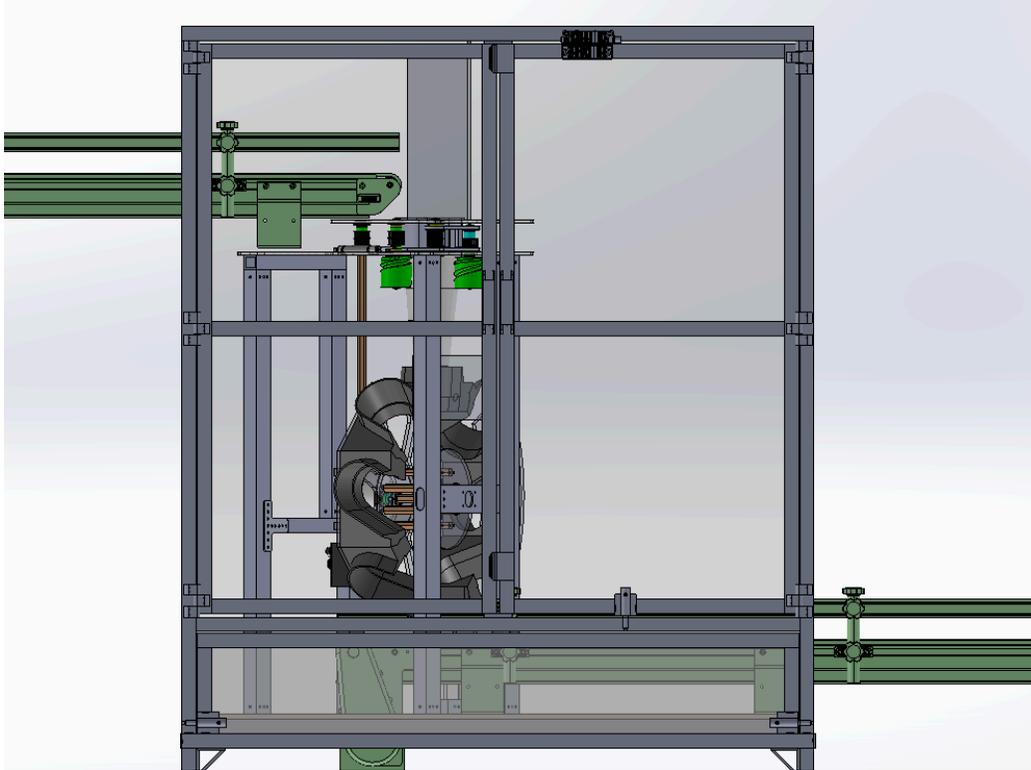


Operation Manual

Cup Denesting Machine

7R33 Series

Single Denester, 8 slot, 4 cup pinwheel style re-orientation



CAUTION:

Before using Machine, read this manual and follow all safety rules and machine operation instructions.

MANUAL INCLUDES:

- Safety Guidelines
- Operation & Changeover Instructions
- Machine Maintenance
- Troubleshooting

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Safety Instructions

Cup Denesting Machine

- Please read all instructions carefully and comply with all safety instructions given in this Manual
- Keep all of the following documents for future reference
- You can find additional Information at sprucepackaging.com
- If you have any Questions, Call us at 1234567890.

 **Warning**

ALWAYS have eye protection on in vicinity of the machine

ALWAYS fully turn off machine fully before performing maintenance

Usage Instructions

 **Warning**

NEVER increase air pressure over 40 PSI

NEVER reach inside the enclosure during operation

ALWAYS E-stop before clearing any jams

NEVER open PLC cabinet door during operation

Safety Warnings

The improper use of any type of machinery can result in serious injury. This document is intended to help those working with the Spruce Packaging Cup Flipping machine to avoid injury through application of safe operating procedures. Those working with this machine should read and understand the entire Safety Section and User Manual before operating or servicing the Denesting Machine.

What follows are guidelines for safe use of the Spruce Packaging equipment.

1. DO NOT OPERATE MACHINE:

- Unless trained and authorized. Machine is automated, qualified operators only.
- Unless all MACHINE manuals are read and understood.
 - This machine is not for use within a Residential Area.

