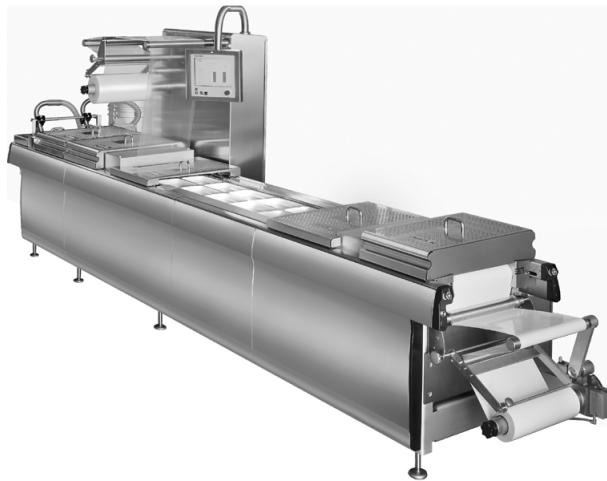


Instruction manual

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MULTIVAC Sepp Haggenmüller SE & Co. KG
Bahnhofstrasse 4
D-87787 Wolfertschwenden
Germany
Tel.: 0049 8334 601 0
www.multivac.com

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Important notice about the instruction manual

Read the instruction manual carefully before you begin working with the machine.

- This instruction manual is part of the machine. Keep the instruction manual for future reference.
- Do not work with the machine until you have read through the instruction manual and completely understood its contents.
- Please contact the manufacturer as soon as possible if there is something you do not understand in the instruction manual! Your comments will help us to further improve the instruction manual.
- This instruction manual has been written for persons who work with or on the machine. Minimum qualifications are required for the respective tasks. See Section 1.1.1 "TARGET GROUP" on page 16.

Only instructed persons may install, operate and maintain the device. The operating company is responsible for qualification and training of the operators.

- If you sell, transfer ownership or lend the machine to others, you must provide the instruction manual along with it!
- For reasons of clarity, some illustrations show the machine without the prescribed safety devices. Operating the machine without the safety devices is prohibited.
- Some illustrations are shown as examples only and may be different from the appearance of the actual machine.

Machine documentation

- Instruction manual
- "For your safety" brochure
- "Stainless steel surfaces must be bright" brochure
- Spare parts catalogue
- Electrical circuit diagram and pneumatic diagram
- EC Declaration of Conformity



Info

The complete scope of delivery is listed in the order confirmation.

Symbols used

Warnings

Warnings draw your attention to hazards. Warnings are displayed in the following form:

DANGER

Immediate danger!

Used to indicate that serious danger is imminent.
Ignoring this danger will result in death or serious injury.

- Observe the notices for avoiding danger.

WARNING

Dangerous situations!

Used to indicate dangerous situations.
Ignoring this danger can result in serious injuries or even death.

- Observe the notices for avoiding danger.

CAUTION

Potentially dangerous situations!

Used to indicate potentially dangerous situations.
Ignoring this danger can cause injuries.

- Observe the notices for avoiding danger.

NOTICE

Material damage!

Used to indicate potentially dangerous situations.
Ignoring these situations can cause material damage.

- Observe the notices for avoiding danger.

**SAFETY
INSTRUCTIONS**

Safety instructions

Safety-related text sections are marked as safety instructions.

Additional information

Information which contributes to better understanding is shown in the following form:



Info

Indicates information on special features deserving your attention.

Action instructions

Action instructions are displayed in the following form:

1. Press key A.
2. Release screw B.
3. Press key C.
✓ The sequence of actions is marked with check marks.

Lists

- Lists are marked with bullet points.
 - The sub-items of lists are marked with indents.

Changes not covered in the manual

Continuous development is the foundation for ensuring that our machines are technically advanced and of high quality. For this reason, you may discover slight deviations between the specifications in the manual and your machine. We also cannot rule out errors. The specifications, figures and descriptions in this manual do not constitute a legal contract between the manufacturer and customer.

Manual layout

- Chapter 1 "Safety":
Generally valid safety instructions are to be observed.
- Chapter 2 "Description":
Description of the main assemblies, functions in the display and technical data.
- Chapter 3 "Start-up":
Notes on starting up and making connections.
- Chapter 4 "Operation":
Information on using the machine.
- Chapter 5 "Adjustment work and setup":
Notes regarding adjustment and setup.
- Chapter 6 "Cleaning":
Instructions for cleaning and information on care products.
- Chapter 7 "Servicing":
Service schedule and instructions for maintenance.
- Chapter 8 "Troubleshooting":
Contains information on how to recognise the causes of malfunctions and troubleshoot them.
- Chapter 9 "Shutdown, transport, storage":
Instructions for shutting down, transporting and storing the machine.



1 Safety

1.1 General safety instructions

The machine incorporates state-of-the-art standards. Nevertheless, potential hazards for persons, the machine and other materials cannot be entirely excluded.

- Before you start up the machine, read through the instruction manual and follow the instructions contained therein.
- Keep the instruction manual near the machine for future reference.
- Observe the safety instructions, which apply in your country.
- Do NOT operate the machine, if you are tired or under the influence of alcohol, drugs or medication.
- Work attentively and with care.
- When performing any work wear personal protective equipment.
- Keep the work area clean and tidy.
- Only carry out work, which is described in the instruction manual, or for which training has been given.
- Do NOT overload the machine.
- Clean and service the machine on a regular basis.
- Check that the machine is in full working order before starting work.
- Do not switch on the machine if external defects or damage to the machine can be seen.
- Switch off the machine if the operating behaviour of the machine changes.
- Have faults and damage repaired immediately by an authorised technician. See Section 1.1.1 "TARGET GROUP" on page 16.
- Repairs and service work should only be carried out by an authorised technician. See Section 1.1.1 "TARGET GROUP" on page 16.

1.1.1 Target group

This manual has been written for persons who work with or on the machine. Minimum qualifications are required for the respective tasks.

Tasks	Recommended minimum qualification
Putting into service	Service personnel
Operation	Operators
Setting and equipping	Operators
Cleaning	Cleaning personnel
Servicing	Service personnel



Tasks	Recommended minimum qualification
Finding faults and troubleshooting	Service personnel
Taking out of service and transport	Service personnel

Recommended minimum qualification

Operators

Persons who work with or on the machine must at least have the following knowledge and skills:

- The persons are authorised by the company operating the machine to carry out the tasks which they perform with or at the machine.
- The persons have been given instruction about the machine and are familiar with the handling of it.
- The persons are at least 14 years old.
- The persons know the danger zones of the machine and the accident prevention regulations.
- The persons know how they should behave in an emergency situation.
- The persons have read and understood the instruction manual of the machine.
- The persons have been informed about and understand the possible hygiene risks.

Service personnel

The persons who put the machine into service, perform service work and eliminate faults must, in addition, have the following knowledge and skills:

- Due to their professional training, their experience, as well as their knowledge of the relevant regulations, these persons are able to assess the tasks assigned to them and to recognize potential hazards.
- The persons can read and interpret technical texts and technical drawings or plans.
- The persons are familiar with the handling of computer-controlled machines.
- The persons can install components and modules for technically complex systems.
- The persons can ensure that the machine remains capable of operation.
- The persons can perform service work and inspections.



Safety

Unauthorised modifications and manufacture of spare parts



Cleaning personnel

Persons who clean the machine must at least have the following knowledge and skills:

- The persons have been instructed on the hazards of the machine.
- The persons have been instructed on the possible hygiene risks.
- The persons have been instructed in the use of cleansers and disinfectants.
- The persons have been instructed in the cleaning procedures that have the manufacturer's approval.
- The persons have been instructed on the use of personal protective equipment.

1.1.2 Unauthorised modifications and manufacture of spare parts

MULTIVAC spare parts and accessories provide the highest level of safety. Parts and equipment from other manufacturers have not been tested by MULTIVAC and are therefore not approved. The use of such components can alter the characteristics of the machine and thereby impair safe operation.

WARNING

Injury hazard!

It is very dangerous to use third-party parts.

The use of third-party parts endangers safe operation and can cause serious injuries.

- Do NOT perform any unauthorised modifications or conversions.
- Do NOT modify or remove any protective or safety devices.
- Use only MULTIVAC spare parts and MULTIVAC accessories.

The manufacturer disclaims any liability for damage caused by the use of third-party parts or unauthorised modifications.



Choose the Original
Choose Success!

Fig. 1: Pro Original

The lubricants recommended by MULTIVAC are ideally matched to the individual modules of the machine.

NOTICE

Material damage!

The use of unsuitable lubricants can increase the wear of the machine and lead to corrosion of the transport chains.

This damages the machine.

- Only use recommended lubricants for the transport chains.



1.2 EC Conformity

The packaging line, packaging machine or auxiliary equipment correspond to the following directives and regulations:

- 2006/42/EC - Machinery Directive
The safety objectives of the EC Low Voltage Directive are complied with in accordance with point 1.5.1 Appendix I to the EC Machinery Directive 2006/42/EC. ¹⁾
- 2014/30/EU - Electromagnetic Compatibility (EMC) Directive¹⁾
- 1935/2004/EC - Regulation on the traceability of materials and articles intended to come into contact with food

In addition to the harmonised basic safety standards and generic safety standards, the following machine standards are also applied:

- EN 415-3:1999+A1:2009 - Safety of packaging machines - Forming, filling and sealing machines ²⁾
- EN 415-7:2006+A1:2008 - Safety of packing machines - Group and secondary machines ³⁾

¹⁾ excluding industrial trucks, such as for example lifting trolleys and die changing trolleys

²⁾ only for types Rxxx and Txxx

³⁾ only for type Hxxx

Agent authorised to compile the relevant technical documentation according to Directive 2006/42/EC:

MULTIVAC Sepp Haggenmüller SE & Co. KG
Department of Technical Services
Bahnhofstraße 4
D-87787 Wolfertschwenden
Germany

Manufacturer:

MULTIVAC Sepp Haggenmüller SE & Co. KG
Bahnhofstraße 4
D-87787 Wolfertschwenden
Germany

Managing Director:

Hans-Joachim Boekstegers

1.3 Intended use

The machine is a piece of technical equipment to be used exclusively as a working appliance. The machine may only be operated by persons that are at least 14 years of age.

The machine is only to be used to pack products in film packages. Reel-fed single-layer or multi-layer films as well as aluminium and paper serve as the packaging material. The forming, filling and sealing of the packs is carried out on the machine.

The machine is not suitable for use in the food contact area.



Safety

Reasonably foreseeable incorrect use



The machine is intended to be set up directly on the production hall floor by means of the machine feet. The distance between the underside of the side cladding and the production hall floor must not be greater than 240 mm (9.45 in) at any position.

The specifications of the machine are described in the 'Technical Specifications'.

Any other use is considered improper and endangers persons, the product and the machine.

1.3.1 Electromagnetic compatibility (EMC)

The machine has been designed for use in business and industrial areas. If used in residential areas, additional interference suppression measures must be taken for electromagnetic compatibility. This requires consultation with the manufacturer.

1.3.2 Non-ionising radiation

The machine produces unintended non-ionising radiation. This is only emitted by electrical operating equipment as a function of its inherent technical nature, e.g., from electric motors, high voltage wires, magnetic coils. Any effect on active implants can therefore be excluded with a high degree of probability as long as a safety distance of 30 cm (11.81 in) is maintained between the implant and the field source.

If the magnetic field strength at the machine should be higher, e.g. , due to permanent magnets, a warning sign will inform you. In this case, a safety distance of 1 m (3.28 ft) must be maintained.

Active implants can be: heart pacemakers, defibrillators etc.

1.4 Reasonably foreseeable incorrect use

The following work methods are not in accordance with intended use and are therefore prohibited:

- Operation under prohibited ambient conditions
- Operation in an atmosphere capable of explosion
- Packing highly flammable, combustible or explosion-prone products
- Packing dust-forming or powder-forming material
- Gas flushing of film pouches with explosive gas mixtures (e.g. oxygen proportion over 21%)
- Aseptic packing of products



Info

Misuse will exclude any liability on behalf of the manufacturer. In such a case, the operating company alone bears the risk.



1.5 Warning about incorrect operation

Incorrect operation is a mistake which is caused by the operator and for which the operator is responsible. Among these are:

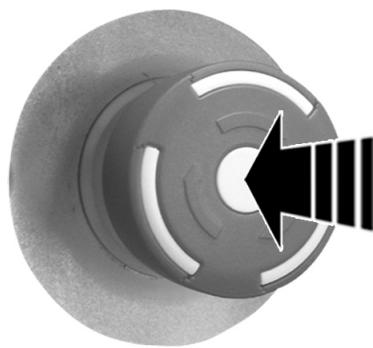
- Wrong inputs or settings
For example: sealing times that are too short or too long and therefore result in improperly sealed packs which in turn damage the product.
- Neglecting the following work tasks:
 - Inspections
 - Cleaning work
 - Service work
- The use of third-party parts, e.g. parts that are not MULTIVAC spare parts
- The impeding of protective devices, e.g. placing products on the safety guards
- Reaching into the machine from below or into the machine interior
- Performing service work with the main switch turned on
- Performing service work on the lifting units, while they are in the cleaning position

1.6 Residual risks

The safety instructions in this manual serve as guidelines for trained operating personnel in safe working practice with the machine. The manufacturer cannot however foresee all possible product-related hazards. This is why the safety instructions and warnings on the machine and in this manual cannot be considered exhaustive. The operating company and operating personnel remain ultimately responsible for safety.

1.7 Conduct in emergencies

-
1. In an emergency, immediately press the EMERGENCY STOP.



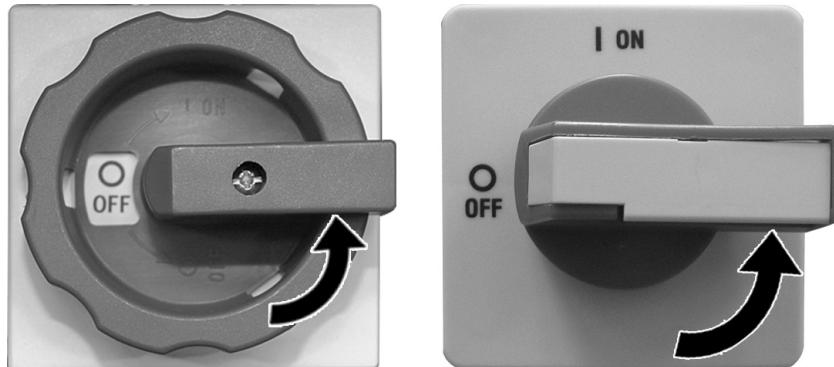


Safety

Freeing persons caught in the machinery



-
2. Switch off the main switch.



-
3. Close all stop-cocks of the supply lines.
 4. If a person is injured, speak to the injured person.
 - 4.1 Summon an additional person for first aid measures.
 - 4.2 Call an emergency doctor and the fire brigade.
-

1.7.1 Freeing persons caught in the machinery

Freeing persons from the forming die

To free a person caught in the forming die or sealing die, the die top section must be lifted.

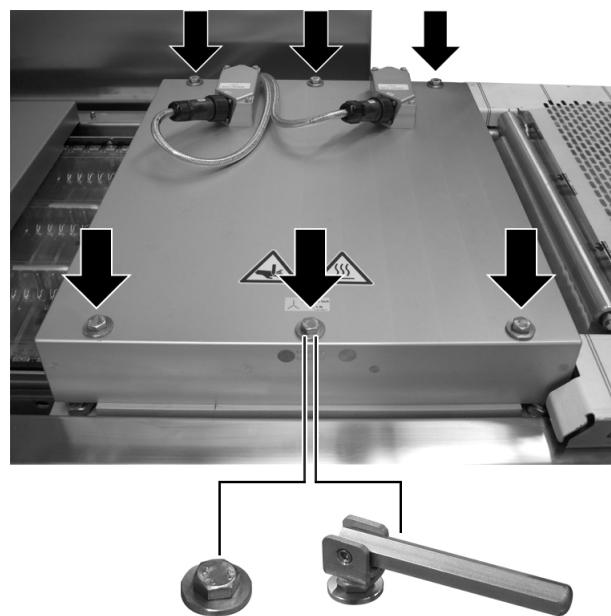


Fig. 2: Sealing die top section

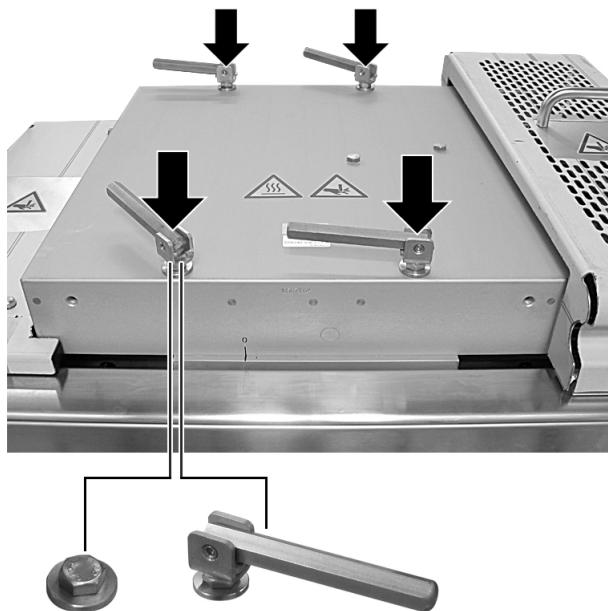


Fig. 3: Forming die top section

1. Switch off the main switch.
2. Unscrew the screws or lever screws on the affected die top section.
3. **WARNING** – The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off. Touching the heating plates can lead to severe burns.
 - When performing any work wear personal protective equipment.
 - Do NOT touch the heating plates.
 - Before starting any work in the danger zone, allow the die to cool down.
4. Lift up the die top section.
5. Free the caught person.

Freeing persons caught in the cross cutter

To free a person caught in the cross cutter, the lever of the lifting mechanism must be unscrewed.



Safety

Freeing persons caught in the machinery

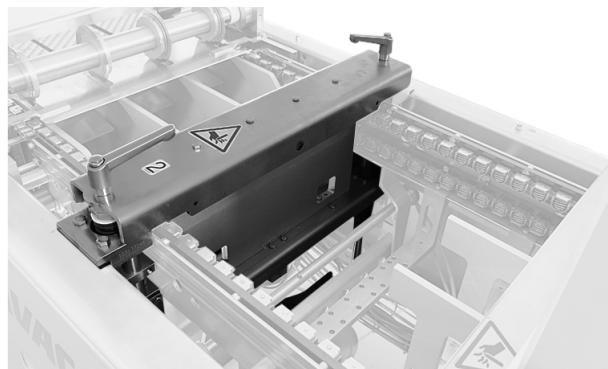


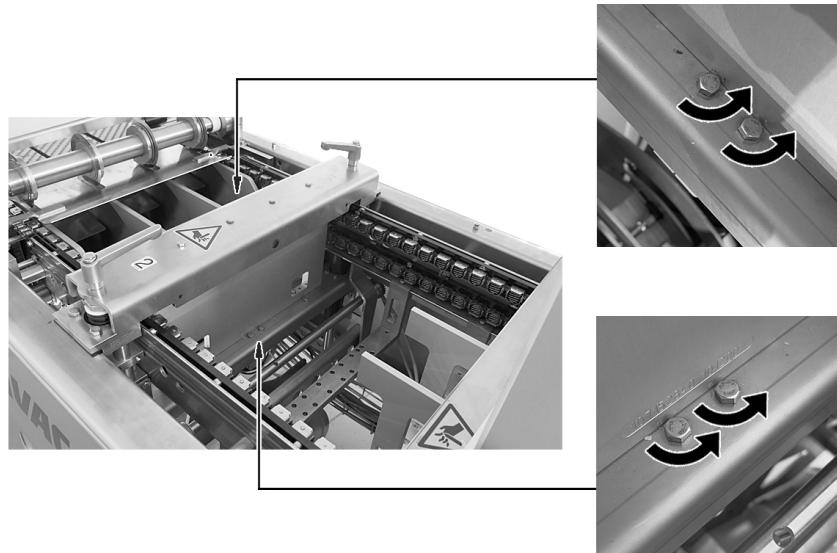
Fig. 4: Cross cutter

1. Switch off the main switch.
2. Remove the safety guards before and after the cutting unit.
 - ✓ The cutting unit is accessible from above.
3. Remove the support bars at the cutting unit.

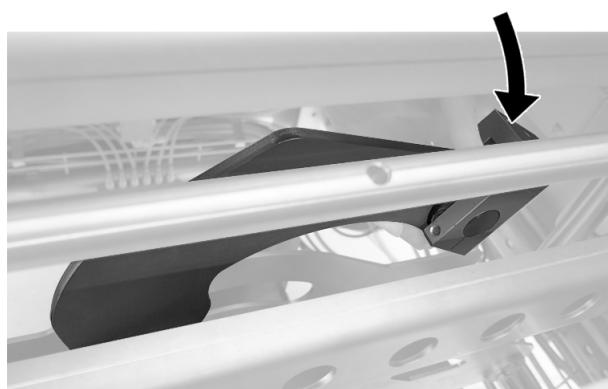




-
4. Unscrew the 4 screws on the cross cutter bottom section.

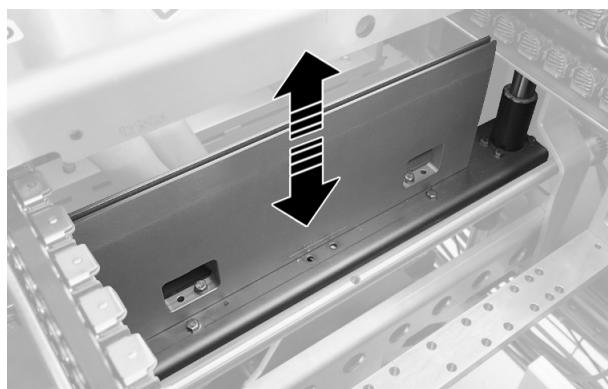


-
5. Move the lever downwards and lay it on the lifting mechanism.



✓ The cross cutter bottom section can be moved freely.

-
6. Shift the cross cutter bottom section.



-
7. Free the caught person.
-



1.8 Obligations of the operating company

1.8.1 Creating the operating directive

The machine and operating materials are a potential source of danger. The operating company is obliged to draw up an operating directive in accordance with the relevant guidelines and legislation. The operating directive regulates the handling of hazardous machines or operating materials, as well as laying down rules for conduct in the case of an emergency.

The operating directive must be handed out to the operators of the machine.

1.8.2 Monitoring obligation

The operating company is obliged to continuously monitor the condition of the entire machine, for example:

- Visible defects or damage
- Changes in the operating behaviour
- Age of the machine

The operating company is obliged to ensure that the machine is no longer operated if it is older than 19 years. The year of manufacture on the type plate of the machine serves as the starting point for assessing the age.

WARNING

Injury hazard!

If the machine is older than 19 years, the correct functioning of the safety functions of the electronic components can no longer be guaranteed.

This can lead to serious injuries.

- Do NOT start up the machine if there are visible defects or if the machine is older than 19 years.
- In order to continue operating the machine, have the safety functions checked by the manufacturer.

1.8.3 Taking precautionary measures for data protection

When using the Ethernet interface, the operating company is obliged to take the usual precautionary measures for data protection, such as for example a firewall and virus protection. If these protective measures are not taken, the software in the machine control can be damaged by viruses, trojans, worms or similar. This can lead to breakdowns in production. The optional MULTIVAC system firewall offers optimum protection for minimising these IT hazards.

Process data in the machine control can be changed via the OPC interface, irrespective of the access right that has been set. This can influence the behaviour of the machine and result in reject packs.



1.8.4 Making the selection of personnel

When selecting the personnel, the operating company must ensure that the personnel are suitable for the activity. See Section 1.1.1 "TARGET GROUP" on page 16.

The personnel selected must observe all the measures for health and safety protection.



Info

Trainees or other persons receiving instructions may only operate the unit under the constant supervision of an experienced technician.

1.8.5 Training the personnel

The operating company is responsible for ensuring, that the personnel is trained and instructed in accordance with the tasks, which have been assigned to them. The following measures can for example contribute to the training and instruction:

- Provide an operating directive, which is comprehensible to the personnel.
- Instruct personnel on how to handle the machine correctly.
- Make the machine instruction manual accessible to the personnel. If necessary, order an instruction manual from the manufacturer in the appropriate official language.
- Inform the personnel about measures for avoiding hygiene risks.
- MULTIVAC offers appropriate training courses.

1.8.6 Providing personal protective equipment

The operating company must ensure that the operators wear the required personal protective equipment (foot protection, head gear, gloves, etc.) in accordance with the national directives which apply. In Europe the directive 89/656/EEC specifies the minimum mandatory requirements for the use of personal protective equipment.

1.8.7 Avoiding hazards

The operating company must check, whether there are special hazards during operation, e.g. through hazardous fumes. The operating company must undertake measures to avoid or limit the hazards.

1.8.8 Making the workplace ergonomic

Non-ergonomic and repetitive tasks can lead to fatigue and muscle pain.

The operating company is responsible for making the operators' workplace ergonomic and for instructing them.

1.8.9 Providing the installation location

The operating company is obliged to provide a suitable installation location for the machine. The requirements for the installation location can be obtained from the manufacturer.



Safety

Observe the requirements for the gas supply



The machine must be accessible for cleaning and service work. This means that a free space of 1.5 m (4.92 ft) is required on all sides of the machine.

1.8.10 Providing power supply

The power supply must be equipped as follows:

- Overcurrent trip device according to IEC 60204-1: 2006
- Mains power breaker in accordance with IEC 60204-1: 2006

Connection via residual current protective device

If the machine is to be operated via a residual current protective device, a residual current protective device which is sensitive to all types of current should be used.



Info

In exceptional cases, the leakage current can be so great that an isolation transformer must be installed upstream from the power infeed of the machine.

Connection to IT network

The machine cannot be connected directly to an IT network. The IT network must be converted to a TN-S network by an isolating transformer. The machine is connected to the TN-S network.

1.8.11 Observe the requirements for the gas supply



Info

Compliance with the following requirements is mandatory and is one of the operating company's imperative obligations!

General requirements

- The operating company is obliged to connect the gas supply in a way that poses no danger to employees or third parties.
- The operating company is obliged to create an operating directive with all necessary safety information for the following phases in the service life of the machine:
 - Putting into service
 - Operation of the machine and conduct in the event of unusual occurrences
 - Servicing during operation
 - Taking machine out of service.
 - Rectification of faults
- All parts of the gas supply and its equipment, which come into contact with oxidizing acting gases, are to be kept free of oil and grease.



- The operating company must ensure that the input and operating pressures given in the Technical specifications are adhered to and not exceeded.

Personnel qualifications

Only qualified persons with the corresponding required training, experience and reliability may perform work on the gas supply.

Structural requirements

- The operating company is obliged to install a pressure reducer and safety valve in the gas supply line to the machine.
- The operating company is obliged to connect the machine to the gas supply with a lockable ball valve.
When the ball valve is closed, the supply of gas to the machine is interrupted.
- It must be ensured that the input pressure at the machine does not exceed that given in the Technical specifications, e.g. through the fitting of an overpressure valve.
- The pressure relief capacity of the safety valve must be dimensioned for the maximum possible throughput of the pressure reducer.
- In the case of a release of pressure, the gas must be diverted to non-hazardous areas.

1.8.12 Avoiding hygiene risks

A high standard of hygiene is achieved through design, choice of materials and workmanship.

It is imperative that this high level of hygiene be maintained by every operating company.

- Where pharmaceutical or sterile medical products are being packed, the currently valid hygiene standards must be strictly observed.
- The person charged by the operating company with safety and/or hygiene must clarify, which regulations apply to the product to be packed, and the person must then implement these regulations.
- Discharge the film out of the machine and cover the web rolls if the machine is due to undergo a prolonged stoppage, also for example overnight. Advance films just immediately before the machine is started again.

The manufacturer assumes no liability whatsoever for any warranty claims and damage claims of any kind resulting from insufficient hygiene and insufficient cleaning.



WARNING

Health hazard!

Insufficient and sporadic cleaning can promote the growth of micro-organisms, which can alter the packed product adversely.

This can pose serious health hazards for people, particularly the end consumer.

Among other measures the following are definitely required:

- Create company cleaning instructions.
- Clean the machine regularly.
- Check the effectiveness of cleaning procedures on a regular basis.
- Follow the instructions in the chapter on "Cleaning".

1.8.13 Observe corrosion protection

MULTIVAC machines are designed for high hygiene requirements. Its metal parts are made of stainless steel wherever possible.

Even stainless steel can rust. It always depends on the boundary conditions. For more information, see the enclosed brochure "Stainless steel surfaces must be bright".

Improper cleaning or a lack of maintenance can damage the machine.

- Do NOT use any cleansers containing chlorine.
- Treat the machine with anti-corrosion agent after every cleaning.
- Follow the instructions in the Cleaning section.

1.8.14 Providing the compressed air supply line

In accordance with the Machinery Directive 2006/42/EC, every machine must be capable of being isolated from every energy source by means of a lockable shut-off device. Compressed air counts as an energy source.

The operating company is required to provide the machine with a lockable stop-cock for the compressed air supply. When a stop-cock is closed, the compressed air supply to the machine is shut off.

1.8.15 Providing cooling water

The operating company is obliged to implement the following points:

- In an open cooling water circuit, the cooling water return flow must be prevented from entering the drinking water circuit.
- If a water chilling unit is in use, the cooling water quality must be checked regularly and a water treatment with a suitable biocide should be performed as needs dictate.



- The cooling water must comply with the requirements given in the Technical specifications.

The values given must not be exceeded, even for a short period of time. If the values are exceeded, the operating company is obliged to stop the machine immediately.

1.8.16 Checking the packs

CAUTION

Health hazard!

Faulty or damaged packs (reject packs) have far-reaching consequences, for example, spoiled products.

Spoiled products can pose a health hazard.

- Check the packs on a regular basis during running operation.
- Do NOT put faulty or damaged packs (reject packs) into circulation.



Info

It is the operating company's duty to determine the overall testing procedure.

Testing procedure

There are various testing procedures depending on the film and the requirements of the packs, e.g.:

- Check seal seam width.
- Check the residual film thickness after forming, e.g. in the corners of the pack.
- Visual inspection: Assess the pack optically.
- Storage test: Store a good pack for a defined period and then re-inspect.
- Stacking test: Stack good packs on top of each other for a defined period and then re-inspect.
- Check the seal seam strength with a tensile testing machine.
- Vacuum test (in the case of vacuum packs)
- Measurement of residual oxygen (in the case of gas flushed packs)

The following faults can result in a pack not being airtight:

- A leaking seal seam. Possible reasons:
 - The seal seam area of the pack is contaminated.
 - The sealing time is too short.
- Damage to the pack caused e.g. by sharp-edged products.

Time of inspection

- After putting the machine into service
- When a defined time interval is reached during running operation
- When the pack size is changed



- When other types of films or other film thicknesses are being used
- After fitting spare parts or wearing parts
- After faults are eliminated on the machine
- After changing the settings on the machine

1.8.17 Testing pressure equipment

The operating company is responsible for observing the country-specific test intervals for pressure equipment. This test is to be performed by qualified persons.

1.9 Danger zones

DANGER

Injury hazard!

Equipment and components can cause sudden, dangerous movements.

Reaching into or standing in a danger zone will lead to serious injuries.

- Do NOT reach into the danger zones of the machine.
- Do NOT linger in the danger zones of the machine.
- Before starting any work in the danger zone, de-energise the machine.

WARNING

Injury hazard!

Altered, damaged, defective or incorrectly applied or missing safety devices will render the danger zones unprotected.

Reaching into unprotected danger zones can lead to serious injuries or death.

- Use only MULTIVAC spare parts and MULTIVAC accessories.
- Do NOT alter the safety devices.
- Before switching on the machine, always check that all safety guards close completely and that they prevent reaching into the danger zones.
- Before switching on the machine, always check that only those safety devices are used, which are suitable for the machine equipment.
- Before switching on the machine, always check that all safety devices are functional and undamaged.

1.9.1 Overview

The diagram shows the general danger zones on the machine. The danger zones of the machine are described in detail below.

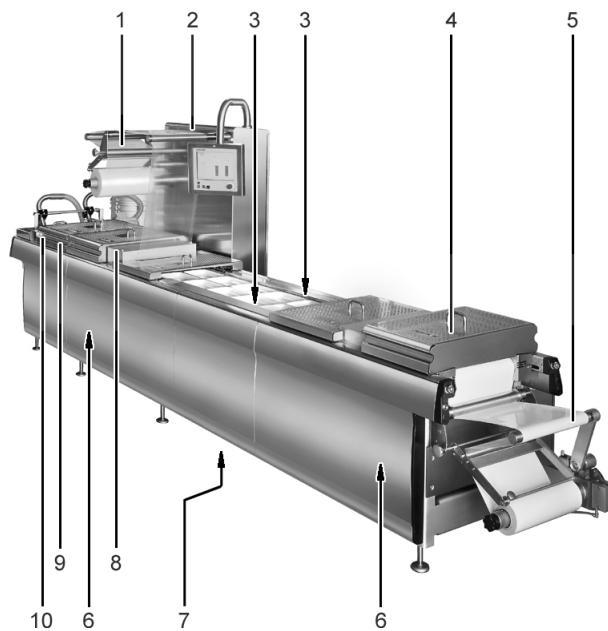


Fig. 5: Danger zones

- 1 Upper web infeed
- 2 Control cabinet
- 3 Transport chains
- 4 Forming station
- 5 Lower web infeed
- 6 Die lifting unit
- 7 Underside of the machine
- 8 Sealing station
- 9 Cross cutter
- 10 Longitudinal cutter

1.9.2 Upper web infeed

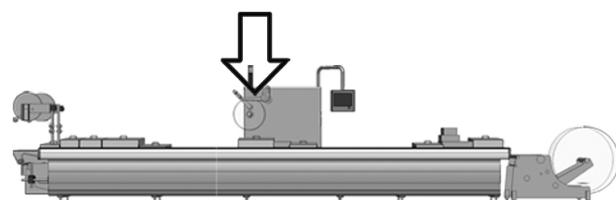


Fig. 6: Position on the machine



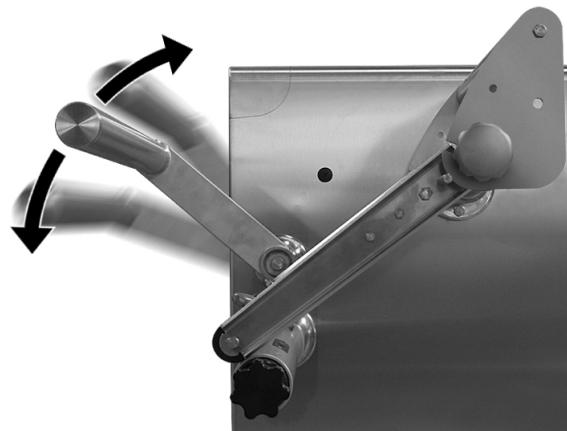
Fig. 7: Upper web infeed, example

 **DANGER**

Injury hazard!

If the film runs out or the film is severed, the swing arm springs back.

Reaching into or standing in the pivoting range of the swing arm will lead to serious injuries.



- Do NOT stand in the pivoting range.
- Do NOT reach into the pivoting range.

**⚠WARNING****Crush hazard!**

The static charge of the film can cause body parts to be pulled in between the deflection roller and the film.

This can lead to crushing injuries.

- Do NOT touch the film.
- Do NOT reach between the film and the deflection roller.
- Do NOT wear any loose clothing.
- Wear a hairnet.

⚠WARNING**Injury hazard!**

The web rolls are heavy.

Carrying heavy web rolls can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.

1.9.3 Control cabinet

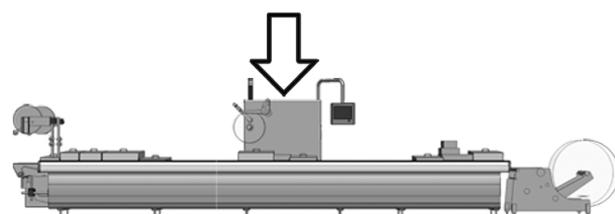


Fig. 8: Position on the machine



Fig. 9: Control cabinet, example



DANGER

Dangerous voltage!

The control cabinet contains live components. Various components are still under voltage even after the machine has been switched off. Touching live components will result in death or serious injury.

- Working on live components is prohibited. Electric lines marked in orange are live.
- Only trained electricians may work on electrical components.
- Do NOT touch damaged cables but have them replaced immediately by a qualified electrician.
- Perform the following steps before starting any work on electrical components:
 1. De-energise the electrical system.
 2. Secure the electrical system to prevent unauthorised start-up.
 3. Check that the electrical components are de-energised.

WARNING

Injury hazard!

Pneumatic lines and pneumatic components in the control cabinet are pressurised.

Working on pressurised pneumatic lines and components can lead to severe injuries.

- Have work in the control cabinet performed by authorised technicians only.
- Keep the safety doors closed.

1.9.4 Heat exchanger

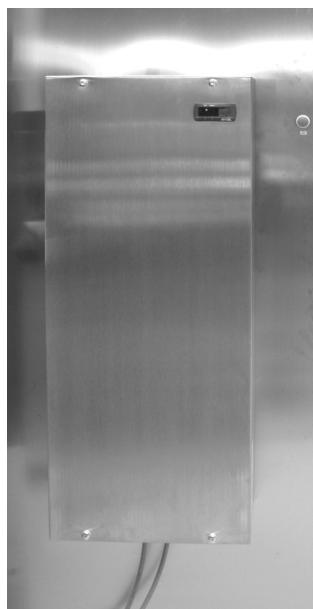


Fig. 10: Heat exchanger

**DANGER****Dangerous voltage!**

Inside are live components.

Touching live components will result in death or serious injury.

- Before opening the housing, disconnect the machine from the mains electricity.
- Only qualified electricians are permitted to work on live components.
- Do NOT touch damaged electrical lines but have them replaced immediately by a qualified electrician.
- If any electrical lines are damaged, stop the machine immediately.

1.9.5 Transport chains

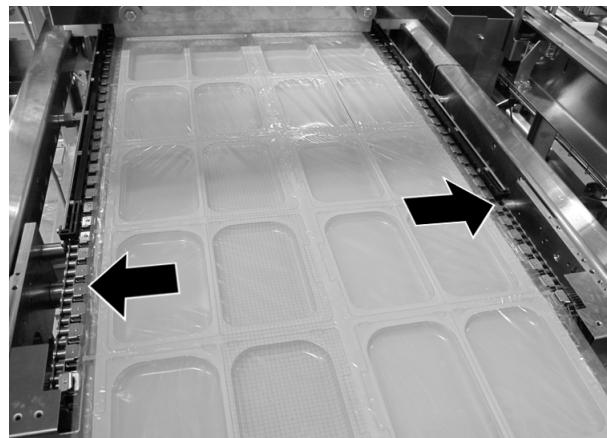


Fig. 11: Transport chains

CAUTION**Injury hazard!**

Moving transport chains can catch on loose clothing, hair and loose objects.

This can lead to injuries.

- Do NOT reach into moving transport chains.
- Wear a hairnet.
- Before starting any work in the area of the transport chain, turn off the main switch and attach a lock to prevent unauthorised start-up.



1.9.6 Forming station

DANGER

Amputation hazard!

The movements of the die are performed automatically and with great force.

Reaching into the moving die can result in loss of limbs.

- Do NOT reach into the die.
- Do NOT remove the safety guards.
- Do NOT reach under the safety guards.
- Before starting any work in the area of the die, de-energise the machine.

WARNING

Burn hazard!

The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off.

Touching the heating plates can lead to severe burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the heating plates.
- Before starting any work in the danger zone, allow the die to cool down.

WARNING

Injury hazard!

Dies are heavy and have sharp edges.

Carrying heavy dies can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

CAUTION

Injury hazard!

Sharp slitting knives or hole punches can be installed in the die bottom section.

Touching the sharp slitting knives or hole punches can lead to injuries.

- When performing any work wear personal protective equipment.

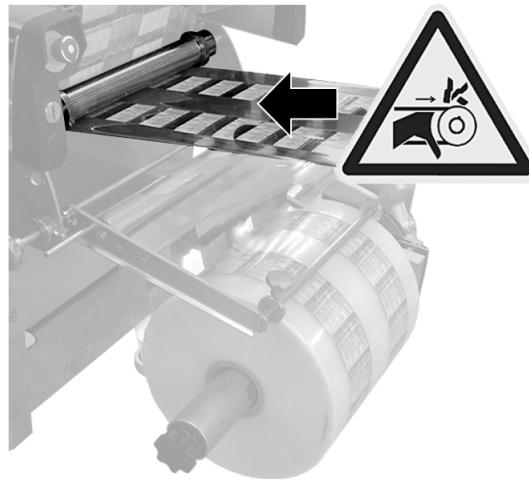


1.9.7 Lower web infeed

WARNING

Crush hazard!

The static charge of the film can cause body parts to be pulled in between the deflection roller and the film.
This can lead to crushing injuries.



- Do NOT touch the film.
- Do NOT reach between the film and the deflection roller.
- Do NOT wear any loose clothing.
- Wear a hairnet.

WARNING

Injury hazard!

The web rolls are heavy.
Carrying heavy web rolls can lead to injuries.

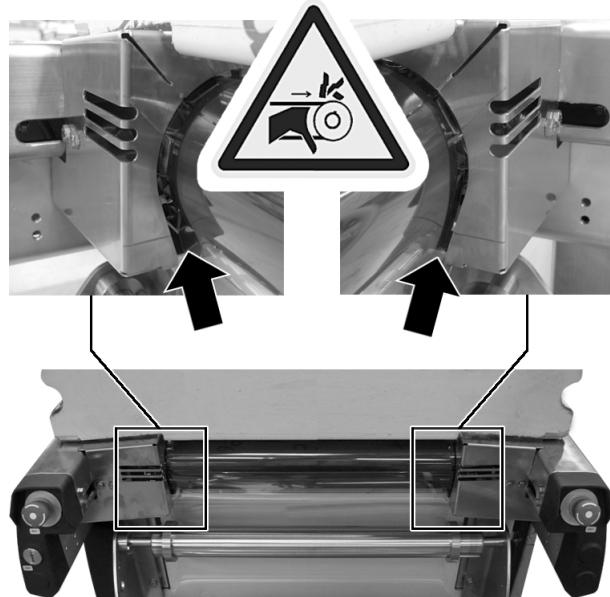
- Use suitable load lifting equipment.
- Have a second person assist you.



 **WARNING**

Crush hazard!

Rotating parts can easily catch on loose clothing, hair and objects. Reaching in between the cover plate and the sprocket can lead to crushing injuries.

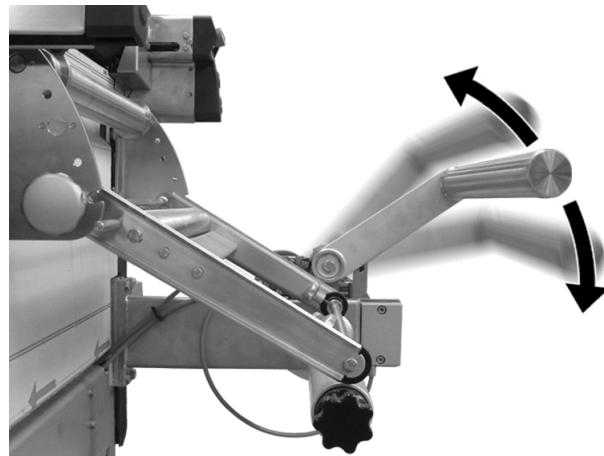


- Do NOT reach between the cover plate and the sprocket.
- Do NOT wear any loose clothing.
- Wear a hairnet.

**⚠CAUTION****Injury hazard!**

If the film runs out or the film is severed, the swing arm springs back.

Standing within the pivoting range of the swing arm, or reaching into the pivoting range, can lead to injuries.



- Do NOT stand in the pivoting range.
- Do NOT reach into the pivoting range.

⚠CAUTION**Injury hazard!**

The swing arm is moved by the web advance.

Limbs can get caught between the swing arm and the machine.

- Exercise caution during all work in the area of the swing arm.

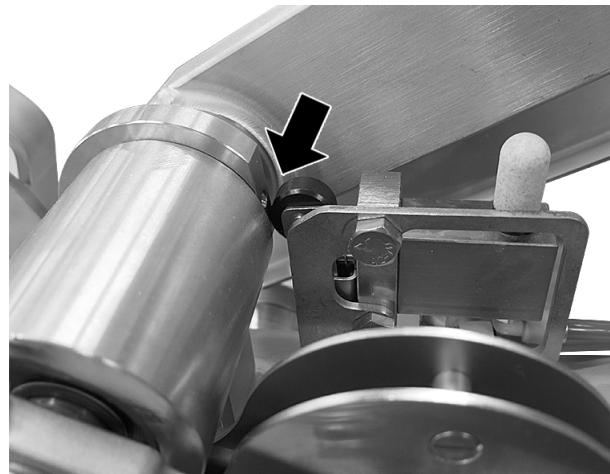


⚠ CAUTION

Injury hazard!

Limbs can be trapped between the roller lever valve and the trip cam.

This can lead to injuries.



- Do NOT reach into the danger zone.

1.9.8 Die lifting unit

⚠ DANGER

Amputation hazard

The movements of the lifting units are performed automatically and with great force.

Reaching into the moving lifting units can result in loss of limbs.

- Do NOT reach into the lifting units.
- Do NOT remove the side panels and safety guards.
- Before starting any work, turn off the main switch and attach a lock to prevent unauthorised start-up.



1.9.9 Underside of the machine

DANGER

Amputation hazard!

The lifting units, dies, cutting units and drives are freely accessible from below.

Reaching into these moving devices will lead to serious injuries.

- Do NOT reach into the machine from below.
- Do NOT reach under the machine.
- Do NOT lie under the machine.
- If the machine is switched on, do NOT pick up any products or objects, which have fallen under the machine. Use a suitable aid to pick up products or objects.
- When carrying out any work in the danger zone, do NOT allow other persons near the machine.
- Before starting any work on the machine, de-energise the machine.

1.9.10 Sealing station

DANGER

Amputation hazard!

The movements of the die are performed automatically and with great force.

Reaching into the moving die can result in loss of limbs.

- Do NOT reach into the die.
- Do NOT remove the safety guards.
- Do NOT reach under the safety guards.
- Before starting any work in the area of the die, de-energise the machine.

DANGER

Risk of death!

During the packing process, inert gases are released.

Inhaling packaging gas can impair your breathing. Over a longer period of time, this can be fatal.

- A surface area of at least 40 square meters per machine must be made available.
- Ventilate the rooms sufficiently and avoid any accumulation of gas.
- Observe the maximum input pressure, see 'Technical Specifications'.
- Cut off the gas supply at the end of work.
- Observe the safety regulations in force in the country where the machine is used.



WARNING

Burn hazard!

The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off.

Touching the heating plates can lead to severe burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the heating plates.
- Before starting any work in the danger zone, allow the die to cool down.

WARNING

Injury hazard!

Dies are heavy and have sharp edges.

Carrying heavy dies can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

CAUTION

Injury hazard!

Sharp slitting knives or hole punches can be installed in the die bottom section.

Touching the sharp slitting knives or hole punches can lead to injuries.

- When performing any work wear personal protective equipment.

1.9.11 Cross cutter

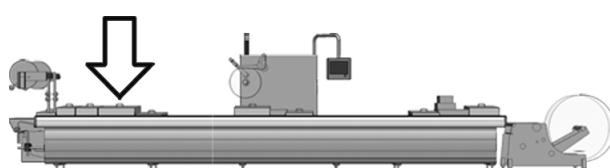


Fig. 12: Position on the machine



Fig. 13: Cross cutter

**DANGER****Amputation hazard!**

The cutting unit closes automatically and has sharp knives.
Reaching into the cutting unit while it is closing can result in loss of limbs.

- Do NOT reach into the cutting unit.
- Do NOT reach under the safety guards.
- Do NOT remove the safety guards.
- When performing any work wear personal protective equipment.
- Before starting any work, de-energise the machine.

CAUTION**Injury hazard!**

Sharp slitting knives or hole punches can be installed in the cutting unit.

Touching the sharp slitting knives or hole punches can lead to injuries.

- When performing any work wear personal protective equipment.

1.9.12 Longitudinal cutter

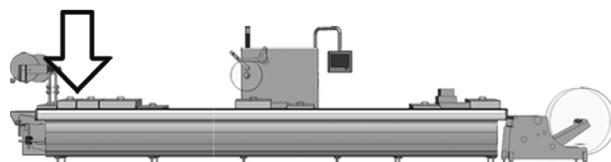


Fig. 14: Position on the machine

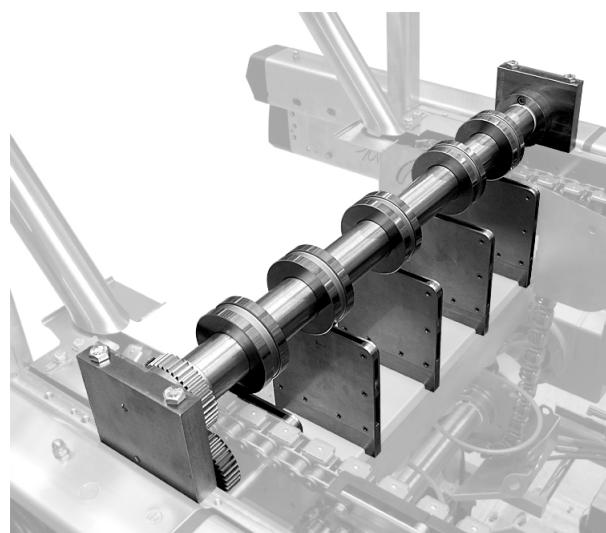


Fig. 15: Squeezing knife unit



⚠ CAUTION

Injury hazard!

The knives of the cutting unit are sharp.
Touching them can lead to injuries.

- When performing any work wear personal protective equipment.
- Do NOT touch the knives.
- Before starting any work in the danger zone, de-energise the machine.

1.9.13 Smooth-body motor

Smooth-body motors can be located in various positions on the machine.

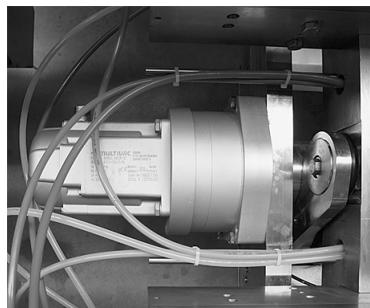


Fig. 16: Smooth-body motor, example

⚠ WARNING

Burn hazard!

The motor surface can become very hot during operation.
Touching the motor can cause burns.

- When performing any work wear personal protective equipment.
- Before starting any work in the danger zone, allow the motor to cool down.

1.9.14 Easy print printer

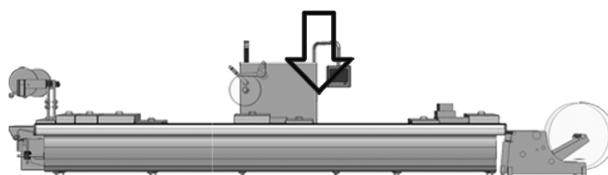


Fig. 17: Position on the machine



Fig. 18: EasyPrint printer

⚠ DANGER

Dangerous voltage!

Inside are live components.

Touching live components will result in death or serious injury.

- Before opening the housing, disconnect the machine from the mains electricity.
- Only qualified electricians are permitted to work on live components.
- Do NOT touch damaged electrical lines but have them replaced immediately by a qualified electrician.
- If any electrical lines are damaged, stop the machine immediately.

⚠ WARNING

Crush hazard!

Movements are performed with great force.

Reaching between moving components can lead to crushing injuries.

- Do NOT reach into the danger zone.
- Before starting any work in the danger zone, de-energise the machine.

⚠ WARNING

Injury hazard!

Rotating parts can easily catch on loose clothing, hair and objects. This can lead to serious injuries.

- Do NOT wear any loose clothing.
- Wear a hairnet.



The documentation of the printer contains further information on the danger zones of this unit.

1.9.15 Edge trim winder

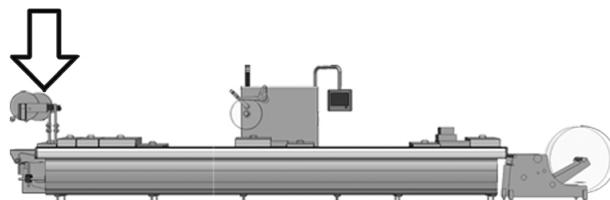


Fig. 19: Position on the machine

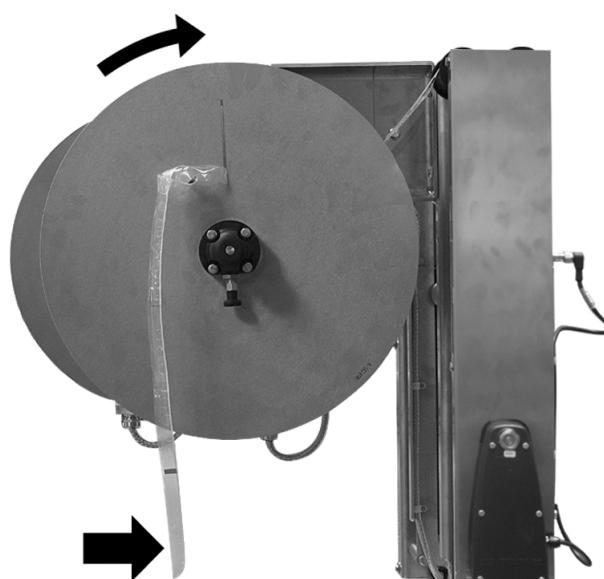
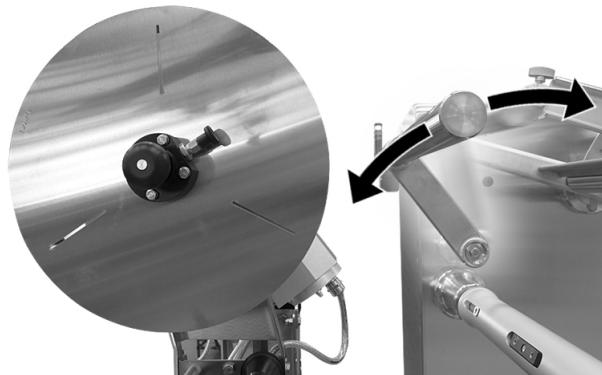


Fig. 20: Danger zones


DANGER
Injury hazard!

If the film runs out or the film is severed, the swing arm springs back.

Standing between the edge trim winder and the swing arm will lead to serious injuries.



- Do NOT stand in the pivoting range of the swing arm.

WARNING
Crush hazard!

Rotating parts can easily catch on loose clothing, hair and objects. Reaching in between the edge trim and winding spool can lead to serious crushing injuries.

- Do NOT reach between the edge trim and winding spool.
- Do NOT wear any loose clothing.
- Wear a hairnet.

CAUTION
Injury hazard!

The edge trim strips of the film have sharp contours. Contact with the edge trim can lead to injuries.

- When performing any work wear personal protective equipment.
- Do NOT touch the edge trim.

CAUTION
Injury hazard!

When the locking bolt is unlocked, the washer of the edge trim winder can fall down.

This can lead to injuries.

- When performing any work wear personal protective equipment.

1.9.16 Belt transfers

If the machine is connected to upstream or downstream equipment, e.g. transport conveyors, danger zones can arise at the belt transfers



between transport conveyors, where for example clothing or body parts may be pulled in.

Do not operate the machine while the danger zones at the conveyor transfers are unprotected.

Implement appropriate measures to rectify the in-running nip points.



Fig. 21: Conveyor transfer, example

 **WARNING**

Crush hazard!

Running transport conveyors and rotating components move with great force.

Reaching into running transport conveyors and between rotating components can cause crushing injuries.

- Do NOT reach into running transport conveyors and between rotating components.
- Before starting any work in danger zones, de-energise the machine.



1.9.17 Discharge unit



Fig. 22: Examples of discharge conveyors

WARNING

Crush hazard!

Running transport conveyors and rotating components move with great force.

Reaching into running transport conveyors and between rotating components can cause crushing injuries.

- Do NOT reach between the deflection rollers and the transport belt or the modular plastic belt.
- Do NOT reach between the fixed components and the transport belt or the modular plastic belt.
- Do NOT reach into running transport conveyors and between rotating components.
- Before starting any work in danger zones, de-energise the machine.

WARNING

Injury hazard!

Moving transport devices can easily catch on loose clothing, hair and objects.

This can lead to serious injuries.

- Do NOT reach into the transport devices when they are running.
- Do NOT wear any loose clothing.
- Wear a hairnet.
- Before starting any work in the area of the transport devices, turn off the main switch and attach a lock to prevent unauthorised start-up.



⚠WARNING

Burn hazard!

The motor surface can become very hot during operation.

Touching the motor can cause burns.

- When performing any work wear personal protective equipment.
- Before starting any work in the danger zone, allow the motor to cool down.

1.9.18 Vision System



Fig. 23: Vision system



Fig. 24: Safety clearance, vision system

**⚠CAUTION****Injury hazard!**

The film can pull limbs under the vision system.
This can lead to injuries.

- Do NOT reach between the film and the vision system.
- Before starting any work, de-energise the machine.
- When guard plates are removed, ensure that the distance between the underside of the vision system and the film level is greater than 100 mm (4 in).

The separate documentation of the vision system contains further information on the danger zones of this unit.

1.9.19 Inspection system

Vision System



Fig. 25: Vision system

The separate documentation for the vision system contains the information on the danger zones of this unit.



Safety

Mink MM xxxx vacuum pump



1.9.20 Mink MM xxxx vacuum pump

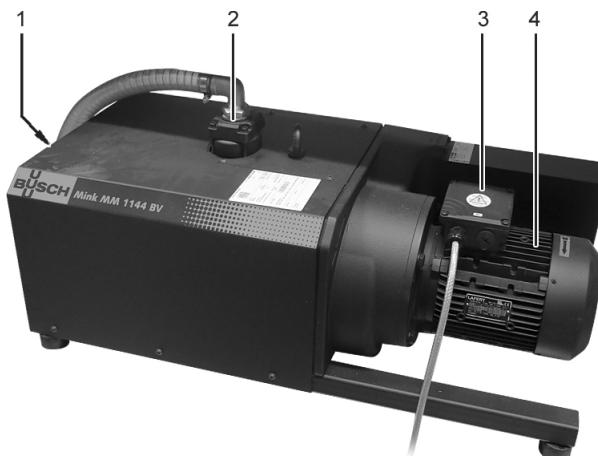


Fig. 26: Mink MM xxxx vacuum pump

- 1 Gas outlet
- 2 Suction connection
- 3 Terminal box
- 4 Electric motor

DANGER

Dangerous voltage!

Inside are live components.

Touching live components will result in death or serious injury.

- Disconnect the vacuum pump from the mains electricity before opening the cover.
- Only qualified electricians are permitted to work on live components.
- Do NOT touch damaged electrical lines. Have them replaced immediately by a qualified electrician.
- Do not put the vacuum pump into operation without the cover of the terminal box.

