OPERATIONS MANUAL FOR
MHE 4010-E
IMPELLER PACKER
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CHAPTER ONE - DESCRIPTION

This packer has been designed to incorporate a primary #1 and secondary #2 hopper. The secondary hopper can be released and removed in a sideways movement completely from the packer whenever it is necessary to replace parts or dislodge foreign material.

The left #4 and right #5 feeder screws are your assurance of consistent feed of product to the four oversize impeller blades #3. High speed fill rates, less dust and improved weight accuracies are the result.

To reduce wear on the hopper assembly there are upper #10 and lower #11 wear plate Weldment that are replaceable.

Important Notice

READ THIS MANUAL COMPLETELY before installing, starting up or operating your equipment. Be certain all personnel concerned with the routine operation of this equipment are fully alerted to the possible HAZARDS of the equipment and its utilities (electrical and pneumatic) before any operation is allowed.

Choice Bagging Equipment, Ltd. cannot emphasize enough the importance of good safety practices in the use of this equipment. Sound engineering and design practices have been applied to minimize the possibility of accidents, however while using equipment of this type, good judgment and extreme caution is necessary on the part of all personnel.
CHAPTER TWO - INTRODUCTION
AND OVERVIEW

I. Introduction

This service manual has been prepared to assist in the installation and servicing of your bag filling machine. This packer has been built using standard parts wherever possible that can be purchased from a local source when replacement is necessary.

We have constructed this equipment with heavy duty frame and components. If properly maintained it will provide you with years of trouble-free operation.

Upon receipt of your packer, a visual inspection should be made to see that all items have been received and in good condition. If any damagers are noted they should be immediately reported to the delivery carrier and supplying dealer.

2. Overview

The 4010-E is an electronically controller Impeller Packer. Product falls from the supply bin into the packer hopper. Augers on both sides (feed screws) bring the product to the center of the hopper and specially designed impeller blades propel it through pinching tube, filling tube and into the bag. This is accomplished on actuation of the "START" signal.

The bag is supported by the fill spout and bag chair which are mounted to the front plate. The front plate assembly is suspended from a Load Cell. Flexures are utilized to prevent sideward movement of the front plate.

The load cell monitors the weight of the bag filling by sending a signal to the electronic package in the Main Control Panel. Here the signal is amplified and sent to an A/D input card. The programmable controller deciphers the information and sends it to the display.
CHAPTER THREE - WARNINGS & PRECAUTIONS

The purpose of this section is to alert operating and maintenance personnel to the possible dangers of this type of equipment. Serious injury and/or equipment damage could result from not heeding these safety precautions.

1. Before Operating Equipment

   A. Any personnel working directly with or on this equipment should read this manual before proceeding with equipment use.

   B. Electricians should familiarize themselves with the electrical drawings before initial start-up of equipment.

   C. Other appropriate operating and maintenance personnel should familiarize themselves with mechanical layout and general arrangement drawings before start-up of equipment.

   D. Determine location of all emergency switches.

   E. Be sure all guards are in place and observe all warning signs.

   F. Check oil level in all motors.

   G. Be sure electrical equipment is free of any accumulation of water.

   H. Be sure all personnel are clear of operating mechanisms before connecting air.

   I. Never start equipment without first checking for loose objects, tools and trash. All persons in the immediate area of the equipment should be alerted prior to starting.

2. When Operating Equipment

   A. Observe extreme caution when switches are turned on. Operation may begin automatically after a time delay.

   B. Do not open junction boxes or control panels unless you are a qualified electrician. Be sure power is off. Except when electricians are performing maintenance, electrical enclosures and junction boxes should always be securely closed.
C. Stop machine and disconnect power supply before servicing or repairing. Maintenance and adjustments must be performed with all power supply disconnected unless otherwise specified in this manual.

D. Do not attempt to defeat any safety switches. Serious injury could result.

E. While machine control power is on, do not activate limit switches manually. Serious injury and/or machine damage could result. Disable machine before attempting any maintenance or manual testing of components.