2. BEFORE STARTING MACHINE:

- Make sure all safety devices are in place and operate properly.
- Be sure your installation conforms to applicable electric codes. Inspect all electrical connections before installing, operating or servicing machine. Be sure supply voltage matches machine transformer voltage and the machine is connected to solid ground (earth).
- Never change or defeat the function of electrical interlocks or other machine “shutdown” devices.
- Never operate a machine after using non-prescription drugs, taking strong medication, or consuming alcoholic drinks.

3. WHEN OPERATING MACHINE:

- Always follow safety recommendations.
- Wear eye protection at all times.

- Never attempt to bypass or remove physical guards.
- Never operate a machine with guards removed.
- Keep hands, limbs, jewelry and clothing away from the machine's moving components.
- Protect your hands. Emergency stop (E-stop) the machine before working on conveyor or pinwheel modules.
- Protect your hands. Emergency stop (E-stop) the machine before cleaning or removing any foreign objects or debris.
- Protect your feet. Wear safety shoes with reinforced steel toes at all times.
- Remove loose fitting clothes and jewelry, as they can easily be caught in moving parts.
- Never allow untrained persons near the machine.
- Never leave the machine unattended.
- Report machine damage or faulty operation immediately.
- Keep work areas clean and dry. Remove unused and scrap materials.
- Follow all vendor precautions when handling liquids that are used on the machine and its components.

4. WHEN SERVICING COMPONENTS:

- Service should be done by qualified maintenance or electrical personnel.
- Emergency stop (E-stop), power down, and lockout/tagout the machine before entering electrical or mechanical cabinets or the machine.
- Never change or defeat the function of electrical interlocks or other machine “shutdown” devices.
- Avoid moving parts. Do not wear loose jackets, shirts, or sleeves.
- Fixed guards are only to be removed by specialized technicians using provided special tools
- Do not open motor drive units after powering down until 5 minutes have passed.
- Wear eye and ear protection when working near or with pressurized air or water.

Conveyor

The conveyor must be unplugged, or lockout/tagout performed before servicing the conveyor. The motor and electrical equipment can cause severe injury when energized.

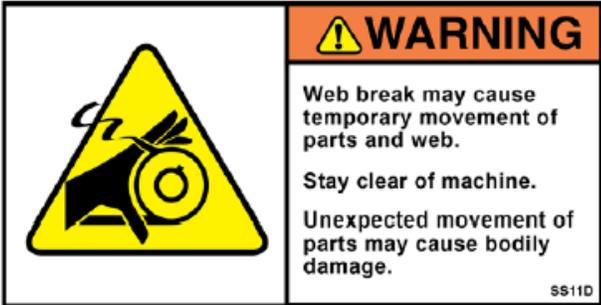


Dump Valve

Exhausting pressurized air produces loud noise and fast moving air. To reduce the risk of hearing loss or other bodily injury, wear protective ear and eye covers.

Removal of the air supply may cause unexpected movement of some components. Check the work area to ensure that all personnel are safely positioned away from the equipment before dumping air. Moving components may cause bodily injury.





Motors, Belts, Bearings, and Actuators

The motors, belts, bearings, and actuators are located in the mechanical cabinet. Follow Safety Precautions for cabinet when maintenance is necessary.

Electrical Boxes

The electrical boxes in the rear of the cabinet house the electrical components. High voltages and exposed terminals pose a potential for fatal or serious injury due to electrical shock. Do not open doors while machine is in operation. Follow lockout/tagout procedures when servicing is necessary.



PNEUMATICS

Valves, Solenoids, and Flow Controls

Do not service or remove from service any valve without first shutting off both the air and electricity to the valve and making certain no pressurized air, which could present a hazard, is retained in the system.

Refer to Miscellaneous Product Literature for each valve.

GUARDING

Guarding is provided to reduce the risk of injury. Do not operate the machine unless the guarding is properly installed and secured. Failure to use the guards will greatly increase the risk of severe injury to personnel. Guarding does not eliminate the risk of injury, therefore, operators must be familiar with all the safety recommendations and follow them.