CAUTION

Injury hazard!

The vacuum pump generates negative pressure during operation.

Touching the open suction connection can lead to injuries.

- Do not touch the suction connection during operation.
- Ventilate the vacuum pump before reaching into it.

**⚠CAUTION****Injury hazard!**

Rotating parts can easily catch on loose clothing, hair and loose objects.

This can lead to injuries.

- Do not remove the guard on the motor fan.
- Wear a hairnet.
- Do NOT wear any loose clothing.

⚠CAUTION**Health hazard!**

The exhaust air at the gas outlet contains traces of oil vapour. Inhalng oil vapour over a longer period of time can impair your breathing.

- Do NOT inhale oil vapour.

1.10 Safety devices

The type and arrangement of the safety devices used depends on the machine equipment.

⚠WARNING**Injury hazard!**

Altered, damaged, defective or incorrectly applied or missing safety devices will render the danger zones unprotected.

Reaching into unprotected danger zones can lead to serious injuries or death.

- Use only MULTIVAC spare parts and MULTIVAC accessories.
- Do NOT alter the safety devices.
- Before switching on the machine, always check that all safety guards close completely and that they prevent reaching into the danger zones.
- Before switching on the machine, always check that only those safety devices are used, which are suitable for the machine equipment.
- Before switching on the machine, always check that all safety devices are functional and undamaged.



Safety

Safety-related parts of the machine control (SRP/CS)



1.10.1 Safety-related parts of the machine control (SRP/CS)

Parts, which react to safety-related input signals and generate safety-related output signals, such as for example:

- Sensors
 - Lock mechanisms of fixed interlocking protective devices with magnetic reed switches and evaluation unit
 - Safety light barriers
 - EMERGENCY STOP command units
 - The magnetic reed switches of movable interlocking protective devices
- Logic
 - Safety switching units
 - Safety PLC
 - Safety circuits
- Actuators
 - Drives
 - Motors
 - Frequency converters
 - Valves
 - Brakes

The SRP/CS are depicted in the electrical circuit diagrams and pneumatic diagrams.

Faults in these parts are excluded through the following measures:

- Use of proven components only
- Use exclusively of MULTIVAC spare parts
- Use of reliable signal cables
- Repairs of the SRP/CS by MULTIVAC service personnel only
- Direct access to pneumatic SRP/CS is prevented by fixed interlocking protective devices

Response time	In accordance with DIN EN 415-3 or DIN EN 415-7
Limits on operation	See "Intended use"
Limits of safety-related parts	See "Safety devices"
Machine maintenance	See "Servicing"
Checklists	See "Checks before switching on"
Spare parts	See "Safety", "Electrical circuit diagram and pneumatic diagram" and "Spare parts catalogue"



Performance level	ISO 13849-1:2015, Category 3 PL d For light barriers ISO 13849-1:2015, Category 2 PL d
Lifespan	19 years
Display and alarms	<ul style="list-style-type: none"> • Display • Signal tower • Signal horn <p>Depending on the equipment on the machine</p>
Operating modes	<ul style="list-style-type: none"> • Automatic mode • Single-cycle mode • Inching mode • Set-up mode • Manual loading (handling modules) • Servicing • Cleaning • Lubrication

1.10.2 Main switch

The machine can be equipped with different main switches. A distinction is made between main switches in a signal colour and black main switches.

- The main switches in a signal colour have an EMERGENCY STOP function. See Section 1.10.3 "EMERGENCY STOP" on page 59.
- The black main switches do not have an EMERGENCY STOP function. The machine control continues to be live after it has been switched off.

DANGER

Injury hazard!

After you switch off the main switch, the machine will NOT be completely without electrical current and will NOT be completely without pressure. Components can still be carrying voltage. Equipment can independently make unexpected and dangerous movements.

Touching live components will result in death or serious injury.

Reaching into or standing in a danger zone will result in death or serious injury.

- Keep the safety doors closed.
- Do NOT touch live components.
- Do NOT reach into the danger zones of the machine.
- Do NOT stand in the danger zones of the machine.



Safety
Main switch

Main switch in a signal colour

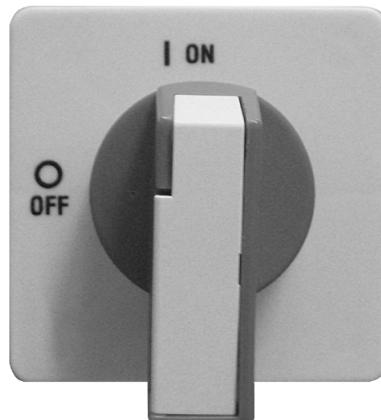


Fig. 27: Main switch turned on

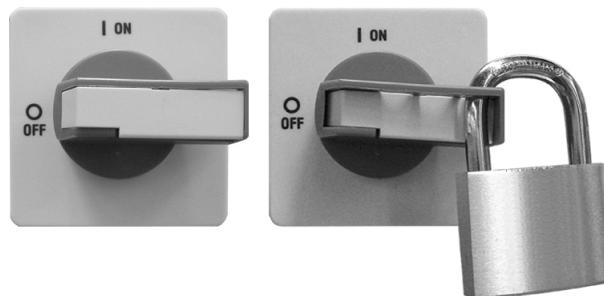


Fig. 28: Main switch turned off

Switching off the main switch has the following effects:

- The packaging procedure stops.
- The power supply is shut off.
 - The control cabinet heater (optional) and the service socket may still be live.
- The compressed air supply is shut off.
 - Individual devices may still be under pressure, such as control valves.
- The cooling water inlet is shut off

Position	Function
I / ON	The machine is switched on
O / OFF	The machine is switched off



Black main switch



Fig. 29: Main switch turned on

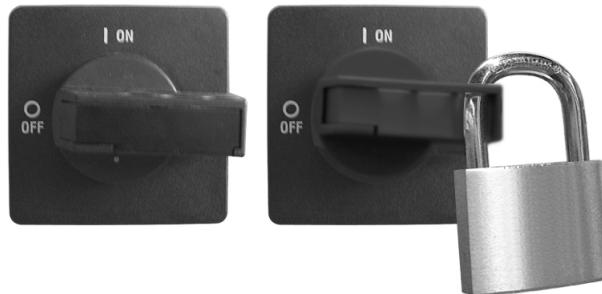


Fig. 30: Main switch turned off

Switching off the main switch has the following effects:

- The packaging procedure stops.
- The power supply is shut off.
 - The machine control continues to be live.
 - The control cabinet heater (optional) and the service socket may still be live.
- The compressed air supply is shut off.
 - Individual devices may still be under pressure, such as control valves.
- The cooling water inlet is shut off

Position	Function
I / ON	The machine is switched on
O / OFF	The machine is switched off

1.10.3 EMERGENCY STOP



Info

The EMERGENCY STOP interrupts the current packaging procedure when there is danger or a fault.

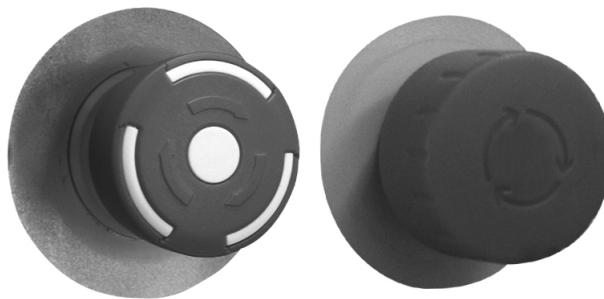


Fig. 31: EMERGENCY STOP

Position	Function
Pressed	EMERGENCY STOP is activated.
Not pressed	EMERGENCY STOP is unlocked.

When the danger has been eliminated, unlock the EMERGENCY STOP by turning it to the right.



Info

Depending on the size and version of the machine, several EMERGENCY STOP switches may be installed.

Machine reaction in the event of an EMERGENCY STOP

If the EMERGENCY STOP is pressed, the machine reacts as described below:

- The packaging procedure is stopped.
- The heaters are switched off.
- The cooling water inlet is shut off
- The compressed air supply is shut off.
 - Individual devices may still be under pressure, such as control valves.
- All outputs of the machine control are shut off.

Lifting systems in cleaning position

In the cleaning position, the lifting systems of the forming station and the sealing station remain closed.

Lifting systems for the format tools

- The electric lifting system of the forming station stops.
- The electric lifting system of the sealing station stops.

Lifting systems for the cutting units

- The electric lifting system of the cross cutting unit stops.

**DANGER****Injury hazard!**

After you press EMERGENCY STOP, the machine will NOT be completely without current and will NOT be completely without pressure. Components can still be carrying voltage. Equipment can independently make unexpected and dangerous movements.

Touching live components will result in death or serious injury.
Reaching into or standing in a danger zone will result in death or serious injury.

- Keep the safety doors closed.
- Do NOT touch live components.
- Do NOT reach into the danger zones of the machine.
- Do NOT linger in the danger zones of the machine.

1.10.4 Signalling device



Fig. 32: Signal tower

The signalling device warns the operator by means of an acoustic signal, a visual signal, or both, before the machine starts.



1.10.5 Support plates

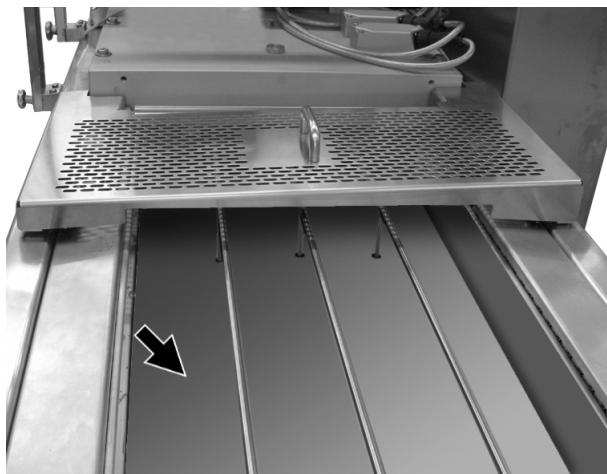


Fig. 33: support plate

Properly attached support plates in the loading area provide protection against access from above to the danger zones of the machine. Support plates are interlocked with magnetic switches. The machine is only operationally ready if the support plates are properly attached.

WARNING

Injury hazard!

Incorrectly attached support plates lead to unprotected danger zones.

Reaching into unprotected danger zones can lead to serious injuries.

- The support plates must completely cover the loading area without gaps.
- Only employ support plates that are appropriate for the machine equipment.

1.10.6 Safety guards

DANGER

Amputation hazard!

There are danger zones under the safety guards.

Reaching under the safety guards can result in loss of limbs.

- Do NOT reach under the safety guards.

**⚠WARNING****Amputation hazard!**

If a safety guard is removed while the machine is switched on, compressed air continues being supplied to the components.

Dangerous movements are possible.

Reaching into unprotected danger zones can result in the loss of the respective limb.

- Do NOT remove the safety guard while the machine is switched on to adjust the settings, carry out repairs or service work.
- Before starting any work on the machine, de-energise the machine.

⚠WARNING**Injury hazard!**

Objects placed on the safety guards can impair their protective function.

The machine does not stop in an emergency. This can lead to serious injuries.

- Do NOT place any objects on the safety guards.
- Do NOT climb on the safety guards.



Fig. 34: Safety guards

Safety guards cover the danger zones beneath them. Safety guards are laid loosely on the machine and interlocked with magnetic reed switches. The safety guards are designed in accordance with the applicable EU standards and, when used as intended, protect against access to danger zones. However, improper conduct may result in exposure to danger zones under the safety guards.

Therefore:

- Never reach under the safety guards!
- Do not place any objects on safety guards! Safety guards only function if they can be lifted easily.



Info

- The safety guards are marked with the number of the safety circuit.
- The division of the safety circuits can be viewed in the equipment schedule of the electrical circuit diagrams.
- The number of the particular safety guard is displayed in the diagnostic message, if the safety guard is lifted.

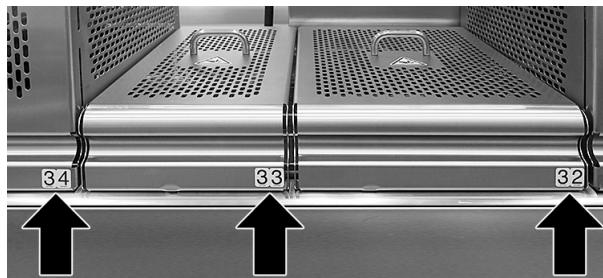


Fig. 35: Safety guard numbering

- In the case of machines with several formats, the formats may have additional markings.
- If the safety guards are assigned to certain formats, the safety guards are also marked with the format number.
 - Forming die: F1 for the first top section used and the corresponding safety guards, F2 for the second, etc.
 - Sealing die: S1 for the first top section used and the corresponding safety guards, S2 for the second, etc.

1.10.7 Safety light barriers



Fig. 36: Safety light barrier

The safety light barriers stop the machine, if persons reach into the danger zones. If the light beam is interrupted, the machine stops.



The safety light barriers can be attached at various positions on the machine:

- Forming die outfeed and sealing die infeed: The safety light barriers are located at the sliding guards. The sliding guards are safeguarded with magnetic reed switches.
- In front of the cutting units: The safety light barriers are located in the machine frame at the infeed area of the safety guard.
- Sealing die outfeed: The safety light barriers are located in the machine frame at the outfeed area of the safety guard.
- Upper web advance system: The safety light barriers are located at the infeed area of the upper web advance system.

1.10.8 Deflection roller at sealing station

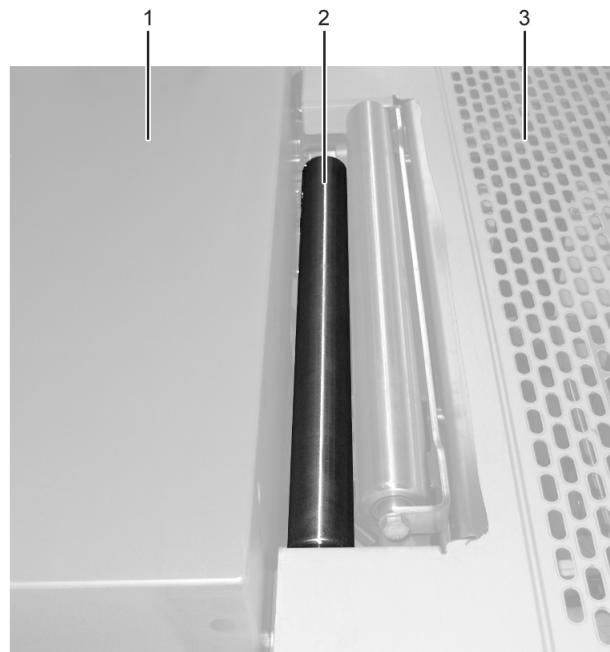


Fig. 37: Deflection roller at sealing station

- 1 Sealing station
- 2 Deflection roller
- 3 safety guard

The deflection roller covers the danger zone behind it. The deflection roller is located in front of the sealing station.



⚠️WARNING

Crush hazard!

If the deflection roller is missing, the danger zone will be unprotected.

Reaching into unprotected danger zones can lead to serious crushing injuries.

- Do NOT put the machine into operation without the deflection roller.

1.10.9 Cladding

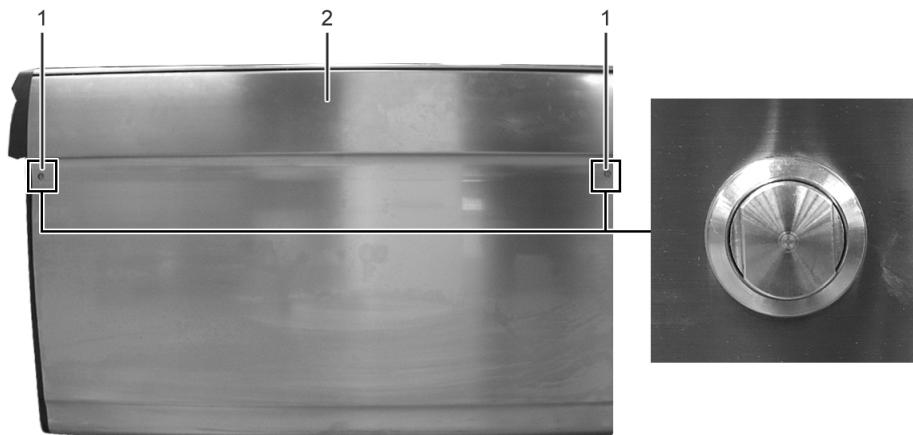


Fig. 38: Cladding that is not subject to a query

- 1 Tool-activated lock mechanism
- 2 Cladding

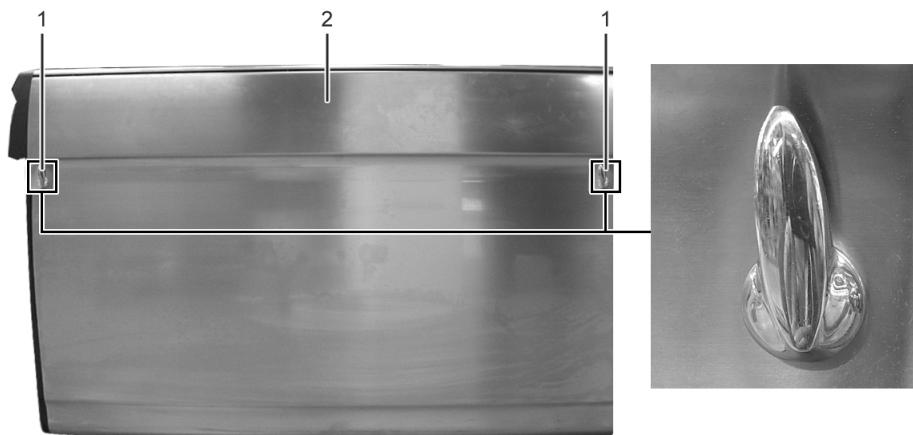


Fig. 39: Cladding that is subject to a query

- 1 Manually activated lock mechanism
- 2 Cladding

The cladding covers the danger zones lying behind it.



Cladding, which is either subject to a query by the machine control or not subject to a query, may be installed in the machine:

- Cladding, which is not subject to a query, can only be opened with a tool.
- Cladding, which is subject to a query, can be opened without a tool.

WARNING

Injury hazard!

Missing side claddings result in unprotected danger zones. Reaching into unprotected danger zones could result in death or serious injury.

- Do NOT put the machine into operation without the side claddings.
- Ensure that all side claddings are attached and undamaged.
- Ensure that all side claddings are closed without gaps.



Info

In the descriptions of the equipment, the safety guards and the side claddings are described as standard for the protection of danger zones. If the device in question is protected with an enclosure, instead of removing the safety guard or opening the side cladding, the safety door must be opened. After the work is finished, the safety door must be closed again.

1.10.10 Guard plate at machine outfeed



Fig. 40: Guard plate at machine outfeed

The guard plate prevents operators from reaching into the danger zones behind it.

The position of the guard plate can be adjusted, so that there are no gaps or openings to the danger zones.



Safety

Guard plate, vision system



⚠WARNING

Injury hazard!

If a guard plate is missing, the danger zone will be unprotected. Reaching into unprotected danger zones can lead to serious injuries.

- Do NOT put the machine into operation without the guard plates.

1.10.11 Guard plate, vision system

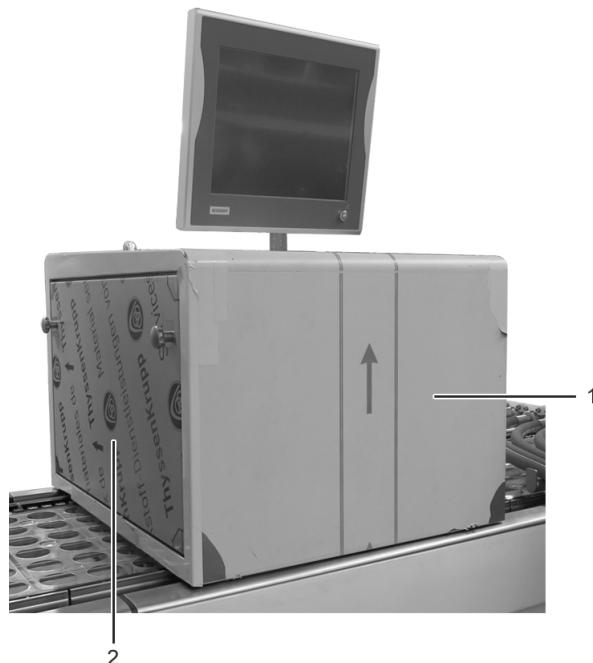


Fig. 41: Vision system, front view

1 Vision system

2 Guard plate

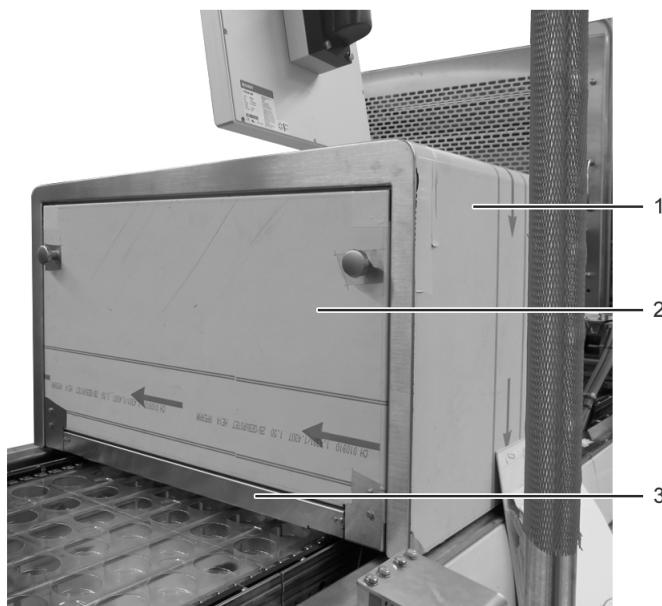


Fig. 42: Vision system, rear view

- 1 Vision system
- 2 Guard plate
- 3 Flap

The guard plates prevent operators from reaching into the danger zones on the vision system.

WARNING

Injury hazard!

If a guard plate is missing, the danger zone will be unprotected. Reaching into unprotected danger zones can lead to serious injuries.

- Do NOT put the machine into operation without the guard plates.

1.11 Safety signs and information labels

Signs are attached to the machine that warn of dangers and provide information on operating the machine.

- Do NOT remove the labels.
- Make sure all labels are intact and legible.
- If necessary, clean the labels with soap and water.
 - Do NOT clean the labels with solvents.
- Replace damaged, scratched or illegible labels with new ones.
- Labels can be obtained from the manufacturer.



Info

The safety signs are available in different versions and sizes. The version depends on the country in which the machine is set up.



1.11.1 Stickers on the machine

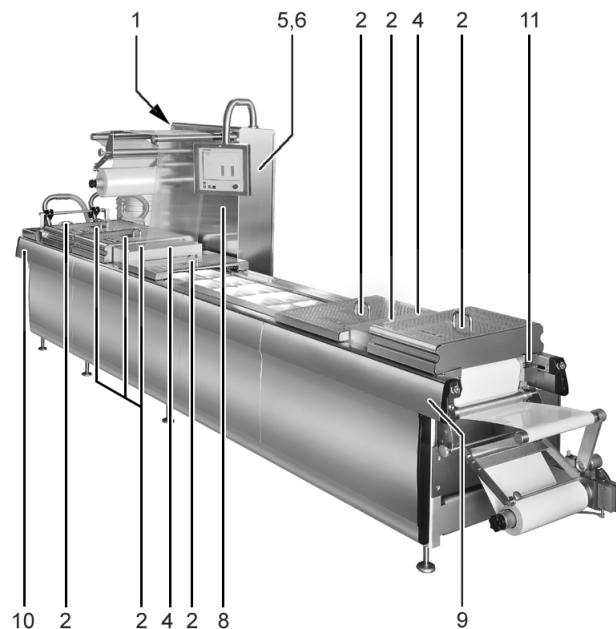


Fig. 43: Position of the labels, front view

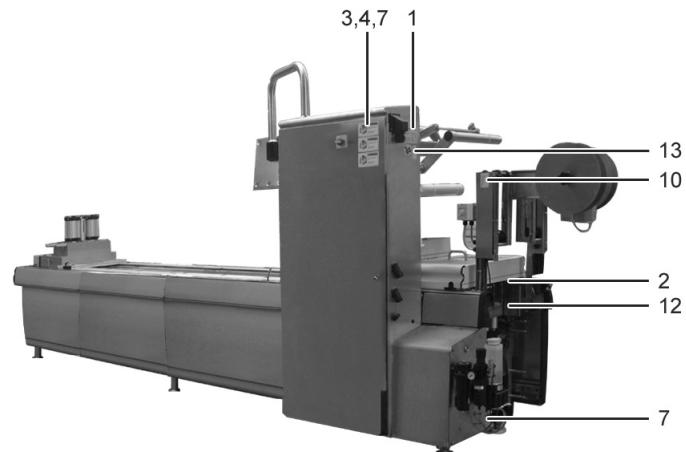


Fig. 44: Position of the labels, rear view

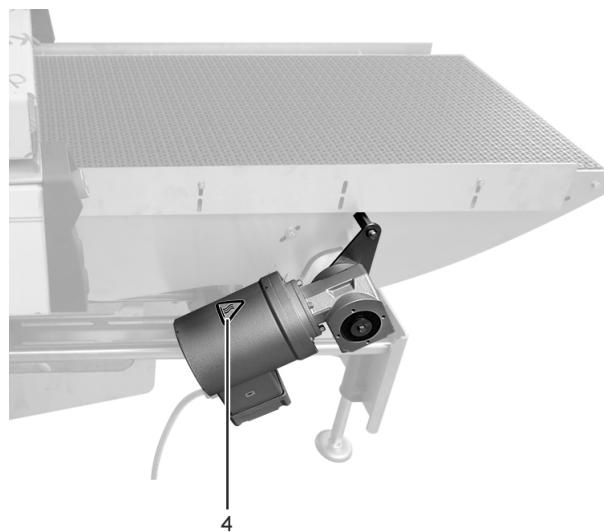


Fig. 45: Label for smooth-body motor, example

Sticker	
1	<p>CE MULTIVAC Verpackungsmaschine Typ Serialnummer Baujahr Netzspannung Phasen Nennleistung kW Nennstrom A Max. Vorsicherung A Max. Kurzschlussstrom kA V Hz Vertrieb und Service 105961237 DE</p>
	<p>proudly APPROVED by In acc. to COP 04.02 MULTIVAC</p>
	<p>XXX KG XXX lbs</p>

Fig. 47: Machine checked sticker

Fig. 48: Weight information label



Sticker

2



Fig. 49: ANSI label: Amputation hazard

3



Fig. 50: ANSI label: High voltage

4



Fig. 51: ANSI label: Burn hazard

5

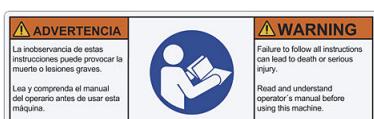


Fig. 52: ANSI label: Read the instruction manual

6

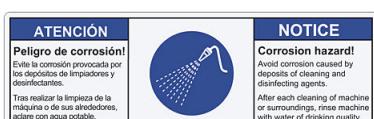


Fig. 53: ANSI label: Corrosion hazard


Sticker

 7


Fig. 54: Water inlet and outlet sticker

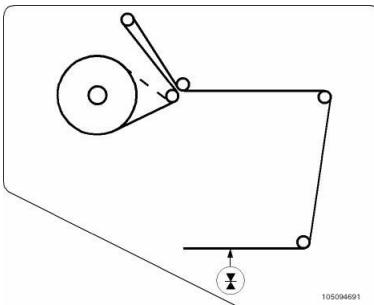
 8


Fig. 55: Example: label with upper web feeding diagram

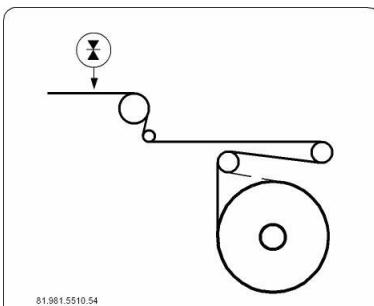
 9


Fig. 56: Example: label with lower web feeding diagram



Sticker

10

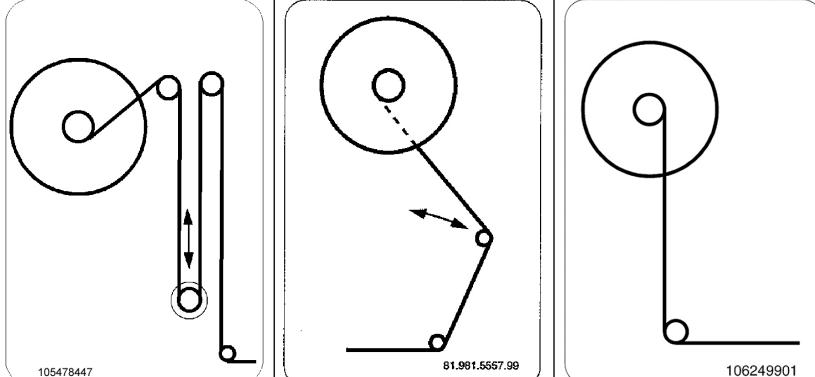


Fig. 57: Label with feeding diagram for the edge trim winder (option)

Fig. 58: Label with feeding diagram for the film trim winder (option)

Fig. 59: Label with feeding diagram for the edge trim winder (option)

11



Fig. 60: Label: Entanglement hazard and crush hazard

12



Fig. 61: "Injury hazard if no guard" label

13



Fig. 62: Label with GS mark



Stickers in the control cabinet

Sticker

1

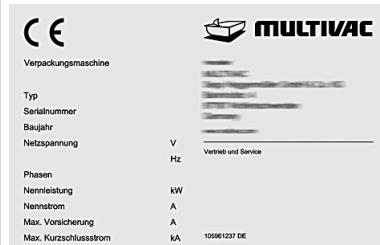


Fig. 63: Type plate

2



Fig. 64: ISO label: High voltage

3



Fig. 65: ISO label: Burn hazard

4



Fig. 66: Label: Residual voltage

This sticker is used to mark all electrical switch devices and converters, which may be live with dangerous voltage for up to 15 minutes after the main switch has been switched off.

2 Description

2.1 Operator work stations

The following diagram shows the operator work stations.

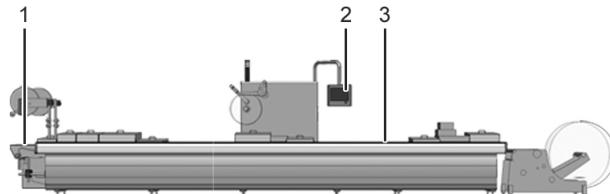


Fig. 67: Work stations

- 1 Machine outfeed: removing packs
- 2 Control terminal: operating machine
- 3 Loading area: loading products

2.2 Design of the machine

2.2.1 Overview

The diagram shows the configuration of the basic machine. The machine equipment is described in detail below.

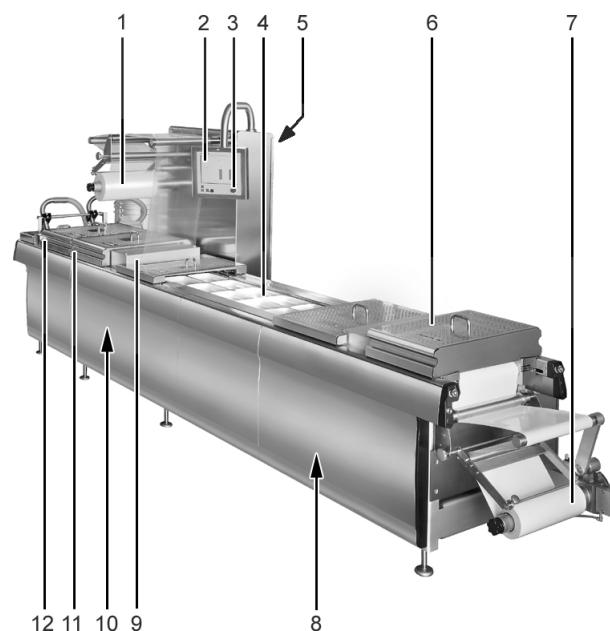


Fig. 68: Front view

- 1 Film unwind for upper web
- 2 Control terminal
- 3 EMERGENCY STOP
- 4 Loading area
- 5 Main switch

- 6 Forming station
- 7 Film unwind for lower web
- 8 Forming die lifting unit
- 9 Sealing station
- 10 Sealing die lifting unit
- 11 Cross cutter
- 12 Longitudinal cutter

2.2.2 Signalling device

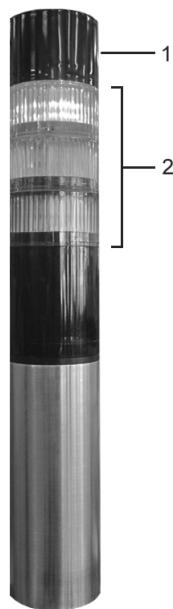


Fig. 69: Signal tower

- 1 Signal horn
- 2 Signal lights

The signal tower emits optical and acoustic signals regarding the operating status of the machine.

The following is a description of the standard configuration.

Signal lights

Red

- Continuous light:
An EMERGENCY STOP is activated.
- Flashing light:
The machine is stopped due to a fault.

Yellow	<ul style="list-style-type: none">• Continuous light: The machine is waiting for a synchronised unit.• Slow flashing light (about one pulse every two seconds): The packaging material has run out, e.g. film. The film trim must be removed.• Fast flashing light (about 2 pulses per second): A diagnostic message, which does not result in the machine stopping, is displayed. The signal light flashes until the start of the next advance.
Green	<ul style="list-style-type: none">• Continuous light: The machine is operating in automatic mode.• Flashing light: The machine is ready for operation.
Blue	This signal is not defined in the standard configuration and can be adapted to meet customer's specific requirements.

Signal horn

Signal horn	<p>The sound of the signal horn depends on the configuration.</p> <ul style="list-style-type: none">• The signal horn always sounds before the machine starts.• If a diagnostic message, which does not result in the machine stopping, is displayed, the signal horn also sounds.• If the machine stops due to a fault, the signal horn also sounds.
-------------	---

2.2.3 Switch combination: Start, Stop, EMERGENCY STOP

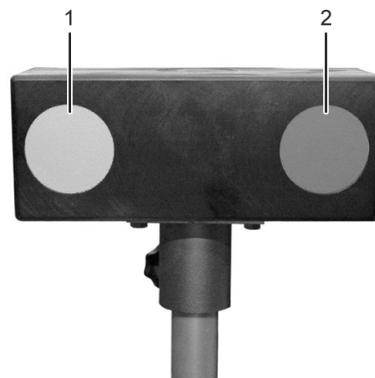


Fig. 70: Contactless start and stop switches

- 1** <Start> switch
- 2** <Stop> switch

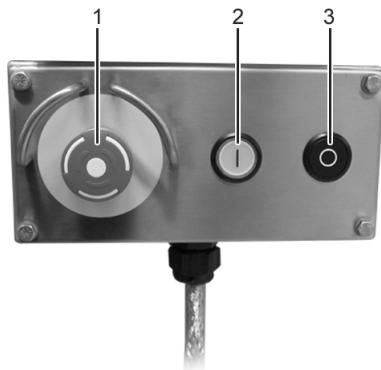


Fig. 71: Start, Stop, and EMERGENCY STOP switches

- 1** EMERGENCY STOP
- 2** <Start> switch
- 3** <Stop> switch

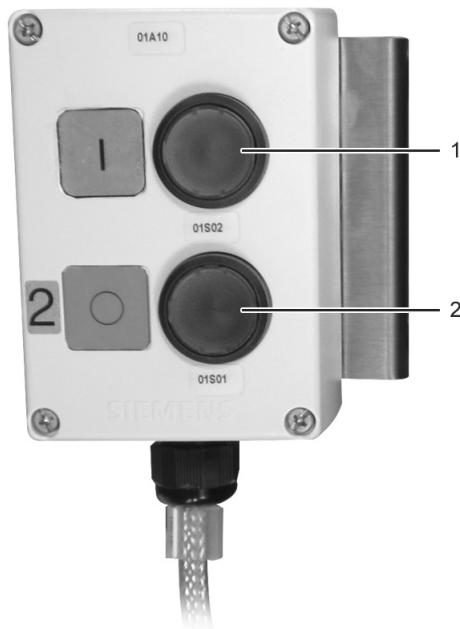


Fig. 72: Start / Stop button

- 1** <Start> switch
- 2** <Stop> switch

Switch	Function
EMERGENCY STOP	Description: See Section 1.10.3 "EMERGENCY STOP" on page 59.

Switch	Function
<Start>	<ul style="list-style-type: none">Start machine. The packaging cycle begins.Acknowledge diagnostic messages.
<Stop>	<ul style="list-style-type: none">Stop the machine. The machine cycle is completed, the dies open.Acknowledge diagnostic messages.

2.2.4 Cleaning position

In the cleaning position, the forming die and sealing die are closed. The cleaning position protects the moisture sensitive dies during the cleaning procedure.

2.2.5 Lower web unwind

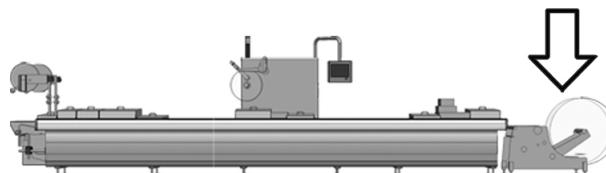


Fig. 73: Position on the machine

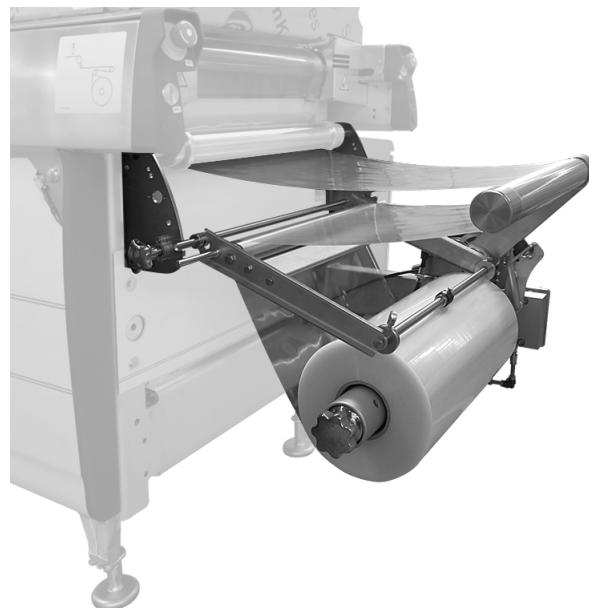


Fig. 74: Example of lower web unwind

The lower web unwind feeds the packaging material to the machine.

2.2.6 Lower web splice monitoring

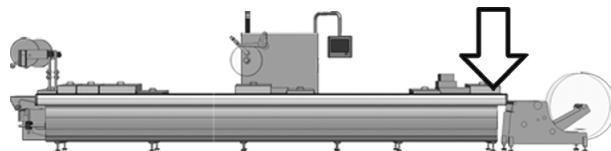


Fig. 75: Position on the machine

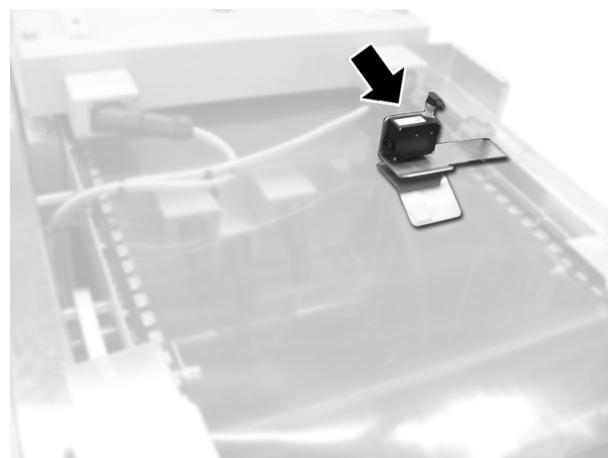


Fig. 76: Lower web splice monitoring

The monitoring detects the points at which the film is taped together.

2.2.7 Forming die

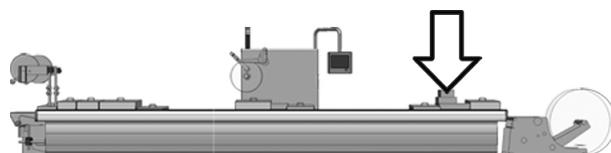


Fig. 77: Position on the machine

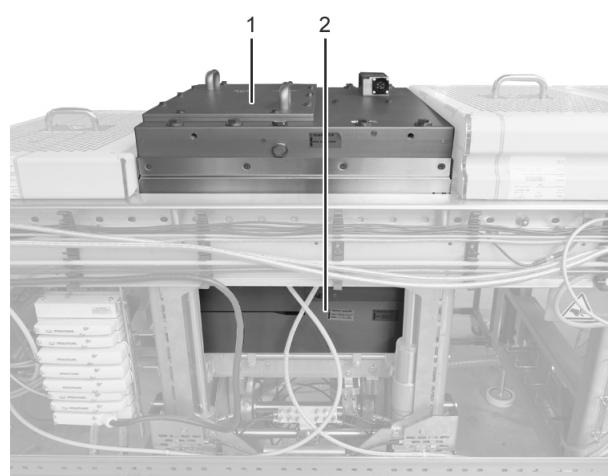


Fig. 78: Example of forming die

- 1 Forming die top section
- 2 Forming die bottom section

The forming die forms the lower web into pack cavities.
Various forming processes are available depending on the version of the forming die.

2.2.8 Lifting unit for forming die

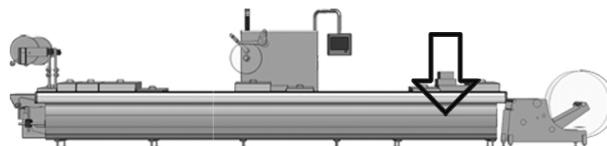


Fig. 79: Position on the machine

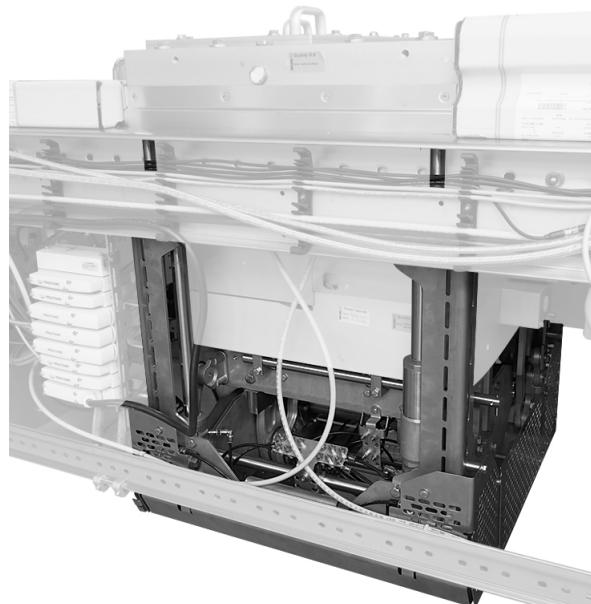


Fig. 80: Example of forming die lifting unit

The lifting unit moves the forming die bottom section up and down when the advance has stopped. This enables the forming die to be closed and opened.

2.2.9 Monitoring of product overhang



Fig. 81: Monitoring of product overhang

The monitor stops the machine if a protruding product is detected. This protects downstream devices from damage.

2.2.10 Upper web unwind

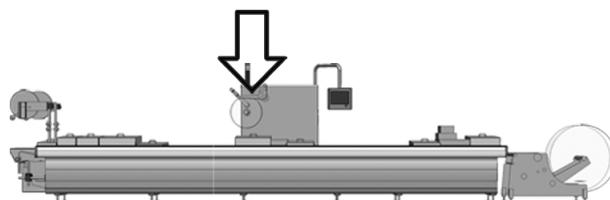


Fig. 82: Position on the machine



Fig. 83: Example of upper web unwind

The upper web unwind feeds the packaging material to the machine.

2.2.11 Upper web splice monitoring

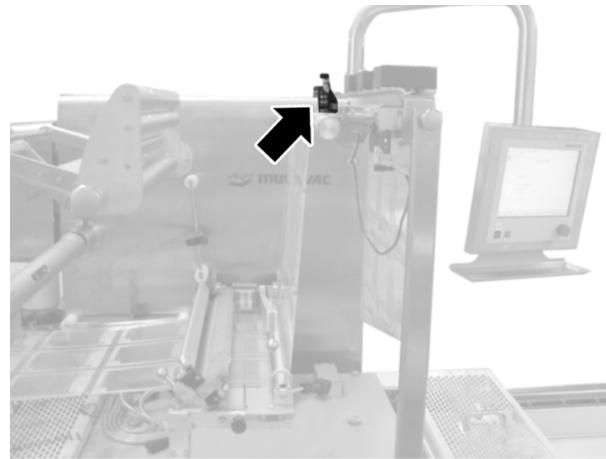


Fig. 84: Upper web splice monitoring

The monitoring detects the points at which the film is taped together.

2.2.12 Sealing die

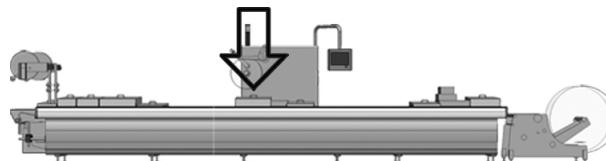


Fig. 85: Position on the machine

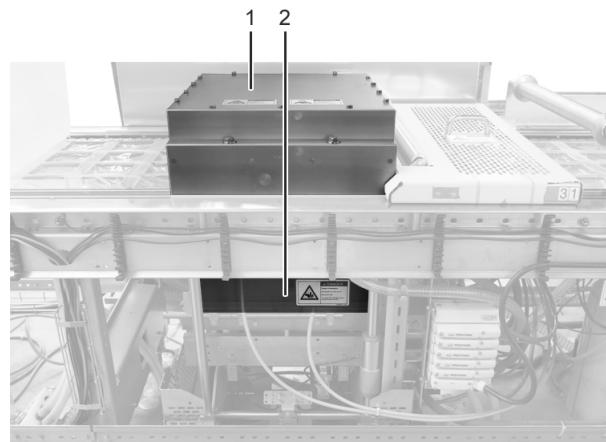


Fig. 86: Example of sealing die

- 1 Sealing die top section
- 2 Sealing die bottom section

The sealing die seals the upper web onto the pack cavities.
Various pack types are available depending on the version of the sealing die.

2.2.13 Lifting unit for sealing die

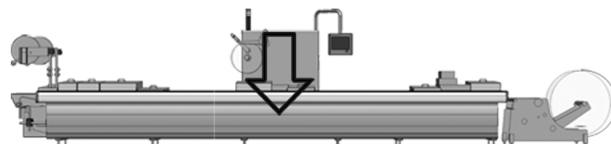


Fig. 87: Position on the machine

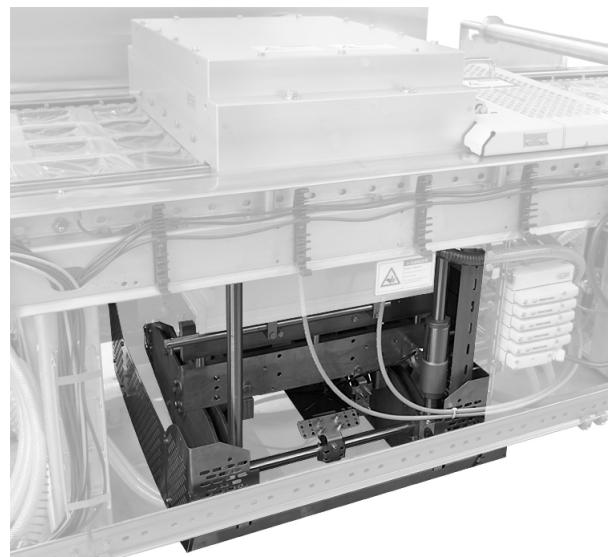


Fig. 88: Example of sealing die lifting unit

The lifting unit moves the sealing die bottom section up and down when the advance has stopped. This enables the sealing die to be closed and opened. In the case of lifting units with top lift, the sealing die top section moves in the opposite direction to the sealing die bottom section.

2.2.14 Easy print printer

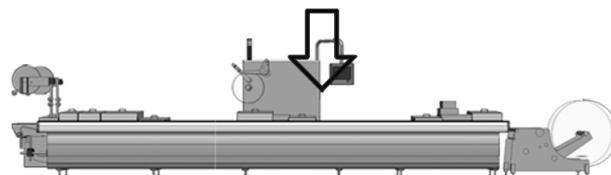


Fig. 89: Position on the machine



Fig. 90: EasyPrint printer

The printer prints packaging data onto the upper web.
The documentation of the printer contains further information on this unit.

2.2.15 Cross cutter

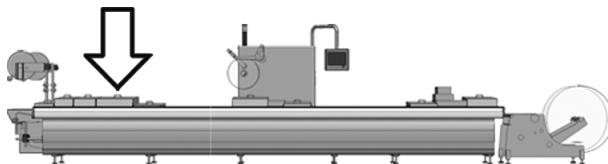


Fig. 91: Position on the machine



Fig. 92: Cross cutter

The cross cutter cuts the film at right angles to the machine running direction.

2.2.16 Longitudinal cutter

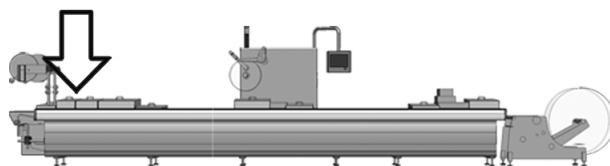


Fig. 93: Position on the machine

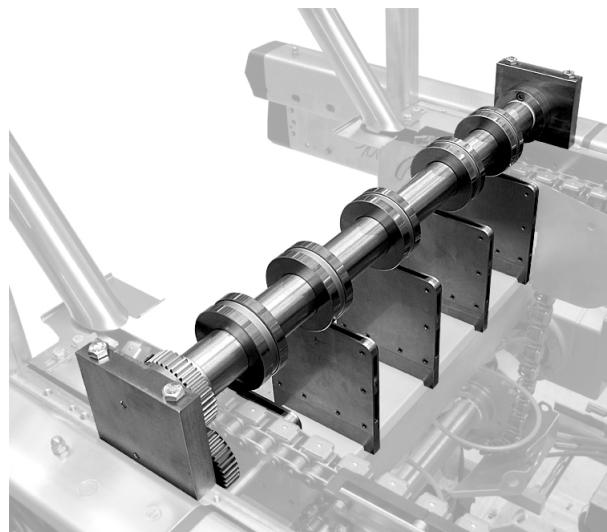


Fig. 94: Squeezing knife unit

The longitudinal cutter cuts the film in the machine running direction.

2.2.17 Edge trim winder

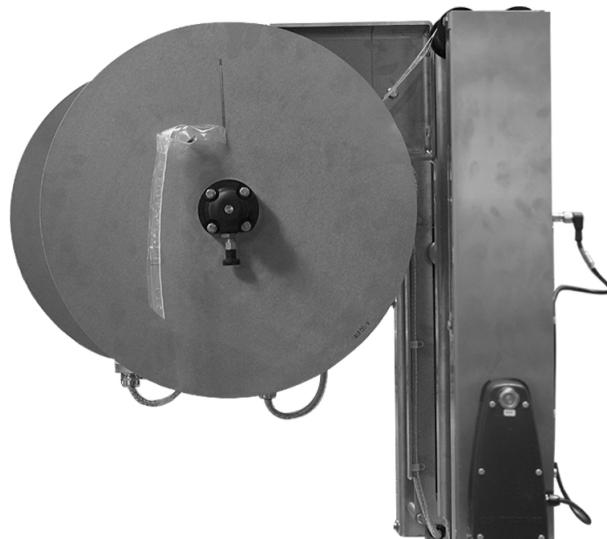


Fig. 95: Edge trim winder

Winding of edge trim strips.

2.2.18 Vision System

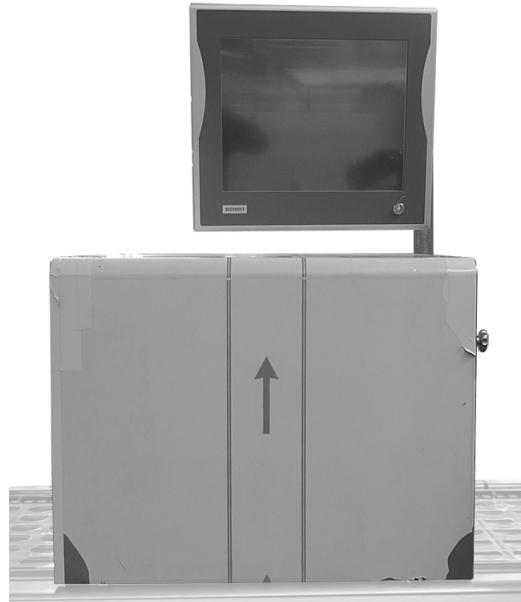


Fig. 96: Vision system

The vision system checks e.g. if the seal seam of a pack is contaminated or if the film is defective.

The separate documentation of the vision system contains further information on this unit.

2.2.19 Discharge unit



Fig. 97: Examples of discharge conveyors

The discharge unit transports the finished packs out of the machine. The discharge unit can vary in design, depending on the version.

2.2.20 Inspection system

Vision System

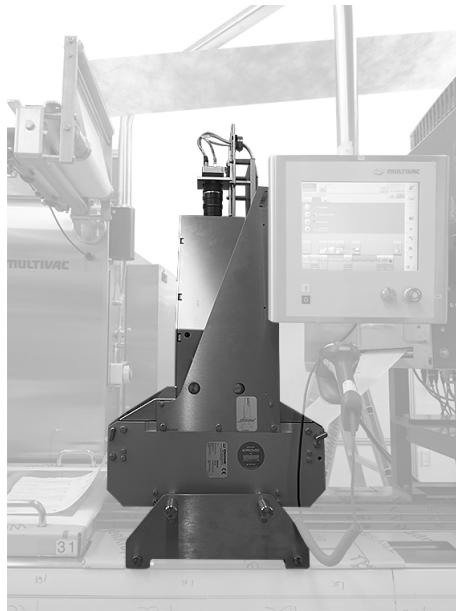


Fig. 98: Vision system

Depending on the design, the vision system can fulfil the following tasks:

- Inspection of the pack
- Inspection of the seal seam
- Inspection of the print image
- Inspection of the print data
- Inspection of the labels

The separate documentation of the vision system contains further information on this unit.

2.2.21 Heat exchanger

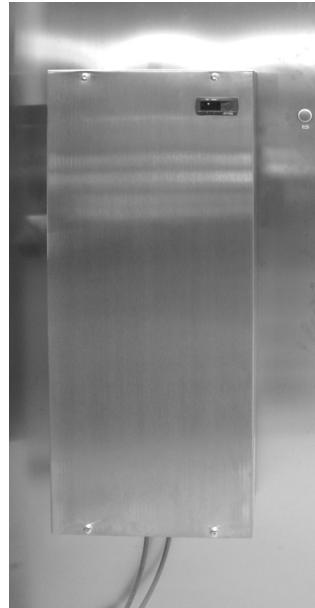


Fig. 99: Heat exchanger

The heat exchanger cools the control cabinet.

2.2.22 Mink MM xxxx vacuum pump

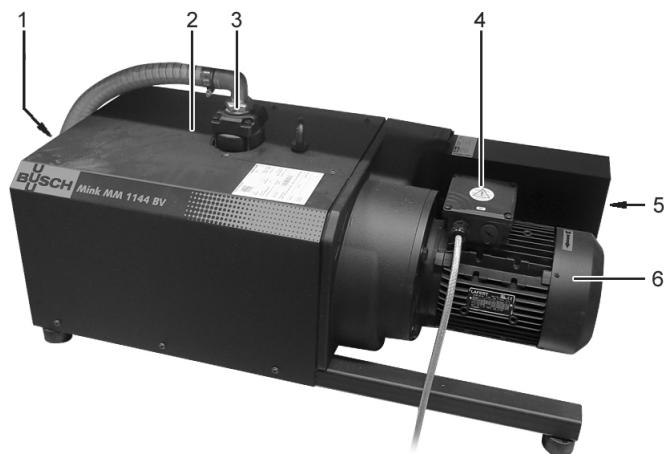


Fig. 100: Mink MM xxxx vacuum pump, front view

- 1 Gas outlet
- 2 Housing cover
- 3 Suction connection
- 4 Terminal box
- 5 Cooling air outlet
- 6 Electric motor

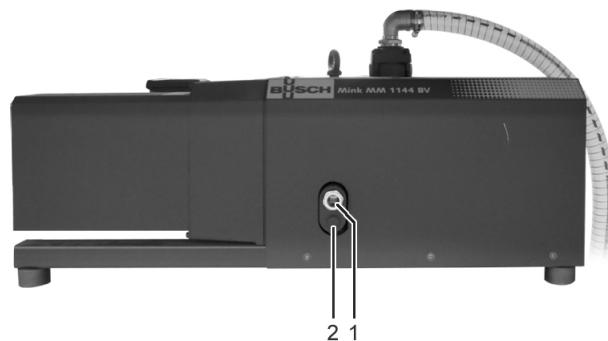


Fig. 101: Mink MM xxxx vacuum pump, rear view

- 1 Sight glass for oil level
- 2 Oil drain plug

The vacuum pump generates the vacuum for the packaging machine, e.g. for forming the lower web in the forming die.

2.3 Process sequence

The described procedure repeats with each machine cycle. The processes occur simultaneously.

2.3.1 Feeding the lower web

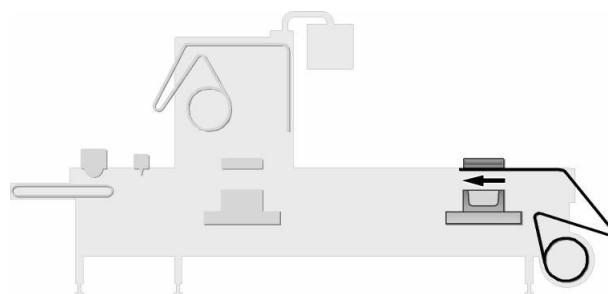


Fig. 102: Feeding the lower web

The lower web is fed into the transport chains from the film unwind. These grip the lower web and transport it in cycles into the forming die. The advance length per machine cycle is called the cut-off length. This is derived from the pack format.

2.3.2 Forming film

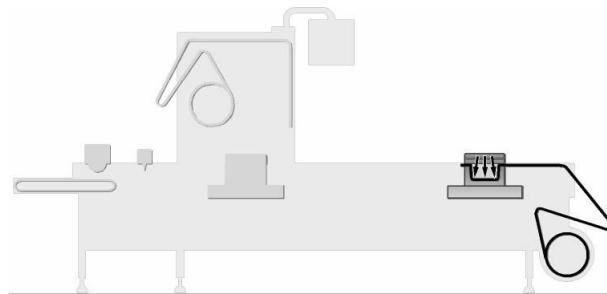


Fig. 103: Forming film

The forming die closes.

