

ENTERPRISE

Endload Cartoner

OPERATION / MAINTENANCE PARTS MANUAL

SCHWANS - ATLANTA
HS5160

REPLACEMENT MANUALS CAN BE ORDERED

AT A NOMINAL CHARGE. PURCHASES ORDER MUST INCLUDE
MACHINE MODEL _____ AND SERIAL NUMBER

(AND MANUAL NUMBER (S) IF AVAILABLE).

You can get additional information by contacting
Kliklok-Woodman at the address below:

Kliklok-Woodman
5224 Snapfinger Woods Drive
Decatur, Georgia 30035
E-Mail: service@kliklok-woodman.com
Telephone: 770/981-5200
Fax: 770/987-7160

To Order Spare Parts,

Ask for the Parts Sales Department.

If you want troubleshooting, maintenance,
or other advice, ask for the
Service Department.

Parts Sales are staffed daily
Monday-Thursday from
7 AM until 7 PM eastern time and
Friday 7AM until 5PM.

OPERATION / MAINTENANCE

ELECTRICAL DRAWINGS

REPLACEMENT PARTS

SPARE PARTS LIST

CUSTOM PARTS LIST

SETUP SHEETS

MANUAL

ELECTRICAL

PARTS

SPARES

CUSTOM

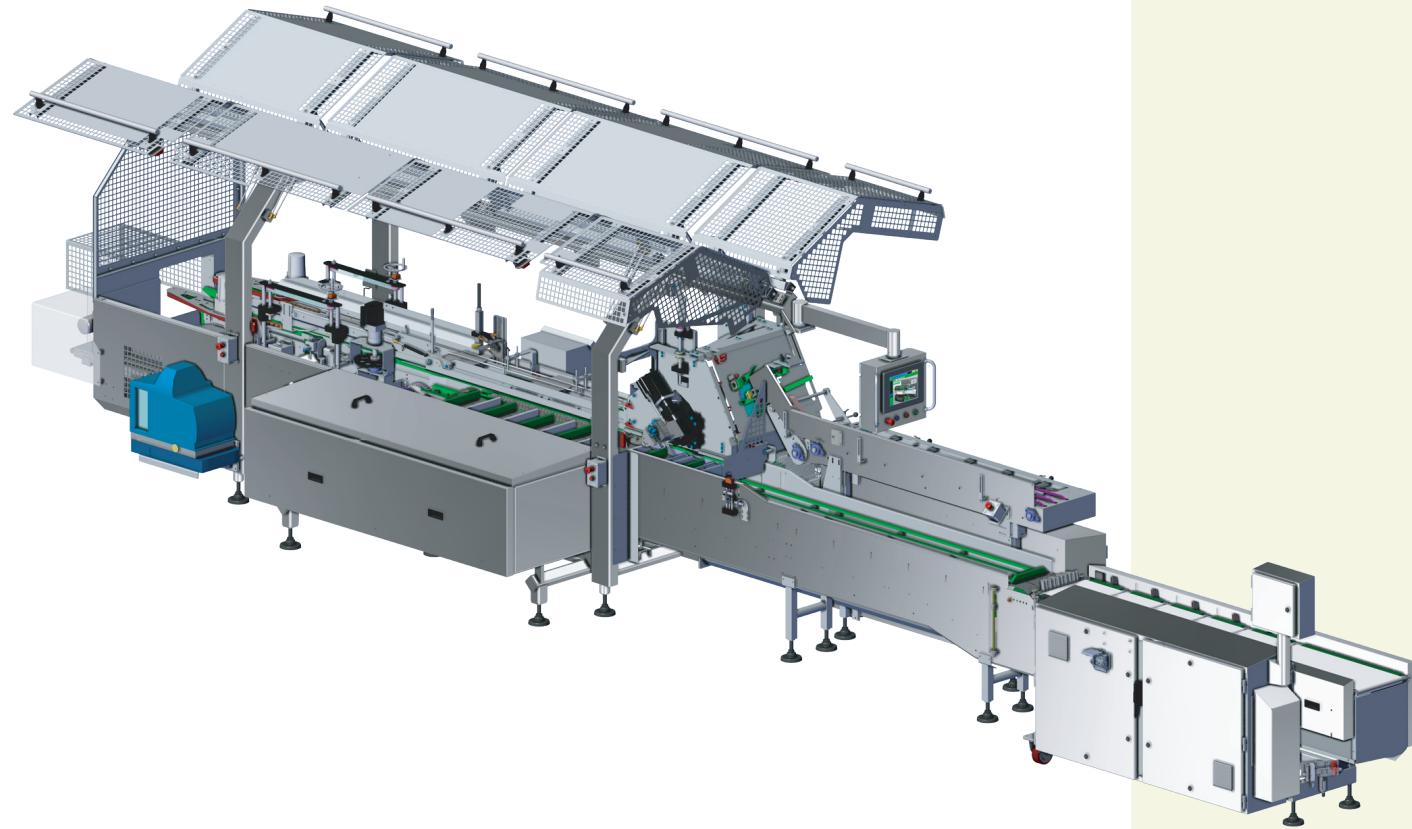
SETUP

SERVICE BULLETINS

SERVICE
BULLETINS

KLIKLOK • WOODMAN®

EXIT



ENTERPRISE

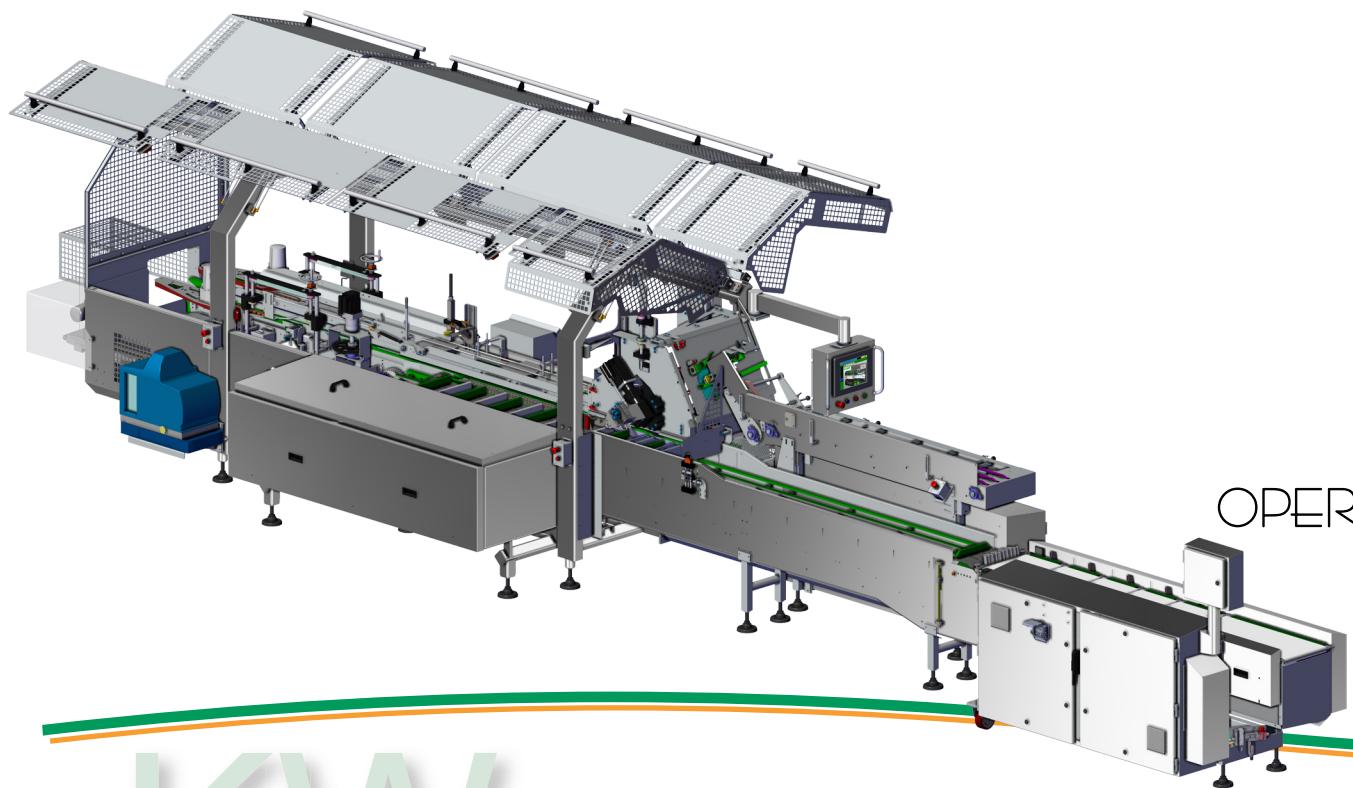
Endload Cartoner

SCHWANS - ATLANTA

HS5160

OPERATION / MAINTENANCE
MANUAL





OPERATION / MAINTENANCE
MANUAL

ENTERPRISE^{PIC}
Endload Cartoner

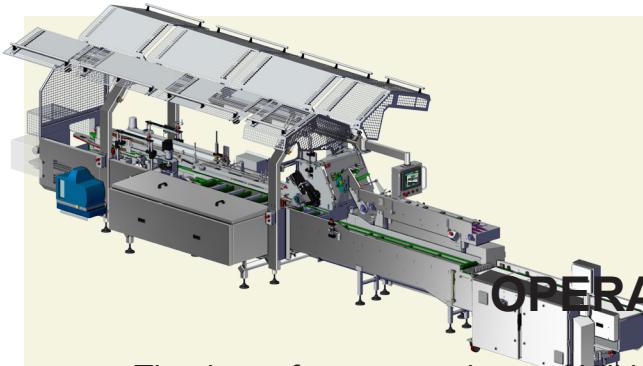
KLIKLOK • WOODMAN®

⚠ WARNING

DO NOT OPERATE OR PERFORM
ANY MAINTENANCE / REPAIRS ON
THIS MACHINE UNLESS YOU HAVE
A FULL UNDERSTANDING OF THE
CONTENTS IN THIS MANUAL



5224 SNAPFINGER WOODS DRIVE, DECATUR GA 30035 USA
TEL: 770/981-5200 • FAX: 770/987-7160
email: publications@kliklokwoodman.com



KLIKLOK
ENTERPRISE
Endload Cartoner

OPERATORS AND MAINTENANCE MANUAL

Thank you for your purchase of Kliklok-Woodman packaging machines. We hope this comprehensive Operators, Maintenance and Parts manual will help you get the best possible performance and reliability from your Enterprise packaging system. Kliklok-Woodman stands behind every machine we make and we are ready to provide any additional assistance you may require.

The operator's sections give step by step procedures on machine operations and set ups. The maintenance sections give brief descriptions of each machine system along with a preventive maintenance schedule and troubleshooting guides.

Should service or assistance in troubleshooting and repair be required, please contact the Kliklok-Woodman Customer Service Department with the following information:

1. Machine Serial Number
2. Software Version

Your machine may differ slightly from those illustrated in this manual due to engineering changes or the addition of optional equipment.

MACHINE SERIAL NUMBERS SOFTWARE VERSIONS

KLIKLOK • WOODMAN®

5224 SNAPFINGER WOODS DRIVE, DECATUR GA 30035 USA

TEL: 770/981-5200 • FAX: 770/987-7160

email: publications@kliklokwoodman.com

KLIKLOK • WOODMAN®

5224 Snapfinger Woods Dr.
Decatur, Georgia 30035
Tel: 770 981 5200 • Fax: 770 987 7160
Email: sales@klikwood.com



ENTERPRISE

Endload Cartoner

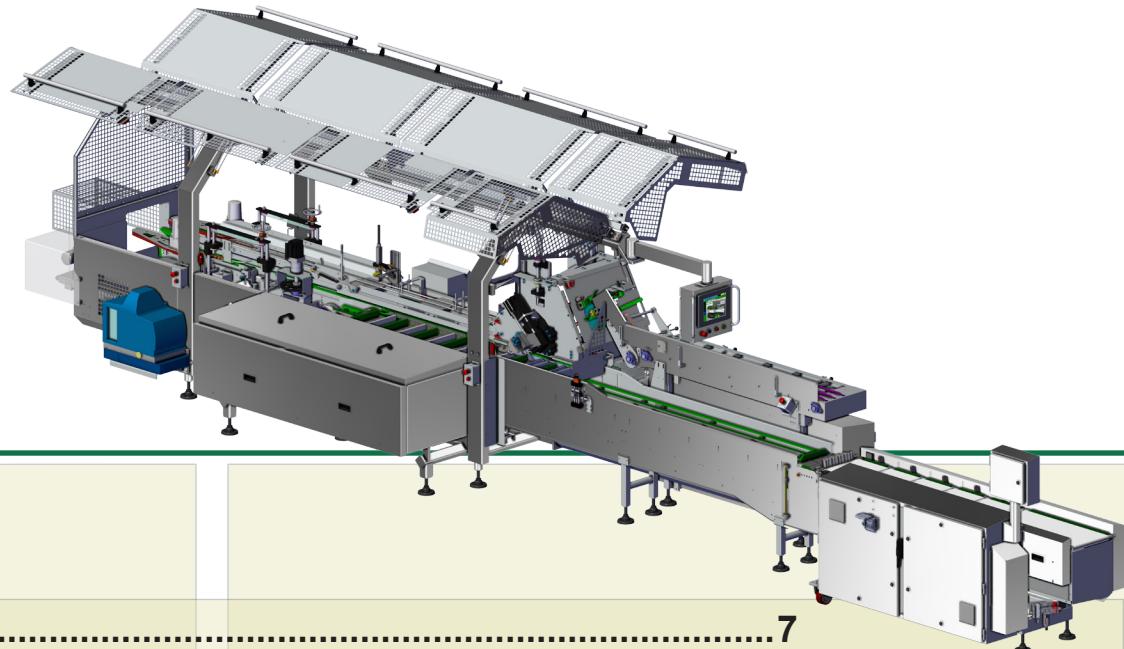


TABLE OF CONTENTS

1.0 INTRODUCTION.....	7
1.1 HOW TO USE THIS MANUAL.....	7
1.2 PERSONNEL SKILL LEVEL	8
1.2.1 OPERATOR SKILL LEVEL.....	8
1.2.2 MAINTENANCE SKILL LEVEL	8
1.2.3 REPAIR PERSONNEL.....	8
1.2.3.1 MECHANICAL REPAIR.....	8
1.2.3.2 ELECTRICAL REPAIR.....	8
1.3 PARTS AND SERVICE CONTACT INFORMATION	9
1.4 MACHINE LAYOUT	10
2.0 SAFETY	11
2.1 SAFETY STANDARDS	11
2.2 LOCK-OUT/TAG-OUT PROCEDURES	11
2.3 SAFETY SYMBOLS.....	12
2.3.1 MACHINE SAFETY LABELS	12
2.4 LOCATION OF EMERGENCY STOP BUTTONS	13
2.5 SAFETY GUIDELINES FOR PERSONNEL	13

2.5.1 OPERATOR / ATTENDANT SAFETY	14
2.5.2 MAINTENANCE PERSONNEL SAFETY GUIDELINES	14
2.6 MACHINE GUARDS AND SAFETY SWITCHES.....	15
2.6.1 MAIN ELECTRICAL DISCONNECT	15
2.7 INSTALLATION SAFETY	16
2.7.1 GENERAL INSTALLATION INFORMATION	16
2.7.2 PERSONNEL REQUIREMENTS	16
2.8 INSTALLATION	16
2.8.1 RECEIVING & UNPACKING THE MACHINE	16
2.8.2 MOVING THE MACHINE.....	17
2.8.3 LEVELING THE MACHINE.....	17
2.8.4 REASSEMBLY	18
2.8.5 REMOVING THE SHIPPING TIE BAR	18
2.8.6 INSTALLING THE PRODUCT INFEED CONVEYOR (P.I.C.).....	19
3.0 OVERVIEW.....	21
3.1 CARTON PROCESS FLOW	21
3.1.1 CARTON / PRODUCT SENSORS	22
3.2 CARTON HOPPER AND GATE	24
3.3 CARTON FEEDING AND ERECTION	25
3.4 PRODUCT LOADING/CARTON CLOSING	27
3.5 Barrel Cam Inserter.....	28
3.5.1 SPEED OF OPERATION	30
3.6 CARTON SPECIFICATION.....	31
3.7 SERVICES	31
3.7.1 NOISE LEVELS	32
3.7.2 MACHINE LAYOUT & DIMENSIONS	32
3.7.3 ADHESIVE SYSTEM	33
3.8 ELECTRICAL SYSTEM SPECIFICATIONS	33
3.8.1 DIAGNOSTIC AND PERFORMANCE MONITORING	33
3.8.2 ELECTRICAL COMPONENT VENDOR LIST.....	34

3.9 MECHANICAL SYSTEM SPECIFICATIONS	34
3.9.1 FINISH	34
3.9.2 CHANGE PARTS	34
3.9.3 GUARDING	35
3.9.4 ADHESIVE APPLICATION	35
3.9.5 SEMI-AUTOMATIC CHANGEOVER	35
3.10 MECHANICAL COMPONENT SPECIFICATIONS.....	36
4.0 OPERATOR INTERFACE.....	41
4.1 INTRODUCTION	41
4.2 HMI SCREENS, BUTTONS, AND FUNCTIONS	42
4.3 HOME SCREEN	43
4.4 OPERATOR LEVEL "I" ACCESS	44
4.4.1 HOME SCREEN	44
4.4.2 RECIPE SETTINGS SCREEN	44
4.4.3 RECIPE MENU SCREEN	49
4.4.4 MODE SCREEN	51
4.4.5 STATISTICS SCREEN	52
4.5 OPERATOR LEVEL "II"	53
4.6 MAINTENANCE LEVEL "M"	53
4.6.1 HOME SCREEN	54
4.6.2 RECIPE SETTINGS SCREEN	55
4.6.3 RECIPE MENU SCREEN	55
4.6.4 MODE SCREEN – MAINTENANCE LEVEL	56
4.6.5 STATISTICS SCREEN – MAINTENANCE LEVEL.....	57
4.6.6 DIAGNOSTICS SCREEN	60
4.6.7 MAINTENANCE SCREEN	64
4.6.8 PVP DIAGNOSTICS	68
5.0 OPERATOR INSTRUCTIONS	70
5.1 MACHINE STATES	70
5.1.1 STOPS	70
5.1.2 OPERATIONAL STATE IDENTIFICATION.....	71

5.1.3 MACHINE STATE CHANGES.....	71
5.2 RUNNING THE MACHINE	72
5.2.1 RUNNING THE MACHINE IN MANUAL MODE	72
5.2.2 RUNNING THE MACHINE IN AUTO MODE	73
5.2.3 STOPPING THE MACHINE – CYCLE STOP	73
5.2.4 STOPPING THE MACHINE – EMERGENCY STOP	73
5.2.5 RESTARTING THE MACHINE AFTER A FAULT	74
5.3 PERFORMING A SIZE CHANGE	74
5.3.1 ADJUSTMENT IDENTIFICATION	75
5.4 DETAILED SIZE CHANGE INSTRUCTIONS	76
5.4.1 SIZE CHANGE – QUICK GUIDE	76
5.4.2 SIZE CHANGE – STEP BY STEP	76
5.5 NORDSON PRO-BLUE 7 USER'S GUIDE	84
5.5.5 Controls and Indicators (contd.).....	87
6.0 MAINTENANCE.....	88
6.1 DAILY MAINTENANCE SCHEDULE	88
6.2 MAINTENANCE SCHEDULE	89
6.2.1 GENERAL	90
6.2.2 EVERY 8 HOURS	90
6.2.3 EVERY 50 HOURS	90
6.2.4 EVERY 250 HOURS	90
6.2.5 EVERY 500 HOURS	91
6.2.6 EVERY 750 HOURS	91
6.2.7 EVERY 3000 HOURS	91
6.3 LUBRICATION	91
6.3.1 GENERAL INFORMATION	91
6.4 CONVEYOR ADJUSTMENTS	92
6.4.1 POWERED HOPPER CONVEYOR	92
6.4.2 PRODUCT INFEED CONVEYOR	92
6.4.3 FLIGHT CHAINS CONVEYOR	93
6.4.4 OUTFEED TAKEAWAY BELTS TENSIONING	94
6.4.5 INSERTER CHAIN TENSIONING	94

6.4.6 SERVO FEEDER HEIGHT BELT TENSIONING	94
6.5 MACHINE CLEANING	94
6.5.1 PRECAUTIONS	94
6.5.2 LOW PRESSURE WASH DOWN IP65.....	95
6.5.3 PROCEDURES FOLLOWING CLEANING.....	96
6.6 TROUBLESHOOTING	96
6.6.1 REPLACING A SERVO MOTOR	96
6.6.2 REPLACING AN AMPLIFIER.....	96
6.6.4 SAFETY CIRCUIT TROUBLESHOOTING.....	98
6.6.5 SERVO FAULTS AND ERROR CODES	99
6.6.5 TROUBLESHOOTING GUIDE	106
7.0 PRODUCT SETUP AND COMPONENT ADJUSTMENT	112
7.1 SELECTING, EDITING, CREATING, ADJUSTMENT.....	112
7.1.1 SELECTING A RECIPE	113
7.1.2 EDITING A RECIPE	113
7.1.3 CREATING A RECIPE	116
7.1.4 DELETING A RECIPE.....	117
7.2 COMPONENT HOMING.....	117
7.2.1 GENERAL GUIDELINES	117
7.2.2 THE HOMING SCREEN MENU.....	118
7.3 SETTING COMPONENT 'HOME' POSITIONS	119
7.3.1 FLIGHT CHAINS – RETARDING LUG SERVO	119
7.3.2 FLIGHT CHAINS – PUSHING LUG SERVO	120
7.3.3 ROTARY FEEDER.....	120
7.3.4 LOAD SIDE ROTARY FLAP TUCKER	121
7.3.5 NON - LOAD SIDE ROTARY FLAP TUCKER #1 & #2	121
7.4 SENSOR TEACH FUNCTION	123
7.4.1 PRODUCT / OVER-HEIGHT SENSOR TEACH	123
7.4.2 CARTON SENSOR TEACH	124
7.4.3 GLUE SENSOR TEACH	124
7.4.4 LOAD / ABORT ACTIVATION TEACH	125
7.4.5 VACUUM POSITION SET UP	126

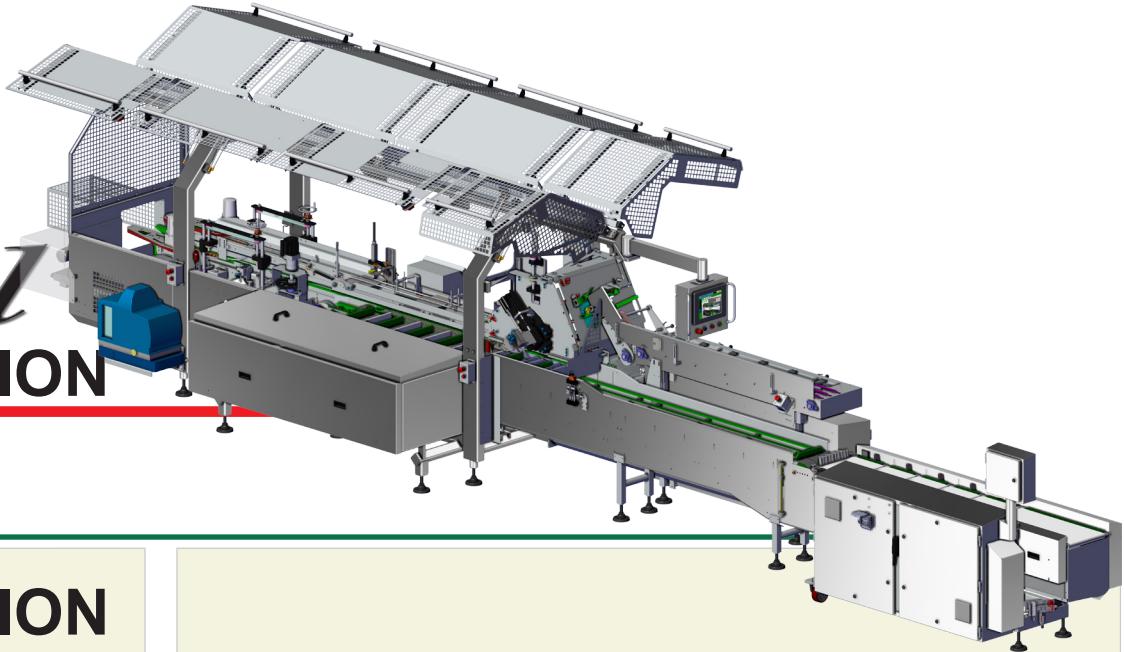
7.4.6 FEEDER, FLIGHT CHAIN AND GLUE POSITION	127
7.4.8 TIMING-TEACH POSITION	128
7.5 ENTERPRISE MECHANICAL	129

ENTERPRISE

Endload Cartoner

Operation Maintenance
Manual

1.0 GENERAL INFORMATION



1.0 GENERAL INFORMATION

1.0 INTRODUCTION

Kliklok-Woodman would like to thank you for choosing our product to fill your packaging needs. We can assure you that you have chosen a prestigious product which offers the latest motion control technology and exceptional reliability, which derives from computer aided design and the high quality materials used in its construction.

The Enterprise 12" Cartoner has been designed to meet your specific needs both in terms of yield and versatility.

Please read this manual carefully. It will help you maintain the machine in prime operating condition and will enable you to maximize its production capacity.

1.1 HOW TO USE THIS MANUAL

The following information describes the content and use of each section of this manual.

SECTION 1- INTRODUCTION

This section provides general overview of the layout of information in this manual and Kliklok-Woodman Parts and Service contact information.

SECTION 2- SAFETY

Information about machine and operator safety and Lockout/ Tagout practices. Safety symbols and their meanings are described here as well as installation/reassembly procedure.

SECTION 3- SYSTEM OVERVIEW

This section provides a description of carton process flow, mechanical/ electrical systems, and subsystems descriptions. You will also find machine specifications, machine options, and various system options available.

SECTION 4- OPERATOR INTERFACE

Description of the various screens utilized to operate the Enterprise Cartoner, control button identification, and machine state description.

SECTION 5- OPERATOR INSTRUCTIONS

Controls and procedures such as start/stop, clearing faults, and performing a size change.

SECTION 6- MAINTENANCE

Identification description of maintenance level screens, homing the Enterprise Cartoner, preventative maintenance, lubrication schedules, and troubleshooting.

SECTION 7- PRODUCT SETUP & ADJUSTMENTS

This section displays the product and component parameter lists in detail. This can be used for fine tuning a product and assist in troubleshooting.

1.2 PERSONNEL SKILL LEVEL

Proper operation and production can be achieved provided the personnel who operate, maintain, and repair this machine have the required skills. The following is a brief description of skill level requirements.

1.2.1 OPERATOR SKILL LEVEL

Any persons that are assigned the task of operating this equipment should have a basic knowledge of machine operation and have completed some form of safety training applicable to his/her job description. The operator should also have basic reading and math skills.

1.2.2 MAINTENANCE SKILL LEVEL

Maintenance personnel assigned to this equipment should have successfully completed a certified mechanical apprentice program or have attained the equivalent maintenance experience. Qualified candidates also must have successfully completed any safety programs or policies that are in effect.

1.2.3 REPAIR PERSONNEL

Repairing and troubleshooting areas on the equipment can be divided into two categories: Mechanical and Electrical

1.2.3.1 MECHANICAL REPAIR

Personnel performing mechanical repairs are to have completed a certified mechanical apprentice program or have the equivalent experience and have knowledge of mechanical assembly techniques and common practices. In addition, he/she must have successfully completed any applicable safety programs or procedures.

1.2.3.2 ELECTRICAL REPAIR

Persons performing basic electrical repair and troubleshooting should be qualified in accordance with the requirements stated in the National Electric Safety Code or equivalent rating. In addition, he/she must have successfully completed any applicable safety programs or procedures.

1.3 PARTS AND SERVICE CONTACT INFORMATION

For replacement parts, emergency service, training, or a qualified service engineer, please contact the Kliklok-Woodman Service Desk.



KLIKLOK • WOODMAN®

You can get additional information by contacting Kliklok-Woodman at the address below:

Kliklok-Woodman
 5224 Snapfinger Woods Drive
 Decatur, Georgia 30035
 E-Mail: service@kliklok-woodman.com
 Telephone: 770/981-5200
 Fax: 770/987-7160

To order spare parts, ask for the Parts Sales Department

If you want troubleshooting, maintenance, or other advice, ask for the Service Department.

Parts Sales are staffed daily M-F from 7 AM until 7 PM eastern time.

Service Parts

PERFORMANCE

SPEED: Variable to 200 cpm (9" pitch) / 150 cpm (12" pitch)

Actual speed depends upon machine configuration and carton size and style. *Ask KW about meeting higher speed requirements.

