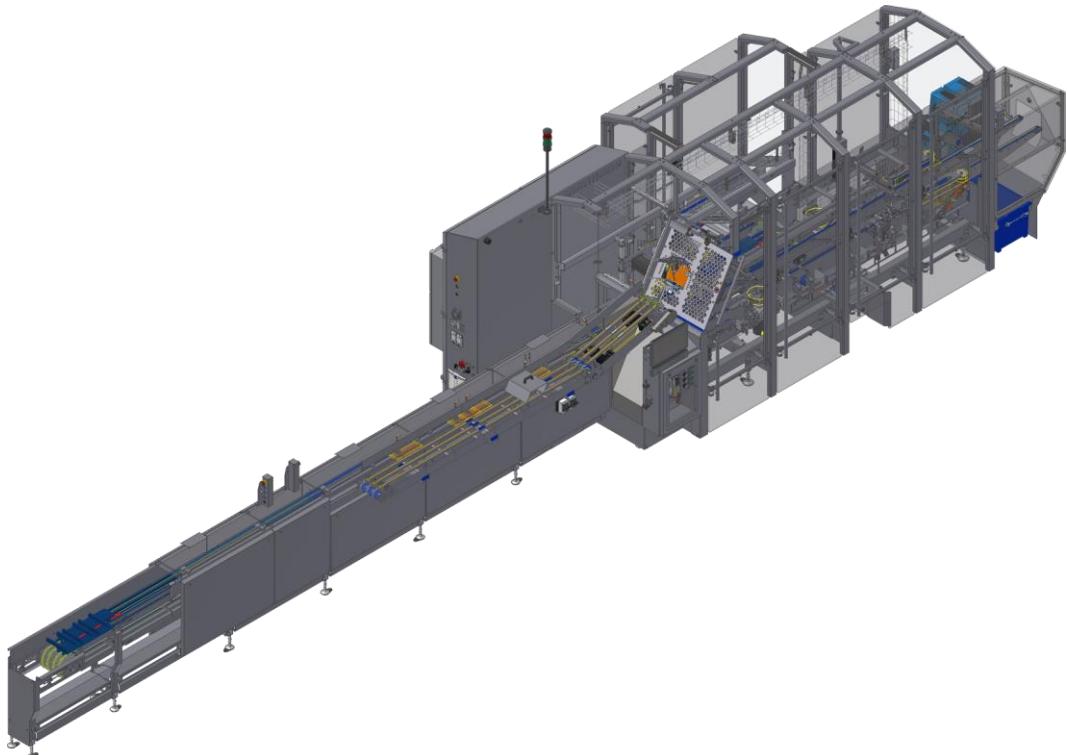




USER MANUAL

Horizontal Continuous Cartoner

VENTO-C



MN201099

The English version is the original

Foreword

Thank you for your purchase of this Mpac machine.

This user manual provides an overview of the use and maintenance of this VENTO-c machine.

The standard Mpac machine has been used as the point of reference throughout this manual, whenever possible. However, due to client-specific requirements, it is possible that some illustrations or descriptions will not entirely match your machine.

This user manual does, however, presume that the user (operator/maintenance technician) possesses the level of knowledge required to properly perform all operations. If the information in this user manual is not clear or is incomplete, please contact the service department of Mpac.

This department may also be contacted for service and technical support. Please make sure that you have the relevant information concerning your machine close at hand whenever you contact Mpac. This information is recorded on the machine specification plate affixed to the machine.

Americas

Sales: sales.americas@mpac-group.com
Service: service.americas@mpac-group.com
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www.mpac-group.com

Liability

This liability clause has been added to prevent any misunderstandings.

ARTICLE 1. USE

1.1.

The machines of Mpac can only be used for the purposes for which they were designed and have to be operated in accordance with the instructions documented/set out in the user manual and all of its supplements.

1.2.

Every use other than for which the machines of Mpac are intended and/or operation other than stipulated/set out in the user manual and all corresponding supplements, and/or actions that are in conflict with the above, render all warranties invalid and specifically exclude all liability for damage, trading loss and consequential damage, whatever the cause and manner.

1.3.

Permission to operate machines of Mpac is granted exclusively to persons who are appropriately skilled, who have been correctly trained and who are both physically and mentally able to carry out the routines for using this machine.

1.4.

Supplements to the manual must be brought to the attention of the operator/user of the Mpac machine immediately and added to the manual.

1.5.

The machines, or components thereof, of Mpac, never comply with the ATEX 114 guideline, unless specifically mentioned in the CE declaration, mentioned in the risk analysis reports, and the machine or components thereof are clearly fitted with the compulsory ATEX warning logos. For that reason, installing Mpac machines, or components thereof, in a potentially explosive environment is not permitted.

ARTICLE 2. SAFETY

2.1.

For safety reasons, the user/operator must strictly follow the instructions in the user manual and its supplements.

2.2.

The user/operator must also strictly adhere to the settings given on the Mpac machine, in the user manual and its supplements.

2.3.

If the safety regulations at a location where work is carried out with the Mpac machine are stricter than the safety guidelines in the user manual and its supplements, these stricter safety regulations must be observed. Ignoring this condition will render all warranties invalid and will result in exclusion of all liabilities.

2.4.

Under no circumstances and in no capacity is any person permitted to be on, underneath or in the Mpac machine. If anyone does need to be underneath, above or on top of the machine for maintenance work, this may only be performed using appropriate and approved work resources as described in the locally prevailing standards.

2.5.

If work must be carried out at, on or in the immediate vicinity of Mpac machines, local lighting has to comply with the locally prevailing standard at all times.

ARTICLE 3. WARRANTY**3.1.**

It is prohibited to make any changes to the Mpac machine without the prior written consent of Mpac.

3.2.

Scheduled maintenance and periodic inspections must be carried out in the way documented/described in the user manual and all its supplements. If spare parts are needed, original Mpac parts must be used. Ignoring this condition without prior written consent of the manufacturer of Mpac machines will render all warranties invalid and specifically excludes all liabilities for damage, trading loss and consequential damage, whatever the cause and title.

3.3.

When the provisions set out in articles 2.5 and 4.1. are ignored, Mpac will declare all warranties invalid and it will specifically exclude all liabilities for damage, trading loss and consequential damage, whatever the cause and title.

ARTICLE 4 CE MARKING**4.1.**

The Mpac machine individually complies with all safety standards in accordance with the Machine Directive 2006/42/EC and comes with a CE declaration. If a third-party machine, not supplied/purchased by Mpac is electronically or mechanically connected to the Mpac machine, or a part thereof, the owner of the Mpac machine must carry out, or have carried out, an all-encompassing CE test, draw up, or have drawn up, a CE declaration and apply the CE marking to all collaborating machines as a whole. All this must be done in accordance with the most recent machine directive, in order to guarantee safety.

Document Conventions

In this manual the following signs and styles are used to draw the reader's attention to important points.

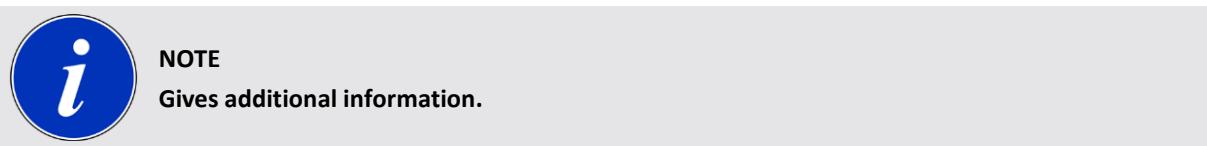
Actions the operator or engineer should do in a specific sequence are numbered:

1. Set the power switch to the 'ON' position.

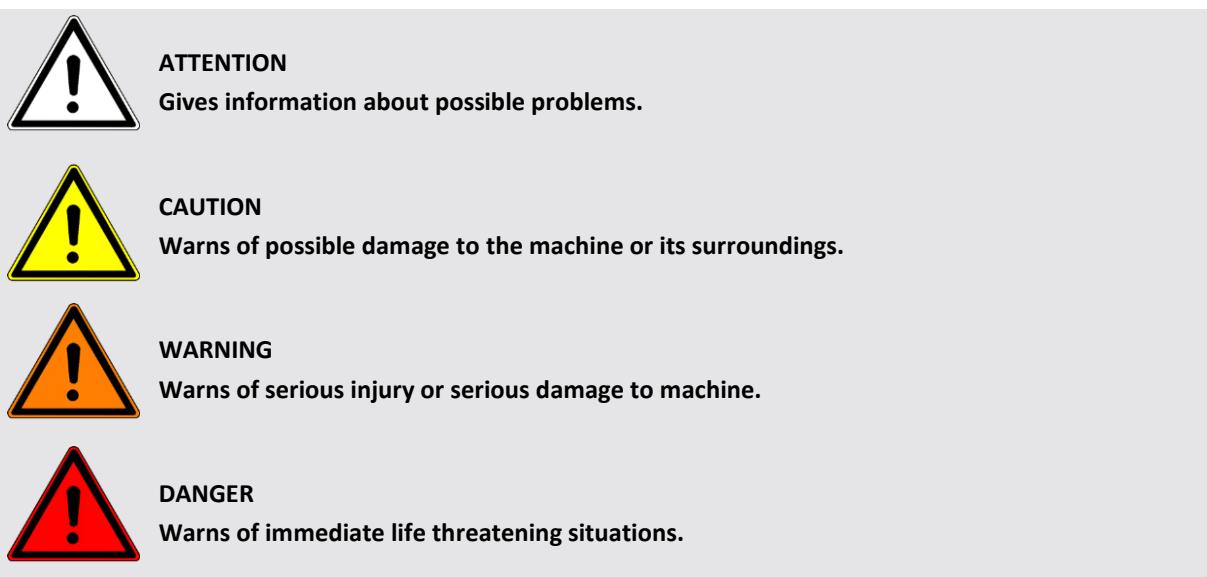
- Bullets are used for lists of items.
 - This bullet is used for a secondary list.

Names of soft keys or touch screen buttons are always shown between 'single quotes'.

Additional information is given in this style:



For safety reasons warnings are given in this document:



Intended use of this manual

This manual is for both operators and service personnel of the Mpac machine.

Supplements to the manual

If you receive any supplements to the manual from Mpac, these must be added to the manual immediately.

Storing the manual

Mpac expects a copy of this manual to be available to the user(s), operators and service technicians of the machine and a copy should always be available during operation and maintenance.

Page numbers

All pages after the table of contents have two numbers at the bottom of the page, separated by a dash (-). The number left of the dash is the chapter number. The number right of the dash is the page number.

Symbols

The following symbols can be found on the machine:



HOT: Increased risk of burns



VOLTAGE/HIGH TENSION: Increased risk of electrocution



LASER LIGHT HAZARD: Increased risk burns due to laser light



DANGER - NO ACCESS: Increased risk of getting caught in moving parts



DANGER - DO NOT REACH IN: Increased risk of getting caught in moving parts



SAFETY GLASSES: Safety glasses must be worn



SAFETY GLOVES: Safety gloves must be worn



FACE PROTECTION: Face protection devices recommended be worn



SAFETY SHOES: Safety shoes must be worn

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1 General

The VENTO-c packs one or more products into a cardboard box. The boxes (pre-glued cartons) are supplied by a magazine. The carton infeed places the cartons on the cartoner. The cartoner folds the cartons, glues them and ejects them for a possible subsequent production step.

The products to be packed are supplied by a separate supply line where the Autoload slides the products into the cartons.

1.1 Specifications

Type:	Horizontal Continuous Cartoner
Name of machine:	VENTO-c
Implementation:	Left
Product type:	Sticks
Weight:	±... kg
Dimensions [lxwxh]:	±11,8 x 3,4 x 2,8 m
Voltage:	...
Maximum power:	... kW at ... A
Maximum pre-fuse:	... A
Operating pressure of compressed air:	6 bar (87 PSI)
Maximum measured sound level:	< 80 dB
Operating temperature:	> 5°C (41°F) and < 40°C (104°F)
Maximum humidity:	70%
Air consumption:	... Nltr/min
IP classification:	IP52

See appendices for further specifications.

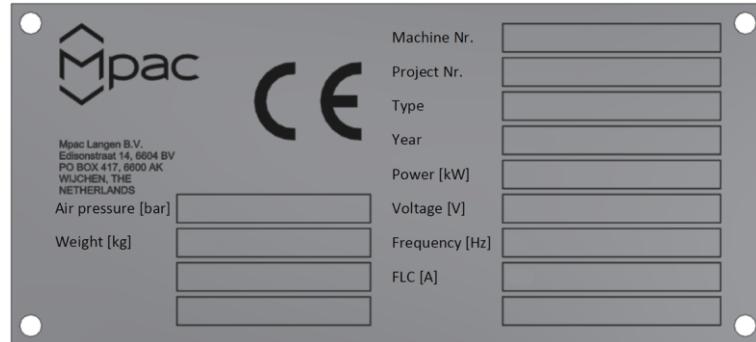
ATTENTION

This machine must only be used within the specification and tolerance ranges shown above. If the machine is used outside of these ranges, the Mpac can no longer bear responsibility for the reliability of the machine.

ATTENTION

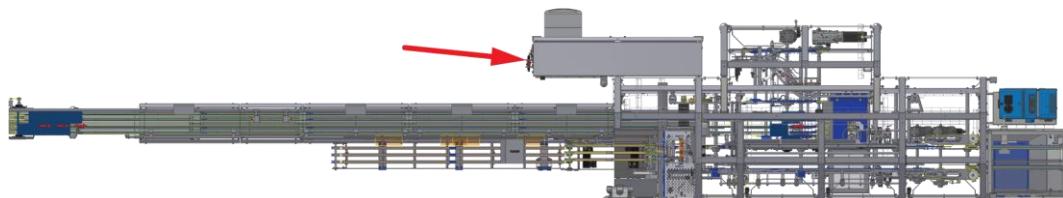
Only use original Mpac components. If components are replaced by components of another brand or type, the guarantee and liability of the Mpac will cease.

1.2 Machine plate



Machine specification plate

Location of the machine plate

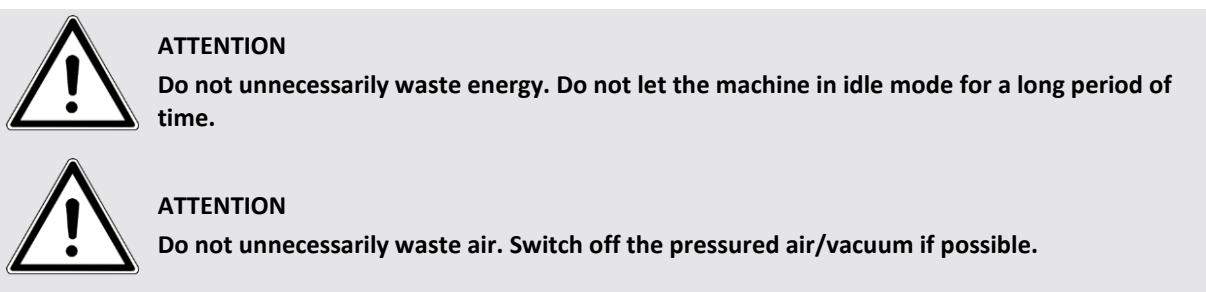


Machine plate

1.3 Environment

To meet current environmental regulations, it is recommended that the following rules be respected:

- Never throw spent lubricating oil, hydraulic oil, grease and glue granules in drains, the sewer or on the ground.
- Ensure that all used up liquids, spent batteries and other chemical waste, is shipped to the proper disposal body for reuse or destruction.



1.4 Transport

Before the Mpac machine can be transported all supply and discharge lines, air and electrical connections must first be fully disconnected.

All other detachable components must also first be removed.



WARNING

Only properly trained forklift operators are authorized to move the machine.

1.5 Storage

A stored Mpac machine must meet the following conditions:

- All products and cartons must be removed.
- The machine must be thoroughly cleaned.
- All required maintenance must be performed.
- The machine must be placed on a clean, flat surface.
- The machine must be put level.
- The machine must be in a dry location.
 - No condensation.
- The machine must not be exposed to temperatures higher than 40°C (104°F) and lower than 5°C (41°F).
- The machine must not be exposed to relative humidity levels higher than 70%.

1.5.1 Battery recharging

When the Mpac machine is stored for longer than one month:

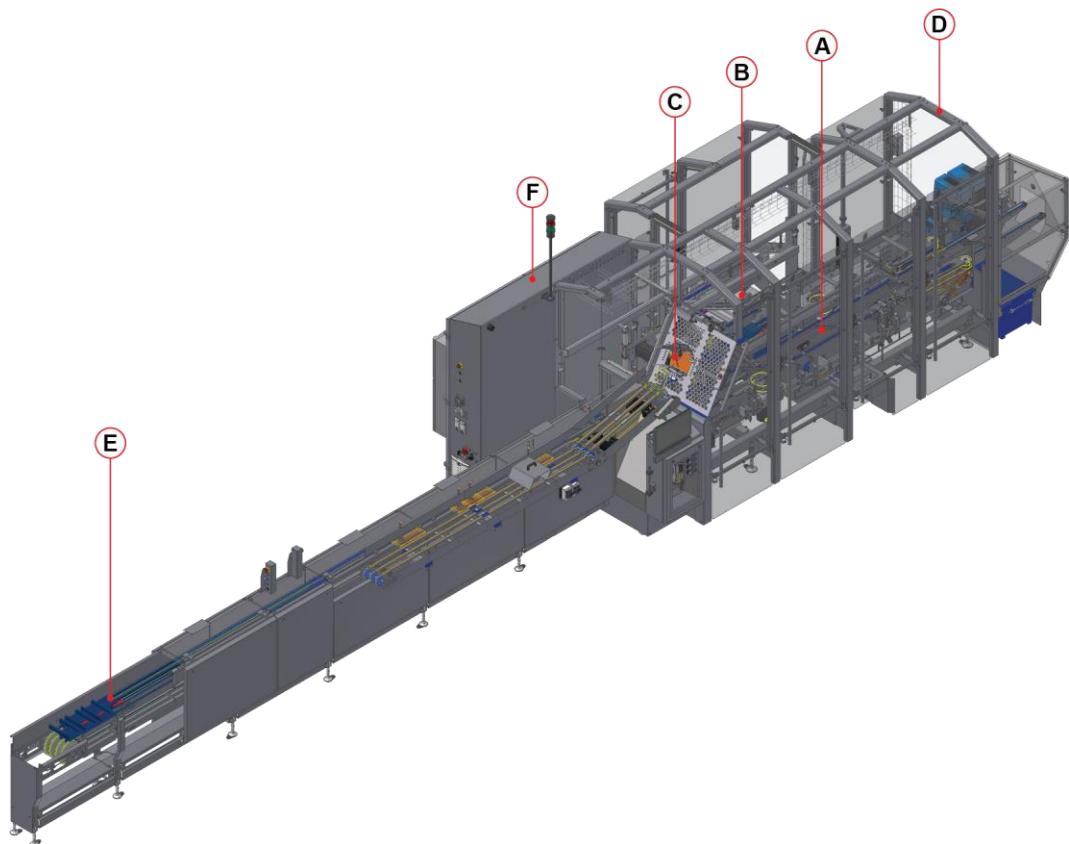
Plug in and turn on the machine for at least once every month to recharge the battery of the UPS. Leave the machine on for a day each time.

1.6 Decommissioning

It is recommended that you contact Mpac before decommissioning the machine because of the potential reuse of components. If reuse is not possible Mpac recommends that the machine will be fully decommissioned in accordance with the then applicable government regulations.

2 The machine

2.1 Machine overview



- | | |
|---------------------|------------------------|
| A. Carton transport | D. Frame with guarding |
| B. Autoload | E. Product infeed |
| C. Carton infeed | F. Electrical cabinet |

Machine overview

2.2 Machine Components

The VENTO-c consists of several standard components. Depending on client specifications, the machine may come with additional components.

Operator panel

The operator panel includes buttons as well as an operating screen (touch screen) for the software-driven operation and regulation of the machine.

2.2.1 Carton transport

The carton transport transports the cartons along different folding and closing systems.

The following are standard:

- Lugs
The lugs transport the cartons along the lug track through a chain drive.

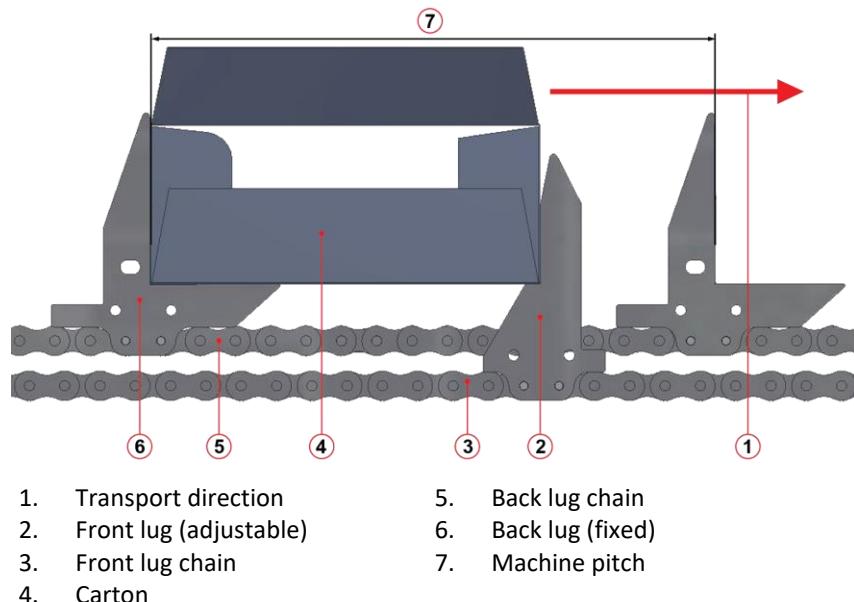
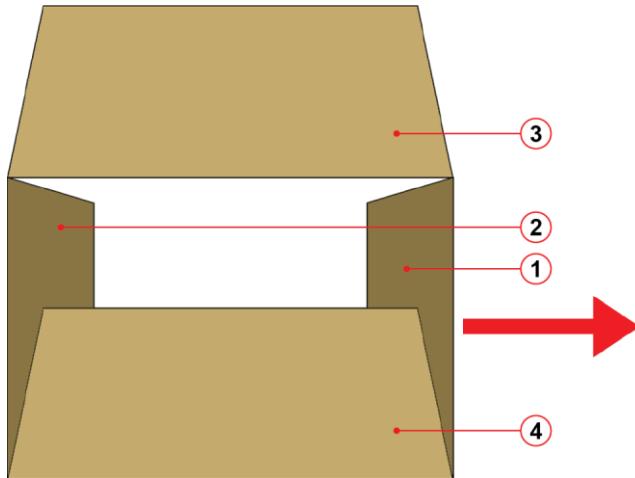


Illustration lugs

- Carton guides
Guides ensure that the carton remains fixed in the lugs when it is placed, filled and closed.

- Carton closing

Guides, rotary kickers, tickers and tuck-ins are used to fold and close the carton flaps.



1. Minor flap (front)
2. Minor flap (rear)

3. Major flap (top)
4. Major flap (bottom)

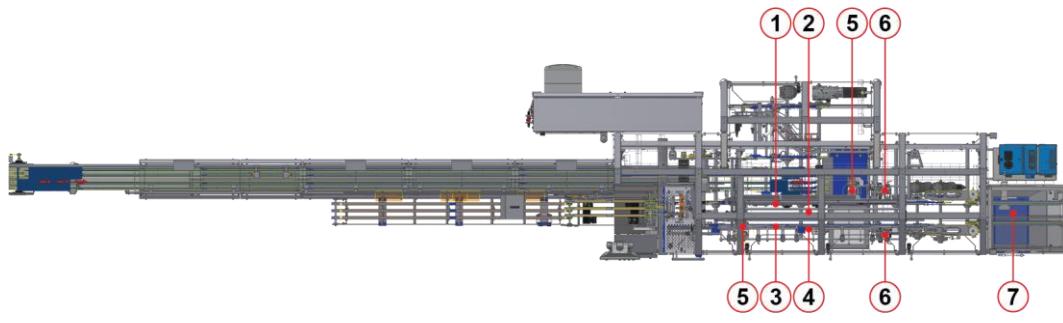
Carton flaps

- Hotmelt

The Hotmelt melts and supplies the glue to the glue guns. The glue guns provide the cartons with hot glue in predetermined patterns.

- Discharge

The discharge includes an acceleration belt, control sensors, and a carton reject mechanism for faulty cartons.



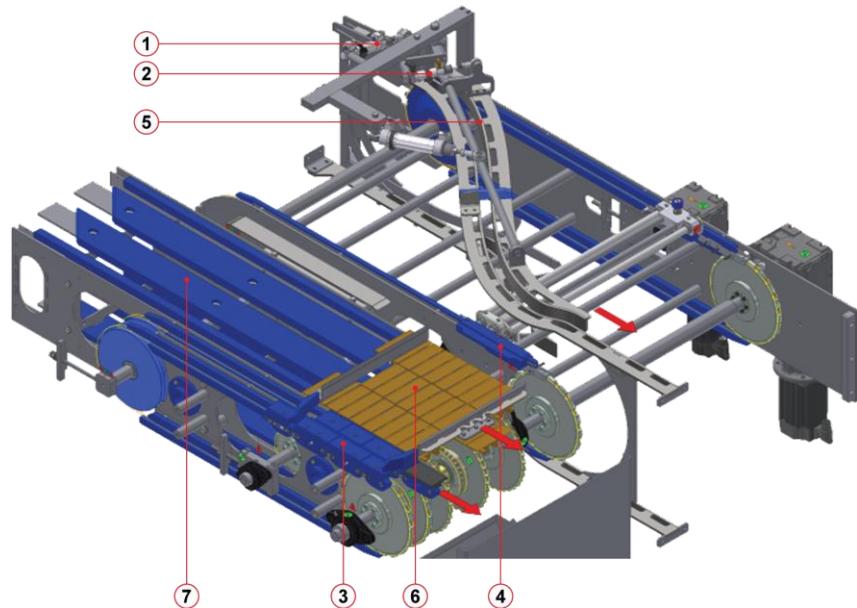
1. Lug track, fixed side
2. Top guides
3. Lug track, adjustable side
4. Fold guides

5. Ticker/Kicker
6. Glue gun
7. Discharge

Cartoner

2.2.2 Autoload

The products are supplied by the infeed system. The pusher pushes the products in the bucket through the funnel into the cartons which are open on one side.

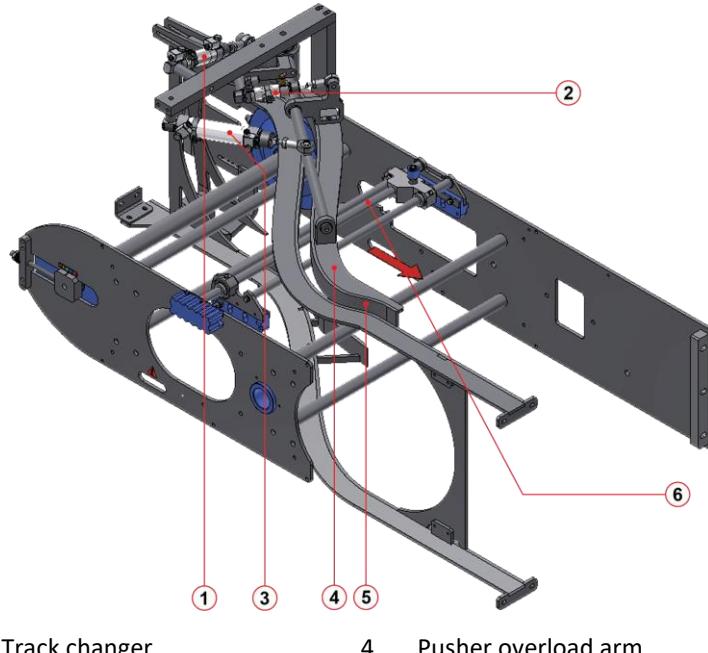


- | | |
|----------------------|--------------------|
| 1. Track changer | 5. Pusher track |
| 2. Overload cylinder | 6. Bucket |
| 3. Funnel | 7. Bucket conveyor |
| 4. Pusher | |

Autoload

2.2.2.1 Track Changer

When an incorrect product is detected the product will be rejected. The track changer (1) changes the pusher path (5) and the incorrect product will not be pushed into the carton but rejected into the reject bin.



- | | |
|-----------------------------|------------------------|
| 1. Track changer | 4. Pusher overload arm |
| 2. Safety overload cylinder | 5. Pusher track |
| 3. Overload cylinder | 6. Pusher |

Autoload principle

2.2.2.2 Pusher overload

To prevent damage a pusher overload detection is installed. When a pusher experiences too much resistance the pusher will retract and the machine will immediately come to a halt.

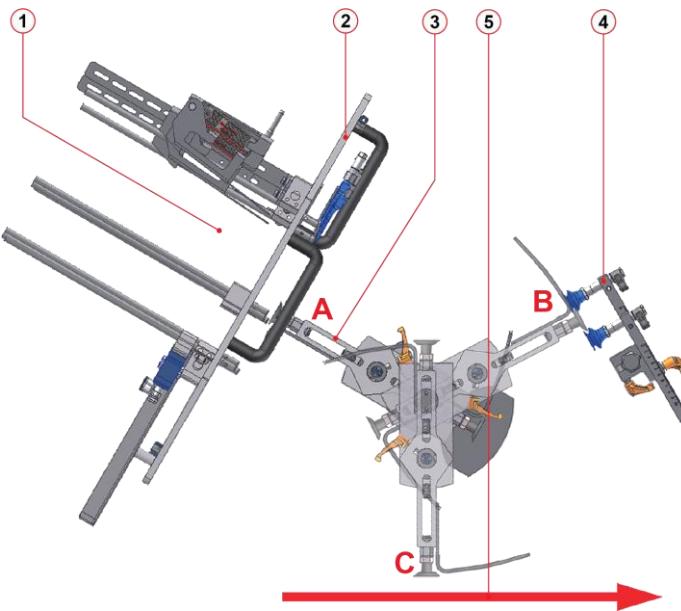
A reject conveyor is installed at the autoload to move the rejected products out of the machine.

2.2.3 Carton infeed

The carton infeed regulates the supply of cartons to the Cartoner and ensures they are properly buffered. The carton infeed is composed of a number of components:

- Carton magazine
- Template
- Rotary Feeder
- Pre-break

The Rotary Feeder picks up the pre-glued cartons from the carton magazine using suction cups (**A**) and places them via the pre-break (detachment of the carton) (**B**) upright on the lug track (**C**).

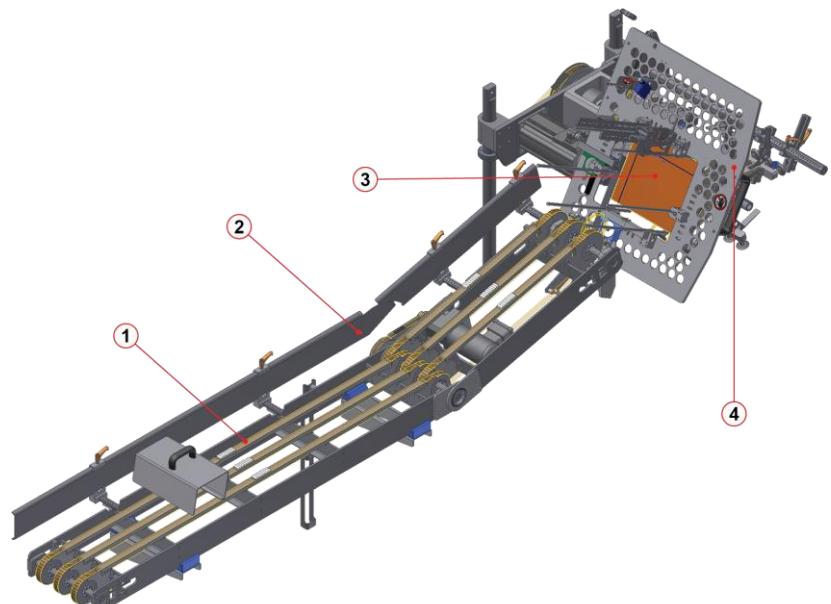


- | | |
|--------------------|--------------------|
| 1. Carton magazine | 4. Pre-break |
| 2. Template | 5. Carton conveyor |
| 3. Rotary feeder | |

Carton Infeed

2.2.4 Extended Magazine

The Extended Magazine feeds the cartons by means of conveyor belts. A sensor on the Template regulates the carton infeed. When the Extended Magazine is nearly empty, a warning signal is given. The machine will stop when the Extended Magazine is empty.



