



OPERATION MANUAL

HMPS 5000

WRAP-AROUND PACKER

Customer:

SAKATA

MACHINE SERIAL NUMBER

005767-06

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1 THE HMPS 5000 WRAP-AROUND PACKER

1.1 Machine Type

This HMPS 5000 is a manual adjust Wrap-around case packer designed to pack 75g / 100g rice cracker packs.

1.2 Design Features

- Constructed from heavy walled stainless steel RHS tube fully welded torsional frame.
- All welded joints are continuous to eliminate the possibility of water ingress and bacteria growth
- Designed for wash down application should any spillage occur.
- Heavy duty sealed bearings eliminating maintenance for life.
- VF drives with soft starting and variable speed for high-speed continuous production.
- High capacity magazine for long production runs.
- PLC controlled for reliability, speed and programmable operation.
- Operator interface with an Allen Bradley PV600 plus
- IP56 waterproof electrical components.
- Fail-safe interlocked Guarding System for total Safety.
- The latest stainless to UHMWPE technology is used to reduce wear and eliminate lubrication requirements.
- Down-line interfacing for automatic production.
- Nordson Hot Melt Applicator.
- Designed to run a range of product and case sizes.
- Year 2000 compliant
- Simple system design easily reconfigured to suit other products or pack configurations.

Flexibility Reliability Simplicity Quality Experience Support

1.3 Warranty Policy

HOT MELT & PACKAGING SYSTEMS provides its warranty to the original purchaser of the equipment and will repair or replace any of the components defective in manufacture or workmanship for a period of twelve (12) months of its manufacture. This is based upon the logical assumption that material and manufacturing deficiencies will manifest themselves within that period.

Excluded are damage or wear caused by misuse, abrasion, corrosion, negligence, accidents, faulty installation by the customer tampering in such a manner to impair the normal working operation of the equipment. The equipment must be installed and operated in accordance with factory recommendations and instructions contained herein.

HOT MELT & PACKAGING SYSTEMS will repair or replace free of charge, all such defective parts if returned prepaid to the factory. In all cases within the warranty period where examination indicates damage due to causes other than defectiveness, repairs will be made at reasonable charge. Purchased assemblies that are incorporated into HOT MELT & PACKAGING SYSTEMS equipment carry the manufacturer's regular warranty. The seller makes no other warranties, expressed or implied, and specifically, no warranty as to the merchantability of fitness for the particular purpose.

This warranty does not apply to products altered or repaired by other than authorised representatives of HOT MELT & PACKAGING SYSTEMS.

HOT MELT & PACKAGING SYSTEMS shall not be responsible for labour or material charges arising from removal or replacement of parts under this warranty.

Shipping costs of alleged defective equipment to the equipment manufacturer's factory and return of said equipment from HOT MELT & PACKAGING SYSTEMS, Melrose Park South Australia, to the customer, shall be the responsibility of the customer.

A qualified HOT MELT & PACKAGING SYSTEMS Service Engineer will perform installation of the machine, personnel training and subsequent services if desired by the user. Service charges are available upon request; please contact Service Manager.

OEM equipment is not included in this statement as this is covered by the supplier's warranty.

1.4 Purpose of this Manual

This manual is designed to help you operate and maintain your HMPS 5000 machine to the highest efficiency levels. The information it contains is important to both the operator and maintenance personnel.

The manual is divided into chapters and all major sections are listed in the Table of Contents.

Important Notes

- NOTE 1:** Read this manual before operating or installing the equipment.
- NOTE 2:** Observe all necessary safety procedures when operating the equipment.
- NOTE 3:** Whenever possible, the machine must be turned OFF and the air supply turned OFF prior to maintenance or adjustment.
- NOTE 4:** Carefully follow the procedures defined in this manual which will aid you in the prevention of major problems and overcome minor difficulties.

If you feel you have a situation that is not covered in this manual please contact HMPS.

1.5 OEM Manuals Supplied

Nordson Hot Melt Applicator Manual
Allen Bradley VF drive Instruction Manual
Festo Valve bank Manual

2 SPECIFICATIONS

2.1 Electrical Requirements:

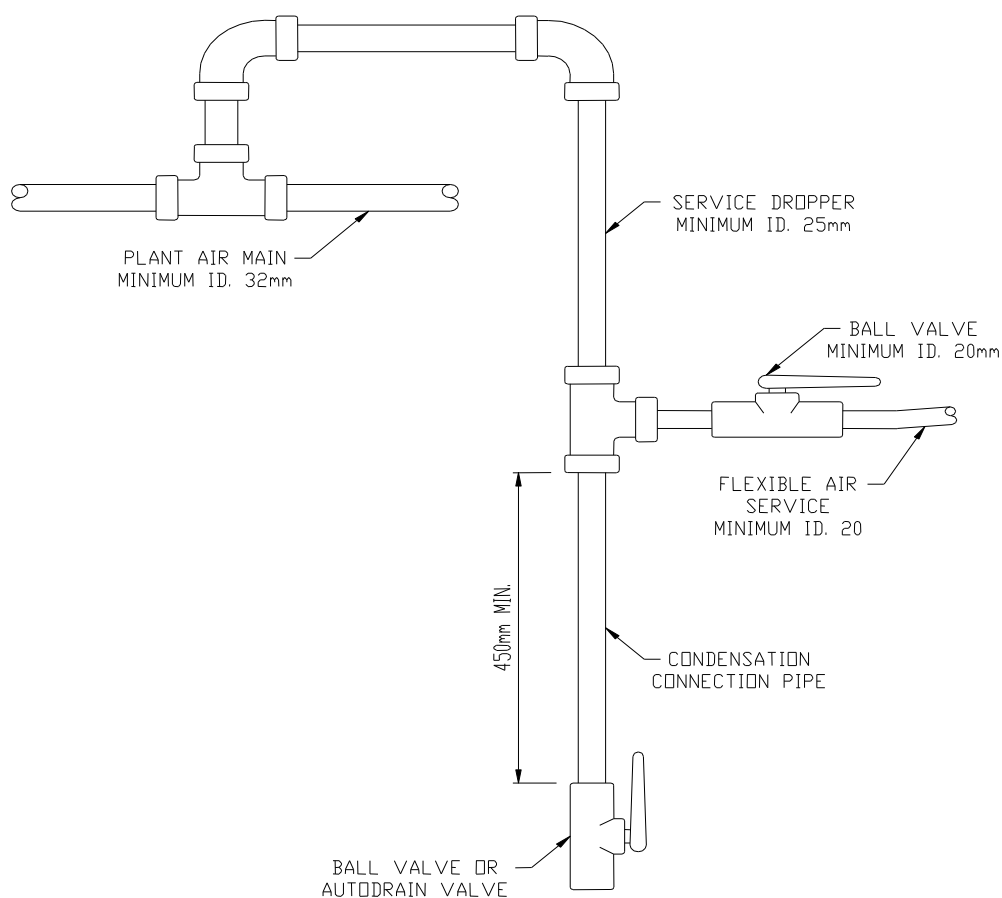
Mains Supply 415VAC, 3 phase Neutral & Earth, 40 Amps, 50 Hz

2.2 Air Requirements:

This system requires clean particles no larger than 3 microns, and dry air to a pressure dew point of 5°C at 6-bar/90 psi with a 25mm inlet service.

Below is a recommended air supply system. It is advisable to follow this method of air supply to the machine if you do not have an effective air drier in your compressed air system.

AIR SUPPLY SYSTEM



3 INSTALLATION

3.1 Introduction

This section of the manual contains the necessary instructions to site and connect services to the equipment in preparation for commissioning.

3.2 Un-crating

Prior to un-crating check for any damage that may have occurred during transportation.

Remove the crating and necessary packaging materials.

Thoroughly check the machine for damage; report as required to the manufacturer and the Transport Company.

3.3 Siting

Carefully move the equipment to the required location. The rugged construction of the machine will reduce any stress during reasonable handling. The machine should be moved with pallet trucks, forklifts or low level roller feet positioned under the main machine feet. Once sited, level the machine on its adjustable feet and secure the feet with the lock nuts.

3.4 Services

Once sited, the air and power services should be connected.

Check with Machine Specifications (Section3) for the relevant service sizes. Ensure an adequate preliminary water trap is provided.

We strongly recommend an air gun be available for daily cleaning of the machine.

3.5 Tests and Checks



Prior to operation the machine must be thoroughly checked.

Note: Any failure caused by inadequate checking may void warranty.

3.5.1 Electrical

Check for any loose wires, both on the machine and in the electrical enclosures. Tighten as necessary. Should any concerns exist regarding the wiring, that may have loosened, contact HMPS.

3.5.2 Pneumatic

After connecting air to the machine, turn on the ball valve and check for any air leak. Repair as necessary. Check all lines, fittings, valves and cylinders.

3.5.3 Mechanical

Check for any loose bolts, which may have loosened during transportation. Repair and tighten as necessary.

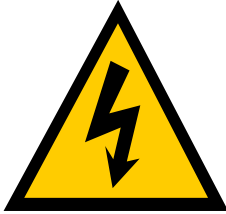
Check for any conveyor belts that are not in their correct tracking position

Should any loosening of major or minor assemblies have occurred re-setting or re-alignment may be required. Please contact.



4 Safety

4.1 Electrical Hazards

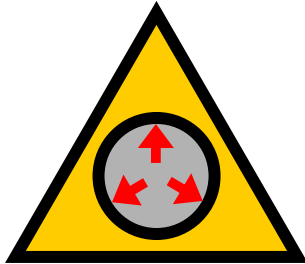


DANGER
HIGH VOLTAGE

ISOLATE POWER
BEFORE SERVICING

- Supply Voltage is 415 Volts.
- Warning the VF drives take several minutes to discharge capacitors after being isolated from the power supply.

4.2 Compressed Air Hazards



DANGER
HIGH PRESSURE

ISOLATE AIR
BEFORE SERVICING

DANGER
STORED ENERGY

ENSURE PERSONNEL CLEAR
BEFORE DISCONNECTING

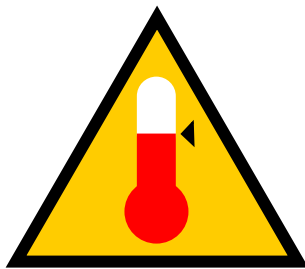


DANGER
PINCH HAZARD

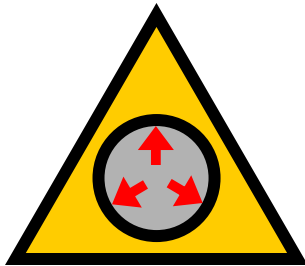
ENSURE PERSONNEL CLEAR
BEFORE DISCONNECTING

Compressed air at 6 Bar is used throughout the machine. Isolate the air before disconnecting air lines.