F. Gear motors will get warm to the touch and should not cause concern for equipment reliability and operation. A temperature rise is normal per new NEMA specifications.

G. If additional wire runs are added to any junction box or control panel, wiring practice should be such as to maintain prevailing electrical hazard classification.

H. High-pressure air systems are dangerous. Do not service or troubleshoot systems with air supply on. Be sure to bleed off any trapped air before working on components since it is possible to have high pressures trapped in airlines and cylinders, etc.

I. Keep fingers, hands, feet, etc., out of path of pneumatically operated components.

J. Safety glasses should be worn in equipment area.

K. Follow the safety regulations for your plant. Always use good judgment.
CHAPTER FOUR - INSTALLATION

1. Precautions for Installation

In the crating method used, all possible care has been taken to avoid damage to the packer during shipment. The machine is mounted on skids which serve as a base to permit movement. During the uncrating process the machine should be inspected carefully. Any transportation damage should be reported immediately. When unloading, care should be taken to prevent the machine from falling or being subjected to severe shock. When possible it is recommended that the machine be transported to its operating location before the crate is removed.

- DO NOT pry against the machine components to remove the crate.

- CAUTION: EXTREME CARE MUST BE USED TO PREVENT DAMAGE WHEN REMOVING PARTS THAT ARE STRAPPED AND/OR BLOCKED FOR SHIPMENT.

- The packer should be bolted to floor using holes provided the bottom of the frame legs.

- NOTE: Packer should be made level in both planes prior to tightening of hold-down bolts.

- DO NOT remove at this time any clamping device on the equipment that were obviously installed for shipping purposes.

- Connection to supply hopper can be made direct only if there is no possibility of vibration being transmitted to the packer. If there is a possibility of vibration being transmitted, a flexible connection must be installed. This is extremely important as vibration will affect all weighing mechanisms on the unit and result in off-weights.

- NOTE: The floor should also be vibration-free as it can cause the same problems.

- Bring electrical serve to MCP-1 and connect to circuit breaker. A 10g minimum ground wire must connect the MCP-1 ground buss to the Main Service ground rod. A blower start/stop selector is provided in the pushbutton station which may be utilized to control motor starter for existing blowers.
• NOTE: This switch is a "DRY CONTACT". If the switch is going to be used be sure to connect it into your control circuit at this time.

• Connect the high pressure air to each packer at the filter regulator. Each packer required 1.5 cu ft of free air @ 80 psi per bag packed. Care must be taken to make certain the air lines are blown clear of any contamination. A shut off valve and air line bleed valve should be installed just prior to the filter regulator. Fill the lubricator with 10 weight, non-detergent oil. Oil level must be 1" from the top. The filter bowl should be checked DAILY and DRAINED DAILY. If an excessive amount of water is present, it may be necessary to install a dryer prior to the packer.

If a dust collection system is present run ducting to the rectangular tube behind the front plate just below the fill tube. Each packer requires 400 CRM @ 4500 FPM or more depending on the application.

The front plate has been adjusted at the factory. However, it is recommended that it be checked prior to start up. Check to make certain all nuts are locked securely on the scale beam and all other parts of the packer. Motion and vibration during shipment often cause nuts to become loose.

Once the packer has been installed and connected to the supply hopper. remove all clamping and hold down devices.

**DO NOT FILL SUPPLY HOPPER WITH MATERIAL YET**
CHAPTER FIVE - ADJUSTMENTS

1. Bag Chair

The height of the bag chair is determined by the size of the bag to be filled. It multiple size bags are run on the same packer it will be necessary to adjust the height of the chair with each bag size change. Place a bag on the fill tube and smooth the body of the bag down. Unfold the bottom of the bag to a horizontal position. Raise the bag chair until it just touches the cheeks of the chair. Mark each notch to expedite change over time.