- 1. Extended Magazine
- 2. Nearly empty sensor
- 3. Pre-glued cartons
- 4. Template

Extended Magazine

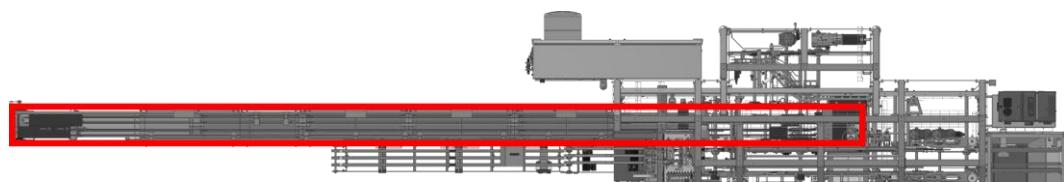
2.2.5 Guarding

All protective covers and safety doors are part of the guarding.

2.2.6 Bucket conveyor

The entire bucket track before the Cartoner and possible peripherals like a Leaflet Feeder are part of the bucket conveyor.

The bucket conveyor transports the products to the Autoload and runs synchronized with the Cartoner.



Bucket Conveyor

2.3 Product infeed

The product infeed is the supply line of the products to be packaged and is generally client-specific.

This machine comes with the following additional module(s):

2.3.1 OEM conveyor

The OEM conveyor transports the products to the infeed (system) of the cartoner.

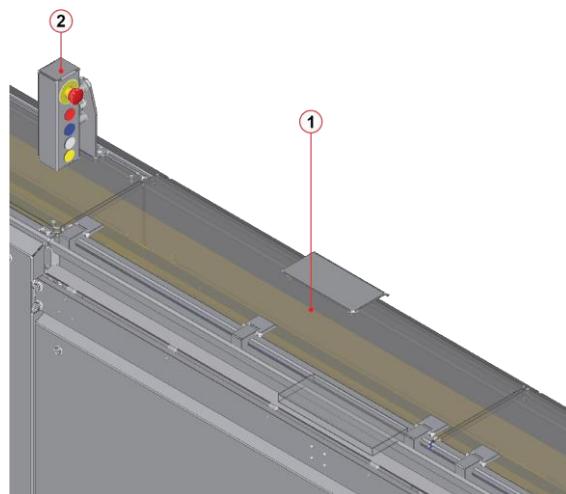
2.3.2 Manual refeed

The manual refeed (**1**) works by directly inserting a product in the bucket track by hand. To ensure everything stays safe, the operator must open a cover, place a product, close the cover again, lock and move machine.

To simplify this action, there is an extra button is located at operating panel OP6 (**2**) that is able to run the machine for a certain amount of pitches when the machine is in idle.

Follow these steps:

1. Machine needs to be in standstill
2. Operator enables manual feed on IMI
3. Machine is stopped
4. Covers are unlocked automatically
5. Open the cover at the refeed
6. Place the products
7. Close the cover
8. Press reset at the operating panel OP6 (**2**)
9. Covers are locked
10. Press yellow button at the operating panel
11. Machine moves x steps (adjustable in IMI)
12. Machine stops (and restart at step 3)



Manual Refeed

2.3.3 Electrical cabinet(s)

Electrical cabinets are placed on and near the machine. Each with their own cabinet number for easy navigation within the electrical drawings.

2.3.4 Peripherals

Mpac refers for all peripherals to the supplier's documentation. With this machine the following peripherals are supplied:

- Hot Melt system

2.4 Working principle Cartoner

Products are fed by an infeed system (1).

1. Products are detected on the bucket conveyor (2).
2. The Rotary Feeder (3) picks the pre-glued cartons from the carton magazine using suction cups and places them via the pre-break upright on the lug track.
3. Lugs attached to a chain drive transport the cartons through the machine (4).
4. On the bucket/pusher side of the machine (fixed side) (B) a guide or kicker opens the front flap for better product access.
5. A guiding is used to open the bottom and top flap.
 - Needed for better product access.

On the adjustable side of the machine (A):

6. Guides close the front flap.
7. A kicker or ticker closes the rear flap.
8. Next the bottom flap on the adjustable side is closed with a guide.
 - This way the product will stay in the carton when pushed in.

On the fixed side of the machine:

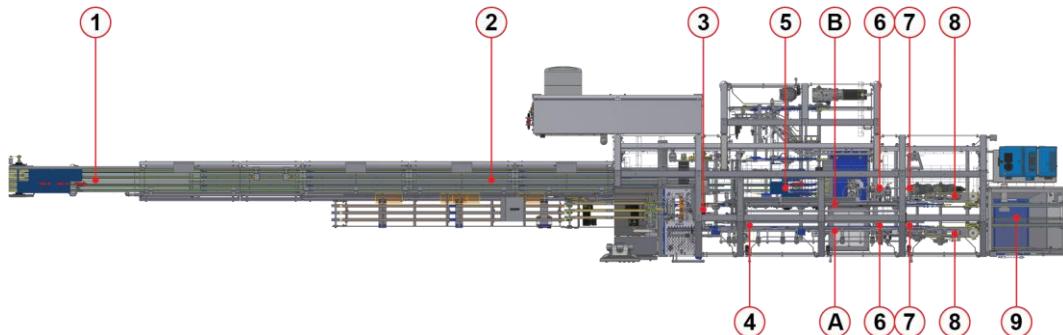
9. The product(s) is/are pushed in the open carton through the funnel (5).
10. A Kicker or Ticker closes the front and rear flap.
11. Guides close the bottom flap.

Both sides of the machine:

12. Glue pistols spray glue on the bottom flaps (6).
13. Guides fold the top flaps to close the carton.
14. Pressure plates force the carton into the correct shape before the glue solidifies (7).
15. Acceleration belts (8) take over the filled and glued cartons from the lug chains and onto a discharge conveyor (9).

Carton rejection

If the sensors detect cartons that are folded or glued incorrectly, these cartons will be rejected.



Working principle Cartoner

2.5 Detection

The following key sensors and switches are installed to run the machine properly.

Carton placed in lugs

When a carton and a product are detected the pusher will go forward or stay in the forward position. The pusher will be retracted when a product is detected while no carton is detected.

Overload side guide fixed side

This sensor detects if there is an overload on the fixed side of the cartoner. If so, the machine stops.

Top guide safe to move

Sensors that detect the position of the adjustable lug track relative to the top guide to prevent damage to the machine.

Top guide down

This sensor detects if the top guide on the lug track is down. If the top guide is not down, the machine will stop.

Carton in glue position

When a carton is detected, it will be glued.

Open rear flap

When an open rear flap is detected, the carton will be rejected.

Open major flap

When an open top or bottom flap is detected, the carton will be rejected.

Carton at major flap detection

When a carton is detected in this position, the major flap detections should be active.

Discharge blocked

When the sensor detects that the discharge is blocked, the machine will stop immediately to prevent damage.

Autoload track changer forward

Detection to see if the track changer is in the forward position. In this position the pusher follows the pusher track to push the products into the cartons.

Autoload overload

When a product cannot be pushed into a carton or the pusher is blocked, the safety overload prevents machine damage and stops the cartoner. Always remove the cartons at the autoload in case of an overload.

Autoload pusher forward

This detection is to see if the pushers follow the pusher track. When the pusher can't move forwards (overload/too much friction) the track moves back and the product will not be pushed into the carton.

Product Reject Bin Full

When this sensor is activated for a certain amount of time, the machine will come to a halt to prevent damage.

Carton magazine almost empty

In case the carton magazine is almost empty, the horn will sound, the amber lamp will flash and a status message will be shown on the main screen.

Carton magazine template empty

In case the carton magazine is empty at this sensor at the end of the magazine conveyor, the machine will stop. Fill the carton magazine and reset the machine to start producing again.

Carton magazine safe to move

This sensor detects if the magazine is safe to move. When the sensor detects the template, the magazine movement locks. Only manual movement (downwards) is allowed. This is to prevent damage when placing an incorrect template.

Product In Bucket

When a product is detected in the bucket, the machine places a carton in the lug track and the corresponding pusher will go forward or stay in the forward position.

Product in bucket too high

When a product is detected to be too high for packaging, the machine puts no carton in the lug track and the corresponding pusher will be retracted. The product will be rejected.

Product sticks out of bucket

When a product is detected to be sticking out of the bucket, the machine stop. Take the product out by hand or place it correctly.

3 Safety

The VENTO-c machine produced by Mpac has the CE certification label (Conformité Européenne). This means that the machine obeys the safety criteria specified by the Machine Directive.

3.1 Safety markings

These safety markings can be attached to the machine.



Access prohibited - No access for unauthorized personnel



Do not reach in - Never reach into the designated opening of the machine



Electricity - Take care to avoid coming into contact with electricity



Hot surface - Take care to avoid coming into contact with a hot surface



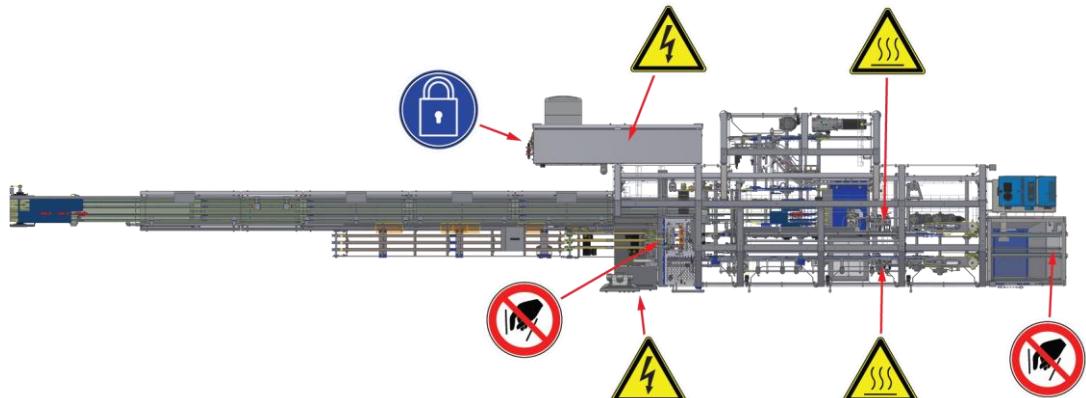
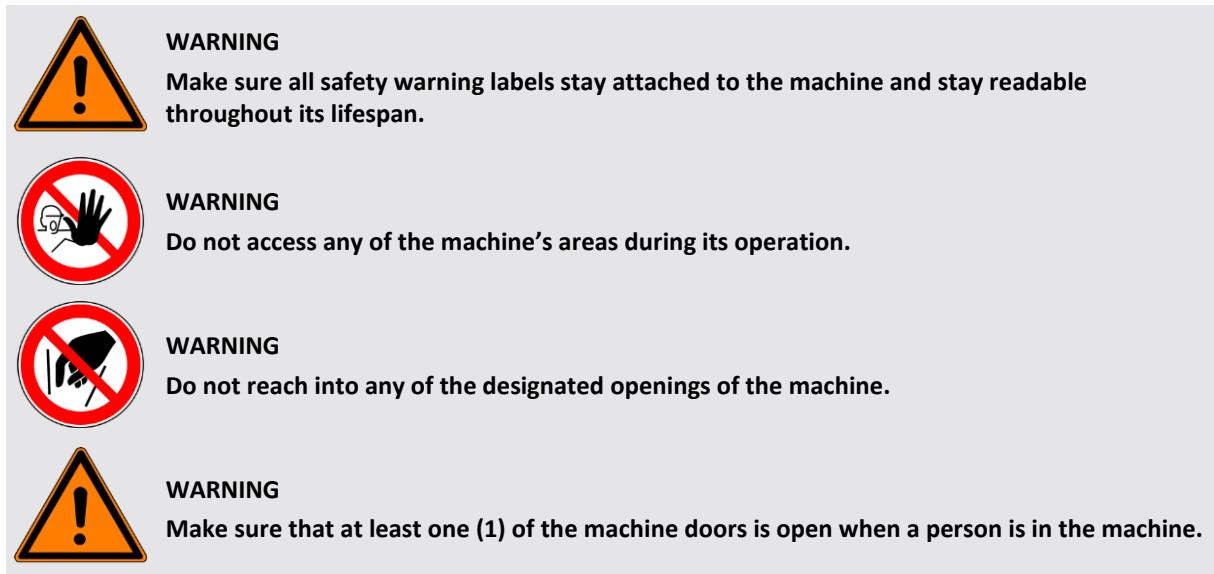
Invisible laser radiation - Avoid eye or skin exposure to direct or scattered radiation



Drawing-in movement - Take care when in the vicinity of counter-rotating rollers



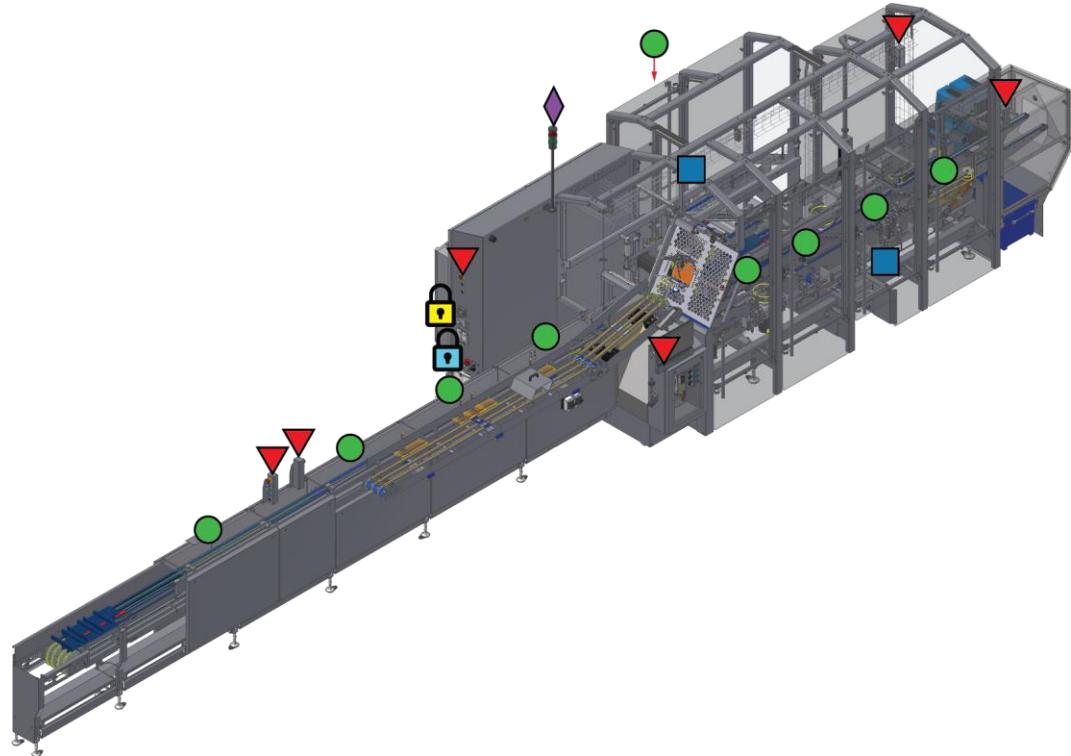
Strong magnetic field - Take care with body implants (pacemakers, defibrillators), loose metal objects, hearing aids and cell phones or pagers.



Standard safety markings

3.2 Safety features

The machine is installed with the following safety features:



ATTENTION

The main power switch can also be located on the electrical cabinet in order to lock out the machine.



DANGER

Never remove or electrically bridge a safety feature. Very dangerous situations can occur when doing so.

3.3 Safety zones

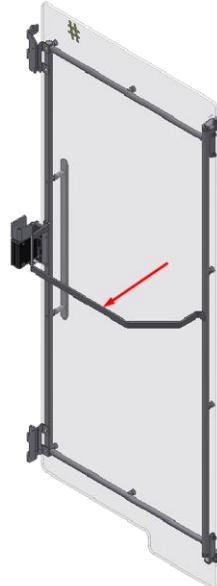
The machine has one or more safety zones. Each safety zone has a protection circuit. If the protection circuit is activated, for example when a door is open, all equipment within that safety zone stops immediately.

When the e-stop is activated the e-stop safety zone is also activated and the complete machine stops immediately.

3.4 Body Bars

Body bars are mounted on the inside of guard doors and are used to ensure that the machine can be neither reset nor run while personnel are physically in the machine.

The bars are located in areas of the machine where personnel have room to enter and close a guard door behind them, hence enabling the machine to be reset and run; potentially causing injury or death.



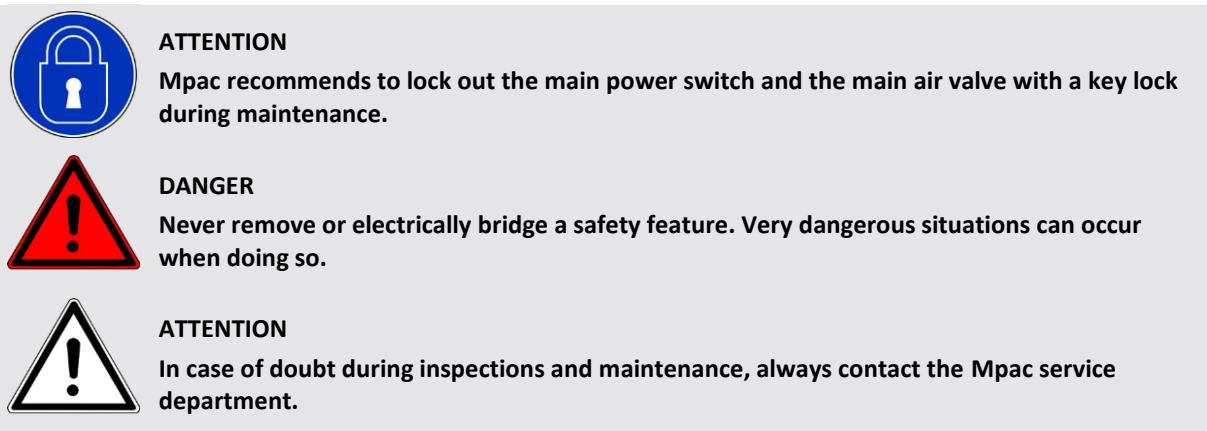
Body Bars



3.5 Lock Out - Tag Out (LOTO)

Never carry out any maintenance or problem solving without proper lock out procedure.

Mpac strongly recommends to follow all regulations concerning lockout/tagout your company has prescribed.



3.5.1 LOTO power

To lockout the main power:

1. Make sure the machine is not running.
2. Turn the main power switch to 'OFF'.
3. Lock the switch with a padlock.



Lockout of the Main Switch

3.5.2 LOTO Safety Air Lock

To lockout the pressurized air a special safety air lock is installed.

To lock out the safety air lock:

1. Turn the red knob to its closed position.
2. Lock the valve with a padlock.



Lockout of the safety air lock

3.6 General safety

3.6.1 Personal Protective Equipment (PPE)



Safety shoes must be worn during the operation, adjustment and maintenance of the machine. Wear safety glasses when the situation requires it and wear hearing protection when noise levels exceed 75 dB.

3.6.2 Clothing



Ensure that the proper clothing, suitable to the workplace, is worn at all times during the operation, adjustment and maintenance of the machine. Avoid wearing loose fitting clothing, long, loose hair and adornments that could get caught in moving parts.

3.6.3 Environment



To prevent dangerous situations from arising, the machine's surroundings must be clean and free of oil and other liquids.

3.6.4 Moving Parts



Keep a safe distance from rotating and/or moving parts.

3.6.5 Cleaning the Machine



Ensure that liquids can never reach electrical components.

3.6.6 Safety Markings



All safety markings affixed to the machine must be followed without exception.

3.6.7 Manual Lifting



Manual lifting of material and/or machine parts is for your own responsibility.

To meet standard ISO 11228 for manual lifting, the maximum weight and frequency must be determined in every case. Mpac recommends the NIOSH method as risk assessment.

3.6.8 Maintaining the Machine



Shut off the machine's power and air supply before all preventive and/or corrective maintenance.

If the activities must be performed when the machine/ installation is live, ensure that there is an additional person present who can operate the emergency stop button or the main switch.



In case of disconnecting the main power cable, shut off the power supply from the main switch board.



Secure the load before all preventive and/or corrective maintenance on the hydraulic system.

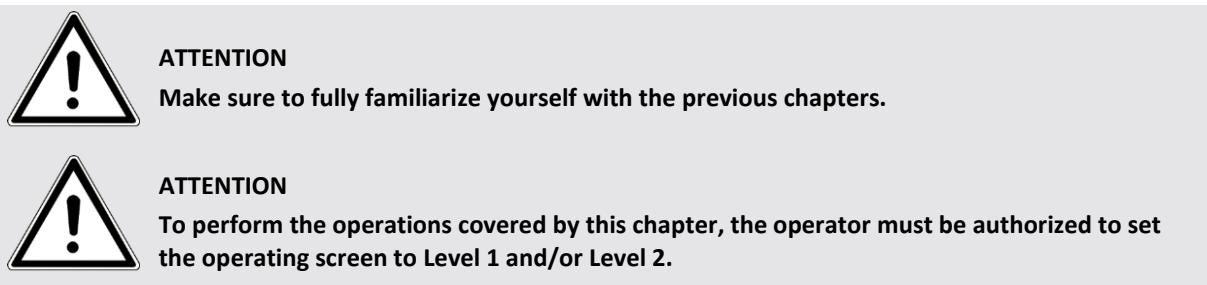


Mpac strongly recommends locking out the main power and the main air valve with a key lock before maintenance is performed.

4 Operating the machine

The operator ensures that the machine's production process runs smoothly.

All the basic operations that are relevant to the operator are described in this chapter.



4.1 Machine status

There are several ways to establish the machine status.

4.1.1 Visual Signals



Beacon light including acoustic signal

Red beacon light

Signal light on (Constant):

Machine has stopped because of an error.

Signal light is blinking (Intermittent):

Machine has stopped because an emergency stop was pressed.

Amber beacon light

Signal light on (Constant):

Machine has stopped.

Signal light is blinking (Intermittent):

Machine is starting.

Blue beacon light

Signal light is blinking (Intermittent):

Machine in standby. (Waiting for down/upstream machine(s).)

Green beacon light

Signal light on (Constant):

Machine in jogging mode.

Signal light is blinking (Intermittent):

Machine is suspended.

4.1.2 Acoustic signals

Some machine statuses are also indicated with acoustic signals:

Sound 1 - Horn, no pulses

Starting up the machine

Acoustic signal of 1 second only.

Sound 2 - Horn pulses of 0.2 seconds

Fault signal

Acoustic signal with a cycle of 2 seconds ON and 10 seconds OFF.

Sound 3 - Horn pulses of 0.1 seconds

Warning signal

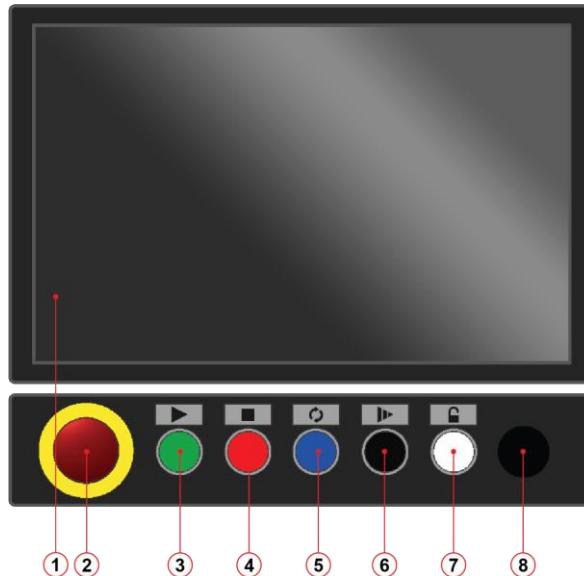
Acoustic signal with a cycle of 2 seconds ON and 10 seconds OFF.

4.1.3 Operating screen

The current machine status can also be read from the operating screen.

4.2 HMI (Human Machine Interface)

Most of the machines operating instruments are located on the Human Machine Interface (HMI).



- | | |
|---------------------|------------------|
| 1. Operating screen | 5. Machine reset |
| 2. Emergency stop | 6. Jog function |
| 3. Machine start | 7. Unlock doors |
| 4. Machine stop | 8. USB |

Image HMI

4.2.1 Start button

The 'Start' button has a light that indicates the status of the machine.

Light in button	Status of the machine
On	Machine is running
Flashing	Machine is ready to start

Push the 'Start' button to start the machine after:

- All emergency buttons are released
- All doors are closed
- All errors are solved

4.2.2 Stop button

The 'Stop' button has a light that indicates the status of the machine.

Light in button	Status of the machine
On	Machine is stopped

Push the 'Stop' button to stop the machine:

- To stop production.
- To stop the machine if there is no emergency.

4.2.3 Reset button

The 'Reset' button has a light that indicates the status of the machine.

Light in button	Status of the machine
Off	No Fault
On	Reset in progress
Flashing: 0.5s on, 0.5s off	Emergency or Error situation

Push the 'Reset' button to reset the machine after:

- All emergency buttons are released
- All doors are closed
- All errors are solved

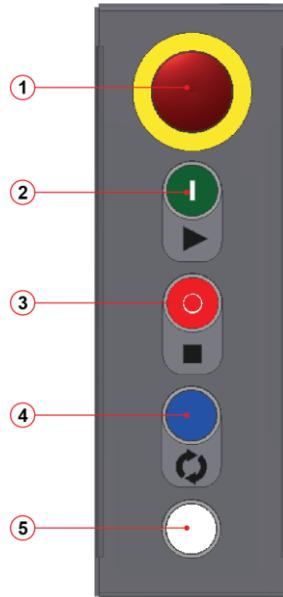
4.2.4 Unlock doors button

The 'Unlock doors' button has a light that indicates the status of the doors.

Light in button	Status of the doors
Off	Unlocked
On	Locked
Flashing: 0.5s on, 0.5s off	Busy locking
Flashing: 0.2s on, 0.2s off	Locking error

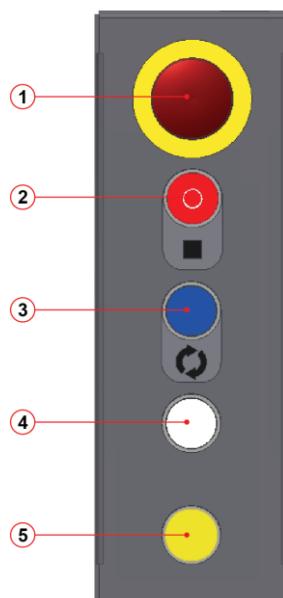
4.3 Infeed Operating Panel

Your machine has one or more additional operating panels to operate the infeed section(s).



- | | |
|-------------------|-----------------|
| 1. Emergency stop | 4. Reset |
| 2. Start machine | 5. Unlock doors |
| 3. Stop machine | |

Infeed Operating Panel Vertical



- | | |
|-------------------|----------------------------------|
| 1. Emergency stop | 4. Unlock doors |
| 2. Stop machine | 5. Special infeed (move x steps) |
| 3. Reset | |

Infeed Operating Panel Vertical

4.4 Operating screen

The operating screen can be used to electronically test the machine and to track down errors. In addition the screen can be used to adjust the machine's settings and functions. Many screens are password-protected to prevent misuse.

4.5 Main screen

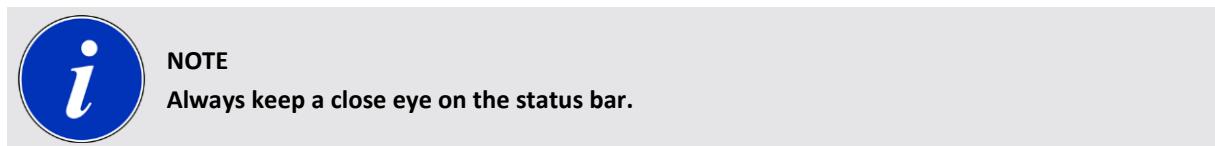
The main screen is displayed when the machine is started up. Here you can find the machines overall functions and an overview of all machine units and their individual status.



Main screen

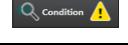
4.5.1 Status bar

The status bar is the ribbon at the bottom of the screen. On the status bar you can find the selected language for the screen, if applicable an active alarm message and the selected recipe.



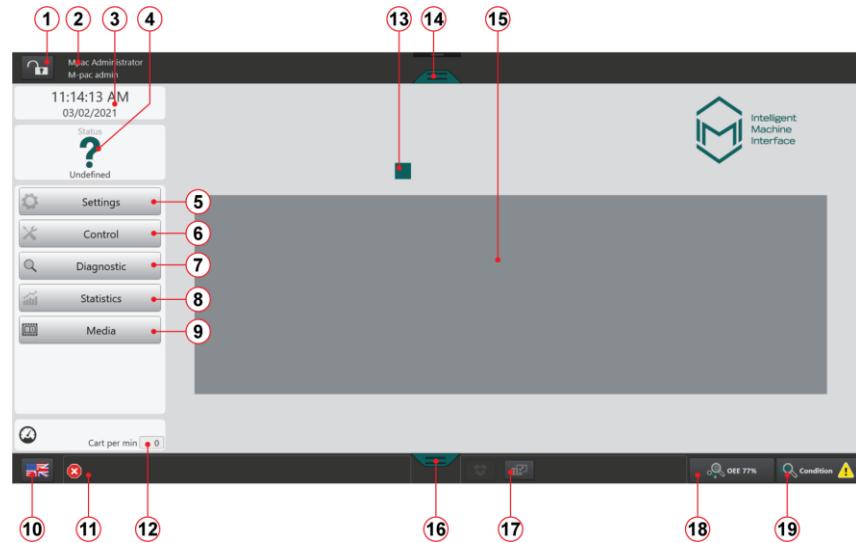
Status bar

Status bar explanation

No alarms.	
Announcements shown.	
Message.	
Alarm indication. Tap to navigate to the alarms screen.	
A message is shown.	
Warning!	
A warning message is shown.	
Alarm!	
The last alarm message is shown.	
Recipe indication.	
Recipe list.	
Overall Equipment Efficiency button	Opens the OEE overview screen. 
Condition monitor button	Opens the condition monitor screen. 

4.6 Functions main screen

The main screen has the following information and functions:



- | | |
|---------------------------------|---------------------------------|
| 1. Login level | 11. Alarm message |
| 2. Machine mode and login level | 12. Machine speed |
| 3. Date and time | 13. Machine module status |
| 4. Machine status | 14. Top menu slider |
| 5. Button Settings screen | 15. Illustrated machine modules |
| 6. Button Control screen | 16. Bottom menu slider |
| 7. Button Diagnostic screen | 17. Selected recipe |
| 8. Button Statistics screen | 18. Button OEE screen |
| 9. Button media screen | 19. Button Condition screen |
| 10. Selected language | |

Main screen functions

4.6.1 Keypads

When a value or text should be entered, tap the value/text field to display a keypad.



Numeric keypad



Qwerty keypad



Use the backspace  to remove the value or text. The large blue button is the 'enter' to confirm the value/text.

4.6.2 Date and time

The date (mm/dd/yy) and time are visible on top of the left column on the main screen.

4.6.3 Machine status

The status of the machine is visible in the left column on the main screen.

Production	
Partial production	
Stopped	
Paused	
Resetting	
Deactivated	

4.6.4 Machine speed

The current machine speed  is visible in the left column of the main screen.

4.7 Bottom menu

To open the bottom menu, slide the bottom menu slider up.



- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Language selection button 2. Alarms tab 3. History tab | <ol style="list-style-type: none"> 7. Condition monitor acclimation 8. Current availability 9. Current OEE, graphical presentation 10. Current performance 11. Current quality |
| <i>Bottom menu</i> | |

4.7.1 Language selection

Within the EU the operating screen is set to the locally applicable language.

Outside the EU, the standard is for the operating screen to be set to the English language.

1. Open the bottom menu by sliding it up.

2. Tap the language selection button of the desired language.

4.7.2 Alarms

All active alarms are visible in the left tab in the bottom menu. The alarms are in chronological order.

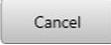
4.7.3 History

The right tab in the bottom menu displays the history of the last error events.

An event can be an error report or the fact that an error is solved. The most recent error is displayed at the top of the screen.