LOCKOUT/TAGOUT

Key Personnel

- Equipment Supervisor
- Authorized Machine Operators
- Service/Maintenance team:
 - ◆ Plant Engineering Electricians
 - ◆ HVAC mechanics
 - ◆ Plumbers
 - ◆ Mechanical Engineers
 - ◆ Electrical Technicians

Preliminary Information

The equipment supervisor must provide authorized/affected employees with:

- Prior notification when equipment service/maintenance is required and power sources must be shut down, locked out, and tagged.
- Appropriate personal protective equipment (PPE) and lockout/tagout devices to all employees performing service/maintenance and lockout/tagout procedures.
- Proper instructions and tools for testing that the equipment is de-energized.
- The latest lockout/tagout procedures for components with independent power supplies.
- The type and magnitude of the equipment's energy.

LOTO Required Equipment

- Lockout Devices (includes lockout hasps, special chains, wedges, key blocks, adaptor pins, self-locking fasteners, and other devices)

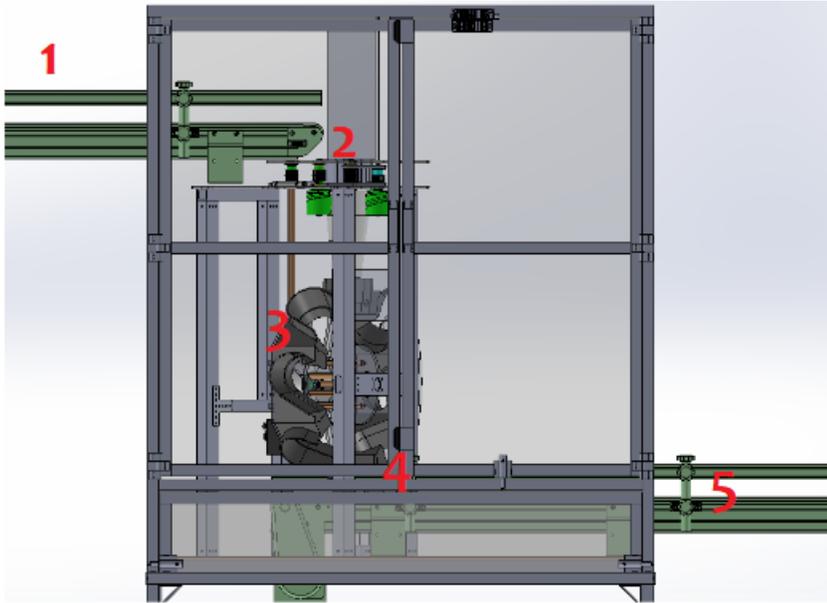
NOTE: Lockout devices are any specialized hardware required for isolating, securing, or blocking equipment from energy sources.

- Key Operated Locks
- Lockout Tags
- Lockout Procedure posted on the machine.
- Test Equipment (to ensure electrical components are fully de-energized.)

NOTE: Ensure test equipment is operational prior to use.

Machine Specific Information

Machine Layout



1. Inbound Conveyor
2. Denesting Module
3. Pinwheel
4. Door Interlock
5. Outbound Conveyor

Machine Description

Single Denester, 8 slot, 4 cup pinwheel style re-orientation

Technical Specifications

Primary Function	De-Nest and Re-Orient Cups
Functional Detail	Dual Cup Size
Power Input	120v 15A 60Hz
Operating Air Pressure	40 PSI
Enclosure Dimensions (L x W x H)	44" x 32.25" x 72"
Machine Dimensions w/o Conveyor/Enclosure (L x W x H)	20" x 18.25" x 47.5"
Conveyor Height Difference	33"
Maximum Cups Per Minute	40 CPM
Cup Feed Stack Height	30 Cups
Maximum Cups Staged on Inbound	210
Number of Photo-Eye Sensors	4
Differing Cup Size Capabilities	20oz., 12 oz.
Adjustability	Yes, One-Button Changeover
Special Features	Hot-swappable Modular Systems
Air Consumed	Less 1 CFM

Installing The Machine

Air Supply

The machine has a filter-regulator with 3/8" NPT ports and requires clean, dry, compressed air at 75-90 PSI (517-620 kPa) with low CFM.

Electrical Power Supply

Unless specified otherwise, the machine requires 15 Amps at 125 VAC 13-phase 3 wire for incoming power.

Power On

To power up the machine, turn the disconnect power switch located on the front of the electrical enclosure from OFF to ON. The customer is responsible for service disconnect.