CARTON SIZE RANGE

	MIN.	MAX.
Length	2 $\frac{1}{8}$ " (54 mm)	7 $\frac{1}{2}$ " (190 mm) 9" Pitch
Width	1.0" (25 mm)	10 $\frac{3}{8}$ " (264 mm) 12" Pitch
Depth	4 $\frac{1}{2}$ " (114 mm)	3 $\frac{5}{16}$ " (100 mm) 13 $\frac{1}{2}$ " (343 mm)*

*(Mods can add $\frac{5}{8}$ " on a 12" pitch machine)

OPERATING REQUIREMENTS

ELECTRICAL:

460 VAC $\pm 5\%$, 3-Phase with earth ground (PE), 50/60 Hz standard
 380–420 VAC, 3-Phase Wye with Neutral and PE, 50/60 Hz available

NORMAL POWER CONSUMPTION: 28 kVA

SERVICE REQUIRED: 40 Amps @ 460 VAC

AIR: 8 cfm (226 L/min) @ 80 psi (5.5 bar)

CONSTRUCTION

Fully welded stainless steel frame. Stainless steel shafts. Clear polycarbonate guards. Chains, pulleys and sprockets are nickel-plated.
Stainless Steel Guards (Optional)
 Approximate shipping weight: 8500 lb (3855 kg)

STANDARD FEATURES

- Heavy-duty, fully-welded, stainless steel, angled-surface washdown frame (IP-65 standards)
- Ergonomic design for outstanding operator access
- Modular design for easy custom configuration
- Powered 60" carton hopper
- Patented servo-driven rotary carton feeder
- Independently-servo-driven flight chains
- Barrel-cam product inserter with jam protection
- Digital Proportional Glue Regulator
- Corrosion-resistant nickel-plated chains
- Insight® color touch screen icon-based operator interface
- Allen-Bradley ControlLogix control system
- Sanitary washdown wiring
- Network connectivity and data acquisition
- 1-D servo-driven semi-automatic carton size adjustment
- CE Mark
- OMAC PackML compatible

OPTIONAL FEATURES

- Caustic washdown
- Trailing minor flap kicker
- Open Flap Reject
- Carton graphic recognition system (visual)
- Cluster and central lubrication systems
- Laser-cut "mesh" guarding
- MPF food-grade servo motors
- Aborted Product Conveyor

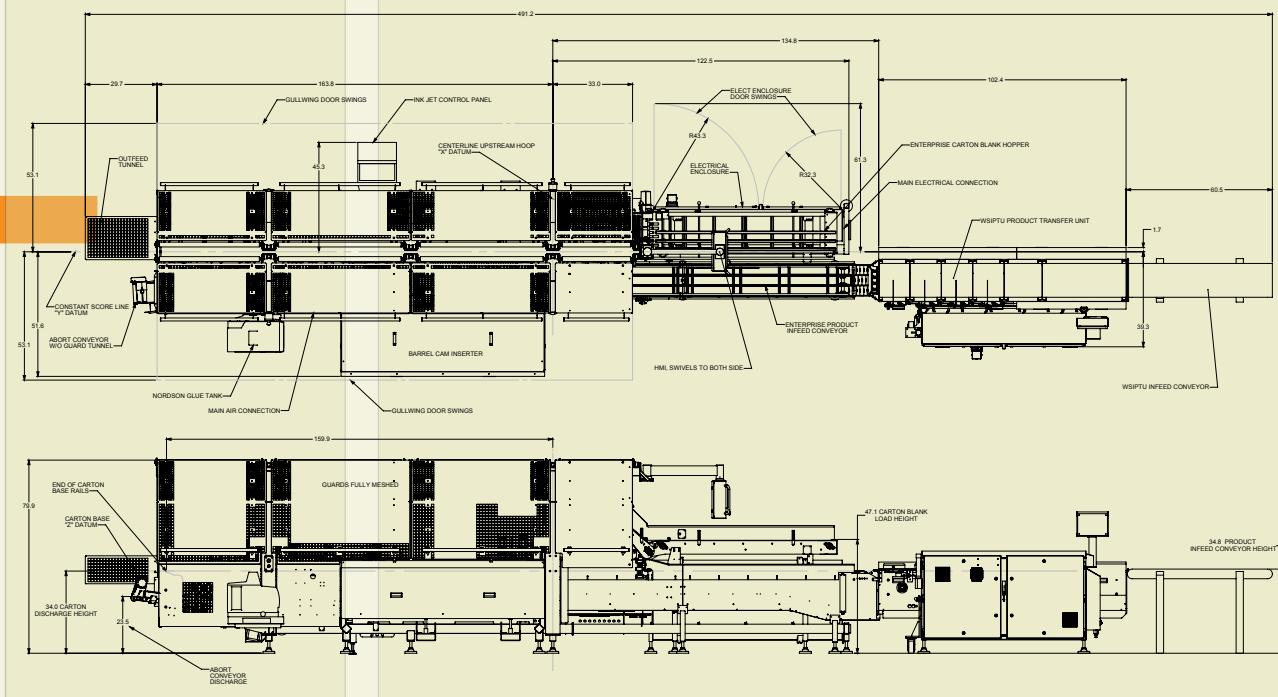


Kliklok-Woodman

Maintains a policy of constant machine improvement. Individual machines, designs and illustrations may vary from this publication, which does not constitute any part of a contract.

As such, it is imperative that you review all information in its entirety. Individual systems may incorporate modifications or added features which are only reflected in attached supplements, drawings or parts lists.

1.4 MACHINE LAYOUT

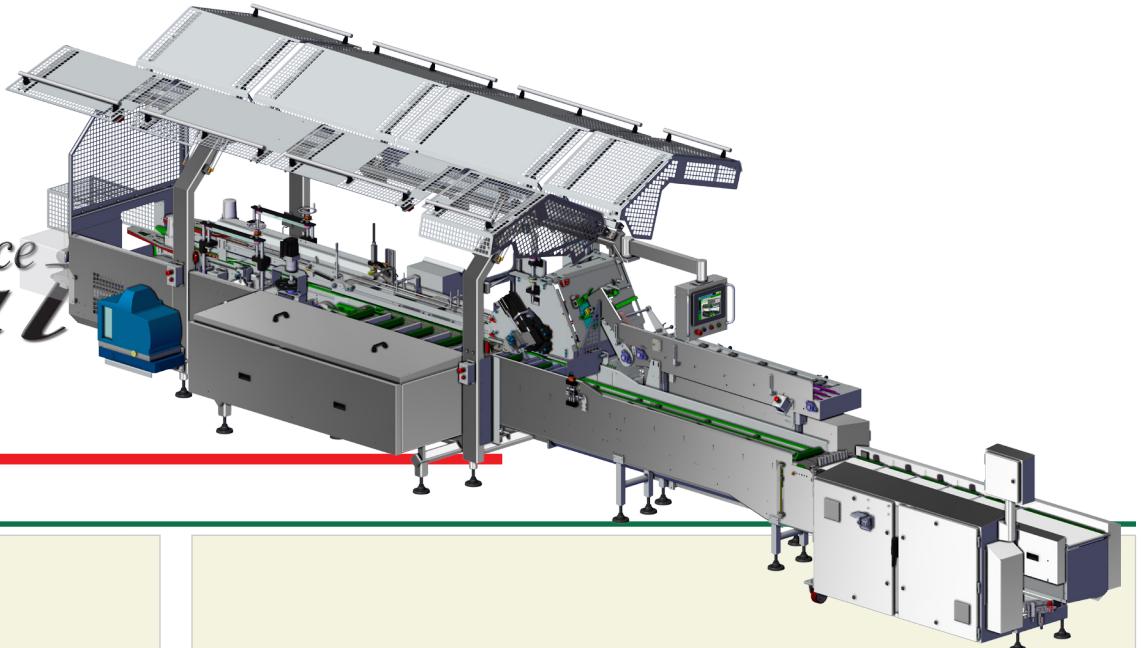


ENTERPRISE

Endload Cartoner

Operation Maintenance Manual

2.0 SAFETY



2.0 SAFETY

This section will describe the various safety standards and general safety practices that should be followed when operating or working on the equipment. Make sure you have a clear understanding of the material in this section before attempting to operate or work on this machine.

2.1 SAFETY STANDARDS

Applicable safety standards are located in the front of your manual. Make sure that all personnel assigned to this equipment read and understand these standards.

2.2 LOCK-OUT/TAG-OUT PROCEDURES

In accordance with the Occupational Safety and Health (OSHA) Bulletin 1910 of the Code of Federal Regulations (CFR), identification of hazardous energy which may be present on this machine and a documented procedure for its removal shall be implemented. Personnel, who are as-

signed to operate, maintain/repair or support the equipment in any way must follow a written safety procedure for locking out hazardous energy sources when any procedures might endanger them or others. This document must describe methods required to disconnect, lock-out, and de-energize any potential energy sources before performing any services necessitating this procedure.

Some potential energy sources that might be present on this equipment are:

- A. Electrical energy
- B. Compressed air for pneumatic devices
- C. Hydraulic energy (gas struts on guarding)



2.3 SAFETY SYMBOLS

Listed below are the safety symbols that are used throughout this manual.



NOTE!! Important Information To Be Aware Of!!



CAUTION!! Describes a process that could damage the machine.



WARNING!!! Risk of Injury or Death!!!



LOCKOUT SYMBOL- When this is at the beginning or next to a procedure, implement lock-out/tag-out procedures before continuing the procedure.



2.3.1 MACHINE SAFETY LABELS



WARNING

Avoid injury.
Do NOT operate with guard removed.
Replace guard before operating machine.



DANGER

Severe Shock Hazard:
Only authorized personnel may service this equipment.
Turn power OFF before entry.

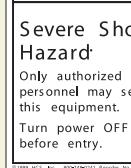


Entanglement hazard
Do not operate with guard removed.
Lockout/tagout before servicing.



CAUTION

Hot surface.
Do not touch.
To avoid possible skin burns, disconnect and lockout power and allow surface to cool before servicing.



Severe Shock Hazard:
Only authorized personnel may service this equipment.
Turn power OFF before entry.



Moving parts can crush and cut.
Keep hands clear while operating machine.

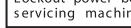


WARNING

CRUSH HAZARD.
Moving parts can crush and cut.
Do NOT operate with guard removed.
Lockout power before servicing machine.



Hazardous voltage.
Follow lockout procedure before servicing.



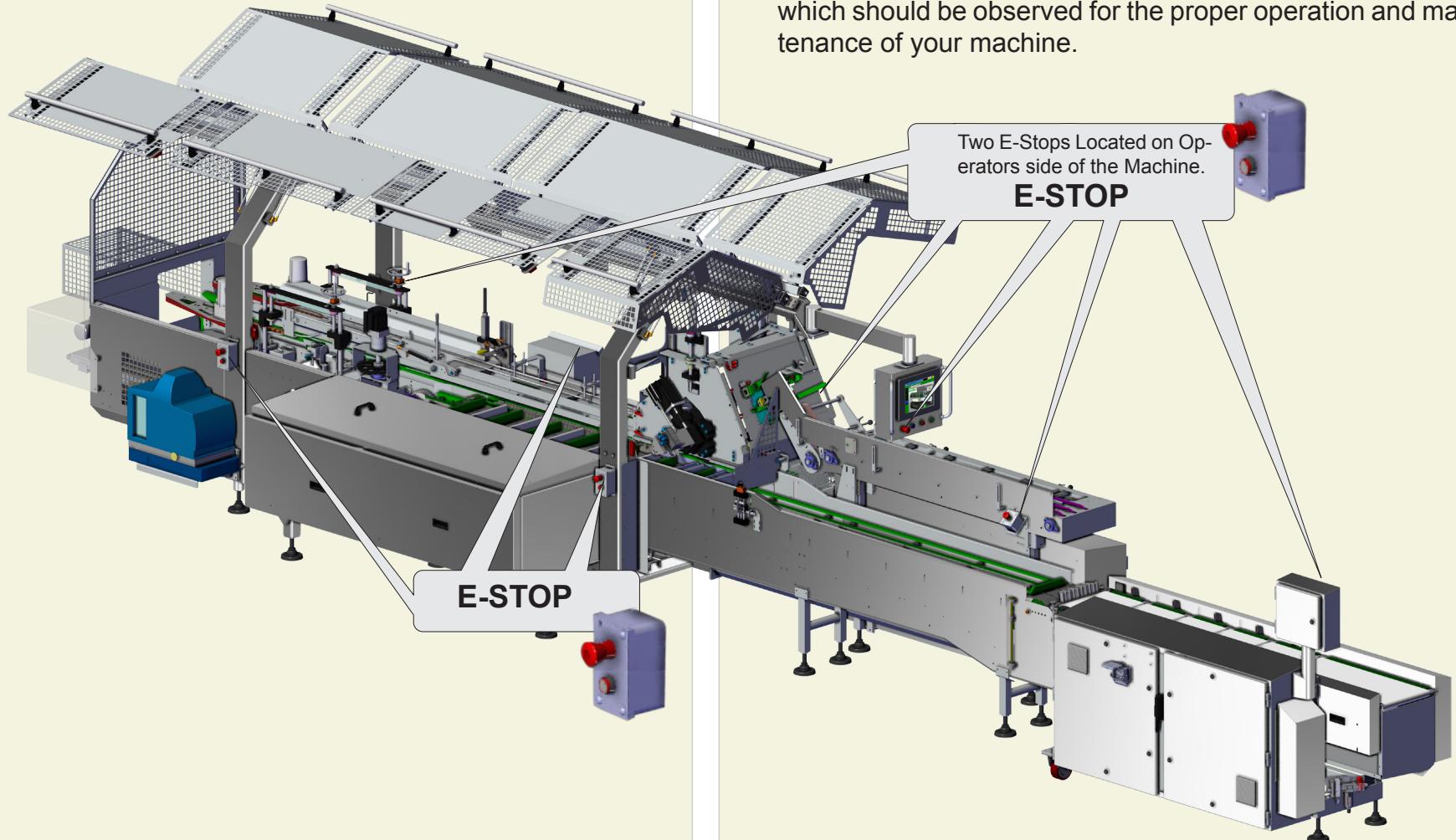
DANGER

Hydraulic, pneumatic and electric power sources present.

Lockout ALL energy sources before servicing.

2.4 LOCATION OF EMERGENCY STOP BUTTONS

There are six (6) Emergency stop Push Buttons located on the Enterprise Cartoner. One on each of the four (4) corners of the machine, one on the HMI control panel and one just over the PIC Infeed to the machine.



2.5 SAFETY GUIDELINES FOR PERSONNEL

The Enterprise Cartoner was designed for safe operation. Carelessness or inattention to safety guidelines could result in accidental injury and/or damage to the machine or components.

The following sections cover important safety precautions which should be observed for the proper operation and maintenance of your machine.

2.5.1 OPERATOR / ATTENDANT SAFETY

1. All personnel know the location of all emergency stop push buttons. All personnel must be trained in the procedure for using these emergency stop push buttons. This will include any and all used to control ancillary equipment on the line.
2. Keep arms and hands clear of moving parts at all times.
3. Do not start the machine if there are any damaged or missing parts.
4. Do not start the machine unless all guards and covers are in place and securely fastened.
5. Never reach around or crawl under any safety guards or guard doors. This includes any that might be attached to other equipment.
6. Remove any tools/obstructions/product jams from the machine prior to start-up.
7. Do not operate machinery with known defective or bypassed safety interlocks.
8. Before starting, restarting, or applying electrical power or compressed air to the machine:
 - A. Make a visual observation that all personnel are clear of moving components.
 - B. Make an audible warning to all personnel in the vicinity of the machine before pressing the START button.

9. Prior to clearing a jam, making some minor adjustments, or performing a size change press the nearest emergency stop push button.
10. Make sure heated components have cooled to a safe temperature before making adjustments to them (i.e. glue guns, heated hoses, etc...)
11. Observe plant safety rules concerning clothing, jewelry, etc. Do not wear any loose clothing that could become entangled within the machine.
12. Never climb, lean, or step on the machine. Serious injury could result.
13. Follow all safety guidelines set in place by your employer.

2.5.2 MAINTENANCE PERSONNEL SAFETY GUIDELINES

Due to the job requirements of maintenance and repair personnel, there are a few additional guidelines that must be adhered to.

1. Follow all safety guidelines, when applicable, from Operator & Attendant Safety Guidelines (section 2.5.1).
2. When performing a task that requires intrusion beyond safety features or barrier guarding, perform the LOCK/OUT/TAG/OUT procedure to remove any harmful energy sources.

3. Replace any broken or defective safety devices. Failure to do so voids machine warranty(s) and injuries and/or damage to the equipment becomes the responsibility of the user.
4. Use only approved Kliklok-Woodman replacement parts when replacing damaged or worn components. Failure to do so voids all expressed warranty(s) and damage to the machine and/or injuries to personnel caused either directly or indirectly from using non-approved components is the responsibility of the user.
5. When replacing fuses, circuit breakers, overloads, or any other circuit protection components, replace only with components of the same rating.

2.6 MACHINE GUARDS AND SAFETY SWITCHES

The operators and attendants are protected from contact with the moving parts of the machine by barrier guarding. This machine is equipped with stainless steel guards on the lower half of the machine and gull wing doors on the upper half of the machine.

All doors are interlocked with the machine control for safety. If any door is opened during production, the machine will stop and air pressure for all pneumatic systems will be released.



⚠ WARNING

NEVER REACH AROUND OR CRAWL UNDER SAFETY DOORS OR GUARDS. DISREGARDING THE SAFETY ASPECTS OF MACHINE GUARDS MAY RESULT IN SERIOUS PERSONAL INJURIES.

SAFETY INTERLOCK SWITCHES ARE NOT TO BE TAMPERED WITH OR BYPASSED. KLIKLOK-WOODMAN NEVER ALLOWS GUARD DOORS OR SAFETY SWITCHES TO BE BYPASSED.

The correct operation of these switches is required at all times to provide the proper guarding. An interlock switch that is not functioning properly should be reported to a supervisor immediately and the machine should be shut down until the switch is repaired or replaced.

2.6.1 MAIN ELECTRICAL DISCONNECT

The electrical cabinet of the machine is equipped with an Electrical Disconnect Switch. This switch is linked to the main circuit breaker inside the cabinet which connects or disconnects the factory supplied power to the machine.

⚠ CAUTION

CAUTION! Be aware that the Electrical Disconnect Switch only removes power AFTER the switch; all incoming power cables will still be live.

During maintenance, services, or repair operations, always use the appropriate Lockout/Tag-out procedure accepted in your plant.

2.7 INSTALLATION SAFETY

The following are important safety guidelines and information for the authorized installer of the equipment.

2.7.1 GENERAL INSTALLATION INFORMATION

1. Operating & Maintenance Manual must be read and understood by installation personnel.
2. Verify all drawing and floor plans are current and correct and that all utility supplies match the requirements of the machine's specifications.
3. Whenever possible, complete all overhead work (conveying systems, conduit, etc...) before placing the machine in line. Minimize construction work over the machine.
4. Do not connect machine to any utility supply unless all welding or other types of electrical arc producing equipment is on an isolated circuit different than the machine's supply line.
5. Make no modifications to the guarding, electrical system devices, or programming unless you have written authorization from Kliklok-Woodman's Engineering Department.

2.7.2 PERSONNEL REQUIREMENTS

1. Make sure personnel who will be installing or testing installed equipment are properly trained and have read the Operation & Maintenance Manual.
2. Only qualified personnel are to be used when connecting electrical supplies.
3. If safety interlocks must be temporarily removed for installation, qualified personnel must note the action and make sure the interlocks are reinstalled and in good working order prior to powering up the machine.

2.8 INSTALLATION

2.8.1 RECEIVING & UNPACKING THE MACHINE

The machine will arrive at your facility mounted to a wooden shipping skid and may be enclosed within a shipping crate. Personnel responsible for unpacking the machine should use caution to avoid damaging the machine or misplacing any loose items that may accompany the machine.

Listed are the steps to observe when unpacking the Enterprise Cartoner.

1. Make sure all motor leads, wires, and air lines are free of obstructions before removing the machine from its shipping skid.
2. Remove all packing straps and tie downs.

3. Collect all loose items contained within the shipping crate (leveling bolts or casters, machine manuals, etc...)
4. Unpack hot melt applicator.
5. Make a thorough visual inspection of the machine and all the components. You must note any damage at this time BEFORE removing the machine from the shipping skid. Report any discrepancies to the shipping company and to Kliklok-Woodman Service Department.

2.8.2 MOVING THE MACHINE

After the unpacking steps are complete, the machine is ready to be moved into position.

During this installation process, be sure to obey all safety instructions outlined in this manual.

1. This process may require two forklift trucks.
2. A firm, level foundation should be provided for the machine.
3. Adjust the forks as wide as possible.
4. Move the main section to the required position, using a forklift truck with sufficient lifting capacity. Study the machine lifting points to ascertain its center of gravity.
5. From the non-load side of the machine, insert the forks of the truck underneath the machine frame and lift the machine.
6. Locate the machine so that the center of the carton out-feed is in line with any downstream equipment.



2.8.3 LEVELING THE MACHINE

The Enterprise Cartoner is equipped with several adjustable feet to aid in leveling the equipment. The product infeed Conveyor has leveling feet and the Electrical Enclosure has leveling feet for aiding in leveling the machine.

During this leveling process, be sure to obey all safety instructions outlined in this manual.

1. The Enterprise Cartoner is equipped with eight (8) adjustable feet to aid in leveling the equipment. The Product Infeed Conveyor has an additional eight (8) feet conveyor extension.
2. Adjust the machine feet until the machine is just below the required height.
3. Adjust the feet at the in-feed and the out-feed ends of the machine to level.
4. Check the level in two directions at right angles, at or near each corner and at one intermediate point on each side of the machine.
5. When the machine is level, check that the Product Inserter is level.



NOTE: For proper machine operation the Inserter Chain Rails MUST sit 190 thousandths of an inch higher than the Carton Rails.

6. When satisfied, adjust the remaining mounting feet to rest firmly on the floor.
7. Re-check the machine and tighten the lock nuts on the mounting feet.

2.8.4 REASSEMBLY

This machine has been strengthened so that it can be moved in and out of position very quickly.

Raise the leveling feet so the wheels are touching the floor. Un-lock the wheels, disconnect the power to the machine by the quick dis-connect and push the machine to the required location. CAUTION: This machine is very heavy care must be used when moving it around.

CAUTION

BEFORE REASSEMBLY, SECTION 2, SAFETY AND SECTION 5, OPERATION, MUST BE READ AND UNDERSTOOD.

2.8.5 REMOVING THE SHIPPING TIE BAR

The SHIPPING TIE BAR is utilized to support the electrical cabinet and powered carton hopper during transport.

Prior to removing the Shipping Tie Bar it is imperative that the machine be positioned, leveled, and that all feet be securely positioned on the floor.

To remove the Shipping Tie Bar:

1. Utilizing a suitable wrench locate and remove the mounting hardware attaching the Tie Bar to the machine.
2. With assistance, remove the Tie Bar from its mounting location.

NOTE:

Retain the Shipping Tie Bar for any future movement of the machine using a forklift, failure to utilize the Tie Bar during machine movement can cause machine damage.

2.8.6 INSTALLING THE PRODUCT INFEED CONVEYOR (P.I.C.)

1. When the Enterprise Cartoner is correctly positioned and leveled, fit Product Infeed Conveyor, and any additional conveyors / equipment.
2. Check that the center lines of extensions are accurately aligned with the center line of the integral infeed conveyor within the main machine
3. Level the extensions by adjusting the support legs. Extensions must be level with integral length of the conveyor.
4. Align the infeed conveyor and connect using the supplied fixing bolts, inserted through the splice plates.

5. Reassemble the P.I.C. chain by joining the sections together with the supplied chain master links (pins). Be sure to install any master links so that the retaining clips face the direction of chain travel.
6. Tension the chain assembly by adjusting the two jacking shafts located at the tail end of the conveyor.
7. Complete the wiring to the product sensors.
8. Fit all remaining guard panels.

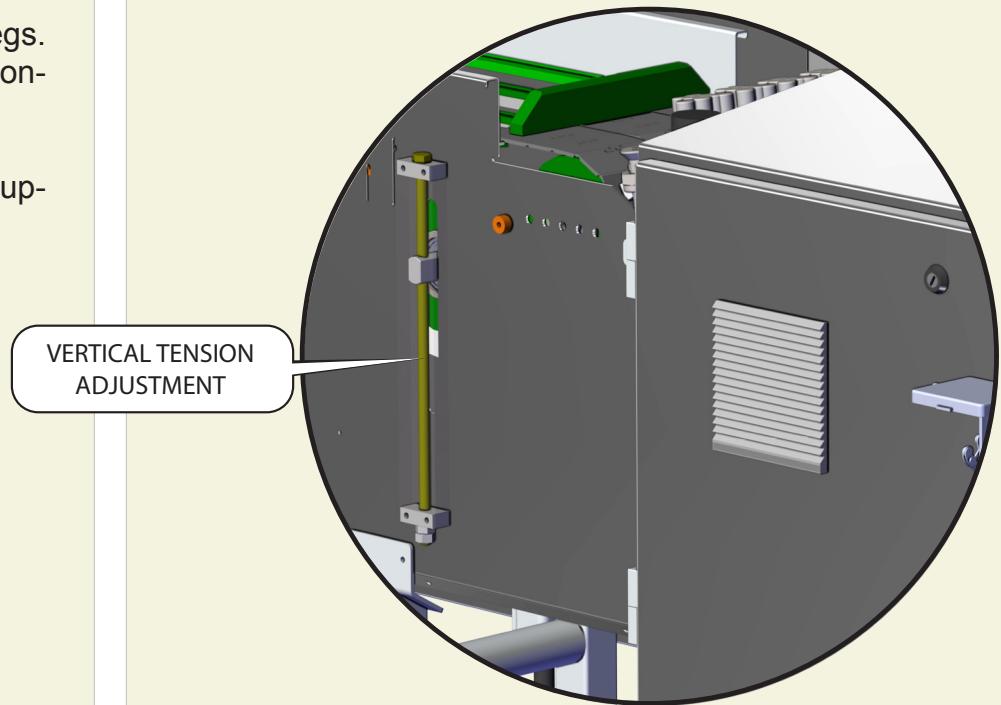


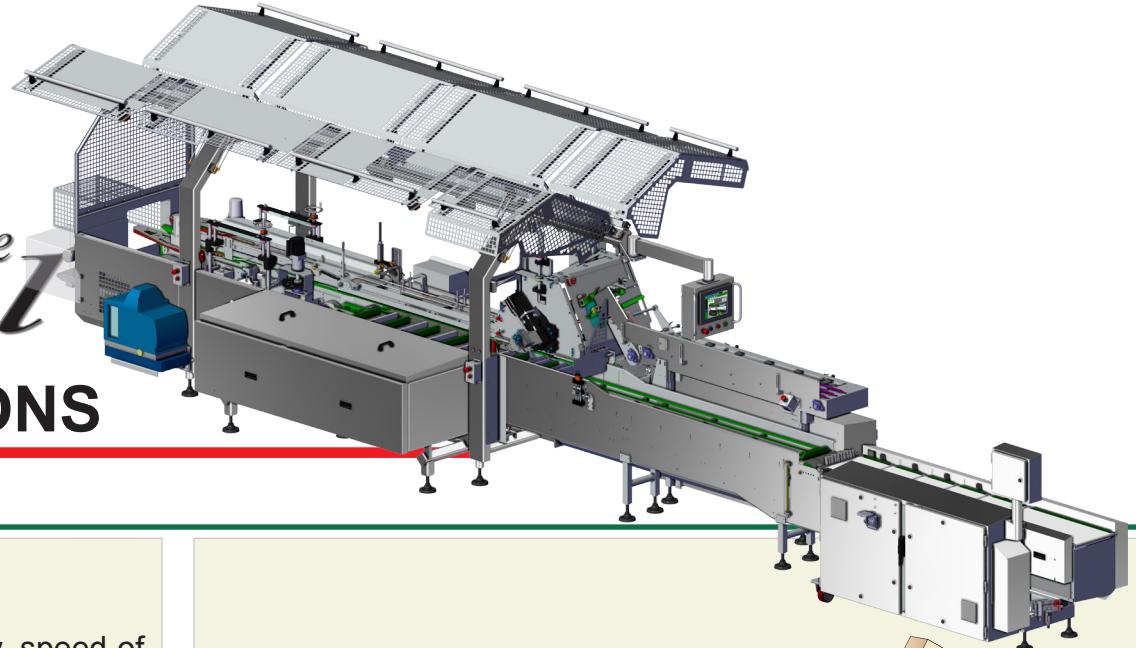
FIGURE 2.8.6
Tensioning Chain Adjustment Assembly

ENTERPRISE

Endload Cartoner

Operation Maintenance Manual

3.0 PARTS AND FUNCTIONS



3.0 OVERVIEW

This section will describe the carton process flow, speed of operation, carton size range, and give specifications for the electrical and mechanical components of the Kliklok-Woodman Enterprise cartoner.

3.1 CARTON PROCESS FLOW

Product loading is achieved by utilizing a Barrel Cam Piston Inserter, which is fed with product via a Product Infeed Conveyor or labeled as PIC. The infeed conveyor is auto-phase adjustable to suit products of different sizes. When a new recipe is selected from the HMI screen menu, the pusher panel of the conveyor will automatically move, (phase) to accommodate the new carton length dimension.

Product is placed onto the infeed conveyor, between the two panels of the lugged chain. As the product is carried into the machine, the

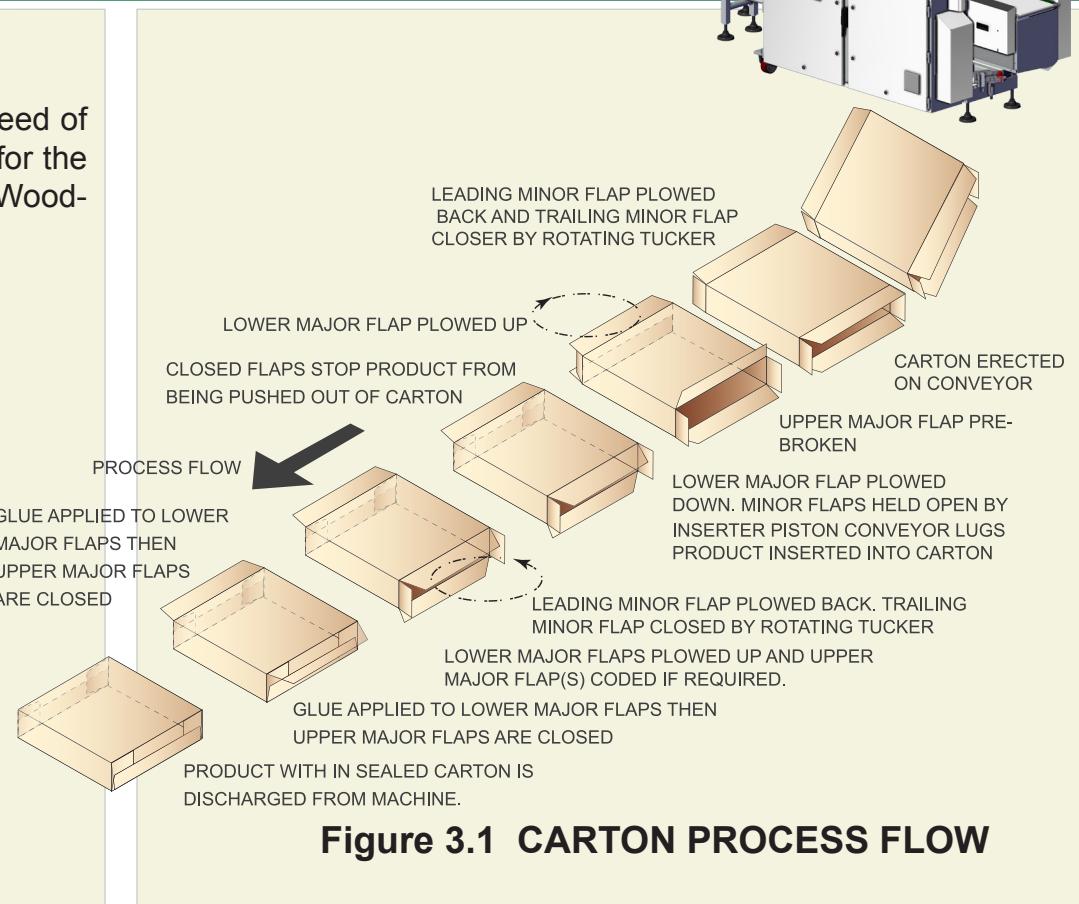


Figure 3.1 CARTON PROCESS FLOW

product detect sensor detects the product and triggers the feeding of a carton. If the product is sitting too high on the conveyor, the product over height Sensor will cause the product to be aborted out of the machine and no carton will be pulled.

When enabled through the recipe settings there are 2 sensors.

- 1) There are 2 sensors on the infeed, the lower one is for detecting a product, and the 2nd is for Over Height product.
- 2) The over height product sensor has a count to stop the machine if 5 (this number is selectable) consecutive products are detected.

