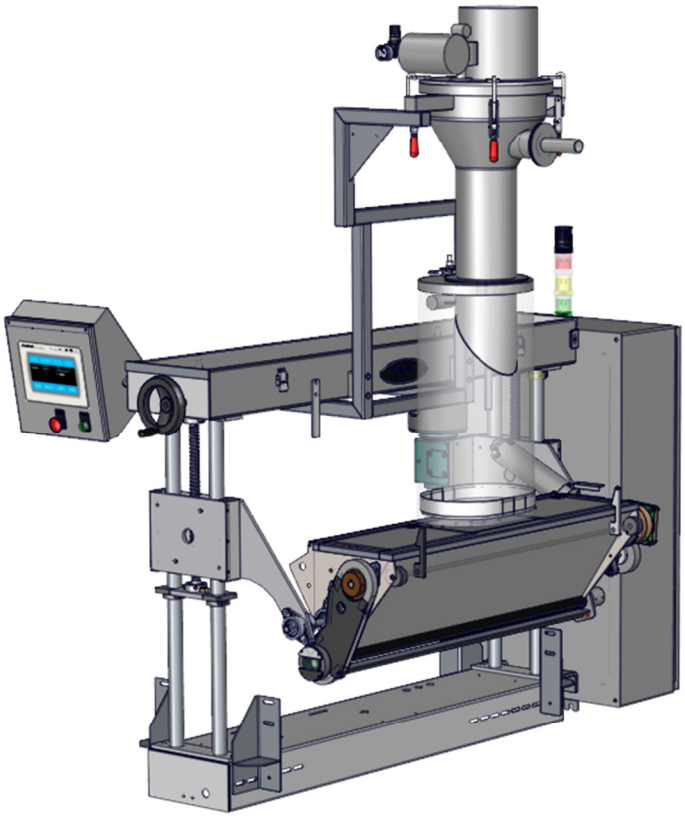
Remove the upper channel lid by releasing the four latches.





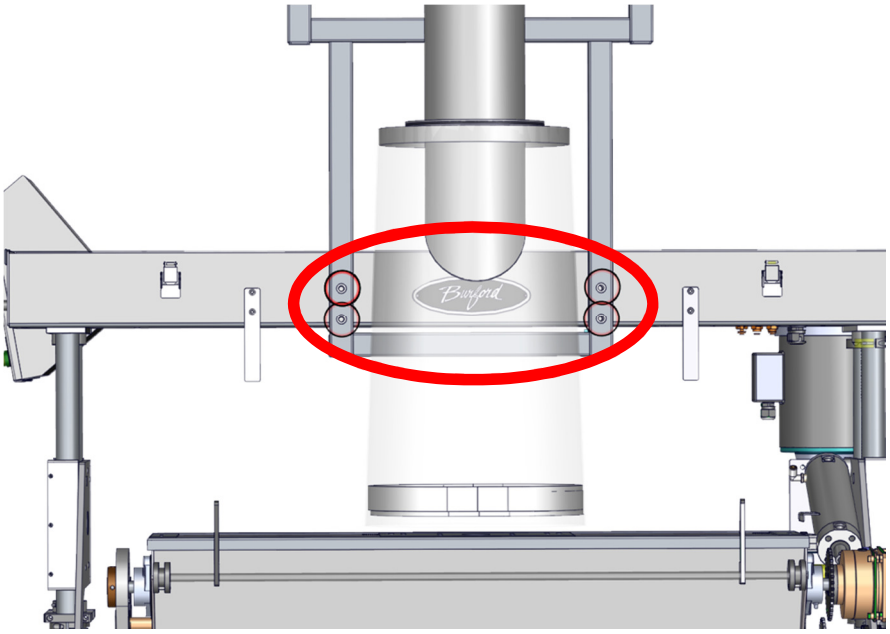
MPA Installation, continued

The MPA is heavy. With at least two people, position the MPA on the hopper. Be careful as not to allow the full weight of the MPA rest upon the hopper or damage may occur.

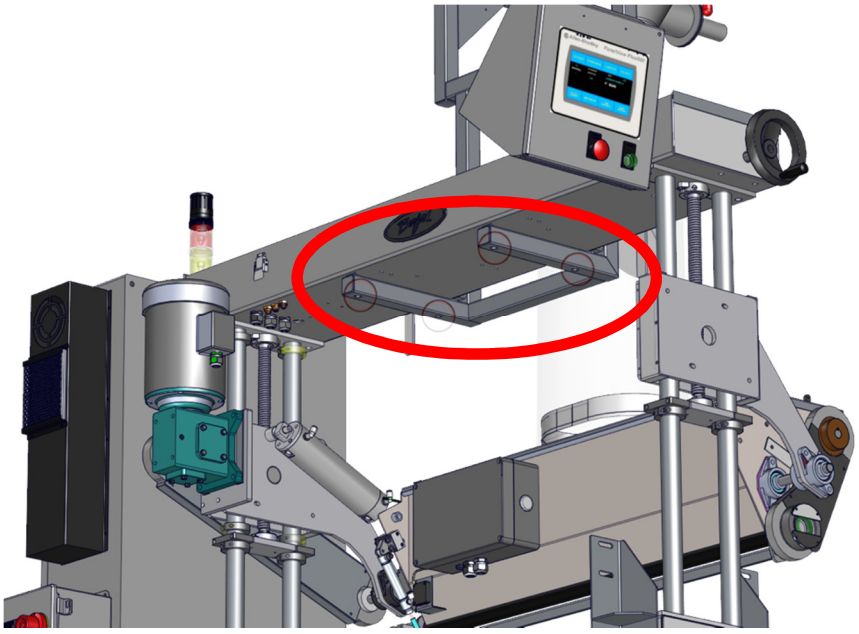


MPA Installation, continued

Secure four of the supplied bolts to the front of the unit.

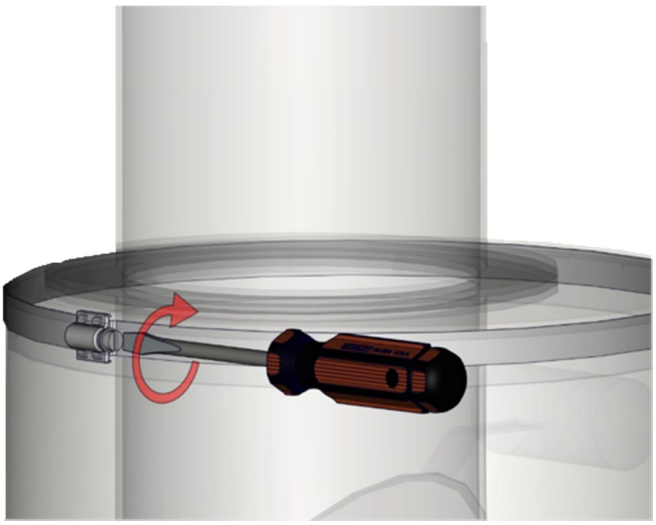


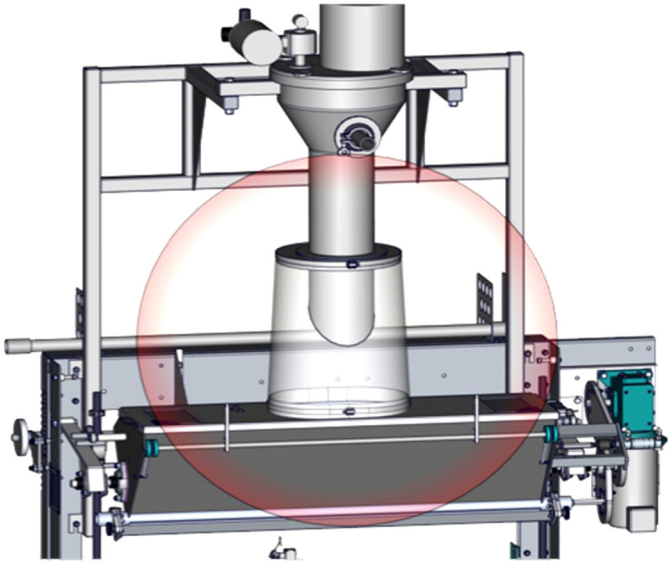
Secure the remaining four bolts the bottom of the mount.



MPA Installation, continued

Connect the transfer duct with the bands provided.





Route electrical, air lines along frame, and connect to vacuum receiver.

Stage the auto-fill hopper(s) to allow the supply hose to reach the vacuum receiver, and then connect supply hose and air lines as shown.

Utility Installation

A qualified electrician must make all electrical hook-ups and the unit must be incorporated into a suitable service with all safety requirements and compliance to local codes.

Installation Arrangements

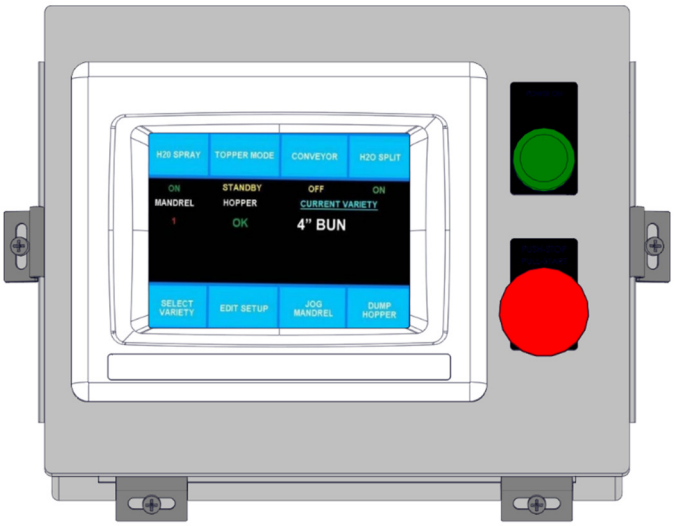
A Burford® factory trained Installation Engineer may be hired for any installation. The arrangement can be made with the Service Manager:

Burford® Corp.
Maysville, Oklahoma
Phone: 1-877-BURFORD or 405-867-4467
Fax: 405-867-4219

Chapter 4

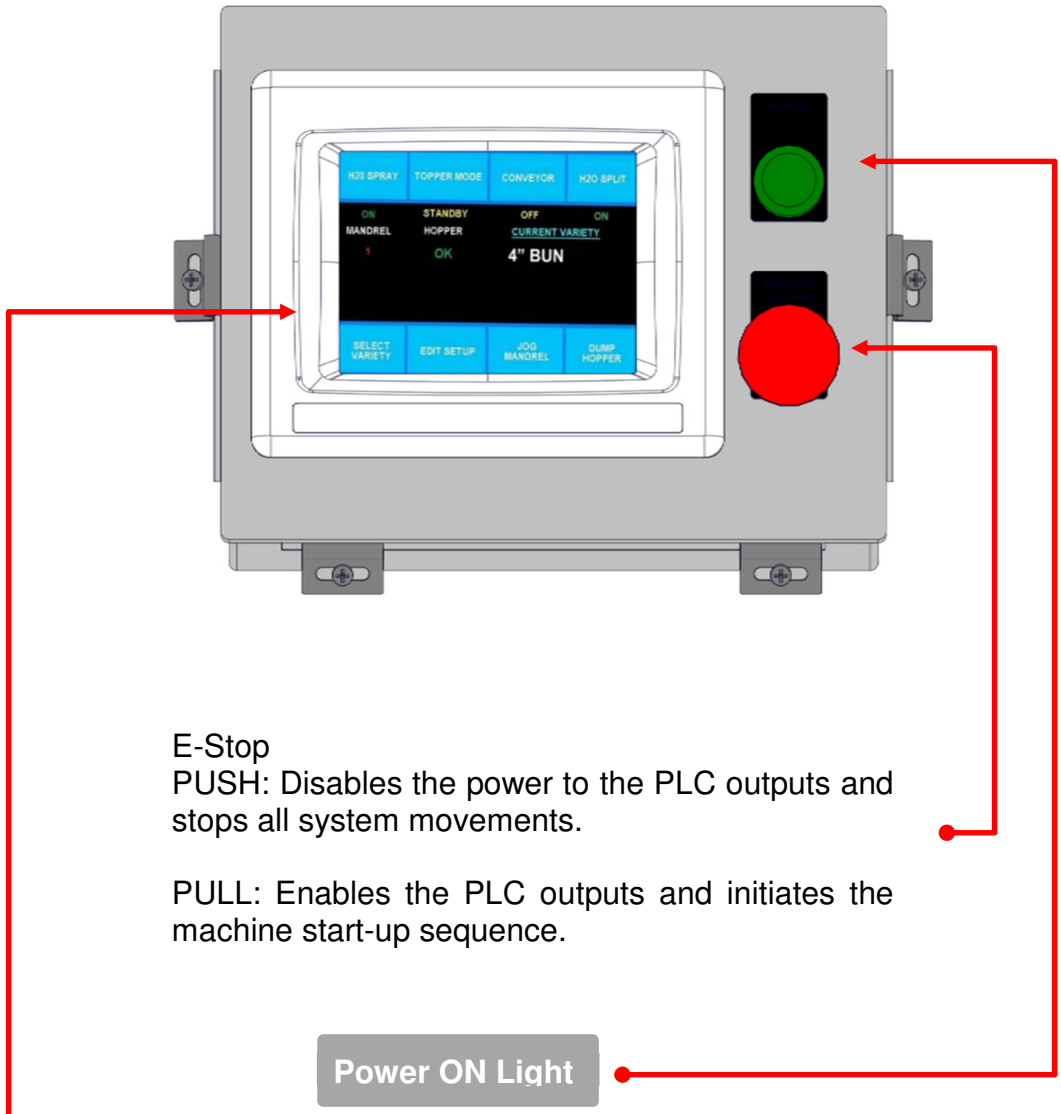
User Interface

Chapter 4: USER INTERFACE



The User Interface is the space where interactions between humans and the machine occur. The interaction by the operator allows control of the machine, while the machine simultaneously sends back information that aids the operator's decision-making process. The HMI (Human-Machine Interface) is the primary method of controlling the machine. The HMI on your unit is touch screen. This gives a more versatile user experience with an intuitive design. The HMI on your unit may differ from the one shown on the following pages.

Control Panel



E-Stop
PUSH: Disables the power to the PLC outputs and stops all system movements.

PULL: Enables the PLC outputs and initiates the machine start-up sequence.

Power ON Light

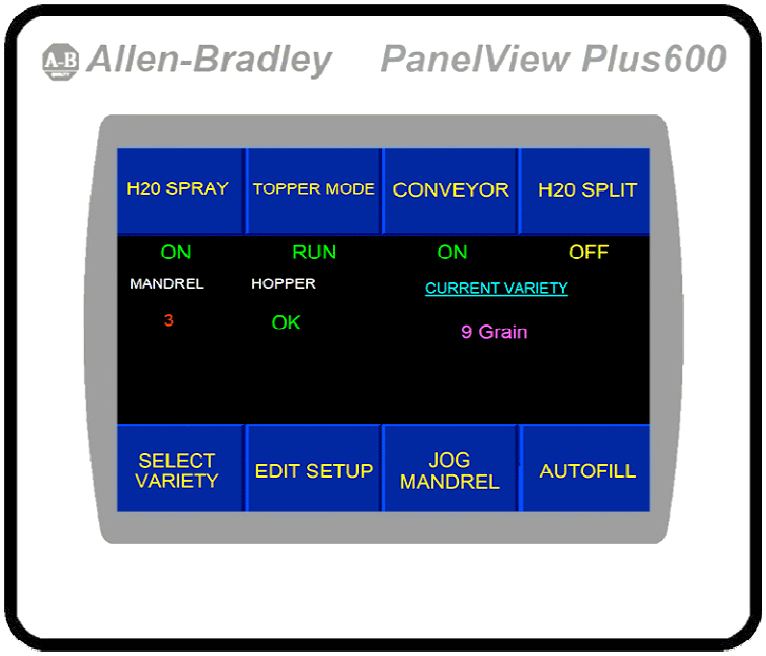
This is the primary operator interface of the unit. It Displays menus, error messages and allows access to screens needed for setup and operation of the unit.

Start Screen

The Start Screen is displayed after initial power up. When safe, pull the E-Stop out.

Press Start to initiate the unit. If the unit is not homed, the unit will home all axis.

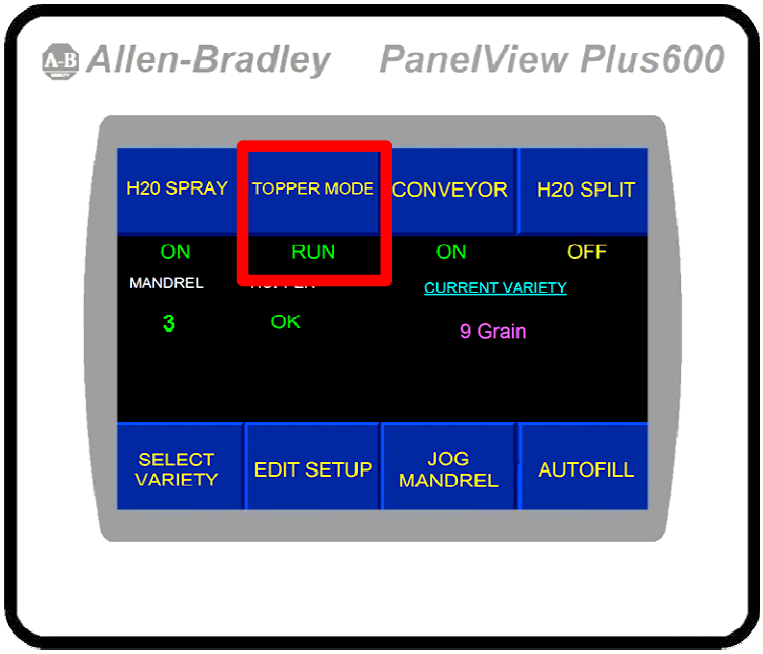
Main Screen



The main screen is the screen that will be available to the operator during production. It has all the system controls necessary to run the unit. In the following section, we will discuss the User Interface.

Some Screen Functions will not be available on the Main Screen. Screen Functions are available depending on model, equipment, and options selected.

Main Screen - Topper Mode



There are two TOPPER MODES: STANDBY and RUN. Touch the TOPPER MODE button to toggle the mode.

Standby Mode: When the unit is in this mode, topping and water will NOT be applied.

The AUTOFILL button in the bottom right corner will change to AUTOFILL, allowing access to control this function.

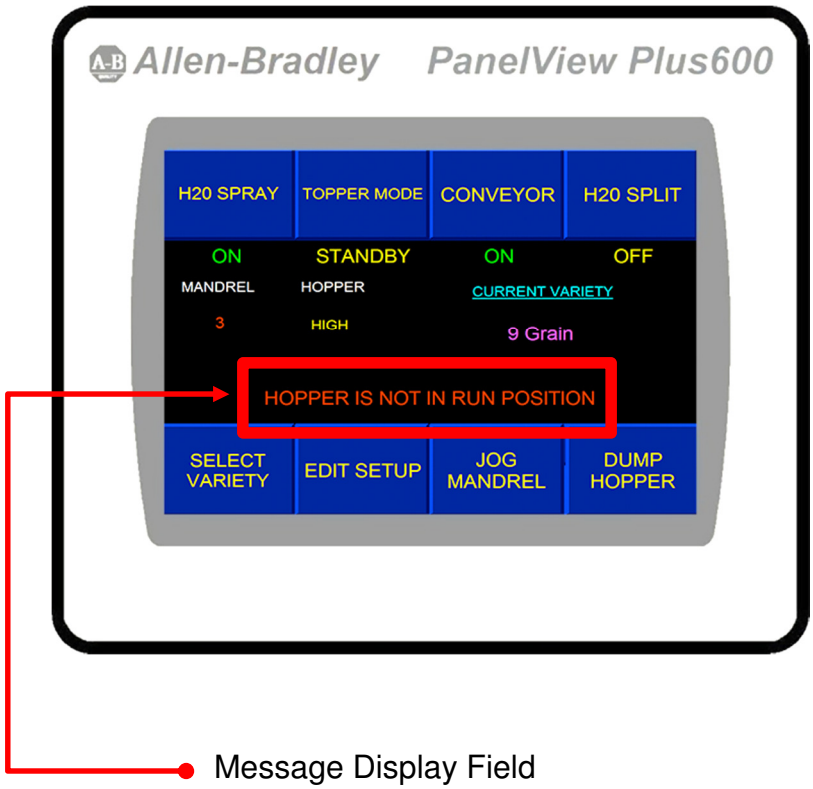
Run Mode: When in this mode, the unit will detect pans, and dispense product.

The DUMP HOPPER button in the bottom right corner will change to AUTOFILL, allowing access to control this function.

The Topper must be in RUN mode for the Water Spray or Water Split to be operational.

All settings may be accessed and changed in both Run and Standby modes.

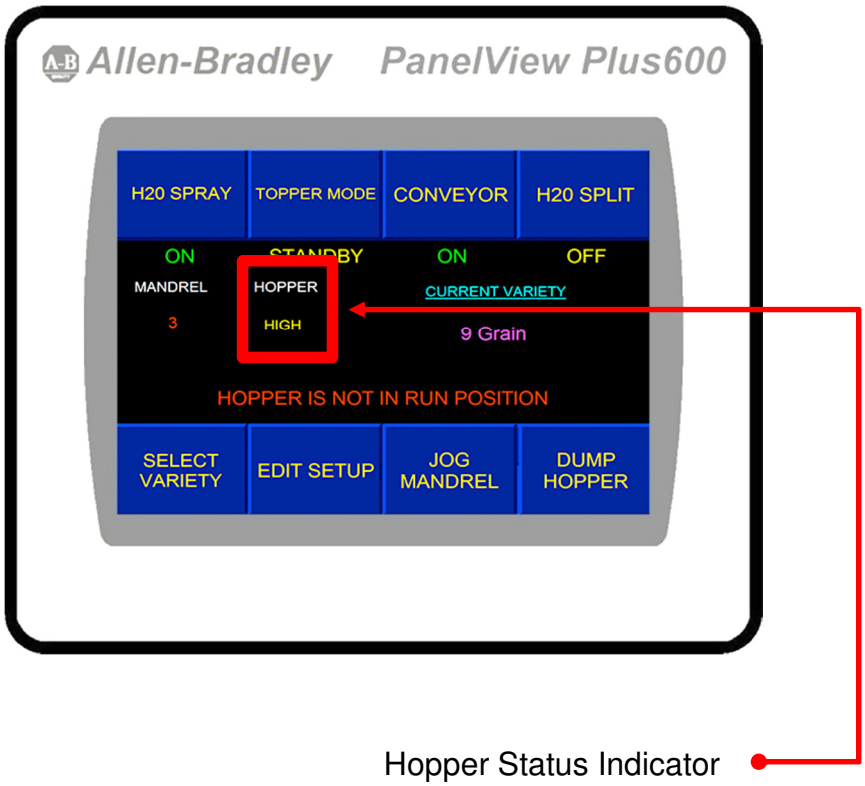
Main Screen - Message Display Field



The Message Display Field will alert the operator of conditions that may prevent the unit from going into RUN mode.

Display Field	Description
HOPPER LID IS AJAR.	Hopper sensor is defective or Hopper lid is not fully closed.
HOPPER IS NOT UPRIGHT.	Hopper is still in “DUMP” position or is not completely returned to the full upright position.
VARIETY MUST BE SELECTED.	Indicates a variety has not been selected. Load the correct mandrel into the unit and select the desired variety.
MUST HOME FIRST.	The unit must be homed before the unit can go into RUN mode.
HOPPER IS NOT IN RUN POSITION.	The position of the Hopper is not adequate for proper operations. Locate the Hopper Status indicator for corrective measures that need to be taken.

Main Screen - Hopper Status Indicator

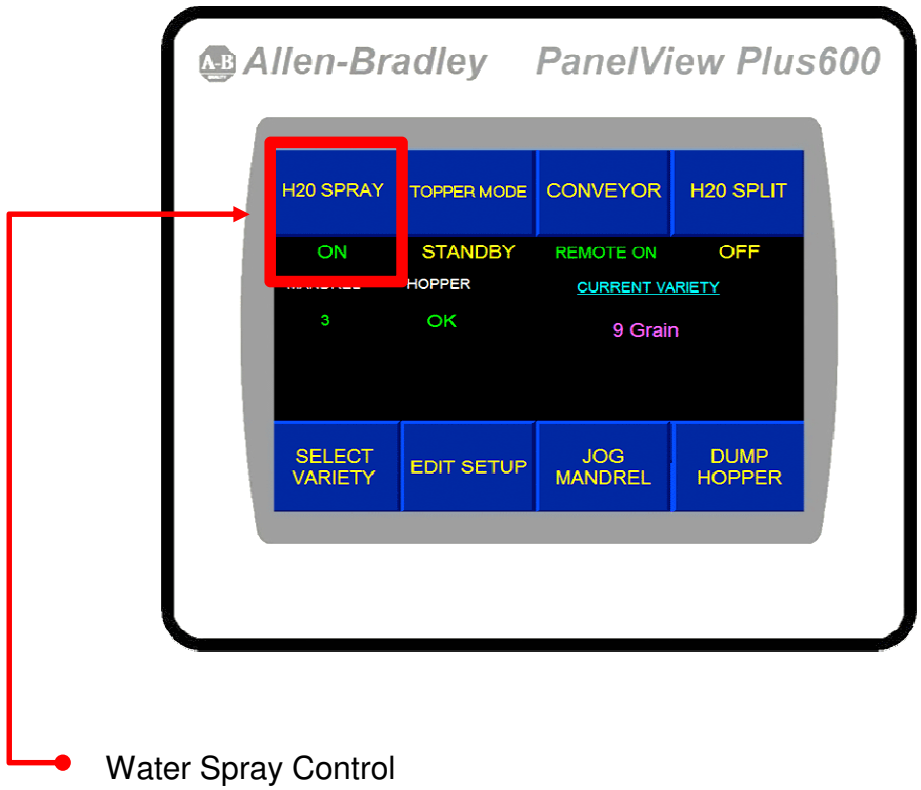


The Hopper Status Indicator provides the operator with the status of the Hopper. The Hopper must be in the proper position before the Topper can be placed into RUN mode. The indicator will display OK when the Hopper is in the correct position to run.

The various indicators of the Hopper Status are listed below.

Hopper Indicator	Description
OK	The hopper is in the correct position to run.
HIGH	The hopper is higher than the preset run height.
TILTED	The hopper is not upright.
OPEN	The hopper lid is not properly closed.
OK TO DUMP	The hopper is raised to the “DUMP” position. Before trying to enter RUN mode, adjust the unit until “OK” is displayed.

Main Screen - Water Spray



The Topper uses a spray of water applied to the dough product to aid in adhering the topping to the dough.

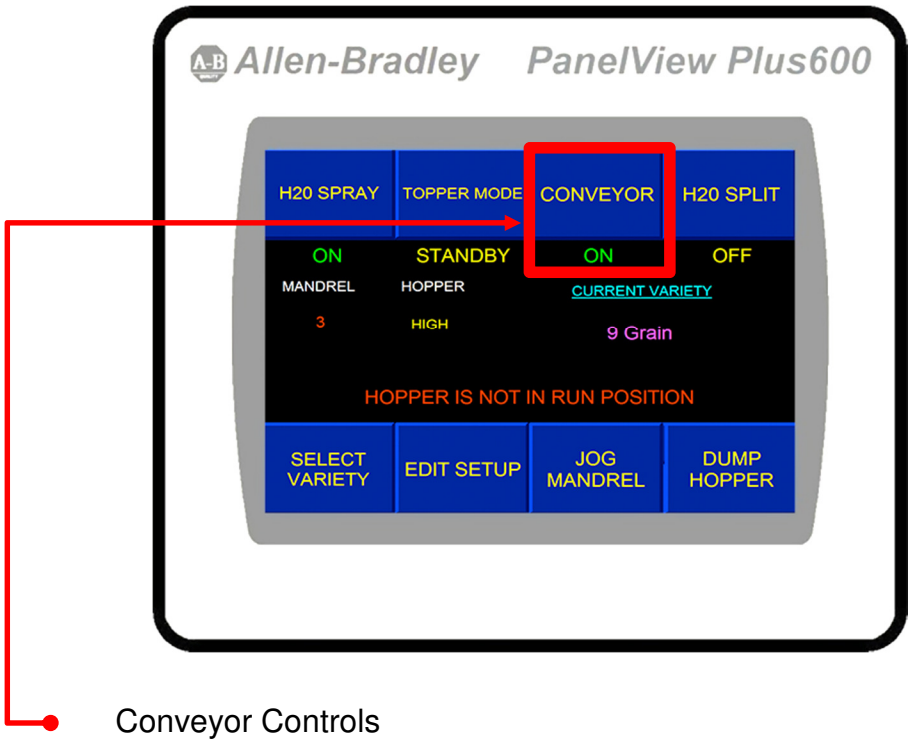
If the Water Spray is enabled for the current variety then the operator can enable, disable, or choose Water Spray only (this will spray the product but not apply any toppings).

Press the H20 SPRAY button to toggle the Water Spray modes.

H20 Spray Mode	Description
OFF	The Water Spray will be disabled in run mode.
ON	The Water Spray will be enabled in run mode.
ONLY	The Water Spray will be enabled in run mode and the topper will be disabled.

The Water Spray must be enabled for the current variety in the setup parameters for the water spray modes to be available. If the Water Spray is turned off for the current variety, the operator will not be able to switch modes.

Main Screen - Conveyor (Optional)

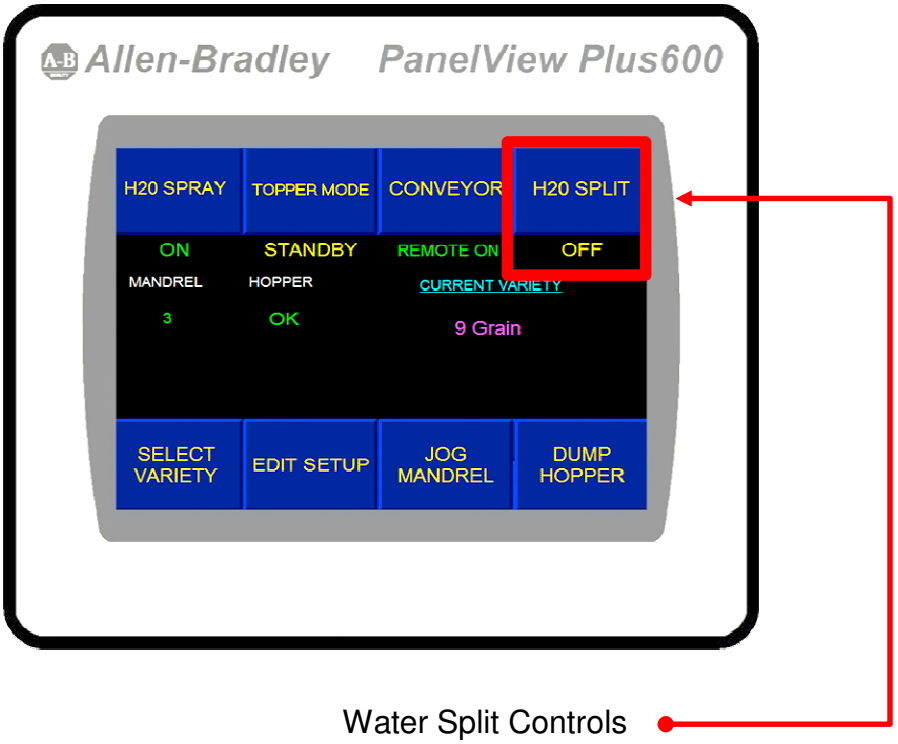


A conveyor is used to transfer product through the unit. The Burford® conveyor can be controlled either by the Topper or by an external signal. Press the CONVEYOR button to toggle between selections.

The status indicator below the button will scroll through the different options, as the button is press. If “REMOTE” mode is chosen, after a few seconds the display will change to show the status of the external signal. “REMOTE ON” shows that the external signal is on and the conveyor is running. “REMOTE OFF” shows that the external signal is off.

Conveyor Modes	Description
OFF	The Conveyor is disabled.
ON	The Conveyor is enabled.
REMOTE	The conveyor is in remote mode and the conveyor will be dependent on an external signal to run.
Remote Status	**Description**
REMOTE ON	The external signal to run the conveyor is present. The Conveyor is enabled.
REMOTE OFF	The external signal to run the conveyor is not present. The Conveyor is disabled.

Main Screen – Water Split controls



The Splitter uses a jet of pressurized water applied to the dough to split the product.

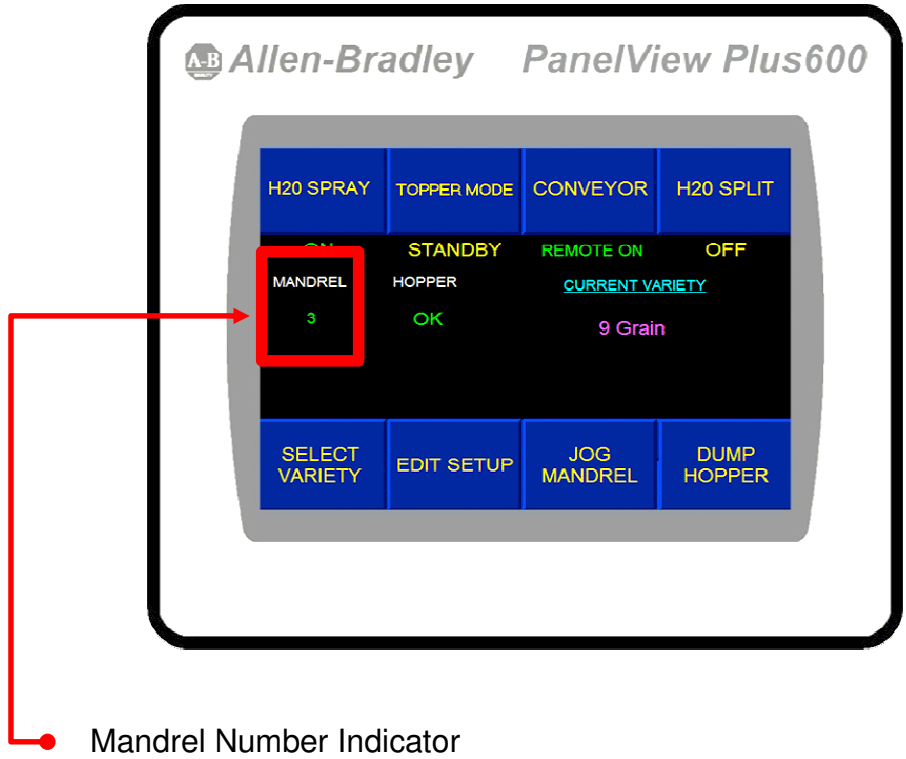
If the Water Split is enabled for the current variety then the operator can enable, disable, or choose Water Split only (this will Split the product but not apply any toppings).

Press the H20 SPLIT button to toggle the Water Split modes.

H20 Split Mode	Description
OFF	The Water Split will be disabled in run mode.
ON	The Water Split will be enabled in run mode.
ONLY	The Water Split will be enabled in run mode and the topper will be disabled.

The Water Split must be enabled for the current variety in the Setup parameters for the water Split modes to be available. If the Water Split is turned off for the current variety, the operator will not be able to change modes from the Main Run screen.

Main Screen – Mandrel Indicator

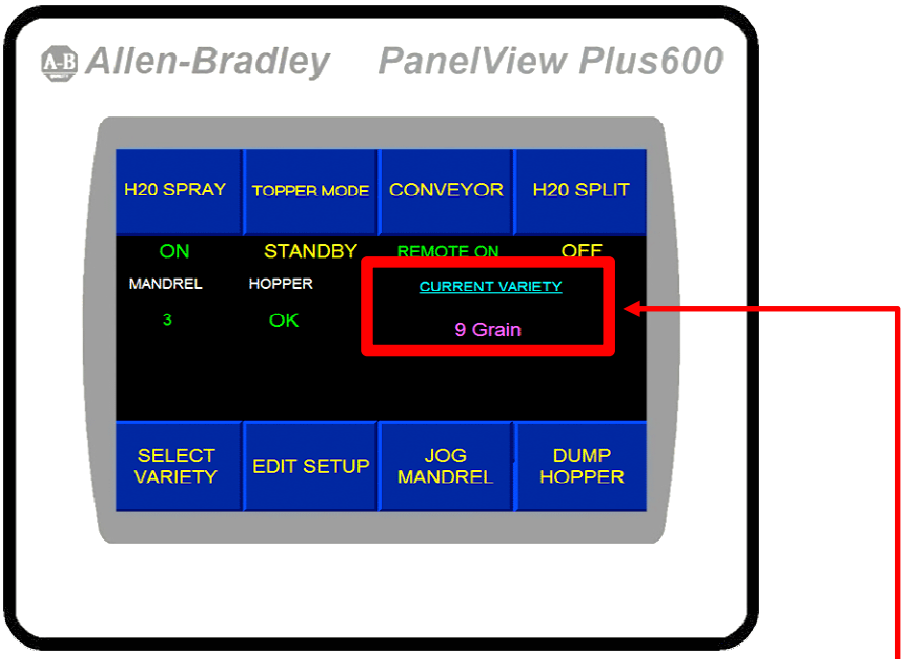


The Smart Seeder features a Mandrel Recognition System (MRS.). The system automatically detects the mandrel that is inserted into the unit. This gives the correct setup parameters for the variety chosen and prevents an incorrect mandrel from being inserted inadvertently.

The Mandrel Number Indicator displays the number of the mandrel now inserted into the unit. If there is not a Mandrel inserted NONE will be displayed.

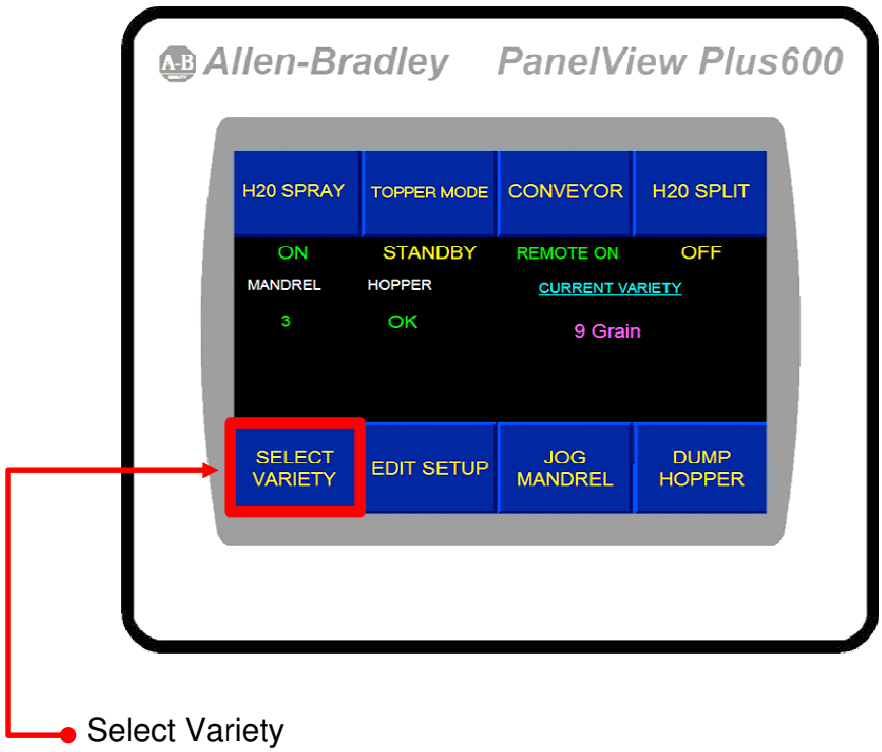
If the mandrel number is blinking with a red number, this shows that the mandrel override option has been activated and the variety selection display may not be using the proper mandrel.

Main Screen - Current Variety



The Current Variety Selected indicator will display the variety that is now loaded for the Topper. All adjustments for the Topper have been performed accordingly to the setup parameters entered for that variety and the unit is ready to run.

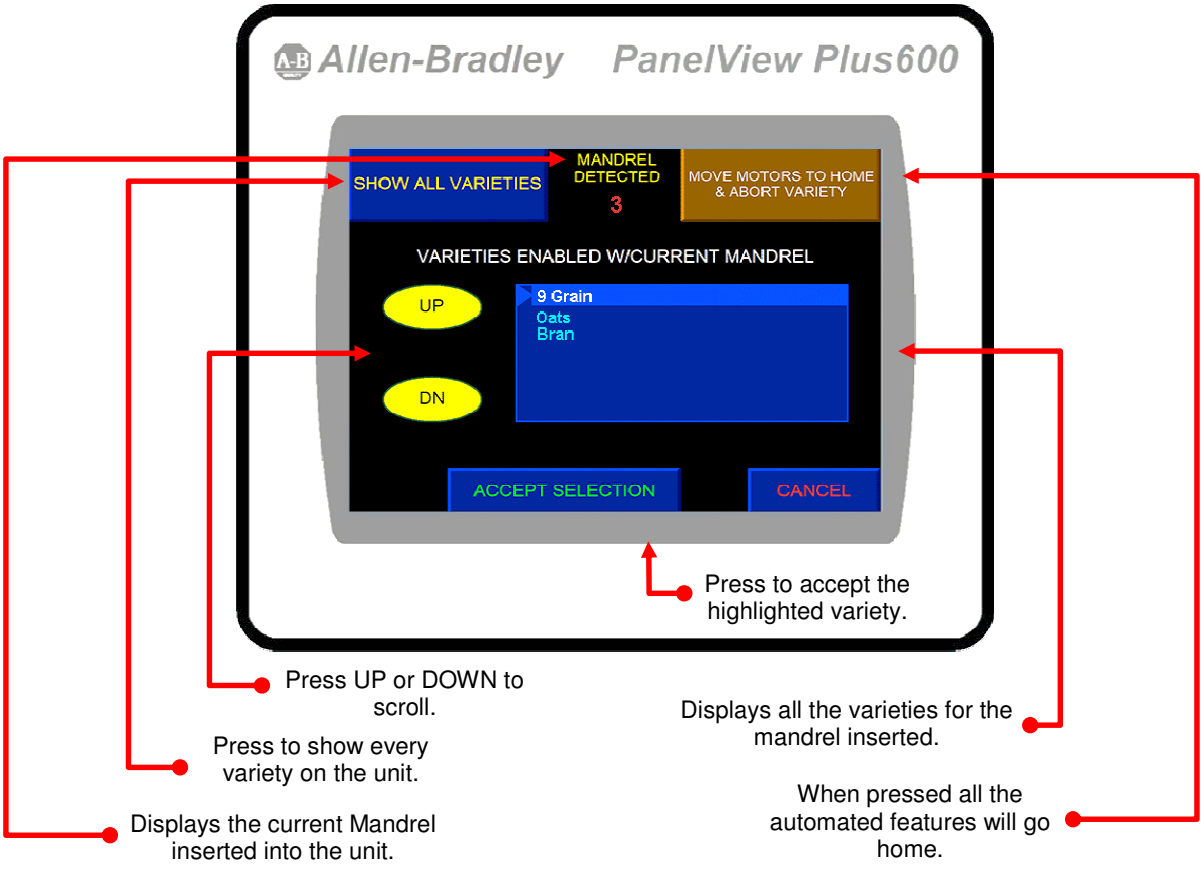
Main Screen - Select Variety / Go Home



The SELECT VARIETY button advances the display to the variety selection screen shown on Page 91, giving a simple method to select a desired variety.

If the machine is not in the home position, the GO HOME button will be shown in place of the SELECT VARIETY button. Pressing the GO HOME button will send all axis to their home position.

Select Variety Screen

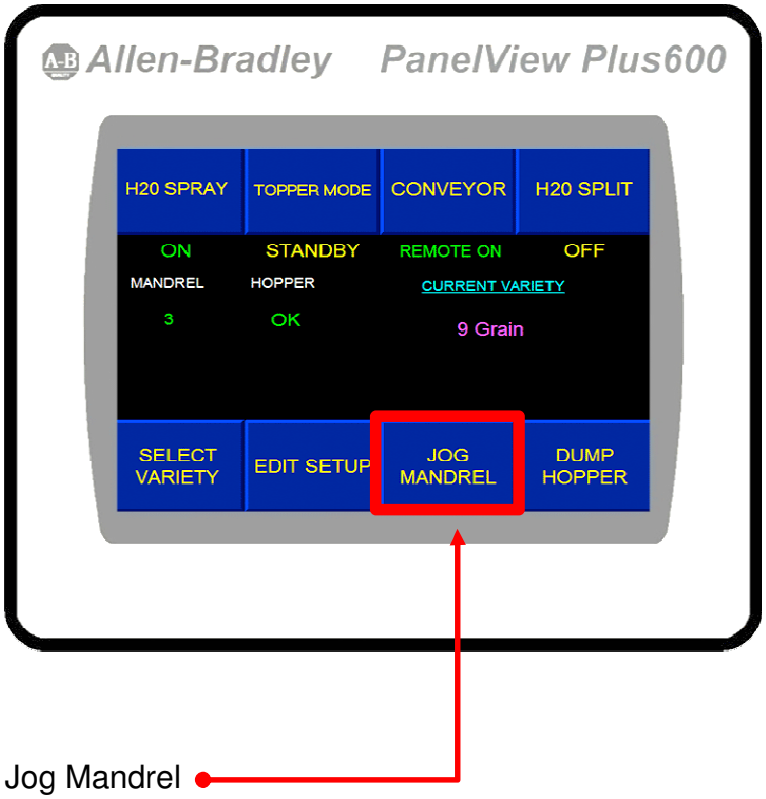


The Select Variety screen allows the user to change the current variety selected. An indicator at the top of the screen displays the current Mandrel inserted into the unit. The box at the middle of the screen shows all the varieties that are available with the current Mandrel inserted. Using the UP and DOWN buttons, the operator can select the variety that they want. Once the variety is highlighted, the operator will push the ACCEPT SELECTION button. The unit will now move all the automated adjustments to the position that was configured for that variety.

The operator may push the SHOW ALL VARIETIES button to display every variety that is configured in the unit. Each variety will be displayed in the box at the middle of the screen. If the operator then selects a variety that is not available with the current Mandrel inserted, a dialog box will appear informing the operator of the correct Mandrel to be inserted for the variety selected. Once the correct Mandrel is inserted, the unit will begin moving to the configured positions for that variety.

Press CANCEL to return to the Main Run screen.

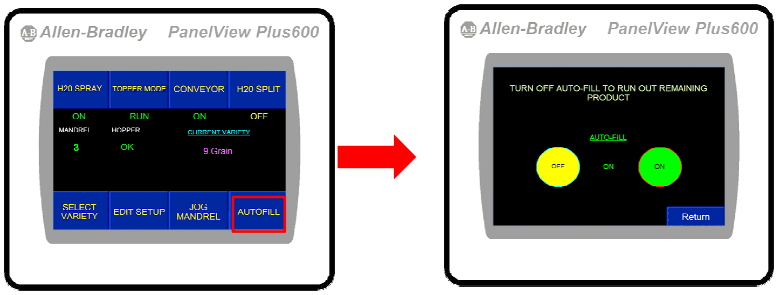
Main Screen - Jog Mandrel



Pressing the JOG MANDREL button will rotate the mandrel. The Mandrel will still be rotating for the duration that the button is pressed.

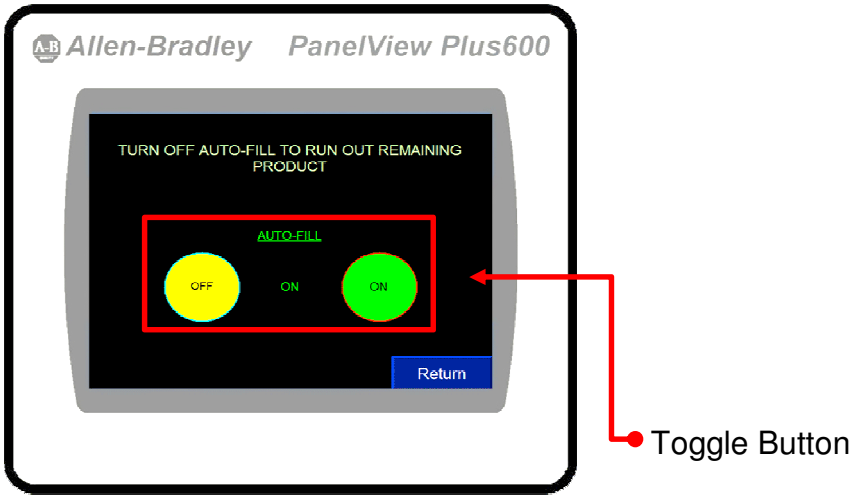
The Jog Mandrel feature is used to load the Mandrel with toppings prior to the first pan and to verify operation.

Main Screen – Auto-Fill Control (Optional)



THE AUTO FILL PROCEDURES ON THIS PAGE REFER TO THE HS SERIES AUTO-FILL SYSTEM. IF A MPA SYSTEM IS INSTALLED, THE BUTTON WILL INDICATE MPA. REFER TO PAGE 140 FOR INSTRUCTIONS ON OPERATOR MPA CONTROLS.

REFER TO PAGE 51 TO LEARN MORE ABOUT THE DIVERSE TYPES OF AUTO-FILL SYSTEMS BURFORD® HAD TO OFFER.



By Pressing the AUTO FILL button on the Main Run screen, the operator will advance to the Auto-Fill Control screen shown above.

Here the operator can turn the Auto-Fill ON or OFF. Press the toggle button to enable or disable the Auto-Fill.

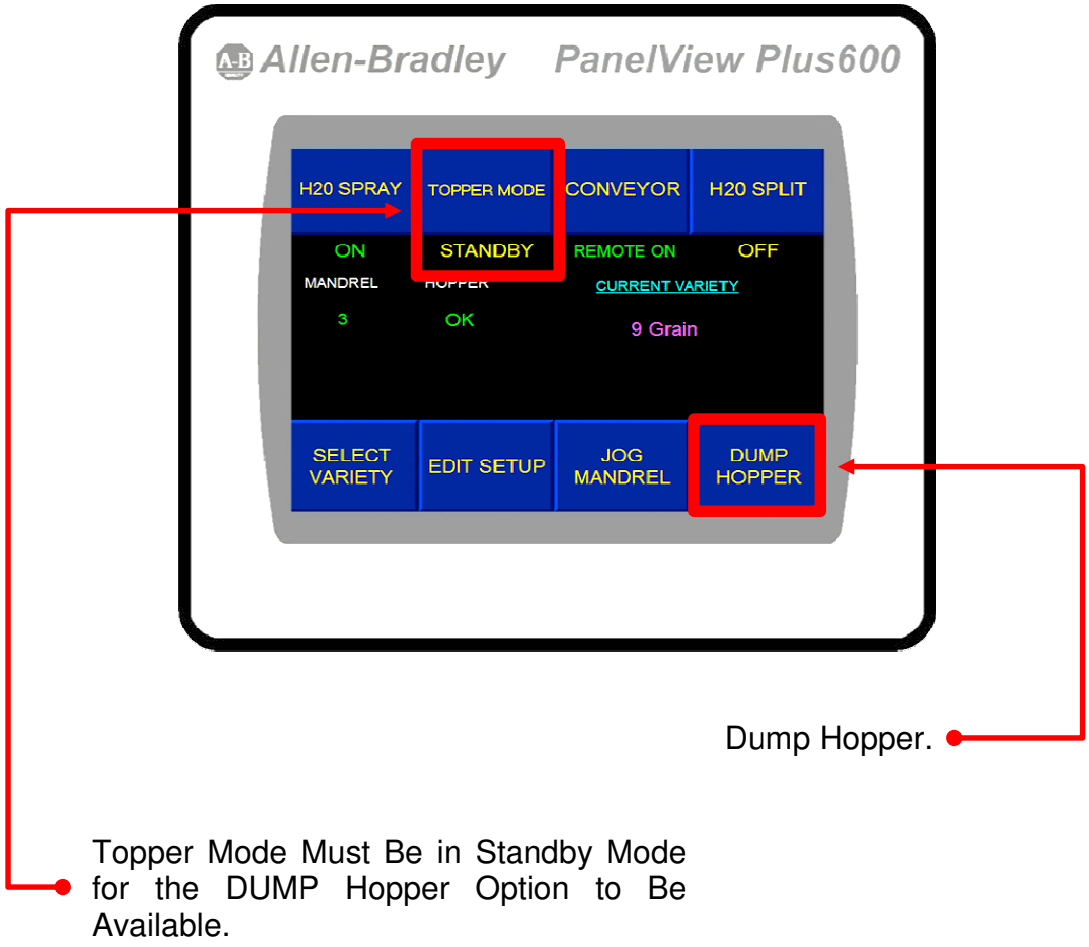
When a changeover of toppings is about to occur, it is usually a good practice to empty as much of the hopper as possible. This will make the changeover process much easier. There will not be as much topping to remove from the hopper in preparation of the new toppings.

The operator can minimize the amount of topping in the hopper by turning the Auto-Fill off and running the remaining topping out.

Many variables will decide the amount of product that a hopper will be able to top once the Auto-Fill is deactivated. Over time, a good operator will become very familiar with the time needed to finish out a production run and precisely know when to disable the Auto-Fill.

Press RETURN to go back to the Main Run screen.

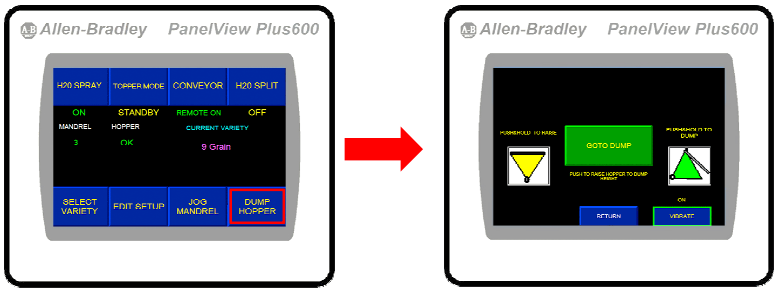
Main Screen - Dump Hopper

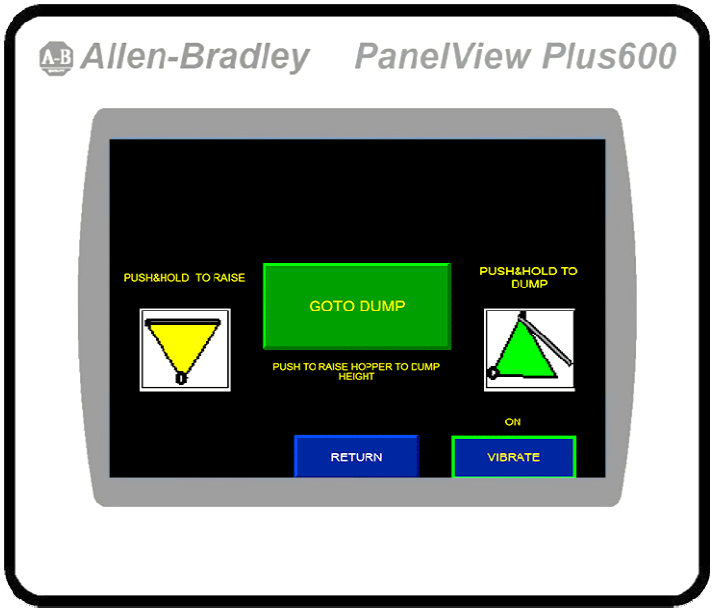


At the end of a production run, or if there is a changeover, the operator may need to empty out the hopper of any toppings. Placing the Topper Mode into Standby Mode will make available the DUMP HOPPER button at the lower right of the screen. Press the DUMP HOPPER button to advance to the Dump Hopper Screen.

See Page 95 for detailed information on the Dump Hopper screen.

Dump Hopper Screen





The Dump Hopper screen aids the operator in removing any topping remaining in the hopper. The hopper can tilt 90º.

The hopper must be at a safe height before it can tilt. Press the **GOTO DUMP** button to raise the hopper to the proper height.

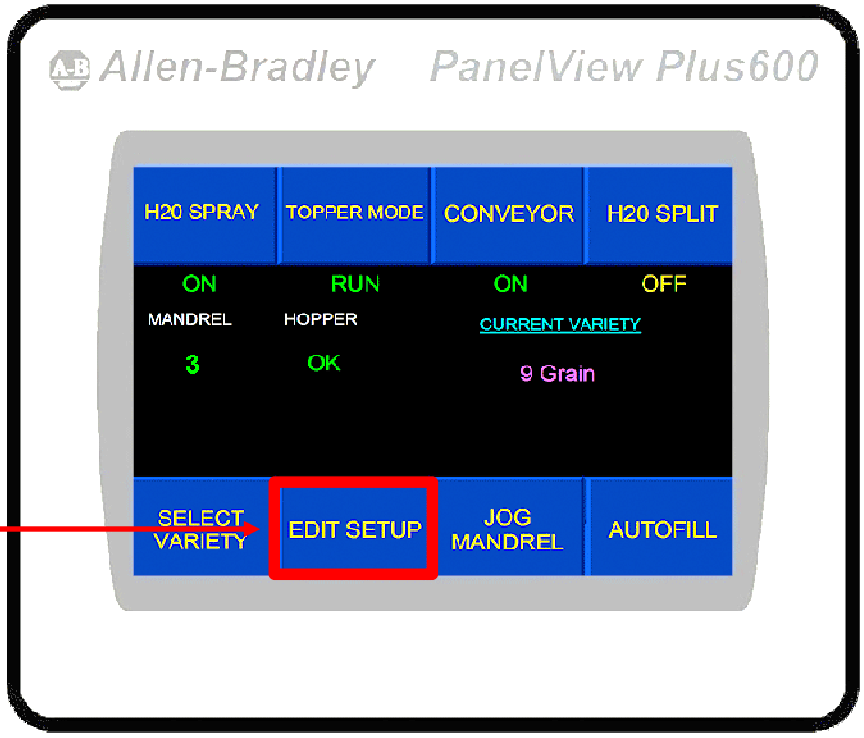
Once the hopper is at the correct height to dump, press and hold the  on the right to tilt the hopper.

To raise the hopper, press and hold the  on the left.

If an optional vibrator is installed on the hopper you may press the VIBRATE button. The Vibrator aids in emptying the hopper of its contents.

Press RETURN to go back to the Main Run screen.

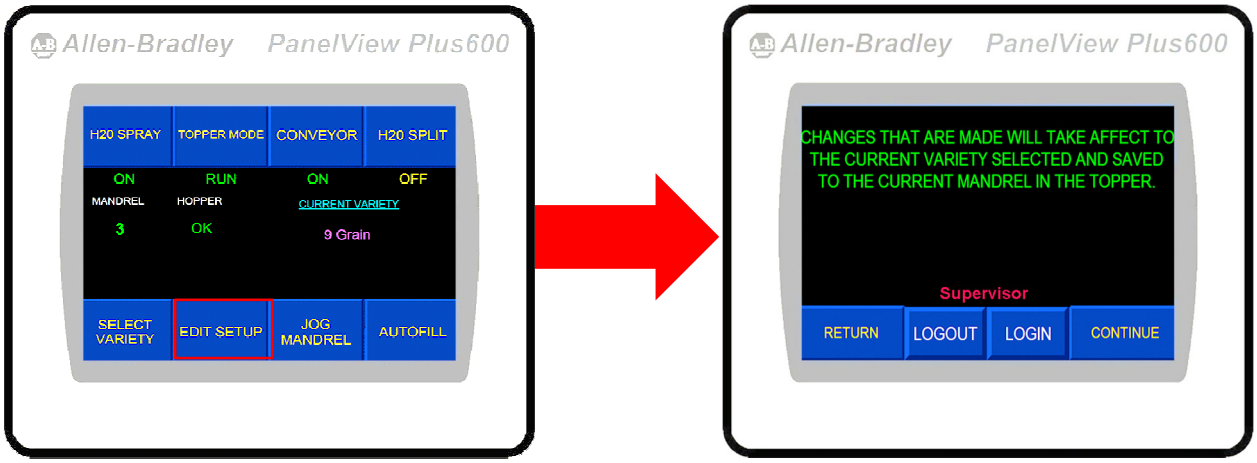
Main Screen - Edit Setup



Main Run Screen

The EDIT SETUP button advances the display to the Setup Login screen shown on page 97.

The SETUP screens are password protected and must only be changed by authorized personnel.



Login Screen

Login Screen

Pressing the **EDIT SETUP** from the Main Run screen will advance to the Login page.

You must be logged in to enter setup.

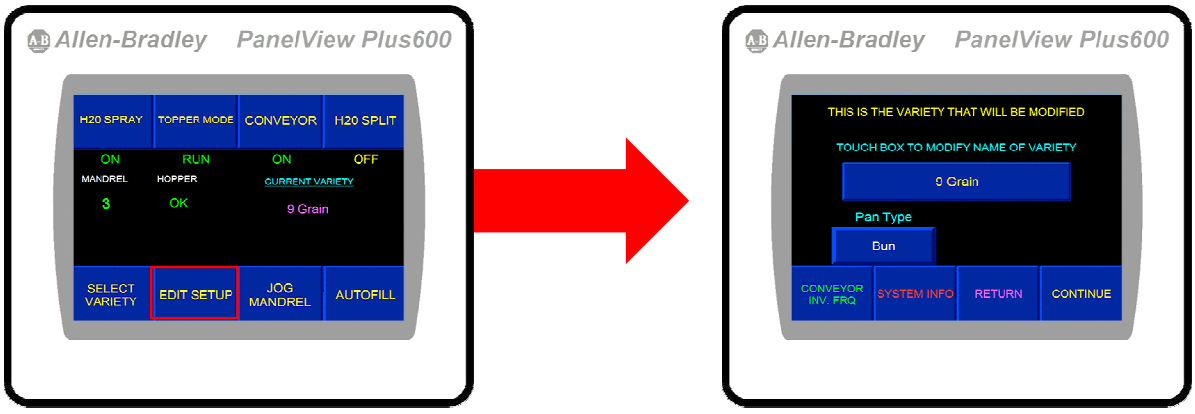
Pressing the **LOGIN** button will open a dialog box. Enter the User Name and the Password. Press enter to close the dialog box.

If successful, your User Name will appear in red.

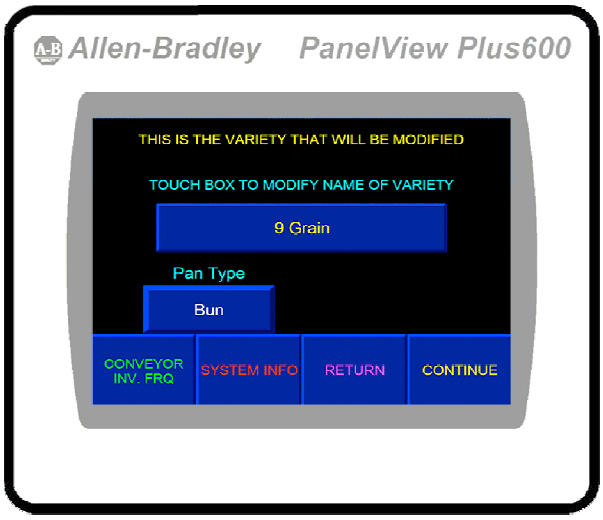
Press **CONTINUE** after logging in to advance to the Setup screen. See Page 103.

Press **RETURN** to go back to the Main Run screen.

Setup Screen



YOU MUST BE LOGGED IN WITH SUPERVISOR PERMISSIONS TO ENTER SETUP. *REFER TO PAGE 97*



Setup Screen

The Setup screen is the first screen that you will meet in the setup menus. It shows the variety that will be changed. Verify it is the variety to change. Changes made will only change the variety loaded.

VARIETY NAME - Touching the box with the variety name will display a keyboard to change the name.

PAN TYPE – Sets the type of pan for the dimension setup.

CONVEYOR INV. FRQ - Controls the speed of the conveyor (Burford Conveyor).

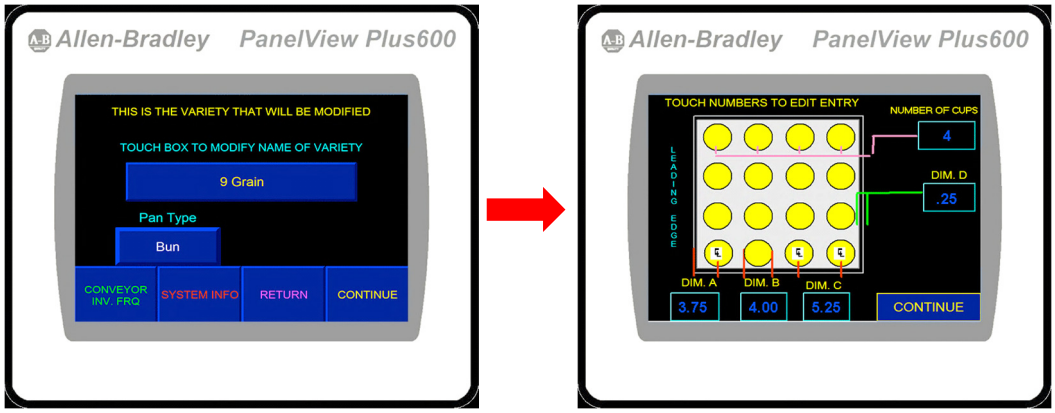
SYSTEM INFO - Displays Alarm Messages and Proximity Sensors.

CONTINUE - Will take you to the Main Setup screen.

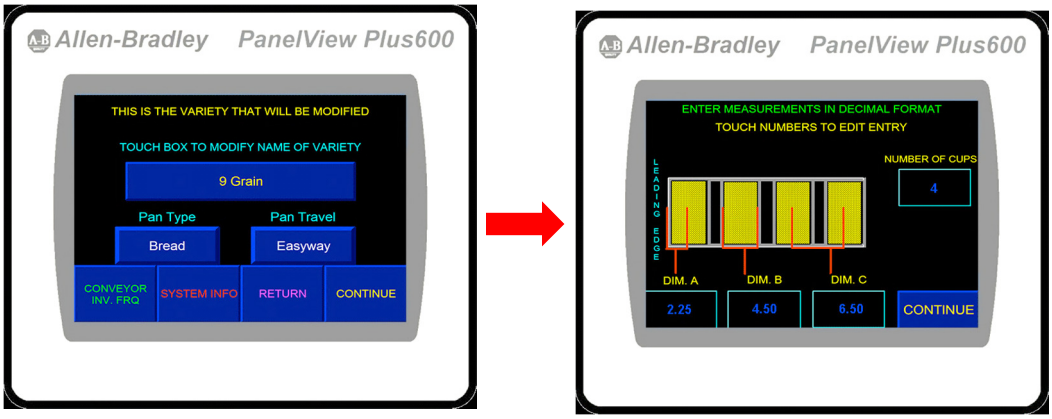
RETURN - Will take you back to the Main Run screen.

Pan Type

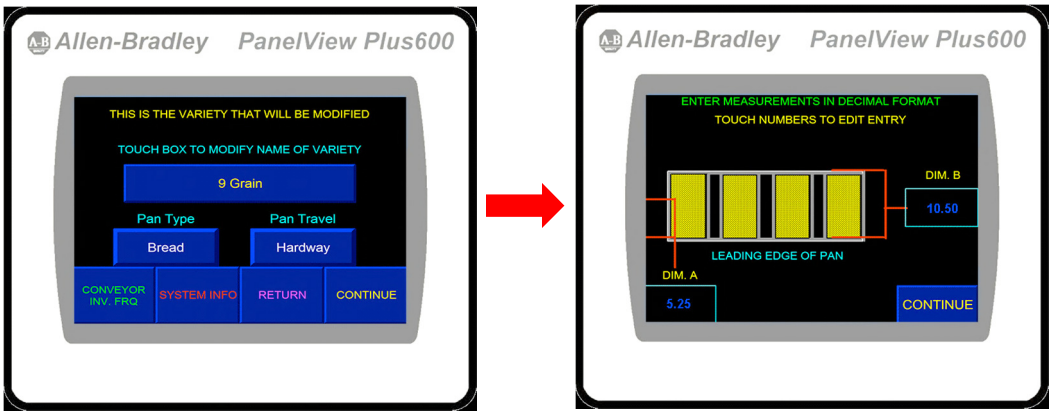
The Burford Smart Seeder can accommodate a variety of pan types. Depending on which pan type you select will decide the configuration of the pan dimension screen for that variety. Press the PAN TYPE button to select between the distinct types available.



Bun

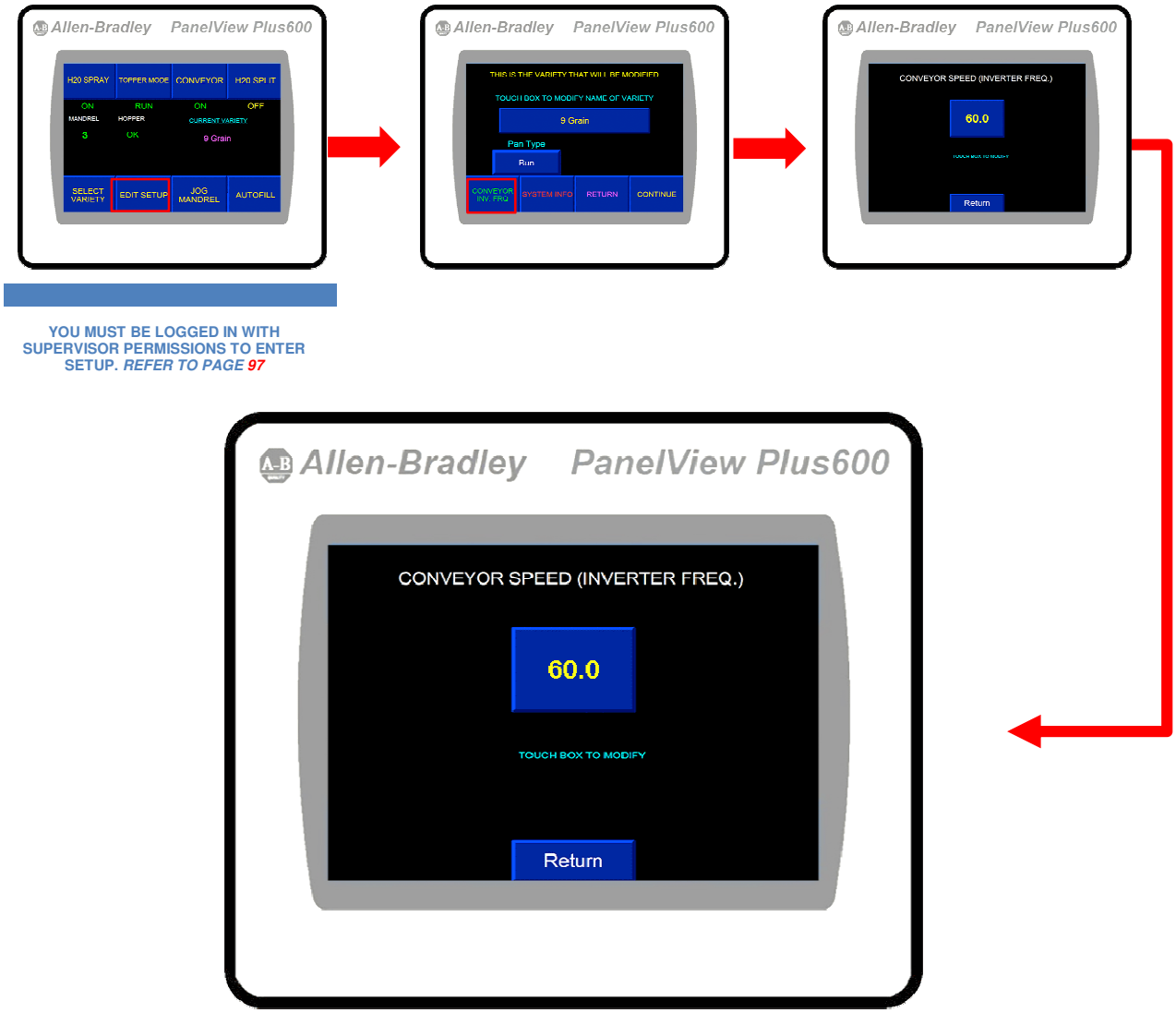


Bread, Effortless way



Bread, Hard Way

Conveyor Speed

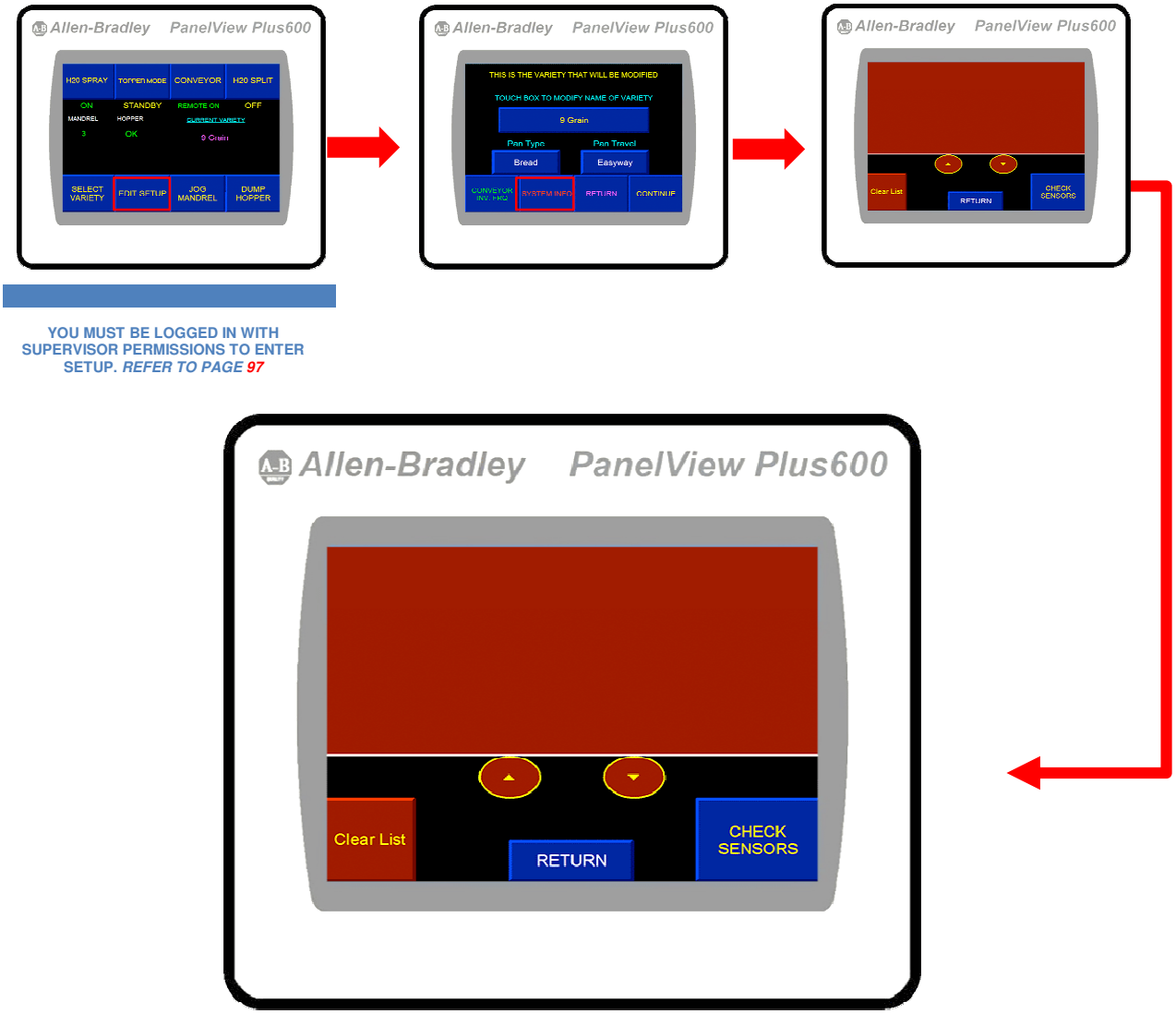


Conveyor Speed

If a Burford® conveyor is present, then you will be able to change the speed of the conveyor. The gauge in the center gives estimated feet per minute. The lower right box shows the frequency of the inverter that controls the conveyor. This value is in Hertz. Touch the box to change the speed. Press Return to go back to the Setup Screen.