4.3 Hot Melt Hazards

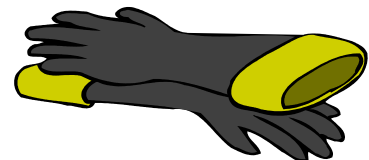
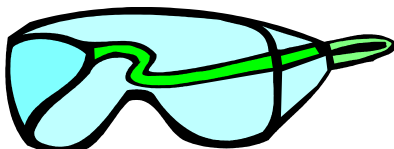


DANGER
HIGH TEMPERATUR
ISOLATE POWER & AIR
BEFORE SERVICING



DANGER
HIGH PRESSURE
ISOLATE AIR
BEFORE SERVICING

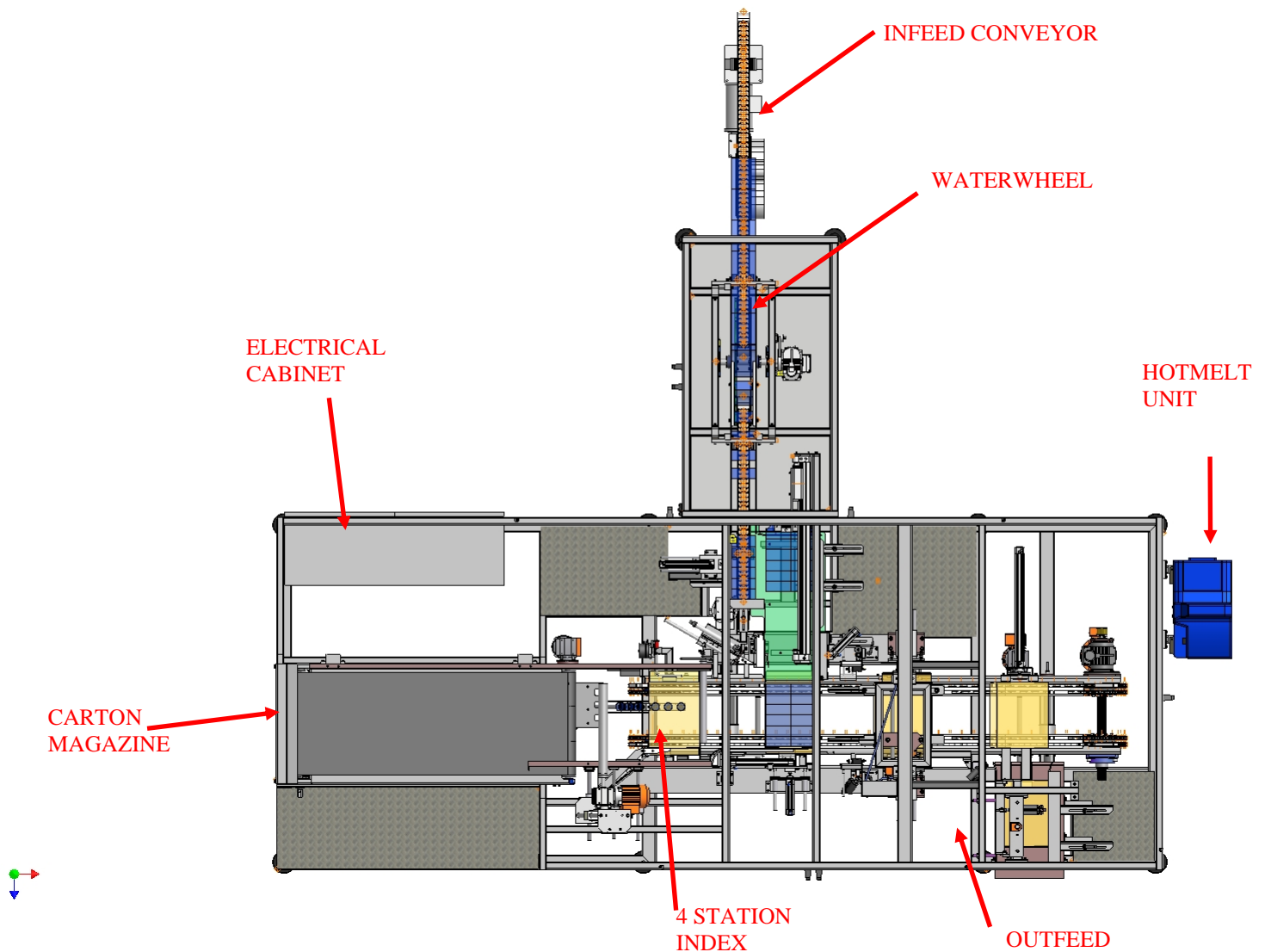
- The Hot- Melt adhesive is heated up to 180 degrees C
- The Hot-Melt adhesive is under pressure. Before performing any maintenance turn the air off and open the pressure relief valve, (Refer to the Hot-Melt manual)
- When working on the system wear gloves and eye protection
- In case of burns do not use force to remove the Hot- Melt from the skin but rinse with clean cold water. In case of serious burns seek medical advice.
- Compressed air operates at 6 to 7bars
- The compressed air to the main machine and Hot Melt Unit is dumped when safety guards or emergency stops are operated.



5 MACHINE TECHNICAL DESCRIPTION

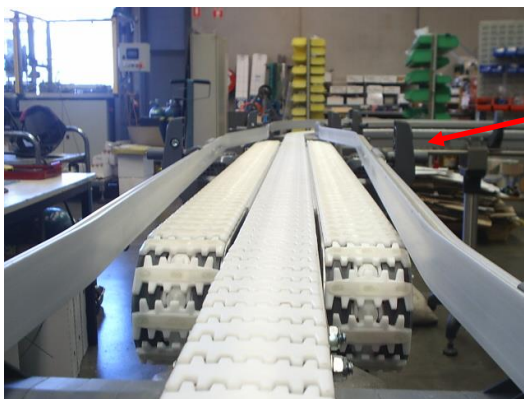
5.1 Introduction

This Chapter is intended to assist you to become familiar with the 5000 Wrap-around Packer. It explains the terminology and location of various features, and the basic operation.



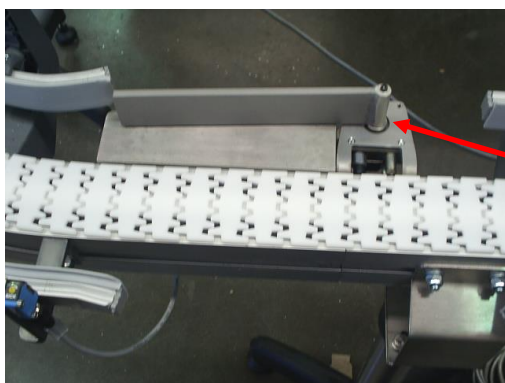
5.2 Infeed Section

The Infeed Section consists of two Infeed Conveyors, a product rotator and a Diverter. The two Infeed Conveyors are direct drive. The Diverter position is controlled by a FESTO rotary valve. The product rotator conveyors are independently controlled by SEW Variable speed drives.



**PRODUCT
ROTATOR**

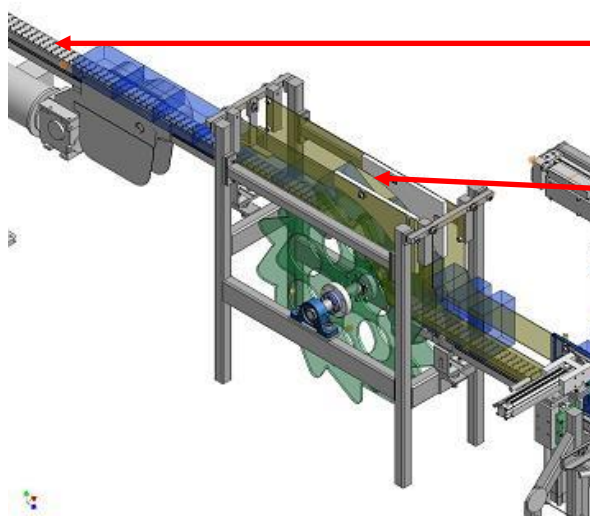
The product rotator accepts the product from the Kliklok machine onto 2 raised conveyor belts that run at different speeds therefore enabling the product to turn before dropping back down onto the Infeed conveyor.



**PRODUCT
DIVERTER**

The product diverter is activated either when the Infeed full sensor is covered for 2 seconds or if RSC product is selected on the Panelview Plus screen. This diverts the product onto a separate bypass conveyor.

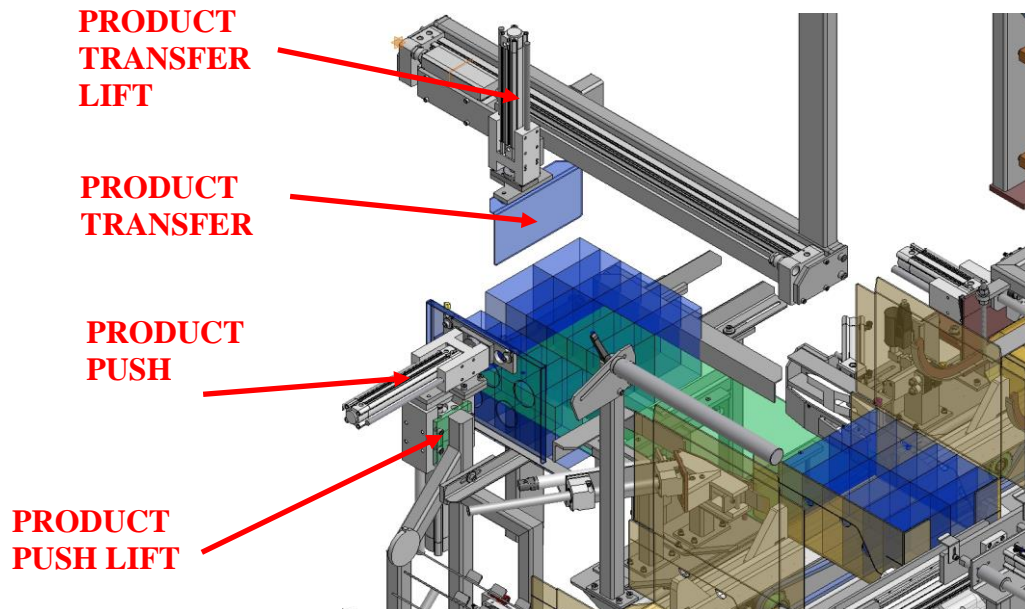
5.3 Waterwheel & Collation Area



**INFEED
CONVEYOR 2**

WATERWHEEL

At the end of the Infeed conveyor, there is a rotary waterwheel mechanism. As each pack enters the wheel it is rotated 90degrees and fed onto the 3rd Infeed conveyor. One revolution of the wheel feeds in 12 packs to the collation area.



As the packs are fed into the collation area the product push cylinder waits for 6 packs before extending and pushing the packs forward into the path of the product transfer cylinder. Before retracing the product push extends to enable continuing collation of product behind the product push cylinder.

Once in the retract position the product push lift retracts and pushes another 6 packs into the product transfer area. The product transfer cylinder then extends and loads the 12 packs into the carton waiting in Station 2. Similarly, the product transfer lift extends before retracting the product transfer to enable product to be collated behind it.