Machine Leveling

Spruce Packaging machines are equipped with leveling pads on the framing legs and should be leveled and maintained in the same way. It is important to level the Spruce Packaging machine periodically in order to maintain performance.

To level the machine:

1. Place a level along the front door frame and adjust the leveling pads (FIGURE 1.1) using an open-end wrench until the machine is leveled.



FIGURE 1. Leveling Pad

TURNING MACHINE ON

1. Make sure machine is plugged in outlet
 - a. Use standard 120V outlet
2. Turn air pressure on
 - a. Set to 40 PSI
 - b. Ensure air hose is connected correctly
3. Make sure PLC cabinet is closed
4. Switch Red lever on PLC cabinet door to ON position
5. Wait for PLC home screen to appear
6. Click Auto on the home screen



Machine Activation Process

1. In the Auto screen select desired cup size



2. Clear all cups for the machine
3. Preload 15 cups of selected size into the denesting mechanism
4. Preload ~6 stacks of ~30 cups of selected size onto Inbound conveyor
5. Press cycle start to begin running the machine



- Utilize the slider on the screen to turn up the speed



- Keep machine fed with stacks of cups on inbound conveyor

Changeover Process

- When changing to a new cup size make sure the machine is fully clear of all cups to ensure a smooth process
- Once the machine is clear select the desired cup size on the touchscreen



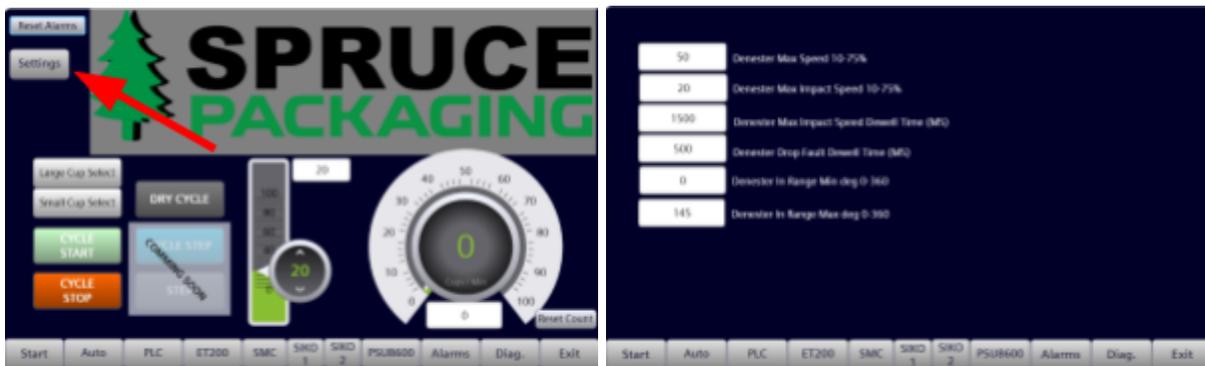
- Follow normal cycle start procedure after cup selection

Extra Information

- To see the total number of cups run through the machine during the uptime the bottom right corner has a counter. This counter is right below our gauge for the number of cups per minute calculated by the last 8 cups run through.



- If any settings need to be changed there is a menu for that on the screen



- Note it is not recommended to change any settings without consulting a technician first then they will walk you through necessary steps
- Dry cycle mode is a display feature that allows a cup per minute reading without having cups run through the machine