The conveyor speed is a global setting. Modifying the speed will apply to every variety. The amount of topping applied is directly proportional to the speed of the conveyor to the speed of the Mandrel. Changing the conveyor speed may result in needing to change every variety.

Alarm Messages



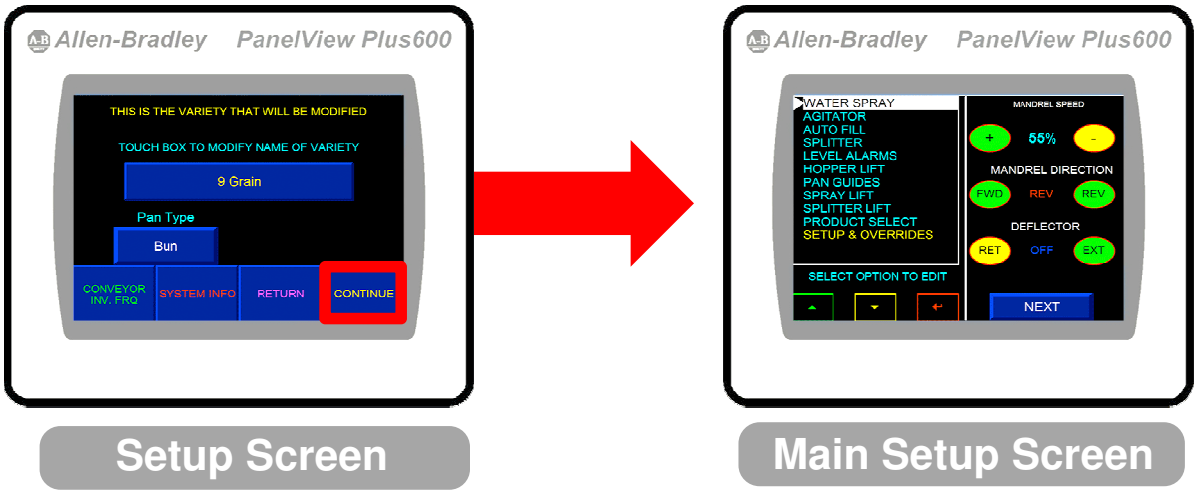
Alarm Messages

The system keeps a log of all fault conditions. The fault message will include the date and time the fault occurred with a brief description of the fault.

The most recent fault will be at the top. Press the UP and DOWN arrows to scroll through the list.

Press RETURN to go back to the Setup Screen.

Main Setup Screen Overview



Setup Screen

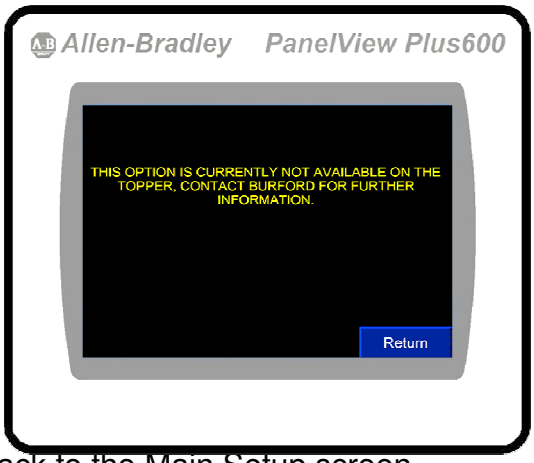
Main Setup Screen

Press CONTINUE from the Setup Screen to advance to the Main Setup screen.

The Main Setup screen offers access to all the configuration options for the variety.

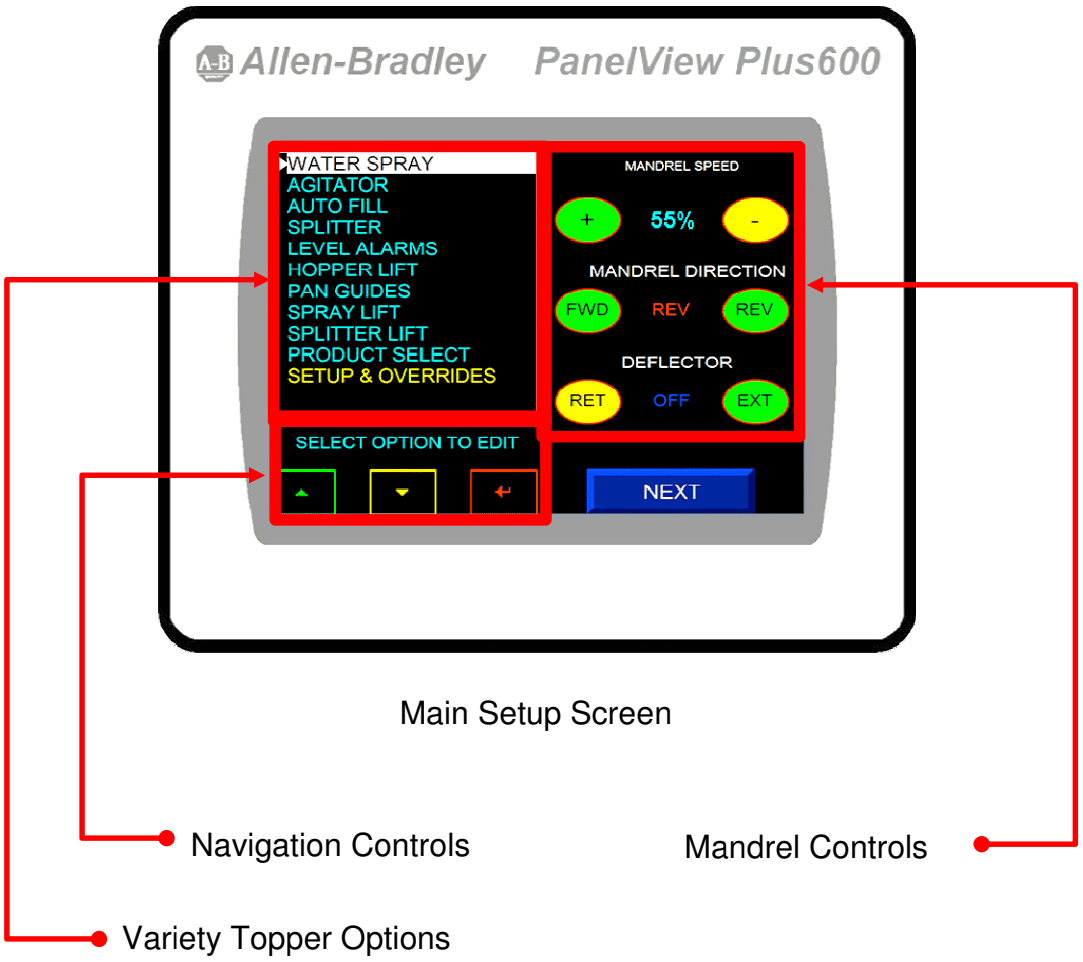
Note that, depending on which options you bought, some options may not be available on your unit. If you select an option that is not installed on your unit, you will receive the following message:

THIS OPTION IS CURRENTLY NOT AVAILABLE ON THE TOPPER. CONTACT BURFORD FOR FURTHER INFORMATION.



Press RETURN to go back to the Main Setup screen.

Main Setup Screen



The Main Setup Screen has the Variety Topper Options, the Navigation Controls, Mandrel Controls, and the Next button.

The Variety Topper Options are a list of features that can be configured for the variety.

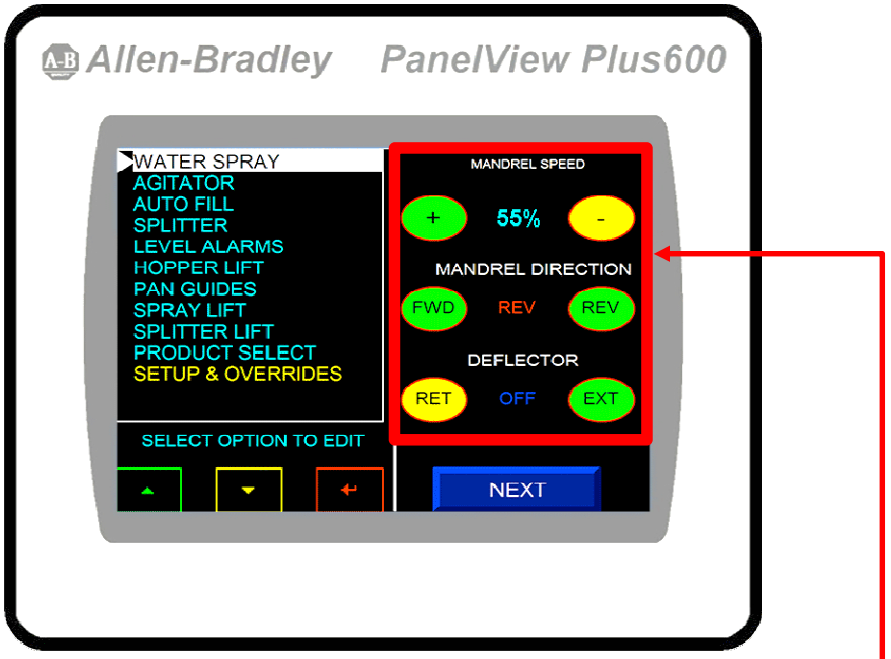
The Navigational Controls are used to select an item in the Automation Menu.

The Mandrel Controls are used to change the Mandrel speed, direction, and deflector bar position.

Pressing NEXT will advance to the Pan Dimension Setup.

See Page 153 for Pan Dimension Info

Main Setup Screen, Mandrel Controls



The Mandrel Controls are used to change the Mandrel speed, direction, and deflector bar position.

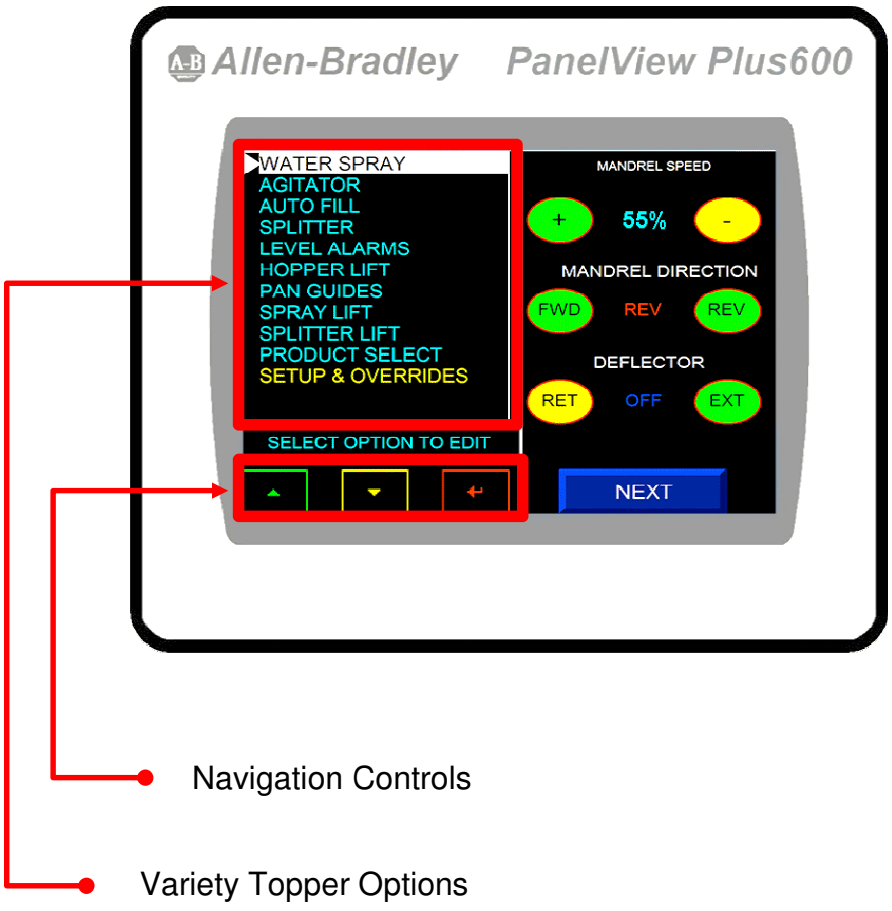
Mandrel Speed - is used to control the amount of toppings applied to the product. The number value is a percentage of the maximum Mandrel Speed from 0 to 99. Press the "+" or "-" button to increase or decrease the rotation speed of the Mandrel.

Mandrel Direction - Changing the direction of rotation on the Mandrel may improve the topping's application and appearance. This may be particularly beneficial on thin and large diameter toppings. Press the "FWD" or "REV" to change the direction.

Deflector - The deflector bar is available to offer optimal product coverage. With the deflector bar in the active position, topping is dispensed by the mandrel onto the deflector bar, which allows large toppings or toppings that clump together to be more evenly applied. On smaller toppings like sesame, the deflector bar should be retracted.

Any changes made on any setup screen will take effect to the current variety selected and will be automatically saved to the current mandrel in the Topper. Verify that you are on the correct variety prior to making any changes.

Variety Topper Options

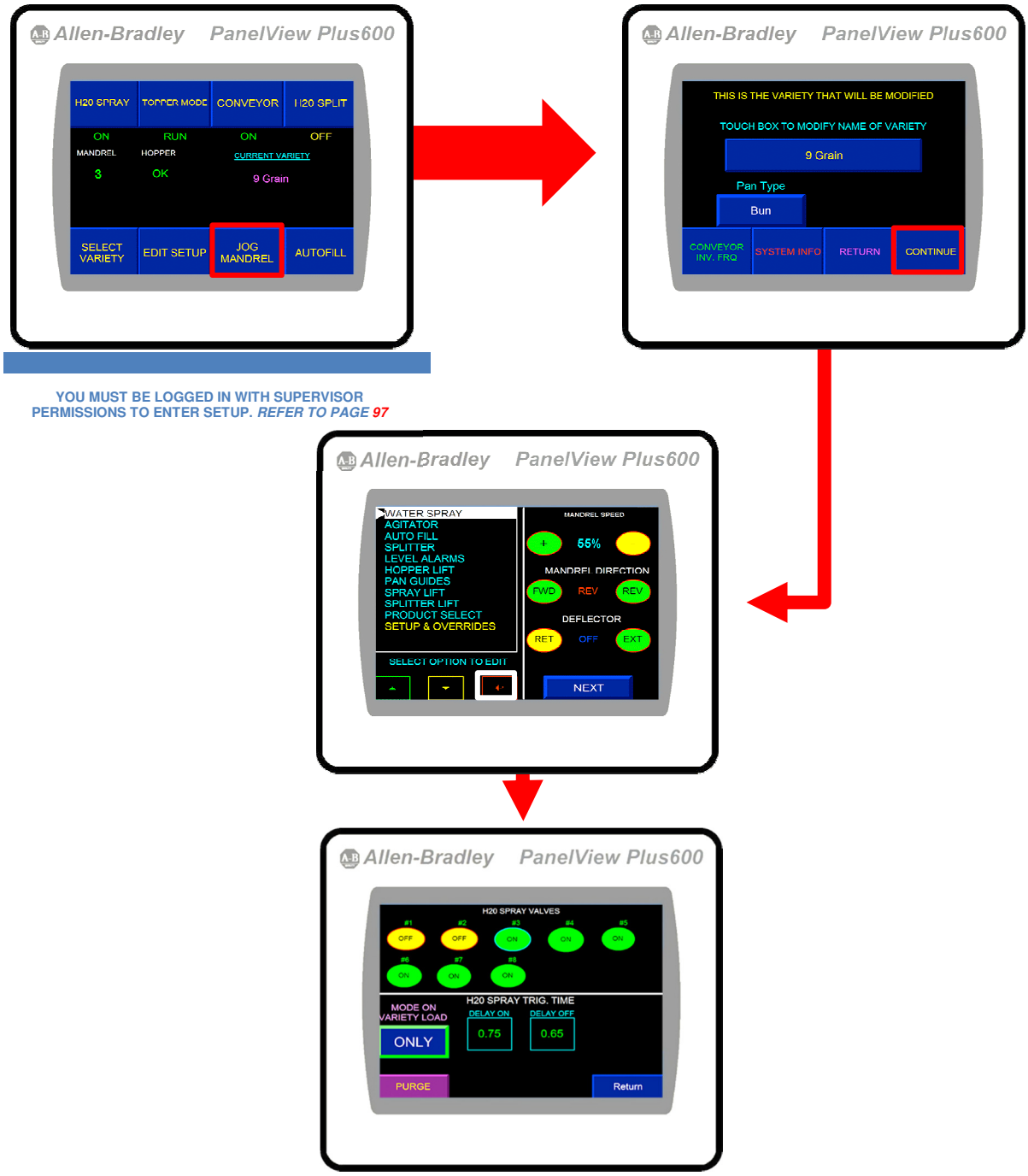


The Variety Topper Options allow configuration of each function available to the variety.

Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the option desired, then touch the red “ACCEPT” to gain access to the highlighted functions setup screen.

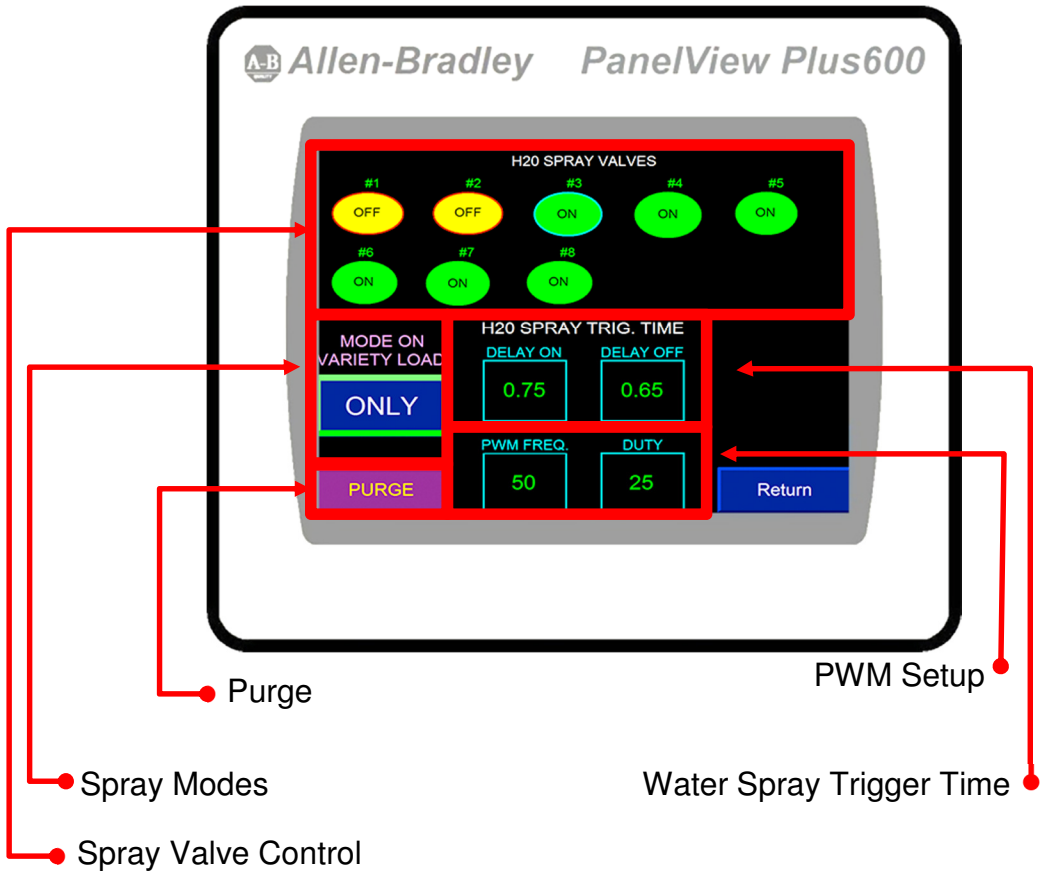
In the following pages, we will discuss in detail each function. Some functions may not be available on your unit, depending on options bought. Consult Burford® for further information.

Water Spray Screen Navigation



Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the choice WATER SPRAY. When the cursor is at WATER SPRAY press **ACCEPT**. You will be taken to Water Spray setup screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

Water Spray Setup



The Topper uses a spray of water applied to the dough product to aid in adhering the topping to the dough.

The spray rail consists of water spray valves that can be turned ON and OFF dependent on variety needs. The standard unit is equipped with six valves but more valves may have been bought when your unit was ordered.

Spray Valve Control – Allows individual control of spray valves.

Spray Modes – Press to toggle between ON, OFF, and ONLY modes.

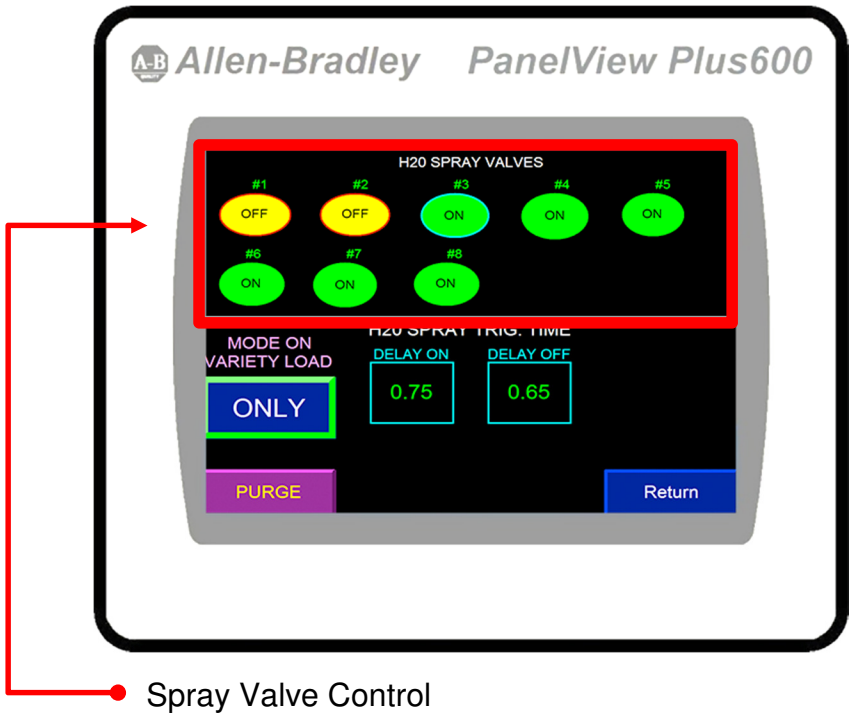
Water Spray Trigger Times – Allows precise control of water spray actuation.

Purge – Activates all enabled water spray valves.

PWM Setup – If equipped with the optional PWM spray valves, enter setup parameters. Refer to PWM instructional manual the shipped with your unit.

Return – Takes you back to the Main Setup screen.

Water Spray Setup - Valve Control

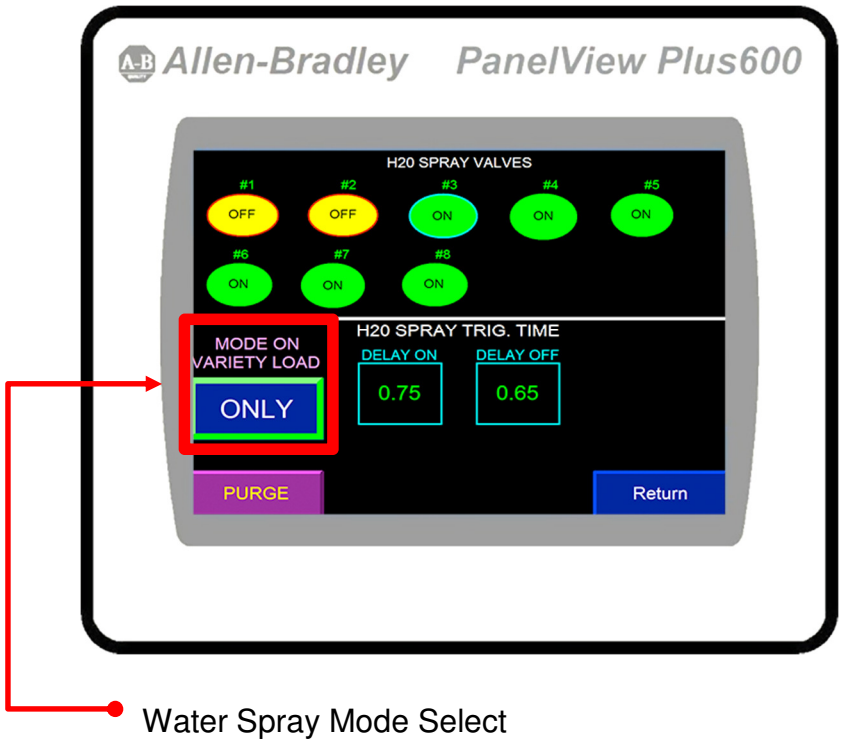


Spray Valve Control – The standard unit is equipped with six valves. Additional valves may have been bought when your unit was ordered. Eight valves are the most common configuration and is displayed in the Spray Valve Controls graphic.

If the unit is equipped with six Spray Valves, then spray valve 1 and 8 will not be operational (but still present on the display graphic). Spray valves 2 through 7 will control the six valves.

The width of the pan, the number of cups, and the amount of water spray desired, will decide the number of water spray valves that will need to be enabled. Press the oval button below each respective valve number to toggle the state of the valve. Green shows that the valve is enabled. Amber shows that the valve is disabled.

Water Spray Setup - Modes



Water Spray Modes – There are three modes available for the Water Spray:

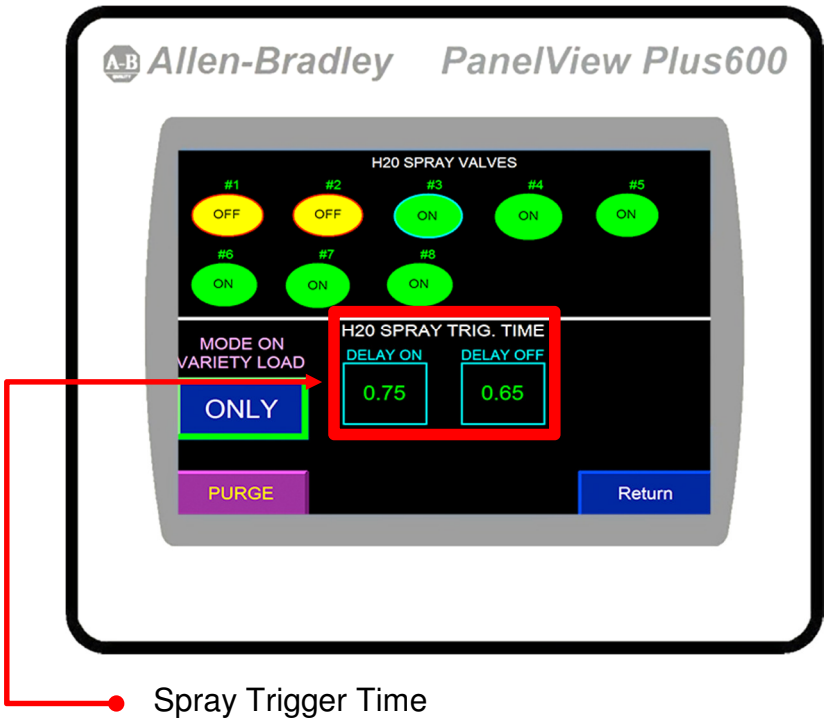
H20 Spray Mode	Description
OFF	The Water Spray will be disabled when variety is selected.
ON	The Water Spray will be enabled when variety is selected.
ONLY	The Water Spray will be enabled and the topper will be disabled when variety is selected.

Press the button in the box to toggle between the modes.

If the Water Spray is ON, then the operator will be able to change modes from the Run Screen. If the Water Spray is OFF, then the operator will not be able to change modes for the Run Screen.

The Water Spray and Water Splitter are independent of each other. The Spray and the Splitter may be in ONLY mode and both will be enabled when triggered. The ONLY mode only refers to the Topper.

Water Spray Setup - Trigger Times



Water Spray Trigger Times – The pan sensor for the water spray rail is found upstream from the water spray valves. It may be necessary to delay the start and stop of the water spray valves to ensure complete coverage of the product.

Delay On – The Delay On is the time from when the pan first makes the pan sensor and the spray valves turn on. When the pan sensor is made, the PLC will wait the value of DELAY ON before turning the water spray valves on. The value of DELAY ON should have the water spray valves turn on when product is directly beneath the valves. The goal is to prevent overspray and wasted water.

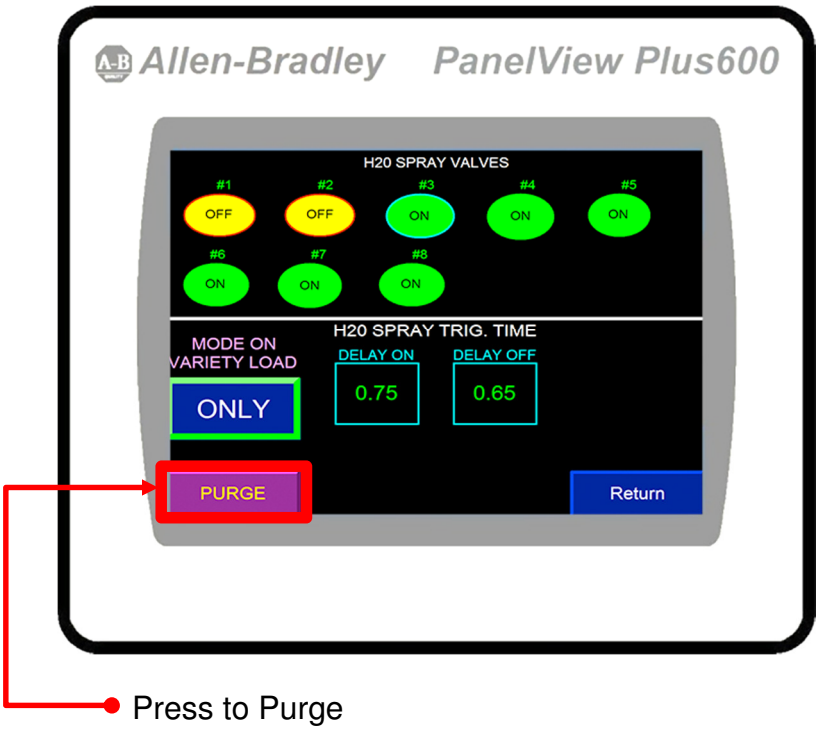
Press the **DELAY ON** box to change the value.

Delay OFF – The Delay Off is the time from when the pan is no longer making the pan sensor and the spray valves turn off. When the pan sensor is no longer made, the PLC will wait the value of DELAY OFF before turning the water spray valves off. The value of DELAY OFF should have the water spray valves turn off when product is no longer directly beneath the valves. The goal is to prevent overspray and wasted water.

Press the **DELAY OFF** box to change the value.

For best results, the Trigger Times should be adjusted with the pan and conveyor speed that will be used for the variety in production.

Water Spray Setup - Purge



Purge – When **PURGE** is pressed, all enabled valves will turn on.

Purge is primarily used to remove any air from the Water Spray valves. Any air in the system will cause adverse effects.

In proper operation, the valves should turn on and off at once without any dripping. The spray should be fanned evenly. If you experience undesirable results, then the valves may need to be purged. Press and hold the purge button for 10 seconds. Release the button shortly and repeat. Repeat until desirable results.

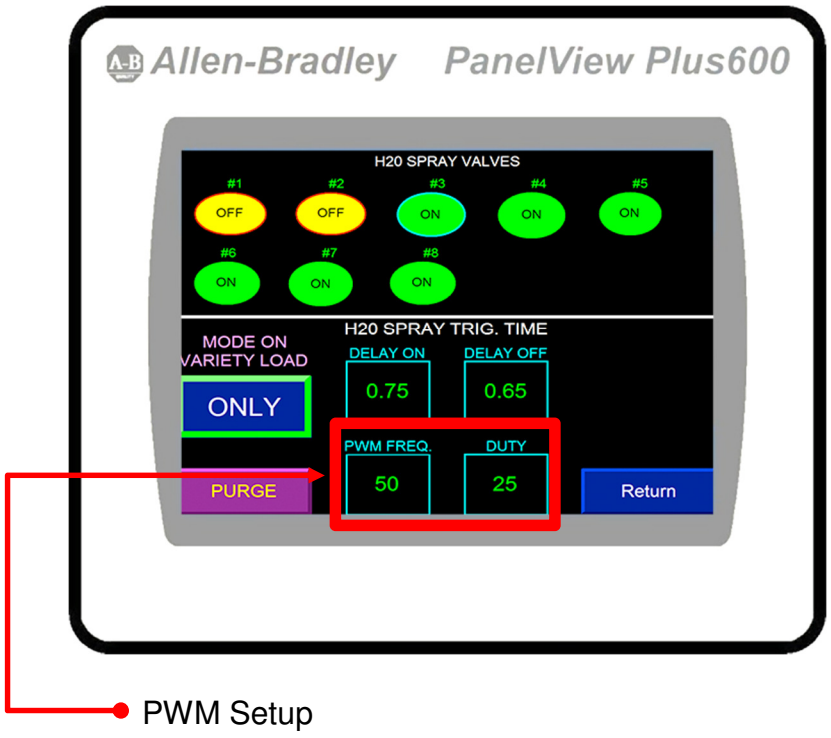
You may also use Purge to verify your valve configuration and placement.

Press and release the Purge button to momentarily turn on the enabled valves.

Press RETURN to go back to the Main Setup screen.

If after several minutes of purging, you are unable to obtain desirable results check for any air leaks in the water lines. Verify that the nozzle tips are seated and tighten properly.

Water Spray Setup – Optional PWM



PWM Setup – An optional PWM spray system is available for your water spray unit.

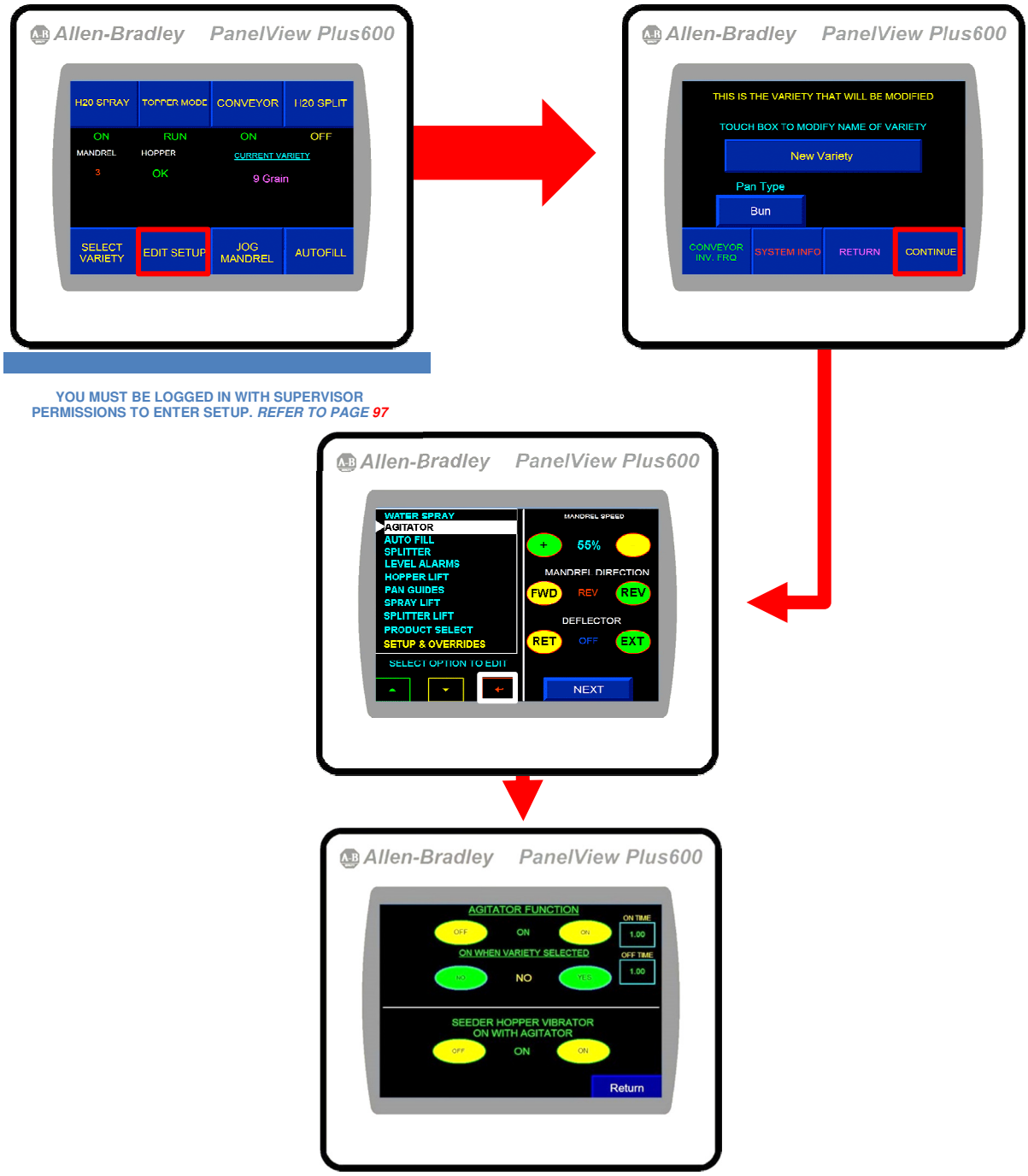
PWM (Pulse Width Modulation) Flow Control involves switching spray nozzles on and off very quickly to control the flow rate. This cycling takes place so quickly that the flow often appears to be constant. PWM Flow Control needs the use of electrically actuated nozzles and a spray controller.

Touch the PWM FREQ box to select between the available frequencies of the spray valves. The frequency decides the number of cycles per second.

Touch the DUTY box to select between the available durations of the spray valves. The DUTY decides the time that the spray valve is on during each cycle.

If after several minutes of purging, you are unable to obtain desirable results check for any air leaks in the water lines. Verify that the nozzle tips are seated and tighten properly.

Agitator Screen Navigation



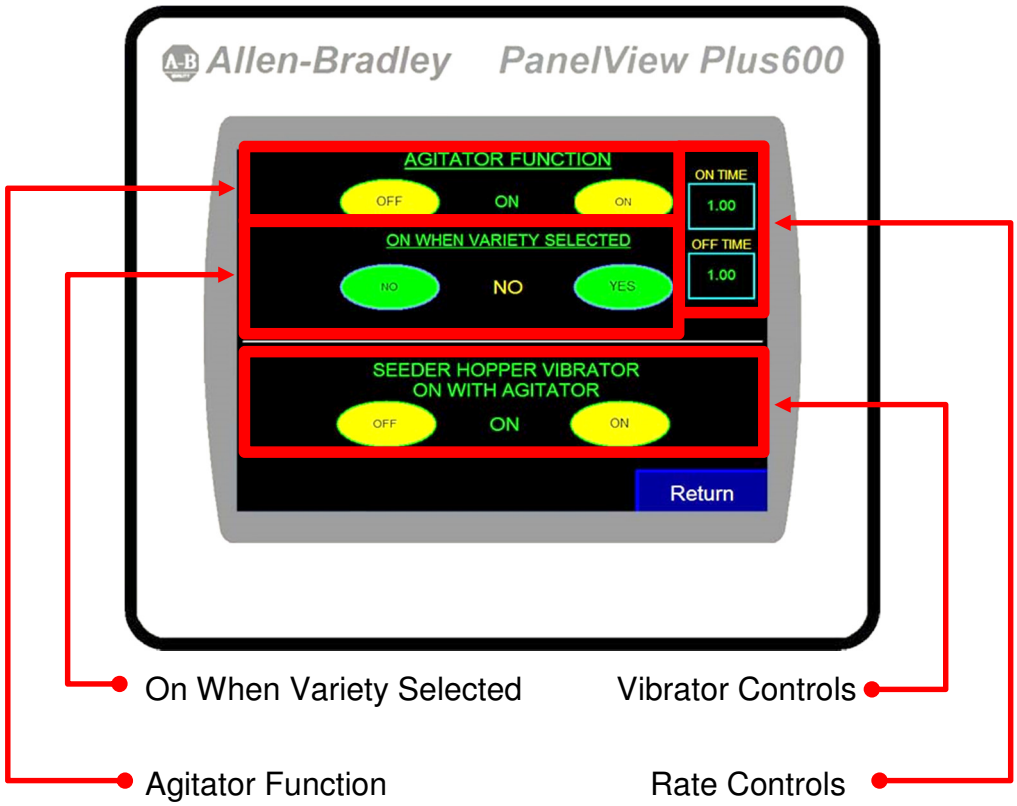
Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the option AGITATOR. When the cursor is at AGITATOR press **ACCEPT**. You will be taken to Agitator setup screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

Agitator (Optional)

The agitator is a rake device that reciprocates in the hopper to keep the topping loose during operations. When the mandrel is rotating the agitator will reciprocate back and forth. This is to prevent any bridgeing from occuring. Bridgeing is when the toppings in the hopper form a cavity around the mandrel preventing product from being dispensed.

Refer to page 35 for more information about the Agitiator.

Agitator Setup Screen



The Agitator Function enables or disables the Agitator for this variety.

You can control the rate at which the Agitator oscillates by adjusting the ON TIME and OFF TIME.

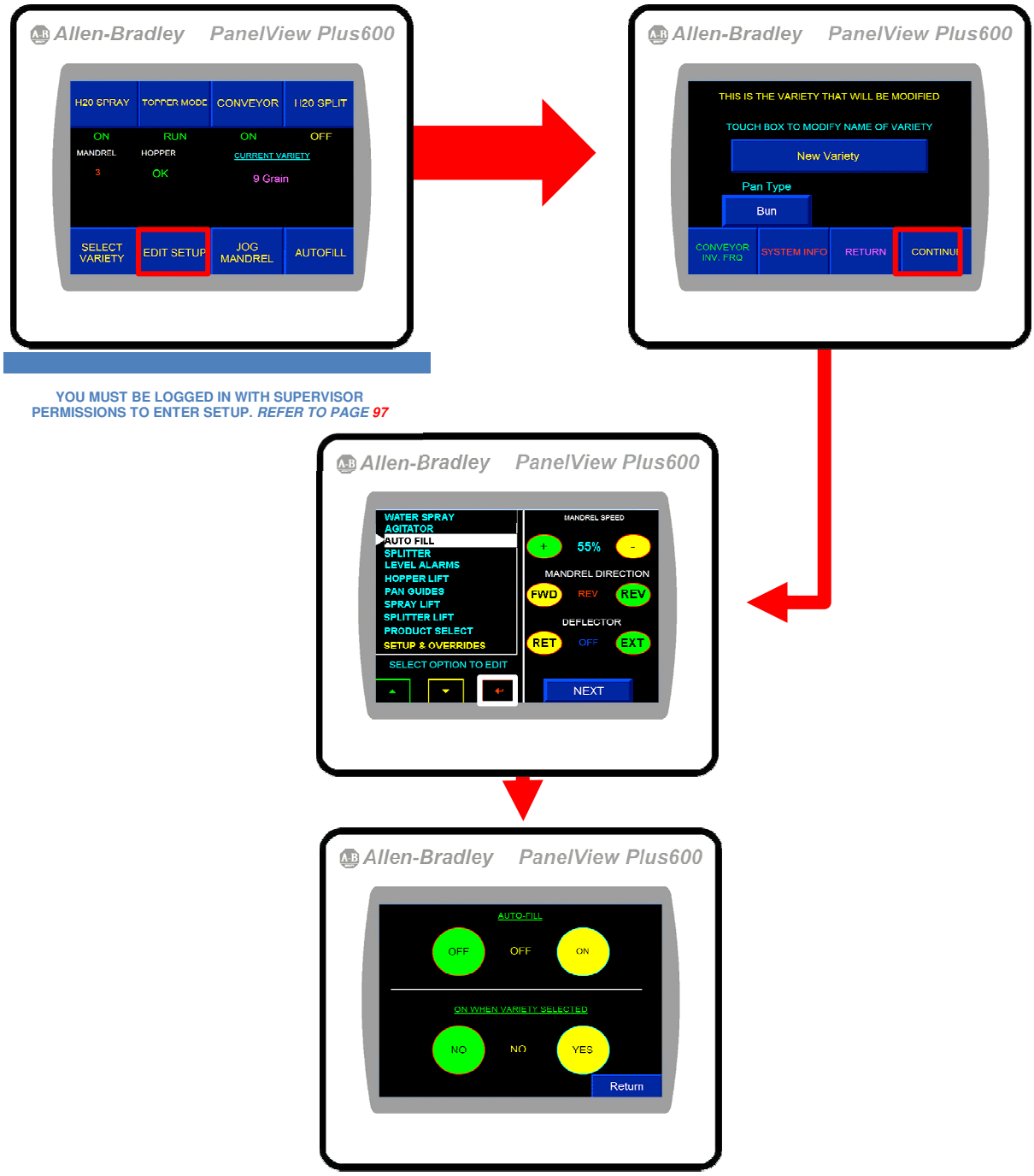
The Agitator Rake will stay extended for the amount of ON TIME and stay retracted for the amount of OFF TIME. With the above settings, the entire cycle is 2.00 seconds. The ON TIME and OFF TIME are both set for 1.00 second each. The rake will extend for 1.00 second and then Retract for 1.00 second. The speed that the rake extends or retracts is controlled by flow controls valves found at the enclosure on the back of the hopper.

The ON WHEN VARIETY SELECTED function selects if the function will be automatically set to ON when the variety is selected.

The SEEDER HOPPER VIBRATOR ON WITH AGITATOR setting determines if the vibrator activates as the agitator is activated. When this setting is “ON”, the vibrator will stay active up to 1 second after the pan cannot be sensed.

Press RETURN to go back to the Main Setup screen.

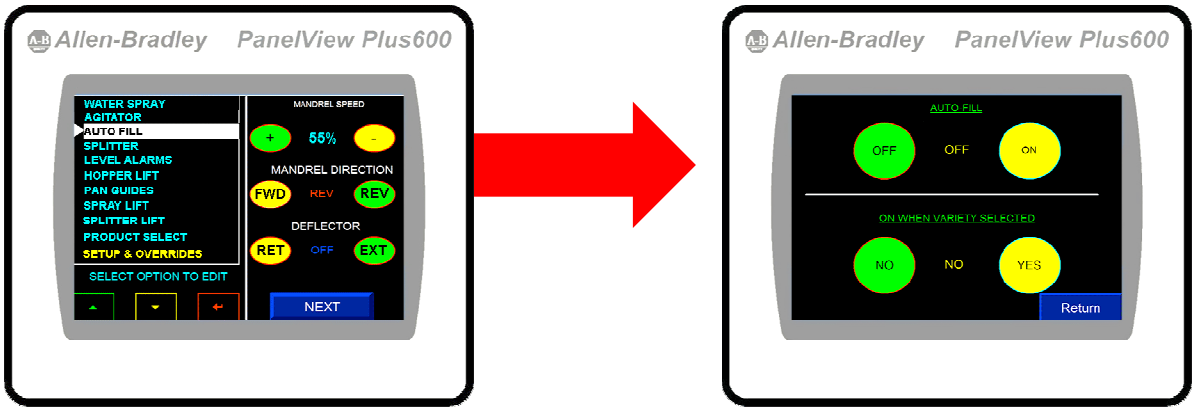
Auto-Fill Screen Navigation



YOU MUST BE LOGGED IN WITH SUPERVISOR PERMISSIONS TO ENTER SETUP. *REFER TO PAGE 97*

Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the option AUTO FILL. When the cursor is at AUTO FILL press **ACCEPT**. You will be taken to Auto Fill setup screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

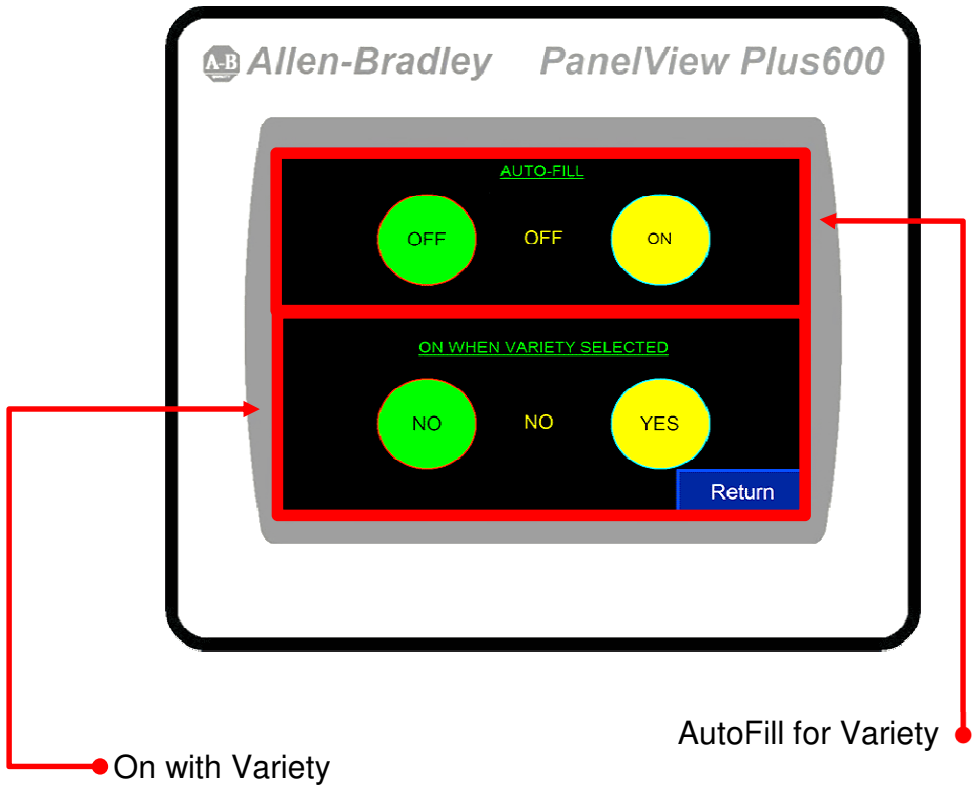
Auto-Fill (Optional)



The Auto-Fill allows the Seeder to be connected to a large external tank that will automaticlay refill the Seeder when it becomes low of toppings.

Refer to page 51 for more information about the Auto-Fill.

AutoFill Setup Screen

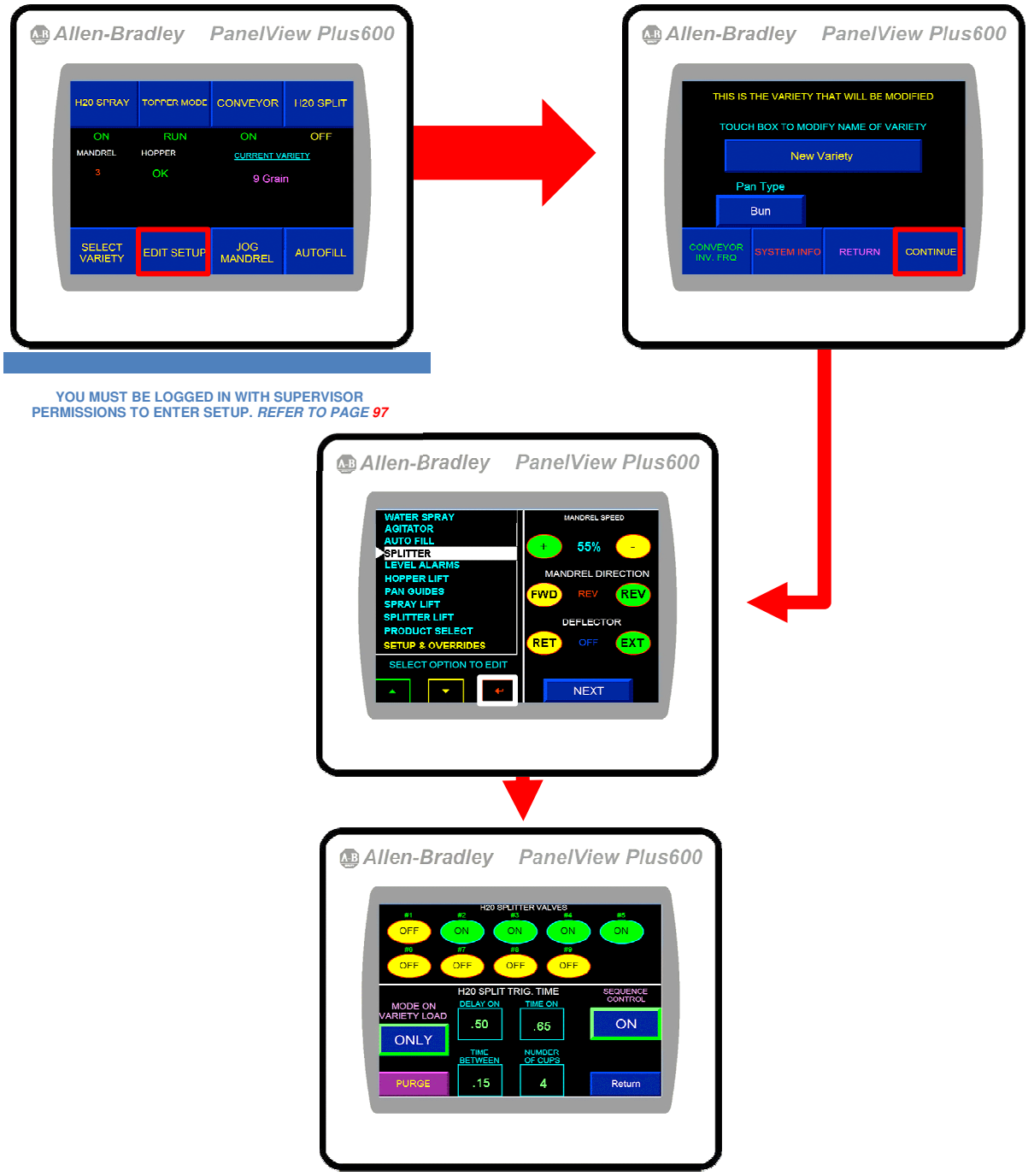


Press the toggle switch “ON” or “OFF” to select if the Auto-fill function is available for this variety. If the Auto-Fill is ON for this variety, then the operator will be able to control it from the Main Run screen.

The ON WHEN VARIETY SELECTED function selects if the function will be automatically set to ON when the variety is selected. Press toggle switch to select YES or NO.

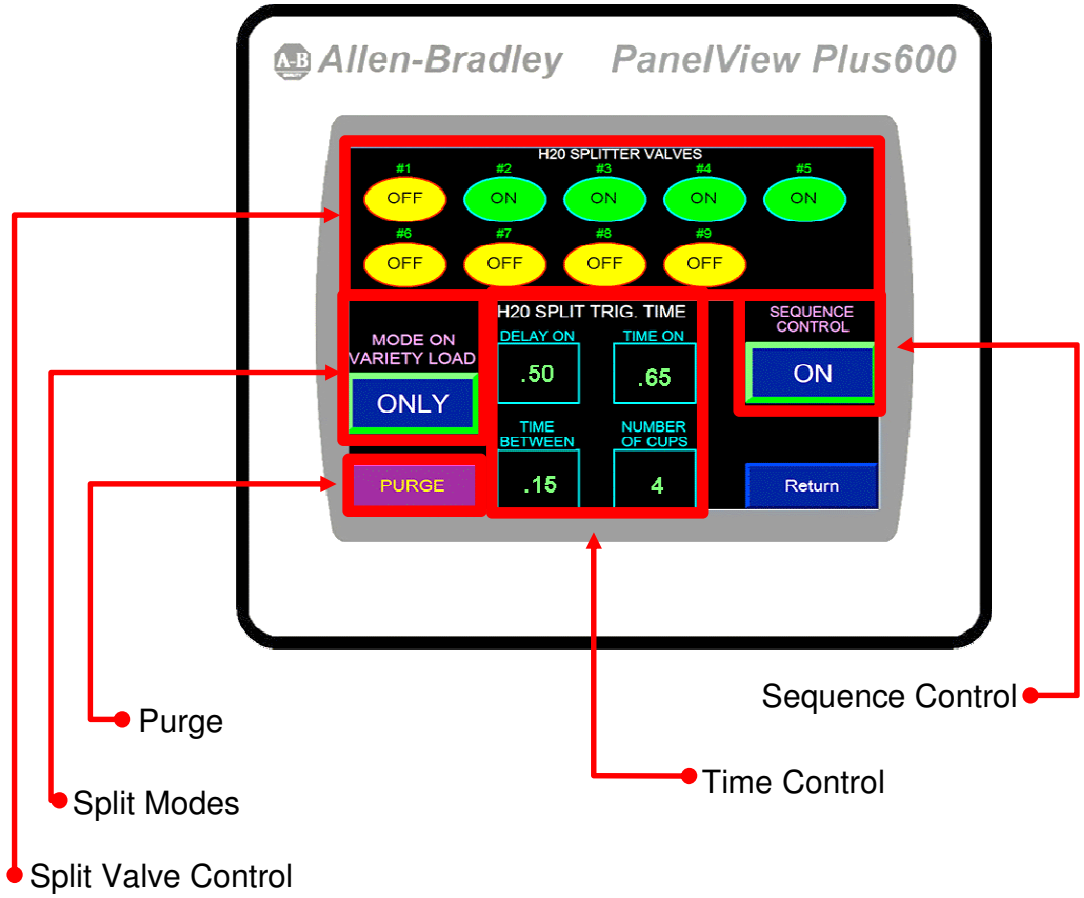
If YES is selected, then the next time the variety is loaded the Auto-Fill function will be automatically enabled.

Water Splitter Screen Navigation



Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the option SPLITTER. When the cursor is at SPLITTER press **ACCEPT**. You will be taken to Splitter setup screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

Water Splitter Setup (Optional)



The Topper features an optional Splitter that is available to enhance your product.

The Split rail consists of water split valves that can be turned ON and OFF dependent on the variety needs. The standard Splitter is equipped with six valves but more valves may have been bought when your unit was ordered.

Split Valve Control – Allows individual control of spray valves.

Split Modes – Toggle between different Splitter modes.

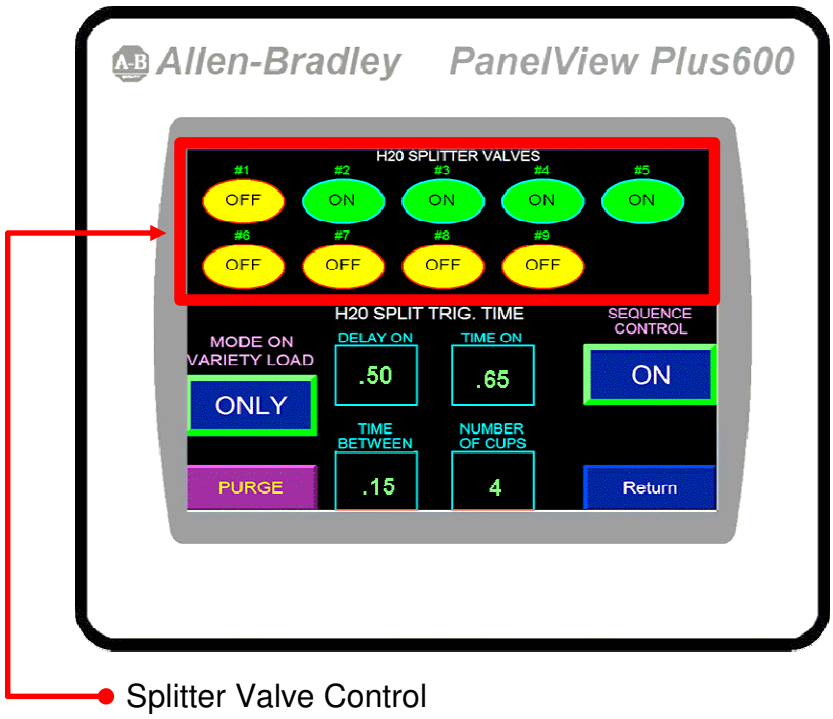
Time Control – Allows precise control of the water split actuation.

Purge – Activates all enabled water splitter valves to remove air from the system.

Sequence Control – Optional feature for precise splits within a pan.

Return – Takes you back to the Main Setup screen.

Water Splitter Setup - Valve Control

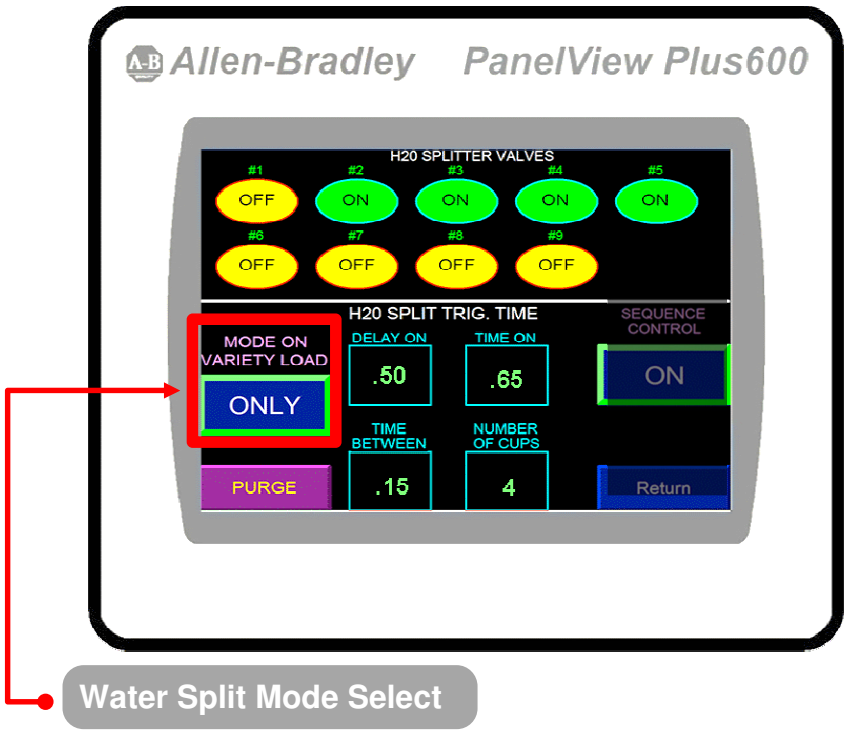


Splitter Valve Control – The standard Splitter is equipped with six valves. Additional valves may have been bought when your unit was ordered. Eight valves are the most common configuration and is what will be displayed in the Splitter Valve Controls.

If the unit is equipped with six Split Valves then valve, one and eight will not be operational, (but still present on the display). Spray valves 2 through 7 will control the six valves.

The number of cups will decide the number of water split valves that are needed. Press the oval button below each respective valve number to toggle the state of the valve. Green shows that the valve is enabled. Amber shows that the valve is disabled.

Water Splitter Setup - Modes



Water Split Modes – There are three modes available for the Water Splitter:

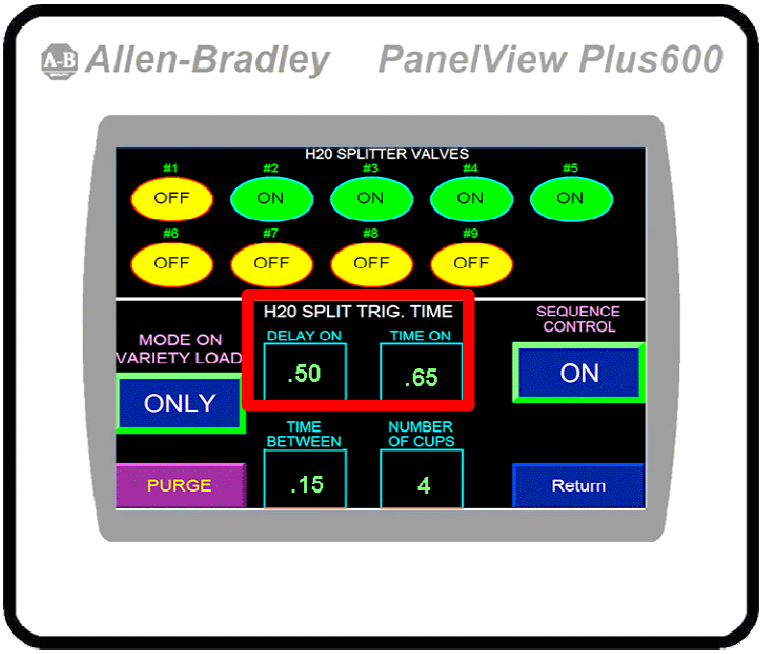
H20 Split Mode	Description
OFF	The Water Split will be disabled when variety is selected.
ON	The Water Split will be enabled when variety is selected.
ONLY	The Water Split will be enabled and the topper will be disabled when variety is selected.

Press the box to toggle between the modes.

If the Water Splitter is ON, then the operator will be able to change modes from the Main Run Screen. If the Water Splitter is OFF, then the operator will not be able to change modes for the Main Run Screen.

The Water Spray and Water Splitter are independent of each other. The Spray and the Splitter may both be in ONLY mode and both will be enabled when triggered. The ONLY MODE only refers to the Topper.

Water Split Setup - Trigger Times



Water Splitter Trigger Times – The pan sensor for the water splitter rail is found upstream from the water splitter valves. It may be necessary to delay the start and stop of the water splitter valves to ensure complete split of the product.

Delay On - The time from when the pan first makes the pan sensor and the splitter valves turn on. When the pan sensor is made, the PLC will wait the value of DELAY ON before turning the water split valves on. The value of DELAY ON should have the water splitter valves turn on when product is directly beneath the valves. The goal is to prevent overspray and wasted water.

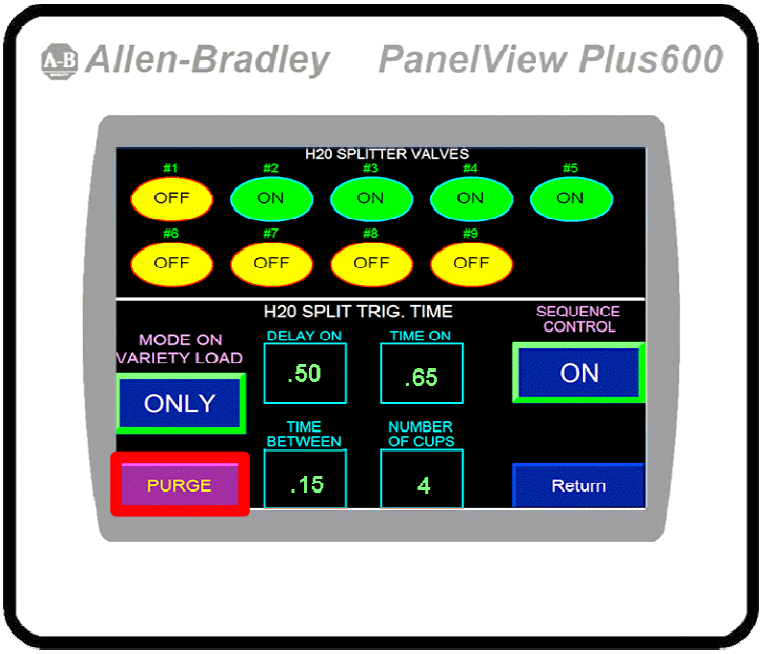
Press the **DELAY ON** box to change the value.

Delay OFF – Delay Off is the time from when the pan is no longer making the pan sensor and the splitter valves turn off. When the pan sensor is no longer being made, the PLC will wait the value of DELAY OFF before turning the water splitter valves off. The value of DELAY OFF should have the water splitter valves turn off when product is no longer directly beneath the valves. The goal is to prevent overspray and wasted water.

Press the **DELAY OFF** box to change the value.

For best results, the Trigger Times should be adjusted with the pan and conveyor speed that will be used for the variety in production.

Water Split Setup - Purge



Purge – When **PURGE** is press all enabled valves will turn on.

Purge is primarily used to remove any air from the Water Splitter valves. Any air in the system will cause adverse effects.

In proper operation, the valves should turn on and off at once without any dripping. The split should be very fine with a tight jet of water. If you experience undesirable results, then the valves may need to be purged. Press and hold the purge button for 10 seconds. Release the button shortly and repeat. Repeat until desirable results.