The heating plate in the forming die heats the film for the duration of the heating phase.

The heated film is formed into the cooled mould using vacuum pressure and/or compressed air. There it is held for the duration of the forming time and cooled. A pack cavity is thus created.

The forming die opens.

2.3.3 Feeding in product

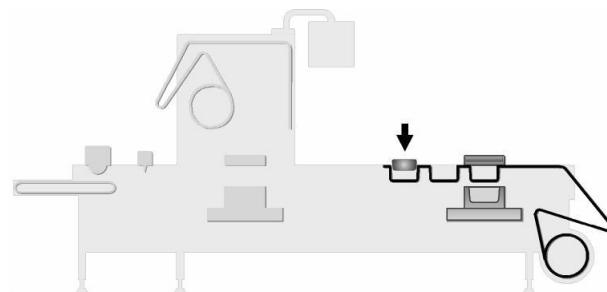


Fig. 104: Feeding in product

The film is further transported (advanced) and the pack pocket moves out of the forming die into the infeed line. In the infeed line, the product is laid in the pack pocket either by hand or by automatically functioning devices.

2.3.4 Feeding the upper web

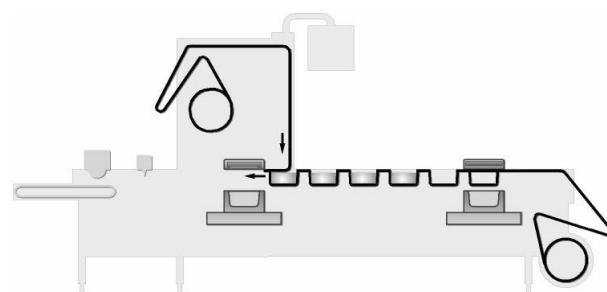


Fig. 105: Feeding the upper web

After several machine cycles, the filled pack cavity reaches the upper web. The upper web then moves, via the film unwind for the upper web and the deflection roller, into position over the pack cavity and covers the product. After a further advance, the pack cavity including product and upper web is located in the sealing die.

2.3.5 Evacuation

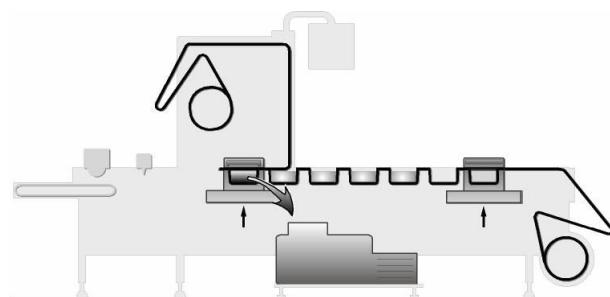


Fig. 106: Evacuation

The sealing die closes.

The sealing die encloses the product hermetically from the outer atmosphere between the two webs of film. During the evacuation process the air is suctioned out of the area around the product and out of the die.

2.3.6 Sealing

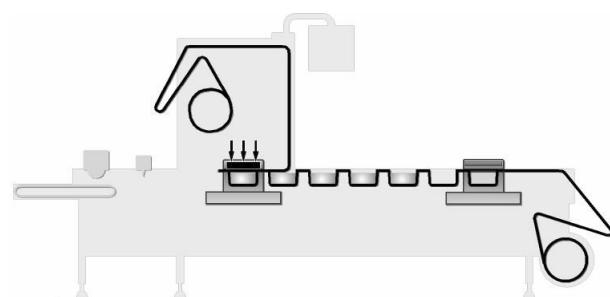


Fig. 107: Sealing

During sealing, the upper and lower webs around the enclosed product are subjected to the sealing pressure and the heat of the sealing plate. The coatings on the film inner sides begin to flow. The upper and lower webs form a uniform, airtight enclosure (pack) for the product. The sealing die opens. The packs are transported out of the sealing die with the next advance.

2.3.7 Cutting

The packs are still joined to each other. Single packs are obtained by cutting.

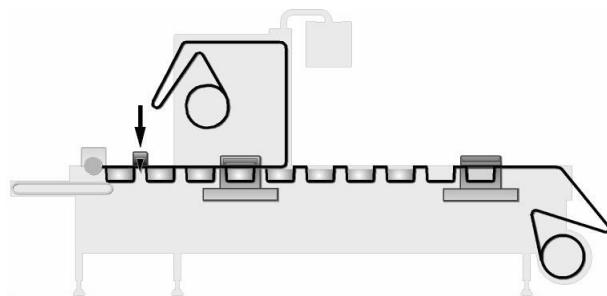


Fig. 108: Cross cutting

The cross cutter separates the pack rows at right angles to the film running direction and cuts when the pack web is stationary. After cross cutting, the severed pack row is still held in the transport chains.

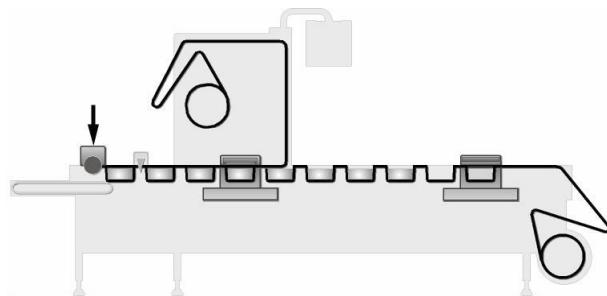


Fig. 109: Longitudinal cutting

The longitudinal cutter severs the edge trim, which was held tensioned by the transport chains. In the case of webs with two or more tracks of packs, the packs are also separated from each other in the longitudinal direction. Longitudinal cutting is carried out during the advance.

2.3.8 Discharging packs

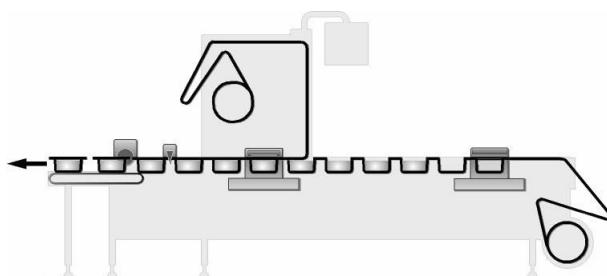


Fig. 110: Discharging packs

The individual packs are transported out of the machine.

2.4 Formats and packs

2.4.1 Format

The following will explain formats and the numbering of pack tracks, pack rows and packs. Each pack is thus clearly assigned and the correct inputs can be entered on the display.

Formats

A format can consist of one or several packs. The number of packs depends on the size of the sealing die. The following sealing die has 4 pack tracks and 2 pack rows.

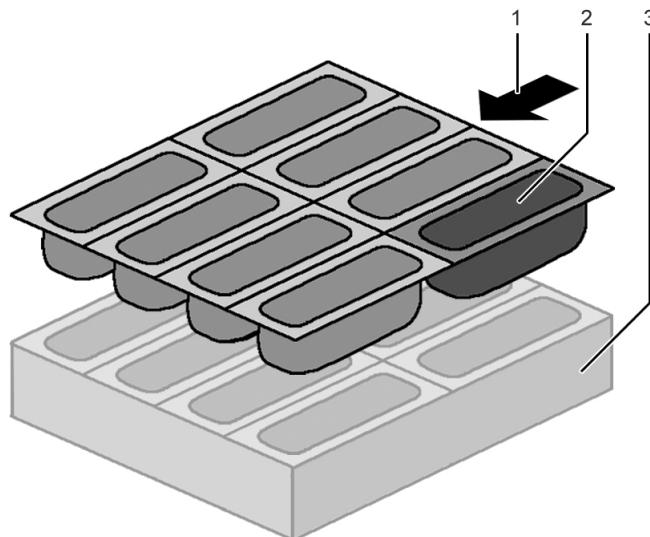


Fig. 111: Format

- 1 Film running direction
- 2 Pack
- 3 Sealing die

Pack tracks

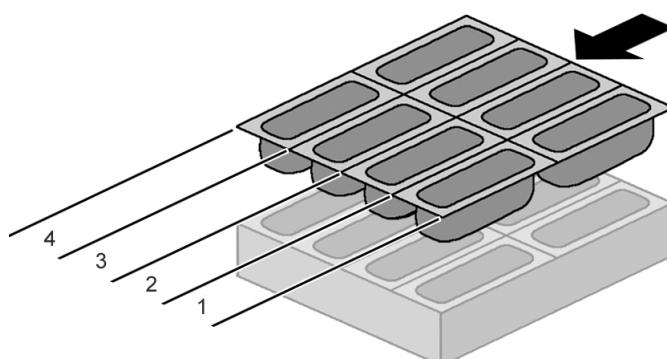


Fig. 112: Pack tracks

- 1 Pack track 1
- 2 Pack track 2

- 3 Pack track 3
- 4 Pack track 4

Pack rows

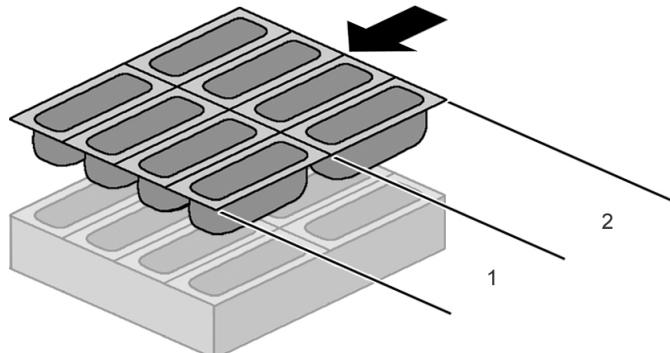


Fig. 113: Pack rows

- 1 Pack row 1
- 2 Pack row 2

Numbering of packs

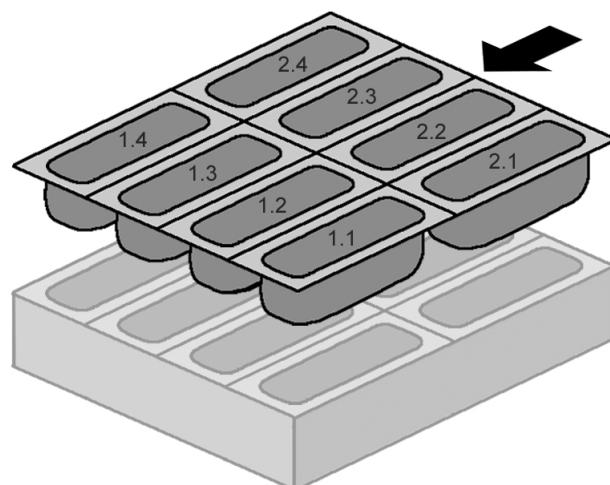


Fig. 114: Packs

2.4.2 Forming method

The selection of the forming process determines the sequences in the forming station. Only forming methods configured by service personnel appear in the display.

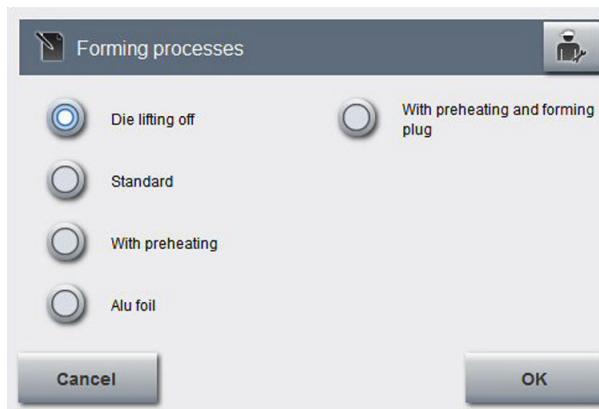


Fig. 115: Example: forming method

- **Die lifting off**

The lifting unit remains open. All processes in the forming die are switched off.

- **Standard**

The film is first heated and then formed in a standard die in a machine cycle.

This process is suitable for the production of flat to medium-deep pack cavities with simple shapes made of thin film up to 300 µm.

- **With preheating**

The film is first heated in a preheating die and then formed in the following machine cycle.

This process is suitable for the production of flat to medium-deep pack cavities with simple shapes made of thick film up to 1200 µm.

2.4.3 Preheating process

By means of the selection of the preheating method the type of film preheating is determined.

Defined preheating method

Depending on the hardware configuration of the machine, the following preheating methods can be selected:

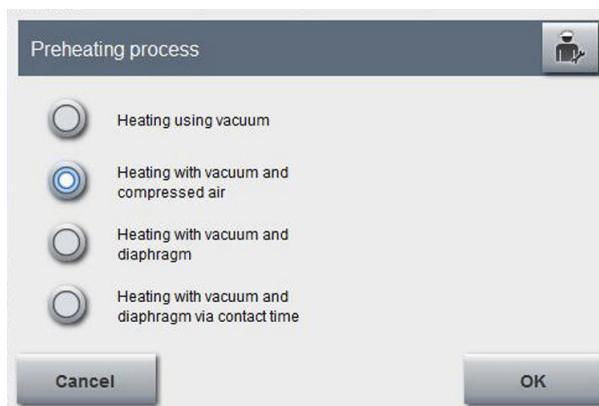


Fig. 116: Example: defined preheating method

- **Heating with compressed air**
The compressed air pushes the film on to the lower heating plate. Only the top heating plate's radiated heat is used.
- **Heating with vacuum**
The enclosed air between the film and the lower heating plate is suctioned away with vacuum. The vacuum pulls the film onto the lower heating plate.
- **Heating with vacuum and compressed air**
The film is pressed against the bottom heating plate with compressed air. The enclosed air between the film and the lower heating plate is suctioned away with vacuum.
- **Heating with diaphragm**
The diaphragm pushes the top heating plate against the bottom heating plate. The film is clamped between the heating plates and is pre-heated from above and from below.
- **Heating with compressed air & diaphragm**
The diaphragm pushes the top heating plate against the bottom heating plate. The film is clamped between the heating plates and is pre-heated from above and from below. Additionally, compressed air pushes the film to the lower heating plate.
- **Heating with compressed air and diaphragm via contact time**
The diaphragm pushes the top heating plate against the bottom heating plate. The film is clamped between the heating plates and is pre-heated from above and from below. Additionally, compressed air pushes the film to the lower heating plate. The time during which the diaphragm pushes the upper heating plate down is adjustable.
- **Heating with vacuum and diaphragm**
The diaphragm pushes the top heating plate against the bottom heating plate. The film is clamped between the heating plates and is pre-heated from above and from below. The enclosed air between the film and the heating plates is suctioned away with vacuum.
- **Heating with vacuum and diaphragm via contact time**
The diaphragm pushes the top heating plate against the bottom heating plate. The film is clamped between the heating plates and is pre-heated from above and from below. The enclosed air between the film and the heating plates is suctioned away with vacuum. The time during which the diaphragm pushes the upper heating plate down is adjustable.

Freely combinable preheating process

Depending on the hardware configuration of the machine, the preheating method can be combined freely based on the individual hardware components. When the preheating method can be combined freely, several hardware components can be selected on the "Preheating method" page.

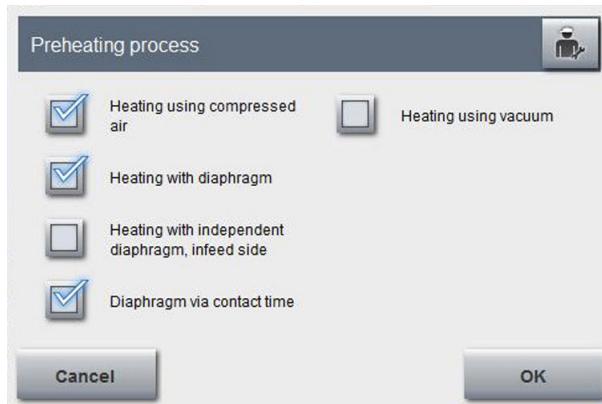


Fig. 117: Example: combinable preheating method

2.4.4 Pack type

Type of pack sealing

The selection of the pack type determines the sequences in the sealing station. Only pack types configured by service personnel appear on the display.

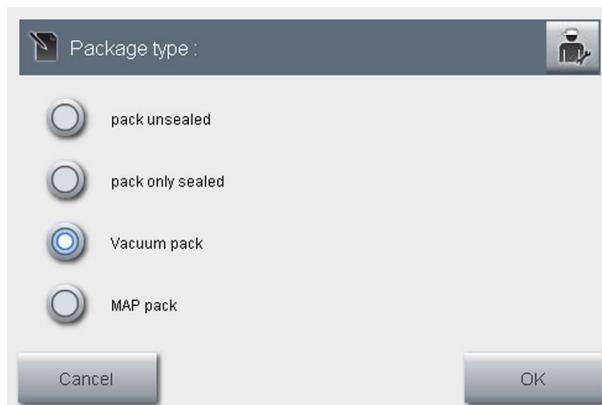


Fig. 118: Example: pack type

- **Unsealed pack**

The lifting unit remains open. All sequences in the sealing die remain switched off.

- **Pack only sealed**

The pack is sealed after a short delay time.

Application: for air packs without a modified atmosphere, such as medical products.

- **Vacuum pack**

The chamber is evacuated. The pack is then sealed.

- **MAP pack (Modified Atmosphere Pack)**

In the case of MAP packs, the ambient air in the pack is replaced with inert gases in order to protect the pack content.

Application: For producing packs with a modified atmosphere.

2.5 Control terminal

Display	Touchscreen to operate the machine, see Section 4.4 "OPERATING THE DISPLAY".
USB connection	Reading out and loading data.
EMERGENCY STOP	Stops the machine immediately.

2.6 Display

The screen contents and functions described in this manual are based on the access rights *Set-up personnel* and *Service*. When the *Set-up personnel* access right is selected, not all described parameters are displayed.



Info

- Depending on the equipment on the machine, the content of the displays or the sections of the displays on the control screen may vary.
- Some of the extra functions and parameters described are only available as options.
- In the explanation of the functions and parameters the relevant display path or, if required, a display section is depicted.
- The explanations of the individual parameters can be found in the index at the end of the manual.

2.7 Display of standard functions

Recurrent functions and commands, such as pressure monitoring or the heating zones, are always depicted in the same way in the display.

2.7.1 Buttons

<Perform> button



Fig. 119: <Perform> button

The <Perform> button is always displayed if any further entries are possible. When the <Perform> button is touched a further display with additional entries is opened.

<Service> button



Fig. 120: <Service> button

The <Service> button is always displayed whenever additional service parameters can be edited. Displaying and editing service parameters is only possible with the *Service* access right. Touching the <Service> button opens a further display with the corresponding service parameters.

Header of tables and lists

Date	User	Group
MESZ 20130425 07:07:46	Programmierer	.
MESZ 20130425 07:07:13	Programmierer	.
MESZ 20130425 07:06:42	Programmierer	.
MESZ 20130425 07:05:57	Programmierer	.
MESZ 20130425 07:01:25	Programmierer	.
MESZ 20130425 06:50:01	Programmierer	.
CEST 20130424 10:42:21	Service	PRG_MAIN.fbStnMachine.
CEST 20130424 10:42:13	Service	PRG_MAIN.fbStnMachine.fbStnMultiprintUW.
CEST 20130424 10:41:37	Service	PRG_MAIN.fbStnMachine.fbStnForming.
CEST 20130424 10:41:33	Service	PRG_MAIN.fbStnMachine.fbStnForming.
CEST 20130424 10:41:20	Service	PRG_MAIN.fbStnMachine.fbStnSealing.
CEST 20130424 10:41:15	Service	PRG_MAIN.fbStnMachine.fbStnSealing.
CEST 20130424 10:02:08	Programmierer	ServerVariablen
CEST 20130424 10:01:35	Programmierer	ServerVariablen

Fig. 121: Table

The header of tables and lists consists of buttons for the column headings. By touching a button in the header, the contents of the table are sorted according to the selected column.

Scroll bars



Fig. 122: Scroll bar

A scroll bar always appears, if a table or list can not be shown completely within the display. This scroll bar is used to move areas of a display, e.g. in order to navigate through long lists.

Display shift bar

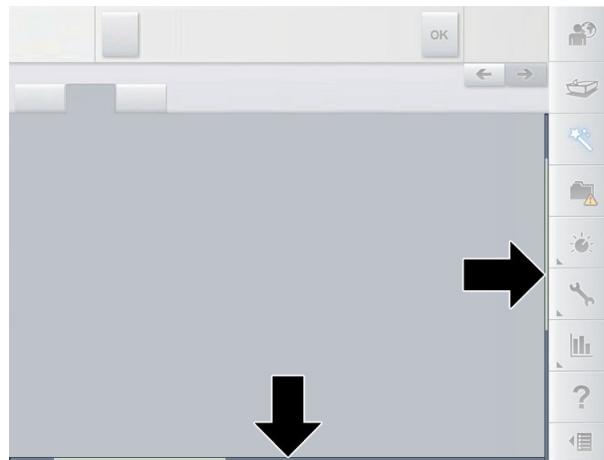


Fig. 123: Display shift bar

A display shift bar always appears, if the display content can not be shown completely within the display. By swiping over the display, the display content is moved.

Drag handle

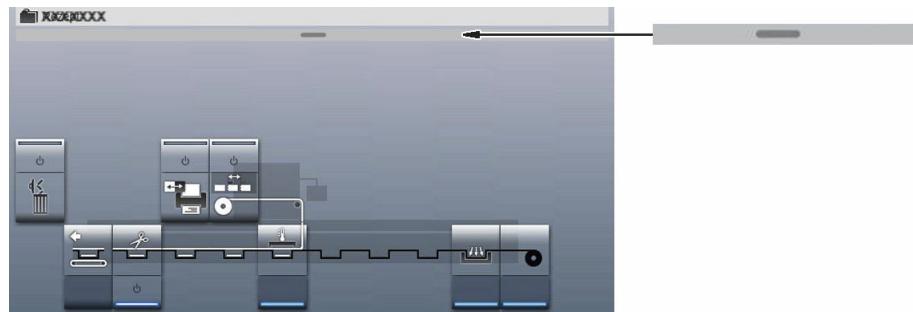


Fig. 124: Drag handle line

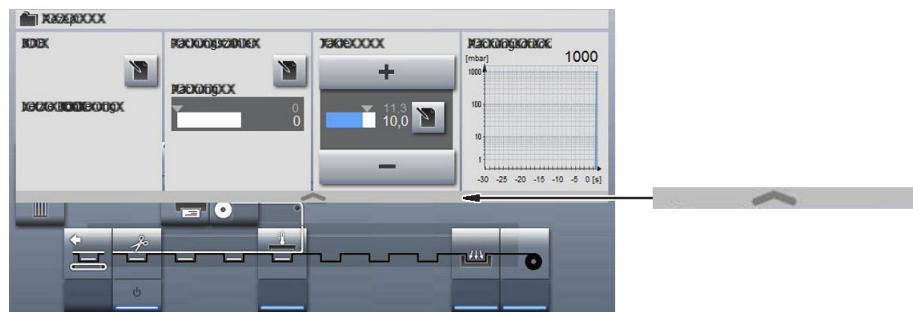


Fig. 125: Drag handle arrow

The drag handle always appears, if the display content is completely or partially covered by another display content. By drawing the drag handle open or closed, the covered display content is revealed.

Alteration in percentage



Fig. 126: Icon for Alteration in percentage

Various parameters are displayed in percentages, e.g.:

- Speed
- Acceleration
- Power
- Frequency

The depiction depends on the required functions.

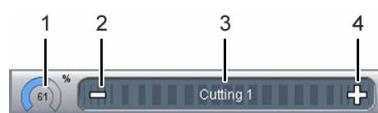


Fig. 127: Alteration in percentage

- 1 Display in percentage
- 2 <-> Decrease value
- 3 Name of the parameter
- 4 <+> Increase value

If only the icon is depicted on the button for <Alteration in percentage>, the display for "Alteration in percentage" appears when the button is touched.

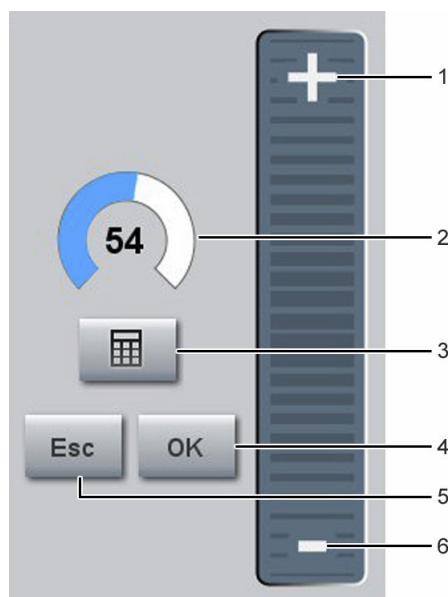


Fig. 128: Alteration in percentage

- 1 <+> Increase value
- 2 Display in percentage

- 3 <Enter value> Enter the value directly
- 4 <OK> Confirm input
- 5 <Esc> Abort the process
- 6 <-> Decrease value

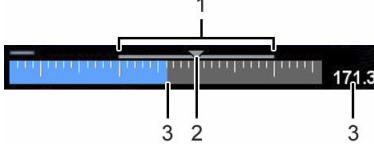
2.7.2 Temperature and temperature monitoring

Here the individual heating circuits and temperature monitoring are activated and deactivated and their temperatures and the tolerances for the temperature monitoring are set.

Heating circuits and temperature monitoring



Fig. 129: Temperature section

Function	Explanation
<i>On/Off</i>	This button activates and deactivates the zone. Which heating elements correspond to which control elements can be seen in the electrical circuit diagram.
<i>Temperature</i>	 <p>Fig. 130: Temperature display</p> <ul style="list-style-type: none"> 1 Tolerance range 2 Target temperature 3 Current temperature
<i>Target</i>	Enter the target temperature.
<i>Name</i>	<ul style="list-style-type: none"> • Zone: The heating and control elements of the machine are divided into zones. Which zone is assigned to which heating element or control element can be read in the electrical circuit diagram. • Name: The <i>name</i> is preset and corresponds to the name in the electrical circuit diagram.

Function	Explanation
<Edit>	Perform temperature settings. The display of the selected zone appears.

Temperature setting



<Edit> Perform temperature settings.

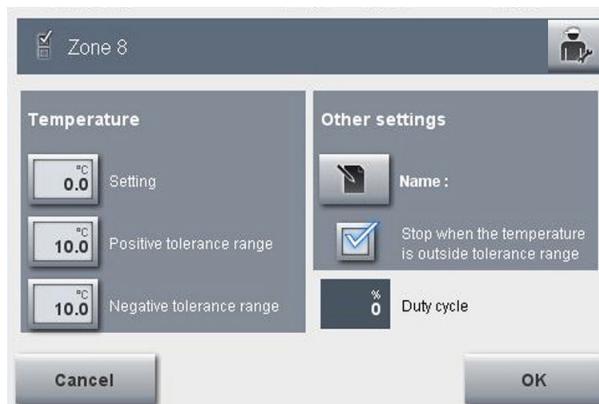


Fig. 131: Change temperature

Function	Explanation
<Service>	Edit service parameters of the respective heating element or control element.

Temperature

Function	Explanation
<i>Target value</i>	Required temperature (target temperature).
<i>Positive tolerance range</i>	Permitted temperature deviation upwards.
<i>Negative tolerance range</i>	Permitted temperature deviation downwards.

Other settings

Function	Explanation
<i>Name</i>	The name is preset and corresponds to the name in the electrical circuit diagram. This button opens the "Name" page with a list of the defined heating elements and the defined control elements.

Description

Temperature and temperature monitoring



Function	Explanation
<i>Stop when the temperature is outside tolerance range</i>	<p>Control the machine response when limit values are exceeded or not met.</p> <ul style="list-style-type: none"> • Box empty: a diagnostic message appears. • Check in box: a diagnostic message appears and the machine stops. <p>This function does not appear with the temperature monitoring of the cooling water.</p>
<i>Duty cycle</i>	Heating element load.

Service parameters for temperature


<Service>

Edit service parameters.



Fig. 132: Service parameter for heating element

Temperature controller

Function	Explanation
<i>Offset</i>	Using the <i>Offset</i> , you can correct a deviation of the actual temperature from the temperature display. By inputting a correction value, the display is changed accordingly. If a negative correction value is necessary, the entered value is negated with the <+/-> button.

Function	Explanation
X_p	This parameter is a control parameter for the “overshoot” or “undershoot”. The entered value influences the transient response of a heating element depending on both the heating element and the film. Recommended value: 5%
T_v	This parameter is a control parameter for the period duration. The entered value influences the transient response of a heating element depending on both the heating element and the film. Recommended value: 20 s

Other settings

Function	Explanation
<Edit>	Type: The type of the heating circuit can only be changed with the MULTIVAC access right.

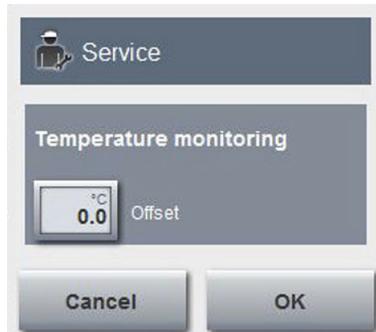


Fig. 133: Service parameter for control element

Temperature monitoring

Function	Explanation
Offset	Using the Offset, you can correct a deviation of the actual temperature from the temperature display. By inputting a correction value, the display is changed accordingly. If a negative correction value is necessary, the entered value is negated with the <+/-> button.

2.7.3 Consecutive errors

If the same type of fault occurs repeatedly in succession, this is a consecutive error.

The *Consecutive error* value limits the number of consecutive machine cycles with this same fault. The machine stops.



Fig. 134: Consecutive errors

Input	Function
0	The function is switched off.
1	The machine stops at the first occurrence of the fault.
2	<ul style="list-style-type: none"> A diagnostic message appears at the first occurrence of the fault. The machine stops at the second occurrence of the fault.
3	<ul style="list-style-type: none"> A diagnostic message appears at the first and second occurrence of the fault. The machine stops at the third occurrence of the fault.

2.7.4 Pressure monitoring

Monitoring the permitted deviation

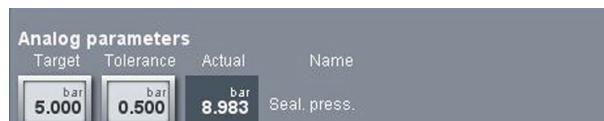


Fig. 135: Analog pressure monitoring

Function	Explanation
<i>Target</i>	The entered value determines the pressure target value.
<i>Tolerance</i>	<p>The entered value determines the permitted positive and negative deviation from the pressure target value. If the currently measured value lies outside the permitted tolerance, the machine reacts depending on the associated consecutive error function.</p> <ul style="list-style-type: none"> So long as the entered consecutive error is not reached, a warning message appears. The machine stops as soon as the entered consecutive error is reached. A diagnostic message appears.

Function	Explanation
<i>Act</i>	This value shows the currently measured value.
<i>Name</i>	Designation of the pressure monitoring.

Monitoring the minimum



Fig. 136: Minimum pressure monitoring

Function	Explanation
<i>Minimum</i>	The entered value determines the permitted minimum pressure value. If the current measured value falls below this minimum value, the machine stops. A diagnostic message appears.
<i>Act</i>	This value shows the result of the actual measurement.
<Service:>	This button opens the page with the service settings.
<i>Name</i>	Designation of the pressure monitoring.
Service:	This button opens the page with the service settings.

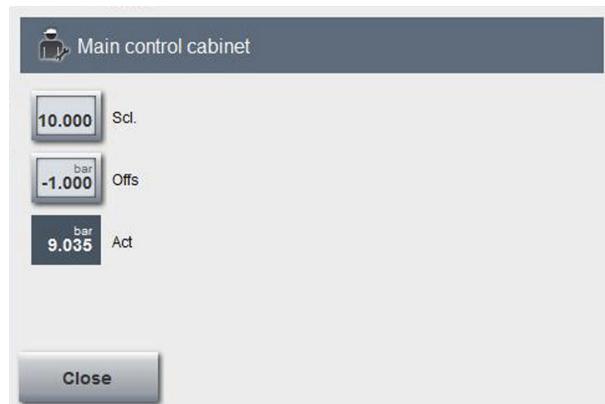


Fig. 137: Service settings for pressure monitoring

Function	Explanation
Scale	<p>The scaling assigns the measured value of the sensor voltage to the actual value of the pressure. The value under <i>Scaling</i> is preset for the sensor used.</p> <p>Example:</p> <ul style="list-style-type: none"> • Measuring range of sensor: 10 bar (145 psi) • Maximum voltage of the machine control: 5 V <p>5 V measured voltage corresponds to 10 bar (145 psi). This means that a voltage value of 1 V corresponds to a pressure of 2 bar (29 psi).</p> <p>The entered value has to correspond to the scaling of the sensor. The scaling is shown on the sensor data sheet.</p>
Offs	Using the offset, you can correct a deviation of the actual pressure to the pressure displayed. By inputting a correction value, the value in the display is changed accordingly. If a negative correction value is necessary, the entered value is negated with the <+/-> button. The correction is independent of the recipe used.
Act	This value shows the result of the actual measurement.

Monitoring with warning limit



Fig. 138: Pressure monitoring with warning limit

Function	Explanation
Gas pressure	This value shows the result of the actual measurement.
Warning	The entered value shows the warning limit. If this warning limit is reached, a diagnostic message appears. The machine continues running.

Function	Explanation
Stop	The machine stops when the entered value is reached.

2.7.5 Wizards

Manual advance wizard



Fig. 139: Manual advance wizard

The *Manual advance* wizard is always displayed whenever it is possible that a manual advance is required, e.g. for feeding in or running out the film. Only the film is transported; all other functions, such as die lifting and cutting, are not performed.

2.8 Access



Fig. 140: Access button

The values entered on the displays are protected by various levels of access authorisation against unintentional alteration. The "Access" display contains all the enabling and administration functions for access rights. It also offers entry to the language choice for the display.

2.8.1 User menu

Access rights are enabled through the "User menu" tab.

Access > User menu



Function	Explanation
<User menu>	The selection of available access rights.
<Edit>	<i>Language selection:</i> Opens the display for selecting the language used in the displays.

Function	Explanation
<Change password>	Change password for current access right.
The access rights are factory-defined as follows:	
Access right	Authorisation
<i>Programmer</i>	This access right is intended exclusively for MULTIVAC's service personnel.
<i>MULTIVAC</i>	This access right is intended exclusively for MULTIVAC's service personnel.
<i>Service</i>	<ul style="list-style-type: none"> • Change all values of the packaging procedure. • Perform test functions. <p>This access right is intended exclusively for the operating company's service personnel.</p>
<i>Administrator</i>	<ul style="list-style-type: none"> • Stop the machine. • Acknowledge faults. • User administration. • Resetting of passwords.
<i>Set-up personnel</i>	<ul style="list-style-type: none"> • Start and stop the machine. • Change values. • Actuate switch functions. • Load, save and delete recipes. • Change cycle output. • Start wizards.
<i>User</i>	<ul style="list-style-type: none"> • Start and stop the machine. • Load recipes. • Change cycle output. • Start wizards. • Log PDA downtimes.

**Info**

The write and read rights for the individual switches and parameters in the display can be changed. see Section 5.18 "CHANGING THE WRITE AND READ AUTHORISATION "These changes can only be made, when the Service access right is selected.

2.8.2 Access settings

Password and logoff settings are only possible with the *Administrator* access right.

Access > Other settings



Password

Function	Explanation
<i>Minimum password length</i>	Minimum number of characters for each password.
<i>Minimum number of figures</i>	Minimum number of figures (0-9), which must be contained in each password.
<i>Minimum number of special characters</i>	Minimum number of special characters, which must be contained in each password.

Automatic logging off

Function	Explanation
<i>Waiting time</i>	If the display is not operated for this amount time, the selected access right is automatically disabled. The access right is then reset to <i>User</i> .
<i>Active</i>	<ul style="list-style-type: none"> Box empty: the access right is not reset. Check in box: The automatic logoff of the access right is activated.

2.8.3 User administration

The inputs for "User administration" are only possible with the *Administrator* access right.

Access > User administration



Table	Explanation
<i>Username</i>	Selection of all user names and access rights registered in the machine control.
<Change password>	Change the password of the selected access right.

2.9 Production



Fig. 141: Production button

The "Production" display shows the most important data for the running operation of the machine. The information displayed there will depend on the configuration in the display for "Other settings/Production data tab".



Info

The top display areas are drawn open with the Drag handle icon. See Section 4.4.2 "MAKING DISPLAY AREAS VISIBLE" on page 298.

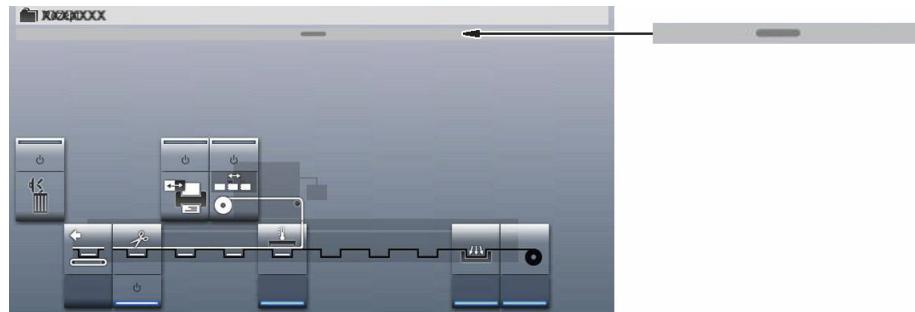


Fig. 142: Drag handle

Production

Recipe



Recipe: ...

Name of loaded recipe.

Production data acquisition (PDA)

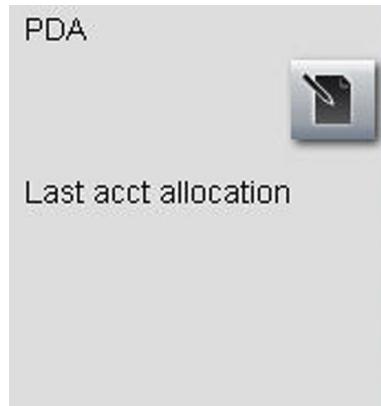


Fig. 143: Production PDA



<Perform>

This button calls up the "Downtime reasons" display for allocating the machine's downtime, see Section 4.19.2 "ALLOCATING DOWNTIME MANUALLY TO AN ACCOUNT".

Last account allocation:

Current downtime reason to which a time is logged.



Fig. 144: Downtime reasons

The buttons in the "Downtime reasons" display allocate the downtime manually to time accounts.



<Conversion>

Downtime due to conversions (e.g. die change).



<Servicing>

Downtime due to servicing (e.g. repairs).



<Lack of film>

Downtime due to lack of film.

	<Lack of product>	Downtime due to lack of product.
	<Pause>	Downtime due to a break.
	<1> to <4>	Other reasons for machine downtime. Buttons <1> to <4> can be used to record any other downtime reason, e.g. downtime due to cleaning.
	<5>	An individual downtime reason can be entered directly in the input box.



Info

The wizards automatically allocate the manual downtime reasons. If the operator makes a preselection, PDA uses the downtime reason, which is allocated by the operator.

Pack counter

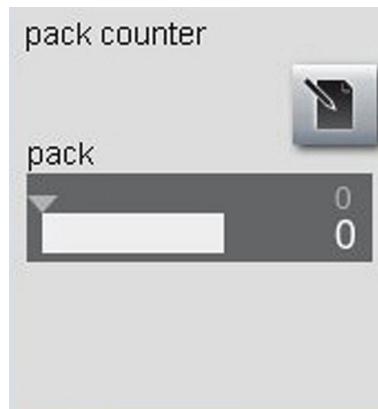


Fig. 145: Production pack counter

Graphic depiction of the packs produced since the resetting of the display.



<Perform>

This button calls up the "Pack counter" display, so that inputs can be entered, see Section 4.16 "CONTROLLING PRODUCTION-RELATED MEASURES".



Fig. 146: Pack counter

Function	Explanation
<i>Number of good packs until STOP</i>	The machine stops after the entered number of good packs has been reached. A diagnostic message appears.
<i>Good packs</i>	Number of good packs produced since resetting the display.
<i>Reject packs</i>	Number of reject packs produced since resetting the display.
<Reset counter>	The data is reset.

Efficiency

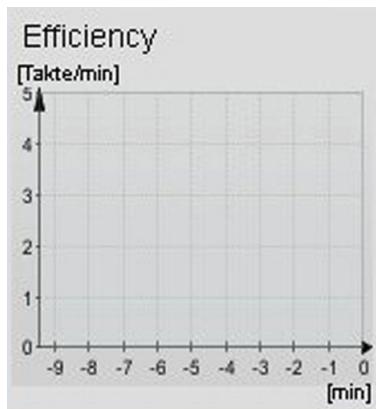


Fig. 147: Production efficiency

Machine cycle output diagram shown over a certain period of time

Cycles

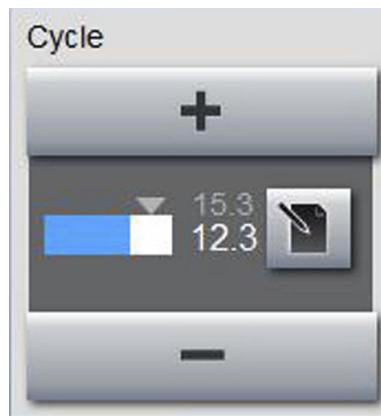


Fig. 148: Production cycles

Graphic display of the current cycle output. The cycle output is the ratio of the operating time to the total time. It is measured in cycles per minute.

	<Increase the set value>	Increase cycle output in steps of 1 cycle/minute.
	<Perform>	Enter the cycle output directly, see Section 4.14 "ADJUSTING THE CYCLE OUTPUT".
	<Decrease the set value>	Reduce cycle output in steps of 1 cycle/minute.

Pack pressure

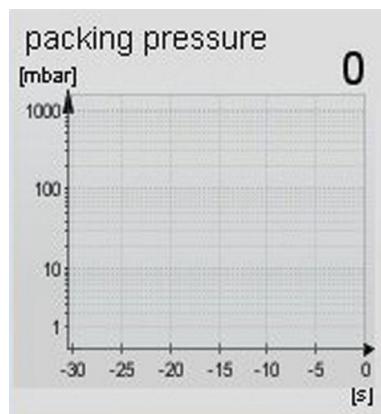


Fig. 149: Production pack pressure

Graphic depiction of the current vacuum in the sealing die

Depiction of the machine

The depiction is based on the equipment on the machine. The following display sections are only intended as an example.

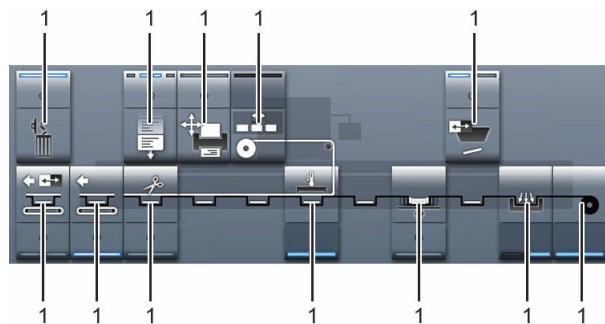


Fig. 150: Production/Machine section (example)

1 Button with icon

- The buttons with an icon open the displays which belong to the particular equipment. The displays for all equipment and functions which influence the packaging procedure can be directly accessed via this. In addition, all the displays can be accessed via the menus starting from the navigation bar.
- If there are several units of the same type, the button with an icon opens an intermediate window with individual buttons for each unit.

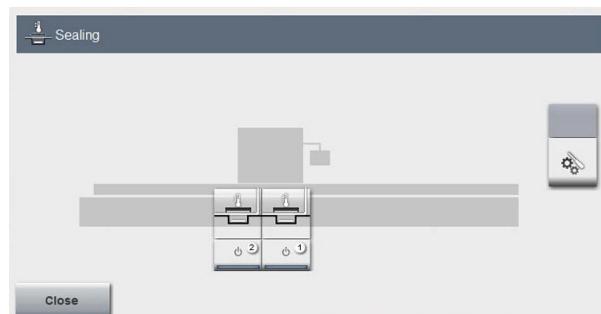


Fig. 151: Activate intermediate window, sealing

- The icons on the buttons correspond to the icons in the main menu. See Section 2.12 "MAIN MENU" on page 127.

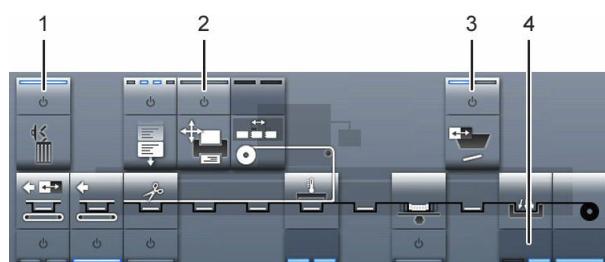


Fig. 152: Production/Machine section (example)

1 Button for <Equipment On/Off> status ON

2 Button for <Equipment On/Off> status OFF

- 3 <Equipment On/Off> button for several units
- 4 <Equipment On/Off> button not active
 - The <Equipment On/Off> buttons switch the corresponding equipment on and off.
 - The equipment can only be switched on, if it is activated in the relevant display.
 - The status of the <Equipment On/Off> buttons is not adopted into the recipe memory. When a recipe is loaded, only the equipment is switched on, which is activated in the relevant display.
 - If there are several units of the same type, the individual equipment can be switched on in the intermediate window.

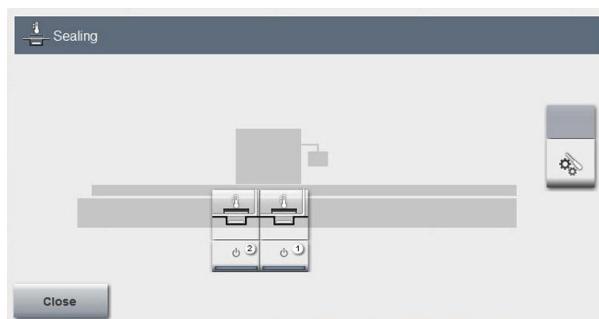


Fig. 153: Activate intermediate window, sealing

- If equipment must always be switched on when the machine starts, the corresponding <Equipment On/Off> button is not active.

The equipment that is switched on becomes operational when the machine is started by pressing the <I>key.

2.10 Wizard



Fig. 154: Wizard button

The "Wizard" assists in the performance of regularly required activities. The Wizard buttons are depicted in the following form:

	Start the wizard	The wizard is started directly by touching the button.
	Wizard active	The wizard is active and is stopped by touching the button.



Call up the wizard	When the wizard is called up, a new page appears on the screen. The <Start wizard> button appears in this display.
--------------------	--

Wizard for production

Wizard > Production



Manual advance

This function performs a *manual advance*, e.g. to feed in and run out the film. Only the film is transported, all other functions are not performed.

Only run the product out of the machine

This function runs the product out of the machine. See Section 4.8.4 "RUNNING THE MACHINE EMPTY" on page 313.
The page for "Line-motion control/station settings tab" is used to specify from which pack row the discharge of products should start and at which pack row the discharge should stop.

Run film out of the machine

This function runs the film out of the machine. See Section 4.8.4 "RUNNING THE MACHINE EMPTY" on page 313.
The page for "Line-motion control/station settings tab" is used to specify at which pack row the discharge of the film should start and at which pack row the discharge should stop.

Stand-by mode

This function starts the stand-by mode to save energy during pauses in production. see Section 2.10.1 "STAND-BY MODE". This function can be configured online.

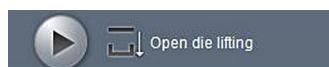
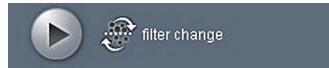
Releasing the squeezing knives

The squeezing knives are lowered. The wizard for *Release squeezing knives* appears, if the squeezing knives are configured for non-stop mode.
When the machine is next started, the wizard is automatically deactivated.

Wizards for the servicing

Wizard > Servicing

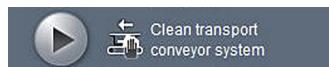


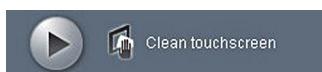
	Vacuum test	This function tests the integrity of the vacuum system and sealing diaphragm. See Section 7.9 "PERFORMING THE VACUUM TEST" on page 515. Explanation of the values for the vacuum test, see Section 2.10.2 "VACUUM TEST".
	Heating imprint	This function tests the temperature distribution in the forming die and the temperature behaviour of the film. The starting of the <i>Heating imprint</i> function is only available with the Service access right.
	Signal tower functional test	This function tests the signal lights and signal horns. See Section 7.8.2 "TESTING SIGNALLING DEVICE" on page 504.
	Open die lifting	This function opens the dies of the forming station and sealing station completely, irrespective of the <i>opening width</i> that has been entered. The dies remain in this position, until the machine is restarted.
	Filter change	This function disconnects the machine from the central vacuum, e.g. to replace the vacuum filter. This function can be configured online.

Wizard for cleaning

Wizard > Cleaning



	Cleaning the machine	This function moves the dies into the cleaning position. See Section 6.2.1 "SWITCHING THE CLEANING POSITION ON AND OFF" on page 444. The cleaning position protects the moisture-sensitive dies during the cleaning procedure.
	Cleaning the transport conveyor system	This function starts the transport conveyor for cleaning. The packaging machine must be stopped or be in the cleaning position. When the wizard is started, all the transport conveyors that are switched on also start. The speed of transport conveyors and the cleaning time can be set on the "Transport conveyor system" display on the "Cleaning" tab. See Section 2.12.13 "TRANSPORT CONVEYOR SYSTEM" on page 170. The software components for the transport conveyor system can be configured online.



Cleaning the touchscreen

This function deactivates the display for 30 seconds for cleaning.

2.10.1 Stand-by mode

This function can be configured online.



Fig. 155: Wizard for stand-by mode

If *Stand-by mode* is activated during pauses in production, this will conserve energy.

- The temperature of the heaters is lowered to 50 °C.
- The vacuum pumps switch off.
- If the temperature of the heaters falls below 60 °C, the flow of cooling water is halted.



Info

Before the pause time expires, the heaters are warmed back up to the operating temperature and the cooling water inlet is reopened. If the *Warm-up mode* function has been selected for the vacuum pumps, they will be automatically switched on.

2.10.2 Vacuum test



Fig. 156: Wizard for vacuum test

The vacuum test is performed to check the integrity of the vacuum system. The procedure tests the valves and the diaphragm of the sealing die.

Wizard > Vacuum test > Die set



Function	Explanation
<i>Current air pressure</i>	Current air pressure in the die chamber.
<i>Minimum vacuum</i>	Minimum vacuum value required for the vacuum test. The <i>minimum vacuum</i> depends on the capacity of the vacuum pump.

Die chamber

Function	Explanation
<i>Limit value</i>	Recommended value: 10 mbar (0.145 psi)
<i>Maximum deviation</i>	<i>Maximum deviation</i> from the limit value during measuring. If the <i>maximum deviation</i> is greater than a fixed specified value, a diagnostic message appears.

Sealing diaphragm

Function	Explanation
<i>Limit value</i>	Recommended value: 20 mbar (0.29 psi)
<i>Maximum deviation</i>	<i>Maximum deviation</i> from the limit value during measuring. If the <i>maximum deviation</i> is greater than a fixed specified value, a diagnostic message appears.

Function	Explanation
<i>Wizard for Vacuum test</i>	Start <i>Vacuum test</i> .
<i>Current process step</i>	Current process during the vacuum test.

2.11 Recipe



Fig. 157: Recipe button

The machine is tuned through individual settings to the product and the packaging material. These settings can be saved as a recipe.



Fig. 158: Recipe icon with warning

If no recipe is loaded, or a change has been made which is not yet saved in the recipe, the warning icon appears on the recipe button.



Info

- Values can be modified in loaded recipes. These values are not saved unless the recipe is saved again.

- If the modified values are not required to be deleted, save the recipe again.

2.11.1 Recipe management

Recipe memory

Recipe > Recipe management



<i>Loaded recipe</i>	This box shows the recipe name of the loaded recipe.
<Recipe selection>	This table column shows all the saved recipes.
<Revision date>	This table column shows the date and time of the last revision of the particular recipe.
<Status>	In the case of write-protected recipes, this table column shows the status of the current access right. Write-protected recipes can only be changed by persons from the Service access right onwards. An open lock is shown in the table column. If the lock is closed, the recipe can not be changed.
	This button loads the selected recipe.
	This button saves a new recipe.
	This button moves the selected recipe to the recycle bin. The recipe can only be finally deleted on the "Recycle bin" tab.

History

On the "History" tab, all recipe changes are listed for each available recipe.

Recipe > Recipe management > History



<Old value>	This table column shows the old value, which was saved before the change to the recipe.
-------------	---

	<New value>	This table column shows the new value, which has been saved in the recipe.
	<Designation of the variables>	This table column shows a list of the changed recipe variables in the selected recipe history.
	<Perform>	This button opens a display with the selection of the recipe histories. Only the recipe histories of the changed recipes are shown in this display.
	<Backwards>	This button scrolls backwards through the change times for the recipes.
	<Forwards>	This button scrolls forwards through the change times for the recipes.

Delete recipe

Recipes can be finally deleted or recovered on the "Recycle bin" tab. Deleting of recipes is only possible with the *Service access* right.

Recipe > Recipe management > Recycle bin



	<Recycle bin>	This table column shows all the recipes that are in the recycle bin.
	<Status>	In the case of write-protected recipes, this table column shows the status of the current access right. Write-protected recipes can only be changed by persons from the Service access right onwards. An open lock is shown in the table column. If the lock is closed, the recipe can not be changed.
	<Recover marked recipe>	This button adopts the marked recipe back into the recipe memory again.
	<Empty recycle bin>	This button finally deletes all recipes in the recycle bin list.

Comparison of the recipes

Different recipes can be compared with each other on the "Compare" tab.

Recipe > Recipe management > Comparison



	<Recipe 1>	This table column shows the values, which differ from each other in the selected recipes.
	<Recipe 2>	This table column shows the values, which differ from each other in the selected recipes.
	<Designation of the variables>	This table column shows the designation of the variables for the values, which are displayed in the <i>Recipe 1</i> table column.
	<Recipe 1>	This button opens a display for selecting the first recipe to be compared.
	<Recipe 2>	This button opens a display for selecting the second recipe to be compared.

2.12 Main menu



Fig. 159: Main menu button

The "Main menu" gives access to the basic machine functions and to the equipment on the machine.

	<Forming>	Forming film.
	<Sealing>	Evacuate, gas flush (option) and seal the packs.
	<Cutting unit>	Control the cutting units, e.g.: <ul style="list-style-type: none"> • Cross cutter • Hole punching device and slitting unit • Longitudinal cutter • Complete cutting units
	<Film transport system>	Transport the film.

	<Register mark control>	Register mark control
	<Synchronisation>	Synchronising auxiliary unit.
	<Bell-Mark EasyPrint printer>	This button leads to the synchronisation with the Bell-Mark EasyPrint.
	<Monitors>	Monitors, e.g.: <ul style="list-style-type: none"> • Voltage monitor • Splice monitoring • Input pressure monitor • Monitoring of product protrusion
	<Line-motion control>	Line-motion control
	<Transport conveyor system>	Synchronise the transport conveyor system. The software components for the transport conveyor system can be configured online.
	<Other settings>	Perform additional optional settings, e.g.: <ul style="list-style-type: none"> • Machine setting • Vacuum pump • Cooling water monitoring • Film trim removal
	<Vision system>	Operate vision system.

2.12.1 forming



Fig. 160: Forming station icon

Functions for forming the film, see Section 2.13 "FORMING".

2.12.2 Sealing



Fig. 161: Sealing station icon

Functions for sealing, evacuation and gas flushing of the pack, see Section 2.14 "SEALING".

2.12.3 Cutting unit



Fig. 162: Cutting unit icon

The functions for cutting the film are explained in a separate section, see Section 2.15 "CUTTING UNIT".

2.12.4 Film transport system



Fig. 163: Icon for advance of lower web

The "Film transport system" controls the transport of the film.

Drive, lower web

Main menu > Film transport system > Advance of lower web



Function	Explanation
<i>Advance movement position</i>	This value shows the advance travelled.
<i>Cut-off length</i>	Desired <i>cut-off length</i> starting with the next advance.
<i>Cut-off length correction</i>	If there is stretching of the transport chains, the entered value must correspond to the correction value that is determined. The stretching of the transport chains arises from wear.

Function	Explanation
<i>Acceleration</i>	Desired <i>acceleration</i> starting with the next advance. <ul style="list-style-type: none">• Low value: gentle starting and braking, lower cycle output.• High value: fast starting and braking, higher cycle output. Recommended value: 50%
<i>Speed</i>	Desired <i>speed</i> starting with the next advance. Recommended value: 50%
<i>End with advance</i>	<ul style="list-style-type: none">• Box empty: for dies with preheating. After you press the <O> key, the machine responds as follows:<ul style="list-style-type: none">– The dies open.– The machine stops.• Check mark in box: for dies without preheating. After you press the <O> key, the machine responds as follows:<ul style="list-style-type: none">– The dies open.– The machine carries out an advance.– The machine stops.
<i>Advance duration</i>	This value shows the actual advance duration.
<i>Manual advance speed</i>	This button opens the "Manual advance speed" page. This page is used to select, whether the manual advance, which is started at the control terminal, should be quick or slow.
Function	Explanation
<i>Manual advance wizard</i>	Perform a <i>manual advance</i> .

Unwinding upper web

The time point at which the unwinding of the upper web occurs is controlled on the "Upper web unwind" tab.

Main menu > Film transport system > Upper web unwind



Unwinding

<i>Independent of advance:</i>	The swing arm is always under pressure. When the proximity switch is activated, the unwinding motor starts. Application: <ul style="list-style-type: none"> • Standard application • If the cut-off length is 1000 mm (39.4 in) or greater, the machine control automatically sets this operating mode.
<i>After advance:</i>	The swing arm is always under pressure. When the proximity switch is activated, the unwinding motor starts as soon as the web advance is completed. Application: <ul style="list-style-type: none"> • With very thin, sensitive films • If the advance is slower than the unwinding speed
<i>Sealable side (option)</i>	This selection adjusts the transport direction of the film to the sealing side of the web roll.
<i>Manual advance wizard</i> 	Perform a <i>manual advance</i> .

2.12.5 Register mark control



Fig. 164: Icon for register mark control

The register mark control governs the positioning in register of printed upper webs and printed lower webs.



Info

As the film is stretched to allow positioning of the print image, the register mark distance must have a negative tolerance.

Not every machine is equipped with a register mark control. The standard software for upper web register mark control and for the associated operating modes of braking and tensioning can be configured online.

The display for lower web register mark control only appears, if the machine is equipped accordingly.

The tabs' page content depends on the operating mode selected.

Operating mode



<Perform operating mode:>

This button calls up the selection of operating modes.