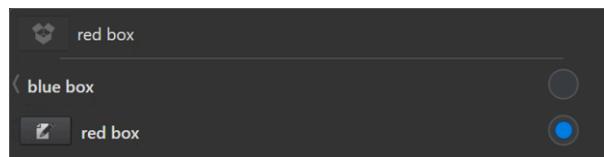
4.7.4 Recipe selection

A different product can be selected in the bottom menu. (When not logged in at password level 1 or higher, this function cannot be used.)

1. Open the bottom menu by sliding it up.
2. Tap the recipe selection button  behind the desired recipe.
 -  Are you sure you want to switch to the selected recipe?
3. Tap  to confirm or  to cancel.
 -  is the active recipe.
4. Changing the settings of the recipe requires password level 3.

4.7.4.1 Edit recipe

Make sure to log in the correct login level to change the recipe settings. (See Login (on page 44))



Recipe selection screen

To edit a recipe, tap the button  in front of the recipe. A menu appears where the following actions can be selected:

- Rename the recipe.
- Save the settings in the recipe.
- Copy the settings of this recipe to an existing recipe.
- Copy the settings of this recipe to a new recipe.
- Delete this recipe.

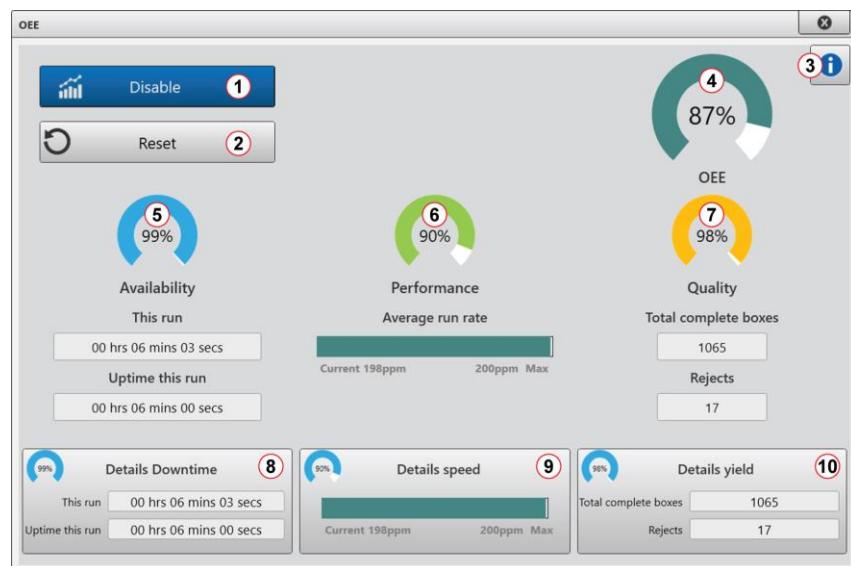
4.7.5 Overall Equipment Efficiency (OEE)

The Overall Equipment Efficiency is a part of our Industry 4.0 program.

This tool shows the manufacturing time that is truly productive. It visualizes the actual performance and indicates production bottlenecks. This way the machine performance becomes controllable and improvement become a part of production.

The Overall Equipment Efficiency in percentage is live calculated with the following formula:

$$\text{OEE} = \text{Availability} * \text{Performance} * \text{Quality}$$



- 1. Disable button
- 2. Reset button
- 3. Information button
- 4. Current OEE
- 5. Current Availability
- 6. Current performance
- 7. Current quality
- 8. Downtime info and button
- 9. Speed info and button
- 10. Yield info and button

Overall Equipment Efficiency screen

4.7.5.1 Disable OEE

Use the disable button to completely disable all OEE functions and calculations. No previous data will be erased.

After enabling the OEE all calculations are resumed from the moment the OEE was disabled.

4.7.5.2 Reset OEE

Use the reset button to discard all previous data and restart monitoring.

4.7.5.3 Availability OEE

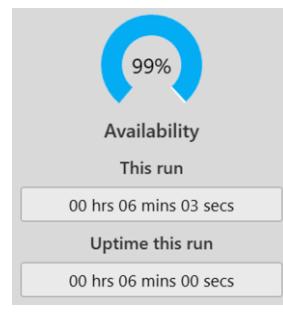
The availability in percentage is calculated with the following formula:

$$\text{Availability} = \text{Total runtime} / \text{Total time}$$

The times are calculated from the last OEE reset.

E.g.

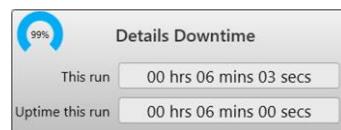
If the last OEE reset was 4 hours ago (This run) and the machine has run for 3 hours total since (Uptime this run), the availability is $4/3 = 75\%$



Availability

Downtime details

As the Availability is 75%, the downtime is 25%. Extra information about the downtime reasons can be found by tapping the Details downtime button.

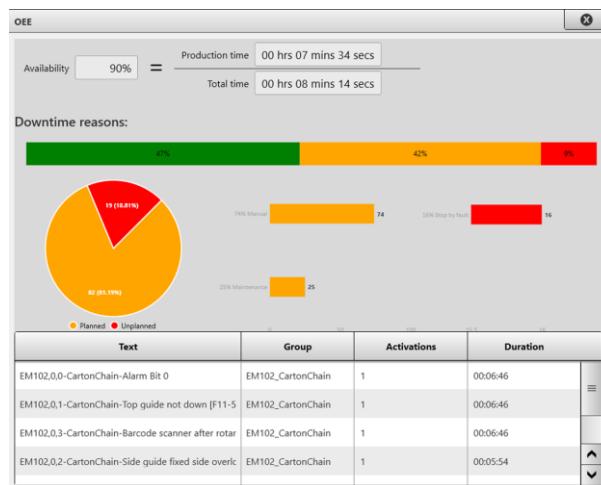


Details downtime button

The downtime can have many reasons. In the downtime detail screen all reasons are shown in graphical detail and even more specific in the table below.

The graphical presentation divides the downtime in the following:

- Production
 - Time no down time has occurred. (Green)
- Planned
 - Planned down time is the time the machine has been in maintenance mode, manual mode, change over mode or any other mode the machine can be set to from the Pack ML status list. (Orange)
- Unplanned
 - Unplanned down time like errors, safety stops and waiting for down/up stream machines. (Red)



Downtime details screen example

4.7.5.4 Performance OEE

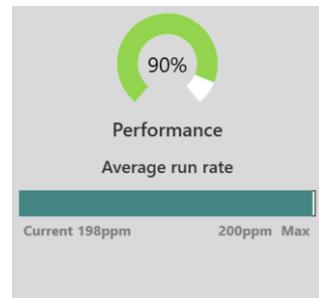
The Performance in percentage is calculated with the following formula:

$$\text{Performance [%]} = \text{Total products} / (\text{Maximum product infeed speed [ppm]} * \text{Total runtime [min]})$$

The times are calculated from the last OEE reset.

E.g.

If the last OEE reset was 10 minutes ago (This run), the maximum product infeed speed is 60 ppm and the total products are 450 products, the Performance is $450 / (60 * 10) = 75\%$

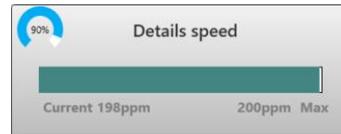


Performance

Speed details

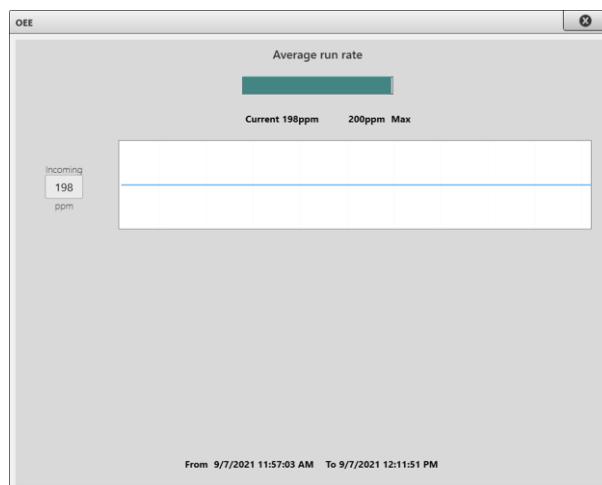
The average product speed, in products per minute [ppm], is shown below Average run rate.

Details of the product speeds related to the time can be found in the Speed details screen by tapping the Details speed button.



Details speed button

The actual speeds in time from the last OEE reset are shown in the graph.



Speed details screen example

4.7.5.5 Quality OEE

The Quality in percentage is calculated with the following formula:

$$\text{Quality}[\%] = \frac{\text{Total approved products}}{\text{Total products}} \times 100$$

The times are calculated from the last OEE reset.

E.g.

Since the last reset a total of 1000 products have been passed through the machine, 750 of them are approved (250 rejects).

Quality = 750 / 1000 = 75%



Quality

Yield details

The total of correctly produced products is the quality. To get the quality as high as possible you want to know the where, why and how many of the rejected products.

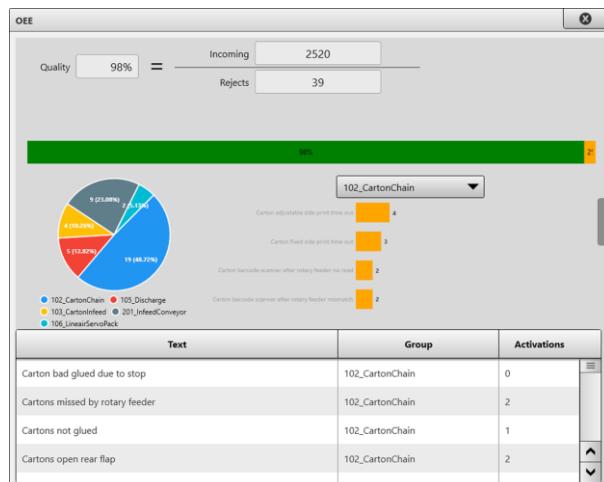
All details of the rejected products can be found in the Yield details screen by tapping the Details yield button.



Details yield button

In the yields details screen all triggered sensors are shown in the table on the bottom.

Choose a group from the pull-down menu to display all triggered sensors within this group in a graph.



Yield details screen example

4.7.6 Condition monitor

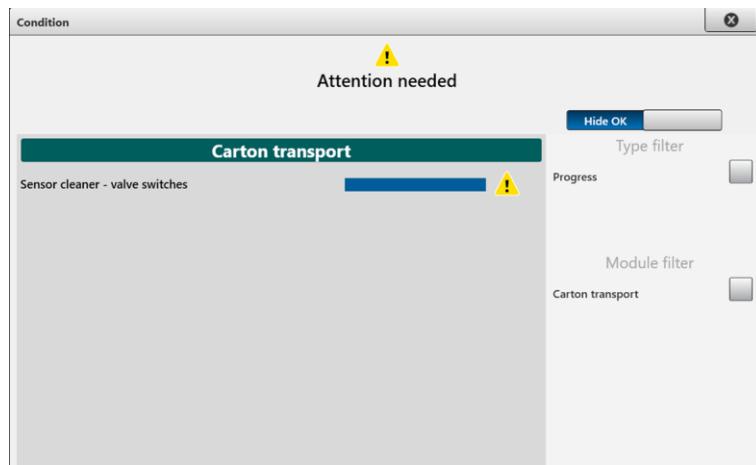
The condition monitor is a part of our Industry 4.0 program.

By predicting upcoming maintenance needs up to six months ahead you are in control of your service intervals. This wear oriented maintenance leads to optimal performance of the machine parts so that the product quality is always at its maximum level.

The condition monitor monitors the following items:

- (servo) motor
 - Temperatures
 - Torque
 - Speed
 - Follow error
- Compressed air
 - Main air flow
 - Air pressure
- Cylinders and valves
 - Number of switches
- Environment
 - Temperature
 - Humidity
- Electrical cabinet
 - Temperature

Tap the condition button in the lower right corner of the main screen to open de condition monitor screen. On this screen all active alerts are shown.



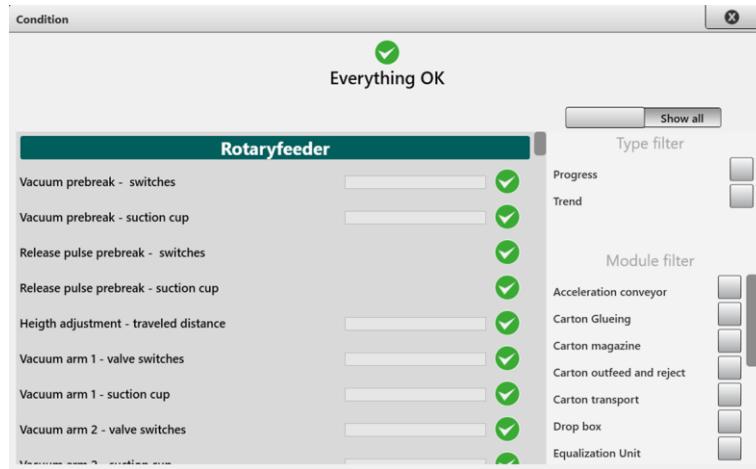
Condition monitor screen example

Show all items

Toggle to 'Show all' to display all items. The icons behind every item will tell the items condition.

Use the module filter on the right to filter the items on module level. Multiple modules can be selected.

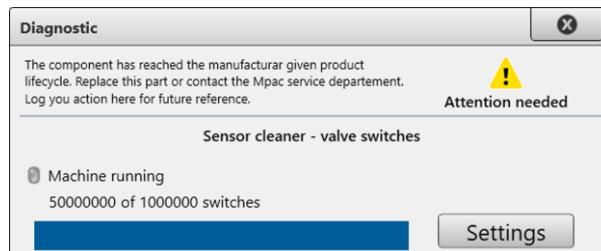
The filter type will display either the progress items or trend items.



Condition monitor screen show all example

Diagnostics

Tap on the item to see its diagnostics and the factory recommendations in case the item is marked for attention.



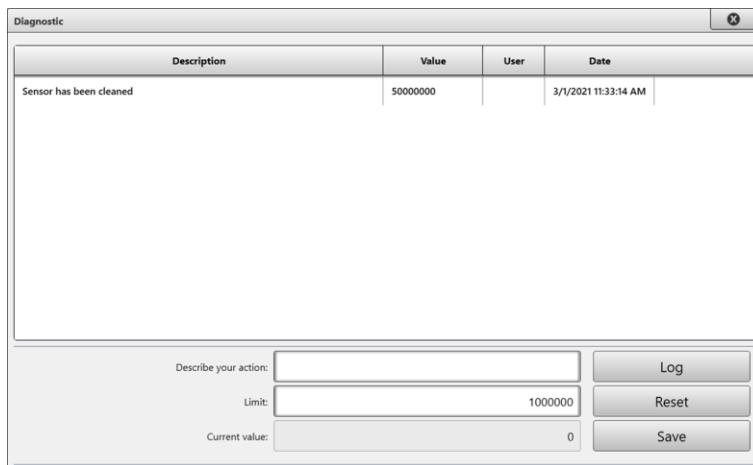
Condition monitor item diagnostics example

Change diagnostics

It is possible to change the item diagnostic to fine-tune the attention trigger according the conditions of the machine on site.

Use the following procedure to change the attention trigger limit:

1. Tap the 'Limit' text box and change the value.
2. Tap the 'Describe your action' text box and give a clear and short reason of the change being made.
3. Tap the 'Save' button to save the value and log the change with the description, new limit value, logged in user, date and time.
 - Any new value cannot be saved without a description.
 - A new entry of the changes appears in the log list.



Diagnostics settings screen

Reset diagnostics

Use the following procedure to reset the counter of the diagnostics:

1. Tap the 'Describe your action' text box and give a clear and short reason for the reset.
2. Tap the 'Reset' button.
 - The counter value will change to '0'.
3. Tap the 'Save' button to save the reset and log the reset with the description, current limit value, logged in user, date and time.
 - A reset cannot be saved without a description.
 - A new entry appears in the log list.

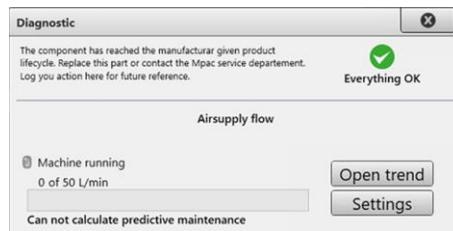
Diagnostics log only

Use the following procedure to log an items diagnostics only. (No changes or reset):

1. Tap the 'Describe your action' text box and give a clear and short reason for the log only reason.
2. Tap the 'Save' button to save the entry as log only with the description, current limit value, logged in user, date and time.
 - A log only entry cannot be saved without a description.
 - A new entry appears in the log list.

Trend

Of some items a trend is monitored as well.



Condition monitor item with trend example

Tap the 'Open trend' button to open the trends screen. The selected item is automatically displayed for its trend in a graph (A).



Trends screen example

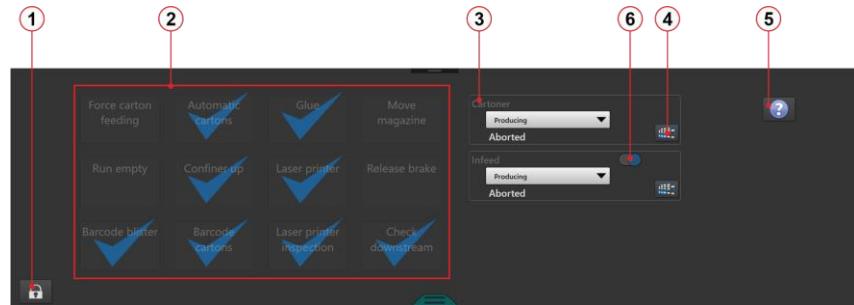
Use the zoom in and out buttons (B) and the left and right buttons (C) to navigate and narrow down the graph to a specific area of interest.

The same narrowing down can be done with the full trend graph (D). To do this you can pinch and move the gray area along the full graph.

Select more than one trend item to display their trends in one graph and with different line colors. This way it is possible to see their relations in time.

4.8 Top menu

To open the top menu, slide the top menu slider  down.



- 1. Login level button
- 2. Quick access functions
- 3. Machine module mode
- 4. PackML diagram
- 5. Help
- 6. Machine module ON/OFF

Top menu example

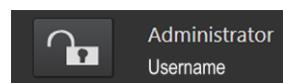
4.8.1 Login

1. Tap on  to open the login screen.
2. Fill in the credentials.
3. Tap  to confirm.



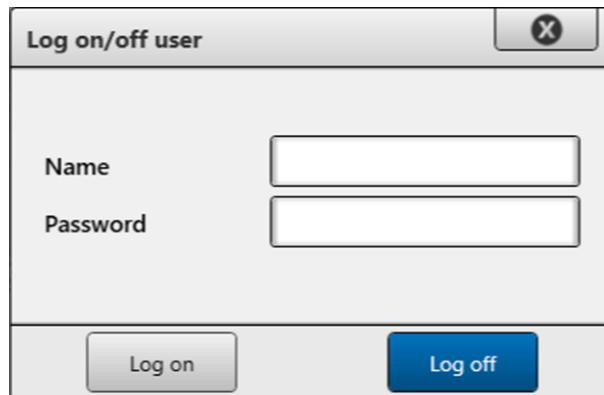
Login screen

When successfully logged in the users login status is shown in the top bar.



4.8.2 Change user or log off

1. Tap  to change the user or to log off.
2. Fill in other credentials then already used.
3. Tap  to confirm.
4. Tap  to log off.

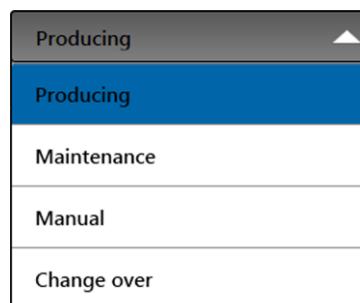


Change user or Log off

4.8.3 Machine module mode

The mode of each machine module can be changed separately. To do so, obey this procedure:

1. Stop the machine with the stop button.
2. Open the top menu by sliding it down.
3. Tap the pull down menu of the module that needs to change mode.
4. Tap the desired mode.



Modes in pull down menu

Descriptions of the different modes:

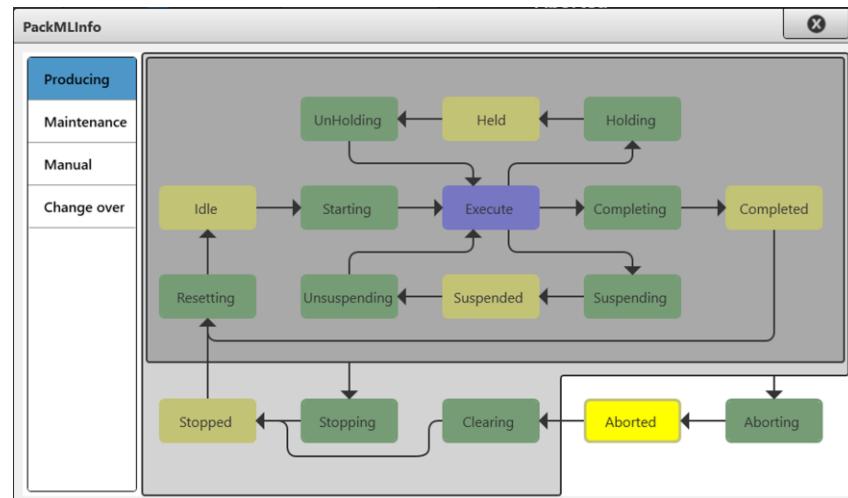
- **Producing mode:** Select this mode for normal production. The unit is now responding to up- and downstream signals. In this mode it is not possible to jog and all peripherals used to check and control the production, like sensors and vision systems, are turned on and cannot be turned off unless another mode is chosen.
- **Maintenance mode:** Select this mode to let the machine run without up- and downstream signals. In this mode it is possible to jog the machine and all peripherals used to check and control the production can be individually turned on or off.
- **Manual mode:** Select this mode to move a single actuator; jog a single axis or move a cylinder.
- **Change over mode:** This mode is automatically selected by the start of the change-over procedure and sets the machine in the correct position to change-over.

4.8.4 PackML diagram

The PackML diagram is a tool that shows the mode and the status of the machine in an orderly manner.

Mpac uses ISA-TR88.00.02-2008 for the PackML functions and diagram.

1. Tap on in the top menu of the corresponding machine module to display the PackML info screen.



PackML diagram

4.9 Quick access functions

A couple of useful functions are collected in the top menu for easy access. Some of these functions can only be used when the machine or module is set in a specific mode, see Machine module mode (on page 45).

1. Open the top menu by sliding it down.
2. Tap the function to activate or deactivate it.

- A function is active when the blue check mark is visible: 
- When a button is grayed out, the current login level is not high enough to adjust this function.

All quick access functions for machine MN201099 are listed below.



4.9.1.1 Enable carton detection

Tap this button to enable or disable the carton detection.

4.9.1.2 Enable minor flap detection

Tap this button to enable or disable the minor flap detection.

4.9.1.3 Glue

Tap this button to glue the cartons. The status of the Hot melt is also checked (temperature, errors, etc.). This function must be activated during production.

4.9.1.4 Automatic cartons

Tap this button to make the Rotary feeder only take a carton out of the template when a product is positioned correctly (e.g. it is not too high).

This function must be activated during production.

4.9.1.5 Force carton feeding

Tap this button to activate or deactivate the vacuum in the Rotary Feeder to take cartons from the Template.

4.9.1.6 Move magazine

This function cannot be activated in producing mode. Tap the button to manually move the carton magazine conveyor.

4.9.1.7 Release brake rotary feeder

The Rotary Feeder brake is activated when a door is open or an E-stop is activated. Use this function to deactivate the brake.

4.9.1.8 Enable product in bucket detection

Tap this button to enable or disable the product in bucket detection.

4.9.1.9 Enable product in bucket too high detection

Tap this button to enable or disable the product in bucket too high detection.

4.9.1.10 Enable Refeed

This function switches on the Refeed.

4.9.1.11 Enable carton at major flap detection

Tap this button to enable or disable the carton at major flap detection.

4.9.1.12 Enable major flap detection

Tap this button to enable or disable the major flap detection.

4.9.1.13 Check downstream

When this function is switched on, the machine goes into standby when the downstream machine is stopped.

4.9.1.14 Check upstream

When this function is switched on, the machine goes into standby when the upstream machine is stopped.

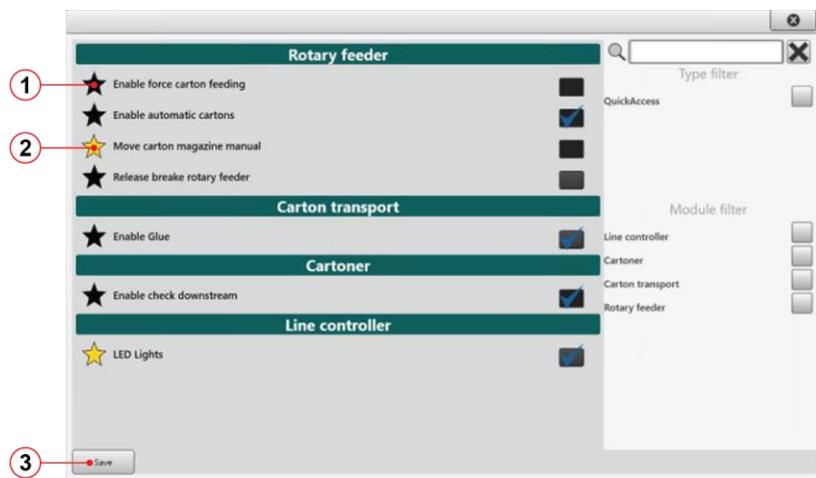
4.9.1.15 Led lights

With this function the lighting in the machine comes on or goes off.

4.9.2 Adjust the Quick access buttons

The Quick access functions can be added or removed from the top menu:

1. Tap the button  under the Quick access buttons.
 - A pop-up screen opens with all options for the Quick access buttons.



Quick access functions screen example

2. Tap the functions to show (2) (highlighted) or hide (1) (dark) them on the top menu.
3. Tap the 'Save' button (3) to save the new settings for the Quick access menu.

4.10 Submenus on main screen

Each of the buttons on the left side of the main screen contain a sub menu as stated below.

4.10.1 Settings



This menu shows all settings in the machine. You can filter the visible settings on input type of the setting and on machine module on the right side of the screen.

All settings for machine MN201099 are listed below.

The icons in front of the settings show the entry possibilities of the settings:



Activate or deactivate by checking the box behind the setting



Fill in a value/number



Fill in text



Fill in the CAM-values by tapping this CAM-icon



Set an offset

4.10.1.1 Autoload settings

Setting	Description
Product sticks out of bucket	Enter the CAM positions for a product that is sticking out of the bucket. The detection is active within the CAM area.
Bucket width offset	Enter the offset for the bucket width.
Autoload position offset	Enter the distance between the autoload and the lug track to synchronize them.
Autoload pusher forwards	Set the cam positions for the forward position of the pusher.
Pusher always forward while jogging	Activate or deactivate the pushers in the jogging mode.
Only push perfect products	Activate or deactivate this option to push only the products into the carton with no faults. When activated, the faulty products will be rejected.
Product in bucket too high	Enter the CAM positions for a product that is too high. The detection is active within the CAM area.
Product in bucket	Enter the CAM positions for a correct position of the product(s) in the bucket. The detection is active within the CAM area.
Delay product reject full	Enter the time the sensor at the product reject is active before the message "Product reject full" is generated.
Maximum consecutive products in bucket overheight	Enter the amount of too high formation faults detected in the buckets before the cartoner stops. Enter "0" to switch off this function.

4.10.1.2 Discharge settings

Setting	Description
Open major flap	Enter the CAM positions for the detection of an open major flap. The detection is active within the CAM area. The start position is the position where the sensor detects the front of the fixed lug. The end position is the position of the end of the lug. An open major flap is detected when there is no gap between start and stop.
Maximum consecutive open major flaps	Enter the amount of open top and bottom flap faults to be detected before the cartoner stops. Enter "0" to switch off the open flap detection.
Carton at major flap detection	Enter the CAM positions for the detection of a carton at the major flap detection. A carton will be detected at the within the CAM area.
Maximum consecutive cartons at major flap detection missed	Enter the amount of missed cartons before the cartoner stops. Enter "0" to switch off the carton detection.
Reject	Activate or deactivate the carton reject.

Setting	Description
Reject forced cartons	Activate or deactivate the option to reject the cartons that are fed while the function "Force carton feeding" is on.
Reject position	Enter the CAM positions for the carton reject at the discharge. A carton will be rejected within the CAM area.

4.10.1.3 Carton transport settings

Setting	Description
Carton width offset	Enter a temporary offset of the carton width. With a product change over, this value will be zero again.
Carton height offset	Enter a temporary offset of the carton height. With a product change over, this value will be zero again.
Carton depth offset	Enter a temporary offset of the carton depth. With a product change over, this value will be zero again.
Carton placed in lugs	Enter the CAM positions for a carton placed in the lugs. The detection is active within the CAM area.
Maximum consecutive missed cartons by Rotary feeder	Enter the amount of missed cartons by the rotary feeder before the cartoner stops. Enter "0" to switch off the function.
Maximum consecutive misfed cartons per arm	Enter the amount of incorrect fed cartons by each rotary feeder arm before the cartoner stops. Enter "0" to switch off the function.
Minor flap not closed	Enter the CAM positions for the detection of an open minor flap. The detection is active within the CAM area. The start position is the position where the sensor detects the front of the fixed lug. The end position is the position of the end of the lug. An open minor flap is detected when there is no gap between start and stop.
Maximum consecutive open minor flaps	Enter the amount of detected open minor flaps before the cartoner stops. Enter "0" to switch off the function.
Carton height home position [mm]	Enter the home position of the adjustment of the carton height.
Carton height discharge for changeover	Enter the carton height at the discharge for the change over procedure.
Carton depth home position [mm]	Enter the home position of the adjustment of the carton depth.
Kicker adjustable side offset	Enter the offset distance between the kicker and the moment of touching the carton flap.
Kicker adjustable side start point acceleration area	Enter the position [°] at which the kicker must start the acceleration.
Kicker adjustable side acceleration area speed factor [%]	Enter the factor in percentage of the normal speed for the acceleration of the kicker.
Kicker adjustable side acceleration area length [°]	Enter the angle area [°] in which the kicker must be accelerating.

Setting	Description
Kicker vertical offset	Enter the offset distance between the kicker and the moment of touching the carton flap.
Kicker fixed side offset	Enter the offset distance between the kicker and the moment of touching the carton flap.
Kicker fixed side start point acceleration area	Enter the position [°] at which the kicker must start the acceleration.
Kicker fixed side acceleration area speed factor [%]	Enter the factor in percentage of the normal speed for the acceleration of the kicker.
Kicker fixed side acceleration area length [°]	Enter the angle area [°] in which the kicker must be accelerating.
Glue fixed side	Enter the start and stop CAM position of the glue track. The glue is applied within the CAM area.
Glue adjustable side	Enter the start and stop CAM position of the glue track. The glue is applied within the CAM area.
Glue pressure at minimum speed [bar]	Enter the glue pressure for the minimum machine speed.
Glue pressure at maximum speed [bar]	Enter the glue pressure for the maximum machine speed.
High reference speed for glue pressure profile [cart/min]	Enter the cartoner speed to use the maximum glue pressure. The glue pressure is calculated linear between the minimum pressure and the maximum pressure depending on the cartoner speed.
Low reference speed for glue pressure profile [cart/min]	Enter the cartoner speed to use the minimum glue pressure. The glue pressure is calculated linear between the minimum pressure and the maximum pressure depending on the cartoner speed.
Glue empty carton	Activate or deactivate the option to glue empty cartons.
Maximum consecutive not glued cartons	Enter the amount of not glued cartons before the cartoner stops. Enter "0" to switch off the function.

4.10.1.4 Cartoner settings

Setting	Description
Machine speed [cart/min]	Enter the speed of the cartoner in cartons per minute.
Minimum production speed	Enter the minimum production speed.
Maximum production speed	Enter the maximum production speed.
Jog speed [cart/min]	Enter the jog speed value to move the machine manually.

Setting	Description
Jog speed maximum [cart/min]	Enter the maximum speed to move the machine manually.
Machine speed during recovery	Enter the speed of the cartoner during the recovery cycle in cartons per minute.
Stop position [mm]	Enter the stop position of the cartoner.
Machine acceleration [seconds]	Enter the acceleration of the machine.
Position stop deceleration	Enter the position to start the deceleration in order to stop the cartoner.
Stop delay after upstream stops	Enter the stop delay of the infeed to stop after the upstream machine is stopped.
Start delay after downstream starts	Enter the start delay of the machine to start after the downstream machine is started.
Stop delay after downstream stops	Enter the stop delay of the machine to stop after the downstream machine is stopped.
Overrule Sigmatek	Enable this function to ignore the signals coming from Sigmatek.