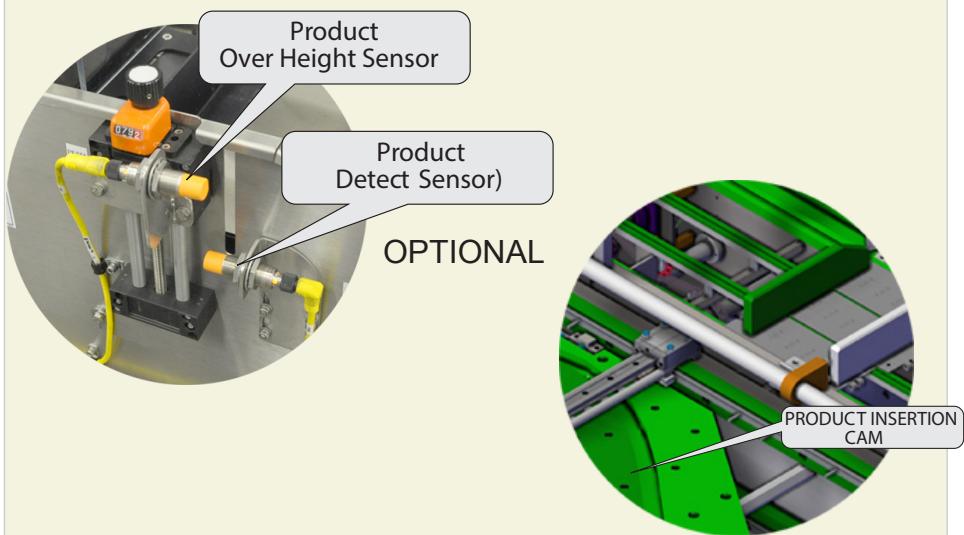


Figure 3.1 A SENSORS

The Inserter Pistons are driven across the Infeed Conveyor, by means of a Linear Cam, pushing the Product toward the open carton.

With the product inserted, the open carton continues downstream passing the non-load side upper major flap beneath (if equipped) a laser date coder. The carton is coded just prior to it entering the closing area of the machine.

Following the coding of the carton, all remaining open flaps are closed in sequence, with the upper major flaps tucked after adhesive is applied. The carton then passes through compression rollers and out the machine.

3.1.1 CARTON / PRODUCT SENSORS

A carton sensor is positioned between the static carton "Ski" guides near the Rotary Feeder. If a corresponding carton is not present to receive the incoming product, the sensor signals the PLC, which triggers the load/abort diverter cam on the Piston Inserter. The piston cam follower then runs into the Abort Cam Track. When a cam follower is in this track, the associated piston arm/plunger does not outstroke/extend and the product remains on the product conveyor until it is delivered outside the machine.

A product sensor is positioned on the load side of the product infeed conveyor. If no product is detected within the conveyor pocket, a signal is sent to the PLC, which disables the vacuum at the Rotary Feeder and no carton is pulled for that corresponding conveyor pocket.



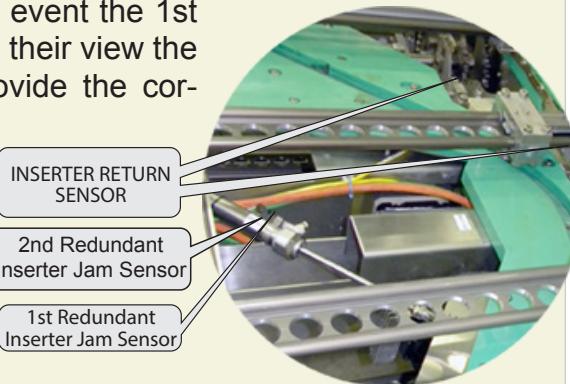
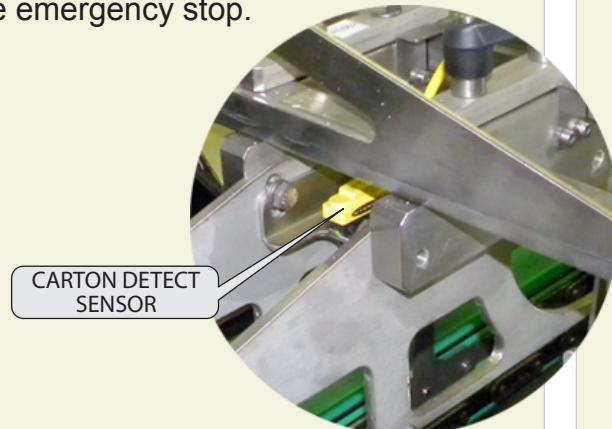
Note! The pistons will stay in their last position until told to change, for example if they are in abort they will stay in abort until told to load and visa versa.

The inserter jam sensor is positioned on the air cylinder. This sensor detects undue pressure on the air cylinder caused by a jam during product insertion. This cylinder can move easily (depending on air pressure) so that, when a jam is detected the internal trigger inside the cylinder moves away from the cylinder sensor. The sensor signals the PLC which immediately triggers a software emergency stop.

The carton detect sensor detects that a carton is present and fully formed, if its not fully formed the product will be aborted and the carton will exit out of the machine.

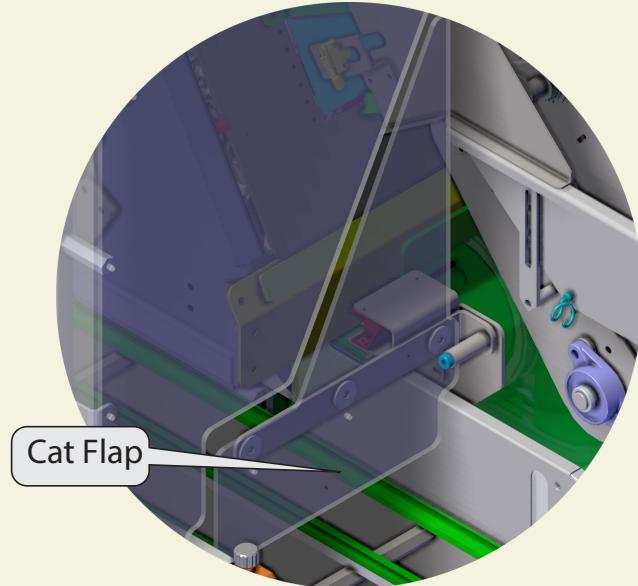
There are three additional jam sensors located on the Piston Inserter. These sensors detect any undue resistance on the Inserter Pistons as they are withdrawing from the push position. Should resistance be met, the sensors will signal the PLC which will immediately trigger a software emergency stop. These sensors are backed up with a secondary set of sensors so that in the event the 1st set were blocked from their view the second set would provide the correct action.

The 2nd redundant jam sensor is a check sensor so the machine is protected if the 1st jam sensor fails.



Over height product is detected by an adjustable sensor located on the load side of the infeed conveyor. Should this sensor be triggered a signal is sent to the PLC and no carton will be pulled and the inserter will be aborted causing the product to remain on the conveyor until it is delivered outside the machine. This sensor is equipped with an adjustment hand knob and digital counter and will need to be adjusted for product changes

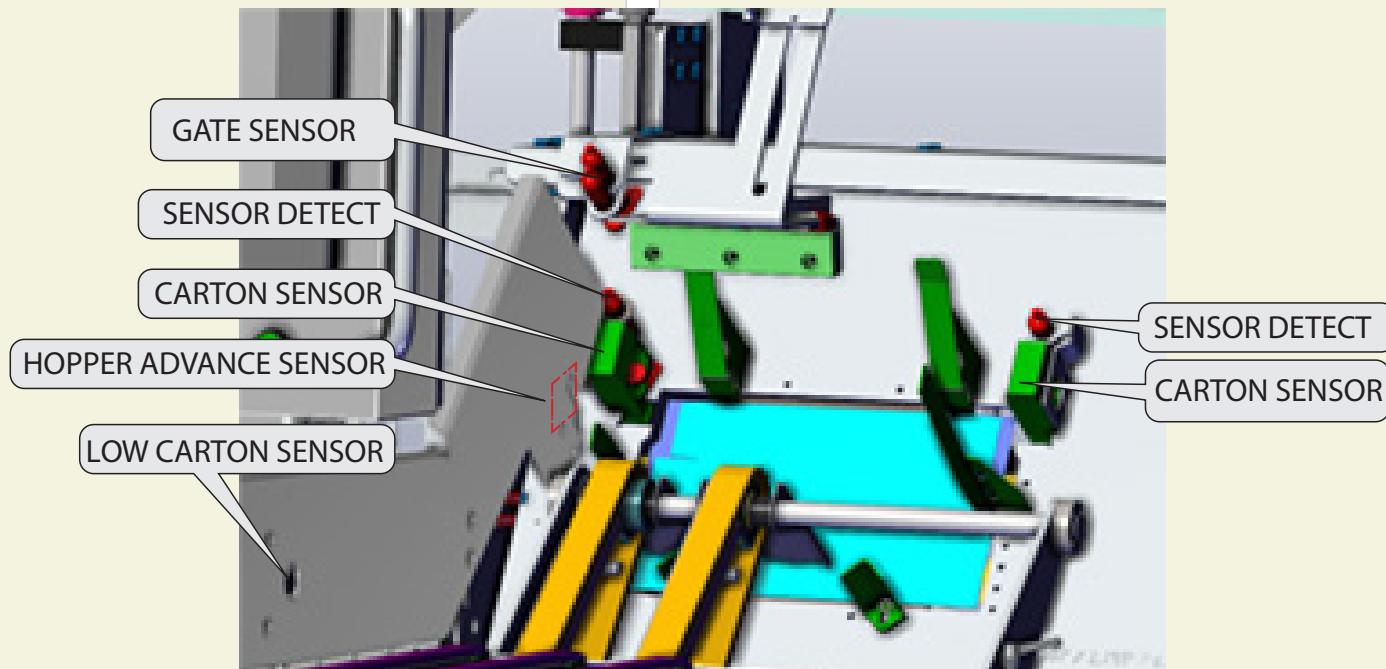
A Cat Flap Guard Switch located on the Infeed Conveyor, just prior to the Rotary Feeder, will cause the machine to stop when it is triggered. This component is designed to protect the operator from injury and the machinery from being damaged and is not to be used for stopping the machine on overheight product, that is what the overheight sensor is for.

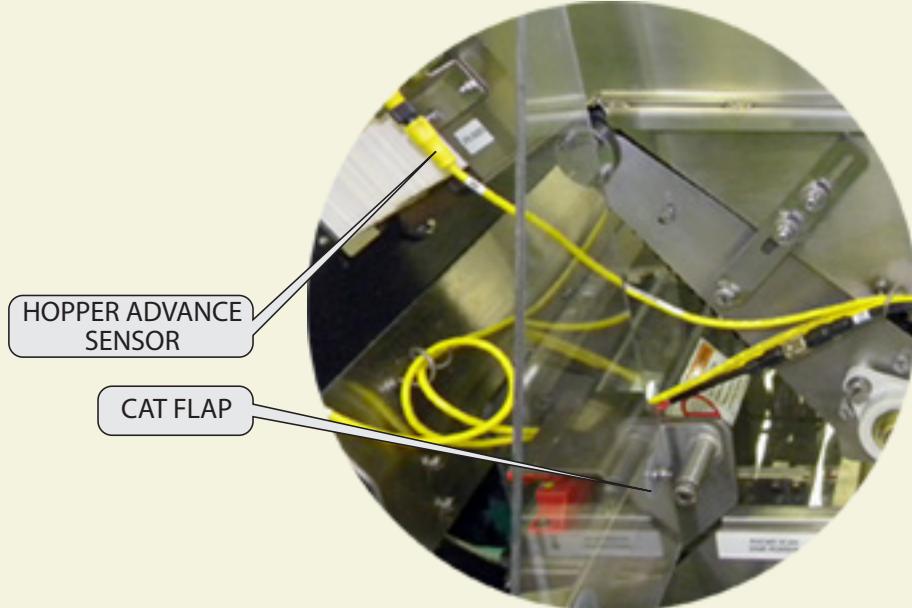


3.2 CARTON HOPPER AND GATE

The gate is equipped with multiple sensors to detect the presence of the gate as well as the cartons being in place. If the Gate is not inserted the machine will not function and will stay in an E-Stop condition. Once the gate is inserted into it's position two(2) Sensors detect it's presence, for the machine to achieve the reset status the carton sensors must be inserted and the carton stack must be present with the carton sensors detecting the presence of the cartons themselves. Once this is all in place the machine is ready to be reset.

Sleeve style cartons are hand loaded on edge onto the horizontal surface of a VFD powered hopper. The stack of cartons is advanced toward the gate for feeding when signaled by the Hopper Advance Sensor that detects a lack of cartons at the gate. Once this has been detected the VFD operates and advances the hopper belts and cartons forward, toward the gate. Once the spacing has been closed the cycle stops, thus keeping an even pressure on the gate.





3.3 CARTON FEEDING AND ERECTION

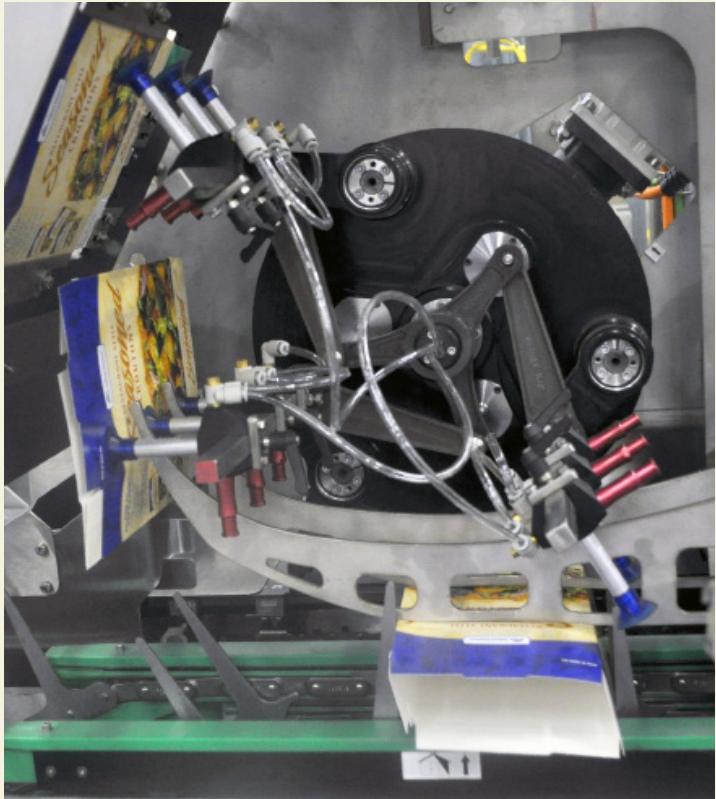
Cartons are pulled from the hopper by vacuum cups mounted on three (3) rotating arms. Each arm plucks a carton from the gate and carries it beneath static overhead carton erector ski guides. The carton leading edge (lower edge) is forced against the retarding lugs on the carton conveyor.

The vacuum cups move faster than the conveyor, while the carton gets into position, then they match the speed of the flight chain, which causes the upper side (top) of the carton to overtake the lower side, (bottom) which is restrained by the retarding lugs. As the top of the carton catches up with the bottom, the carton is opened and erected. At the same

time the vacuum cups move down toward the conveyor, forcing the carton down between the retarding lugs and the following set of pusher lugs. Soon after the carton is fully erected, the vacuum is released while the carton is still just above the conveyor. As the carton moves along the conveyor, the carton erector ski guides drive the carton into contact with the conveyor rails. The carton is then held in position and in shape between the retarding and pushing lugs and between the conveyor rails and the overhead guides.



Vacuum is “switched” on and off (distributed to the vacuum arms) by valves connected to a pneumatic supply and is controlled from the HMI.

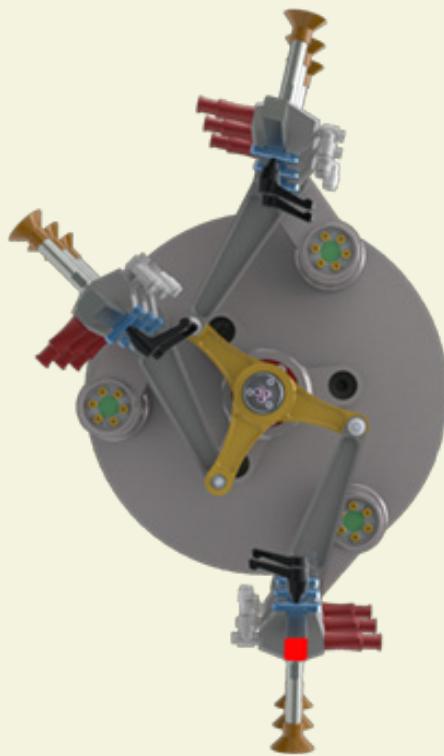


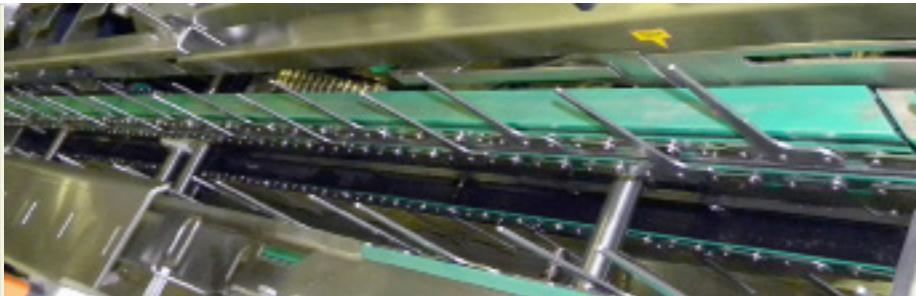
The Rotary Feeder is a patented servo driven mechanical gearbox with servo profile. This means it has the flexibility to uniquely alter its profile at any point in its cycle.

Adjustable vacuum cups are mounted on the three feed arms of the rotary feeder to pluck cartons from the gate and deliver them onto the conveyor. Each suction cup has its own vacuum generator which must be kept clean and free of carton debris.

The carton is transported through the machine from feeding to out-feed, between twin front and back lugs (retarding

and pushing) which are mounted to mechanical chains, each with servo driven control.

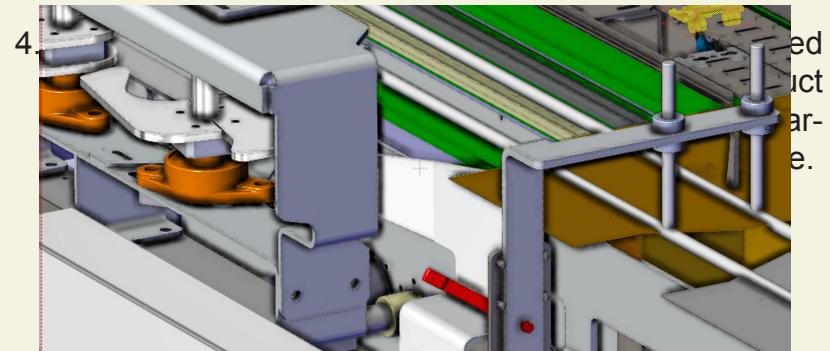
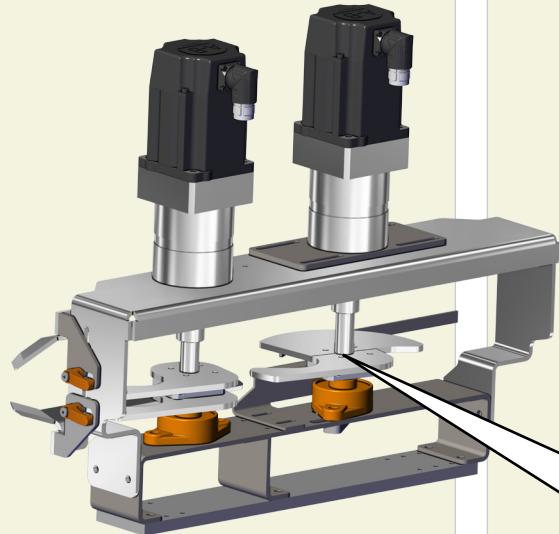




3.4 PRODUCT LOADING/CARTON CLOSING

The sequence of operations on the non-loading side of the machine, after the carton has been erected, is as follows.

1. The upper major flap is plowed up and retained open, but will be closed downstream after glue has been applied along the lower major flap.
2. The leading, and then trailing, minor carton flaps are tucked in by two (2) horizontally rotating Tucker Disc.
3. The upstream tucker is not used on a rectangular or square carton and gets “parked” out of the way. The downstream tucker is used to tuck rectangular or square cartons but one part gets removed on a size change (this part is marked). On a hexagon carton this part must be fitted.

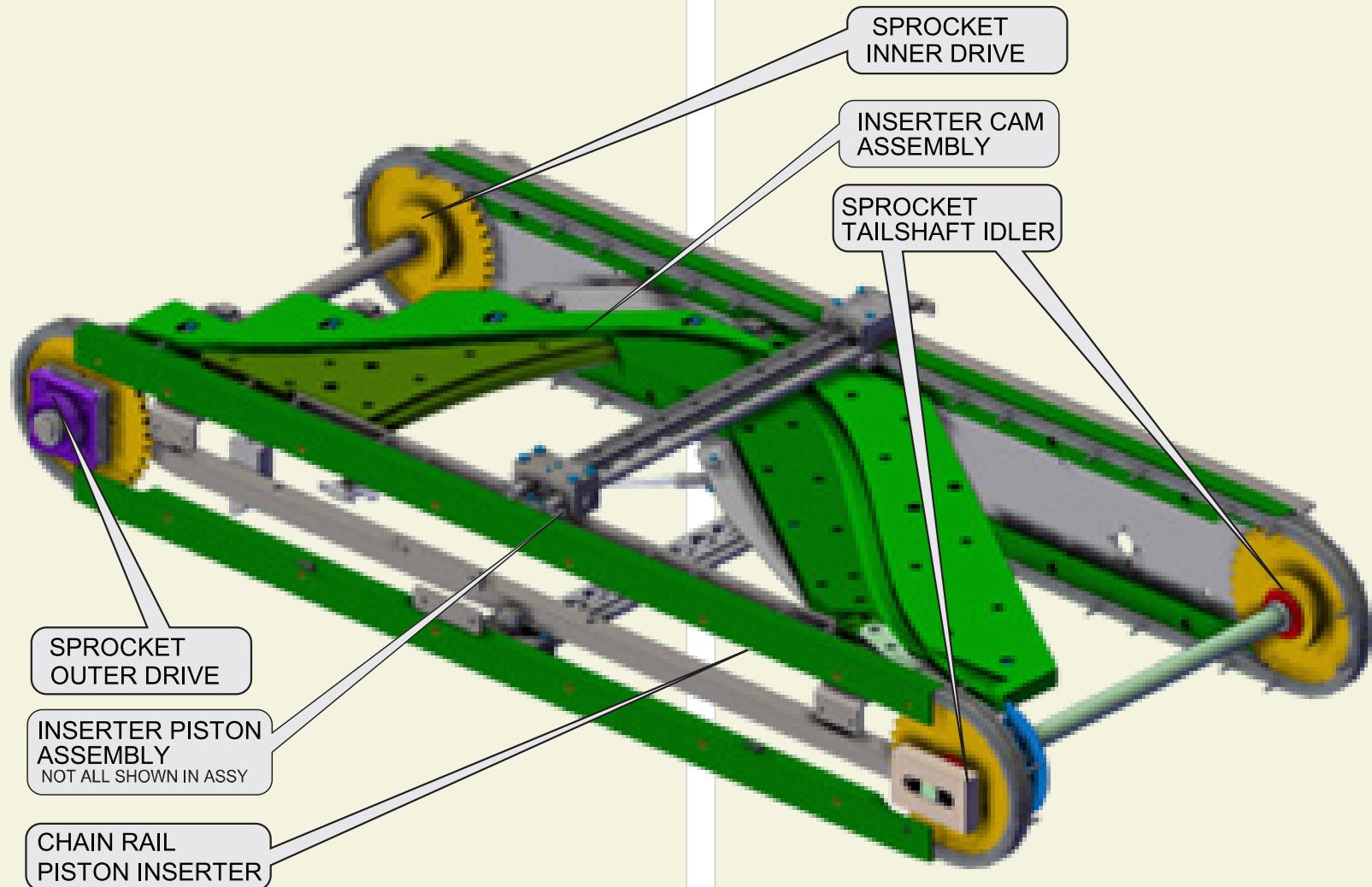


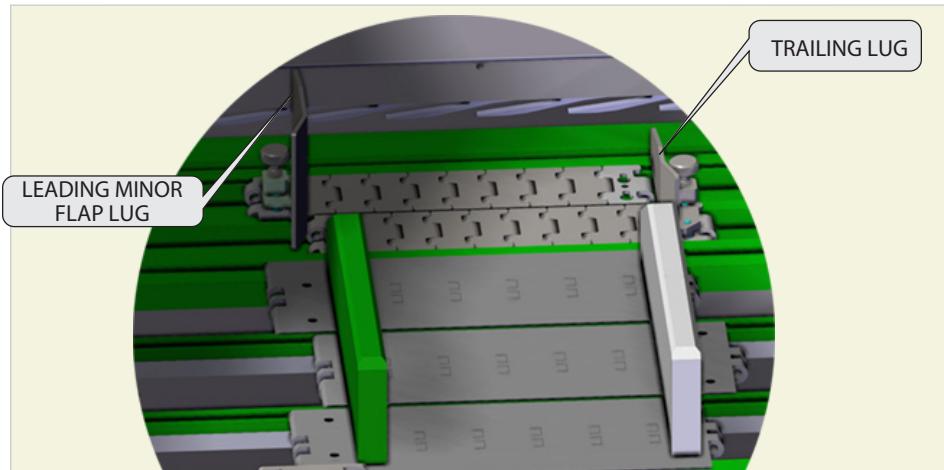
The sequence of operations on the loading side of the machine, after the carton has been erected, is as follows.

4. The lower major flap is deflected downward behind a static guide.
5. The leading minor flap is collected by a lug on the TRANSFER CHAIN.
6. The trailing minor flap is collected and retained by the trailing lug of the transfer chain which holds the carton flap away from the mouth of the carton during product loading.
7. The upper major flap is deflected upwards and captured by an Overhead guide. This presents the open mouth of the carton during loading with no edges to interfere with the products entry.

Remove this change part when running rectangular or square cartons. This part must be fitted to run hexagonal cartons.



3.5 BARREL CAM INSERTER

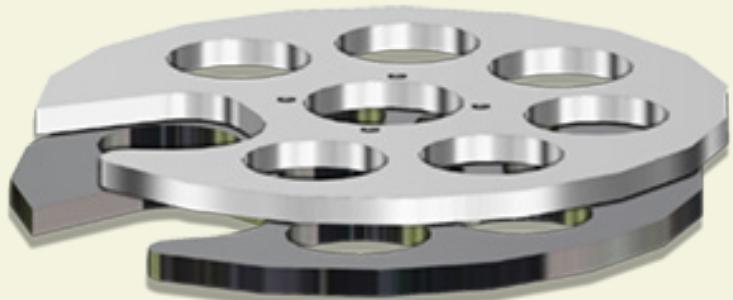


9. The Inserter pistons are then driven across the Product Infeed Conveyor, by means of a linear cam, pushing product into the open carton.

After the loading process is completed, the open carton flaps are closed in a way similar to the non-load side.

10. Once the product has been loaded, on the load side of the machine, the carton leading minor flap and then the trailing minor flap is tucked in by the downstream rotating tucker.

(Optional) In some cases the size of the carton is much larger than others, depending on the product. If your product requires a larger box you may have the Downstream Tucker Assembly utilizing a double set of Tucker wheels. In this case the 2 wheels are staggered slightly to begin the fold at the base and finalize the fold at the top. Of the 2 tucker wheels the lower wheel is the master wheel. It's location setting is the setting for homing.



11. Overhead carton guide rails retain and hold the carton on the conveyor as it is forwarded through the machine. These are height adjustable to accommodate a size change.

12. As the carton approaches the gluing station, the load side lower major flap is plowed up by a static guide.

13. An overhead sensor detects the presence of the carton and sends a signal to the PLC to initiate the application of the glue. Hot melt adhesive is applied via glue jet guns on both the load and non-load sides of the carton, along the lower major flap. (The parameters within which the adhesive is applied are controlled by the operator within the HMI recipe screen).

14. As the carton leaves the gluing station, the upper major flaps are plowed down via static guides or rollers.



15. A roller assembly then applies compression to the glued face of the carton.

16. As the retarding and then the pushing lugs fade down, faster running out-feed belts accelerate the cartons out of the cartoner and provide some extra compression contact time for sealing the glued carton faces.

The passage of the product through the machine is now complete.

3.5.1 SPEED OF OPERATION

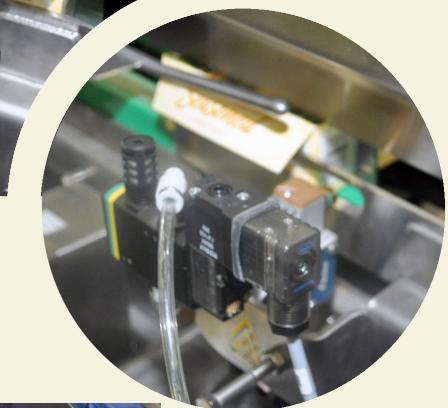
The speeds given below are the maximum continuous (cycling rate) rating of the machine. Factors such as carton board quality and product may affect the final operational speed.

30 – 150 cpm for the 12" pitch machine with Article Bucket Infeed.

30 – 175 cpm for the 12" pitch machine with P.I.C.

40 – 200 cpm for the 9" pitch machine

40 – 240 cpm for the Enterprise 9H, high speed.



3.6 CARTON SPECIFICATION

The basic carton style to run on this cartoner is a pre-glued sleeve conforming to Kliklok Specification 14-001. Elimination of the key cut out for minor flap control is possible with the use of an optional flap kicker assembly. See Kliklok specification 14-001. The carton travels through the machine with the factory glued seam down and trailing. If the aforementioned key cut out is used for minor flap control it must be on the lower portion of the leading minor flap.

**Note:**

The above specifications are based on a cartoner with 12" flight centers. All maximum dimensions cannot be applied for the same carton. When any carton dimension approaches a maximum condition the entire carton should be reviewed to verify that it does not exceed the cartoner's capabilities.