5.4 Carton Magazine

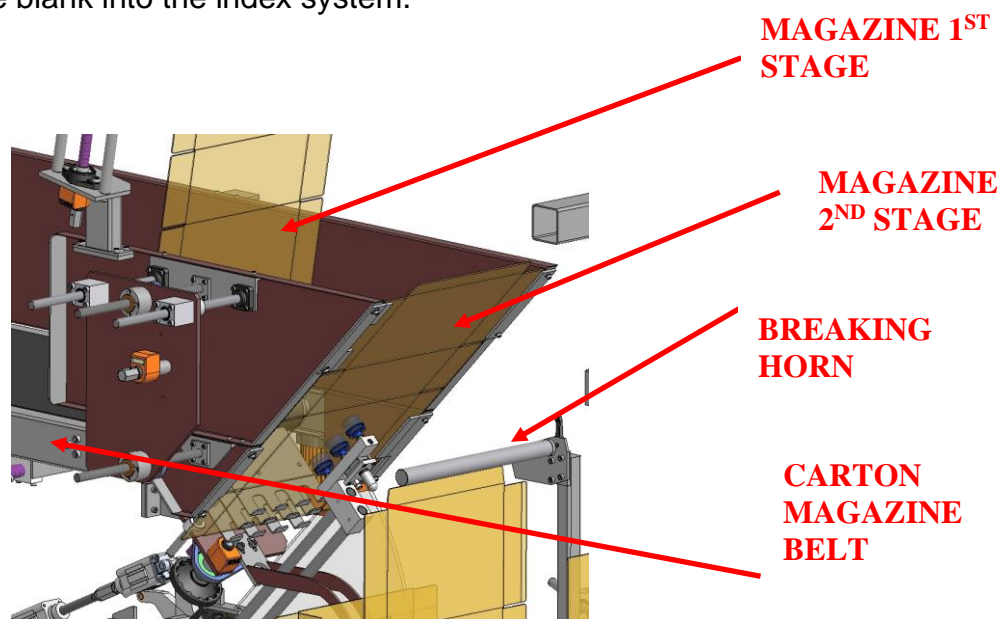
The HMPS magazine design is referred to as a 2-stage magazine. The 1st stage consists of a smooth top conveyor belt and the 2nd stage consists of a 45° angled case guide section. Case blanks can be loaded into the case magazine while the machine is running. Blanks are loaded manually onto the first stage. From here they are driven forward into the second stage on demand.

The magazine has two side supports, one fixed and one that is adjusted to the case size. The 1st stage holds the bulk of the case blanks and feeds them to the 2nd stage as required. The 2nd Stage only holds a few case blanks to reduce the pressure on the front blank for reliable case opening.

A photoelectric sensor mounted in the 2nd section detects when the case level is low and inches the conveyor belt forward to maintain the supply of case blanks.

Fingers at the front of the 2nd section are adjusted so they hold the case blanks from falling out. They must not be too tight but adjusted so the case blanks can be pulled past them. These fingers also assist in the opening up of the case blank.

Two arms fitted with vacuum cups pull a blank from the second stage of the magazine. These arms are operated by two pneumatic cylinders and place the blank into the index system.



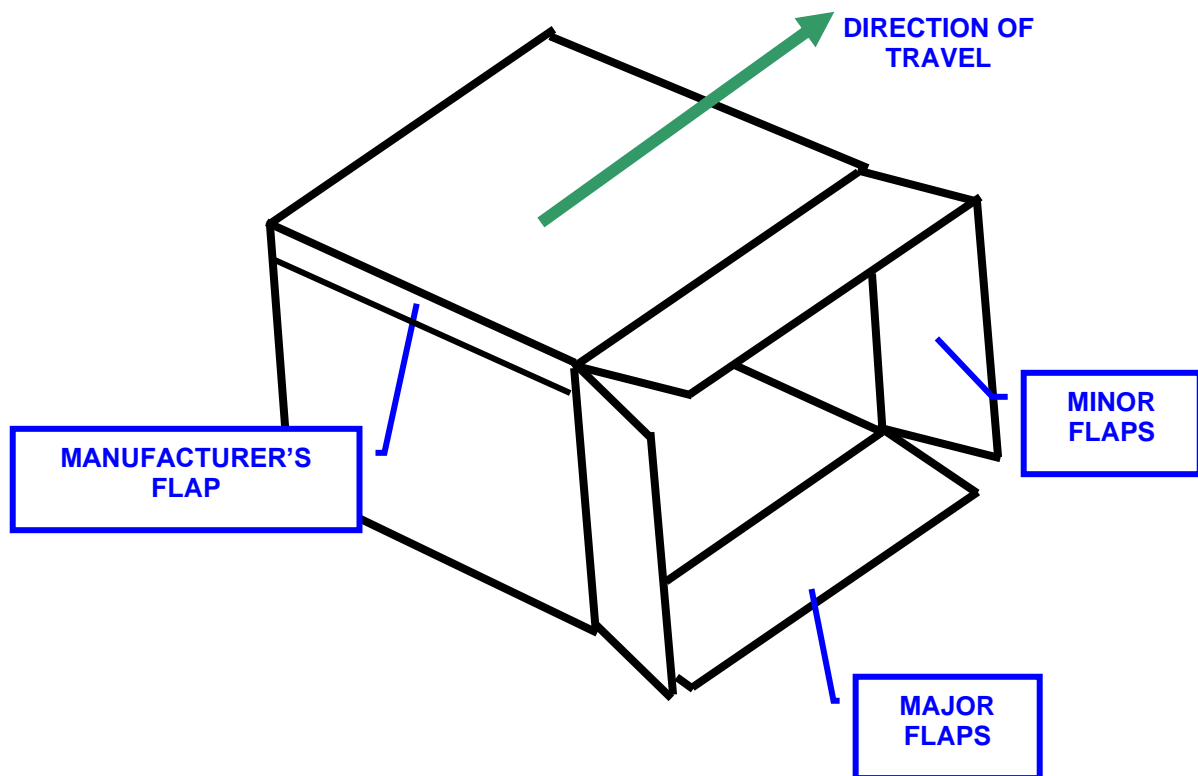
5.5 Index System

The Index System consists of the Index conveyor, erecting, loading, folding & closing, glueing & compression.

5.5.1 Case Terminology

To understand how a case is made it is useful to understand the terminology used to refer to the various parts of the case.

- ◆ **Manufacturer's Flap**, the final closure of the case.
- ◆ **Major Flaps**, generally the larger of the case panel flaps are referred to as the major flaps. These are folded over the minor flaps
- ◆ **Minor Flaps**, generally the smaller of the case panel flaps are referred to as the minor flaps. These are the first flaps to be folded.
- ◆ **Rear**, this is the trailing edge of the case from direction of travel.
- ◆ **Front**, this is the leading edge of the case from direction of travel.
- ◆ **Upper**, this is the top of the case.
- ◆ **Lower**, this is the bottom of the case.



5.5.2 Index Conveyor

The Index Conveyor is a stainless steel adjustable width (Auto Adjusted) chassis fitted with UHMWPE (Ultra High Molecular Weight Polyethylene) chain tracks. These tracks require NO lubrication.

The chain is Nickel Plated 2050 double pitch fitted with special stainless steel links. These links have plastic fingers attached to them.

There are two leading and two trailing chains. Leading and trailing chains have opposing fingers fitted. Each pair of chains is driven by a separate servo motor. This enables the distance between leading and trailing fingers to be automatically accurately adjustable.

The Index conveyor accurately positions the space between the trailing and leading fingers at each of five stations. The functions of erecting, loading, closing, sealing, and compression are performed as the conveyor indexes through these stations. Sensors check that case conditions are met before an operation is performed.

The station functions are described below.

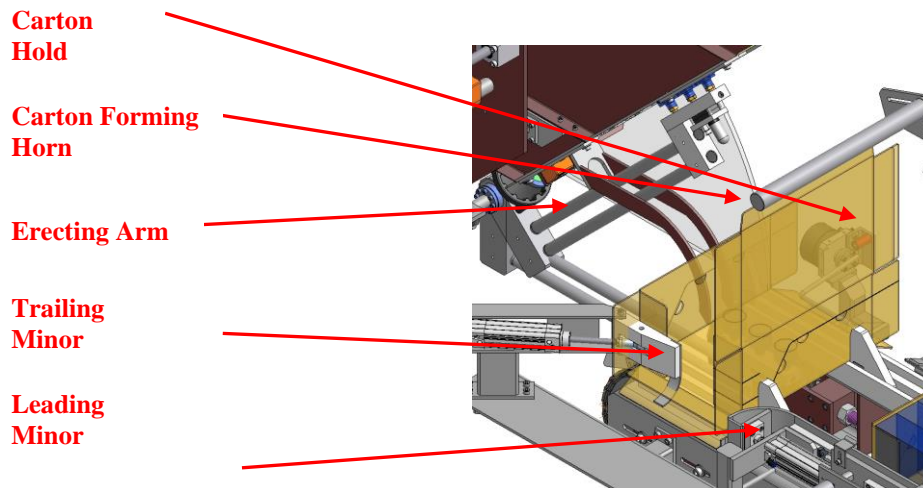
5.5.2.1 Station 1

The Erecting System consists of two joined arms controlled by two pneumatic cylinders (one long, one short) with 3 stopping positions. Each Erecting Head contains its own vacuum generator to provide vacuum for the suction cups that attach to the case.

When a case is required, the two cylinders are extended to push the suction cups up against the case blank. The vacuum generators are started and the cups attach to the case.

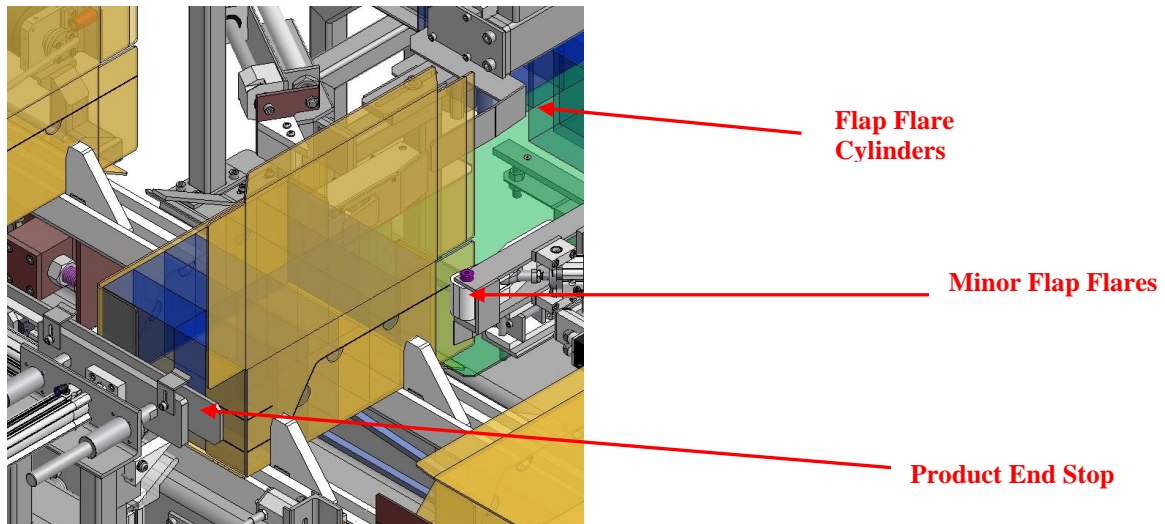
When vacuum is detected, the erecting arm retracts, pulling the case blank from the magazine. As the case blank is being pulled from the magazine and guided into the index chain it is folded along the bottom crease lines. When the case bottom reaches the chain tracks, the erecting arm is stopped and held in that position. The carton hold cylinders then rotate holding the base against the index tracks.