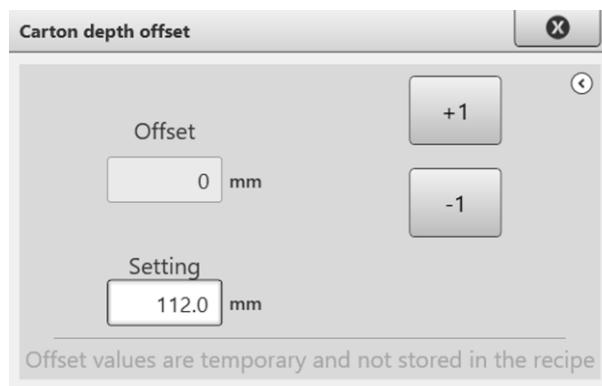
4.10.1.5 Rotary feeder setting

Setting	Description
Carton magazine vibration unit	Activate or deactivate the vibration unit on the carton magazine template.
Blow air between cartons	Activate or deactivate the option to blow air between the cartons on the template magazine.
Carton magazine inclined speed [%]	Enter the percentage of the carton magazine inclined speed relative to the actual cartoner speed.
Carton magazine stop distance	Enter the distance that the carton magazine moves when the template is not empty.
Carton magazine height home position	Enter the home position of the carton magazine in height.
Magazine height offset	The position offset from the magazine height zero point. Different carton types can have different height positions.
Position offset rotary feeder	Enter the distance between the rotary feeder and the lug track to synchronize them.
Maximum consecutive of forced cartons	Enter the amount of forced cartons before the cartoner stops. Enter "0" to switch off the function.
Rotary feeder vacuum	Enter the CAM positions for the rotary feeder vacuum. The rising edge engages the vacuum of each rotary feeder arm.
Blow air time on	Enter the time that air is blown during an air pulse.

Setting	Description
Pre-break vacuum	Enter the CAM positions for the pre-break vacuum CAM value. The rising edge engages the vacuum.
Prebreak release pulse duration	Enter the compensation time for the pre-break air pulse.

4.10.2 Offset settings

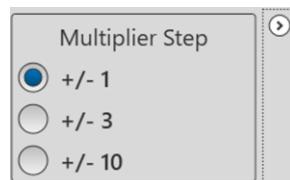
The settings with this icon: are "Offset settings". Tap the setting to open the following screen:



Offset setting screen

Depending on your login rights you can change only the Offset or the Offset and the Setting itself.

With an offset setting you can adjust a position a little bit, if that is necessary to make the machine run smoother or to make the product/carton fit better. By tapping the + and - buttons, the value is changed. (The step size can be changed in the menu under the little white arrow.)



Step setting

The adjustment of the offset setting is not saved in the recipe, so when the changeover procedure is done, the offset setting will be reset to 0 (zero).

4.10.3 Control



The control menu contains all adjustments. For some parts only the current status is displayed. Use these for solving issues.



NOTE

Your machine may not have all the adjustment types as displayed below.

You can filter the adjustments on type and on machine module on the right side of the screen. The different adjustment types are indicated by icons:

-  Linear adjustments
-  Servo motor adjustments
-  Beacon light and sound adjustments
-  Cylinder adjustments
-  Glue adjustments
-  Motor adjustments
-  Barcode scanner adjustments
-  Other adjustments
-  Conveyor product errors
-  Interface signals

4.10.4 Linear adjustments screen

Tap the linear actuator icon  to open the adjustments screen of this actuator.



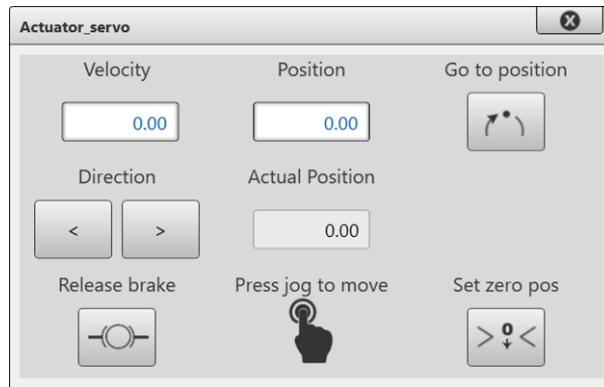
Linear adjustments screen

The functions on this screen are explained below:

- The number under "Velocity" shows the speed of the selected drive. Tap on the number to change this speed.
- The number under "Position" shows the desired position in millimeters of the selected drive. Tap on the number to change this position.
- Tap the button  to move the selected drive to the desired position under "Position".
- Tap the directions buttons  and  to change the moving direction of the actuator.
- The number under "Actual Position" shows the current position of the selected drive.
- Tap the button  to move the selected drive to its home position.
 - To move the selected drive, press and hold the 'Jog' button under the HMI.

4.10.5 Servo adjustments screen

Tap the servo actuator  icon to open the adjustments screen of this actuator.



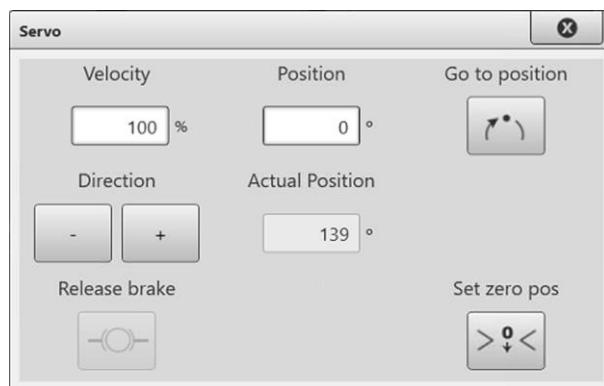
Servo adjustments screen

The functions on this screen are the same as on the Linear adjustments screen. The extra functions on this screen is explained below:

- Tap the button  to release the brake of the selected servo drive.
- Tap the button  to set the zero position of the selected drive.
 - To be able to use this button, first push the 'Reset' button under the HMI.

4.10.6 Rotary feeder servo adjustments screen

Tap the servo actuator icon  to open the adjustments screen of this actuator.



Rotary feeder servo adjustments screen

The functions on this screen are explained below:

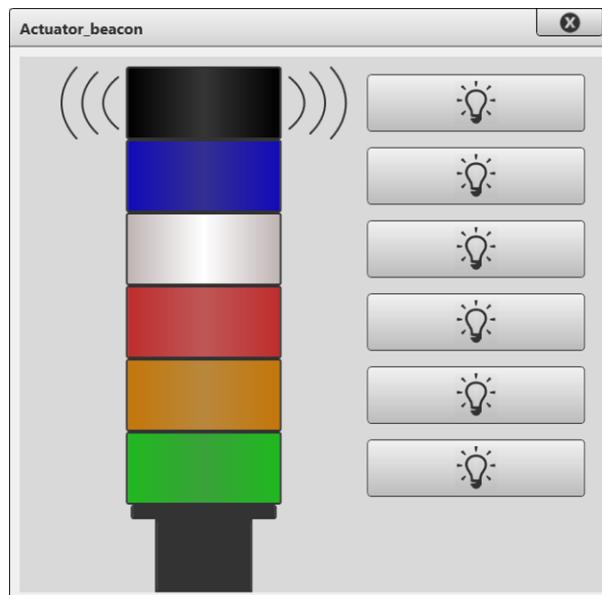
- The value under "Velocity" shows the speed of the selected drive in percentage [%]. Tap on the value to change this speed.
- The value under "Position" shows the desired position of the selected drive in degrees [°]. Tap on the value to change this position.

- Tap the button  to move the selected drive to the desired position under "Position".
- Tap the directions buttons  and  to change the moving direction of the actuator.
- The value under "Actual Position" shows the current position of the selected drive in degrees [°].
- Tap the button  to set the zero position of the selected drive.
 - To be able to use this button, first push the 'Reset' button under the HMI.
- Tap the button  to release the rotary feeder brake of the selected servo drive.

4.10.7 Beacon screen

Tap the beacon icon to open the adjustments screen of this actuator. This screen shows the beacon lights and sound module.

Tap the button  next to the sound or light module to test it.



Beacon screen example

For the explanation of each lamp on this machine see Machine status (on page 23).

4.10.8 Cylinder adjustments screen

Tap the cylinder icon to open the adjustments screen of this actuator.



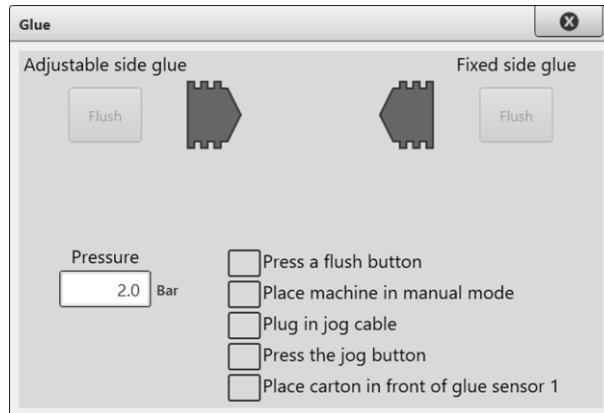
Cylinder adjustments screen

The functions on this screen are explained below:

- Tap the directions buttons and to change the moving direction of the actuator.
- To move the selected drive, press the 'Jog' button under the HMI.
- The indicators above the cylinder icon show whether the cylinder is fully 'in' or 'out'.
 - When the indicator is , the cylinder is on that side.
 - The indicators are a representation of sensors on the cylinders.

4.10.9 Glue adjustments screen

Tap the glue icon to open the adjustments screen of this actuator.



Glue screen

The functions on this screen are explained below:

- The working of the glue guns can be checked in production: In this screen the glue gun icons show when the glue guns are spraying glue.
- The glue guns can be flushed: Tap the 'Flush' button of the glue gun you want to flush. Follow the procedure shown in this screen.
 - When a step of the procedure is completed, the box in front of that step will be checked.
 - When all steps are completed, the glue gun will flush.

4.10.10 AC motor adjustments screen

Tap the motor adjustments icon  to open the adjustments screen of this actuator.

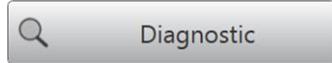


Motor adjustments screen

The functions on this screen are explained below:

- The value under "Velocity" shows the speed of the selected drive in percentage [%]. Tap on the value to change this speed.
- Tap the direction button  to move the motor with the chosen velocity value.

4.10.11 Diagnostic



The diagnostic menu shows diagnostic information of all machine modules. You can filter the information on type and on machine module on the right side of the screen.

Tap on the icon behind the servo or frequency drive to see the status of this drive. If an indicator is blue , the fault behind this indicator has occurred.

The different adjustment types (if installed) are indicated by icons:

 Linear diagnostics

 Servo motor diagnostics

 Printer diagnostics

 Vision diagnostics

 Shift register

 Other adjustments

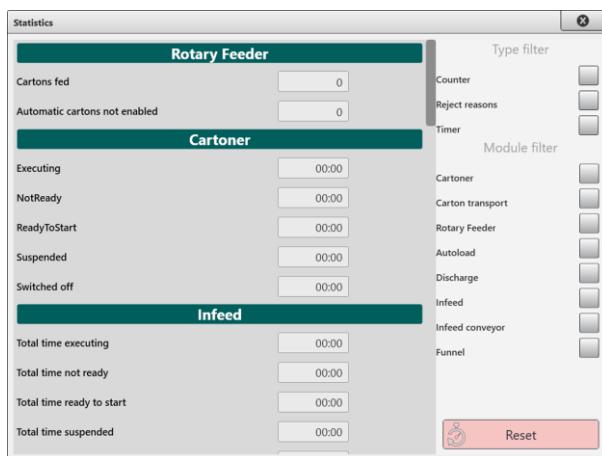
4.10.12 Statistics



The statistics menu shows all counters and timers in the machine.

On the right of the screen the statistics can be filtered on type (counter or timer) and on machine module.

By selecting a counter or timer, it can be set to zero by tapping the "Reset" button.



Example Of A Statistics Screen

4.10.13 Media screen



On the media screen all available media is shown.

The following media can be shown here:

Video



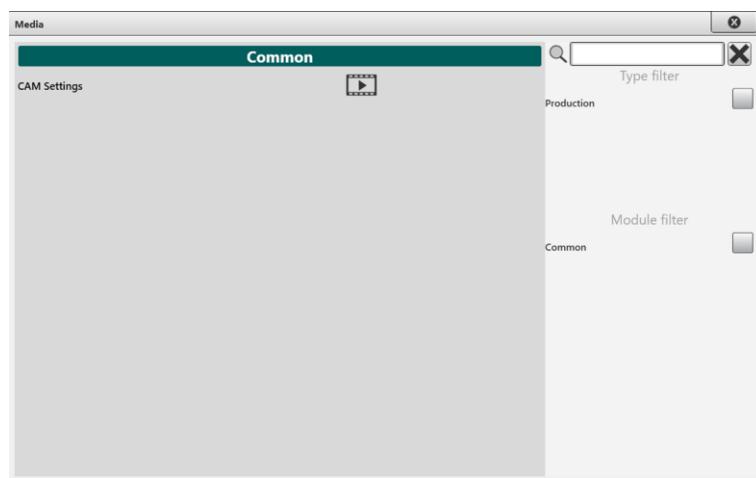
PDF-documents



Images



Use the search tool to find a specific media or narrow it down using the filter option.



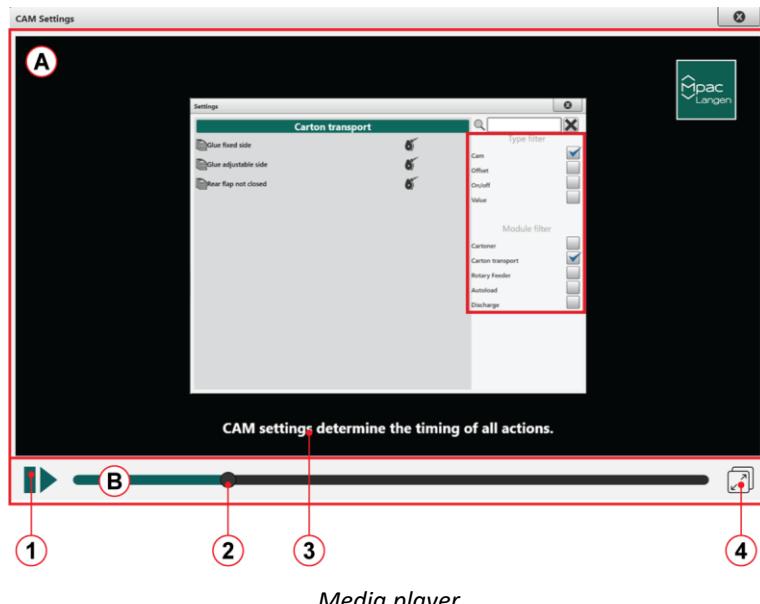
Example media screen

4.10.13.1 Media player

In case a video is selected to play, the media player screen (A) pops up. Expand the video to full screen if needed (4).

Use the time slider (2) to skip time or to see specific content again. Tap on the play button (1) to pause the player or resume playing.

The subtitles (3) are very important to support the video as there is no sound available. They are always visible and change to the chosen language on the main screen. (See Language selection (on page 33))



4.11 Machine start-up



WARNING

Obey all safety requirements.

Safe machine start-up procedure:

1. Turn the main switch(es) to 'ON'.
2. Check the temperature of the glue unit and ensure that it is properly filled up. See Refill Glue Unit (on page 68)
 - It may take some time for the glue unit to reach the proper temperature.
 - Replenish the glue unit with glue granules if necessary.
3. Verify that there is a sufficient number of pre-glued cartons on hand.
 - Replenish the pre-glued cartons if necessary. See Refill Carton Magazine (on page 68)
4. Verify that all emergency stops are deactivated. See Safety features (on page 16)
5. Turn on compressed air to the machine.
6. Check the operator panel to verify whether the proper functions have been activated.
7. Push the 'RESET' button twice.
 - See error messages if the designated fault lamp illuminates. See Machine status (on page 23)
8. Push the 'START' button for 3 seconds.

4.12 Production process



WARNING

Obey all safety requirements.

Keep an eye on the following aspects during the production process:

- Ensure that the Extended Magazine is properly filled with pre-glued cartons. See Refill Carton Magazine (on page 68)
- Ensure that the glue unit contains sufficient glue granules. See Refill Glue Unit (on page 68)
 - Stop production in case the supply of glue is insufficient.
- Ensure that the supply of the products to be packed is running smoothly.
 - A lamp and acoustic signal can be given when no products are being supplied. See Machine status (on page 23)
- Ensure that the discharge of the packed products is running smoothly.
 - A lamp and acoustic signal can be given when cartons are not being discharged. See Machine status (on page 23)
- Remove the rejected cartons/products from the rejection trays on a regular basis.

4.13 Stopping the machine

The following procedures can be used to stop production on the Mpac machine.

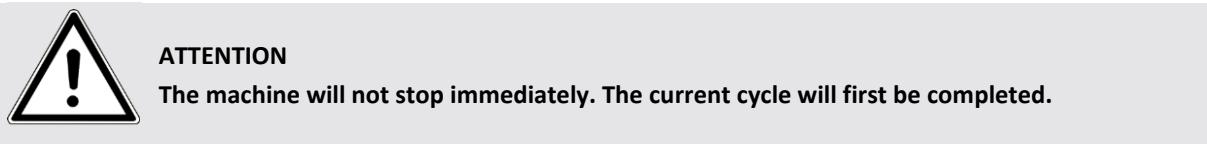
- Cycle stop
- Emergency stop
- Production stop

4.13.1 Cycle stop

A cycle stop is used to stop the machine in a controlled way. The machine will first complete the current cycle before it comes to a stop.

Procedure:

- Hit the 'STOP' button.
 - End of cycle.



- Hit the 'START' button to resume production.
 - Start of new cycle.
 - A lamp and sound signal can be given. See Machine status (on page 23)

4.13.2 Emergency stop

In case of an emergency stop the machine immediately stops. The cycle's position is ignored. Emergency stops should be avoided whenever possible.



An emergency stop is activated by hitting an emergency stop button.

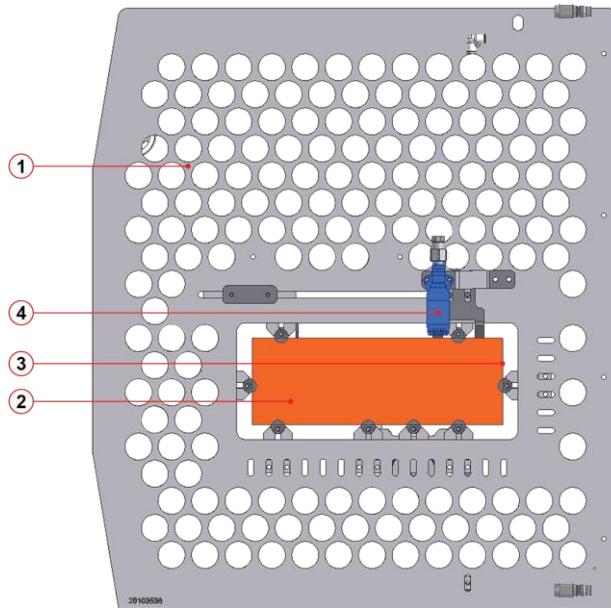
Emergency shutdown procedure after an emergency stop is activated.

1. The machine will slow down to a standstill as quickly as possible.
 - The reason is to limit damage to the maximum extent possible.
 - A lamp and sound signal can be given. See Machine status (on page 23)
2. The power supply to all electric motors will be shut down.
3. The primary air compression system will be shut down and ventilated.
 - Pressure in the red hoses will be maintained.
4. The operator panel will display a message indicating that an emergency stop occurred/was activated.
 - The 24V power supply is not shut down.
5. Localize the problem and resolve it.
6. Prepare for a restart.
 - Remove all products.
 - Close all covers and doors.
 - Disengage all emergency stops.
7. Push the 'RESET' button on the operator panel.
 - The compressed air is re-pressurized.
8. Check any error messages displayed on the operating screen.
9. Push the 'RESET' button again.
10. Push the 'START' button on the operator panel.
 - See error messages if the designated fault lamp illuminates and a sound signal is given. See Machine status (on page 23)

4.14 (Re)filling

4.14.1 Refill Carton Magazine

Make sure the cartons are correctly positioned in the Template. They must be placed in such way that the Rotary Feeder is able to place them on the lug track.

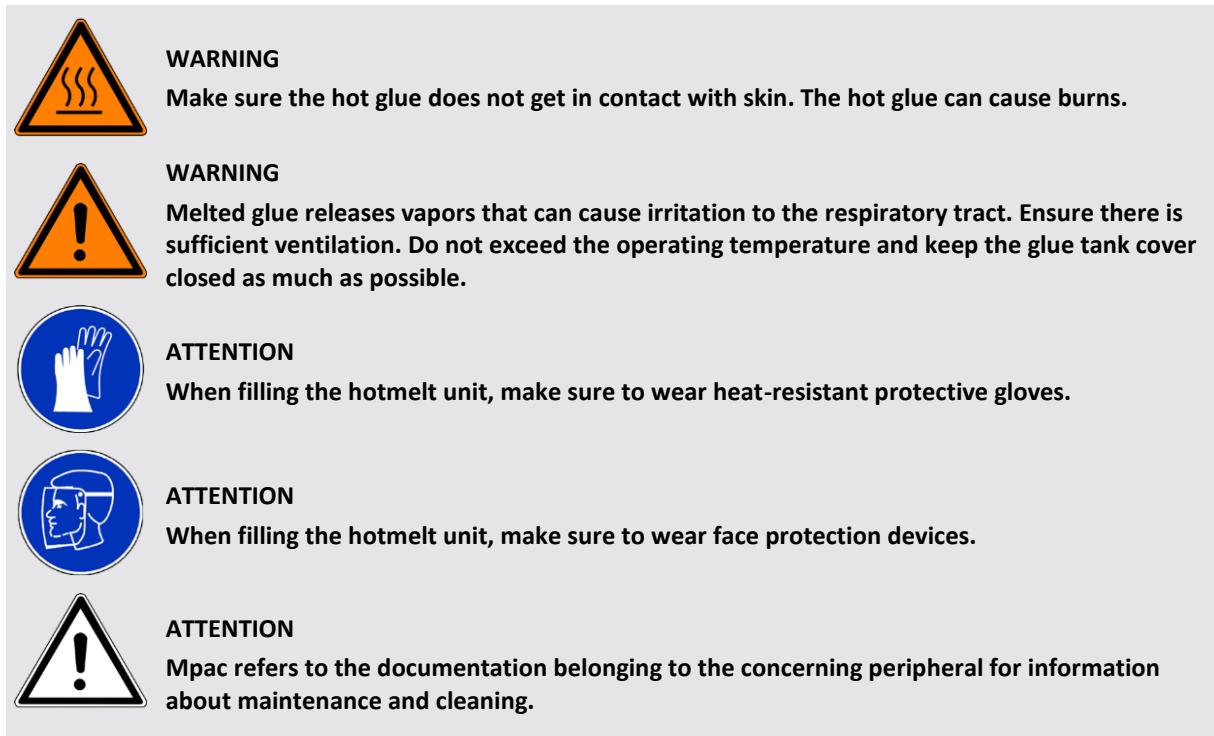


- | | |
|--------------------|--------------------------|
| 1. Template | 3. Side flap fixed side |
| 2. Top side carton | 4. Air nozzle (optional) |

Carton Magazine (Template) example

4.14.2 Refill Glue Unit

The glue unit melts the glue granules required to glue the carton flaps. With high pressure the melted glue is pressed through a heated supply hose. Glue guns spray the glue in patterns on the flap insides.



The glue unit has a storage container for the glue granules. From the storage container an automatic fill system (B) fills the glue unit tank (A) with glue granules as necessary.

The current level of granules can be seen through a transparent section (D) in the storage container.

Procedure:

1. If the level of glue granules is too low open the cover (C) of the storage container.
2. Fill up the tank to the full mark.
 - Never mix different glue types.



Refilling the storage container of the hotmelt

3. Close the cover of the storage container.
4. Check the programmed temperatures.
 - Refer to the corresponding glue data sheet.

Mpac refers to the enclosed user manual for all other glue unit procedures and settings.

5 Format change

The changeover from one carton type to another is referred to as a format change.

This requires many settings to be adjusted which must be properly executed. A faulty setting can cause the machine to malfunction and may even seriously damage it.

It is also of key importance to adhere to the sequence in which the settings are to be adjusted. This can vary from one carton type to the next.



ATTENTION

Make sure to fully familiarize yourself with the previous chapters.

5.1 Format change chart

All settings per product needed for a format change are listed in the format change chart.

The codes correspond with the codes attached on the Mpac machine.



WARNING

Never change a value without sufficient knowledge of the subject. Serious damage can occur when incorrect values are used.

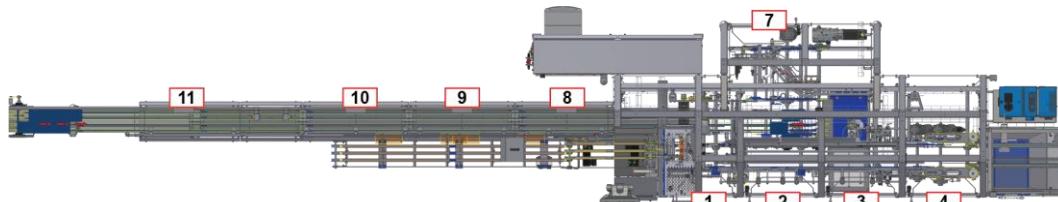
In case of doubt, always contact Mpac service department.

Format Change Chart		Mpac Langen					
Code	Description	1					
B1.01	Extended magazine width	35					
B2.00	Template	●					
B3.20	Rotary feeder width	105					
B4.00	Pre break width	20					
B4.01	Pre break width 2	105					
B4.10	Pre break height	75					
B4.11	Pre break height 2	75					

Example format change chart

5.2 Door assignment

All doors and covers with electrical safety locks are numbered. The changeover chart can refer to these door numbers for the location of adjustments and change over parts.



Door number assignment

5.3 Format change procedure



ATTENTION

To perform the operations covered by this chapter, the operator must be authorized to set the operating screen to Level 1.



WARNING

Unless specifically indicated otherwise, never start the machine during a format change. This could cause serious damage to the machine.

All codes contained between [...] refer to the setting's label used in the format change chart. These codes are also used as part of the settings displayed on the machine.



ATTENTION

Always obey the changeover list. The procedure that follows gives extra explanations of the changeover steps. If the format change chart and the procedure are not the same, the format change chart is leading.



WARNING

Obey all safety requirements.

5.3.1 Empty the machine

1. Make sure the machine is stopped. See Production process (on page 65, "Stopping the machine" on page 66)
2. Remove all cartons and products still in the machine.
3. Remove any remaining pre-glued cartons from the magazine.
4. Remove all products from the reject bins/conveyors and around the machine.

5.3.2 Product format change wizard

**NOTE**

The machine can only start normal production after the format change wizard has successfully completed.

1. Make sure the machine is empty. See Empty the machine (on page 72).
2. Select a changeover recipe in the product selection screen. See Recipe selection (on page 33)
 - Confirm to change the product recipe.
3. Make sure all doors and covers are closed.
 - Use the 'Reset' button to reset the machine for faults.
4. Follow the instructions on the HMI.

The machine starts the automatic format change cycle.

- Acoustic signal.
- Pusher(s) will retract.
- All related servo drive shafts are moving to their format change positions.
 - Positions for easy access during the manual format change procedure.
- All related linear adjustments are moving to their format change positions.
 - Positions to prevent unintended collisions.
- 5. If installed, use the 'Jog' button to move the Extended magazine to its format change position.

**WARNING**

This movement is outside the protective covers of the machine, keep hands and other body parts clear from the moving components.

Manual adjustments

6. Open the door or cover to set the manual adjustments according the format change chart. See Manual format change procedure (on page 74)
 - When needed the jog function can be used to change out parts.
 - Close all doors/covers and reset the machine before jogging the machine.
7. Confirm the manual adjustments when done on the HMI to proceed with the automatic format change cycle.

Resuming the automatic format change cycle

- All automatic format change adjustments are moving to the actual positions of the chosen product recipe.

**NOTE**

The automatic format change procedure is guarded by sensors. When a problem is detected the complete format change cycle starts over.

8. If installed, use the 'Jog' button to move the Extended Magazine back to its production position.
 - This adjustment is outside the machine and must be done with care for safety.
9. Confirm the format change on the HMI when the format change procedure is completed.
10. Use the 'Reset' button to reset the machine.
 - All servo drive shafts are moving to the actual positions of the chosen product recipe.
11. Fill the Template Magazine and the Extended Magazine with pre-glued cartons.
12. Use the 'Jog' function to check the machine for any faults.
13. Start the machine for production. See Machine start-up (on page 64)

5.3.3 Manual format change procedure

5.3.3.1 Extended magazine width

Adjust the extended magazine guiding for the magazine width [B1.01].



Extended magazine width

5.3.3.2 Uncouple air hose(s)

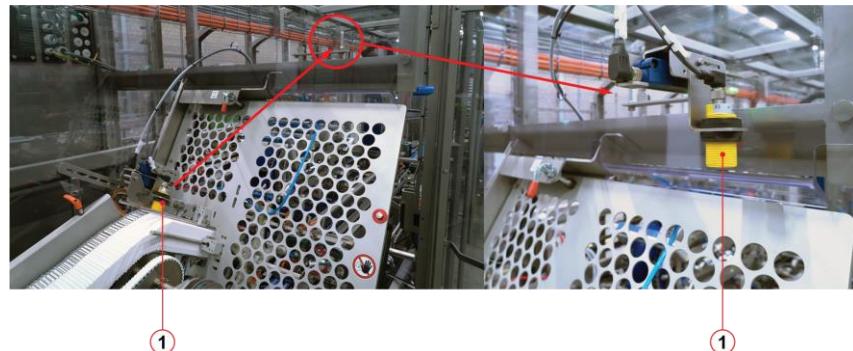
Uncouple the air hose(s).



Air hose template

5.3.3.3 Relocate Template Sensor

Disconnect the sensor (1) on the Template magazine and place it temporarily on the sensor holder.



Template sensor relocation

5.3.3.4 Remove Template

1. Make sure all cartons are removed from the template magazine and extended magazine.
2. Slide the entire Template magazine out.



CAUTION

When sliding the template out, hold on carefully. It could fall out of the template holder and damage.

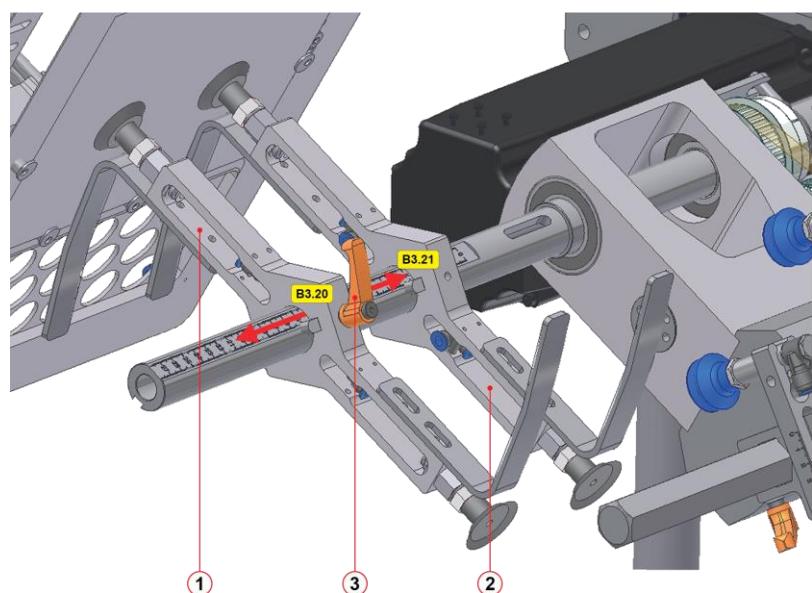
3. Carefully slide another Template magazine [B2.00] in the template holder.
4. Reattach the air hoses.
5. Replace the Template sensor back from the holder to the Template magazine.