3.7 SERVICES

Electrical supply	380 to 480 volt, 3 phase, 50/60 Hz
Electrical consumption	40 Amps required
Air consumption	8 CFM at 80 PSI filtered plant air supply

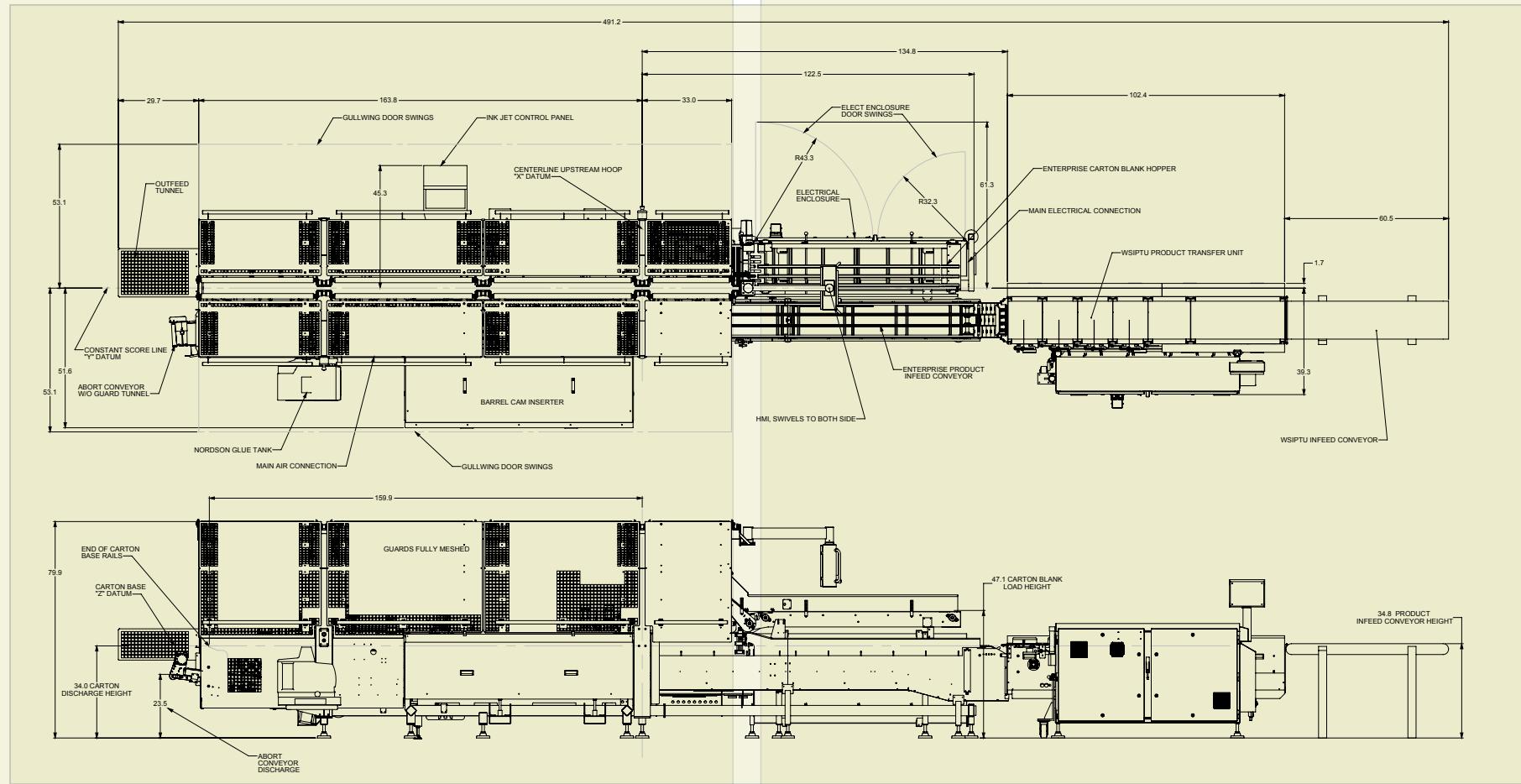
3.7.1 NOISE LEVELS

Less than 78 dBA free field, at max cycle rate

3.7.2 MACHINE LAYOUT & DIMENSIONS

Infeed and outfeed height 34" +/- 2" (865mm +/- 50mm)

Standard Hand Configuration is shown. See Machine Layout section 1.4.



3.7.3 ADHESIVE SYSTEM

Nordson Pro-Blue 7 integrated hot melt adhesive applicator with SureBead guns and water wash down hoses. Glue system is IP-54.

3.8 ELECTRICAL SYSTEM SPECIFICATIONS

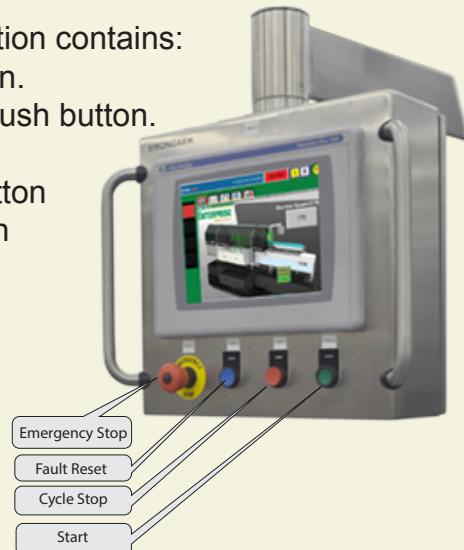
The electrical system is designed to comply with the latest editions of NFPA 79, as well as the HSW NIEC 204 (EN60204)

The electric will comply with a sanitary design. No open troughs, and exposed wires will have separation for easy cleaning.

Isolators in the door protect the main electrical control panel. The main electrical disconnect will be flange mounted with a lock-out feature.

The operators control station contains:

1. HMI color touch screen.
2. An Emergency Stop push button.
3. A Reset push button.
4. A Cycle Stop push button
5. A Machine Start Button



There are six (6) Emergency Stop push-button stations. One on each corner of the machine, one on the operator control station and one on the back of the hopper above the PIC Infeed.

The Jog Pendant can be used during machine set-up to force empty cartons in a run mode with no product present.

All guard doors and removable guards not requiring a tool to open will be equipped with interlock switches. These when opened will emergency stop the machine.

The control system of this machine is based on a PLC and Multi-axes Servo controller with a color touch screen HMI. The PLC handles all I/O, the major machine state functions, communication with the touch screen, and the servo controllers. All the programmable equipment is connected via high speed data networks such as Ethernet.

Standard control voltage is 24VDC.

3.8.1 DIAGNOSTIC AND PERFORMANCE MONITORING

The touchscreen will provide a full range of performance monitoring, glue control, diagnostics, and help functions. It has been designed to be intuitive, with a very small learning curve. Highlights include:

- Graphical glue control
- Basic on-screen help
- Semi automatic size change
- Performance monitoring
- Functional troubleshooting and diagnostics
- Insight look and feel
- On screen manuals (Optional)

3.8.2 ELECTRICAL COMPONENT VENDOR LIST

PLC System

Processor	Allen Bradley Control Logix
Digital Inputs	Allen Bradley Flex IO
Digital Outputs	Allen Bradley Flex IO

Drives and Amps

Servo Motors	Allen Bradley MPL / MPF Series Motors
Servo Amps	Allen Bradley Kinetix 5500 480 VAC Amplifiers
VFD Motor	Oriental Motors
VFD Drive	AB PowerFlex Drive

Graphical HMI

Touchscreen	Allen Bradley Panel View Plus 10" Diagonal
-------------	--

Networks

Ethernet Hub	Hirschmann 5-port Hub
--------------	-----------------------

Sensors

Fiber optic-diffused Send/Receive	AB Fiber Optic-diffused 42KL series AB Infrared 42KL series
-----------------------------------	--

Other Components

Main Disconnect	Allen Bradley
E-Stops	Allen Bradley
Guard Switches	Schmersal
Fuses	Bussmann

Relays
Safety Relay

Solid-State Relays
Pneumatics
Power Supply
Filters

Allen Bradley / Finler
Allen Bradley Safety Monitoring
Relay
Allen Bradley
SMC / Festo
Sola
EMC / Allen Bradley

3.9 MECHANICAL SYSTEM SPECIFICATIONS

The Kliklok-Woodman Enterprise is washdown rated to NEMA 4 standards. However, the touch screen and glue tank will need to be completely wrapped for protection prior to any washdown procedure. (See section 6.5 Machine Cleaning).

3.9.1 FINISH

The machine will be constructed from the following: Imperial Stainless steel tube, sheet and bar stock Metric Stainless steel shafting. Aluminum, hard anodized, all sizes to be imperial Some components will be mild steel, electro-less nickel plated.

3.9.2 CHANGE PARTS

Change parts may require a tool for change over. Manual adjustments for size changes may require a tool. (See section 5.3 Performing a Size Change).

3.9.3 GUARDING

The machine will be fully guarded to meet OSHA requirements for packaging equipment. All guard doors will be interlocked as described in section 2.6. The machine will be safe to use provided it is operated in accordance with training and Operation & Maintenance Manual instructions. The upper guard doors are laser cut stainless steel guards.

3.9.4 ADHESIVE APPLICATION

This machine uses a hot melt glue system to apply glue to the lower major carton flaps. This system consists of an integrated glue tank, two heated hoses, and two glue guns with appropriate size nozzles. (See section 3.7.3 Adhesive System.) The guns and hoses are water wash down IP66 rated. The glue tank is rated at IP54.

3.9.5 SEMI-AUTOMATIC CHANGEOVER

The following list describes the items that need to be changed or adjusted to change the Enterprise cartoner from one carton size to another. The sequence of these events may change depending on whether the changeover is from a large carton to a small carton, or vice versa. Some of these items will change automatically when a recipe is selected on the touch screen. Each item below is listed as automatic or manual depending on how the change is to be made.

1. Adjust the carton carrying chains for carton length (automatic)

2. Adjust the pocket size of the Product Infeed Conveyor (automatic)
3. Phase load side minor flap lugs to carton length (automatic)
4. Phase the Product Infeed Conveyor to carton carrying lugs (automatic)
5. Re-synchronize the rotary feeder position (automatic)
6. Adjust the machine speed (automatic)
7. Adjust the glue pattern (automatic)
8. Adjust the cartoner depth of insertion size (manual)
9. Adjust the rotary feeder height for carton width (manual)
10. Adjust the overhead carton ski guides for carton depth (manual)
11. Re-synchronize the carton flap tuckers (automatic)
12. Adjust carton hopper feed rate (automatic)
13. Adjust the rotary feed arms for carton depth (manual)
14. Change the carton gate for carton size (manual)
15. Adjust the carton hopper rail for major flap size (manual)

16. Adjust the glue gun guides for carton width (manual)
17. Adjust the glue gun height for carton width (manual)
18. Adjust the overhead carton guides for carton width (manual)
19. (Carton Specific) Adjust the Upper and Lower major flap plows. Swap the upper to the lower and lower to the upper locations depending on the carton size used.
20. Add or remove the downstream Non Load side tucker change part.

3.10 MECHANICAL COMPONENT SPECIFICATIONS

A. BEARINGS

All bearings, wherever possible, have been spaced off the frame to facilitate wash down procedures and to promote sanitary conditions.

1. All flange bearings mounted in a vertical position are sealed bearings with a composite housing and ZMaRC coated inserts.
2. All flange bearings mounted in a horizontal position are sealed bearings with a composite housing and stainless steel inserts.
3. Ball bearings are hardened steel.
4. Rod end bearings are stainless steel housing with steel inserts.
5. Plastic bushings are Igus iglide T500.

B. BELTING

1. Brecoflex belting
2. Gates Poly Chain GT Carbon Drive Belt

C. CARTON CONTROL GUIDES

1. All plastic guides that contact the carton are made of green or white UHMW.
2. All metal guides to be stainless steel.

D. CHAINS

1. Carton Carrying chains. ANSI 2060, electro-less nickel plated with stainless steel lugs
2. Inserter Piston chains. ANSI #60, with extended pins, electro-less nickel plated
3. Drive chains. ANSI #40, and 50, electro-less nickel plated
4. Product Infeed Conveyor 4" wide series 820 tabletop chain.
5. Adjusting chains. ANSI #35, electro-less nickel plated

E. CHAIN GUIDES

1. Carton carrying chain guides are green plastic inserts in aluminum extrusions.
2. Inserter Piston chain guides are green plastic.
3. Product Infeed Conveyor chain guides are green plastic inserts in aluminum extrusions.

F. COLLARS & COUPLINGS

1. Collars and couplings are stainless steel.

G. COUNTERS & SCALES

1. Counters to be SIKO metric washdown counters, attached to stainless steel trapezoidal threaded shafts.

2. Scales to be metric laser etched in place with high visibility pointers.

H. GAS SPRINGS/STRUTS

1. SGS gas struts
2. NitroLift gas struts

I. GEAR BOXES

1. GAM EPL series.
2. GAM Dyna series.
3. GAM DynaLite series.

J. GLUE COMPONENTS

1. Nordson applicator, 230 volt ProBlue 7.
2. Nordson SureBead glue guns with removable, reduced cavity Saturn style nozzles.
3. Nordson heated washdown hoses.
4. Nordson 24 VDC Solenoid.
5. All components to meet a minimum IP-54 rating.

K. MOTORS

1. Servo motors Allen Bradley, MPL motors.
2. AC gear motor, Oriental motor (Powered Hopper)
3. AC gear motor, Oriental motor (Outfeed Belts)

L. PULLEYS & SPROCKETS

1. Metal sprockets to be made from mild steel, electro-less nickel plated.
2. Plastic sprockets to be made from green UHMW
3. Pulleys to be aluminum hard coat anodized.

M. PNEUMATICS

1. SMC
2. Festo

N. SHAFTS

1. All shafts to be G&P stainless steel

O. VACUUM COMPONENTS

1. Piab vacuum generators
2. VICAS vacuum cups VC-2C3

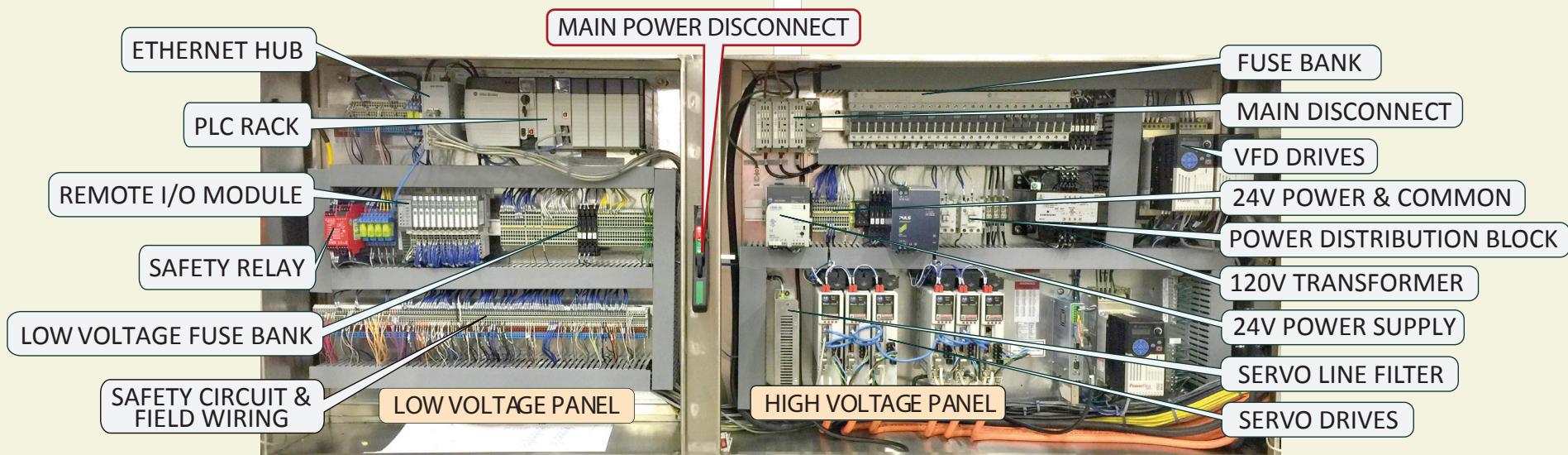
3.11 ELECTRICAL PANEL COMPONENT SPECIFICATIONS

3.11.1 Electrical Cabinet

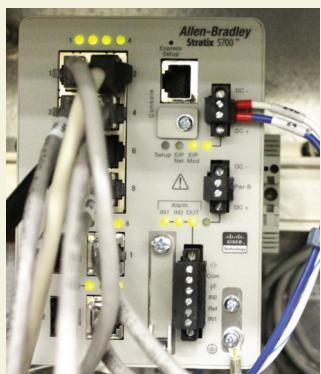
The Electrical Cabinet is divided into two (2) sections. The Low Voltage Panel and The High Voltage Panel.



The remote I/O retrieves the inputs for various contacts and allows the output of power when told by the PLC.



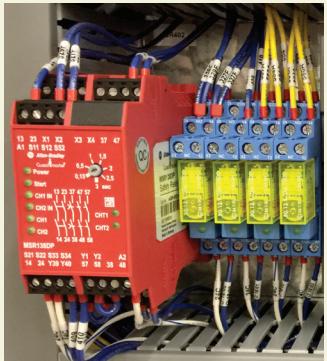
3.11.2 Low Voltage Panel



The Ethernet Hub can connect up to 8 different Ethernet cables. Parts such as the HMI connect here and are distributed to the Ethernet Module. of the PLC bank.

The PLC Bank Houses the Power Supply, Processor, Ser-cos Card, Ethernet Module and provides four (4) Blanks for future attachments.





This is the Main Safety Relay and the Solid State Relay. These are the main Safety Input and Output Communicators.



THIS IS THE CUSTOMER CONTACTS POWER

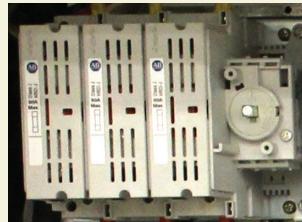
THIS IS THE 24V DC FUSE BANK

**CYCLE STOPS ARE
CONNECTED HERE**

THESE ARE THE GROUNDS



3.11.3 HIGH VOLTAGE PANEL



MAIN DISCONNECT

The Control Cabinet Main Disconnect is 3- Phase Power and is where the entire machine is fed.

HIGH VOLTAGE FUSE PANEL

Servo Drive, Transformer, Power Supply and VFD.



VFD DRIVES

These are the VFD Drives for the Hopper and Outfeed Belts. They receive 480V and Releases 230V



24V POWER SUPPLY

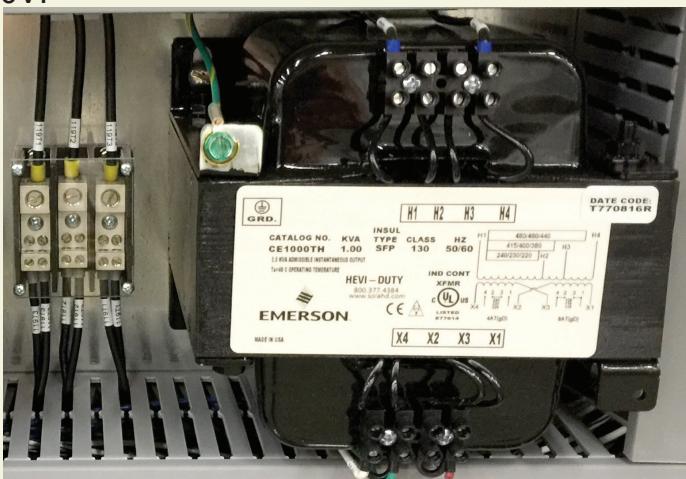
The Power Supply takes 480 Power and Distributes it into Low Voltage 24V for Relays and Solenoids.

The Thermostat for the Vortex Cooler (Electrical Cabinet is Air Conditioned)



POWER DISTRIBUTION BLOCK

TRANSFORMER TAKES 480V AND DISTRIBUTES OUT 120V.



SERVO DRIVES

This is all the Servo Drives with the First Drive Providing the Power Supply.



SERVO LINE FILTER



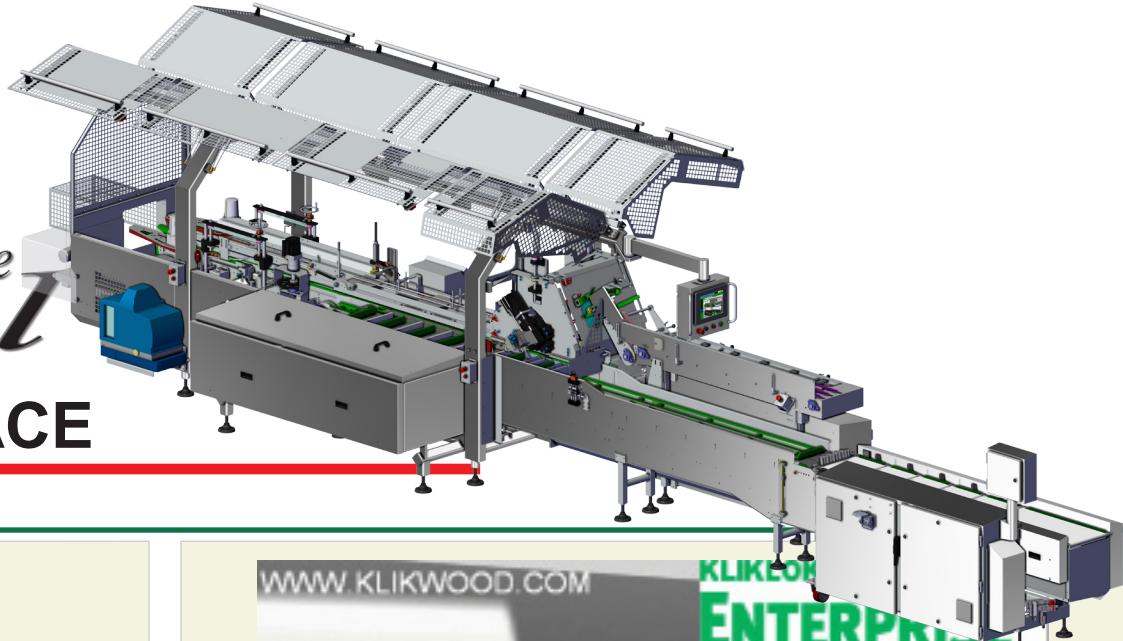
This is the Servo Line Filter, it keeps a clean source of Voltage Continuous to the Servos.

ENTERPRISE

Endload Cartoner

Operation Maintenance Manual

4.0 OPERATOR INTERFACE



4.0 OPERATOR INTERFACE

This section will identify the various operator controls you will encounter while working with the Enterprise Endload Cartoner.

Detailed instructions covering the use of these controls can be found in sections 5.0 Operator Instructions and 7.0 Product Setup and Component Adjustment.

This section should be read and understood by any personnel who will operate, maintain, or service the equipment.

4.1 INTRODUCTION

The Enterprise endload cartoning machine is mainly controlled by a software program written into the PLC which interfaces with the machine and its components. A comprehensive, password protected screen menu system is provided on a color, touch sensitive HMI (Human Machine



HMI VERSION:
XXXX
PLC VERSION:
XXXX

North America, Asia-Pacific and Latin America
and Central Canada
6024 Sherrill Woods Drive
Decatur, Georgia 30035
PH: 770-961-5200, FAX: 770-961-2180
Email: sales@klik-int.com

UK, Europe, Middle East, Indian Sub-Continent
Western Drive, Hengrove Park Estate
Bristol, BS14 6AY, England
PH: +44-1275-891191, FAX: +44-1275-891154
Email: sales@klik-int.com

Interface), mounted on a moveable pivoting arm next to the main electrical panel.



Note! HMI passwords are not included in this manual.

Common terms you will encounter in the following section include:

ICON – Graphic symbol used to represent a command or function.

Navigate – Process of moving from one screen menu to another by using the buttons on the screen.

TAB – The icons located across the top and down the right side of the HMI display give the user access to the various screens and pages contained within the HMI.

PAGE – Pages are contained within various HMI screens, these are accessed by selecting the tabs running vertically along the right side of any given screen.

HOME SCREEN – Name used for the screen menu displayed during normal operation, (pictured below), also sometimes referred to as the “Running Screen”

KW GRAPHIC: Touching the KW Graphic on the Home Screen will open the Splash Screen. This screen gives the user contact information for Klik-lok-Woodman as well as the installed HMI and PLC versions.



4.2 HMI SCREENS, BUTTONS, AND FUNCTIONS

Operator machine controls are mounted on the HMI control panel, and consist of the following buttons.



Emergency Stop

Fault Reset

Cycle Stop

Start

4.3 HOME SCREEN

The Home Screen is the main screen displayed during normal production. This screen has been developed to give the operator pertinent production information at a glance such as Machine State, Machine Operating Speed, Loaded Recipe, and any Active Machine Faults. From here the different levels of operator access can be selected.

LOG-OFF COUNTER: This counter, located in the upper left hand of the Home Screen, counts-down the time until an automated log off from advanced level access to the HMI will be initiated.



Recipe: B-10oz Bag

11:17:06 AM 3/2/2012

MESSAGE BANNER: The message banner located at the top of the screen displays the current recipe, time, date, machine state, access level, and the help icon.

HELP ICON: Pressing the Help Icon activates the Help Function. Activating this feature will cause yellow question marks to be displayed over key controls. Touch any question mark and an explanation of that controls function will be given. (??)



HOME ICON: Returns the user to the home screen.

Servo Drives Ready Icon – This Icon will highlight GREEN once the servos on the Enterprise Cartoner have completed their homing sequence and the Enterprise is ready for production.

Ink Jet Printer- This Icon indicates that the Ink Jet printer is on line and enabled. When green the PLC is displaying that the system is ready with no known faults.

Prime Hopper Icon- Once the machine is ready to run, the prime hopper button is visible. Touch the button to engage the drive which will transfer the cartons to the Gate. This Button will not be visible if the machine is in the not ready mode or if the machine is running operation. All E-Stops and faulted messages must be cleared to have the ability to utilize this feature

MACHINE SPEED: The machines operating speed in Cartons Per Minute (CPM).

ACCESS LEVEL ICON: The screen menu structure has been developed for three levels of access:



- Operator Level-Only change machine speed although most buttons are visible they cannot be changed.



- Operator Level II-Can change certain buttons but cannot save any values.



- Maintenance Level-Can change, save & delete values

Touching the Maintenance Level "II" icon will bring up an alphanumeric key pad prompting the user for a password. Type the password and press enter for admittance to this level. Passwords are not included in this manual, contact Kliklok-Woodman Service for information.

Touching the "I" icon will return the user to the Operator Level of Access.

These Icons are displayed on all pages and can be accessed at anytime.



4.4 OPERATOR LEVEL "I" ACCESS

At the OPERATOR LEVEL you have access to view, but not change, five distinct screens in the HMI program. Each screen is accessed from tabs located horizontally along the top of the displayed home screen. Some screens are di-

vided into pages; these are accessed by selecting the tabs located vertically along the right side of the screen. These pages give the operator the settings needed to do a size changeover. The information contained within these pages will change with each recipe loaded/selected. Below is a description of each of these selectable screens and their pages.



4.4.1 HOME SCREEN

Returns user to the HOME SCREEN (see 4.3)

4.4.2 RECIPE SETTINGS SCREEN

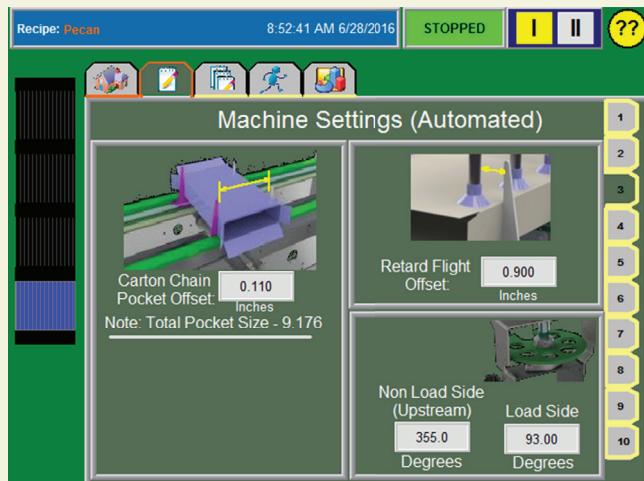
The **RECIPE SETTINGS SCREEN** gives the user the currently selected recipe name, carton dimensions, and settings of the various automatic and manually adjusted components within the machine. This screen is divided into 10 pages.



PAGE #1 – Loaded recipe name, carton dimensions, and



PAGE #2 – Automated glue stripe start/stop dimensions.
Settings are relative to the leading edge of the upper major flaps.



PAGE #3 – Automated machine settings.



PAGE #4 – Automated Machine Settings displayed are pertinent to the proper forming of the carton.

Flap Kicker setting helps fold the lower major flap and is based off of the desired distance from the photo sensor located at the ski guides. The Enable feature is displayed for the Flap Kicker to show that it is functional when illuminated Green.

Cycle Stop Position- Is the determined position that the machine stop in when a cycle stop is pressed. This allows the machine to stop so that the cartons are not in a position which requires the physical removal of carton before restarting the machine. In the desired position the operator should be able to cycle stop the machine and then start without the requirement to open guards and clear cartons.

Double Stack Product - If desired the machine can utilize a secondary sensor setup to review the condition of a double stacked product. This Icon when illuminated green displays this function Enabled or On.



Hopper Gate Vibrator (Optional) - The carton Gate is equipped with a vibrator system that helps in the efforts to feed the cartons into the gate without gaps. When this icon is illuminated Green the vibrator is Enabled or On.

Non Load Side Double Tucker System

OFFSET – This starts the tucker moving relative to the flight chains, this is degrees.

TUCK START POSITION - This is the start of the pause of the tucker wheel relative to the flight chain position (the smaller the number the longer the pause and the larger the number the shorter the pause stopping the tucker) this is in inches.

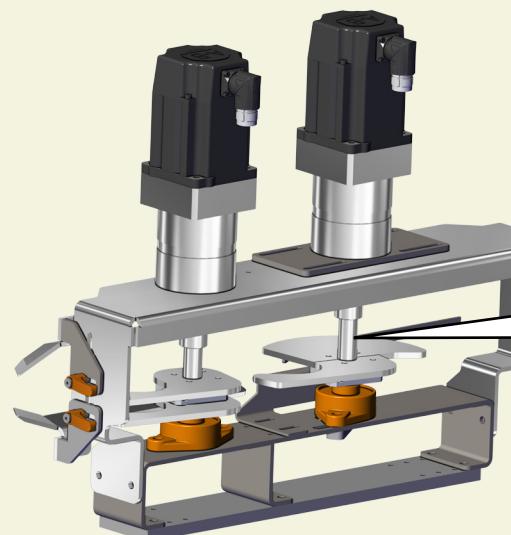
TUCKER END POSITION – This is the end of the pause of the tucker wheel i.e. when the tucker starts to move relative to the flight chains (the smaller the number the smaller the pause and larger the number the longer the pause starting the tucker) this is in inches.