CAUTION: NEVER ADJUST CHAIR WITH THE POWER ON! PERSONAL INJURY MAY RESULT FROM THIS OVERSIGHT. ALWAYS USE COMMON SENSE AND CAUTION WHEN PERFORMING MAINTENANCE ON THIS EQUIPMENT.

2. Auto Start Lever and Switch

An auto start lever is included on your packer. This allows the fill cycle to be initiated by the bag being placed on the fill spout. The lever mechanism must be adjusted such that the front edge of the empty bag fully pivots the lever back when it is in position on the fill tube. NOTE: A Mechanical stop is provided to prevent over travel.

As the bag fills its front edge rounds out and retracts away from lever allowing it to move to its normal position. It is critical that the bag releases the lever as it fills or the fill cycle will not stop.

As the lever moves back, a bolt head pushes on the actuator of a 3-way valve which directs air to the pressure switch. The rise in pressure holds the pressure switch closed. Thus sending a signal to the PC to initiate the fill cycle.

The pressure switch may require adjusting. Follow the procedure below:

1. Set Filter/Regulator to operating pressure.
2. Open MCP door and turn key switch on PC to the STOP position.
3. Turn main breaker ON - DO NOT press POWER button!
4. Look at the LED 12 on the second card right from the PC. The LED should be OFF. If it is not off, turn adjusting screw on top of the pressure switch "CLOCKWISE" until the light de-energizes.
5. With LED OFF push start lever to shift air to switch. The LED should come on. If not, turn adjusting screw on top of the Pressure Switch "COUNTER-CLOCKWISE” while holding lever until LED comes on.
3. **Front Plate**

The front plate is set at the factory and probably will not require adjustment. However a simple Repeatability Test can be performed to find out.

1. Ensure key switch on PLC is in the RUN position
2. Turn main breaker on - Let stand for 15 minutes to allow electronics to power up.
3. Place mode switch to the CAL/ZERO position.
4. Turn fine zero knob until 000.10 is displayed on read out
5. Push down on spout. See if Readout display returns to between 000.05 and 000.15.
6. Push up on spout - See if readout returns as above.
7. If readout DOES NOT return to the proper reading:
   a. check air hoses to ensure they are not rubbing against frame
   b. check dust collection tube at front plate to ensure there is a gap present
   c. if neither of the above conditions are present raise front plate on hanger bolt assembly to get more tension on flexures. Raise 1/4 turns at a time and DO NOT move more than 1/8" total.
CHAPTER SIX - CALIBRATION AND SETUP

1. Preliminary Adjustments

The majority of calibration is done at the factory. However, due to shipping, climate and change of product density, the unit must be re-calibrated in the field.

After inspecting the unit for possible shipping damage, loose bolts and nuts, loose wire terminals, etc., install the unit where it will be used. Make electrical and air connections. WITHOUT any material in the hopper and STANDING CLEAR of the unit, turn on the main control panel, then the air supply. Let sit for an hour to allow all the electronics to settle. Then follow the steps below with power off (E-Stop, Not Main).

1. Place empty bag on spout and put the Mode Selector Switch in the CAL/ZERO Position. Caution should be used as bag clamp will lower. Keep fingers and hands clear of the bag clamp.

2. Adjust fine zero so that all zeros are showing, but no minus (-) sign.

3. Place a known weight (target weight is best is possible) on the bag chair. Adjust the fine gain pot until display reads the correct weight.

4. Remove weight and rest zero, if necessary.

5. If zero was reset, replace know weight and readjust fine gain know. If necessary, run steps 1-4 again.

In the following steps, disregard minus sign if it come/stays on until the final procedure.

6. Set target weight per the following:
   a. Turn "CAL, RUN, SETUP" switch to set up position
   b. Turn "TARGET, COMP" switch to target position
   c. Turn "VALUE" switch (increase/decrease) to correct position to dial in target weight. { NOTE: Holding switch in increase or decrease position will make numbers change rapidly on display. Switching between center position and increase (or decrease) will cause display to change by 0.05 increments }.
   d. When desired target weight is reached, switch "TARGET COMP" switch to "COMP" position and dial in1.00 using "VALUE" switch. This is only a preliminary setting, as it might be changed during the course of a run.
2. **Final Adjustments**

For this final stage product is needed in the hopper. If product is not redeemable, expect to waste a few bags because of off-weights.