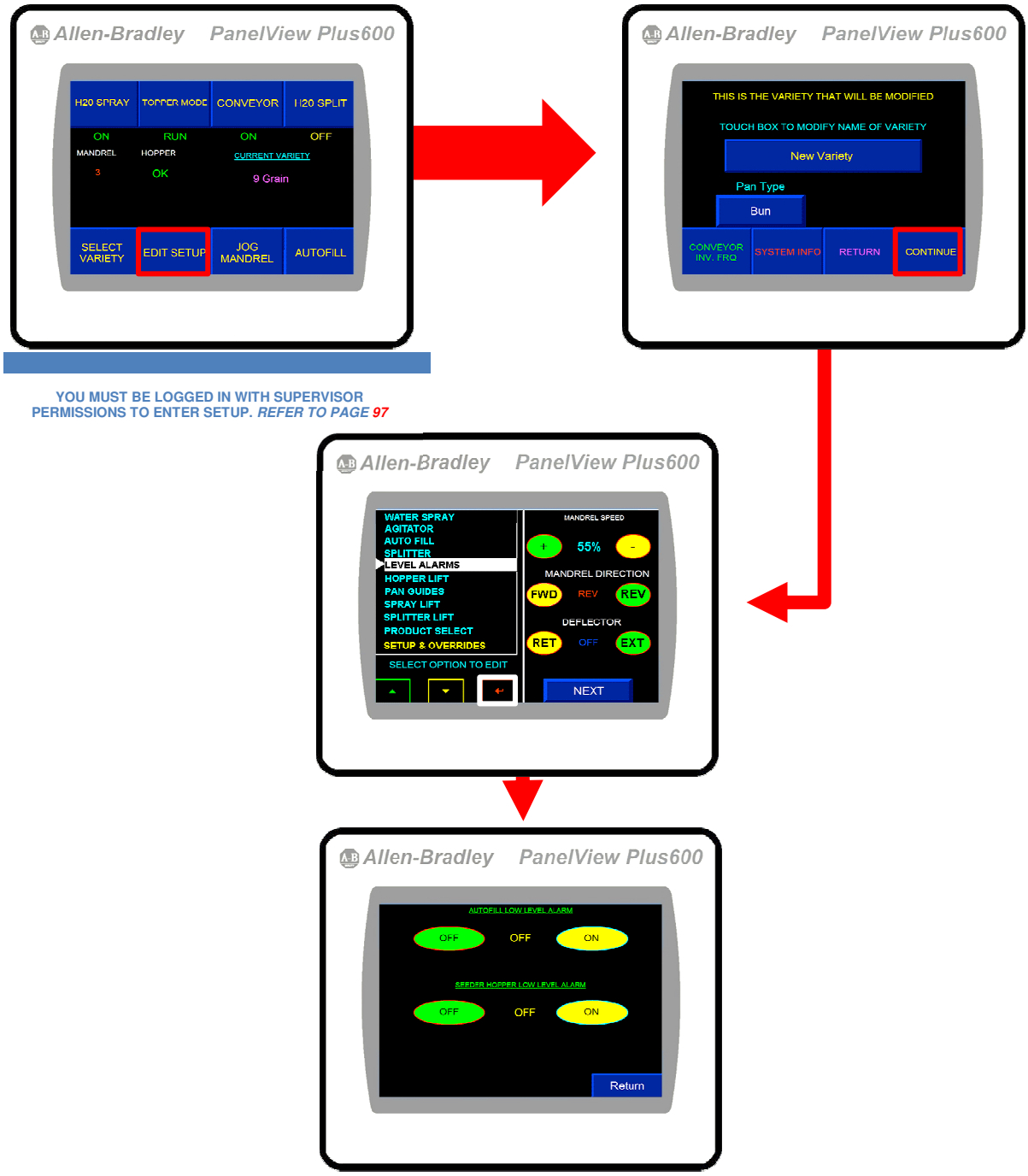
You may also use Purge to verify your valve configuration and placement.

Press and release the Purge button shortly to turn on the enabled valves.

Press RETURN to go back to the Main Setup screen.

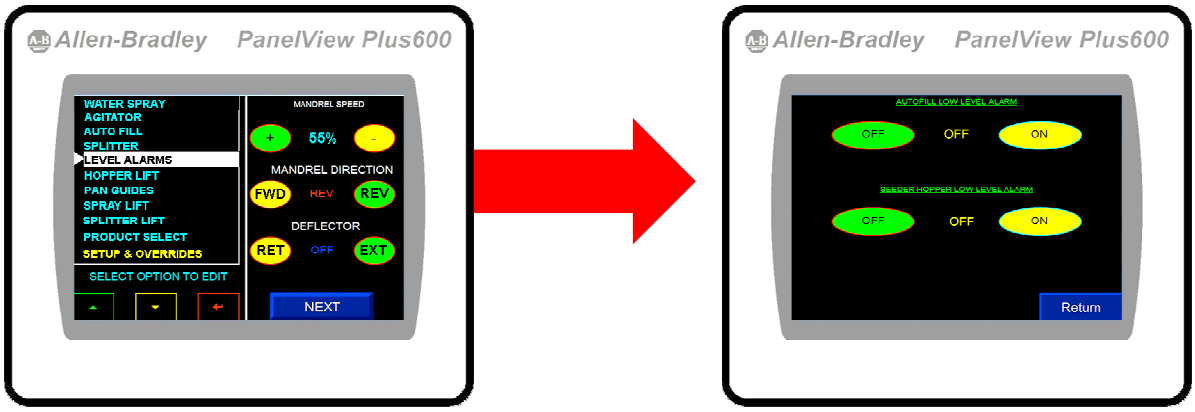
If after several minutes of purging, you are unable to obtain desirable results check for any air leaks in the water lines. Verify that the nozzle tips are seated and tighten properly.

Level Alarms Screen Navigation



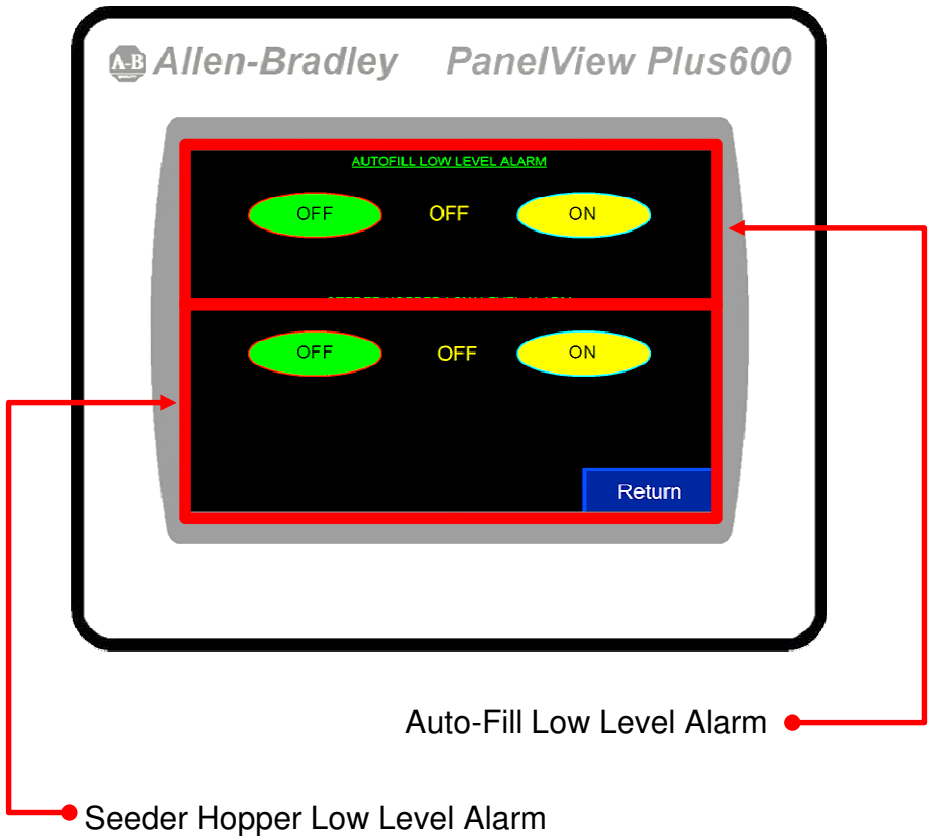
Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the option LEVEL ALARMS. When the cursor is at LEVEL ALARMS press **ACCEPT**. You will be taken to Level Alarms setup screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

Level Alarms (Optional)



The Low Level alarm is an optional feature that alerts the operator if either the Seeder's hopper or the Auto-Fill external tank become low. The alarm should provide the operator with enough time to refill the respected hopper.

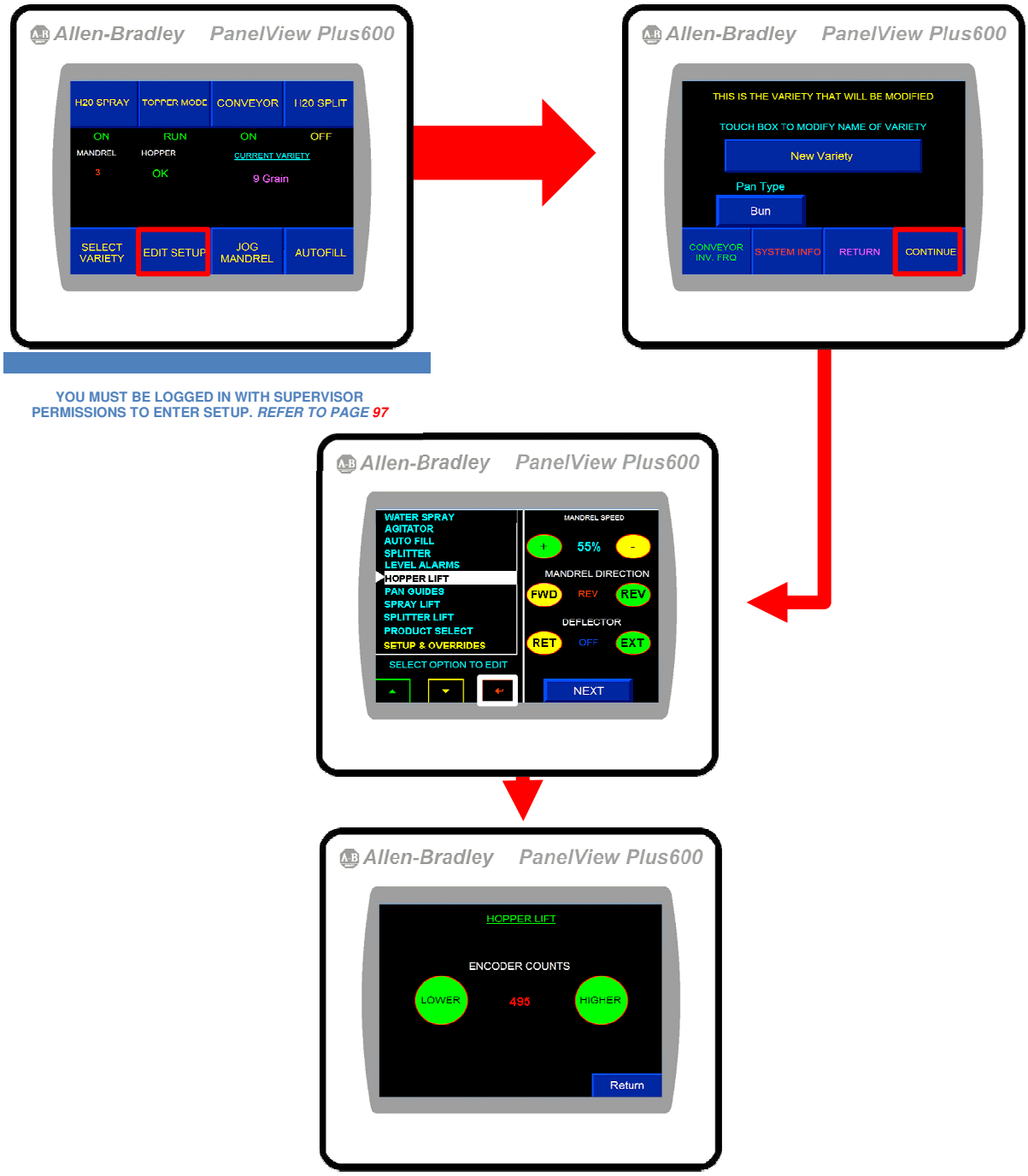
Level Alarms Setup Screen



The top section controls the Auto-Fill Low Level Alarm. Press the toggle switch ON or OFF to enable or disable the Low-Level Alarms.

The bottom section controls the Seeder's hopper Low Level Alarm. Press the toggle switch ON or OFF to enable or disable the Low-Level Alarms.

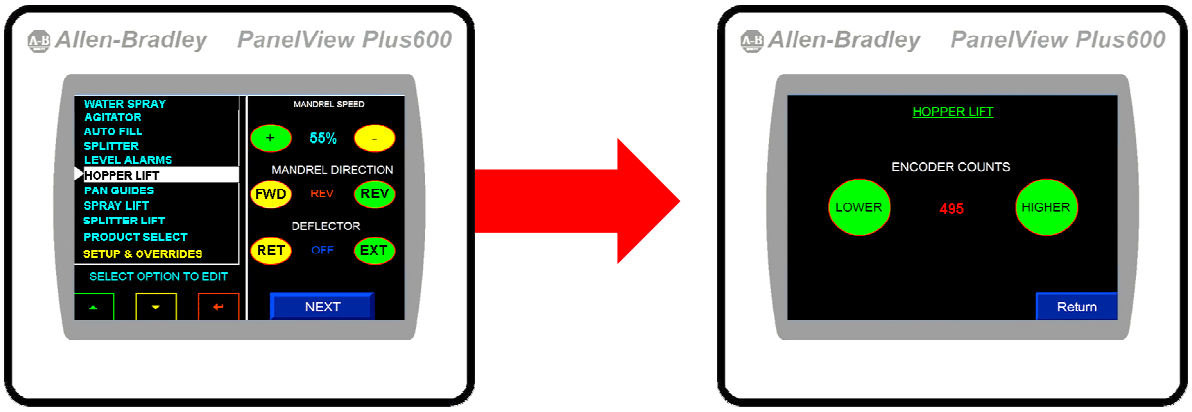
Hopper Lift Screen Navigation



YOU MUST BE LOGGED IN WITH SUPERVISOR PERMISSIONS TO ENTER SETUP. *REFER TO PAGE 97*

Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the option HOPPER LIFT. When the cursor is at HOPPER LIFT press **ACCEPT**. You will be taken to Hopper Lift setup screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

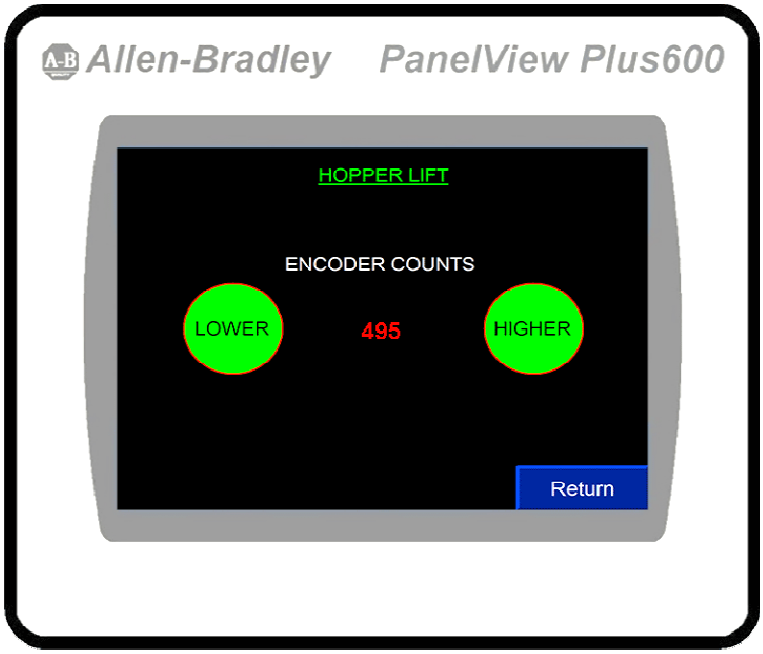
Hopper Lift (Optional)



The height of the hopper may affect the application of your topping. The adjustable height hopper will return to the exact height every time the variey is selected. Normally 2 to 3 inches above the product is acceptable for most toppings.

Use the “UP” or “DOWN” buttons in the Navigation Controls to position the white cursor next to the option HOPPER LIFT. When the white cursor is at HOPPER LIFT, press enter. You will be taken to HOPPER LIFT setup screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

Hopper Lift Setup Screen



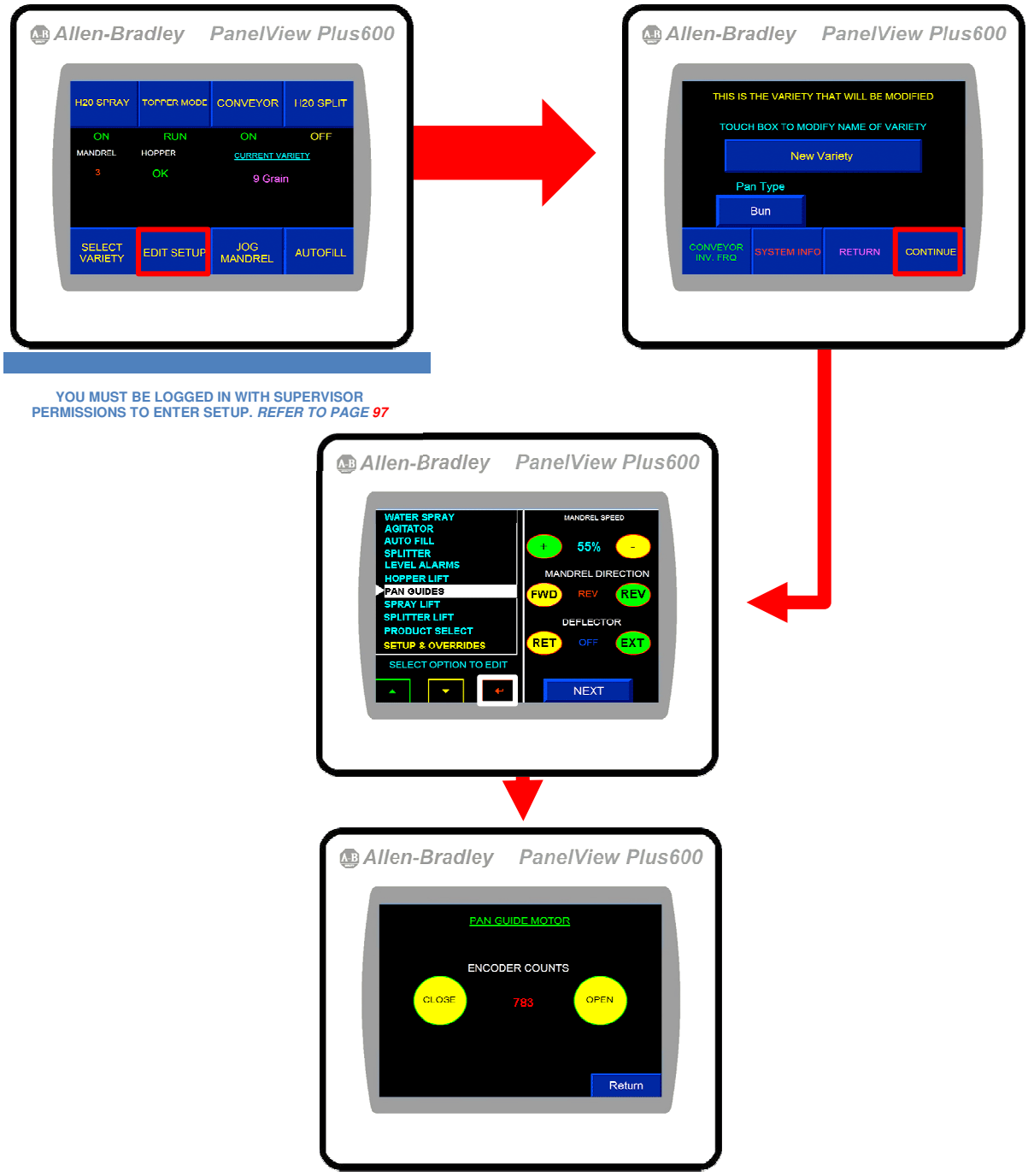
When setting the height of the hopper it is preferably to do so with the product in production. This way you can immediately see the results while adjusting.

The numeric value in the center displays the number of encoder counts from the home position. This is for reference only.

Press the LOWER or HIGHER button to move the hopper in the respective direction until the hopper is in the desired position for the variety selected.

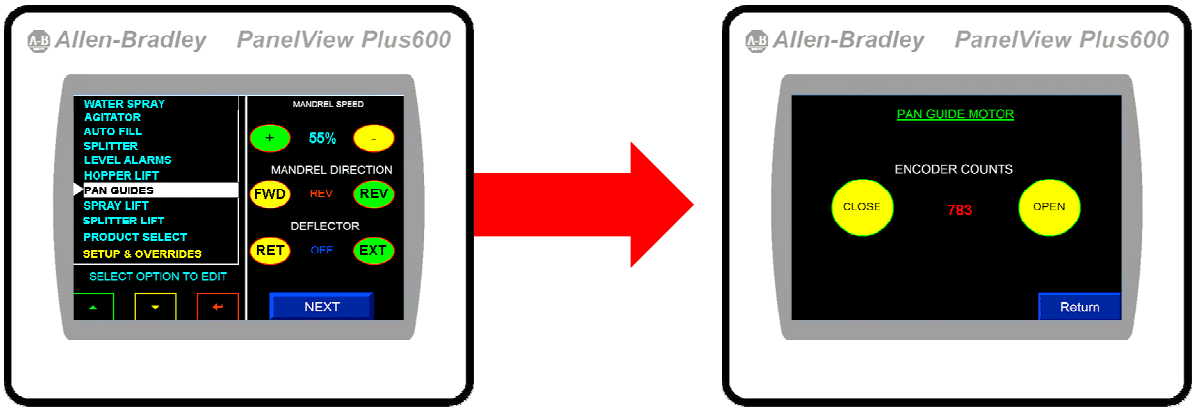
Once the hopper height is set, press the RETURN button to save and return to the Main Setup screen.

Pan Guide Screen Navigation



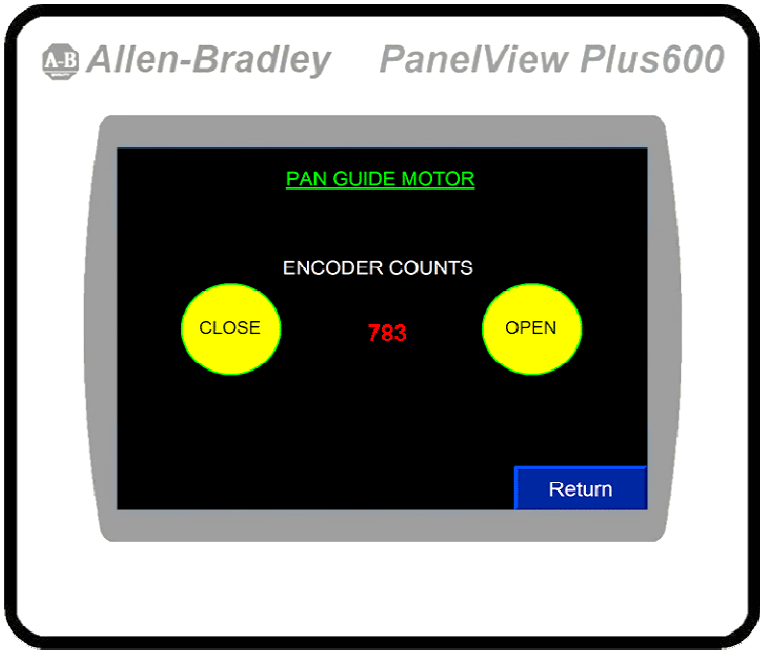
Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the option PAN STOP. When the cursor is at PAN STOP press **ACCEPT**. You will be taken to Pan Stop setup screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

Pan Guides (Optional)



With such a wide range of pans on the market today, the Smart Seeder features an optional pan guide system. The Pan Guides can be automatically adjusted each time a variety is ran, fitting the pan perfectly every time.

Pan Guides Setup Screen



When setting the Pan Guides have a pan on the conveyor that is used for the variety being setup.

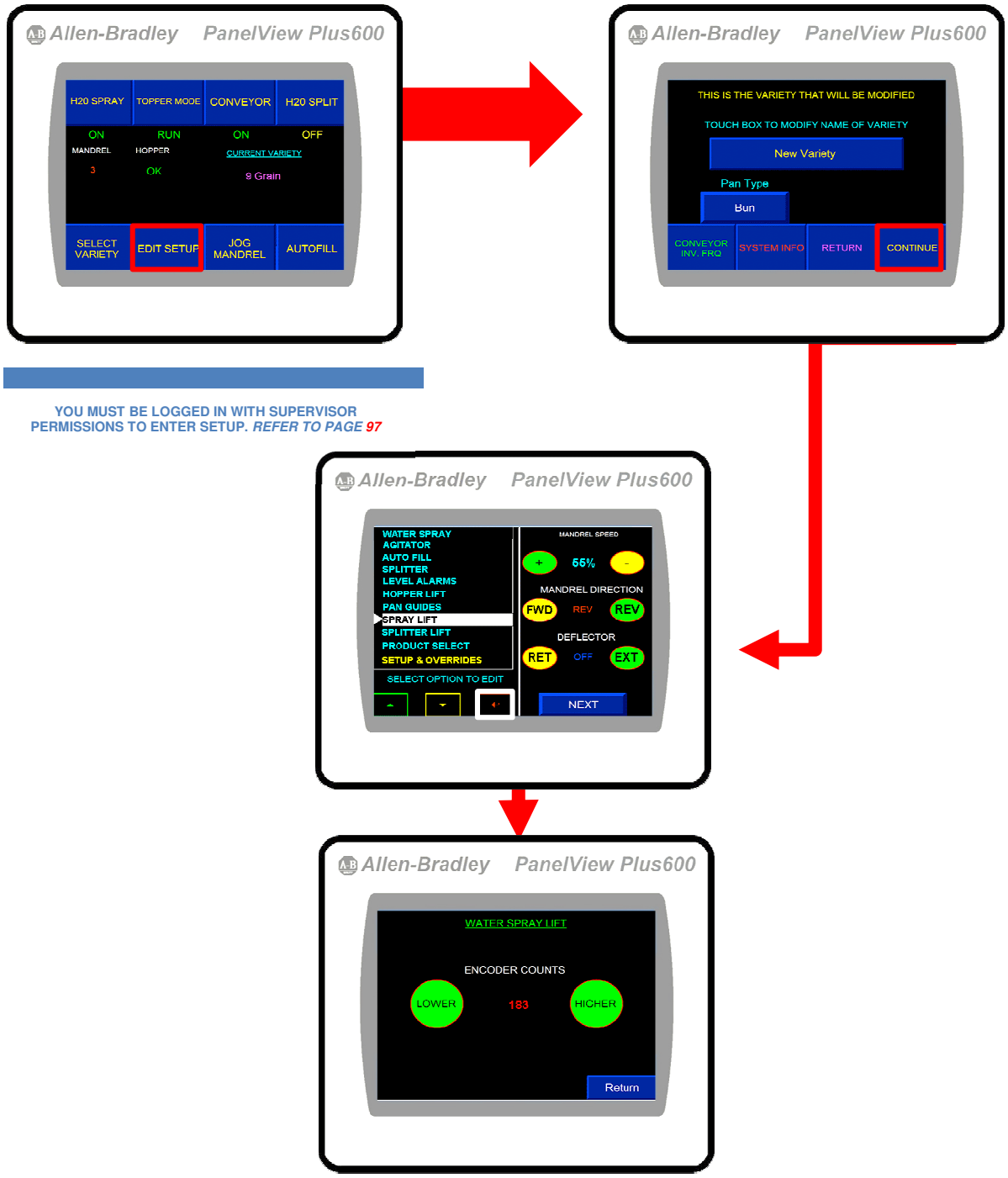
Press the OPEN or CLOSE button to move the Pan Guides in the respective direction until the Pan Guides are at the desired position.

You must have at least a 1/2” from the side of the pan to the Pan Guide. This will prevent pans from binding during the Seeder transfer.

The numeric value in the center displays the number of encoder counts from the home position. This is for reference only.

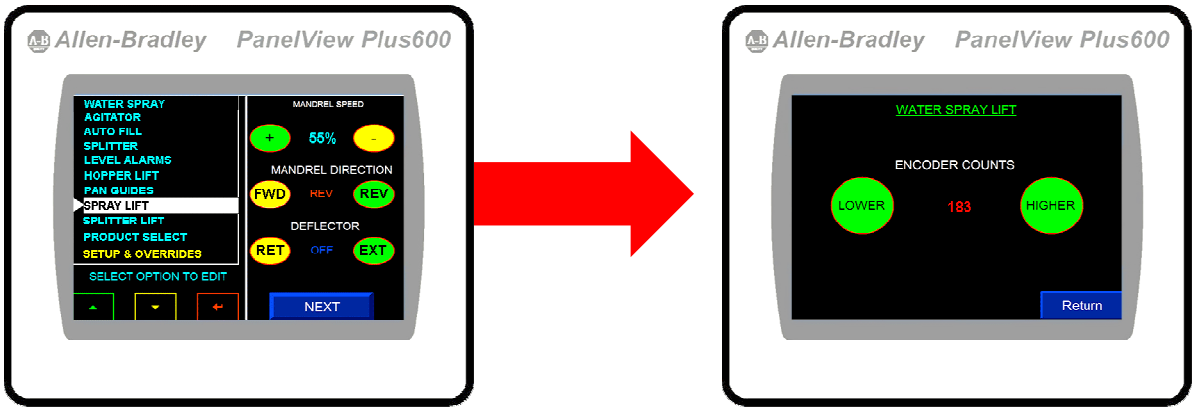
Once the Pan Guide is set, press the RETURN button to save and return to the Main Setup screen.

Spray Lift Screen Navigation



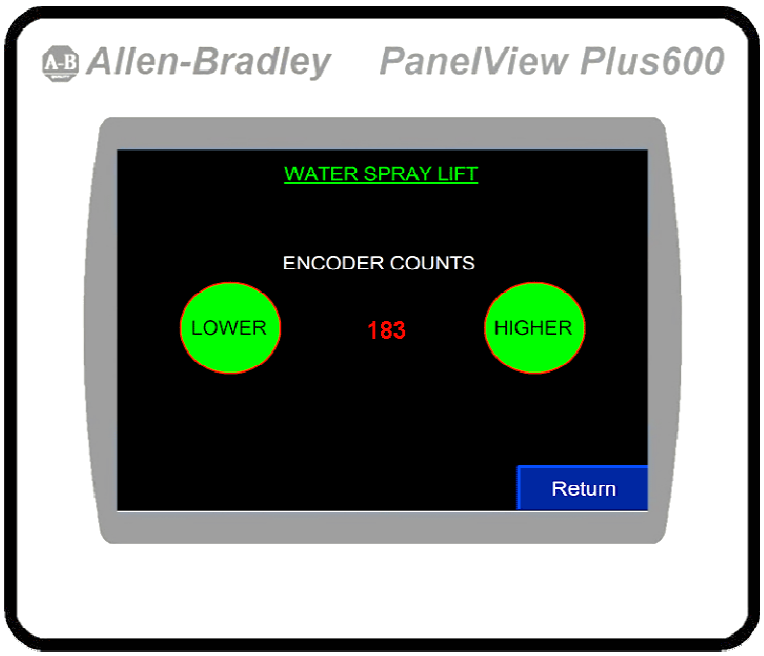
Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the option WATER SPRAY. When the cursor is at WATER SPRAY press **ACCEPT**. You will be taken to Water Spray setup screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

Spray Lift (Optional)



The height of the Spray Rail will affect the amount of water coverage on the product. The higher that the spray rail is the wider the water spray will be at the product.

Spray Lift Setup Screen



When setting the Spray Lift, it is best to have a pan on the conveyor that is going to be used for the variety being setup.

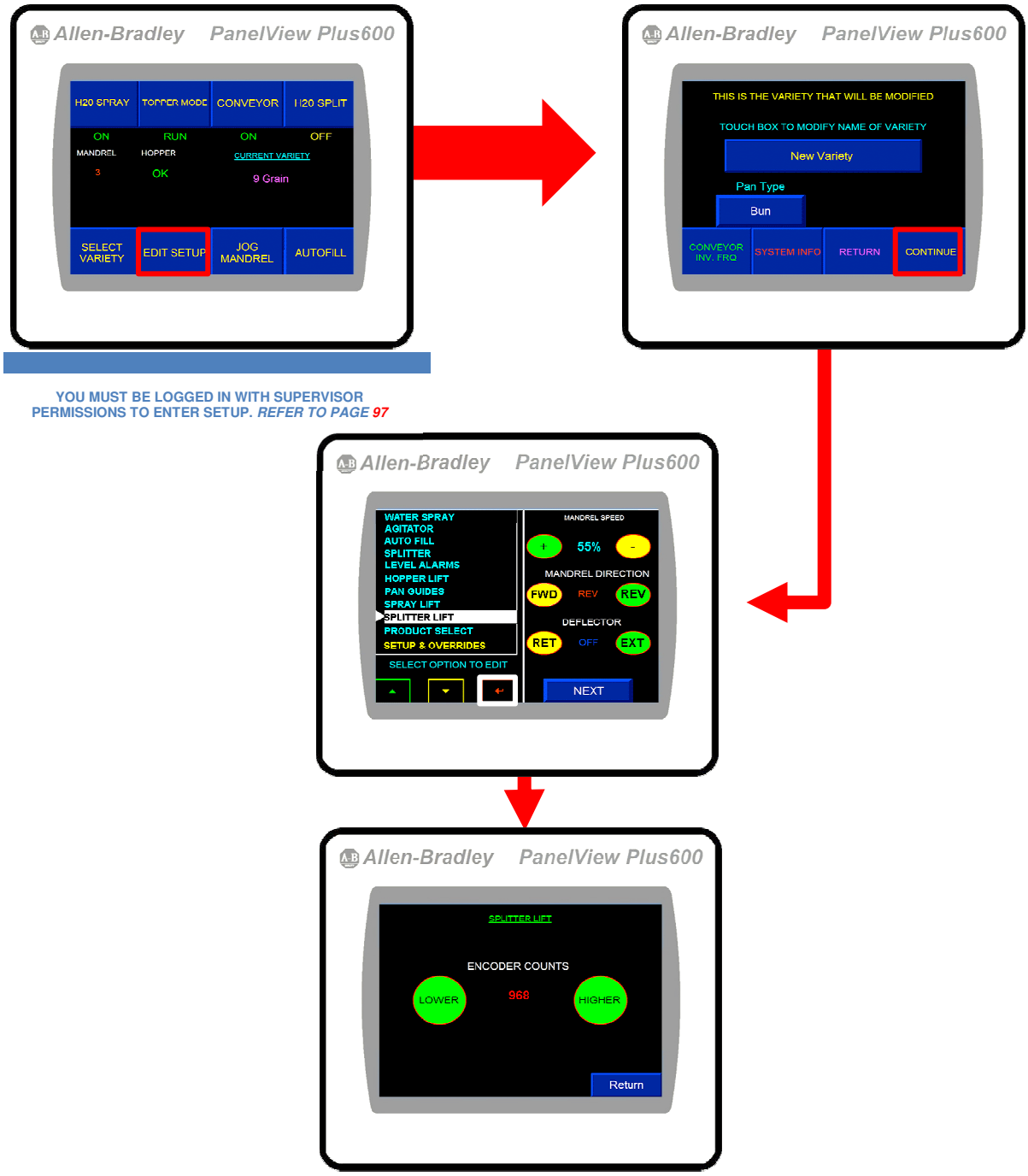
Press the LOWER or HIGHER button to move the Spray Lift in the respective direction until the Spray Lift is in the desired position for the variety being setup.

Position the Spray Lift so there is complete coverage of product along the width of the pan.

The numeric value in the center displays the number of encoder counts from the home position. This is for reference only.

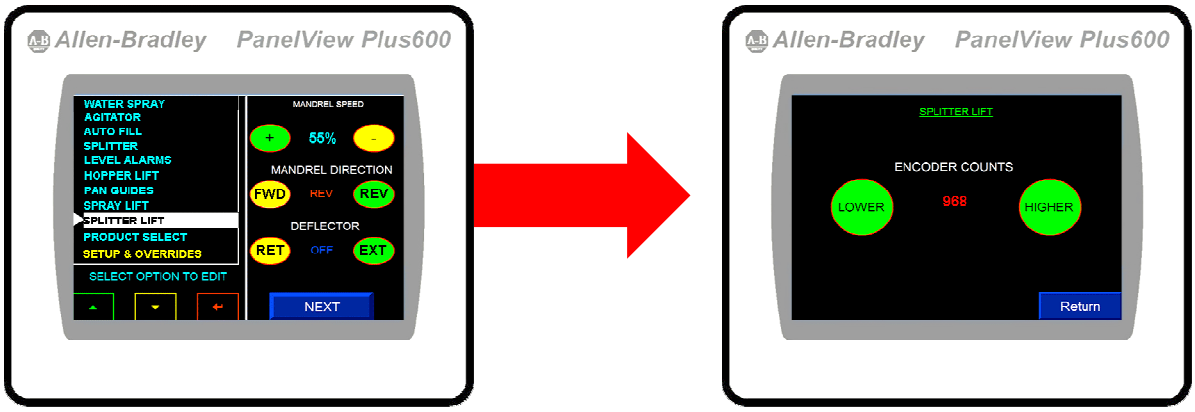
Once the Spray Lift is set, press the RETURN button to save and return to the Main Setup screen.

Splitter Lift Screen Navigation



Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the option SPLITTER LIFT. When the cursor is at SPLITTER LIFT press **ACCEPT**. You will be taken to Splitter Lift setup screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

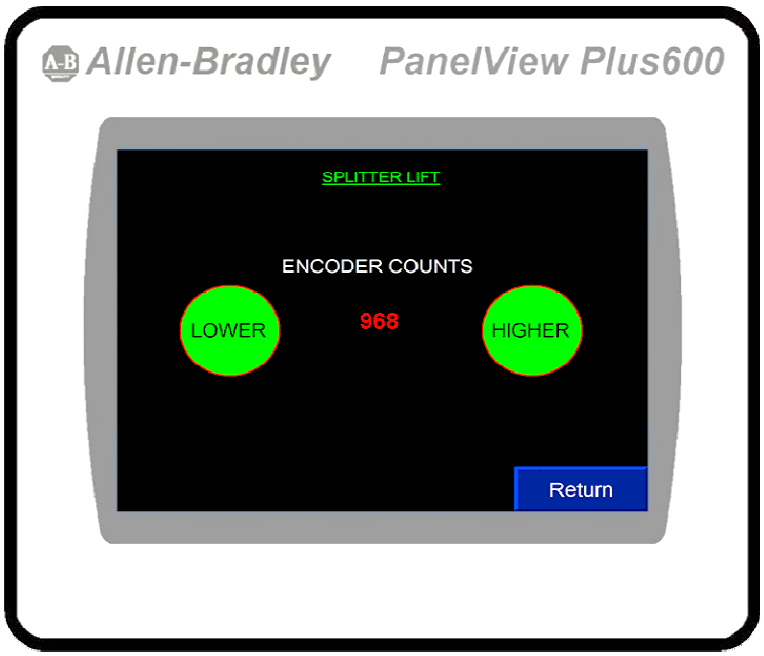
Splitter Lift (Optional)



The height of the Split Rail will affect the split in the dough. The lower the spray rail is the deeper the split will be at the product.

The height of the Splitter Rail is just one of many variables that may affect the split in the dough. Water pressure, dough moisture content, bake time, and zone one oven temperature are just some of the variables that may affect the split.

Splitter Lift Setup Screen



When setting the Splitter Lift, it is best to have product on the conveyor that is being used for the variety. Being setup. View the product after it has been baked to see the results.

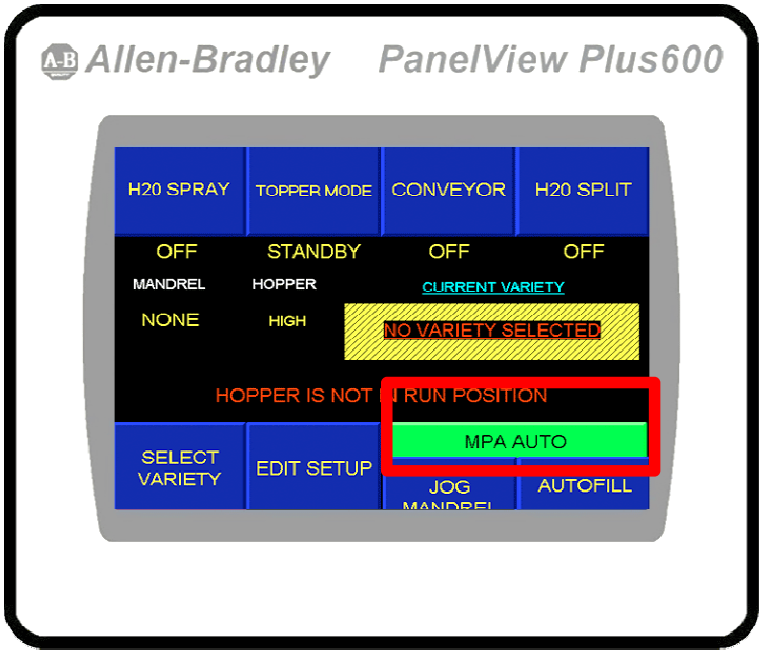
Press the LOWER or HIGHER button to move the Splitter Lift in the respective direction until the Splitter Lift is in the desired position for the variety being setup.

Position the Splitter Lift so that the width of the split after baking is at the desired width.

The numeric value in the center displays the number of encoder counts from the home position. This is for reference only.

Once the Splitter Lift is set, press the RETURN button to save and return to the Main Setup screen.

MPA – Main Screen Controls



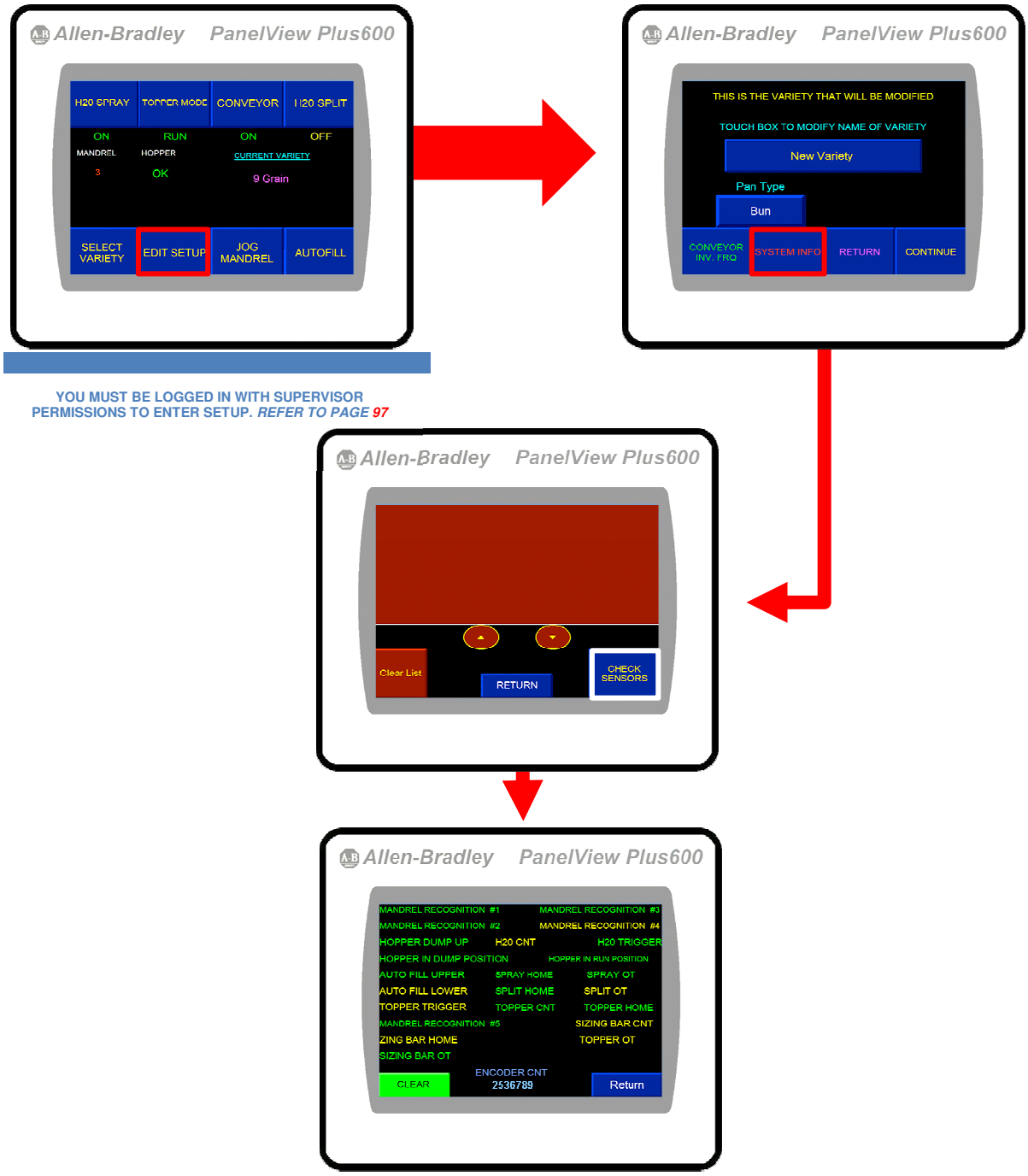
With a MPA system installed on your Seeder, a button will be displayed on the Main Run screen titled MPA. Beneath the button will show the status of the MPA system.

Pressing the MPA button will toggle the available modes.

MPA Modes – There are two modes available to the operator for the MPA:

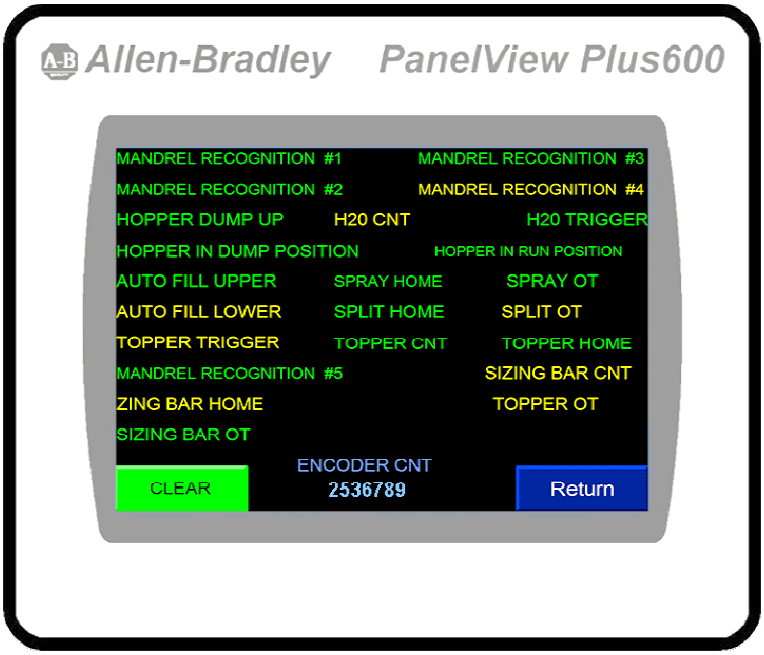
MPA Mode	Description
OFF	The MPA is disabled.
AUTO	The MPA is enabled and will only be activated with a trigger from the hopper low-level sensor.

Check Sensor Screen Navigation



YOU MUST BE LOGGED IN WITH SUPERVISOR PERMISSIONS TO ENTER SETUP. *REFER TO PAGE 97*

Sensor Status



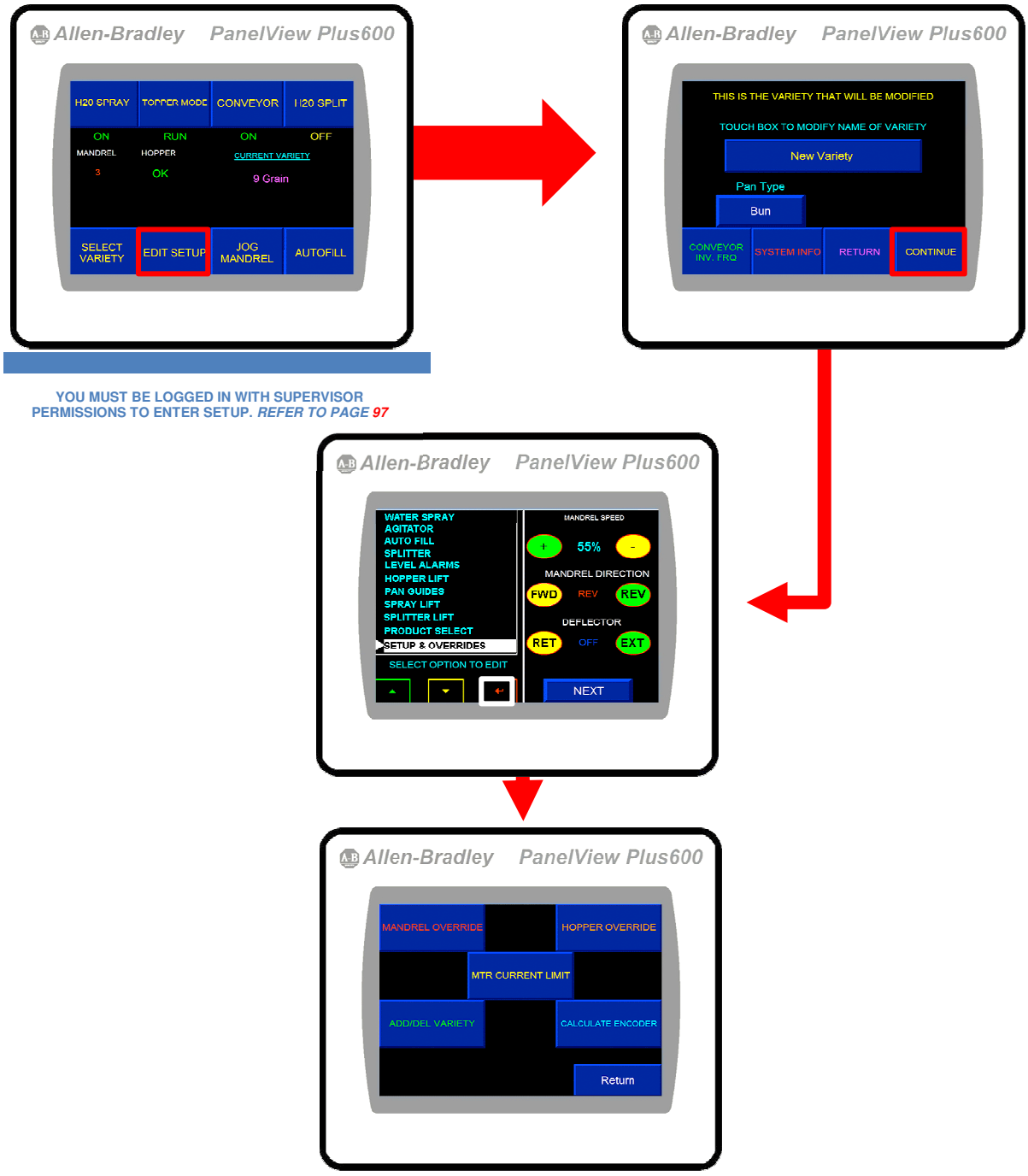
Sensor Status

The Check Sensor screen gives the status of the unit's sensors. Green shows that the sensor is energized. Amber shows that the sensor is not energized.

Press CLEAR to reset all the sensor states and the cumulative conveyor encoder counter.

Press RETURN to go back to the Main Setup Screen.

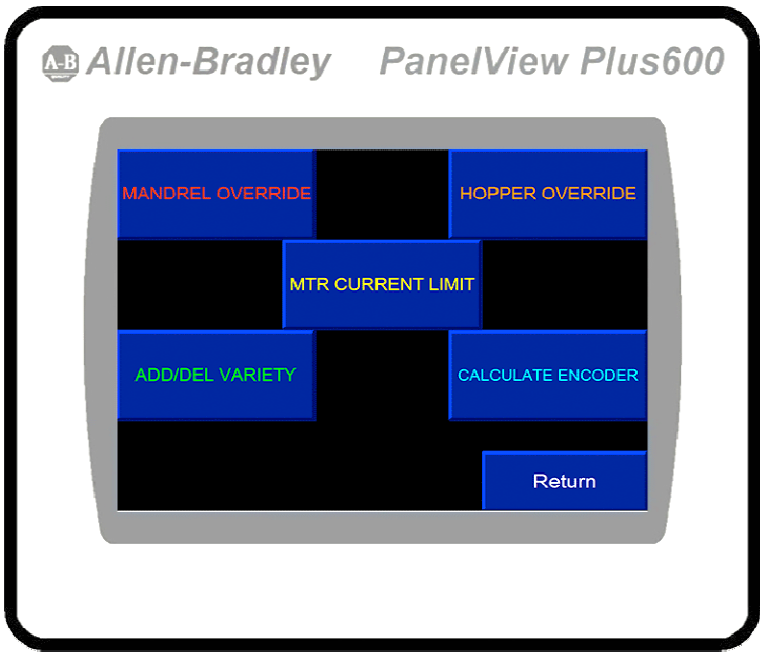
Setup & Overrides Navigation



YOU MUST BE LOGGED IN WITH SUPERVISOR PERMISSIONS TO ENTER SETUP. *REFER TO PAGE 97*

Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the option SET UP & OVERRIDES. When the cursor is at SET UP & OVERRIDES press **ACCEPT**. You will be taken to Setup & Overrides setup screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

Setup & Overrides

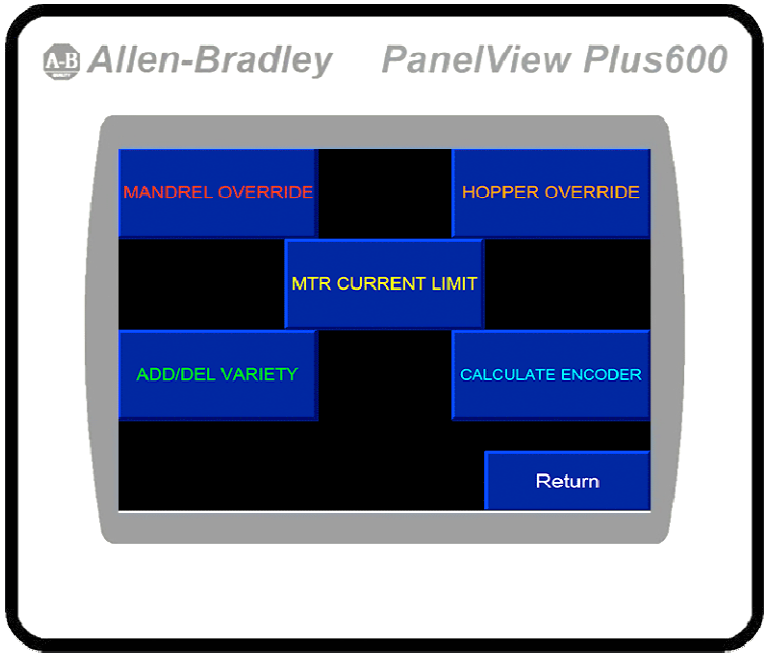


SETUP & OVERRIDES MAIN MENU

Setup & Overrides contain settings that could cause adverse effects on the unit and safety. Only authorized personnel should make changes to these settings.

Authorized personnel should only change these settings. Damage to the unit and / or bodily injury may occur. Exercise extreme caution when making changes.

Setup & Overrides Overview



Setup & Overrides allows you to change critical unit functions and override certain features. Use extreme caution when changing any settings.

MANDREL OVERRIDE – Bypasses the Mandrel Recognition System.

HOPPER OVERRIDE – Bypasses hopper safeguards.

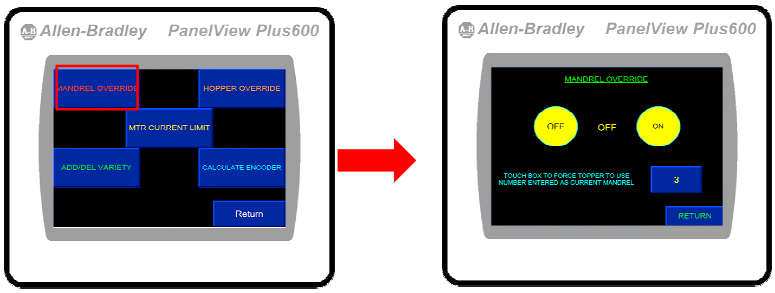
MTR CURRENT LIMIT – Automation motor's current settings.

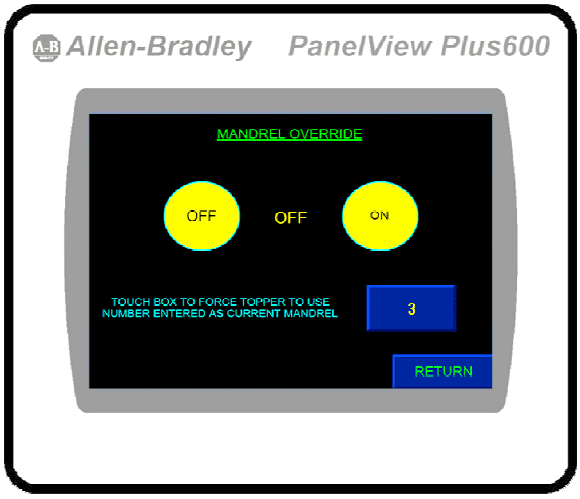
ADD/DEL VARIETY – Variety manangement.

CALCULATE ENCODER – Conveyor setup.

RETURN – Go back to Main Setup screen.

Setup & Overrides – Mandrel Override





The topper uses sensors to detect which Mandrel is inserted into the unit. In rare circumstances, the sensors may fail. It may then be necessary to override the Mandrel Recognition System to run a variety. If the Mandrel Override function is turned ON, the Mandrel Recognition System will be ignored and whatever Mandrel number is in the box will be used.

Press the toggle switch ON or OFF to enable / disable the Mandrel Override function.

Press the blue box. A numeric keypad will appear. Enter the desired Mandrel number and press enter. This will be the loaded Mandrel for the unit until the Mandrel Override is turned off or the number is changed.

When this option is active, the mandrel number shown on the Main Run screen will be “blinking red” to show that the override option is active. *See Page 147 for more information of the Mandrel Recognition System.*

Mandrel Recognition System

The Burford® Smart Seeder features a Mandrel Recognition System (MRS). The MRS automatically detects the inserted mandrel and only load varieties associated to that mandrel. This feature eliminates the operator from inadvertently loading the incorrect mandrel for a variety.

The system uses metal rings appropriately spaced at the end of each mandrel. Each mandrel has a unique sequence of rings. Proximity sensors found at the end of the mandrel tube detects if a metal rings is present or not. Using a binary system, the PLC can detect which mandrel is inserted.

Binary System

Most of us are familiar with the decimal numbering system. That is “0” through “9”. In the Decimal system, the most right number is the One’s column. The next column to the left is the Ten’s then the Hundred’s and so forth.

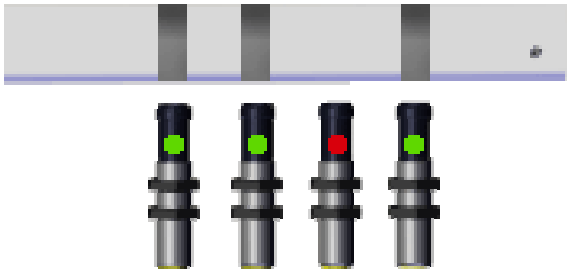
Binary is a base 2 numbering system. The only digits, or bits, are “1” and “0”. The most right column is the 1’s column. The next column to the left is the 2’s then the 4’s, 8’s and so forth, doubling each time.

To convert a Binary number to decimal you add all of 1’s in their respective column together. For example, Binary 0100 shows that there is a “1” in the 4’s column. 0100 is the decimal equivalent of 4. Binary 0101 shows that there is “1” in the 4’s column and a “1” in the 1’s column. We add 4 + 1 to get the decimal equivalent of 5. Binary 0111 shows that there is “1” in the 4’s column, a “1” in the 2’s column, and a “1” in the 1’s column. We add 4+2+1 to get the decimal equivalent of 7. The table below lists the Binary numbers for 0 through 15.

Binary Number				
8	**4**	**2**	**1**	**Decimal**
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	0	0	0	8
1	0	0	1	9
1	0	1	0	10
1	0	1	1	11
1	1	0	0	12
1	1	0	1	13
1	1	1	0	14
1	1	1	1	15

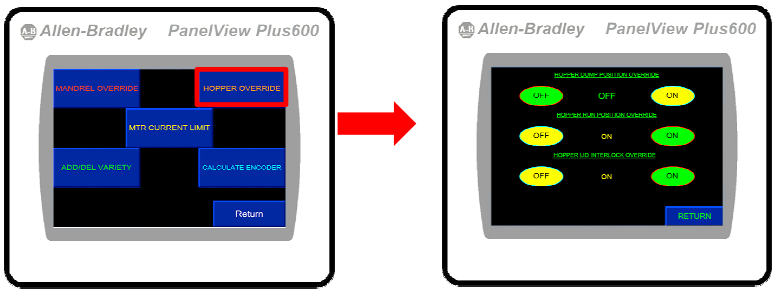
Mandrel Recognition System, continued

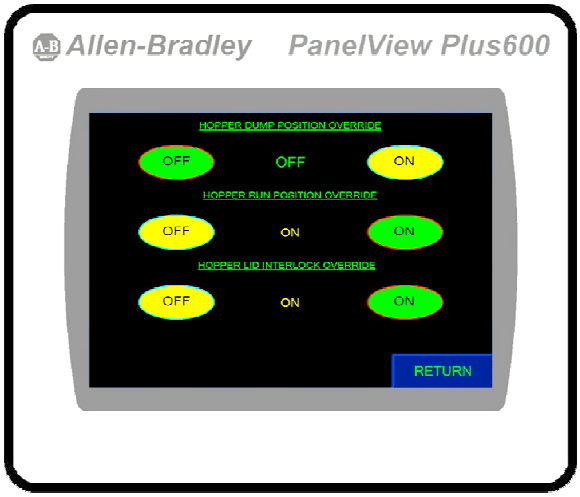
When the mandrel is inserted, certain proximity sensors will be energized dependent if a metal ring is present at the sensor's location. In the illustration below, the proximity sensors would send the binary number 1101 to the PLC. The PLC detecting that mandrel 13 has been inserted will make available to the operator the varieties that are configured for that mandrel only.



1 1 0 1 = Decimal 13

Setup & Overrides – Hopper Override



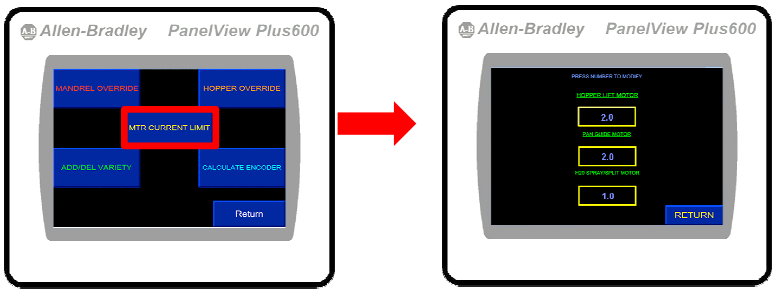


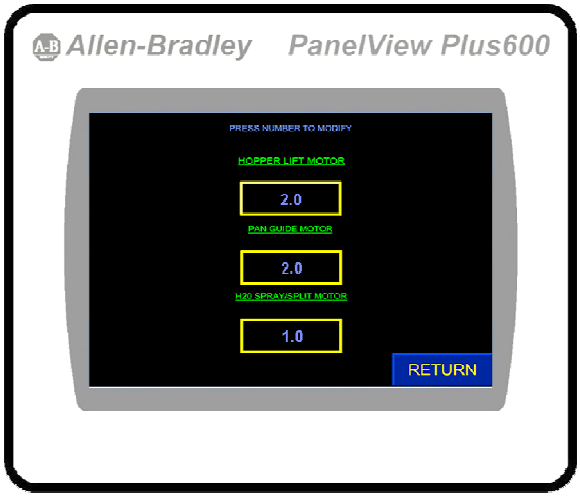
The hopper has many sensors. These sensors detect the angle, height, and lid position of the hopper. In rare circumstances, the sensors may fail. It may then be necessary to override the hopper position sensors to run a variety.

HOPPER DUMP - Press the toggle switch ON or OFF to enable / disable the Dump Position override. With this enabled, you may dump the hopper regardless of the hopper height. IF THE HOPPER IS DUMPED TOO LOW, DAMAGE MAY OCCUR TO THE UNIT.

HOPPER LID INTERLOCK OVERRIDE - Press the toggle switch ON or OFF to enable / disable the Hopper Lid Interlock override. With this enabled, you may run the unit regardless of the hopper lid position. THE UNIT WILL CONTINUE TO RUN EVEN IF THE HOPPER LID IS OPEN. MECHANICAL MOVEMENT IN THE HOPPER CAN CAUSE SERIOUS BODILY INJURY.

Setup & Overrides – Motor Current Limit



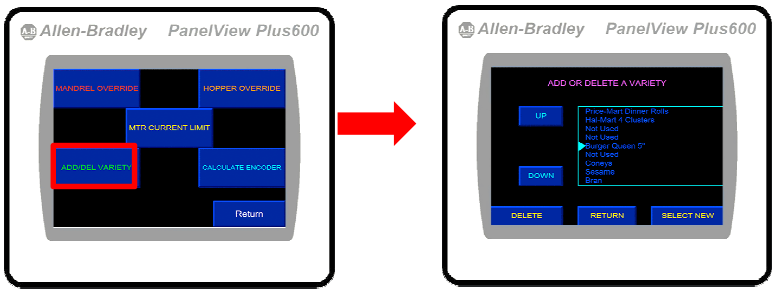


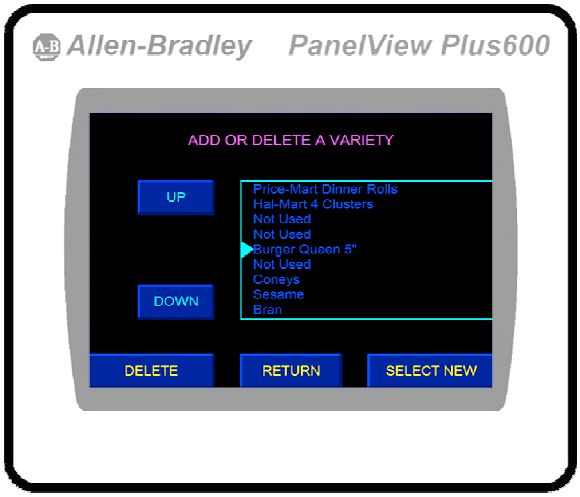
The Motor Current Limit sets the most current that will be sent to the motor. You can set the limit for each of the automated controls: Hopper Lift, Pan Guides, and the Spray / Split Lift.

The values for this screen are factory preset. If changes are necessary, change these values in very small increments until the desired result is obtained. Settings too low will not allow the machine to function properly. Settings too high may result in machine damage.

Contact Burford® if any changes need to be made.

Setup & Overrides – Add / Cut Variety



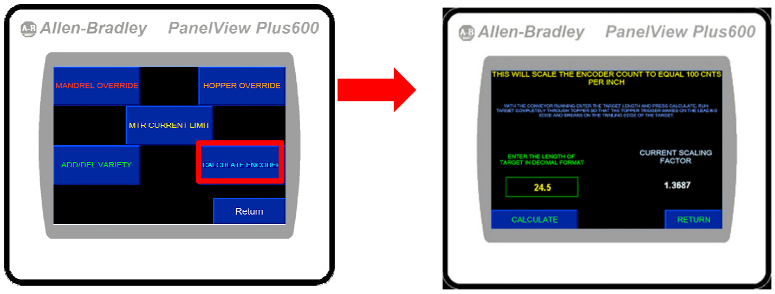


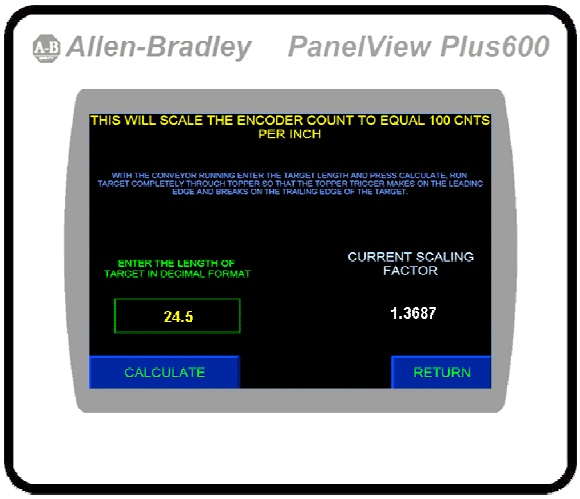
The Add / Delete screen allows you to add or delete a variety. You may have up to 15 varieties.

To remove a variety, use the UP or DOWN buttons to move the selection arrow to the desired variety. Touching the DELETE button will prompt the user to touch the DELETE button again to confirm the variety to be deleted. Deleting a variety will assign a mandrel number of zero, return all variety options to their default state, and rename the variety to NOT USED.

To add a variety, verify that the correct mandrel is loaded into the hopper for the new variety. Move the selection arrow to an unused variety labeled NOT USED and touch the “ADD NEW” button.

Setup & Overrides – Calculate Encoder





For the Smart Seeder to function properly, we must know the distance that the conveyor is traveling at any time. This is carried out with an encoder linked to the conveyor shaft. We need to know distance of travel per encoder count.

Using the topper's pan sensor and the known length of a target, a pan, we can calculate a scaling factor that can be used to ensure that 100 encoder counts equal one inch of conveyor travel.

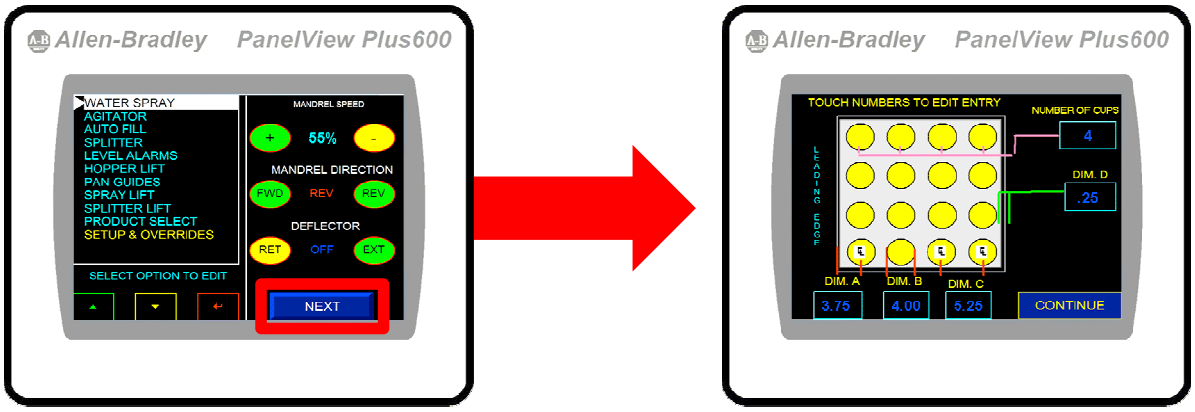
SCALING

Turn ON the conveyor (page 86), and verify that the speed is set to the speed that the varieties will be running in production (page 99). Locate a pan and measure the length. Enter the length in a decimal format, for example, 22 1/2" would be 22.5.

Press calculate. Release the pan upstream of the topper and allow it to travel through the unit, downstream of the topper. The CURRENT SCALING FACTOR value will update.

If a Burford conveyor shipped with the unit then the scaling was set from the factory. Scaling will need to be performed at installation if the topper is mounted on customer's conveyor. **WHEN SCALING IS PERFORMED, EACH VARIETY WILL NEED TO BE RE-CONFIGURED.**

Pan Dimension



The Burford® Smart Seeder applies topping precisely on the dough with the ability to skip the area between rows. This significantly reduces topping consumption.

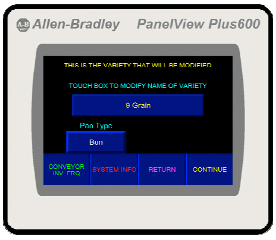
Entering your pan information for the vairety allows the software to accurately calculate when to engage the topping output.

The Pan Dimension screen is where the user enters certain dimensions of the pan for the software to perform the computation necessary to provide topping savings.

Press each individual box to modify the value.

Refer to CHAPTER 5: CREATING A NEW VARIETY for Pan setup instructions.

Press CONTINUE to return to the Setup screen



The values for the dimensions are not in inches. Do not assume that the values are in inches.

Be mindful of the LEADING-EDGE indicator on the graphic.

Chapter 5

Creating a New Variety

CHAPTER 5: CREATING A NEW VARIETY

New Variety - Introduction

The Burford® Smart Seeder uses varieties to store the setup information from the user. The system can store up to 15 individual varieties.