The vacuum is turned off and the erecting head continues its downward travel, away from the carton. The vacuum cups are then clear of the case as the index chain moves the case to station 2. This is to prevent wear of the suction cups when the case is moving.



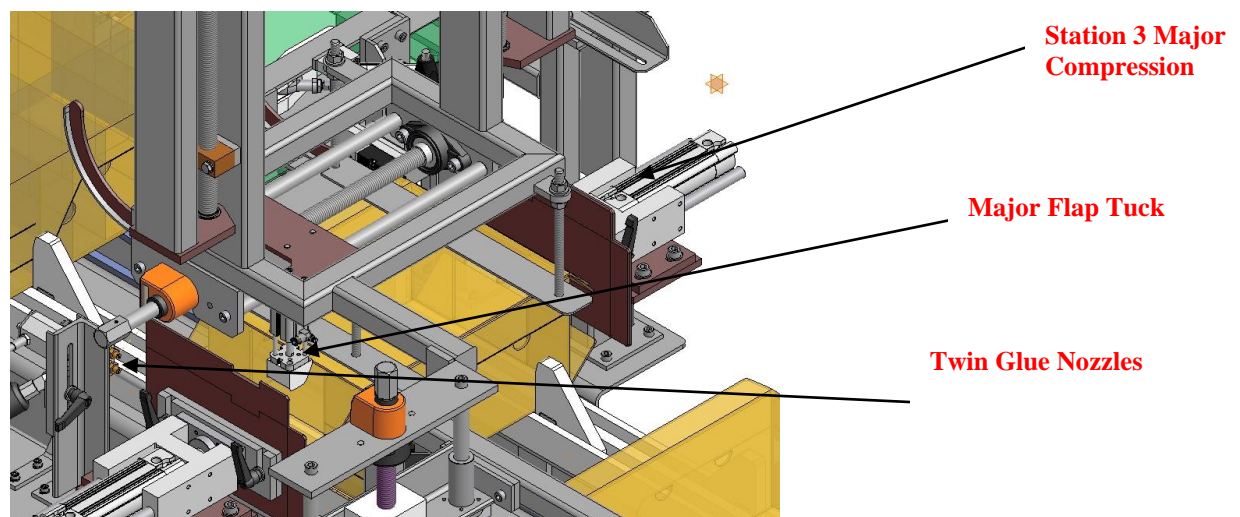
5.5.2.2 Station 2

When the case is stopped at station 2 the flap flare cylinders open the minor flaps of the carton. This is to prevent the product from catching the minor flaps during the loading process. Once the transfer servo has loaded the product into the carton, the flap flare cylinders retract.



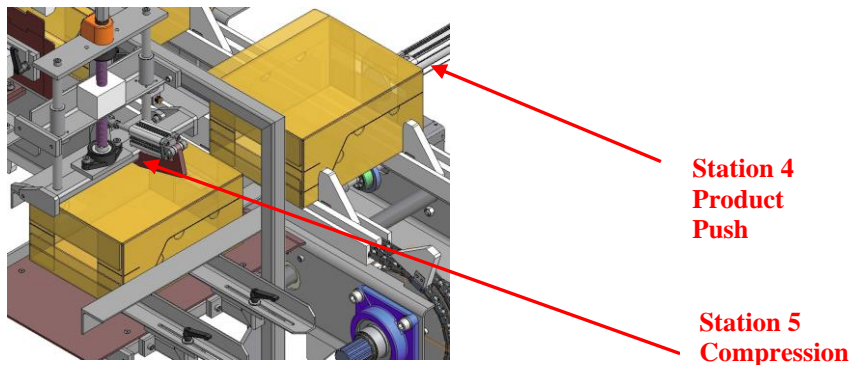
5.5.2.3 Station 3

When the case is indexed to station 2 from station 3, the glue gun fires on both the Infeed and Outfeed side of the carton. The front and rear minor flaps are tucked and the top and bottom majors are folded and compressed and held to allow the glue to set.



5.5.2.4 Station 4 & 5

Station 4 product push extends and pushes carton out of index into station 5. As carton passes into station 5 the glue gun is activated firing glue bead underneath manufacturers flap before being compressed and held to allow glue to set. Carton is ejected onto outfeed conveyor by next carton ejected out of index.



5.6 Main Electrical Enclosure

The main electrical enclosure contains the PLC, servo controllers, and VF drives and the control hardware.

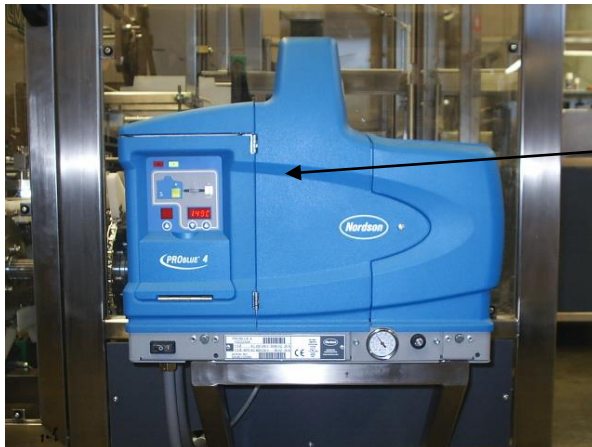
The Machine's Main Isolator is located on the side of the Main Electrical Enclosure. To isolate the power from the machine for maintenance, turn the Main Isolator Switch off.

5.7 VF Drives

VF drives are used to control the motor speed of the infeed. As well as controlling the speed of these motors they also control other functions such as acceleration and stopping. The control parameters are programmed into each drive. Most of these parameters are standard factory settings, however some are changed to suit the specific application. Refer to the manual supplied for instructions for changing these parameters or contact HMPS for assistance.

5.8 Hot Melt System

The Hot Melt System is located on the outside of the casepacker in front of station 4. Only clean adhesive of the same type should be put into the Hot-melt tank. A separate manual describes the operation of the Hot Melt Unit.

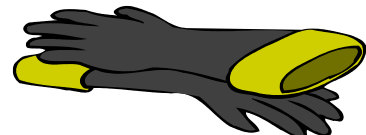
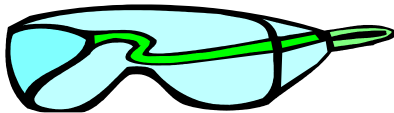


Hotmelt ready
light.

NOTE: To reset a fault from the hot melt unit message display you may have to turn the Hot Melt Unit Power off then on again. (Switch located on Hot Melt Unit)

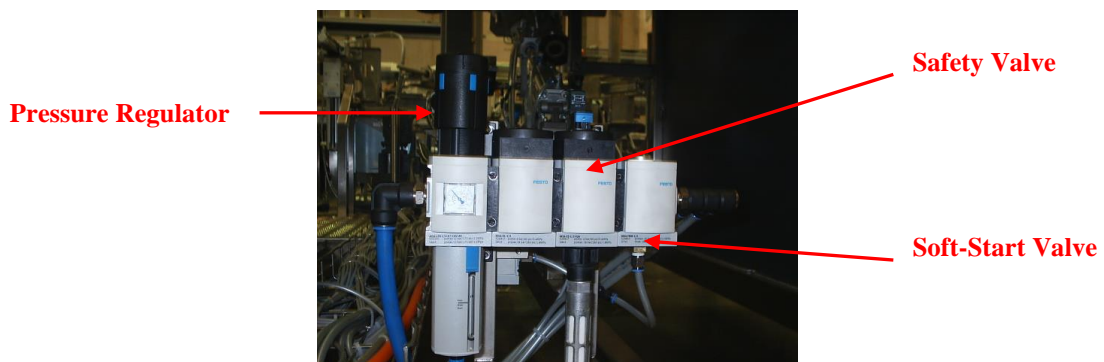
The Hot Melt Unit controls the glue temperature and pressure in the tank, hoses and guns. The system will not pump any glue until the operating temperature has been reached. When at the set operating temperature the ready light will go on and the machine can be started. The actual firing of the glue guns is controlled by the PLC. No Glue will be fired from the guns unless the operating temperature is reached and a case is in position.

- **When working on the glue guns wear protective gloves and eye protection.**



5.9 Compressed Air supply

5.9.1 Safety Valve



The safety valve releases air pressure when a door is opened or an emergency stop is pressed. If the blue toggle at the top of the unit is down,

the air is not released. THIS MAKES THE MACHINE UNSAFE and should only be done when maintenance is necessary.

5.9.2 Air Pressure Regulators

This machine contains an Air Regulator / moisture trap combination. Adjust the air regulator to 6-bar system input air pressure. Check the water trap bowl daily and drain as required.

NOTE 1. THERE IS NO AIR SERVICE OIL. All cylinders are lubricated at manufacture. Should a lubricator be added later, the Hot-melt System **MUST** be isolated from lubrication.

5.9.3 Soft Start Valve

Next to the air pressure regulator is the soft start valve. This valve allows air to enter the system slowly at initial start up, ensuring safe cylinder pressurizing. This is needed, as there is no air in the cylinders at start up for flow control and cushioning effects.

5.9.4 Solenoid Valves

CAUTION: HOT MELT & MOVING PARTS

Solenoid valves control the pneumatic cylinders. They can be operated manually by pressing the manual button on the valve.

Note: Use Caution and make sure no one is in any danger and keep your hands and body away from moving cylinders.

HOTMELT AND COMPRESSED AIR HAZARDS

- The Hot-Melt adhesive is under pressure. Before performing any maintenance turn the air off and open the pressure relief (Refer to the Hotmelt manual)
- Compressed air operates at 6 to 7bars
- The compressed air to the main machine is dumped when safety guards or emergency stops are operated.

5.10 Emergency Stop

When any Emergency Stop button is pressed, the machine will stop instantly for safety.

- The motors will stop
- All machine functions will stop
- The air supply will dump air stopping all the cylinders
- The Hot Melt Guns will not fire glue
- However the Hot Melt heating will remain on

This action should only be used in an Emergency, as clearing the machine may be required before the machine can be operated again.

Opening a Safety door also acts as an “Emergency Stop”

5.11 Tower lights

The tower lights on top of the electrical enclosure indicate a range of machine conditions. They allow operators to tell visually the current status of the machine.