5.3.3.5 Rotary Feeder width

Adjust the Rotary Feeder arm 1 (1) using clamp (3) [B3.20].

In case more than one Rotary Feeder arm (2) can be adjusted:

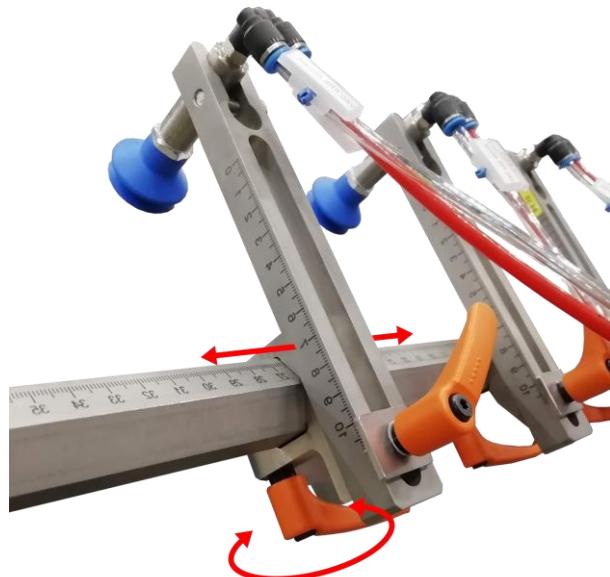
- Rotary Feeder arm 2 - [B3.21]
- Rotary Feeder arm 3 - [B3.22]
- Rotary Feeder arm 4 - [B3.24]



2 Head Rotary Feeder arm width example image

5.3.3.6 Pre-break width

Adjust the width of the pre-break arms [B4.00] to [B4.05].



Pre-break arms width example image

5.3.3.7 Rotary Feeder width

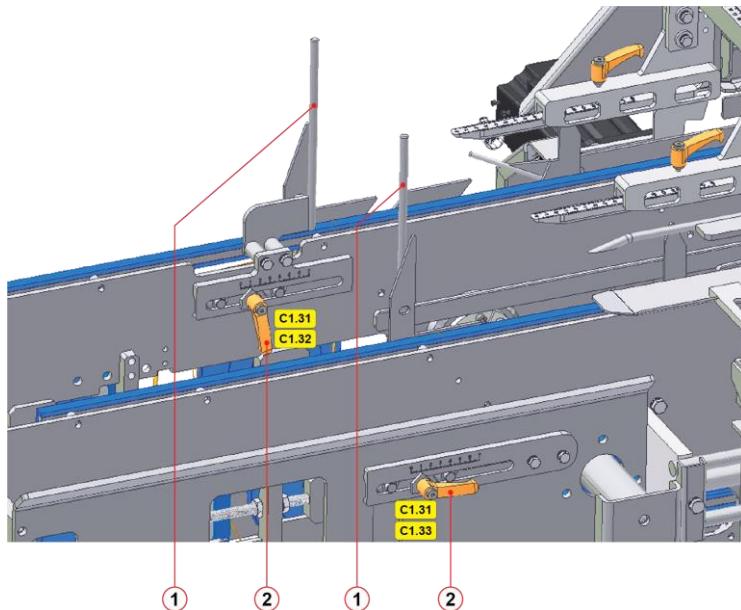
To adjust the Pre Break [B4.10] and [B4.11], loosen the clamp and move the Pre Break to the correct position.

- This also applies to the Pre Break assist height [B4.30] and [B4.31].

5.3.3.8 Carton inset guiding

Loosen the clamp (2) to adjust the carton inset guiding (1).

- Both sides equal: [C1.31]
- or
- Fixed side: [C1.32]
- Adjustable side: [C1.33]

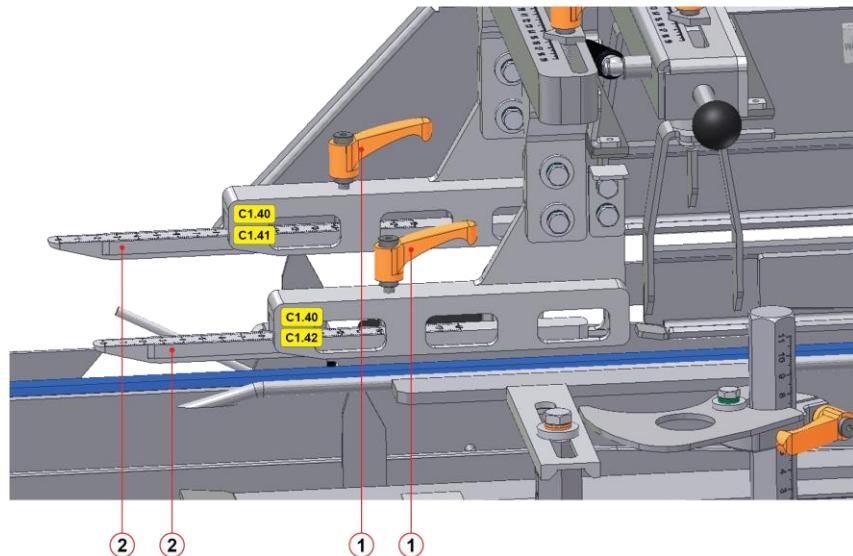


Carton inset guiding example image

5.3.3.9 Top guiding nose length

Loosen the clamp (1) to adjust the length of the top guide nose (2).

- Both sides equal: [C1.40]
- or
- Fixed side: [C1.41]
- Adjustable side: [C1.42]

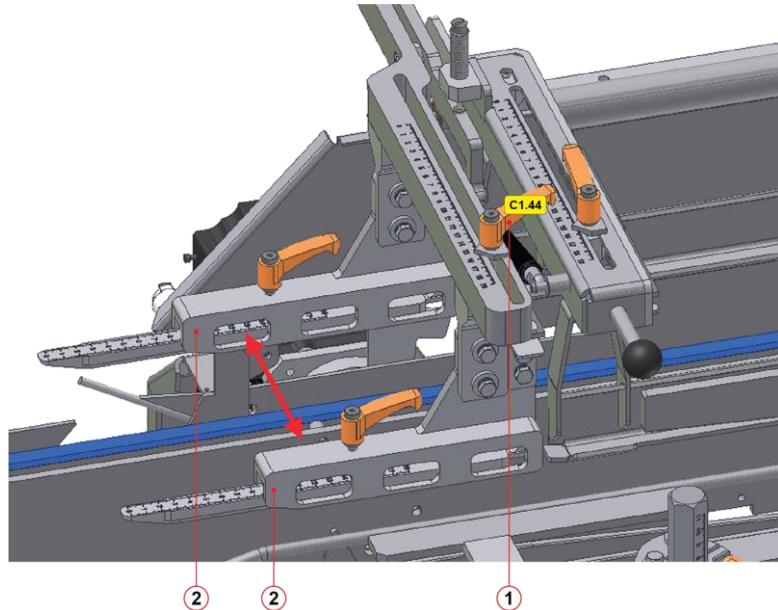


Top guiding nose length example image

5.3.3.10 Top guiding nose width

Loosen the clamp (1) to adjust the widths of the top guide noses (2).

- fixed side [C1.43].
- Adjustable side [C1.44].

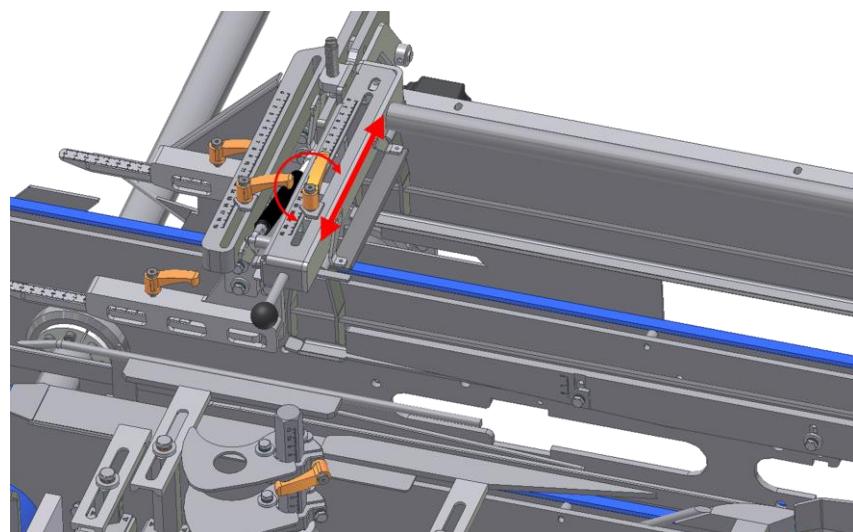


Top guide nose width example image

5.3.3.11 Top guiding width

Adjust the width of the top guides on the front and back side of the machine.

- fixed side [C1.51].
- Adjustable side [C1.52].

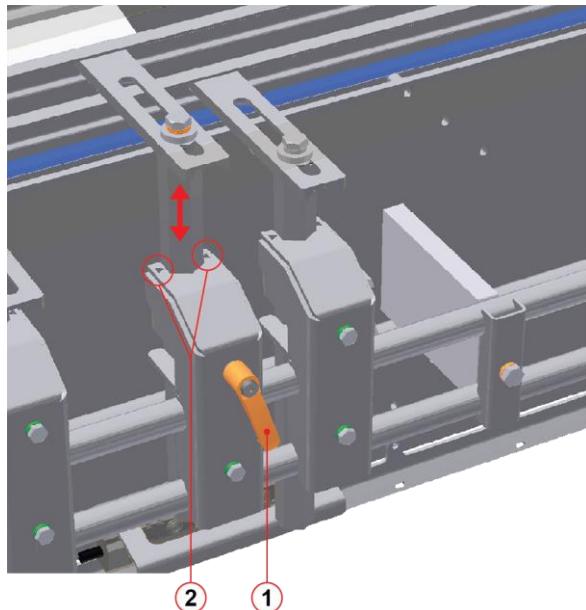


Top guiding example image

5.3.3.12 Side guiding height

Loosen the clamp (1) to adjust the height of the cartoner side guides [C1.61] and [C1.62].

- Use the indicators (2) for the correct position.



Cartoner side guide

5.3.3.13 Folding guides fixed side

Adjust the height and depth of all folding guides on the fixed side [C2.00] to [C2.40].

Refer to the changeover list to determine the applicable settings.

5.3.3.14 Fold guide pressure plate

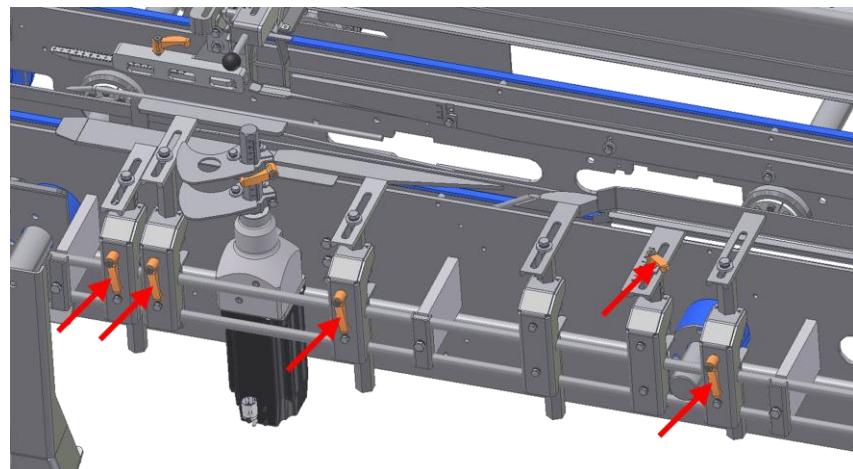
Loosen the clamp (1) to adjust the fold guide pressure plate (2).

- fixed side [C2.60].
- Adjustable side [C3.60].

5.3.3.15 Folding guides adjustable side

Adjust the height and depth of all folding guides on the adjustable side [C3.00] to [C3.35].

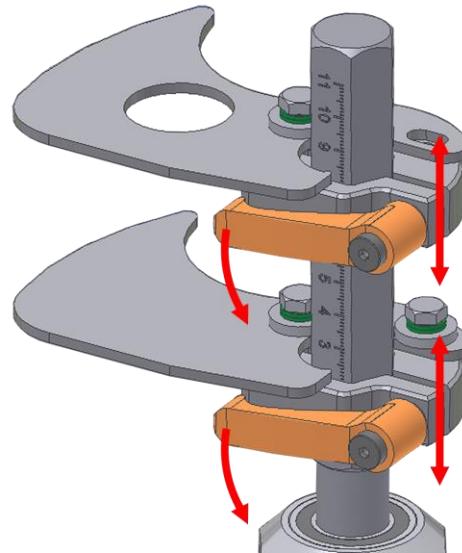
Refer to the changeover list to determine the applicable settings.



Folding guides adjustable side example image

5.3.3.16 Horizontal kicker height

Loosen the clamp to adjust height of the horizontal kicker on the adjustable side [C4.10], as well as the fixed side [C4.20].



Horizontal kicker height

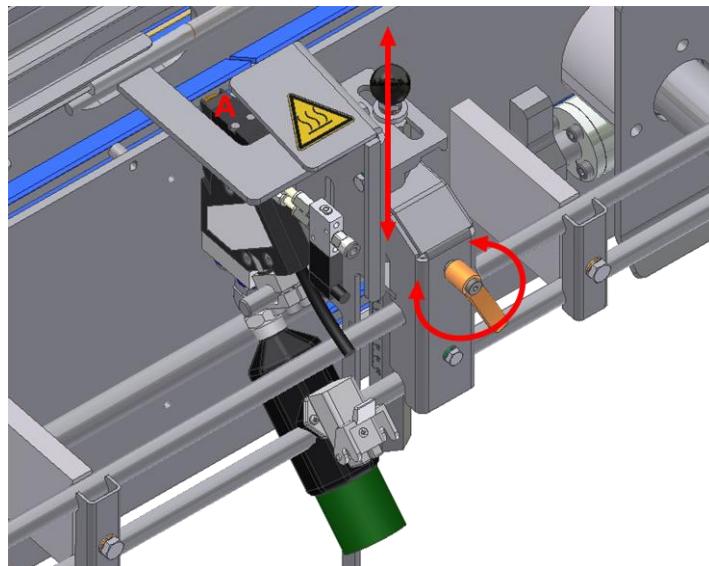
5.3.3.17 Open flap closer

Loosen the clamp to adjust the open flap closer.

- fixed side [C5.40] and [C5.41].
- Adjustable side [C5.42] and [C5.43].

5.3.3.18 Glue head height

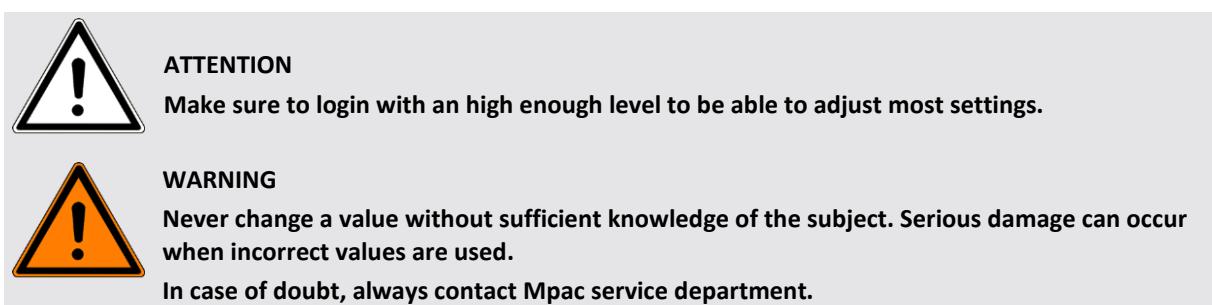
Adjust the height of the glue heads (**A**) on the adjustable [G1.00] - [G1.03], as well as the fixed [G1.10] - [G1.13] side.



Glue heads example image

6 Machine adjustments

Machine adjustments consist of all adjustments directly related to the machine itself and to the production process. These can be mechanical, as well as software settings.



Some specific machine adjustments will be explained in this chapter.

6.1 Manage users and rights

Extra buttons are available in the top bar when logged in as administrator.



Manage users



Manage rights

6.2 Manage users

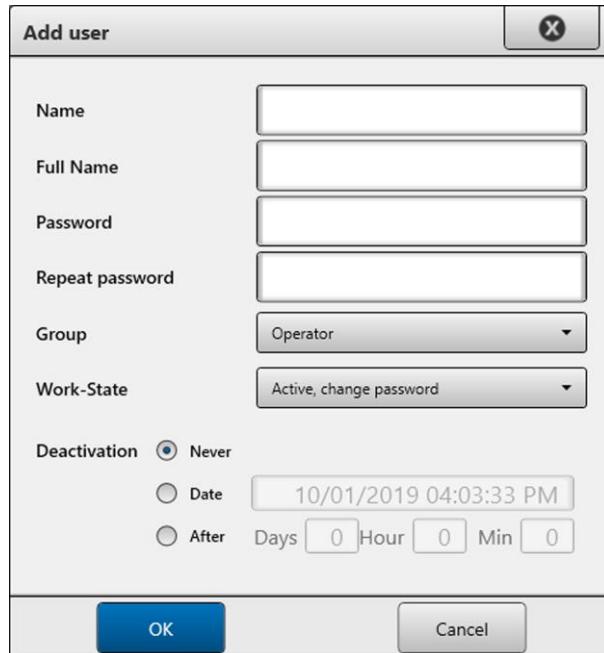
Tap  to open the manage users screen.

Manage users					
Name	Full name	State	Group	Comment	Add
mpac	M-pac admin	Active	Administrator		<button>Change</button>
juulsi	Juul user admin	Active, change password	SiAdministrator		<button>Change password</button>
Work-State					
<button>Remove</button>					

Manage users screen

6.2.1 Add users

Tap the 'Add' button in the manage users screen to add a new user.



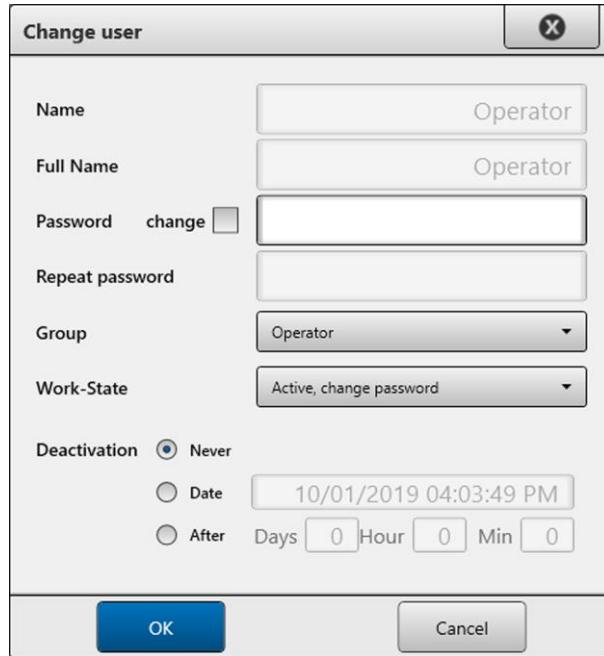
The screenshot shows the 'Add user' dialog box. It has fields for Name, Full Name, Password, Repeat password, Group (set to Operator), Work-State (set to Active, change password), and a Deactivation section where Never is selected. The Date field shows 10/01/2019 04:03:33 PM. At the bottom are OK and Cancel buttons.

Add users screen

1. Fill in all the credentials:
 - Name
 - Full name
 - Password
 - Repeat password
 - Group:
 - Operator (Able to enter production data and activate production)
 - Quality (Able to adjust certain machine settings and format changes)
 - Maintenance (Able to do maintenance and make system adjustments)
 - Administrator (Access to the entire system)
 - Work-state:
 - Active, change password
 - Deactivated
 - Suspended
 - 2. Choose the deactivation for the user:
 - Never (Until removed the user will be active.)
 - Date (The user will be deactivated on this date and time.)
 - After (The user will be deactivated after the filled in days, hours and minutes.)
 - 3. Tap the 'OK' button to add this user.
On the first login, the user is asked to change the password.

6.2.2 Change user

1. Select the user from the list in the manage user screen to change its credentials.
2. Tap the 'Change' button.



The screenshot shows the 'Change user' dialog box. It contains the following fields:

- Name: Operator
- Full Name: Operator
- Password: change
- Repeat password: (empty)
- Group: Operator
- Work-State: Active, change password
- Deactivation: Never
 Date: 10/01/2019 04:03:49 PM
 After Days: 0 Hour: 0 Min: 0

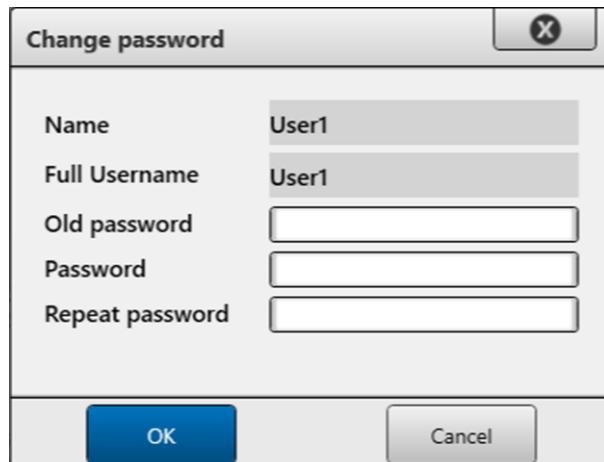
At the bottom are 'OK' and 'Cancel' buttons.

Change user screen

3. Change what can and need to be changed for this user.
4. Tap the 'OK' button to save the changes.

6.2.3 Change password

1. Select the user from the list in the manage user screen to change the password.
2. Tap the 'Change password' button.



The screenshot shows the 'Change password' dialog box. It contains the following fields:

- Name: User1
- Full Username: User1
- Old password: (empty)
- Password: (empty)
- Repeat password: (empty)

At the bottom are 'OK' and 'Cancel' buttons.

Change password screen

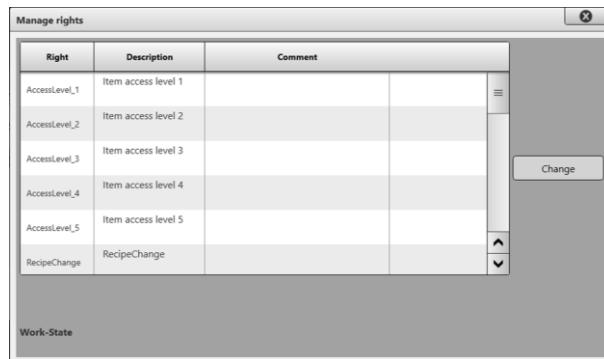
3. Fill in the current password and choose a new one.
4. Tap the 'OK' button to save the changes.

6.2.4 Remove user

1. Select the user to be removed from the list in the manage user screen.
2. Tap the 'Remove' button.
3. Tap the 'OK' button to verify the deletion.
4. The user is deleted.

6.3 Manage rights

Tap  to open the manage rights screen.

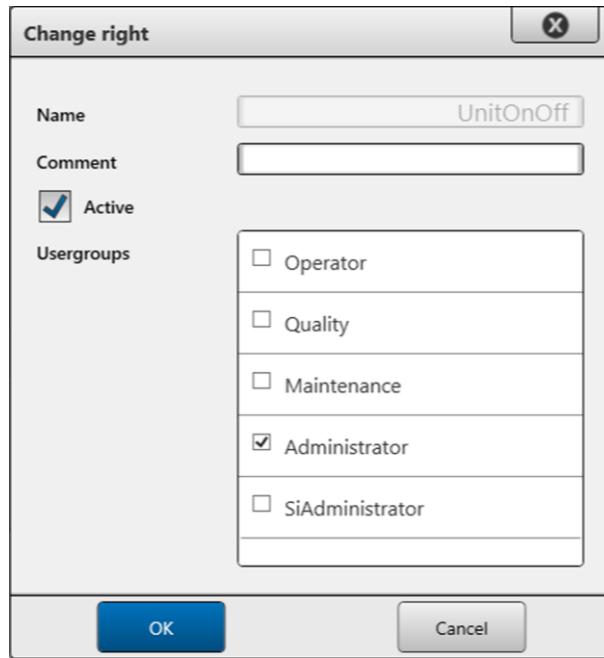


Right	Description	Comment
AccessLevel_1	Item access level 1	
AccessLevel_2	Item access level 2	
AccessLevel_3	Item access level 3	
AccessLevel_4	Item access level 4	
AccessLevel_5	Item access level 5	
RecipeChange	RecipeChange	

manage rights screen

6.3.1 Change rights

1. Select the rights rule from the list in the manage rights screen to change it.
2. Tap the 'Change' button.



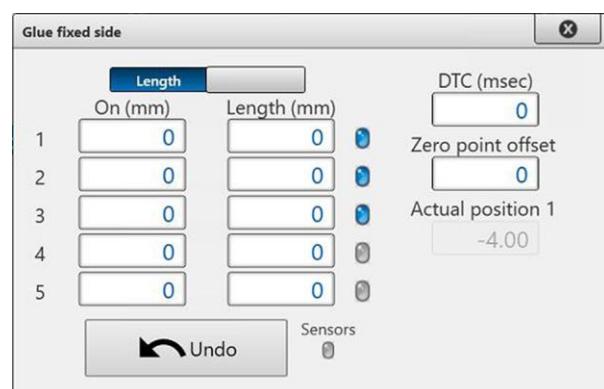
Change rights screen

3. Change what can be changed for this rights rule.
4. Tap the 'OK' button to save the changes.

6.4 CAM positioner

The pre-programmed values of the CAM positioner (CAM values) determine the timing of all actions. All CAM positioner outputs (or channels) and their settings can be found and adjusted in the sub menu 'Settings'. All CAM settings can be recognized by this icon: .

Tap the cam setting in the sub menu 'Settings' to change its values.



Settings multi-CAM example screen

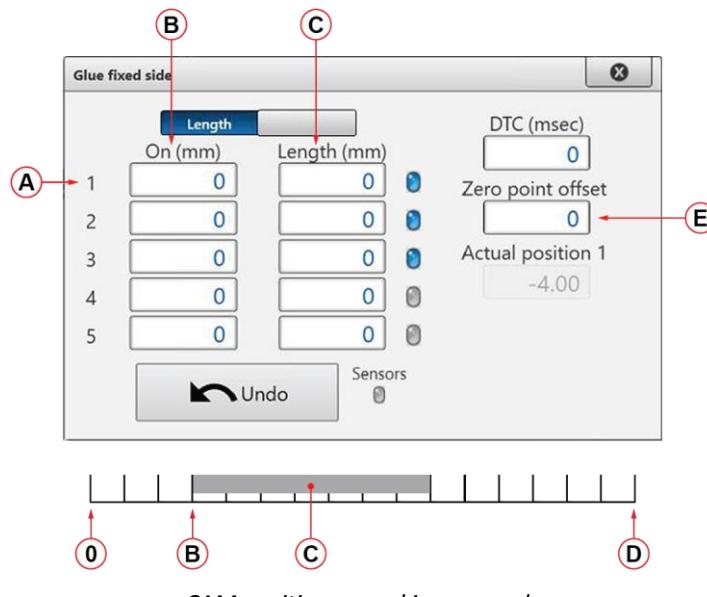
6.4.1 Working principle CAM Positioner

The products total travel length through the Mpac machine is used to trigger certain actions on certain positions for every CAM-position channel.

For the determination of the trigger positions and duration of each channel (**A**), a rising edge (**B**) and length of the action (**C**) must be valued.

It is possible that only the rising edge is used. The length is of no importance but must still have a value.

When both rising edge and length are set to 0 (Zero), the channel's function is not used.



The unwind value (**D**) is the full length of one pitch. This means this is the maximum value for the rising and falling edges because after this value the CAM goes back to 0 (zero).

6.4.2 DTC (Dead Time Compensation)

The DTC value compensates the delay in response time of valves, vacuum, air and glue.

E.g. an air valve needs time to open and pressurize the system before a cylinder will move. This needed time is fixed and cannot be altered. When the machine runs at a high speed a certain distance is already made before the cylinder moves. To make sure the cylinder moves at exactly the same time at every speed, the DTC must be experimentally determined. The PLC calculates new values for each rising edge and falling edge using the DTC value.

6.4.3 Zero point offset

The value of the zero point offset (**E**) is the distance in millimeters from the sensor/valve to the zero point of the Rotary Feeder. This value determines the actual position.

6.4.4 Slider button

The slider on the top of the CAM screen can be set to 'Length' (1) to fill in the length of the active area, between the rising and falling edge.

When the slider is set to 'Off' (2) the rising and falling edge need to be entered.



Slider button

6.4.5 Status CAM-positioner

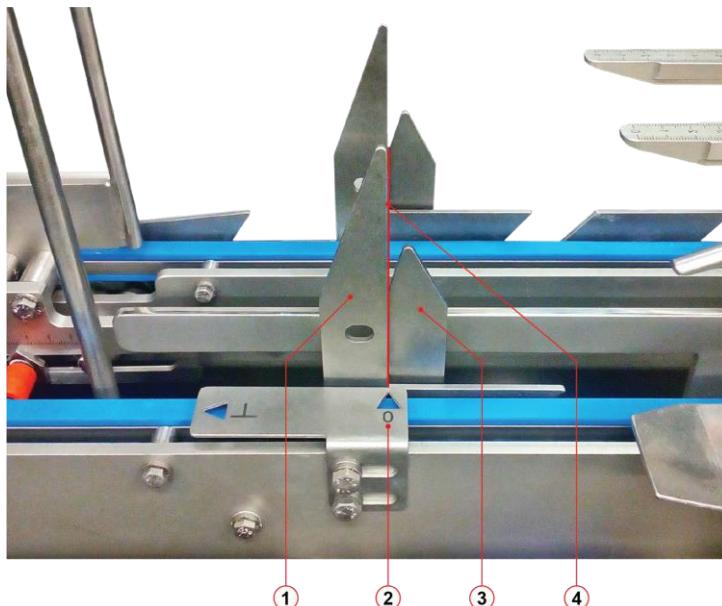
The status of each channel's CAM and sensor are displayed as virtual LED's.

6.5 Zero points

Damaged products and/or cartons/cases can be caused by a not correctly synchronized machine. All corresponding axles can be checked and adjusted separately by means of their zero point.

6.5.1 Zero Point Lug Track

1. Stop the machine. See Production process (on page 65, "Stopping the machine" on page 66)
2. Set the Machine mode to 'Manual'. See Machine module mode (on page 45)
3. Go to the control screen of the Lug Track.
 - Tap on the text or icon to open the corresponding servo adjustments screen.
4. Tap on the 'Position' text field and make sure the value is 0.00.
5. Tap the 'Go to position' button .
 - The servo drive moves the lugs to the zero position.
 - Use the jog buttons.
6. Press the 'Unlock doors' button under the HMI.
7. Open the door closest to the Rotary Feeder.
8. Check if the front and back lug are in line with the zero point arrow, see image below.



1. Back lug (fixed)
2. Zero-point indicator
3. Front lug (adjustable)
4. Zero point line

Drive Axle Zero-Point Check Position

If the lugs are in line with the zero point arrow, the zero point of the lug track is correct.

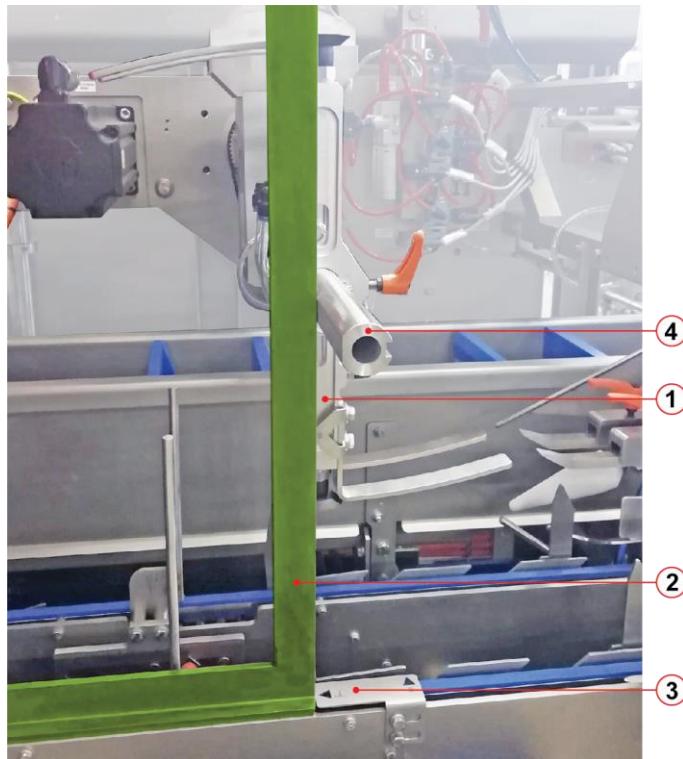
If not, obey this procedure:

1. Close all doors and reset the machine.
2. Select the servo drive moving direction with the buttons  and  in the servo adjustment screen.
3. Jog to move the cartoner to the position where the lugs are in line with the zero point indicator.
 - Make sure the jog cable is plugged in correctly when using the remote control.
4. Tap the button  on the servo adjustment screen to set the zero position value back to '0'.
5. Set the cartoner mode to 'Production'.
6. Reset the machine.