Each variety will have a mandrel number associated with it. Varieties can only be linked to one mandrel number at a time. The mandrel number that is associated with the variety must be inserted into the unit to be able to run that variety.

The Variety stores all the data needed to be able to return to the user set position each time.

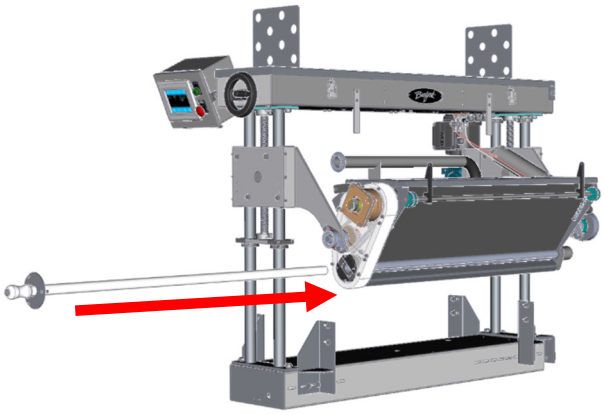
As we create a variety, we go through all the features available on the Burford® Smart Seeder. Some of these optional features may not be on your unit. Advance to the next section if we are discussing an option that is not on your unit.

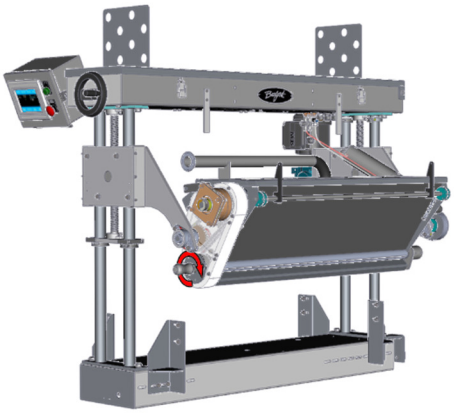
Setting up a new variety will need several pans of the product that you would like to create the variety for to pass through the system.

The user should familiarize themselves with Chapter 4, *User Interface*, before trying to create a new variety.

New Variety - Insert Mandrel

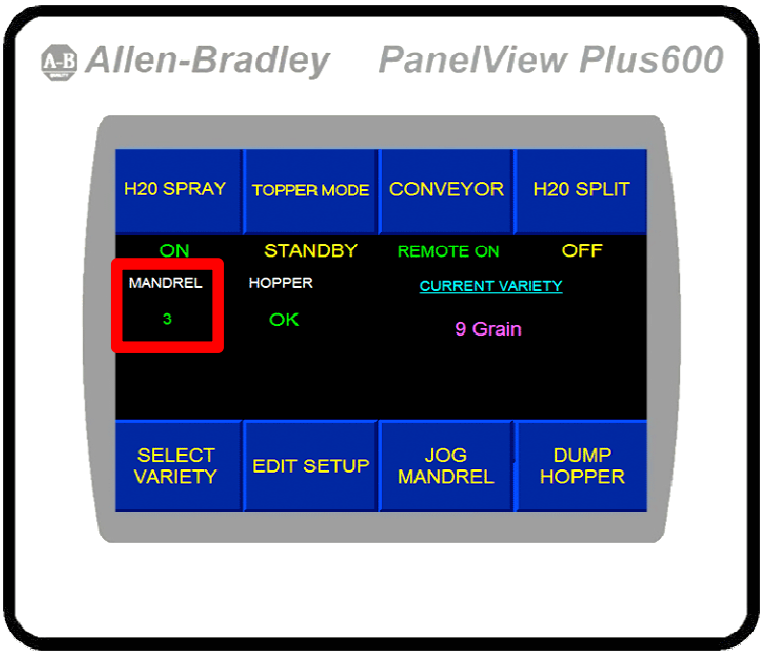
Determine which mandrel will have the new variety and insert it into the topper. Twist the mandrel to lock it into the hopper.





New Variety - User Interface (HMI)

We will begin from the Main Run screen. The unit should be powered, homed, and the mandrel matching the pan receiving the new variety inserted. In our example, we will be creating a new variety on mandrel number 3.

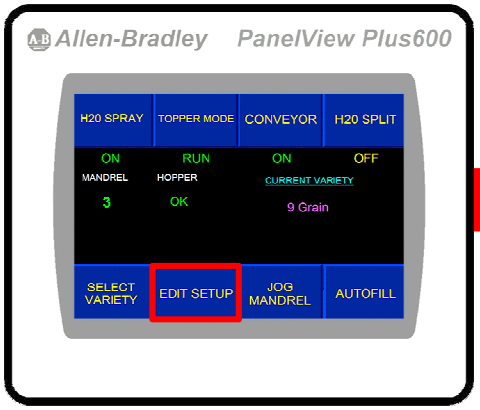


Main Run Screen

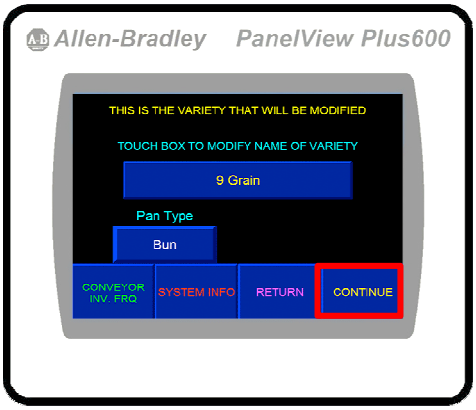
Verify that the mandrel receiving the new variety is inserted into the topper.

New Variety - Login

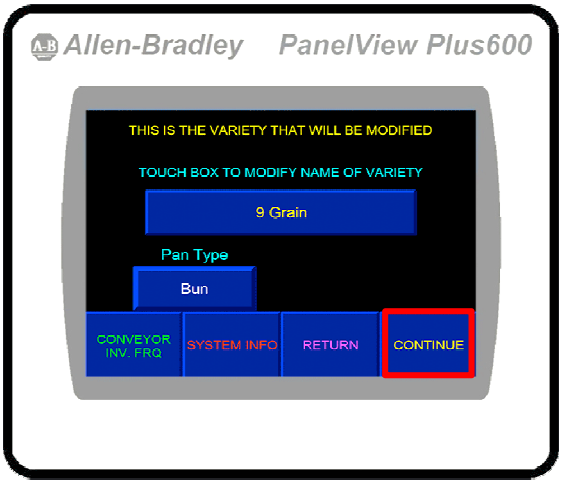
To add a variety, we must advance to the Setup & Overrides screen. To have access to the setup screens you must be logged in with supervisor privileges. For more information, please contact your supervisor or Burford® Corp. For a navigational map to the Setup & Overrides screen see to page 143.



Main Run Screen



Login Screen



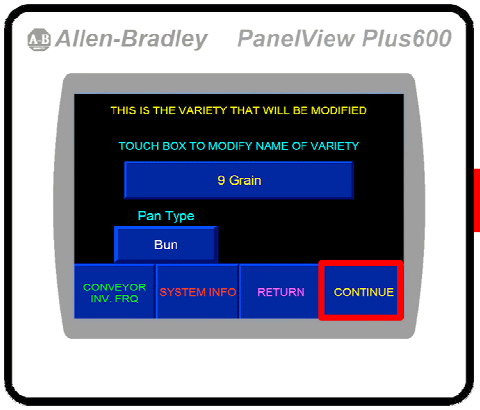
Login Screen

You must be logged in to enter setup. Pressing the EDIT SETUP from the Main Run screen will advance to the first setup screen.

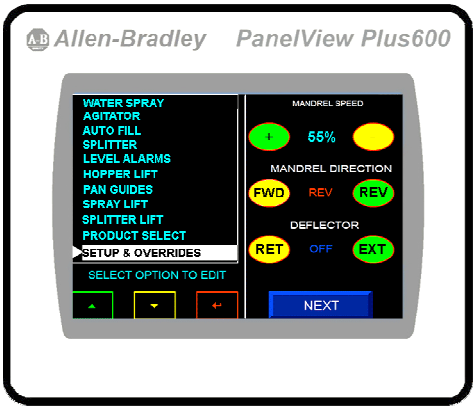
We do not want to change anything on the first Setup screen. Press CONTINUE the first Setup screen to advance to the Main Setup screen.

Main Setup Screen

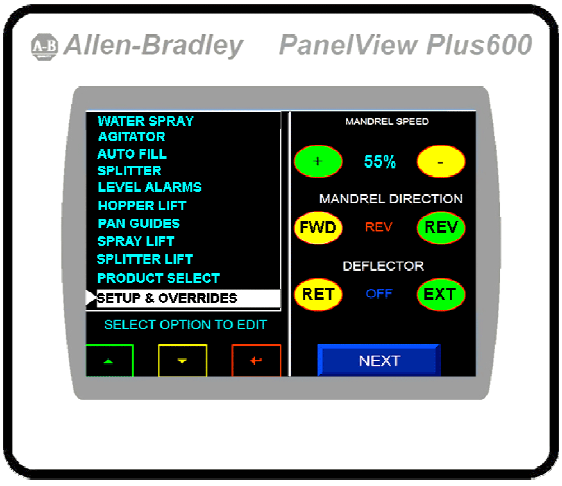
Pressing CONTINUE from the Setup screen advances to the Main Setup screen. As of now, we do not want to change anything on the Main Setup screen. Continue to the next page in the manual.



Setup Screen



Main Setup Screen

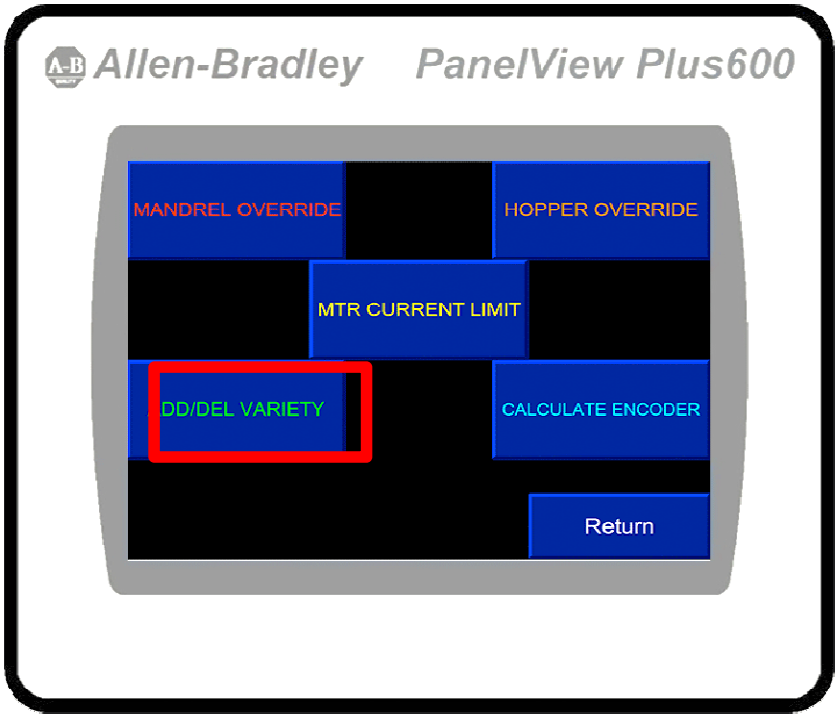


Use the “UP” or “DOWN” buttons in the Navigation Controls to position the cursor next to the option SETUP & OVERRIDES. When the cursor is at SETUP & OVERRIDES press **ACCEPT**. You will be taken to Setup & Overrides screen. *Refer to page 105 for instructions on how to navigate the Variety Topper Options.*

Authorized personnel should only change these settings. Damage to the unit and / or bodily injury may occur. Exercise extreme caution when making changes.

Setup & Overrides Overview

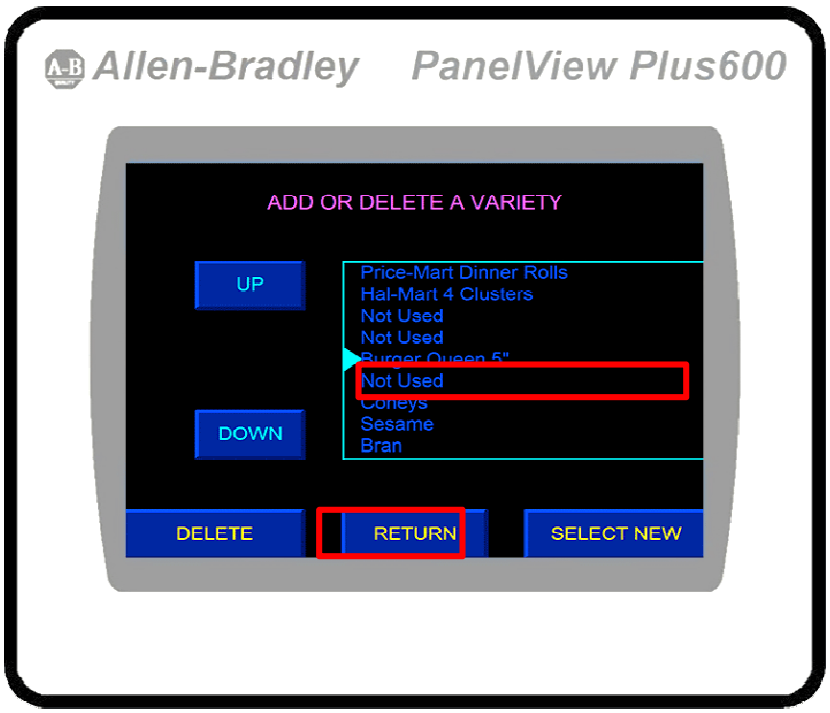
In the Setup & Overrides menu, press the ADD/DEL VARIETY button.



SETUP & OVERRIDES MAIN MENU

Add / Del Variety

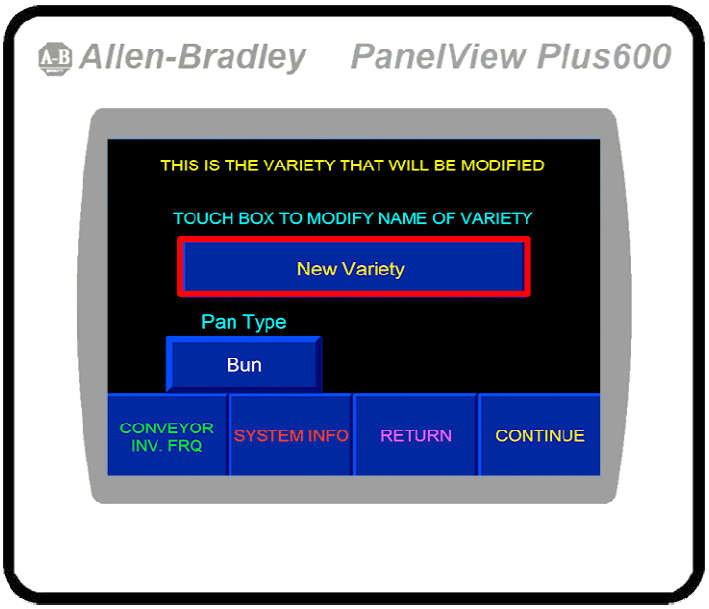
Press the UP and DOWN arrows until you find a slot labeled ***Not Used***. Press the ADD NEW button.



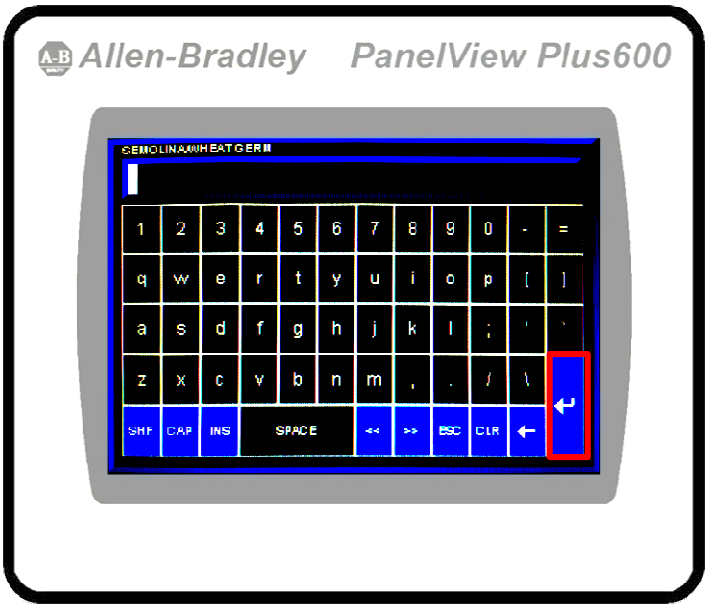
If there are not any empty slots available, you may need to remove an unused variety. Refer to page 151 for instructions on how to remove a variety.

Modify Variety Name

Now we are at the Setup screen. Touch the box to change the name.

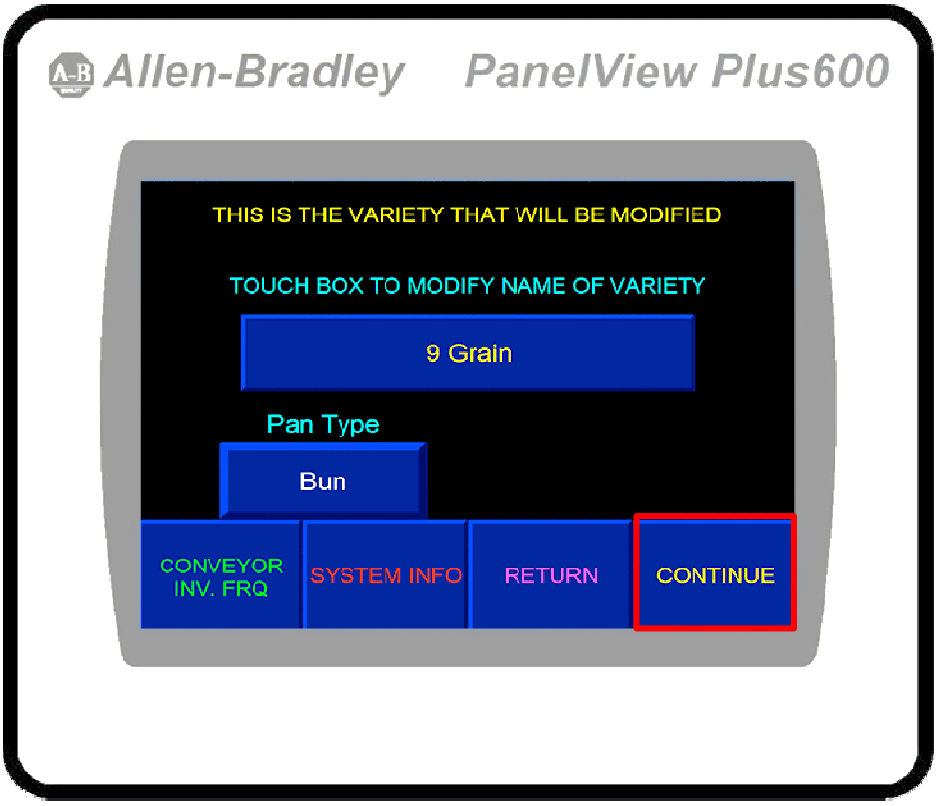


Type in the name of the new variety with the on-screen keyboard. Press the Return key when finished. In our example, the name is 9 Grain.



Continue Setup

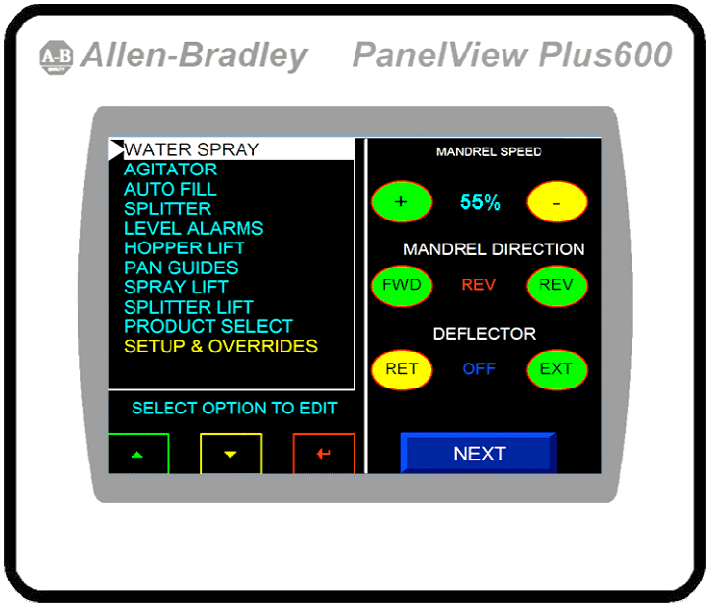
Select the type of pan that you want to use, refer to page 99 for instructions of pan types. Press CONTINUE.



New Variety Topper Options Setup

We will go through each variety topper option and configure accordingly.

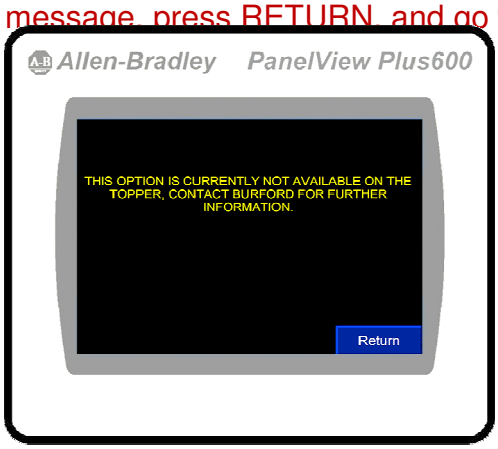
Use the navigation keys and select WATER SPRAY. See page 103 for complete instructions.



Note that depending on which options you bought some options may not be available to you. If you select an option that is not installed on your unit, you will receive the following message:

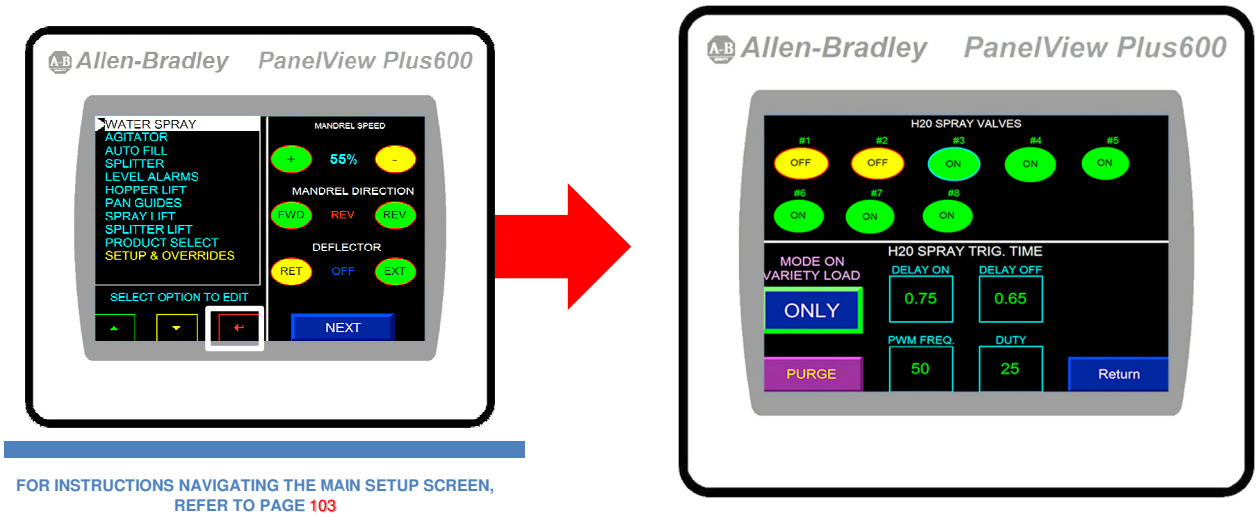
THIS OPTION IS CURRENTLY NOT AVAILABLE ON THE TOPPER. CONTACT BURFORD® FOR FURTHER INFORMATION.

If you receive this message, press RETURN and go to the next option.



New Variety - Water Spray

On the Main Setup Screen, select **Water Spray** and press ACCEPT, (Enter).



FOR INSTRUCTIONS NAVIGATING THE MAIN SETUP SCREEN, REFER TO PAGE 103

Determine if the variety will be sprayed when variety is loaded. Select the proper mode for the water spray.

With a pan for the variety present, turn on the valves that will be enabled when the variety is loaded. Position the valves on the spray rail in alignment with the pan. *Refer to page 215 for information on Topper Spray Nozzle position.*

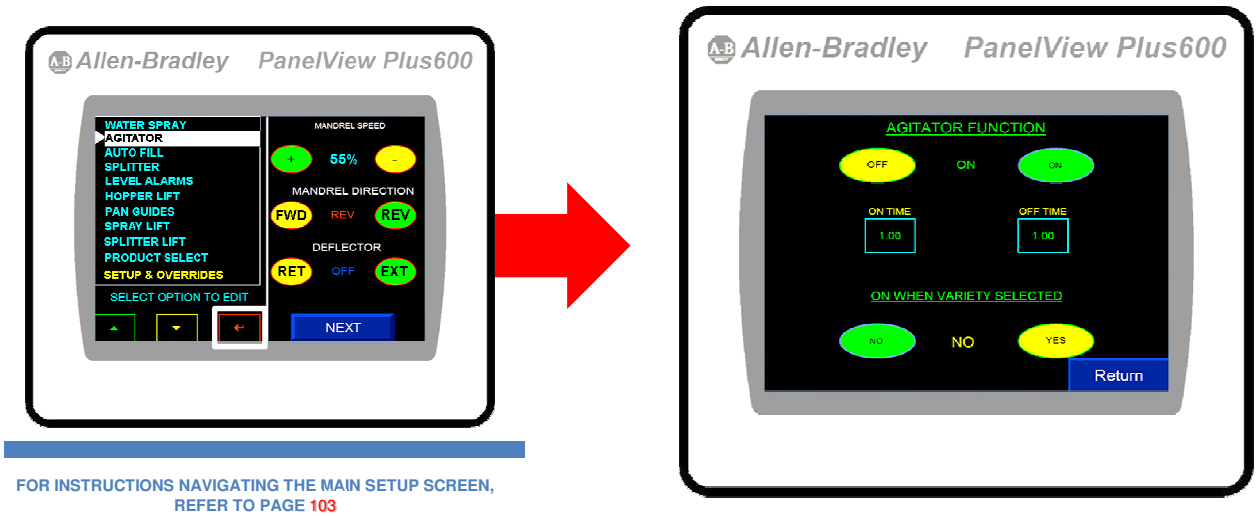
With the conveyor running, place the pan on it and allow it to pass under the spray rail. Observe the ON and OFF actuation of the valves in reference to the beginning and end of the pan. Adjust the ON and OFF delays until you are satisfied with spray coverage.

For Complete information on Water Spray setup, see page 107.

When finished with the Water Spray setup press RETURN

New Variety - Agitator

On the Main Setup Screen, select **Agitator** and press ACCEPT (Enter).



FOR INSTRUCTIONS NAVIGATING THE MAIN SETUP SCREEN, REFER TO PAGE 103

Determine if the Agitator is needed for this variety. Select either ON or OFF under AGITATOR FUNCTION.

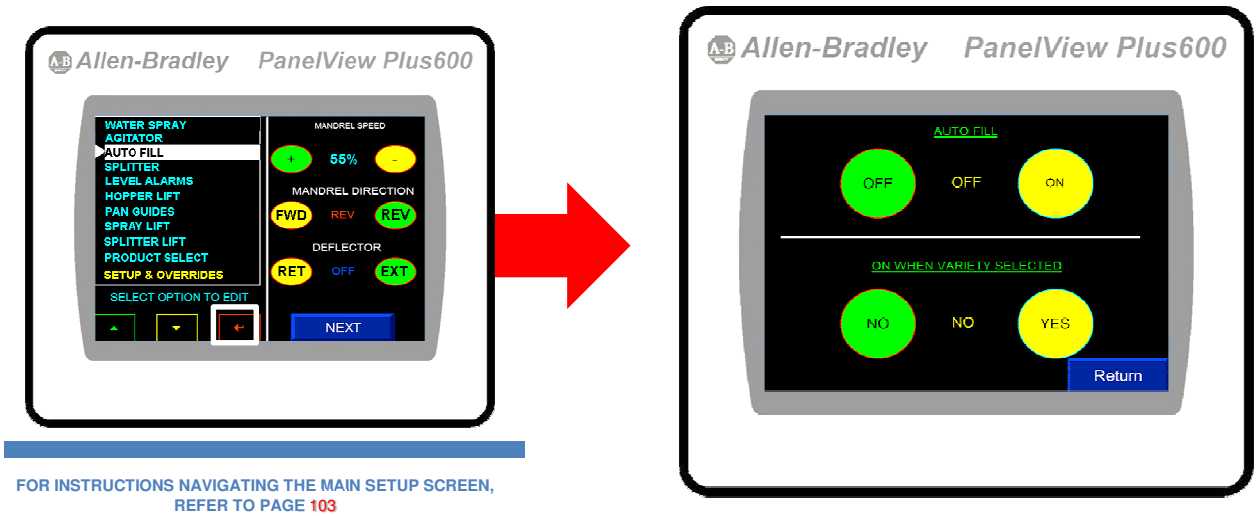
If the Agitator is enabled, set the ON TIME and OFF TIME.

For Complete information on the Agitator setup, see page 115.

When finished with the Agitator setup press RETURN

New Variety - Auto-Fill

On the Main Setup Screen, select **Auto-Fill** and press ACCEPT (Enter).



FOR INSTRUCTIONS NAVIGATING THE MAIN SETUP SCREEN, REFER TO PAGE 103

Determine if the Auto-Fill is needed for this variety. Select whether the Auto-Fill will be available for this variety when loaded by the ON or OFF on the top half of the screen.

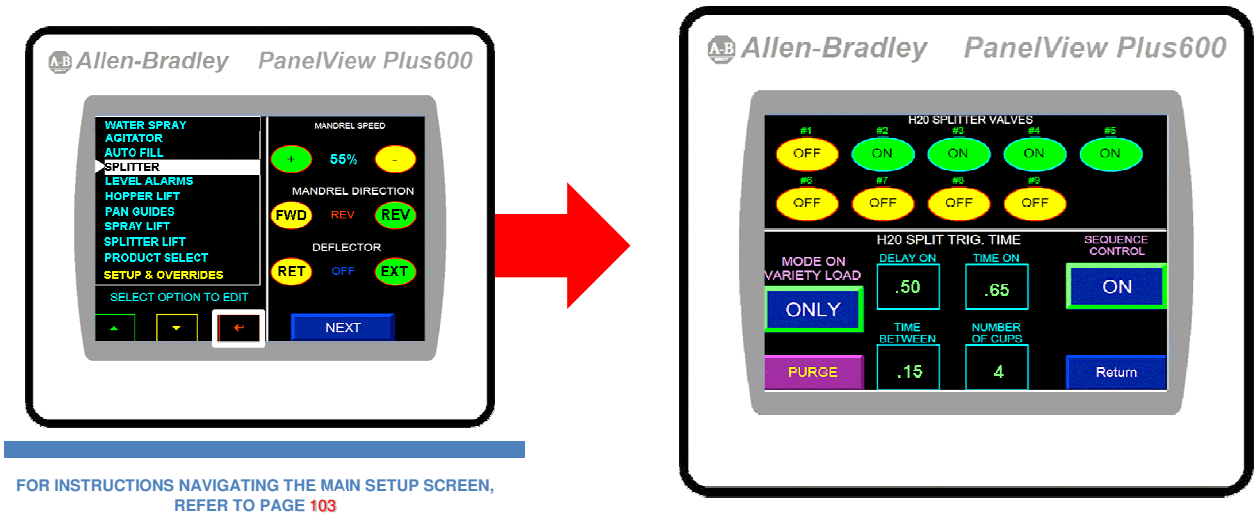
If the Auto-Fill will be available on this variety then select whether it will be automatically on when the variety is loaded by the YES or NO on the bottom half the screen.

For Complete information on the Auto-Fill setup, see page 118.

When finished with the Auto-Fill setup press RETURN

New Variety - Splitter

On the Main Setup Screen, select **Splitter** and press ACCEPT (Enter).



FOR INSTRUCTIONS NAVIGATING THE MAIN SETUP SCREEN, REFER TO PAGE 103

Determine if the variety will be Split when loaded. Select the proper mode for the water splitter.

With a pan for the variety present, turn on the valves that will be enabled when the variety is loaded. Position the valves on the splitter rail in alignment with the pan.

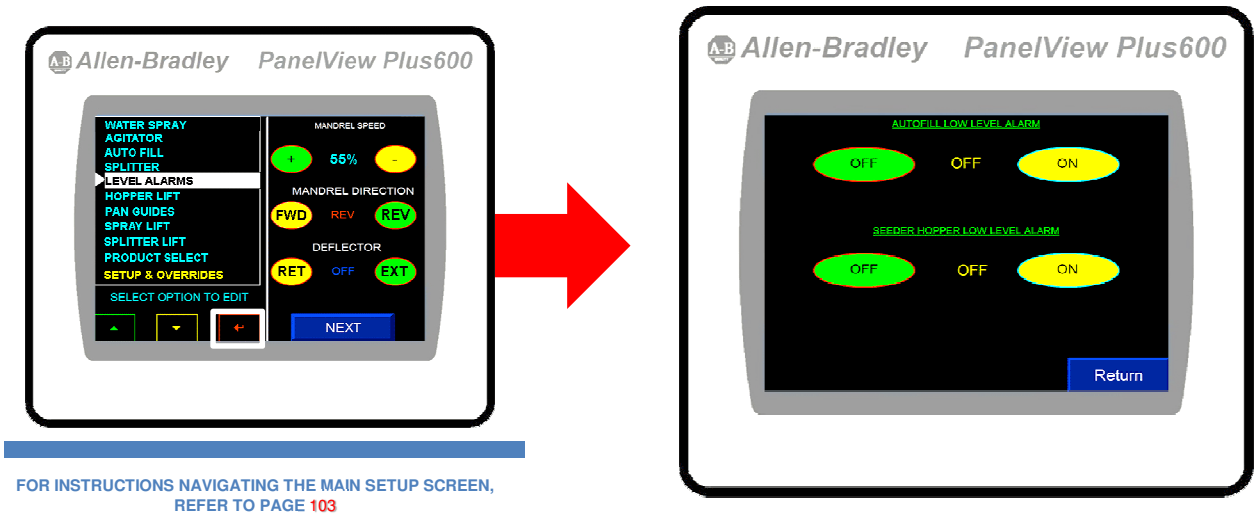
With the conveyor on, place the pan on it and pass the pan under the split rail. Observe the ON and OFF actuation of the valves in reference to the beginning and end of the pan. Adjust the ON and OFF delays until you are satisfied with spray coverage.

For Complete information on Splitter setup, see page 119.

When finished with the Splitter setup press RETURN

New Variety - Level Alarms

On the Main Setup Screen, select **Level Alarms** and press ACCEPT (Enter).



FOR INSTRUCTIONS NAVIGATING THE MAIN SETUP SCREEN, REFER TO PAGE 103

Determine if the AutoFill and Hopper Low level alarms are needed for this variety.

Turn the AutoFill Low Level Alarm ON or OFF.

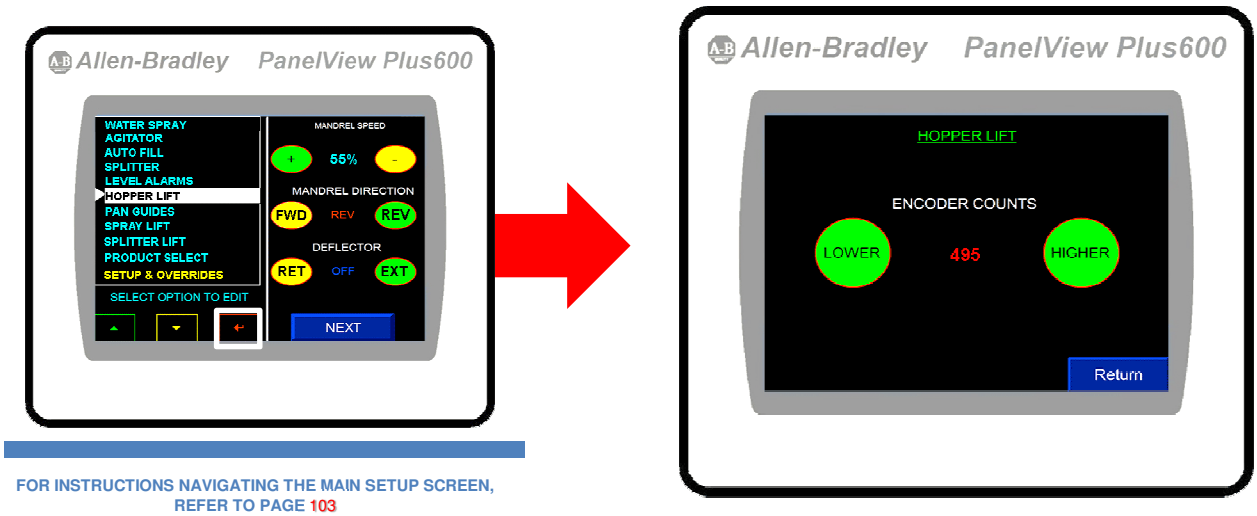
Turn the Seeder Hopper Low Level Alarm ON or OFF.

For Complete information on Level Alarms setup, see page 127.

When finished with the Level Alarm setup press RETURN

New Variety - Hopper Lift

On the Main Setup Screen, select **Hopper Lift** and press ACCEPT (Enter).



FOR INSTRUCTIONS NAVIGATING THE MAIN SETUP SCREEN, REFER TO PAGE 103

Determine the height of the hopper for this variety.

Press **LOWER** to lower the Hopper

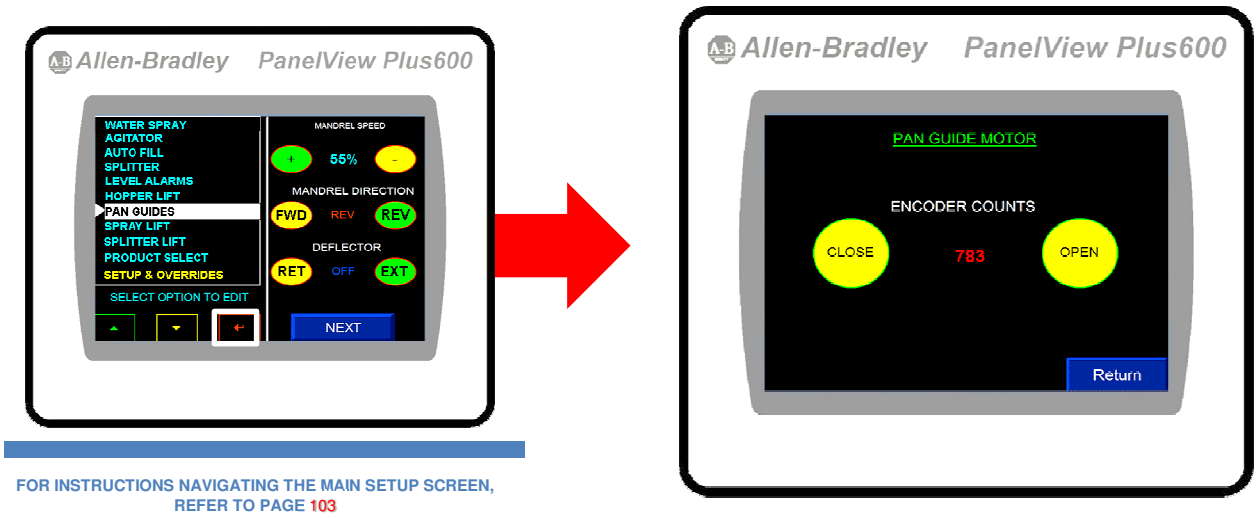
Press **HIGHER** to raise the Hopper.

For Complete information on Hopper Lift setup, see page 130.

When finished with the Hopper Lift setup press RETURN

New Variety - Pan Guides

On the Main Setup Screen, select **Pan Guides** and press ACCEPT (Enter).



FOR INSTRUCTIONS NAVIGATING THE MAIN SETUP SCREEN, REFER TO PAGE 103

Determine the width of the Pan Guides for this variety. Place the pan for this variety on the conveyor. Close the guides until there is ½" gap from the sides of the pan to the guides.

Press **OPEN** to open the Pan Guides.

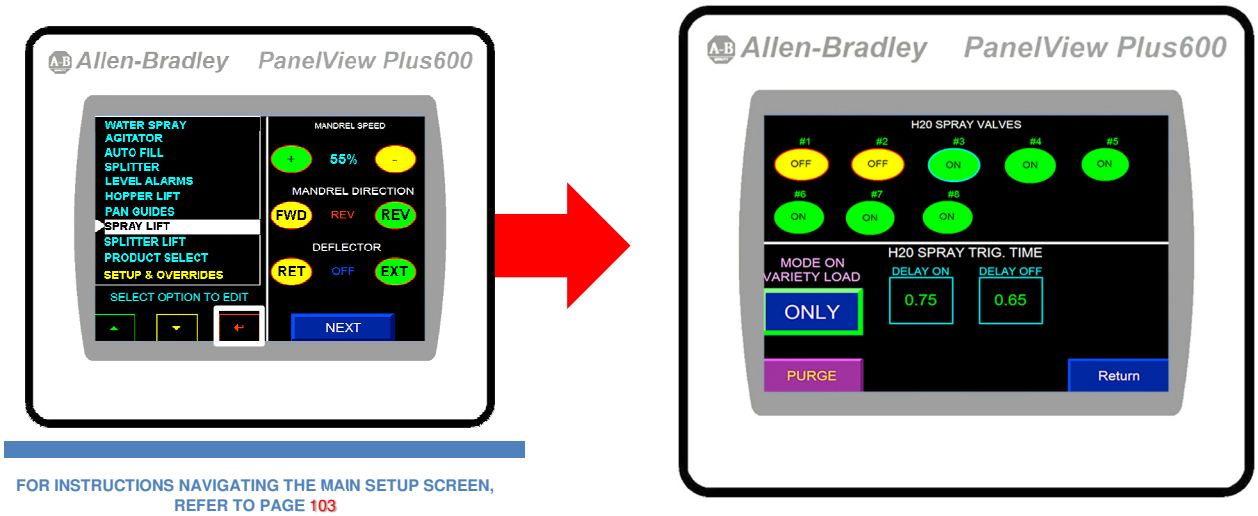
Press **CLOSE** to close the Pan Guides.

For Complete information on Pan Guide setup, see page 133.

When finished with the Pan Guide setup press RETURN

New Variety - Spray Lift

On the Main Setup Screen, select **Spray Lift** and press ACCEPT (Enter).



FOR INSTRUCTIONS NAVIGATING THE MAIN SETUP SCREEN, REFER TO PAGE 103

Determine the height of the Spray Lift for this variety.

Press **LOWER** to lower the Spray Lift.

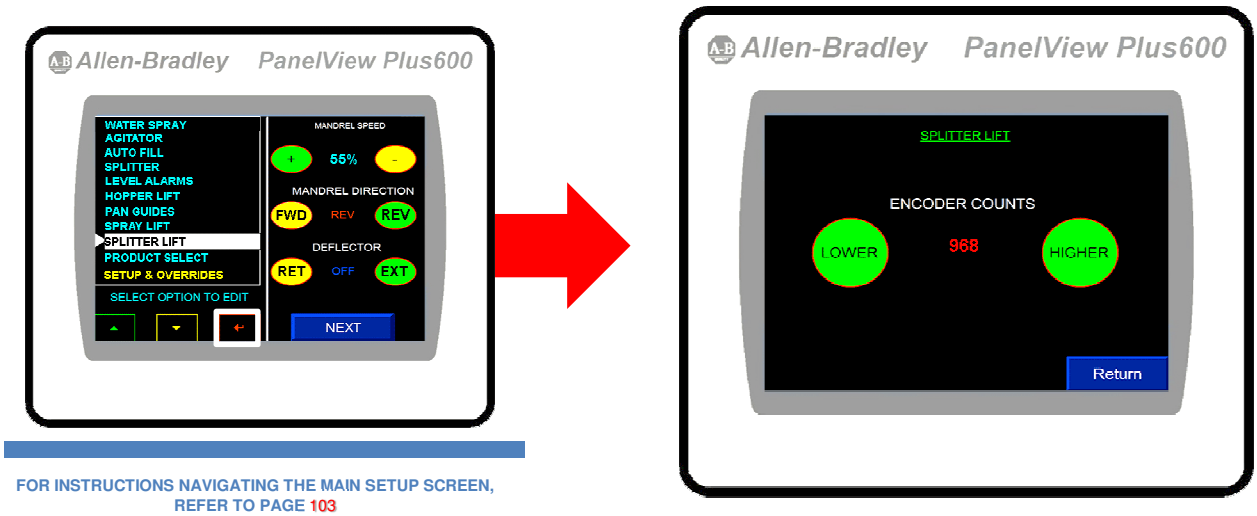
Press **HIGHER** to raise the Spray Lift.

For Complete information on Spray Lift setup, see page 136.

When finished with the Spray Lift setup press RETURN

New Variety - Splitter Lift

On the Main Setup Screen, select **Splitter Lift** and press ACCEPT (Enter).



FOR INSTRUCTIONS NAVIGATING THE MAIN SETUP SCREEN, REFER TO PAGE 103

Determine the height of the Splitter Lift for this variety. The height of the Splitter Rail and the water pressure will affect the split of the product.

Press **LOWER** to lower the Splitter Lift.

Press **HIGHER** to raise the Splitter Lift.

For Complete information on Splitter Lift setup, see page 139.

When finished with the Splitter Lift setup press RETURN

New Variety - Mandrel Controls

We will now setup the mandrel controls.

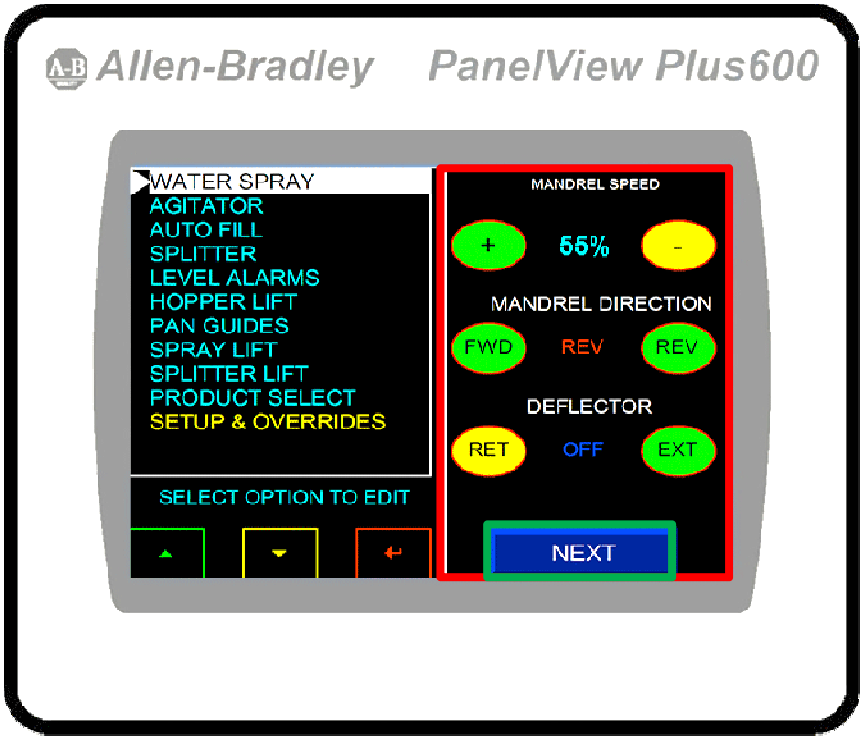
Set the Mandrel Speed by pressing the UP or DN buttons at the PERCENT MANDREL SPEED. The higher the number the more toppings applied to the product.

Set the Mandrel Direction. Usually FWD (forward), will be chosen.

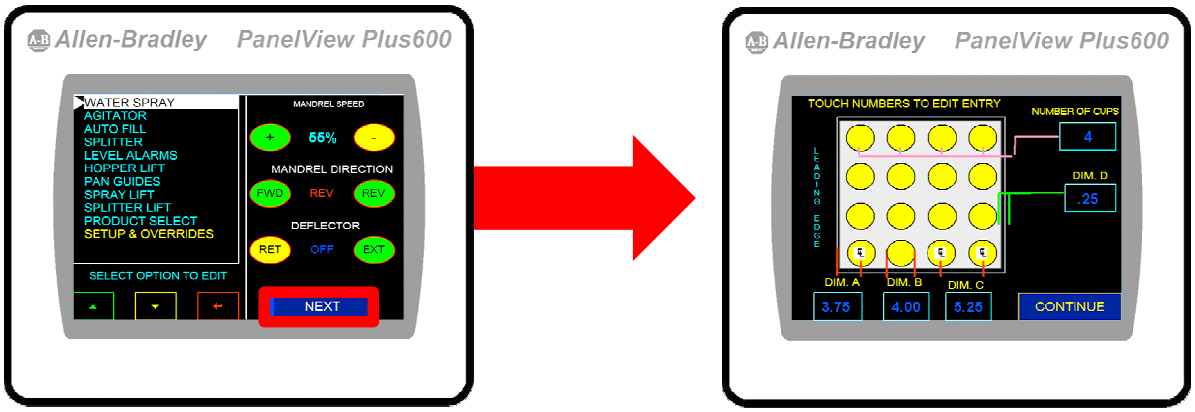
Extend (ON), or Retract (OFF), the Deflector bar.

For complete information on the Mandrel Controls, see page 104.

Press Next to continue to Pan Dimension Setup



Pan Dimension Setup



The Burford® Smart Seeder applies topping precisely on the dough with the ability to skip the area between rows. This significantly reduces topping consumption.

Entering your pan information for the variety allows the software to accurately calculate when to engage the topping output.

The Pan Dimension screen allows the user enter dimensions of the pan for the software to perform the computation necessary to provide topping savings.

The Topper can be used with Bun Pans and Bread Pans.

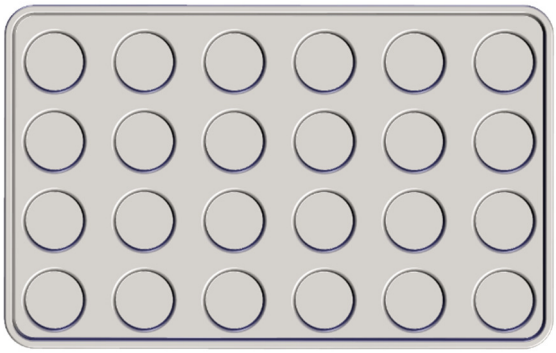
In next few pages we will go over the proper setup procedures of setting up your pan dimensions.

This step is critical to maximize the cost saving benifts of your Burford® Smart Seeder.

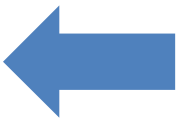
Pan Types

Your Smart Seeder can accommodate diverse types of pans. Bun and bread the hard way, and bun and bread the easy way. Hard way and easy way refers to the orientation of the pan through the conveyor system. We will discuss how to setup each variation of pan.

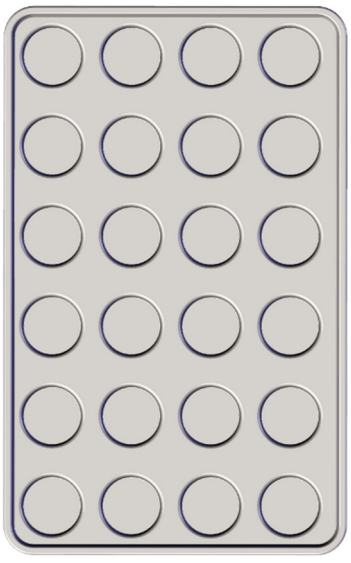
Bread Pan Easy Way



Bun Pan Easy Way



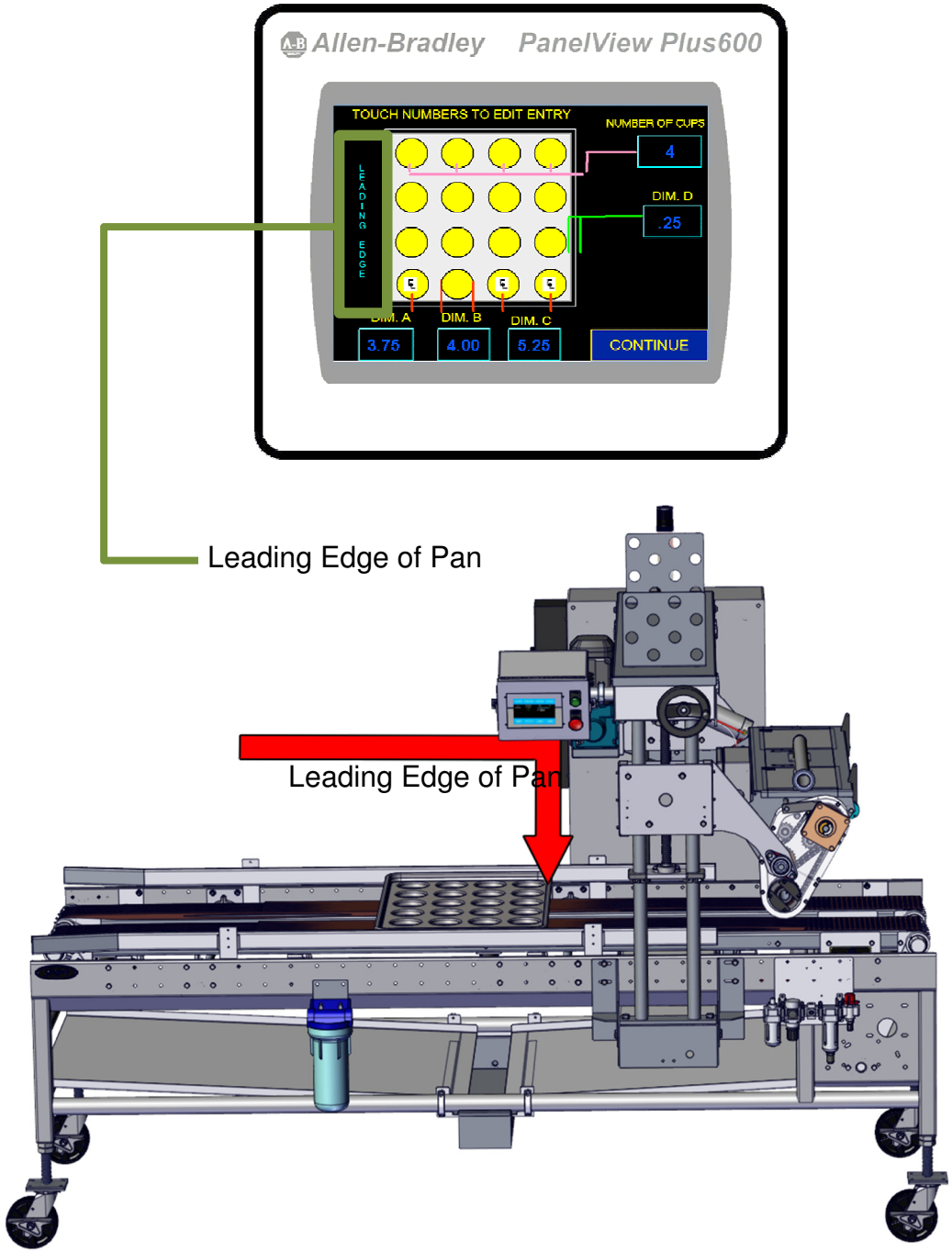
Bread Pan Hard Way



Bread Pan Hard Way

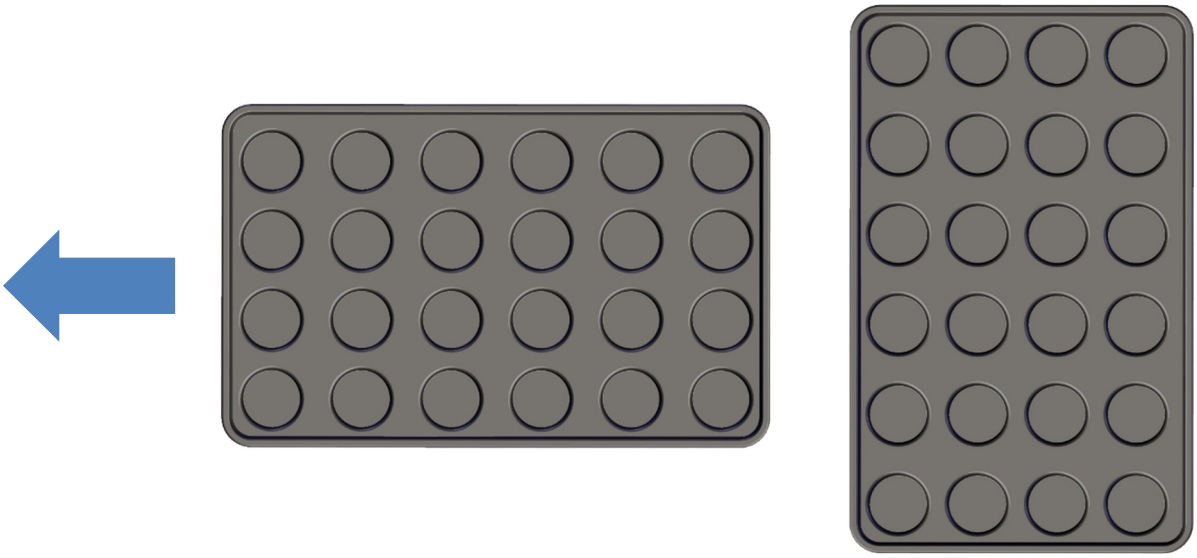
Leading Edge

Be mindful of the leading edge of the pan. Depending on the purchase of a right or left-hand topper, the pan graphic on the display may be facing the opposite direction of actual pan travel.



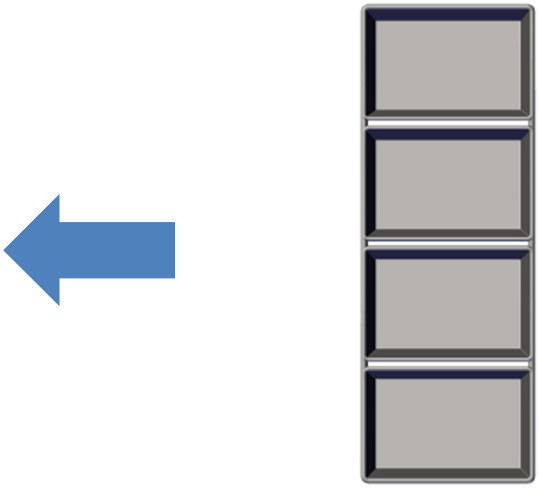
Pan Dimension Setup

If setting up a bun pan the easy or hard way turn to page 180.



If setting up a bread pan the easy way turn to page 186.

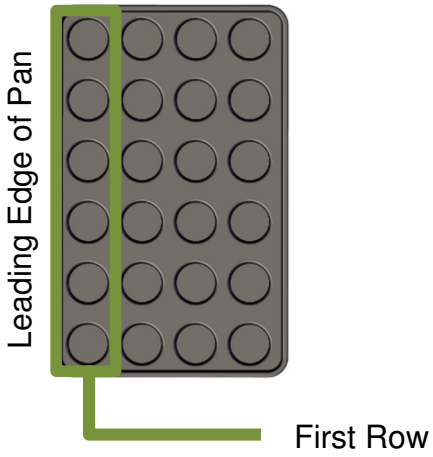
If setting up a bread pan the hard way turn to page 191.



Pan Dimension – Bun Pan Setup 1 of 6

We will fine tune the pan dimensions for the bun pan to maximize coverage and minimize the use of toppings.

The first objective is to place a small line of toppings at the center of the first row.

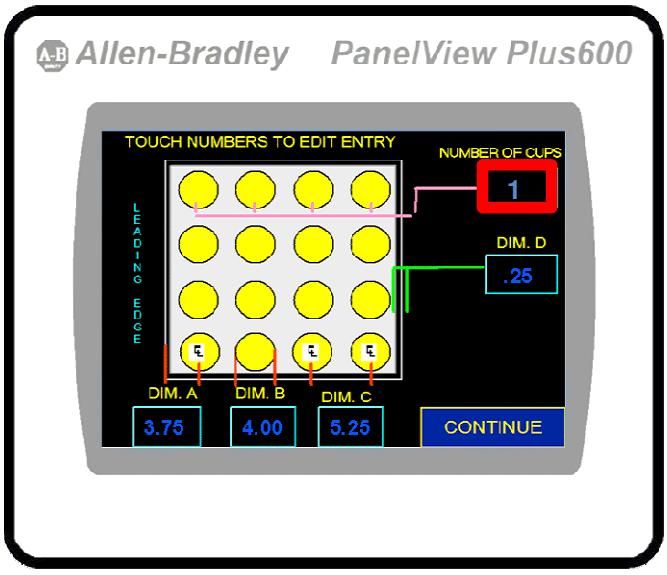


YOUR LEADING EDGE OF THE PAN MAY BE ON THE OTHER SIDE DEPENDING IF YOU BOUGHT A RIGHT OR LEFT-HAND SEEDER.

MAKE THE FOLLOWING ADJUSTMENTS

Set the NUMBER OF CUPS to 1

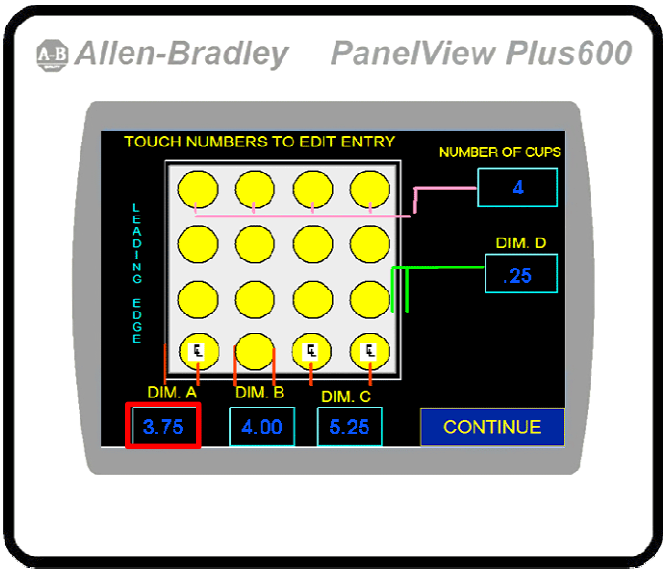
Set DIM A to 3.75
Set DIM B to 2.00
Set DIM C to 5.25

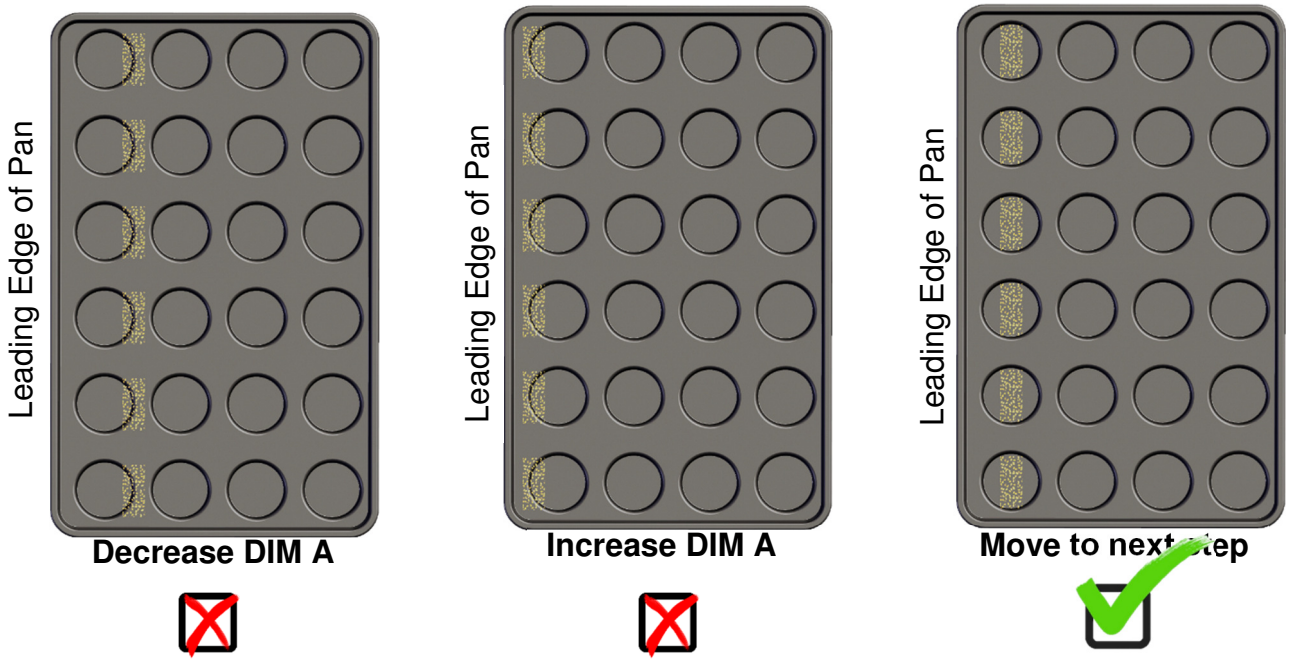


Pan Dimension – Bun Pan Setup 2 of 6

Begin by running pans of product through the system. It may take several pans to setup up a variety. There should be dough in the pan to achieve the best results.

Adjust Dim A until the row of toppings are exactly at the center of the first row. Adjust in increments of .25. To move the row away from the leading edge increase DIM A. To move the row closer to the leading edge decrease DIM A. When close to the center, adjusting with smaller increments may be necessary.



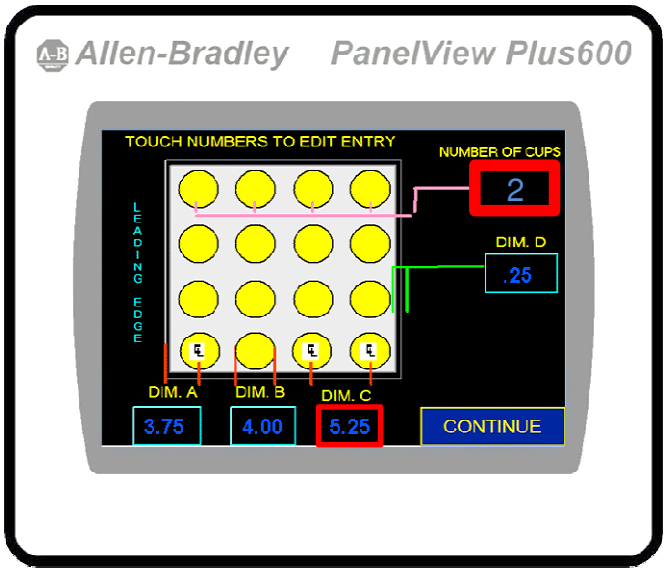


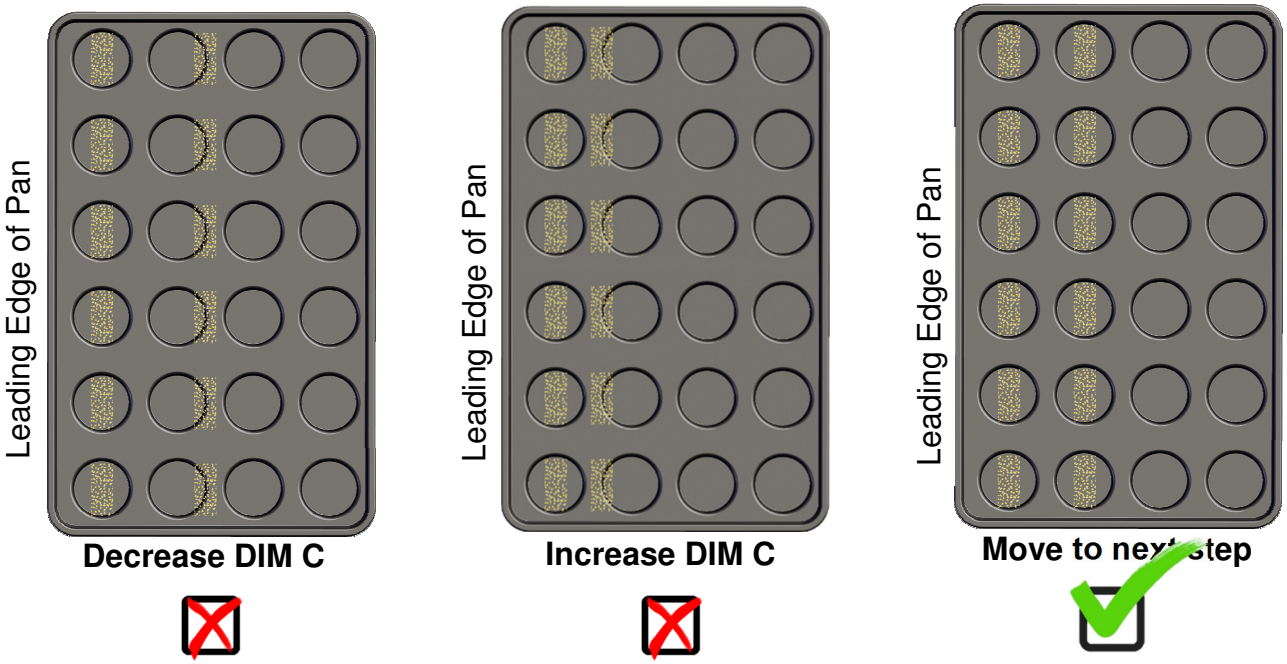
Pan Dimension – Bun Pan Setup 3 of 6

The second goal is to place a small line of toppings at the center of row 1 and row 2.

Change the NUMBER OF ROWS to “2”.

Adjust Dim C until row “2” toppings are exactly at the center of the second row. Adjust in increments of .25. To move the row away from the leading edge increase DIM C. To move the row closer to the leading edge decrease DIM C. When close to the center of the second row, adjusting with smaller increments may be necessary.



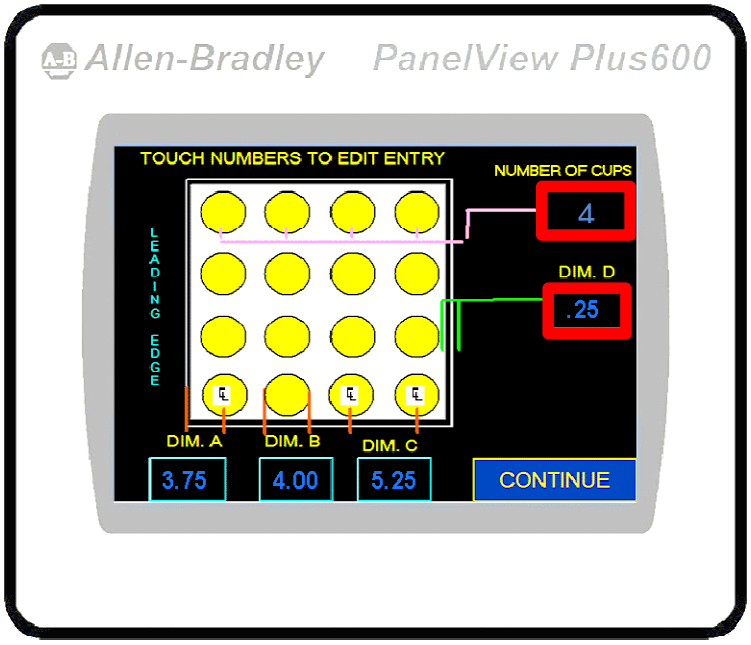


Pan Dimension – Bun Pan Setup 4 of 6

The next goal is to place a small line of toppings at the center of each row.

Change the NUMBER OF ROWS to the number of rows in your pan.