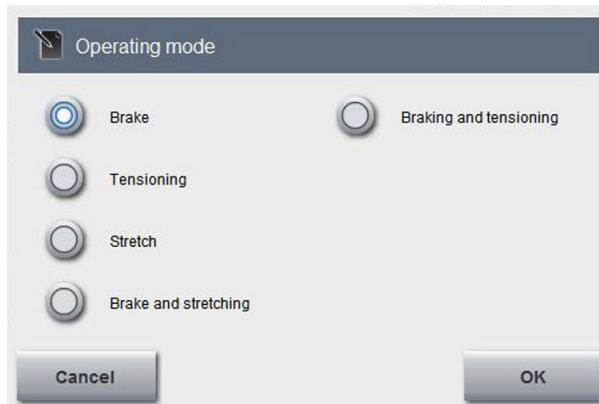


Fig. 165: Example: Register mark control operating mode

The following operating modes are possible:

- Brake..
- Tensioning
- Braking and tensioning.

Heating current monitoring

The tab for "Heating current monitoring" contains the calibration data for this unit. The calibration data is used to monitor the heat output of the heating circuits.

Explanation of functions: See Section 2.16.3 "HEAT OUTPUT MEASUREMENT" on page 217.

Register mark control sensor

The teaching of the register mark sensors is controlled on the "Sensor" tab. Inputs are only possible with Service access rights.

Main menu > Upper web register mark > Sensor



Light barrier

Function	Explanation
<i>Enable teaching key on the sensor</i>	<ul style="list-style-type: none">• Box empty: the teaching of the sensor is disabled.• Box with check mark: The teaching of the sensor is enabled. Teaching is carried out directly at the sensor.

Function	Explanation
<i>High sensitivity</i>	Selecting the sensitivity of the sensor: <ul style="list-style-type: none"> Box empty: normal sensitivity of the sensor. The register mark is detected if the sensor scans the centre of the register mark. Box with check mark: <i>High sensitivity</i> of the sensor. The register mark is detected if the sensor scans on or near the register mark.
<i>Manual teaching</i>	Call up the wizard for <i>Manual teaching</i> of the sensor.

Brake operating mode

Shortly before the end of the advance, the film is clamped and stretched by the remaining advance by a value which is calculated by the machine control. This stretching positions the film. The Break operating mode is used for register-printed film.

Main menu > Upper web register mark



On/Off

This button activates and deactivates the register mark control.

Lower web advance

Function	Explanation
<i>Advance movement position</i>	Current advance movement position.

Register mark

Function	Explanation
<i>Target position</i>	Desired position of the register mark.
<i>Actual position</i>	Current position of the register mark. The distance between register mark and lens of the photo scanning head.
<i>Calculated brake position</i>	The film brake clamps the web at this distance from the end of the advance. The value is calculated by the machine control based on the position of the register marks.
<i>Average value of register mark distance</i>	This value shows the average distance between the register marks over the last ten machine cycles.

Function	Explanation
<Edit>	This button calls up the "Register mark settings" page.

Register mark settings

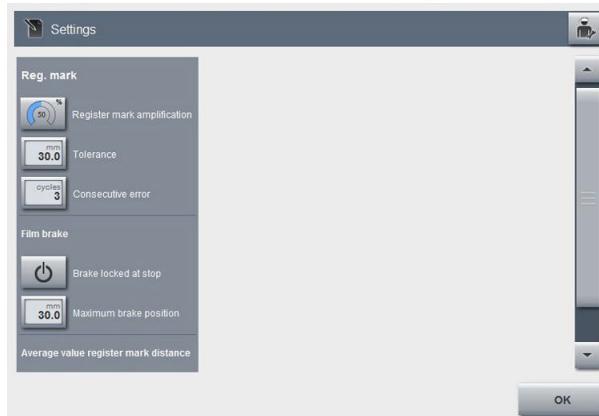


Fig. 166: Settings for register mark brake



<Service> This button calls up the service settings.

Register mark

Function	Explanation
<i>Register mark amplification</i>	Register mark control setting. It is necessary to change the <i>amplification</i> if the <i>actual position</i> deviates from the <i>target position</i> or if the position of the print image on the film fluctuates. Depending on the level of <i>amplification</i> , the time needed to correct the print image position may vary. Recommended value: 40% With 0 percent <i>amplification</i> there will remain a continual misalignment of the print image in relation to the pack.
<i>Tolerance</i>	Permitted print image deviation from the <i>target position</i> . Recommended value: 20 mm (0.79 in)
<i>Consecutive errors</i>	The value entered determines for how many consecutive machine cycles the print image may be outside the tolerance, before the machine stops. See Section 2.7.3 "CONSECUTIVE ERRORS" on page 107.

Function	Explanation
<i>Film brake</i>	<ul style="list-style-type: none"> <i>Brake closed at machine stop:</i> If this function is activated, the film brake remains closed after the machine is stopped. This function is used for applications with printers. <i>Maximum brake position:</i> The <i>maximum brake position</i> is the limit of the automatically calculated brake position and therefore the earliest permitted time for clamping the film. The <i>maximum brake position</i> depends on the material and the gauge of the film. Stretching the film too much compromises the seal seam or leads to tearing of the film.
<i>Average value of register mark distance</i>	<p><i>Consecutive error:</i> If the average distance between the register marks has been too great over the last ten machine cycles, a warning message appears. The value entered determines, how many additional consecutive machine cycles there can be, where the average distance between the register marks is too large, before the machine stops. See Section 2.7.3 "CONSECUTIVE ERRORS" on page 107.</p>

Service settings



Fig. 167: Brake service settings

Braking - manual operation

Function	Explanation
<i>Active</i>	<ul style="list-style-type: none"> When this box is activated, the brake can be operated manually. When this box is empty, manual operation of the brake is disabled.
<i>Brake</i>	If the button is touched and held, the brake remains closed until the button is released.

Seal seam strain relief

Function	Explanation
<i>Film brake opens</i>	<ul style="list-style-type: none">• <i>With last die:</i> With standard applications.• <i>At start of security time for sealing die</i>

Tensioning operating mode

The upper web is clamped just before the end of the advance and is tensioned by the remainder of the advance. Application: with unprinted film, so that creasing is prevented.

Main menu > Upper web register mark



On/Off

This button activates and deactivates the register mark control.

Lower web advance

Function	Explanation
<i>Advance position</i>	Current advance position.

Tensioning

Function	Explanation
<i>Tensioning</i>	The film brake clamps the web at this distance from the end of the advance. This value depends on the upper web material and thickness that is used.
<Edit>	This button calls up the "Settings" display.

Settings

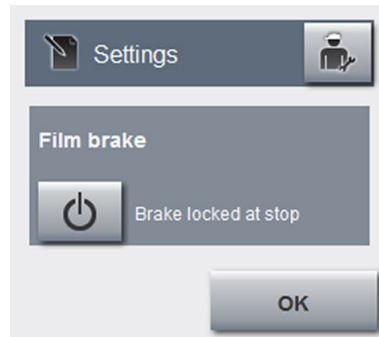


Fig. 168: Tensioning settings



<Service:> This button calls up the service settings.

Film brake

Function	Explanation
<i>Brake closed after stop</i>	If this function is activated, the film brake remains closed after the machine is stopped. This function is used for applications with printers.

Service settings

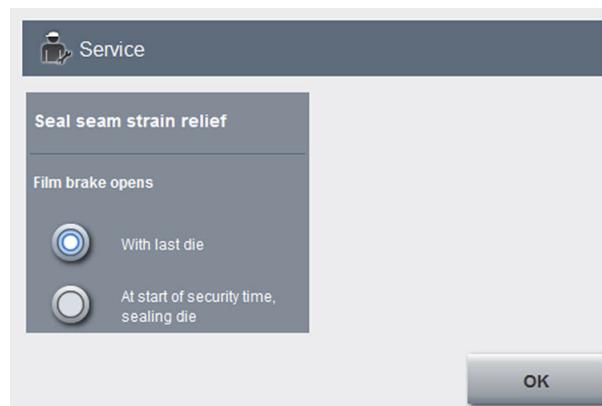


Fig. 169: Tensioning service settings

Seal seam strain relief

Function	Explanation
<i>Film brake opens</i>	<ul style="list-style-type: none"> <i>With last die:</i> With standard applications <i>At start of security time for sealing die</i>

Braking and tensioning operating mode

This operating mode is used, if the film has only one register mark per format and the film brake is to be run in partial advances. Only the last partial advance of the format is controlled by the register mark. The film is tensioned during the remaining partial advances. This operating mode can be configured online

Main menu > Upper web register mark



On/Off

This button activates and deactivates the register mark control.

Lower web advance

Function	Explanation
<i>Advance movement position</i>	Current advance movement position.

Register mark

Function	Explanation
<i>Target position</i>	Desired position of the register mark.
<i>Actual position</i>	Current position of the register mark. The distance between register mark and lens of the photo scanning head.
<i>Calculated brake position</i>	The film brake clamps the web at this distance from the end of the advance. The value is calculated by the machine control based on the position of the register marks.
<i>Average value of register mark distance</i>	This value shows the average distance between the register marks over the last ten machine cycles.
<Edit>	This button calls up the "Register mark settings" page.

Tensioning during partial advance

Function	Explanation
<i>Tensioning</i>	The film brake clamps the web at this distance from the end of the partial advance. This value depends on the upper web material and thickness that is used.

Register mark settings

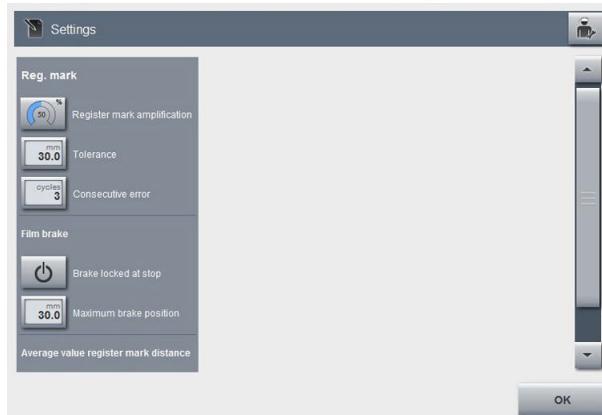


Fig. 170: Settings for register mark brake

 <Service>	This button calls up the service settings.
Register mark	
Function	Explanation
<i>Register mark amplification</i>	Register mark control setting. It is necessary to change the <i>amplification</i> if the <i>actual position</i> deviates from the <i>target position</i> or if the position of the print image on the film fluctuates. Depending on the level of <i>amplification</i> , the time needed to correct the print image position may vary. Recommended value: 40% With 0 percent <i>amplification</i> there will remain a continual misalignment of the print image in relation to the pack.
<i>Tolerance</i>	Permitted print image deviation from the <i>target position</i> . Recommended value: 20 mm (0.79 in)
<i>Consecutive errors</i>	The value entered determines for how many consecutive machine cycles the print image may be outside the tolerance, before the machine stops. See Section 2.7.3 "CONSECUTIVE ERRORS" on page 107.

Function	Explanation
<i>Film brake</i>	<ul style="list-style-type: none"> <i>Brake closed at machine stop:</i> If this function is activated, the film brake remains closed after the machine is stopped. This function is used for applications with printers. <i>Maximum brake position:</i> The <i>maximum brake position</i> is the limit of the automatically calculated brake position and therefore the earliest permitted time for clamping the film. The <i>maximum brake position</i> depends on the material and the gauge of the film. Stretching the film too much compromises the seal seam or leads to tearing of the film.
<i>Average value of register mark distance</i>	<i>Consecutive error:</i> If the average distance between the register marks has been too great over the last ten machine cycles, a warning message appears. The value entered determines, how many additional consecutive machine cycles there can be, where the average distance between the register marks is too large, before the machine stops. See Section 2.7.3 "CONSECUTIVE ERRORS" on page 107.

Service settings



Fig. 171: Brake service settings

Braking - manual operation

Function	Explanation
<i>Active</i>	<ul style="list-style-type: none"> When this box is activated, the brake can be operated manually. When this box is empty, manual operation of the brake is disabled.
<i>Brake</i>	If the button is touched and held, the brake remains closed until the button is released.

Seal seam strain relief

Function	Explanation
<i>Film brake opens</i>	<ul style="list-style-type: none"> • <i>With last die:</i> With standard applications. • <i>At start of security time for sealing die</i>

2.12.6 Synchronisation



Fig. 172: Synchronisation icon

The synchronisation controls the interfacing of the packaging machine with external auxiliary units, such as fillers, printers, labellers.


Info

To control the synchronisation first make the following selection.

- When and for how long is the output signal of the packaging machine sent to the auxiliary unit?
- Which feedback signal does the auxiliary unit give to the packaging machine?

Function	Explanation
<i>On/Off</i>	Activating and deactivating this synchronisation separately
<i>Synchronisation</i>	<p>This page area shows the designation of the synchronisation channel for the selected synchronisation. The synchronisation channel designates the transmission path for the synchronisation signals, via which the auxiliary unit communicates with the machine, and via which the auxiliary unit is controlled.</p> <ul style="list-style-type: none"> • The synchronisation channel appears in the associated diagnostic messages. • The designation of the synchronisation channel corresponds to the associated designation in the electrical circuit diagram.
<i>Customer-specific designation</i>	The synchronisation can be given any designated name for easier identification. This specific designation appears in the associated diagnostic messages.

Consecutive errors (option)

Function	Explanation
<i>Reject packs</i>	Depending on the feedback signal set for the auxiliary unit, the feedback signal of the synchronisation is evaluated for the line-motion control. Based on this evaluation, the line-motion control records 'good' or 'reject'. Machine control of the corresponding consecutive error function, see Section 2.7.3 "CONSECUTIVE ERRORS".

Status signal

The "Status signal" page is used to configure, which status message the packaging machine receives from the auxiliary unit.

Main menu > Synchronisation



<Edit>



This button opens the "Status signal" page.



Fig. 173: Signal: Status signal

Signal

Status signal	Explanation
<i>None</i>	The auxiliary unit does not issue a status signal.
<i>Operational at 24V</i>	When the auxiliary unit is operational, the packaging machine receives a signal of 24 V. If the signal is missing, the diagnostic message "Not ready" appears.

Status signal	Explanation
<i>Operational at 0V</i>	When the auxiliary unit is operational, the packaging machine receives a signal of 0 V. If the signal is missing, the diagnostic message "Not ready" appears.
<i>Fault at 24V</i>	If there is a fault on the auxiliary unit, the packaging machine receives a signal of 24 V. The diagnostic message "Fault" appears.
<i>Fault at 0V</i>	If there is a fault on the auxiliary unit, the packaging machine receives a signal of 0 V. The diagnostic message "Fault" appears.

Output signal

The packaging machine sends an output signal to the auxiliary unit. The display of parameters is based on the selected output signal.

Main menu > Synchronisation



<Edit>



This button opens the "Output signal" page.

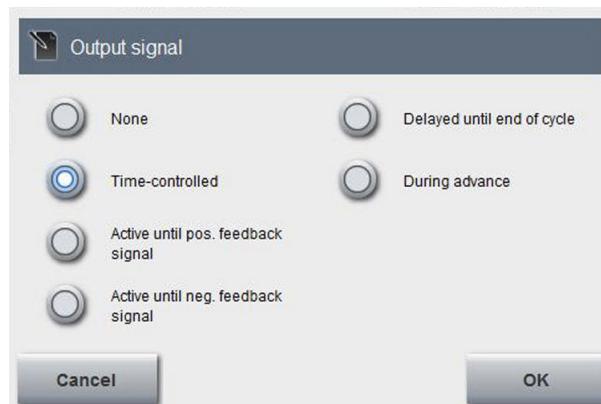


Fig. 174: Signal: Output signal

Signal

Output signal	Explanation
<i>None</i>	The packaging machine sends no output signal.
<i>Time-controlled</i>	If the advance is within target, the output signal is present for the <i>Signal length</i> time.

Output signal	Explanation
<i>Active until positive feedback signal</i>	If the advance is within target, the output signal is present until the auxiliary unit sends a feedback signal with a positive edge.
<i>Active until negative feedback signal</i>	If the advance is within target, the output signal is present until the auxiliary unit sends a feedback signal with a negative edge.
<i>Delayed until end of cycle</i>	If the advance is within the target, the time for <i>Delay output signal</i> is started. After this time has elapsed, the output signal is present until the end of the machine cycle.
<i>During advance</i>	The output signal is present during the advance.
Function	Explanation
<i>Early start</i>	Desired distance from <i>Synchronisation start</i> to <i>Advance end</i> . This reduces the delay caused by the start-up time which auxiliary units need for mechanical reasons. This serves to optimise the cycle output.
<i>Signal length</i>	Impulse duration of output signal Recommended value: 0.5 s
<i>Output signal delay time</i>	Delay time of output signal. Recommended value: 0.5 s

Feedback signal

Feedback signal of the auxiliary unit to the packaging machine. The display of parameters is based on the selected feedback signal.

Main menu > Synchronisation



<Edit>



This button opens the "Feedback signal" page.

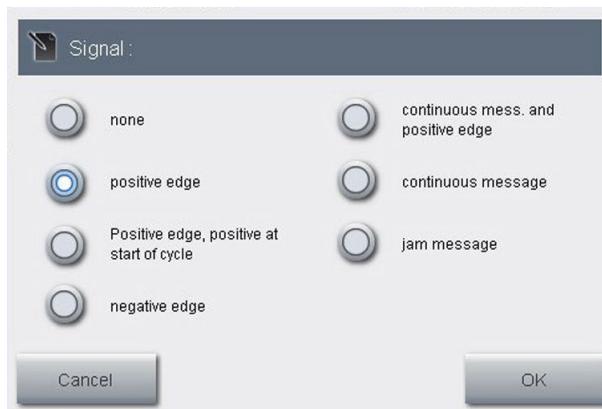


Fig. 175: Signal: Feedback signal

Signal

Feedback signal	Explanation
None	The auxiliary unit sends no feedback signal to the packaging machine. A fault in the auxiliary unit results in neither a diagnostic message nor a machine stop.
Positive edge	The auxiliary unit sends the ready message to the packaging machine within the machine cycle and before the <i>maximum waiting time</i> has elapsed. The ready message is sent through an impulse of at least 0.1 s with a positive edge.
Positive edge, positive at cycle start	The feedback signal of the auxiliary unit is as with Positive edge . Additionally, there must be at the start of the cycle a positive signal for the ready message from the auxiliary unit.
Negative edge	The auxiliary unit sends the ready message to the packaging machine within the machine cycle and before the <i>maximum waiting time</i> has elapsed. The ready message is sent through an impulse of at least 0.1 s with a negative edge.
Continuous message and positive edge	The auxiliary unit gives the same feedback signal as with positive edge . However, there must be +24 V present at the packaging machine during the entire advance. Otherwise the advance will not start or it will be aborted. Application: auxiliary units that dip into the pack cavity, e.g. fillers.
Continuous message	The auxiliary unit sends a continuous feedback signal (e.g. operational) to the packaging machine. If the signal is no longer present, the packaging machine stops. A diagnostic message appears.

Feedback signal	Explanation
<i>Jam message</i>	The auxiliary unit sends a continuous feedback signal of +24 V to the packaging machine. If the signal drops for longer than the set time for <i>Jam detection delay</i> , the packaging machine waits until +24 V is present again or until the <i>Maximum waiting time</i> has elapsed.
Function	Explanation
<i>2-edged feedback signal</i>	<p>Optimisation of the cycle time in the case of forming dies with preheating. This requires that the <i>Feedback signal</i> of the auxiliary unit is sent with two impulses and that all stations are ready at the time of the respective impulse.</p> <ul style="list-style-type: none"> • <i>Off</i>: Optimisation of the cycle time is deactivated. • <i>On</i>: The first impulse of the auxiliary unit opens the forming die. The second impulse immediately starts the advance. The time for opening the forming die does not affect the cycle time.
<i>External start</i>	<p>Activating and deactivating the <i>External start</i> of the machine by the auxiliary unit. The <i>External start</i> must take place within 15 minutes after the machine has stopped. An <i>external start</i> is not possible under the following conditions:</p> <ul style="list-style-type: none"> • The machine was stopped with the <O> key. • The machine stopped due to removal of a protective device. • Machine fault.
<i>Opening the sealing die lock</i>	<p>The machine waits for the <i>Feedback signal</i> from the auxiliary unit as follows:</p> <ul style="list-style-type: none"> • <i>Off</i>: open sealing die. • <i>On</i>: closed sealing die. <p>Application: synchronisation of printers. The closed sealing die fixes the packs in place. The upper web thus remains stationary and the print image is improved.</p>
<i>Advance delay</i>	The advance delay time is necessary if the auxiliary unit gives the <i>Feedback signal</i> earlier than the advance can start.

Function	Explanation
<i>Delay time for jam detection</i>	Any jam which is detected is only signaled by the synchronisation after this delay time has elapsed. The <i>Delay time for jam detection</i> is required for example, if there is a light barrier for jam detection. This should only signal a jam, if the light beam is broken for longer than a pack requires to travel past the light barrier.
<i>Maximum waiting time</i>	<p>During this time, the machine waits for the <i>Feedback signal</i> from the auxiliary unit. Recommended value: 10 s Processes in the machine if the maximum waiting time is exceeded.</p> <ul style="list-style-type: none"> • After the machine cycle ends, the waiting time begins. • The machine waits with open or closed dies. This depends on the setting of <i>Open sealing die lock</i> and on the settings for forming and sealing. • After the waiting time has elapsed, the machine stops. Closed dies open. A diagnostic message appears. <p>The machine is started by pressing the <I> key or by the auxiliary unit via the <i>external start</i> function.</p>

Examples of synchronisation

Example	Feedback signal	Output signal
Filler with no feedback signal, e.g. dosing filler	<i>None</i>	<i>Time-controlled</i>
Filler with feedback signal and start signal via impulse.	<i>Positive edge</i>	<i>Time-controlled</i>
Filler with a start signal until ready message given.	<i>Positive edge</i>	<i>Active until positive feedback signal</i>
Slicer with shingle loader, e.g. Weber slicer.	<i>Positive edge</i>	<i>During advance</i>
Slicer with stacking loader, e.g. Weber Slicer.	<i>Continuous message and positive edge</i>	<i>Active until negative feedback signal</i>
MULTIVAC labeller without feedback signal.	<i>None</i>	<i>During advance</i>

Example	Feedback signal	Output signal
MULTIVAC labeller with feedback signal.	<i>Positive edge</i>	<i>During advance</i>
MULTIVAC H240 handling module with feedback signal	<i>Jam message</i>	Depending on the application

2.12.7 Bell-Mark EasyPrint printer



Fig. 176: Bell-Mark Easyprint printer icon

When the machine is equipped with several printers, a small triangle appears in the <Printer> button in the main menu.



Fig. 177: Printer menu icon

If the <Printer> button is touched, the "Printer menu" appears. The displays of the individual printers can be accessed via the "Robot menu".

Main menu > Printer > Bell-Mark EasyPrint MLP



<On/Off> This button activates and deactivates the printer.

Start signal

Function	Explanation
<i>Delay time</i>	After the closing of the die the printer starts with a delay. The entered value determines the delay. The closed sealing die fixes the packs in place. The upper web thus remains stationary and the print image is improved.

Feedback signal

Function	Explanation
<i>Maximum waiting time</i>	<p>The entered value determines how long the machine waits for the feedback signal of the printer. Recommended value: 10 s</p> <p>The processes in the machine, if the <i>Maximum waiting time</i> is exceeded, are explained below.</p> <ul style="list-style-type: none"> When the machine cycle is ended, the machine waits for a feedback signal from the printer. A warning message appears. The <i>Maximum waiting time</i> starts. After the entered waiting time has elapsed, a fault message appears and the machine stops.

Consecutive errors

Function	Explanation
<i>Ink ribbon shortage</i>	The value entered determines, for how many consecutive machine cycles the ink ribbon may be used up, until the machine stops. See Section 2.7.3 "CONSECUTIVE ERRORS" on page 107.
<i>Active during manual advance</i>	<ul style="list-style-type: none"> When this field is activated, the printer operates in automatic mode and with manual advance. When this field is empty, the printer only operates in automatic mode.

Recipe

Function	Explanation
<i>Recipe number</i>	<p>The entered number defines a recipe from the printer's recipe selection. The recipe selection is stored in the machine control and has to be activated in the "Service" page.</p> <p>Not all printers support the recipe selection option.</p>

Service parameters

	<Service:>	This button calls up the "Service" page.
---	------------	--



Fig. 178: Bell-Mark Easy Print Service

Function	Explanation
<i>Recipe selection</i>	A recipe selection for the printer is stored in the machine control. When this box is activated, the recipe selection option is enabled. An input box for the recipe number appears in the "Bell-Mark Easy-Print" page. Not all printers support the recipe selection option.

Reset counter: An internal counter of the printer counts the individual printings. The following selection specifies when the counter will be reset.

Function	Explanation
<i>Deactivated</i>	The counter is not reset.
<i>Home position</i>	When the printer has reached the initial position, the counter is reset.
<i>Start signal</i>	When the printer receives a start signal from the machine, the counter is reset.

2.12.8 Vision System



Fig. 179: Vision system icon

The functions and operation of the vision system are described in the separate "I 420 inspection system" instruction manual.

2.12.9 Discharge unit



Fig. 180: Discharge unit icon

The discharge unit takes up the packs from the machine. The packs are then separated in such a way, that they can be taken up by a downstream unit.

The discharge unit can function using the following distinct operating modes:

- Non-stop mode
- Converging

**Info**

- The method of functioning for the operating modes is explained in the section on "Setting the discharge unit".
- The operating mode is changed over on the "Other settings" tab.
- The page content of the "Discharge conveyor" tab is based on the operating mode selected.

Operating mode: converging

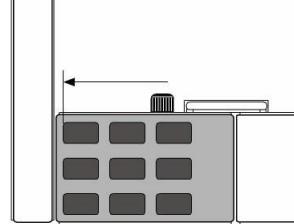
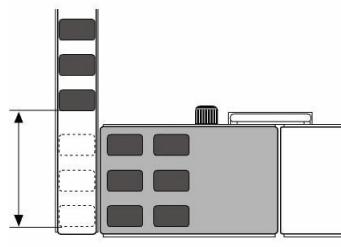
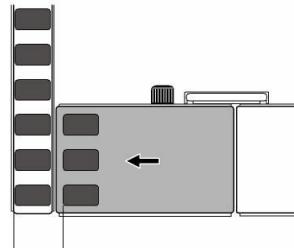
The *Row separation* function controls, when the packs are transported onto a downstream unit, e.g. a transversal conveyor.

Main menu > Discharge unit > Discharge conveyor



Function	Explanation
On/Off	This button activates and deactivates the discharge unit.

Row separation

Function	Explanation
<i>Travel to the end of the conveyor</i>	 <p>Fig. 181: Travel to the end of the conveyor</p> <p>The value that you enter determines, how long the discharge conveyor runs in order to transport the packs of a format to the converging position at the end of the conveyor.</p>
<i>Pause time</i>	 <p>Fig. 182: Pause time</p> <p>The value that you enter determines, how long the machine waits until the downstream unit has discharged a pack row.</p>
<i>Separation run</i>	 <p>Fig. 183: Separation run</p> <p>The value that you enter determines, how long the discharge conveyor runs in order to transfer a pack row to the downstream unit. This parameter appears, if the <i>Format transfer</i> function is not activated on the "Other settings" tab.</p>

Function	Explanation
<i>Transfer run</i>	The value that you enter determines, how long the discharge conveyor runs in order to transfer the packs of one format to the downstream unit. This parameter appears, if the <i>Format transfer</i> function is activated on the "Other settings" tab.
<i>Number of pack rows</i>	The value that you enter determines, how many pack rows are transferred in succession to the downstream unit.
<i>End with stop</i>	<ul style="list-style-type: none"> If this box is activated, the discharge conveyor stops as soon as the last separation run has taken place. If this box is empty, the discharge conveyor continues to run after the end of the last separation run.

Function	Explanation
<i>Running-on time</i>	The value that you enter determines, how long the discharge unit continues to run after the machine stops, in order to discharge the packs safely from the discharge unit.

Operating mode: non-stop mode

Main menu > Discharge unit > Discharge conveyor



Function	Explanation
<i>On/Off</i>	This button activates and deactivates the discharge unit.
<i>Running-on time</i>	The value that you enter determines, how long the discharge unit continues to run after the machine stops, in order to discharge the packs safely from the discharge unit.

Setting the discharge unit

The content of the "Other settings" tab depends on the selected operating mode.

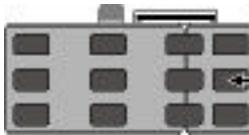
Main menu > Discharge unit > Other settings



Operating mode

Function	Explanation
<i>Non-stop mode</i>	If this box is activated, the discharge conveyor runs continuously at a fixed set speed.
<i>Converging</i>	If this field is activated, the packs are separated and transferred to the downstream unit, e.g. another discharge conveyor, at the end of the conveyor.
<Service:>	This button opens the "Format transfer" display.

Function during advance: for the Converging operating mode

Function	Explanation
<i>Synchronised movement</i>	<p>Application: discharge conveyors with frequency converter.</p>  <p>Fig. 184: Converging, synchronised movement</p> <p>The discharge conveyor takes up the packs of a cycle in synchronisation with the web advance. The received pack rows are then further transported with unchanged spacing. The speed and acceleration of the discharge conveyor are preset on the frequency converter and can be optimised or changed by the service personnel if required.</p>
<i>Non-stop mode</i>	<p>Application: discharge conveyors without frequency converter.</p>  <p>Fig. 185: Converging, non-stop mode</p> <p>The discharge conveyor runs continuously during the web advance. The spacing between the received pack rows depends on the speed of the discharge conveyor.</p>

Manual reject pack removal

Function	Explanation
<i>On/Off</i>	<ul style="list-style-type: none"> If this function is activated, the machine stops as soon as a pack, which is marked as "reject" by the line-motion control, is on the discharge conveyor. The affected pack can be removed by hand. If this function is deactivated, the line-motion control has no effect upon the function of the discharge conveyor.
<i>Conveyor running-on time</i>	If the line-motion control has marked packs as "reject", the discharge conveyor stops after this time has elapsed. This enables the removal position for the reject packs to be determined.
<i>Switched off for one machine length</i>	If this function is activated, no evaluation is made by the line-motion control of the packs contained in one full machine length, e.g. in the case of feeding in the film.

Function	Explanation
<i>Active during manual advance</i>	<ul style="list-style-type: none"> When this box is activated, the discharge unit operates in automatic mode and with manual advance. When this box is empty, the discharge unit only operates in automatic mode.

Service settings

Function	Explanation
<i>Row separation</i>	<i>Frequency converter:</i> If this function is activated, the discharge unit must be equipped for <i>row separation</i> with a frequency converter.

Format transfer


<Service:> This button opens the "Format transfer" display.

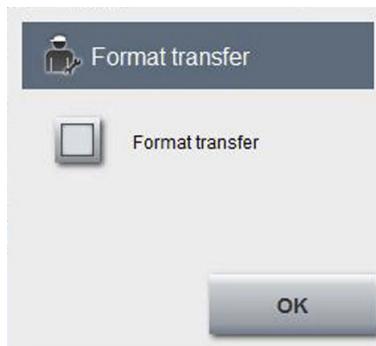


Fig. 186: Format transfer

Function	Explanation
<i>Format transfer</i>	<ul style="list-style-type: none">If this box is activated, the packs are transported to the end of the conveyor. As soon as the time that is entered under Pause time has elapsed, the machine control checks whether there is a jam. If there is no jam, the discharge unit transfers all the packs of the format together to the downstream unit.If this box is empty, the discharge unit transfers the packs row by row to the downstream unit. The machine then waits for the amount of time that was entered under Pause time. If there is no jam, the discharge unit transfers the next pack row.

2.12.10 Monitors



Fig. 187: Icon for monitors

Voltage monitor

This monitor checks if the input voltage is within a given tolerance.

Main menu > Monitors > Voltage monitoring



Actual values of electrical voltage

Function	Explanation
<i>Phase 1</i>	Current measured values of voltage.
<i>Phase 2</i>	
<i>Phase 3</i>	

Voltage

Function	Explanation
<i>Lower warning limit</i>	If the input voltage is below this value longer than the <i>Measuring time</i> , a diagnostic message appears.
<i>Upper warning limit</i>	If the input voltage is above this value longer than the <i>Measuring time</i> , a diagnostic message appears.
<i>On/Off</i>	Activating and deactivating the voltage monitor
<i>Measuring time</i>	Maximum duration of the input voltage deviation.

Splice monitoring

The splice monitoring detects the points at which the film is taped together. The splice monitoring is controlled separately for the upper web, the lower web and the zip strips.

Main menu > Monitors > Splice monitoring



Splice

Function	Explanation
<i>A: distance</i>	The monitoring range in front of and after a splice. All cycles which lie within the monitoring range are marked as 'reject' and separated out by the line-motion control system.
<i>B: Sensor distance</i>	Distance from the light beam of the sensor to the following cycle limit. The machine control uses this measurement to calculate the reject cycles for the line-motion control.
<i>Consecutive errors</i>	Machine control of the consecutive error function, see Section 2.7.3 "CONSECUTIVE ERRORS".
<i>On/Off</i>	Activating and deactivating the splice monitoring.
<Service:>	This button opens the "Sensor teach-capable?" page. This selection configures whether the sensor can be taught via the software.



Input pressure monitoring

This monitor checks, whether the input pressure of the compressed air is above the specified minimum.

Main menu > Monitors > Comp. air monitoring



Explanation of the compressed air monitoring, see Section 2.7.4 "PRESSURE MONITORING".

Monitoring of product protrusion

This monitoring function checks whether a product protrudes over the pack cavity. This protects downstream units from damage.

Main menu > Monitors > Monitoring of product protrusion



Stop procedure

Function	Explanation
On/Off	Activating and deactivating the monitoring of product protrusion
Stop after end of advance	When a protruding product is detected, the machine stops after the advance.
Stop during advance	When a protruding product is detected the machine stops immediately.

Acknowledging fault messages

Function	Explanation
Control terminal	Fault messages are acknowledged at the control terminal with the keys <O> and <I>.
Monitoring device	Fault messages are acknowledged by manually activating the flap once directly at the monitoring device.

Sensor monitors

The teaching of the light barriers is controlled on the "Sensor" tab. Teach light barriers, see Section 5.22 "SETTING THE SENSORS".

Main menu > Monitors > Sensor



Splice

Function	Explanation
<i>Teaching key on the sensor</i>	<ul style="list-style-type: none"> Box empty: the teaching of the sensor is disabled. Box with check mark: Teaching of the sensor is enabled. Teaching is carried out directly at the sensor.
<i>High sensitivity</i>	Selecting the sensitivity of the sensor: <ul style="list-style-type: none"> Box empty: Normal sensitivity of the sensor. Box with check mark: <i>High sensitivity</i> of the sensor.
<i>Manual teaching</i>	Call up the wizard for <i>Manual teaching</i> of the sensor.

This page area appears if the sensor has been configured as teach-capable on the "Splice monitoring" tab.

2.12.11 Line-motion control



Fig. 188: Icon for line-motion control

The line-motion control can be used to distinguish between good packs and reject packs and to control stations such as forming, filling, sealing, printing and discharging. A station can be a device, e.g. a filler, as well as a function, e.g. synchronisation.



Info

When the recipe is saved, the inputs for the line-motion control are adopted into the particular recipe.

To produce the packs, the film runs through the machine from the film infeed to the machine outfeed. This flow path is described as the line.

Visualisation

The "Line-motion control" tab provides a graphic depiction of the active line-motion control. The visualisation is derived from the inputs on the following tabs:

- "Station settings"
- "Other settings"
- "Monitors"

Main menu > Line-motion control



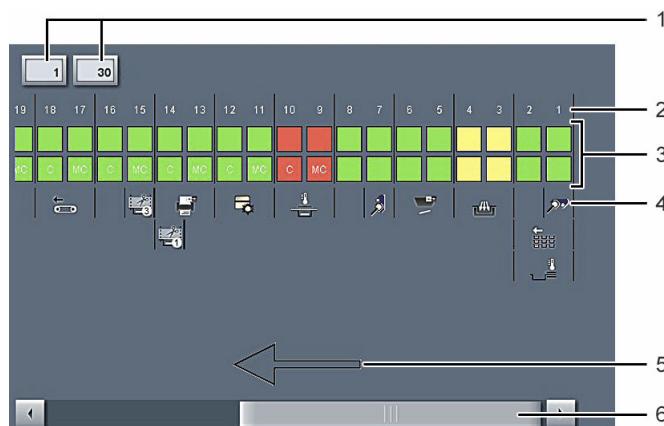


Fig. 189: Visualisation section of line-motion control system

- 1 Display area
- 2 Position
- 3 Pack cavities
- 4 Stations
- 5 Transport direction
- 6 Scroll bars

Function	Explanation
Display area	Number of pack rows depicted on the display.
Position	Position on the line.
Pack cavities	Coloured display of the pack cavities during production: <ul style="list-style-type: none"> • White: pack row not processed, e.g. in the case of deleted line-motion data. • Yellow: pack row being processed. • Green: pack row is marked as "good". • Red: pack row is marked as "reject".
Stations	Graphic depiction of the devices and functions for which row numbers are assigned on the "Station settings" tabs.
Transport direction	The displayed arrow shows the running direction of the depiction. The page for "Other settings/Machine settings tab" is used to match the running direction of the depiction to the running direction of the machine.
Scroll bars	View the whole <i>display area</i> .

Reading and writing line-motion data

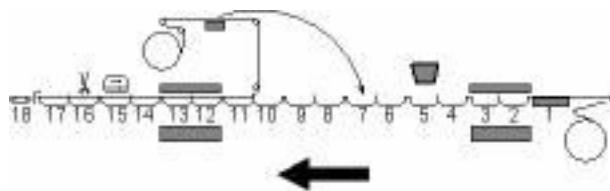


Fig. 190: Example: line-motion control

- 1 Splice monitoring
- 2 Forming station
- 5 Synchronisation 1 (filling unit)
- 7 Upper web register mark
- 12 Sealing station
- 15 Synchronisation 2 (labeler)
- 16 Cutting
- 18 Discharge unit

In order to control the stations on the line individually and at the correct point in time, the position of each station on the line must be determined. For this purpose, pack rows are counted. The counting of the pack rows begins with the first station on the line (splice monitoring in the example).

The row numbers of the lower web are transferred to the upper web. If the register mark on the upper web lies outside the tolerance, this is detected by the line-motion control (pack row 7 in the example). Subsequent stations are controlled accordingly.

The following line data is defined on the "Station settings" tabs:

- Which station does the line-motion control have an effect on?
- Which stations have an effect on the line-motion control?

Main menu > Line-motion control > Station settings



Position

First *position* of each individual station on the line. When the positions are specified, the stations can be controlled individually and at the correct point in time.



Number of pack rows

Number of pack rows, which can be simultaneously processed by the relevant station. With this value, a partial advance can be specified if required.

	Read information	<ul style="list-style-type: none"> Box empty: <i>Read information</i> is deactivated. This station does not request any information from the line. Faults from previous stations have no influence on this station. The pending machine cycle is always carried out. Check in box: <i>Read information</i> is activated. This station queries the line as to whether the pending machine cycle has already been marked as "reject". If yes, this machine cycle is not processed by the station.
	Write information	<ul style="list-style-type: none"> Box empty: <i>Write information</i> is deactivated. This station does not send a message to the line. A fault at this station has no influence on subsequent stations. Check in box: <i>Write information</i> is activated. This station writes to the line, informing whether the operating procedure was carried out with, or without, errors. If the pending machine cycle was faulty, this machine cycle is marked as "reject" and the following stations are controlled accordingly.
	Control of good packs	<p>This setting is only available with the <i>service access</i> right.</p> <ul style="list-style-type: none"> Box empty: <i>Control of good packs</i> is deactivated. The pending machine cycle is only carried out if all packs are good. Check in box: <i>Control of good packs</i> is activated. The pending machine cycle is carried out as soon as one pack is designated as good. Storing maintenance tasks is only possible with the <i>Service access</i> right.



Info

Good packs and reject packs can only be distinguished if the stations are correctly coordinated with each other.

Settings for line-motion control

Main menu > Line-motion control > Other settings



Function	Explanation
<i>Number of pack tracks</i>	Number of pack tracks of the format set used.
<i>Standardised format</i>	<ul style="list-style-type: none"> • Box empty: The number of pack rows is specified for each individual station on the "Station settings" tabs. • Check in box: The number of pack rows is the same for all station on the line. It corresponds to the input under <i>Number of pack rows</i> in this display.
<i>Number of pack rows</i>	Number of rows of the format set used.
<i>Deleting line-motion data</i>	<p>All line-motion data is deleted the next time the machine is started. The inputs on the "Station settings" tabs remain saved. All packs on the line are marked as "reject" and ejected at the end of the machine.</p> <p>Deletion of line-motion data is only possible with the service access right.</p>

Line-motion control monitoring

Main menu > Line-motion control > Monitors



The settings on the "Monitoring" tabs determine, which stations are to be taken into account for the visualisation of monitoring.
If only some individual stations are activated, this will for example determine, which station has first marked a machine cycle as "reject".

Station masking

Function	Explanation
<i>All</i>	<ul style="list-style-type: none"> • If this box is activated, all stations on the "Monitoring" tabs are activated. • If this box is deactivated, the stations can be individually activated on the "Monitoring" tabs.

2.12.12 Other settings



Fig. 191: Icon for Other settings

Machine settings

Additional optional settings are contained under "Machine settings".

Main menu > Other settings > Settings



Machine settings

Function	Explanation
<i>Delay time of machine start</i>	The start of advance and of closing of the dies is delayed by this amount of time. The <i>Machine start delay time</i> becomes effective when the <I> key is pressed or if the machine is started externally by an auxiliary unit.
<i>External start</i>	The functions of the <I> (start) and <O> (stop) keys on the control terminal are also assigned to switches at other positions on the machine. This parameter defines whether starting the machine is permitted via these switches. <ul style="list-style-type: none">• <i>Off</i>: Starting the machine via the additional <I> switch is disabled.• <i>On</i>: Starting the machine via the additional <I> switch is enabled. If the machine is in the cleaning position, the additional <I> and <O> switches are deactivated.

Light barrier

Function	Explanation
<i>Locking the setting</i>	Prevents unintended shifting of the light barriers. <ul style="list-style-type: none">• <i>Off</i>: Setting of the light barriers is enabled.• <i>On</i>: Setting of the light barriers is disabled.

Yellow signal light

Function	Explanation
<i>Signal light, yellow</i>	The yellow signal light flashes: <ul style="list-style-type: none">• <i>Standard</i>: The machine is waiting for a synchronised unit.• <i>Packaging material</i>: packaging material has run out, e.g. film.

External stop

Function	Explanation
<i>External stop</i>	Configuration specifying whether the additional switches for stopping the machine are normally open contacts or normally closed contacts.

Machine version

Function	Explanation
<i>Left</i>	<p>This configuration will determine how the machine is depicted in the "Production" and "Wizard" displays. The machine running direction in the illustrations is defined as seen by the operator.</p> <ul style="list-style-type: none"> Box empty: Machine running direction from right to left Box with check mark: Machine running direction from left to right

Signal horn

Function	Explanation
<i>Signal horn</i>	<p>Configuration of the signal horn:</p> <ul style="list-style-type: none"> <i>Inactive</i>: The signal horn is switched off. <i>Start-up warning</i>: The signal horn sounds prior to the machine starting. <i>Start-up warning and fault in automatic mode</i>: The signal horn sounds prior to the starting of the machine and in the event of a fault in automatic mode. <i>Start-up warning and fault</i>: The signal horn sounds prior to the starting of the machine and in the event of any fault.

Vacuum pump

Main menu > Other settings > Vacuum



Vacuum pump

Function	Explanation
<i>Start-up time</i>	Time before the first machine cycle. When the <i><I></i> key is pressed, the machine start is delayed by the amount of the <i>start-up time</i> for the vacuum pump. This allows the vacuum pump to achieve full suction power before the machine starts.

Function	Explanation
<i>Running-on time</i>	After pressing the <O> key, the vacuum pump switches off in a time-delayed manner by the amount of <i>Running-on time</i> . To switch it off immediately, press the <O> key twice briefly in succession.
<i>Warm-up mode</i>	The vacuum pump runs immediately after switching on the main switch. This is necessary, if the vacuum pump requires a warm-up time.

Cooling water monitoring

Main menu > Other settings > Cooling water



Flow rate monitoring

Function	Explanation
<i>Minimum flow rate</i>	Minimum cooling water flow rate required to sufficiently cool the dies.
<i>Current flow rate</i>	Actual cooling water flow rate. The quantity of cooling water consumed is shown in the "Production data/Consumption tab" display.

Temperature monitoring

Function	Explanation
<i>Temperature</i>	In this area the individual heating circuits are activated and deactivated, and their temperatures and the tolerances for the temperature monitoring are set. See Section 2.7.2 "TEMPERATURE AND TEMPERATURE MONITORING " on page 104.

Film trim removal

Main menu > Other settings > Film trim removal



Suction unit

The parameters for the suction unit can be configured online.

<On/Off>	This button activates and deactivates the suction unit.
----------	---


<Edit>

This button opens the display for "Suction unit settings"



Fig. 192: Suction unit settings

Suction unit

Function	Explanation
<i>Start-up time</i>	In the case of machine start for example, the suction unit needs a certain amount of time to achieve the required suction power. When the <I> key is pressed, the first machine cycle is delayed by this amount of <i>start-up time</i> .
<i>Running-on time</i>	After pressing the <O> key, the suction unit switches off after a <i>running-on time</i> delay.

Edge trim winder

The parameters for the film trim winder can be configured online.


<On/Off>

This button activates and deactivates the edge trim winder.

<Edit>

This button opens the page for "Edge trim winder settings".

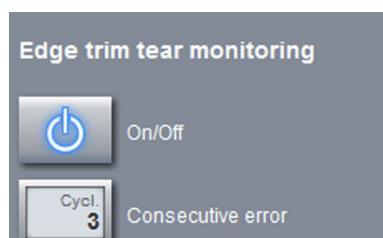


Fig. 193: Edge trim winder settings

Edge trim tear monitoring

Function	Explanation
On/Off	This button activates and deactivates edge trim tear monitoring.
Consecutive errors	This value determines in how many successive cycles this fault may occur before the machine stops, see Section 2.7.3 "CONSECUTIVE ERRORS".

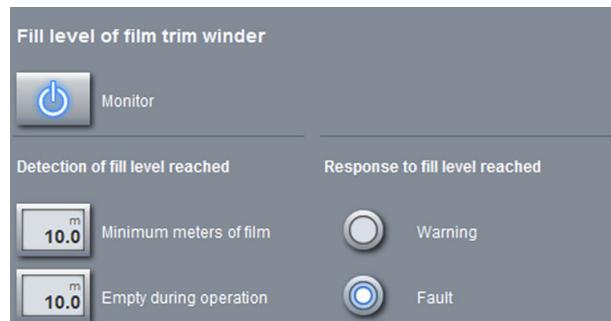


Fig. 194: Settings for film trim winder fill level

Fill level of film trim winder

Function	Explanation
Monitor	This button activates and deactivates the fill level monitoring.
Detection of fill level reached	<ul style="list-style-type: none"> <i>Minimum film running metres:</i> The value that you enter causes a delay in fill level monitoring. If the sensor is interrupted until the distance for <i>Minimum film running metres</i> has been travelled, fill level monitoring reports that the maximum fill level is reached. <i>Emptying during operation</i> The value that you enter describes the capacity of the edge trim winder, specified as the length of film run on the line. The length of film trim to be entered depends on the film thickness and the width of the edge trim.
Response to fill level reached	<p>Configuration of the fill level monitoring:</p> <ul style="list-style-type: none"> <i>Warning:</i> If the maximum fill level is reached, a diagnostic message appears. <i>Fault:</i> If the maximum fill level is reached, a diagnostic message appears and the machine stops.

Production data

Main menu > Other settings > Production data



HLS production data acquisition

Function	Explanation
<i>Active</i>	<ul style="list-style-type: none"> Box empty: The HLS production data acquisition is deactivated. Box with check mark: The HLS production data acquisition is activated. The input box appears for the <i>IP address</i> and the <i>port</i> of the HLS server. The main screen of the HLS server is shown in the "Production data acquisition" display.

System of units

Function	Explanation
<i>Metric</i>	The inputs in the displays are entered in metric units.
<i>Anglo-American</i>	The inputs in the displays are entered in Anglo-American units.

Configuration of production display

Function	Explanation
<i>Choose max. 4</i>	<ul style="list-style-type: none"> Box empty: No information on this subject will be shown in the "Production" display. Check in box: The relevant information will be shown in the "Production" display.

Network

Main menu > Other settings > Network



Remote Assistance

Function	Explanation
<i>Active</i>	If the box is activated, remote access via Remote Assistance is active. The <Remote Assistance> button is shown in the "Diagnosis" menu. Special hardware is required for remote access via the Remote assistance function.

2.12.13 Transport conveyor system



Fig. 195: Transport conveyor system

The transport conveyor system with the individual transport conveyors is controlled in these displays. The software components for the transport conveyor system can be configured online.

Transport conveyor



Info

The "Transport conveyor" tab only displays the transport conveyors that have been activated on the "Connection configuration" tab.

Main menu > Transport conveyor system > Transport conveyor



Function	Explanation
<i>On/Off</i>	If this button is activated, the transport conveyor starts when the packaging machine starts, and it runs at the set speed.
<i>Speed</i>	The entered value determines the speed of the transport conveyor during automatic mode.
<i>Running-on time</i>	The entered value determines the time required to discharge the remaining packs after the packaging machine stops.
<i>Jam detection</i>	If this status display lights up, the <i>Jam detection</i> function is active. If a pack jam is detected, a diagnostic message appears and the machine stops.
<Jam detection>	This button calls up the "Jam detection" display for the particular transport conveyor.





Fig. 196: Conveyor jam detection

Jam detection

Function	Explanation
<i>On/Off</i>	This button activates and deactivates the jam detection function.
<i>External start</i>	If this function is activated, the machine starts automatically when the transport conveyor system has been freed after a pack jam.
<i>Delay time for jam detection</i>	The value entered determines the permissible duration of a pack jam. If there is still a pack jam after this time has expired, the machine stops. A diagnostic message appears.
<i>Maximum waiting time</i>	The value entered determines how long the packaging machine waits after the expiry of the <i>Jam detection delay time</i> . <ul style="list-style-type: none"> • If the pack jam is resolved during this time, the transport conveyors and the packaging machine restart. • If there is still a pack jam after this time has expired, the machine stops. A diagnostic message appears.
<i>Start-up delay of upstream conveyor</i>	In order to resolve the pack jam, the last transport conveyor must start first. After the subsequent transport conveyor is started, the preceding transport conveyor starts after a delay. The entered value determines the length of the delay.

Description

Transport conveyor system



<Diagnosis>



This button calls up the "Diagnosis" display for the particular transport conveyor. Have this information ready for the service personnel, when making enquiries about fault analysis.

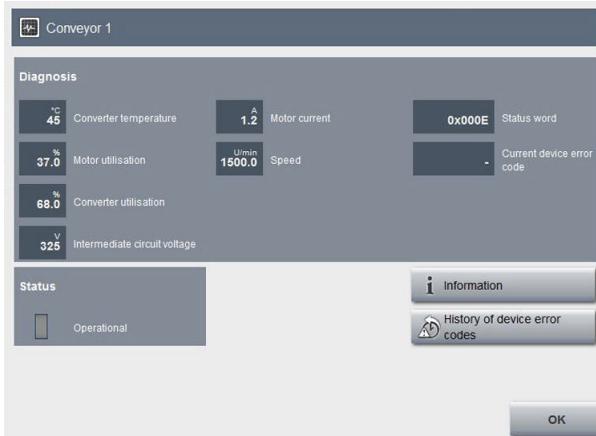


Fig. 197: Conveyor diagnosis

Diagnosis

This display contains the drive parameters.

Status

If this status display lights up, the transport conveyor is operational.

<Information>

This button calls up the display with the diagnostic values for the drive.



<History of equipment error codes>

This button calls up the fault list for the drive with a time stamp.



<Settings>

This button calls up the "Settings" display for the particular transport conveyor.

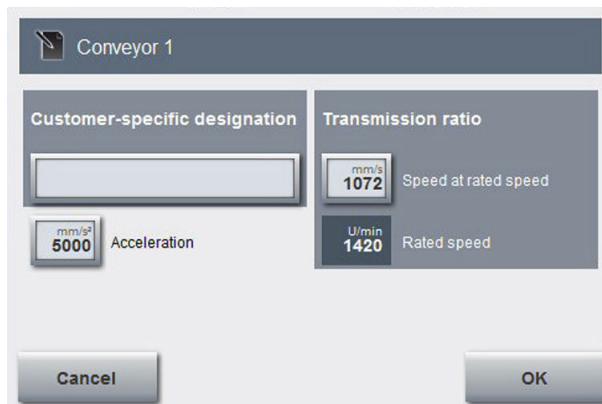


Fig. 198: Conveyor settings

Customer-specific designation

Function	Explanation
<i>Customer-specific designation</i>	The designation that you enter appears on the "Transport conveyor" and "Connection configuration" tabs instead of the standard designation for the particular transport conveyor. The associated diagnostic messages also appear with this customer-specific designation.

Function	Explanation
<i>Acceleration</i>	The value entered controls the start-up acceleration of the transport conveyor. The lower the value, the gentler the start-up. The cycle output is lower. If a new acceleration is entered, this becomes active with the next advance. Recommended value: 50%

Transmission ratio

Function	Explanation
<i>Speed at rated speed</i>	The entered value determines the speed of the transport conveyor at the rated speed of the motor.
<i>Rated speed</i>	This value shows the speed of the motor at rated power. The rated speed must accord with the information on the type plate of the motor.

Manual operation

Main menu > Transport conveyor system > Manual operation



Function	Explanation
<i>On/Off</i>	If this button is activated, the transport conveyor runs when the packaging machine is stopped.
<i>Speed</i>	The entered value determines the speed of the transport conveyor during manual operation.
<i>Acceleration</i>	The entered value controls the start-up acceleration of the transport conveyor during manual operation. The lower the value, the gentler the start-up. The cycle output is lower. If a new acceleration is entered, this becomes active with the next advance. Recommended value: 50%



Info

Jam detection is not active during manual operation. The *Running-on-time* and *External start* functions are also interrupted by manual operation.

Cleaning

In this display, the settings are jointly specified for cleaning all the transport conveyors.

Main menu > Transport conveyor system > Cleaning



Cleaning

Function	Explanation
<i>On/Off</i>	If this button is activated, all the transport conveyors that are switched on start at the set <i>conveyor speed</i> and stop after the set <i>cleaning time</i> . If the button is touched again, the transport conveyors start immediately.
<i>Conveyor speed</i>	The entered value determines the speed of the transport conveyors during cleaning.
<i>Cleaning time</i>	The value entered determines how long the transport conveyors run for cleaning.

Connection configuration

A maximum of ten transport conveyors can be integrated in the process sequence. The transport conveyors which are to be integrated are specified in this display.

Main menu > Transport conveyor system > Connection configuration





Fig. 199: Connection configuration

Function	Explanation
<i>Target</i>	If this field is activated, the transport conveyor is displayed on the "Transport conveyor" tab. The address of the transport conveyors can be seen from the equipment designation.
<i>Actual</i>	If this status display lights up, the transport conveyor is connected.

2.12.14 Vision System



Fig. 200: Vision system icon

In this display, the synchronisation of the vision system is controlled.

Status / monitoring

Main menu > Camera quality control > Status / Monitor



Status line

Function	Explanation
<i>Colours of the status display</i>	This field shows the status of the vision system: <ul style="list-style-type: none"> Red: there is a fault related to the vision system. Yellow: there is a warning related to the vision system. Green: the vision system is operating fault-free.
<i>Status text</i>	The status text shows the operating status of the vision system or the vision system fault messages.
<OK>	Acknowledge the vision system diagnostic messages.

Communication

Function	Explanation
<i>Hostname</i>	Enter the IP address of the vision system.
<i>Machine control</i>	<ul style="list-style-type: none"> Connected: the vision system is connected to the machine control. Disconnected: the vision system is not connected to the machine control. <p>The value displayed shows the corresponding interface.</p>
<i>Control terminal</i>	<ul style="list-style-type: none"> Connected: the vision system is connected to the machine control. Disconnected: the vision system is not connected to the machine control. <p>The value displayed shows the corresponding interface.</p>

Loaded recipe

Function	Explanation
<i>Loaded recipe</i>	This value shows the recipe name of the recipe loaded.
Function	Explanation
<i>On/Off</i>	This button activates and deactivates the vision system.
<i>Consecutive errors</i>	The value entered determines the number of successive machine cycles in which reject packs may occur until the machine stops, see Section 2.7.3 "CONSECUTIVE ERRORS".

Production data

Main menu > Camera quality control > Production data



Function	Explanation
<i>Loaded recipe</i>	This value shows the recipe name of the recipe loaded.

Product

Function	Explanation
<i>Good packs</i>	This value shows the number of good packs detected since the display was reset.
<i>Reject packs</i>	This value shows the number of reject packs detected since the display was reset.
<i>Reset counter</i>	This button sets the <i>good packs</i> and <i>reject packs</i> counters to 0.

Shift

Function	Explanation
<i>Good packs</i>	This value shows the number of good packs detected per shift since the display was reset.
<i>Reject packs</i>	This value shows the number of reject packs detected per shift since the display was reset.
<i>Reset counter</i>	Set the <i>good packs</i> and <i>reject packs</i> counters to 0. The counters are managed by the vision system. Automatic reset by the machine control of the packaging machine is not possible.

Recipe memory

Main menu > Camera quality control > Recipe management



Function	Explanation
<i>Loaded recipe</i>	This value shows the recipe name of the recipe loaded. The stored recipes of the vision system are available only on the vision system. They are not stored with the recipes of the packaging machine.
<i>Recipe selection</i>	The recipe selection shows a list of all recipes stored by the vision system.
<Get recipe>	Load the recipe selected in the list.

Diagnosis

Main menu > Camera quality control > Diagnosis



The image of the last reject pack is shown on the "Diagnosis" tab.
The identified faults are marked on the image.

2.13 Forming

2.13.1 Forming station



Fig. 201: Forming station icon

Depending on the equipping of the machine, the following forming method can be selected. See Section 2.4.2 "FORMING METHOD " on page 96.

- Standard

This process is suitable for the production of flat to medium-deep pack cavities with simple shapes made of thin film up to 300 µm.

- With preheating

This process is suitable for the production of flat to medium-deep pack cavities with simple shapes made of thick film up to 1200 µm.