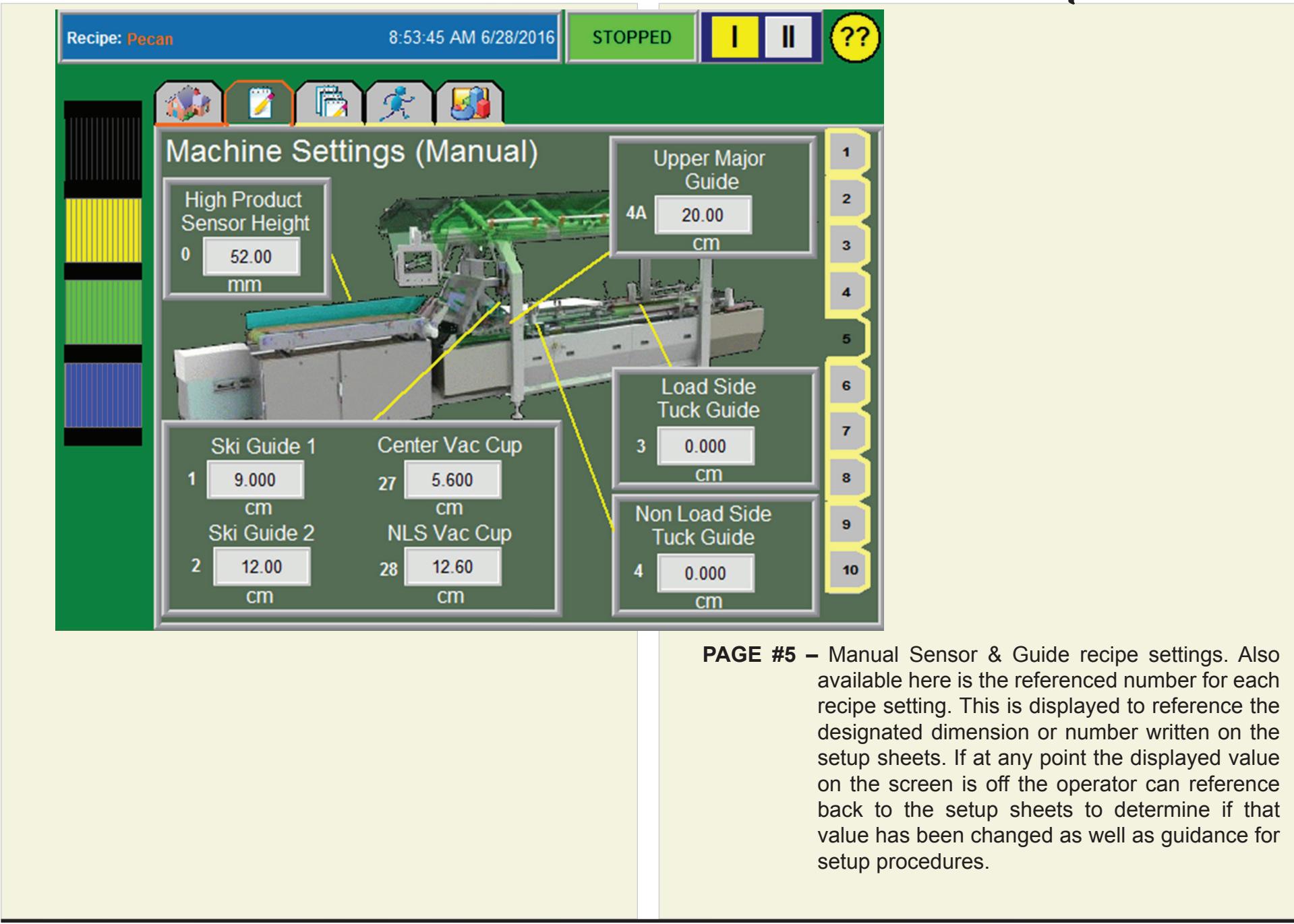
TUCKER POSITION – This is the position the tucker stops (angular position) i.e. 1 o'clock, 2 o'clock etc. this is in inches.

Explanation of operation.....

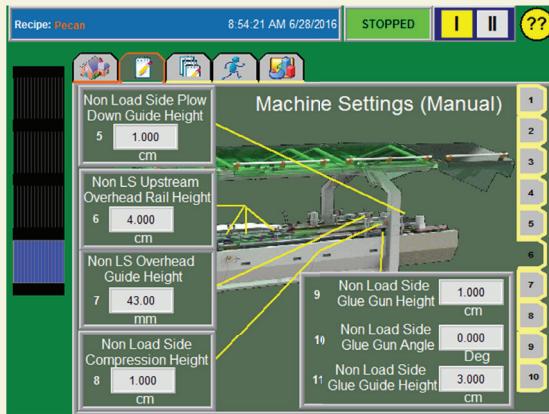
The stationary downstream tucker knocks the leading edge of the carton backwards (upstream) into the carton and at approximately the same time the upstream tucker kicks the trailing edge of the carton forwards (downstream) into the carton. The downstream tucker then starts to move so the carton is not damaged by the tucker. The downstream tucker then completes the tucking of the trailing part of the carton. The downstream tucker then rotates to its stop position waiting for the next carton to approach and the process starts all over again, while the upstream tucker continues to rotate.

Park Upstream NLS Tucker - Depending on the carton shape, when using square or rectangle cartons the Upstream Non Load side Tucker wheel is disabled and put into the “park” position. The icon shown here will display a red illuminated feature to disable this tucker wheel. When using Hexagonal Cartons this icon will be illuminated green showing enabled and the Tucker will be functional for this type of carton.





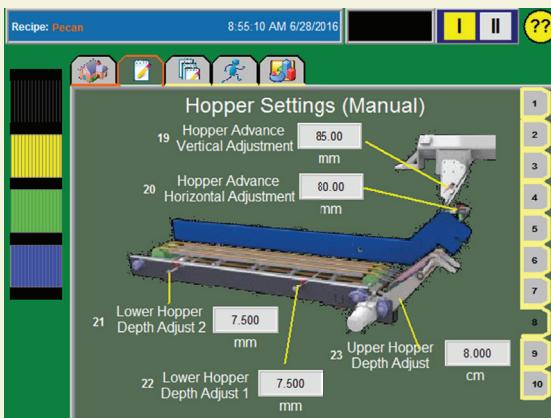
PAGE #6 – Manual non-load side guide, rail, compression, and glue settings.



As discussed with page 5, available here is the referenced number for each recipe setting. This is displayed to reference the designated dimension or

number written on the setup sheets. If at any point the displayed value on the screen is off the operator can reference back to the setup sheets to determine if that value has been changed as well as guidance for setup procedures.

PAGE #7 – Manual load-side guide, rail, compression, and glue settings.

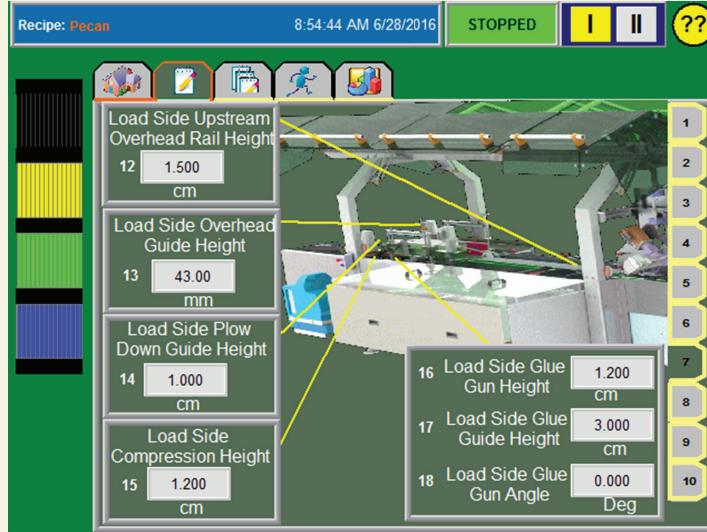


This is displayed to reference the designated dimension or number written on the setup sheets. If at any point the displayed value on the screen is off the operator can refer-

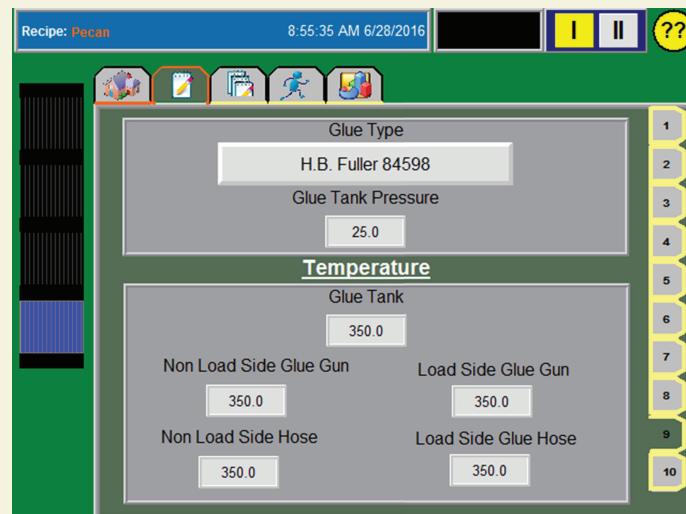
ence back to the setup sheets to determine if that value has been changed as well as guidance for setup procedures.

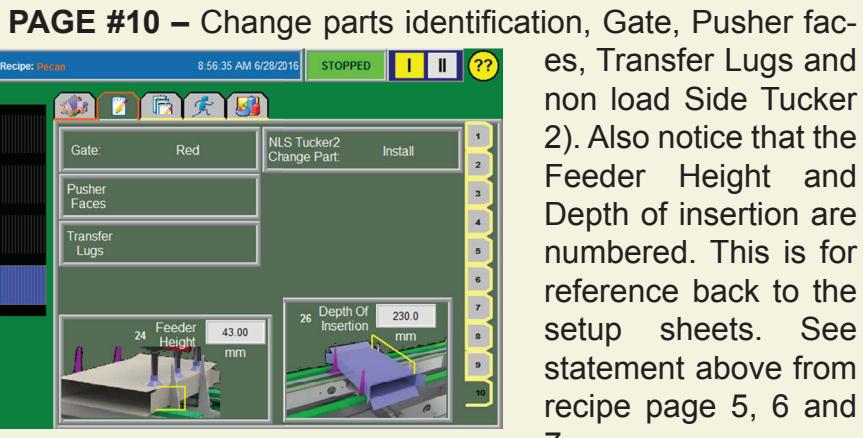
PAGE #8 – Manual Hopper settings.

Again, displayed are the numbered settings referenced on the setup



Glue type used and pneumatic pressure settings. Operational temperature of the glue tank, hoses, and guns. This screen is for informational purposes only.





Also notice that the Feeder Height and Depth of insertion are numbered. This is for reference back to the setup sheets. See statement above from recipe page 5, 6 and 7.

The shown NLS Tucker 2 Change Part box is to remind the operator to make sure that the change part has been either installed or removed for the specific recipe during the size change procedure.

4.4.3 RECIPE MENU SCREEN

This screen displays all available recipes. The recipe currently loaded for production is revealed by an arrow ► to its left.



To do a size change load the new recipe and press Recipe Check list, a prompt will come which is a check to see if a size change is required.



Inserter Retract

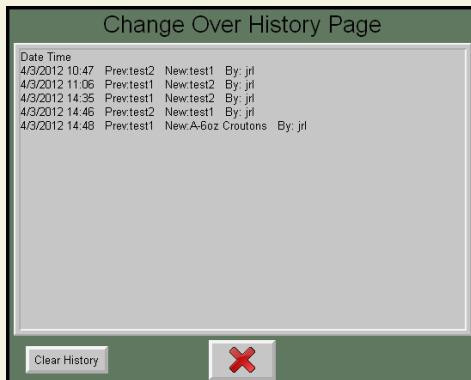
Are you sure you would like to move the Inserter rails to the retracted position?



Caution:
The machine will automatically move if the button is pressed.

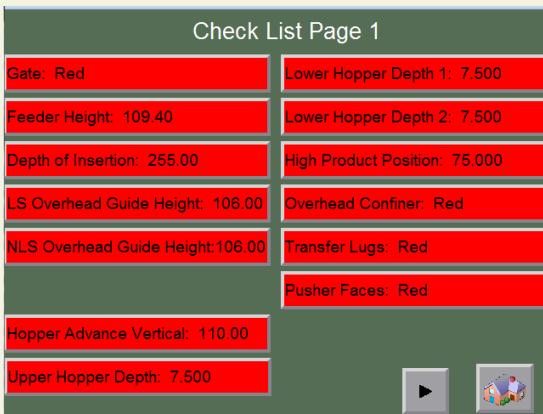
CAUTION

The machine will automatically move and all the inserter pushers will go into abort. Care must be taken when changing machine parameters. Always ensure there is no interference between machine components. We recommend jogging the machine, prior to running, anytime changes have been made.

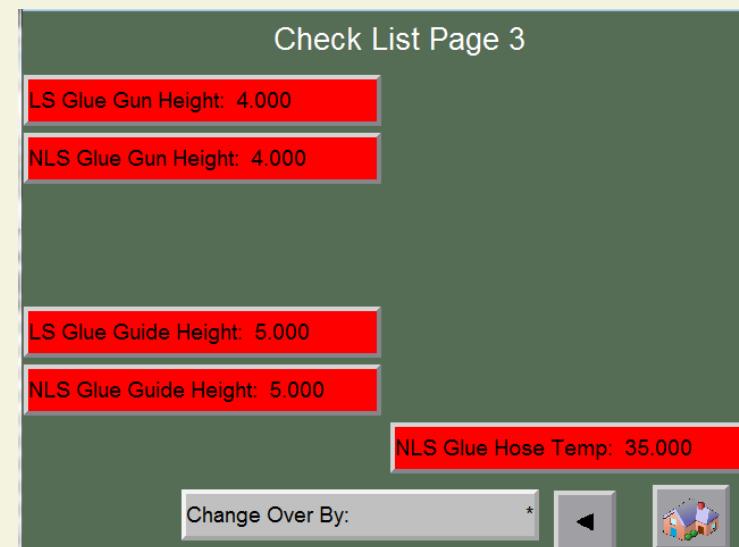
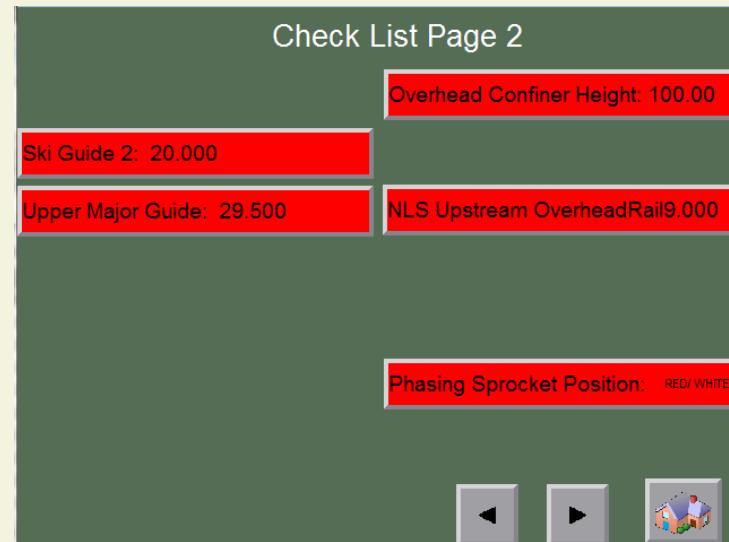


The change over history gives details of the size change, for example by whom and what date the size change was done.

Once the prompt screen has been ticked then the check box screens appear, these screens must be touched and will turn from red to green, next press the right arrow at the bottom of the page to go to the next screen and touch these boxes, then go to the last screen and do the same.



Note! Screens shown are for example only, actual change components are customer specific and may vary. Review HMI for accurate descriptions of change parts.



Once ALL adjustments have been completed, touch the Change Over By Icon and enter your initials on the popup keyboard.

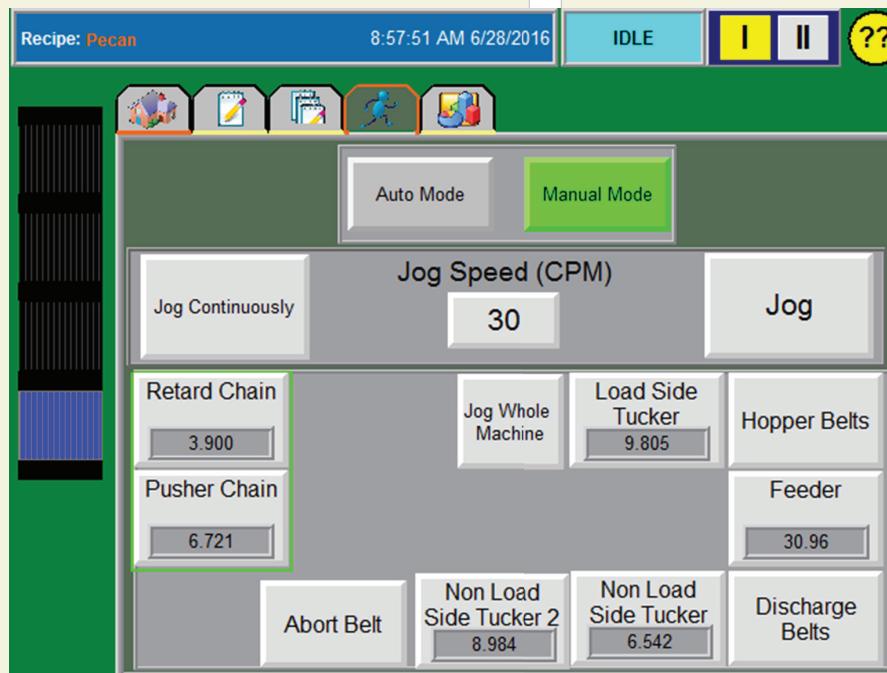
4.4.4 MODE SCREEN

This screen gives the operator the ability to select between AUTOMATIC and MANUAL/JOG running modes.

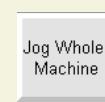


NOTE: That the machine must be reset with **No Faults** to enter Manual Mode

The JOG MODE allows the operator to slow machine motion to ensure no interference between machine components. Utilizing the JOG PENDANT gives the operator freedom to move around the machine while checking said components.



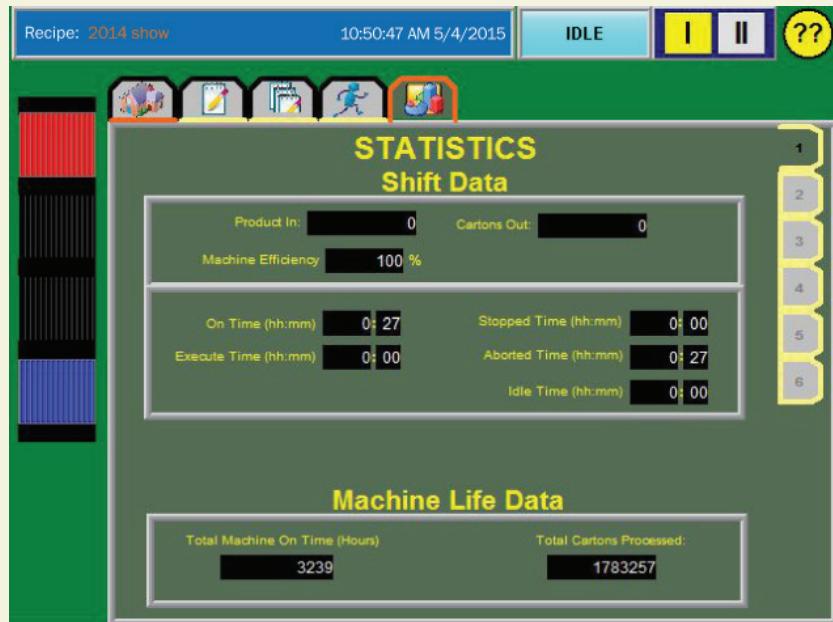
ENTERPRISE JOG SCREEN



To utilize the Jog function, “Jog the whole machine button” must be touched, the machine will synchronize all servos, Once this is completed, the Jog hole machine Icon will turn solid blue. Then the Jog function may be used.

4.4.5 STATISTICS SCREEN

This screen gives the operator a wealth of information pertaining to overall machine as well as individual component performance. This screen is divided into the six (6) pages identified below.



PAGE #1 – SHIFT STATISTICS

Statistics Screen 1 utilizes various sensors to gather production data such as the product in and the number of cartons out. This information is used to calculate machine efficiency.



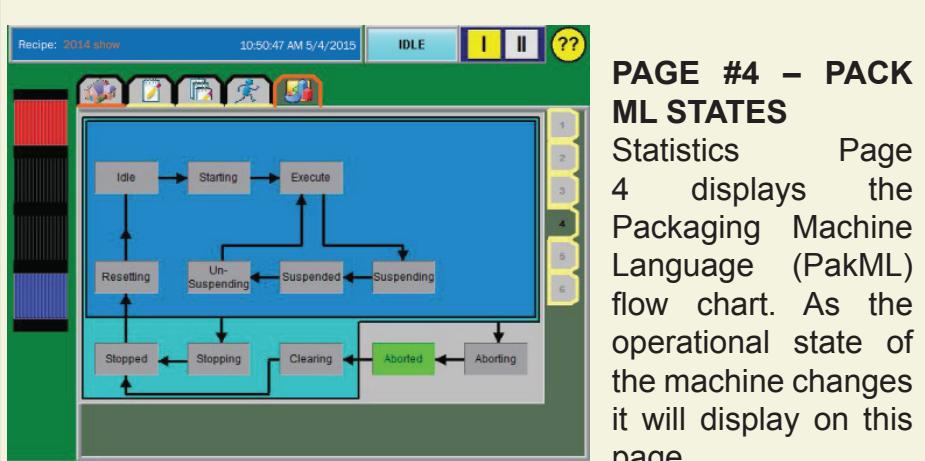
PAGE #2 – OVERALL EFFICIENCY

Statistics Page 2 utilizes the carton sensors to display a real-time Machine Efficiency Graph, when in production this screen allows the user to view the past hour of production.



PAGE #3 – REAL-TIME COMPONENT TORQUE GRAPH

Statistics Page 3 displays Servo Torque Trending for each of the five (5) servo driven components, this screen allows the user to view servo torque profiles while the machine is in production.



PAGE #4 – PACK ML STATES

Statistics Page 4 displays the Packaging Machine Language (PakML) flow chart. As the operational state of the machine changes it will display on this page.

The current machine state will be highlighted green.



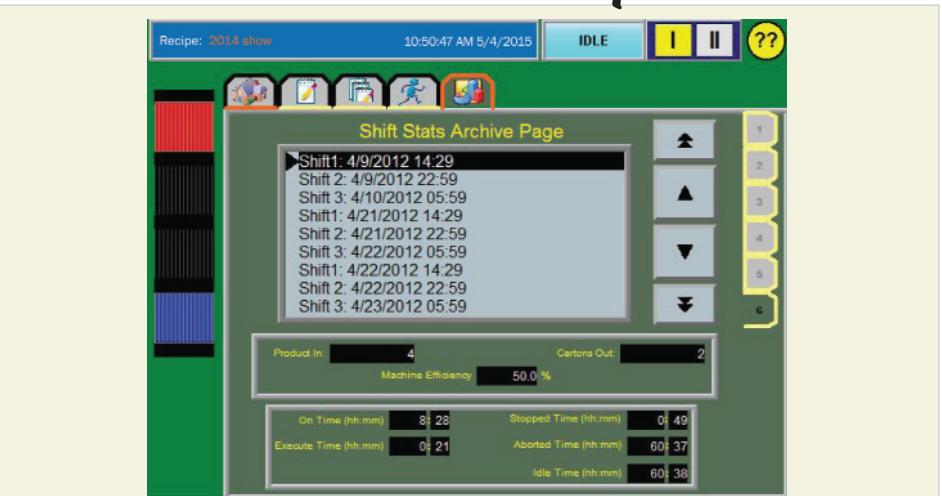
PAGE #5 – SHIFT SET-UP

Statistics Page 5, Shift Setup Page, allows the user to define the shift start and end times. This information is utilized for the collection and archiving of shift statistics.

Up to three 3) shifts may be entered. It is important that the start and end time do not overlap.



Note! – Any Shift may possibly end the following day. Any figures going into the following day may be transferred into that day



PAGE #6 – SHIFT STATISTICS ARCHIVE

Statistics Page 6, Shift Stats Archive Page, allows the user to view a history of past shift efficiency. Shift data is organized by shift number, date, and shift end time.

The scroll icons on the right side of the page permit the user to scroll through the stored data.

4.5 OPERATOR LEVEL “II”

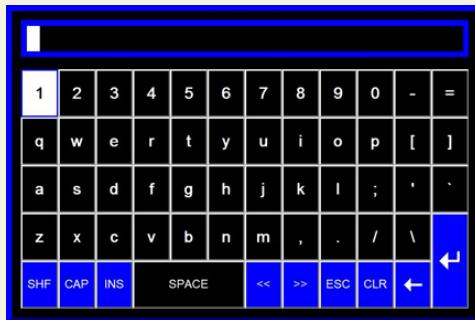


Operator Level II allows access to all Level I screens with the addition of Diagnostics and Maintenance. When logged into Operator Level II, all recipe and machine parameters may be changed, however they may not be saved.

4.6 MAINTENANCE LEVEL “M”



MAINTENANCE LEVEL ACCESS is password protected. Selecting the “II” Maintenance Level button will display an alphanumeric keypad. Entering the wrong password will return the user to the “I” Operator Level.



Once logged into Maintenance Level, the “II” icon will change to a red highlighted “M”



These Icons are displayed on all pages and can be accessed at anytime.

Once logged into Maintenance Level, a timer located in the upper left hand corner of the Home Screen will begin to countdown. When this counter reaches “0” the system will initiate an automatic log-off, reverting access to Level I, Operator Access.

Passwords are not included in this manual. Contact Kliklok-Woodman Customer Service Department for more information

Maintenance Level Access has all of the functionality of Operator Level access with the following features added:

- Access to Diagnostics, and Maintenance Screens.
- The ability to reset stored statistical data.
- The ability to create, modify, and delete many of the parameters relating to recipes, automated and manual machine settings, and component timing.
- Ability to jog an individual Servo Axis independently of all others.

CAUTION

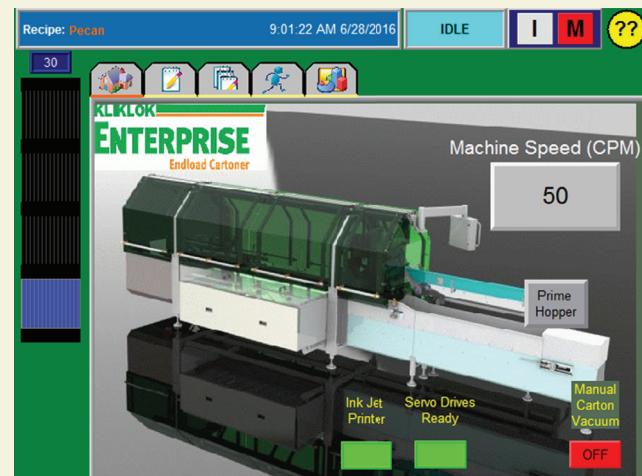
It is required that this manual be read and fully understood prior to attempting any changes to the stored settings.

CAUTION

Care must be taken when changing machine parameters. Always ensure there is no interference between machine components. We recommend jogging the machine, prior to running, anytime changes have been made.

4.6.1 HOME SCREEN

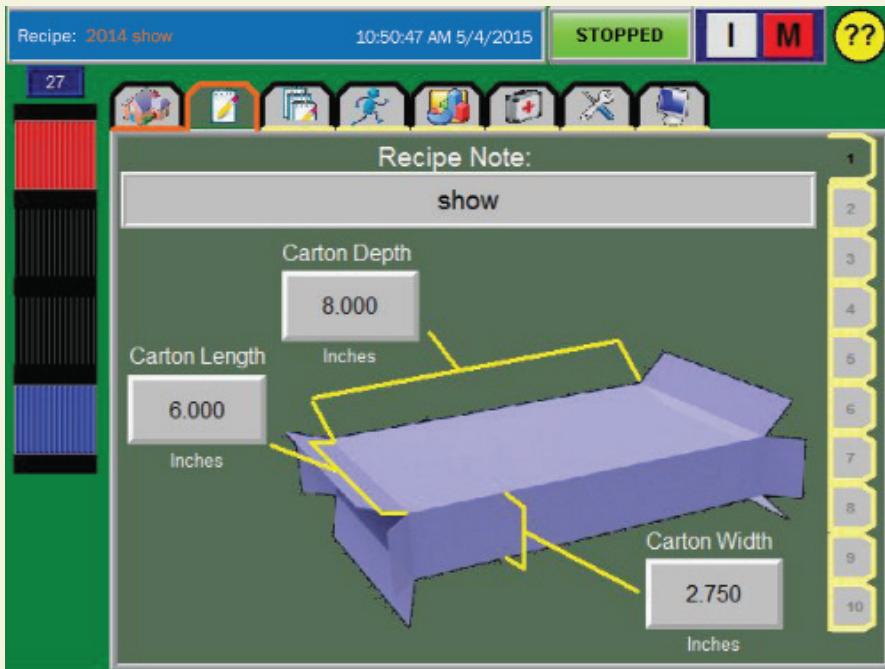
Returns user to the home screen (see 3.2)



When maintenance level is achieved, on the Home screen the Manual Carton Vacuum is now available. This icon displays the on / off feature for the engagement of pulling cartons regardless of product detection. If selected the feeder will start pulling cartons and continue to pull cartons until the feature is turned off by touching the icon again.

4.6.2 RECIPE SETTINGS SCREEN

The RECIPE SETTINGS SCREEN gives the user the currently selected recipe name, carton dimensions, and settings of the various adjustable components within the machine. This screen is divided into 10 pages. (See section 4.4.2 for page descriptions.)



CAUTION

These parameters are able to be edited when accessed in the maintenance level. It is required that this manual be read and fully understood prior to attempting any changes to the stored settings.

4.6.3 RECIPE MENU SCREEN

This screen displays all available recipes and empty recipe locations. The recipe currently loaded for production is revealed by an arrow ► to its left. When accessed at the maintenance level, recipes are able to be created, edited, saved, and deleted.

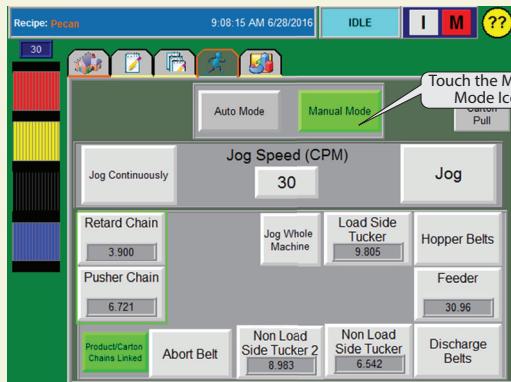


4.6.4 MODE SCREEN – MAINTENANCE LEVEL

This screen gives the user the ability to select between automatic and manual/jog running modes. In maintenance level the user has the option to jog each axis independently or as a whole machine. The Jog feature is especially helpful when setting the machine up to run a new carton, as well as

for troubleshooting. Utilizing the jog pendant gives the user freedom to move around the machine while checking said components.

Servo positions are displayed for the Retard Chain, Pusher Chain, both Tuckers, and the Feeder.



ENTERPRISE JOG SCREEN

now available in maintenance level on the jog screen. If it is desired to pull cartons, regardless of product detection the operator can touch and hold this icon. Once the icon is released the feeder will stop pulling cartons.

NOTE: That the machine must be reset with **No Faults** to enter Manual Mode. When exiting the jog screen this feature is re-enabled.

CAUTION

Damage may occur when disabling this feature as the chains will not physically pass each other.



Note: To Jog the machine all guard doors must be closed and the machine reset and in a ready state.