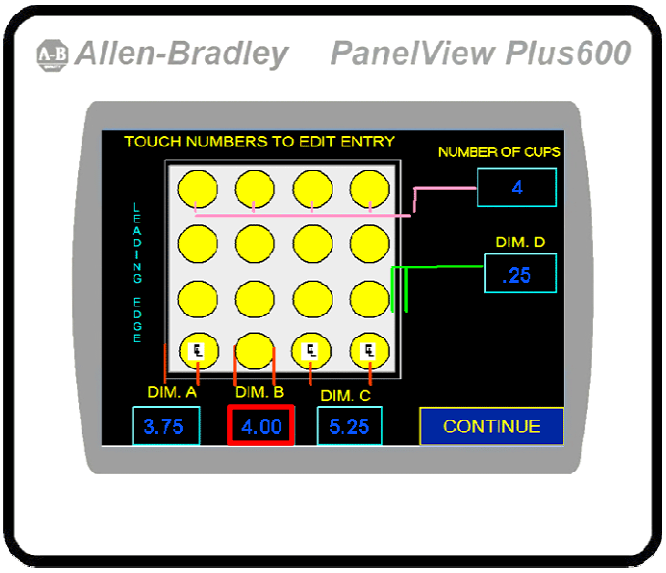
Adjust Dim D until the last row is exactly at the center of the cup. Adjust in increments of .10. To move the row away from the leading edge decrease DIM D. To move the row closer to the leading edge increase DIM D.

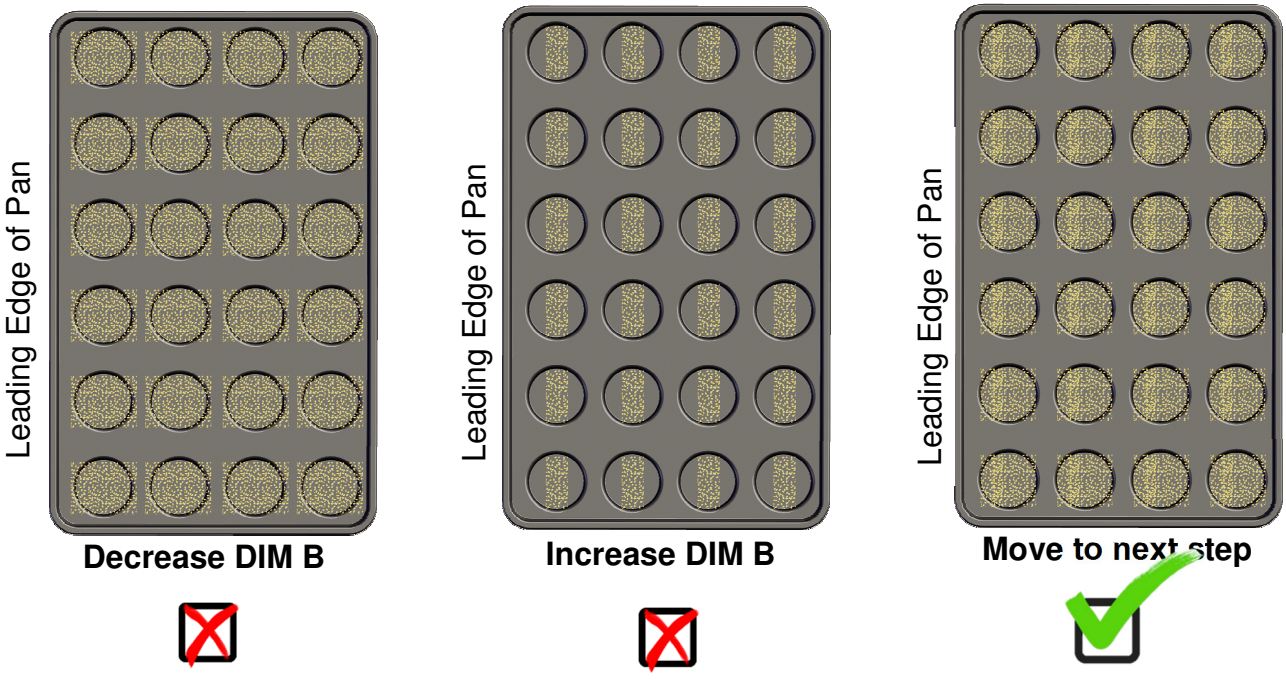


Pan Dimension – Bun Pan Setup 5 of 6

Now we will increase the width of the cup size with DIM B until the topping is covering the entire cup.

Adjust Dim B until the toppings just barely cover the entire product. Adjust in increments of .10. To widen the width of the topping in the cup increase DIM B. To narrow the the width of the topping in the cup decrease DIM B.

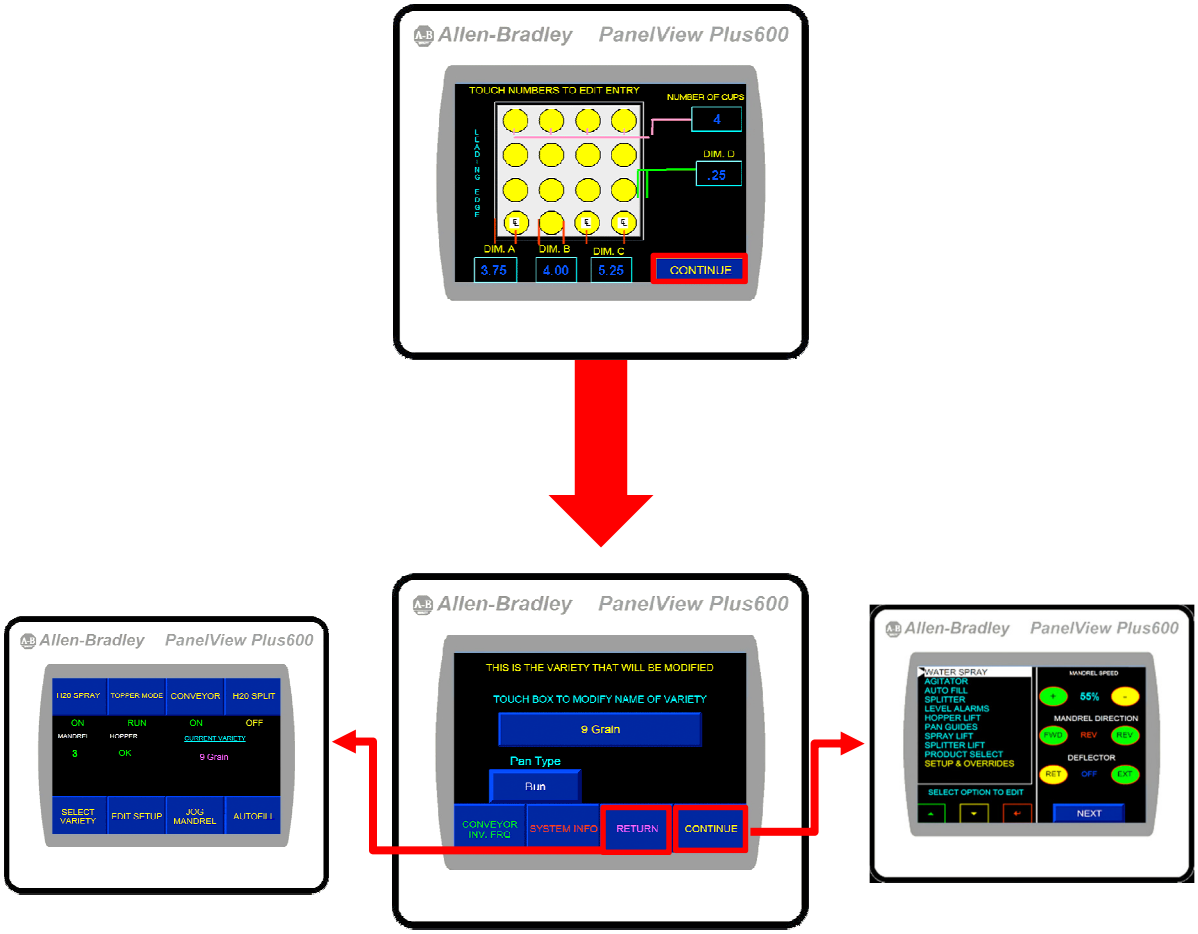




Pan Dimension – Bun Pan Setup 6 of 6

This setup method should provide you with close to ideal settings; however, you may need to fine-tune some of the pan dimension values. When fine-tuning, do so when the product is running. Make small incremental changes. If set properly it should be clear by the starting and stopping of the mandrel between the rows of the cups.

Press Continue when satisfied with the results.

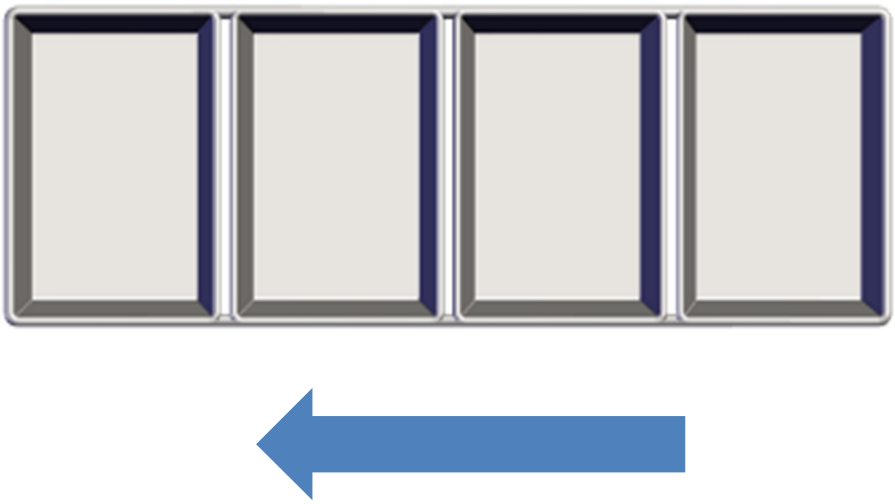


From the Setup screen press RETURN to go to the Main Run screen. Press Continue to go to the Main Setup screen. You may find it necessary to re-adjust some of the Variety Topper Options, go to page 165 for more instructions.

Congratulations, you have successfully completed a new variety!

Bread Pan Easy Way Setup

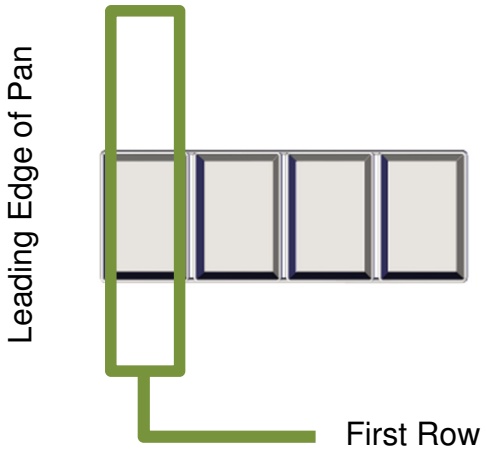
The following setup instructions will be for a bread pan going the easy way.



Pan Dimension – Bread Pan Easy Way Setup 1 of 6

We will fine tune the pan dimensions for the bread pan, easy way, to maximize coverage and minimize use of toppings.

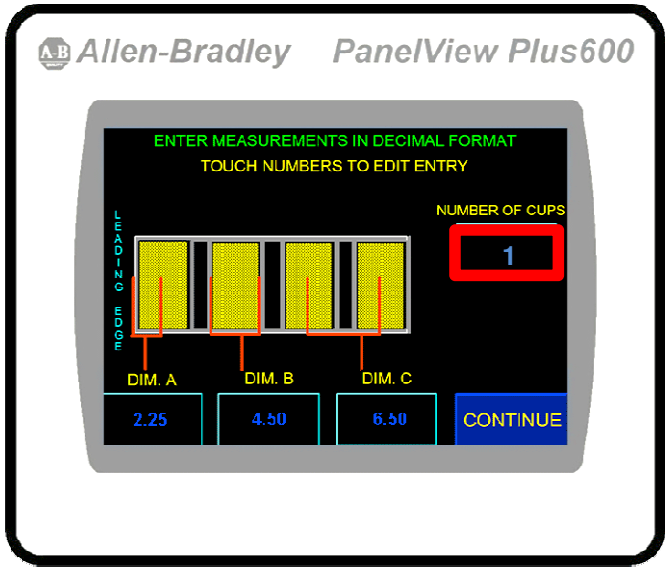
The first objective is to place a small line of toppings at the center of the first row.



YOUR LEADING EDGE OF THE PAN MAY BE ON THE OTHER SIDE DEPENDING IF YOU BOUGHT A RIGHT OR LEFT-HAND SEEDER.

MAKE THE FOLLOWING ADJUSTMENTS

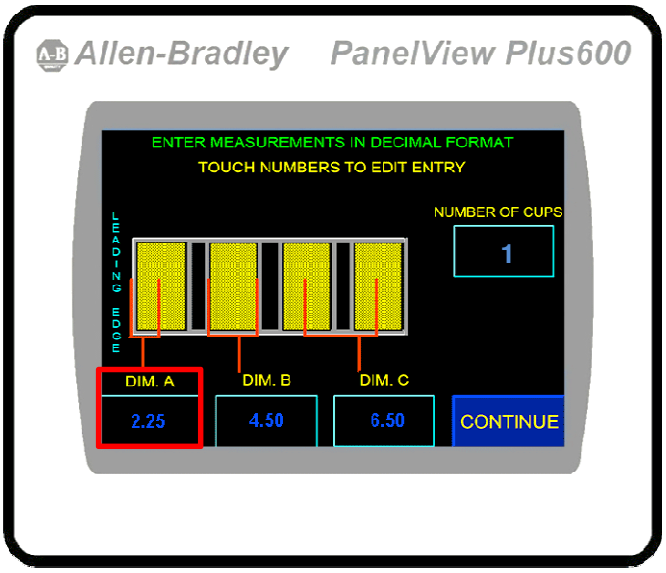
Set the NUMBER OF CUPS to 1
Set DIM A to 2.25
Set DIM B to 4.50
Set DIM C to 6.50

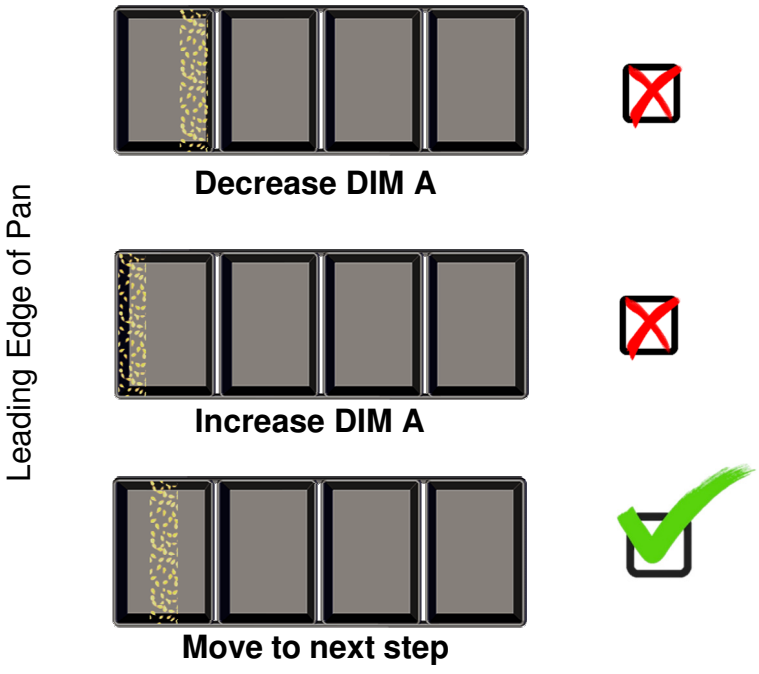


Pan Dimension – Bread Pan Easy Way Setup 2 of 5

Begin by running pans of product through the system. It may take several pans to setup up a variety. There should be dough in the pan to achieve the best results.

Adjust Dim A until the row of toppings are exactly at the center of the first row. Adjust in increments of .25. To move the row away from the leading edge increase DIM A. To move the row closer to the leading edge decrease DIM A. When close to the center, adjusting with smaller increments may be necessary.



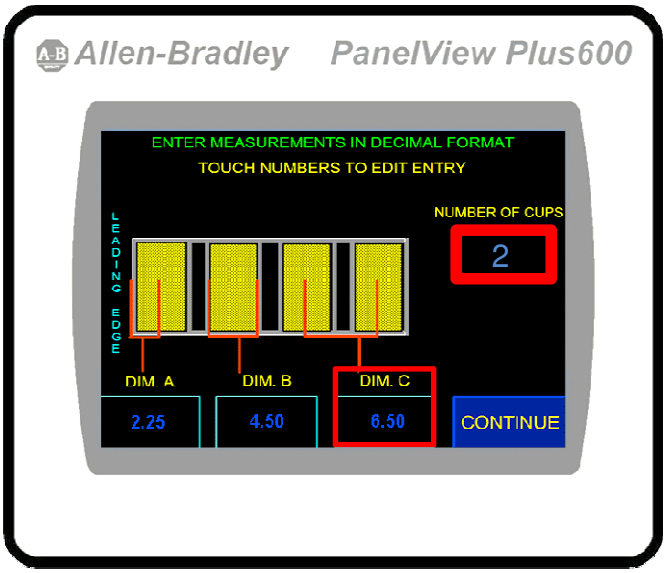


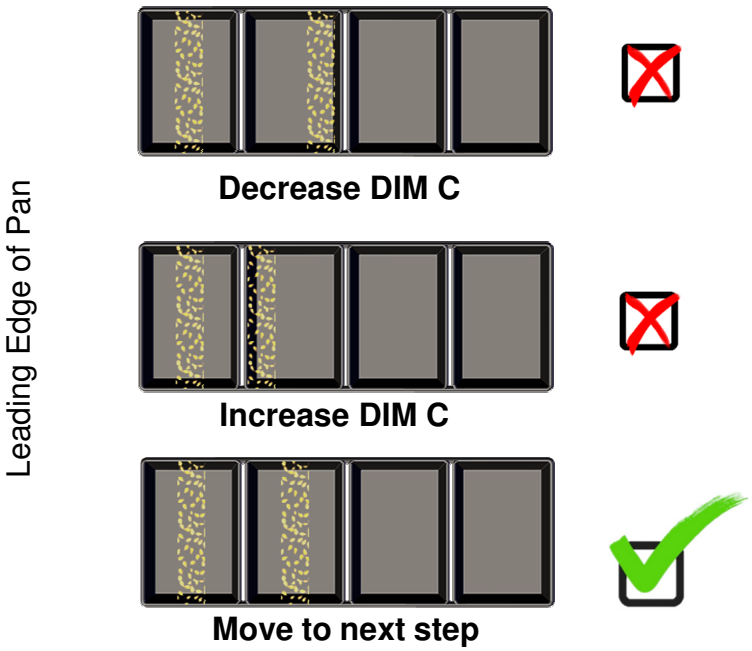
Pan Dimension – Bread Pan Easy Way Setup 3 of 5

The second goal is to place a small line of toppings at the center of row 1 and row 2.

Change the NUMBER OF ROWS to “2”.

Adjust Dim C until the second row toppings are exactly at the center of the row. Adjust in increments of .25. To move the row away from the leading edge increase DIM C. To move the row closer to the leading edge decrease DIM C.

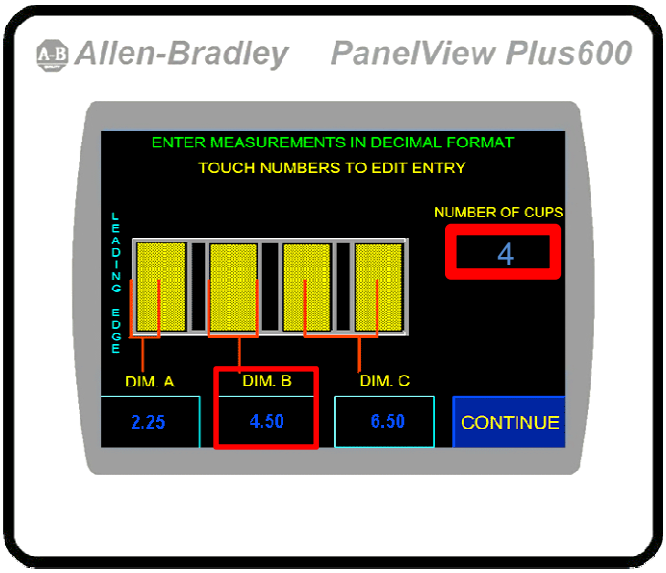


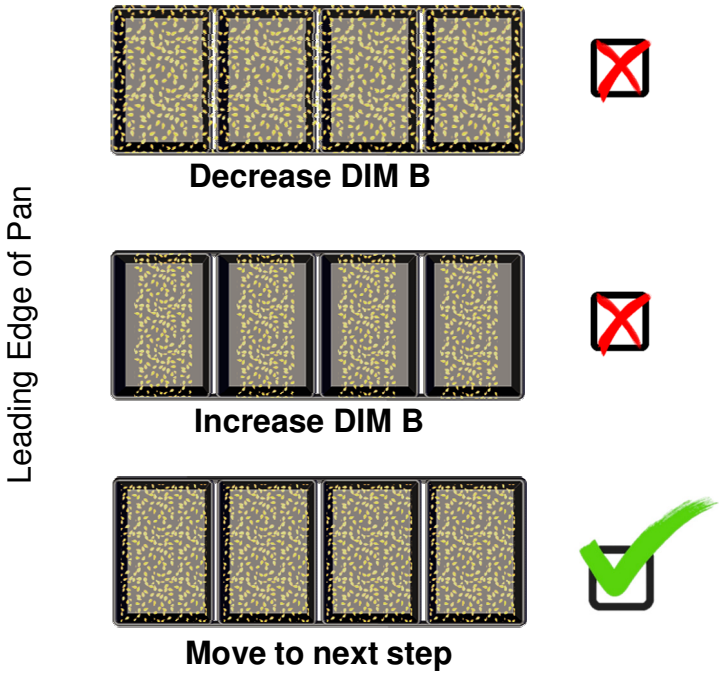


Pan Dimension – Bread Pan Easy Way Setup 4 of 5

Change the NUMBER OF ROWS to the number of rows in your pan.

Now we will increase the width of the cup size with DIM B until the topping is covering the entire cup.

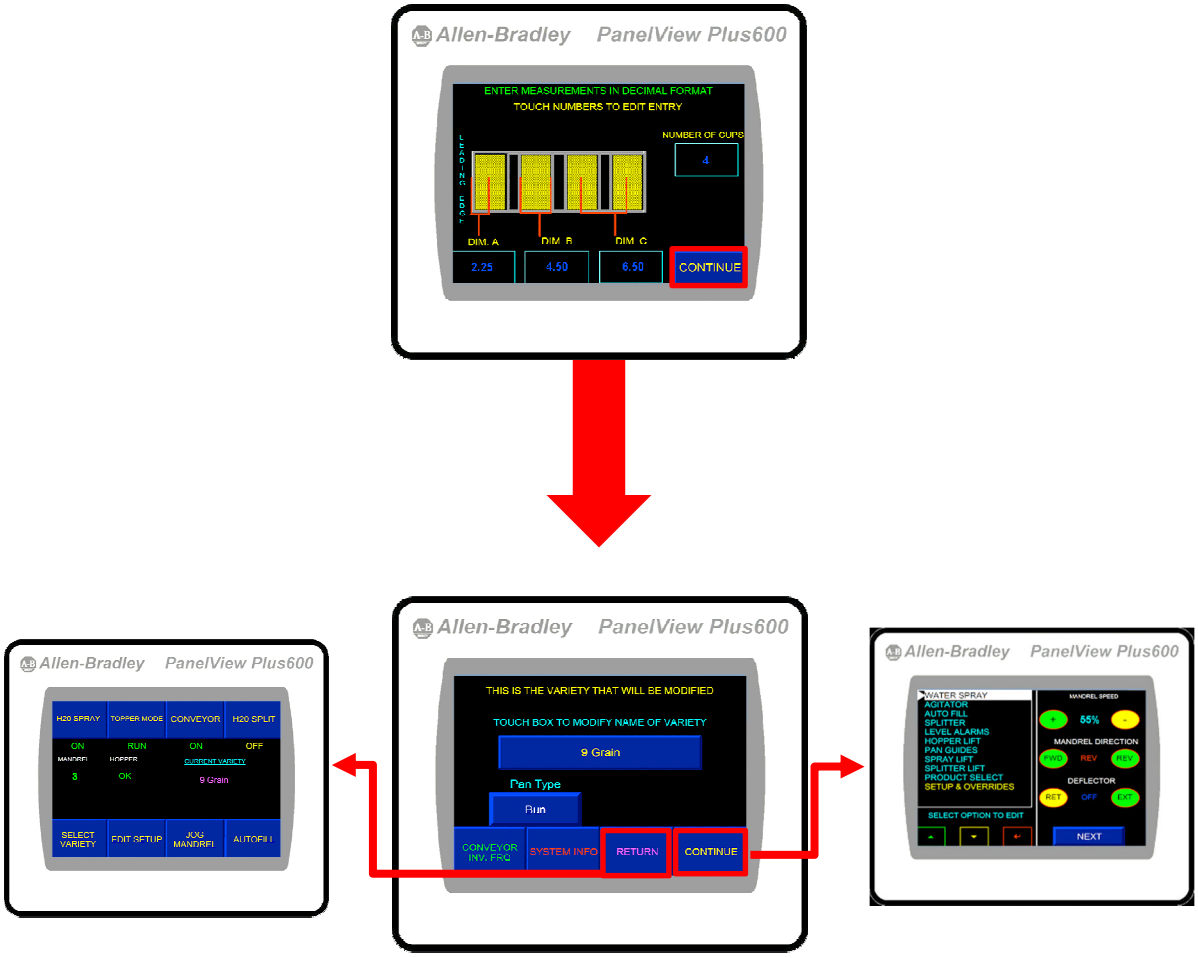




Pan Dimension – Bread Pan Easy Way Setup 5 of 5

This setup method should provide you with close to ideal settings; however, you may need to fine-tune some of the pan dimension values. When fine-tuning, do so when the product is running. Make small incremental changes. If set properly it should be clear by the stopping of the mandrel between the rows of the cups.

Press Continue when satisfied with the results.

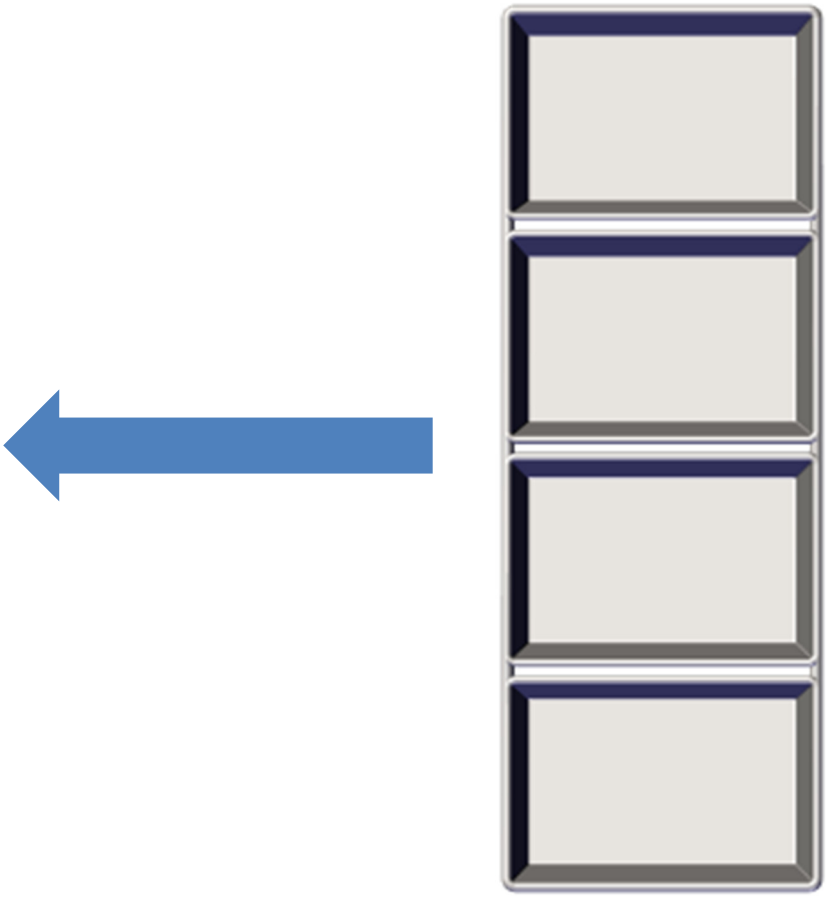


From the Setup screen press RETURN to go to the Main Run screen. Press Continue to go to the Main Setup screen. You may find it necessary to re-adjust some of the Variety Topper Options, go to page 165 for more instructions.

Congratulations, you have successfully completed creating a new variety!

Bread Pan Hard Way Setup

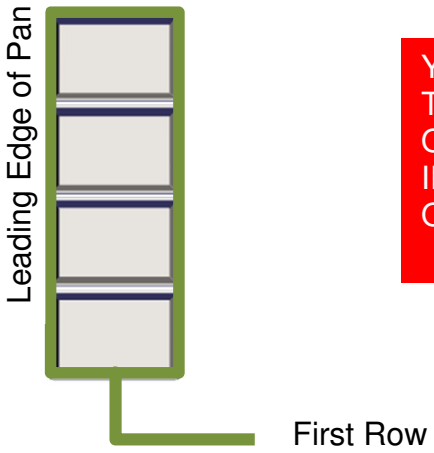
The following setup instructions will be for a bread pan going the hard way.



Pan Dimension – Bread Pan Hard Way Setup 1 of 6

We will fine tune the pan dimensions for the bread pan, hard way, to maximize coverage and minimize use of toppings.

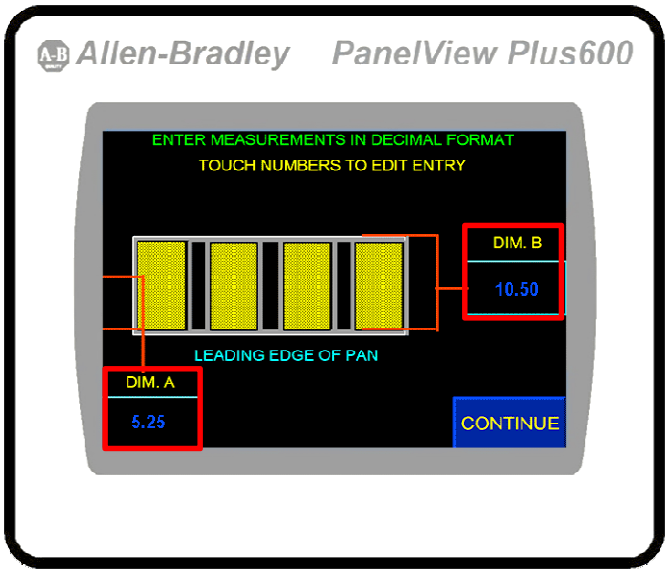
The first objective is to place a small line of toppings at the center of the first row.



YOUR LEADING EDGE OF THE PAN MAY BE ON THE OTHER SIDE DEPENDING IF YOU BOUGHT A RIGHT OR LEFT-HAND SEEDER.

MAKE THE FOLLOWING ADJUSTMENTS

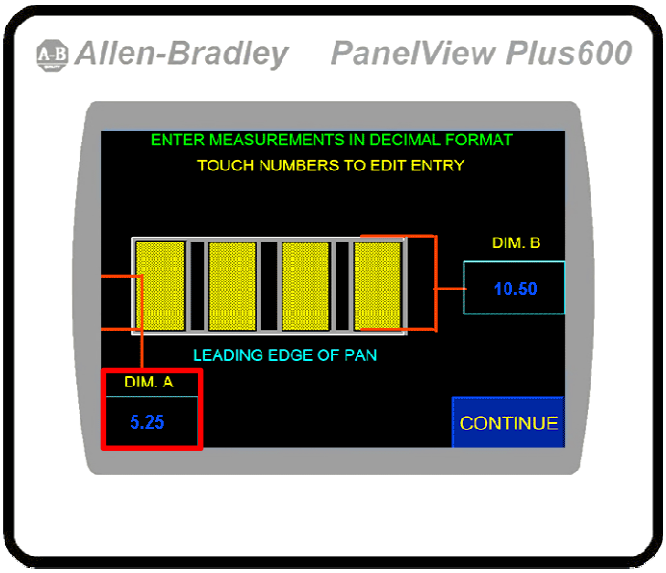
Set DIM A to 5.25
Set DIM B to 2.00

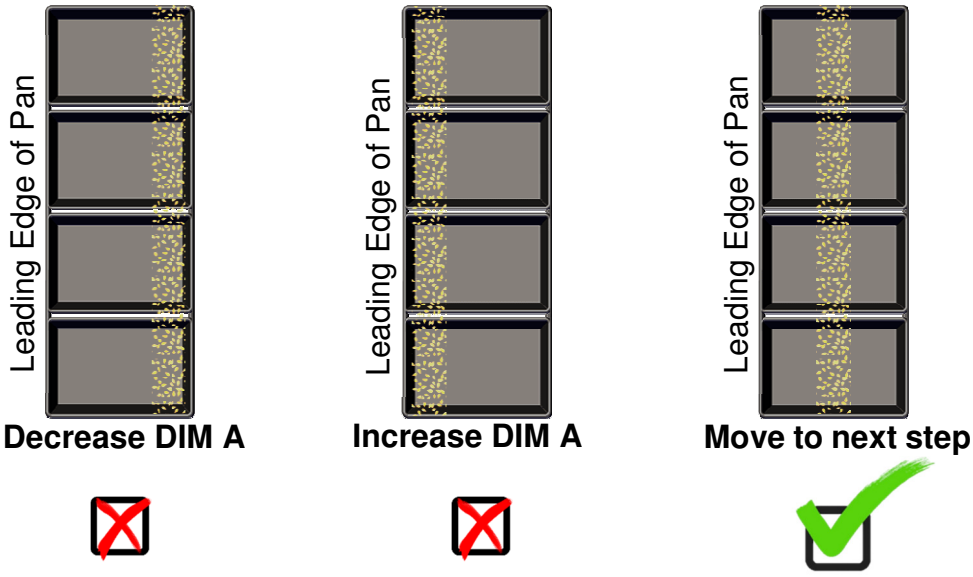


Pan Dimension – Bread Pan Hard Way Setup 2 of 5

Begin by running pans of product through the system. It may take several pans to setup up a variety. There should be dough in the pan to achieve the best results.

Adjust Dim A until the row of toppings are exactly at the center of the row. Adjust in increments of .25. To move the row away from the leading edge increase DIM A. To move the row closer to the leading edge decrease DIM A. When close to the center, adjusting with smaller increments may be necessary.

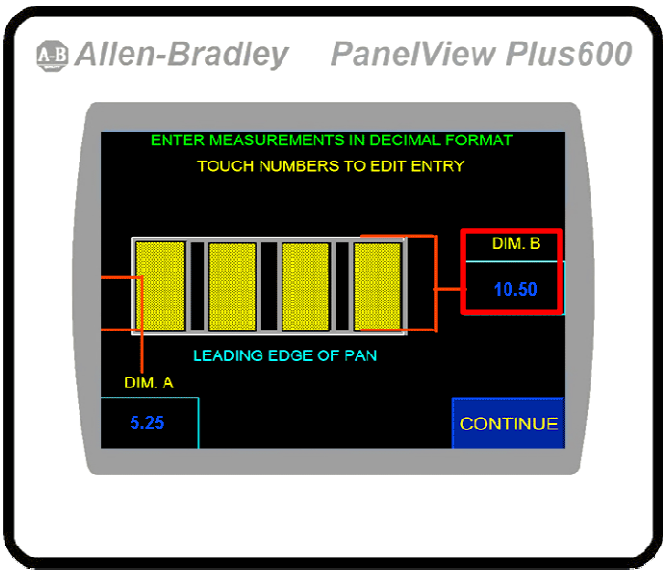


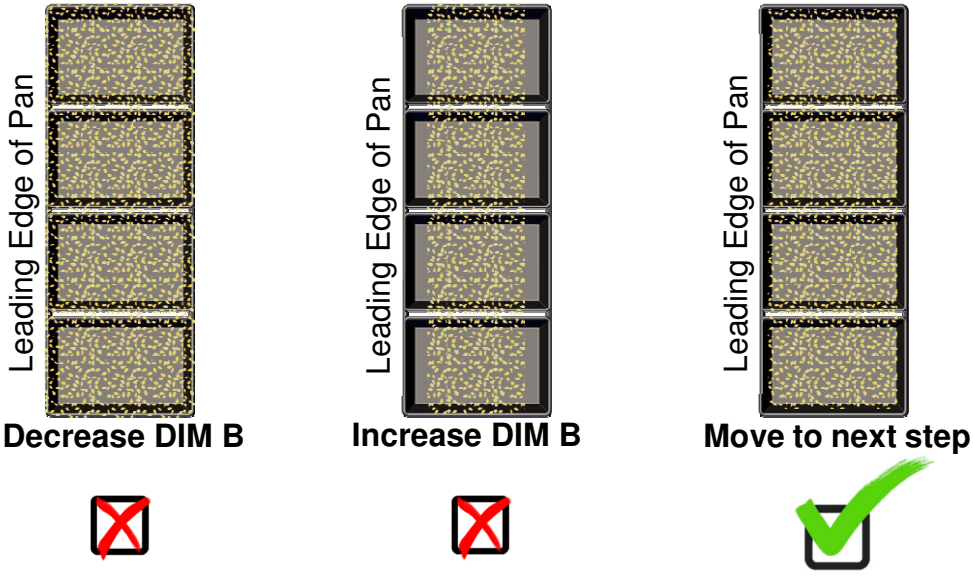


Pan Dimension – Bread Pan Hard Way Setup 3 of 5

The second goal is to cover the entire product.

Adjust Dim B until the toppings are covering the entire product. Adjust in increments of .25. To increase the coverage increase DIM B. To decrease the coverage decrease DIM B.

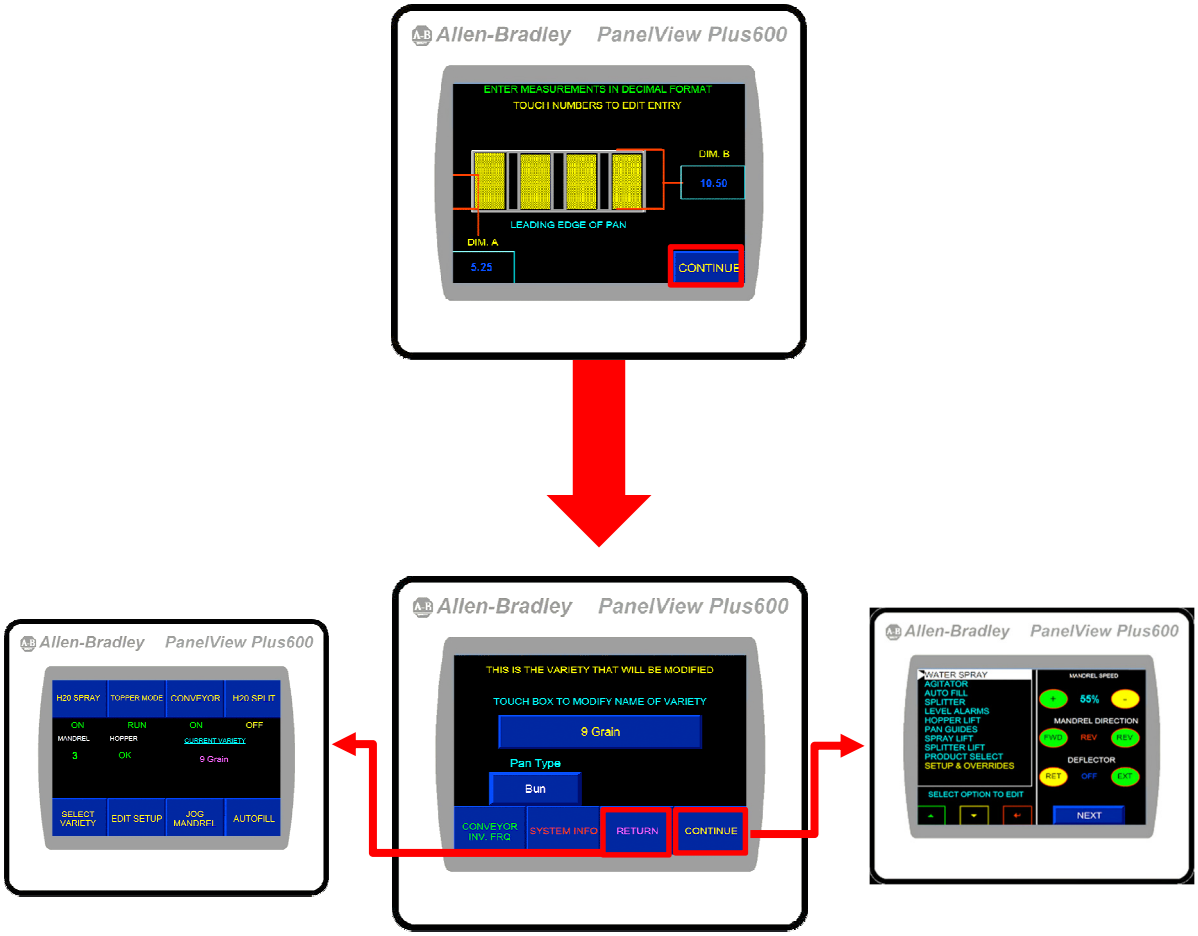




Pan Dimension – Bread Pan Easy Way Setup 4 of 5

This setup method should provide you with close to ideal settings; however, you may need to fine-tune some of the pan dimension values. When fine-tuning, do so when the product is running. Make small incremental changes. If set properly it should be clear by all the topping being in the pan.

Press Continue when satisfied with the results.



From the Setup screen press RETURN to go to the Main Run screen. Press Continue to go to the Main Setup screen. You may find it necessary to re-adjust some of the Variety Topper Options, go to page 165 for more instructions.

Congratulations, you have successfully completed a new variety!

Chapter 6

Operations

CHAPTER 6: OPERATION PROCEDURES

Theory of Operation

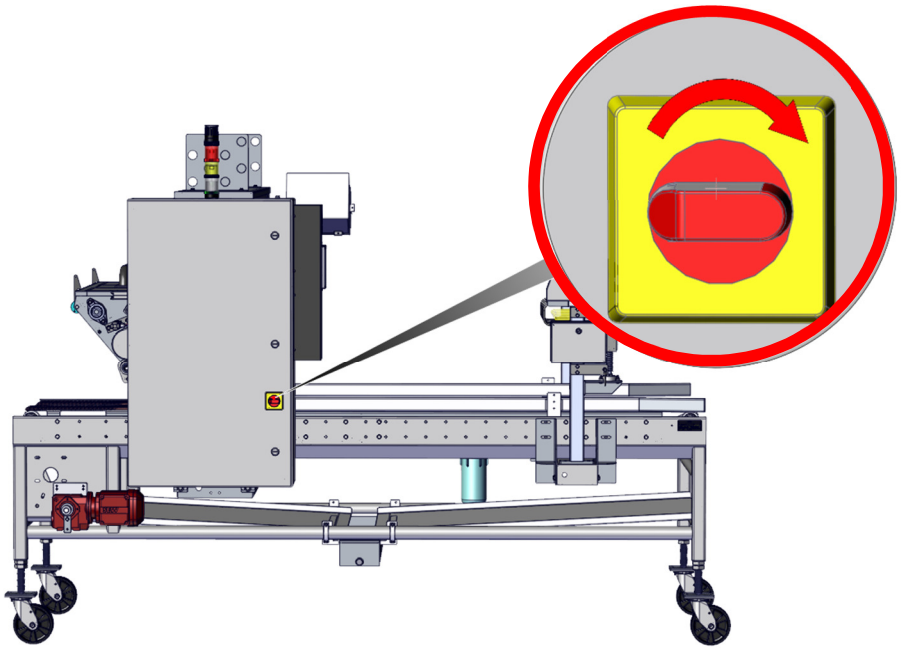
Product begins to flow onto the unit's conveyor. As the product moves down the conveyor chain it meets a product sensor. Once the product has actuated the product sensor for the time entered in the "SPRAY DELAY" the spray sequence begins (decided by the setup information gave via the control panel). Product then travels beneath the spray head assemblies. The application of water is a crucial step in the application of topping since it helps bond the topping to the dough. An insufficient application of water will lead to the topping bouncing or slipping off the product; too much water can lead to spotting during bake out. The product then exits the spray / split area and continues downstream.

After water has been applied, the pans travel to the topping application area found directly under the unit's hopper. A pan sensor is used to sense the leading edge of the pan. When a pan is sensed, an electrically controlled clutch/brake is actuated, causing the mandrel assembly to rotate and dispense topping. The mandrel will rotate for the pan dimension data entered for the variety. The encoder signal from the conveyor figures out the timing and duration of the mandrel rotation.

Main Disconnect

The main disconnect controls the power to the unit. This is where the machine is turned “ON” or “OFF”. Turn the Unit “ON” by turning the disconnect Switch to the “ON” position.

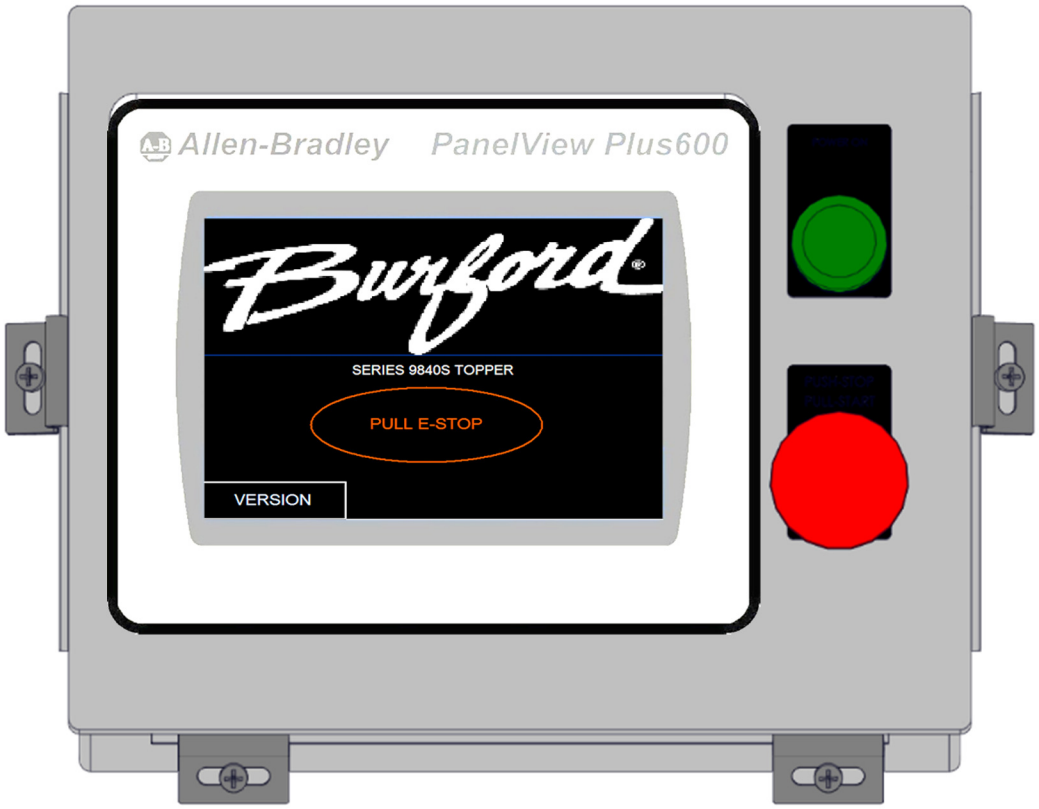
Turn the Unit “ON” by turning the disconnect Switch to the “ON” position. The HMI will perform self-diagnostic tests.



Shown above is the disconnect switch in the “OFF” position. Turn the handle 90º clockwise to turn the unit ON.

E-Stop

When safe to do so, pull the E-Stop out to initialize the unit. The HMI will perform self-diagnostic tests.

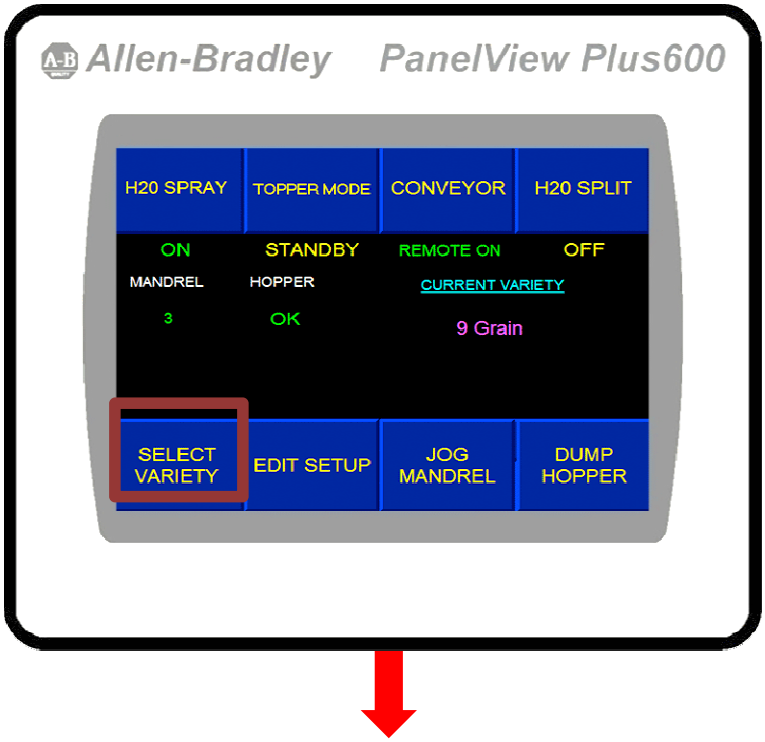


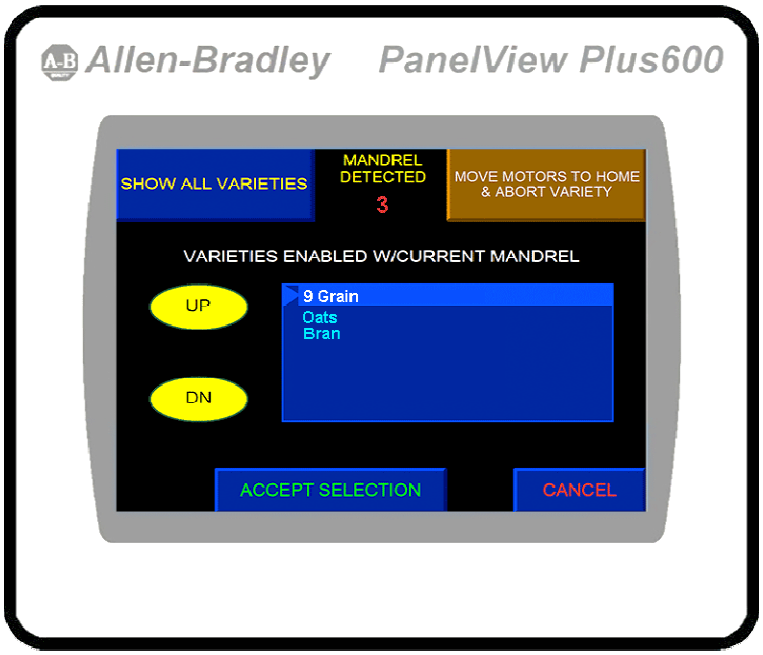
Press Start

Press start on the screen. The unit will begin homing in the following sequence: Hopper Lift, Pan Guides, Spray Lift, and Split Lift. The homing process can take several minutes. Do not interrupt the homing of the unit.

Select Variety

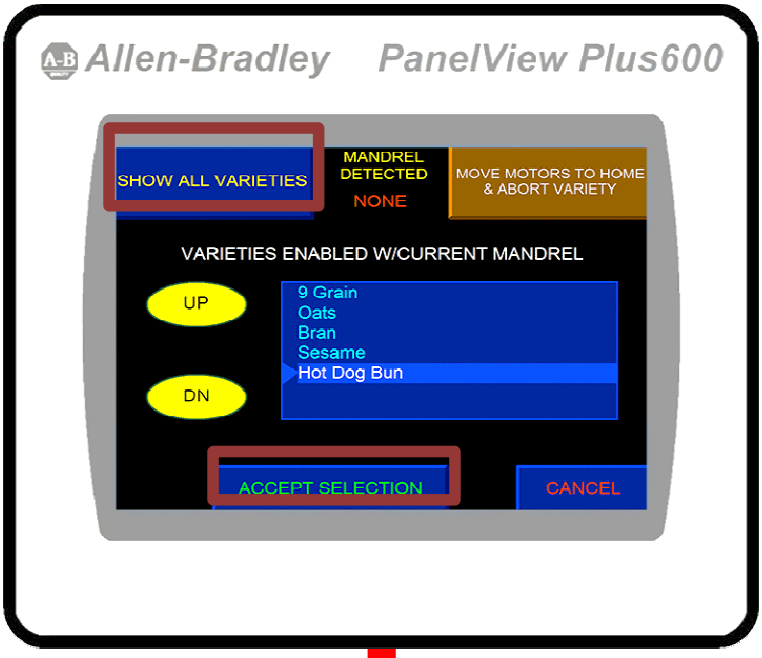
After the homing process, you will be at the Main Run screen. A variety must be selected. Press the SELECT VARIETY button. You will advance to the select variety screen.

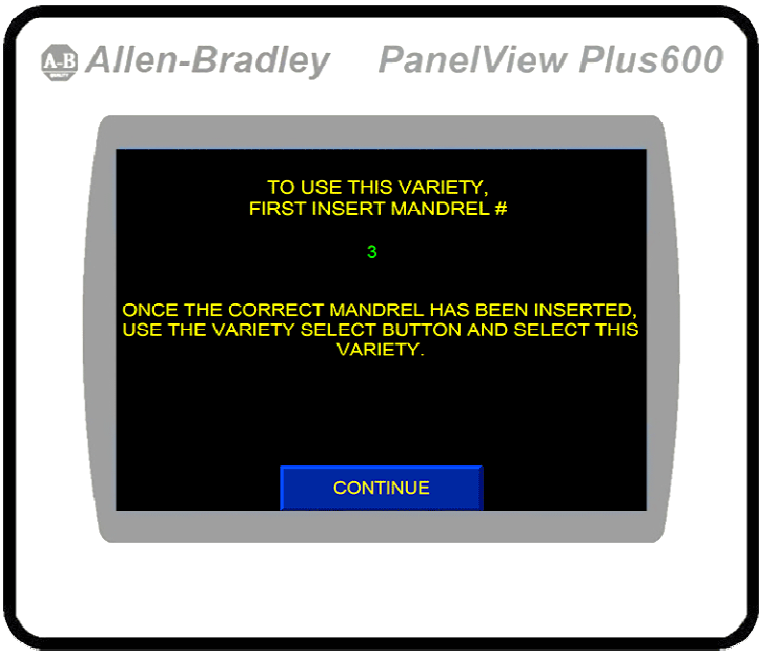




Select Variety, continued

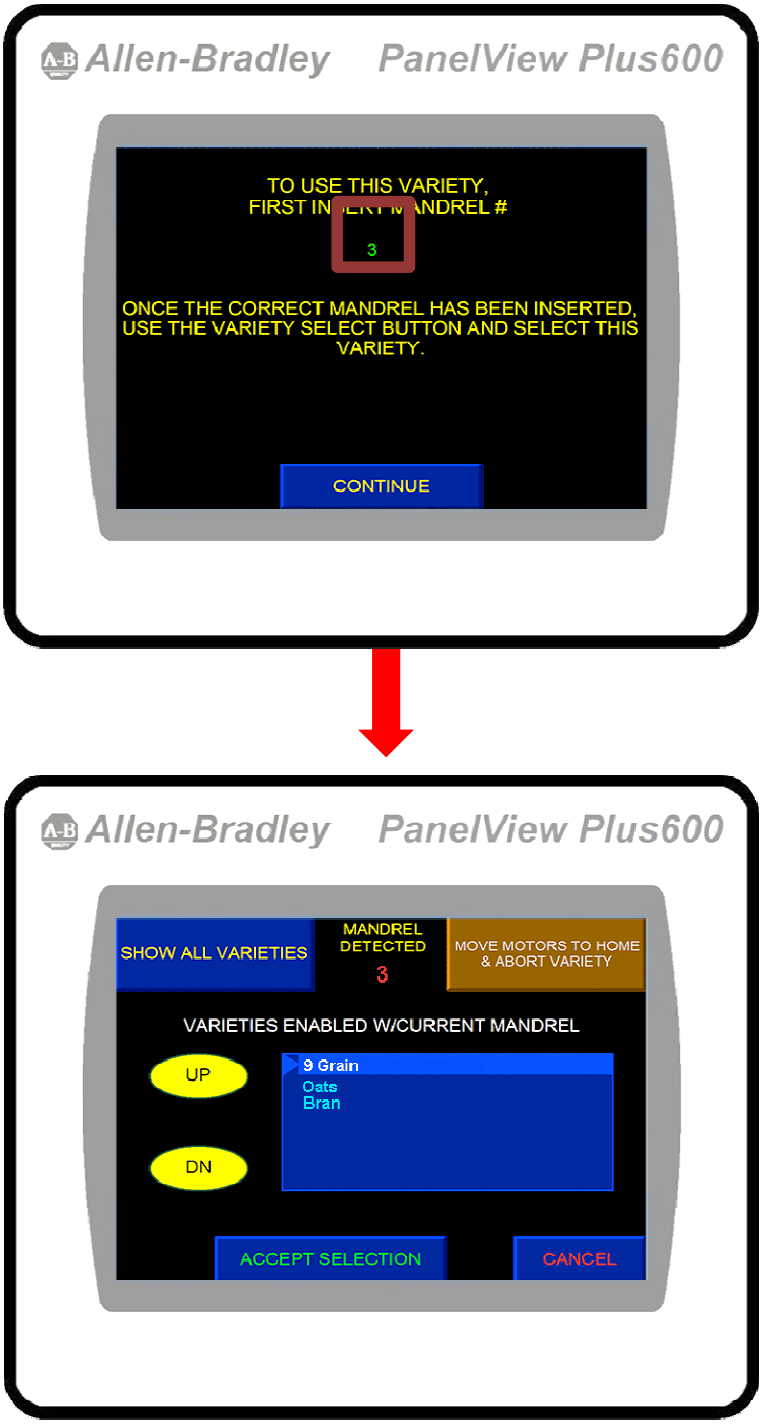
Press the SHOW ALL VARIETIES button. This will display all the varieties that are installed on the unit. Use the UP and DOWN buttons to highlight the desired variety that you want to load. Press the ACCEPT SELECTION button.





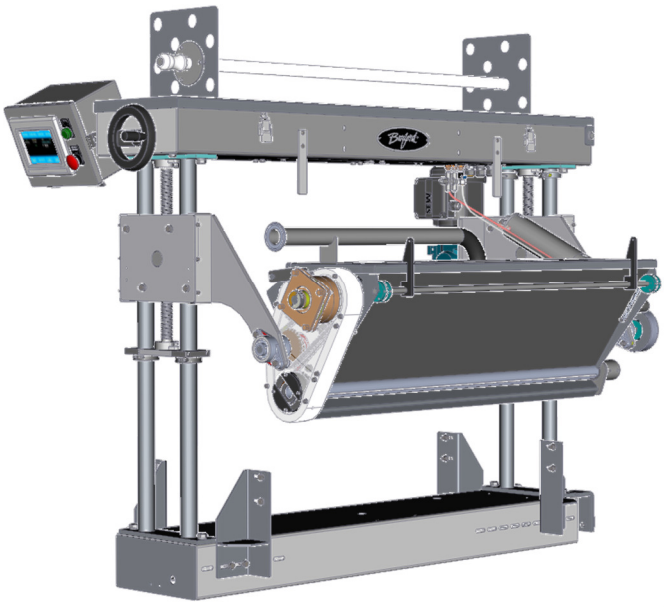
Mandrel Identification Screen

You will advance to the Mandrel Identification Screen. This screen will show which mandrel must be inserted for the selected variety. Insert the Mandrel number shown and press continue. Refer to page 205 for instructions on inserting the mandrel.



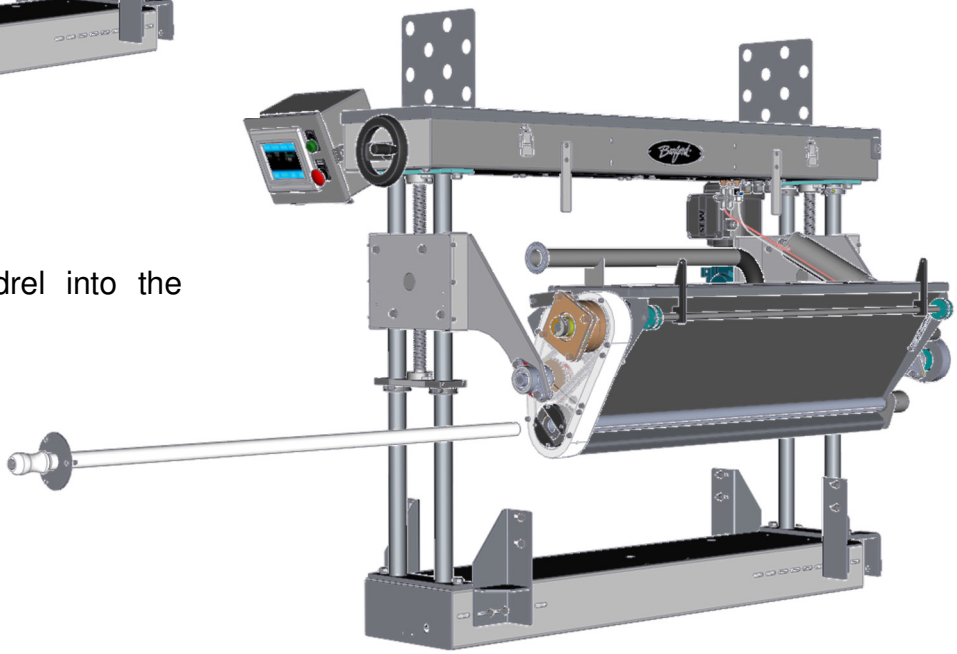
Insert Mandrel

Insert the Mandrel number shown and press continue to return the SELECT VARIETY screen.

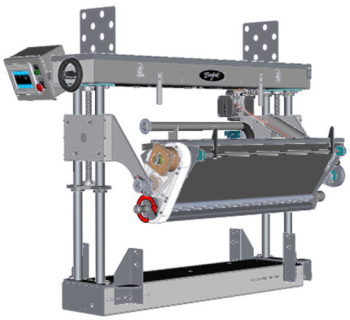


Retrieve the mandrel from the mandrel storage.

Insert the mandrel into the mandrel tube.



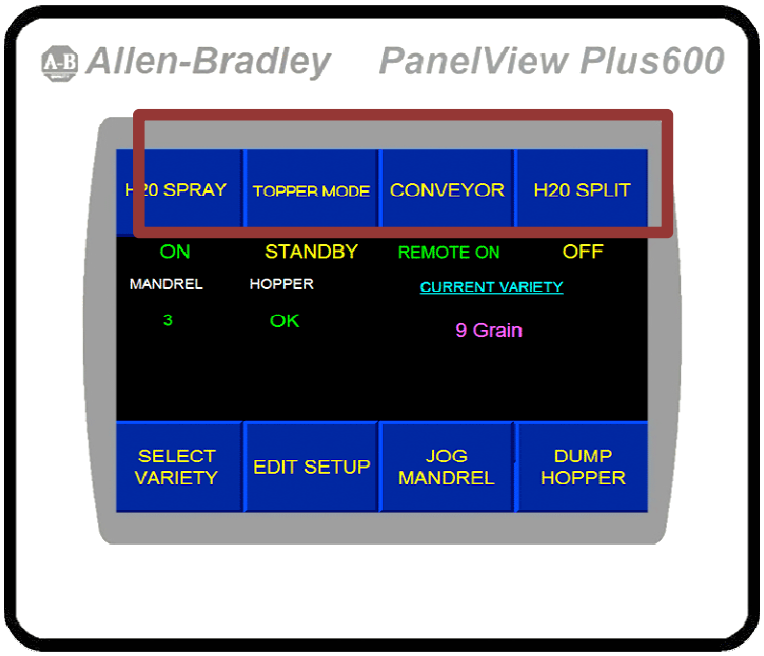
Twist the mandrel to lock it into drive.



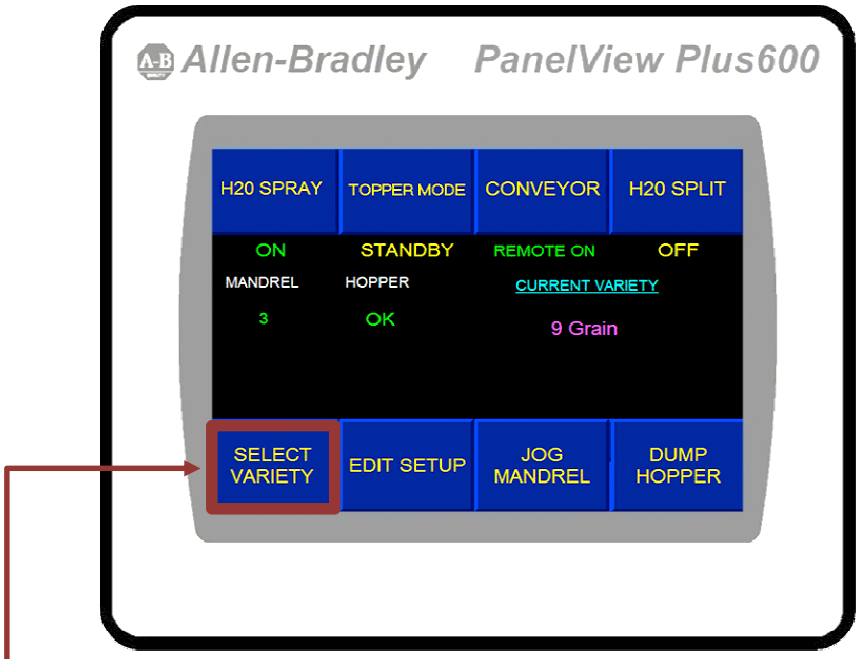
Run Mode

Verify Water Spray, Topper, Conveyor, Auto-fill, and Split Options are on in accordance with the selected variety.

To set up a variety refer to Chapter 5



Variety Change Same Mandrel

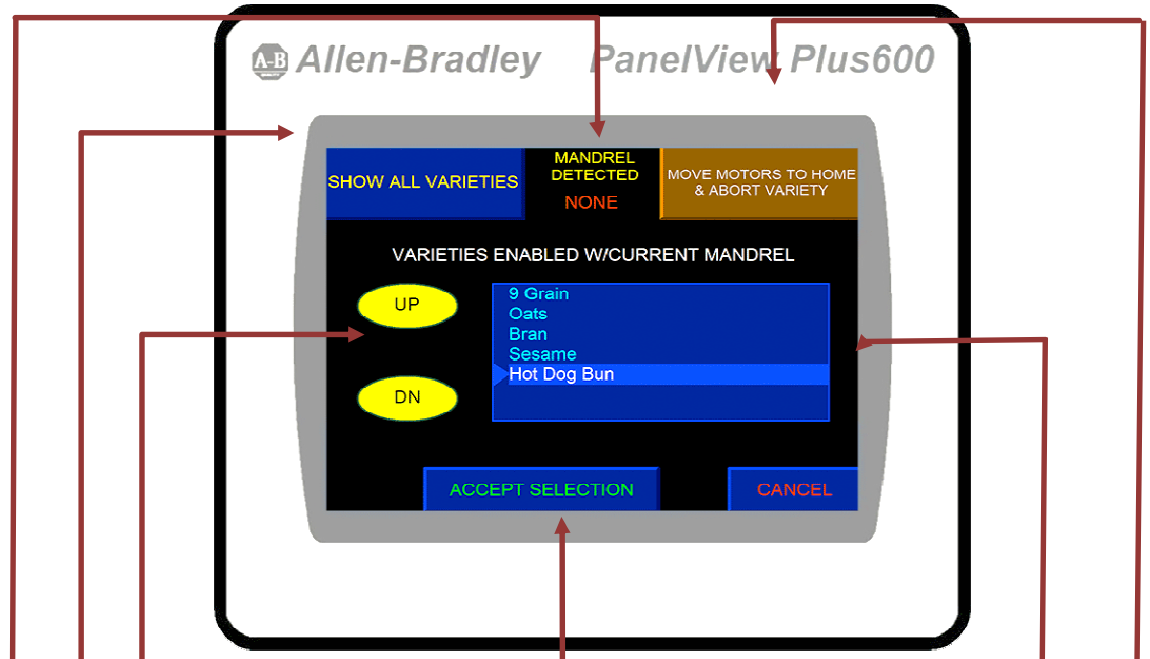


Select Variety

The SELECT VARIETY button advances the display to the variety choice screen shown on following page, offering a simple method to select a desired variety.

If the machine is not in the home position, the GO HOME button will be shown in place of the SELECT VARIETY Button. Pressing the GO HOME button will send all axis to their home position.

Select Variety Screen Topper Setup Procedures



Press UP or DOWN to scroll.

Press to show every variety on the unit.

Displays the current Mandrel inserted into the unit.

Press to accept the highlighted variety.

Displays all the varieties for the mandrel inserted.

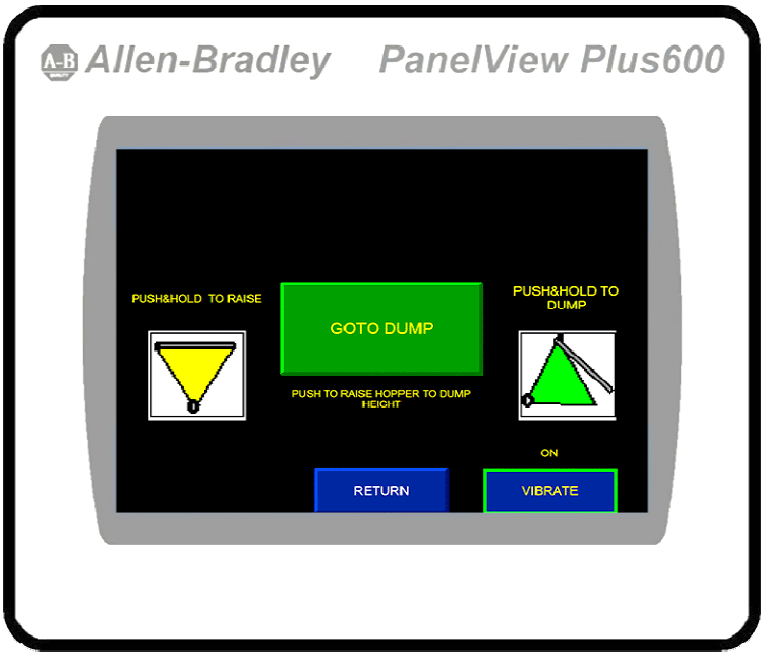
When pressed all the automated features will go home.

The Select Variety screen allows the user to change the current variety selected. An indicator at the top of the screen displays the current Mandrel inserted into the unit. The box at the middle of the screen shows all the varieties that are available with the current Mandrel inserted. Using the UP and DOWN buttons, the operator can select the variety that they want. Once the variety is highlighted, the operator will push the ACCEPT SELECTION button. The unit will now move all the automated adjustments to the position that was configured for that variety.

The operator may push the SHOW ALL VARIETIES button to display every variety that is configured in the unit. Each variety will be displayed in the box at the middle of the screen. If the operator then selects a variety that is not available with the current Mandrel inserted, a dialog box will appear informing the operator of the correct Mandrel to be inserted for the variety selected. Once the correct Mandrel is inserted, the unit will begin moving to the configured positions for that variety.

Press CANCEL to return to the Main Run screen.

Variety Change Different Toppings



The Dump Hopper screen aids the operator in removing any topping remaining in the hopper. The hopper can tilt 90º.

The hopper must be at a safe height before it can tilt. Press the **RAISE HOPPER TO DUMP HEIGHT** button to raise the hopper to the proper height.