Main menu > Forming

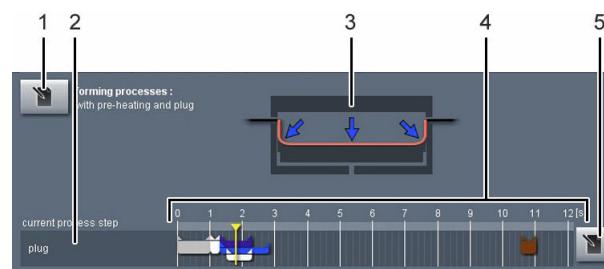


Fig. 202: Forming station during automatic mode

1 <Perform>:Select forming method

2 Current process step

3 Graphic depiction of the forming station

4 Graphic depiction of the process sequence in the forming station

5 <Perform>: Display target values

The depiction is based on the forming method selected.

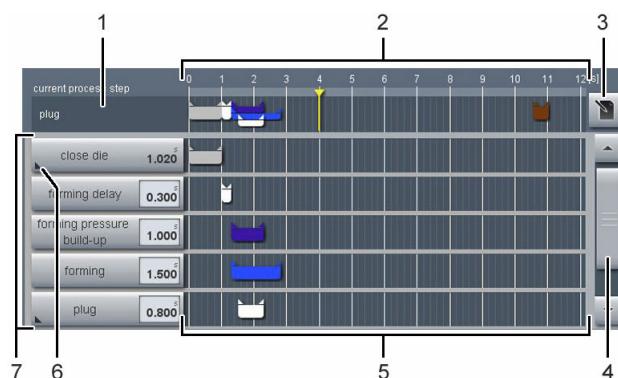


Fig. 203: Values for forming

- 1 Current process step
- 2 Graphic depiction of the process sequence in the forming station
- 3 <Perform>: Display switch points
- 4 Scroll bar: Navigating within the list of values
- 5 Graphic depiction of the time sequence during forming process
- 6 Icon for menu: single values appear when the button is touched
- 7 Buttons for changing the values

The values shown and their order are based on the forming method selected.

Forming standard

The film is first heated and then formed within the same machine cycle. The heating-up phase and forming time are added together.

Function	Explanation
<i>Die closing</i>	<p>These values optimise the cycle output of the machine.</p> <ul style="list-style-type: none"> <i>Early start of die:</i> Die closing starts before the advance is completed. The value entered determines how much earlier the closing of the die starts. This reduces the mechanically unavoidable dead time between <i>Advance completed</i> and <i>Die closed</i>.
<i>Heating pressure build-up</i>	<p>The entered value determines the time for building up the pressure in the die for heating the film. The built up heating pressure presses the film onto the heating plate.</p>

Function	Explanation
<i>Heating</i>	<ul style="list-style-type: none"> • <i>Heating [s]</i>: The value that you enter determines the time for heating up the film. The required time for reaching the necessary forming temperature of the film depends on the material and the film thickness. • <i>Heating [bar]</i>: The value entered determines the pressure which is built up to press the film onto the heating plate.
<i>Pressure increase for forming</i>	<p>The entered value determines the time for building up the pressure in the die for forming the film. The built up forming pressure presses the previously heated film into the forming cavities.</p> <p>The required time depends on the size of the die. The larger the die, the more time will be required to build up the pressure.</p>
<i>Forming</i>	<ul style="list-style-type: none"> • <i>Forming (s)</i>: The value that you enter determines the time for forming the film. • <i>Forming (bar)</i>: The value entered determines the pressure which is built up to press the film into the pack cavity.
<i>Security time</i>	<p>The value that you enter determines the time between <i>End of forming</i> and <i>Die opening</i>. The die is ventilated during this time. The required time depends on the size of the die.</p>
<i>Release the film</i>	<p>The formed pack cavity can be released from the forming die by means of an air blast. The entered value determines the length of this air blast. To release the film the "Forming/Other settings tab" must be activated in the display.</p>
<i>High pressure forming</i>	<ul style="list-style-type: none"> • <i>High pressure forming [s]</i>: The entered value determines the time for pre-forming the film with the entered pressure. • <i>High pressure forming [bar]</i>: The entered value determines the pressure which is built up in the die for moulding the pack cavities. <p>The function <i>High pressure forming</i> must be activated in the "Forming/Other settings tab".</p>

Forming with preheating

The film is first heated in one machine cycle and then formed in the following machine cycle. The heating-up phase and the forming time run simultaneously, thus allowing a higher cycle output.

Function	Explanation
<i>Die closing</i>	<p>These values optimise the cycle output of the machine.</p> <ul style="list-style-type: none"> • <i>Early start of die</i>: Die closing starts before the advance is completed. The value entered determines how much earlier the closing of the die starts. This reduces the mechanically unavoidable dead time between <i>Advance completed</i> and <i>Die closed</i>.
<i>Forming press. build up</i>	<p>The entered value determines the time for building up the pressure in the die for forming the film. The built up forming pressure presses the previously heated film into the forming cavities.</p> <p>The required time depends on the size of the die. The larger the die, the more time will be required to build up the pressure.</p>
<i>Forming</i>	<ul style="list-style-type: none"> • <i>Forming (s)</i>: The value that you enter determines the time for forming the film. • <i>Forming (bar)</i>: The value entered determines the pressure which is built up to press the film into the pack cavity.
<i>Security time</i>	<p>The value that you enter determines the time between <i>End of forming</i> and <i>Die opening</i>. The die is ventilated during this time. The required time depends on the size of the die.</p>
<i>Release film</i>	<p>The formed pack cavity can be released from the forming die by means of an air blast. The entered value determines the length of this air blast. To release the film the "Forming/Other settings tab" must be activated in the display.</p>

<p><i>High pressure forming</i></p>	<ul style="list-style-type: none">• <i>High pressure forming [s]:</i> The entered value determines the time for pre-forming the film with the entered pressure.• <i>High pressure forming [bar]:</i> The entered value determines the pressure which is built up in the die for moulding the pack cavities. <p>The function <i>High pressure forming</i> must be activated in the "Forming/Other settings tab".</p>
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2.13.2 Preheating



Fig. 204: Preheating icon



Info

The "Preheating" tab only appears if a forming method with preheating is selected.

Depending on the hardware configuration of the machine, the following preheating methods can be selected: See Section 2.4.3 "PREHEATING PROCESS" on page 97.

- *Heating using compressed air*
The compressed air pushes the film on to the lower heating plate. Only the top heating plate's radiated heat is used.
- *Heating using vacuum*
The enclosed air between the film and the lower heating plate is suctioned away with vacuum. The vacuum pulls the film onto the lower heating plate.
- *Heating with vacuum and compressed air*
The film is pressed against the bottom heating plate with compressed air. The enclosed air between the film and the lower heating plate is suctioned away with vacuum.
- *Heating with diaphragm*
The diaphragm pushes the top heating plate against the bottom heating plate. The film is clamped between the heating plates and is pre-heated from above and from below.
- *Heating with compressed air & diaphragm*
The diaphragm pushes the top heating plate against the bottom heating plate. The film is clamped between the heating plates and is pre-heated from above and from below. Additionally, compressed air pushes the film to the lower heating plate.

- *Heating with compressed air and diaphragm via contact time*
 The diaphragm pushes the top heating plate against the bottom heating plate for the time that is entered. The film is clamped between the heating plates and is pre-heated from above and from below. Additionally, compressed air pushes the film to the lower heating plate.
- *Heating with vacuum and diaphragm*
 The diaphragm pushes the top heating plate against the bottom heating plate. The film is clamped between the heating plates and is pre-heated from above and from below. The enclosed air between the film and the heating plates is suctioned away with vacuum.
- *Heating with vacuum and diaphragm via contact time*
 The diaphragm pushes the top heating plate against the bottom heating plate for the time that is entered. The film is clamped between the heating plates and is pre-heated from above and from below. The enclosed air between the film and the heating plates is suctioned away with vacuum.
- *Freely combinable preheating process*
 Depending on the hardware configuration of the machine, the pre-heating method can be combined freely based on the individual hardware components.

In the following table, the preheating parameters are assigned to the possible preheating methods.

Selected preheating method	Parameters for preheating method									
	A	B	C	D	E	F	G	H	I	J
<i>Heating using compressed air</i>	X	X	X							X
<i>Heating using vacuum</i>	X	X								X
<i>Heating with vacuum and compressed air</i>	X	X	X							X
<i>Heating with diaphragm</i>	X	X		X						X
<i>Heating with compressed air & diaphragm</i>	X	X		X	X			X	X	
<i>Heating with compressed air and diaphragm via contact time</i>	X	X		X	X	X			X	X
<i>Heating with vacuum and diaphragm</i>	X	X		X						X
<i>Heating with vacuum and diaphragm via contact time</i>	X	X		X	X					X
<i>Freely combinable preheating process</i>	All parameters are possible, depending on the combination.									



The graphics correspond with that depicted for the forming station. The values shown and their order are based on the preheating method selected.

Function	Explanation
A: Close die	<p>These values optimise the cycle output of the machine.</p> <ul style="list-style-type: none"> • <i>Early start of die:</i> Die closing starts before the advance is completed. The value entered determines how much earlier the closing of the die starts. This reduces the mechanically unavoidable dead time between <i>Advance completed</i> and <i>Die closed</i>. • <i>Early start start of the heating vacuum:</i> When this function is activated, the vacuum for heating the film starts 0.2 s before the die is closed, and this functions from the second machine cycle. This reduces the formation of creases in the film. <p>This function can be configured online.</p>
B: Minimum preheating time	<ul style="list-style-type: none"> • <i>Minimum preheating time:</i> The value that you enter determines the time for heating up the film. The required time for reaching the necessary forming temperature of the film depends on the material and the film thickness. • <i>Heating:</i> <ul style="list-style-type: none"> – Compressed air: The value entered determines the pressure which is built up to press the film onto the heating plate. – Vacuum: The value entered determines the vacuum that is created to pull the film onto the heating plate.
C: Heating press. incr.	<p>The entered value determines the time for building up the pressure in the die for heating the film. The built up heating pressure presses the film onto the heating plate.</p>

Function	Explanation
D: Diaphragm pressure increase	The entered value determines the time for increasing the pressure in the diaphragm for heating the film. The pressure built up in the diaphragm pushes the top heating plate against the bottom heating plate.
E: Top heating plate contact	The value entered determines the time in which the upper heating plate is pressed onto the film. The required time depends on the film thickness.
F: Security time	The value that you enter determines the time between <i>End of forming</i> and <i>Die opening</i> . The die is ventilated during this time. The required time depends on the size of the die.
G: Compressed air delay time	The value that you enter delays the compressed air for heating the film. As soon as the die is closed, the delay time starts. After the delay time has elapsed, the compressed air presses the film on to the lower heating plate.
H: Vacuum delay time	The value that you enter delays the vacuum for heating the film. As soon as the die is closed, the delay time starts. After the delay time has elapsed, the vacuum pulls the film to the lower heating plate.
I: Diaphragm delay time	The entered value delays the pressure build-up in the diaphragm. As soon as the die is closed, the delay time starts. After the delay time has elapsed, the diaphragm pushes the top heating plate against the bottom heating plate.
J: Compressed air pressure increase	The entered value determines the time for building up compressed air in the die for heating the film. The built up heating pressure presses the film onto the heating plate.

2.13.3 Forming settings

Main menu > Forming > Other settings



Die options

Forming

<i>Release the film</i>	If this function is activated, the formed pack cavity is released from the forming die by means of an air blast. The corresponding parameter appears on the "Forming" tab. The function for <i>Releasing the film</i> can be configured online.
<i>Waiting with closed die</i>	If this function is activated, the machine waits with closed forming die to prevent a shrinking back of sensitive film due to radiating heat. The forming die remains closed until the end of the machine cycle. This parameter only appears if the standard forming method is selected.

Preheating

<i>Diaphragm</i>	If a diaphragm is integrated in the preheating die, the diaphragm has to be activated with this button. This button is only visible, if <i>Heating with compressed air</i> and <i>Heating with diaphragm</i> are configured in the hardware configuration of the machine.
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Function	Explanation
<i>High pressure forming</i>	When this function has been activated, the pack cavity is preformed with the entered pressure. The corresponding parameter appears on the "Forming" tab.

2.13.4 Forming heating

On the "Heating" tab the individual heating zones are activated and deactivated, and their temperatures and the tolerances for the temperature monitoring are set.

Main menu > Forming > Heating



Depending on the equipping of the machine, individual control zones for temperature monitoring are installed.

Main menu > Forming > Temperature monitoring



Explanation of the heating zones, see Section 2.7.2 "TEMPERATURE AND TEMPERATURE MONITORING ". The required temperatures depend on the film material.

**Recommended values:
forming temperature**

Packaging material	Abbreviation	Forming temperature
Polyamide	PA	75 °C (167 °F) to 100 °C (212 °F)
Polyethylene	Easy-open corner	70 °C (158 °F) to 90 °C (194 °F)
Polypropylene	PP	150 °C (302 °F) to 155 °C (311 °F)
Surlyn		60 °C (140 °F) to 80 °C (176 °F)
Polyester, amorphous	A-PET	95 °C (203 °F) to 110 °C (230 °F)
Polycarbonate	PC	140 °C (284 °F) to 170 °C (338 °F)
Polystyrene	PS	105 °C (221 °F) to 135 °C (275 °F)
Polyvinyl chloride	PVC	110 °C (230 °F) to 135 °C (275 °F)

2.13.5 Heating current monitoring, forming

The tab for "Heating current monitoring" contains the calibration data for monitoring the heat output for the heating zones of this unit.

Main menu > Forming > Heating current monitoring



Function	Explanation
<i>Zone</i>	The heating elements of the machine are divided into heating zones. Which zone is assigned to which heating element can be read in the electrical circuit diagram.
<i>Target value</i>	The heat output target value for this heating zone, which was saved during calibration.
<i>Difference</i>	The difference between the value of the current individual output measurement and the calibration data. A <i>Difference</i> is only displayed if the diagnostic message 1038 appears, or if the calibration was discontinued with the <Cancel> button.

Function	Explanation
<i>Voltage</i>	The target value which was determined during calibration for the voltage of this heating zone.
<i>Electrical current ...</i>	The target value which was determined during calibration for the electrical current of this heating zone.

2.13.6 Die lifting, forming station

The "die lifting" tab is used to control the lifting unit for the forming station.

Forming station for lower web

Main menu > Forming > Die lifting



Function	Explanation
<i>Opening width</i>	Required Opening width of the die. This is dependent on the pack height.
<i>Test run</i>	Starting the <i>Test run</i> function is only available with the <i>Service</i> access right.

Process times

Function	Explanation
<i>Open die lifting</i> <i>Close die lifting</i>	These values show the actual measured times for the closing and opening of the die. The process times depend on the following factors: <ul style="list-style-type: none">• Opening width of the die• Air pressure system, e.g. flow through the throttle valves

2.13.7 Monitoring, forming

Main menu > Forming > Monitors



Function	Explanation
<i>Max. cooling down time for the preheating</i>	<p>During the time between heating and forming the film, the die is opened, an advance movement is carried out and the die is closed. If these procedures take too long, the preheated film will cool down too much.</p> <p>The entered value determines, after which time the current cycle is marked as reject by the line-motion control.</p> <p>This parameter only appears at forming systems with preheating.</p>

Heating imprint

Function	Explanation
<i>Number</i>	Desired number of machine cycles for the <i>heating imprint</i> function.

Consecutive errors

Function	Explanation
<i>Consecutive error</i>	The entered values control the corresponding consecutive error function. See Section 2.7.3 "CONSECUTIVE ERRORS" on page 107.

Dwell time monitoring

Dwell time monitoring Dwell time monitoring can be configured online.

<i>Max. film dwell time</i>	<p>The entered value determines how long the film may be under the forming die heating. The time depends on the temperature sensitivity of the film. The maximum dwell time starts at the end of the advance.</p> <p>If the <i>Max. film dwell time</i> is exceeded, affected cycles are discharged by the line-motion control. A diagnostic message appears.</p> <p>If 0 s is entered, the dwell time monitoring is switched off.</p>
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<i>Additional reject rows</i> 	<p>This function determines the reaction of the line-motion control when the <i>Max. dwell time of the film</i> is exceeded. The <i>Additional reject rows</i> function must be activated on the "Extended dwell time monitoring" page.</p> <ul style="list-style-type: none"> • <i>Pack rows in front of the heating</i> The entered value determines how many pack rows located before the heating of the forming die are additionally discharged via the line-motion control. • <i>Pack rows after the heating</i> The entered value determines how many pack rows located after the heating of the forming die are additionally discharged via the line-motion control.
<i><Service:></i>	<p>This button opens the "Extended dwell time monitoring" page.</p>

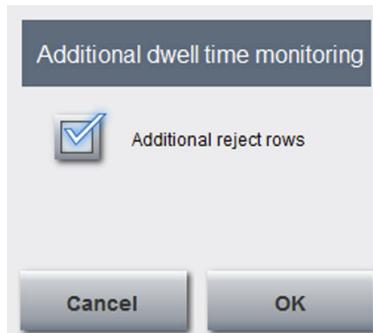


Fig. 205: Extended dwell time monitoring

<i>Additional reject rows</i>	<p>This function determines the reaction of the line-motion control when the <i>Max. dwell time of the film</i> is exceeded. If this function is activated, the associated parameters appear in the "Dwell time monitoring" page area.</p>
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Analog parameters: Depending on the machine equipment, additional devices may be installed for monitoring the forming station.

Function	Explanation
<i>Forming pressure</i>	The entered values control the monitoring of the pressure for forming the film. If, for example, hoses or valves are damaged, the set value will not be achieved. The affected pack cavities can be ejected via the line-motion control. See Section 2.7.4 "PRESSURE MONITORING" on page 108.

<i>Forming vacuum</i>	The entered values control the monitoring of the vacuum for forming the film. If the pack cavity has a larger leak, the set value will not be achieved. The affected pack cavities can be ejected via the line-motion control. See Section 2.7.4 "PRESSURE MONITORING" on page 108.
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2.14 Sealing

2.14.1 Sealing station



Fig. 206: Sealing station icon

Depending on the equipping of the machine, the following pack types can be selected. See Section 2.4.4 "PACK TYPE" on page 99.

- Pack only sealed
Application: producing packs without a special atmosphere
- Vacuum pack
Application: producing evacuated packs
- MAP pack
Application: for producing packs with a modified atmosphere

Main menu > Sealing

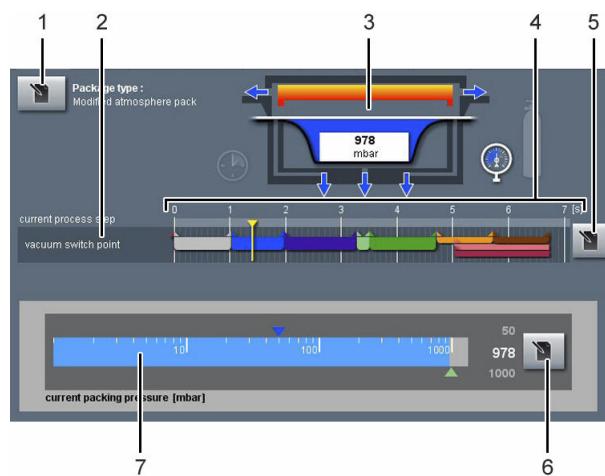


Fig. 207: Sealing station during automatic mode

- 1 <Perform>:Select pack type
- 2 Current process step
- 3 Graphic depiction of the sealing station
- 4 Graphic depiction of the process sequence in the sealing station

- 5 <Perform>: Display parameters
- 6 <Perform>: change switch points
- 7 Graphic depiction of the pack pressure

The depiction is based on the pack type selected.

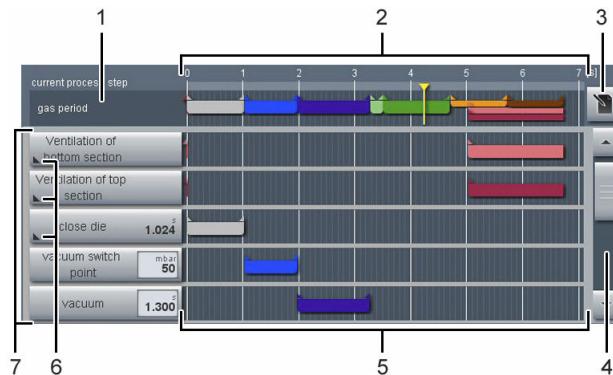


Fig. 208: Target values for sealing

- 1 Current process step
- 2 Graphic depiction of the process sequence in the sealing station
- 3 <Perform>: Display switch points
- 4 Scroll bar: Navigating within the list of parameters
- 5 Graphic depiction of the time sequence during sealing process
- 6 Icon for menu: single values appear when the button is touched
- 7 Buttons for changing the parameters

The values shown and their order are based on the pack type selected.

Pack only sealed

The pack is sealed after a short delay time. The sealing time can be set.

Function	Explanation
<i>Die closing</i>	<p>These values optimise the cycle output of the machine.</p> <ul style="list-style-type: none"> • <i>Early start of die</i>: Die closing starts before the advance is completed. The value entered determines how much earlier the closing of the die starts. This reduces the mechanically unavoidable dead time between <i>Advance completed</i> and <i>Die closed</i>.
<i>Sealing delay time</i>	Sealing begins with a delay after the <i>Die closed</i> signal. This ensures that the die is fully closed during sealing.

Sealing	<ul style="list-style-type: none"> • Sealing [s]: The value that you enter determines the time for sealing the pack. This time depends on the material and film thickness. • Sealing [bar]: The value that you enter determines the pressure that is required to seal the pack. The required sealing pressure depends on the total area of the seal seam and on the film thickness. <ul style="list-style-type: none"> – If a 1-row, 1-track die and a thin film are used, a lower sealing pressure is required. – If a multi-row, multi-track die and a thicker film are used, a higher sealing pressure is required.
Security time	The value that you enter determines the time between <i>End of sealing</i> and <i>Die opening</i> . This ensures that the sealing diaphragms are vented and the die is ventilated before the die is opened.

Vacuum pack

The chamber is evacuated, until the set vacuum is reached and the set time has elapsed. The pack is then sealed.

Function	Explanation
<i>Ventilation delay time</i> <i>Delay time for bottom ventilation</i> <i>Delay time for top ventilation</i>	<p>The values that you enter determine, by how much time later than sealing the ventilation of the die starts.</p> <p>Separate ventilation:</p> <ul style="list-style-type: none"> • If the ventilation delay for the die bottom section is longer than that for the die top section, the upper web is shaped to the product contour. • If the ventilation delay for the die top section is longer than that for the die bottom section, a skin effect is achieved. The heated lower web lies tightly around the product. Here it is necessary to use the appropriate film. <p>Separate ventilation can be configured online.</p>
<i>Die closing</i>	<p>These values optimise the cycle output of the machine.</p> <ul style="list-style-type: none"> • Early start of die: Die closing starts before the advance is completed. The value entered determines how much earlier the closing of the die starts. This reduces the mechanically unavoidable dead time between <i>Advance completed</i> and <i>Die closed</i>.

<i>Delay time for top vacuum</i>	The entered value delays the evacuation of the die top section. This function can be configured online. For <i>Upper web</i> the function <i>Narrow</i> has to be selected in the "Sealing / Other settings tab" display.
<i>Delay time for product vacuum</i>	The evacuation of the pack begins with a delay after evacuation of the die; the delay is determined by the time entered. This function can be configured online. For <i>Upper web</i> the function <i>Wide</i> has to be selected in the "Sealing / Other settings tab" display.
<i>Vacuum switch point</i>	<ul style="list-style-type: none"> <i>Vacuum switch point:</i> The value that you enter determines the desired product vacuum. Unnecessarily small settings reduce the cycle output. The maximum achievable product vacuum depends on the following factors: <ul style="list-style-type: none"> – Suction power of the vacuum pump – Product characteristics – Temperature of the product – Moisture in the product
<i>Vacuum</i>	The value entered determines how long the pack is evacuated. The <i>vacuum</i> time starts as soon as the vacuum switch point has been reached.
<i>Sealing delay time</i>	The entered value delays the sealing of the pack. This reduces creases in the film when packaging with narrow films. This function can be configured online. For <i>Upper web</i> the function <i>Narrow</i> has to be selected in the "Sealing / Other settings tab" display.
<i>Sealing</i>	<ul style="list-style-type: none"> <i>Sealing [s]:</i> The value that you enter determines the time for sealing the pack. This time depends on the material and film thickness. <i>Sealing [bar]:</i> The value that you enter determines the pressure that is required to seal the pack. The required sealing pressure depends on the total area of the seal seam and on the film thickness. <ul style="list-style-type: none"> – If a 1-row, 1-track die and a thin film are used, a lower sealing pressure is required. – If a multi-row, multi-track die and a thicker film are used, a higher sealing pressure is required.

Security time	The value that you enter determines the time between <i>End of sealing</i> and <i>Die opening</i> . This ensures that the sealing diaphragms are vented and the die is ventilated before the die is opened.
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MAP pack

In the case of MAP packs, the ambient air in the pack is replaced with inert gases in order to protect the product.

The chamber is evacuated, until the set vacuum is reached and the set time has elapsed. The chamber, and with it the pack, is then flushed with inert gas. When the set gas pressure has been reached and the set time has elapsed, the pack is sealed.

Function	Explanation
<i>Delay time for ventilation</i> <i>Delay time for bottom ventilation</i> <i>Delay time for top ventilation</i>	The values that you enter determine, by how much time later than sealing the ventilation of the die starts. Separate ventilation: <ul style="list-style-type: none"> • If the ventilation delay for the die bottom section is longer than that for the die top section, the upper web is shaped to the product contour. • If the ventilation delay for the die top section is longer than that for the die bottom section, a skin effect is achieved. The heated lower web lies tightly around the product. Here it is necessary to use the appropriate film. Separate ventilation can be configured online.
<i>Die closing</i>	These values optimise the cycle output of the machine. <ul style="list-style-type: none"> • <i>Early start of die</i>: Die closing starts before the advance is completed. The value entered determines how much earlier the closing of the die starts. This reduces the mechanically unavoidable dead time between <i>Advance completed</i> and <i>Die closed</i>.
<i>Vacuum up delay time</i>	The entered value delays the evacuation of the die top section. This function can be configured online. For <i>Upper web</i> the function <i>Narrow</i> has to be selected in the "Sealing / Other settings tab" display.

<i>Product vacuum delay time</i>	The evacuation of the pack begins with a delay after evacuation of the die; the delay is determined by the time entered. This function can be configured online. For <i>Upper web</i> the function <i>Wide</i> has to be selected in the "Sealing / Other settings tab" display.
<i>Vacuum switch point</i>	<ul style="list-style-type: none"> <i>Vacuum switch point:</i> The value that you enter determines the desired product vacuum. Unnecessarily small settings reduce the cycle output. The maximum achievable product vacuum depends on the following factors: <ul style="list-style-type: none"> – Suction power of the vacuum pump – Product characteristics – Temperature of the product – Moisture in the product
<i>Vacuum</i>	The value entered determines how long the pack is evacuated. The <i>vacuum</i> time starts as soon as the vacuum switch point has been reached.
<i>Gas switch point</i>	The value that you enter determines the required gas pressure in the pack.
<i>Gas flushing time</i>	The value entered determines how long the pack is gas flushed. The <i>Gas period</i> starts as soon as the gas switch point has been reached.
<i>Gas distribution time</i>	The time after gas flushing during which the inert gas can distribute itself within the pack.
<i>Sealing</i>	<ul style="list-style-type: none"> <i>Sealing [s]:</i> The value that you enter determines the time for sealing the pack. This time depends on the material and film thickness. <i>Sealing [bar]:</i> The value that you enter determines the pressure that is required to seal the pack. The required sealing pressure depends on the total area of the seal seam and on the film thickness. <ul style="list-style-type: none"> – If a 1-row, 1-track die and a thin film are used, a lower sealing pressure is required. – If a multi-row, multi-track die and a thicker film are used, a higher sealing pressure is required.

Security time	The value that you enter determines the time between <i>End of sealing</i> and <i>Die opening</i> . This ensures that the sealing diaphragms are vented and the die is ventilated before the die is opened.
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Product options

The desired product options must be selected in the display for "Sealing/Other settings tab".

Cyclical gas purging

Cyclical gas purging controls the number of evacuation cycles and gas flushing cycles prior to sealing. The proportion of residual oxygen in the pack is reduced to a minimum by means of repeated evacuation and gas flushing. A gas flushing cycle takes place at the end of the procedure.

- Evacuation cycle:
The die is evacuated. When the *vacuum switch point* is reached, the evacuation continues for the amount of the *vacuum time*.
- Gas flushing cycle:
The die is gas flushed until the *gas switch point* is reached. Gas flushing then continues for the amount of the *Gas flushing time*. The *gas distribution time* takes place at the end of the last gas flushing cycle.

If the *Cyclical gas purging* product option is selected, several vacuum values are used when producing MAP packs.

Function	Explanation
<i>Delay time for ventilation</i> <i>Delay time for bottom ventilation</i> <i>Delay time for top ventilation</i>	<p>The values that you enter determine, by how much time later than sealing the ventilation of the die starts.</p> <p>Separate ventilation:</p> <ul style="list-style-type: none"> • If the ventilation delay for the die bottom section is longer than that for the die top section, the upper web is shaped to the product contour. • If the ventilation delay for the die top section is longer than that for the die bottom section, a skin effect is achieved. The heated lower web lies tightly around the product. Here it is necessary to use the appropriate film. <p>Separate ventilation can be configured online.</p>

Function	Explanation
<i>Die closing</i>	<p>These values optimise the cycle output of the machine.</p> <ul style="list-style-type: none"> • <i>Early start of die:</i> Die closing starts before the advance is completed. The value entered determines how much earlier the closing of the die starts. This reduces the mechanically unavoidable dead time between <i>Advance completed</i> and <i>Die closed</i>.
<i>Previous vacuum switch point</i>	The value that you enter determines the desired product vacuum for the first evacuation cycles.
<i>Previous vacuum</i>	The value entered determines how long the pack is evacuated during the first evacuation cycles.
<i>Gas switch point</i>	The value that you enter determines the required gas pressure in the pack.
<i>Gas flushing time</i>	The value entered determines how long the pack is gas flushed. The <i>Gas period</i> starts as soon as the gas switch point has been reached.
<i>Last vacuum switch point</i>	<p>The value that you enter determines the desired product vacuum during the last evacuation cycle. Unnecessarily small settings reduce the cycle output. The maximum achievable product vacuum depends on the following factors:</p> <ul style="list-style-type: none"> • Suction power of the vacuum pump • Product characteristics • Temperature of the product • Moisture in the product
<i>Last vacuum</i>	The value entered determines how long the pack is evacuated during the last evacuation cycle. The <i>vacuum</i> time starts as soon as the vacuum switch point has been reached.
<i>Gas distribution time</i>	The time after gas flushing during which the inert gas can distribute itself within the pack.

Sealing	<ul style="list-style-type: none"> • Sealing [s]: The value that you enter determines the time for sealing the pack. This time depends on the material and film thickness. • Sealing [bar]: The value that you enter determines the pressure that is required to seal the pack. The required sealing pressure depends on the total area of the seal seam and on the film thickness. <ul style="list-style-type: none"> – If a 1-row, 1-track die and a thin film are used, a lower sealing pressure is required. – If a multi-row, multi-track die and a thicker film are used, a higher sealing pressure is required.
Security time	The value that you enter determines the time between <i>End of sealing</i> and <i>Die opening</i> . This ensures that the sealing diaphragms are vented and the die is ventilated before the die is opened.

2.14.2 Sealing settings



Info

The "Other settings" tab appears irrespective of the pack type that is selected.

The values displayed are based on the options selected.

Main menu > Sealing > Other settings



Function	Explanation
<i>Early end of bottom vacuum</i>	In the case of <i>Early end of bottom vacuum</i> , evacuation in the die bottom section ends as soon as the vacuum switch point is reached. The die top section continues to be evacuated during the <i>vacuum</i> time. This function can be configured online and is required in order to produce packs with a narrow upper web.
<i>Emptying the gas reservoir</i>	This button activates the emptying or flushing of the gas reservoir. If the switch is activated when the machine is stopped, the gas valve opens once for five seconds.

Options	
Function	Explanation
<i>Bottom vacuum during gas flushing</i>	If this function is activated, bottom evacuation continues during gas flushing.
Service settings	
Function	Explanation
<i>Cycles of evacuation and gas flushing</i>	If this box is activated, the product option for cyclical gas purging is enabled.

Product options

Product options	
<i>Cyclical gas purging</i>	This button activates cyclical gas purging. Cyclical gas purging is suitable for products which are sensitive to vacuum, if a low residual oxygen content is required. The cyclical gas purging function only appears if the Service access right has been enabled.
<i>None</i>	This box activates No special product options.

Cyclical gas purging

Cyclical gas purging controls the number of evacuation cycles and gas flushing cycles prior to sealing.

Examples:

- Number of cycles 1:
 - Evacuation cycle with the standard values
 - Gas flushing cycle and sealing
- Number of cycles 2:
 - Evacuation cycle with the values for *previous vacuum switch points* and *previous vacuums*
 - Gas flushing cycle
 - Evacuation cycle with the values for *last vacuum switch point* and *last vacuum*
 - Gas flushing cycle and sealing

- Number of cycles 3:
 - Evacuation cycle with the values for *previous vacuum switch points* and *previous vacuums*
 - Gas flushing cycle
 - Evacuation cycle with the values for *previous vacuum switch points* and *previous vacuums*
 - Gas flushing cycle
 - Evacuation cycle with the values for *last vacuum switch point* and *last vacuum*
 - Gas flushing cycle and sealing

Function	Explanation
<i>Emptying the gas reservoir</i>	This button activates the emptying or flushing of the gas reservoir. If the switch is activated when the machine is stopped, the gas valve opens once for five seconds.
<i>Evacuation and gas flush. cycles</i>	Number of cycles for cyclical gas purging.

2.14.3 Seal heating

On the "Heating" tab the individual heating zones are activated and deactivated, and their temperatures and the tolerances for the temperature monitoring are set.

Sealing station

Main menu > Sealing > Heating



Depending on the equipping of the machine, individual control zones for temperature monitoring are installed.

Main menu > Sealing > Temperature monitoring



Explanation of the heating zones, see Section 2.7.2 "TEMPERATURE AND TEMPERATURE MONITORING ". The required temperatures depend on the film material.

**Recommended values:
sealing temperature**

Material	Abbrevia-tion	Sealing temperature
Polyethylene	Easy-open corner	130 °C (266 °F) to 145 °C (293 °F)
Polyethylene with metallocene		120 °C (248 °F) to 145 °C (293 °F)
Low pressure PE of high density	High density PE	140 °C (284 °F) to 160 °C (320 °F)
Polypropylene	PP	170 °C (338 °F) to 190 °C (374 °F)
Surlyn		70 °C (158 °F) to 120 °C (248 °F)
Medical paper		110 °C (230 °F) to 160 °C (320 °F)
Hot sealing lacquer		90 °C (194 °F) to 120 °C (248 °F)

2.14.4 Heating current monitoring, sealing

The tab for "Heating current monitoring" contains the calibration data for monitoring the heat output for the heating zones of this unit.

Sealing station

Main menu > Sealing > Heating current monitoring



Function	Explanation
<i>Zone</i>	The heating elements of the machine are divided into heating zones. Which zone is assigned to which heating element can be read in the electrical circuit diagram.
<i>Target value</i>	The heat output target value for this heating zone, which was saved during calibration.
<i>Difference</i>	The difference between the value of the current individual output measurement and the calibration data. A <i>Difference</i> is only displayed if the diagnostic message 1038 appears, or if the calibration was discontinued with the <Cancel> button.
<i>Voltage</i>	The target value which was determined during calibration for the voltage of this heating zone.

Function	Explanation
<i>Electrical current ...</i>	The target value which was determined during calibration for the electrical current of this heating zone.

2.14.5 Sealing die lifting

The "Die lifting" tab is used to control the lifting unit of the sealing station.

Sealing station

Main menu > Sealing > Die lifting



Function	Explanation
<i>Opening width</i>	Required Opening width of the die. This is dependent on the pack height.
<i>Test run</i>	Starting the <i>Test run</i> function is only available with the <i>Service</i> access right.

Process times

Function	Explanation
<i>Close die lifting</i> <i>Open die lifting</i>	<p>These values show the actual measured times for the closing and opening of the die.</p> <p>The process times depend on the following factors:</p> <ul style="list-style-type: none"> • Opening width of the die • Air pressure system, e.g. flow through the throttle valves

2.14.6 Monitoring, sealing

Main menu > Sealing > Monitors



Mark reject packs

Function	Explanation
<i>Change pack type</i>	<p>Mark reject packs by visually changing the pack type.</p> <ul style="list-style-type: none">• In the case of modified atmosphere packs, the reject packs are only evacuated and sealed.• In the case of vacuum packs, the reject packs are only sealed.• In the case of packs which are only sealed, the reject packs are not changed.

Dwell time monitoring

Dwell time monitoring Dwell time monitoring can be configured online.

<i>Max. film dwell time</i>	<p>The entered value determines, how long the film and product may be under the sealing die heating when it is hot. This time depends on the temperature sensitivity of the film and of the product. The maximum dwell time starts at the end of the advance.</p> <p>If the <i>Max. film dwell time</i> is exceeded, affected cycles are discharged by the line-motion control. A diagnostic message appears.</p> <p>If 0 s is entered, the dwell time monitoring is switched off.</p>
<i>Product protection advance (option)</i>	<p>An automatic advance function for product protection can be used if there are sensitive products which should only be under the hot heating of the sealing die for a limited time. The machine stops when the first empty pack cavities are in the sealing die.</p> <ul style="list-style-type: none">• <i>On/Off</i>: Activate and deactivate the product protection advance function.• <i>Start before the maximum dwell time has elapsed</i>: The product protection advance starts by this amount of time before the <i>Max. dwell time of film</i> elapses.

<i>Additional reject rows</i>	<p>This function determines the reaction of the line-motion control when the <i>Max. dwell time of the film</i> is exceeded. The <i>Additional reject rows</i> function must be activated on the "Extended dwell time monitoring" page.</p> <ul style="list-style-type: none"> • <i>Pack rows in front of the heating</i> The entered value determines how many pack rows located before the heating of the sealing die are additionally discharged via the line-motion control. • <i>Pack rows after the heating</i> The entered value determines how many pack rows after the heating of the sealing die are additionally discharged via the line-motion control.
 <i><Service:></i>	<p>This button opens the "Extended dwell time monitoring" page.</p>

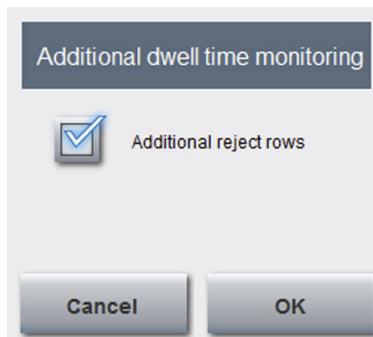


Fig. 209: Extended dwell time monitoring

<i>Additional reject rows</i>	<p>This function determines the reaction of the line-motion control when the <i>Max. dwell time of the film</i> is exceeded. If this function is activated, the associated parameters appear in the "Dwell time monitoring" page area.</p>
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Sealing pressure monitoring

<i>Sealing pressure</i>	<p>The machine control monitors the sealing diaphragm pressure, which is required for sealing the pack. If the sealing pressure does not reach the entered target value, the line-motion control marks a reject cycle at this position. A diagnostic message appears. See Section 2.7.4 "PRESSURE MONITORING" on page 108.</p>
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<p>Sealing pressure in the tolerance range</p>	<p>The machine control monitors, whether the sealing pressure is held long enough within the tolerance range. This function can be configured online.</p> <ul style="list-style-type: none"> • Target: The entered value determines, how long the sealing pressure must be held within the entered tolerance range. • Tolerance: The entered value determines the permitted positive and negative deviation from the target value. • Actual: This value shows the currently measured time for sealing the pack.
	<p><Service:></p> <p>This button opens the page for "Sealing pressure target value". This page is used to select, whether the sealing pressure target value can be set manually, or whether this function is adopted by the proportional valve.</p>

Consecutive errors

Function	Explanation
Consecutive errors	The entered values control the corresponding consecutive error function. See Section 2.7.3 "CONSECUTIVE ERRORS" on page 107.

Process times

Function	Explanation
<i>Evacuation</i>	<p>This value shows the actual time needed for the evacuation.</p> <p>This time depends on the following factors:</p> <ul style="list-style-type: none"> • Vacuum switch point • Time Vacuum • Output of the vacuum pump
<i>Gas flushing</i>	<p>This value shows the actual time needed for gas flushing.</p> <p>This time depends on the following factors:</p> <ul style="list-style-type: none"> • Gas switch point • Gas flushing time • Gas distribution time • The set gas pressure at the gas cylinder

2.15 Cutting unit

The machine is equipped with the following cutting units:

- Longitudinal cutters:

The longitudinal cutters, such as the roller shear cutting unit or squeezing knife, separate the packs from each other in the longitudinal direction and sever the edge trim.

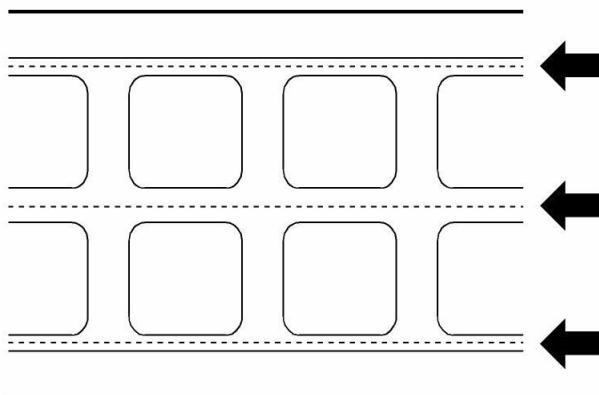


Fig. 210: Cutting line of longitudinal cutter

- Cross cutters:

The cross cutters separate the packs crosswise from one another. These include the film punches and cross cutters with a knife.

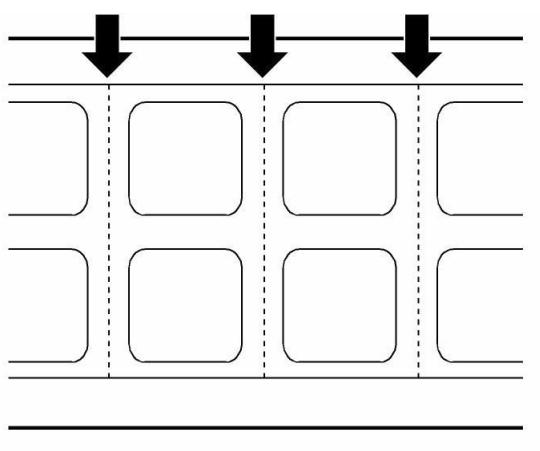


Fig. 211: Cutting line of cross cutter

When the <Cutting unit> button in the main menu is touched the "Cutting unit" menu appears.

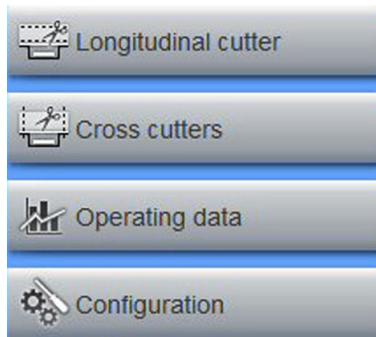


Fig. 212: Example: Cutting unit menu

The "Cutting unit" menu gives access to the displays for the different cutting units on the machine. The <Configuration> button opens the display for configuring the cutting units.

2.15.1 Longitudinal cutter

The squeezing knives are controlled via the "longitudinal cutter" display.

The behaviour of the squeezing knives during machine stop depends on the configuration of the machine.

- *Automatic active*
If the machine stops, the squeezing knives are lowered after the time, which was entered under *Running-on time* parameters.
- *Non-stop mode*
If the machine stops, the squeezing knives remain extended and press against the cutting rings.

Main menu > Longitudinal cutter



Squeezing knife

Function	Explanation
<i>On/Off</i>	Activating and deactivating the squeezing knives
<i>Start-up time</i>	The value entered determines the time for the squeezing knives to move up.
<i>Running-on time</i>	The entered value determines the time, after which the squeezing knives are lowered. This parameter appears, if the squeezing knives are configured for <i>Automatic active</i> operation.

Main menu > Longitudinal cutter > Monitors



Analog parameters

Function	Explanation
<i>Squeezing knife monitoring</i>	The machine control monitors the pressure, with which the squeezing knives press against the cutting rings. See Section 2.7.4 "PRESSURE MONITORING" on page 108.

2.15.2 Cross cutter

The cross cutters are controlled via the "Cross cutter" display.

Main menu > Cutting unit > Cross cutter



Function	Explanation
<i>Minimum cooling time of seal seam (option)</i>	The entered value determines, how long the seal seam must be cooled as a minimum. This time influences the cutting quality.
<i>Delay time</i>	Time required for closing the cutting unit. Recommended value: 0.6 s to 1.0 ss
<i>Cutting</i>	Time required to cut the film. Recommended value: 0.8 s to 1.5 ss
<i>Active during manual advance</i>	<ul style="list-style-type: none"> Box empty: The cutting units only function in automatic mode. Box with check mark: The cutting units function in automatic mode and with manual advance.
<i>Cutting unit</i>	Activating and deactivating the relevant cutting unit
<i>Top lift</i>	Activating and deactivating the top lift
<i>Power lifting unit</i>	Option for punches with power lifting unit. Activate and deactivate the power lifting unit
<i>Start sequence</i>	When a machine is equipped with several cross cutters, grouping and delayed starting prevents the compressed air pressure from dropping. The value entered determines the delay time between starting the individual cutting groups.

<i>Start group</i>	The value that you enter determines the maximum amount of cutting units per start group. <ul style="list-style-type: none"> • Example for input '2': When a machine is equipped with five cross cutters, they are divided up into three groups. <ul style="list-style-type: none"> – Start group 1 consists of cross cutters 4 and 5. – Start group 2 consists of cross cutters 2 and 3. – Start group 3 consists of cross cutter 1.
<i>Security time</i>	Time required for opening the cutting unit. Recommended value: 0.4 s to 1.0 ss
<i>Running-on time, closing</i>	The <i>Running-on time, closing</i> begins after the limit switch is reached. This ensures that the cutting unit is fully closed. Recommended value: 0.04 s
<i>Running-on time, opening</i>	The <i>Running-on time, opening</i> begins after the limit switch is reached. This ensures that the cutting unit is fully opened.

2.15.3 Operating data for cutting unit

The information in the "Production data" display is used to calculate the service life of the cutting units. It displays the cutting cycles performed by each individual cutting unit since the resetting of the display (e.g. after a blade change).

Main menu > Cutting unit > Production data



Info

Resetting the display is only possible with the *Service* access right.

2.15.4 Configuration of the cutting unit



Fig. 213: Configuration icon

The inputs in the "Configuration" display configure the cross cutters. The buttons shown and their order are based on the cutting units selected.

Main menu > Cutting unit > Configuration



Configuration

Function	Explanation
<i>Connected pack rows</i>	The entered value determines, how many pack rows should be connected.
<i>Crosswise perforation</i>	This button activates and deactivates the cross cutter for crosswise perforation. This button is only visible, if <i>Cross perforator</i> is selected as a cutting unit.
<i>Hanger hole</i>	This button activates and deactivates the cross cutter for hanger holes. This button is only visible, if <i>Hanger hole device</i> is selected as a cutting unit.
<Perform> <i>Hanger hole position:</i>	This button calls up the selection of positions for the hanger hole. This button is only visible, if <i>Hanger hole device</i> is selected as a cutting unit.

Mark reject packs

Function	Explanation
<i>Omit transverse cuts</i>	If this function is activated, reject packs are marked by the fact that crosswise cutting is omitted. Omitting crosswise cutting is recommended, if reject packs cannot be marked in any other way.
<Perform> <i>Attach good packs:</i>	This button calls up the display for "Attach good packs".

Cross cutter

Function	Explanation
<Perform> <i>Cutting unit ...</i>	This button calls up the display for configuring the type of cutting unit.

Hanger hole position:



<Perform> <i>Hanger hole position:</i>	This button calls up the display for "Hanger hole position".
---	--

Description

Configuration of the cutting unit



Fig. 214: Hanger hole position

Function	Explanation
All	The hanger hole is punched in each pack.
Infeed side	In the case of connected packs, the hanger hole is punched in the last pack in the machine infeed direction.
Discharge side	In the case of connected packs, the hanger hole is punched in the first pack in the machine outfeed direction.

Attach good packs:

The selection in the display for "Attach good packs" specifies, how the good packs are attached to the reject packs for the function *Omitting crosswise cutting*.



<Perform> Attach good packs:

This button calls up the display for "Attach good packs".



Fig. 215: Attach good packs

Function	Explanation
<i>Infeed side</i>	There is no crosswise cutting before the reject pack. The good packs are attached before the reject pack.
<i>Discharge side</i>	There is no crosswise cutting after the reject pack. The good packs are attached after the reject pack.

Configuration of type of cutting unit:

The machine control requires the information about which type of cutting unit is mounted in which position on the machine.



<Perform> Cut-
ting unit ...:

This button calls up the display for configuring the type of cutting unit.

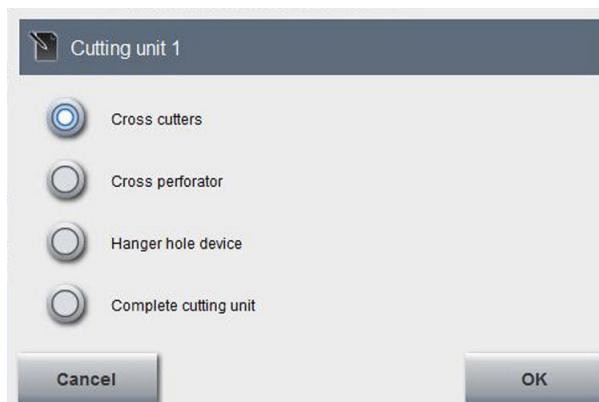


Fig. 216: Select cutting unit

Function	Explanation
<i>Cross cutter</i>	A cutting unit, which severs the film in crosswise direction, is mounted at the relevant position.
<i>Cross perforator</i>	A perforating unit, which perforates the film in crosswise direction, is mounted at the relevant position.
<i>Hanger hole device</i>	A punch unit, which punches hanger holes in the film, is mounted at the relevant position.
<i>Complete cutting unit</i>	A complete cutting unit, which cuts out the packs completely in one machine cycle, is mounted at the relevant position.

2.16 Maintenance menu



Fig. 217: Maintenance menu button

The "Maintenance menu" provides access to functions for machine maintenance and to displays for precise identification of the machine.



Fig. 218: Maintenance menu icon with warning

If a machine parameter, which is a constituent part of the loaded basic setting, has been changed, the warning icon appears on the <Maintenance menu> button. See Section 2.18.6 "BASIC SETTING" on page 243.

	<p><Machine info></p> <ul style="list-style-type: none">• Machine identification.• View cycle times.
	<p><Data backup></p> <p>Saving and loading recipes and machine data.</p>
	<p><Heat output></p> <ul style="list-style-type: none">• Monitor the measurement of the heat output.• Calibrate the monitoring of the heat output.
	<p><Diagnosis></p> <p>The "Diagnosis" menu contains functions and information for fault analysis. See Section 2.17 "DIAGNOSIS" on page 221.</p>
	<p><Service menu></p> <p>The "Service menu" contains functions for Customer service. See Section 2.18 "SERVICE MENU" on page 231. The <Service menu> button is only visible, if the Service access right was selected.</p>

2.16.1 Machine info



Fig. 219: Icon for machine info

The "Machine info" contains all the important technical information on the machine control.

Machine info

The "Machine info" tab shows information for precisely identifying the machine.

Maintenance menu > Machine info



When enquiring in regard to the machine control unit, please provide the service department with all information from this screen.

History

The "History" tab shows the changes made to the software of the machine control.

Maintenance menu > Machine info > History



Table	Explanation
<i>Version</i>	Software version of machine control.
<i>Date</i>	The date the software of the machine control was installed.
<i>Programmer</i>	The person who modified the software.

Cycle times

The cycle times of the stations which limit output are calculated automatically. During operation the *Cycle time* and the *Cycle completion time* for each individual station can be viewed on the "Cycle times" tab. The sum of these gives the total cycle time.

Maintenance menu > Machine info > Cycle times



Table	Explanation
<i>Station</i>	Station on the machine.
<i>Cycle time (s)</i>	The time the station requires for the internal process.
<i>Cycle completion time (s)</i>	Time after finishing the internal process until the 'finished' signal to the machine control. (<i>Cycle completion time</i> = <i>Security time</i> + <i>Die opening</i> .)

2.16.2 Data backup



Fig. 220: Data backup icon

The "Data backup" display is used for the data exchange between the machine control and a USB stick. See Section 1.8.3 "TAKING PRECAUTIONARY MEASURES FOR DATA PROTECTION" on page 26.

Data saving

All the machine-related data for the machine control can be saved on an external USB stick via the "Create data backup" tab.

Maintenance menu > Data backup > Create data backup



Function	Explanation
<Create data backup>	<p>Save the following data to the USB stick:</p> <ul style="list-style-type: none">• Recipes• Message list• User data• Cause and solution for troubleshooting• Data of the audit trail• Diagnostic data• Control program of the machine <p>The data is saved as a zip archive on the USB stick. If a USB stick is not used, the zip archive is saved on the F: drive of the machine control. Access to this data can be gained via FTP.</p>
<Save images>	Back up all the display images, including all tabs, to a USB stick. The images are stored in the selected language.
<Create PDA database backup>	Back up the production data acquisition database on the USB stick.
<Safely remove USB stick>	Log off the USB stick before disconnecting it from the machine control.

Loading data

Data can be loaded from an external USB stick to the machine control via the "Load data backup" tab.

Maintenance menu > Data backup > Load data backup



Function	Explanation
<Loading recipes>	Loading recipes from the USB stick into the recipe memory of the machine.
<Load PDA database backup>	Load the production data acquisition database from the USB stick to the machine control.
<Safely remove USB stick>	Log off the USB stick before disconnecting it from the machine control.

2.16.3 Heat output measurement



Fig. 221: Heat output measurement icon

The heat output measurement measures the current electrical output of all active heating zones and compares the results with the calibrated values. The measurement of the output is obtained by means of an EL3403 3-phase output terminal.

Cumulative output measurement

Measuring process sequence:

- During automatic mode the total output of all the heaters switched on at the time of measuring are measured by a cumulative output measurement. During each measurement voltage and frequency are measured and display.
- Next, the measured value of the total (*actual*) output is compared with the value of the nominal (*target*) output. The value of the target output is reached by the addition of all the fixedly stored individual target values of those heaters active during the measuring time.
Actual value and target value are normalized to one adjustable norm voltage and are therefore not falsified by different customer mains supplies or by deviations in line voltage.
- If during the comparison of target value and actual value a deviation is found the value of which is greater than the permitted *maximum deviation* then the machine stops. A diagnostic message appears.

- Finally the defective heating zone is determined by means of an individual output measurement of all heaters and then displayed.

Maintenance menu > Heat output measurement > Main control cabinet > Heating current monitoring



Electrical output of active heating zones

Function	Explanation
Target	This value indicates the total target value of all activated heating zones at the time of measurement.
Act	This value indicates the total current measured value of all heating zones active at the time of measurement.

Output difference

Function	Explanation
Act	This value indicates the difference between the target value and the actual value.
Min	This value indicates the smallest difference determined since last switching on the machine or since resetting the value to zero.
Max	This value indicates the largest difference determined since last switching on the machine or since resetting the value to zero.

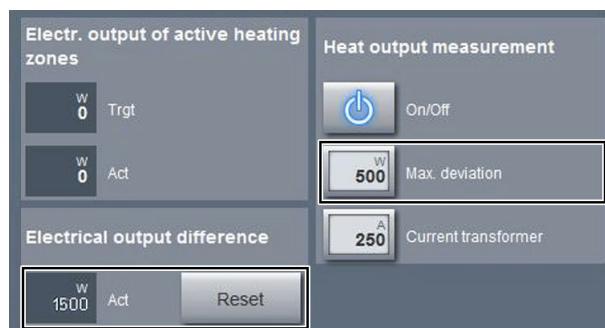


Fig. 222: Comparison: current value and target value

If the *output difference* is greater than the set *maximum deviation*, the machine stops. The diagnostic message 1038 appears.

<Reset>	Reset values.
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Heat output measurement

Function	Explanation
<i>On/Off</i>	This button activates and deactivates the heat output measurement.
<i>Max. deviation</i>	The entered value determines the maximum permissible deviation of the measured value from the target value.
<i>Current transformer</i>	The entered value determines the primary current at the current transformer.
Function	Explanation
<Calibration>	Individual output measurement of each heating zone with subsequent adoption as the target value.

Calibration data

After all activated heating zones have heated up, the calibration process of each heating zone is displayed on the "Heating current monitor 2" tab. This enables tracking of the output measurement of the individual heating zones.

In addition, the individual heating zones are displayed on the "Heating current monitoring" tabs of all devices equipped with a heater, such as forming and sealing.



Info

By pressing the <Calibration> button, the values are saved as target values.

Maintenance menu > Heat output measurement > Main control cabinet > Heating current monitoring



Function	Explanation
<i>Zone</i>	The heating elements of the machine are divided into heating zones. Which zone is assigned to which heating element can be read in the electrical circuit diagram.
<i>Target value</i>	The heat output target value for this heating zone, which was saved during calibration. If the heater is heating, the status display is green.
<i>Difference</i>	The difference between the value of the current individual output measurement and the calibration value. A <i>Difference</i> is only displayed if the diagnostic message 1038 appears, or if the calibration was discontinued with the <Cancel> button.

Function	Explanation
<i>Voltage</i>	The target value which was determined during calibration for the voltage of this heating zone.
<i>Electrical current ...</i>	The target value which was determined during calibration for the electrical current of this heating zone.
Function	Explanation
<Calibration>	Individual output measurement of each heating zone with subsequent adoption as the target value.

Measured values of output terminal

The current measured values are displayed on the "Calibration" tab.

Maintenance menu > Heat output measurement > Main control cabinet > Calibration



Function	Explanation
<i>Actual values of electrical output</i>	This value indicates the current measured values of the electrical output.
<i>Frequency</i>	This value indicates the frequency of the nominal voltage.
<i>Actual values of electrical voltage</i>	This value indicates the current measured value of the voltage.
<i>Actual values, electrical current</i>	This value indicates the current measured value of the current.
Function	Explanation
<Calibration>	Individual output measurement of each heating zone with subsequent adoption as the target value.

2.16.4 Diagnostics



Fig. 223: Diagnostics icon

Functions and information for fault analysis, see Section 2.17 "DIAGNOSIS".

2.16.5 Service menu



Fig. 224: Service menu symbol

Functions for customer service, see Section 2.18 "SERVICE MENU".



Info

The <Service menu> button is only visible if the *Service* access right was selected.

2.17 Diagnosis



Fig. 225: Diagnosis icon

The "Diagnosis" menu is used to access functions and information for fault analysis.