6.5.2 Zero Point Rotary Feeder

Stop the machine. See Production process (on page 65, "Stopping the machine" on page 66)

1. Set the Machine mode to 'Manual'. See Machine module mode (on page 45)
2. Go to the control screen of the Rotary Feeder 'Servo adjustable lug' and 'Servo rotary feeder'.
 - Tap on the text or icon to open the corresponding servo adjustments screen.
3. Tap on the 'Position' text field and make sure the value is 0.00.
4. Tap the 'Go to position' button .
 - The servo drive moves the Rotary Feeder to the zero position.
 - Use the jog buttons.
5. Press the 'Unlock doors' button under the HMI.
6. Open the door closest to the Rotary Feeder.
7. The Rotary Feeder suction cup arm number 1 (1) must face down.
8. Place a square (2) against the zero-point indicator (3) as shown in the picture.
9. The axle (4) should be against the square and the Rotary Feeder arms should be parallel to the square (2) at the same time.



Rotary Feeder Zero-Point Check Example

If the Rotary Feeder arms are parallel to the square, the zero point of the Rotary Feeder is correct.

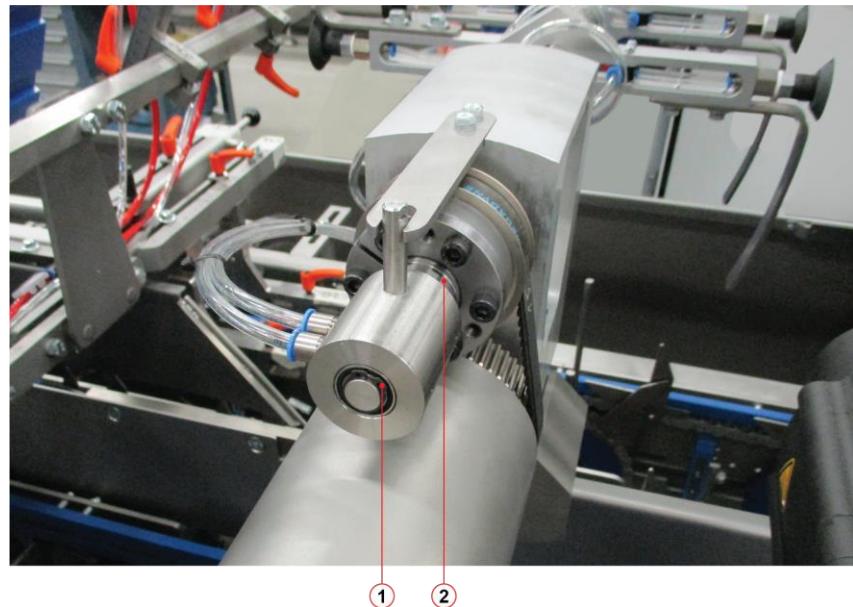
If not, obey this procedure

1. Release the Rotary Feeder brake.
2. Open the Rotary Feeder door.
3. Position a square (2) against the zero point indicator (3).
4. Turn the Rotary Feeder axle (1) manually to the square.
5. Tap the button  on the servo adjustment screen to set the zero position value back to '0'.
6. Close the Rotary Feeder door.
7. Set the cartoner mode to 'Production'.
8. Reset the machine.

6.5.2.1 Adjust Rotary feeder

In case the entire Rotary feeder is displaced.

1. Open the cover that gives the best access to the Rotary Feeder.
2. Release the bolts (2)
 - Do not remove them.
3. Position the Rotary feeder with a square as described and shown in Zero Point Rotary Feeder (on page 92).
 - Turn the Rotary feeder axle (1) manually until a suction cup arm is perfectly perpendicular to the lug track.
4. Tight the bolts (2) and replace the cover.
5. Reset the zero point as in Zero Point Rotary Feeder (on page 92).



Rotary Feeder Adjustment

6.5.3 Zero Point Autoload

1. Stop the machine. See Production process (on page 65, "Stopping the machine" on page 66)
2. Set the Machine mode to 'Manual'. See Machine module mode (on page 45)
3. Go to the control screen of the Autoload 'Autoload fixed side'.
 - Tap on the text or icon to open the corresponding servo adjustments screen.
4. Tap on the 'Position' text field and make sure the value is 0.00.
5. Tap the 'Go to position' button .
 - The servo drive moves the Autoload to the zero position.
 - Use the jog buttons.
6. Press the 'Unlock doors' button under the HMI.
7. Open the door closest to the Autoload.
8. Check if one of the Autoload pushers is in line with the zero point indicators.



Zero point autoload

If the Autoload pusher is in between the zero point indicators, the zero point of the Autoload is correct.

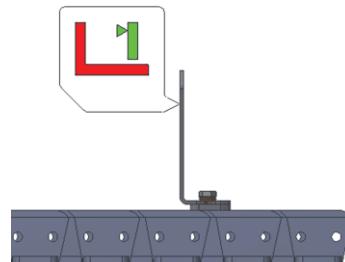
If not, obey this procedure:

1. Close all doors and reset the machine.
2. Select the servo drive moving direction with the buttons  and  in the servo adjustment screen.
3. Jog to move the pushers to the position one of the pushers is in between the zero point indicators.
 - Make sure the jog cable is plugged in correctly when using the remote control.
4. Tap the button  on the servo adjustment screen to set the zero position value back to '0'.
5. Set the cartoner mode to 'Production'.
6. Reset the machine.

6.5.4 Zero point Bucket Wall Adjustable

To check the zero point of the bucket walls, the front - and back walls can not be checked simultaneously.

- Make sure the back bucket wall is moved backwards so it is not in the way of the front wall in its zero position.
1. Stop the machine. See Production process (on page 65, "Stopping the machine" on page 66)
 2. Set the Machine mode to 'Manual'. See Machine module mode (on page 45)
 3. Go to the control screen of the Infeed conveyor 'Autoload adjustable side'.
 - Tap on the text or icon to open the corresponding servo adjustments screen.
 4. Tap on the 'Position' text field and make sure the value is 0.00.
 5. Tap the 'Go to position' button .
 - The servo drive moves the bucket track to the zero position.
 - Use the jog buttons. 6. Press the 'Unlock doors' button under the HMI.
 7. Open the door closest to the Rotary Feeder.
 8. Check if one of the adjustable buckets walls is in line with the zero point indicators.



Zero point bucket track

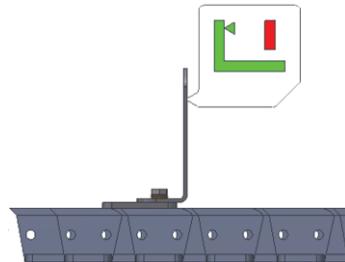
If the bucket is in line with the zero point indicator, the zero point of the bucket track is correct.

If not, obey this procedure:

1. Close all doors and reset the machine.
2. Select the servo drive moving direction with the buttons  and  in the servo adjustment screen.
3. Jog to move the bucket track to the position that one of the bucket walls is in line with the zero point indicator.
 - Make sure the jog cable is plugged in correctly when using the remote control.
4. Tap the button  on the servo adjustment screen to set the zero position value back to '0'.
5. Set the cartoner mode to 'Production'.
6. Reset the machine.

6.5.5 Zero point Bucket Wall Fixed

1. Stop the machine. See Production process (on page 65, "Stopping the machine" on page 66)
2. Set the Machine mode to 'Manual'. See Machine module mode (on page 45)
3. Go to the control screen of the Infeed conveyor 'Autoload fixed side'.
 - Tap on the text or icon to open the corresponding servo adjustments screen.
4. Tap on the 'Position' text field and make sure the value is 0.00.
5. Tap the 'Go to position' button .
 - The servo drive moves the bucket track to the zero position.
 - Use the jog buttons.
6. Press the 'Unlock doors' button under the HMI.
7. Open the door closest to the Rotary Feeder.
8. Check if one of the fixed buckets walls is in line with the zero point indicators.



Zero point bucket track

If the bucket is in line with the zero point indicator, the zero point of the bucket track is correct.

If not, obey this procedure:

1. Close all doors and reset the machine.
2. Select the servo drive moving direction with the buttons  and  in the servo adjustment screen.
3. Jog to move the bucket track to the position that one of the bucket walls is in line with the zero point indicator.
 - Make sure the jog cable is plugged in correctly when using the remote control.
4. Tap the button  on the servo adjustment screen to set the zero position value back to '0'.
5. Set the cartoner mode to 'Production'.
6. Reset the machine.

6.5.6 Zero point extended magazine

1. Stop the machine. See Production process (on page 65, "Stopping the machine" on page 66)
2. Set the Machine mode to 'Manual'. See Machine module mode (on page 45)
3. Go to the control screen of the Rotary feeder 'Linear adjustment magazine height'.
 - Tap on the text or icon to open the corresponding adjustments screen.
4. Tap on the 'Position' text field and make sure the value is 0.00.
5. Tap the 'Go to position' button .



WARNING

This movement is outside the protective covers of the machine, keep hands and other body parts clear from the moving components.

- The extended magazine moves to the zero position.
 - Use the jog buttons.
6. Check the position of the extended magazine.
 - It should be in lowest position with the bottom of the plate against the clamping ring, as indicated on the picture.



Extended magazine zero point

When the extended magazine is in its lowest position possible, the zero point is correct.

If not, obey this procedure:

1. Move the extended magazine to its lowest position, against the clamping ring, with the jog button.
2. Tap the button  on the adjustment screen to set the zero position value back to '0'.
3. Set the cartoner mode to 'Production'.
4. Reset the machine.

6.5.7 Horizontal Kickers

1. Stop the machine. See Production process (on page 65, "Stopping the machine" on page 66)
2. Set the Machine mode to 'Manual'. See Machine module mode (on page 45)
3. Go to the control screen of the Carton transport 'Servo kicker adjustable side' and 'Servo kicker fixed side'.
 - Tap on the text or icon to open the corresponding servo adjustments screen.
4. Tap on the 'Position' text field and make sure the value is 0.00.

5. Tap the 'Go to position' button .
 - The servo drive moves the Kicker to the zero position.
 - Use the jog buttons.
6. Press the 'Unlock doors' button under the HMI.
7. Open the door closest to the horizontal kicker.
8. Check the position of the kicker.
 - The slot in the clamping ring should be in line with the slot in the kicker base, as shown on the picture.



Horizontal kicker zero point

When the slots are in line, the zero point of the horizontal kicker is correct.

If not, obey this procedure:

1. Turn the horizontal kicker by hand in the correct position.
2. Tap the button  on the servo adjustment screen to set the zero position value back to '0'.
3. Set the cartoner mode to 'Production'.
4. Close all doors.
5. Reset the machine.

6.5.8 Vertical kicker(s)

1. Stop the machine. See Production process (on page 65, "Stopping the machine" on page 66)
2. Set the Machine mode to 'Manual'. See Machine module mode (on page 45)
3. Go to the control screen of the Carton transport 'Servo kicker vertical'.
 - Tap on the text or icon to open the corresponding servo adjustments screen.
4. Tap on the 'Position' text field and make sure the value is 0.00.
5. Tap the 'Go to position' button .
 - The servo drive moves the Vertical Kicker to the zero position.
 - Use the jog buttons.
6. Press the 'Unlock doors' button under the HMI.
7. Open the door closest to the vertical kicker.
8. Check if the vertical kicker is in the position the two notched (one in the kicker, one in the lug frame) are aligned.



Vertical Kicker Zero Point Check Example

When the vertical kicker notch is in line with the notch in the frame, the zero point of the vertical kicker is correct.

If not, obey this procedure:

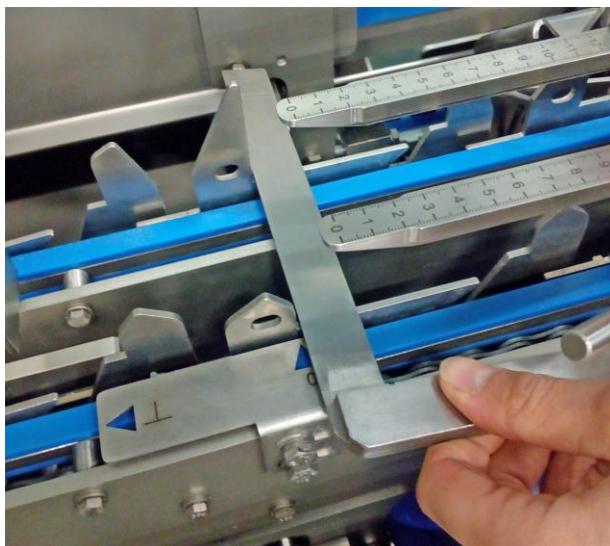
1. Turn the vertical kicker by hand in the correct position.
2. Tap the button  on the servo adjustment screen to set the zero position value back to '0'.
3. Set the cartoner mode to 'Production'.
4. Close all doors.
5. Reset the machine.

6.6 Lugs Alignment

Follow the next procedure when the front/back lugs at the adjustable side are not in line with the front/back lugs on the fixed side.

6.6.1 Lugs Alignment Procedure

1. Stop the machine and open the Cartoner cover. See Production process (on page 65, "Stopping the machine" on page 66)
2. Hold a square against the frame of the machine and the rear lugs, as on the picture below.
 - Both the lugs should be in line with the arrow on the plate mounted to the frame of the machine.
3. Hold the square against the frame of the machine and the front lugs.
 - The front lugs should also be in line.
4. When adjustment is needed lock out the machine. See Lock Out - Tag Out (LOTO) (on page 18)



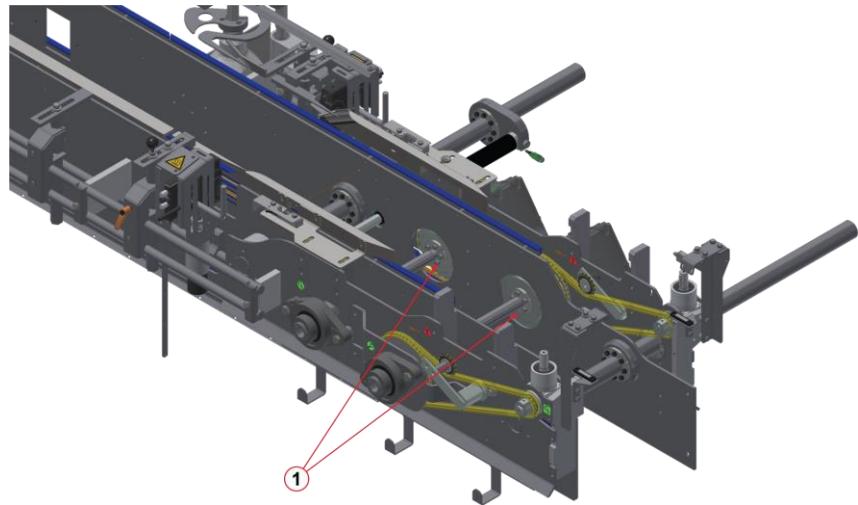
Lug Alignment check



ATTENTION

Mpac recommends to lock out the main power switch and the main air valve with a key lock during maintenance.

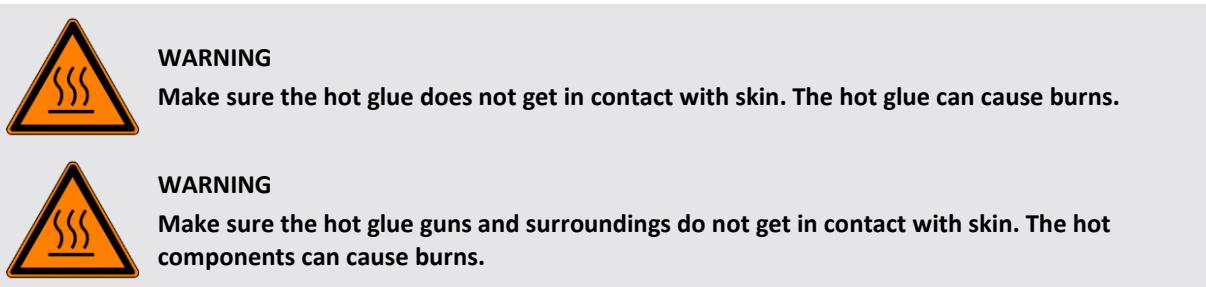
5. Loosen the clamping bushes of the lugs to be adjusted (chain).
 - (1) clamping bushes of the front lug chain, (2) clamping bushes of the back lug chain.
6. Adjust the lugs by hand to the proper position.
7. Properly tighten the lock bolts or the clamping bush.
8. Check the drive axle zero-point. See Zero Point Lug Track (on page 91)



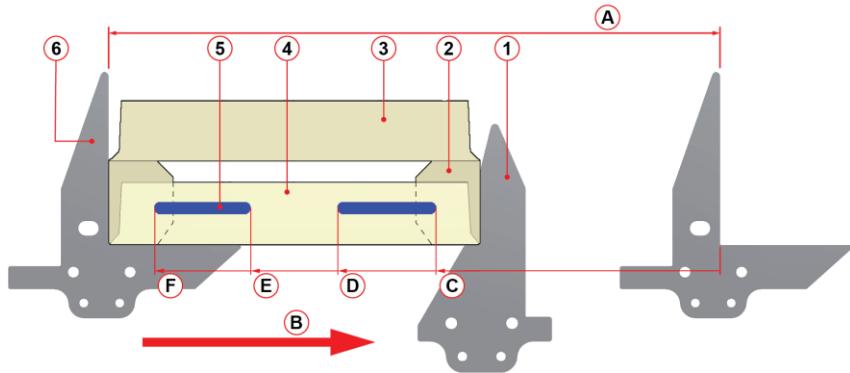
Adjustment Lug Drive Axles

6.7 Glue Track

The position and length of the glue tracks are stored as cam positioner values. To determine these cam positioner values follow the below described procedure.



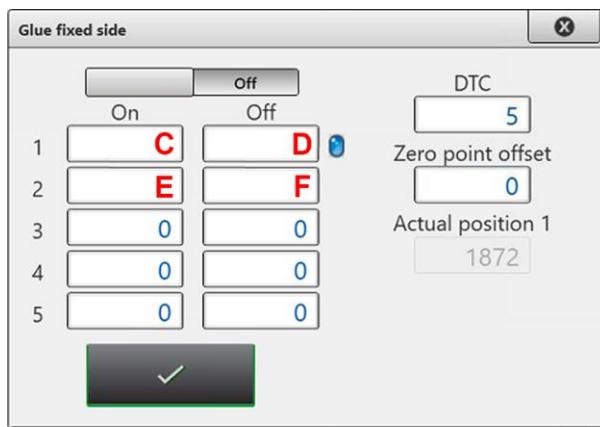
1. Set the machine mode to 'Maintenance' in the top menu on the HMI, see Top menu (on page 44).
2. Make sure the glue function is set to off. Quick access menu functions
3. Run the machine with an empty carton up to the glue guns.
 - Use the jog function.



- | | |
|------------------------------|---------------------------|
| A. Pitch | 1. Front lug |
| B. Transport direction | 2. Front side flap |
| C. Glue start 1st glue track | 3. Top flap |
| D. Glue stop 1st glue track | 4. Bottom flap |
| E. Glue start 2nd glue track | 5. Glue track |
| F. Glue stop 2nd glue track | 6. Rear lug (Pushing lug) |

Glue Tracks

4. Position the carton in front of the glue gun where the 1st glue track must start (**C**).
– Use the jog function.
5. Read the cam-position value from the operator screen at 'Position' and note it as 'Glue track 1, on'.
6. Position the carton in front of the glue guns where the 1st glue track must end (**D**).
7. Read the cam-position value from the operator screen at 'Position' and note it as 'Glue track 1, off'.
8. Position the carton in front of the glue guns where the 2nd glue track must start (**E**).
9. Read the cam-position value from the operator screen at 'Position' and note it as 'Glue track 2, on'.
10. Position the carton in front of the glue guns where the 2nd glue track must end (**F**).
11. Read the cam-position value from the operator screen at 'Position' and note it as 'Glue track 2, off'.

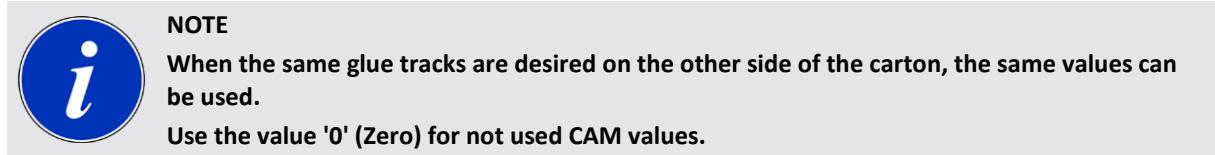


Glue CAM Values

12. Tap the setting 'Cam Glue Left' in the cartoner>maindrive settings screens to open its cam value screen.

Fill in:

- 'Value glue track 1, on': box C
- 'Value glue track 1, off': box D
- 'Value glue track 2, on': box E
- 'Value glue track 2, off': box F



13. Use the value 15 as value for the DTC.
14. Select the option 'Glue On' in the cartoner maintenance screen to switch the function on.
15. Make sure the glue function is set to on. See Quick Access Menu Functions



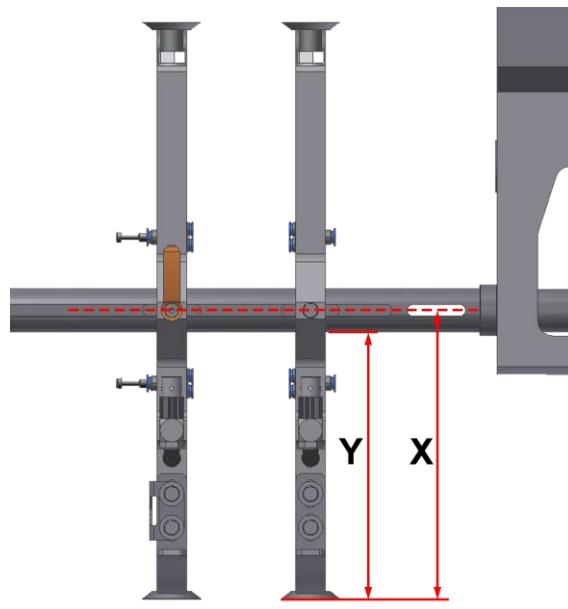
ATTENTION

Before using the glue system, the hotmelt must be at its correct temperature.

16. Run the machine with an empty carton and check the glue tracks.
17. Correct the DTC and/or glue track values if necessary.

6.8 Rotary Feeder Suction Cups

The distance of the suction cups to the star wheel axle (**X**) is important for the functioning of the Rotary feeder. The positioning of the carton template, pre-break and lug track is based on this.



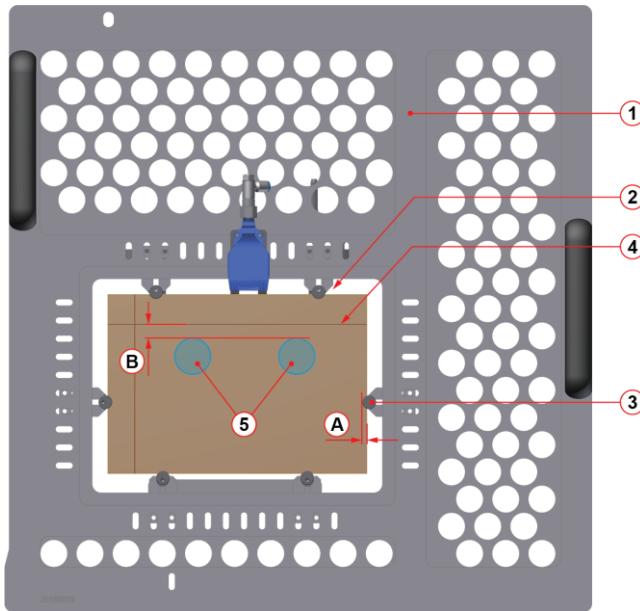
To check the suction cup distance (**X**) of the machine:

1. Stop the machine and open the door of the Rotary feeder.
2. Measure the distance between the suction cups and the axis (**Y**).
 - **Measured distance Y = X - 15 mm.**
 - **X should be 172 mm, Y should be 157 mm.**
3. Loosen the bolts on the Rotary feeder arms in order to adjust the distance.
4. Tighten the bolts if the suction cups are on the correct distance from the axis.
5. Close the door and reset the machine.

6.9 Template

Template adjustments procedure:

1. Place a few cartons in the magazine.
2. Turn the rotary feeder until the suction cups are (almost) touching the carton.
 - Use the jog function.
3. Check the distance between the template guides and the edges of the carton.
 - The distance **(A)** should be 3 mm. (may vary for special types of carton)
 - Adjust the template guides **(2)** if necessary.
4. Check the stop brackets **(3)**.
 - It must be easy to extract the carton with the suction cups.
5. Check the distance between the edge of the suction cups and the top crease **(4)** of the carton.
 - The distance **(B)** should be 4 mm. (may vary for special types of carton)
 - Adjust this distance using the top and bottom template guides.



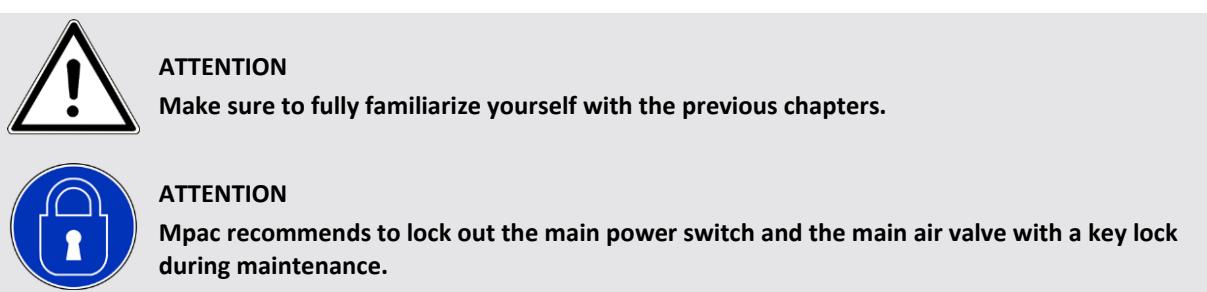
- | | |
|------------------|---|
| 1. Template | 5. Suction cup |
| 2. Guides | A. Distance template guides/carton edge |
| 3. Stop bracket | B. distance suction cup edge/top crease |
| 4. Carton crease | |

Template Principle

7 Maintenance

The lifespan of the Mpac machine is considerably extended if it is properly maintained. Mpac therefore recommends that the maintenance schedule set out below be followed.

This chapter requires in-depth knowledge of the machine and is intended for trained maintenance technicians with access to level three.



7.1 Set machine mode

Before any maintenance on the Mpac machine is done the machine should be in maintenance mode.

- Change the machine mode in the top menu on the HMI, see Top menu (on page 44).

7.2 Inspection Icons

To identify every inspection and lubrication point for bearings, transmissions and chains of the machine the following icons are used:



Bearing inspection only



Transmissions inspection only



Chain inspection only



Bearing inspection + grease lubrication



Transmission inspection + oil lubrication



Chain inspection + oil lubrication



Chain inspection + spray lubrication



General inspection only - See user manual



General inspection + maintenance high interval - See user manual



General inspection + maintenance low interval - See user manual

Inspections of machine parts can be found in the inspection schedule. See Inspection schedule (on page 113)

Lubrication of critical machine parts can be found in the lubrication schedule. See Lubrication schedule (on page 143)

7.3 Cleaning schedule

The following applies to the cleaning schedule:

- 'Hours' represents hours of operation.

Table: Cleaning schedule

Category	Reference	Cleaning Interval [hours]				
		8	40	160	960	1920
Clean machine exterior	Clean Machine Exterior (on page 109)	X				
Clean machine interior	Clean Machine Interior (on page 109)	X				
Clean Sensors and reflectors	Clean Sensors (on page 110)	X				
Clean glue guns	Clean Glue Guns (on page 111)			X		
Clean glue gun area	Clean Glue Gun Area (on page 111)	X				
Clean filters	Clean Filters (on page 112)		X			

7.4 Cleaning

7.4.1 Clean Machine Exterior



CLEAN

Clean daily or after every 8 hours of operation.

Always clean the outside of the machine with a small quantity of a mild, non-corrosive detergent dissolved in water and a soft moist lint-free towel. The inside of all Plexiglas doors and covers may also be cleaned this way. Ensure that all soap residues are completely removed after cleaning to avoid mold from developing. Ensure that the machine is dry after cleaning.



DANGER

Keep all liquids away from electrical components.

Make sure the Mpac machine does not get in contact with:

- Aggressive detergents, for example chlorine bleaching lye and sodiumhypochloride
- Abrasives or scourers, etc.
- Strong glue and grease solvents, such as alcohol and dry-cleaning naphtha
- Pressure cleaners



WARNING

Never use a pressure cleaner to clean the machine.



WARNING

Make sure chemical detergents used surrounding the Mpac machine do not precipitate or get in contact with the Mpac machine.

7.4.2 Clean Machine Interior



CLEAN

Clean daily or after every 8 hours of operation.

Remove dust, grease, powder, cardboard residues or any other product related residues in the following areas:

- Complete lug track (chains, chain paths, lugs, guidings and carton closing mechanisms)
- Complete bucket track (chains, chain paths, buckets and surroundings)
- Complete autoload system (pushers, pusher track, funnels and surroundings)
- Discharge (chains, belts and rejects)

If installed:

- Confiner and/or overhead systems (chains, chain paths, paddles and surroundings)
- Infeed systems like Bomb Bays, Turn Units, robot systems, servo trains

Cleaning methods:

- Remove any glue residues with a plastic scraper
- Remove dust or powder with compressed air or with a vacuum cleaner
- Remove grease with a small quantity of a mild, non-corrosive detergent in water and a soft moist lint-free towel



WARNING

Make sure the hot glue guns and surroundings do not get in contact with skin. The hot components can cause burns.



ATTENTION

When cleaning the machine with compressed air, make sure no contamination stays on/in the components.

7.4.3 Clean Sensors



CLEAN

Clean daily or after every 8 hours of operation.

1. Clean the sensor lenses and their associated reflectors or receivers carefully with a small quantity of a mild, non-corrosive detergent in water and a soft moist lint-free towel.
2. Dry the sensors carefully with a dry, clean lint-free towel.

7.4.4 Clean Glue Guns



CLEAN

Clean after every 160 hours of operation.

When needed the glue guns and glue hoses can be flushed to clean them out. See Glue adjustments screen (on page 60)



ATTENTION

Mpac refers to the documentation belonging to the concerning peripheral for information about maintenance and cleaning.



WARNING

Make sure the hot glue guns and surroundings do not get in contact with skin. The hot components can cause burns.

7.4.4.1 Flush Glue Guns

1. Stop the machine. See Production process (on page 65, "Stopping the machine" on page 66)
2. Set the Machine mode to 'Manual'. See Machine module mode (on page 45)
3. Go to the control screen of the Carton transport 'Glue'.
 - Tap on the text or icon to open the corresponding adjustments screen.
4. Obey the procedure as shown on the screen, see Glue adjustments screen (on page 60).
 - Make sure the glue that comes out of the glue guns will be caught and removed afterwards.
5. Jog the machine until the glue guns run smoothly.
6. Set the machine back in producing mode on the Pack ML screen.

7.4.5 Clean Glue Gun Area



CLEAN

Clean daily or after every 8 hours of operation.



WARNING

Make sure the hot glue guns and surroundings do not get in contact with skin. The hot components can cause burns.

To prevent the machine from stalling or disruptions in the production process any glue on the surrounding components of the glue guns needs to be removed.

1. Stop the machine. Production process (on page 65, "Stopping the machine" on page 66)
2. Wait until the glue guns are cooled down.
3. Open the cover where the glue guns are located.
4. Remove the glue on the pressure plates and components under the glue guns with a scraper or spatula.
5. Close the cover.