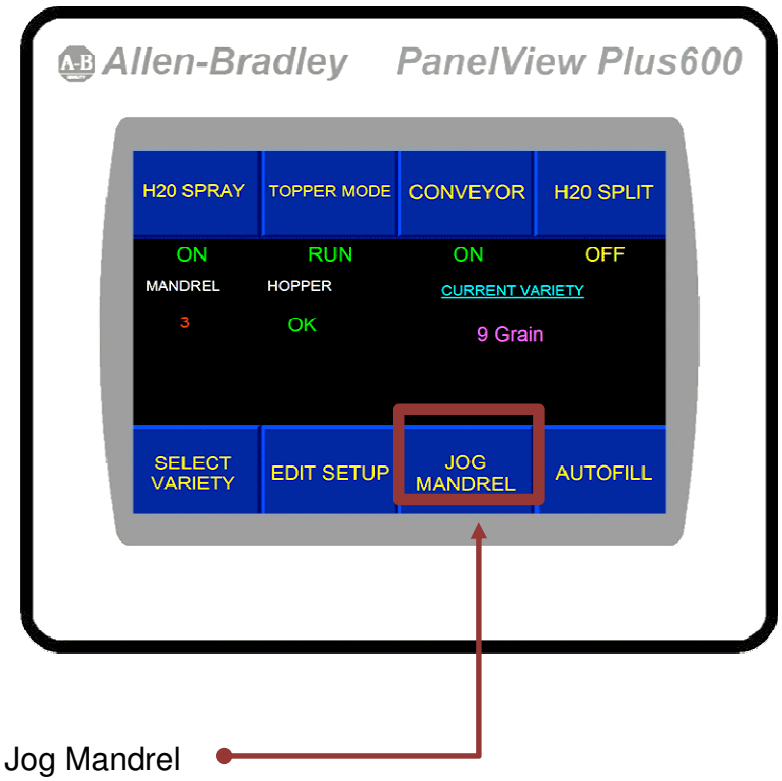
Once the hopper is at the correct height to dump, press and hold the  on the right to lower the hopper.

To raise the hopper, press and hold the  on the left.

If an optional vibrator is installed on the hopper you may press the VIBRATE button. The Vibrator aids in emptying the hopper of its contents.

Press RETURN to go back to the Main Run screen.

Variety Change - Jog Mandrel



Pressing the JOG MANDREL button will rotate the mandrel. The Mandrel will still be rotating for the duration that the button is pressed.

The Jog Mandrel feature is used to load the Mandrel with toppings prior to the first pan and to verify operation.

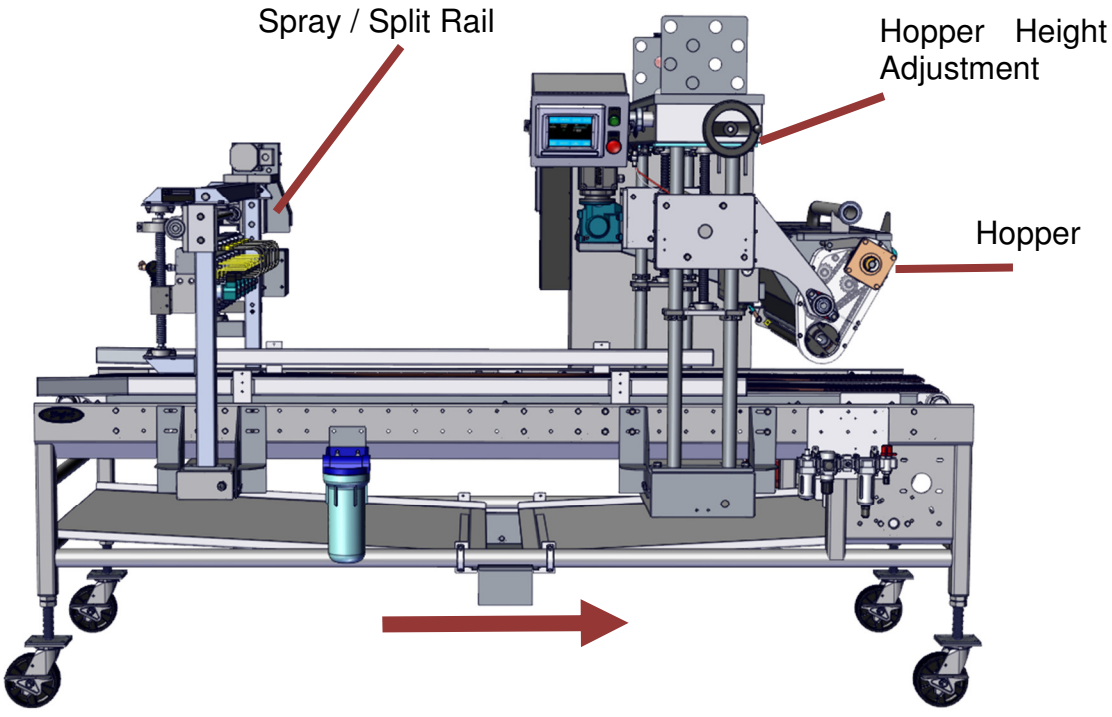
Options

Depending on options bought, your unit may or may not be fully automated. The next few pages reviews the procedures for manual setup of the pan guides, Hopper height. Spray and Split lift. If your unit is fully automated, refer to Chapter 4 and 5 on how to set the automation of your Unit.

Models with no Automation

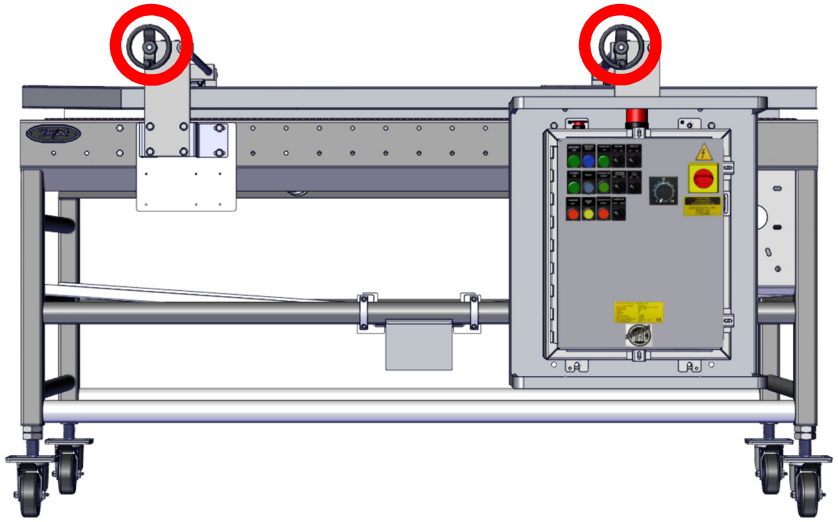
Before running a variety, the Topper must be setup properly. If the unit is fully automated, the Topper will automatically position itself for the variety selected. Depending on the automation options bought, the operator may have to adjust:

- Pan Guides
- Hopper Height
- Water Spray / Water Split Height

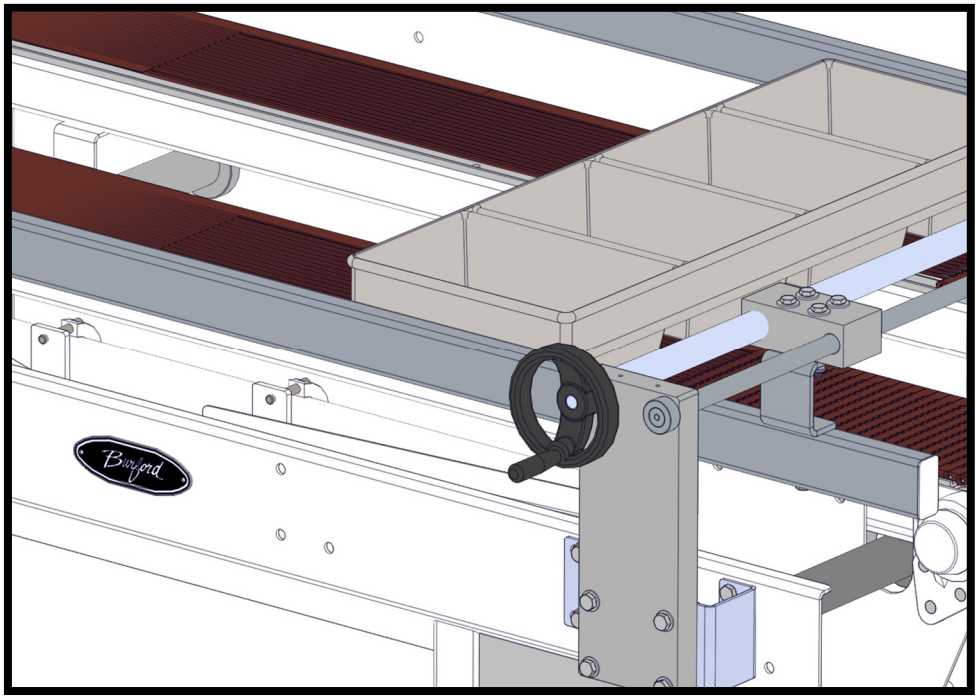


Pan Guide Adjustment - Manual

Place your pan on the conveyor and adjust the pan guide so there is no more than a ¼" gap on either side. The pan must be squared beneath the topper hopper.



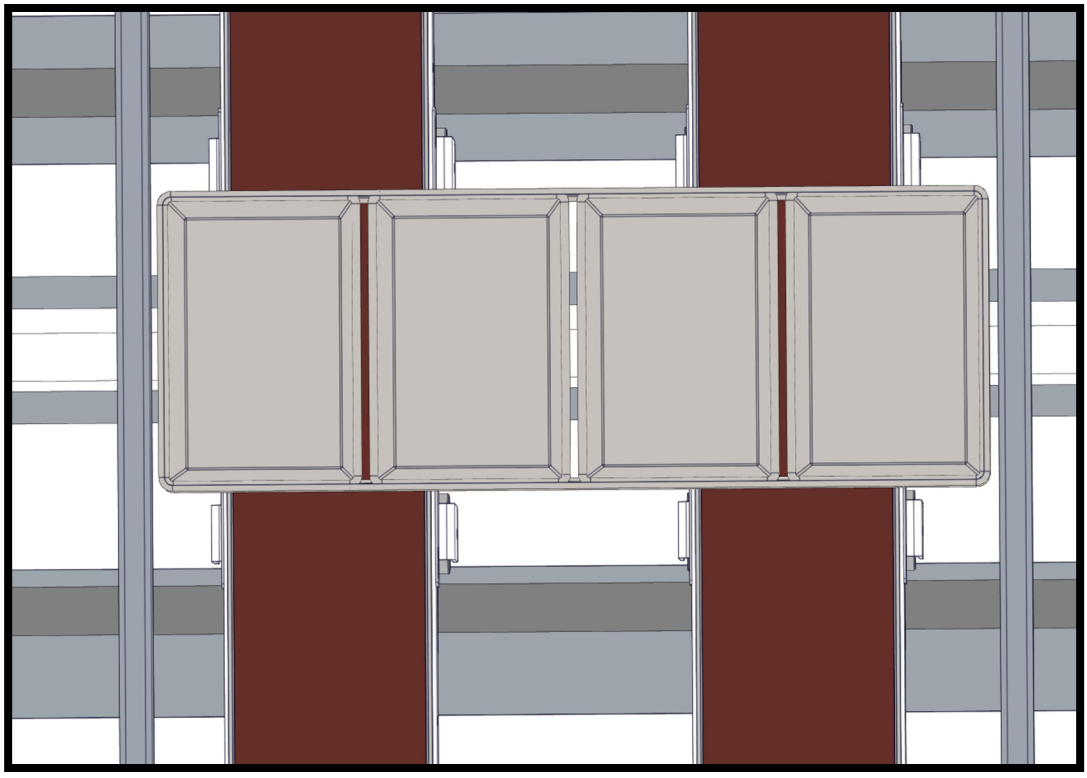
The Pan Guide system has two hand cranks for adjustment.



When adjusting, both hand cranks **MUST** be turned simultaneously to prevent binding of pan guide mechanism.

Pan Guide Adjustment – Manual, continued

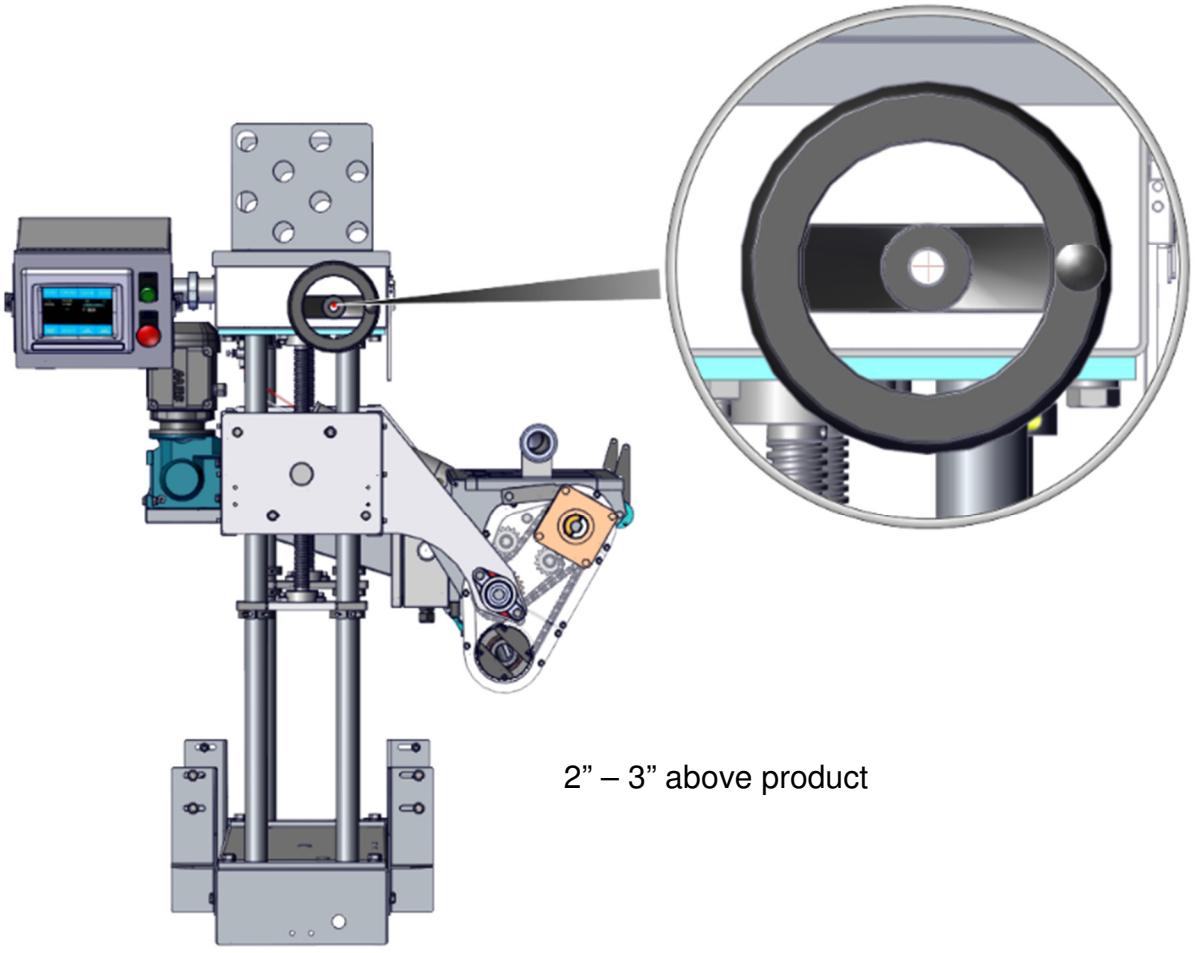
The pan guides need to be adjusted to prevent the pan from turning during transfer through the Topper. It is important that the pan travels straight under the Topper dispense for proper topping coverage. A slight gap must be present on the sides of the pan to prevent pans from stopping on the conveyor.



There should be a ¼” gap on either side of pan in relation to the pan guide.

Topper Height Adjustment – Manual

Locate the hand crank shown below. Adjust the height of the hopper so that it is 2” - 3” above the product.

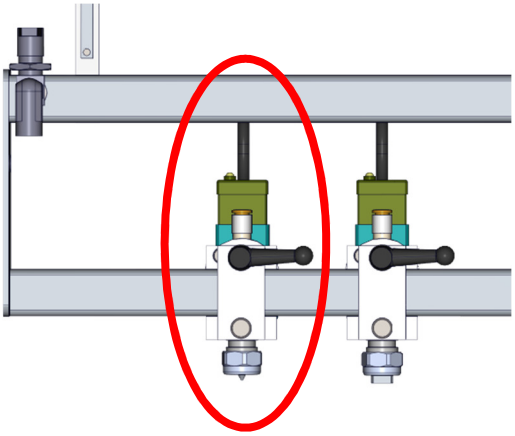


Hopper Height Adjustment

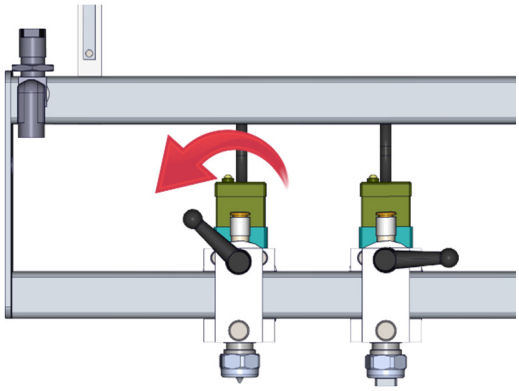
Topper Spray Nozzle Position

The position of the nozzles should be set so the spray is directly over the cups of the pan. All the nozzles should be set in a direct line with one another. The nozzles can easily be moved using the T-handle lock on each nozzle.

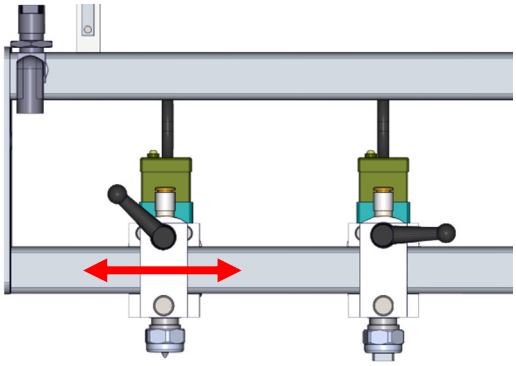
The Nozzles are adjustable laterally for alignment with product.



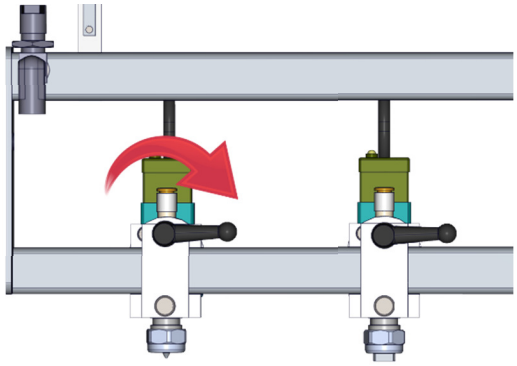
1. Locate nozzle to be positioned.



2. Rotate lever to free nozzle.



3. Position nozzle to desired location.



4. Rotate lever to lock nozzle.

When positioning nozzles be mindful of the water hoses and electrical connections. Plumbing and connectors to the nozzles should not be taut.

Topper Nozzle Dampness Output

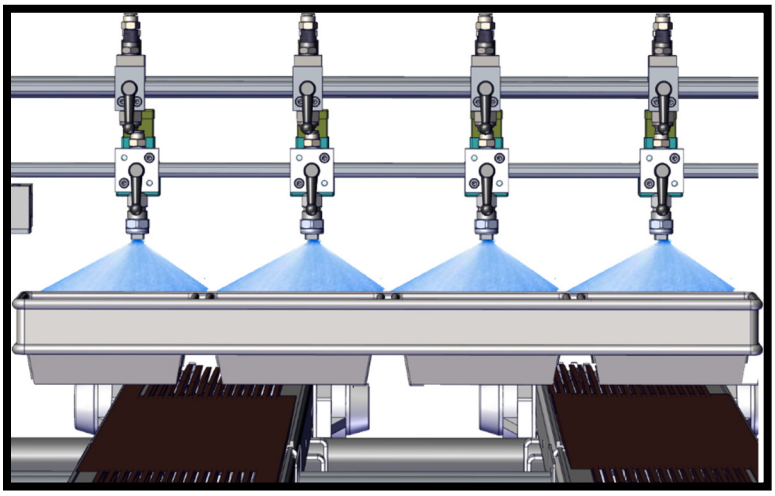
The degree of dampness obtained on the product will be decided by the number of nozzles used, water pressure, and orifice size used in each nozzle.

Each nozzle may be individually turned off or on and should be used accordingly to the number of cups in the pan.

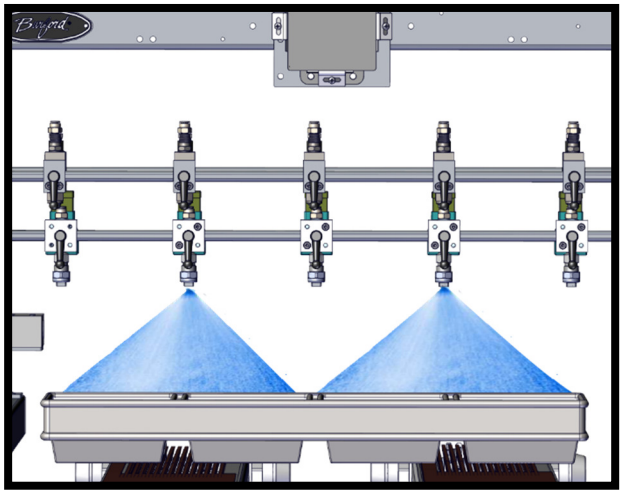
The recommended pressure setting is 40 psi for water.

The orifice size of each nozzle as it came from factory is .012. This size should be enough for your product, but larger or smaller sizes may be obtained if needed.

Below is an example of using one spray nozzle for each cup. This will supply more volume of water.

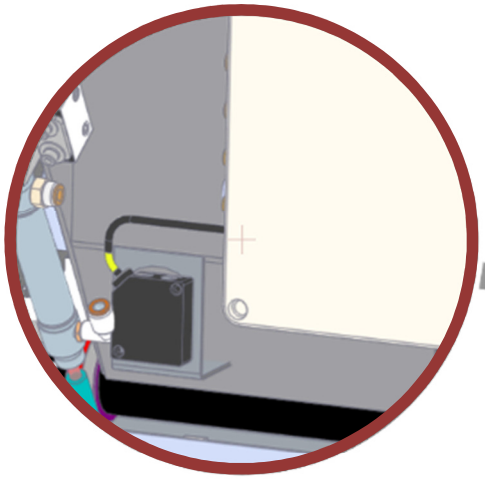


Below is an example of using one nozzle for two cups. This will supply less volume of water.

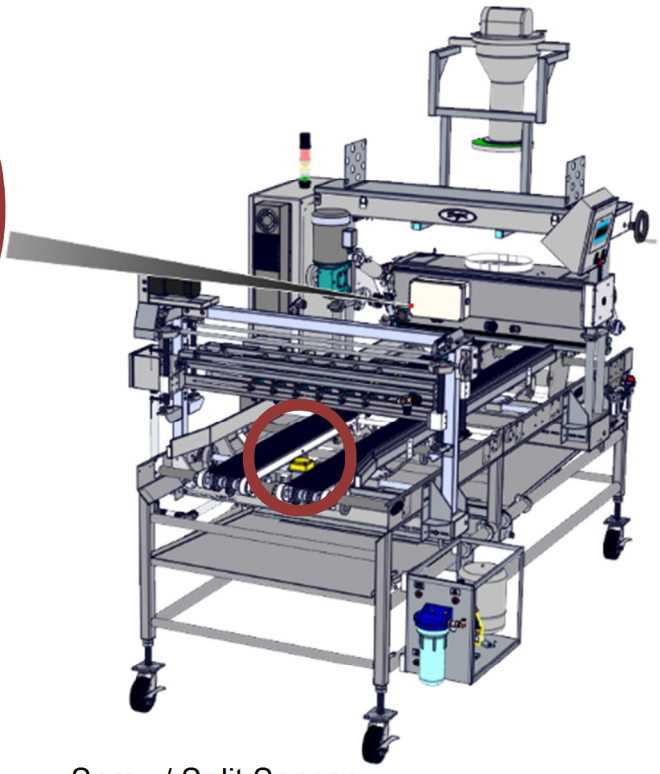


Topper Product Sensors Topper

The 9840S Topper has two product sensors assemblies. One for the Spray / Split and the other for the Topper.



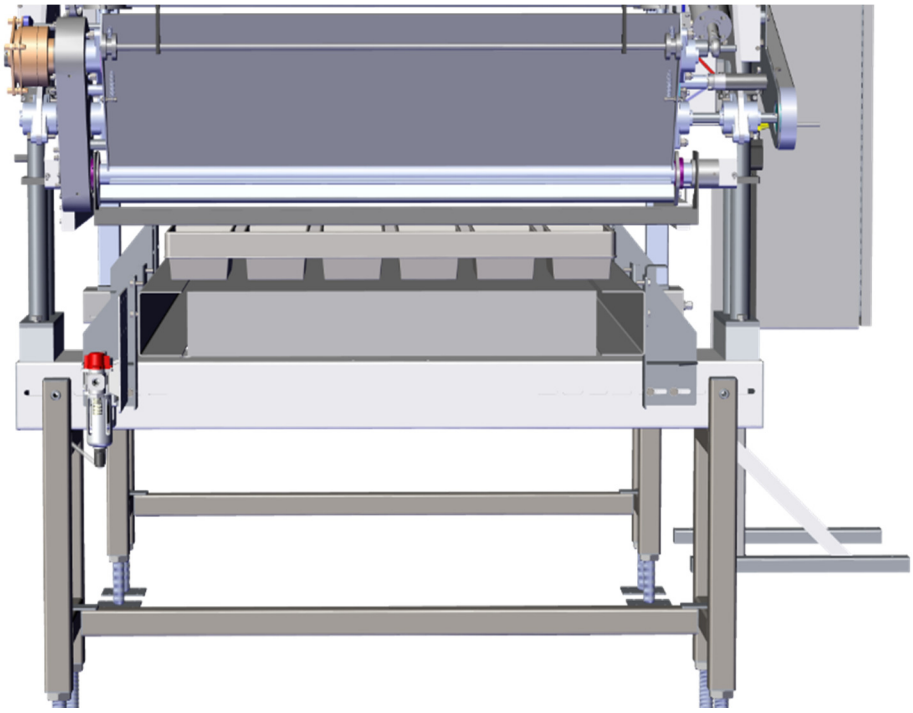
Topping Sensor



Spray / Split Sensor

Catch Tray

Install the Catch Tray as shown below when running varieties that do not need toppings. This will reduce or eliminate the contamination of other dough's.



Chapter 7

Troubleshooting

CHAPTER 7: TROUBLESHOOTING

Topper

Problem

Product not damp enough for topping to stick.

Probable Causes	Solutions
Nozzles set too high from product.	Decrease hopper height.
Water pressure too low.	Increase water pressure.
Nozzles not centered over cups of pan.	Re-adjust nozzles.
Nozzle tips too small.	Order larger tips.
Conveyor moving too fast.	Slow conveyor speed.

Problem

Spot spray system not activating.

Probable Causes	Solutions
Water spray control is turned off.	Check Spray control.
Limit switch not sensing cups.	Check switch.
Pan guides allowing pans to turn and not activating limit switch.	Re-adjust pan guides.

Problem

Nozzles not dispensing water.

Probable Causes	Solutions
Water pressure too low.	Increase air pressure.
Valve(s) turned off.	Check operator panel.
Obstruction in nozzle tip.	Clean tip.

Problem

Not enough topping on product.

Probable Causes	Solutions
Mandrel speed to slow	Increase Mandrel speed.
Hopper set too high over product.	Lower hopper height.

Problem

Too much topping on product

Probable Causes	Solutions
Mandrel speed set too fast.	Slow Mandrel speed down.
Pans slow down when going over sensor.	Re-adjust pan guides.

Problem

Topper not activating.

Probable Causes	Solutions
Control switch turned off.	Turn control on.
Product sensors not sensing cups, .	Set sensor properly.
Pan guides allowing pans to turn and miss product sensor.	Re-adjust pan guide.
Unit set to Remote Conveyor and not Receiving signal.	Check Signal and setting.
Conveyor Encoder not sending data	Check Encoder signal.

Problem

Topping not dispensing.

Probable Causes	Solutions
Air pressure too low.	Increase air pressure.
Mandrel not engaging	Replace Clutch.
Foreign material in hopper.	Clean hopper.
Clutch not receiving signal	Check Clutch Circuit.

Problem

Streaks showing on product.

Probable Causes	Solutions
Foreign material in hopper, restricting flow of topping.	Clean out hopper.
Pan guides off-center.	Re-adjust pan guides to center cups of pan to pattern mandrel.

Problem

Product not topped from one end to the other.

Solutions
Adjust Pan Dimensions.
Check Product Sensor.
Check pans for warped bottom.

Water Splitter Troubleshooting

Problem:

UNIT WILL NOT POWER UP

A. Check incoming power supply.

Problem:

INADEQUATE SPLITTING DEPTH

A. Check nozzle height setting.
B. Check manifold output setting.
C. Check product sensor to nozzle timing.

Problem:

EXCESSIVE SPLITTING DEPTH

A. Check manifold output setting.
B. Check nozzle height setting.

Problem:

LOSS OF NOZZLE PRESSURE

A. Check fluid output setting.
B. Check fluid filter.
C. Check for dirty tips.

Problem:

UNEVEN DISTRIBUTION OF SPLITS

A. Check nozzle height setting.
B. Check sensor to nozzle timing.
C. Check for dirty tips.

Problem:

SENSOR NOT DETECTING PRODUCT

A. Check sensor height.
B. Check sensor alignment.
C. Check for product.

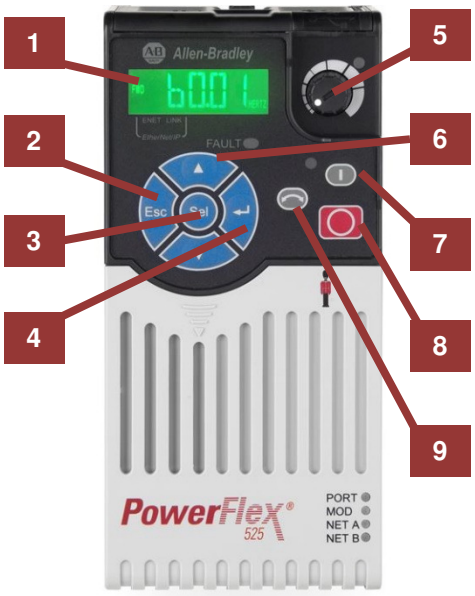
Chapter 8

Maintenance

CHAPTER 8: MAINTENANCE

Drive Settings

The Burford® Unit is equipped with up to (3) AC motor drives to control the operation of the unit. The above programmable motor controller is an example of the drives used. The table below gives a brief description of the function keys. See supplied motor drive manual for more information.



REF	FUNCTION	DESCRIPTION
1	Display	Displays parameter groups and values. Also has status LEDs. See accompanying owner manual for more information.
2	Escape	Back one-step in programming menu. Cancels a change and exit programming mode.
3	Select	Advance one-step in programming menu. Selects a digit when viewing parameter values.
4	Enter	Advance one-step in programming menu. Save a change to a parameter value.
5	Speed Dial	Used to control speed of drive.
6	Scroll	Used to scroll through parameters or to increase/decrease parameter values.
7	Start	Used to start the drive.
8	Stop	Used to stop the drive or clear a fault.
9	Reverse	Used to reverse direction of drive.

Drive Settings

The motor controllers have been preset at Burford® Corp. for your application. The digital input function is used to configure the controllers for remote operation via the programmable logic controller and touch screen interface. See Drive Settings in Drawings and Parts for the settings of your unit.

Recommended Weekly Maintenance

Drain air filter.
Check and fill lubricator.
Inspect water/air lines and replace if defective.
Check and clean water filter.
Inspect electrical enclosure air filter. Clean if necessary.
Use compressed air to clean dust and debris from the smart seeder.

Recommended Monthly Maintenance

Check all mounting screws and insure they are secure.
Check sprocket setscrews and keys for tightness.
Check the chain alignment and lightly lubricate chains.
Remove product from hopper and clean thoroughly.
Replace water filter.

Recommended Bi-Annual Maintenance

Lubricate all-threads and worm gears with food-grade grease.
Check all sensors for proper operation.
Check all spray and split valves for proper operation.
Check all pneumatic restrictors for proper operation.

Cleaning Recommendations

Remove all catch pans and catch trays from unit and thoroughly clean at a site away from the Topper.

Separate the conveyor chain and clean at a site away from the Topper.

Maintenance Procedures

Purging Spray Valves

When the unit is initially installed, all water lines must be purged, which can take 15-20 minutes to carry out. However, once the main lines have been purged, they will stay full of water so that later purging, due to changing of tips or check screens, can be done more quickly.

The proper procedure is as follows:

Remove all check-screens, O-rings, and tips from valve assemblies.

Connect a ¼" line to the "PURGE" valve and route to a suitable container (purging may require approximately 10 – 20 gallons of water through the system).

With the "PURGE" valve open, depress the "purge" button.

Allow the water to flow until a smooth, continuous stream appears.
Close the "PURGE" valve and repeat while watching the water flow from the spray valves.

Install the check-screens, O-rings, and tips into the valve assemblies. Purge the unit: every time the water is turned off, the stream spraying from the tips should have a clean and instant cut off. There should be no dribbling or slow stopping of water. If this occurs, you will need to repeat the steps for purging until a clean stop of water is apparent.

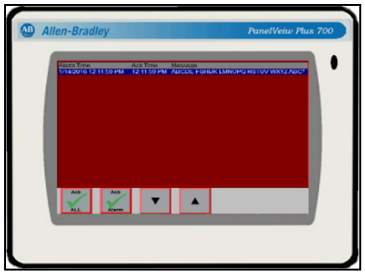
Keep clear of hopper when moving the hopper to "DUMP".

The Smart Seeder has multiple sensors and electronic components that may be damaged by water. Keep the Smart Seeder dry.

It is very important to purge all the air from the manifold and nozzles for proper operation of the water spray valves.

Alarm Banner

The Alarm Banner is configured to pop up over any screen to display that an error has occurred with the unit. A sample alarm banner below shows a failure has occurred with the Hopper movement. The banner will remain until the “Acknowledge” box is touched or the condition has been resolved. There are 77 different alarm banners to help with troubleshooting the unit.



Item	Text ID	Code	Message Displayed
1	1075	INFO 1.16	Recipe Change
2	1076	INFO 1.17	Mandrel Change
3	1082	ERROR 1.01	Mandrel Drive COM Error-Read. PLC was unable to read data from the device.
4	1086	ERROR 1.03	Conveyor Drive COM Error-Read. PLC was unable to read data from the device.
5	1087	ERROR 1.02	Mandrel Drive COM Error-Write. PLC was unable to write data to the device.
6	1090	ERROR 1.04	Conveyor Drive COM Error-Write. PLC was unable to write data to the device.
7	1345	INFO 1.18	System Restart
8	2884	ERROR 2.1	Mandrel Drive Power Loss.
9	2885	ERROR 2.2	Mandrel Drive Under voltage.
10	2886	ERROR 2.3	Mandrel Drive Overvoltage.
11	2887	ERROR 2.4	Mandrel Drive Motor Stalled.
12	2888	ERROR 2.5	Mandrel Drive Motor Overload.
13	2889	ERROR 2.6	Mandrel Drive Heat Sink Over temperature.
14	2890	ERROR 2.7	Mandrel Drive HW Overcurrent (300%).
15	2891	ERROR 2.8	Mandrel Drive Ground Fault.
16	2893	ERROR 2.9	Mandrel Drive Auto Reset Tries.
17	2894	ERROR 2.10	Mandrel Drive Phase U to Ground Short.
18	2895	ERROR 2.11	Mandrel Drive Phase V to Ground Short.
19	2896	ERROR 2.12	Mandrel Drive Phase W to Ground Short.
20	2897	ERROR 2.13	Mandrel Drive Phase UV Short.
21	2898	ERROR 2.14	Mandrel Drive Phase UW Short.
22	2899	ERROR 2.15	Mandrel Drive Phase VW Short.
23	2900	ERROR 2.16	Mandrel Drive Software Overcurrent.
24	2901	ERROR 2.17	Mandrel Drive Overload.
25	2902	ERROR 2.18	Mandrel Drive Power Unit Fail.
26	2904	ERROR 2.19	Mandrel Drive Communication Loss.
27	2905	ERROR 2.20	Mandrel Drive Parameter Checksum Error.
28	2906	ERROR 2.21	Mandrel Drive I/O Board Fail.
29	2910	ERROR 3.1	Conveyor Drive Power Loss.
30	2911	ERROR 3.2	Conveyor Drive Under voltage.
31	2912	ERROR 3.3	Conveyor Drive Overvoltage.
32	2913	ERROR 3.4	Conveyor Drive Motor Stalled.
33	2914	ERROR 3.5	Conveyor Drive Motor Overload.

Alarm Banner, continued

Item	Text ID	Code	Message Displayed
34	2915	ERROR 3.6	Conveyor Drive Heat Sink Over temperature.
35	2916	ERROR 3.7	Conveyor Drive HW Overcurrent (300%)
36	2917	ERROR 3.8	Conveyor Drive Ground Fault.
37	2919	ERROR 3.9	Conveyor Drive Auto Reset Tries.
38	2920	ERROR 3.10	Conveyor Drive Phase U to Ground Short.
39	2921	ERROR 3.11	Conveyor Drive Phase V to Ground Short.
40	2922	ERROR 3.12	Conveyor Drive Phase W to Ground Short.
41	2923	ERROR 3.13	Conveyor Drive Phase UV Short.
42	2924	ERROR 3.14	Conveyor Drive Phase UW Short.
43	2925	ERROR 3.15	Conveyor Drive Phase VW Short.
44	2926	ERROR 3.16	Conveyor Drive Software Overcurrent.
45	2927	ERROR 3.17	Conveyor Drive Overload.
46	2928	ERROR 3.18	Conveyor Drive Power Unit Fail.
47	2930	ERROR 3.19	Conveyor Drive Communications Loss.
48	2931	ERROR 3.20	Conveyor Drive Parameter Checksum Error.
49	2932	ERROR 3.21	Conveyor Drive I/O Board Fail.
50	2935		Axis Option Drive Power Loss.
51	2936		Axis Option Drive Under voltage.
52	2937		Axis Option Drive Overvoltage.
53	2938		Axis Option Drive Motor Stalled.
54	2939		Axis Option Drive Motor Overload.
55	2940		Axis Option Drive Heat Sink Over temperature.
56	2941		Axis Option Drive HW Overcurrent (300%)
57	2942		Axis Option Drive Ground Fault.
58	2944		Axis Option Drive Auto Reset Tries.
59	2945		Axis Option Drive Phase U to Ground Short.
60	2946		Axis Option Drive Phase V to Ground Short.
61	2947		Axis Option Drive Phase W to Ground Short.
62	2948		Axis Option Drive Phase UV Short.
63	2949		Axis Option Drive Phase UW Short.
64	2950		Axis Option Drive Phase VW Short.
65	2951		Axis Option Drive Software Overcurrent.
66	2952		Axis Option Drive Overload.
67	2953		Axis Option Drive Power Unit Fail.
68	2955		Axis Option Drive Communications Loss.
69	2956		Axis Option Drive Parameter Checksum Error.
70	2957		Axis Option Drive I/O Board Fail.
71	2984	ERROR 1.05	Topping Hopper Product Level Low.
72	3116	ERROR 1.06	Hopper Movement Failed. Unable to move to programmed position. Unit will continue to setup. You must move this axis to position manually!
73	3117	ERROR 1.08	Spray Rail Movement Failed. Unable to move to programmed position. Unit will continue to setup. You must move this axis to position manually!
74	3118	ERROR 1.07	Pan Guide Movement Failed. Unable to move to programmed position. Unit will continue to setup. You must move this axis to position manually!
75	3122	ERROR 1.09	Splitter Movement Failed. Unable to move to programmed position. Unit will continue to setup. You must move this axis to position manually!
76	3136	ERROR 1.10	Pan Sensor Blocked. Check for pan spacing or reflector dirty or damaged. Check for sensor problem.
77	3174	ERROR 1.11	Autofill Hopper Product Level Low.

Chapter 9

Parts & Drawings

CHAPTER 9: PARTS & DRAWINGS

Recommended Spare Parts List Seeder

To prevent unnecessary down time, Burford® Corp. recommends the list of parts in the Drawings and Parts section be kept in stock.

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Call 1-877-BURFORD or fax
405-867-4219 to order your parts.

Drawings & Parts

Recommended Spare Parts

Please have the following machine information on hand before calling Burford®.

- Machine Voltage
- Model Number
- Serial Number

QTY	PART #	DESCRIPTION
1	304239	Clutch/Brake, Shaft Mount, 24 VDC
1	610151	Sensor, Prox, 6.5mm, 10-30 VDC, PNP, N.C.
1	610172	Switch, Light Bulb, 24 VDC, LED
3	610404	Relay, Terminal Mounting, 24 VDC, 6A, 1 PDT
1	610421	Relay, Terminal Mounting, 24 VDC, 2A, SSR
1	610426	Bearing, Rod End, 1/2" ID, 1/2-20 UNF
1	610913	Power Supply, 480VAC-24 VDC,10A,3PH
1	611027	Sensor, Photo, Diffuse, 500MM, 24V,QC
1	611102	Encoder, 1.375 Thru Bore
1	611119	Valve, Solenoid, 24 VDC, 3-Way, Closed Cen 1/4P
2	611237	Bearing, Pillow Block, 5/8" SST
2	611238	Bearing, Flange, 5/8" SST
1	611365	Valve, Solenoid, 24 VDC, 2-Way, With Flow Controls
2	611387	Bearing, Flange, 3/4" SST
1	611574	Valve, Pulsating Spray
1	611604	Gearmotor,1/3HP,230/460-60-3,RH
1	611634	PLC,ML1400,Relay,24VDC,20IN/12OUT
1	611907	Gearmotor,1/2HP,460-60-3,109RPM,LH
1	612275	Gearmotor,1/2HP,460-60-3,LH,WD
1	*610412	Relay, Terminal Mounting, 220 VAC, 2A, SSR
1	*610452	Relay, Terminal Mounting, 110 VAC, 2A, SSR
1	304123-001	Motor,Gear,1/8HP,200/230-50/6,3.6:1
2	304350-001	Sensor, Prox, 8mm, 10-30 VDC, PNP N.C.
1	304465-002	PLC,Display,PV+(6)600,Color,Touch
1	611422-004	Controller, Pwr FLX4M,480-3,480-3
1	611469-010	Encoder,3/8 Bore,IP64,010CPR,SMJ
2	C00565	Spray Tip, SS, Tee Jet
1	C00579	Filter, Water, Replacement #AP110
2	C01164	O-Ring, 0.489" ID X 0.070" THICK
4	C05724	Varistor, Surge, 125A, 25 VAC / 31 VDC
1	C06753	Sensor, Cable, M12, 5-Wire, Straight, Female, QC
1	C07101	Switch, Contact Cartridge, 1, N.C.
1	C07663	Sensor, Field Attach, M12, 5-Wire

MPAS-100

QTY.	PART #	DESCRIPTION
1	610295	Sensor, Prox 18 mm, 24 VDC
1	C07670	Sensor, Prox, 30 mm, 24 VDC
1	611117	Valve, Solenoid, 24 VDC
1	210453	Filter, Dust, Unifilter
1	210454	Gasket, Rim, White Silicone
1	611951	Vacuum Motor, 220V, 10A
1	C06702	Relay, Motor Starter, 24VDC, 10A

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Verify your machine voltage before ordering parts.

* For external system/conveyor run signal that is not 24 volts, select the relay with the appropriate coil voltage. If signal is 24 volts, neither relay is needed.

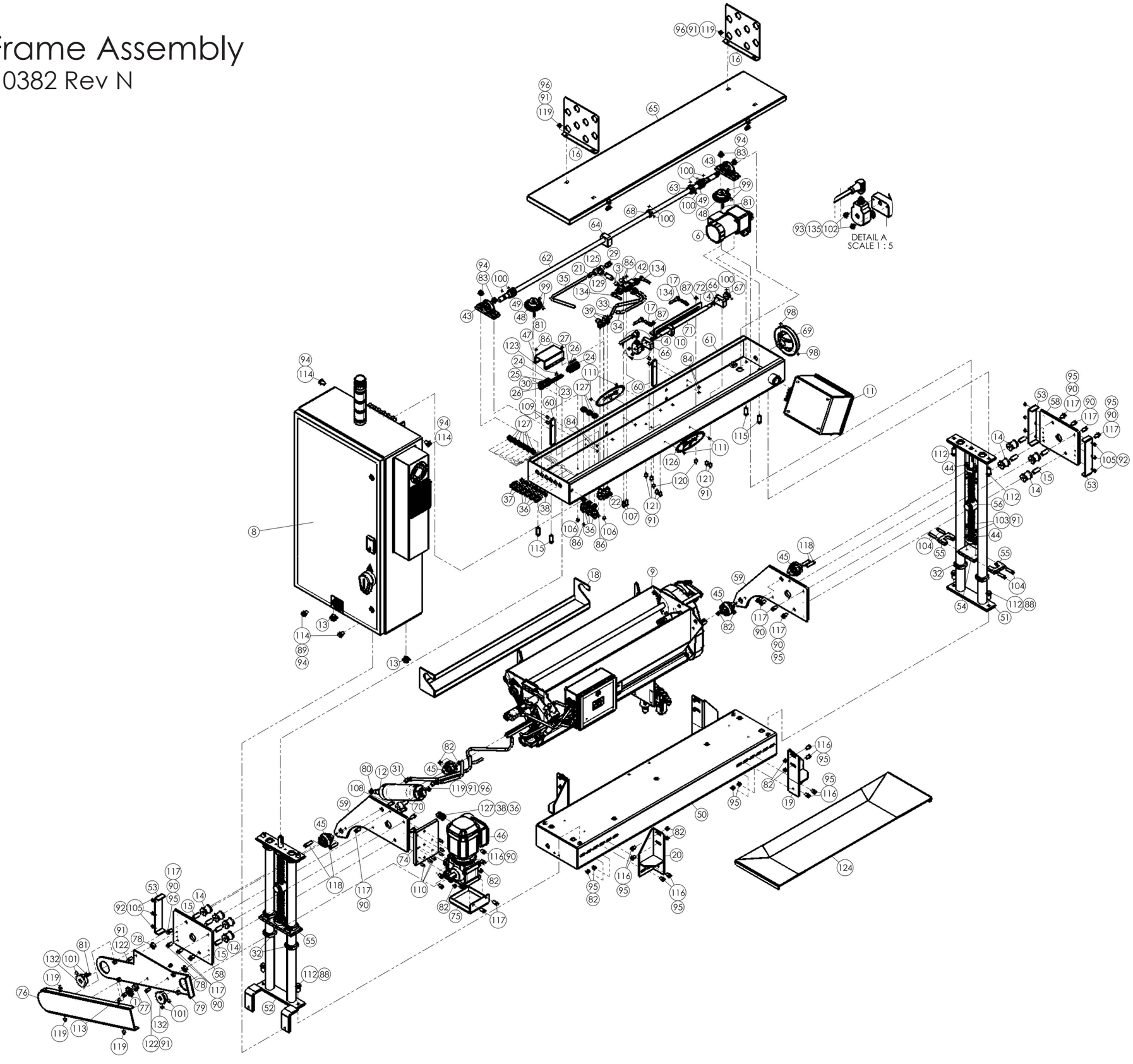
Seeder Frame Assembly
210382 Rev N

ITEM #	QTY.	PART#	DESCRIPTION
1	1	103478	SPROCKET IDLER, 35-A-15 3/8" BORE
2	1	108331	CABLE, 18 AWG, 4 COND, BLACK CORD
3	2	111497	MUFFLER, 1/8" NPT
4	2	122228	BUSHING 3/8 X 3/4 X .024 MACH
5	6'	142113	CABLE,16AWG,4 COND
6	REF	210384	ASSY, HEIGHT ADJ., HOPPER, 9840S
7	1	210385	ASSY, PNEUMATICS, SEEDER, 9840S
8	1	210400	ASSY,ENCL,MAIN,9840
9	1	210404-008	ASSY, SEEDER HOPPER, 9840
10	1	210411	ASSY, BLOCK, HEIGHT ADJ TARGET
11	1	210429	ASSY,ENCLOSURE,DISPLAY,9840S/9940S
12	1	210446	ASSY, CYLINDER, HOPPER DUMP
13	2	303056	PLUG, HOLE, SST 7/8" DIA
14	8	304015	ROLLER, LIFT
15	8	304016	SHAFT SPACER ROLLER LIFT 9840
16	2	304109	BRACKET, MANDREL RACK
17	2	304350-001	SENSOR,PROX,8MM,10-30V,PNP,NC,TURCK
18	1	304365	A/W, CATCH PAN - SEEDER HOPPER
19	2	304830	A/W, ANGLE MOUNT, 9840
20	2	304831	A/W, ANGLE MOUNT, 9840S
21	3	401152	FITTING,CONN,1/4MPT X 1/4T,ENP,Q.R.
22	2	401302	VALVE, REG, FLOW CONTROL, ENP, Q.R.
23	6"	610360	TERMINAL, DIN RAIL, MINI
24	25	610361	TERMINAL, BLOCK, MINI
25	3	610362	TERMINAL,END COVER,MINI
26	2	610363	TERMINAL,ANCHOR,END CLAMP,MINI
27	1	610364	TERMINAL, JUMPER, 10-POLE, MINI
28	1	610505	FITTING,ELL,1/4NPT X 3/8T, ENP, Q.R
29	3	610507	FITTING,CONN,1/4NPT X 3/8T,ENP,Q.R.
30	1	610534	TERMINAL,GROUNDING,MINI
31	2	610602	FITTING, ELL, 1/4NPT X 1/4T,ENP,Q.R
32	8	610839	COLLAR,1-1/2 SPLIT, SST
33	3'	610885-02	TUBING, 1/4" POLYURETHANE, BLUE
34	3'	610885-04	TUBING, 1/4" POLYURETHANE, RED
35	10'	610885-07	TUBING, 1/4" POLYURETHANE, CLEAR
36	8	610953	CONNECTOR, CORD, .20-.35, DOME, NYLON
37	2	610954	CONNECTOR, CORD, .39-.56, DOME, NYLON
38	10	610955	CONNECTOR,SEAL RING,1/2NPT,POLYETH
39	4	610956	FITTING,BLKHD ELL 1/4T,ENP,Q.R.
40	1	610957	FITTING,PLUG IN "Y" 1/4 TUBE,Q.R.
41	1	611102	ENCODER, 1.375 THRU BORE
42	1	611119	VALVE,SOL,24V,3 WAY,CLOSED CEN,1/4P
43	2	611237	BEARING, 5/8 PILLOW BLOCK, SST
44	4	611238	BEARING, 5/8, 2 BOLT FLANGE, SST
45	4	611387	BEARING, 3/4", 2 BOLT FLANGE, SST
46	1	611604	GEARMOTOR,1/3HP,230/460-60-3,RH
47	1	710161	COVER, TERMINAL STRIP, 9840S/9940S
48	2	711938	RWK, WORM GEAR
49	2	711939	RWK, WORM STEEL, 5/8" B, 10 D.P.
50	1	711992	AW, CHANNEL BASE, 9840S
51	1	711995	A/W, UPRIGHT SUPT
52	1	711997-BBU	A/W, UPRIGHT SUPT ENCL MT,9840-BBU
53	3	712000	BRACKET, COVER UPRIGHT ROLLER, 9840S
54	2	712001	PLATE, BEARING MT, HEIGHT ADJ, 9840S
55	4	712002	BLOCK, CLAMP, BEARING PLATE
56	2	712003	NUT, HIEGHT ADJ, 9840S
57	2	712004	ALL-THREAD, 1"-5 ACME, HEIGHT ADJ.
58	2	712005	PLATE, SIDE, HEIGHT ADJ, 9840S
59	2	712006	PLATE, SIDE, HOPPER MNT, 9840S
60	REF	712008	BAR, HOPPER LID STOP, 9840S
61	1	712010	A/W, TOP SEEDER CHANNEL, 9840S
62	1	712025	SHAFT, HEIGHT ADJUSTMENT, 9840S
63	1	712026	SPROCKET, REWORK,35B14, 5/8 BORE
64	1	712029	BLOCK, SHAFT SUPT, HEIGHT ADJ.
65	1	712444	A/W, HOPPER COVER, 9840S/MPA-100
66	2	712219	BLOCK, HIEGHT ADJ SHAFT
67	1	712221	SPROCKET, 25-B-19 3/8" BORE
68	1	712222	SPROCKET, 25-B-19 5/8" BORE
69	1	712376	HANDLE,REWORK, 6" DIA, ALUM
70	1	712853	ROD, CYL. MNT., HOPPER DUMP
71	1	712958	SHAFT, ALL-THREAD PROX COUNT
72	1	712961	BRACKET, HEIGHT ADJ. PROX
73	1	712980	SENSOR, REFLECTR, TAPE 4/34 X 1-1/2
74	1	714506	PLATE, MOTOR MNT, MANDREL DRIVE
75	1	714507	A/W, CATCH PAN, MANDREL MOTOR
76	1	715528	A/W, MANDREL DRIVE GUARD, OUTER
77	1	715531	ROD, ECCENTRIC IDLER, 9840
78	2	715532	SPACER, MANDREL DRIVE GUARD
79	1	715540	A/W, MANDREL DRIVE, GUARD MNT. 9840
80	1	955400	NUT HEX JAM 1/2-20 SST
81	3	955470	KEY, SQ 3/16 X 1.00 .002 UNDERSIZE
82	22	955619	NUT HEX NYLOC 5/16-18 UNC SST
83	6	955620	NUT HEX NYLOC 3/8-16 UNC SST
84	4	955621	NUT HEX NYLOC #10-24 UNC SST
85	4	955624	NUT HEX NYLOC #6-32 UNC SST
86	6	955625	NUT HEX NYLOC #8-32 UNC SST
87	2	955661	NUT HEX NYLOC 1/4-20 UNC SST
88	8	955937	WASHER LOCK 1/2 SST
89	2	955938	WASHER, LOCK 3/8" SST
90	20	955939	WASHER, LOCK 5/16" SST
91	22	955940	WASHER LOCK 1/4" SST
92	13	955941	WASHER LOCK #10 SST
93	2	955972	WASHER FLAT #6 SST
94	8	955975	WASHER FLAT 3/8" SST
95	31	955976	WASHER FLAT 5/16 SST
96	5	955977	WASHER FLAT 1/4" SST
97	4	955978	WASHER FLAT #10 SST
98	2	971204	SCREW SET SOC 1/4-20 UNC X 1/4 SST
99	4	971208	SCREW SET SOC 1/4-20 UNC X 1/2 SST
100	10	971804	SCREW SET SOC #10-24 UNC X 1/4 SST
101	4	972008	SCREW SET SOC 5/16-18 UNC X 1/2 SST
102	2	976906	SCREW SOC HD CAP #6-32 X 3/8 SST
103	8	978312	SCREW SOC HD CAP 1/4-20 X 3/4 SST
104	8	978328	SCREW SOC HD CAP 1/4-20 X 1 3/4 SST
105	9	978906	SCREW SOC HD CAP #10-24 UNC X 3/8 SST
106	2	979508	SCREW SOC HD CAP #8-32 UNC X 1/2 SST
107	2	979520	SCREW SOC HD CAP #8-32 UNC X 1 1/4 SST
108	1	981620	SCREW FLT HD SOC 5/16-18 UNC X 1 1/4 SST
109	4	982310	SCREW FLT HD SOC #10-24 X 5/8 SST
110	6	982316	SCREW FLT HD SOC #10-24 X 1 SST
111	4	987506	SCREW BUTT HD SOC #6-32 X 3/8 SST
112	8	988320	SCREW FIN HEX 1/2-13 X 1 1/4 SST
113	1	988910	SCREW FIN HEX 3/8-16 X 5/8 SST
114	4	988916	SCREW FIN HEX 3/8-16 X 1 SST
115	4	988924	SCREW FIN HEX 3/8-16 X 1 1/2 SST
116	20	989712	SCREW FIN HEX 5/16-18 X 3/4 SST
117	18	989716	SCREW FIN HEX 5/16-18 X 1 SST
118	4	989728	SCREW FIN HEX 5/16-18 X 1 3/4 SST
119	10	989908	SCREW FIN HEX 1/4-20 X 1/2 SST
120	2	989910	SCREW FIN HEX 1/4-20 X 5/8 SST
121	6	989912	SCREW FIN HEX 1/4-20 X 3/4 SST
122	2	989916	SCREW FIN HEX 1/4-20 X 1 SST
123	2	998908	SCREW RD HD SLOT #8-32 X 1/2 SST
124	1	A04755	A/W, SEEDER DUMP TRAY
125	1	A06858	FITTING,TEE,1/4 NPTF,SST
126	2	A08049	NAMEPLATE,BURFORD LOGO,LARGE
127	10	C00174	LOCKING NUT, 1/2 NPT, NYLON
128	1	C00404	FRL COMBO w/ SHUTOFF VALVE & GAUGE
129	1	C00905	FITTING,NIPPLE,1/4 NPTM X 2,SST
130	6'	C01237	CABLE,22AWG,15 COND,SHIELDED
131	REF	C03335	PLATE, MOUNTING F.R.L.
132	2	C04828	SPROCKET, REWORKED 35-B-21, .75B
133	1	C06753-002	SENSOR,CABLE,M12,5WIRE,F,QC,STR,SH
134	4	C07626	SENSOR,CABLE,M8,3WIRE,F,QC,90
135	2	955936	WASHER LOCK #6 SST
136*	4	717930	SPACER
137*	1	955936	A/W FINGER GUARD
138*	1	955936	BAR, SENSOR BACKUP
139*	2	955936	#10-24 WELDNUT

*NOT SHOWN

Seeder Frame Assembly

210382 Rev N



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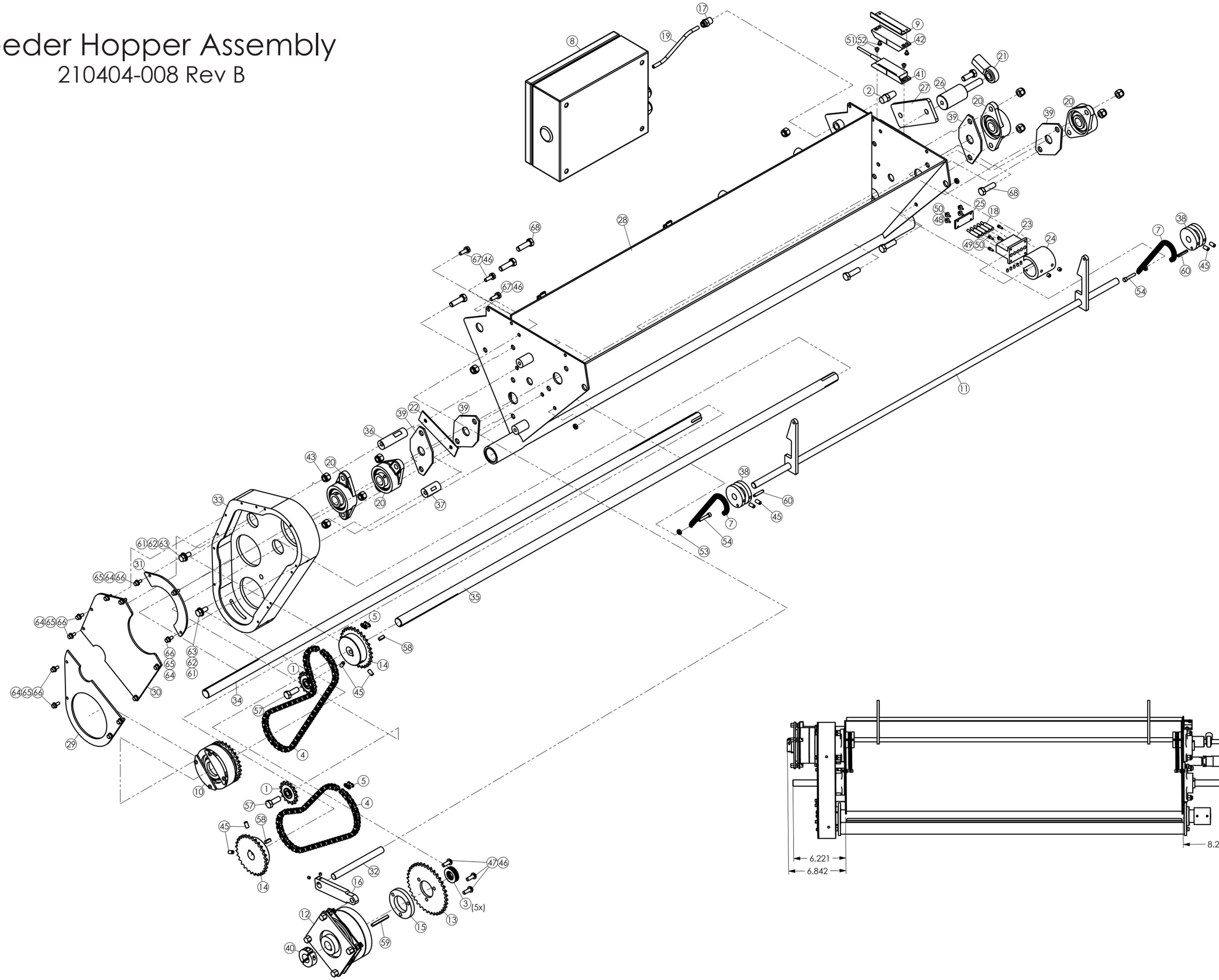
Seeder Hopper Assembly
210404-008 Rev B

ITEM #	QTY.	PART#	DESCRIPTION
1	2	103478	SPROCKET IDLER, 35-A-15 3/8" BORE
2	1	111498	FITTING,MUFFLER,1/4 NPTM,BRS
3	5	122223	BUSH,MACH 3/4ID 1-1/4 ODX.0747
4	3'	152169	CHAIN,ROLL,#35,NICKEL PLATED
5	2	152175	CHAIN LINK #35 CONNECTING N.P.
6	2	152180	CHAIN,LINK,#35,OFFSET,SHORT PIN,NP
7	2	152186	SPRING EXTENSION
8	1	210386-004	ASSY, ENCL, SEEDER HOPPER, 9840-BBU
9	2	300684	BRACKET, SEEDER MAGLOCK MT, CE
10	1	304060	ASSY, MANDREL DRIVE
11	1	304195	A/W, HOPPER COVER LATCH, 9840
12	1	304239	CLUTCH/BRAKE, SHAFT MOUNT 24 V.
13	1	304264	SPROCKET RWK 35-A-36 1.43" B
14	2	304265	SPROCKET, RWK 35-B-28 3/4" BORE
15	1	304322	SPACER, CLUTCH SPROCKET
16	1	304323	PLATE, RESTRAINT C/B, 9840
17	1	401152	FITTING,CONN,1/4MPT X 1/4T,ENP,Q.R.
18	5	610151	SENSOR,PROX,6.5MM,10-30VDC,PNP,N.O.
19	1'	610885-07	TUBING, 1/4" POLYURETHANE, CLEAR
20	4	611387	BEARING, 3/4", 2 BOLT FLANGE, SST
21	1	710623	RWK,BEARING, ROD END,1/2-20NF
22	1	711573	PLATE, AGITATOR COVER
23	1	712022	BLOCK, MANDREL SENSOR MT, 9840S
24	1	712023	CLAMP, MANDREL SENSOR BLOCK
25	1	712024	PLATE, COVER, MANDREL SENSOR, 9840S
26	1	712042	ROD, CYLINDER MT, HOPPER DUMP, 9840S
27	1	712127	BAR, HOPPER AIR CYL. STIFFENER
28	1	715520	A/W, SEEDER HOPPER, 9840S, R/H
29	1	715524	COVER, MANDREL DRIVE SPROCKET, LWR
30	1	715525	COVER, MANDREL DRIVE SPRKT, MID
31	1	715526	COVER, MANDREL DRIVE SPRKT,TOP
32	1	715527	STANDOFF, C/B SHAFT LOCK
33	1	715537-002	GUARD, CHAIN, MANDREL/CLUTCH, RH
34	1	715612	SHAFT, HOPPER INNER, 9840-BBU

ITEM #	QTY.	PART#	DESCRIPTION
35	1	715613	SHAFT, CLUTCH BRAKE, 9840-BBU
36	1	715614	ROD, ECCENTRIC IDLER, LONG
37	1	715615	ECCENTRIC, IDLER SHAFT, SHORT
38	2	A04792	COLLAR, LATCH RETURN, HOPPER
39	4	A05015	PLATE, BEARING SEAL
40	1	A05020	COLLAR,3/4" SPLIT,SST
41	1	C07219	SENSOR,INTERLOCK,MAGNETIC,KEYED
42	1	C07220	ACTUATOR, MAGNET
43	10	955620	NUT HEX NYLOC 3/8-16 UNC SST
44	2	971803	SCREW SET SOC #10-24 UNC X 3/16 SST
45	8	971208	SCREW SET SOC 1/4-20 UNC X 1/2 SST
46	6	955940	WASHER LOCK 1/4" SST
47	3	985712	SCREW BUTT HD SOC 1/4-20 X 3/4 SST
48	4	955971	WASHER FLAT #4 SST
49	8	955935	WASHER LOCK #4 SST
50	8	976006	SCREW SOC HD CAP #4-40 X 3/8 SST
51	4	955942	WASHER LOCK #8 SST
52	4	986904	SCREW BUTT HD SOC #8-32 X 1/4 SST
53	4	955380	NUT HEX JAM #10-24 UNC SST
54	2	978916	SCREW SOC HD CAP #10-24 UNC X 1 SST
55	5	972704	SCREW SET SOC #6-32 X 1/4 SST
56	2	971204	SCREW SET SOC 1/4-20 UNC X 1/4 SST
57	3	988916	SCREW FIN HEX 3/8-16 X 1 SST
58	2	955457	KEY SQ 3/16 X 1/2 .002 UNDER SIZE
59	1	955455	KEY, SQ 3/16 X 1 3/4 (CUT FROM C01260)
60	2	958416	PIN ROLL 3/16 X 1 SST
61	2	955976	WASHER FLAT 5/16 SST
62	2	955939	WASHER, LOCK 5/16" SST
63	2	989712	SCREW FIN HEX 5/16-18 X 3/4 SST
64	13	955978	WASHER FLAT #10 SST
65	13	955941	WASHER LOCK #10 SST
66	13	978908	SCREW SOC HD CAP #10-24 UNC X 1/2
67	3	989912	SCREW FIN HEX 1/4-20 X 3/4 SST
68	6	988920	SCREW FIN HEX 3/8-16 X 1 1/4 SST

Seeder Hopper Assembly

210404-008 Rev B



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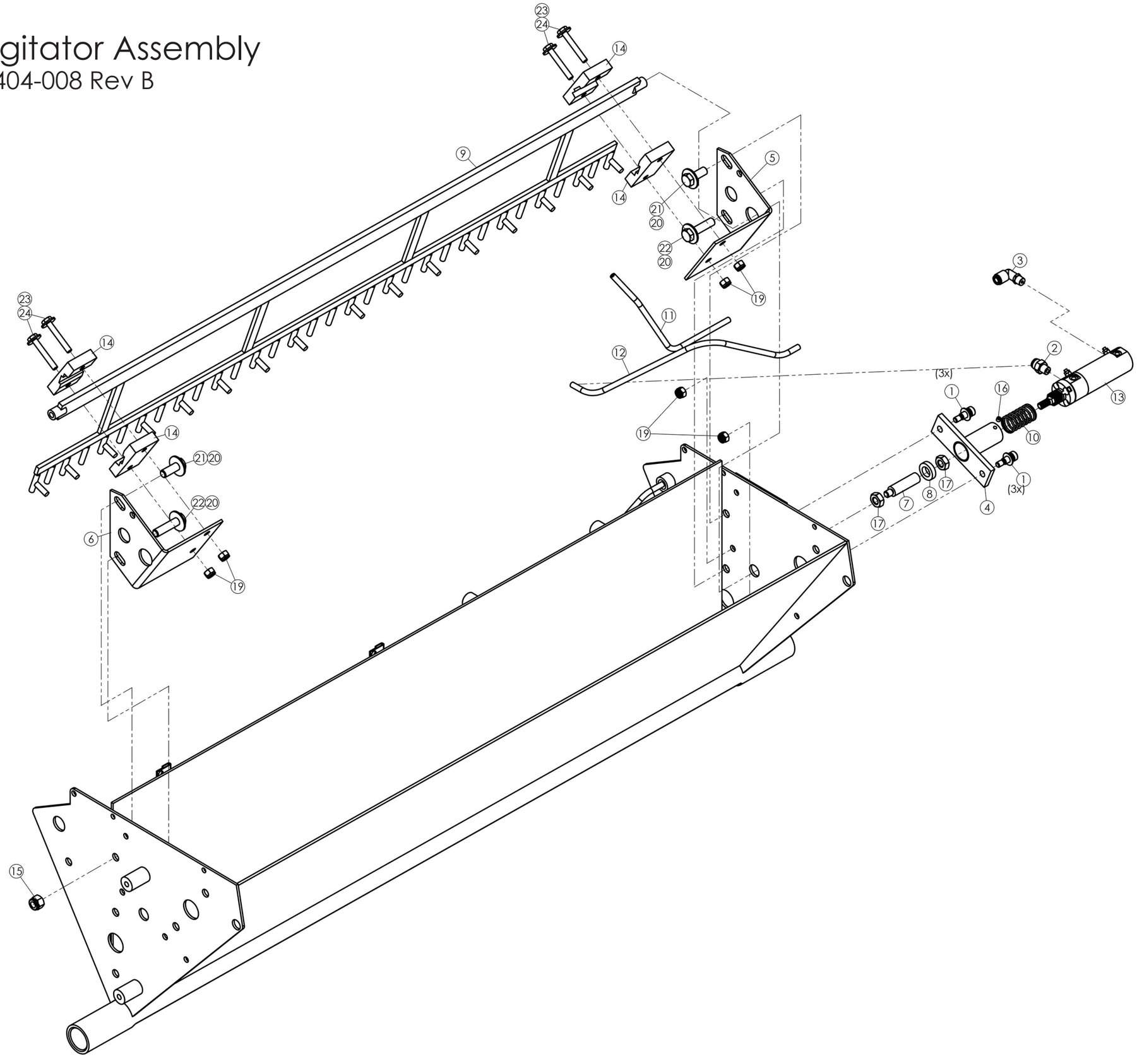
Hopper Agitator Assembly
210404-008 Rev B

ITEM #	QTY.	PART#	DESCRIPTION
1	6	113646	WASHER BELLEVILLE SPRING
2	1	119534	FITTING,CONN,1/8MPT X 1/4T,ENP,Q.R.
3	1	174049	FITTING,ELL,1/8MPT X 1/4T,Q.R,SHORT
4	1	304280	A/W, MOUNT CYLINDER AGIT, 9840
5	1	304284	BRACKET, SLIDE MOUNT AGIT, 9940
6	1	304285	BRACKET, SLIDE MOUNT AGIT, 9940
7	1	304610	SHAFT, AGITATOR CONNECTOR
8	1	304611	SEAL, HOPPER AGITATOR
9	1	304986	A/W, DUAL RAKE, 9840 AGITATOR
10	1	610504	SPRING,COMP .88 OD X .067 WD X 1.5 FL
11	1	610885-02	TUBING, 1/4" POLYURETHANE, BLUE
12	1.5'	610885-04	TUBING, 1/4" POLYURETHANE, RED
13	1	611366	CYLINDER, AIR, 1" BORE, 1" STRK, MAG
14	4	A04348	BLOCK, BEARING, SEEDER
15	1	955620	NUT HEX NYLOC 3/8-16 UNC SST
16	1	971803	SCREW SET SOC #10-24 UNC X 3/16 SST
17	2	955375	NUT HEX FIN 3/8-16 UNC SST
18	2	975008	SCREW SHLDR 5/16 X 1/2, 1/4-20 SST
19	6	955661	NUT HEX NYLOC 1/4-20 UNC SST
20	4	955975	WASHER FLAT 3/8" SST
21	2	988916	SCREW FIN HEX 3/8-16 X 1 SST
22	2	988924	SCREW FIN HEX 3/8-16 X 1 1/2 SST
23	4	955977	WASHER FLAT 1/4" SST
24	4	989928	SCREW FIN HEX 1/4-20 X 1 3/4 SST