<Machine control>	View the fault analysis information.
<Audit trail>	View the log of all inputs and changes in the displays.
<Message list>	View information on the last message in the display.
<TwinSAFE>	View the TwinSAFE diagnosis.
<EtherCAT>	View the information on the status of the EtherCAT bus system.
<Remote Assistance>	Control the remote servicing of the packaging machine through the manufacturer's service network.
<Fault notification>	Send by e-mail diagnostic messages which arise.

2.17.1 Machine control

Diagnosis > Machine control > Process times



The "Process times" tab shows the longest achieved cycle time in automatic mode. The *current cycle time* and the loading of the machine

control are also displayed. Have this information ready for the service personnel when making enquiries about fault analysis.

Function	Explanation
<i>Maximum cycle time</i>	This value shows the longest achieved cycle time in automatic mode.
<i>Current cycle time</i>	Display of the current cycle time.
<i>Mean value for real-time load</i>	This value shows the average CPU load. If a data backup is created, the average load and the peak load of the CPU is written to the file "machineinfo.txt".
<Reboot>	Reboot of the control program

Diagnosis > Machine control > UPS

The tab for Uninterruptible Power Supply "UPS" displays the charge status and holding time of the Uninterruptible Power Supply (UPS). If the holding time is shorter than 200 s, the rechargeable battery must be replaced by a qualified electrician authorised by the operating company.

Diagnosis > Machine control > Station blocking flags

The different variables that control the process of the machine are displayed on the "Station blocking flags" tab. Keep this information ready for the service personnel when making enquiries in respect of the fault analysis.

2.17.2 Audit trail

The audit trail function tracks all inputs and changes made on the display.

- All data sets are provided weekly as a PDF file in the machine control.
- The data can be issued via the Data backup function.
- It is also possible to access the data via File Transfer Protocol (FTP). See Section 5.21 "FTP ACCESS" on page 431.
- The audit trail reports for the last 90 days remain saved.

Audit trail logbook

All the inputs and switching functions, which have been activated during the last 90 days, are logged on the "Logbook" tab.

Diagnosis > Audit trail > Logbook



<Date>	This table column shows the date stamp and time stamp for the action.
--------	---

<Username>	This table column shows the user, who has performed the action.
<Action>	This table column shows the change, which was performed at the display.
<Item ID>	This table column shows the <i>Item ID</i> for clear identification of the changed variables.

2.17.3 Message list

The "Message list" display lists the last displayed notes, warnings and machine faults. In the event of a fault, have this information readily available for the service department.

Diagnosis > Message list



Table	Explanation
<i>Date</i>	This column shows, at which time point the message arose.
<i>Status</i>	The colour of the icon shows the status of the message: <ul style="list-style-type: none"> • Red/white: Fault • Black/yellow: Warning • White: Note
<i>Explanation</i>	This column shows an explanation of the message. This explanation contains information on where the message has occurred and what has happened.
<i>Error code</i>	This column shows the diagnostic number of the message.
<Troubleshooting>	This button calls up troubleshooting for the selected list entry. The associated causes and solutions appear.

2.17.4 EtherCAT diagnosis

NOTICE

Material damage!

If EtherCAT diagnosis is deactivated, the machine runs in a non-defined status.

The machine can be damaged, or reject packs can be produced.

- Only deactivate EtherCAT diagnosis in exceptional cases.

EtherCAT Master

The "Master" tab provides information on the status of the EtherCAT bus system, see Section 1.8.3 "TAKING PRECAUTIONARY MEASURES FOR DATA PROTECTION".

Diagnosis > EtherCAT > Master



Status

Function	Explanation
On/Off	This button activates and deactivates <i>EtherCAT diagnosis</i> . EtherCAT Master is automatically activated, when the machine is switched on.
Status display	If the EtherCAT bus is functioning faultlessly, the status display lights up blue.
Status message	Status of the connection: <ul style="list-style-type: none"><i>Operation</i>: the bus system is ready.<i>Initialize</i>: the bus system is being initialized.<i>Pre-operation</i>: Fault in the bus system (Master)<i>Safe operation</i>: Fault in the bus system (Master)<i>Undefined</i>: Fault in EtherCAT diagnosis

Topology

Function	Explanation
Configured number of subscribers	This value shows the expected number of bus subscribers (slaves), e.g. bus terminals, which are specified by the software (target value).
Found number of subscribers	This value shows the number of bus subscribers, which are logged on at the Master (actual value). The value can be larger or smaller than the value for <i>Configured number of subscribers</i> .

Statistics

Function	Explanation
<i>Data packets per second</i>	This value shows the data packets, which are sent per second by the EtherCAT Master.
<i>Lost data packets</i>	This value shows the data packets, which have not reached the EtherCAT Master again, i.e. which have gone missing during data transfer with the bus subscribers.
<i>Delete statistics</i>	This wizard resets the displays for <i>Data packets per second</i> and <i>Lost data packets</i> .

Tolerance

Function	Explanation
<i>Lost data packets</i>	The entered value determines the permitted proportion of lost data packets in relation to the data packets currently sent. If this proportion is exceeded, a diagnostic message appears.
<i>Checksum</i>	The entered value determines the permitted proportion of adulterated data packets in relation to the data packets currently sent. If this proportion is exceeded, a diagnostic message appears.

Function

Function	Explanation
<i>Reset communication</i>	This wizard restarts the EtherCAT Master. The EtherCAT Master can only be restarted, if the machine is stopped.
<i>Load data</i>	This wizard updates the diagnostic data manually.



Info

The fault-free status is displayed as follows:

- The status display lights up blue.
- *Status: Operation*
- *Configured number of subscribers* corresponds to the *Found number of subscribers*
- *EtherCAT diagnosis: Activated*

EtherCAT Topology

All the EtherCAT terminals with their full reference designator are listed on the "Topology" tab.

Diagnosis > EtherCAT > Topology



If a fault occurs, the affected bus subscriber is highlighted in red in the tree structure. The diagnostic messages are defined on the basis of "Type of fault" to "Interface". Up to four faults can be displayed.



Info

In the event of a fault, the "Topology" tab assists Service personnel in finding the cause of a fault more easily. With the aid of the topology display, the Service personnel can be directed straight to the EtherCAT terminal, which has caused the diagnostic message.

EtherCAT Slave

The "Slave" tab contains detailed information about all the connected and configured EtherCAT terminals.

Diagnosis > EtherCAT > Slave



All the EtherCAT terminals connected in the machine (*Scanned* column) are compared to the EtherCAT terminals programmed in the system manager (*Configured* column).

Depiction of the scanned type designation:

- The type designation is not highlighted in colour:
The scanned and configured type designations are identical.
- The type designation is highlighted in yellow:
There is a warning present. The scanned type designation is not the same as the configured one. The EtherCAT bus subscriber is however classified as compatible.
- The type designation is highlighted in red:
There is a fault present. The scanned type designation is smaller than the configured one, and there is no compatibility. The EtherCAT bus subscriber can not be operated. Depending on the type of EtherCAT terminal, a diagnostic message is also issued.

Overview (table)

Function	Explanation
<i>Address</i>	This column shows the addresses of all EtherCAT terminals in the EtherCAT bus system.
<i>Name</i>	This column shows the reference designator for the EtherCAT terminals.
<i>Configured</i>	This column shows the EtherCAT terminals programmed in the system manager.
<i>Scanned</i>	This column shows all the EtherCAT terminals connected in the machine.

Function	Explanation
<i>Checksum</i>	This column shows the checksum warnings of the four possible communication interfaces for the EtherCAT bus subscribers. Warnings are depicted as yellow. All the checksum warnings are shown since the machine was last restarted or since the <Delete statistics> button was last used for manual resetting.
Function	Explanation
<i>Output</i>	This button saves the comparison overview in a csv file on the inserted USB stick.
<i>Additional information</i>	This button opens the "Additional information" page. This page is used to contrast the configured and scanned information of the relevant bus subscribers. This button is active, if a bus subscriber is selected in the table.
<i>Remove USB stick safely</i>	This button logs off the USB stick from the machine control, so that the USB stick can be unplugged.

EtherCAT connection configuration

Depiction of the connection configuration:

- The name is not highlighted in colour:
The connection configuration is OK.
- The name is highlighted in red:
 - The module is configured as required, but not however connected to the bus system.
 - The module is not configured as required, but is however connected to the bus system.

Connection configuration 1

The "Connection configuration 1" tab gives an overview of the connection configuration and the connection status of the option modules.

Diagnosis > EtherCAT > Connection configuration



Option modules

Function	Explanation
<Load data>	This wizard updates the diagnostic data manually.

Function	Explanation
<i>Device ID</i>	This column shows the device IDs of the optional modules. The device ID is visible in the electrical circuit diagram.
<i>Target</i>	<p>This status display shows the target connection status of the option module set via the HMI.</p> <ul style="list-style-type: none"> • The status display is blue: The option module should be operated in the bus system and is expected by the EtherCAT bus. • The status display is grey: The option module should not be operated in the bus system. The option module must not be connected.
<i>Act</i>	<p>This status display shows the connection status of the option module.</p> <ul style="list-style-type: none"> • The status display is blue: The option module is connected to the EtherCAT bus system and has been successfully identified. • The status display is grey: The option module is not connected to the EtherCAT bus system.
<i>Name</i>	This column shows the names of the option modules, which are entered in the system configuration.

Connection configuration 2

The "Connection configuration 2" tab gives an overview of the connection configuration and the connection status of the configurable modules.

Diagnosis > EtherCAT > Connection configuration



Configurable modules

Function	Explanation
<Load data>	This wizard updates the diagnostic data manually.

Function	Explanation
<i>Target</i>	<p>This status display shows the target activation status of the configurable module, which was set at the HMI and which should be established after the machine control is next restarted.</p> <ul style="list-style-type: none"> • The status display is blue: The configurable module should be operated in the EtherCAT bus system. • The status display is grey: The configurable module should not be operated in the EtherCAT bus system.
<i>Act</i>	<p>This status display shows the activation status of the configurable module.</p> <ul style="list-style-type: none"> • The status display is blue: The configurable module is activated in the EtherCAT bus system and is expected by the EtherCAT bus. • The status display is grey: The configurable module should not be operated in the EtherCAT bus system. The configurable module must not be connected.
<i>Name</i>	<p>This column shows the names of the configurable modules, which are entered in the system configuration.</p>

2.17.5 Remote Assistance

The "Remote Assistance" display is used to control the remote maintenance of the packaging machine via the service network of the manufacturer.

Remote Assistance

Diagnosis > Remote Assistance



Machine control

<Connect>

The machine control of the packaging machine is connected with the manufacturer's service network.

Properties of an existing connection:

- The info line is coloured blue.
- The access indicator on the navigation bar displays the symbol *Remote Assistance*.



Fig. 226: Remote Assistance active

- “Connection active” appears in *Status*.

<Disconnect>

The machine control of the packaging machine is disconnected from the MULTIVAC network.

Status

Status

Status of the connection:

- Fault.
- Connection severed.
- Establish connection.
- Connection active.
- Sever connection
- Username or password incorrect
- Device not connected
- No connection to MULTIVAC possible
- Unknown connection

Logbook

Logbook

Log of the statuses recorded so far.
Date, time and status are logged.

Other settings

The "Other settings" tab contains the basic settings for the network connection.

Diagnosis > Remote Assistance > Other settings



Connection data



<Effect Gate-way>	IP address of the Remote Assistance hardware.
<i>Connection</i>	The name of the connection that is to be activated.
<i>User</i>	Username for logging onto the Remote Assistance hardware.
<i>Password</i>	Password for logging onto the Remote Assistance hardware.

2.17.6 Fault notification

Diagnostic messages which arise are sent to a receiver address by e-mail via the "Fault notification" display. To use this function, all the information must be entered. The fault notification is restricted to certain error codes by means of the *Filter*.

Diagnosis > Fault notification



Box	Explanation
<i>SMTP mail host</i>	The name of the outgoing mail server (e.g. smtp.googlemail.com).
<i>Receiver</i>	The email address of the receiver who is to receive the email (e.g. Thomas.Mustermann@multivac.de).
<i>Sender</i>	The email address of the sender (factory setting: machine designation, e.g. R535_123456@multivac.de).
<i>Filters</i>	The error code (4 digits) that is displayed in the status line is entered here. Several codes are separated by commas (1012, 1021, 1500) or semicolons (1012; 1021; 1500). In addition, error code ranges can be provided (1200 - 1500).

2.18 Service menu



Fig. 227: Service menu symbol

The customer service functions can be accessed from the "Service menu".



Info

The "Service menu" is only visible if the *Service access* right was selected.

<Machine configuration>	Enable and disable the pre-configured software components via online configuration.
<Remote terminal>	This button leads to the connection with the remote terminal.
<Identification of variables>	Allocate the variables to the operating components.
<Temperature validation>	Temperature validation provides an overview of the control behaviour of the heating circuits.
<Analog parameters>	The "Analog parameters" page is used to adjust the analog sensors.
<Basic setting>	The machine control values, which are specific to the machine, are saved or loaded as basic settings in the "Basic setting" page.

2.18.1 Machine configuration

Various software components of the machine can be enabled online in the machine control in the "Machine configuration" display.

It depends on the equipment of the machine which access rights are necessary to enable single functions.

	Enabled function	This function is enabled and can only be disabled with the <i>Service access</i> right.
	Enabled function	This function is enabled and can only be disabled by MULTIVAC Service.
	Available function	This function is available and can be enabled with the <i>Service access</i> right.
	Available function	This function is available and can be enabled by MULTIVAC Service.
	Fee-based function	This function is available for a fee and can be enabled by MULTIVAC Service with a password.

Cutting unit

<i>Squeezing knives</i>	This software component controls the longitudinal cutter equipped with squeezing knives.
<i>Cutting unit 1 to Cutting unit x</i>	Available software components for planned cross cutters can be enabled or hidden.

Synchronisation

<i>Synchronisation</i>	Available synchronisation channels can be enabled or hidden. Depending on the equipment of the machine, the synchronisation channels are already assigned to specific auxiliary units, e.g. Filler, printer or discharge unit.
------------------------	--

Discharge unit

<i>Row separation</i>	The <i>Row separation</i> function controls, when the packs are transported onto a downstream unit, e.g. a transversal conveyor.
-----------------------	--

Film trim removal

<i>Suction unit</i>	This software component controls the suction unit.
<i>Film trim winder</i>	This software component controls the film trim winder.

Register mark control

<i>Upper web</i>	The register mark control governs the positioning of a printed upper web.
Breaking and tensioning	<ul style="list-style-type: none"> • <i>Upper web</i> This operating mode is used, if the film has only one register mark per format and the upper web brake is to be run in partial advances.

Cleaning

<i>Cleaning position</i>	The cleaning position protects the moisture-sensitive dies during the cleaning procedure.
--------------------------	---

Lubrication

<i>Chain lubrication</i>	The chain lubrication function controls the relubrication of the transport chains, especially after wet cleaning of the machine.
--------------------------	--

Flow rate monitoring

<i>Cooling water 2 to Cooling water x</i>	The flow rate monitoring for cooling water circuits 2 to x can be deactivated.
---	--

Film end monitor

<i>Lower web</i>	This function stops the machine when the end of the lower web has been reached.
<i>Upper web</i>	This function stops the machine when the end of the upper web has been reached.

Stand-by mode

<i>Stand-by mode</i>	This software component controls the saving of energy during pauses in production.
----------------------	--

Option modules

<i>Transport conveyor system</i>	This software component controls the transport conveyor system with its individual transport conveyors.
----------------------------------	---

Forming

<i>Dwell time monitoring</i>	This function monitors how long the film of one cycle remains under the hot heating plate in the forming die.
<i>Release film</i>	This function releases the formed pack cavity from the forming die by means of an air blast.
<i>Explosive forming</i>	With explosive forming, the pack cavity is pre-formed with high pressure.

Preheating

<i>Heating vacuum early start</i>	When this function is activated, the vacuum for heating the film starts 0.2 s before the die is closed, and this functions from the second machine cycle. This reduces the formation of creases in the film.
-----------------------------------	--

Production data acquisition

<i>OEE</i>	This function collects the operating data of the machine, which can be evaluated by means of individual settings. The collected data can be stored for a seamless documentation of the overall equipment effectiveness.
------------	---

Sealing

<i>Dwell time monitoring</i>	This function monitors how long the film of one cycle remains under the hot heating plate in the sealing die.
<i>Product protection advance</i>	For sensitive products that should only be in the hot sealing die for a limited time, the automatic advance function can be used.
<i>Separate ventilation top/bottom</i>	With this function the ventilation of the die after the sealing process can be controlled separately for the die top section and the die bottom section.
<i>Product vacuum delay time</i>	With this function, the evacuation of the pack starts with a delay after the evacuation of the die. This function is necessary for some pack types.
<i>Sealing delay time</i>	With this function, the sealing starts with a delay after the die was closed. This reduces creases in the film when packaging with narrow films.
<i>Early end of bottom vacuum</i>	This function is required when packing with a narrow upper web.
<i>Filter change</i>	This function disconnects the machine from the central vacuum, e.g. to replace the vacuum filter.

Protective interruption

<i>Complete process</i>	If a protective interruption occurs, this function finishes the started process in the sealing die if the sealing die was already closed completely. Subsequently, the machine stops. The lifting units remain closed. A protective interruption occurs if a safety guard was lifted or if a side cladding that is subject to a query is opened.
-------------------------	---

2.18.2 Machine configuration

Various software components of the machine can be enabled online in the machine control in the "Machine configuration" display. It depends on the equipment of the machine which access rights are necessary to enable single functions.

	Enabled function	This function is enabled and can only be disabled with the <i>Service</i> access right.
	Enabled function	This function is enabled and can only be disabled by MULTIVAC Service.

	Available function	This function is available and can be enabled with the <i>Service</i> access right.
	Available function	This function is available and can be enabled by MULTIVAC Service.
	Fee-based function	This function is available for a fee and can be enabled by MULTIVAC Service with a password.
Cutting unit		
<i>Squeezing knives</i>		This software component controls the longitudinal cutter equipped with squeezing knives.
<i>Cutting unit 1 to Cutting unit x</i>		Available software components for planned cross cutters can be enabled or hidden.
Synchronisation		
<i>Synchronisation</i>		Available synchronisation channels can be enabled or hidden. Depending on the equipment on the machine, the synchronisation channels are already assigned to specific auxiliary units, e.g. filler, printer or discharge unit.
Discharge unit		
<i>Row separation</i>		The <i>Row separation</i> function controls, when the packs are transported onto a downstream unit, e.g. a transversal conveyor.
Film trim removal		
<i>Suction unit</i>		This software component controls the suction unit.
<i>Film trim winder</i>		This software component controls the film trim winder.
Register mark control		
<i>Upper web</i>		The register mark control governs the positioning of a printed upper web.
Breaking and tensioning		<ul style="list-style-type: none"> • <i>Upper web</i> This operating mode is used, if the film has only one register mark per format and the upper web brake is to be run in partial advances.

Cleaning

<i>Cleaning position</i>	The cleaning position protects the moisture-sensitive dies during the cleaning procedure.
--------------------------	---

Lubrication

<i>Chain lubrication</i>	The chain lubrication function controls the relubrication of the transport chains, especially after wet cleaning of the machine.
--------------------------	--

Flow rate monitoring

<i>Cooling water 2 to Cooling water x</i>	The flow rate monitoring for cooling water circuits 2 to x can be deactivated.
---	--

Film end monitor

<i>Lower web</i>	This function stops the machine when the end of the lower web has been reached.
------------------	---

Stand-by mode

<i>Stand-by mode</i>	This software component controls the saving of energy during pauses in production.
----------------------	--

Option modules

<i>Transport conveyor system</i>	This software component controls the transport conveyor system with its individual transport conveyors.
----------------------------------	---

Forming

<i>Dwell time monitoring</i>	This function monitors how long the film of one cycle remains under the hot heating plate in the forming die.
<i>Release film</i>	This function releases the formed pack cavity from the forming die by means of an air blast.

Preheating

<i>Heating vacuum early start</i>	When this function is activated, the vacuum for heating the film starts 0.2 s before the die is closed, and this function starts from the second machine cycle. This reduces the formation of creases in the film.
-----------------------------------	--

Production data acquisition

OEE	This function collects the operating data of the machine, which can be evaluated by means of individual settings. The collected data can be stored for a seamless documentation of the overall equipment effectiveness.
------------	---

Sealing

<i>Dwell time monitoring</i>	This function monitors how long the film of one cycle remains under the hot heating plate in the sealing die.
<i>Product protection advance</i>	For sensitive products that should only be in the hot sealing die for a limited time, the automatic advance function can be used.
<i>Sealing pressure monitoring over a time period</i>	This function monitors, whether the sealing pressure is held long enough within the tolerance range.
<i>Separate ventilation top/bottom</i>	With this function the ventilation of the die after the sealing process can be controlled separately for the die top section and the die bottom section.
<i>Product vacuum delay time</i>	With this function, the evacuation of the pack starts with a delay after the evacuation of the die. This function is necessary for some pack types.
<i>Sealing delay time</i>	With this function, the sealing starts with a delay after the die was closed. This reduces creases in the film when packaging with narrow films.
<i>Early end of bottom vacuum</i>	This function is required when packing with a narrow upper web.
<i>Filter change</i>	This function disconnects the machine from the central vacuum, e.g. to replace the vacuum filter.

Protective interruption

<i>Complete process</i>	If a protective interruption occurs, this function finishes the started process in the sealing die if the sealing die was already closed completely. Subsequently, the machine stops. The lifting units remain closed. A protective interruption occurs if a safety guard was lifted or if a side cladding that is subject to a query is opened.
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2.18.3 Identification of variables

The values in the machine control can be assigned to the operating components based on the information in the display for "Identification of variables". See Section 1.8.3 "TAKING PRECAUTIONARY MEASURES FOR DATA PROTECTION" on page 26.

Service menu Identification of variables



Table	Explanation
<i>Variable ID</i>	Identification number of the variable
<i>Value</i>	Current value of the variable with the associated unit.
<i>Item ID</i>	The <i>Item ID</i> gives the unique name of a variable in association with the <i>Group</i> .
<i>Group</i>	The <i>Group</i> gives the unique name of a variable in connection with the <i>Item ID</i> . The <i>Group</i> describes the associated station to the machine control.

Service menu Identification of variables Other settings



Activating

Function	Explanation
<i>ID mode</i>	If this function is activated, the associated Variable ID is shown in all displays for each switch and for each parameter.
<i>Differentiating access rights</i>	If this function and the <i>ID mode</i> function are activated, the displayed Variable IDs are differentiated by colours according to the access authorisation. It can be seen in the "Access/User menu tab", which colour is allocated to the individual access authorisation.

Filters

Function	Explanation
<i>Filter</i>	Full text filter over the columns for <i>Variable ID</i> , <i>Item ID</i> and <i>Group</i> in the "variables identification" display. All filters are simultaneously active. In this way the content of the table can be localized precisely. If the input box is empty, the associated column is not filtered.

Output	
Function	Explanation
<i>Output</i>	<ul style="list-style-type: none"> <i>All</i>: all variables are saved on the USB stick when issued. <i>Only recipe values</i>: only the variables, which are saved in the recipes, are saved on the USB stick when issued. <i>Filtered</i>: if the filters are set, only the variables, which appear in the table, are saved on the USB stick when issued.
<i>Loaded recipe</i>	Recipe name of the recipe currently loaded.
<i><Data saving></i>	Saving variables on the USB stick.
<i><Safely remove USB stick></i>	Log off the USB stick before disconnecting it from the machine control.

Column width	
Function	Explanation
<i>Value</i>	Adapt the <i>column width</i> to the <i>Value</i> column in the "variables identification" display.
Function	Explanation
<i>Table can be edited</i>	<ul style="list-style-type: none"> Box empty: the values of the variables can not be changed in the table in the "identification of variables" display. More lines are displayed. Box with check mark: the values of the variables can be changed directly in the table in the "identification of variables" display.

2.18.4 Temperature validation

The pages give an overview of the control behaviour of the heating circuits.

The page content depends on the equipment on the machine.

Service menu > Temperature validation



Reset This button resets the values under *Min.* and *Max.* to 0.

Table	Explanation
<i>Zone</i>	The heating and control elements of the machine are divided into zones. Which zone is assigned to which heating element or control element can be read in the electrical circuit diagram.
<i>Target</i>	The value that you enter determines the desired temperature.
<i>Actual</i>	The value shows the currently measured temperature.
<i>Offset</i>	Using the <i>Offset</i> , you can correct a deviation of the actual temperature from the temperature display. By inputting a correction value, the display is changed accordingly. If a negative correction value is necessary, the entered value is negated with the <+/-> button.
<i>Min.</i>	This value shows the maximum deviation downwards from the target temperature since the last <i>reset</i> .
<i>Max.</i>	This value shows the maximum deviation upwards from the target temperature since the last <i>reset</i> .
<Name>	The name is preset and corresponds to the name in the electrical circuit diagram. This button opens the "Name" page with a list of the defined heating elements and the defined control elements.

2.18.5 Analog parameters

The "Analog parameters" page is used to adjust the analog sensors. The page content depends on the equipment on the machine.

Service menu  Analog parameters

Depiction of pressure monitoring

These pages are used to adjust the sensors for pressure monitoring.

Function	Explanation
<i>Scaling</i>	The scaling assigns the measured voltage of the sensor to the actual pressure target value. The value under <i>Scaling</i> is preset for the sensor used. Example: <ul style="list-style-type: none">• Measuring range of sensor: 10 bar (145 psi)• Maximum voltage of the machine control: 5 V 5 V measured voltage corresponds to 10 bar (145 psi). This means that a voltage value of 1 V corresponds to a pressure of 2 bar (29 psi). The entered value has to correspond to the scaling of the sensor. The scaling is shown on the sensor data sheet.
<i>Offs</i>	Using the offset, you can correct a deviation of the actual pressure to the pressure displayed. Entering a correction value will change the display accordingly. If a negative correction value is necessary, the entered value is negated with the <+/-> button. The correction is independent of the recipe used.
<i>Act</i>	This value shows the result of the actual measurement.
<i>Calibration position</i>	This function moves the forming die and sealing die to the calibration position for the sensors.



Display of position monitorings

These pages are used to adjust the sensors for the position monitoring.

Function	Explanation
<i>Scaling</i>	The scaling assigns the measured voltage of the sensor to the actual position. The value under <i>Scaling</i> is preset for the sensor used. The entered value has to correspond to the scaling of the sensor. The scaling is shown on the sensor data sheet.

Function	Explanation
Offs	Using the offset, you can correct a deviation of the actual position to the position displayed. Entering a correction value will change the display accordingly. If a negative correction value is necessary, the entered value is negated with the <+/-> button. The correction is independent of the recipe used.
Act	This value shows the result of the actual measurement.

2.18.6 Basic setting

The basic settings include all the parameters, which are specific to the machine. The machine-specific parameters are managed in the "Basic settings" display.

Basic setting

Service menu > Basic setting



<i>Loaded basic setting</i>	This box shows the name of the loaded basic setting.
<Date>	This table column shows by means of the date stamp and time stamp, when the basic setting was created.
<User>	This table column shows the user, who has created the basic setting.
<Comment>	This table column shows the saved comment of the user, who has created the basic setting.
<Load>	This button loads the marked basic setting.
<Save>	This button saves the current settings as a basic setting.
<Delete>	The button moves the marked basic setting to the "Recycle bin".

Basic setting recycle bin

The basic settings can be restored on the "Recycle bin" tab.

Service menu > Basic setting > Recycle bin



	<p><Date></p> <p>This table column shows by means of the date stamp and time stamp, when the basic setting was created</p>
	<p><User></p> <p>This table column shows the user, who has created the basic setting.</p>
	<p><Comment></p> <p>This table column shows the saved comment of the user, who has created the basic setting.</p>
	<p><Restoring></p> <p>This button moves the marked basic setting from the recycle bin to the "Basic setting" tab.</p>

Comparing the basic settings

Different basic settings can be compared with each other on the "Compare" tab.

Service menu > Basic setting > Comparison



	<p><Basic setting 1></p> <p>This table column shows the values, which differ from each other in the selected basic settings.</p>
	<p><Basic setting 2></p> <p>This table column shows the values, which differ from each other in the selected basic settings.</p>
	<p><Designation of the variables></p> <p>This table column shows the designation of the variables for the values, which are displayed in the <i>Basic setting 1</i> table column.</p>
	<p><Perform></p> <p>This button opens the "Basic setting 1" display to select the first basic setting, which is to be compared.</p>
	<p><Edit></p> <p>This button opens the "Basic setting 2" display to select the second basic setting, which is to be compared.</p>

Machine reset

The machine's factory settings can be restored on the "Machine reset" tab.

Service menu > Basic setting > Machine reset





<Perform machine reset>
wizard

This button opens the "Perform machine reset" display.

Perform machine reset wizard

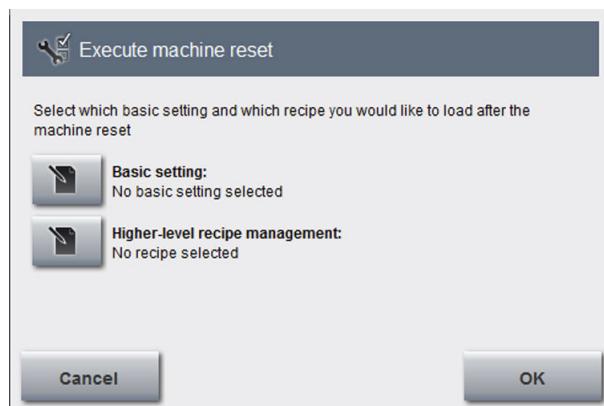


Fig. 228: Example: Perform machine reset



<Editing basic setting>

This button opens the "Basic setting" display. After the machine reset has been performed, the selected basic setting is loaded.



<Editing recipe>

This button opens the "Recipe" display. After the machine reset has been performed, the selected recipe is loaded.

Cancel

<Cancel>

This button closes the *Perform machine reset* wizard. The machine reset is not performed.

OK

<OK>

This button confirms the inputs. The machine reset is performed. The selected basic setting and the selected recipe are loaded.

2.19 Statistics



Fig. 229: Statistics button

The "Statistics" menu gives access to data and functions for statistical purposes and for coordinating service intervals.

	<Production data>	<ul style="list-style-type: none"> • Call up the specified production data. • View the quality factors by means of good packs and reject packs. • Coordinate service intervals and create corresponding service schedules. • Call up the consumption data.
	<HLS production data acquisition>	Call up the main page of the HLS server.
	<Production data acquisition>	View and set up production data acquisition (PDA).

2.19.1 Production data



Fig. 230: Production data icon

The production data recorded by the machine is analysed and displayed on the "Production data" tabs.

Production data

Production data is that data from the production operation of the machine.

Statistics > Production data



Current count

Function	Explanation
<i>Quality factor</i>	Ratio of good packs to total packs in percent since resetting the display.
<i>Good packs</i>	Number of good packs produced since resetting the display.
<i>Reject packs</i>	Number of reject packs produced since resetting the display.
<i><Reset counter></i>	The data under <i>Current count</i> is reset.

Last count: After the resetting of the counter for *Current count*, the data of the current count is adopted as the *Last count*.

Function	Explanation
<i>Quality factor</i>	Ratio of good packs to total packs in percent at the last count.
<i>Good packs</i>	Number of good packs produced at the last count.
<i>Reject packs</i>	Number of reject packs produced at the last count.

Total count since putting into service

Function	Explanation
<i>Quality factor</i>	Ratio of good packs to total packs in percent since putting the machine into service.
<i>Good packs</i>	Number of good packs produced since putting machine into service.
<i>Reject packs</i>	Number of reject packs produced since putting machine into service.

Function	Explanation
<i>Number of good packs until STOP</i>	The machine stops after the entered number of good packs has been reached. A diagnostic message appears.
<i>Hours of production</i>	Hours of production (automatic mode) since putting machine into service.
<i>Machine cycles</i>	Number of machine cycles run since putting machine into service.

Order data: The *Order data* field appears, if the HLS production data acquisition is activated in the page for "Other settings/production data tab". The values in the *Order data* field can be entered manually or can be set via OPC if the HLS link is active.

Function	Explanation
<i>Format</i>	The entered value determines the number of packs per machine cycle.
<i>Number of packs</i>	The entered value determines the total number of packs, which are to be produced for the current order. The machine stops, when the packs are produced.
<i>Remaining packs</i>	The entered value determines the number of packs, which still have to be produced for the current order.

Function	Explanation
<i>Job number</i>	The order number entered here is transferred to HLS production data acquisition. If this order number is changed by HLS production data acquisition, the machine stops.

Quality factor

Display of the quality factor of individual stations for the *Current count* and the *Last count*.

Statistics > Production data > Quality factor



Function	Explanation
Quality characteristic	Indicates whether the table represents <i>good packs</i> or <i>reject packs</i> .
Table	Explanation
<i>Station</i>	Display of the individual stations.
<i>Current count</i>	Value of the quality factor of the current count.
<i>Last count</i>	Value of the quality factor at the last count.
<Edit>	Adapt the <i>Display of values</i> and the <i>Quality characteristic</i> in the table.

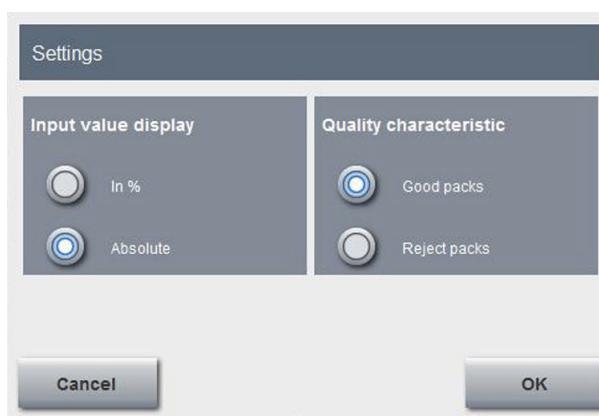


Fig. 231: Settings

Settings

Function	Explanation
<i>Display of values</i>	Display of values for <i>Current count</i> and <i>Last count</i> <ul style="list-style-type: none"> <i>Percentage</i>: Display of packs as a percentage. <i>Absolute</i>: Display of counted packs.
<i>Quality characteristic</i>	<ul style="list-style-type: none"> <i>Good packs</i>: Display of good packs. <i>Reject packs</i>: Display of reject packs.

Service interval

After a certain number of hours of operation, specified service work is required. This work is divided into intervals. When the machine reaches an interval, the corresponding diagnostic message appears.

Statistics > Production data > Service interval



Function	Explanation
<i>Target value</i>	Specified service intervals. Factory setting: <ul style="list-style-type: none"> <i>Level 1</i>: 200 hours of operation. <i>Level 2</i>: 1000 hours of operation. <i>Level 3</i>: 5000 hours of operation.
<i>Actual value</i>	Hours of operation since the last acknowledged interval.
<i>Service schedule</i>	Text box for storing the required maintenance tasks for the particular interval. Storing maintenance tasks is only possible with the <i>Service</i> access right.
 <Safely remove USB stick>	Log off the USB stick before disconnecting it from the machine control.
 <Load data from the USB stick>	Load service schedules from the USB stick to the machine control.

Consumption

The "Consumption" tab provides information for example on the quantities of consumables and packaging materials used.

Description

Production data acquisition (PDA)



Statistics > Production data > Consumption



Cooling water consumption

This value shows the cooling water consumed since putting machine into service. Each cooling water circuit is displayed separately.

Film consumption

This value shows the lower web consumed and the upper web consumed since resetting the display.

This function can be configured online.

2.19.2 HLS production data acquisition



Fig. 232: Icon for HLS production data acquisition

The settings for production data acquisition are performed on the main page of the HLS server.

input	info	PDA	Testline3
head state		batches	
current:	5	set-up	raw material 0
		set-up	top web 0
		cleaning	bottom web 0
		maintenance	end product 0
		pause	
		repair	
		off	
employee		order	
		log off shift	
current:	S2	late shift	order No. 157542
		early shift	article No. 333110
shift foreman	1	Erich Mustermann	Bierschinken, 150g
No. of employees	2		target quantity 12,000
accept		close order	
		01.03.2011 16:19:13	

Fig. 233: HLS server for production data acquisition

2.19.3 Production data acquisition (PDA)



Fig. 234: Icon for Production data acquisition

PDA collects machine operating data, which can be evaluated by means of individual settings. The recorded data can be saved for seamless documentation of the production process.

- PDA records production times and downtime with the reasons for interruptions in production, e.g. set-up times and service times, and it makes time accounts available for these.

- The following information is contained in the recorded operating data:
 - Machine status
 - Messages, e.g. faults, warnings and notes
 - Recipes
 - Downtime reasons
- The evaluations, which are shown on the display, extend for a maximum of 90 calendar days.
 - The evaluations can be filtered.
 - The evaluations are available as diagrams and tables.


Info

- The quantity of data is limited. If too much data is being processed, a warning message appears. The quantity of data has to be restricted by means of filter settings.
- Production data acquisition is remote-enabled. Only one application can gain access at any time to the PDA database. If PDA is also utilized by another user, a message appears.

Machine effectiveness

The content of the "Machine effectiveness" tab displays the complete process in the machine control and therefore helps to improve productivity.

Statistics > Production data acquisition > Machine effectiveness



The tab shows the times, which are recorded in the evaluation, in the form of a diagram. The depicted columns each show the percentage proportion of the time accounts for operating status in relation to the total time.

The main filters limit the evaluation for the diagram to a desired time period for consideration.

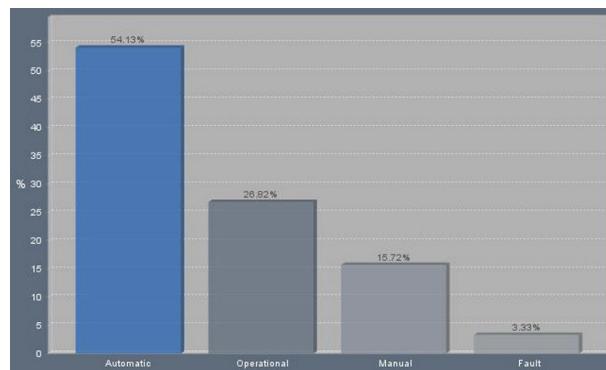


Fig. 235: Machine effectiveness

Description

Production data acquisition (PDA)



Diagram	Explanation
<i>Automatic</i>	This column shows the production time of the machine in automatic mode.
<i>Operational</i>	This column shows the downtime of the machine, for which no reason is given.
<i>Manual</i>	This column shows the downtime, which was recorded on the basis of a manually allocated machine downtime reason.
<i>Fault</i>	This column shows the downtime, which was recorded on the basis of a fault on the machine.
 <Backwards>	This button scrolls backwards through the columns, which are depicted in the diagram.
 <Forwards>	This button scrolls forwards through the columns, which are depicted in the diagram.
 <Perform>	<p>This button calls up the "Settings" display. The displays for setting the main filters can be accessed.</p> <ul style="list-style-type: none"> • "Time period" • "Recipe selection" <p>These filters limit the evaluation for the diagram to the desired time period for consideration.</p>
 <Update>	This button updates the content of the diagram.

Message overview

The "Message overview" tab shows the messages, which are recorded in the evaluation, in the form of a diagram. The depicted columns show the percentage proportion of each message in relation to the total time of messages, and they therefore make a fault search easier.

- The integrated message filter restricts the displayed messages.
- The main filters limit the evaluation for the diagram to a desired time period for consideration.

Statistics > Production data acquisition > Message overview



 <Backwards>	This button scrolls backwards through the columns, which are depicted in the diagram.
---	---

	<Forwards>	This button scrolls forwards through the columns, which are depicted in the diagram.
	<Filter>	This button calls up the "Message filter" display. The message filter limits the evaluation to the desired messages.
	<Perform>	<p>This button calls up the "Settings" display. The displays for setting the main filters can be accessed.</p> <ul style="list-style-type: none"> • "Time period" • "Recipe selection" <p>These filters limit the evaluation for the diagram to the desired time period for consideration.</p>
	<Update>	This button updates the content of the diagram.

Message list

The "Message list" tab contains the last 500 displayed notes, warnings and faults.

- The integrated message filter restricts the displayed messages.
- The main filters limit the evaluations to a desired time period for consideration.

Statistics > Production data acquisition > Message list



Table	Explanation
<i>Start</i>	This column shows, at which time point the message arose.
<i>Status</i>	<p>The colour of the icon shows the status of the message:</p> <ul style="list-style-type: none"> • Red/white: Fault • Black/yellow: Warning • White: Note
<i>Error code</i>	This column shows the diagnostic number of the message.

Description

Production data acquisition (PDA)



Table	Explanation
<i>Explanation</i>	This column shows an explanation of the message. This explanation contains information on where the message has occurred and what has happened.
<i>Duration</i>	This column shows, how long the reason for the message was present on the machine.
	<Perform filter display> This button calls up the display filter.
	<Filter> This button calls up the "Message filter" display. The message filter limits the evaluation to the desired messages.
	<Troubleshooting> This button calls up troubleshooting for the selected list entry. The associated causes and solutions appear.
	<Perform> This button calls up the "Settings" display. The displays for setting the main filters can be accessed. <ul style="list-style-type: none">• "Time period"• "Recipe selection" These filters limit the evaluation to the desired time period for consideration.
	<Update> This button updates the content of the table.

Downtime

The "Downtime" tab can be used to store any customer-specific downtime reasons for manual account allocation on the time accounts.

Statistics > Production data acquisition > Downtime

**Customer-specific designation**

Function	Explanation
<i>Downtime reason 1 to Downtime reason 4</i>	The entered designation appears on the customer-specific buttons for the account allocation of Downtime reasons <1> to <4> in the "Downtime reasons" display.

Function	Explanation
<i>Downtime reason 5</i>	The entered designation appears on the customer-specific button for the account allocation of Downtime reason <5> in the "Downtime reasons" display. <i>Downtime reason 5</i> can also be entered and changed directly in the Downtime reasons display with the <i>User access</i> right.

Database settings

Statistics > Production data acquisition > Database settings



Configuration

Function	Explanation
<i>Maximum storage time</i>	This value defines, how many days the data is to be saved in the database. Older data is automatically deleted.
<i>Maximum storage capacity</i>	This value determines the upper limit for the size of the database. As soon as the database has reached this size, data is deleted on the basis of its age, in order to ensure that new data can be saved.
<i>Capacity buffer</i>	This value determines, what percentage of the data can additionally be deleted, when the maximum storage capacity has been reached. This capacity buffer creates a longer time distance, before the maximum storage capacity is next reached.

Function	Explanation
<Compress PDA database>	This button organizes the database manually. This means that the effort in searching for certain information is minimised, and if possible the physical size of the database is reduced.
<Delete database>	This button removes the entire database. The machine control restarts. This procedure is written in the audit trail.

Filter settings

Main filter

All components of the main filter are simultaneously active. These filters limit the displayed data quantity to an exact time period for consideration.

Description

Production data acquisition (PDA)

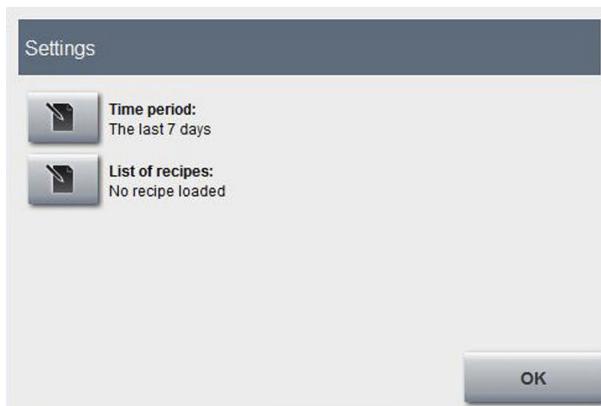


Fig. 236: Main filter settings



<Edit time period>

This button calls up the "Time period" display. The option boxes limit the time period for consideration. The *starting time* and *finishing time* show the selected time period for consideration in detail.



Fig. 237: Time period

- *Today*: The filter limits the data to the whole of today's data.
- *The last 7 days*: The filter limits the data to that of the last seven days, starting from today.
- *Yesterday*: The filter limits the data to the whole of yesterday's data.
- *Individual time period*: The filter limits the data to that from the time period for consideration, which is entered by the operator.



<Perform recipe selection>

This button calls up the "Recipe selection" display. Recipe selection limits the time period for consideration to selected recipes, which have been used in the last 90 days.

- Several individual recipes can be selected simultaneously.
- *Independent of recipe*: The filter ignores all recipes and does not limit the data.
- *No recipe loaded*: The filter limits the data to the times, in which the machine was operated without a loaded recipe.

Message filter

The message filter restricts the displayed data quantity to certain diagnostic messages. Several different types of message can be selected simultaneously.

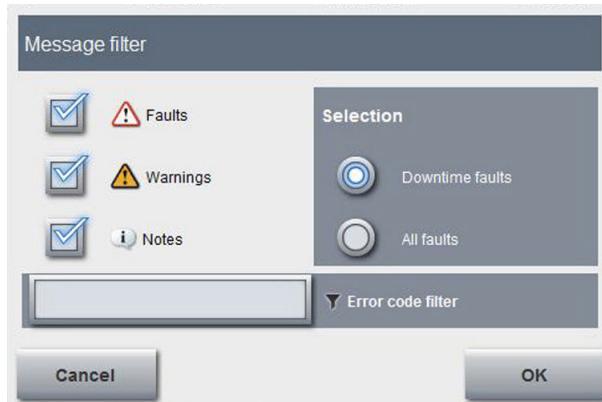


Fig. 238: Message filter

 Faults, white/red	<p>All the fault messages in the selected time period for consideration flow into the particular evaluation.</p> <p>Selection</p> <ul style="list-style-type: none"> <i>Downtime faults:</i> The message filter limits the displayed data quantity to faults, which were responsible for a machine stop. <i>All faults:</i> The message filter does not limit the displayed data quantity any further.
 Warnings, black/yellow	All the warning messages in the selected time period for consideration flow into the particular evaluation.
 Notes	All the information messages in the selected time period for consideration flow into the particular evaluation.
 Error code filter	<p>The error code filter is a full-text filter for the error code of the diagnostic message.</p> <ul style="list-style-type: none"> Example: Input "53" The filter limits the data to the diagnostic messages of all discharge units and to all the error codes, which contain the number "53" in any position. If in addition a certain message type has been selected, the evaluation is limited to this one message type.

Display filter for the message list

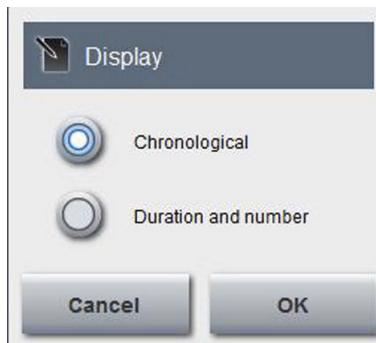


Fig. 239: Display list

Chronological	The table shows the chronological progression of the individual table entries.
Duration and number	<i>Duration and number</i> shows the added-up view of the chronological table. Each table entry appears only once in the table. The total duration and the number of same table entries are at the start of the line.

2.20 Help for troubleshooting

The "Troubleshooting" display shows causes and solutions for troubleshooting.

- **Previous fault or warning:**

- The "Troubleshooting" display appears if, starting from a message list, the <Troubleshooting> button is touched. The message lists are in the "Diagnosis" menu and in the displays for production data acquisition.

- **Current diagnostic message:**

- The "Troubleshooting" display appears, if the <Help> button with the warning icon is touched in the info line.

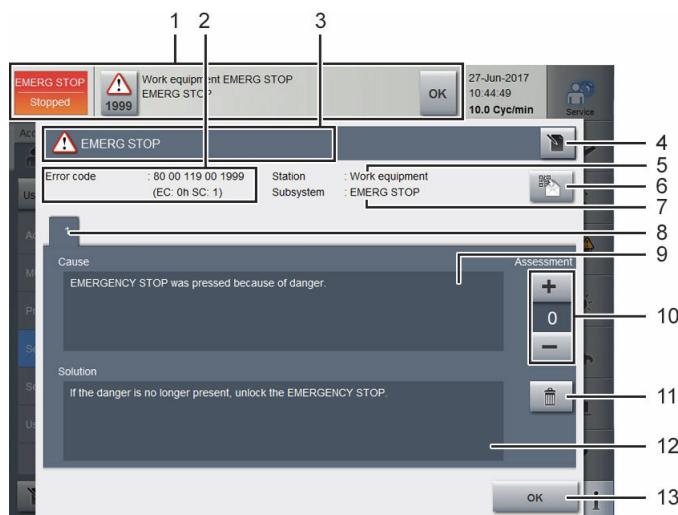


Fig. 240: Troubleshooting

- 1 Info line
- 2 Error code
- 3 Fault or warning
- 4 <Perform> button
- 5 Station
- 6 <QR code> button
- 7 Subsystem
- 8 Tabs
- 9 Cause
- 10 Assessment
- 11 <Delete> button
- 12 Solution
- 13 <OK> button

Aids in troubleshooting

Info line	The following information is contained in the info line, if there is a fault or warning: <ul style="list-style-type: none"> • The operating status of the machine • The diagnostic number • The diagnostic message
Error code	The error code shows the detailed diagnostic number of the fault or warning.
Fault or warning	The text of the diagnostic message appears beside the warning icon.
<Perform>	This button creates a new tab with a cause and solution. The "add cause and solution" display appears. See Section 8.1.4 "INPUTTING CAUSES AND SOLUTIONS" on page 555.



<i>Station</i>	This information shows, which station is reporting this fault or warning.
 <i><QR code></i>	This button calls up the QR code for the current fault present. The button only appears if, starting from the info line, the Troubleshooting display is accessed. See Section 8.1.4 "INPUTTING CAUSES AND SOLUTIONS" on page 555.
<i>Subsystem</i>	This information shows which module, subordinate to the station depicted, reports this fault or warning.
<i>Tabs</i>	Each tab shows a <i>cause</i> and the associated <i>solution</i> for troubleshooting.
<i>Cause</i>	This box shows a cause of the fault or warning.
<i>Assessment</i>	<p>The assessment number increases or decreases with each positive or negative assessment. The individual tabs are sorted according to their assessment number.</p> <ul style="list-style-type: none"> • <Increase the value>: Give a positive assessment of the cause and solution on this tab. • Assessment number • <Decrease the value>: Give a negative assessment of the cause and solution on this tab.
 <i><Delete></i>	This button deletes the current tab with <i>cause</i> and <i>solution</i> .
<i>Solution</i>	This box shows the relevant solution to the displayed cause.
 <i><OK></i>	This button closes the "Troubleshooting" display.

2.21 Info mode



Fig. 241: Information button

This button activates and deactivates the Info mode.

Write and read authorisation

If the button is touched, the write and read authorisation is shown for all operating components in the current page.

- 0: All
- 5: User
- 10: Set-up personnel or key switch
- 15: Service
- 25: programmer
- 99: No authorisation

Information about operating components

If an operating component is touched when Info mode is active, the page with information about the operating component appears.

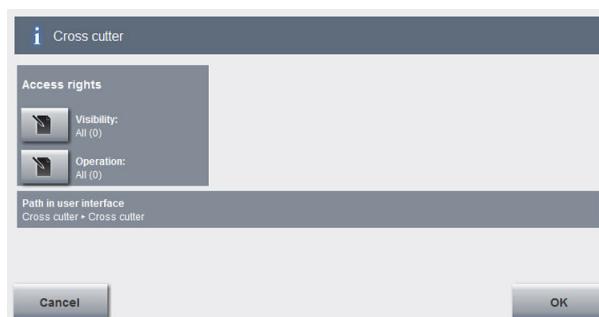


Fig. 242: Navigation information button

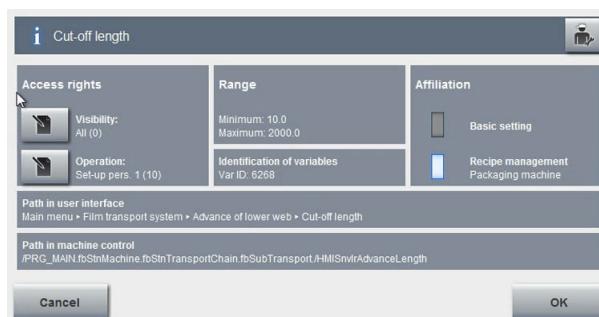


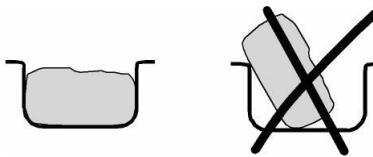
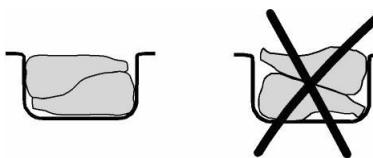
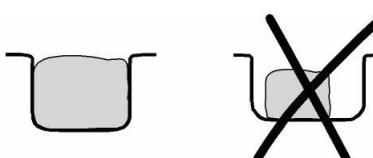
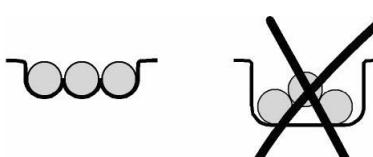
Fig. 243: Parameters and switching function information

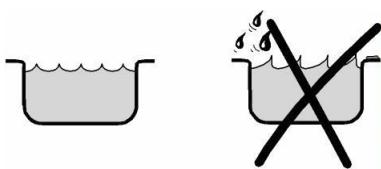
Access rights

- <Edit visibility>:
Depending on the selected access right, this button opens the "Visibility" page. Here the read authorisation for the operating component can be specified.
- <Edit operation authorisation>:
Depending on the selected access right, this button opens the "Operation" page. Here the write authorisation for the operating component can be specified.

<i>Range</i>	This box shows the lower limit and upper limit of the valid range for the operating component.
<i>Identification of variables</i>	This box shows the identification number of the variables for the selected operating component.
<i>Affiliation</i>	This box shows, whether the variable belongs to the basic settings or to the recipe variables.
<i>Path in the user interface</i>	This box shows the associated path in the user interface.
<i>Path in the machine control</i>	This box shows the path of the variables in the machine control. This path is required in order to clearly identify the variables.

2.22 Feeding rules

Rule	Correct/incorrect	Effect
No protruding product	 Fig. 244: Inserting product, protruding	Protruding products destroy dies and cutters.
Insert sharp product edges so that they point toward one another.	 Fig. 245: Inserting product, sharp-edged	Sharp product edges destroy the pack.
Adapt the pack pocket to the product size.	 Fig. 246: Inserting product, size	A pack pocket that is too large will be deformed during vacuum-packing.
Adapt the form of the pack pocket to the product.	 Fig. 247: Inserting product, form	A pack pocket with an unsuitable form will be deformed during vacuum-packing.

Rule	Correct/incorrect	Effect
Keep the sealing zone clean.	 Fig. 248: Inserting product, keep sealing zone clean	A dirty sealing zone endangers the shelf-life of the product.

2.23 Technical specifications

2.23.1 Technical specifications of the basic machine

Machine

Power supply

Mains voltage	See type plate
Phases	See type plate
Rated power	See type plate
Rated current	See type plate
Maximum mains fuse	See type plate
Max. short circuit current	See type plate
Protection rating	IP65

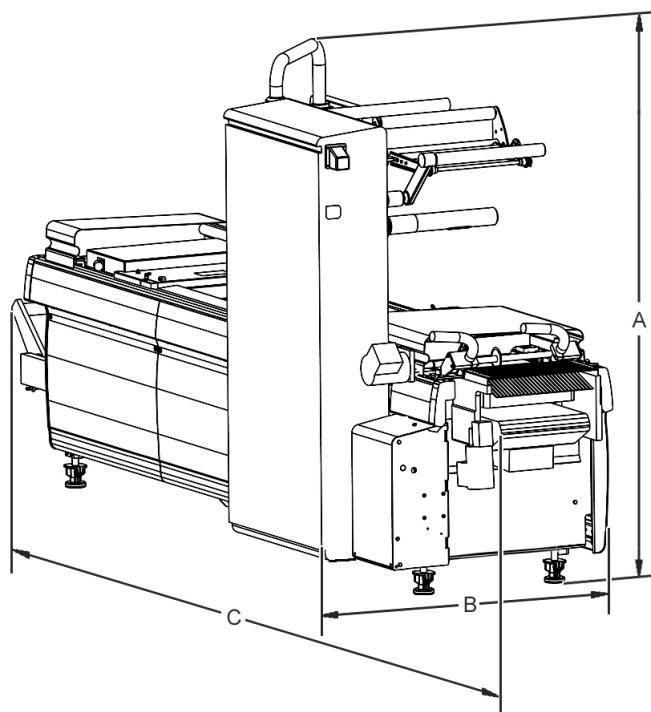
Dimensions of the machine

Fig. 249: Dimensions

Height (A) approx.	See order confirmation
Width (B) approx.	See order confirmation
Length (C) approx.	See order confirmation
Weight without accessories, approx.	See weight information on the control cabinet

Installation conditions and ambient conditions

Ambient temperature during operation of the machine	+2 °C (36 °F) to 40 °C (104 °F) MULTIVAC recommends the use of a heat exchanger if the temperature in the installation room exceeds +25 °C (77 °F).
Storage temperature without cooling water	-25 °C (-13 °F) to +80 °C (176 °F)
Relative air humidity for operation or storage of the machine, max.	85 % non-condensing
Incline of the machine during transport, max.	15 °

Installation conditions and ambient conditions

Minimum room size for machines with the gas flushing option	40 m ² (50 yd ²) For safety reasons, a minimum room size is mandatory to prevent high concentrations of gas.
---	--

Safety-related parts of the machine control

Service life	19 years
Performance Level	ISO 13849-1:2015 PL d
Category	ISO 13849-1:2015 Category 3

Interfaces

Ethernet 100 MB/s	IEEE 802.3 u
USB	USB 2.0

Operating materials
Cooling water - fresh water cooling and water chilling unit

Min. input pressure	1.5 bar (22 psi)
Max. input pressure	4.5 bar (65 psi)
Pressure difference between water inlet and water outlet, min.	1.5 bar (21.76 psi)
Inner diameter of supply line	1/2 "
Inner diameter of outlet pipe	1/2 "
Max. input temperature	15 °C (59 °F)
Min. input temperature	10 °C (50 °F)
General requirements of the cooling water	Free of solids
Filter element that can be back-flushed	50 µm
pH value	7 to 8.5
Hardness in case of untreated water	0.534 mmol/l (53.4 ppm) to 0.712 mmol/l (71.2 ppm) CaCO ₃
	3 °dH to 4 °dH
	3.5 °e to 5 °e
	5 °fH to 7 °fH

Description

Technical specifications of the basic machine

**Cooling water - fresh water cooling and water chilling unit**

Hardness with the addition of hardness stabilisers	0.534 mmol/l (53.4 ppm) to 3.56 mmol/l (356 ppm) CaCO ₃
	3 °dH to 20 °dH
	3.5 °e to 25 °e
	5 °fH to 36 °fH
Copper, max.	0.01 g/m ³
Sulphate in the case of untreated water, max.	200 g/m ³
Chloride in the case of untreated water, max.	50 g/m ³
Bacterial count, max.	1000 CFU/ml
Electrical conductivity, max.	500 µS/cm

Compressed air for machine

Min. input pressure	7 bar (102 psi) 5.5 bar (80 psi)
Max. input pressure	10 bar (145 psi) 7 bar (101 psi)
System pressure	7 bar (102 psi) 5.5 bar (80 psi) to 7 bar (101 psi)
Operating pressure for heating film	1 bar (14.5 psi) to 2 bar (29 psi)
Operating pressure, forming	1 bar (14.5 psi) to 2 bar (29 psi)
Operating pressure, sealing	6 bar (87 psi)
Inner diameter of supply pipe	3/4 " to 1 "
Residual oil content, max.	0.01 mg/m ³
Max. particle size	0.1 µm
Particle density, max.	0.1 mg/m ³
Olfactory properties	Odourless
Max. condensation point	3 °C (37.4 °F)
Input temperature* above the pressure condensation point	15 °C (59 °F)
Moisture content, max.	6 g/m ³

* If temperatures in the compressed air system are under 10 °C (50 °F), use an adsorption dryer.