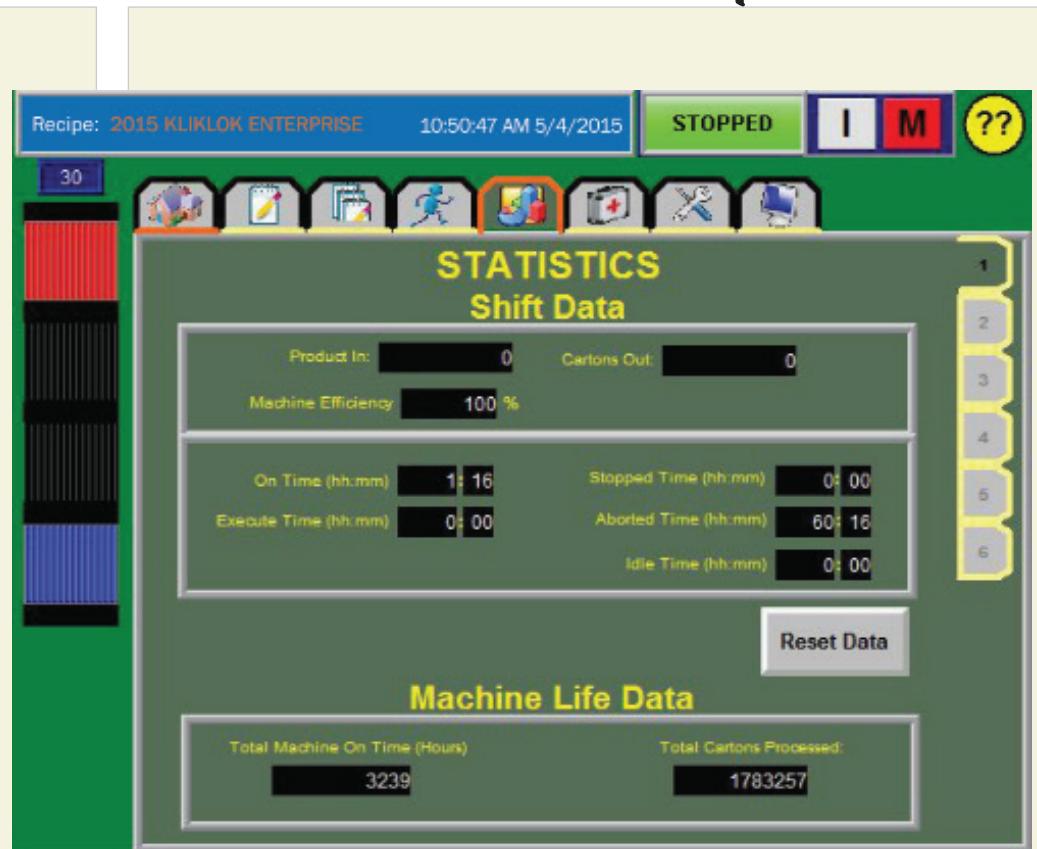
To operate the machine in Manual Mode:

1. Navigate to the Jog Screen.
2. Touch the Manual Mode Icon.
3. Touch the Jog Speed Icon and input the desired jog speed into the pop-up keypad.
4. Select individual components to jog or select Jog Whole Machine.
5. Touch the Jog Icon to place the machine into motion or utilize the Jog Pendant. The machine will stop all motion when the Jog Icon or Jog Pendant buttons are released.
6. The Jog Continuously Icon can be used to place the machine into constant motion. Touching the Jog Continuously Icon a second time will stop machine motion.
7. Exiting the Mode Screen will automatically place the machine back into Auto Mode.

4.6.5 STATISTICS SCREEN – MAINTENANCE LEVEL

This screen gives the user a wealth of information pertaining to overall machine as well as individual component performance. This screen is divided into the six (6) pages identified below.

In maintenance level the user has the ability to reset the stored statistical data.



PAGE #1 – SHIFT STATISTICS / MACHINE LIFE DATA

Statistics Screen 1 utilizes the carton sensors to gather production data such as the product in and the number of cartons out. This information is used to calculate machine efficiency.

The Machine Life Data tracks the total time the machine is operational. This information is helpful in determining a schedule for performing preventative maintenance.

To reset the Shift Data, touch the Reset Data icon. The Machine Life Data values cannot be reset.



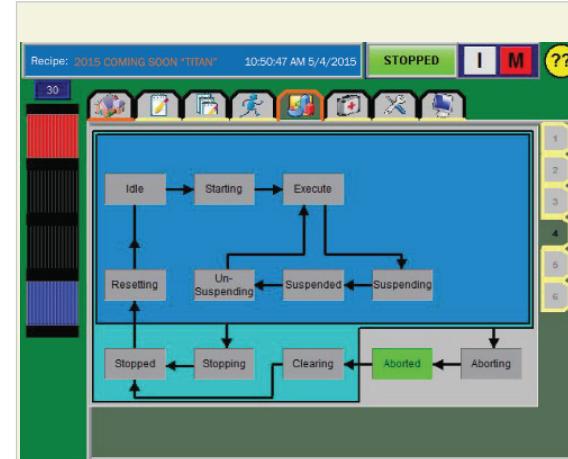
PAGE #2 – OVERALL EFFICIENCY

Statistics Page 2 utilizes the carton sensors and displays a real-time Machine Efficiency Graph, when in production this screen allows the user to view the past hour of production.



PAGE #3 – REAL-TIME COMPONENT TORQUE GRAPH

Statistics Page 3 displays Servo Torque Trending for each of the five (5) servo driven components, this screen allows the user to view servo torque profiles while the machine is in production.



PAGE #4 – PACK ML STATES

Statistics Page 4 displays the Packaging Machine Language (PakML) flow chart. As the operational state of the machine changes it will display on this page.

The current machine state will be highlighted green.

This screenshot shows the 'SHIFT SET-UP' shift setup page. The top bar displays the recipe as '2015 KW COMING SOON "TITAN"' and the date/time as '10:50:47 AM 5/4/2015'. The status is 'STOPPED' with icons for 'I' (Idle) and 'M' (Machine). A yellow question mark icon is also present. The main area shows three shift entries: Shift 1 Times (Start: 0601, End: 1430), Shift 2 Times (Start: 1431, End: 2300), and Shift 3 Times (Start: 2301, End: 0600). Each entry has a checked checkbox icon.

PAGE #5 – SHIFT SET-UP

Statistics Page 5, Shift Setup Page, allows the user to define the shift start and end times. This information is utilized for the collection and archiving of shift statistics. Up to three (3) shifts may be entered. It is important that the start and end time do not overlap.



Any shift may possibly end the following day, any figures from statistics going into the following day will be transferred into that day.



PAGE #6 – SHIFT STATISTICS ARCHIVE

Statistics Page 6, Shift Stats Archive Page, allows the user to view a history of past shift efficiency. Shift data is organized by shift number, date, and shift end time.

The scroll icons on the right side of the page permit the user to scroll through the stored data.

The following information is collected and stored in the Shift Stats Archive Page:

PRODUCT IN: The number of products processed as counted by the Product Sensor on the P.I.C.

CARTONS OUT: The number of filled cartons processed as counted by the Glue Sensor on the Discharge Conveyor.

EFFICIENCY: A calculation of Cartons Out divided by Product In. Displayed as Machine Efficiency %.

ON TIME: The total time the machine is powered up for the specific shift being viewed.

EXECUTE TIME: The total time the machine was in a production state for the specific shift being viewed.

STOPPED TIME: The total time the machine was in a stopped state for the specific shift being viewed.

ABORTED TIME: The total time the machine was in an aborted state for the specific shift being viewed.

IDLE TIME: The total time the machine spent in a ready to run state for the specific shift being viewed.

4.6.6 DIAGNOSTICS SCREEN

This screen provides information pertinent to troubleshooting machine faults. The pages accessed from this screen allow the user to monitor sensor input and output, set/view servo torque limits/statistics, and view stored servo fault history. Each page is further described below.

DIAGNOSTICS PAGE #1 – REMOTE I/O

Diagnostics Page 1 provides operational state of the eleven (11) Remote Input/Output Slots located within the PLC.

Red denotes an input/output that is HIGH (+24VDC).



DIAGNOSTICS PAGE #2 – INPUTS

Page 2 identifies each Input switch/sensor and its location within the PLC slots, and displays the operational state of said components.

Inputs	
I/O	
11/0	MCR Ready
11/1	Op Station Estop PB
11/2	Upstream Load Side Estop PB
11/3	Downstream Load Side Estop PB
11/4	Downstream Non-Load Side Estop
11/5	Upstream Non-Load Side Estop PB
11/6	Upstream Load Side Guard Switch
11/7	Upstream Non-Load Side Guard
12/0	Main Load Side Guard Switch 1
12/1	Main Load Side Guard Switch 2
12/2	Main Non-Load Side Guard 1
12/3	Main Non-Load Side Guard 2
12/4	Discharge Load Side Guard
12/5	Discharge Non-Load Side Guard
12/6	Cat Flap Door Switch
12/7	Pressure Sensor
13/0	Start PB
13/1	Stop PB
13/2	Reset PB
13/3	Jog PB
13/4	Product Detect Sensor
13/5	Overheight Product Sensor
13/6	Customer Signal 1
13/7	Customer Signal 2

DIAGNOSTICS PAGE #3 – INPUTS

Page 3 identifies additional Input switch/sensor and its location within the PLC slots, and displays the operational state of said components.



DIAGNOSTICS PAGE #4 – INPUTS

Page 4 identifies each remaining Input switch/sensor and its location within the PLC slots, and displays the operational state of said components.



DIAGNOSTICS PAGE #5 – REMOTE OUTPUTS

Page 5 identifies each Remote Output switch/sensor within Slots 8 and 9, and displays the operational state of said components



(OPTIONAL) DIAGNOSTICS PAGE #6 ILOCAL OUTPUTS

PAGE #6 identifies each Local Output switch/sensor within Slots 10&11, and displays the operational state of said components



DIAGNOSTICS PAGE #7 – SERVO TORQUE

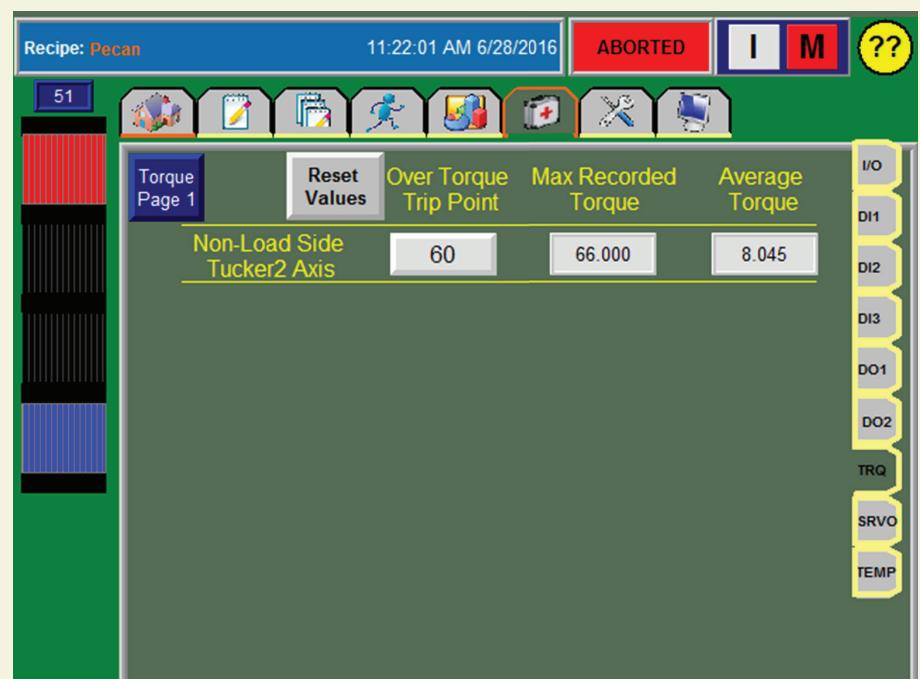
Page 7 allows the user to set Over-Torque trip points for each servo axis. This page also records the Maximum Torque an axis has encountered as well as Torque Averages.

To enter a Trip Point value, touch the corresponding icon and input the new value on the pop-up keypad that displays.

To clear the max recorded and average torque touch the Reset Values icon.

	Over Torque Trip Point	Max Recorded Torque	Average Torque
Feeder Axis	80	60.766	1.191
Pusher Chain Axis:	100	76.616	5.575
Retard Chain Axis:	80	49.301	3.354
Load Side Tucker Axis:	60	23.773	11.17
Non-Load Side Tucker Axis	60	32.453	7.360

TORQUE PAGE 2- In the upper left hand portion of the Diagnostics Screen #7 is the Torque Page 2 icon. Select this icon to review the additional torque values for the Non - Loadside Tucker 2 Servo axis. The following screen displays that value. On Torque page 2 in the upper left hand corner is the Torque Page 1 icon which will bring you back to Torque Page 1.



DIAGNOSTICS PAGE #8 – SERVO FAULT HISTORY

Page 8 records and displays Servo Faults. This page allows the user to view a history of fault codes, date and time the fault occurred, problem encountered, potential cause, and possible solutions.

To reset the stored history for a given servo drive; touch the Reset Servo Drive Fault History icon.



DIAGNOSTICS PAGE #9 – SERVO TEMPERATURES

Page 9 monitors and displays the internal temperature of all the servo motors serving the Enterprise Cartoner. This information is very helpful for troubleshooting potential problems.

Recipe: Pecan		11:24:50 AM 6/28/2016		I M ??	
Feeder Axis		89.907	Internal Motor Temperature (F)		
Pusher Chain Axis:		93.087			
Retard Chain Axis:		91.639			
Load Side Tucker Axis:		92.151			
Non-Load Side Tucker Axis		91.953			
Non-Load Side Tucker2 Axis:		91.617			

4.6.7 MAINTENANCE SCREEN

This screen gives the user access to global set-up features, servo homing, sensor teach, and machine options. There are five (5) pages located within the MAINTENANCE SCREEN each of which is described below.

CAUTION

NEVER MAKE ANY CHANGES TO DATA CONTAINED WITHIN THE FOLLOWING SCREENS UNLESS THIS ENTIRE MANUAL HAS BEEN READ AND FULLY UNDERSTOOD.



MAINTENANCE PAGE #1 – GLOBAL SET-UP

Page 1 allows the user to set the Date, Time, and Distance Units (metric/imperial).

To enter a value, touch the corresponding icon and input the value with the pop-up keypad that displays.

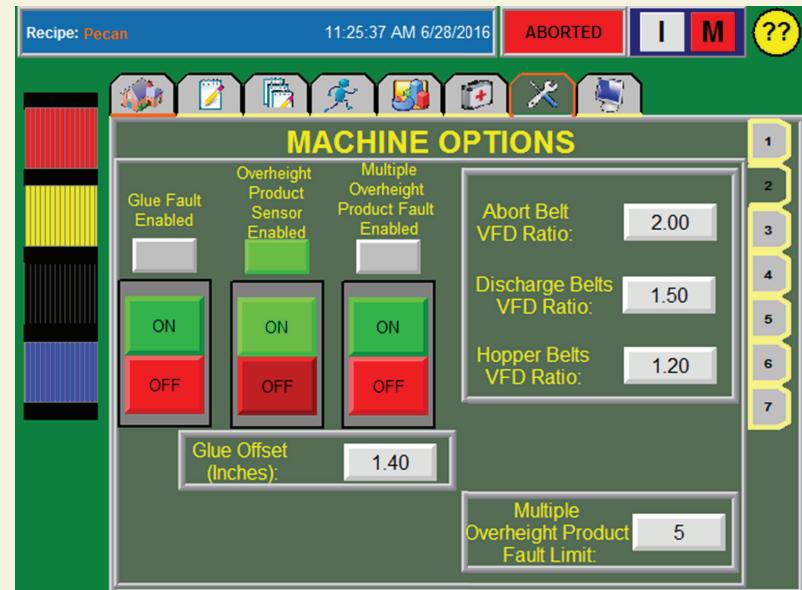
When changing the date/time, enter the desired values into the popup keypad and HOLD the blue clock icon for 5 seconds to apply the change.

MAINTENANCE PAGE #2 – MACHINE OPTIONS

Page 2 allows the user to enable/disable the Glue Fault and Over-Height sensors, as well as the glue gun offset (gun to eye) and discharge belt speed.

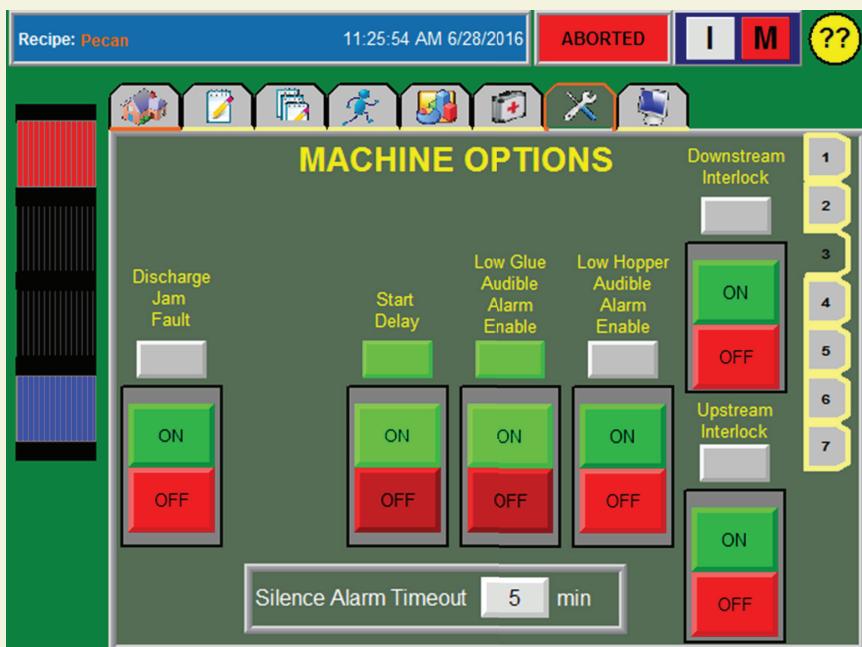
Glue Offset - is available here so that the operator can determine the necessary offset to fire the glue gun. This is based on the distance from the photoeye to the glue gun itself.

The Fault Limits allow a value to be set to define how many rejects/ over height products are allowed before the PLC will trigger a faulted state.



MAINTENANCE PAGE #3 – MACHINE OPTIONS

Page 3 allows the user to enable/disable the Start Delay, Discharge Jam Fault, Air Pressure Fault, Downstream Interlock, and the Upstream (Optional) Low Glue Audible Alarm enable / disable, is available here. The block at the bottom is the timeout setting in minutes.

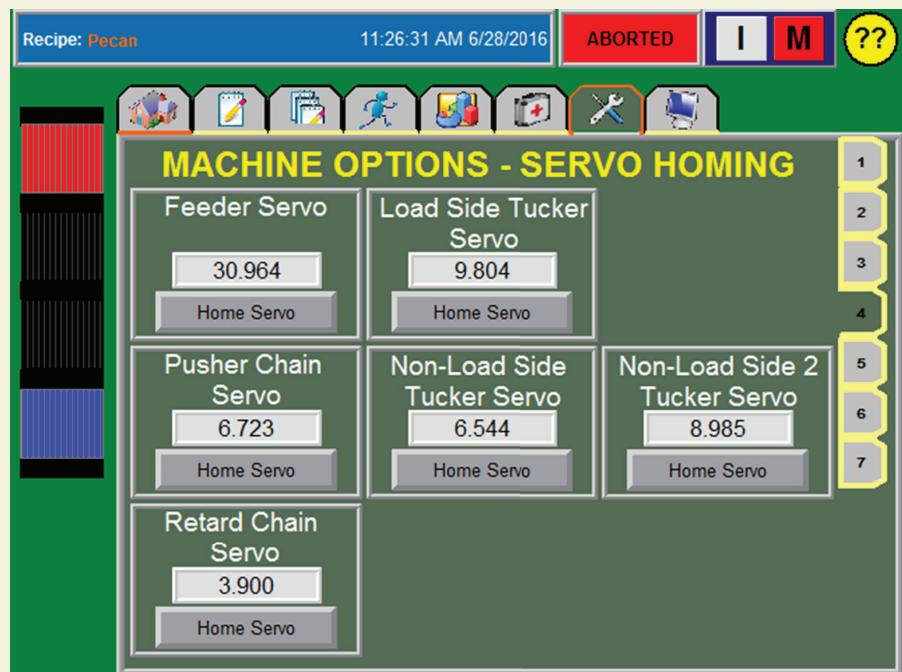


MAINTENANCE PAGE #4 – SERVO HOMING

CAUTION

NEVER ATTEMPT TO RE-HOME A SERVO DRIVE UNLESS THIS ENTIRE MANUAL HAS BEEN READ AND THOROUGHLY UNDERSTOOD, AND YOU FULLY UNDERSTAND THE RAMIFICATIONS OF MAKING THE CHANGES.

Page 4 provides the user the ability to “Home” each Servo Axis to a predetermined position. Actual servo position is displayed for each axis.



MAINTENANCE PAGE #5 – SENSOR TEACH

Page 5 gives the user the ability to “Teach” each product, carton, and glue sensor listed an operational set point, and set the vacuum off and on positions (in degrees).



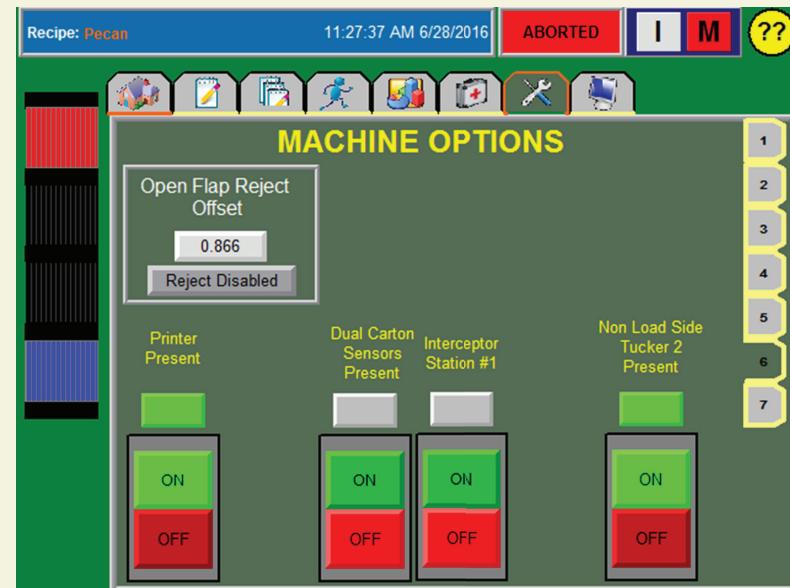
MAINTENANCE PAGE #6 – MACHINE OPTIONS

The Enable Disable Features available here are:

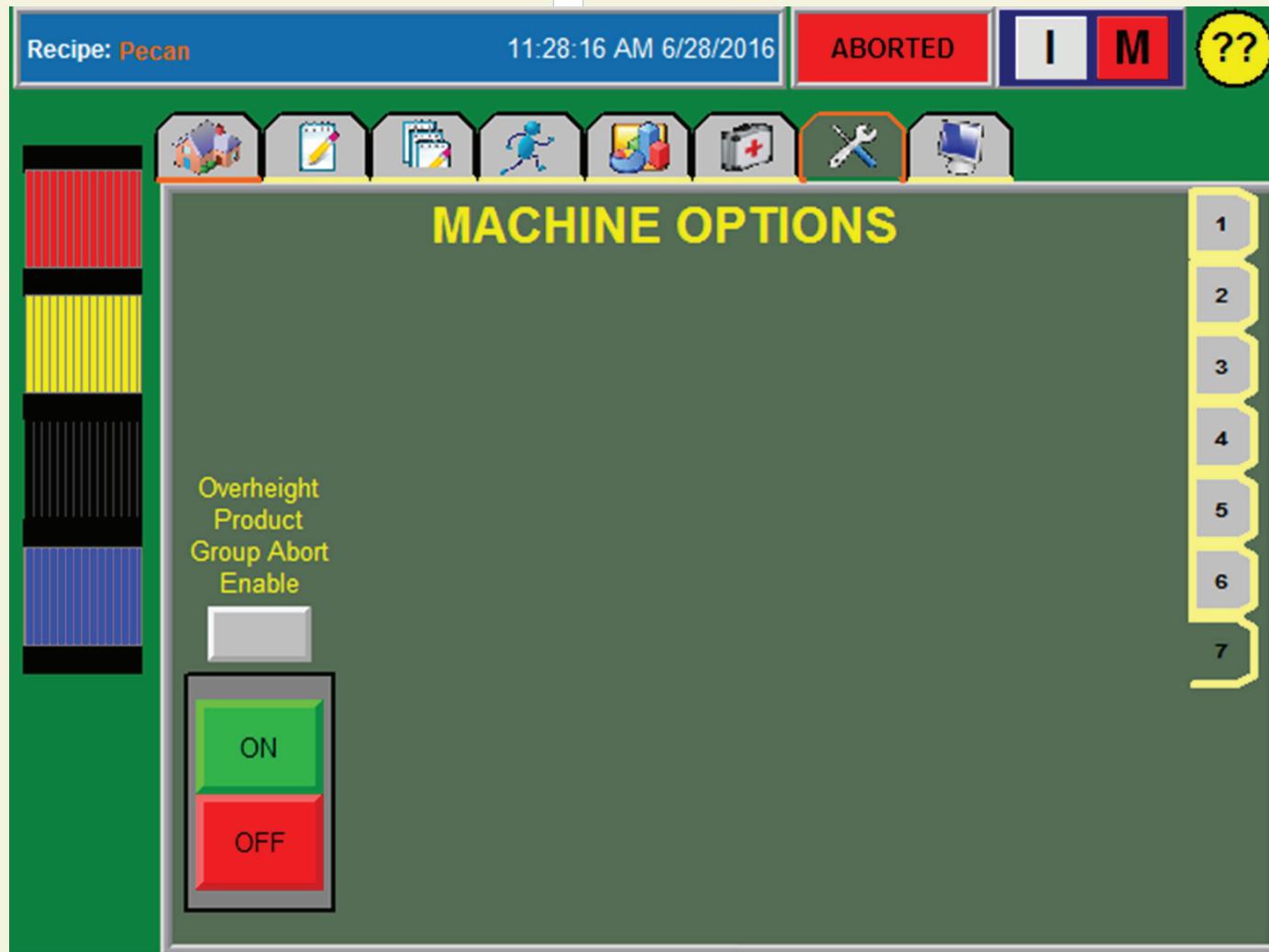
Printer Preset- Allows the machine to know if there is a printer enabled on.

Overhead Confiner Enable Disable- Allows the machine to know that the Overhead use is enabled.

Dual Carton Sensors Present- Enables the feature to detect the dual carton feature.



MAINTENANCE PAGE #7 - MACHINE OPTIONS



Page 7 displays the Enable Disable for the Product Group Abort feature. This is an optional feature which helps in detecting the presence of 2 or more products being joined together and then aborted from the machine.

This feature (When Enabled) aborts more products than a normal overheight system. This is to abort the overheight product which is connected (Joined Product) to another product. (Film not cut).

4.6.8 PVP DIAGNOSTICS

PVP Diagnostics provides access to the diagnostic and configuration screens for the Allen Bradley PanelView Plus HMI. This screen is divided into two pages, each identified below.

CAUTION

NEVER ATTEMPT TO MAKE CHANGES TO THE HMI PROGRAMMING UNLESS THIS ENTIRE MANUAL HAS BEEN READ AND THOROUGHLY UNDERSTOOD, AND YOU FULLY UNDERSTAND THE RAMIFICATIONS OF MAKING THE CHANGES.

WARNING

These screens are used by Kliklok-Woodman Engineering; DO NOT make any changes on the PVP Diagnostics screens UNLESS you thoroughly understand the ramifications of said changes.

PVP DIAGNOSTICS PAGE #1 – CONFIGURE

PVP Diagnostics Page 1 displays the computing memory used by the HMI and provides access into the configuration section of the display programming.



PVP DIAGNOSTICS PAGE #2

PVP Diagnostics Page 2 provides access to the computing log of the HMI program. This information can be helpful for troubleshooting potential problems.

Utilize the scroll arrows to move through the recorded data.

Utilize the clear and clear all icons to delete the recorded data.



Operation Maintenance
Manual

5.0 OPERATOR INSTRUCTIONS

5.0 OPERATOR INSTRUCTIONS

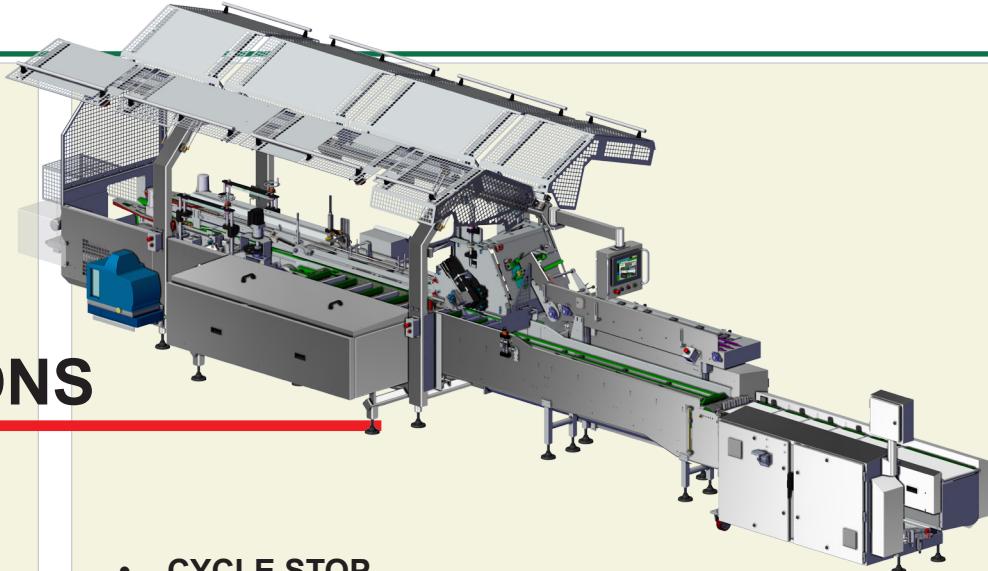
In this section, the Operator will learn how to load recipes, start, stop, and setup the Enterprise Cartoner for production and how to jog the machine manually. This section should be thoroughly read and understood prior to attempting any of the procedures outlined.

Any personnel that will work with this machinery should be familiar with the information provided in the previous sections of this manual. These sections give essential safety information and terminologies that will be utilized to complete the actions detailed.