1. Turn off bag chair air using the flow control valves on the chair. At this point, we don't want the bag to automatically discharge. Put Auto Comp ON/OFF Switch to OFF position.
2. Press "POWER ON" button.
3. Place a bag on the fill spout. Press "START FILL" pushbutton.
4. Fill a bag using the already programmed target and comp. weights.
5. When weight is locked in the display (Bag Clamp Raises) remove the bag by hand and weigh it on an accurate scale and record the weight.
6. Now that there is material in the fill tube the scale will have to be re-zeroed out.
   a. Place empty bag on fill spout (DO NOT contact START Lever) and put Mode Selector in CAL/ZERO position.
   b. Adjust Fine zero pot. Until display reads 000.00 but no minus sign is present.
7. Turn Mode Selector back to run. Remove empty bag and put filled bag back onto spout. Turn Mode Selector to CAL/ZERO. The display MUST read +/- .05 lbs. of what the actual weight of the bag is. If the display does not match weight adjust the fine gain knob until the display reads the proper weight then repeat step 6.
8. Fill another bag. Record display reading then weigh bag on an accurate scale. If display is not +/- .05 lbs repeat step 7. If display reads correct weight proceed to step 9.
9. If the displayed weight is higher than the target weight, increase the compensation setting. If lower, decrease the compensation setting.
10. Run enough bags to properly set the compensation value.
11. If your packer is equipped with the "Auto Compensation" feature it can be engaged at this time by putting the auto Comp ON/OFF Selector to the "ON" position. The compensation will be automatically changed as necessary after every 20th bag.

3. **Fill Cycle**

Ensure that the air pressure is set and the main breaker is ON. Allow 15 minutes for warm up. Press the Power ON button and the Green indicator will energize.

Place an empty bag on the fill spout and slide it on far enough to actuate Auto Start lever or press the start fill push button. Refer to Phase Two per following diagram.

**STOP CYCLE**

When the target weight of the bag reaches the cutoff point (Target Weight minus Compensation Weight) refer to Phase One per following diagram.
The bag clamp remains down while the scale is allowed to settle for a set period of time. During this time the operator MUST NOT TOUCH THE SCALE. When the settle time expires the FINAL bag weight is frozen on the display, the bag clamp raises and the bag chair dumps the bag. If it a manual chair the operator must remove the bag when the filling indicator de-energizes. After a short delay the bag chair retracts to hold position. At this time another bag should be on the spout and slid into place to start the next cycle.

Due to material build up on scale systems, or temperature fluctuations the scale will have to be zeroed from time to time. The ZERO point is looked at after the bag clamp is lowered and before the pinch tube is opened. The zero indicator illuminates when it is necessary to readjust the zero setting. Indicator will remain on until the following procedure is performed.

1. Place empty bag on spout, but DO NOT contact the start lever. Set Mode switch to the CAL/ZERO position. This will unlock display and lower the Bag Clamp.

2. Turn fine zero knob until minus sign disappears or the display reads 000.00.

If the STOP FILL push button is pressed the filling cycle will stop as described above with the exception of the bag discharge cycle, and locking in the final bag readout. The packer will begin filling again only when the START FILL push button is pressed. This holds true whether the partially fill bag is completed or a new empty bag is put on in its place.
CHAPTER SEVEN - TROUBLESHOOTING

A. SLOW FILL RATES

1. Check to be sure bag is put on the fill tube far enough so tube is not blocked. Excess air build-up in bag will cause back pressure and flow fill rates.

2. Check for lumps in packer chamber. If lump gets in nozzle area and it is not too big that it completely stops the flow, it can allow some material to get by but fill rates will be slow.