LIGHT	STATUS	MACHINE	INDICATES
AMBER	Flashing	Running	WARNING – Process problem
RED	Fixed	Stopped	Machine not running (Fault or Cycle stop)
GREEN	Fixed	Running	MACHINE OK
GREEN	Flashing	Stopping Or Starting	The machine may be waiting on downstream machinery

6 CONTROLS

6.1 Introduction

This chapter explains the control system used to run the machine. The major control components in this machine are electrical and pneumatic.

6.2 Major control elements

An Allen Bradley MicroLogix 600 PLC controls the machine functions.

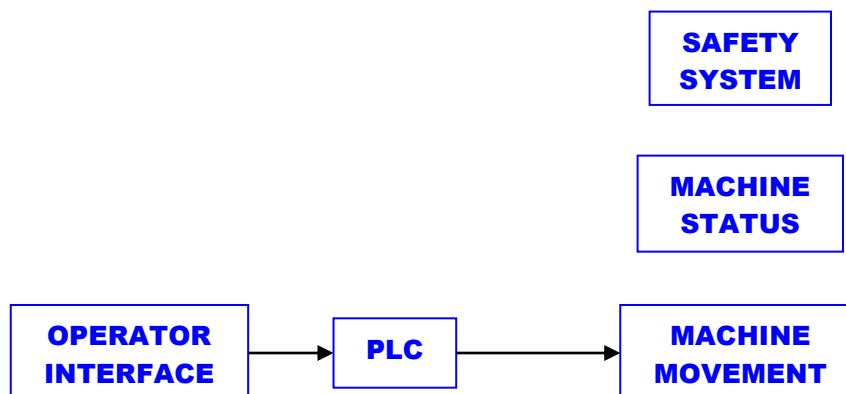
An Allen Bradley Panel View provides the operator interface.

Festo Solenoid valves control the pneumatic cylinders, and vacuum generators.

There are two Festo valve banks which communicate to the PLC via hard wired multicores.

A Nordson Pro-blue Hotmelt Unit controls the hot melt glue temperature and pressure.

6.3 Machine flow chart



6.4 Machine Isolating Switch

The Machine's Main Isolator is located on the side of the Main Electrical Enclosure. This isolates the main 3-phase power from the machine.

To isolate the power from the machine for maintenance work, use the Main Isolator and lock it off.

6.5 Operator Control Panel



The main operator controls consist of 5 push buttons and an Allen Bradley Panel View Operator Interface screen.

<u>PUSH BUTTON</u>	<u>DESCRIPTION</u>	<u>FUNCTION</u>
Emergency Stop	Red Mushroom	Push to turn off all motor & cylinder outputs and dump valve bank air supply.
Power On	White illuminated	Push to supply power to controls & air soft-start valve When illuminated – shows controls ON
Fault / Reset	Orange illuminated	Push and release to reset faults. Push and hold for 3 seconds to reset diverter, collation and transfer. Push and hold for 10 seconds to reset diverter, collation, transfer and index servos
Cycle Start	Green illuminated	Push to Start the machine cycling
Cycle Stop	Red Illuminated	Push to stop. Machine will complete last cycle

6.6 Operating Screens

The display area of the Allen Bradley panel view is touch sensitive. The screen has several functions:

Display machine data that can be selected to change operating parameters.

Display fault messages.

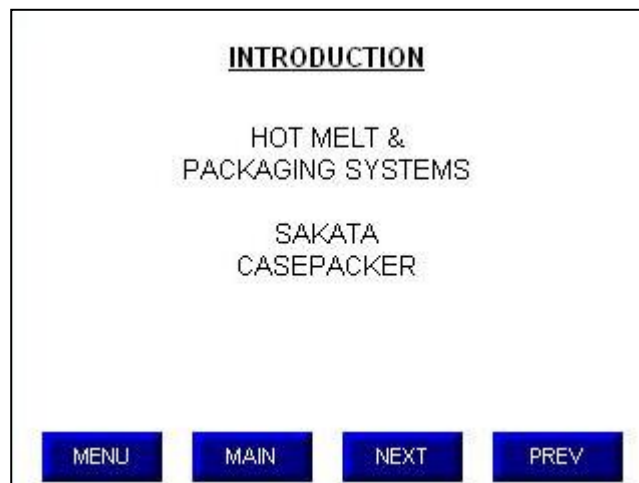
Display machine statistics

The screen is formatted to display information in several ways to make it easy to read and operate.

FAULT MESSAGE AREA AT TOP OF SCREEN

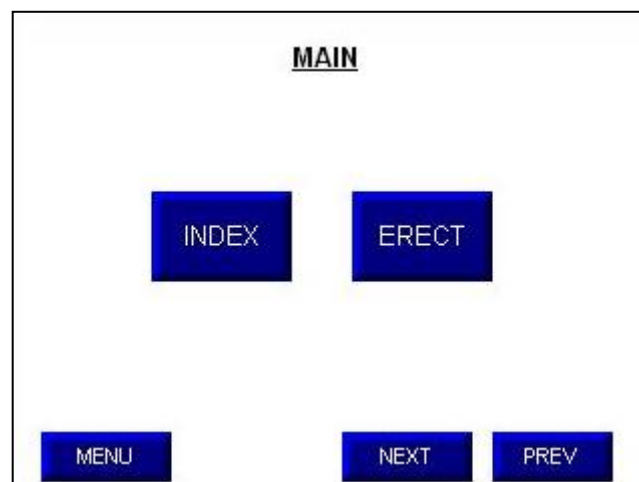
Displays the fault messages. There may be more than one fault message at a time so they scroll through. Most faults will automatically be reset when they are cleared. System faults however will need to be reset, such as machine function time outs.

6.6.1 Introduction



This is a display only screen and is displayed only after the case packer is initially powered up, or after the screen has been configured.

6.6.2 Main



Provides machine control through pressing the buttons on the screen.

Press **INDEX**: The index chain will index (move) 1 station.

For the index chain to move:

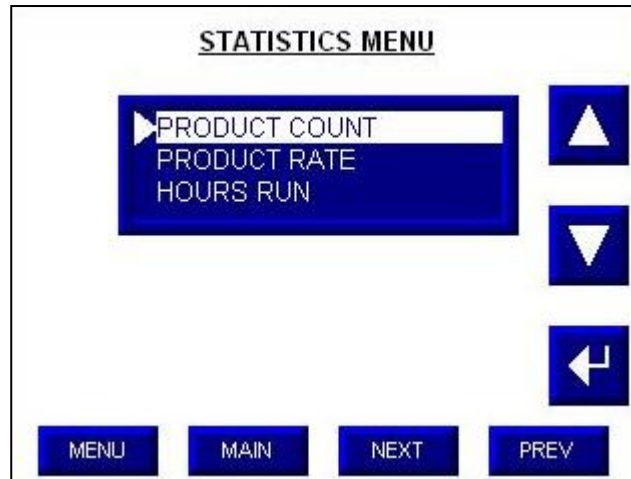
Station 1 can be either empty or have an erected case in position.

Station 2 can be either empty or have a fully packed case in position.

When the index button is pressed a case is NOT erected into station 1. All other functions are activated – folding, glueing, compression and transfer.

Press **ERECT**: If there are carton blanks in the 2nd stage tray of the magazine, one will be erected into station 1. This is useful for checking magazine adjustment parameters and index finger width.

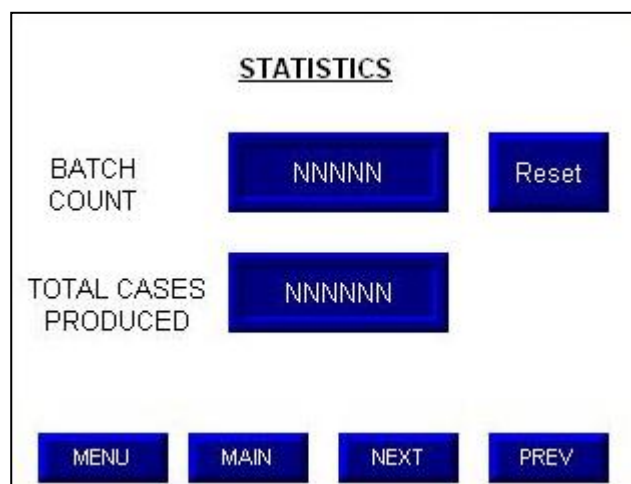
6.6.2.1 Statistics



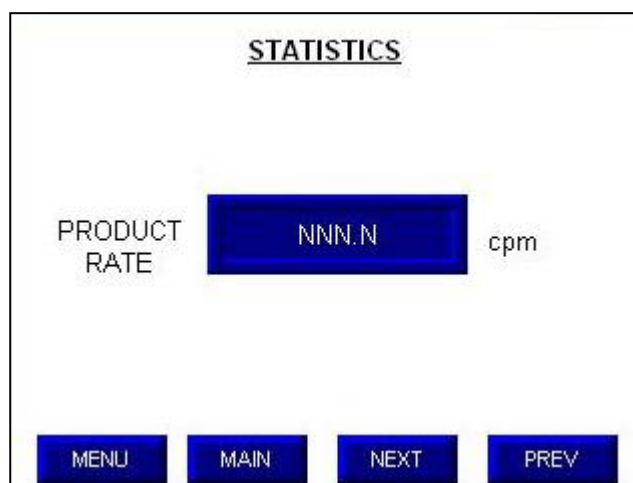
This screen can be accessed by the Main screen and pressing the 'Next' button. This screen contains the following data

- : Product Count
- : Product Rate
- : Hours Run

6.6.2.2 Product Count



6.6.2.3 Product Rate

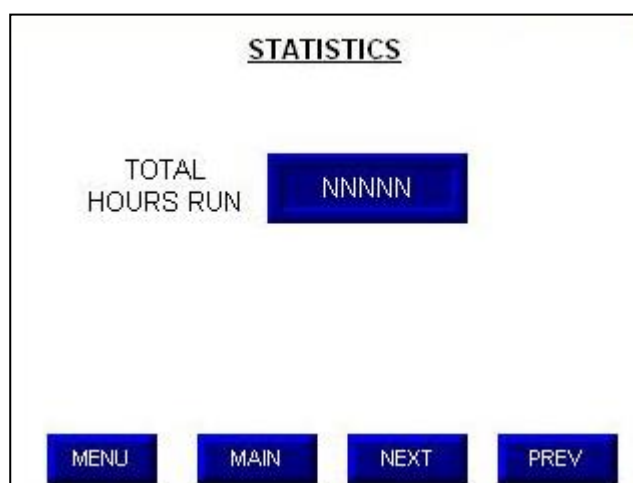


6.6.2.4 Hours Run

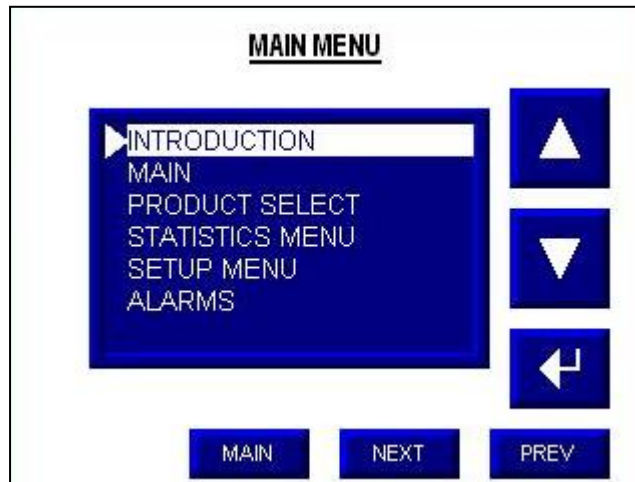
These screens can be accessed by pushing 'Previous' on the Main screen. Product count represents the total cases produced by the machine as well as the amount during the current production run.