Micro-filter for compressed air

Particle size, max.	0.01 µm
---------------------	---------

Activated carbon filter for compressed air

Residual oil content, max.	0.003 mg/m³
----------------------------	-------------

Film unwinds
Film

Width	See order confirmation	
Max. roll diameter	Type: FA 20 Type: FAV 20	500 mm (19.69 in) 500 mm (19.69 in)
Film unwind type	See order confirmation	
Film material of lower web	Thermoformable, heat-sealable film	
Film material of upper web	Heat-sealable film	
Max. weight of the web roll	Type: FA 20 Type: FAV 20	90 kg (198 lb) 90 kg (198 lb)

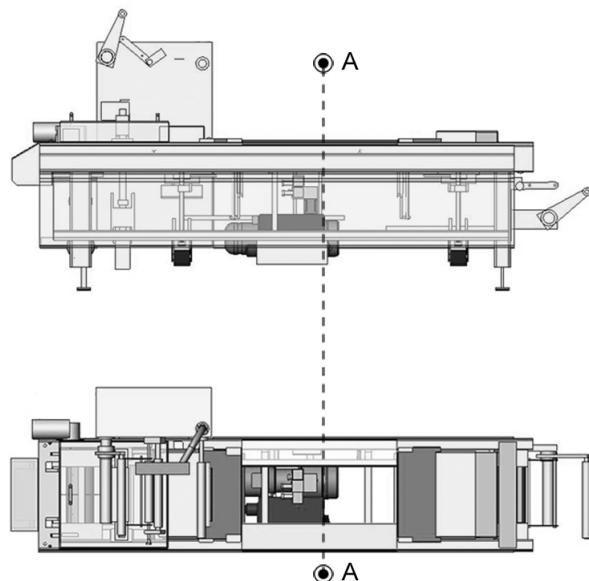
Noise exposure


Fig. 250: Noise exposure measuring point

A Workplace

Description

Technical specifications of the basic machine

**Noise exposure at the workplace**

Basic principles	DIN EN ISO 3744/3746 and 11202/11204				
Measuring instrument	Precision sound level meter, IEC 61672-1, class 1				
Status of the machine	New condition with optimum settings at the time of delivery				
Measuring point at the machine, workplace A	<ul style="list-style-type: none">Distance from the machine frame: 1 m (3.28 ft)Height above the ground: 1.6 m (5.25 ft)				
Equipment on the machine	Vacuum pump	Suction unit	Film punch	Edge trim macerator	
A-weighted sound pressure level at the workplace L_{pA} (accuracy class 2)	--	--	--	--	71 dB
	X	--	X	--	77 dB
	X	X	X	--	77 dB
	X	--	--	--	74 dB
	X	X	--	--	79 dB
	X	--	--	X	80 dB

**Info**

Extraneous noise and ambient influences are taken into account during the measuring of noise emission.

Higher measured values may be produced as a result of the following:

- Highly sound-reflecting rooms
- Changed settings
- Wear

3 Start-up

3.1 Observe storage period

1. Check how long the machine has been stored.
2. If the machine has been stored for more than six months, have the machine examined by MULTIVAC Service before being put into service.

3.2 Checking the delivery

1. Check the delivery for completeness and inspect for transport damage.
 - 1.1 Inspect the crates.
 - 1.2 Inspect the machine parts.
2. If transport damage is noted, immediately notify MULTIVAC service and report the damage.
 - 2.1 Photograph the damage.
 - 2.2 Have the photos sent to MULTIVAC service.

3.3 Setting up the machine

**Info**

We recommend that a service engineer be requested for the machine installation.

3.3.1 Setting up the machine

DANGER**Danger of explosion!**

Operating the machine in a potentially explosive atmosphere can result in explosion due to hot machine parts.

Explosions can cause serious injuries or even death.

- Do NOT use the machine in rooms that are exposed to explosion hazards.

1. Prepare a firm and level site for the machine.
2. Ensure there is adequate access to the control cabinet and the connections at the desired location.
3. Take into consideration the installation and ambient conditions at the intended machine location. The installation and ambient conditions are listed in the "Technical specifications".
4. Transport the machine to the desired location. See Section 9.2 "TRANSPORTING THE MACHINE" on page 567.

Setting up with forklift

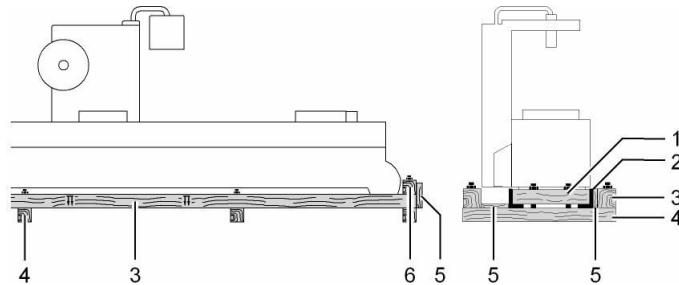


Fig. 251: Machine with wooden base

- 1 Cross timbers for transport rails
- 2 Transport rail
- 3 Longitudinal timbers
- 4 Lower cross timbers
- 5 Boards
- 6 Upper cross timbers

1. Remove boards.
2. Remove upper cross timbers and longitudinal timbers.
3. Lift the machine on the transportation angle bars until the lower cross timbers are free.
4. Remove the lower cross timbers.
5. Remove the transportation angle bars, see Section 3.3.2 "REMOVE THE TRANSPORTATION ANGLE BARS".
6. Keep the transport rails and accessories for later transport.

Setting up with lifting trolley

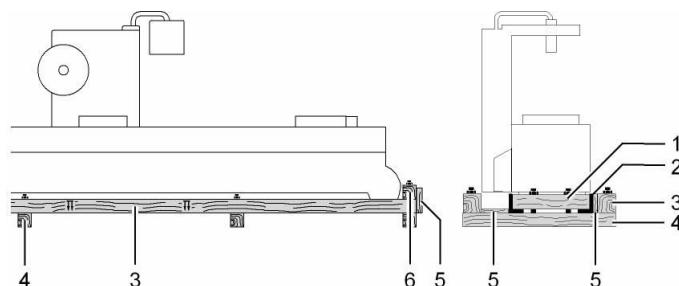
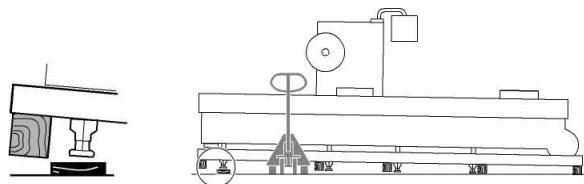


Fig. 252: Machine with wooden base

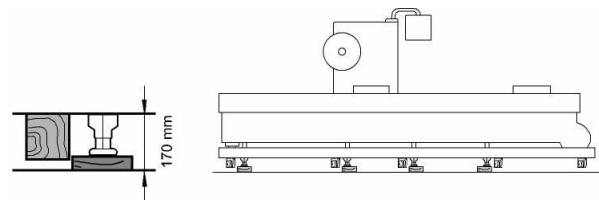
- 1 Cross timbers for transport rails
- 2 Transport rail
- 3 Longitudinal timbers
- 4 Lower cross timbers

- 5 Boards**
6 Upper cross timbers

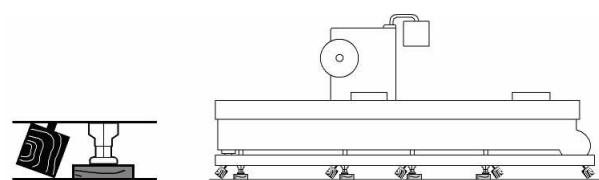
-
1. Remove boards and set them aside.
 2. Remove upper cross timbers and longitudinal timbers.
 3. Lift the machine at one end by the transport rail until as many machine feet as possible are free.
 4. Place one of the boards under each of the suspended machine feet.



-
5. Lift the machine at the other end by the transportation angle bars until the remaining machine feet are free.
 6. Place one of the boards under each of the suspended machine feet.



-
7. Tilt the cross timbers and remove them.



-
8. Lift the machine at each respective end and remove the boards underneath.
 9. Remove the transportation angle bars, see Section 3.3.2 "REMOVE THE TRANSPORTATION ANGLE BARS".
 10. Keep the transport rails and accessories for later transport.

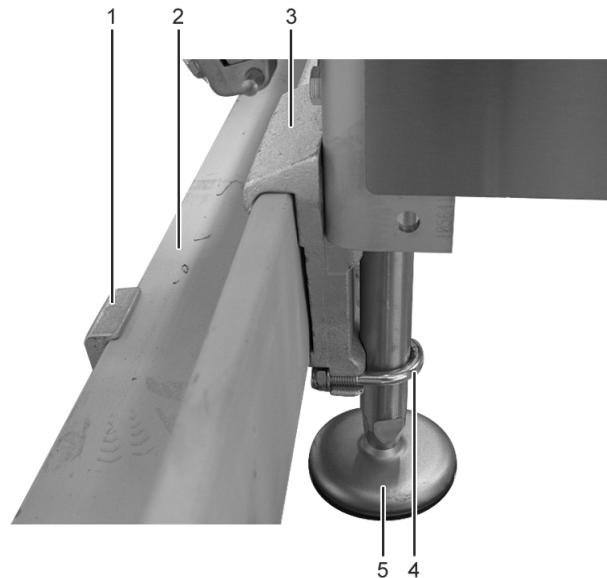
3.3.2 Remove the transportation angle bars

Fig. 253: Transportation angle bar and machine foot

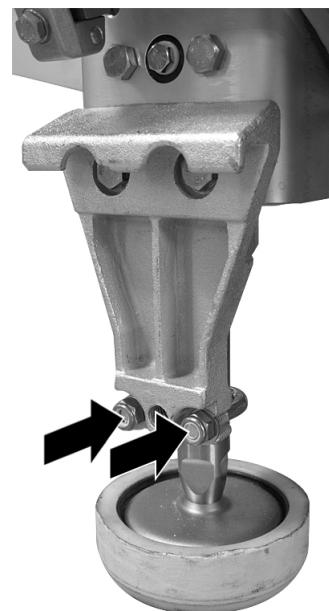
- 1** Hook
- 2** Transportation angle bar
- 3** Holding device
- 4** Bracket screw
- 5** Machine foot

-
- 1. Move the lifting trolley under the transport rail. For long transport rails use two lifting trolleys.
 - 2. Raise the lifting trolley until it is on the transport rail.
 - 3. Unscrew the screws on the hook and remove the hook.
-

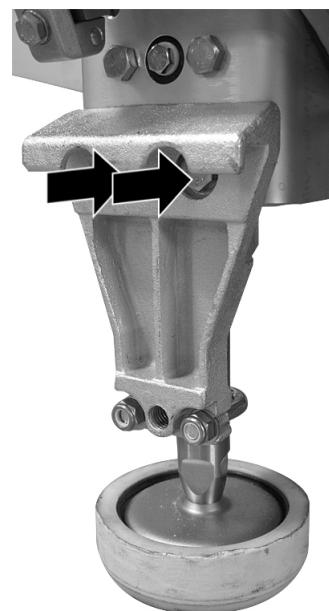


-
- 4. Lower lifting trolley slightly.
 - 5. Remove the transportation angle bars.
 - 6. Remove the holding device on the machine feet:
-

- 6.1 Unscrew the nuts on the bracket screw and remove the bracket screw.

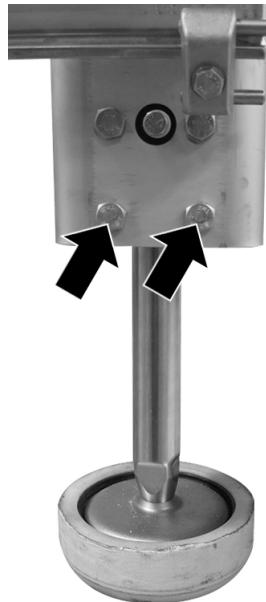


- 6.2 Unscrew the screws on the holding device.



- 6.3 Remove holding device.

-
7. Screw in the screws in the machine foot and tighten.

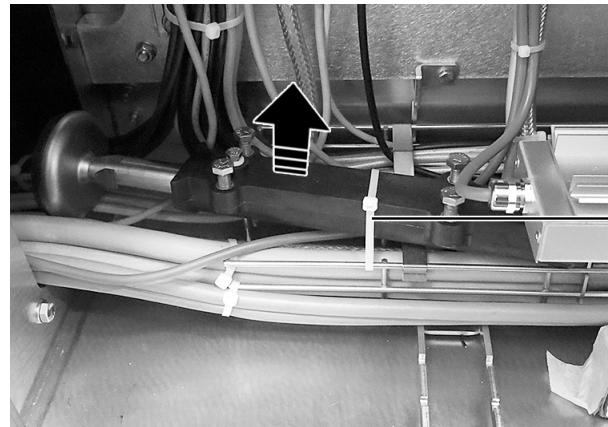


-
8. Screw the hook and the bracket screw onto the holding device so that the holding device can be stored as a unit.
 9. Keep the transport rails and holding device for later transport.
-

3.3.3 Attaching additional machine foot

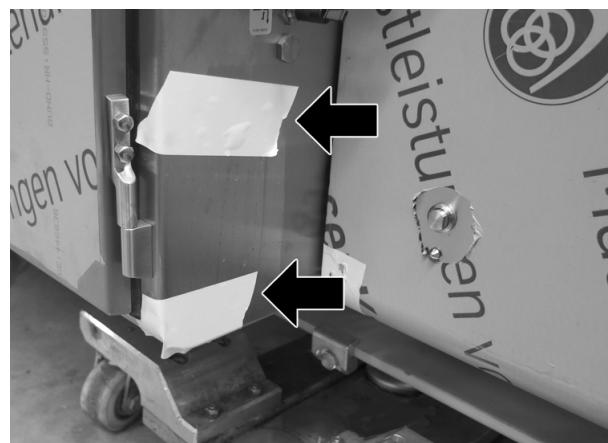
1. **DANGER** – Turning off the machine with the main switch does not rid it of electrical current. Touching live components will result in death or serious injury.
 - Only qualified electricians are permitted to work on live components. Electric lines marked in orange are live.
 - Do NOT touch live components.
2. Open the control cabinet doors.

-
3. Take the additional machine foot from the control cabinet.



-
4. Undo the screws and washers from the machine foot.

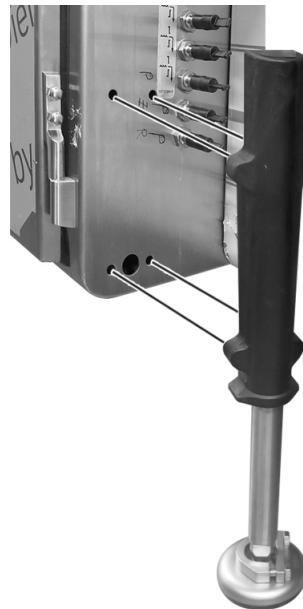
5. Remove the adhesive tape on the control cabinet.



- ✓ The drill holes for fastening the machine foot are accessible.



-
6. Position the machine foot at the control cabinet and fasten it from inside with the washers and screws.



-
7. Close the control cabinet doors.
 8. Set the height of the machine foot together with the other machine feet.
-

3.3.4 Aligning the machine

NOTICE

Material damage!

Incorrectly set up machines will undergo increased wear.
Wear will eventually damage the machine.

- Align the machine carefully.
- Always align the machine again after it has been moved.

Setting the machine height

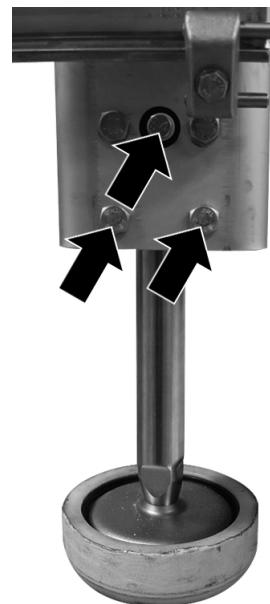


Info

The distance between the underside of the side cladding and the production hall floor must not be greater than 240 mm (9.45 in) at any position.

-
1. Setting the height of the machine:

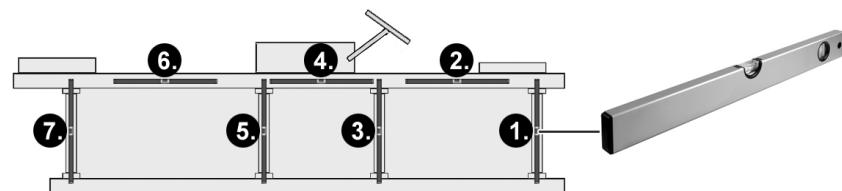
-
- 1.1 Release the screws on the machine feet.



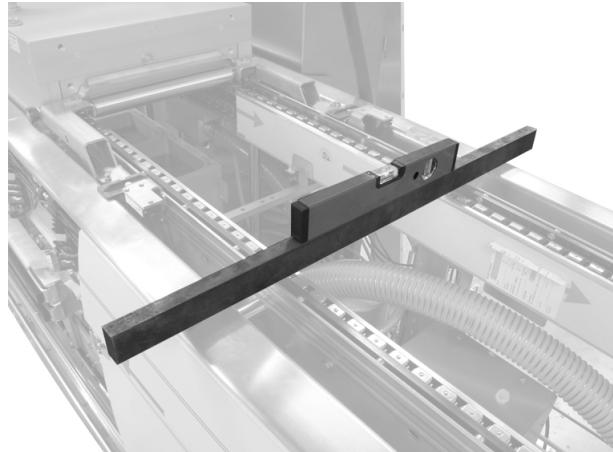
- 1.2 Rotate the machine foot on the spanner gap until it is at the desired height.



-
2. Check the vertical and horizontal alignment of the machine using a spirit level and the specified measuring points.



-
3. In order to measure the alignment in the crosswise direction, place the spirit level on a flat rule across the machine frame in the area of the machine feet.



✓ The spirit level should not lie on the chain guide.

-
4. Align the machine by means of the spirit level by turning the machine feet.
 5. Tighten the screws on the machine feet.
-

Longitudinal alignment

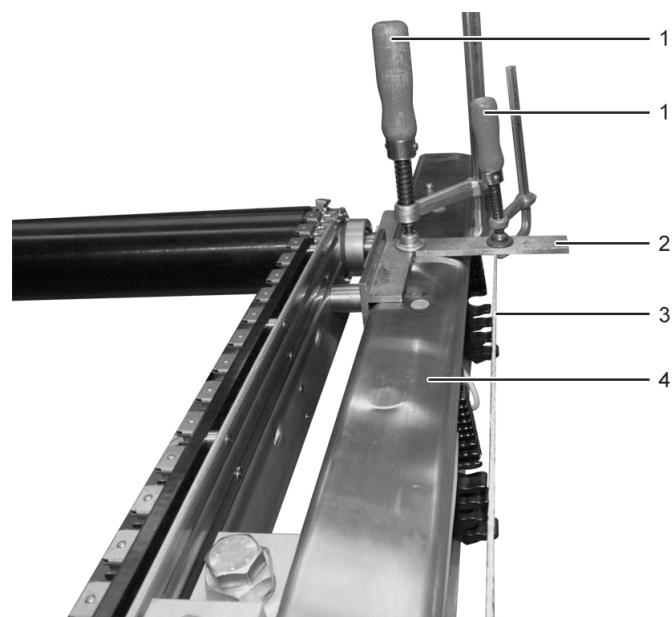
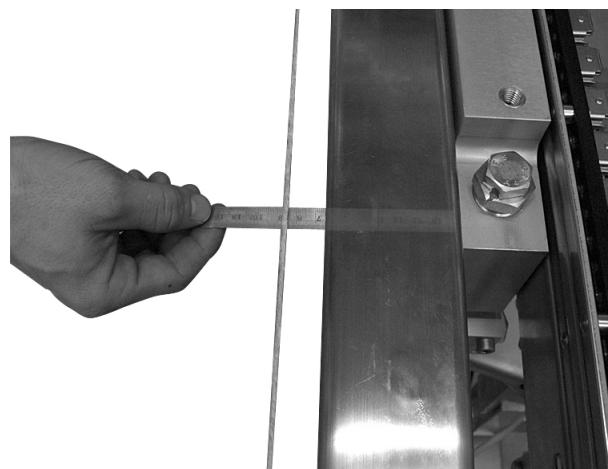


Fig. 254: Checking the longitudinal alignment

- 1 Screw clamp
- 2 Set square
- 3 Alignment wire

4 Machine frame

1. Remove all panels on the machine frame.
2. Place one set square at the machine infeed and one at the machine outfeed on the inside of the machine frame.
3. Fix both set squares with screw clamps.
4. Tightly clamp the alignment wire with screw clamps between the set squares at the same distance from the inside of the machine frame.
5. Measure the alignment from the inside of the machine frame up to the alignment wire in all the areas of the machine feet.



6. If required, align the machine frame to the machine feet on a millimetre basis with a plastic hammer.



Crosswise alignment

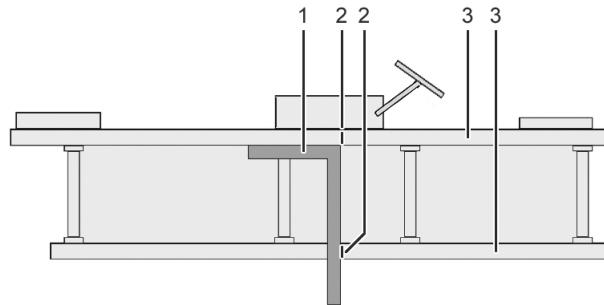
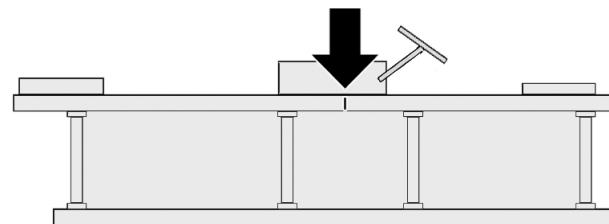


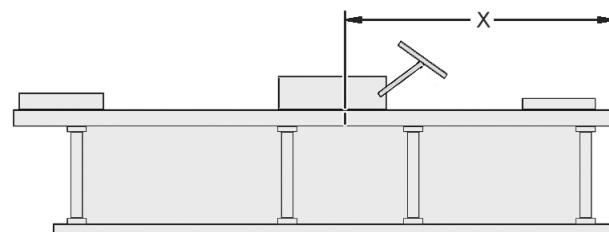
Fig. 255: Crosswise alignment

- 1 The set square
- 2 Marking
- 3 Machine frame

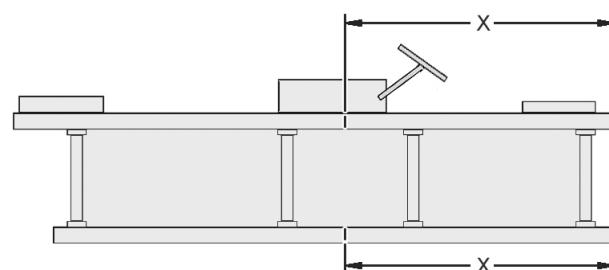
-
1. Mark a point on the machine frame in the loading area, e.g. using a marker pen.



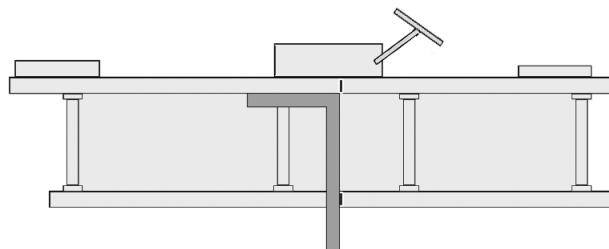
2. Measure the distance from the start of the machine frame to the selected point.



3. Apply this measurement to the opposite machine frame.

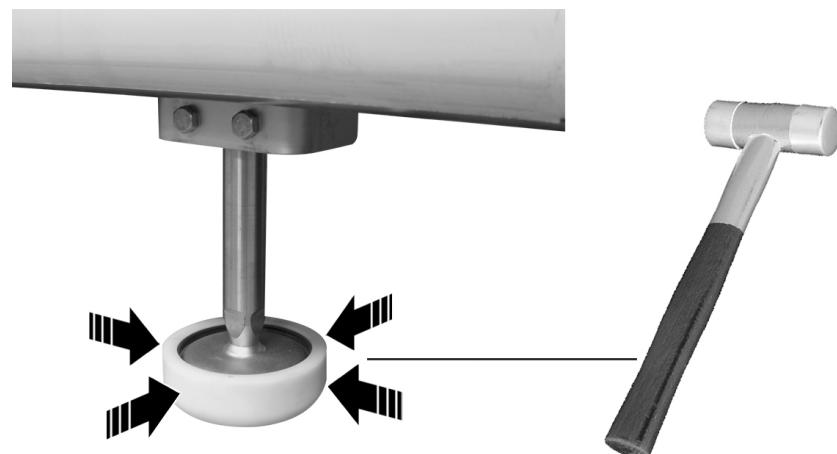


-
4. Check the alignment of the two markings by means of the set square.



- ✓ If the markings are flush: The machine is aligned in the correct crosswise alignment.
- ✓ If the markings are not flush: Align the machine frame in the crosswise direction.

-
5. If required, align the machine frame to the machine feet on a millimetre basis with a plastic hammer.



3.3.5 Installing the condensate drain



Fig. 256: Condensate outlet

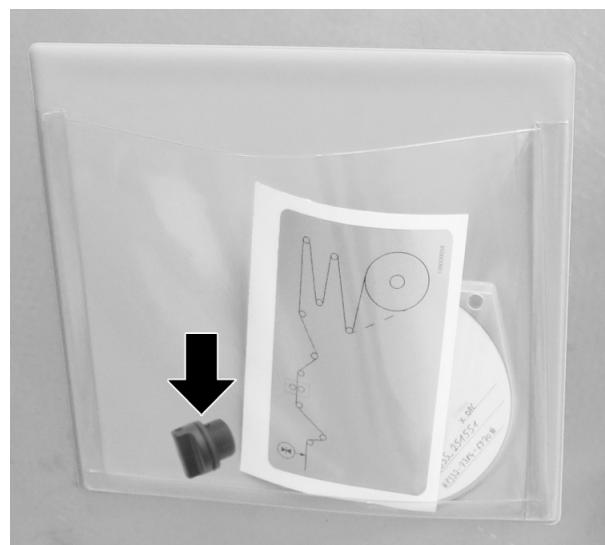
NOTICE**Material damage!**

If the condensate drain is not installed, water can penetrate into the control cabinet.

Water can lead to a short circuit and damage the machine.

- Install the condensate drain before putting into service.
- Protect the control cabinet from moisture when the condensate drain is removed.

1. If the power supply for the machine is already connected, switch off the voltage supply to the machine.
2. Open the control cabinet door.
3. Take the condensate drain out of the control cabinet door.



4. Remove the protective film from the control cabinet.
5. Push the condensate drain and gasket from below through the hole in the control cabinet floor.



6. Tighten the condensate drain by hand.
7. Close the control cabinet door.

3.4 Preparations to be made by the operating company

1. Attach a lockable stop-cock to the compressed air supply.
2. Ensure that the cooling water cannot flow back into the drinking water circuit.
 - 2.1 First option: installation of a backflow preventer in the cooling water circuit.
 - 2.2 Second option: separate the cooling water circuit from the drinking water circuit.
3. For machines with gas flushing function, fit a stop-cock to the gas supply.

3.5 Supply and drainage connections

3.5.1 Supply connections

Power supply

The mains power connection is located on the right side of the main control cabinet.

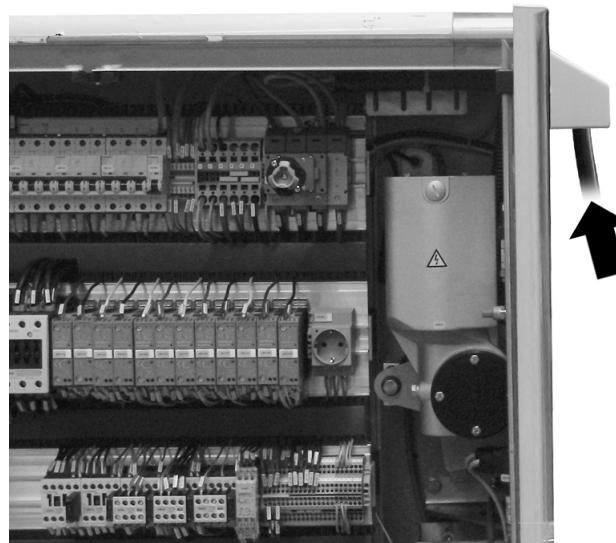


Fig. 257: Power supply

Central compressed air connection

The central compressed air connection is located at the machine out-feed.



Fig. 258: Central compressed air connection

Cooling water inlet

The cooling water inlet is located at the machine outfeed.

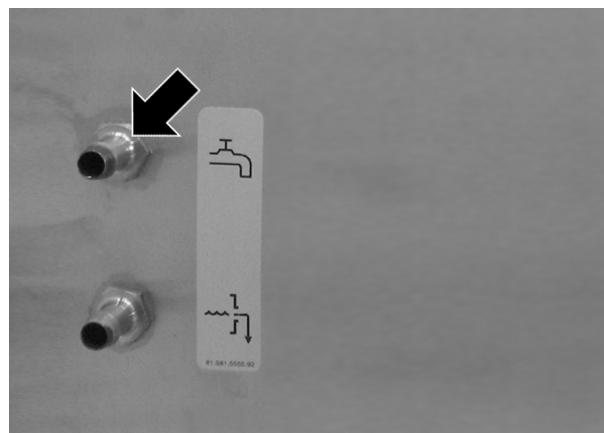


Fig. 259: Cooling water inlet

3.5.2 Drainage connections

Cooling water outlet

The cooling water outlet is located at the machine outfeed.

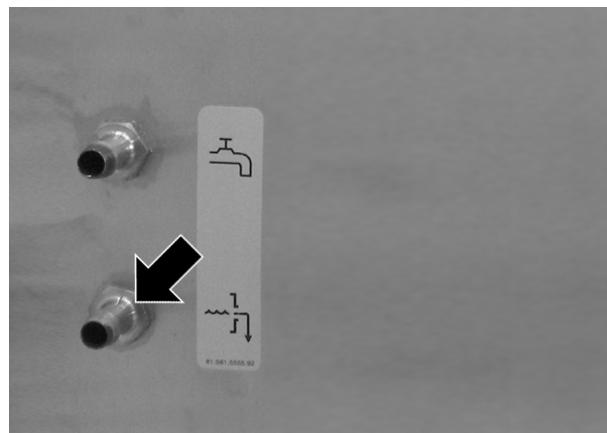


Fig. 260: Cooling water outlet

Exhaust air discharge collection

The exhaust air discharge collection is located behind the side panel in the area of the sealing die.

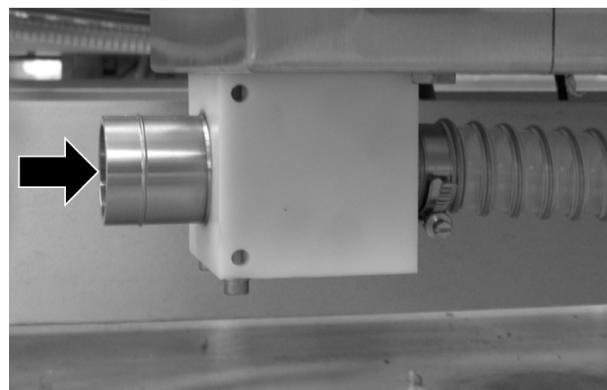


Fig. 261: Exhaust air discharge collection

3.6 Connecting to the power supply

DANGER

Dangerous voltage!

There are live components in the control cabinet that are still under a dangerous voltage even after the main switch has been switched off.

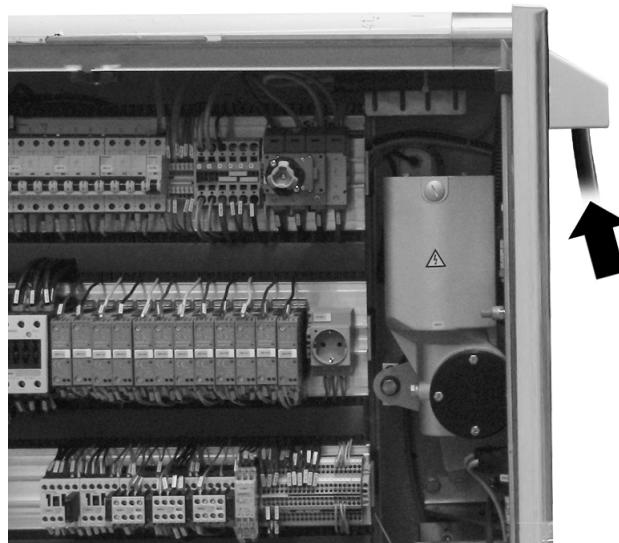
Touching live components will result in death or serious injury.

- Only qualified electricians are permitted to work on live components. Electric lines marked in orange are live.
- Do NOT touch damaged cables but have them replaced immediately by a qualified electrician.
- Before starting any work on live components, disconnect the machine's power supply from the mains electricity.

**Info**

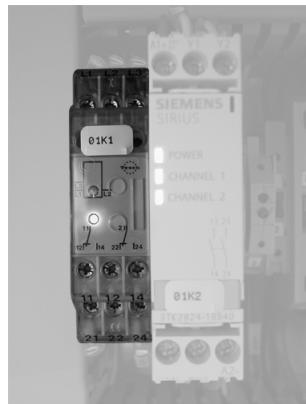
Only electrical lines with a copper conductor are permitted for the electrical connection.

1. Switch off the main switch and attach a lock to prevent unauthorised start-up.
2. **NOTICE** – If the mains voltage of the machine does not match that of the mains electricity, the machine will be overloaded. This can lead to damage of the machine.
 - Only connect the machine to the mains electricity, if the voltages are identical.
3. Check the nominal voltage on the type plate and compare it with the voltage of the mains.
4. Lay the supply line into the control cabinet and connect it to the terminals, observe the electrical circuit diagrams.



5. Switch on the main switch.

-
6. Check the phase sequence at the phase sequence relay (01K1) in the control cabinet.



- ✓ Green light emitting diode lights up: phase sequence is correct.
- ✓ Green light emitting diode does not light up: two phases of the line are interchanged or the fuse is defective.

-
7. Switch off the main switch and attach a lock to prevent unauthorised start-up.
 8. Secure the line with a cord grip.
-

**Info**

To operate an external vacuum pump or to connect external auxiliary units, such as printers or infeed units, observe the electrical circuit diagram.

3.7 Connecting the cooling water

NOTICE**Material damage!**

Unsuitable materials in the cooling water circuit can cause corrosion.

Corrosion can destroy the machine.

- Use only stainless steel, aluminium or plastic for the cooling water circuit.

**Info**

When connecting the cooling water, observe the following:

If water backs up at the outlet, the water pressure at the inlet is too low. Set the water pressure between inlet and outlet to a pressure difference of at least 1.5 bar (21.76 psi).

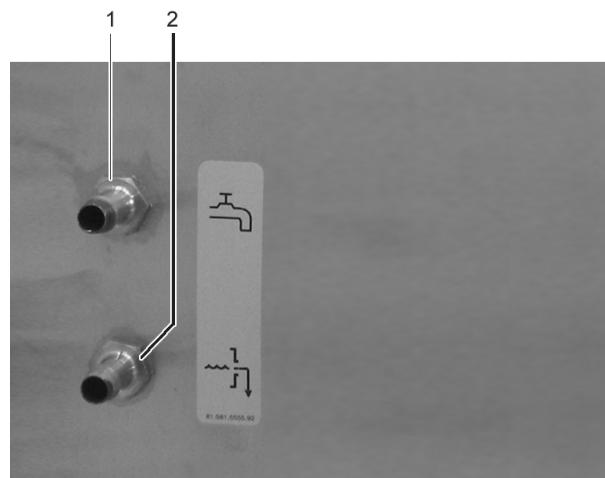


Fig. 262: Cooling water connection for the packaging machine

- 1** Cooling water inlet for the packaging machine
- 2** Cooling water outlet for the packaging machine

Preparing the cooling water connection

1. Ensure that the cooling water cannot flow back into the drinking water circuit:
 - 1.1 Possibility 1: Install a backflow preventer in the cooling water inlet.
 - 1.2 Second option: separate the cooling water circuit from the drinking water circuit.

Connecting cooling water

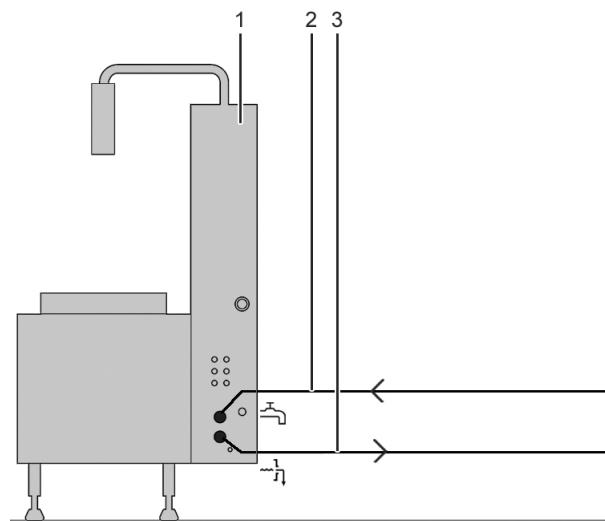


Fig. 263: Connecting cooling water

- 1** Packaging machine
- 2** Cooling water inlet
- 3** Cooling water outlet

-
1. Connect the cooling water inlet for the packaging machine to the water supply inlet using a hose.
Use a hose which is opaque for ultraviolet light.

 2. Route the cooling water outlet from the packaging machine into a drain.

 3. Fasten all hoses with hose clamps.

 4. Set the temperature monitoring of the cooling water.
Temperature monitoring of the cooling water is explained under "Other settings".
-

3.8 Connecting heat exchanger

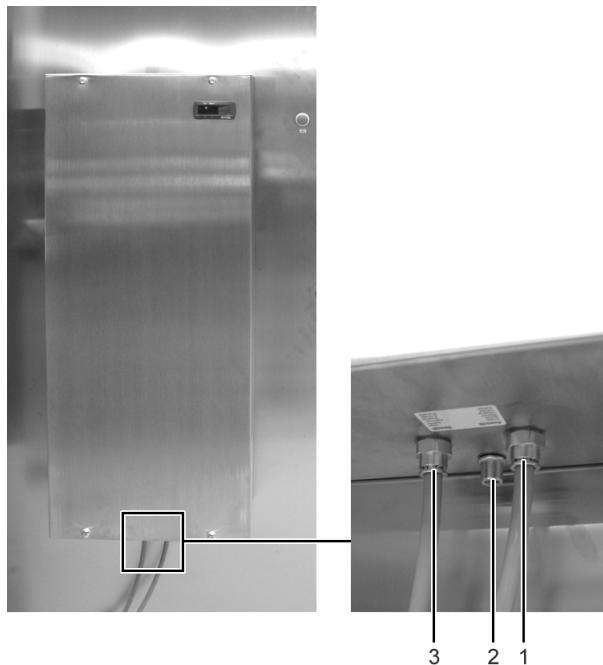


Fig. 264: Heat exchanger cooling water connection

- 1 Cooling water outlet
2 Condensate outlet
3 Cooling water inlet

-
1. Close the stop-cock for the cooling water inlet.

 2. Slide a hose for the condensate outlet onto the condensate nozzles of the heat exchanger.

 3. Fasten the hose with a hose clamp.

 4. Guide the hose with a slope into a drain, do not form any bends.
-

-
5. Connect the cooling water inlet of the thermoforming packaging machine with the cooling water inlet of the heat exchanger.

 6. Connect the cooling water outlet of the thermoforming packaging machine with the cooling water outlet of the heat exchanger.

 7. Open the stop-cock for the cooling water inlet.
-

3.9 Connecting the compressed air

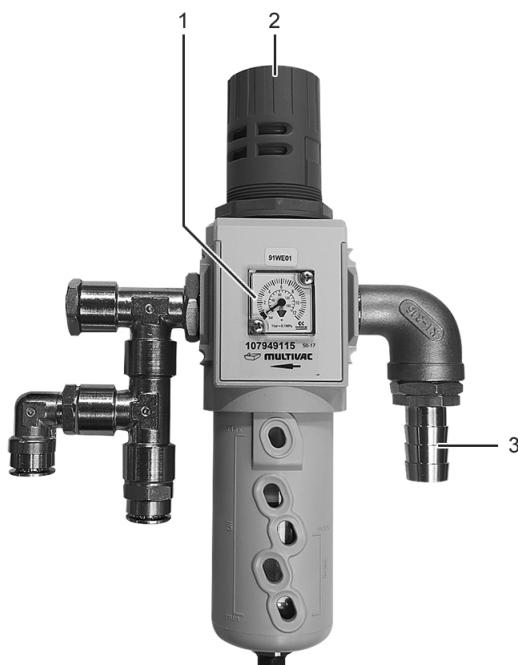


Fig. 265: Air preparation unit compressed air

- 1 Manometer
- 2 Regulator
- 3 Compressed air connection

-
1. Attach the compressed air hose to the compressed air connection.

 2. Fasten the compressed air hose with hose clamps.

 3. Open the stop-cock for the compressed air supply.

 4. Check the system pressure on the manometer of the air preparation unit.

 5. If necessary, adjust the system pressure, see Section 5.1 "ADJUSTING THE COMPRESSED AIR".
-

3.10 Attaching the central exhaust unit

**Info**

- The connection for the central exhaust unit is located in the area of the sealing die. The attachment point can vary for special versions of the machine.
- For larger exhaust volumes, further connections can be attached.

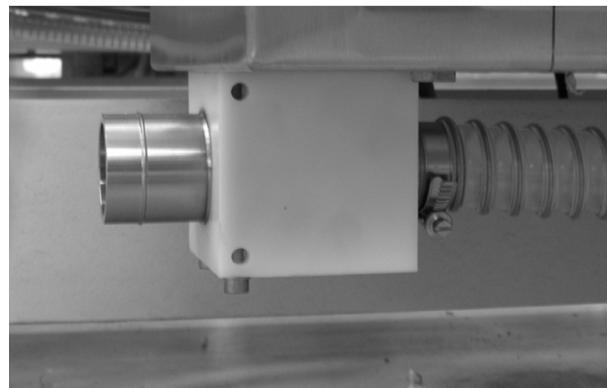


Fig. 266: Attachment of central exhaust

-
1. De-energise the machine, see Section 5.2 "DE-ENERGISING THE MACHINE".
 2. Open the locks of the side panel in the area of the sealing die.
 3. Fold open the side panel and remove it.
 4. Move the exhaust hose to the central exhaust attachment.
 5. Fasten the exhaust hose with hose clips.
 6. Attach the side panel.
 7. Close the lock mechanisms.
-

3.11 Putting vacuum pump into operation

3.11.1 Taking Mink MM xxxx vacuum pump into operation

**Vacuum pump Mink
MM11xx**

DANGER

Dangerous voltage!

There are live components inside the vacuum pump.

Touching live components will result in death or serious injury.

- The vacuum pump must only be connected to the mains electricity by a trained and qualified electrician.
- Only qualified electricians are permitted to work on live components.
- Do NOT touch damaged electrical lines. Have them replaced immediately by a qualified electrician.

DANGER

Danger of explosion!

Operating the vacuum pump in a potentially explosive atmosphere can result in explosion due to hot machine parts.

Explosions can cause serious injuries or even death.

- Do NOT use the vacuum pump in rooms which are exposed to explosion hazards.

NOTICE

Material damage!

Incorrect connection of external vacuum pumps or auxiliary units, e.g. printers or infeed units, will lead to damage.

The machine or the auxiliary units can be damaged.

- Have external vacuum pumps or auxiliary units connected by a trained and qualified electrician.
- Observe the electrical circuit diagram.

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.

2. If the vacuum pump is installed outside the machine, set up and connect the vacuum pump in accordance with the manufacturer's documentation.

2.1 Follow the electrical circuit diagram and pneumatic diagram for the packaging machine.

2.2 Put the external vacuum pump into service in accordance with the manufacturer's documentation.

3. Ensure that the connections of the vacuum pump are not closed.

4. Perform the visual inspection of the vacuum pump. See Section 7.11 "VACUUM PUMPS" on page 515.
 5. Check the fill level of the gear oil. See Section 7.11 "VACUUM PUMPS" on page 515.
-

3.12 Cleaning the machine (basic cleaning)

1. Remove all protective films, which are used to protect the machine against scratches.
 2. After putting the machine into service, carry out intensive cleaning. See Section 6 "CLEANING" on page 438.
-

**Info**

The machine is only to be used for production after basic cleaning.

3.13 Create some test packs

1. Create test packs as described in the "Operation" chapter.
 2. Check the packs. See Section 1.8.16 "CHECKING THE PACKS" on page 31.
-

4 Operation

**SAFETY
INSTRUCTIONS**

4.1 Checks before switching on

1. Ensure that the machine is externally undamaged.
2. Ensure that all safety devices are attached and undamaged. See Section 1.10 "SAFETY DEVICES" on page 55.
3. Ensure that all safety devices are functioning. See Section 7.8 "TESTING SAFETY DEVICES" on page 503.
4. Ensure that all control cabinets are closed.
5. Ensure that all components, which were removed for cleaning or service work, are installed again.
6. Ensure that there are no objects on the safety guards and safety tunnel.
7. Ensure that the dies are fitted.
8. Ensure that all labels are attached and undamaged, see Section 1.11 "SAFETY SIGNS AND INFORMATION LABELS".
9. Ensure that there is sufficient oil in the vacuum pump.
10. Ensure that compressed air is available.
 - 10.1 Ensure that the compressor is switched on.
11. Ensure that cooling water is available.
 - 11.1 Ensure that the stop-cock for the cooling water inlet is open.
12. Ensure that the machine is cleaned and disinfected.
13. Ensure that the edge trims are threaded into the winders provided for them.

**Info**

Due to optional equipment on the machine, other checks might be necessary.

4.2 Switching on the machine

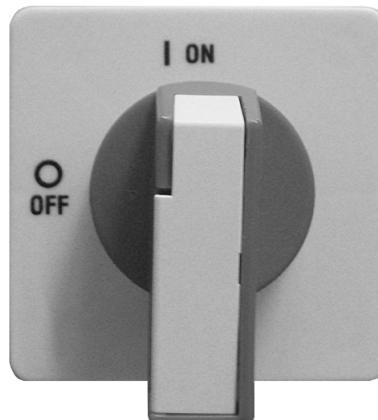


Fig. 267: Main switch I / ON

WARNING

Injury hazard!

Missing components can result in unprotected danger zones. Reaching into unprotected danger zones can lead to serious injuries.

- Before switching on the machine, always refit all components that were removed for the work, such as for cleaning or service, after the work has been completed.

-
1. Open the stop-cock for the compressed air supply.
 2. Turn on the main switch.
 - ✓ The heaters heat up to the set target temperatures (requires about 10 to 20 minutes).
 - ✓ The "Production" page appears.
 - ✓ The machine is ready for operation.
-

4.3 Switching off the machine

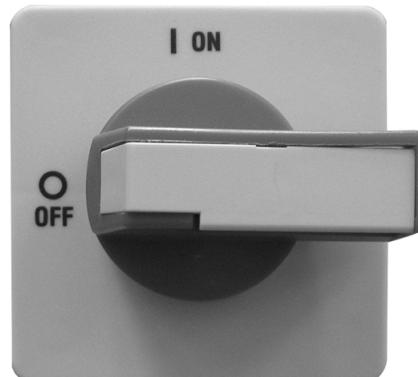


Fig. 268: Main switch O/Off

-
1. Turn off the main switch.
 - ✓ The power supply, compressed air supply line and cooling water inlet are shut off.
 - ✓ The control cabinet heater (optional) and service socket may still be live.
-

**SAFETY
INSTRUCTIONS**

Repairs and service work

-
1. Before starting any repairs or service work, turn off the main switch and attach a lock to prevent unauthorised start-up.



4.4 Operating the display

1. Lightly touch certain areas of the display, e.g. buttons, with a fingertip or small, blunt object made of plastic.
 - ✓ The field touched changes colour.
 - ✓ The cursor moves to the touched area.

4.4.1 Calling up displays



Info

The following menu trees are shown as a reference. They are only to be taken as examples that can vary, depending on the machine equipment.

Call up displays via the navigation bar

-
1. Touch the required button on the navigation bar.
 - ✓ The selected display appears.
-

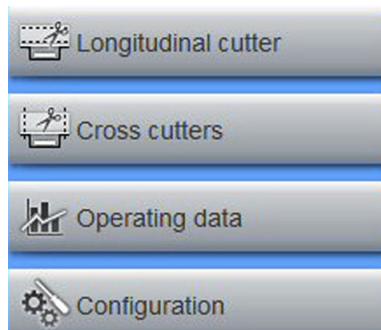
Call up displays via a menu

Buttons with a small delta at the bottom left lead to a menu.



Fig. 269: Main menu button

1. Touch the button of the required menu on the navigation bar.
✓ The selected menu appears.
2. In the menu touch the button of the required device or function.
- 2.1 If several pieces of equipment are grouped on a single button, touch the button of the required equipment or function in the intermediate menu.



- ✓ The display of the relevant device or function appears.

Call up displays directly

The content of the "Production" and "Wizard" displays varies depending on the equipping of the machine.

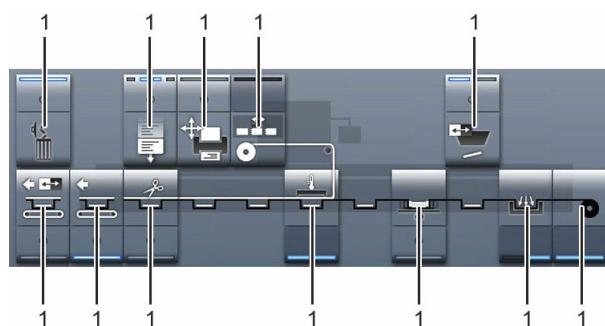
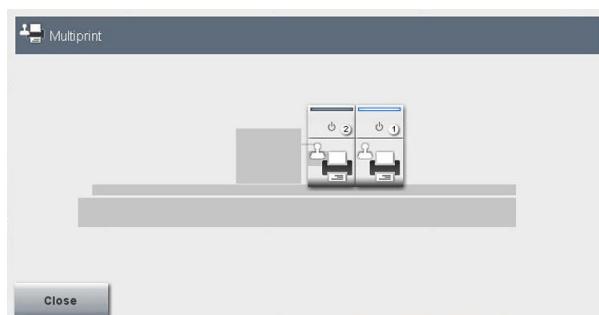


Fig. 270: Production/Machine section

- 1 <Film trim removal> button
- 2 <Register mark control> button
- 3 <Synchronisation> button

- 4 Button for <Film transport system, lower web>
- 5 <Forming station> button
- 6 <Sealing station> button
- 7 <Cutting unit> button
- 8 <Discharge unit> button

-
1. Touch the <Production> button or <Wizard> button on the navigation bar.
 - ✓ The corresponding "Production" display or "Wizard" display appears.
 2. On the depicted machine touch the button of the required device.
 - 2.1 If several devices are grouped on a single button, touch the button of the required device in the intermediate window.



- ✓ The display of the relevant device or function appears.
-

4.4.2 Making display areas visible

Scrolling in tables



Fig. 271: Scroll bar

-
1. If a scroll bar appears at the right or bottom edge of a table, touch the buttons with the arrows or touch and drag the bar.
 - ✓ The table content is moved.
 - ✓ Other table columns or table lines become visible.

4.4.3 Switching functions and equipment on and off



Info

- **Functions:**

Functions are activated in the relevant displays and thereby switched on.

- **Equipment:**

- Equipment is activated in the relevant displays.
- They are switched on in the "Production" display or "Wizard" display with the <On/Off> equipment buttons.
- They are started with the machine by pressing the <l> key.

Activate and deactivate

-
1. Call up the desired display on the screen. See Section 4.4.1 "CALLING UP DISPLAYS " on page 296.

2. Activate the function or equipment.



- 2.1 Touch the <On/Off> button of the relevant device or function.

- ✓ The relevant equipment or function is activated.
- ✓ The status of the button is adopted into the recipe memory when the recipe is saved.
- ✓ The button changes the status to ON.



- 2.2 Touch the empty box of the relevant device or function.



- ✓ The relevant equipment or function is activated.
- ✓ The status of the box is adopted into the recipe memory when the recipe is saved.
- ✓ A check mark appears in the box.



Switching on and off

- Equipment can be switched on and off in the "Production" display and in the "Wizard" display.
- The equipment can only be switched on, if it is activated in the relevant display.

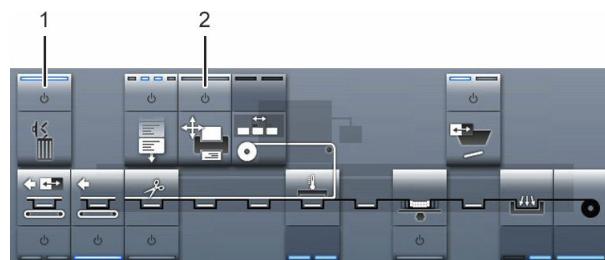


Fig. 272: Production/Machine section

1 Button for <Equipment On/Off> status ON

2 Button for <Equipment On/Off> status OFF

If several pieces of equipment are grouped on a single button, the <Equipment On/Off> button will depict the corresponding number of status displays.



Fig. 273: On/Off button, 4 status displays



1. Touch the <Production> button on the navigation bar.

✓ The "Production" display appears.

Production

Switching on the individual equipment

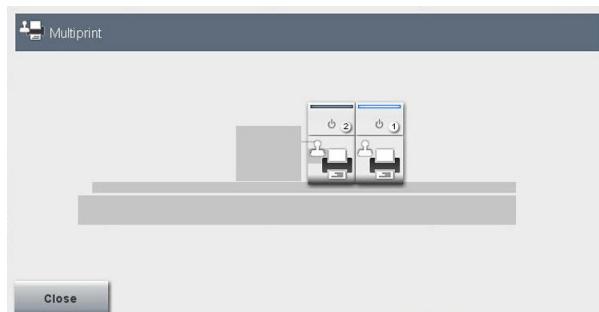
1. In the "Production" display touch the <Equipment On/Off> button of the relevant equipment.

✓ The relevant device is switched on.

✓ The status display in the button lights up.

**Switching on grouped equipment**

1. In the "Production" display, touch the button with the icon for the relevant equipment.
✓ An intermediate window with individual <Equipment On/Off> buttons appears.



2. In the intermediate window, touch the <Device On/Off> button of the relevant device.
✓ The status display in the button lights up.



3. Touch the <Close> button.



4. In the "Production" display touch the <Equipment On/Off> button of the relevant equipment.
- ✓ The relevant device is switched on.
 - ✓ The relevant status display in the button lights up.

Start



Info

Particular equipment, such as the spools of the edge trim winder, must be started and stopped during the operation of the machine. These are started and stopped directly at the device.

4.4.4 Entering inputs

Entering values directly

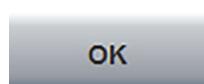


Fig. 274: Value input box

1. Touch the input box.
- ✓ A numeric keypad appears.



-
2. Enter the desired value directly on the keypad. Observe the displayed value range.



-
3. Confirm the entry with the <OK> button.
- ✓ The keypad is closed.
 - ✓ The new value appears in the input box.
-

Alteration in percentage



Fig. 275: Icon for Alteration in percentage

Parameter

Various parameters are displayed in percentages, e.g.:

- Speed.
- Acceleration.
- Power.
- Frequency

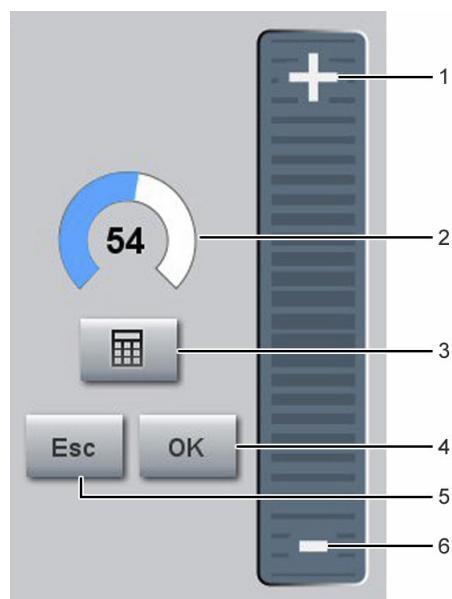


Fig. 276: Alteration in percentage

- 1 <+> Increase value
- 2 Display in percentage
- 3 <Enter value> Enter value directly
- 4 <OK> Confirm input
- 5 <Esc> Abort the process
- 6 <-> Decrease value



1. Touch the <Alteration in percentage> button.
✓ The "Alteration in percentage" display appears.



2. Changing the value:

- 2.1 1st possibility: In the <+/-> box stroke upwards or downwards with your finger.
✓ The new value appears in the display.
 - 2.2 2nd possibility: Touch the <+> button or the <-> button and hold it.
✓ The new value appears in the display.
 - 2.3 3rd possibility: Touch the <Enter value> button and enter the desired value directly on the keypad.
-
3. Touch the <OK> button to confirm the new value.

Motion profile

The parameters of the drive are altered in a motion profile in conjunction with each other.

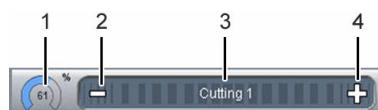


Fig. 277: Change in the motion profile

- 1 Display of this value in percentage
- 2 <-> Decrease the drive settings in conjunction with each other
- 3 Name of the electric drive
- 4 <+> Increase the drive settings in conjunction with each other

-
1. Changing the value:
 - 1.1 1st possibility: In the <-/+> box stroke to the left or right with your finger.
 - 1.2 2nd possibility: Touch the <-> button or the <+> button and hold it.
✓ The new value appears in the display.