7.4.6 Clean Filters



CLEAN

Clean all general filters after every 40 hours of operation.

1. Remove the filter (1) from the filter holder (2).
2. Use compressed air to blow the filter clean.
 - Always do this outside.
3. Replace the filter in its holder.



General Filter in Electrical Cabinet

7.5 Inspection schedule



ATTENTION

In case of doubt during inspections and maintenance, always contact the Mpac service department.

The following applies to the inspection schedule:

- Operating temperature between 5°C and 40°C
- Normal operating conditions
- 'Hours' represents hours of operation

Table: Inspection schedule

Category	Reference	Inspection Interval [hours]				
		8	40	160	960	1920
General						
Check personal safety features	Personal Safety Features (on page 115)			X		
Export settings with USB	Export settings on USB (on page 118)			X		
Drives and gearboxes						
Check drives and gearboxes	Check drives and gearboxes (on page 119)					X
Transmissions						
Check discharge transmissions	Check Transmissions (on page 121)				X	
Chains And Belts						
Check Lug chains	Check Chains (on page Error! Bookmark not defined., "Lug chains" on page 125)			X		
Check bucket chains	Bucket Chains (on page 125)			X		
Check funnel chains	Funnel Chains And Drive Chains Adjustable Side (on page 126)			X		
Check pusher chains	Pusher Chains (on page 126)			X		
Check machine safety features	Machine Safety Features (on page 116)					X
Check rotary feeder drive belts	Check Belts (on page 127, "Rotary Feeder Drive Belt Replacement" on page 127)			X		

Category	Reference	Inspection Interval [hours]				
		8	40	160	960	1920
Check acceleration belts	Tension of the acceleration belt (on page 128)			X		
Air System						
Check air system	Check Air System (on page 130)			X		
Check suction cups	Check Suction Cups (on page 132)	X				
Autoload System						
Check autoload	Check Autoload System (on page 133)			X		
Glue System						
Check glue system	Check Glue System (on page 135)				X	
Filters						
Replace filters	Replace Filters (on page 135)					X
Sensors						
Check sensors	Check Sensors (on page 136)		X			
Miscellaneous						
Check lugs	Check Lugs (on page 137)				X	
Check Buckets	Check Buckets (on page 138)				X	
Bearings						
Check drive shaft bearings adjustable side	Check Bearings (on page 138, "Replace Drive Shaft Bearings - Adjustable Side" on page 139)				X	
Check drive shaft bearings fixed side	Check Bearings (on page 138, "Replace Drive Shaft Bearings - Fixed Side" on page 139)				X	
Check autoload pusher bearings	Replace Pusher Bearings - Shaft (on page 140)				X	
Check rotary feeder height adjustment bearings	Check Bearings (on page 138, "Replace Rotary Feeder Height Bearings" on page 141)				X	
Check top guiding height adjustment bearing	Replace Top Guiding Height Bearings (on page 142)				X	

7.6 Inspection

7.6.1 General



WARNING

Do not access any of the machine's areas during its operation.



ATTENTION

Always replace an old component/part with a component/part of the same brand and type.



LUBRICATION

Always apply a lubricant to the thread of all stainless steel fasteners (bolts and screws).

7.6.1.1 Personal Safety Features



CHECK

Do a check after every 160 hours of operation.

All safety features that protect an individual are considered personal safety features. (Protective covers, door switches, stop buttons, light screens, etc.).

Inspection procedure:

1. Set the machine speed to 15 cartons/min.
2. Pull a handle of a protective door/cover.
 - The door/cover shouldn't open. (The doors/covers should only open when the 'unlock doors' button is activated)



WARNING

If the door or cover opens, press an emergency stop, turn off the main switch and immediately contact Mpac.



WARNING

Do not operate the machine if a personal safety feature does not function properly.

3. Hit the 'stop' button under the HMI.
 - The machine must stop.



WARNING

If the machine fails to stop, press an emergency stop, turn off the main switch and immediately contact Mpac.

4. Hit the 'unlock doors' button under the HMI.
5. Open a protective door/cover.
6. Check the warning on the HMI.
 - The open door/cover must be identified in the warning on the HMI.



WARNING

If the open door/cover is not visible on the HMI, press an emergency stop, turn off the main switch and immediately contact Mpac.

7. Close the protective door/cover.
8. Use the 'Reset' button to reset the machine for faults.
9. Start the machine.
 - Repeat point 2 up to point 7 for all other protective covers and door switches.
10. Repeat the procedure for all other personal safety features as well.
 - Emergency stops
 - Light screens



CHECK

Do a check after every 160 hours of operation.

7.6.1.2 Machine Safety Features



WARNING

Do not operate the machine if a personal safety feature does not function properly.



CHECK

Do a check yearly or after every 1920 hours of operation.

All safety features that protect the machine from damage are considered machine safety features. (Overload safety features in pushers, Confiner, Pick and Place, Turn Unit, etc.)

Checking procedure:



WARNING

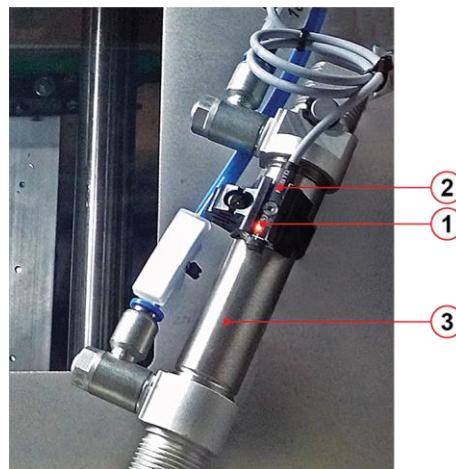
If during the inspection procedure different results are produced from those described, immediately turn off the machine and contact the Mpac service department.



CHECK

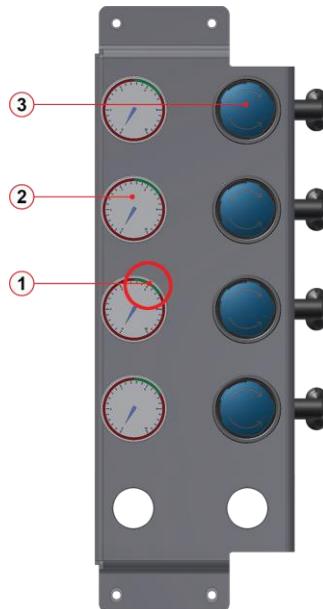
While testing the safety features, make sure that the optical and acoustic signals are functioning properly.

1. Make sure that the machine is stopped. Production process (on page 65, "Stopping the machine" on page 66)
2. Open the protective cover or door.
3. Manually activate the overload sensors.
 - Push or pull the overload cylinder (3) in/out until the sensor's light turns off (1).
4. Check the location of the overload sensor (2).
 - The sensor must not be loose.
 - The cylinder must never be able to move more than a few millimeters before the sensor is activated.



Overload Safety Principle

5. Close all protective covers and doors and start the machine.
 - Let the machine run in jog mode.
6. Open the doors and find the pressure gauges of the pressure regulators.
7. Check the pressure gauge (2) of the regulator (3).
 - The values must be in the safe zone (1). The safe zone is the zone that is **NOT** marked red.
8. Turn the adjustment knob (3) to adjust these values if necessary.



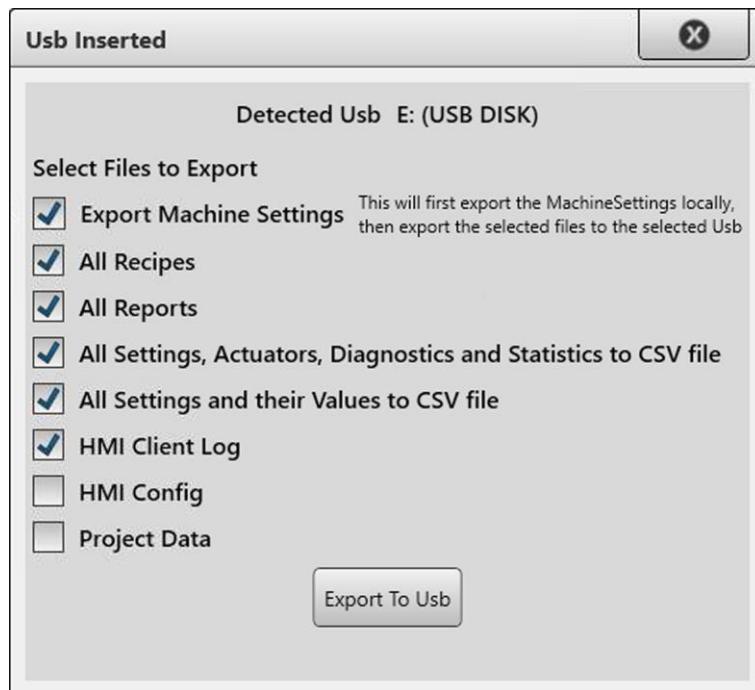
Pressure regulators

9. Close all covers.

7.6.1.3 Export settings on USB

To minimize downtime on the machine when something happens to the HMI or PLC, make sure to export the settings from the machine regularly. Mpac advises to do this monthly. This way the machine can be reset to the last settings quickly. To make an export, obey the following steps:

1. Insert a USB stick into the USB port under the HMI.
 - A pop-up appears in the HMI.



Pop-up when a USB stick is inserted

2. Select the information to be exported to the USB stick.
3. Tap the "Export to USB" button.
 - Wait until the export is completed.
4. Remove the USB stick from the machine.

7.6.2 Check drives and gearboxes



CHECK

Do a check yearly or after every 1920 hours of operation.

Check the following for each drive and gearbox:

- Sealing rings for desiccation, wear and oil leaks.
- Drain and fill plugs for leaks.
- The immediate environment for oil.
- The operation of the bleed nipple.



REPLACE

The oil in the gearboxes must be replaced every 3 years of operation.



ATTENTION

In case of doubt during inspections and maintenance, always contact the Mpac service department.

Start up the machine and check for:

- Sound of the drives and gearboxes.
 - For example, an excessive metal or knocking sound is not good.
- Unusual vibrations.
- Temperature of the drives and gearboxes too high.
 - A minor increase in temperature during production is normal.

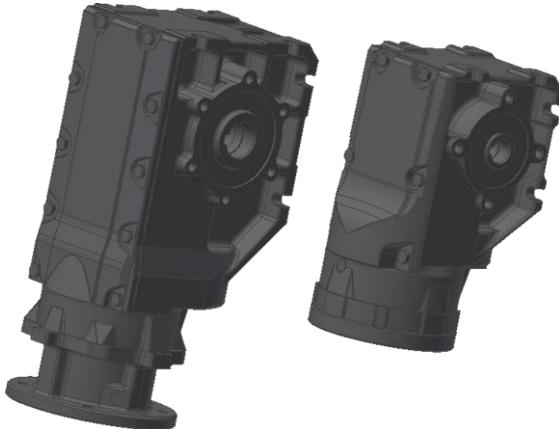
7.6.3 Transmissions

General procedure:

1. Ensure that the machine is stopped. Production process (on page 65, "Stopping the machine" on page 66)
2. Lock out the machine. See Lock Out - Tag Out (LOTO) (on page 18)
3. Open the safety doors.

7.6.3.1 Transmission Types

Different types of transmissions may be used on an Mpac machine.



Used as overall transmission



Often used for the discharge drive

7.6.3.2 Check Transmissions



CHECK

Do a check after every 160 hours of operation.

Check the following for each transmission:

- Sealing rings near the shafts for desiccation, wear and oil leaks.
- Drain and fill plugs for leaks.
- The immediate environment for oil.
- The operation of the bleed nipple.



ATTENTION

In case of doubt during inspections and maintenance, always contact the Mpac service department.

Start up the machine and check for:

- Sound of the transmission.
 - For example, an excessive metal or knocking sound is not good.
- Unusual vibrations.
- Temperature of the transmission too high.
 - A minor increase in temperature during production is normal.

7.6.4 Check Chains



CHECK

Do a check after every 160 hours of operation.

Check the chains (and chain wheels) for:

- Wear (worn down parts, centerline spacing of links)
- Formation of rust
- Rough running motor
- Tension
- Stretch



ATTENTION

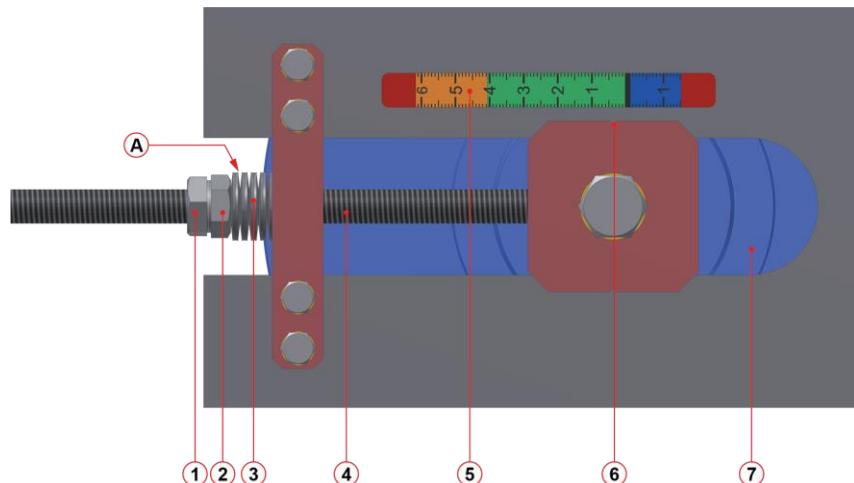
Do not replace a chain without special training. Contact the Mpac service department.

7.6.4.1 Chain Tension

If drive chains are too loose or too tight the chain drive will not run smoothly. In both cases it is important to adjust the chain's tension.

7.6.4.2 Tensioning Chains

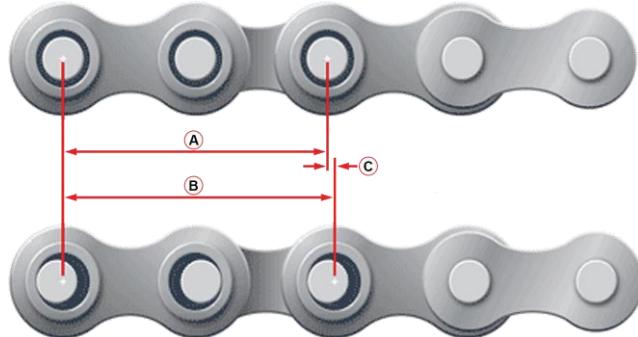
1. Loosen the lock nut (1).
2. Adjust the chain tension using the tensioning nut (2).
 - Make sure the washer gaps (A) are between 0.1 mm to 0.3 mm.
 - Use a feeler gauge to determine the gaps.
3. Check the chain wear.
 - The notch (6) of the tensioning device must be in the green area.
 - Replace the chain when the notch is in the orange or red area.
 - The chain might be in the blue area when it is new and just been placed in the machine.
4. Check the aligning of the chain as explained in Chapter Machine adjustments (on page 84)
 - There is a possibility that the chain must be replaced earlier when the aligning cannot be done correctly.



Chain Tensioning Device Example

7.6.4.3 Chain Stretch

When a chain is a subject to permanent load it will wear by stretching out.



- A. 2x pitch
- B. Wear + 2x pitch

- C. Elongation due to pin and bushing wear.

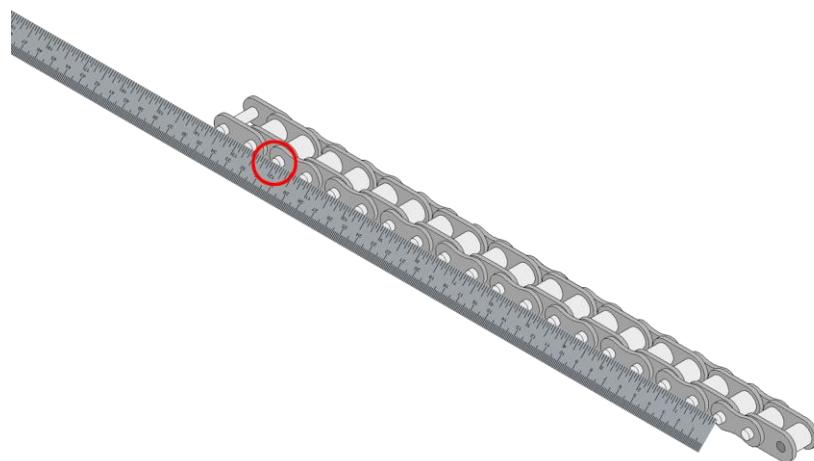
Chain Wear

When the chain is stretched for 1% or more the chain must be replaced.

The total chain elongation can be determined by measuring the distance between the chain pins. One pitch is the distance between two chain pins.

Procedure:

1. Make sure the chain is properly tensioned.
2. Use a metal ruler of at least 12" in length. (304,8 mm)
3. Measure the distance between the pins for 12":
 - Funnel and pusher chains, 8 pitches is 12".
 - Lugs, bucket and confiner chains, 16 pitches is 12".

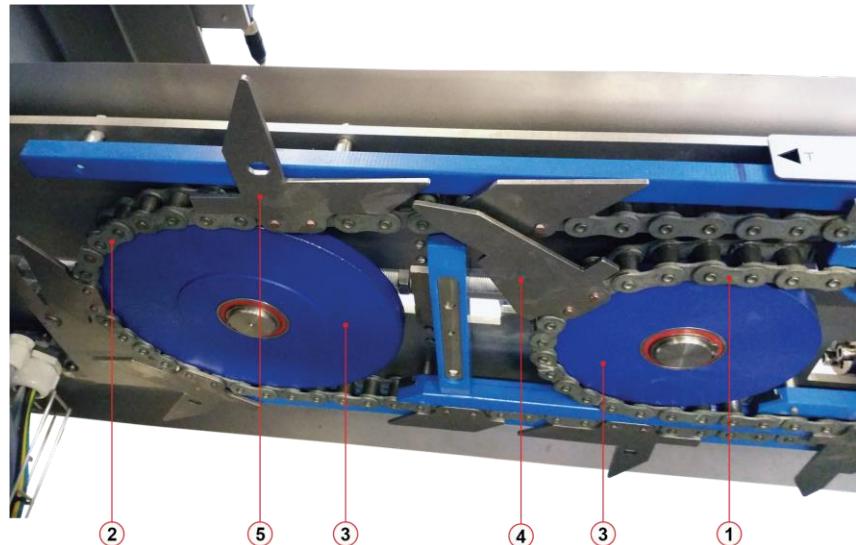


Measuring Tensioned Chain

4. Is the measured length more than 12" + 0.12 of an inch (1%), the complete chain combination must be replaced.
 - Maximum length in millimeters: 307,8 mm.

7.6.5 Lug chains

Use a mirror to inspect the entire front and back lug chains, including the chain wheels, for both sides of the machine.

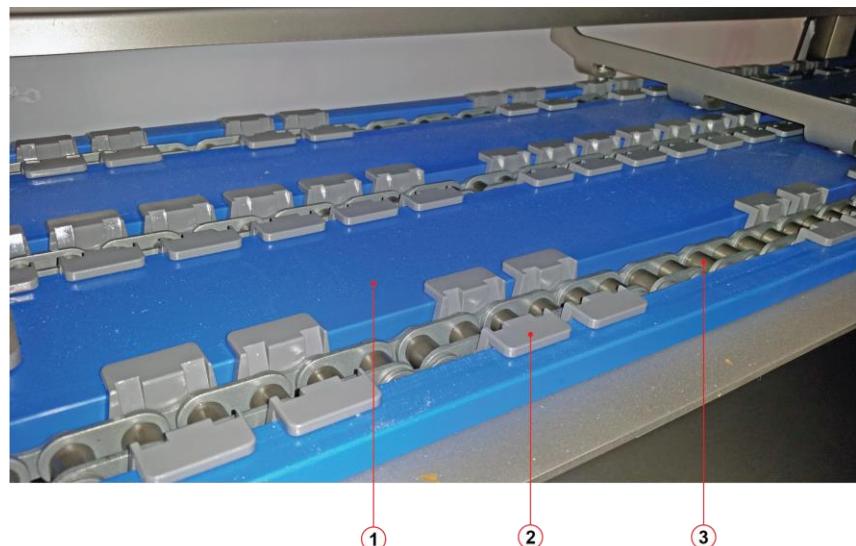


- 1. Front lug chain
- 2. Back lug chain
- 3. Chain wheel
- 4. Front lug
- 5. Back lug

Lug chains

7.6.6 Bucket Chains

Remove a side cover from the bucket/infeed conveyor to inspect all bucket chains.

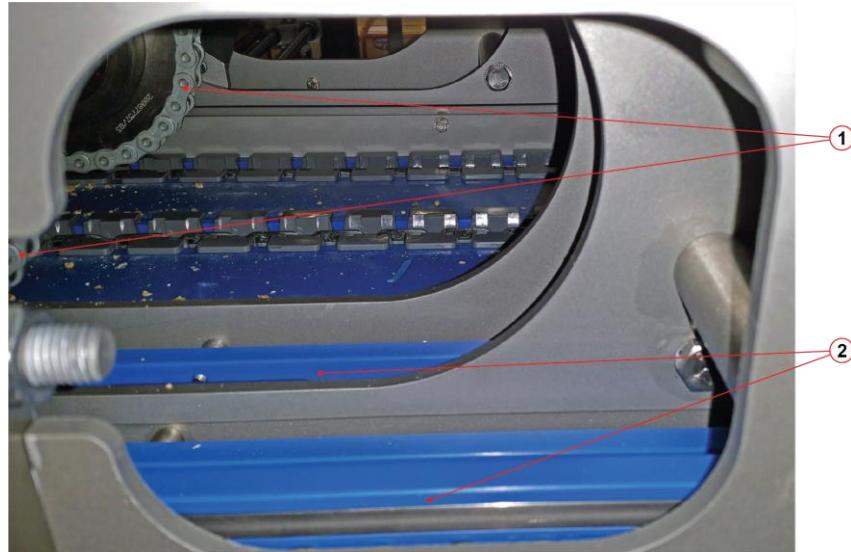


- 1. Chain guiding
- 2. Table top plate
- 3. Bucket chain

Bucket Chain Inspection

7.6.7 Funnel Chains And Drive Chains Adjustable Side

Open a guarding door and use the inspection hole in the frame to inspect the funnel chains. Use a flash light for this inspection.

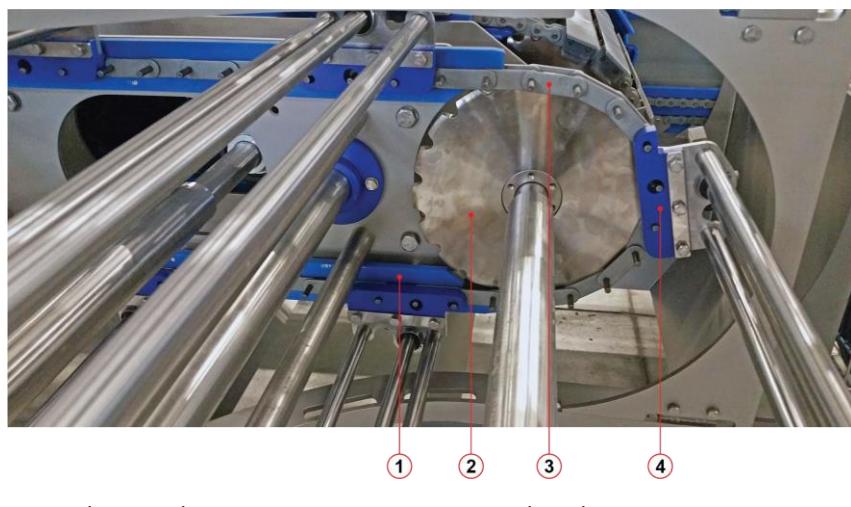


1. Drive chains adjustable side 2. Funnel chains

Drive Chains Adjustable Side and Funnel Chains

7.6.8 Pusher Chains

Open a guarding door at the Autoload side to inspect the pusher chains on both sides.



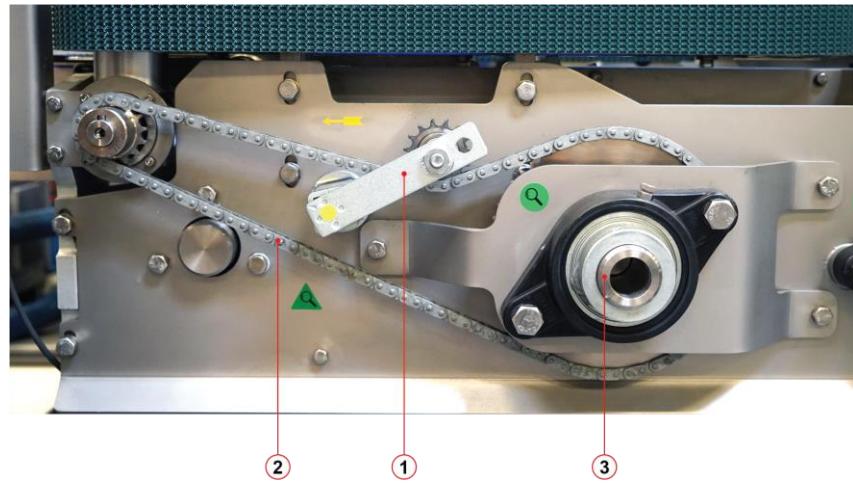
1. Chain guiding
2. Chain wheel

3. Pusher chain
4. pusher system

Pusher Chains

7.6.9 Acceleration belts drive chains

Open a guarding door to inspect the drive chains of the acceleration belts on both sides.



Acceleration drive chain inspection

7.6.10 Check Belts



CHECK

Do a check after every 160 hours of operation.

Check the drive belts for:

- Hairline tears
- Frayed edges
- Broken and worn-down teeth
- Damage caused by grating along edges
- Oil caused by leaks
 - Oil must never come in contact with a drive belt as it causes the belt to swell.
- Tension
 - The lifespan of a geared belt and its bearing is significantly shortened if it is set too loose or too tight.

7.6.10.1 Rotary Feeder Drive Belt Replacement

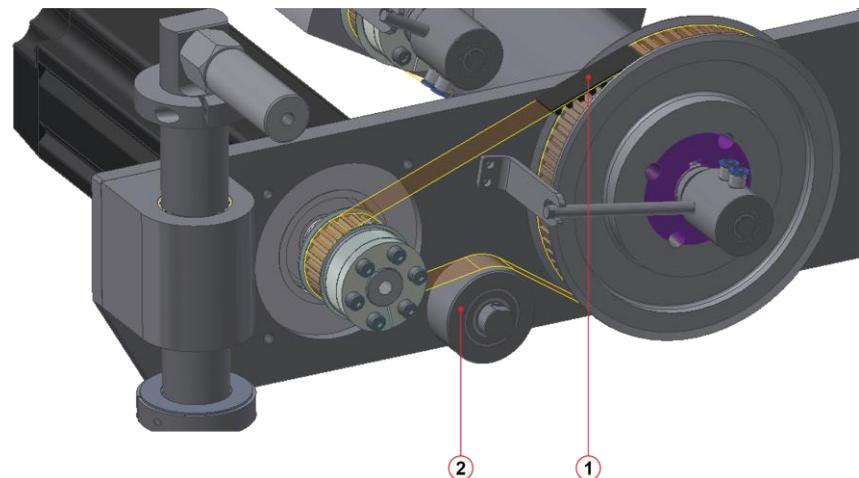


ATTENTION

Only use original Mpac components. If components are replaced by components of another brand or type, the guarantee and liability of the Mpac will cease.

Rotary Feeder drive belt replacement procedure:

1. Make sure the machine is locked out. See Lock Out - Tag Out (LOTO) (on page 18)
2. Loosen the tensioning roller bolt (2).
 - The belt (1) should be tensionless.
3. Replace the belt with a new one.
4. Make sure the Rotary feeder is on its correct zero position, see Zero Point Rotary Feeder (on page 92).
5. Tighten the new belt by turning the entire tensioning roller around the asymmetric axle.
6. Secure the tensioning roller with the bolt.
7. Reset the machine.



Rotary Feeder Drive Belt

7.6.10.2 Tension of the acceleration belt

The correct tension of the acceleration belts is important for a proper functioning of the discharge.



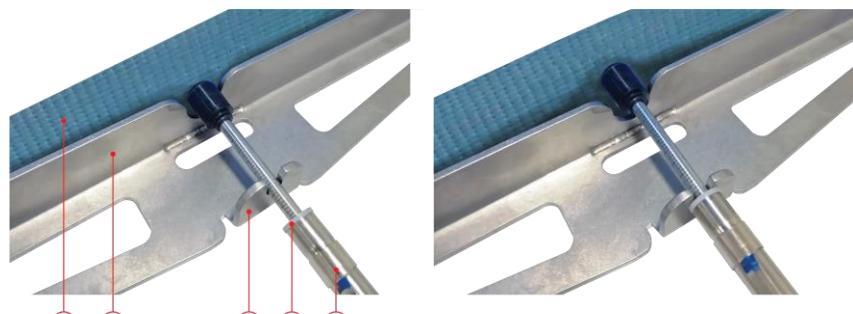
WARNING

If the tension of the belt is too high, the gearbox can get damaged or break.

To do a check on the tension of an acceleration belt, a tension tool is required. This tension tool is supplied with the VENTO-c machine.

Obey this procedure to check the acceleration belt tension:

1. Stop the machine. See Stopping the machine (on page 66)
2. Open the door closest to the acceleration belt.
3. Place the guiding plate (2) of the tension tool against the outer side (side without support plate) of the belt (1).
 - Make sure it is in the center of the belt, in height and width.
4. Place the measuring pen (4) in the guiding plate.
5. Press the measuring pen against the belt until the edge on the pen (5) is against the raised tab (3) of the guiding plate. (see image below)
6. Check the value on the pen in kilograms. The value should be between 1 and 1,5 kilograms.
 - If the value is lower than 1 kilogram, the tension of the belt is too low.
 - If the value is higher than 1,5 kilograms, the tension of the belt is too high.



1. Acceleration belt
2. Guiding plate of tension tool
3. Raised tab on guiding plate
4. Measuring pen of tension tool
5. Edge on measuring pen

Acceleration belt with tension tool

7.6.10.3 Adjust the tension of the acceleration belt

To adjust the tension of an acceleration belt, loosen the mounting bolts (1). Tighten or loosen the belt (2) by adjusting the tensioning bolt (3) outwards or inwards. Tighten the mounting bolts again.



Acceleration belt

7.6.10.4 Acceleration belts replacement



ATTENTION

Always replace an old component/part with a component/part of the same brand and type.

1. Loosen the mounting bolts (1) on the acceleration belts.
 - Do not fully remove the bolts.



Acceleration belt

2. Loosen the belt by adjusting the tensioning bolt (3).
3. Remove the belt (2).
4. Place a new belt.
5. Tension the belt with the tensioning bolt (3).
6. Tighten the mounting bolts (1).
7. Reset the machine.

7.6.11 Check Air System



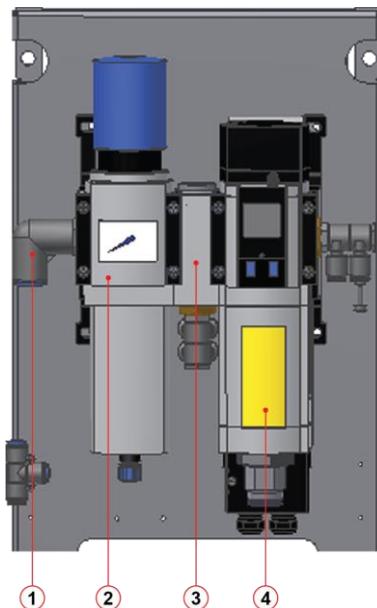
CHECK

Do a check after every 160 hours of operation.

To ensure the proper use of air and safe and proper operation of the machine it is essential that the entire air system be checked regularly.

General procedure:

1. Ensure that the machine is stopped.
2. Lock out the machine. See Lock Out - Tag Out (LOTO) (on page 18)
3. Open the door or cover to the air valve(s).
4. Check the system pressure.
 - The value shown on the main valve pressure gauge must match the value 6 bar.