3. Check to be certain High pressure air is at minimum of 60 psi.

4. Check to see if "V" belts are slipping.

5. Impeller speed may have to be increased or decreased. Check factory for recommendations.

B: PACKER WON'T SHUT OFF

1. Bag too small causing jamming. Reduce Target Weight

2. Scale jammed against something.

3. Start lever not released as bag fills.

C. PACKER WONT' START

1. Power on button not pressed.

2. Pressure switch not adjusted properly or valve not being actuated.

3. Press Start PB again. If packer will not start replace contacts.

4. Replace contacts on Stop Fill pushbutton.
D. PACKER RE-STARTS AS SOON AS BAG KICKS OFF

1. Auto start valve malfunctioning. Replace

E. OFF WEIGHTS

1. Bag too small. Reduce Target Weight
2. Product not filling uniformly in bag during filling cycle
3. Vibration from floor or bin.
4. Product not feeding to packer consistently.
5. Front plate in contact with conduit, air hoses, wires, etc. or front plate needs to be raised to put more pressure on flexures.
6. Zero not fine tuned. If above zero, bag will be light. If below zero, bag will be heavy.
7. High pressure air fluctuation. Control air must be CONSISTENT at a minimum of 60 psig and 80 psig preferred.
8. Check to make sure packer chamber is filled before empty bag placed on filling spout. If operator goes too fast, he will get ahead of product and weights cannot be maintained.
9. Lumps of material inside packer chamber will block nozzle.
10. Check to make sure operator is not touching bag during final stages of filling.
11. Check pinch tube wear. If it is worn on the inside or badly distorted replace with new tubing.
12. Check proper position of bag chair which should be set so that filled bag just barely rests on it. Too high or too low will cause off weights.
CHAPTER EIGHT - ELECTRICAL DESCRIPTION

A. PACKERS PUSH-BUTTON AND INDICATOR

<table>
<thead>
<tr>
<th>SWITCH OR INDICATOR:</th>
<th>FUNCTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Setup 2-Position Selector Switch</td>
<td></td>
</tr>
<tr>
<td>A. Target:</td>
<td>This position allows the target weight to be set. When the MODE switch is in the Set-Up position.</td>
</tr>
<tr>
<td>B. Comp</td>
<td>This position allows the target weight to be set. When the MODE switch is in the Set-Up position.</td>
</tr>
<tr>
<td>2. Value Increase/Decrease 3-Position Selector Switch</td>
<td>Used in conjunction with MODE switch in setup position and setup switch to increase or decrease the value of target weight or compensation. When left in one position long enough, the rate of change automatically increases. Center position stops and holds value.</td>
</tr>
<tr>
<td>3. Zero Indicator - Yellow indicator.</td>
<td>Illuminates when zero is 1/4 lbs high or below zero.</td>
</tr>
<tr>
<td>4. Fill Cycle Start NOPB</td>
<td>Manually starts a fill cycle. If fill cycle stop has been pressed, the fill cycle start must be pressed before the auto start switch can be used.</td>
</tr>
<tr>
<td>5. Fill Cycle NOBP</td>
<td>Deactivates the fill cycle and releases the bag clamp when pressed. Fill cycle start pushbutton must be pressed to resume cycle or start a new bag.</td>
</tr>
<tr>
<td>6. Power ON NOBP Green indicator</td>
<td>Turn on power to packer to allow moving parts to operate. When on, Green indicator is illuminated.</td>
</tr>
</tbody>
</table>
### PACKERS PUSH-BUTTON AND INDICATOR