5.1 MACHINE STATES

5.1.1 STOPS

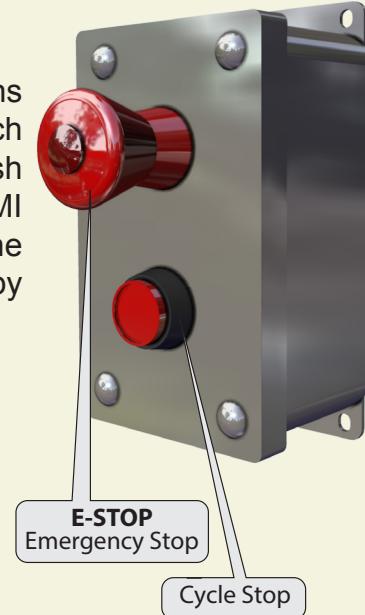
There are two types of stops, Cycle Stops and Emergency Stops. Each of these will be described below.



- **CYCLE STOP**

A CYCLE STOP is the standard means of stopping the machine. Unless required for safety concerns (i.e. when a guard door is opened, or the machine faults), all stops are cycle stops.

There are six (6) cycle stop buttons located on the machine. One on each of the four (4) emergency stop push button housings, one (1) on the HMI control panel and one (1) over the PIC. A cycle stop can be initiated by depressing any of these buttons.



- **EMERGENCY STOP**

There are six (6) EMERGENCY STOP buttons located on the machine. One on each of the four (4) corners of the machine, and one (1) on the HMI control panel and one (1) over the PIC.

An Emergency Stop (E Stop) situation exists when any of the following occur.

1. An E-Stop push button is depressed.
 2. A guard door is opened.
 3. A sensed jam.
 4. A servo fault.
 5. A glue fault

An Emergency Stop will immediately stop all machine motion, dump pneumatic air, and the control screen will display that an Emergency Stop has been actuated.

5.1.2 OPERATIONAL STATE IDENTIFICATION

The control system has four main operational states: E-Stop, Homing, Ready, and Run. These are explained in detail below.

- **E-STOP** – The machine is stopped, power is removed from components, and pneumatic pressure is released at the main regulator.
 - **HOMING** – The machine is moving each axis to its home position.
 - **READY** – Power is on, the servos are in their home position, and other systems are powered and ready to run.
 - **RUN** – The system is running

Each state is identified either by the color coded light bar

located on the left side of the HMI screen, and/or on the message banner located at the top of the HMI screen.
(see 4.3 Home Screen)

5.1.3 MACHINE STATE CHANGES

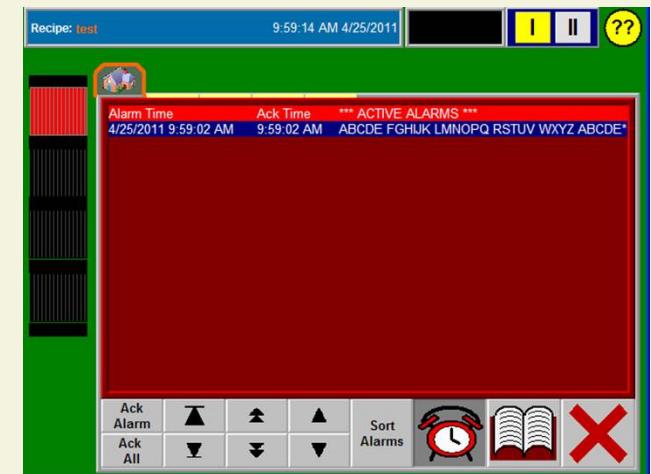
The system will enter an E-STOPPED STATE anytime a guard door is opened, an E-Stop button is pressed, or a machine fault occurs. This is also the initial state after a power-up. Change out of this state requires that all guard doors to be closed, all E-Stop buttons be reset, and all machine faults be cleared.

From E-Stop the system will change to a Resetting State, whenever the Reset button on the Control Panel is pressed. Once the safety circuit has been checked the machine will enter the “Ready State”.

In the READY STATE the system is primed to start production. To change from Ready to Run depress the Start button. Once the Start Button is pressed, the servos will move to the Start position for the selected recipe. Once this move is complete, the machine will Start. To change from Run to Ready press the cycle stop button.



Touching the red beacon will take the operator to the alarm history page.



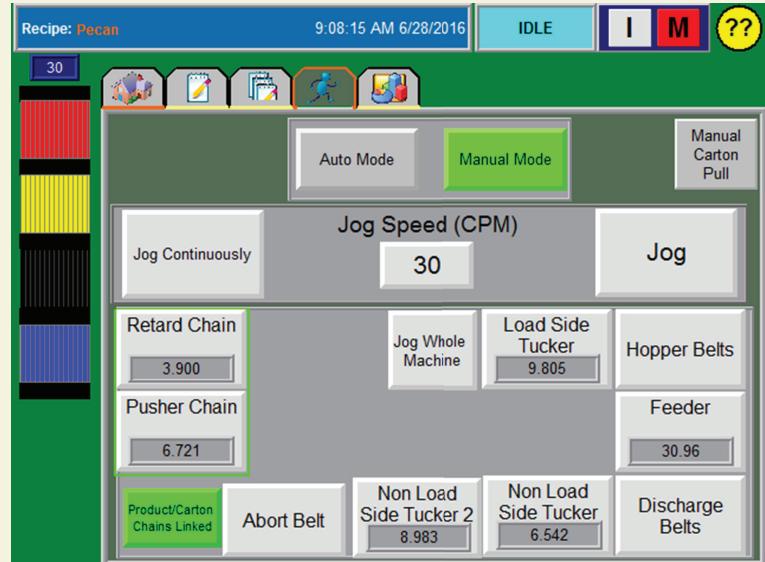
5.2 RUNNING THE MACHINE

This section will outline the steps required for a production run, how to restart the machine after a fault or jam, and how to operate the machine in manual mode.

The following procedure assumes that the machine has been setup, ready for production with the correct size change parts fitted and the required recipe selected.

The adhesive system should be at normal operating temperature, and the compressed air supply ON

5.2.1 RUNNING THE MACHINE IN MANUAL MODE



ENTERPRISE JOG SCREEN

1. Close all guard doors, clear all alarms, and reset the machine.
2. From the HOME SCREEN touch the MODE TAB.
3. Touch the MANUAL ICON to open the JOG SCREEN.
4. Touch the JOG SPEED ICON and enter the desired jog speed in the pop up keypad.
5. Touch the JOG WHOLE MACHINE ICON.



Note: In Operator mode the chains can only be jogged together.

5.2.2 RUNNING THE MACHINE IN AUTO MODE

1. Clear all machine faults.
2. Load product onto the upstream Product Infeed Conveyor.
3. Load cartons into the Hopper with the factory glue seams to the top facing upstream, and adjust guides accordingly.
4. Ensure the cartons are seated firmly and squarely in the Gate with no visible gaps.
5. Check that the Carton Sensors are reading the presence of the cartons in the hopper, adjust as necessary.
6. Check that all change parts are fitted and that all manual adjustments have been made.
7. Close all guards.
8. Check that the required recipe has been selected (see 5.4.1).
9. Check to ensure adhesive tank, hoses, and guns are at operating temperature.
10. Press the reset button to home servos.
11. Press the start button to begin production.

5.2.3 STOPPING THE MACHINE – CYCLE STOP

1. Remove any product from the Infeed Conveyor.
2. Press any of the five (5) Red Cycle Stop buttons.
3. If the machine is to be stopped for more than an hour, disable the power via the main electrical disconnect.

5.2.4 STOPPING THE MACHINE – EMERGENCY STOP

The Emergency Stop system is designed to prevent people from being injured while working on or around the machine. It is also automatically actuated when a jam occurs during operation, or if the guard doors are opened.

1. In the case of an emergency, press any of the Emergency Stop buttons positioned around the machine. The machine will come to an immediate stop, the pneumatic system will be disabled, and the control screen will display that an Emergency Stop has been actuated.
2. Remove any incompletely sealed cartons from the sealing and closing area of the machine.

CAUTION

use caution when working around hot components

3. Check the area of the machine where the jam occurred for damage.

4. Clear all machine faults that are indicated on the displayed alarm screen.
5. Close all guard doors.
6. Press the reset button to re-home the servos.
7. Press the start button.

5.2.5 RESTARTING THE MACHINE AFTER A FAULT

Recipe: A-6oz Croutons

3:20:14 PM 1/9/2016

Alarms are categorized into two types: Warnings and Faults

All warnings are self clearing and generally will not stop the machine. Warnings are displayed in the upper banner on the home screen.

In the event of a fault, the machine will stop, the pneumatic system will be disabled, and a red warning banner will be displayed on the HMI screen detailing the cause of the fault.

Clearing a fault message and resetting the machine:

1. Inspect the area where the fault has occurred and remove the cause of the fault.
2. Remove any incompletely sealed cartons from the sealing and closing area of the machine.

CAUTION

use caution when working around hot components

3. Inspect the surrounding area where the fault occurred for damage.
4. Close all guard doors.
5. Touch the displayed alarm banner to return to the home screen.
6. Press the reset button to clear the fault message.
7. Press the start button to resume production.

5.3 PERFORMING A SIZE CHANGE

The Enterprise Endload Cartoner has a semi automatic size change feature. By simply selecting a recipe, some components within the machine will automatically move and reset to new datum positions for the carton and product size while others will need to be manually adjusted.

The following sections identify the automatically adjusted components; the manually adjusted components, and describes the size change process for both.



Note: The photos and illustrations shown in this section may differ from the components on your machine. Though the size change components are customer specific and will change accordingly, the size change process remains the same.

5.3.1 ADJUSTMENT IDENTIFICATION

Automatic Servo Driven Adjustments

- Adjust the carton carrying chains to carton length.
- Adjust the P.I.C. pocket.
- Re-synchronize the Rotary Feeder position.
- Adjust the machine speed.
- Adjust the glue pattern.
- Re-synchronize carton flap tuckers.
- Phase P.I.C. to carton carrying chains.
- Park / Unpark 1st (upstream NLS) tucker.



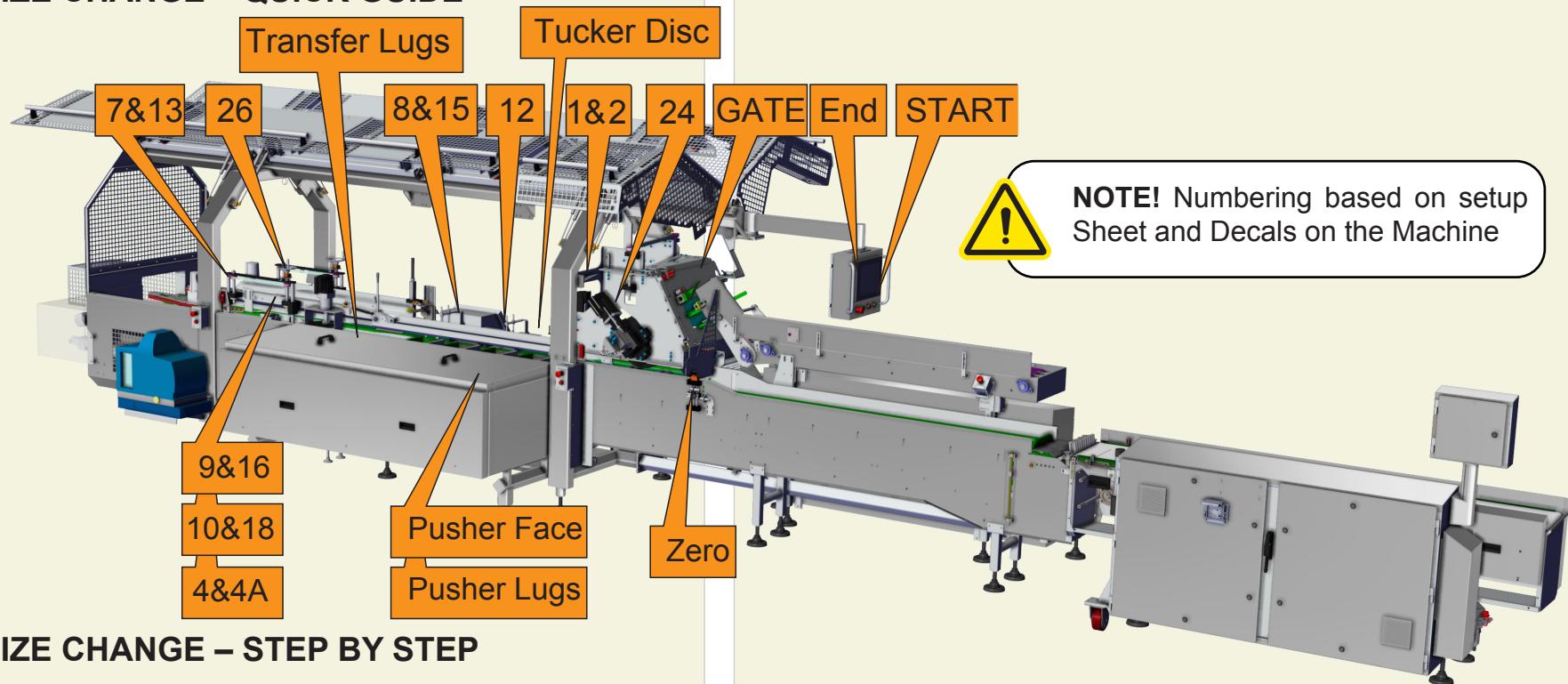
Note! If equipped with upstream equipment such as the SIPTU machine, when a new recipe is loaded the required recipe will also load with the joining equipment from KW.

Manual Adjustments

- Adjust the Cartoner Depth of Insertion.
- Adjust the Rotary Feeder Height.
- Adjust the Overhead Carton Guides.
- Adjust the Carton Hopper Feed Sensor.
- Adjust the Vertical and Horizontal Hopper Advance.
- Adjust the Rotary Feeder Feed Arms.
- Change the Quick Disconnect Inserter pusher faces.
- Change the Carton Gate.
- Adjust the Hopper Carton Guide Rail.
- Adjust the Glue Guns.
- Adjust the Over Height Product Sensor
- Phase P.I.C. to transfer chain.
- Phase transfer chain to carton carrying chains.
- Swap out Tucker disc's if required on the Upstream Flap Tucker Wheel.
- Adjust and or swap the upper major and lower major flap plow (Depending on Carton Size)
- Remove / add 2nd (downstream NLS) tucker change part.

5.4 DETAILED SIZE CHANGE INSTRUCTIONS

5.4.1 SIZE CHANGE – QUICK GUIDE



5.4.2 SIZE CHANGE – STEP BY STEP

The Change Parts required for a Size Change are identified on the RECIPE SETTINGS SCREEN. Prior to starting a Size Change it is recommended that you gather the needed Change Parts.

The numbers displayed are in reference to the setup sheets. In some cases the machine is equipped with additional change parts that are not required for the specific setup of the recipe. If shown as optional the operator must determine if part needs to be changed. Those are described and not numbered. Called out numbers are in sequence and does not reflect the order of the setup sheets. Setup Sheets follow screen pages.



CHANGING THE RECIPE

START

Stop any upstream equipment and allow remaining product to run out of machine.

Stop the machine by pressing the **CYCLE STOP** button.

From the Home Screen on the HMI touch the **RECIPE MENU ICON**. This screen displays the currently selected recipe, with an arrow ► to its left as well as other accessible recipes.



To select a recipe for production, touch whichever of the ten (**10**) **BLUE RECIPE BARS** (containing the recipe name) you want to run. This will move the selection arrow ► to that recipe. You may also scroll the arrow ► up/down through the Recipe Bar by utilizing the scroll icons to its right. You may also scroll the arrow up/down through the available recipes by utilizing the Scroll Icons.



Pusher Face

Touch the **LOAD ICON**. This will cause a pop-up box to display asking you to confirm your selection. Touch the green check ✓ to confirm the change, touch the red X to cancel the change.

6. Before completing the checklist an “INSERTER RETRACT” pop-up box will display on the HMI, touch the green check to confirm the retraction of the Inserter Rails. This will facilitate changing the Inserter Piston Pusher Faces and ensure no machine damage from inserter piston interference with other components.

Touch the **RECIPE CHECK LIST ICON**.

Consecutively complete the required changes shown on the **RECIPE CHECK LIST** and by following the instructions below.

Inserter Retract

Are you sure you would like to move the Inserter rails to the retracted position?



Caution:

The machine will automatically move if the ✓ button is pressed.

CHANGING THE INSERTER PUSHER FACE (Optional Change Part - Change if required)

If the INSERTER PISTON PUSHER LUGS are to be changed, it will be necessary to manually jog the machine to gain access to the components. (see section 5.2.1)

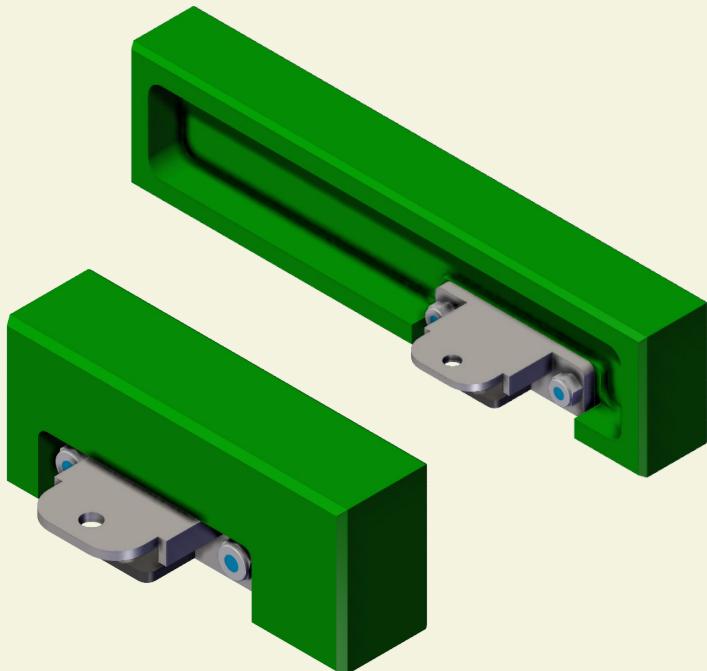
Open the guard door on the load side of the machine. Remove the QUICK DISCONNECT PISTON PUSHER LUGS that are accessible and install new ones.

Close the guard door and jog the machine until the remaining lugs and paddles are accessible, remove/install the remaining lugs and paddles.

Check the alignment of the PISTON PUSHER LUGS to ensure they do not clash with the TRANSFER CHAIN or each other.

Pusher Lugs

CHANGING THE INSERTER PISTON PUSHER LUGS.



If the **INSERTER PISTON PUSHER LUGS** are to be changed, it will be necessary to manually jog the machine to gain access to the components. (See 5.2.1). It is very important when changing the pusher lugs that when re-fitting them, the locking pins spring into the fixing holes.

9. Open the guard door on the load side of the machine. Remove the **QUICK DISCONNECT PISTON PUSHER LUGS** and **QUICK DISCONNECT** that

are accessible and install new ones. It is very important when changing the pusher lugs and transfer lugs that when re-fitting them the locking pins spring into the fixing holes.

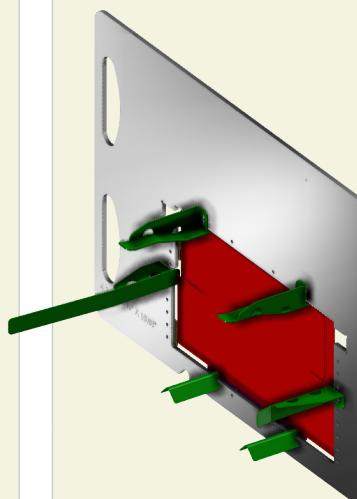
Use a small pointed object to push the pusher pins so the pushers can be released.

Close the guard door and jog the machine until the remaining lugs are accessible, remove/install the remaining lugs.

Check the alignment of the **PISTON PUSHER LUGS** to ensure they do not clash with the **PIC** or **Transfer Chain**

GATE

CHANGING THE CARTON GATE / ADJUSTING THE HOPPER (Color Coded Change part / Optional Change)



Release the locking handle on the **VERTICAL HOPPER ADVANCE** and slide upwards to clear the carton stack.

Empty the cartons from the **CARTON HOPPER**.

Remove the **LOW CARTON SAFETY SENSORS** from each side of the Carton Gate.

Pull the **GATE LATCH** down to release the **CARTON GATE**.

Remove the **CARTON GATE** by sliding outwards.

Refit the new **CARTON GATE**, ensuring that it is securely seated within the location slots, and that the **GATE LATCH** fully engages.

Refit the **LOW CARTON SAFETY SENSORS**.

Load the new cartons onto the gate with the factory glued seam to the top, facing upstream, pressing them firmly together so that no gaps are visible between cartons.

Adjust the **CARTON SIDE GUIDE** on the side of the hopper to accommodate the new carton size. Adjustment is achieved by turning the two (2) handles located on the non-load side of the Powered Hopper Conveyor.

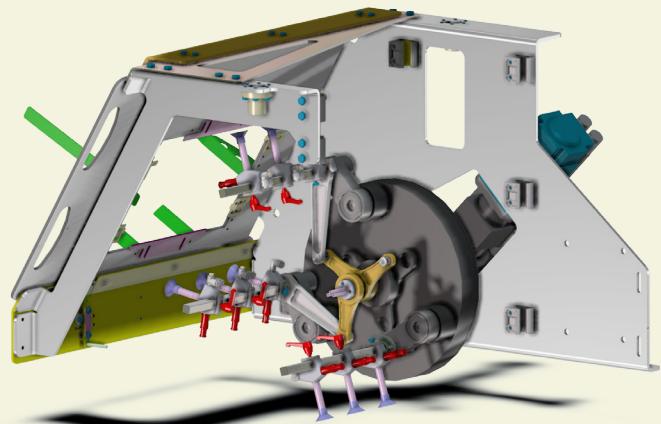
Slacken the fixing handle on the **VERTICAL HOPPER ADVANCE** and slide downwards. Position the guides so that they just contacts the tangent point of the carton stack profile. Tighten the fixing handle.

24

ADJUSTING THE ROTARY FEEDER

Loosen the handles on the **ROTARY FEED ARMS** and adjust the **VACUUM CUPS** to the desired setting on the etched scale. Tighten the handles and repeat the process for the two remaining arms.

Utilizing a suitable size socket (13mm), adjust the **HEIGHT** using the size change control until the desired setting is displayed on the digital indicator.



1&2

ADJUSTING THE CARTON ERECTOR SKI GUIDES



!NOTE! The following two steps must be completed simultaneously. Extra care must be taken to ensure no interference between the Erector Ski Guides, and Carton Conveyor Lugs. Interference between these components could result in personnel injury and/or machine damage.

Loosen the handle on the non-load side **CARTON ERECTOR SKI GUIDE**.

Move the guide so it does not contact with the main carton conveyor pushing/retarding lugs should adjustment to the **CARTON CONVEYOR DEPTH OF INSERTION** be carried out.

Adjust the **ERECTOR SKI GUIDES** to the desired setting on the etched scale, **AFTER** the **CARTON CONVEYOR DEPTH OF INSERTION** adjustment has been carried out.

26 ADJUSTING THE CARTON CONVEYOR – DEPTH OF INSERTION

Locate the size change control for the **CARTON CONVEYOR DEPTH OF INSERTION** adjustment on the non-load side of the machine.

Utilizing a suitable size socket (13mm), rotate the adjuster until the desired dimension is displayed on the digital indicator.

Adjust the **SKI GUIDES** to the desired settings as outlined in the previous steps.

Transfer LUG**Changing the TRANSFER LUG**

(Optional Change Part - Change if required)

During each Size change you may be required to change the transfer Lug Assembly. These come as retarder lug and a pusher lug. The lugs are located in sync with the inserter piston arms and the infeed lugs which carry the cartons. As stated before all change parts are labeled with a specific color coded system and a stamped letter. For each size box find the correct color or letter for the box and look for that on the Transfer lugs.



Note: Each Transfer Lug Assembly requires the operator to slide into place utilizing the key hole slots. Each one has a knob which is spring loaded. The pin must drop into the hole correctly. Be sure to check each lug once installed, that they are secure. Hold the top of the lug and lightly shake checking for loose connections.

12**ADJUSTING THE UPSTREAM OVERHEAD CARTON GUIDE**

Locate the **NON-LOAD SIDE OVERHEAD CARTON GUIDE** on the upstream end of the machine.

Loosen the three (3) handles securing the guide to its attachment points.

Adjust the **NON-LOAD SIDE OVERHEAD CARTON GUIDE** to the desired setting on the three (3) etched scales

Tighten the three (3) handles.

7 & 13**ADJUSTING THE DOWNSTREAM OVERHEAD CARTON GUIDES**

Locate the **OVERHEAD CARTON GUIDES** on the downstream end of the machine.

Utilizing the **HAND CRANK**, rotate the adjuster until the desired dimension is displayed on the digital indicator.

Repeat the process for the opposing side.

9 & 16 ADJUSTING THE GLUE GUN HEIGHT

Make sure all heated components are allowed time to cool completely prior to making adjustments to them. Failure to do so could result in severe injury.

Utilizing a suitable socket (10mm) slacken the three attachment bolts securing the **GLUE GUN BRACKET** to the **GLUE GUN MOUNT**.

Slide the **GLUE GUN** to the desired setting on the etched scale.

Tighten the three attachment bolts.

Repeat process for the opposing side.

10 & 18 ADJUSTING THE GLUE GUN ANGLE

Make sure all heated components are allowed time to cool completely prior to making adjustments to them. Failure to do so could result in severe injury.

Utilizing a suitable socket (10mm) Loosen the three (3) attachment bolts securing the **GLUE GUN ANGLE** adjustment point.

Rotate the glue gun to the desired setting on the etched scale.

Tighten the attachment bolts.

Repeat process for the opposing side.

4 & 4A ADJUSTING THE LOWER AND UPPER MAJOR FLAP PLOWS.

LOWER MAJOR FLAP PLOW : Locate the Lower major flap plow on the upstream end of the machine, just after the tuck wheel.

Utilizing a suitable socket (10mm), loosen the two (2) attachment bolts securing the plow to the bracket.

. Slide the PLOW to the desired setting on the etched scale.

Tighten the attachment bolts.

UPPER MAJOR FLAP PLOW : Locate the upper major flap on the downstream end just after the glue guns.

Utilizing a suitable socket (10mm), loosen the two (2) attachment bolts securing the plow to the bracket.

Slide the PLOW to the desired setting on the etched scale.

Tighten the attachment bolts.

8 & 15 ADJUSTING THE COMPRESSION ROLLER ASSEMBLIES

Locate the **COMPRESSION ROLLER ASSEMBLIES** on the downstream end of the machine, just prior to the out feed belts.

Utilizing a suitable socket (13mm) Loosen the attachment bolts securing the compression rollers.

Slide the assembly to the desired setting on the scale.

Tighten the attachment bolts

0 (Zero)

ADJUSTING THE OVER HEIGHT PRODUCT DETECT SENSOR

Locate the **OVER HEIGHT PRODUCT SENSOR** on the upstream end of the machine, load side, prior to the **ROTARY FEEDER**.

65. Rotate the handle on the size change control until the desired dimension is displayed on the digital indicator.

When processing irregular shaped products it is recommended that you allow an extra 2mm - 3mm for the setting.

Tucker Disc

Tucker Disc Swap (If Required)

Depending on the recipe it may be necessary to swap the tucker disc's or remove a portion of the disc. On the upstream tucker assembly the discs are color coded to match requirements for each recipe. Based on the setup sheets for each recipe determine the required method and perform the change.

Using a suitable wrench remove the screws and either remove or swap the necessary Tucker Disc assembly.

Install the required tucker disc (if any) and secure tightly back into place.

End

CHECKS AND FINAL ADJUSTMENTS

Close all guard doors and reset any stops.



Retrieve the JOG Control Screen and **slowly** operate the machine.



Check that the **ROTARY FEEDER VACUUM CUPS** are correctly timed and will not clash with the **OVERHEAD CARTON ERECTOR SKI GUIDES**.



Check that the inserter pusher faces do not clash with the product infeed conveyor.



Check that the **PRODUCT INFEED CONVEYOR** does not clash with the **OVERHEAD CONFINER PADDLES (OPTIONAL)**



Check that the cartons are erecting correctly, and the glue stripe position is correct. This is achieved by briefly covering the product sensor on the infeed conveyor with a piece of card stock then running the machine.



Slowly run the machine with product. Check that the **P.I.C. POCKET** is set correctly for the product.

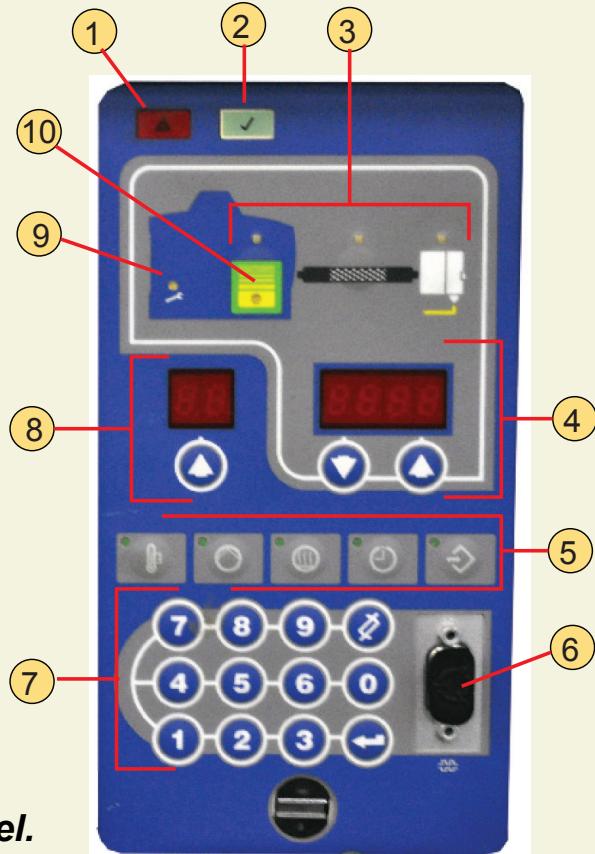


Check that the product passes smoothly from the a PIC under the overhead confiner, and into the carton.



Gradually increase the machine speed, checking that the machine continues to operate correctly.

5.5 NORDSON PRO-BLUE 7 USER'S GUIDE



Control panel.

1. Fault LED
2. Ready LED
3. Component keys/LEDs
4. Right display and scroll keys
5. Function keys
6. Serial port
7. Keypad
8. Left display and scroll key
9. Service LED
10. Tank low-level LED

DANGER

Safety when Gluing

As a safety feature the Nordson glue jetting is only enabled in the run condition, when in hand, jog or guard/emergency stop actuated mode the jetting is disabled.