1. Main air connection
2. Water separator + operating pressure adjustment
3. Splitter valve
4. Safety valve

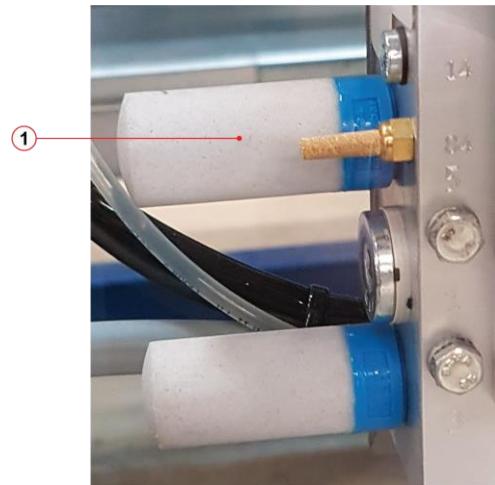
Main Valves Air System



ATTENTION

Immediately replace a defective, worn or damaged component in order to guarantee the safe and proper operation of the machine.

5. Check the water separator for residue.
 - Open the drain plug below the water separator to empty the water separator.
 - It is possible for the drain plug to be always open.
6. Check the hoses and connections for:
 - Loose hoses.
 - Damage (keep hoses away from sharp edges).
 - Faulty connections.
7. Check that the safety lockout is working properly.
 - See Lock Out - Tag Out (LOTO) (on page 18)
8. Check the safety valve.
 - Air pressure must be between 3-4 bar.



Air silencer example

7.6.11.1 Check Suction Cups



CHECK

Do a check daily or after every 8 hours of operation.

Check all suction cups and have them replaced if:

- Too many cartons are missed by the Rotary feeder suction cups.
 - This can be verified via the alarms history on the HMI, see History (on page 33).
- The rubber is frayed or shows tears.

7.6.11.2 Suction Cup Replacement



ATTENTION

Always replace an old component/part with a component/part of the same brand and type.

Ensure that the machine is completely at a standstill.

- Press one of the emergency stops.
- 1. Pull the old suction cup (1) from the nipple (2).
- 2. Place the new suction cup by sliding it fully onto the nipple.



Rotary Feeder Suction Cup

7.6.12 Check Autoload System



CHECK

Do a check after every 160 hours of operation.



ATTENTION

Immediately replace a defective, worn or damaged component in order to guarantee the safe and proper operation of the machine.

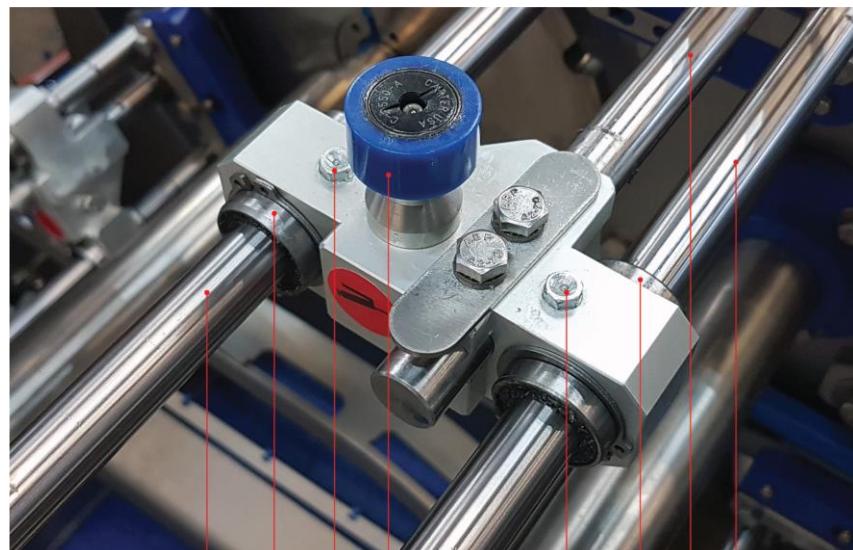


NOTE

Use the jog function to be able to reach all components.

Check the guide roller(s) (1).

- Replace the guide roller in case of visible wear.
 - Replace the guide roller in case of play in the bearings.
1. Check the guide(s) for play.
 - In case of play, replace the guide as well as the linear bearing (**4 and 3**).
 2. Lubricate the linear bearing(s).
 - Attach a lubricating gun to the lubricating nipple (**2**) of the linear bearing (**3**) and keep pumping until new lubricant appears.



- | | |
|--|-------------------|
| 1. Guide roller | 4. Straight guide |
| 2. Lubrication nipple for linear bearing | 5. Pusher rod(s) |
| 3. Linear bearing | |

Autoload System Example

7.6.13 Check Glue System



ATTENTION

Mpac refers to the documentation belonging to the concerning peripheral for information about maintenance and cleaning.



WARNING

Melted glue releases vapors that can cause irritation to the respiratory tract. Ensure there is sufficient ventilation. Do not exceed the operating temperature and keep the glue tank cover closed as much as possible.



WARNING

Make sure the hot glue does not get in contact with skin. The hot glue can cause burns.



CHECK

Do a check after every 960 hours of operation.

Check the glue system for:

- Glue residues
 - Glue and carbonized glue on and near the glue guns must be removed.
- Leaks
 - Check the glue guns, couplings and hoses.
 - Damage and wear.
- If required, immediately replace the parts
 - Refer to the accompanying supplier's documentation for the replacement of parts.

7.6.14 Replace Filters



REPLACE

Replace all general filters after every 1920 hours of operation.



ATTENTION

Always replace an old component/part with a component/part of the same brand and type.

3.

1. Remove the filter cover (2) by pulling it carefully.
2. Remove the old filter sheet (1).
3. Place a new filter sheet.
4. Click the cover back in its place.



Filter replacement

7.6.15 Check Sensors



CHECK

Do a check weekly or after every 40 hours of operation.

The sensors do not require specific maintenance. Mpac recommends to check all screws and plugs to ensure the sensors are tightly mounted.

7.6.16 Miscellaneous

7.6.16.1 Check Lugs



CHECK

Do a check after every 960 hours of operation.

Check the lugs for:

- The presence of glue residues, powder residues, oil, grease, etc.
 - Remove as required.
- Damage

7.6.16.2 Replace Lugs

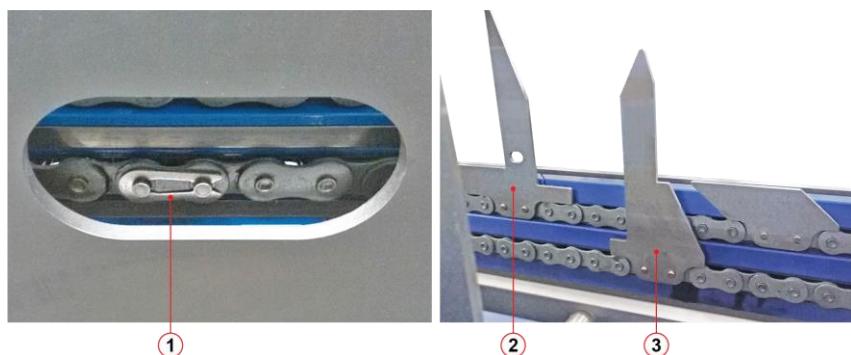


ATTENTION

Immediately replace a defective, worn or damaged component in order to guarantee the safe and proper operation of the machine.

The lugs should be replaced as follows:

1. Jog the machine until the lug to be replaced is positioned in front of the lug replacement opening.
 - The lug replacement opening is located below the Rotary Feeder.
2. Loosen the chains tension.
3. Remove the locking clip (1).
4. Remove the damaged lug (2 or 3).



Lug Replacement

5. Place the new lug.
 - Replace a front lug with a new front lug, replace a back lug with a new back lug.
 - There is only one way in which the lugs can be placed.
6. Replace the locking clip.
 - Always place the locking clip with the closed edge pointing in the direction of the chain transport.
7. Retention the chain.

7.6.16.3 Check Buckets



CHECK

Do a check after every 960 hours of operation.



NOTE

Use the jog function to be able to reach all components.

Check the buckets for:

- The presence of cardboard, product residues, oil, grease, etc.
 - Remove as required.
- Damage
 - Replace the buckets as required.

7.6.17 Check Bearings



CHECK

Do a check after every 960 hours of operation.



ATTENTION

In case of doubt during inspections and maintenance, always contact the Mpac service department.

Check the bearing during production for:

- Grinding (During the start-up and stop procedure)
- Humbling, rumbling or growling noise.
- Vibration and/or wobble.

Check the bearings during lock-out for:

- Snapping, clicking or popping sounds when pulled or pushed the axle. (Indicates for excessive play.)
 - Axially and diagonally.

When any of above happens to a bearing it must be replaced to ensure the machines life span and to ensure safety.



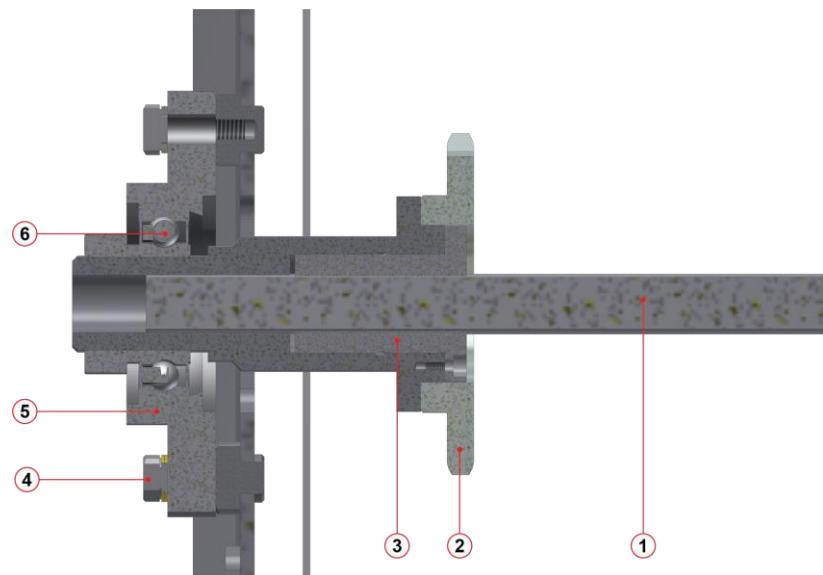
ATTENTION

Do not replace a bearing without special training. Contact the Mpac service department.

7.6.17.1 Replace Drive Shaft Bearings - Adjustable Side

Procedure:

1. Make sure the machine is locked out. See Lock Out - Tag Out (LOTO) (on page 18)
2. Remove the fixing bolts (4) from the bearing housing (5).
3. Remove the entire bearing housing including the roller bearing (6).
4. Replace the roller bearing.
5. Replace the bearing housing.
6. Fixate the housing with the fixing bolts.

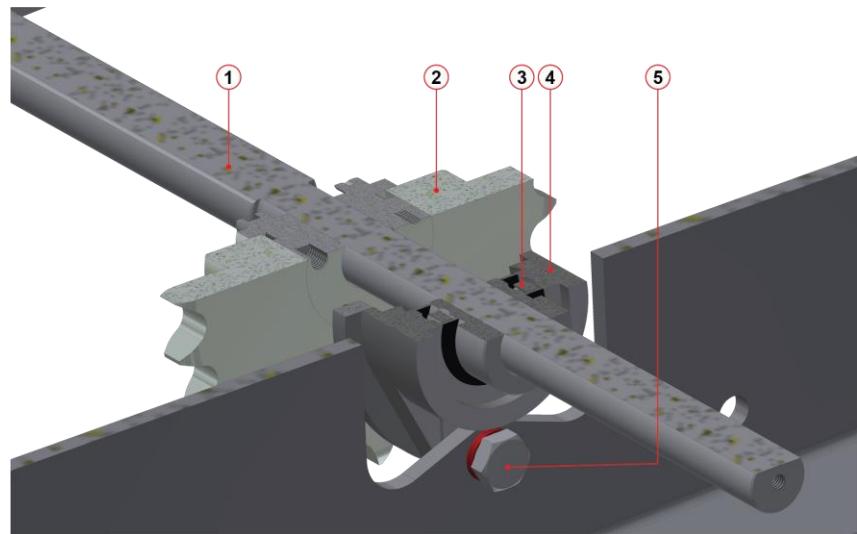


Drive Shaft Bearing - Adjustable Side

7.6.17.2 Replace Drive Shaft Bearings - Fixed Side

Procedure:

1. Make sure the machine is locked out. See Lock Out - Tag Out (LOTO) (on page 18)
2. Remove the fixing bolt (5) from the bearing housing (4).
3. Remove the entire bearing housing including the roller bearing (3).
 - Turn the housing to the left or right to remove it through the notch.
4. Replace the roller bearing.
5. Replace the bearing housing.
6. Fixate the housing with the fixing bolt.



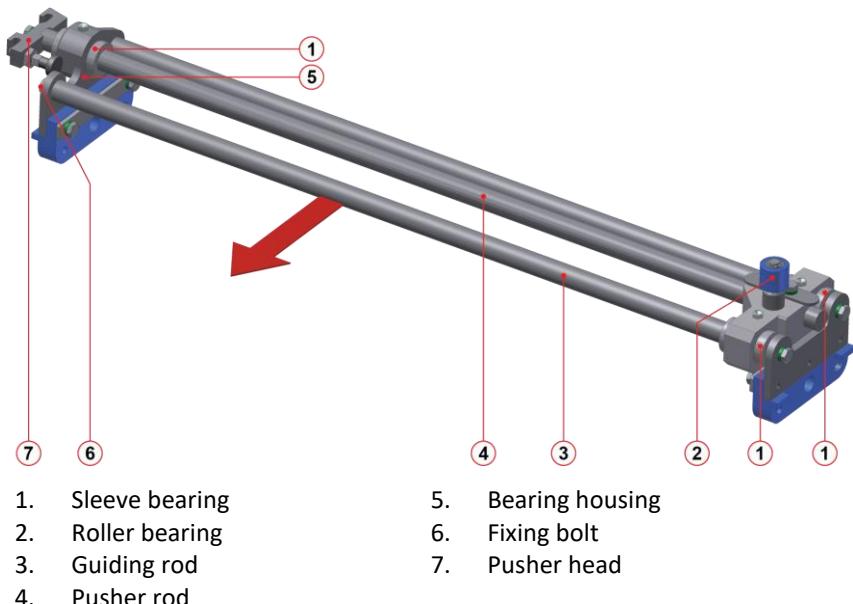
- | | |
|-------------------|--------------------|
| 1. Spline axle | 4. Bearing housing |
| 2. Chain wheel | 5. Fixing bolt |
| 3. Roller bearing | |

Drive Shaft Bearing - Fixed Side

7.6.17.3 Replace Pusher Bearings - Shaft

Procedure:

1. Make sure the machine is locked out. See Lock Out - Tag Out (LOTO) (on page 18)
2. Remove the fixing bolts (6) from the housing (5).
3. Dismantle the entire pusher system.
4. Replace the sleeve bearings (1).
5. Replace the roller bearing (2).
6. Fixate the housing with the fixing bolts.

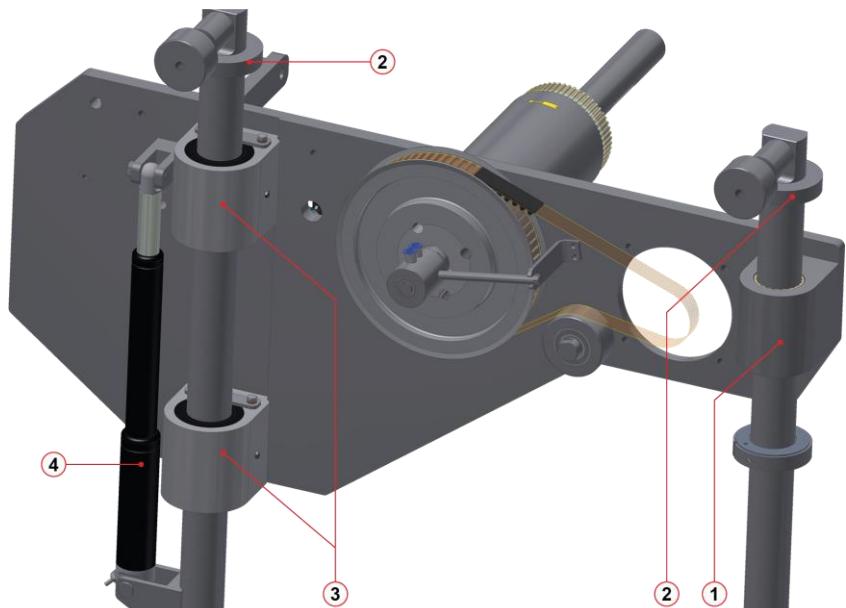


Pusher Bearings

7.6.17.4 Replace Rotary Feeder Height Bearings

Procedure:

1. Make sure the machine is locked out. See Lock Out - Tag Out (LOTO) (on page 18)
2. Mark or measure the height of the bearing relative to the axle.
3. Remove the clamping ring (2).
4. Remove the fixing bolts of the bearing housing.
 - Always leave one side firmly attached due to safety precautions.
5. Slide the bearing housing from the guide.
6. Replace the sleeve bearing (1) or roller bearing (3).
7. Assemble the bearing housing and clamping ring.



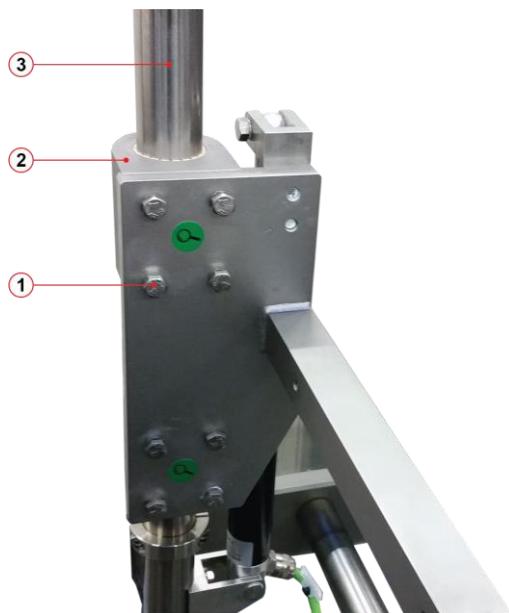
- | | |
|-------------------|-------------------------------|
| 1. Sleeve bearing | 3. Roller bearing |
| 2. Clamping ring | 4. Height adjustment cylinder |

Rotary Feeder Height Bearing

7.6.17.5 Replace Top Guiding Height Bearings

Procedure:

1. Make sure the machine is locked out. See Lock Out - Tag Out (LOTO) (on page 18)
2. Remove the clamping ring.
3. Remove the fixing bolts of the bearing housing (1).
4. Slide the bearing housing (2) from the guide (3).
5. Replace the sleeve bearings.
6. Assemble the bearing housing and clamping ring.



1. Fixing bolt
2. Sleeve bearing housing

3. Height guiding

Top Guiding Height Bearings

7.7 Lubrication schedule

The following applies to the lubrication schedule:

- 'Hours' represents hours of operation.

Table: Lubrication Schedule

Category	Reference	Lubrication Interval [hours]				
		8	40	160	960	1920
Chains						
Do not lubricate the chains!	Self-lubricating chains					
Bearings						
Lubricate linear bearings pusher system	Lubricating Linear Bearings Pusher System (on page 145)				X	
Lubricate height bearings Rotary feeder	Lubricating Blister Pusher System				X	

7.8 Lubrication

7.8.1 Lubricating Bearings

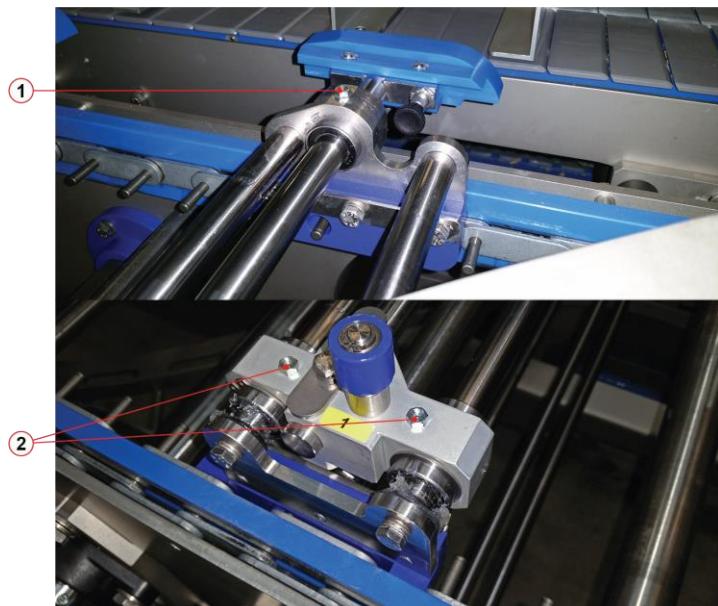
7.8.1.1 Lubricating Linear Bearings Pusher System



LUBRICATION

Lubricate after every 960 hours of operation.

1. Lubricate the linear bearing(s).
 - Attach a lubricating gun to the lubricating nipple of the linear bearing and keep pumping until new lubricant appears.
 - Remove any redundant lubricant.



1. Lubrication point pusher side 2. Lubrication points roller side

Pusher system Lubrication Points

7.9 Oil/Grease and Lubricants

Table standard lubrication

Component	Type of oil
Transmissions	Shell Cassida Fluid GL 460 SKF LHFP 150 Klüber Oil 4UH1 460 (SEW type R., K., F., S..) Klübersynth UH1 6-460 (SEW type W..)
Chains	Normal: Interflon Fin Food Lube + Teflon Autom.: SKF LHFP 150 Chain oil
Bearings	Fag Arcanol Food 2 Bearing Grease Castrol Obeen UF 2 Grease
Hydraulic oil	Cassida Fluid HF 22
Stainless steel fasteners	Molykote P-1900 FM

8 Troubleshooting chart

In the troubleshooting chart below you can find the most common issues of your Mpac machine.

When your issue cannot be found here, please contact our service department.

Issue	Possible cause	Action
24V fuses not OK.	Short circuit.	A technician is required. Check the fuse module in the electrical cabinet. Push the button to reset the electrical circuitry when the button indicator is flashing red. Check the wiring or replace electrical parts if the button keeps flashing.
	Overload.	The total amount of electrical current is too much. A technician is required to solve this issue.
	Other.	Contact your service department.
Door x open.	Door x is open.	Make sure all doors are properly closed. Reset the machine to re-activate the safety circuit.
	Door x not properly closed.	Make sure the indicators on the door lock are: Green led: ON Orange led: flashing Open and close the door if necessary. Reset the machine to re-activate the safety circuit.
	Other.	Contact your service department.
Air pressure too low.	Incoming air supply not sufficient.	Do a check on the incoming air supply.
	There is an air leak.	Make sure the air equipment is not damaged.
	Other.	Contact your service department.

Issue	Possible cause	Action
Autoload track changer not in forward position.	Autoload track changer is blocked	Make sure the pusher roller does not block the autoload track changer on its edge in case of a power failure or e-stop. Move the pusher roller away from the track changer edge by hand.
	Other.	Contact your service department.
Cartons are not glued properly.	The glue does not solidify in time.	The glue temperature is set too hot. Lower the glue temperature.
	The glue solidifies too fast.	The glue temperature is set too cold. Raise the glue temperature.
	No glue is sprayed on the flaps.	Make sure the glue option is activated on the HMI. Clean or replace the glue filters or nozzles.
	Sensor 'Carton in glue position' is not working properly.	Check the sensor. See 'Sensor x NOK'.
	Incorrect zero position of the lug track.	Check the lug track zero point. Zero Point Lug Track (on page 91)
	CAM settings for gluing are not set correctly.	Make sure the CAM settings for gluing are set correctly.
	Not enough glue pressure.	The pressure of the glue pump is too low. Raise the pressure on the glue unit or in the HMI.
	Other.	Contact your service department.
Cartons are not placed correctly on the lug track.	Pre break problem.	See 'Too many cartons missed by rotary feeder'.
	Carton quality is too low.	Do a check on the carton quality. (bends, glue, thickness etc.)
	Lug track zero point is incorrect.	Check the lug track zero point.
	Suction cups are worn out.	Replace suction cups.
	Other.	Contact your service department.
Error servo drive (location)	No power on the drive.	A technician is required. Activate the correct fuse on the fuse module in the electrical cabinet.
	Resistance on drive is too high.	Check lubrication, tension, contamination and/or possible blockage of the driven part.

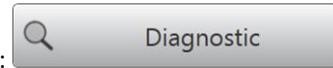
Issue	Possible cause	Action
	Error on servo drive.	A technician is required. Attach a computer with diagnostic tools to the drive and locate the exact issue. Follow the instructions in the servo drive manual.
	Other.	Contact your service department.
E-stop (location) pressed.	Emergency stop is activated.	Resolve the reason of the emergency stop. De-activate the concerning emergency stop. Reset the machine to re-activate the safety circuit.
	Other.	Contact your service department.
Frequency drive (location) not ready.	Fuse deactivated.	A technician is required. Activate the correct fuse on the fuse module in the electrical cabinet.
	Error on frequency drive.	A technician is required. Attach a computer with diagnostic tools to the drive and locate the exact issue. Follow the instructions in the frequency drive manual.
	Other.	Contact your service department.
Glue unit fault.	The glue unit has an error.	Check the glue unit HMI for errors.
Motion group not synchronized.	A servo motor is not synchronized.	Reset the machine. All servo motors will be synchronized. Start the machine.
	Servo motor overload.	See 'Motion group Physical axis fault'.
	Other.	Contact your service department.
Motion group physical axis fault.	Servo motor overload.	Check the HMI for error messages according servo motors to determine the concerning motor. Check the complete servo drive for any blockages what could cause the overload. Remove the blockages and reset the machine. Contact your service department if the problem persists.
Over current frequency drive (location).	Drive location is blocked.	Make sure nothing blocks the drive. Reset and start the machine.
	Other.	Contact your service department.
Products are not correctly pushed into the cartons.	Products are not detected.	Check the shift register for the detection of products. If not detected, see 'Sensor x NOK'.
	Sensor 'Product too high' is incorrectly activated.	Check the shift register for the detection of the product height. If incorrect, see 'Sensor x NOK'.
	Sensor 'Carton placed in lug' is incorrectly activated.	Check the shift register for the detection of the carton placing. If incorrect, see 'Sensor x NOK'.

Issue	Possible cause	Action
	Other.	Contact your service department.
Pusher overload.	Pusher is blocked.	Make sure no product is blocking the pusher. In case of an installed Confiner: Make sure the Confiner is set correctly according to its height.
	Incorrect pusher overload detection pressure.	The overload detection pressure is not set height enough. (Attention! A too high overload detection pressure can cause damage in case of a serious product jam.)
	Carton not set up correctly.	Do a check on the lug chain and rotary feeder to make sure the cartons are set up correctly.
	Pusher overload caused by other machine parts.	Make sure the zero point for the autoload, lug track and confiner are correct. Make sure the offset of the autoload, lug track and confiner are correct. Make sure the pusher does not point downwards. Adjust the pusher guiding. Check for all autoload parts for wear and play.
	Other.	Contact your service department.
Reject Autoload Full.	The reject bin is full.	Empty the reject bin.
	The reject sensor does not detect correctly.	See 'Sensor x NOK'.
	Other.	Contact your service department.
Safety input not ok.	Not all covers/doors are properly closed.	Make sure all covers/doors with safety door switches are closed. Check the HMI for error messages according safety door switches to determine which cover/door is open.
	The template magazine safety switch is activated.	See 'Template magazine safety switch NOK'.
	An emergency stop is activated.	Make sure all emergency stops are de-activated. Check the HMI for error messages according emergency stops to determine which stop is activated.
	Other.	Contact your service department.
Sensor x NOK.	The sensor is triggered due to a dirty lens.	Clean the sensor. See Clean Sensors (on page 110)
	The sensor is blocked.	Make sure the sensor area is free of carton, glue and other residues.
	The sensor or sensor cable is damaged.	Replace sensor or sensor cable.
	Other.	Contact your service department.
Template magazine safety switch NOK.	Not enough cartons in the carton magazine.	Replenish the carton magazine.

Issue	Possible cause	Action
	Other.	Contact your service department.
The jog function is not working.	Wrong machine mode.	Make sure the machine is set in maintenance mode in order to use the jog function.
	Other.	Contact your service department.
Too many cartons missed by the rotary feeder.	Vacuum generators are not producing enough vacuum.	Clean the vacuum generators, venturi's and or silencers or replace them.
	Pneumatic system has leaks.	Make sure the entire pneumatic system is leak free. Check Air System (on page 130)
	Suction cups are worn out.	Replace suction cups. Check Suction Cups (on page 132)
	Rotary Feeder zero position is incorrect.	Make sure the zero position is correct. Zero Point Rotary Feeder
	CAM settings of the Rotary Feeder are not set correctly.	Make sure the CAM settings of the Rotary Feeder are set correctly.
	Carton quality is too low.	Do a check on the carton quality. (bends, glue, thickness etc.)
	Cartons are placed incorrectly.	Make sure the cartons are placed correctly on/in the carton magazine.
	Other.	Contact your service department.
Too many empty cartons.	Empty carton sensor doesn't work (correctly).	Check empty carton sensor for contamination and damage.
	Other.	Contact your service department.
Too many open flaps.	The kicker dents the carton.	Make sure all fold guides are set correctly according the changeover chart.
	Zero position of the lug track is incorrect.	Check the lug track zero point.
	Incorrect kicker timing.	Check the kicker zero point.
	Carton quality has changed.	Make sure the kicker phase shift is set correctly.
	Other.	Contact your service department.
Too many open side flaps.	Cartons are not glued properly.	See 'Cartons are not glued properly'.
	Cartons are not folded properly.	Make sure all fold guides are set correctly according the changeover chart.
	Incorrect zero position of the lug track.	Check the lug track zero point. Zero Point Lug Track (on page 91)
	The side flap detection is incorrect.	See 'Sensor x NOK'.
	Other.	Contact your service department.
Top guide not down.	Top guide is not in the correct position.	Make sure the top guide is in the horizontal position. Reset the machine.

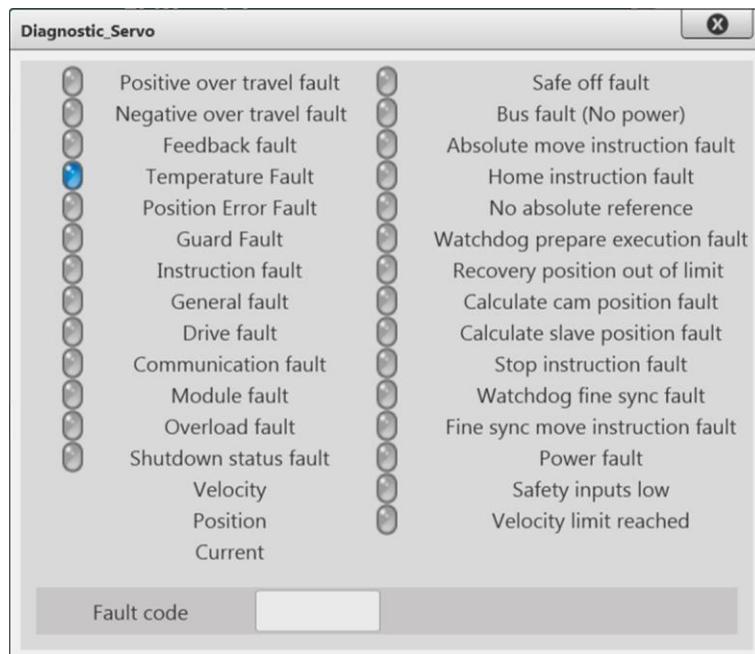
Issue	Possible cause	Action
	The sensor does not detect the top guide position.	Make sure nothing blocks the sensor. Clean the sensor. (See Check Sensors (on page 136))
	Other.	Contact your service department.
Wrong products are not rejected.	Faults are not detected.	Check the shift register for the detection of product faults. If false, see 'Sensor x NOK'.
	Incorrect working reject system.	Check the entire reject system for malfunctioning parts. Replace if necessary.
	Other.	Contact your service department.
Servo x Fault.	A problem with a servo motor.	Check the diagnostic page for the concerning servo motor on the HMI. * Resolve the indicated issues.
	Other.	Contact your service department. **

* On the main screen, tap the diagnostics button:



Tap the servo icon behind the servo motor mentioned in the alarm message.

When an indicator is highlighted , this fault applies to the servo motor.



Example of a servo motor diagnostics screen

** When contacting the service department, make sure to open the servo motor diagnostics screen as shown above. With the information shown on this screen the service engineer can help you the quickest.