<table>
<thead>
<tr>
<th>SWITCH OR INDICATOR:</th>
<th>FUNCTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Power OFF NCPB</td>
<td>Prevents moving parts on packer from activating by de-energizing Power ON Mode. Note: Display and Indicators remain enabled.</td>
</tr>
<tr>
<td>8. Fine Gain</td>
<td>This is a multi-turn (10) concentric scale dial. It is used for fine turning during calibration. DO NOT use except when calibrating.</td>
</tr>
<tr>
<td>9. LED Display</td>
<td>Displays the weight in 0.05 lb increments. Negative sign displayed indicates below zero.</td>
</tr>
<tr>
<td>10. Fine Zero</td>
<td>This is a multi-turn (10) concentric scale dial. It is used zero scale.</td>
</tr>
<tr>
<td>11. Filling Indicator</td>
<td>This indicator is illuminated during a filling cycle. It de-energizes when the bag chair dumps the bag off the packer or the fill cycle</td>
</tr>
<tr>
<td>12. Mode</td>
<td>3-Position Selector Switch</td>
</tr>
<tr>
<td>A. Cal/Zero Position:</td>
<td>This position allows the display to show weight for calibration and zeroing. Will not allow packer to run when this position is selected.</td>
</tr>
<tr>
<td>B. Run Position</td>
<td>This position is selected for operation of packer.</td>
</tr>
<tr>
<td>C. Setup</td>
<td>This position is selected when target weight or compensation is to be adjusted. Will not allow packer to run in this position.</td>
</tr>
</tbody>
</table>
B. RELAYS

SWITCH OR INDICATOR:  

FUNCTION:

1. PSMCR  
   Plug Stack  
   Master Control Relay  
   This relay is controlled by the program. It in turn controls the moving parts.

2. POR  
   Power On Relay  
   POR is used in latch Power ON when the Power On Push button is pressed.

3. 100# DR  
   100# Digit Relay  
   This relay is switch on to illuminate the 100 lb digit.

4. DSR  
   Digit Strobe Relay  
   This relay is switched to lock in the last reading of a weight for a bag weight after filling.

C. RELAYS

SWITCH OR INDICATOR:  

FUNCTION:

1. Hour Meter  
   Elapsed Time  
   Records in hours the amount of time the packers have been run.

2. C/B Handle  
   Circuit breaker handle used to turn main power on and off.

3. Auto Comp On/Off  
   2-Position Selector Switch (Inside Panel)  
   Enables and disables automatic compensation feature.
# CHAPTER NINE - SPARE PARTS

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>44018</td>
<td>Pinch Tube</td>
<td>3</td>
</tr>
<tr>
<td>44018</td>
<td>Isolator Section from Pinch Tube</td>
<td>3</td>
</tr>
<tr>
<td>40141</td>
<td>Fill Tube</td>
<td>2</td>
</tr>
<tr>
<td>50104</td>
<td>RH Feeder Screw</td>
<td>1</td>
</tr>
<tr>
<td>50105</td>
<td>LH Feeder Screw</td>
<td>1</td>
</tr>
<tr>
<td>50103</td>
<td>Impeller</td>
<td>1</td>
</tr>
<tr>
<td>Wool</td>
<td>Stuffing Box Wool</td>
<td>1 pound</td>
</tr>
</tbody>
</table>

**NEW PARTS**

<table>
<thead>
<tr>
<th>DESCRIPTION OF PARTS</th>
<th>PART NUMBER</th>
</tr>
</thead>
</table>

Choice Bagging Equipment, Ltd.
2007
DESCRIPTION

1. Upper Pinch Bar Weldment
2. Small Linkage Bar
3. Medium Linkage Bar
4. Large Linkage Bar
5. Lower Pinch Bar
6. Mounting Yoke
7. Lower Pinch Bar Bracket (Machine)
8. Lower Pinch Bar Bracket (Cast)
9. Shoulder Screw (.25 x .75)
10. Shoulder Screw (.25 x 1)
11. Lock Nut (10-24)
12. Cotter Pin

PART NUMBER

40054
40120
40121
40122
40123
40124
40125
40126
60288
60289
60398
60522
### Front Plate Assembly