Product rate displays the current carton per minute rate.

Total hours run displays the machine total operating hours.

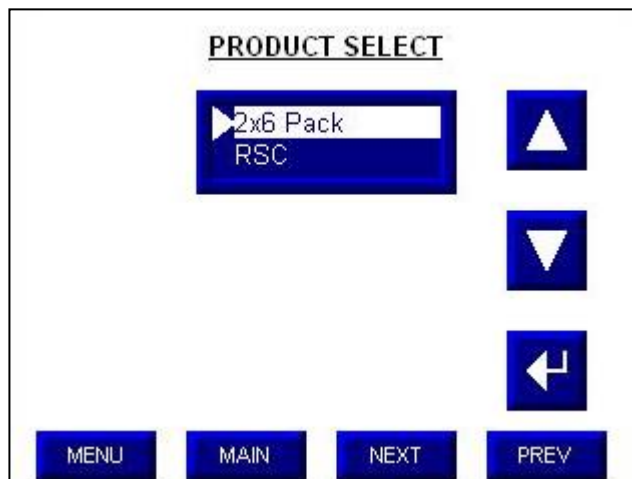


6.6.3 Main Menu



This screen can be accessed by pressing the Menu button on the Main screen. Items can be selected using the arrow and enter buttons on the right hand side of the screen.

6.6.3.1 Product Selection



The Product Selection screen allows the required product to be selected. RSC can be selected to operate the diverter arm on the infeed conveyor and bypass the HMPS carton erector to be packed manually.

6.6.3.2 Setup Menu



This menu provides access to product specific setup parameters.

6.6.3.3 Setup – Product Collation



This screen provides access to timer parameter to change the duration sensors must be covered before collation cylinders will push.

To change a parameter, press on the value to be changed and enter in the new value.

6.6.3.4 Setup – Glue

STATION 2/3 GLUE SETUP

	START		STOP	
BEAD 1	####	mm	####	mm
BEAD 2	####	mm	####	mm

Glue Beads for the Front and Rear of Carton will be Identical

MENU
MAIN
NEXT
PREV

STATION 4/5 GLUE SETUP

Bead Start Time	####	ms
Bead Length Time	####	ms

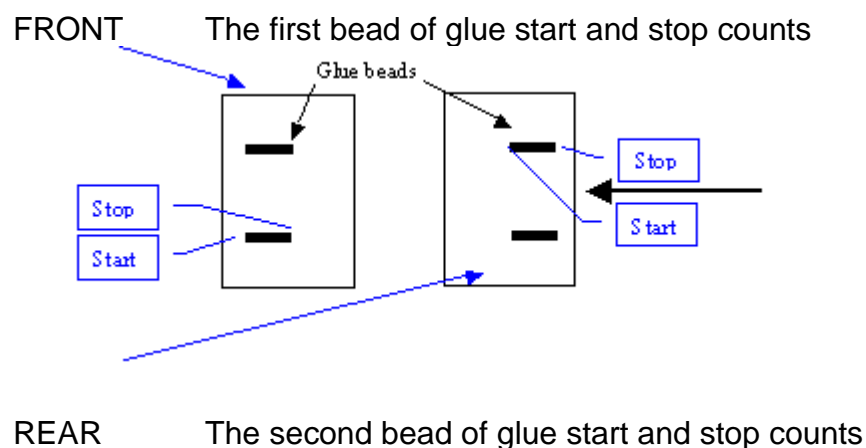
MENU
MAIN
NEXT
PREV

From these screens you can adjust the Glue application timing.

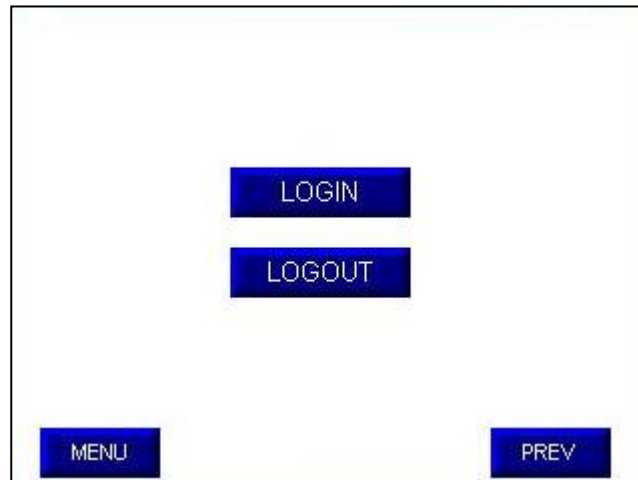
The start and finish points of the glue beads are set-up on this screen by entering appropriate values into each of the windows.

The Station 2/3 Glue beads are measured in milliseconds from the time the box has left station 2. The program is setup to produce a solid bead –solid bead – solid bead pattern on both the Infeed and Outfeed side minor flaps.

The Station 4/5 Glue beads are measured in milliseconds from when the box passes the beam switch into station 5.



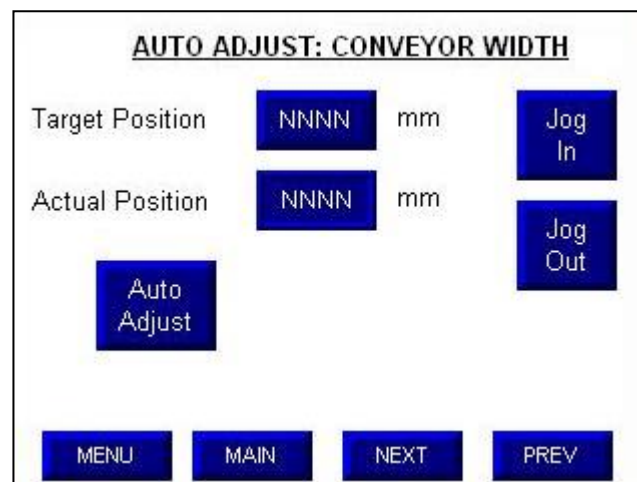
6.6.3.5 Password



Enables access to auto adjust and encoder reset screens.

6.6.3.6 Auto Adjust Menu

This screen can be accessed from the main menu after password has been entered and allows access to conveyor width adjustment.



6.6.3.6 Encoder Reset

INDEX

ENCODER RESET COUNT

###.#

mm

This is a setpoint that will position the conveyor aligned with all stations - this is independant of the selected product.

MENUMAINNEXTPREV

This enables you to adjust the amount the index moves between stations.
NOTE : This value should not be adjusted unless absolutely necessary as incorrect adjustment could damage the machine.

7 MACHINE OPERATION

7.1 Starting the Casepacker

If the machine is already set for the correct pack size, and there are cartons loaded, the machine is ready to run. When all doors are closed and all emergency stops are released, the machine can be powered up by pressing the white button. If the machine powers up, it can be started by pressing the green cycle start button.

7.2 Stopping the Machine

- Press the red cycle stop button to stop the machine
- **Note:** Do not press the Emergency Stop button for a normal stop, as you may have to clear the machine of product. This is because the “Emergency Stop” will immediately stop the machine in mid-cycle and a process may not be fully completed.

However if there is a dangerous situation definitely use an Emergency Stop button to instantly stop the machine.



7.3 Standby State

If the Casepacker is waiting for downstream equipment or waiting for the exit conveyor to be clear, the green light will flash. This indicates that the machine is ready to run but is waiting. As soon as it is clear to run, it will start automatically.

7.4 Full Reset

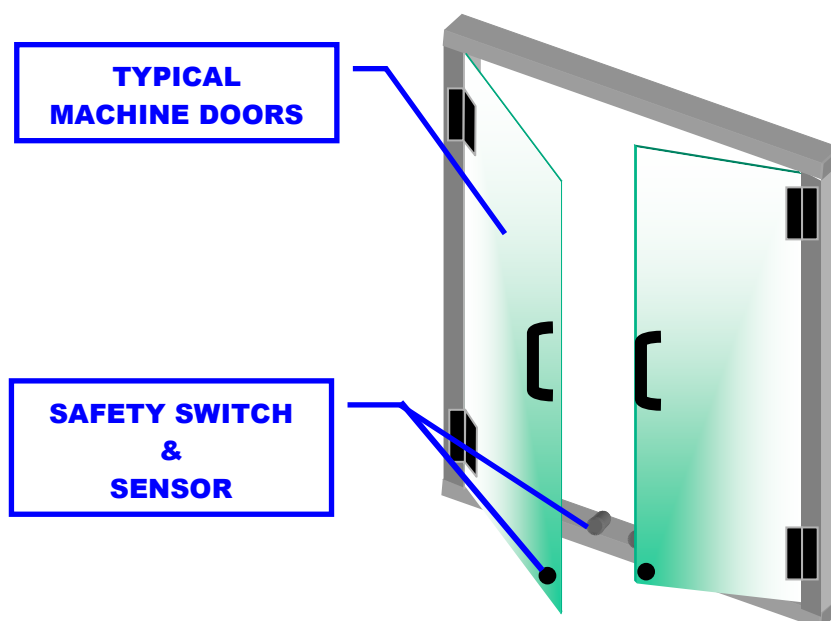
If there is a product crash inside the stackdown, it may be necessary to perform a 'full reset'. This is done by holding down the orange button for 5 or more seconds. This will retract both of the combs. When the machine is started, the stackdown servo's and the stack pusher servo will travel to their home position before starting. This ensures that those servo's are in their correct position.

7.5 Starting from Emergency Stop



- Remove any half-erected cartons in station 1 and any cartons in or near station 5.
- Remove any product from the bottom of the stackdown
- Ensure all the doors are closed.
- Ensure the air supply is on.
- Ensure all the Emergency Stops are released
- Press the Power on button
- If the index is in position the machine should be able to be restarted by pressing the green cycle start button.