Hopper Agitator Assembly

210404-008 Rev B



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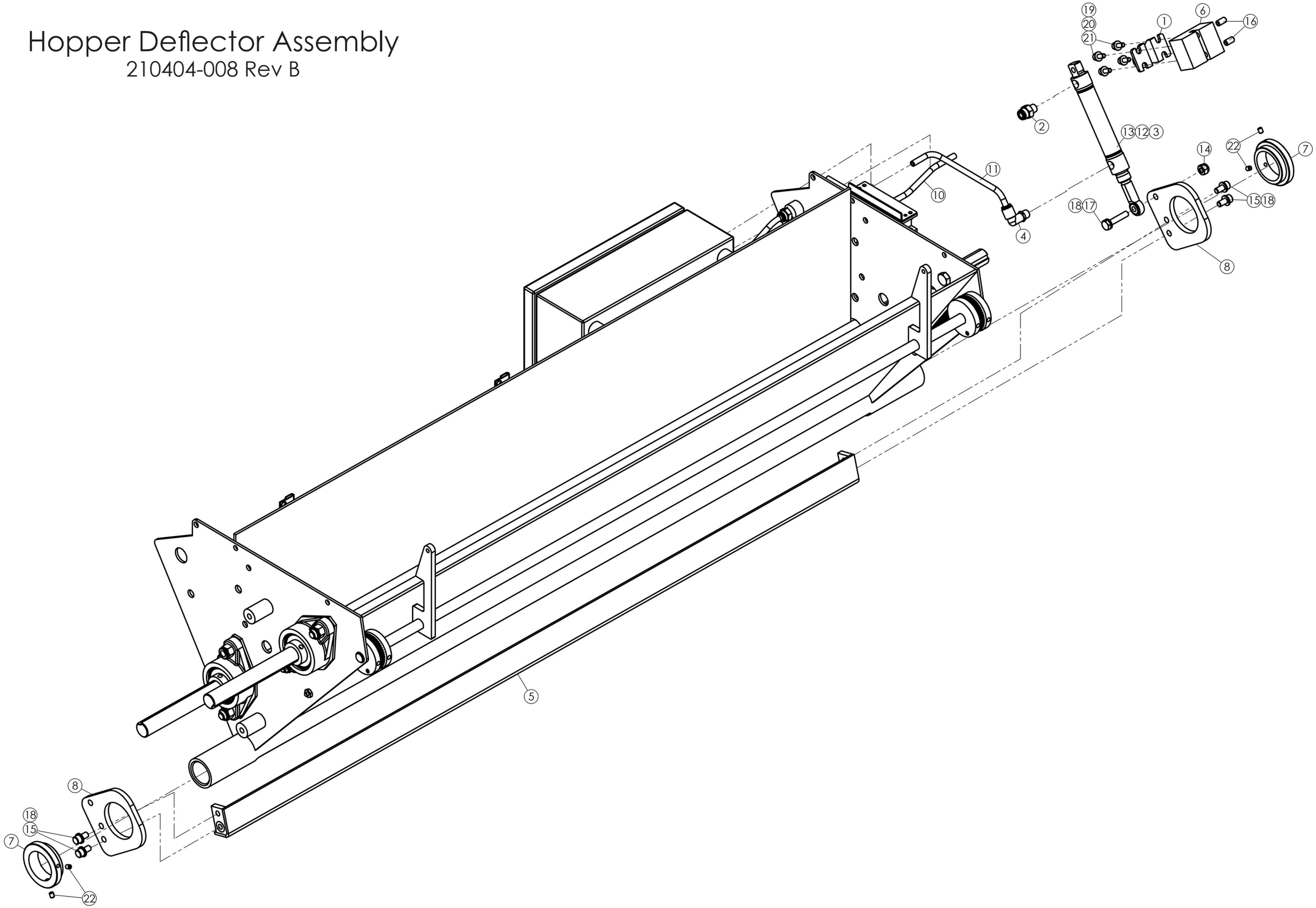
Hopper Deflector Assembly
210404-008 Rev B

ITEM #	QTY.	PART#	DESCRIPTION
1	1	111937	PIVOT BRACKET CYLINDER (PKG)
2	1	119534	FITTING,CONN,1/8MPT X 1/4T,ENP,Q.R.
3	1	152074	ROD END, BEARING 1/4"
4	1	174049	FITTING,ELL,1/8MPT X 1/4T,Q.R,SHORT
5	1	304125	A/W, DEFLECTOR, 9840
6	1	304130	BLOCK CYL MOUNT DEFL. 9840
7	2	304192	COLLAR PIVOT DEFLECTOR 9840
8	2	304193	PLATE, SWIVEL DEFLECTOR
9	1	401152	FITTING,CONN,1/4MPT X 1/4T,ENP,Q.R.
10	1'	610885-02	TUBING, 1/4" POLYURETHANE, BLUE
11	1'	610885-04	TUBING, 1/4" POLYURETHANE, RED
12	1	C02463	TRIP COLLAR
13	1	301406	CYLINDER, AIR, 3/4" BORE, 2" STROKE
14	1	955661	NUT HEX NYLOC 1/4-20 UNC SST
15	4	978308	SCREW SOC HD CAP 1/4-20 X 1/2 SST
16	2	971208	SCREW SET SOC 1/4-20 UNC X 1/2 SST
17	1	989920	SCREW FIN HEX 1/4-20 X 1 1/4 SST
18	5	955940	WASHER LOCK 1/4" SST
19	4	955978	WASHER FLAT #10 SST
20	4	955941	WASHER LOCK #10 SST
21	4	978908	SCREW SOC HD CAP #10-24 UNC X 1/2 SST
22	4	971804	SCREW SET SOC #10-24 UNC X 1/4 SST

Hopper Deflector Assembly

210404-008 Rev B



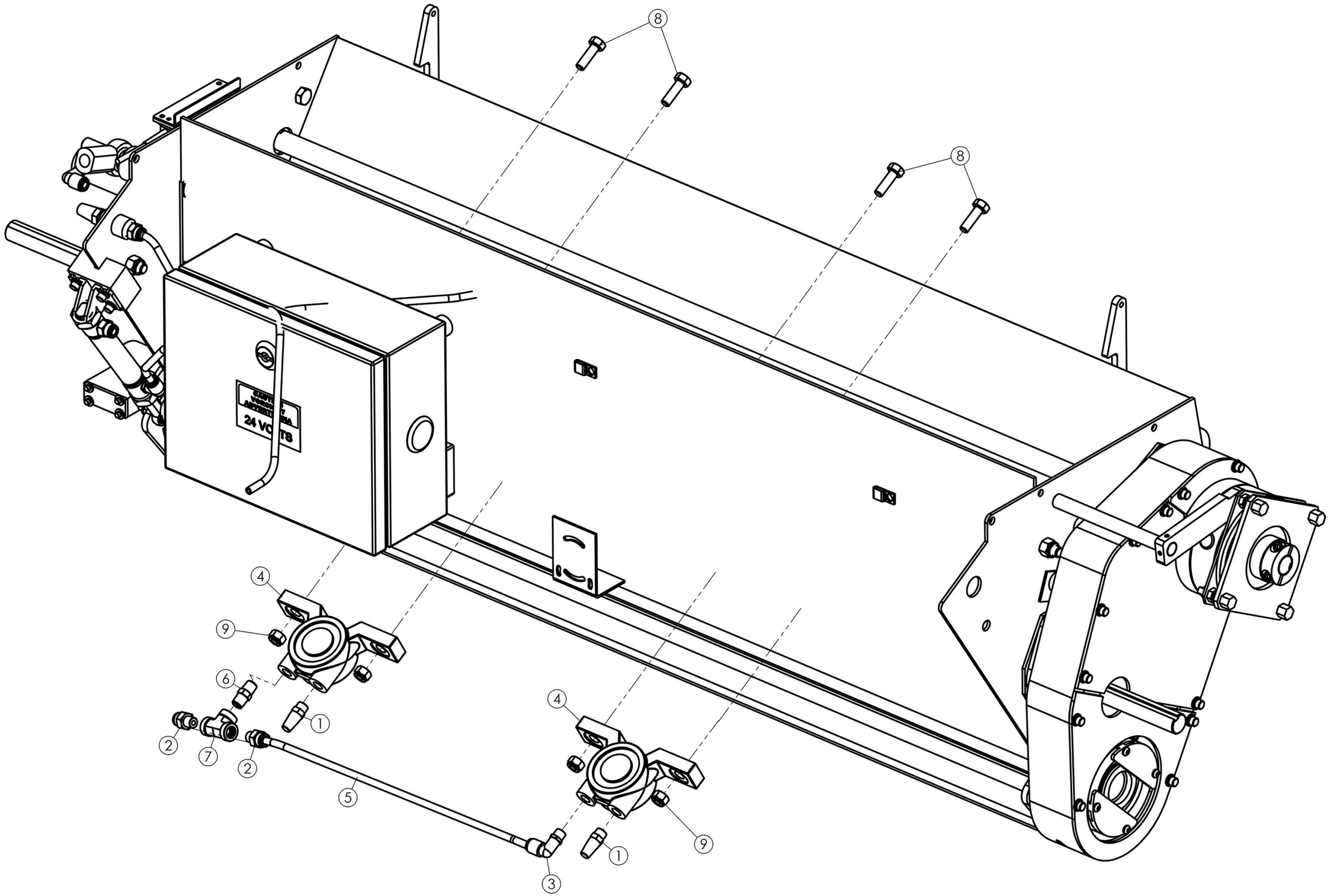
FOLD OUT TO VIEW DRAWING

Hopper Vibrator Assembly
210404-008 Rev B

ITEM #	QTY.	PART#	DESCRIPTION
1	2	111497	MUFFLER, 1/8" NPT
2	2	119534	FITTING,CONN,1/8MPT X 1/4T,ENP,Q.R.
3	1	174049	FITTING,ELL,1/8MPT X 1/4T,Q.R,SHORT
4	2	301455	VIBRATOR AIR US-13
5	1	610885-07	TUBING, 1/4" POLYURETHANE, CLEAR
6	1	A06905	FITTING,NIPPLE,HEX,1/8 NPTM,SST
7	1	C00924	FITTING, TEE, 1/8" NPT, SST
8	4	989716	SCREW FIN HEX 5/16-18 X 1 SST
9	4	955619	NUT HEX NYLOC 5/16-18 UNC SST

Hopper Vibrator Assembly

210404-008 Rev B



FOLD OUT TO VIEW DRAWING

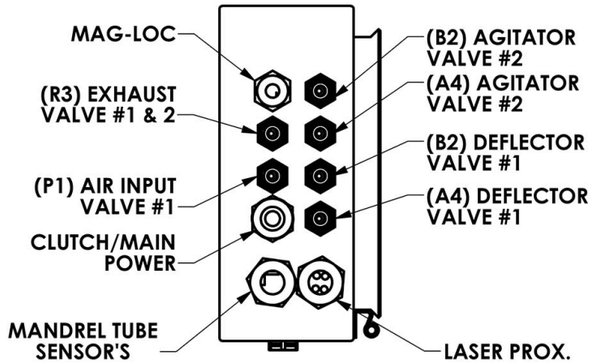
Hopper Enclosure Assembly

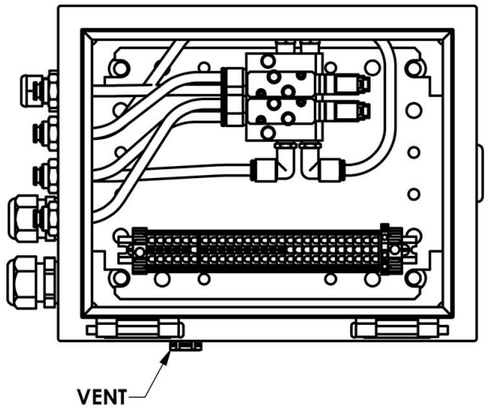
210386-004 Rev A

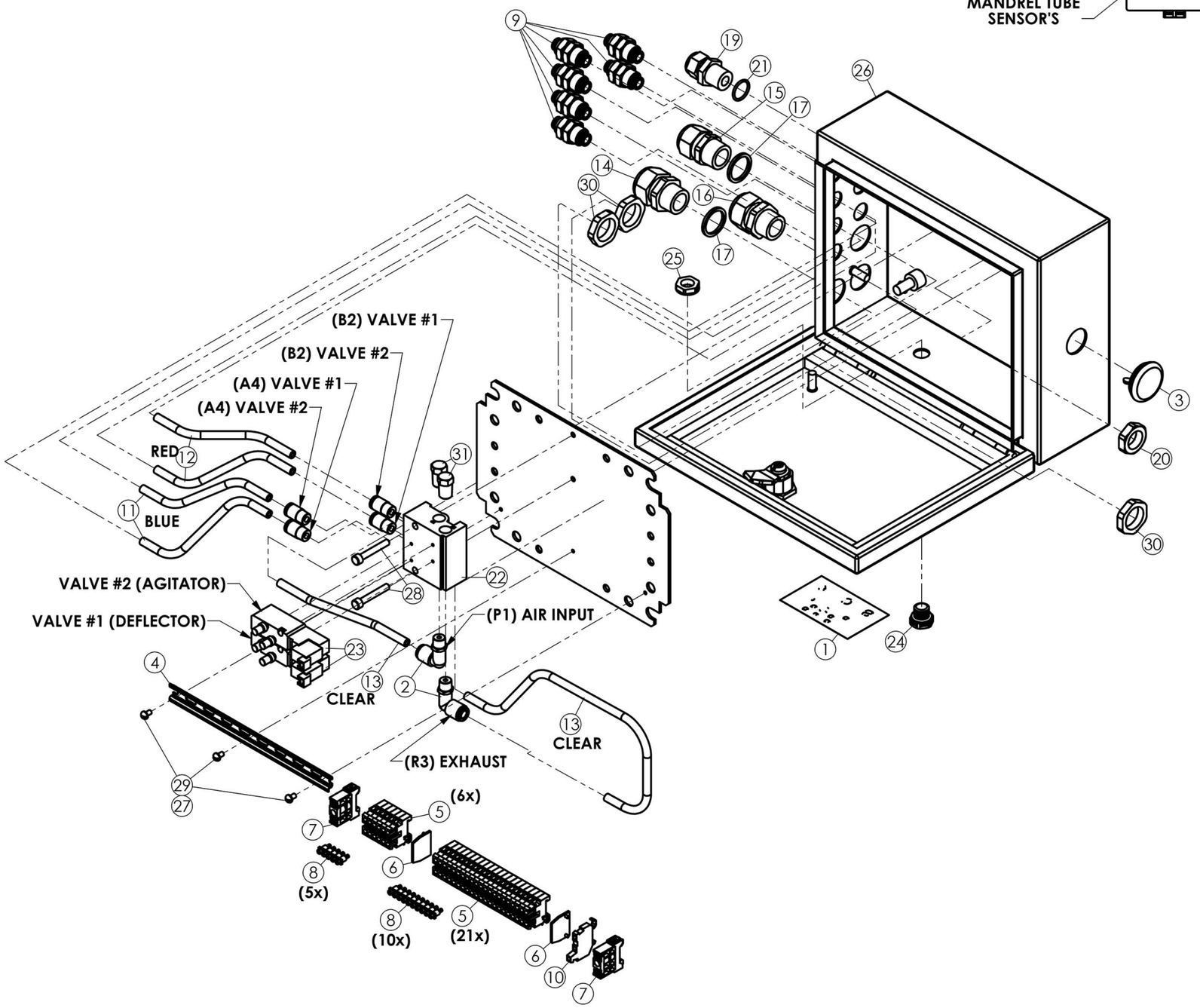
ITEM #	QTY.	PART#	DESCRIPTION
1	1	113315	DECAL,24 VOLTS
2	2	174049	FITTING,ELL,1/8MPT X 1/4T,Q.R,SHORT
3	1	303056	PLUG, HOLE, SST 7/8" DIA
4	7"	610360	TERMINAL, DIN RAIL, MINI
5	27	610361	TERMINAL, BLOCK, MINI
6	2	610362	TERMINAL,END COVER,MINI
7	2	610363	TERMINAL,ANCHOR,END CLAMP,MINI
8	1.5	610364	TERMINAL, JUMPER, 10-POLE, MINI
9	6	610459	FITTING, BULKHEAD UNION 1/4T, ENP
10	1	610534	TERMINAL,GROUNDING,MINI
11	2'	610885-02	TUBING, 1/4" POLYURETHANE, BLUE
12	2'	610885-04	TUBING, 1/4" POLYURETHANE, RED
13	2'	610885-07	TUBING, 1/4" POLYURETHANE, CLEAR
14	1	610952	CONNECTOR, SEAL INSERT, .160 4 HOLES
15	1	610953	CONNECTOR, CORD, .20-.35, DOME, NYLON
16	1	610954	CONNECTOR, CORD, .39-.56, DOME, NYLON
17	3	610955	CONNECTOR,SEAL RING,1/2NPT,POLYETH
18	4	610966	FITTING,CONN,1/8NPT x 1/4T, Q.R.,HEX
19	1	610969	CONNECTOR,CORD,3/16-5/16 STR, NYLON
20	1	610974	CONNECTOR,LOCKING-NUT,3/8NPT,NYLON
21	1	610975	CONNECTOR 0-RING 3/8 NPT .51 OD .06 THK
22	1	611364	VALVE, MANIFOLD, 2 STATION, 1/8"NPT PORTS
23	2	611365	VALVE,SOL,2-WAY,w/ FLOW CNTRLS
24	1	611371	MEMBRANE VENT, .413"
25	1	611372	NUT, BACKING, MEMBRANE VENT
26	1	715536-002	RWK, ENCLOSURE, 9.84x7.87x 3.98 (611875)
27	3	955936	WASHER LOCK #6 SST
28	2	978820	SCREW SOC HD CAP #10-32 UNF X 1 1/4" SST
29	3	999504	SCREW RD HD SLOT #6-32 X 1/4 SST
30	3	C00174	LOCKING NUT, 1/2 NPT, NYLON
31	2	C00916	FITTING,PLUG,1/8 NPTM,SST
32	4	C05724	VARISTOR,SURGE,125A,25VAC,31VDC
33	6'	C07066	CABLE,22AWG,25 COND

Hopper Enclosure Assembly

210386-004 Rev A







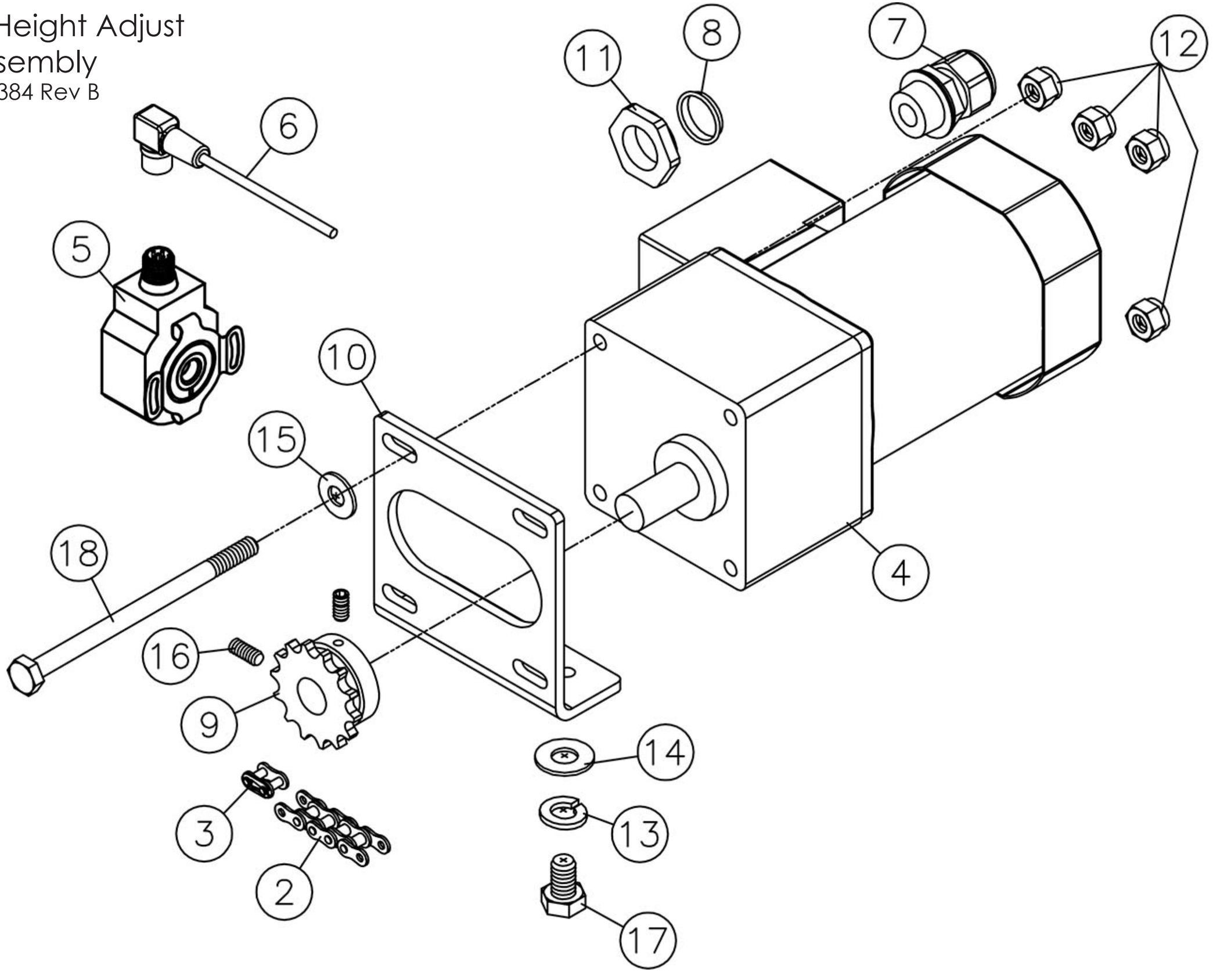
FOLD OUT TO VIEW DRAWING

Hopper Height Adjust Assembly
210384 Rev B

ITEM #	QTY.	PART#	DESCRIPTION
1	5'	142113	CABLE, 16AWG, 4 COND
2	1'	303631	CHAIN LINK #35 ROLL NICKEL PLATE
3	1	152175	CHAIN LINK #35 CONNECTING
4	1	304123-001	GEARMOTOR, 1/8HP, 100RPM, 3.6:1 RATIO
5	1	611469-010	ENCODER, 3/8 BORE, IP64,10CPR,SMJ
6	1	C06754-002	SENSOR, CABLE M12,5WIRE,F,QC,90,SH
7	1	610954	CONNECTOR, CORD,.39-.56, DOME, NYLON
8	1	610955	CONNECTOR,O RING,1/2NT,BUNA-N
9	1	712026	SPROCKET, REWORK, 35B14 5/8 BORE
10	1	712027	BRACKET, MOTOR MT, HEIGHT ADJ, 9840S
11	1	C00174	CONNECTOR, LOCKING NUT,1/2NPT, NYLON
12	4	955661	NUT HEX NYLOC 1/4-20 UNC SST
13	2	955939	WASHER LOCK 5/16 SST
14	2	955976	WASHER FLAT 5/16 SST
15	4	955977	WASHER FLAT 1/4 SST
16	2	971808	SCREW SET SOC 10-24 X 1/2 SST
17	4	989610	SCREW FIN HEX 5/16-24 X 5/8 SST
18	4	989964	SCREW FIN HEX 1/4-20 X 4 SST

Hopper Height Adjust Assembly

210384 Rev B



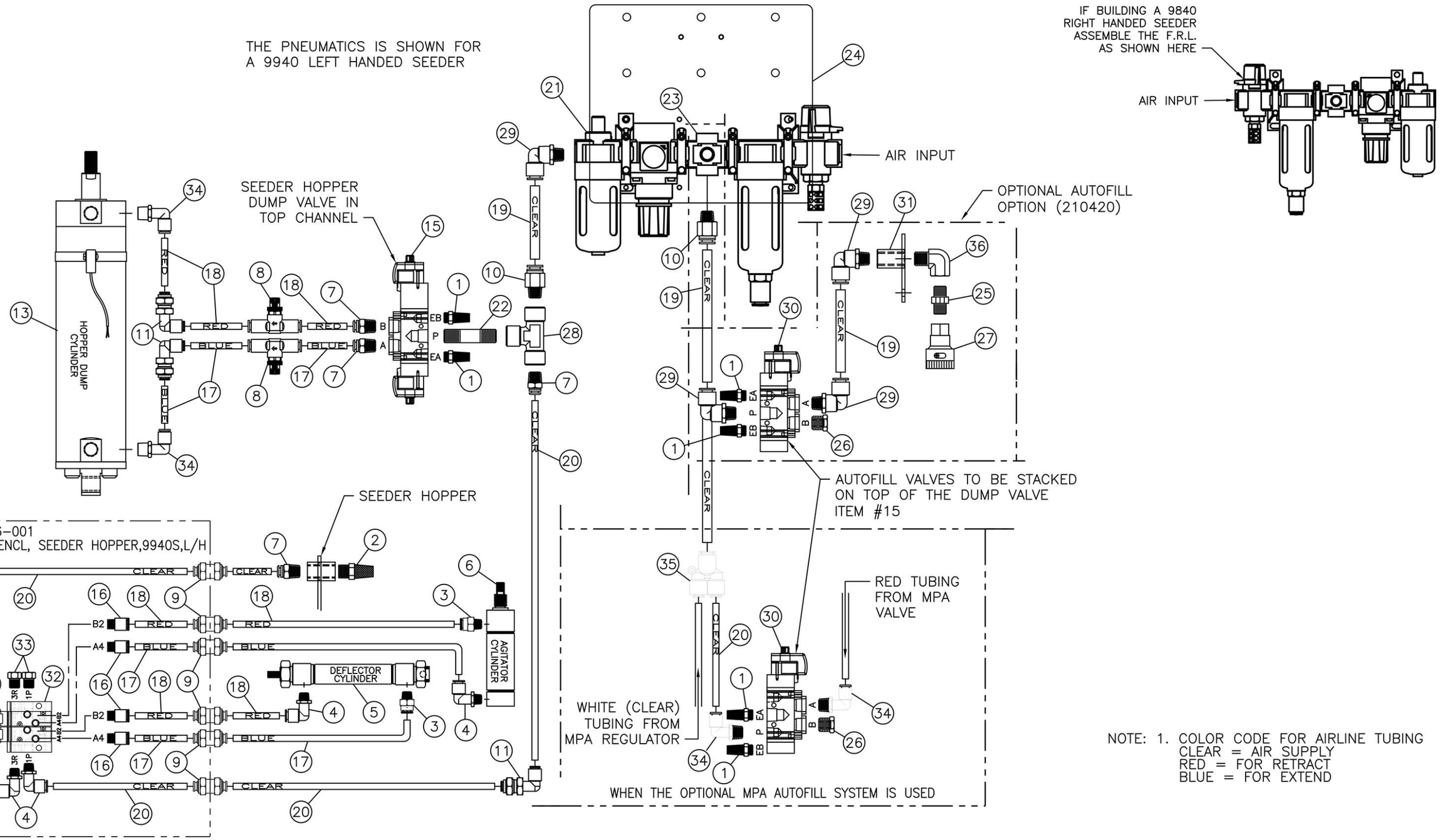
FOLD OUT TO VIEW DRAWING

Seeder Pneumatic System
210385 Rev D

QTY	ITEM	PART #	DESCRIPTION
1	36	110417	FITTING,STREET ELL,1/4M X 1/4F,BRS
1	35	610673	FITTING "Y" 3/8 X 1/4 2X QR
4	34	610602	FITTING,ELL,1/4NPT X 1/4T,ENP,Q.R.
2	33	C00916	FITTING,PLUG,1/8 NPTM,SST
1	32	611364	VALVE,MANIFOLD,2 STATION,1/8" PORT
1	31	712305	A/W, AUTO FILL Q.C. MOUNT
1	30	611117	VALVE,SOL,24V,2 WAY,1/4P
4	29	610505	FITTING,ELL,1/4NPT X 3/8T,Q.R
1	28	A06858	FITTING, TEE, 1/4 NPTF, SST
1	27	118872	FITTING,QC,BODY,AIR,1/4 NPTF,BRS
1	26	110423	FITTING,PLUG,1/4 NPTM,BRS
1	25	110414	FITTING,NIPPLE,HEX,1/4 NPTM,BRS
1	24	C03335	PLATE, FRL MOUNTING
1	23	C00398-002	PORTING BLOCK INSERT KIT
1	22	C00905	FITTING, NIPPLE, 1/4 NPTM X 2, SST
1	21	C00404	F.R.L. COMBO, 1/4 NPTF, 72 SERIES
30'	20	610885-07	TUBING, 1/4" POLYURETHANE, CLEAR
20'	19	610886-07	TUBING, 3/8" POLYURETHANE, CLEAR
25'	18	610885-04	TUBING, 1/4" POLYURETHANE, RED
7'	17	610885-02	TUBING, 1/4" POLYURETHANE, BLUE
4	16	610966	FITTING, CONN, 1/8NPT X 1/4T, Q.R., HEX
1	15	611119	VALVE,SOL,24V,3 WAY,CLOSED CEN,1/4P
2	14	611365	VALVE,SOL,24VDC,2-WAY,W/FLOW CTRLS
1	13	210446	ASSY, CYLINDER, HOPPER DUMP
1	12	611363	VALVE,MANIFOLD,BLANK PLATE(611364)
3	11	610956	FITTING, BLKHD ELL 1/4T, ENP, Q.R.
2	10	610507	FITTING, CONN, 1/4NPT X 3/8T, ENP, Q.R.
6	9	610459	FITTING, BULKHEAD UNION 1/4T, ENP
2	8	401302	VALVE, REG, FLOW CONTROL, ENP, Q.R.
4	7	401152	FITTING, CONN, 1/4MPT X 1/4T ,ENP, Q.R.
1	6	611366	CYLINDER AIR 1 1/16 BORE 1" STR MAG
1	5	301406	CYLINDER, AIR, 3/4" BORE, 2" STROKE
2	4	174049	FITTING, ELL, 1/8MPT X 1/4T, Q.R, SHORT
1	3	119534	FITTING, CONN, 1/8MPT X 1/4T, ENP, Q.R.
1	2	111498	FITTING, MUFFLER, 1/4 NPTM, BRS
4	1	111497	FITTING, MUFFLER, 1/8 NPTM

Seeder Pneumatic System

210385 Rev D



NOTE: 1. COLOR CODE FOR AIRLINE TUBING
CLEAR = AIR SUPPLY
RED = FOR RETRACT
BLUE = FOR EXTEND

FOLD OUT TO VIEW DRAWING

Water Spray/Split Assembly (MOD)

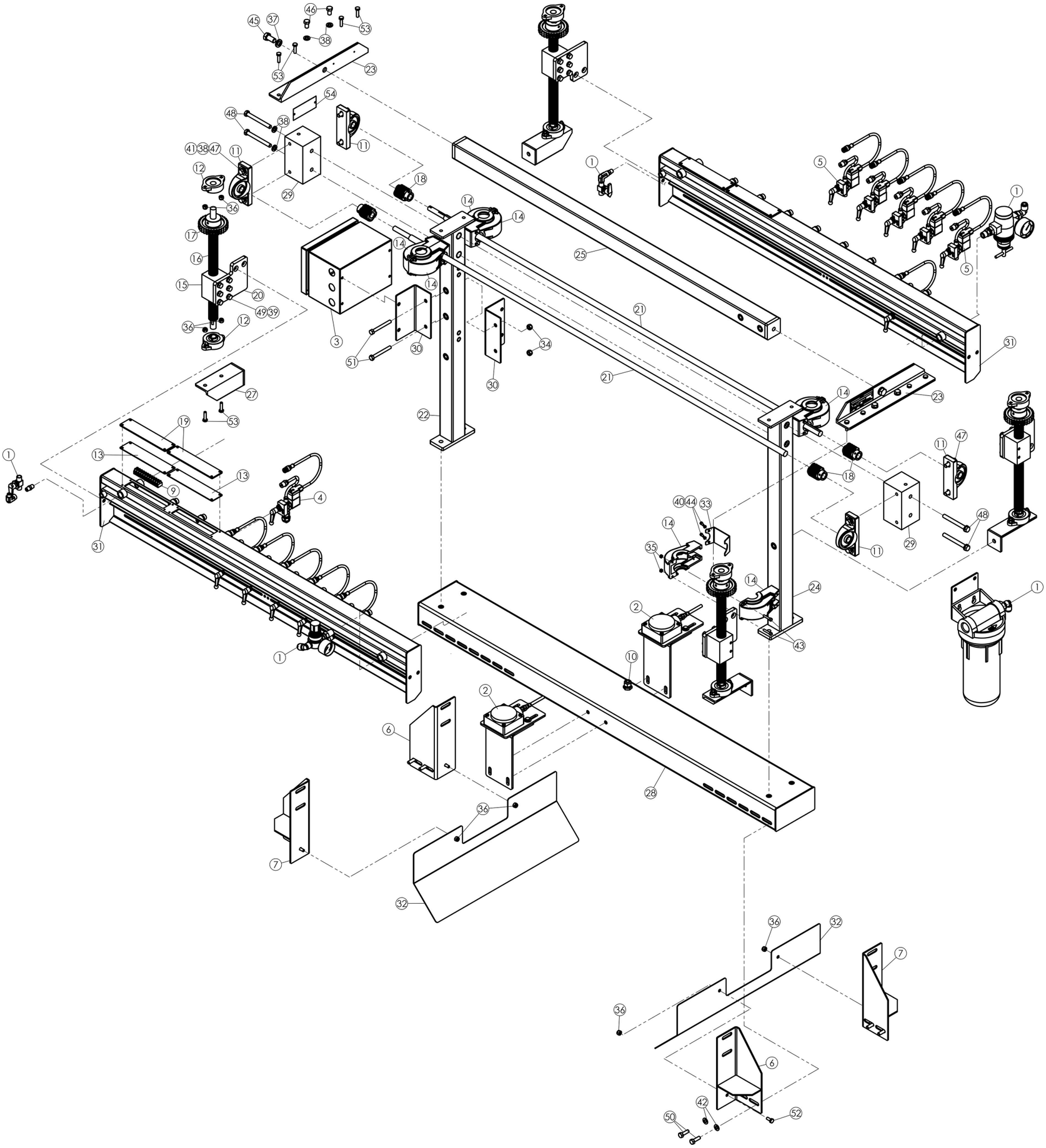
210766-002 Rev F

ITEM #	QTY.	PART#	DESCRIPTION
1	1	210391-002	ASSY, CIRCUIT, H20, DUAL SPRAY/SPLIT
2	2	210397-003	ASSY, SENSOR, PANCAKE PROX.
3	1	210769-002	ASSY, ENCLOSURE WATER, SPRAY/SPLIT
4	REF.	210398-PWM	ASSY, NOZZLE, WATER SPRAY, 9840
5	REF.	211099	ASSY, NOZZLE, WATER SPLITTER, 9840
6	2	304830	A/W, ANGLE MOUNT, 9840
7	2	304831	A/W, ANGLE MOUNT, 9840S
8	16	610169	SENSOR,BULKHEAD,M12,5 WIRE,F,QC
9	2	610967	TERMINAL,STRIP,BREAK-A-PART,MINI 12
10	1	610969	CONN.,CORD,3/16-5/16 STR, NYLON
11	4	611237	BEARING, 5/8 PILLOW BLOCK, SST
12	8	611238	BEARING, 5/8, 2 BOLT FLANGE, SST
13	4	611534	GASKET, TERMINAL MANIFOLD COVER
14	8	612307	GUARD, WORM GEAR HOUSING
15	4	711933	BLOCK, INNER CHASSIS, HEIGHT ADJ.
16	4	711934	SHAFT, INNER CHASSIS, HEIGHT ADJ.
17	4	711938	RWK, WORM GEAR
18	4	711939	RWK, WORM STEEL, 5/8" B, 10 D.P.
19	4	712058	PLATE, TERMINAL MANIFOLD COVER
20	4	712078	PLATE, MANIFOLD MNT. MAIN
21	2	712080	SHAFT, HEIGHT ADJUSTMENT, WATER
22	1	715630	A/W, UPRIGHT, WATER SPRAY FRAME
23	2	715639	ANGLE, SPRAY/SPLIT, MANIF. MT, TOP
24	1	715641	A/W, UPRIGHT, WATER SPRAY FRAME
25	1	715643	A/W, TOP CROSS SUPP., WATER FRAM
26	2	715645	A/W, SPRAY MANIF. BEARING MT, LWR
27	2	715647	A/W,SPRAY MANIF. BEARING MT, LWR
28	1	715662	A/W, BASE WATER SPRAY 46"

ITEM #	QTY.	PART#	DESCRIPTION
29	2	715665	BLOCK, WATER SPRAY, BEARING MT.
30	2	715666	BRACKET, ENCLOSURE MOUNT, WATER
31	1	715667	A/W, MANIFOLD, WATER 8 NOZ, L/H
	1	113516-023	A/W, MANIFOLD, WATER 10 NOZ
32	2	716159	PLATE,SPLASH GUARD,WATER SPRAY
33	4	716468	CHANNEL, WORM GEAR END PLATE
34	3	955619	NUT HEX NYLOC 5/16-18 UNC SST
35	8	955621	NUT HEX NYLOC #10-24 UNC SST
36	20	955661	NUT HEX NYLOC 1/4-20 UNC SST
37	6	955937	WASHER LOCK 1/2 SST
38	16	955938	WASHER, LOCK 3/8" SST
39	24	955939	WASHER, LOCK 5/16" SST
40	8	955942	WASHER LOCK #8 SST
41	8	955975	WASHER FLAT 3/8" SST
42	9	955976	WASHER FLAT 5/16 SST
43	8	978916	SCREW SOC HD CAP #10-24 UNC X 1
44	8	979506	SCREW SOC HD CAP #8-32 UNC X 3/8
45	2	988316	SCREW FIN HEX 1/2-13 X 1 SST
46	4	988910	SCREW FIN HEX 3/8-16 X 5/8 SST
47	8	988920	SCREW FIN HEX 3/8-16 X 1 1/4 SST
48	4	988956	SCREW FIN HEX 3/8-16 X 3 1/2 SST
49	24	989712	SCREW FIN HEX 5/16-18 X 3/4 SST
50	8	989716	SCREW FIN HEX 5/16-18 X 1 SST
51	2	989744	SCREW FIN HEX 5/16-18 X 2 3/4 SST
52	4	989910	SCREW FIN HEX 1/4-20 X 5/8 SST
53	16	989916	SCREW FIN HEX 1/4-20 X 1 SST
54	2	A05584	PLATE-SERIAL NUMBER

Water Spray/Split Assembly

210766-002 Rev F



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Pulsating Spray Gun
210389-PWM Rev B

ITEM #	QTY.	PART#	DESCRIPTION
1	1	119534	FITTING,CONN,1/8MPT X 1/4T,ENP,Q.R.
2	1	210379-PWM	ASSY, NOZZLE MOUNTING BLOCK
3	1	304208	ADJUSTABLE HANDLE 1/4-20 THREAD
4	1	401152	FITTING,CONN,1/4MPT X 1/4T,ENP,Q.R.
5	1'	610885-05	TUBING, 1/4" POLYURETHANE, YELLOW
6	1	611574	VALVE, PULSAJET GUN
7	1	955409	NUT HEX JAM 1/4-20 UNC SST
8	1	955940	WASHER LOCK 1/4" SST
9	1	955977	WASHER FLAT 1/4" SST
10	2	982912	SCREW FLT HD SOC #8-32 X 3/4 SST
11	1	C00506	RETAINER CAP CP1325-NP
12	1	C00565	TIP #650017 SS TEE JET
13	1	C07663	FIELD ATTACH, M12,5 WIRE,MALE

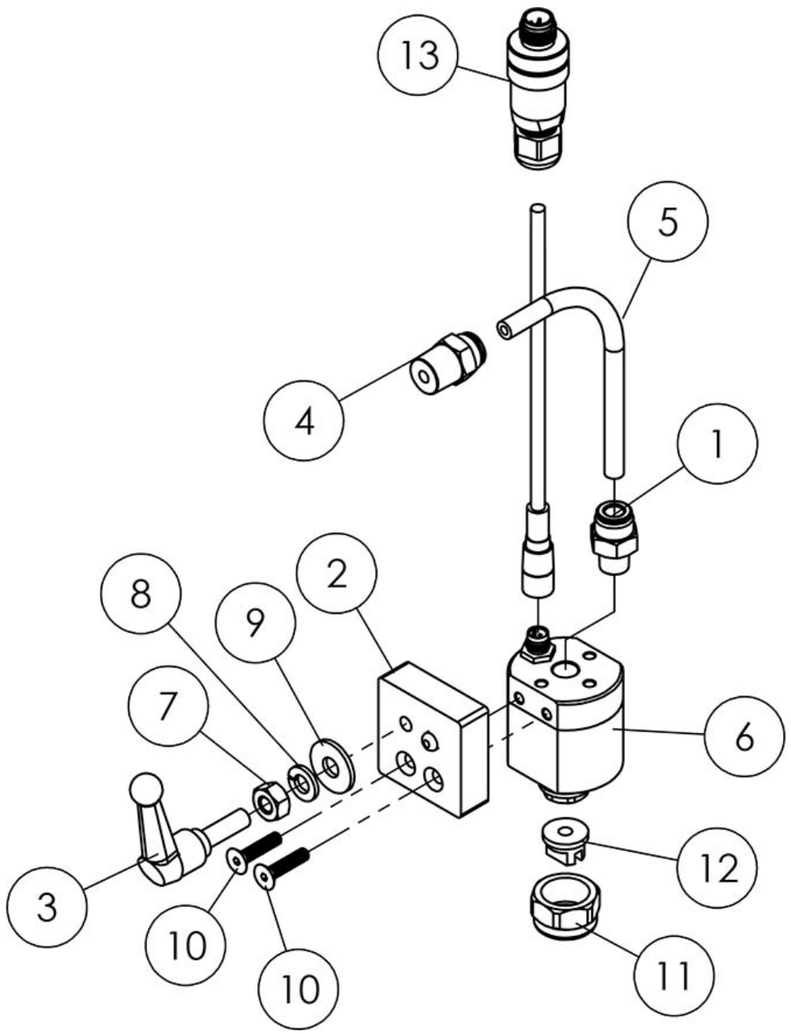
Proximity Sensor
210397-003 Rev B

ITEM #	QTY.	PART#	DESCRIPTION
1	1	304430	CABLE,SENSOR,M12,5WIRE,F,QC,STR
2	1	715600	PLATE, PROX. MNT.
3	1	715601	BRACKET, PROX. MNT
4	4	955621	NUT HEX NYLOC #10-24 UNC SST
5	2	955661	NUT HEX NYLOC 1/4-20 UNC SST
6	2	955977	WASHER FLAT 1/4" SST
7	4	982324	SCREW FLT HD SOC #10-24 X 1 1/2 SST
8	2	989914	SCREW FIN HEX 1/4-20 X 7/8 SST
9	1	C06752	SENSOR,PROX,80MM,10-55VDC,NPN,EDDY

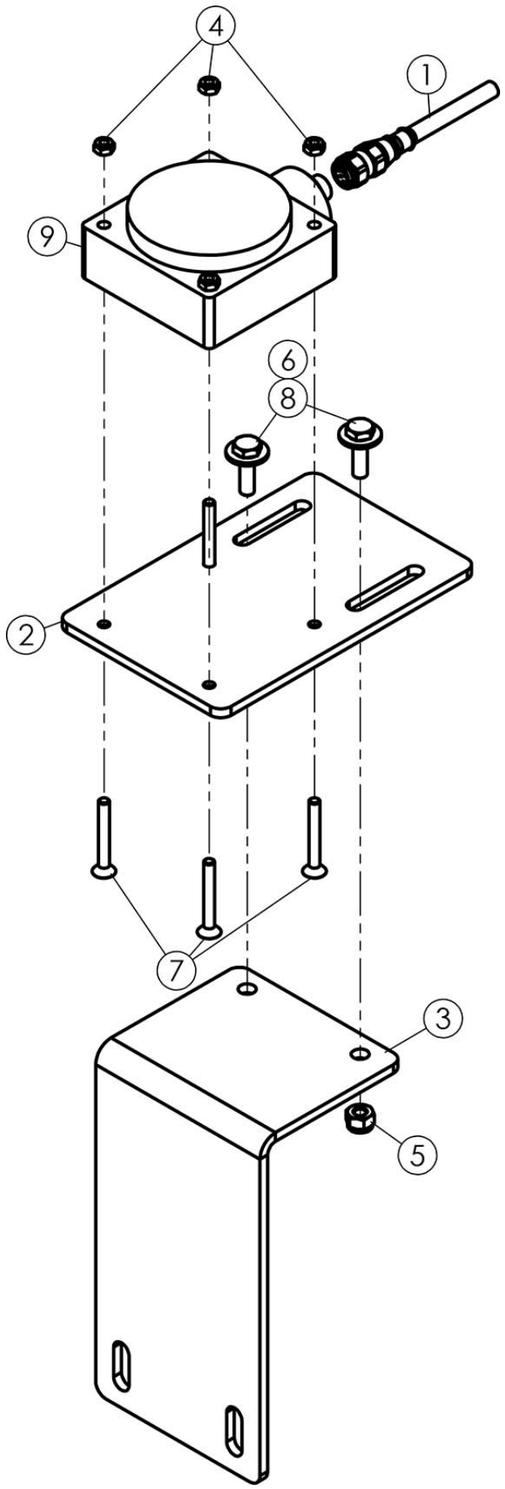
Splitter Nozzle
211099 Rev B

ITEM #	QTY.	PART#	DESCRIPTION
1	1	211100	ASSY, NOZZLE MOUNT (612008)
2	1	304208	ADJUSTABLE HANDLE 1/4-20 THREAD
3	1	401152	FITTING,CONN,1/4MPT X 1/4T,ENP,Q.R.
4	1	610187-002	CABLE,MICRO-CHANGE,M12,5WIRE,SPRAYM
5	1	610885-05	TUBING, 1/4" POLYURETHANE, YELLOW
6	1	610966	FITTING,CONN,1/8NPT x 1/4T, Q.R.,HEX
7	1	612008	VALVE,SOL SS 1/8NPT 2 WAY 24VDC
8	1	612018	TIP, SPLIT, BETE, .020", 1/8" NPT
9	1	955409	NUT JAM 1/4-20 UNC
10	1	955940	WASHER LOCK 1/4" SST
11	1	955977	WASHER FLAT 1/4" SST
12	2	MC0320	SCREW, FLAT HD, 3 X 20 MM

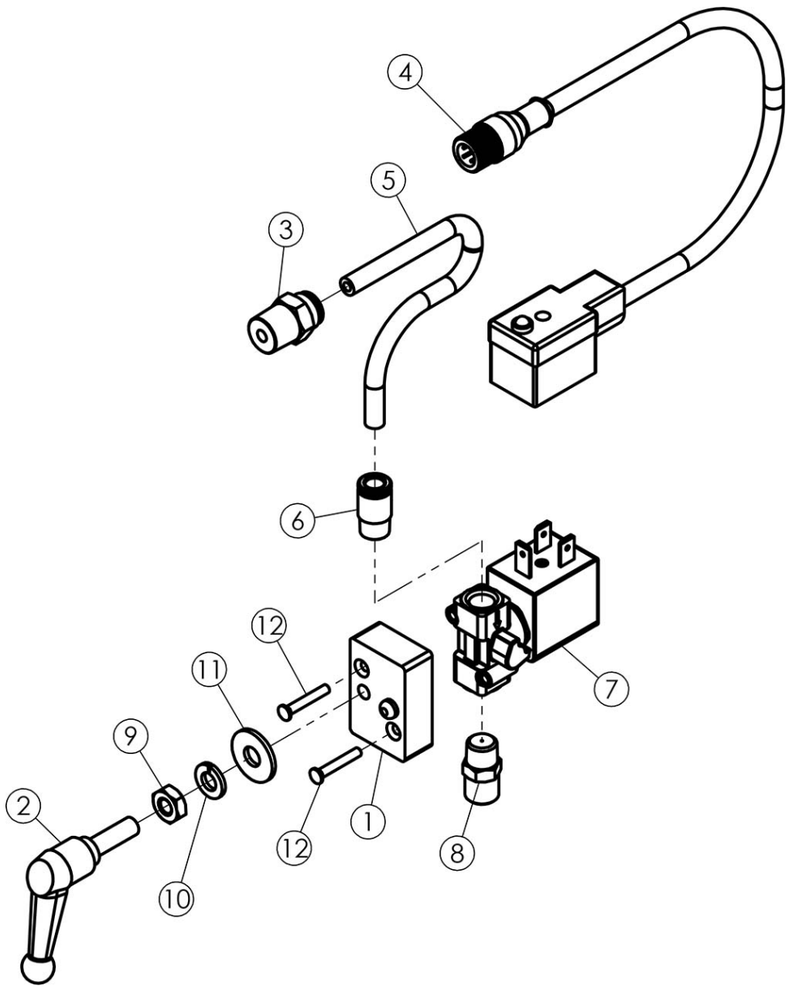
Pulsating Spray Gun
210389-PWM Rev B



Proximity Sensor
210397-003 Rev B



Splitter Nozzle
211099 Rev B



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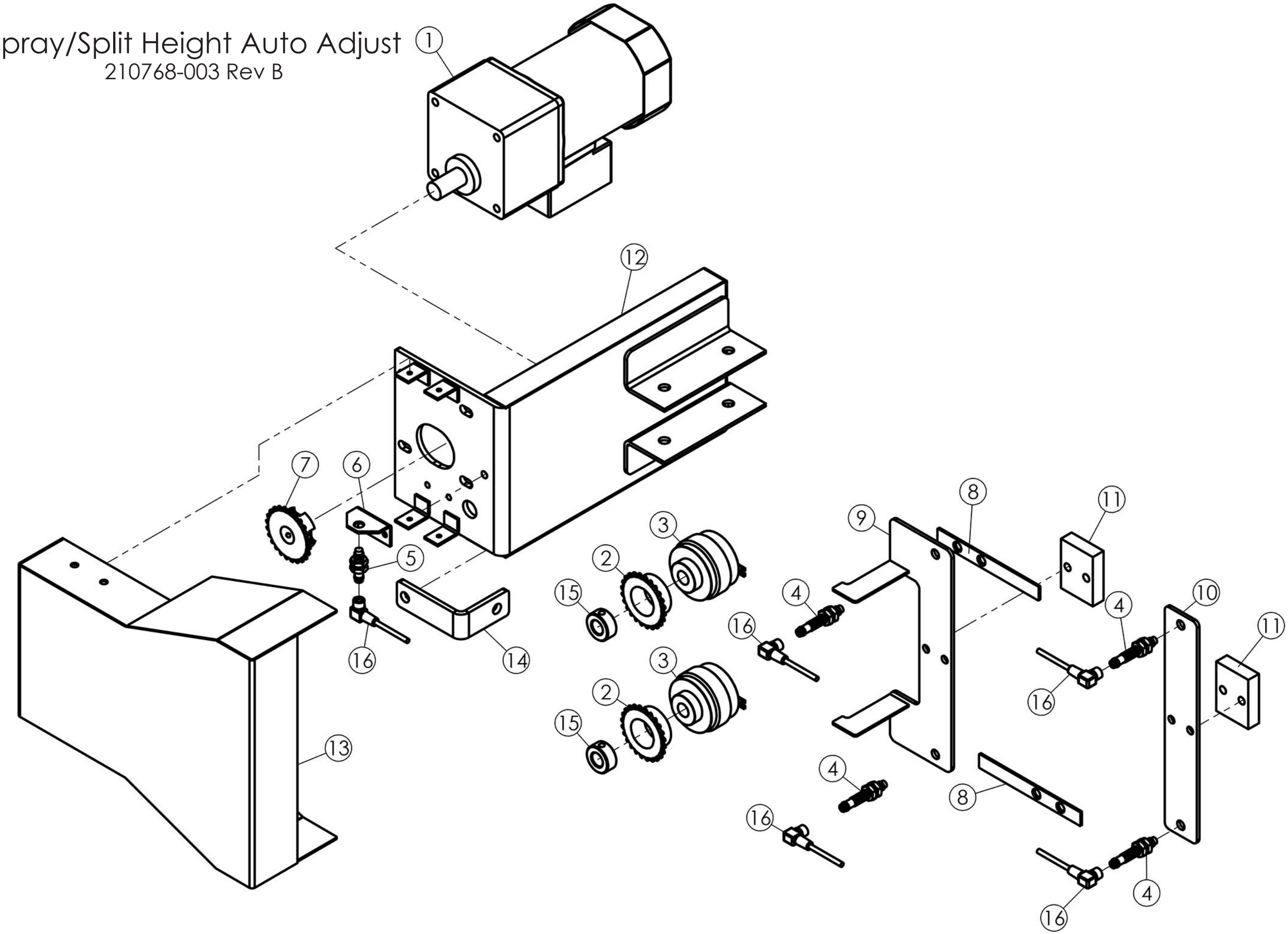
Spray/Split Height Auto Adjust
210768-003 Rev B

ITEM #	QTY.	PART#	DESCRIPTION
1	1	304123-001	MOTOR,GEAR,1/8HP,200/230-50/6,3.6:1
2	2	304219	SPROCKET,RWK,25-B-24 1.104 BORE
3	2	304238-001	CLUTCH,24 VDC,9840
4	4	304350-001	SENSOR,PROX,8MM,10-30V,PNP,NC,TURCK
5	1	304350-003	SENSOR,PROX,8MM,10-30V,PNP,NC,TURCK
6	1	712075	BRACKET, ENCODER MOTOR H2O
7	1	712076	SPROCKET, MOTOR H2O
8	2	712082-001	PLATE, SENSOR MNT.
9	1	715650	A/W, HOME SENSOR/CLUTCH TAB
10	1	715651	PLATE, OVERTRAVEL SENSOR MT
11	2	715653	BLOCK, SPACER, WATER SPRAY SENSOR
12	1	715654	A/W, MOTOR MOUNT, WATER
13	1	715657	A/W, CHAIN COVER FRONT, WATER
14	1	715661	BRACKET, MOTOR MNT SUPT
15	2	C05448	COLLAR,1/2" SET,SST
16	5	C07626	SENSOR,CABLE,M8,3WIRE,F,QC,90

Spray/Split Height Auto Adjust

210768-003 Rev B



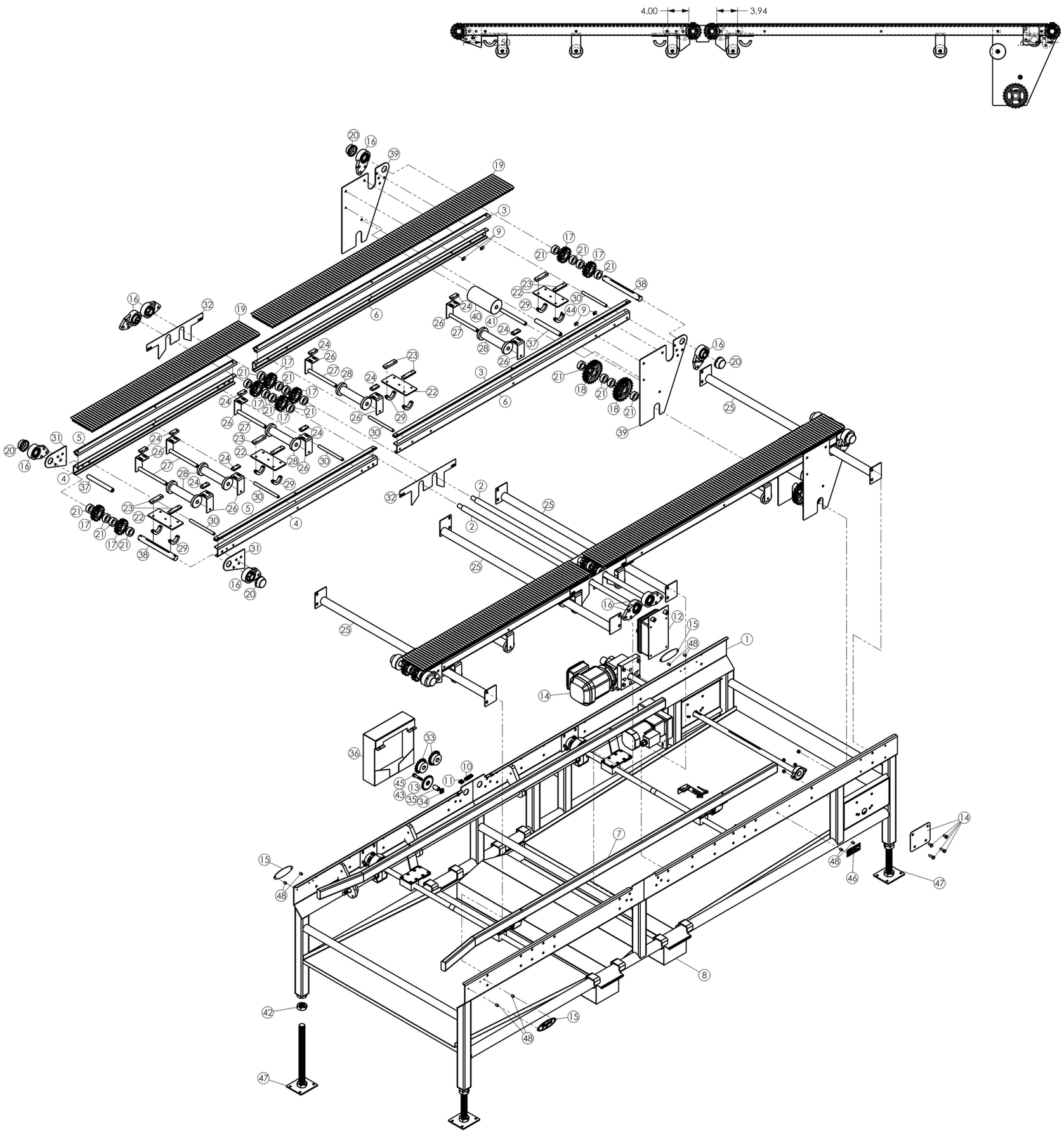
FOLD OUT TO VIEW DRAWING

Conveyor Components
113516-100

ITEM #	QTY.	PART#	DESCRIPTION
1	1	113516-001	A/W, CONV, 946RI-116S
2	2	113516-007	SHAFT, TRANSFER, 46"
3	4	113516-009	GUIDE, CLIP-ON, TABLETOP CHAIN, 116
4	4	113516-010	CHANNEL, CHAIN GUIDE, 116S
5	4	113516-013	GUIDE, CLIP-ON, TABLETOP CHAIN, 116
6	4	113516-017	CHANNEL, CHAIN GUIDE MNT.
7	1	113516-101	ASSY, PAN GUIDE, AUTO, 46" X 116S
8	1	113516-102	ASSY, CATCH TRAYS, 946RI-116S
9	8	118241	NUT, WELD ON 1/4-20 NC, SST.
10	1.50'	152173	CHAIN ROLL #40 NICKEL PLATED
11	1	152179	CHAIN LINK #40 RUSTLESS CONNECTING N.P.
12	1	210369	ASSY,MOTOR DISCONNECT,600V,15A
13	1	210647	ASSY, SPRKT IDLER, 40-A-17, 3/8" BORE
14	1	210934-046	CONVEYOR,DIRECT DRIVE,SEW,R/H,46"
15	3	303000	LABEL,BURFORD LOGO,4.25 SCRIPT
16	12	611635	BEARING, 1" BORE 3 HOLE FLANGE
17	16	611723	SPROCKET, 16T, 3.11" OD EZ CLEAN
18	4	611724	SPROCKET, 24T, 4.65" OD EZ CLEAN
19	44.00'	611725	BELT,6" WIDE x 1/2" PITCH,SERIES 1100
20	8	611868	END CAP, BEARING (611635)
21	40	711757	COLLAR, SET, 1" SST
22	8	712734	PLATE, CHAIN GUIDE CLAMP, MAGNET
23	16	712735	PLATE, TOP CHAN GUIDE CLAMP
24	20	712735-001	BAR, ROLLER/PROX CLAMP, ADJ.
25	4	712738-046	A/W, CONVEYOR CROSS BRACE, 46"
26	20	712741	BRACKET, ROLLER SHAFT
27	10	712744	SHAFT, ROLLER IDLER, CHAIN
28	10	712745	ROLLER, IDLER, TABLETOP CHAIN
29	16	712781	COLLAR,HALF REWORK, 1-1/2 SPLIT, SST
30	10	712782	SHAFT, SPACER, CHAIN GUIDE
31	4	714329-001	GUARD, INFEED DRIVE, BBU
32	4	714330	GUARD, TRANSFER CENTER DRIVE
33	2	714357	SPROCKET, RWK, 40-B-17, 5/8" B
34	1	714358	T-NUT, TRANSFER IDLER ADJ.
35	1	714359	SHAFT, ECCENTRIC IDLER
36	1	714360	A/W, COVER INTERLACE DRIVE
37	4	714871	SHAFT, IDLER SPACER, BBU
38	4	714872	SHAFT, IDLER, M-QNB SPROCKET
39	4	714904	GUARD, MAIN CHAIN DRIVE SPROCKET
40	2	714908	ROLLER, IDLER, TABLETOP CHAIN
41	2	714909	SHAFT, IDLER ROLLER, TABLETOP CHAIN
42	4	955390	NUT HEX JAM 1-1/8-7 UNC SST
43	1	955938	WASHER LOCK 3/8"
44	2	981708	SCREW FLT HD SOC 1/4-20 X 1/2 SST
45	1	988932	SCREW FIN HEX 3/8-16 X 2 SST
46	1	A05584	PLATE-SERIAL NUMBER
47	4	C03324	A/W, ALL-THREAD LEG, CONV.
48	8	717930	SPACER, .38 OD x .19 ID x .438L,SS

Conveyor Components

113516-100



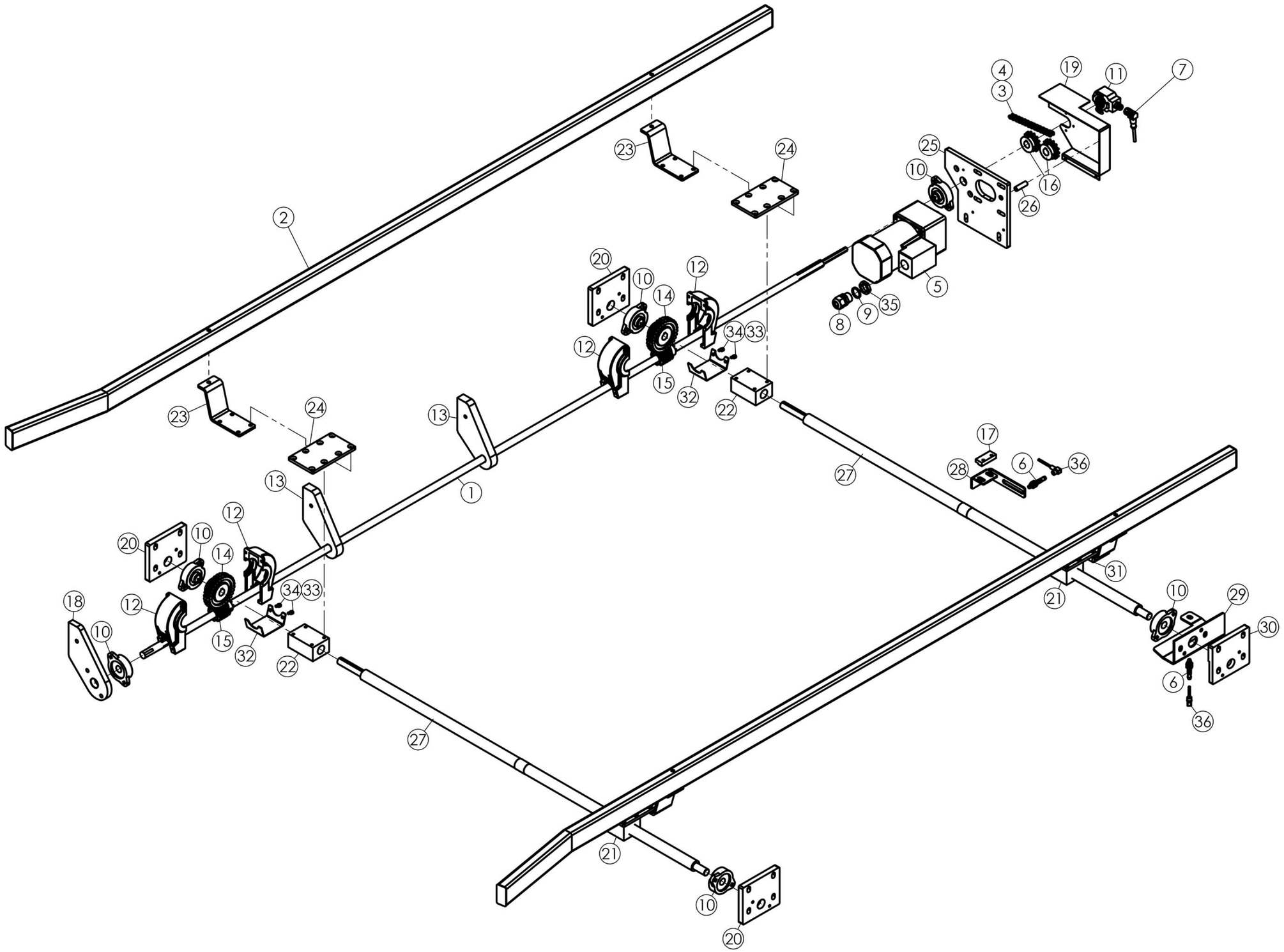
FOLD OUT TO VIEW DRAWING

Pan Guide Assembly
113516-101

ITEM #	QTY.	PART#	DESCRIPTION
1	1	113516-008	SHAFT, PAN GUIDE, 116S
2	2	113516-012	AW, BUN PAN GUIDE, 9840
3	1'	152169	CHAIN,ROLL,#35,NICKEL PLATED
4	1	152175	CHAIN LINK #35 CONNECTING N.P.
5	1	304123-001	MOTOR,GEAR,1/8HP,200/230-50/6,3.6:1
6	2	304350-001	SENSOR,PROX,8MM,10-30V,PNP,NC,TURCK
7	1	304431	CABLE,SENSOR,M12,5WIRE,F,QC,90
8	1	610953	CONNECTOR, CORD, .20-.35, DOME, NYLON
9	1	610955	CONNECTOR,SEAL RING,1/2NPT,POLYETH
10	6	611238	BEARING, 5/8, 2 BOLT FLANGE, SST
11	1	611469-010	ENCODER, .375 THRU BORE
12	4	612307	GUARD, WORM GEAR HOUSING
13	2	710832	SUPPORT, PAN GUIDE SHAFT
14	2	711938	RWK, WORM GEAR
15	2	711939	RWK, WORM STEEL, 5/8" B, 10 D.P.
16	2	712026	SPROCKET, REWORK,35B14, 5/8 BORE
17	1	712735-001	BAR, ROLLER/PROX CLAMP, ADJ.
18	1	712831	SUPPORT, PAN GUIDE SHAFT
19	1	712859	AW, GUARD, PAN GUIDE DRIVE
20	3	712860	BLOCK, BEARING MOUNT
21	2	712861	BLOCK, PAN GUIDE, 1" ACME, LH
22	2	712862	BLOCK, PAN GUIDE, 1" ACME, RH
23	4	712865-001	BRACKET, BUN PAN GUIDE MNT.
24	4	712866	PLATE, PAN GUIDE MNT
25	1	712870	PLATE, MOTOR MOUNT, PAN GUIDE
26	1	712876	STANDOFF, CHAIN GUARD COVER
27	2	712878	SHAFT, PAN GUIDE, 46" DRIVE
28	1	712903	BRACKET, PROX MNT, 9840
29	1	712987	BRACKET, PROX MOUNT
30	1	712988	BLOCK RWK, BEARING MOUNT
31	2	714869	BLOCK, PROX TRAVEL, SHORT
32	2	716468	CHANNEL, WORM GEAR END PLATE
33	4	955942	WASHER LOCK #8 SST
34	4	979506	SCREW SOC HD CAP #8-32 UNC X 3/8 SST
35	1	C00174	LOCKING NUT, 1/2 NPT, NYLON
36	2	C07626	SENSOR,CABLE,M8,3WIRE,F,QC,90

Pan Guide Assembly

113516-101



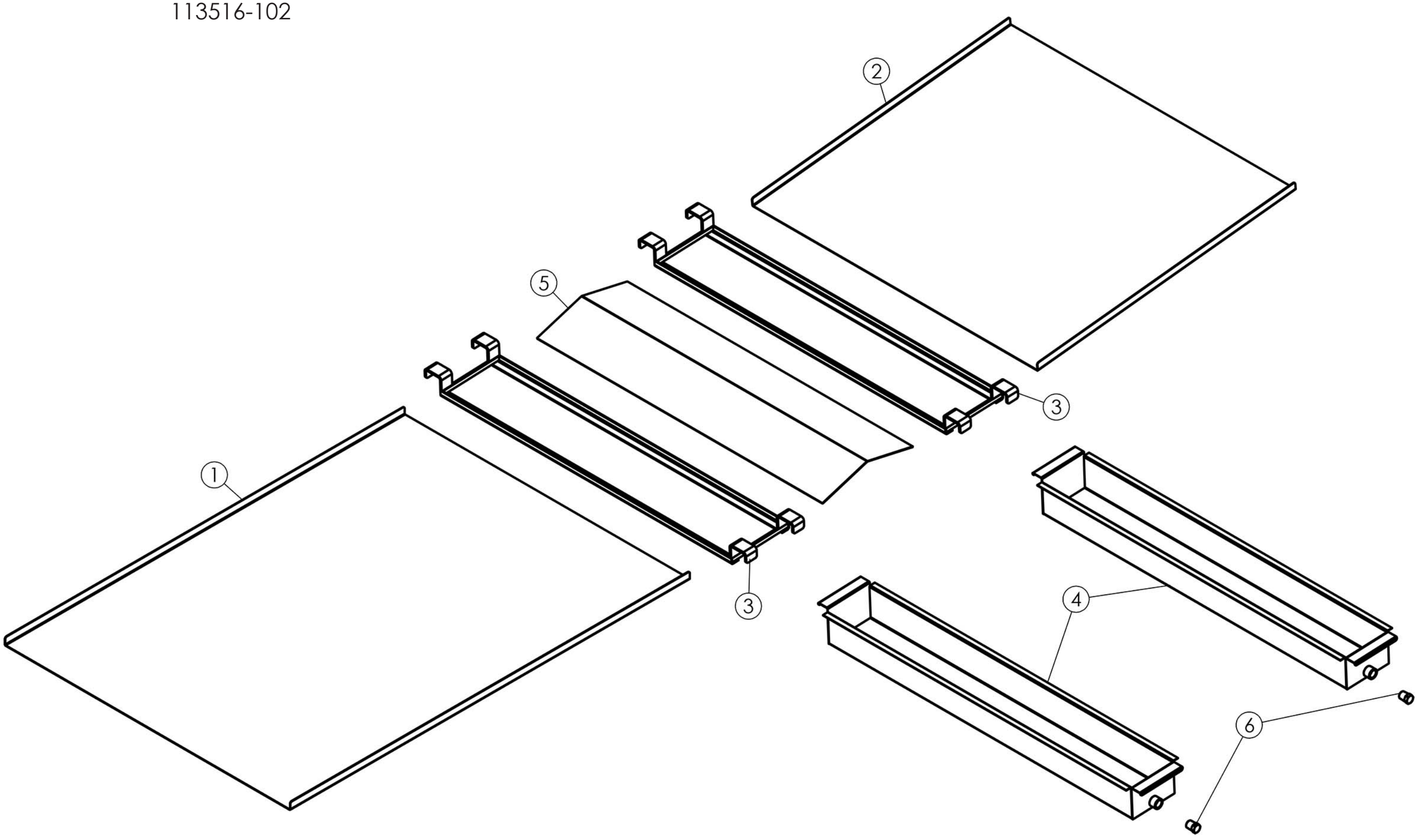
FOLD OUT TO VIEW DRAWING

Catch Tray Assembly
113516-102

ITEM #	QTY.	PART#	DESCRIPTION
1	1	113516-015	A/W, WATER DEFLECTOR END
2	1	113516-019	A/W, WATER DEFLECTOR END
3	2	113516-211	A/W, DRIP PAN SUPPORT, 46" CONV.
4	2	301727	A/W, CATCH TRAY, 46" CONV.
5	1	712830-046	A/W, CENTER DEFLECTOR, WET-DRY
6	2	A07726	FITTING, PLUG 1/2" PVC