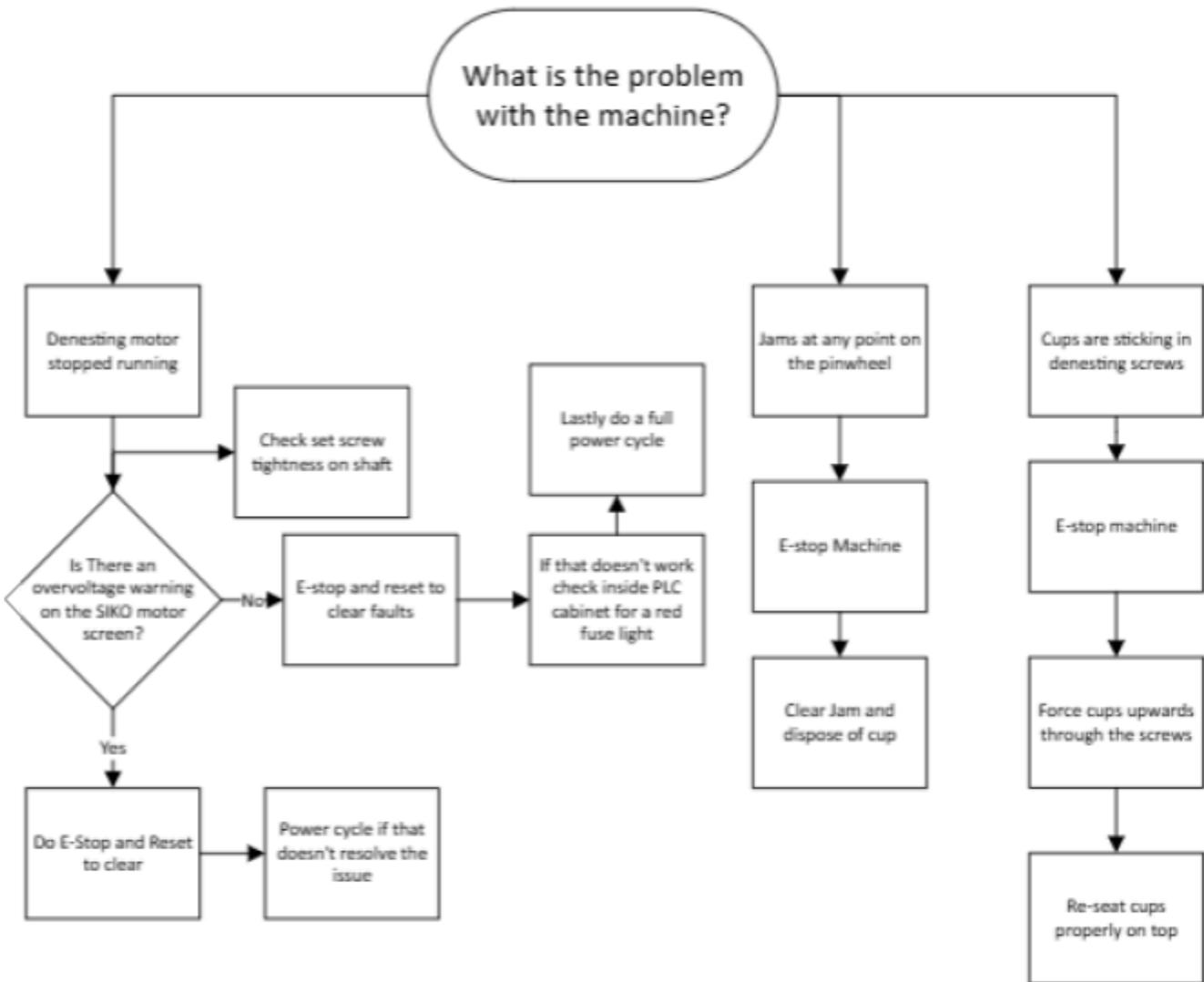
Preloading Cups

Operator can preload up to ~230 cups at the start of the run. Seven stacks up to 30 cups each, depending on cup size plus preload cups in the denesting assembly.



Troubleshooting

- Alarms and faults are features of this machine that will tell you when a sensor detects something is wrong
 - Alarms are just notices that won't stop the machine
 - There is one alarm on the machine that will notify the operator if there are no parts on the inbound conveyor
 - Faults will stop the machine and give a readout that informs what is wrong
 - Fault 1 is "Fault Safety System". Which comes about from either the E-Stop being pushed in or the door safety sensor detecting an open door
 - Fault 2 is "Fault No Cups Selected". This stops the machine from running while the Denester changeover isn't set to a cup size
 - Fault 3 is "Fault Denst Drop Time Out". This tells the operator that a cup dropped improperly to the Re-Orienter and could cause a potential jam.