7.6 Starting from Safety Door Open



All machine doors are fitted with safety switches. This makes them Safety Doors

- If a safety door is opened during normal running it will perform the same function as an “Emergency Stop”. To restart follow the procedure as for an Emergency Stop.
- If the machine has been stopped by the “Cycle Stop” button before a door is opened then it can be restarted by pressing the “Power On” button and the “Cycle Start” button as for a normal start.
If it is not an Emergency always press the cycle stop button first to stop the machine, before opening the doors.
NOTE: Cycle Stop, Power On and Cycle Start buttons are all located on the operator control panels.
- If the machine is in the auto run mode and all the operations have been fully completed but the machine is idle waiting for product the doors can be

opened without causing any problems. When the doors are closed again the machine can be restarted as normal. Make sure all the glueing and sealing operations have been completed before opening a door.

8 Machine Set-up & Adjustment

8.1 Introduction

This chapter is intended as a guide into the initial setup and minor adjustments for optimising the running of the machine.

8.2 Pneumatic cylinder adjustments

Pneumatic cylinders drive a number of the machine's functions. The speed and operation of the cylinders is critical. Speed and the smooth operation of the cylinders are set by the adjustments of the flow controls and the cushion controls.

Problems can occur if these settings are not maintained. The types of problems that may occur are operational time-outs, reduced output speeds and damage to the cylinders. Below is a detailed description of how to adjust Flow control and Cushion control valves.

8.2.1 Cylinder Flow Control Valves

NOTE 1: THE CONTROLLED EFFECT IS ALWAYS ON THE EXHAUST AIR.

- The cylinder flow control valve controls the speed of movement of the cylinder throughout the full stroke.
- The cylinder flow control valve effect will be increased by screwing the valve clockwise and reduced by screwing the valve anti-clockwise.
- If the flow valve is closed too much it may effect the operation of the machine. Alternatively, if the valve is opened completely, the resultant impact may be too large for the cylinder strength. A fast but smooth operation is the ideal setting.

8.2.2 Cylinder Cushion Control Adjustments

- The cylinder cushion values are set to suit the proposed working environment. These however, may be reset to suit a change in working conditions.
- The cushion effect will be increased by screwing the valve clockwise and reduced by screwing the valve anti-clockwise.
- Some cylinders are provided with lock nuts to lock the position. Others are provided with shake proof plastic threads.
- After a period of time, the seals may wear; in which case re-adjustment may be required.
- If the cushion valve is closed completely during operation the piston may bounce at the end stroke or alternatively restrict the full movement of the cylinder.
- Alternatively, if the valve is opened completely, the resultant impact may be too large for the cylinder's design.

8.2.3 Manual Adjustments

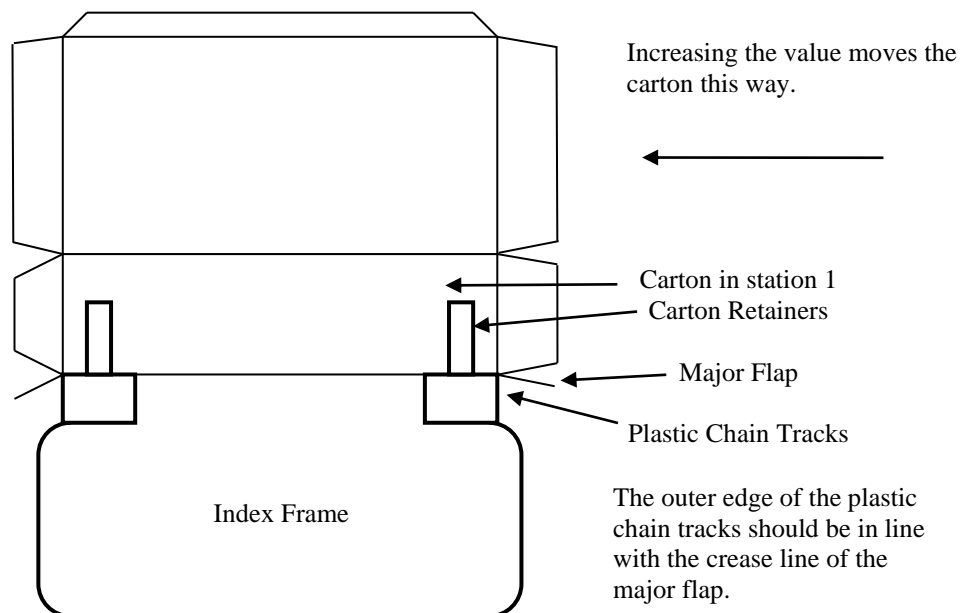
The manual adjustment points have been designed to minimise the use of trade tools.

The manual adjustment points have been outlined below.

8.2.3.1 Adjust Point 1 – Carton Magazine Move.

Auto adjust point 1 adjusts the lateral position of the carton magazine. A larger value moves the magazine further toward the loading side. It should be adjusted so that when a carton blank is erected, the far side fold line is in line with the edge of the index track.

Current Position 70.0



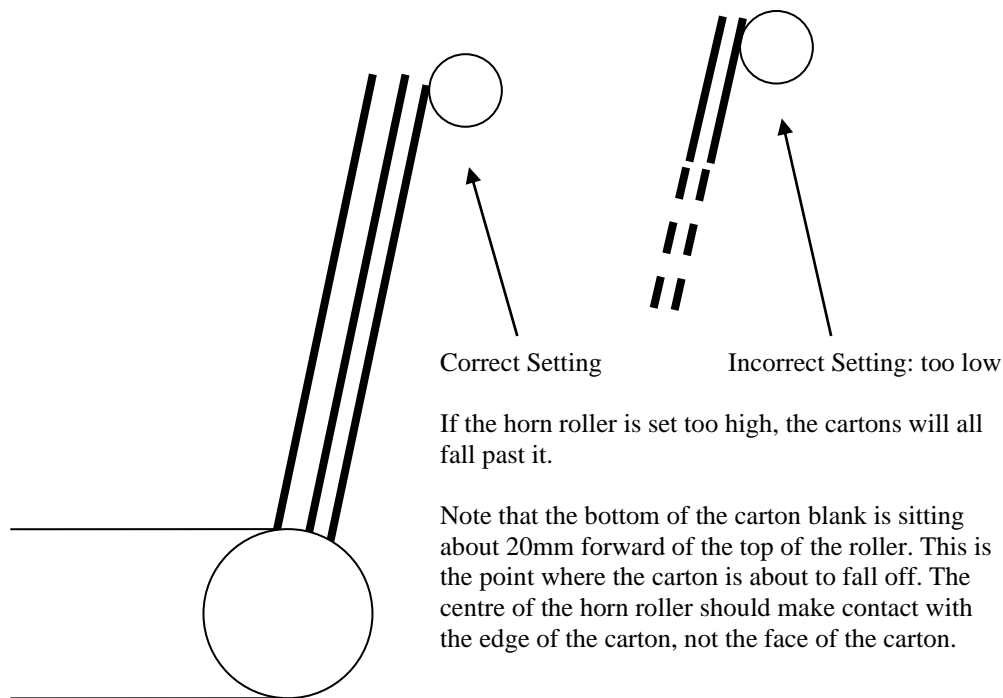
8.2.3.2 Adjust Point 2 – Carton Magazine Horn Height

Auto adjust point 2 adjusts the height of the carton magazine horn roller. A larger value moves the horn higher. It should be adjusted so that when a carton blank is on the edge of the magazine belt, the top edge of the blank rests on the centre of the roller.

Jogging 'out' makes the horn lower

Jogging 'in' makes the horn higher

Current Position 295.0



8.2.3.3 Adjust Point 3 – Carton Magazine Width

Auto adjust point 3 adjusts the position of the carton magazine right side fence. A larger value effectively makes the magazine narrower. It should be adjusted so that the carton blanks fit neatly between the magazine side fences.

Jogging 'out' makes the magazine wider

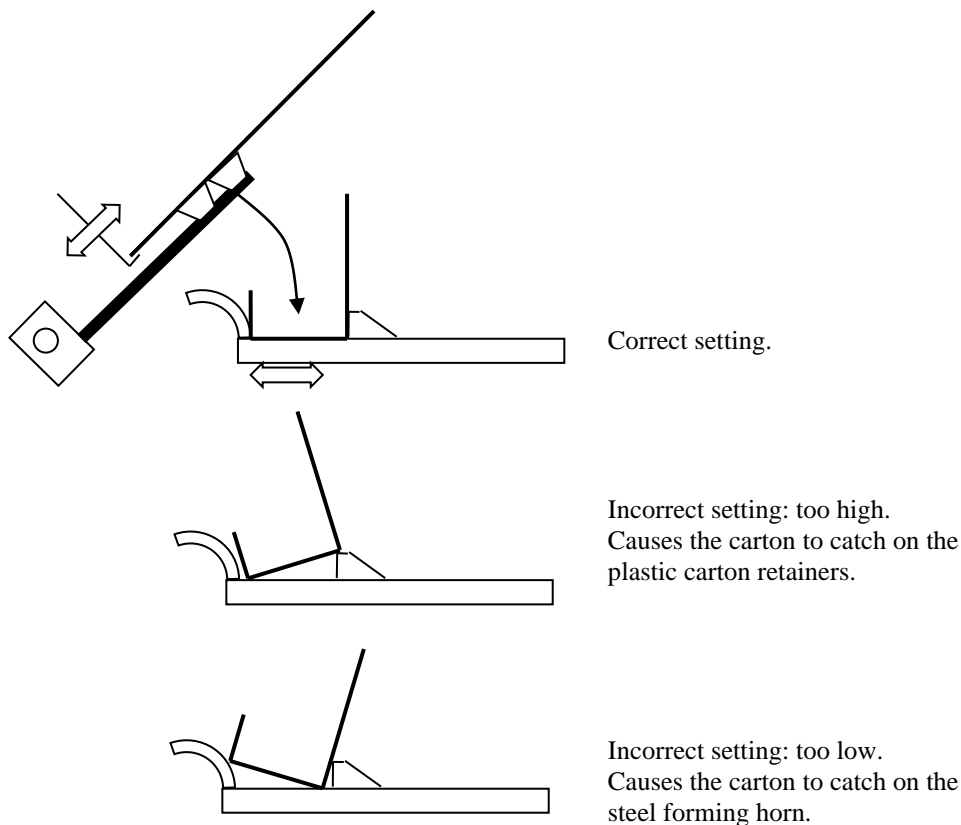
Jogging 'in' makes the magazine narrower

Current Position 202.0

8.2.3.4 Adjust Point 4 – Carton Magazine Tray Height

Auto adjust point 4 adjusts the height of the carton magazine 2nd stage tray. A larger value moves the tray higher. It should be adjusted so that when a carton blank is erected the base panel fits neatly in the station one index pocket.

Current Position 95.0



8.2.3.5 Adjust Point 5 – Station 3 Height Adjust

Adjust point 5 adjusts the height of the overhead guide horns that close the top of the box and form the lid.

Current Position 112.0

8.2.3.6 Adjust Point 6 – Station 3 Width Adjust

Adjust point 6 adjusts the width of the overhead guide horns to allow for different sized cartons.

Current Position 200.0

8.2.3.7 Adjust Point 7 – Station 5 Compression Height Adjust

Adjust point 7 adjusts the height of the overhead manufacturers flap compression.