#### MHE 40006-E

**Description**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
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</thead>
<tbody>
<tr>
<td>Bag Clamp Bracket Weldment</td>
<td>40057</td>
<td>Hex Jam Nut 1/4&quot; UNC</td>
<td>60422</td>
</tr>
<tr>
<td>Front Plate Weldment</td>
<td>40058</td>
<td>Air Cylinder</td>
<td>44010</td>
</tr>
<tr>
<td>Dust Shroud Weldment</td>
<td>40059</td>
<td>Cylinder Repair Kit</td>
<td>44023</td>
</tr>
<tr>
<td>Automatic Bag Clamp Assembly</td>
<td>40003</td>
<td>Retainer Plate</td>
<td>46001</td>
</tr>
<tr>
<td>Fill Tube: ___ID x ___OD</td>
<td>40141</td>
<td>Flexure Mounting Angle</td>
<td>46002</td>
</tr>
<tr>
<td>Taper Sleeve: ___ID x ___OD</td>
<td>40142</td>
<td>Flexures</td>
<td>46003</td>
</tr>
<tr>
<td>Clamping Sleeve: ___ID</td>
<td>40143</td>
<td>Top Flexure Mounting Bracket</td>
<td>46004</td>
</tr>
<tr>
<td>Lower Fill Tube Clamp</td>
<td>40144</td>
<td>Bottom Flexure Mounting Bracket</td>
<td>46005</td>
</tr>
<tr>
<td>Upper Fill Tube Clamp</td>
<td>40145</td>
<td>Isolation Bracket</td>
<td>46006</td>
</tr>
<tr>
<td>Female Scale Point</td>
<td>44011</td>
<td>Isolation Connection Tube</td>
<td>46007</td>
</tr>
<tr>
<td>Pinch Tube: ___ID x ___OD</td>
<td>44013</td>
<td>Load Cell</td>
<td>46008</td>
</tr>
<tr>
<td>Hose Clamp</td>
<td>60152</td>
<td>Eye Bolt</td>
<td>46009</td>
</tr>
<tr>
<td>Square Head Set Bolt 1/4&quot; UNC</td>
<td>60306</td>
<td>Hook Support</td>
<td>46010</td>
</tr>
</tbody>
</table>
## Hopper Assembly

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Primary Hopper Weldment</td>
<td>50100</td>
<td>13. Stuffing Box Weldment</td>
<td>50113</td>
</tr>
<tr>
<td>3. Impeller Blade Weldment</td>
<td>50103</td>
<td>15. Keeper Disc</td>
<td>50239</td>
</tr>
<tr>
<td>4. Left Feeder Screw Weldment</td>
<td>50104</td>
<td>16. Shaft Slinger</td>
<td>50240</td>
</tr>
<tr>
<td>5. Right Feeder Screw Weldment</td>
<td>50105</td>
<td>17. Slinger Standoff</td>
<td>50241</td>
</tr>
<tr>
<td>7. Right Feeder Trough Weldment</td>
<td>50107</td>
<td>19. Hopper Flange Gasket</td>
<td>50243</td>
</tr>
<tr>
<td>~</td>
<td></td>
<td>21. Bearing</td>
<td>52003</td>
</tr>
<tr>
<td>Upper Wear Plate Weldment</td>
<td>50110</td>
<td>22. Impeller Shaft</td>
<td>50219</td>
</tr>
<tr>
<td>Lower Wear Plate</td>
<td>50111</td>
<td></td>
<td></td>
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<tr>
<td>12. Wear Plate Shroud Weldment</td>
<td>50112</td>
<td>23. Stuffing Wool</td>
<td>44029</td>
</tr>
</tbody>
</table>
Below Zero Signal driver
Added to Top of PN001 Rev A

Signal in from D1 Cathode
of Part # 001 Rev A

Parts List
R1 120Ω 1/4 watt
R2 1KΩ 1/4 watt
R3 10KΩ 1/4 watt
D1, D2 1N4001
Q1 2N2229
R1y1 5R15 P20 QD1 (Selector Switch)
5V DC Coil, PCB Term (16 pin dip) Pin 14-16
0.3A @ 120VAC Contacts
DPDT
TB1 Terminal Block 1
PCB Mount, 3 pin

+15 Volts DC
120V AC In
120V AC Out