5.5.1 ProBlue Melters - Symbols



ProBlue Melters



DuraBlue Melters



DuraBlue L Melters

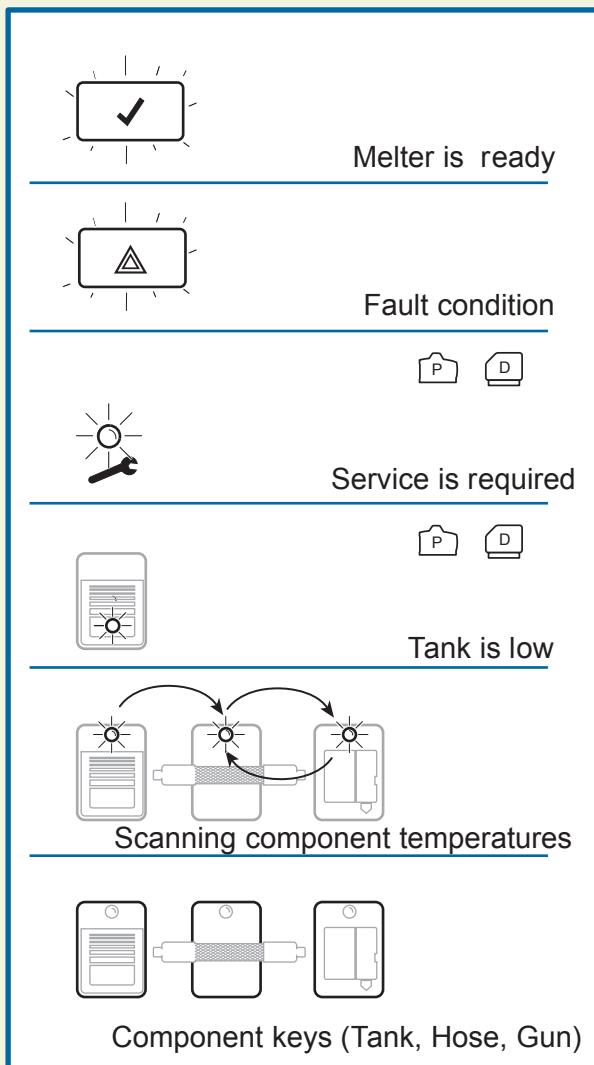


Observe
Attention
Beachten
Osservare

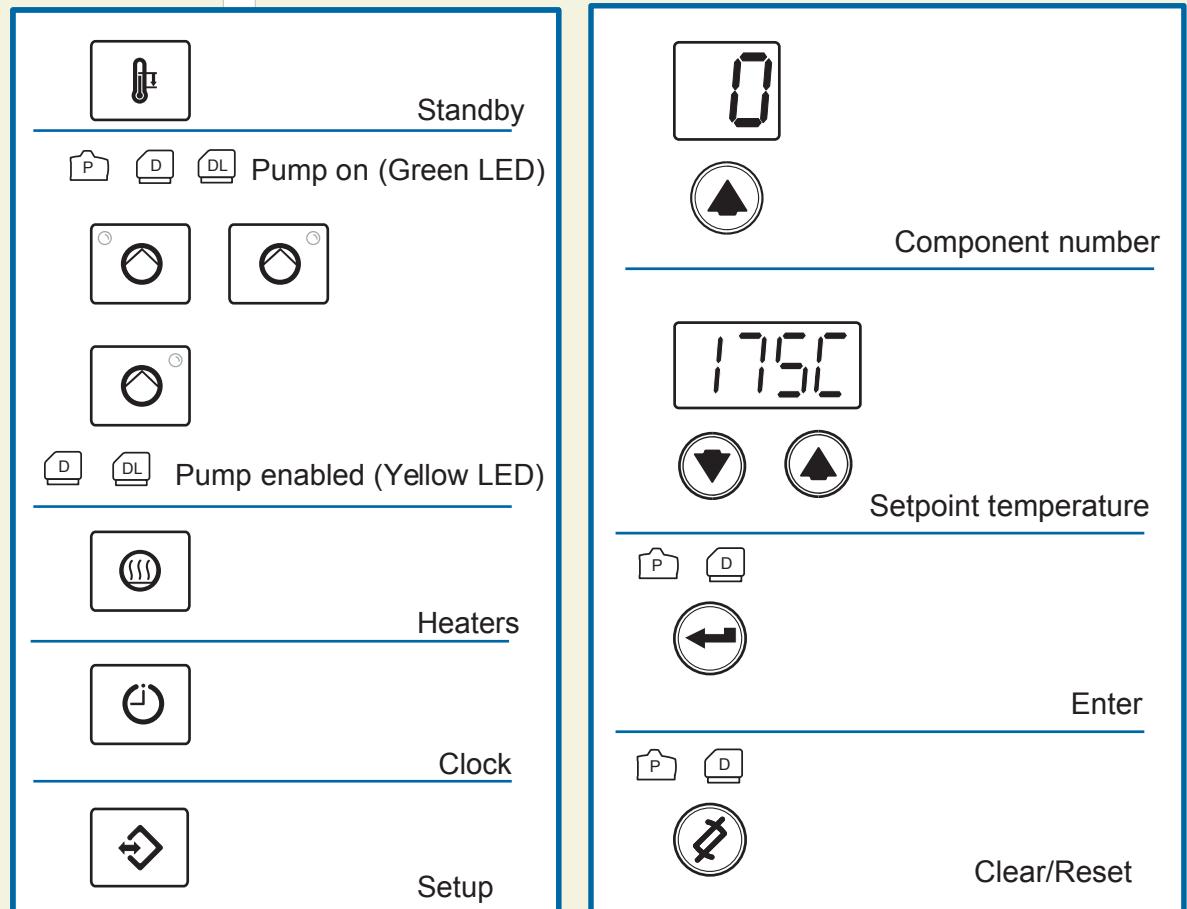


Press or hold

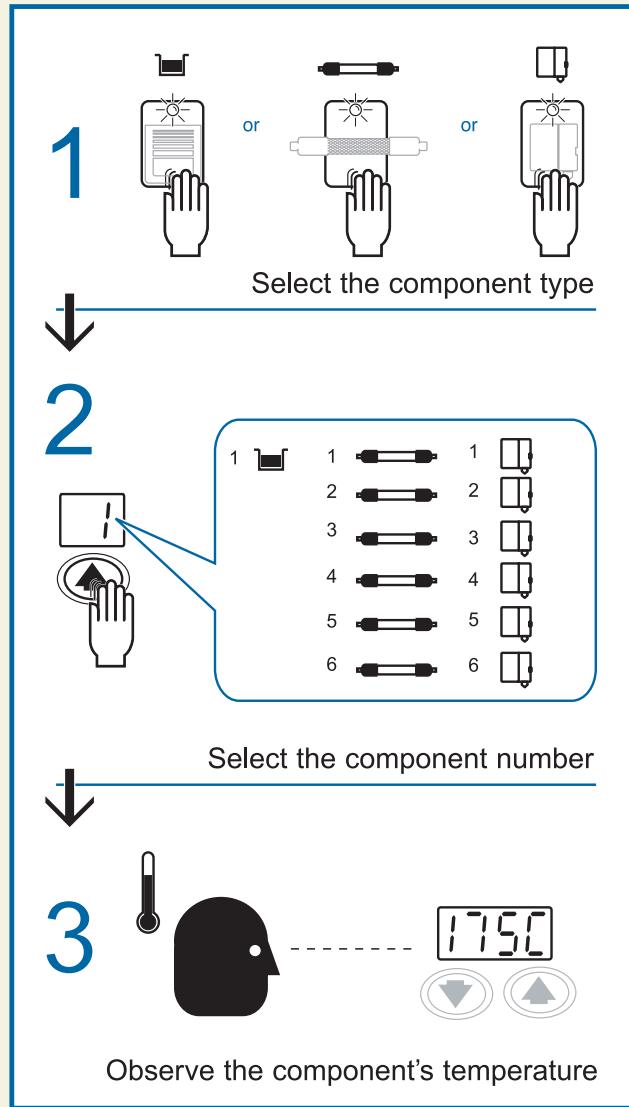
5.5.2 Controls and Indicators



5.5.3 Controls and Indicators



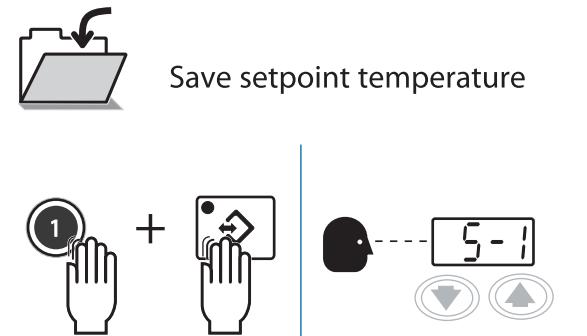
5.5.4 To Check Component Temperatures



5.5.5 To Save or Restore Set-point Temperatures

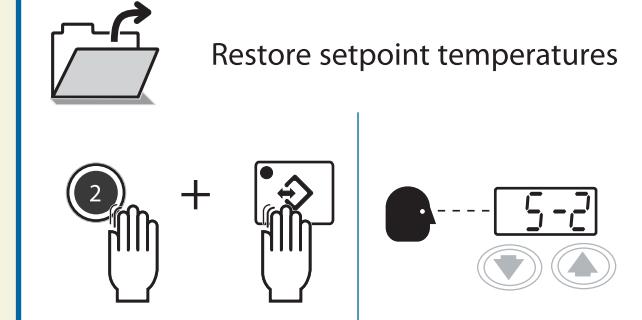
To save a set-point temperatures.

1. Press the one and setup key.

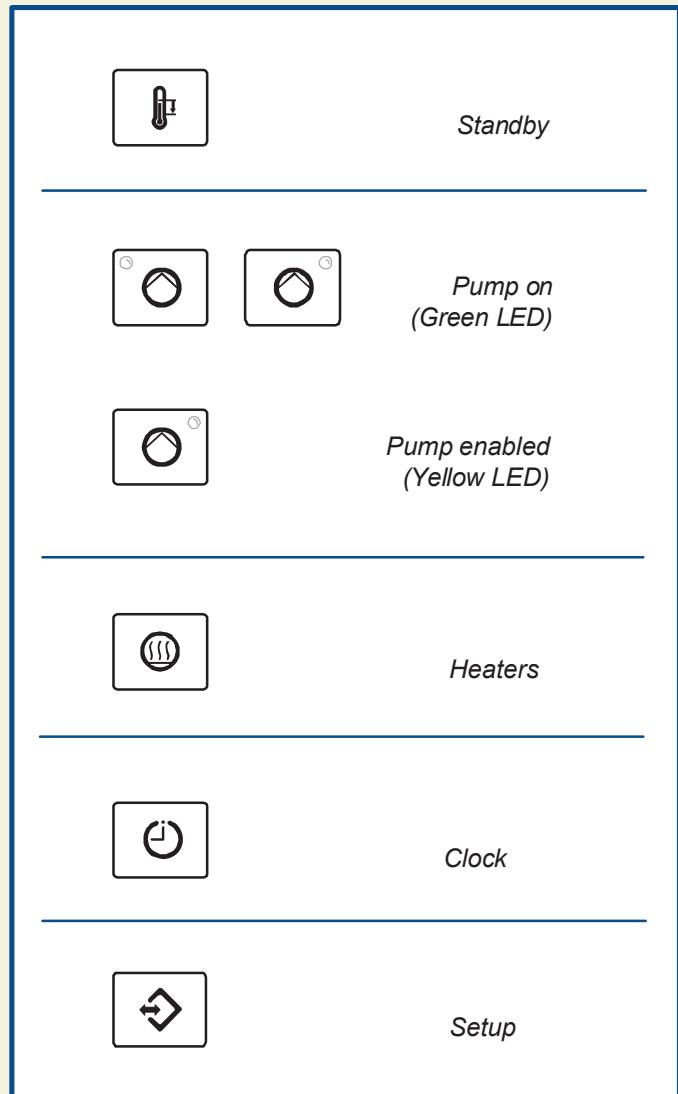


To Restore a set-point temperatures.

1. Press the one and setup key.



5.5.5 Controls and Indicators (contd.)



Operation Maintenance
Manual

6.0 MAINTENANCE

6.0 MAINTENANCE

This section will detail Recommended Maintenance Schedules, Lubrication Tables, Machine Cleaning, and Troubleshooting.

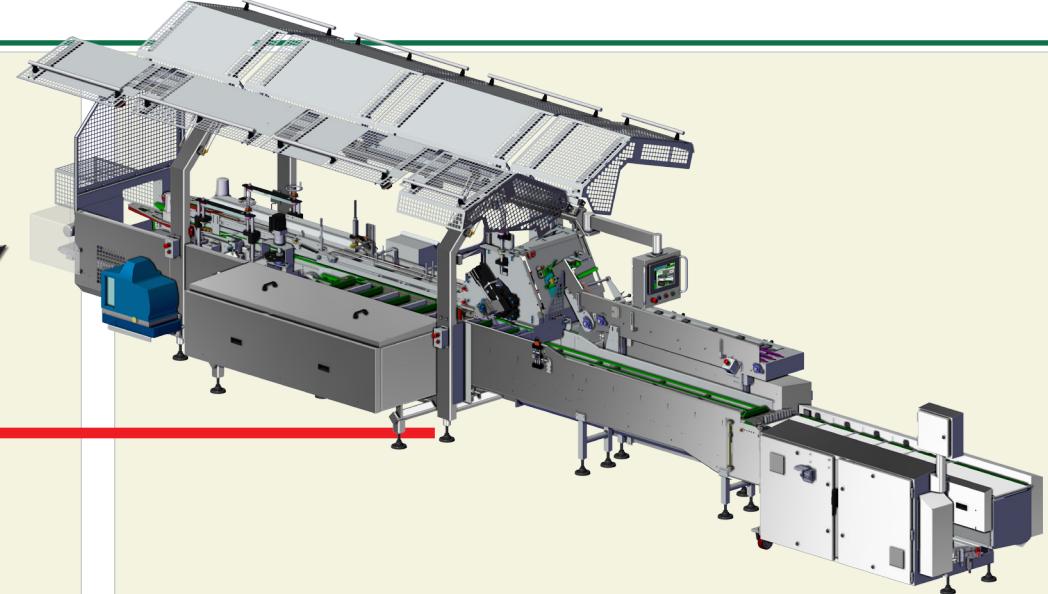
Any personnel responsible for completing maintenance tasks on the Enterprise Endload Cartoner must have thoroughly read, and completely understand, the information contained within this manual.

Prior to carrying out any maintenance activity, push in one of the emergency stop buttons and open a guard door to prevent machine from being started.



6.1 DAILY MAINTENANCE SCHEDULE

New parts, particularly conveyor or drive chains and belts, may affect machine operation and timing.



A preventative maintenance schedule should be employed every 8 hours. The following checks should be carried out daily before starting production.



1. Check for missing or damaged parts
2. Check all moving parts for signs of wear or insecure fixing.
3. Inspect the condition of all belts. Clean if required, with warm water and a soft cloth. Replace a belt that is damaged or broken.
4. Report noisy operation of the motors and gearboxes to Kliklok-Woodman Service Department.
5. Check that all interlock switches on the guards are working properly. Replace if damaged or defective.

6. Check that all Emergency Stop push buttons are working properly. Replace if damaged or defective.
7. Gently clean and inspect all sensors. Take care not to disturb the position of any sensor.
8. Inspect all pneumatic filters. Clean / replace as required.

Every 100 Hours of Operation

Component	Maintenance Task	Corrective Action
Chain Tracks	Check for wear and foreign objects or Glue build up	Clean or Scrape out as required
Gearboxes	Check for leaks and oil levels	Fill as required
Jack Shafts & Nuts	Check to make sure they are lobed and Operating normally	Lube as required

6.2 MAINTENANCE SCHEDULE

Every 8 Hours of Operation

Component	Maintenance Task	Corrective Action
Belts	Check for wear and proper tension	Replace and / or adjust
Glue System	Check for glue build up and / or charring on The glue nozzles	Clean with stiff bristle brush. Do not Use a steel brush.
	Check for contamination	Purge one cup of glue from tank
	Check for glue build up on plows and Folders	Scrape glue off
	Check for glue pattern accuracy and timing	Adjust as necessary through the HMI
Compression Rollers	Check for missing or loose roller rubbers	Replace and / or adjust as necessary
Pop-Up Lugs	Check for missing or damaged lugs	Replace as necessary
Bearings	Follow prescribed lubrication schedule	N/A
Sensors & Reflectors	Check for dirt build-up or damage	Clean with soft cloth
Air Filter	Check air filter for electrical enclosure Cooling system	Clean and / or replace as outlined in Owners manual
Interlocks	Check for proper operation	Replace as required
Lug Actuator	Check for proper operation	Adjust as necessary

Every 50 Hours of Operation

Component	Maintenance Task	Corrective Action
Chains	Check for wear and proper tension	Replace and / or adjust
Bearings	Check excessive play and / or noise	If worn, replace
Fasteners	Check for loose or missing fasteners	Tighten and / or replace as necessary
Guard Doors	Check for dirty build up	Scrape glue off
	Check to ensure that the actuator and Switch are still secure	Adjust as necessary through the HMI
	Check and examine all cable entries and Connections	Replace and / or adjust as necessary
	Check that the latch is adjusted correctly	Replace as necessary

6.2.1 GENERAL

8. Every 25 hours, check the tension on new chains. These stretch quickly during the first 200 hours of operation
9. Within four weeks of initial installation, check all nuts, bolts, and other fasteners for security. Tighten any that may have worked loose.
10. Within two weeks of fitting new parts, check that the parts are securely fastened. Tighten any loose fasteners.

6.2.2 EVERY 8 HOURS

Refer to the Daily Maintenance Schedule in 6.1 above.

6.2.3 EVERY 50 HOURS

1. Check the operation of the Electrical Power Isolator. Repair or replace as needed.
2. If the carton size has not been changed during the previous 50 hours running, after lubricating the screws, jack nuts, and splined shafts as laid out in the Lubrication section, adjust the Carton Conveyor, Hopper Side Guide, and Closing Guide Assemblies over the full size range. The movement of the adjustment screws carries lubricant into the threads and prevents them from seizing.
3. Inspect the Carton & Product Conveyors. Fit new belts / chains if needed.

4. Check/adjust the tension of all conveyor chains and bands. The main carton conveyor has visual tension gauges located beneath the carton gate. The Product Infeed Conveyor has visual tension gauges on the upstream end. If these gauges are in the red, add tension to the chains to move the indicator into the green. (see section 6.4 Conveyor Adjustments)
5. Check that all sensors and associated circuits operate correctly. Correct any faults.
6. Check the operation of the Load/Abort Jam Sensors on the Piston Inserter (If Equipped).. Replace if damaged or defective.

6.2.4 EVERY 250 HOURS

1. Inspect all sensors. Clean them or fit new ones as needed.
2. Check the operation of all Sensors.
3. Check the operation of all Guard Safety Switches.
4. Inspect all Drive Motors, Drive Belts, and/or Drive Chains.
5. Inspect all Conveyors.
6. Inspect all Chain Driven Sprockets for signs of wear/ damage. Replace as needed.
7. Check/change the bearings in Idler Sprockets.

8. Inspect all Pulleys for wear/damage. Replace as needed.

6.2.5 EVERY 500 HOURS

1. Inspect all chains. If the chain stretch exceeds 2%, fit new chains.
2. Lubricate the external grease fittings of the Rotary Feeder with: Tom-Pacific.....TP-2431, as defined on the included lubrication chart.

6.2.6 EVERY 750 HOURS

1. Inspect all gearboxes. Check for noisy operation and backlash.

6.2.7 EVERY 3000 HOURS

1. Remove all drive chains for cleaning and lubrication. Fit new chains if required.
2. Inspect all bearings. Check for bearing wear and damage to the bearings and housings.
3. Strip and inspect the overload clutches, if applicable. Clutch removal is described within manufactures bulletins located in the back of this manual.
4. If the clutches are serviceable, lubricate as recommended in the section 6.3 Lubrication. Reassemble and refit.
5. Fit new blades and filter to the vacuum pumps, if applicable, as described in the manufacture's literature located in the back of this manual.

6.3 LUBRICATION

Kliklok-Woodman Lubrication Instructions (Food Machinery Lubricants)

- Oil applications**
- Oil cups-Daily (Formers).....Lubriplate.....FMO85AW
 - General Use-Daily.....Lubriplate.....FMO85AW
 - Chain-Weekly.....Lubriplate.....FP-150L

- Grease Applications**
- Bearings-Weekly.....Lubriplate.....FML-1
 - Cam Followers-Weekly.....Lubriplate.....FML-2
 - Spine Shafts-Weekly.....Locite Anti Seize :1167237
 - Jack Screws-Weekly.....Locite Anti Seize :167237

- Rotary Feeders**
- Servo Feeder Boxes.....Klübersynth.GE 14-151 (Reconditioned Units Only)
 - Manual Rotary Feeders - Monthly.....Tom-Pacific.....TP-2431

- Gear Boxes**
- Refer to Manufacturers instru
 - Tolo-Matic gearboxes-Monthly.....Anderol.....783-2

- Central Lubrication System**
- Manual system (Oil)-Pump Once per day (check reservoir often)....FMO85AW
 - Manual system (grease)-Pump Once per day (check reservoir often)....FGL-0

- Open Drives**
- Open Gears-----Weekly---(Brush On).....Lubriplate.....FML-2
 - Cam Tracks-----Weekly---(Brush On).....Lubriplate.....FML-2

RED = DailyBlue = WeeklyBlack = Monthly ... Green = Overhaul Only

Refer to the machine Manual if high Pressure wash down is used

039428C

6.3.1 GENERAL INFORMATION

The Enterprise Cartoner has been fitted with maintenance free, "lubricated for life" bearings. No further lubrication is required.

The Main Drive Gearbox is "lubricated for life" and requires no additional lubrication.

It is recommended that light weight oil be applied to the chains following any washdown procedure, to aid in the displacement of any remaining water.

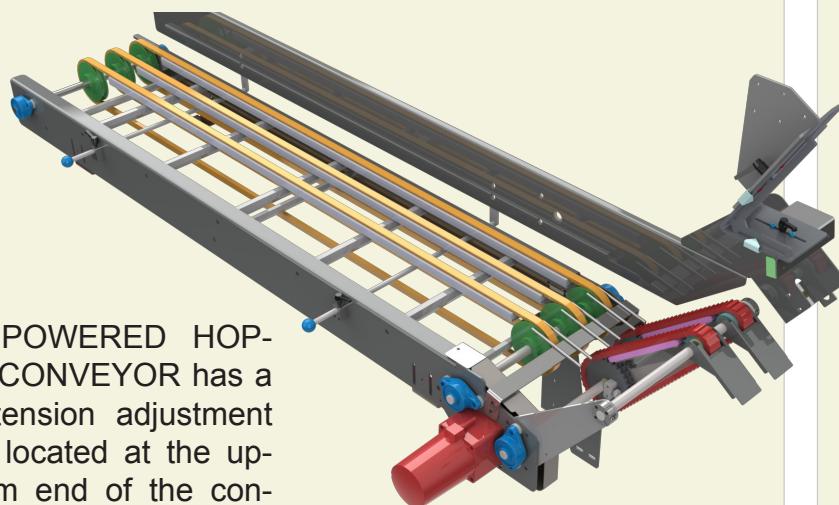
It is recommended that the Jacking Shafts be lubricated with an anti-seize lubricant. After lubricating the screws and jack nuts adjust the components through their entire adjustment range. The movement of the adjustment screws carries lubricant into the threads and prevents them from seizing.

6.4 CONVEYOR ADJUSTMENTS

It is recommended that the Jacking Shafts be lubricated with an anti-seize lubricant. After lubricating the screws and jack nuts adjust the components through their entire adjustment range. The movement of the adjustment screws carries lubricant into the threads and prevents them from seizing.

This section will identify the adjustment points of each and then explain the steps necessary to make any needed adjustments.

6.4.1 POWERED HOPPER CONVEYOR

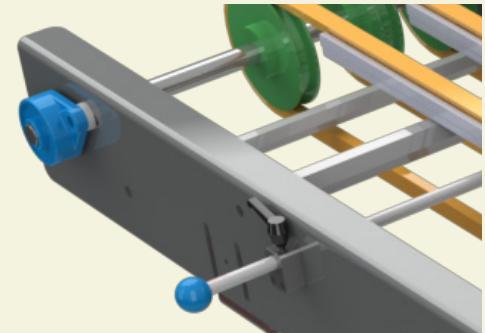


The POWERED HOPPER CONVEYOR has a belt tension adjustment point located at the upstream end of the conveyor bed.

To adjust the conveyor belt tension:

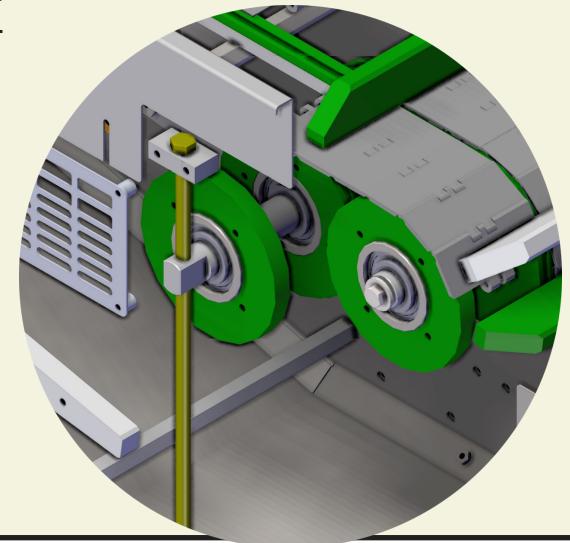
1. Locate the four (4) attachment bolts securing the tail shaft bearings to the conveyor frame.

2. Utilizing a 17mm socket slacken these four attachment bolts.
3. Manually pull the shaft and bearings upstream, (away from the gate) applying tension to the belts.
4. While keeping the tension firm, tighten the four attachment bolts.



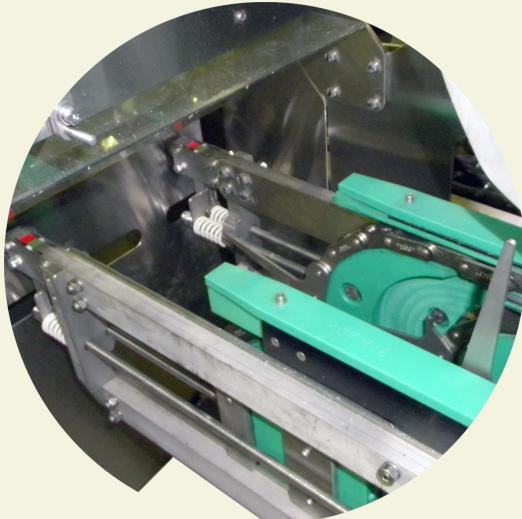
6.4.2 PRODUCT INFEED CONVEYOR

The PRODUCT INFEED CONVEYOR has two (2) conveyor tension adjustments. These are located on the upstream tail end of the conveyor, one on the load side and another on the non-load side.



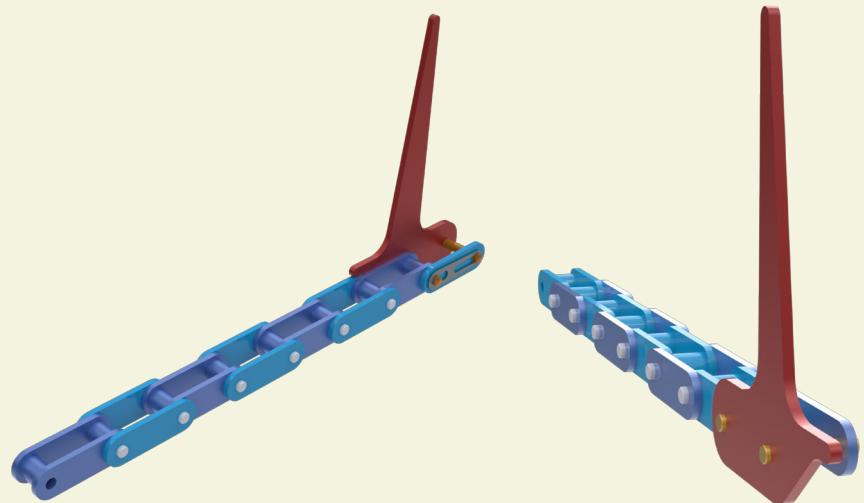
To adjust the tension:

1. Locate the two (2) TENSION ADJUSTMENT POINTS on the upstream end of the product infeed conveyor.
2. Utilizing a suitable wrench (19mm) loosen the jam nuts located on each of the JACKING SHAFTS.
3. Turn the adjustment nuts, adding/removing tension to the conveyor chains, until the POINTERS are just fully in the GREEN AREA.
4. Tighten the jam nuts, locking the jacking shafts in place.



6.4.3 FLIGHT CHAINS CONVEYOR

The **FLIGHT CHAINS CONVEYOR** has two (2) conveyor tension adjustments, each fitted with VISUAL INDICATORS. These are located on the non-load side, upstream end of the conveyor beneath the carton gate.



Inspection of the **VISUAL INDICATORS** will show if the conveyor is tensioned properly. A **POINTER IN THE GREEN** area indicates the conveyor is tensioned properly. A **POINTER IN THE RED** area indicates tension must be added.

To adjust the tension:

1. Locate the four (4) **TENSION ADJUSTMENT POINTS** on the non-load side, upstream end of the flight chains conveyor. Beneath the carton gate.
2. Utilizing a suitable wrench (17mm) turn the attached cap nuts, adding/removing tension to the conveyor chains, until the **POINTERS** are just fully in the **GREEN AREA**.

6.4.4 OUTFEED TAKEAWAY BELTS TENSIONING

The outfeed belts take the cartons away from flight chains as the flight lugs go around the head sprockets so that no damage is done to the cartons by the flight chains. The speed of the belts is controlled by the HMI and the belt tensioning is shown by loosening the motor and sliding it upstream. Do not over tighten the belt as it will become quite noisy.

6.4.5 INSERTER CHAIN TENSIONING

The inserter chain is tensioned by jacking the tail shaft on both sides of the inserter. The shaft should be kept parallel as the chains/sprockets will wear quickly if they are not kept parallel.

6.4.6 SERVO FEEDER HEIGHT BELT TENSIONING

To keep the feeder horizontal across the machine it is important to keep a good tension on the height adjustment belt.

Simply loosen the bolt and turn the tensioner pulley to tighten the belt.

6.5 MACHINE CLEANING

6.5.1 PRECAUTIONS

Stop the machine and set the electrical isolators to the OFF position before starting any cleaning procedure.

1. Consult the manufacturers bulletins located in the back of this manual prior to starting any cleaning procedures.

2. Use hot water with care. Overheating can damage components.
3. Germicidal solutions may, in time, degrade some materials.
4. If a water jet or steam hose is utilized for cleaning. DO NOT direct the jet at electrical boxes and motors.
5. Although the machine is sealed to resist penetration of the washing solution into working parts, electrical cabinets, etc., hose jets could penetrate the seals. Use caution.
6. Take care when cleaning items which could be damaged by washing down. For example
 - Hot Components
Allow to cool before cleaning
 - Chains
Lubricate after cleaning if required
 - Belts
Rinse off washing solutions and air dry
 - Grease Nipples, Sensors, Bearing Seals
Do not clean with direct high pressure
 - Lexan guarding

DO NOT USE DETERGENTS OR USE A SCRUBBING ACTION AS THE LEXAN WILL SCRATCH VERY EASILY.

7. Wash down the machine as specified in section 6.4.2
8. After washing with chemical solutions, rinse with clear water.