Current Position 110.0

8.2.3.8 Adjust Point 8 – Station 3 Outfeed Glue Hight Adjust

Adjust point 8 adjusts the height of the outfeed side glue gun heights.

Current Position 80.0

8.2.3.9 Adjust Point 9 – Station 3 Infeed Glue Hight Adjust

Adjust point 9 adjusts the height of the Infeed side glue gun heights.

Current Position 60.0

8.2.3.10 Adjust Point 10 – Station 2 Rear Minor Flare Adjust

Adjust point 10 adjusts the position of the rear minor flare cylinder to allow for variation in carton size.

Current Position 108.0

8.2.3.11 Adjust Point 11 – Station 2 Guide Fence Adjust

Adjust point 11 adjusts the position of the guide fence to allow for variation in carton size.

Current Position 150.0

8.2.3.12 Adjust Point 12 – Station 2 Infeed Stop Adjust

Adjust point 12 adjusts the position of the Infeed stop fence to determine where the product stops before being pushed by the product push cylinder.

Current Position 40.0

8.2.3.13 Adjust Point 13 – Station 5 Guide Fence Adjust

Adjust point 13 adjusts the position of station 5 guide fence. This is to allow for different carton sizes. It should be adjusted in conjunction with the index width adjust.

Current Position 129.0

9 FAULT PROCEDURES

9.1 Introduction

This Chapter is intended to guide the operator and maintenance personnel into the procedures required to recover quickly from any faults. It covers the main known situations, which could cause fault conditions, but of course, others may occur. These will require alternative action to rectify as necessary. Please contact Hot Melt & Packaging Systems if additional assistance is required.

9.2 Fault Light on control panel

The flashing amber fault/reset light will indicate an operating fault in the machine that will be displayed in the fault area on the screen. Listed on the next pages are all the fault messages.

9.3 Fault Messages - Explanation and checks

The Operator Interface screen displays all faults. Each fault has a number that identifies it and a written description.

The following list shows the fault number, description that appears on the screen, gives an explanation of the fault and the action to take to correct it.

Erecting Main Cyl. Operation Timeout	B31:0/0
Erecting Extra Cyl. Operation Timeout	B31:0/1
Station 1 Front Minor Timeout Alarm	B31:0/2
Station 1 Rear Minor Timeout Alarm	B31:0/3
Station 1 Blank Hold Timeout Alarm	B31:0/4
Station 2 Bottom Major Timeout Alarm	B31:0/5
Station 2 Product Stop Timeout Alarm	B31:0/6
Station 2 Flap Flare Timeout Alarm	B31:0/7
Station 2 Rear Minor Timeout Alarm	B31:0/8
Station 2 Front Minor Timeout Alarm	B31:0/9
Station 23 Bottom Major Timeout Alarm	B31:0/10
-	B31:0/11
-	B31:0/12
Station 23 Top Major Timeout Alarm	B31:0/13
Station 3 Compression Timeout Alarm	B31:0/14
Station 4 Transfer Timeout Alarm	B31:0/15
Manufacturers Flap Compression Timeout Alarm	B31:1/0
Infeed Lift Timeout Alarm	B31:1/1
Infeed Push Timeout Alarm	B31:1/2
Infeed Trasfer Lift Timeout Alarm	B31:1/3
Infeed Transfer Timeout Alarm	B31:1/4
-	B31:1/5
-	B31:1/6
-	B31:1/7
-	B31:1/8
-	B31:1/9
-	B31:1/10

-	B31:1/11
-	B31:1/12
-	B31:1/13
-	B31:1/14
-	B31:1/15
Index VFD Faulted Alarm	B31:2/0
Water Wheel VSD Faulted Alarm	B31:2/1
Hotmelt System Faulted Alarm	B31:2/2
Infeed Conveyor 1 Tripped Alarm	B31:2/3
Infeed Conveyor 2 Tripped Alarm	B31:2/4
Infeed Conveyor 3 Tripped Alarm	B31:2/5
Auto Width Adjust Tripped Alarm	B31:2/6
Magazine Conveyor Tripped Alarm	B31:2/7
Magazine Horn Roller Tripper Alarm	B31:2/8
Outfeed Conveyor Tripped Alarm	B31:2/9
-	B31:2/10
-	B31:2/11
-	B31:2/12
-	B31:2/13
-	B31:2/14
-	B31:2/15

9.3.1 Emergency Stops Faults

The main air will dump and all movement will stop

Release Emergency Stop, press power on button, and restart machine

NOTE: Hot melt system will remain on to heat the glue. Also air to the hot melt system will remain on.

9.3.2 Access Gates / Guards Faults

The main machine air will dump and all movement will stop

Close access gate, press power on button, reset and restart machine

NOTE: Hot melt system will remain on to heat the glue. Also air to the hot melt system will remain on.

9.3.3 VF Drive Fault

The VF drive fault relay has operated

Read fault message on VF drive display and refer to fault description in the VF drive manual. Check for mechanical jam-ups.

9.3.4 Motor Overload

Check for obstructions, reset the over load.

9.3.5 Hot Melt Not Ready

Hot melt not up to temperature

Check hot melt unit is on and heating up, refer to hot melt manual for fault description.

9.3.6 Hot Melt Fault

A Fault has developed with the hot melt unit

If a temperature sensor is faulty check all relevant plugs on out-put board, hoses and guns first.

9.3.7 Magazine Low Level

When the magazine low level sensor has been uncovered for too long, this fault is displayed

Check cases are not jammed in the magazine

9.3.8 Time-Out Faults

The operation of all Casepacker functions has a pre-programmed time to function. If an operation takes too long, the fault is displayed and the machine stopped.

Check for jam-up

Check the sensors

9.3.9 Extend Or Retract Faults

For all cylinder EXTEND or RETRACT faults the following conditions may have occurred.

The cylinder in that station or position has not reached it's desired position in the allocated time

Check for jam-ups. Clear and reset

Check the cylinder's reed switches: -These can be checked by moving the cylinder with the emergency stop in and checking the reed switch LEDs light up when the cylinder is fully extended and retracted.

9.3.10 Carton Erect Vacuum

When erecting a carton, if vacuum is not detected within a few seconds, a fault is displayed. This can be caused if the machine is cycle started too soon after power on (while air pressure is still building up in the system). If there are no half-formed cartons in station 1, the machine can be restarted straight away.

10 Nordson Hot Melt System

NOTE: Refer to the Nordson “Pro-Blue” Manual for a detailed description of the Hotmelt unit

10.1 Control Switch

On the Nordson Pro-Blue side panel there is a control switch that turns the system on and off.

NOTE: this control switch does not isolate the Mains power from the unit.

10.2 Control options

Can be turned on and off by internal time clock if programmed to do so.

If production stops the Pro-Blue can be programmed to turn tank, hose & gun temperature down after a set pre-programmed time period.

If production does not re-start it can be programmed to turn off the heating completely after a pre-programmed time period.

(Both of these functions are designed to prevent the glue from deteriorating by reducing the temperature of the glue, while it is not being used.)

Can be programmed for production re-start to turn the Pro-Blue unit back on. (Production will only be possible when operating temperature is reached)

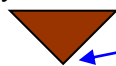
NOTE: If a fault occurs with the Pro-Blue Hot Melt unit an error code will appear on the display. Refer to the Nordson Pro-Blue manual for an error code listing. To clear a fault message from the Hot Melt unit you may have to turn the control switch Off then On again.

10.3 Filling with Hot Melt

CAUTION HIGH TEMPERATURE GLUE

When filling the tank with Hot Melt Glue Use approved Personal Protective Equipment & **Caution** as contact with heated adhesive results in burns.

Never over fill the tank. Fill only to the tip of the red filling mark.



Never mix two different types of Hot Melt Material. The System must be completely drained and cleaned if a different type of Hot Melt material is to be used.

Always operate the unit with the lid closed. This is for safety and also to exclude oxygen over the surface of the hot melt that will cause a deterioration of the glue.

10.4 Hot-melt unit Operation

The Pro-Blue unit controls the temperature and pressure of the Hot Melt glue in the system.

The PLC controls the firing of the glue via the solenoid valves on the glue gun heads.

The glue must be up to its operating temperature before the pump will operate.

For safety the machine must have a carton moving in the machine before the PLC can fire the glue guns.

11 Maintenance Procedures



11.1 Introduction

This chapter is a guide to assist maintenance personnel into the regular procedures required to maintain the efficient operation of the machine. This procedure is minimal and should be attended to regularly.

The timing for checks, inspections and replacements is based on the machine running 3 x 8hour shifts on a five day working week.

Follow all safety procedures and warnings when working around the machine.

Supply Voltage is:

HIGH VOLTAGE 415 VOLTS

Hotmelt Glue is at:

HIGH TEMPERATURE

Hot Melt Glue is under:

HIGH PRESSURE

Compressed Air is supplied at:

HIGH PRESSURE

The machine has:

MOVING PARTS AND PINCH POINTS

11.2 Daily

Ensure the general cleanliness of the machine (especially spillage).

Blow out all cardboard dust that accumulates on the machine.

NOTE: Do not blow compressed air directly into the vacuum sensors.

Clean any hot melt adhesive from the machine bed.

Apply a little silicone polish or spray to any parts where glue builds up.

Check and drain moisture trap and filter from the air supply as required.

Drain the air filter drier system daily.

Top up the hot melt tank with clean adhesive, DO NOT OVERFILL TANK.

NOTE: Clean adhesive will prevent major glue system problems.

11.3 Weekly

Drain approximately half a litre of hot melt adhesive from the system's drain valve.

Check the operations of all hot melt guns.

Clean the lenses and reflectors of the photoelectric sensors.

Clean the vacuum generator in-line filters of dust.

Lightly lubricate the ceramic bearings on the station 4 compression top plate and side plates.

11.4 Monthly

Check vacuum cups for wear, cracking or damage. Replace as necessary.

Clean vacuum generators and silencers.

Check belt tracking, condition and tension.

Inspect the machine for damage to glue hoses, air lines and electrical cabling.

11.5 3-Monthly

Grease the bearing on the index chain drives. Check oil levels in all gearboxes.

11.6 6-Monthly

Check Index chains - tension and adjust as necessary.

Check index chain fingers for damage and looseness.

Check air cylinders for wear, leaks and correct operation.

Check sprockets and pulleys for wear and tightness.

11.7 General Maintenance

Refer to the Hot Melt Manual for specific maintenance requirements and procedures.

11.8 Air service

The filter should be drained daily

Clean bowl and filter monthly.

12 PROCEDURE FOR ORDERING PARTS

When ordering parts for your HOT MELT & PACKAGING SYSTEMS HMPS 5000 machine, please ensure you include the following information.

1. Machine Serial Number
2. Model. Number
3. Part Number if shown

The above information is required to ensure you receive the correct component. The part may vary because of individual applications.

.....

Machine Serial Number: 5767-06

Model Number: HMPS 5000

Part Number

Breakdown / Fault