Catch Tray Assembly

113516-102



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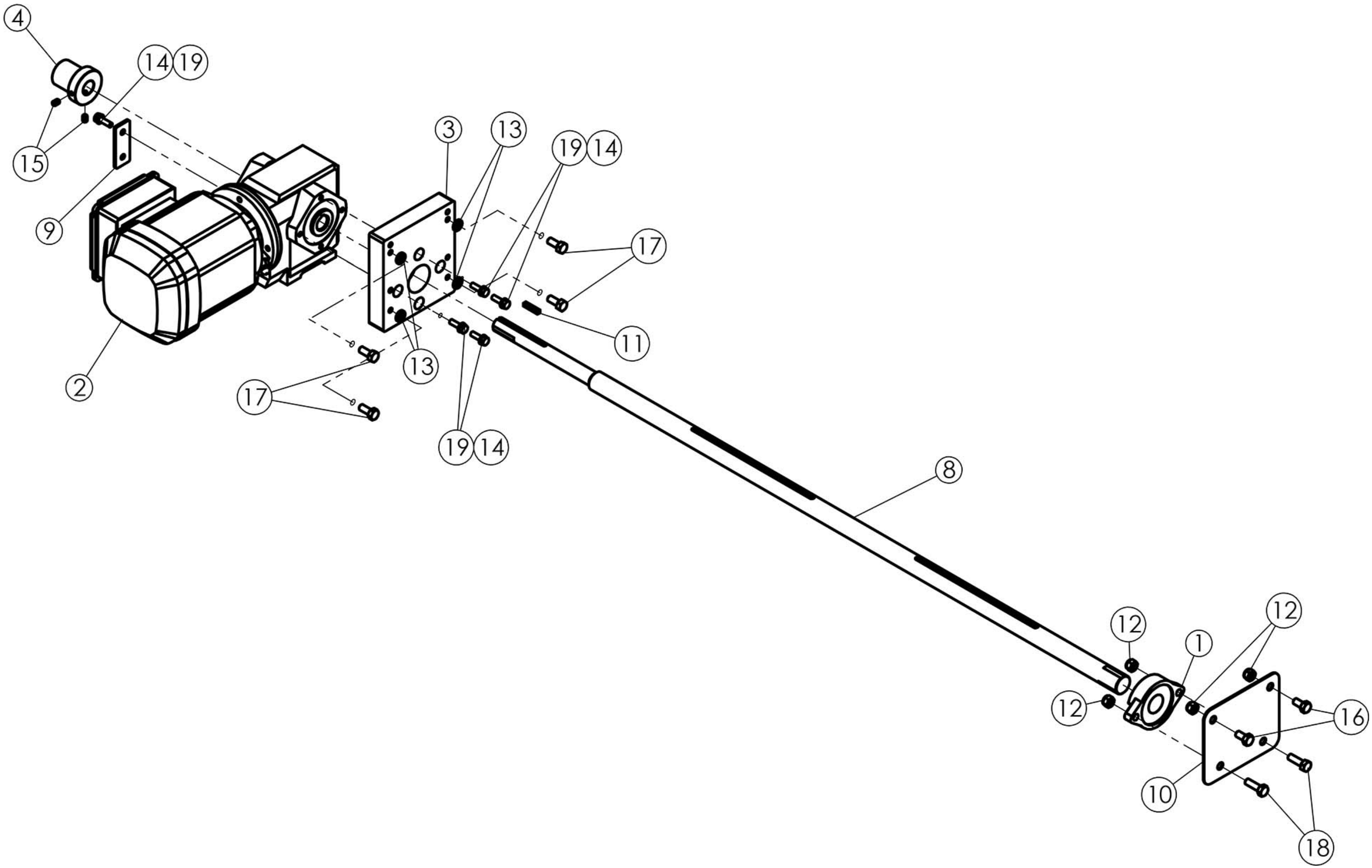
Conveyor Drive Assembly
210934-046 Rev D

ITEM #	QTY.	PART #	DESCRIPTION
1	1	611388	BEARING, 1", 2 BOLT FLANGE, SST
2	1	611907	GEARMOTOR,1/2HP,460-60-3,LH
3	1	715348	PLATE, GEARMOTOR MOUNT, SEW
4	1	715349	SLEEVE, ENCODER MOUNT, SEW
8	1	715350-046	SHAFT, LOWER CONV. DRIVE, 46", SEW
9	1	715351	PLATE, ENCODER MOUNT, SEW
10	1	716891	PLATE, BEARING COVER
11	1	955470	KEY, SQ 3/16 X 1.00 .002 UNDERSIZE
12	4	955619	NUT HEX NYLOC 5/16-18 UNC SST
13	4	955939	WASHER LOCK 5/16" SST
14	5	955940	WASHER LOCK 1/4" SST
15	2	971206	SCREW SET SOC 1/4-20 X 3/8 SST
16	2	989710	SCREW FIN HEX 5/16-18 X 5/8 SST
17	4	989712	SCREW FIN HEX 5/16-18 X 3/4 SST
18	2	989716	SCREW FIN HEX 5/16-18 X 1 SST
19	5	991312	SCREW FIN HEX M6-1 X 20 MM SST

Conveyor Drive Assembly

210934-046 Rev D



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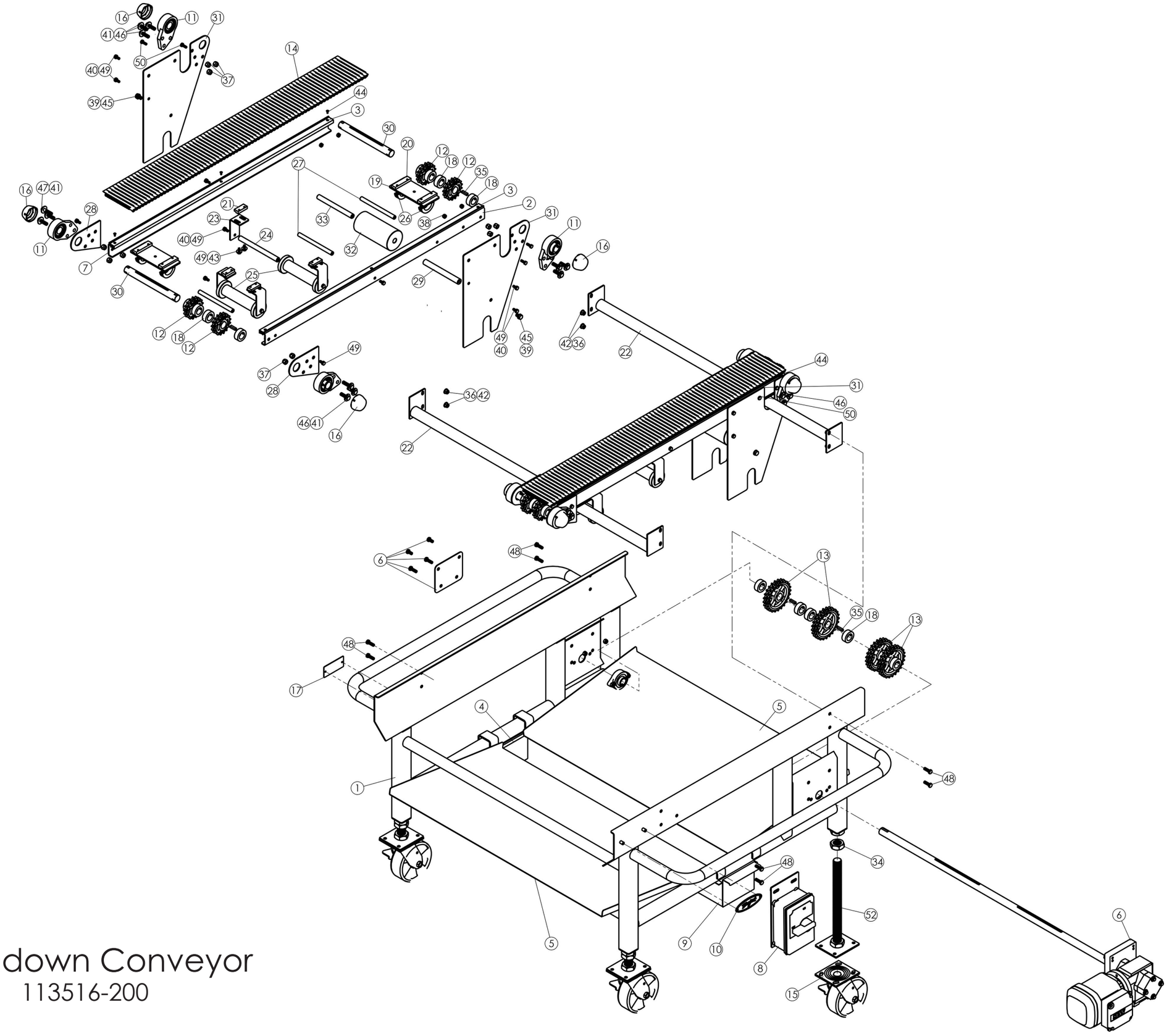
Washdown Conveyor
113516-200

ITEM #	QTY.	PART#	DESCRIPTION
1	1	113516-201	A/W,CONV. FRAME,948RI-48WD
2	2	113516-209	CHANNEL, CHAIN GUIDE MNT, 48"
3	4	113516-210	GUIDE, TABLETOP BELT, WEARSTRIP 48"
4	1	113516-211	A/W, DRIP PAN SUPPORT, 46" CONV.
5	2	113516-213	A/W, WATER DEFL. END, 946RI-48
6	1	113516-215	CONVEYOR,DIRECT DRIVE,SEW,L/H,46"
7	2	113516-217	CHANNEL, CHAIN GUIDE MNT, 48"
8	1	210369	ASSY,MOTOR DISCONNECT,600V,15A
9	1	301727	A/W, CATCH TRAY, 46" CONV.
10	1	303000	LABEL,BURFORD LOGO,4.25 SCRIPT
11	8	611635	BEARING, 1" BORE 3 HOLE FLANGE
12	8	611723	SPROCKET, 16T, 3.11" OD EZ CLEAN
13	4	611724	SPROCKET, 24T, 4.65" OD EZ CLEAN
14	30	611725	BELT,6" WIDE x 1/2" PITCH,SERIES 1100
15	4	611730	CASTER, 6" SWIVEL LOCKING, SST
16	8	611868	END CAP, BEARING (611635)
17	1	612136	SERIAL PLATE, 16GA SS, MADE IN USA
18	24	711757	COLLAR, SET, 1" SST
19	4	712734	PLATE, CHAIN GUIDE CLAMP, MAGNET
20	8	712735	PLATE, TOP CHAN GUIDE CLAMP
21	8	712735-001	BAR, ROLLER/PROX CLAMP, ADJ.
22	2	712738-046	A/W, CONVEYOR CROSS BRACE, 46"
23	8	712741	BRACKET, ROLLER SHAFT
24	4	712744	SHAFT, ROLLER IDLER, CHAIN
25	4	712745	ROLLER, IDLER, TABLETOP CHAIN
26	8	712781	COLLAR,HALF REWORK, 1-1/2 SPLIT, SST

ITEM #	QTY.	PART#	DESCRIPTION
27	6	712782	SHAFT, SPACER, CHAIN GUIDE
28	4	714329-001	GUARD, INFEED DRIVE, BBU
29	2	714871	SHAFT, IDLER SPACER, BBU
30	4	714872	SHAFT, IDLER, M-QNB SPROCKET
31	4	714904	GUARD, MAIN CHAIN DRIVE SPROCKET
32	2	714908	ROLLER, IDLER, TABLETOP CHAIN
33	2	714909	SHAFT, IDLER ROLLER, TABLETOP CHAIN
34	4	955390	NUT HEX JAM 1-1/8-7 UNC SST
35	12	955460	KEY, SQ 1/4 x 1.00 x .002 UNDERSIZE
36	8	955619	NUT HEX NYLOC 5/16-18 UNC SST
37	24	955620	NUT HEX NYLOC 3/8-16 UNC SST
38	8	955661	NUT HEX NYLOC 1/4-20 UNC SST
39	4	955938	WASHER LOCK 3/8"
40	40	955940	WASHER LOCK 1/4" SST
41	24	955975	WASHER FLAT 3/8" SST
42	8	955976	WASHER FLAT 5/16 SST
43	10	955977	WASHER FLAT 1/4" SST
44	12	983506	SCREW FLT HD SOC #6-32 X 3/8 SST
45	4	988910	SCREW FIN HEX 3/8-16 X 5/8 SST
46	20	988920	SCREW FIN HEX 3/8-16 X 1 1/4" SST
47	4	988924	SCREW FIN HEX 3/8-16 X 1 1/2 SST
48	8	989616	SCREW FIN HEX 5/16-24 X 1 SST
49	40	989910	SCREW FIN HEX 1/4-20 X 5/8" SST
50	8	989912	SCREW FIN HEX 1/4-20 X 3/4" SST
51	1	A07726	FITTING, PLUG 1/2" PVC
52	4	C03324	A/W, ALL-THREAD LEG, CONV.



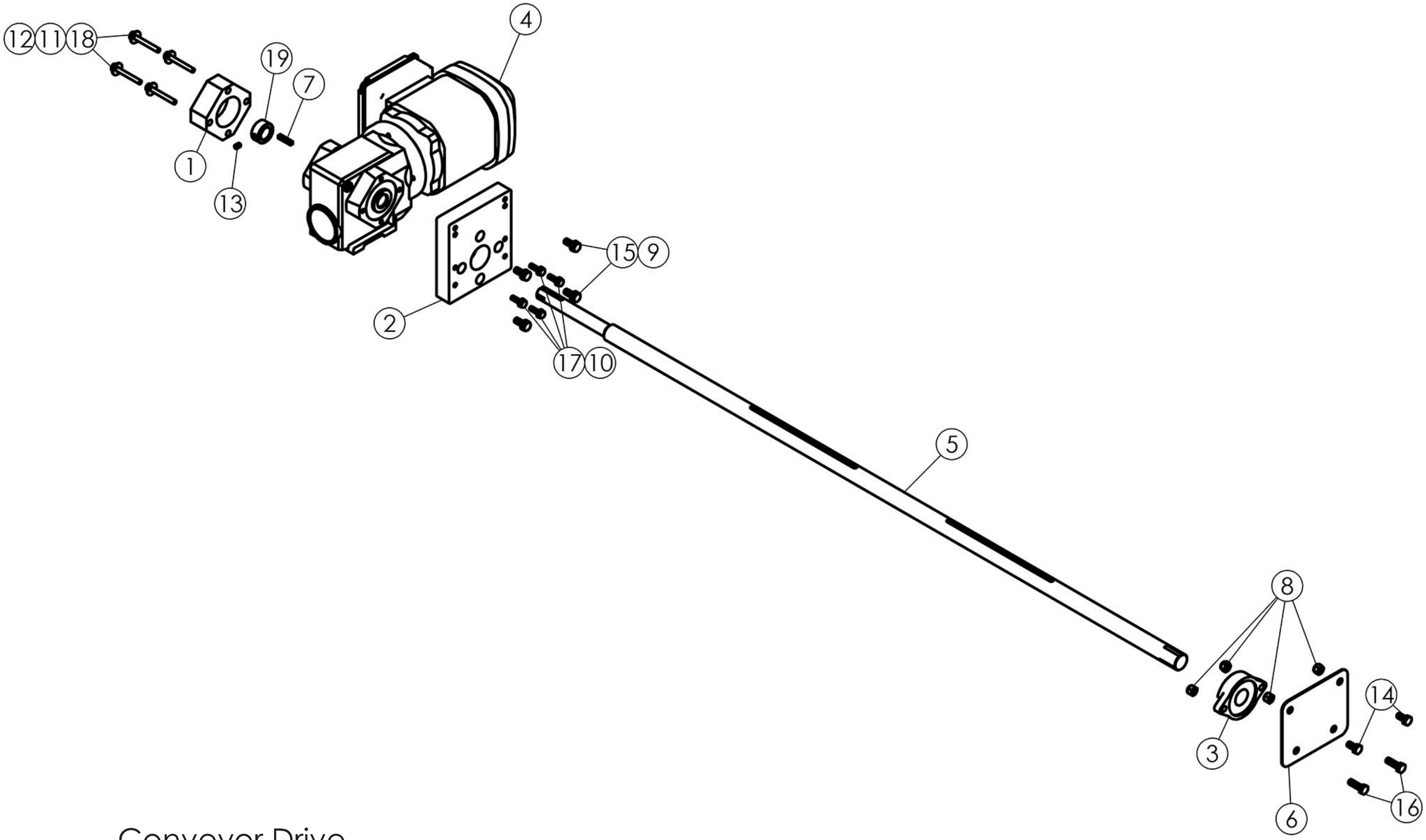
Washdown Conveyor

113516-200

FOLD OUT TO VIEW DRAWING

Conveyor Drive
113516-215

ITEM #	QTY.	PART#	DESCRIPTION
1	1	108370-210	COVER, GEAR BOX SHAFT
2	1	113516-216	PLATE, GEARMOTOR MNT, SUB OUT, ENP
3	1	611388	BEARING, 1", 2 BOLT FLANGE, SST
4	1	612275	GEARMOTOR, 1/2HP, 460-60-3, LH, WD
5	1	714497-046	SHAFT, LWR DIRECT DRIVE, 46" SEW
6	1	716891	PLATE, BEARING COVER
7	1	955470	KEY, SQ 3/16 X 1.00 .002 UNDERSIZE
8	4	955619	NUT HEX NYLOC 5/16-18 UNC SST
9	4	955939	WASHER LOCK 5/16" SST
10	4	955940	WASHER LOCK 1/4" SST
11	4	955940	WASHER LOCK 1/4" SST
12	4	955977	WASHER FLAT 1/4" SST
13	1	971206	SCREW SET SOC 1/4-20 X 3/8 SST
14	2	989710	SCREW FIN HEX 5/16-18 X 5/8 SST
15	4	989712	SCREW FIN HEX 5/16-18 X 3/4 SST
16	2	989716	SCREW FIN HEX 5/16-18 X 1 SST
17	4	991312	SCREW FIN HEX M6-1 X 20 MM SST
18	4	991350	SCREW FIN HEX M6.1 X 50 MM
19	1	C01008	COLLAR,3/4" SET,SST



Conveyor Drive

113516-215

FOLD OUT TO VIEW DRAWING

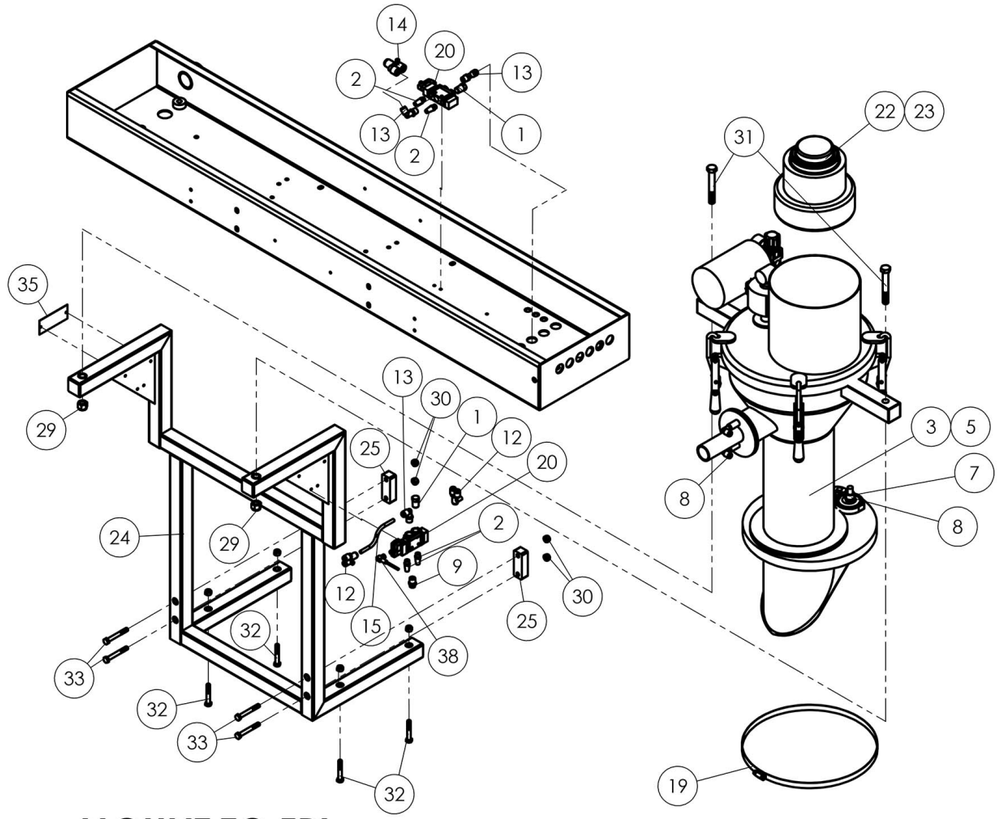
Autofill Assembly (MOD)
210443-001 Rev L

ITEM #	QTY.	PART #	DESCRIPTION
1	3	110423	FITTING, 1/4" NPT PLUG
2	4	111497	MUFFLER, 1/8" NPT
3	REF.	210430	ASSY, MPA-100, AUTO-FILL, 110V
4	REF.	210450	ASSY,MPA-100 AUTO-FILL,220VAC MOTOR
5	1	304268	BLOCK, 30MM, PROX MT, AUTO-FILL, 9840
6	1	304430	CABLE,SENSOR,M12,5WIRE,F,QC,STR
7	1	304431	CABLE,SENSOR,M12,5WIRE,F,QC,90
8	1	305772	INLET TUBE REWORK MPA-100
9	1	401152	FITTING,CONN,1/4MPT X 1/4T,ENP,Q.R.
10	1	610295	SENSOR,PROX,18MM,10-30VDC,PNP,N.O.
11	1	610507	FITTING,CONN,1/4NPT X 3/8T,ENP,Q.R.
12	2	610531	FITTING, 1/4"Y", Q.R.
13	3	610602	FITTING, ELL, 1/4NPT X 1/4T,ENP,Q.R
14	1	610673	FITTING "Y" 3/8 X 1/4 2X QR
15	10'	610885-07	TUBING, 1/4" POLYURETHANE, CLEAR
16	3	610954	CONNECTOR, CORD, .39-.56, DOME, NYLON
17	3	610955	CONNECTOR,SEAL RING,1/2NPT,POLYETH
18	5'	611047	HOSE, 12" ID CLEAR VIEW, PVC
19	2	611051	HOSE CLAMP, 12"
20	2	611117	VALVE,SOL,24V,2 WAY,1/4P
21	1	611899	PLC,ML1200,IN/OUTPUT MODULE,8IN/6OU
22	REF	611950	VACUUM MOTOR 110V(MPA)
23	REF	611951	VACUUM MOTOR 220V (MPA)
24	1	712432	A/W, MPA-100 SUPPORT FRAME, 9840S
25	2	712438	BLOCK, VAC. FRAME SPACER
26	REF.	712444	A/W, HOPPER COVER, 9840S / MPA-100
27	4	714312	AUGER, SPLIT COLLAR RIGHT
28	4	714313	AUGER, SPLIT COLLAR LEFT
29	2	955618	NUT HEX NYLOC 1/2-13 UNC SST
30	8	955619	NUT HEX NYLOC 5/16-18 UNC SST
31	2	988356	SCREW FIN HEX 1/2-13 X 3 1/2 SST
32	4	989732	SCREW FIN HEX 5/16-18 X 2 SST
33	4	989740	SCREW FIN HEX 5/16-18 X 2 1/2 SST
34	1	A05038	BRACKET, PROXIMITY MTG.
35	1	A05584	PLATE-SERIAL NUMBER
36	3	C00174	LOCKING NUT, 1/2 NPT, NYLON
37	1	C00398-002	PORTING, BLOCK INSERT KIT, 1/4NPT
38	1	C07626	SENSOR,CABLE,M8,3WIRE,F,QC,90
39	1	C07670	SENSOR,CAPACITIVE,30MM,DC,PNP-N/C
40	REF	610886-07	TUBING, 3/8" POLYURETHANE, CLEAR
41*	4	A05025	COLLAR REWORKED
42*	2	A05073	AUGER ROD

*NOT SHOWN

Autofill Assembly (MOD)

210443-001 Rev L



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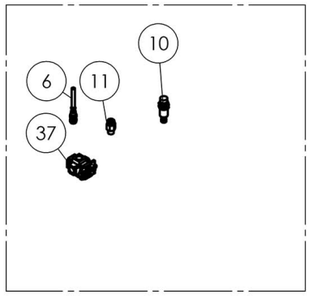

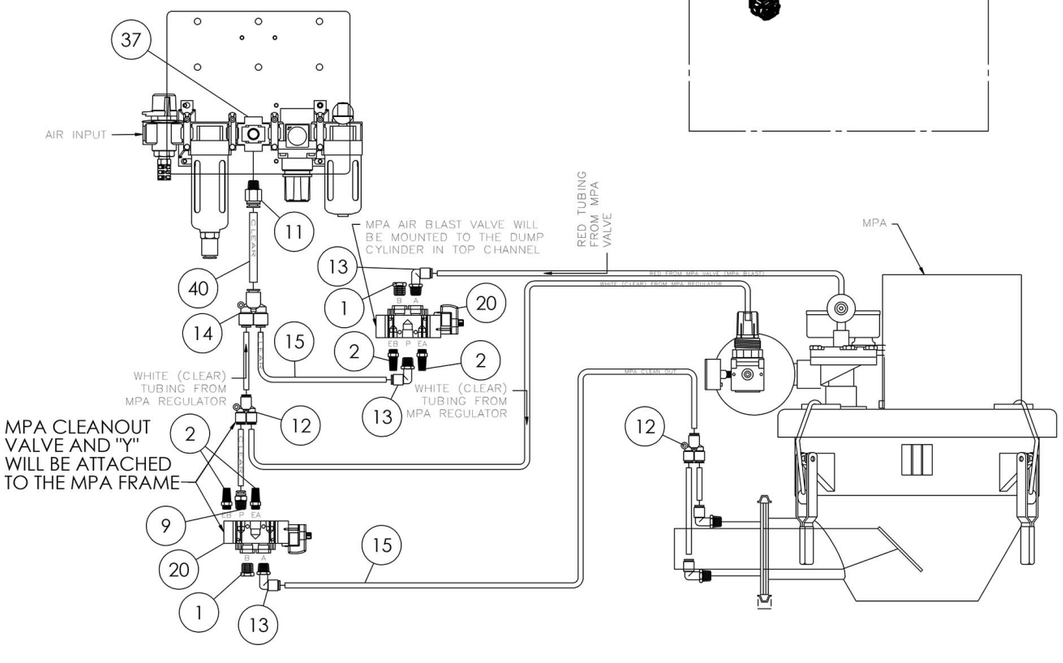

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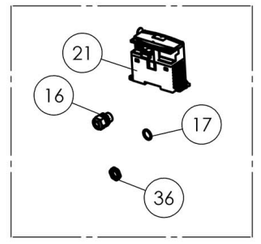

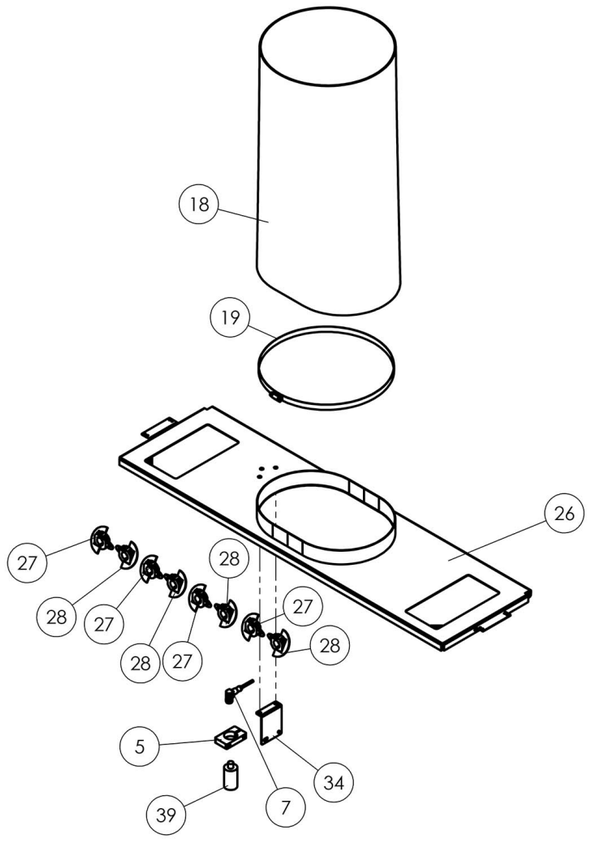

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MPA Hose Assembly
210438-020 Rev B

ITEM #	QTY.	PART#	DESCRIPTION
1	2	268074	CLAMP HOSE 1 1/2 TO 3/4
2	20'	305084	HOSE, POLYWIRE, VAC TRANSFER 1.5 ID
3	1	712517	A/W CONNECTOR HOPPER

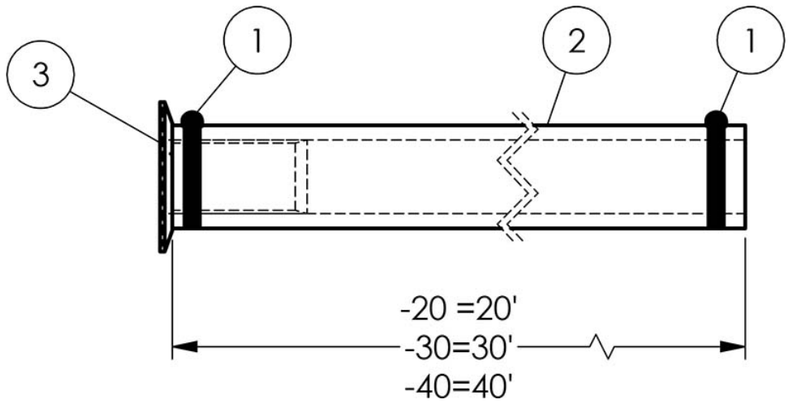
MPH-300 Assembly
306102 Rev E

ITEM #	QTY.	PART#	DESCRIPTION
1	1	211240	KIT MPHS-300/500
2	1	306100	HOPPER HS-300

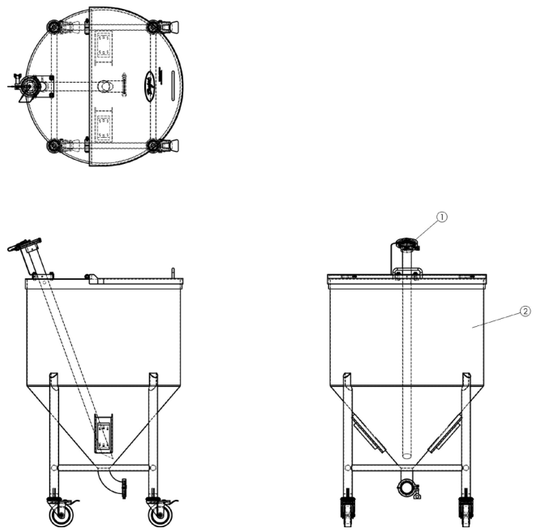
MPH-300/500 Kit
211240 Rev C

ITEM #	QTY.	PART#	DESCRIPTION
1	1	611014	LANYARD, QUICK RELEASE PIN, CABLE
2	1	611097	CLAMP, TRI-CLOVER, 2 1/2"
3	1	611098	GASKET, TRI CLOVER, 2-1/2"
4	1	611285	CLAMP, HEAVYWEIGHT, 2"
5	1	612039	LANYARD, CABLE 6"
6	1	712514	PLATE DOWN TUBE MPH300
7	1	712516	A/W CONNECTOR HOPPER
8	1	716539	END CAP SOLID 2 1/2 RWK
9	1	716702	WAND PICK UP
10	4	955940	WASHER LOCK 1/4" SST
11	1	955941	WASHER LOCK #10 SST
12	4	955977	WASHER FLAT 1/4" SST
13	2	971204	SCREW SET SOC 1/4-20 UNC X 1/4 SST
14	2	971210	SCREW SET SOC 1/4-20 UNC X 5/8 SST
15	1	978906	SCREW SOC HD CAP #10-24 UNC X 3/8 SST
16	4	989920	SCREW FIN HEX 1/4-20 X 1 1/4 SST
17	1	C00532	CAP # 16AMP-2 2"
18	1	C01005	GASKET 2"

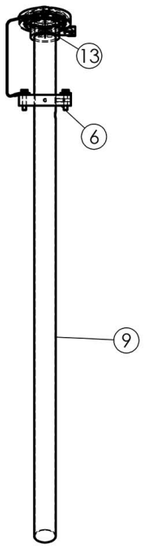
MPA Hose Assembly
210438-020 Rev B

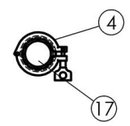


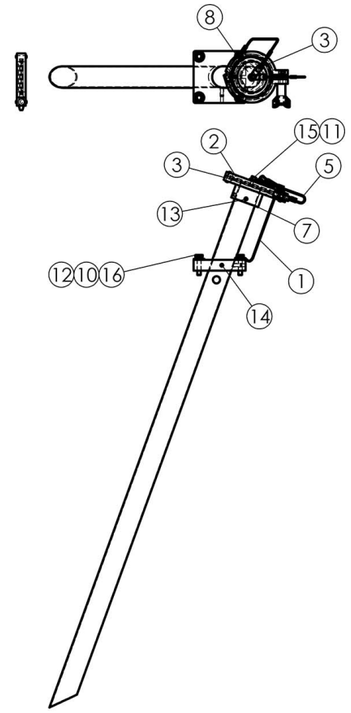
MPH-300 Assembly
306102 Rev E

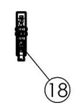


MPH-300/500 Kit
211240 Rev C









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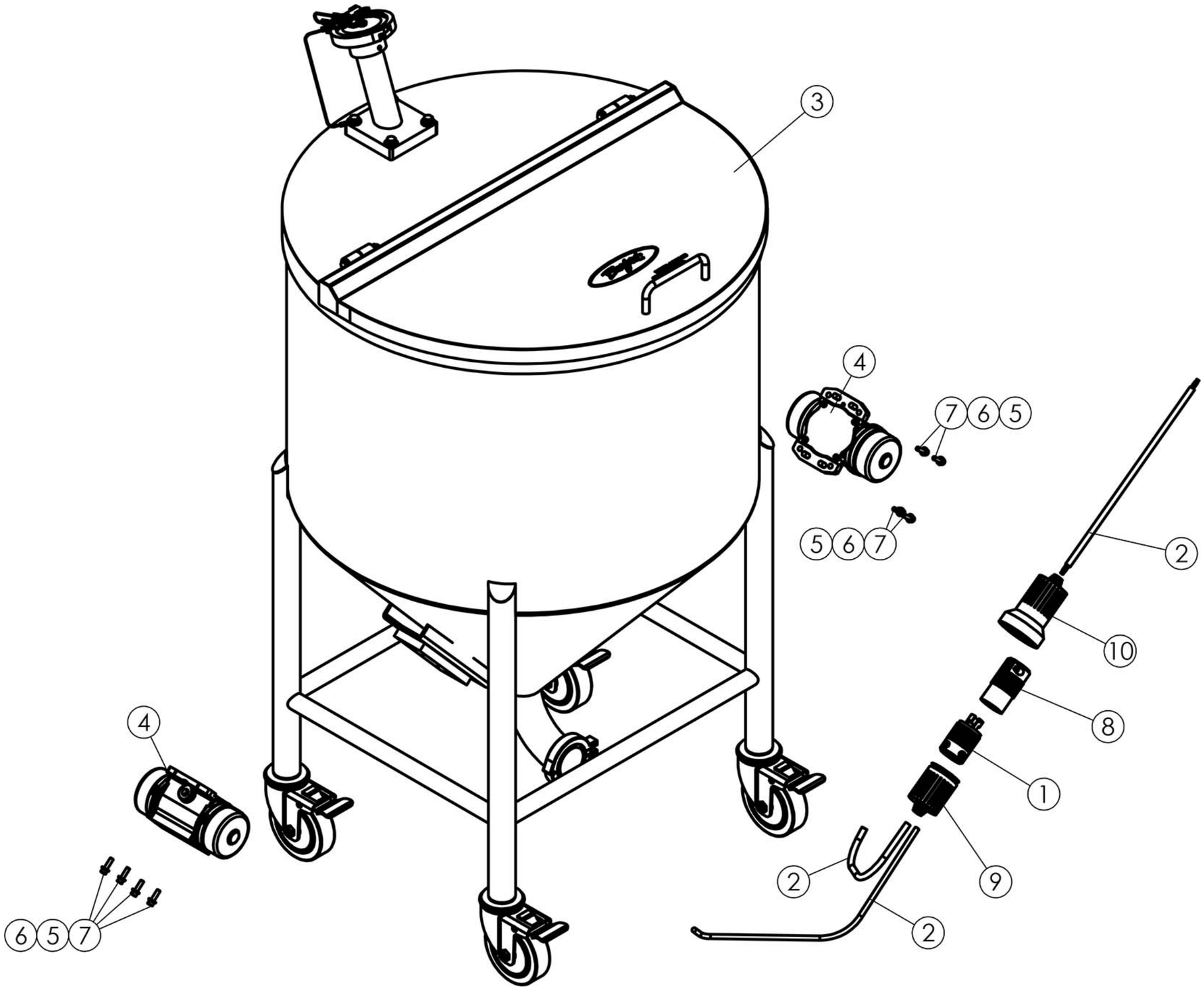
Hopper Vibrator Assembly
211136 Rev B

ITEM #	QTY.	PART#	DESCRIPTION
1	1	113393	PLUG MALE 3 POLE TWIST LOCK
2	2	142007	CABLE, 16AWG, 3 COND., BLACK CORD
3	REF.	306102	HOPPER ASSEMBLY MPHS-300
4	2	612297	VIBRATOR 115V NEA5050
5	8	955941	WASHER LOCK #10 SST
6	8	955978	WASHER FLAT #10 SST
7	8	978912	SCREW SOC HD CAP #10-24 UNC X 3/4 SST
8	1	A05379	PLUG FEMALE 3 POLE TWIST LOCK
9	1	C07644	COVER, WEATHER PROOF - 113393
10	1	C07645	COVER, WEATHER PROOF - A05379

Hopper Vibrator Assembly

211136 Rev B



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Deaerator Pump Assembly
113516-105

ITEM #	QTY.	PART#	DESCRIPTION
1	1	113516-020	A/W, DEAERATOR-PUMP FRAME
2	1	113516-400	FITTING, UNION, 1/2 TUBE X 3/8 TUBE
3	1	303674	GAUGE 0-200 PSI 1/4 NPT BACK MT SST
4	1	305716	FLOAT VALVE MINI ADJ 1/2"
5	2	610505	FITTING,ELL,1/4NPT X 3/8T, ENP, Q.R
6	1	610886-07	TUBING, 3/8" POLYURETHANE, CLEAR
7	1	611121	PUMP, AIR POWERED DBL DIAPHRAGM
8	5	611343	FITTING,ELL,1/2NPT X 1/2,ENP,Q.R.
9	3	611350-05	TUBING,1/2" POLYURETHANE,YELLOW
10	1	612278	FITTING,DBL ELL,1/2 NPTM X 1/2 TUBE
11	1	713714	REGULATOR BRACKET, PUMP CART
12	2	955409	NUT HEX JAM 1/4-20 UNC SST
13	12	955661	NUT HEX NYLOC 1/4-20 UNC SST
14	2	955939	WASHER LOCK 5/16" SST
15	2	955976	WASHER FLAT 5/16 SST
16	14	955977	WASHER FLAT 1/4" SST
17	2	989712	SCREW FIN HEX 5/16-18 X 3/4 SST
18	8	989910	SCREW FIN HEX 1/4-20 X 5/8" SST
19	4	989912	SCREW FIN HEX 1/4-20 X 3/4" SST
20	2	989948	SCREW FIN HEX 1/4-20 X 3 SST
21	1	A06856	FITTING, REDUCING ELL 1/2F X 3/8M SS
22	1	A07726	FITTING, PLUG 1/2" PVC
23	1	C00537	REGULATOR, AIR, 1/4 NPT PORTS
24	1	C00578	FILTER, WATER, 3/4" NPTF
25	1	C00579	FILTER REPLACEMENT # AP110
26	4	C01013	FITTING, REDUCER, 3/4MPT X 1/2FPT, SST
27	1	C01018	FITTING,NIPPLE,HEX,1/2 NPTM,SST
28	1	C01958	FITTING,REDUCER,1" MPT X 3/8FPT,SST
29	1	C05339	FITTING, REDUCER, 1" x 1/2" PVC
30	1	C05431	VALVE, 1/2 NPT 2-WAY, BALL, SST
31	2	C05576	FITTING, 1/2 NPT BULKHEAD, PL.
32	1	C06171	TANK, WATER RECHARGER
33	1	C06174	FITTING, BULKHEAD 1" POLY
34	1	C06176	RWK, TANK & COVER
35	1	C06183	TEE MOUNT A/W
36	1	C06195	PLATE, COVER CLAMP
37	1	C06196	BRACKET, UPPER TANK

Deaerator Pump Assembly

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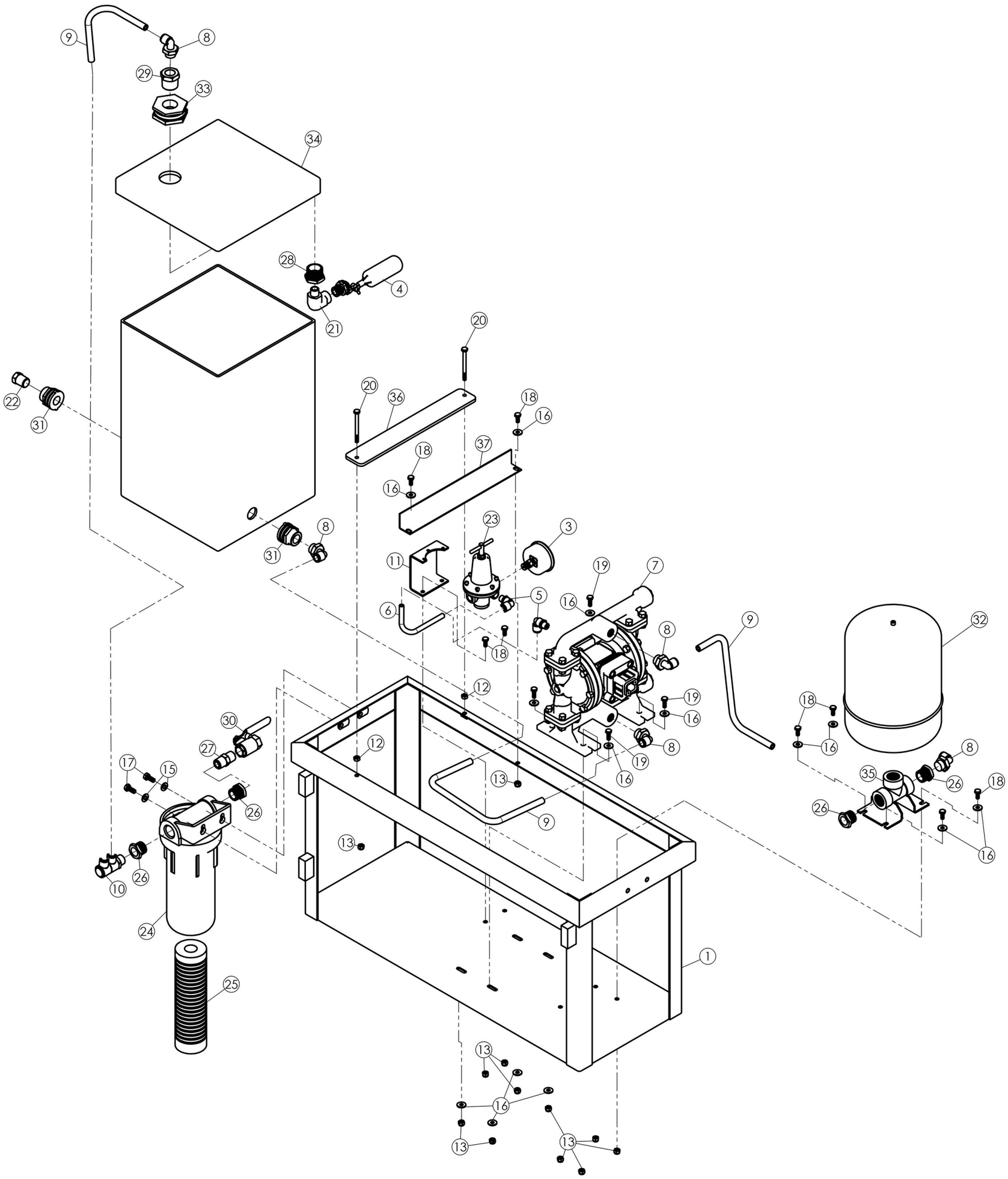

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Drive Settings/ Electrical Schematics

Drive Settings

Parameters not listed below should remain at the manufacturer's default values. Verify the Inverter that is installed in your unit before checking the settings below.

9840 / 9940 SMART TOPPER 9840S / 9940S SMART TOPPER (POWER FLEX 4M) DRIVES							
DRV1	**Mandrel**	**DRV2**	**Conveyor**	**DRV3**	**Automate**	**DRV4**	**FD300**
A424	0.2 sec	A424	0.2 sec	A424	0.2 sec	A424	0.2 sec
A425	0.5 amp	A425	1.0 amp	A425	0.5 amp	A425	1.0 amp
A451	5	A451	5	A451	5	A451	5
C302	4	C302	4	C302	4	C302	4
C303	1	C303	2	C303	3	C303	4
C304	2	C304	2	C304	2	C304	2
C305	5 sec	C305	1 sec	C305	1 sec	C305	1 sec
P101	460	P101	motor vac	P101	230 vac	P101	motor vac
P106	5	P106	5	P106	2	P106	5
P107	6	P107	6	P107	6	P107	6
P108	5	P108	5	P108	5	P108	5
P109	0.1 sec	P109	0.1 sec	P109	0.1 sec	P109	0.1 sec
P110	0.1 sec	P110	0.1 sec	P110	0.1 sec	P110	0.1 sec
T201	0	T201	0	T201	0	T201	0
T202	0	T202	0	T202	0	T202	0

*Power cycle inverter for any changes to take affect.

Electrical BOM

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210122 ASSY,DISC-BOX ARC FLASH

DISC1	1	C07631	DISCONNECT,CIRCUIT BREAKER,FUSIBLE
DISC1	1	C07632	DISCONNECT,CIRCUIT BREAKER,HANDLE
DISC1	1	C07633	DISCONNECT,CIRCUIT BREAKER,SHAFT
ENCL5	1	C07740	ENCLOSURE,REWORK,SST
FU1,2,3	3	C07063	FUSE,LPCC,25A,600V,13/32x1-1/2
GND	2	C06488	LUG,GROUNDING,ENCLOSURE
PNL5	1	C07741	PANEL,ELEC,REWORK
SYMBOL	QTY	PART #	DESCRIPTION

WATER SPLITTER SENSOR CIRCUIT (210397)

PRS9	1	C06752-001	SENSOR,PROX,80MM,10-55VDC,PNP,EDDY
PSC2/PRS9	1	304430	SENSOR,CABLE,M12,5WIRE,STR
PRS9	1	610953	CONNECTOR,CORD,.20-.35,DOME,NYLON
PRS9	1	610955	CONNECTOR,O-RING,1/2NPT
SYMBOL	QTY	PART #	DESCRIPTION

WATER SPLIT LIFT CIRCUIT (210395-002)

PRS18,19	2	304350-001	SENSOR,PROX,8MM,10-30VDC,PNP,NC
PRS18,19	2	C07626	SENSOR,CABLE,M8,3WIRE,90°
SOL27,28	2	304238-001	CLUTCH,SHAFT MTG,24VDC
SUP27,28	2	C05724	SUPPRESSOR,TRANSIENT,25VAC/31VDC
SYMBOL	QTY	PART #	DESCRIPTION

WATER SPLITTER NOZZLE CIRCUIT (211099)

PLC1	1	610883	PLC,ML1200,OUTPUT MODULE,16 OUT
	1	610967	TERMINAL,BREAK-A-PART,12POS.
SOL11-20	10	612008	VALVE,APPLICATOR HEAD
SOL11-20	10	610187-002	CABLE,MICRO-CHANGE,M12,5WIRE,W/SUP
SOL11-20	10	610169	CABLE,BULKHEAD,M12,5WIRE,F,O/C.
SOL11-20	10	610174	CABLE,CAP,BULKHEAD,M12,F,O/C.
SYMBOL	QTY	PART #	DESCRIPTION

ENCLOSURE WATER SPRAY/SPLIT CIRCUIT (210769-002)

TB8	7"	610360	RAIL,DIN,MOUNTING,MINI
TB8	30	610361	TERMINAL,BLOCK,MINI
TB8	2	610362	END COVER,TERMINAL,MINI
TB8	2	610363	ANCHOR,END CLAMP,MINI
TB8	2	610533	JUMPER,TERMINAL,3-POS,MINI
TB8	1	610534	TERMINAL,GROUNDING,MINI
TB9	1	610967	TERMINAL,BREAK-A-PART,12POS.
SYMBOL	QTY	PART #	DESCRIPTION

WATER SPRAY LIFT CIRCUIT 210395-001

MTR5	1	304123-001	MOTOR,GEAR,1/8HP,100RPM,3.6:1 RATIO
PRS15,16	2	304350-001	SENSOR,PROX,8MM,10-30VDC,PNP,NC
PRS17	1	304350-003	SENSOR,PROX,8MM,10-30VDC,PNP,NC,SW
PRS15,16,17	3	C07626	SENSOR,CABLE,M8,3WIRE,90°
	20'	142113	CABLE,16AWG,4 COND.
SYMBOL	QTY	PART #	DESCRIPTION

WATER SPRAY SENSOR CIRCUIT (210397)

PSC2	1	611027	SENSOR,PHOTO,DIFFUSE,500MM,24VDC
PRS20	1	C06752-001	SENSOR,PROX,80MM,10-55VDC,PNP,EDDY
PSC2/PRS20	1	304430	SENSOR,CABLE,M12,5WIRE,STR
PRS20	1	610953	CONNECTOR,CORD,.20-.35,DOME,NYLON
PRS20	1	610955	CONNECTOR,O-RING,1/2NPT
SYMBOL	QTY	PART #	DESCRIPTION

WATER SPRAY NOZZLE CIRCUIT (210936-001)

CR21-CR28	8	610404	RELAY,TERMINAL MTG,24VDC (WHITE)
CTRL1	1	611573	VALVE,CONTROLLER,DRIVER,PULSAJET
FLTR1	1	611569	VALVE,PULSAJET,LINE FILTER
SOL1-8	8	611574	VALVE,APPLICATOR HEAD
SOL1-8	8	A02349	CABLE,M8,3WIRE,FEMALE,OC,STR
SOL1-8	8	C07663	FIELD ATTACH,M12,5WIRE,MALE,OC,STR
SOL1-8	8	610169	CABLE,BULKHEAD,M12,5WIRE,F,O/C.
SOL1-8	8	610174	CABLE,CAP,BULKHEAD,M12,F,O/C.
SYMBOL	QTY	PART #	DESCRIPTION

ENCLOSURE WATER SPRAY CIRCUIT (210769-001)

ENCL4	1	715640	ENCLOSURE,REWORK,8X6X6 (611915)
PNL4	1	715637	PANEL,ELEC,REWORK (611916)
TB6	5"	610360	RAIL,DIN,MOUNTING,MINI
TB6	25	610361	TERMINAL,BLOCK,MINI
TB6	2	610362	END COVER,TERMINAL,MINI
TB6	2	610363	ANCHOR,END CLAMP,MINI
TB6	2	610533	JUMPER,TERMINAL,3-POS,MINI
TB6	1	610534	TERMINAL,GROUNDING,MINI
TB7	1	610967	TERMINAL,BREAK-A-PART,12POS.
SYMBOL	QTY	PART #	DESCRIPTION

CONVEYOR CIRCUIT (210387-210388)

ENCO1	1	611102	ENCODER,INCREMENTAL,3 CHANNEL
ENCO1	1	304430	SENSOR,CABLE,M12,5WIRE,F,OC,STR
	20'	142113	CABLE,16AWG,4 COND.
SYMBOL	QTY	PART #	DESCRIPTION

SEEDER LIFT CIRCUIT (210384)

ENCO2	1	611469-010	ENCODER,DIRECTIONAL,2 CHANNEL
ENCO2	1	304431	SENSOR,CABLE,M12,5WIRE,F,OC,90
MTR3	1	304123-001	MOTOR,GEAR,1/8HP,100RPM,3.6:1 RATIO
PRS11,12	2	304350-001	SENSOR,PROX,8MM,10-30VDC,PNP,NC
PRS11,12	2	C07626	SENSOR,CABLE,M8,3WIRE,90°
PRS12	1	712217	BRACKET,HEIGHT ADJ,PROX
PRS**	1	304022	ANGLE,PROX MOUNT,LIFT CTR
	6'	142113	CABLE,16AWG,4 COND.
SYMBOL	QTY	PART #	DESCRIPTION

SIZING BAR CIRCUIT (210383)

ENCO3	1	611469-010	ENCODER,DIRECTIONAL,2 CHANNEL
ENCO3	1	304431	SENSOR,CABLE,M12,5WIRE,F,OC,90
MTR4	1	304123-001	MOTOR,GEAR,1/8HP,100RPM,3.6:1 RATIO
PRS13,14	2	304350-001	SENSOR,PROX,8MM,10-30VDC,PNP,NC
PRS13,14	2	C07626	SENSOR,CABLE,M8,3WIRE,90°
	6'	142113	CABLE,16AWG,4 COND.
SYMBOL	QTY	PART #	DESCRIPTION

FREQ. DRIVE 380/460VAC CIRCUIT (210403-004)

AC0	1	611662	PLUG,120V,3A W/ETHERNET PORT
CB1	1	C07650-315	CIRCUIT BREAKER,15AMP,DIN RAIL MTG.
CB2,3,4,5	4	C07650-303	CIRCUIT BREAKER,3AMP,DIN RAIL MTG.
CB1,2,3,4,5	1	C07721-003	CIRCUIT BREAKER,CONN. RAIL,18POS.
CB1,2,3,4,5	1	C07722	CIRCUIT BREAKER,TERMINAL CAP
CBL2	1	304502	CABLE,YELLOW PATCH,2' SHIELDED
CR2,CR3,CR4	9	610404	RELAY,TERMINAL MTG,24VDC (WHITE)
CR2,CR3,CR4	2	610387	RELAY,TERMINAL MTG,SEPARATION PLATE
DRV1,3	2	611422-004	DRIVER,PWR-FLEX4M,440-3PH,440-3PH.
DRV1,3 P/O	2	304473	PLC,PWR-FLX,RJ45 TERMINAL BLOCK
FU4,5,6	2	C07061	FUSE,LPCC,15A,600V,13/32x1-1/2
PLC1	1	610883	PLC,ML1200,OUTPUT MODULE,16 OUT
PSM1	1	610913	POWER SUPPLY,460VAC-24VDC,10AMP
SYMBOL	QTY	PART #	DESCRIPTION

MPA-100 AUTOFILL CIRCUIT (210443-001)

CB7	1	C07650-203	CIRCUIT BREAKER,3AMP,600V
M1	1	C06702-001	RELAY,MOTOR STARTER,24VDC
MTR7	1	210450	MOTOR,VACUUM,220-60-1
OL1	1	C06597-001	RELAY,OVERLOAD,3PH,ADJ,5.5-8.0AMP
PLC1	1	610739	PLC,ML1500,IN/OUT MODULE, 6IN/4OUT
PRS25	1	610295	SENSOR,PROX,M12,3WIRE,PNP,NO,QC.
PRS25	1	304431	SENSOR,CABLE,M12,5WIRE,90°
SOL25,26	2	611117	VALVE,SOLENOID,24VDC,2 WAY
SOL25,26	2	C07626	SENSOR,CABLE,M8,3WIRE,90°
T1	1	A06997	TRANSFORMER,1.5KVA,190/480-50/60
T1 P/O	1	C03403	TRANSFORMER,MOUNT PLATE (A06997)
SYMBOL	QTY	PART #	DESCRIPTION

HOPPER LID AUTOFILL CIRCUIT (210407-002)

PRS6,7	2	C07670	SENSOR,PROX,30MM,10-30VDC,PNP,N.C.
PRS6,7	2	304431	SENSOR,CABLE,M12,5WIRE,90°
PRS6,7	2	304268	SENSOR,PROX,MOUNT BLOCK
PRS6	1	A05038	SENSOR,PROX,MOUNT PLATE,EMPTY
PRS7	1	A05018	SENSOR,PROX,MOUNT PLATE,LOW
SOL26	1	611117	VALVE,SOLENOID,24VDC,2 WAY
SYMBOL	QTY	PART #	DESCRIPTION

HOPPER LID LOW-LEVEL ALARM CIRCUIT (210409)

PRS6	1	C07670	SENSOR,PROX,30MM,10-30VDC,PNP,N.C.
PRS6	1	304431	SENSOR,CABLE,M12,5WIRE,90°
PRS6	1	304268	SENSOR,PROX,MOUNT BLOCK
PRS6	1	A05038	SENSOR,PROX,MOUNT PLATE,EMPTY
SYMBOL	QTY	PART #	DESCRIPTION

AUTOFILL POWER CIRCUIT

PL*	1	113393	CONNECTOR,TWISTLOCK,MALE,3POLE
PL*	1	A05379	CONNECTOR,TWISTLOCK,FEMALE,3POLE
PL*	1	C07644	COVER,WEATHER PROOF (113393)
PL*	1	C07645	COVER,WEATHER PROOF (A05379)
SYMBOL	QTY	PART #	DESCRIPTION

HOPPER DUMP VIBRATOR CIRCUIT (304497)

PRS9	1	611267	SENSOR,REED,SSR,2 WIRE",24VDC
PRS9	1	611268	SENSOR,REED,STRAP
SYMBOL	QTY	PART #	DESCRIPTION

AGITATOR CIRCUIT (210399)

SOL25	1	611365	VALVE,SOLENOID,24VDC,2 WAY
SYMBOL	QTY	PART #	DESCRIPTION

ASSY,ENCLOSURE,SEEDER HOPPER (210386-003/004)

ENCL3	1	715536-001	ENCLOSURE,REWORK,SEED HOPPER L/H
		715536-002	ENCLOSURE,REWORK,SEED HOPPER R/H
PNL3	1	P/O ENCL3	PANEL,ELEC,REWORK,SEEDER HOPPER
PSC1/PRS10	1	304430	SENSOR,CABLE,M12,5WIRE,STR
SOL23/25	1	611364	VALVE,SOLENOID,BASE
SOL23	1	611365	VALVE,SOLENOID,1/8 PORT,24VDC
SUP23-26	4	C05724	VARISTOR,SURGE,125A,25VAC,31VDC
TB5	7"	610360	RAIL,DIN,MOUNTING,MINI
TB5	27	610361	TERMINAL,BLOCK,MINI
TB5	2	610362	END COVER,TERMINAL,MINI
TB5	2	610363	ANCHOR,END CLAMP,MINI
TB5	1.5	610364	JUMPER,TERMINAL,10-POS,MINI
TB5	1	610534	TERMINAL,GROUNDING,MINI
	2	303056	PLUG,HOLE,SST 7/8 DIA.
	6'	C07066	CABLE,22AWG,25 COND.
SYMBOL	QTY	PART #	DESCRIPTION

ASSY,SEEDER HOPPER (210404-001/002)

INTLK1	1	C07219	INTERLOCK,MAGNETIC,KEYED
INTLK1	1	C07220	ACTUATOR,MAGNET
PRS1-4(5)	4	610151	SENSOR,PROX,6.5MM,10-30VDC,PNP,NO
PSC1 PRS10	1	611027	SENSOR,PHOTO,DIFFUSE,500MM,24VDC
		C06752-001	SENSOR,PROX,80MM,10-55VDC,PNP,EDDY
SOL24	1	304239	CLUTCH,SHAFT MTG,24VDC
SYMBOL	QTY	PART #	DESCRIPTION

ASSY,SEEDER FRAME (210381/210382)

MTR1	1	611603	MOTOR,GEAR,1/3HP,230/460-60-3,LH
		611604	MOTOR,GEAR,1/3HP,230/460-60-3,RH
PRS8	1	611267	SENSOR,REED,SSR,2 WIRE",24VDC
PRS8	1	611268	SENSOR,REED,STRAP
SOL21/22	1	611119	VALVE,SOLENOID,DUAL,24VDC
SOL21/22	2	C07626	SENSOR,CABLE,M8,3WIRE,90°
TB11	6"	610360	RAIL,DIN,MOUNTING,MINI
TB11	25	610361	TERMINAL,BLOCK,MINI
TB11	3	610362	END COVER,TERMINAL,MINI
TB11	2	610363	ANCHOR,END CLAMP,MINI
TB11	1	610364	JUMPER,TERMINAL,10-POS,MINI
TB11	1	610534	TERMINAL,GROUNDING,MINI
TB11	1	710161	TERMINAL STRIP,COVER
	6'	C01237	CABLE,22AWG,15 COND.
	6'	142113	CABLE,16AWG,4 COND.
SYMBOL	QTY	PART #	DESCRIPTION

ASSY,ENCLOSURE,DISPLAY (210429)

CBL1	1	611745	PLC,ML1500,CABLE,OPER/PRG 16.4 FT.
CBL1	1	611636-002	CONNECTOR,D-SUB,DB9/15,COVER,90
DISP1	1	304465-002	PLC,DISPLAY,PV-600+COLOR,TOUCH
ENCL2	1	711988	A/W,ENCLOSURE,DISPLAY,9840S/9940S
ENCL2 P/O	1	712044	A/W,TRI-CLAMP,1.50"
ENCL2 P/O	1	610760	GASKET,TEFLON,1.50"
LT1	1	C01301	LIGHT,ASSY,24VDC,W/LATCH
LT1	1	C01218	LENS,GREEN
LT1	1	C01263	NAMEPLATE,POWER ON
LT1	REF	610172	BULB REPLACEMENT,24VDC 800E LED
PB1	1	C07213	SWITCH,PUSH/PULL,RED,MUSHROOM
PB1	1	C07101	CONTACT CARTRIDGE,1-N.C.
PB1	1	C05395	NAMEPLATE,PUSH-STOP/PULL-START
	20'	C07133	CABLE,18AWG,6COND.
SYMBOL	QTY	PART #	DESCRIPTION

ASSY,MAIN ENCLOSURE CIRCUIT (210400)

CB20	1	C07649-010	CIRCUIT BREAKER,250V,10AMP
CR1,CR9,10	8	610404	RELAY,TERMINAL MTG,24VDC (WHITE)
CR1,CR5-8,10	7	610421	RELAY,TERMINAL MTG,24VDC (BLACK)
CR11	1	610452	RELAY,TERMINAL MTG,110VAC (BLACK)
	1	610412	RELAY,TERMINAL MTG,220VAC (BLACK)
CR1-15 P/O	11	610387	RELAY,TERMINAL MTG,SEPARATION PLATE
ENCL1	1	304425	ENCLOSURE,REWORK,MAIN (304460)
ENCL1	1	611811	ENCLOSURE,LOCK,COVER,1/4 TURN
EXC1	1	610741-001	HEAT EXCHANGER,24VDC
EXC1	1	611163	HEAT EXCHANGER,AIR FILTER,HOUSING
GND	1	C06488	GROUND LUG
LT2/AH1	1	C01399	LIGHT TREE,24VDC,W/HORN TOP MTG
LT2/AH1	REF	611592	BULB,REPLACEMENT,LIGHT TREE,24VDC
PLC1	1	611634	PLC,ML1400,PROCESSOR,12K MEMORY
PLC1	1	611883	PLC,ML1400,MEMORY MODULE
PLC1	1	304468	PLC,PWR-FLX,COMM. MODULE
PLC1	1	611898	PLC,ML1200,INPUT MODULE,16 IN
PLC1	1	610883	PLC,ML1200,OUTPUT MODULE,16 OUT
PNL1	1	304463	PANEL,REWORK,MAIN (304461)
RES1	1	610093	RESISTER,1/4 WATT,120 OHM.
TB1	2	C06369	JUMPER,TERMINAL,2-POS
TB1	2	C06387	BRACKET,MOUNT DIN RAIL,30"
TB1	190	C05843	MARKER,STRIP,BLANK
TB1	80	C06461	TERMINAL,BLOCK
TB1	1	C06462	END COVER,TERMINAL
TB1	1	C06463	JUMPER,TERMINAL,10-POS
TB1-4	48"	C06464	RAIL,DIN,MOUNTING
TB1-4	10	C06465	ANCHOR,END CLAMP
TB1	10	C06525	TERMINAL,GROUNDING
TB1-4	13	C07117	TERMINAL,BLOCK,DUAL
TB1-4	4	C07118	END COVER,TERMINAL,DUAL
	1	611660	VOLTAGE,PRE-TEST POINTS KIT
	1	611661	VOLTAGE,VISION (R-3W) KIT
	96"	C07687	DUCT,WIRE,1.25x1.625x6'
	96"	C07689	DUCT,COVER,WIRE,1.25x6'
SYMBOL	QTY	PART #	DESCRIPTION

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Electrical Ladder

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Electrical Ladder

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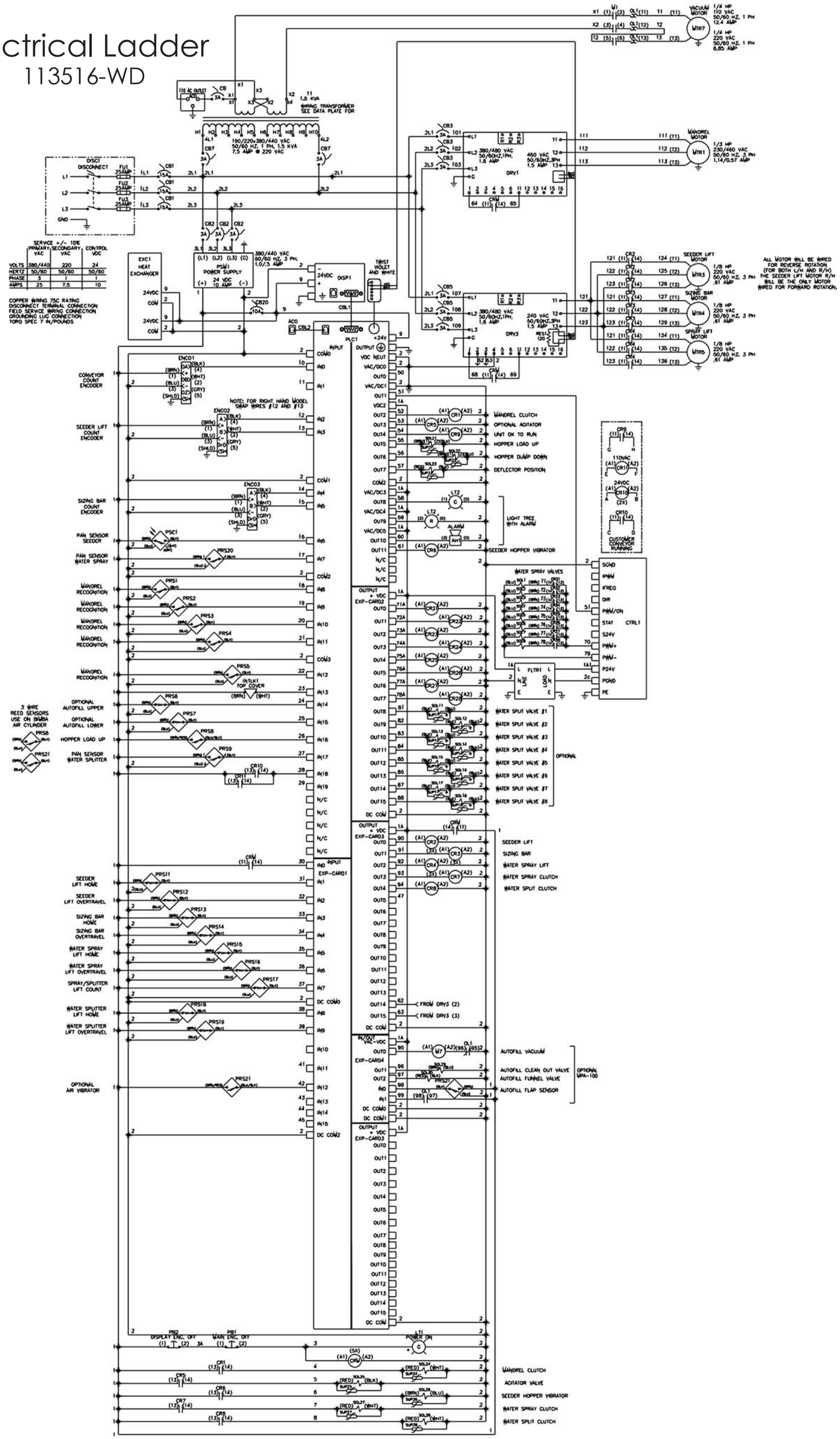

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Electrical Layout
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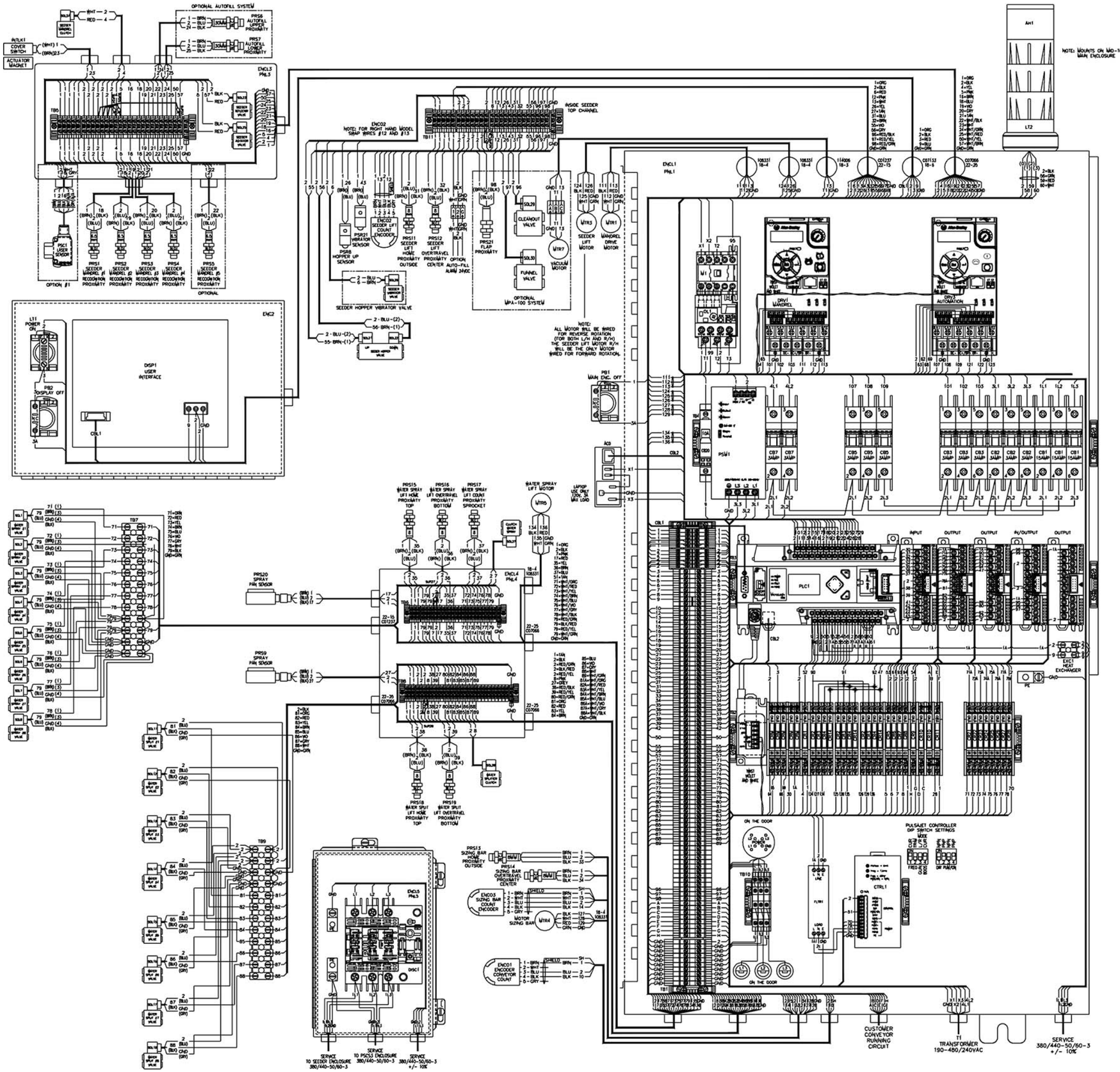
Electrical Layout

113516-WD



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