Troubleshooting Sensor Issues

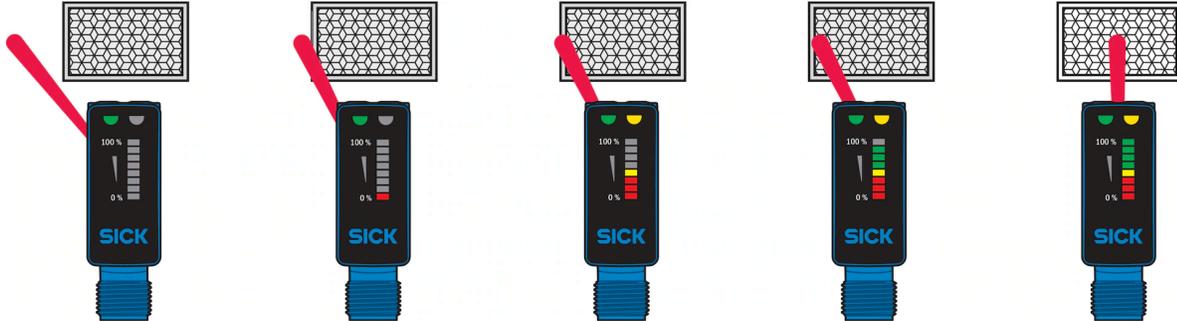
There are four sensors used on the machine.



Photoelectric sensors: H18 Sure Sense

HL18T-P4A3BB

Ensure sensor is properly aligned with the reflector for robust signaling to the PLC input to ensure proper machine functionality.

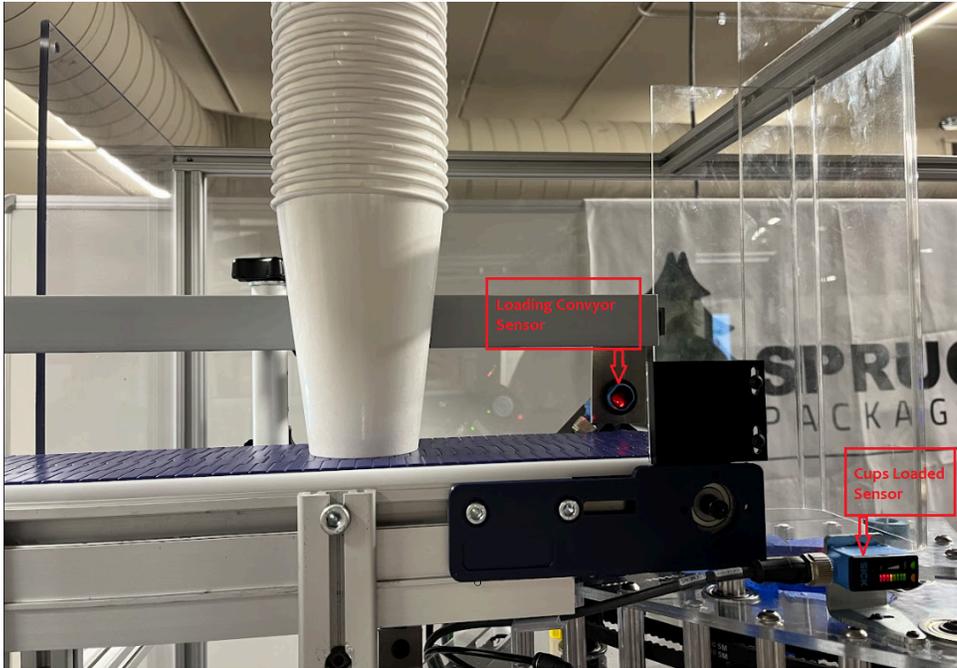


Adjustment - can be made to help ensure signal by adjusting sensitivity.

Potentiometer, right Sensitivity

Potentiometer, left None

Sensor Location and Function



Loading Conveyor Sensor

- Stops the conveyor if sensor detects stack of cups
- If no cups present after running for ~10 seconds alerts operator with warning message that inbound conveyor is empty

Denester Cup Present Sensor

- Checks level of cups in denesting assembly
- When no cups present turns on loading conveyor to load new stack of cups



Pinwheel Sensor

- Checks for jams between the transfer from denesting to pinwheel
- If sensor is block, machine stop fault



Outbound Conveyor Sensor

- Counts number of cups exiting pinwheel
- Uses 8 cups passing to calculate
- Use to verify we have a cup passing thru each index of pinwheel



Model: 7R33
Serial # 20241025
Manufacturer Date: 10/25/2024