Entering text



Fig. 278: Example: text input box.

-
1. Touch the input box.
 - ✓ An alphanumeric keypad appears.



-
2. Enter the desired text directly on the keypad.
 3. Confirm the entry with the <OK> button.
 - ✓ The keypad is closed.
 - ✓ The new text appears in the input box.
-

OK

4.4.5 Selecting operating modes and processes



Info

Option boxes are used for selecting operating modes and processes. There can only ever be one operating mode or one process selected.



Fig. 279: Option boxes

-
1. Touch the desired option box.
 - ✓ The active display changes to the option box touched.
 - ✓ The display content of the relevant display corresponds to the selected function.
-

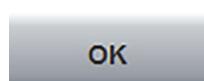
4.4.6 Changing temperature

Change target temperature



Fig. 280: Temperature section

1. Touch the *Target* input box.
 - ✓ The numerical keypad appears.
2. Enter the desired temperature.
3. Touch the <OK> button
 - ✓ The target temperature is changed.
4. To switch on the heating zone touch the <On/Off> button.
 - ✓ The button changes the status to ON (lights up).



Adjusting the temperature monitoring



Fig. 281: Temperature section



1. Touch the <Perform> button.
 - ✓ The "Change temperature" display appears.



2. In the *Positive tolerance range* input box enter the permitted deviation upwards in temperature.

-
3. In the *Negative tolerance range* input box enter the permitted deviation downwards in temperature.

 4. In the box for *Stop with temperature outside temperature range* define whether the machine should stop or whether only a diagnostic message should appear.

 5. Touch the <OK> button.
 - ✓ The "Change temperature" display is closed.

 6. To switch on the heating zone touch the <On/Off> button.
 - ✓ The button changes the status to ON (lights up).



4.5 Language selection

1. Touch the <Access> button in the navigation bar.


2. Touch the <Perform> button below next to the national flag.
 - ✓ The "Language selection" display appears with option boxes and national flags.

3. Touch the option box next to the national flag for the language you want.

4. Close the language selection window.
 - 4.1 Touch the <OK> button to confirm the selection.
 - ✓ The display changes to the selected language.
 - 4.2 To cancel the selection, touch the <Cancel> button.
 - ✓ The previously selected language remains activated.



4.6 Select and block access right, Alter password



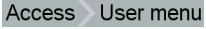
Info

The access rights are protected.

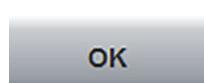
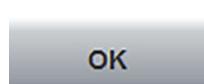
- Standard: password protection.
To avoid unauthorised operation, the passwords should be changed by the respectively authorised personnel.
Factory setting:
 - *Set-up personnel*: 1234
 - *Service*: 9999
 - *Administrator*: 2111
 - *User*: no password

4.6.1 Selecting access authorisations



1. Touch the <Access> button in the navigation bar.
 - ✓ The "Access/User menu" tab appears.

2. Touch the desired access right.
 - ✓ The input dialog for the selected access right appears.

Entering the password manually



1. Touch the input box.
 - ✓ A keypad appears.
2. Enter the password on the keypad and confirm with the <OK> button.
3. Touch the <OK> button.
 - ✓ The input dialog closes.
 - ✓ The selected access right appears on the <Access> button.

4.6.2 Resetting access right



Info

If the automatic logoff for the access right is activated, the access right is reset after the set time. The access right with the least rights appears on the display.



1. Touch the <access> button in the navigation bar.
 - ✓ The "Access/User menu" display appears.

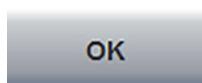
2. Reset the access right.
 - 2.1 Standard user administration: Touch the *User* access right.
 - ✓ The access right with the least rights appears in the <Access> button.

4.6.3 Change password



1. Touch the <Access> button in the navigation bar.
 - ✓ The "Access/User menu" tab appears.

2. Set the desired access right.
3. In the display "access / user menu", touch the <change password> button.
 - ✓ The input dialog for the selected access right appears.
4. Touch the *old password* input box.

-  **OK**
-
5. Enter the old password and confirm with the <OK> button.
-
-  **OK**
-
6. Touch the *new password* input box.
-
7. Enter the new password and confirm with the <OK> button.
-
-  **OK**
-
8. Touch the *repeat new password* input box.
-
9. Enter the new password again and confirm with the <OK> button.
-
-  **OK**
-
10. Conclude the process.
- 10.1 Touch the <OK> button to confirm the password change.
- ✓ The input dialog closes.
 - ✓ The password has been changed.
- 10.2 To cancel the password change, touch the <Cancel> button.

**Info**

If self-selected passwords are no longer available, these can be reset with the *administrator* access right.

4.7 Working with recipes

4.7.1 Calling up recipe management



1. Touch the <Recipe> button on the navigation bar.
 - ✓ The display for "Recipe / Recipe management tab" appears.

 Recipe Recipe management

4.7.2 Loading a recipe

**Info**

When loading a recipe, all inputs are overwritten by the new recipe. Therefore, save all current inputs before calling up a new recipe!



1. Call up recipe management in the display.
 2. Touch the desired recipe in the *Recipe selection* list.
 3. Touch the <Load recipe> button.
-
-  **OK**
-
4. When the "Load recipe" display appears, touch the <OK> button, if the current settings are no longer required or if these have already been saved.

OK

- 4.1 If the message *Old recipe version called up, please check* appears, touch the <OK> button again and check the recipe.
- ✓ The selected recipe is loaded.
 - ✓ The recipe name then appears in the *loaded recipe* box.

4.7.3 Save recipe

Overwriting recipes



Info

The *Status* table column shows write-protected recipes with a lock. Write-protected recipes can only be overwritten with the *Service* access right. If the current access right is lower, a warning message appears when the recipe is overwritten.

-
1. Call up recipe management in the display.



2. Touch the <Save recipe> button.

- ✓ The display for "Please enter recipe name" appears.

OK

3. If the recipe name in the input box is correct, touch the <OK> button.

- ✓ The "Save recipe" display appears.

- ✓ If a warning message appears, a write-protected recipe is due to be overwritten.

OK

4. Touch the <OK> button again.

- ✓ The currently loaded recipe is saved with the newly entered values.

Saving new recipes



-
1. Call up recipe management in the display.



2. Touch the <save recipe> button.

- ✓ The display for "Please enter recipe name" appears.

3. Touch the input box.

- ✓ A keypad appears.



4. Delete the existing recipe name in the input box with the <Delete> button.

OK

5. Enter the new recipe name on the keypad and confirm with the <OK> button.

- 5.1 If the current access right is *Service*, activate the *Write-protected recipe* box if required.

OK

6. In the display for "Please enter recipe name", touch the <OK> button.

OK

- 6.1 If using an already existing recipe name, touch the <OK> button again.
- ✓ The recipe is saved.
 - ✓ The saved recipe appears in the *recipe selection* and in the *Loaded recipe* box.

4.7.4 Delete recipe

OK



1. Call up recipe management in the display.
2. Touch the recipe in the *recipe selection* that you wish to delete.
3. Touch the <delete recipe> button.
 - ✓ The "delete recipe" display appears.
4. If the recipe is no longer needed, touch the <OK> button.
 - ✓ The recipe has been deleted.
 - ✓ The recipe name disappears from the *recipe selection* list.

4.8 Starting and stopping the machine

4.8.1 Starting the machine

1. Perform the checks before switching on the machine. See Section 4.1 "CHECKS BEFORE SWITCHING ON" on page 294.
2. Switch on the machine. See Section 4.2 "SWITCHING ON THE MACHINE" on page 295.
3. Insert the upper web and lower web. See Section 4.9 "INSERTING FILM AND FEEDING FILM" on page 314.
4. Switch on the required devices in the <Production> page.
 - ✓ The selection remains activated even after the main switch is turned off.
5. Load the recipe.
See Section 4.7 "WORKING WITH RECIPES" on page 309.
6. Wait until the heaters have reached the set target temperatures.

4.8.2 Starting the machine after faults

**Info**

After faults have occurred, the status of the machine is not clearly defined. It is unclear whether the packs have been correctly evacuated, sealed and cut.

Power failure

1. Check whether products have slid out of the pack cavity.
2. Mark all packs in the machine.
3. Acknowledge diagnostic messages with the <O> or <I> key.
4. After a lengthier period of downtime, wait for the dies to heat up.
5. Check the marked packs.

EMERGENCY STOP pressed

1. Eliminate the hazard.
2. Check whether products have slid out of the pack cavity.
3. Mark all packs in the machine.
4. Make sure that no other persons are near the machine.
5. Unlock EMERGENCY STOP.
6. Acknowledge diagnostic messages with the <O> or <I> key.
7. After a lengthier period of downtime, wait for the dies to heat up.
8. Check the marked packs.

4.8.3 Delaying machine start



1. Touch the <Main menu> button on the navigation bar.



2. Touch the <Other settings> button in the Main menu.
 - ✓ The display for "Other settings / setting tab" appears.
Main menu > Other settings > Settings
3. Enter the desired delay time under *machine start delay time*.
 - ✓ The start of the advance and the closing of the dies is delayed by this amount of time after pressing the <I> key.



Info

The optional output *Signal horn start delay* is switched during this time. A signal horn or signal lamp can be connected to this output, for example.

4.8.4 Running the machine empty

4.8.5 Starting stand-by mode

This function can be configured online.



1. Touch the <Wizard> button on the navigation bar.

✓ The "Wizard/production tab" display appears.

Wizard Production



2. Start the *Stand-by mode* wizard.

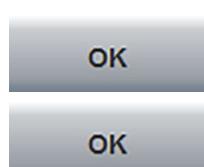
✓ The "Stand-by mode" display appears.



3. Select the desired pause time.

4. If the desired pause time is not contained in the list, enter a new pause time.

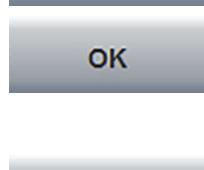
- 4.1 Touch the <Perform> button.



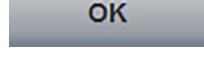
- 4.2 Touch the input box for the desired time.

✓ A keypad appears.

- 4.3 Enter the desired time on the keypad and confirm with the <OK> button.



- 4.4 Touch the <OK> button again.



- 4.5 Select the new pause time.

5. Touch the <OK> button.

✓ The diagnostic message *Stand-by mode* appears.
✓ The display time elapses in the *Stand-by mode* wizard.
✓ Before the pause time expires, the heaters are warmed back up to the operating temperature and the cooling water inlet is reopened. If the *Warm-up mode* function has been selected for the vacuum pumps, they will be automatically switched on.



6. To cancel *Stand-by mode* prematurely, stop the *Stand-by mode* wizard.

4.8.6 Stopping the machine



Info

If the suction unit and vacuum pump are required to switch off immediately, press the <O> key twice briefly.

4.9 Inserting film and feeding film

⚠WARNING

Injury hazard!

The web rolls are heavy.

Carrying heavy web rolls can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.

⚠CAUTION

Injury hazard!

The web rolls are heavy.

Limbs can become trapped when sliding the web roll on.

- Slide the web roll carefully onto the film unwind.
- Do NOT reach between the web roll and fixed parts.

⚠CAUTION

Injury hazard!

The film edges can be sharp.

Touching the film edges can lead to injuries.

- When performing any work wear personal protective equipment.

4.9.1 Determining the sealable side of the film



Info

- The sealable side of the lower web must face upwards in the die.
- The sealable side of the upper web must face downwards in the die.

Using a film marker

1. Use a film marker to mark the inner and outer sides of the film.
 - ✓ If the marking is fully visible, this is the non-sealable side.
 - ✓ If the marking crimps, this is the sealable side.

Using a fingernail

1. Scratch with a fingernail on the inner and outer sides of the film.
 - ✓ The sealable side can be roughened and appears milky when held against light.

4.9.2 Insert the lower web

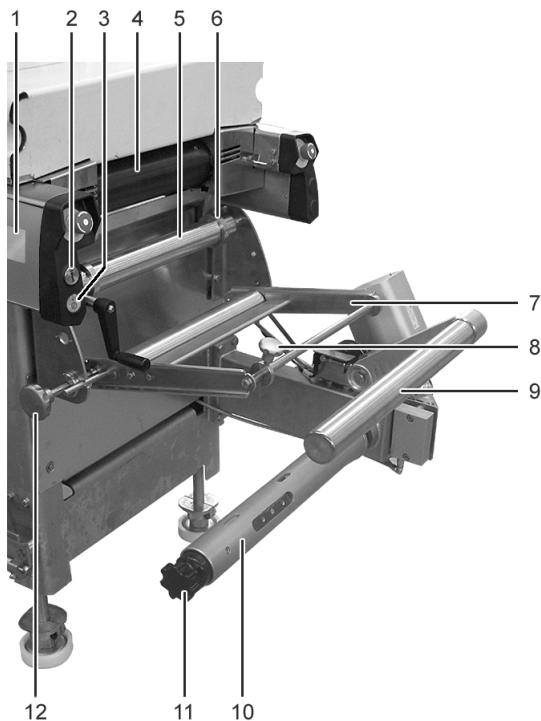


Fig. 282: Film unwind for lower web

- 1** Feeding diagram for lower web
- 2** <Advance> key
- 3** <Web roll clamping> key (option)
- 4** Infeed roller
- 5** Deflection roller
- 6** Guide ring
- 7** Guide
- 8** Handwheel with guide disc
- 9** Swing arm
- 10** Holding mandrel
- 11** Clamp handwheel (option)
- 12** Film run handwheel

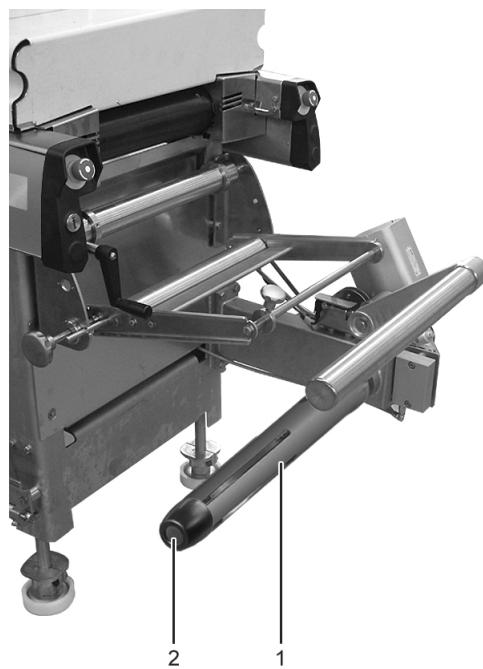
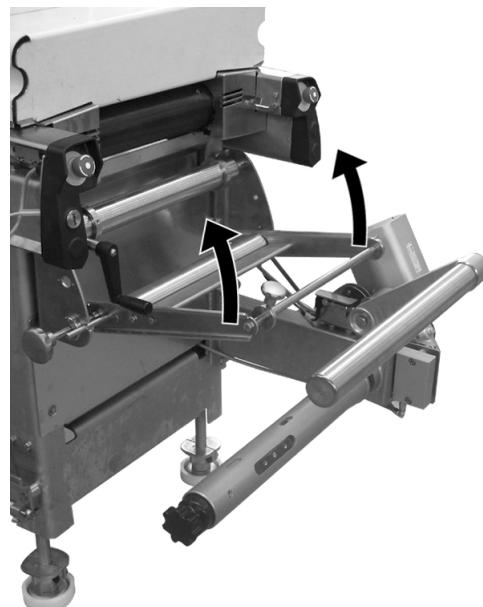


Fig. 283: Film unwind for lower web

- 1** Holding mandrel with pneumatic clamp
- 2** <Web roll clamp> key (option)

1. Pivot the guide upward until it latches.



-
2. Push the web roll onto the holding mandrel until it reaches the end stop. Ensure the sealable side of the film conforms to the feeding diagram for the lower web.



3. Clamping the web roll with the handwheel:
Tighten by turning the handwheel clockwise.



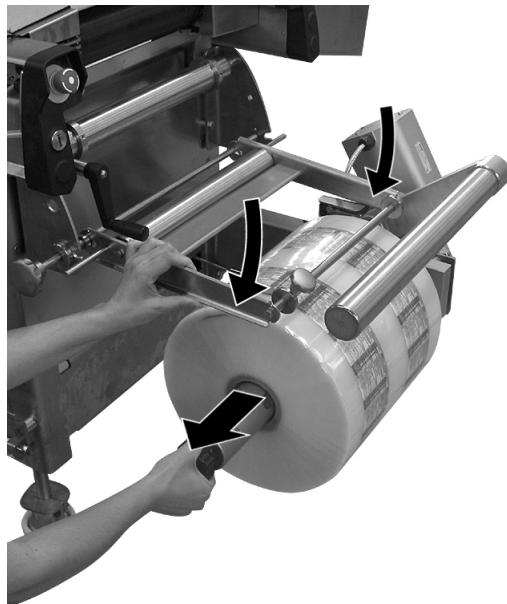
4. **NOTICE** – If the pneumatic clamp is activated without the web roll having been loaded, the wear on the clamp is increased. This can cause the pneumatic clamp to fail.
 - Only activate the pneumatic clamp, if a web roll has been pushed onto the holding mandrel.



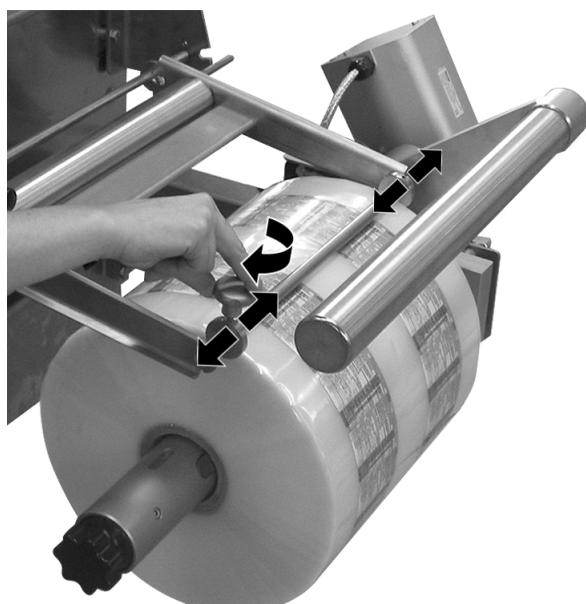
5. Clamping the web roll with the pneumatic clamp:
Press the <Web roll clamp> key on the machine frame.
✓ The LED of the key lights up.



6. Clamping the web roll on a holding mandrel with pneumatic clamp:
Press the <Web roll clamp> key on the holding mandrel.
7. Pull out the holding mandrel with web roll while applying the guide.



8. Adjust the guide discs to the film width and screw them tight.



-
9. Draw off film for threading.



-
- 9.1 Motorised unwinding: Activate the swing arm until 1.5 m (4.92 ft) to 2.0 m (6.56 ft) of film have been unwound.
 - 9.2 Without motorised unwinding: Activate the swing arm and draw off 1.5 m (4.92 ft) to 2.0 m (6.56 ft) of film.
 10. When the film is inserted for the first time, thread it in according to the feeding diagram.
 11. When the film is changed, tape the new film over the old film.
In the case of registered print films, tape the new film on so that it covers the old film exactly.
-

4.9.3 Advancing the lower web

⚠ CAUTION

Injury hazard!

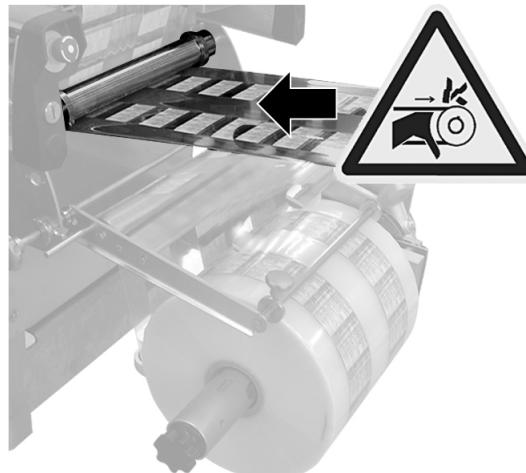
- The swing arm is moved by the web advance.
Limbs can get caught between the swing arm and the machine.
- Exercise caution during all work in the area of the swing arm.



Info

Only advance the lower web with the *Advance* key or the *Manual advance* wizard so that the sealing die does not close. If the sealing die closes without the retracted upper web, the lower web sticks to the sealing plate.

1. When the film is retracted for the first time, place the start of the film on the film infeed roller and slide it about 100 mm (3.94 in) under the safety guard. Do not lift the safety guard when doing so.
2. **WARNING** – The static charge of the film can cause body parts to be pulled in between the deflection roller and the film. This can lead to crushing injuries.



- Do NOT touch the film.
- Do NOT reach between the film and the deflection roller.
- Do NOT wear any loose clothing.
- Wear a hairnet.

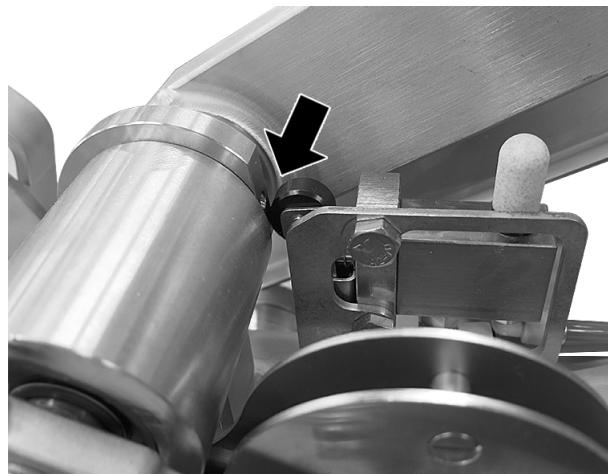


3. Repeatedly press the <Advance> key until the film is on the other side of the forming die.

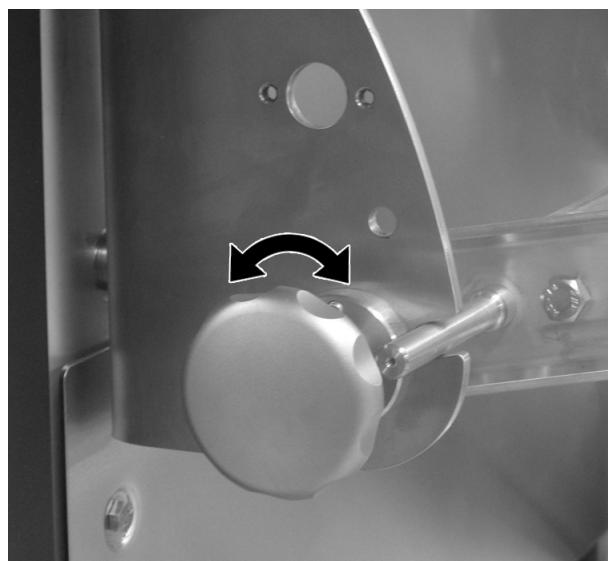


4. Continue running a few cycles using the <advance> key.
5. Check whether the film is fed symmetrically into the transport chains.

- 5.1 **CAUTION** – Limbs can be trapped between the roller lever valve and the trip cam. This can lead to injuries.



- 5.2 • Do NOT reach into the danger zone.
If the film does not run symmetrically into the transport chains, adjust the guide as needed with the handwheel while the web roll is turning.



-
6. Pull the film on the film infeed roller to both sides to remove creases.
-
7. Adjust the guide rings on the deflection roller.
-

4.9.4 Inserting the upper web

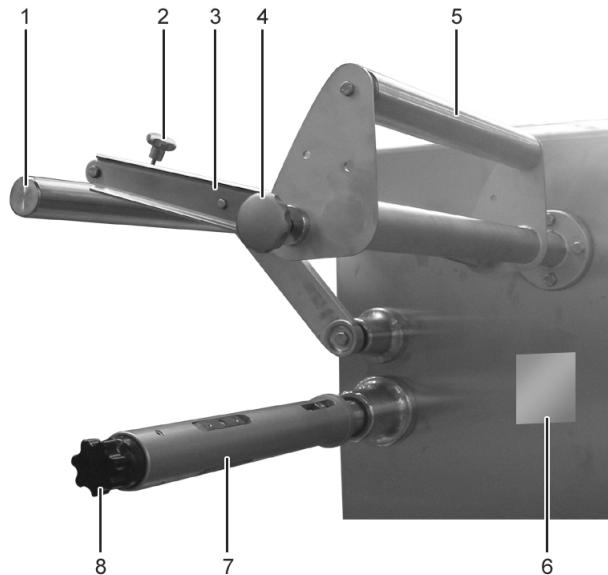


Fig. 284: Film unwind for upper web

- 1 Swing arm
- 2 Guide disc
- 3 Guide
- 4 Handwheel for film run
- 5 Deflection roller
- 6 Feeding diagram for upper web
- 7 Holding mandrel
- 8 Handwheel clamp (Option)

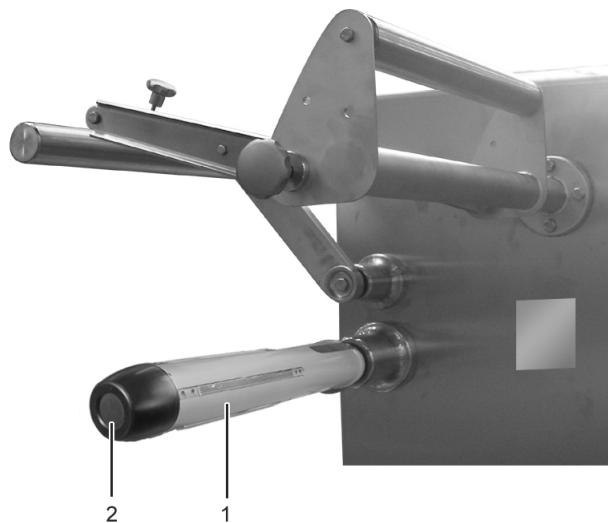
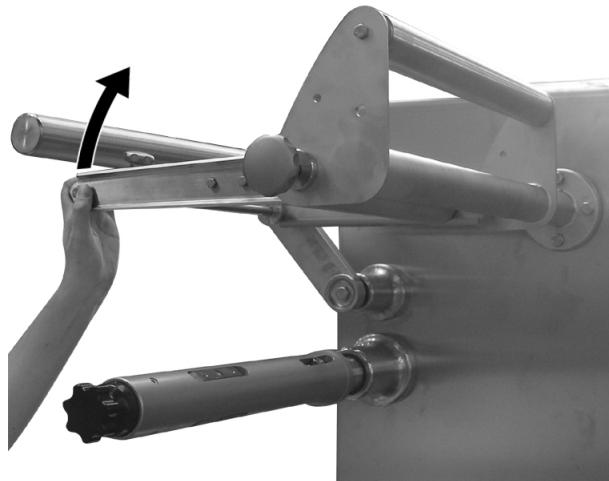


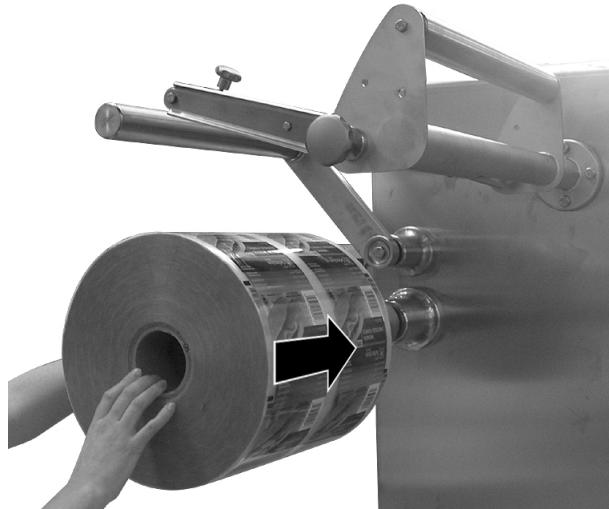
Fig. 285: Upper web film unwind

- 1 Holding mandrel with pneumatic clamp
- 2 <Web roll clamping> key (option)

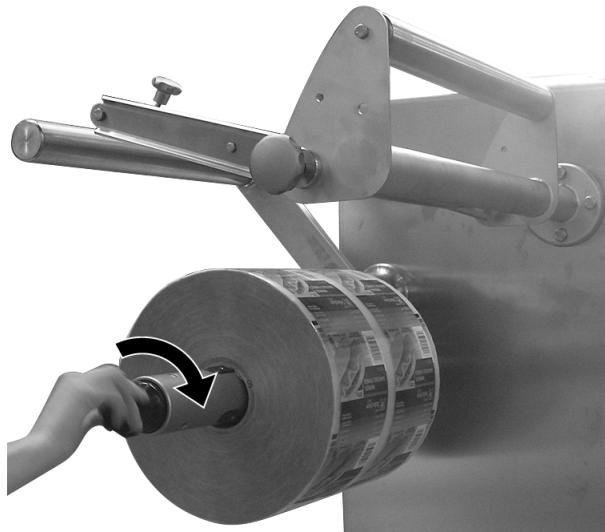
-
1. Swing the guide upwards.



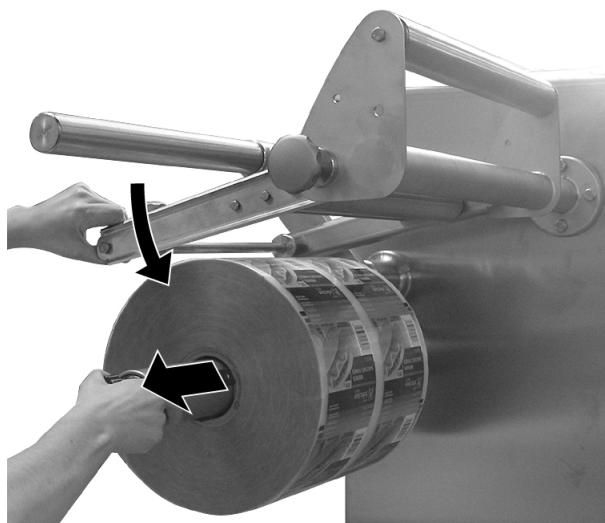
2. Push the web roll onto the holding mandrel until it reaches the end stop. Ensure the sealable side of the film conforms to the feeding diagram for the upper web.



-
3. Clamping the web roll with the handwheel
Tighten by turning the handwheel clockwise.



-
4. **NOTICE** – If the pneumatic clamp is activated without the web roll having been loaded, the wear on the clamp is increased. This can cause the pneumatic clamp to fail.
 - Only activate the pneumatic clamp, if a web roll has been pushed onto the holding mandrel.
 5. Clamping the web roll with the pneumatic clamp:
Press the <Web roll clamp> key on the holding mandrel.
 6. Pull out the holding mandrel with web roll while applying the guide.



-
7. Adjust the guide discs to the film width.



-
8. Draw off film for threading.
 - 8.1 Motorised unwinding: Activate the swing arm until 1.5 m (4.92 ft) to 2.0 m (6.56 ft) of film have been unwound.
 - 8.2 Without motorised unwinding: Activate the swing arm and draw off 1.5 m (4.92 ft) to 2.0 m (6.56 ft) of film.
 9. When the film is inserted for the first time, thread it in according to the feeding diagram.
 10. When the film is changed, tape the new film over the old film.
In the case of registered print films, tape the new film on so that it covers the old film exactly.
-

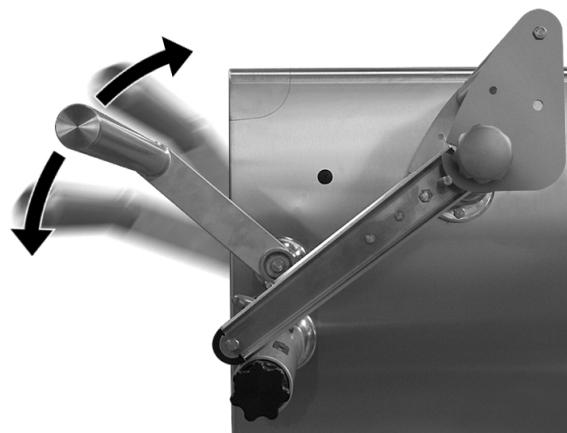
4.9.5 Advancing the upper web

DANGER

Injury hazard!

If the film runs out or the film is severed, the swing arm springs back.

Reaching into or standing in the pivoting range of the swing arm will lead to serious injuries.



- Do NOT stand in the pivoting range.
- Do NOT reach into the pivoting range.

WARNING

Crush hazard!

The static charge of the film can cause body parts to be pulled in between the deflection roller and the film.

This can lead to crushing injuries.

- Do NOT touch the film.
- Do NOT reach between the film and the deflection roller.
- Do NOT wear any loose clothing.
- Wear a hairnet.

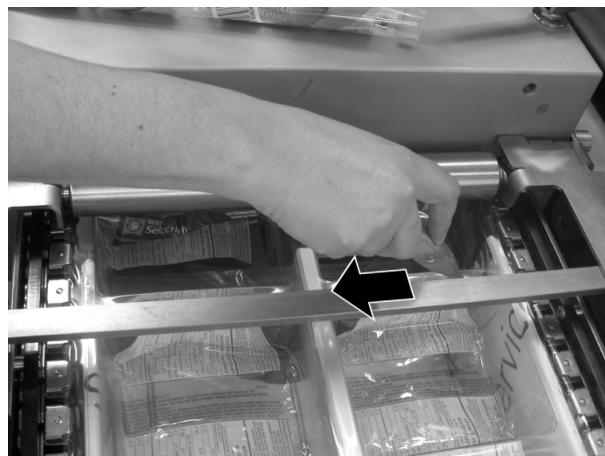
1. When the film is retracted for the first time, proceed as follows:

- 1.1  – The heating plates in the die top section can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off. Touching the heating plates can lead to severe burns.

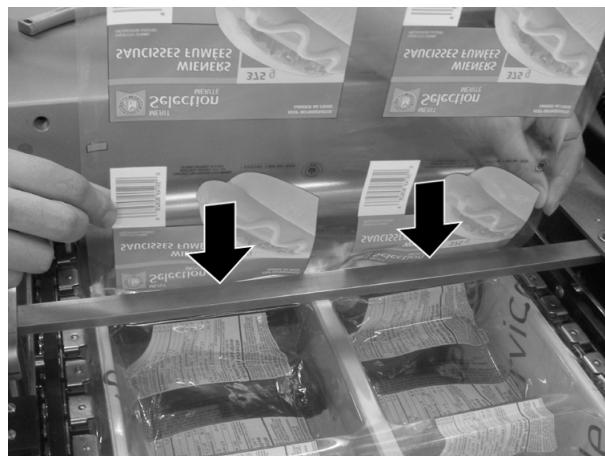
- When performing any work wear personal protective equipment.
- Do NOT touch the heating plates.
- Before starting any work in the danger zone, allow the die top section to cool down.

- 1.2 Remove the safety guard in front of the sealing station.

- 1.3 Cut a slit in the lower web.



- 1.4 Slide about 0.5 m (1.64 ft) of upper web into the slit in the lower web.

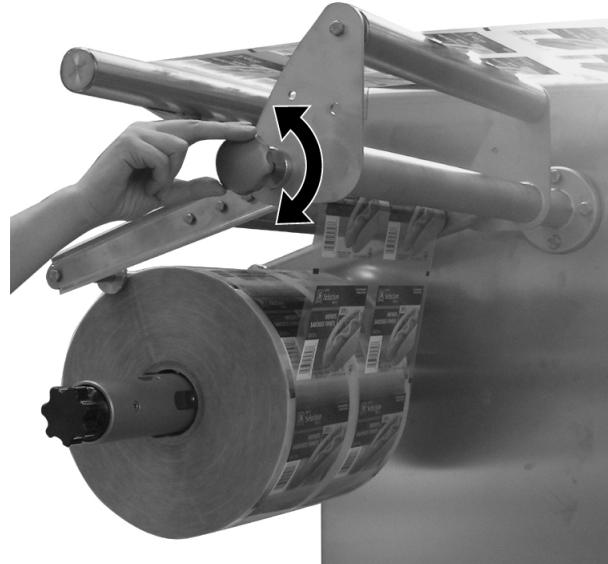


- 1.5 Attach the safety guard.
- 1.6 Acknowledge the diagnostic message.
2. Pull the upper web towards both sides of the film infeed roller to eliminate creases.
3. Set the desired sealing temperature and wait until it has been reached.
4. Touch the <Wizard> button on the navigation bar.
 - ✓ The "Wizard/production tab" page appears.



Wizard Production

-
5. **⚠WARNING** – The static charge of the film can cause body parts to be pulled in between the deflection roller and the film. This can lead to crushing injuries.
 - Do NOT touch the film.
 - Do NOT reach between the film and the deflection roller.
 - Do NOT wear any loose clothing.
 - Wear a hairnet.
 6. Repeatedly perform the *Manual advance* wizard until the start of the film is on the other side of the sealing die.
 7. Check whether the film runs symmetrically into the sealing station.
 8. If the film does not run symmetrically into the sealing station, adjust the guide as needed with the handwheel while the web roll is turning.
-



-
9. Set the guide rings on the deflection rollers.
-

4.10 Cutting units

4.10.1 Switching the cutting units on and off.

Switching on the cutting units

-
1. Turn on the main switch.
 2. Touch the <main menu> button on the navigation bar.
-





3. Touch the <Cutting> button in the "Main menu".



4. Touch the desired button, e.g. <Cross cutting. unit>
✓ The "cutting / cross cutting unit tab" display appears.

Main menu > Cutting unit > Cross cutter

5. Activate the desired cross cutting unit.

6. Activate all additional required cutting units as described.



7. Touch the <Wizard> button on the navigation bar.
✓ The "Wizard/production tab" display appears.

Wizard > Production



8. In the depiction of the machine touch the <Cutting On/Off>button.
✓ All activated cutting units are switched on.

Switching off cutting units



1. Touch the <Wizard> button on the navigation bar.
✓ The "Wizard/production tab" display appears.

Wizard > Production



2. In the depiction of the machine touch the <Cutting On/Off>button.
✓ All cutting units are switched off.

4.10.2 Combining cross cutters in groups



Info

With the *Start group* and *Start sequence* functions a drop in compressed air pressure for other devices is avoided when several cutting units are activated.

The *Start group* and *Start sequence* functions are described below by means of an example using 5 cross cutting units.

1. Switch on the main switch.



2. Touch the <Main menu> button on the navigation bar.



3. Touch the "Cutting unit" button in the <Main menu>.



4. Touch the <Cross cutting unit> button.

- ✓ The display for "Cutting unit / Cross cutter tab" appears.

Main menu > Cutting unit > Cross cutter

5. Activate 5 cross cutters.

6. Enter 2 in the *Start group* box.
 - ✓ The 5 cross cutters are divided into 3 groups.
 - ✓ Group 1 consists of cross cutters 4 and 5.
 - ✓ Group 2 consists of cross cutters 2 and 3.
 - ✓ Group 3 consists of cross cutter 1.
7. Enter 1 in the *Start sequence* box.
 - ✓ Group 2 starts one second after group 1.
 - ✓ Group 3 starts one second after group 2.

4.11 Entering inputs for forming the film

1. For the first test packs, use the times and values from the "multivac" recipe.

4.11.1 Selecting forming process



1. Touch the <Main menu> button on the navigation bar.

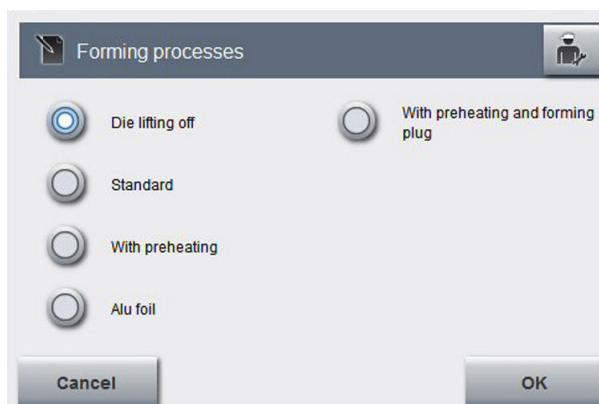


2. Touch the <Forming> button in the "main menu".
 - ✓ The first tab of the selected station appears.

Main menu > Forming



3. Touch the <Perform> button for *Forming process*.
 - ✓ The "Forming process" display appears.
 - ✓ The content of the display depends on the enabled forming process.



4. Select the desired forming process. See Section 2.4 "FORMATS AND PACKS " on page 95.
5. Touch the <OK> button.
 - ✓ The selected forming process appears next to the <Edit> button for *Forming process*.

OK

4.11.2 Select preheating method



1. Touch the <Main menu> button on the navigation bar.



2. Touch the <Forming> button in the "main menu".
 - ✓ The first tab of the selected station appears.

3. Select a forming method with preheating of the film.



4. Touch the <Preheating> tab.
 - ✓ The "Forming/Preheating tab" display appears.

Main menu > Forming > Preheating



5. Touch the <Edit> button for *Preheating process*.

- ✓ The "Preheating process" display appears.
- ✓ The content of the page will depend on the hardware configuration of the machine.

6. Select the desired preheating method. See Section 2.4.3 "PREHEATING PROCESS" on page 97.

- 6.1 When set preheating methods are displayed on the page, select a preheating method.

- 6.2 When a freely combinable preheating process is enabled, select the desired hardware components.

7. Touch the <OK> button.

- ✓ The preheating method is set.

OK

4.11.3 Entering values for forming



Info

The times for *Heating pressure increase* and *Forming pressure increase* are very short. Even minor changes can have an effect on the quality of the pack.

Avoid times that are too long for the following reasons:

- They strain the die unnecessarily.
- They reduce the cycle output.
- They increase consumption of compressed air.



1. Touch the <Main menu> button on the navigation bar.



2. Touch the <Forming> button in the "main menu".

- ✓ The first tab of the selected station appears.

3. Enter the required values on all the tabs.

-
4. To form the pack cavity, adapt the following values to each other:
The *Forming* time
The *Forming pressure build up* time
The target temperature on the "Heating" tab

 5. To heat the film, adapt the following values to each other:
The *Heating* time
The *Heating pressure build up* time
The target temperature on the "Heating" tab

 6. Touch the <heating> tab.


 7. Enter the required target temperatures.

 8. Activate the required heating zones.


 9. Wait until the target temperature has been reached.

 10. Create test packs and inspect them.
-

4.12 Entering inputs for evacuation, gas flushing and sealing of the packs

-
1. For the first test packs, use the times and values from the "multivac" recipe.
-

4.12.1 Selecting pack type



-
1. Touch the <Main menu> button on the navigation bar.
-

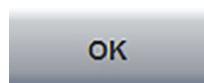


2. Touch the <Sealing> button in the "main menu".
 - ✓ The first tab of the selected station appears.

Main menu > Sealing



3. Touch the <Perform> button for *Pack type*.
- ✓ The "Pack type" display appears.
 - ✓ The content of the display depends on the enabled pack types.



4. Select the preferred pack type. See Section 2.4 "FORMATS AND PACKS " on page 95.
5. Touch the <OK> button.
- ✓ The selected pack type appears next to the <Edit> button for *Pack type*.

4.12.2 Entering values for sealing


Info

The *sealing* time is very short. Even minor changes can have an effect on the quality of the pack.



1. Touch the <Main menu> button on the navigation bar.



2. Touch the <Sealing> button in the "main menu".
- ✓ The first tab of the selected station appears.



3. Enter the required values on all the tabs.



4. Touch the <heating> tab.

5. Enter the required target temperatures.



6. Activate the required heating zones.

7. Wait until the target temperature has been reached.

8. Create test packs and inspect them.

4.13 Creating packs

1. Adapt the support system, see Section 5.6 "ADAPTING THE SUPPORT SYSTEM TO THE PACK SUPPORT".
 2. Switch on the main switch.
 - ✓ The heaters heat up to the set target temperatures (requires about 10 to 20 minutes).
 - ✓ The "Production" page appears.
 - ✓ The machine is ready for operation.
- Production**
3. Load the desired recipe, see Section 4.7 "WORKING WITH RECIPES" or enter inputs for forming and sealing.
 4. Adapt the forming and sealing temperatures to the film.
 5. Insert and advance the upper and lower webs, see Section 4.9 "INSERTING FILM AND FEEDING FILM".
 6. Switch on the device for film trim removal.
 7. Switch on the cutting units.
 8. Inspect the pack cavities.
 - 8.1 If necessary, optimise the forming of the pack cavities, see Section 4.11.3 "ENTERING VALUES FOR FORMING".
 9. Thread in the edge trim on the edge trim winder winder.
 10. Fill the formed pack cavities in the loading area with product.
 11. Remove and inspect the packs.
 - 11.1 If necessary, optimise the sealing of the packs, see Section 4.12.2 "ENTERING VALUES FOR SEALING".



Info

Visually inspect the packs on a regular basis while the machine is running. Depending on the product and pack, it may be necessary to carry out additional and considerably more complex testing procedures. The operator is responsible for this see Section 1.8.16 "CHECKING THE PACKS".

4.14 Adjusting the cycle output

The cycle output is adjusted in the *Cycles* box within the "Production" display.



Fig. 286: Production cycles

4.14.1 Altering the cycle output

1. Touch the <production> button on the navigation bar.
2. Keep touching the <Increase value> button in the *Cycles* box until the desired cycle output is displayed.
 - ✓ The set cycle output is changed with the next cycle.
3. Keep touching the <Reduce value> button in the *Cycles* box until the desired cycle output is displayed.
 - ✓ The set cycle output is changed with the next cycle.

4.14.2 Entering the cycle output directly

1. Touch the <Production> button on the navigation bar.
2. In the *Cycles* box touch the <Perform> button.
3. Enter the desired cycle output and confirm with the <OK> button.
 - ✓ The set cycle output is changed with the next cycle.

4.15 Optimising the cycle output

4.15.1 Optimising through early start.

Example: Early start of die 0.0 s

Early start of die 0.0 s:

The closing of the die starts **with** the *Advance completed* signal.

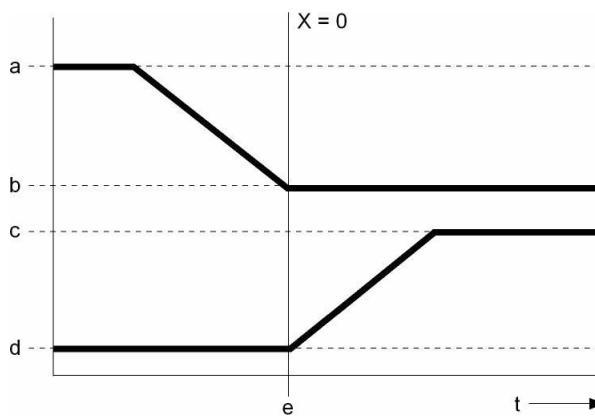


Fig. 287: Die start at end of advance

- a**: Advance on
- b**: Advance off
- c**: Die closed
- d**: Die open
- e**: Advance completed
- x**: Time from die start to advance completed

Example: Early start of die 0.1 s to 2.0 s*Early start of die 0.1 s to 2.0 s:*

The closing of the die begins by this amount of time **before** the *Advance completed* signal.

The possible value depends on the following factors:

- Size and weight of the die
- Opening width of the die.

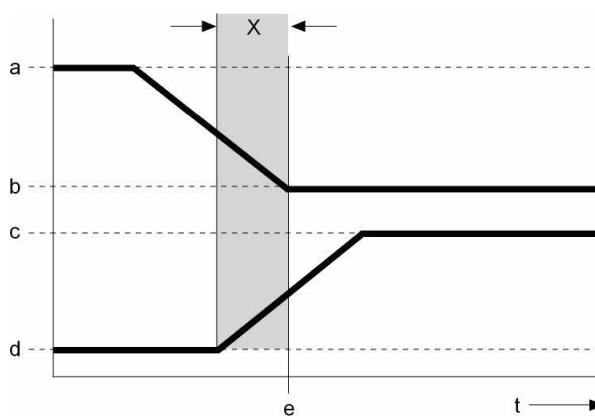


Fig. 288: Early start of die

- a**: Advance on
- b**: Advance off
- c**: Die closed
- d**: Die open
- e**: Advance completed
- x**: Time from die start to advance completed

Early start of die closing

**Info**

Die closing starts by this amount of time before the advance is completed. This reduces the mechanically unavoidable dead time between *Advance completed* and *Die closing*.

-
1. Touch the <Main menu> button on the navigation bar.



2. Touch the <Forming> button in the "main menu".

✓ The first tab of the selected station appears.

3. Touch the <Die closing> button.

4. Enter the desired time under *Early start of die*.

4.1 Start with small values.

4.2 Touch the <OK> button.

✓ The closing of the respective die begins by this amount of time before the *Advance completed* signal.

5. Touch the <Main menu> button on the navigation bar.



6. Touch the <Sealing> button in the "main menu".

✓ The first tab of the selected station appears.

7. Touch the <Die closing> button.

8. Enter the desired time under *Early start of die*.

8.1 Start with small values.

8.2 Touch the <OK> button.

✓ The closing of the respective die begins by this amount of time before the *Advance completed* signal.

9. Enter the time for *early start of die* separately for each station.

OK

OK

Early start of auxiliary units

**Info**

The synchronisation starts before the advance reaches its target position. This reduces the delay caused by the start-up time which auxiliary units need for mechanical reasons.

-
1. Touch the <Main menu> button on the navigation bar.



2. Call up the required synchronisation in the "Main menu".

3. Measure how many millimetres before *End of advance* the auxiliary unit is supposed to start.

-
4. Enter the measured distance under *Early start* at the synchronisation for the auxiliary unit.
 - ✓ The respective auxiliary unit will start as soon as the advance has this distance left to complete.
 5. Enter the distance for *Early start* individually for every auxiliary unit.
-

4.16 Controlling production-related measures

Production-related measures, such as a product change for example, can be controlled in the "Production" display under *Pack counter*.

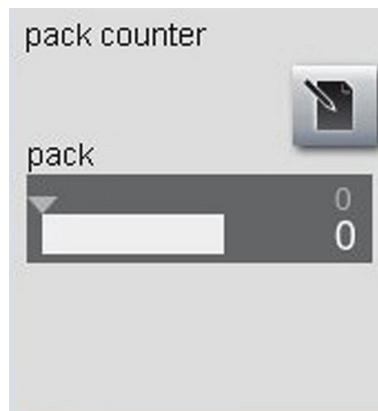


Fig. 289: Production pack counter

-
1. Touch the <Production> button on the navigation bar.

 2. Touch the <Perform> button under *pack counter*.
 - ✓ The "Pack count" display appears.

-



-
3. Under *Number of good packs until STOP* enter the desired number of packs after which the machine should stop.
-



4. Touch the <Close> button.
5. Carry out production-related measures such as changing the product.
6. To perform the function again, touch the <Reset counter> button and start the machine.

4.17 Synchronising auxiliary units



1. Touch the <Main menu> button on the navigation bar.



2. Select the desired synchronisation function.
 - 2.1 For a filler touch the <Filler> button.



- 2.2 For video monitoring, touch the <Video monitoring> button.



- 2.3 For a metal detector, touch the <Metal detector> button.



- 2.4 For a printer touch the <Printer> button.



- 2.5 For a labeller touch the <Labeller> button.

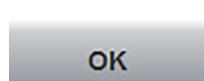


- 2.6 For a discharge unit, touch the <Discharge unit> button.



- 2.7 For other auxiliary units touch the <Synchronisation> button.

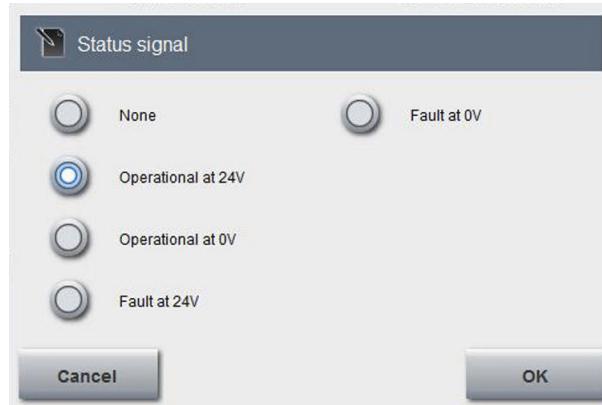
3. Touch the input box under *customer-specific designation*.
 - ✓ A keypad appears.



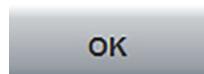
4. Enter a designation for the synchronisation on the keypad and confirm with the <OK> button.
 - ✓ The designation entered appears under *customer-specific designation*.



5. Under *Status signal* touch the <Perform> button.
✓ The "Signal: Status signal" display appears.



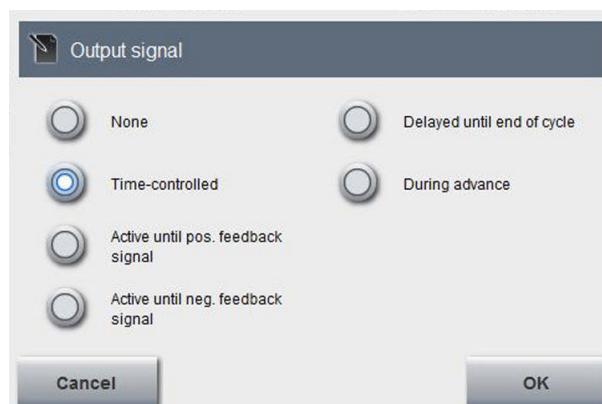
6. Select the status signal of the auxiliary unit to the packaging machine.



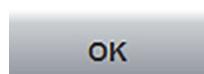
7. Touch the <OK> button.



8. Under *Output signal*, touch the <Perform> button.
✓ The display "Signal: output signal" appears.



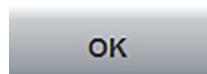
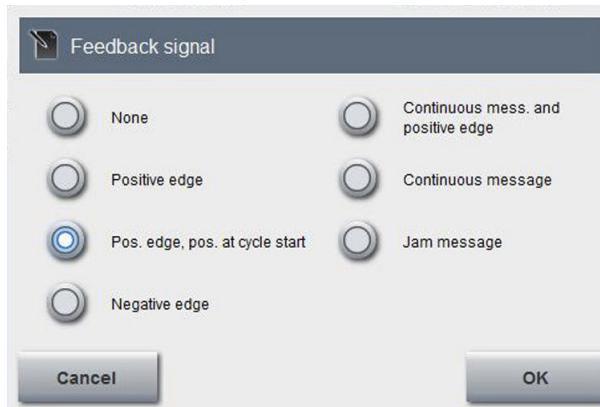
9. Select the output signal of the packaging machine.



10. Touch the <OK> button.



11. Under *Feedback signal*, touch the <Perform> button.
✓ The display "Signal: feedback signal" appears.



12. Select the feedback signal for the auxiliary unit (see the instruction manual of the auxiliary unit).

13. Touch the <OK> button.

14. Enter the required times.

15. Operate the desired switching function.



16. Under *On/Off*, switch the synchronisation on.



17. Touch the <Production> button on the navigation bar.

- ✓ The "Production" display appears.

Production

18. In the depiction of the machine switch on the corresponding synchronisation.

4.18 Adapting the line-motion control

4.18.1 Determining positions on the line

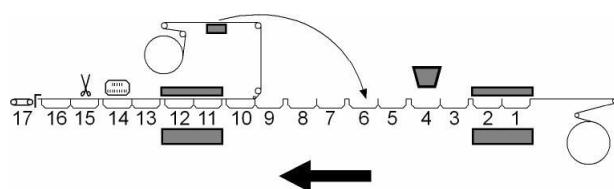


Fig. 290: Example: line-motion control

- 1 Forming station
- 4 Synchronisation 1 (filling unit)
- 6 Upper web register mark

- 11 Sealing station
- 14 Synchronisation 2 (labeller)
- 15 Cutting
- 17 Discharge unit

-
- 1. Create a diagram of the entire line, as in the example.
 - 2. Count the pack rows of the entire line.
 - 2.1 Start the counting at the first station on the line.
 - 2.2 Transfer the lower web numbers for the upper web stations.
 - 3. Make a note of the row numbers for the individual stations.
-

4.18.2 Entering positions



-
- 1. Touch the <Main menu> button on the navigation bar.
-



- 2. Touch the <Line-motion control> button in the "Main menu".
 - ✓ The "line-motion control" page appears.
-



- 3. Touch the <Other settings> tab.
 - ✓ The page for "Line-motion control/other settings tab" appears.
-

Main menu > Line-motion control > Other settings



- 4. Under *Number of tracks*, enter the number of pack tracks of the format set used.
-



- 5. Activate *Standardised format* (box with check mark).
 - 6. Under *Number of rows*, enter the number of pack rows of the format set used.
-



- 7. Touch the <Station settings...> tabs.
-



- 8. Enter the determined *Position* for each station.
-



- 9. Under *Read information*, specify for each station whether it should send a query to the line or whether this machine cycle has already been marked as reject.
-



- 10. Under *Write information*, specify for each station whether a message should be sent to the line or whether its operating procedure was completed without errors.



11. Under *Control of good packs*, specify under which conditions the machine cycle is to be performed.

Box empty: The machine cycle is only performed if **all** packs are good.

Box with check mark: The machine cycle is performed as soon as **one** pack is designated as good.

**Info**

- Good packs and reject packs can only be distinguished if the stations are correctly coordinated with each other.
- If "0" is entered for a station, the station is not evaluated by the line-motion control.
- When the recipe is saved, the inputs for the line-motion control are adopted into the particular recipe.
- When converting to a different cut-off length, determine the new positions and assign the individual stations.

4.18.3 Specifying partial advances



1. Touch the <Main menu> button on the navigation bar.



2. Touch the <Line-motion control> button in the "Main menu".

✓ The "line-motion control" display appears.



3. Touch the <Other settings> tab.

✓ The display for "Line-motion control/other settings tab" appears.

Main menu > Line-motion control > Other settings

4. Deactivate *Standardised format* (box empty).



5. Touch the <Station settings...> tabs.



6. For each station, enter under *Number of rows* the number of pack rows after which this function is to operate.

4.19 Production data acquisition

4.19.1 Assigning downtime reasons



1. Touch the <Statistics> button on the navigation bar.



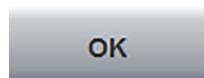
2. In the "Statistics menu", touch the <Production data acquisition> button.

✓ The display for "Production data acquisition/machine effectiveness tab" appears.



3. Touch the <Downtime> tab.
- ✓ The display for "Production data acquisition/downtime tab" appears.

Statistics > Production data acquisition > Downtime



4. In the *customer-specific designation* area touch the desired input box.
- ✓ A keypad appears.

5. Enter the downtime reason on the keypad and confirm with the <Enter> button.
- ✓ The new downtime reason is adopted in the input box.
 - ✓ The new downtime reason appears in the "Downtime reasons" display on the corresponding button.

4.19.2 Allocating downtime manually to an account

Example: Downtime due to conversion

The production data acquisition starts when the main switch is turned on.



1. Touch the <Production> button on the navigation bar.



2. Touch the <Perform> button in the "PDA" field.
- ✓ The "Downtime reasons" display appears.



3. If the machine has to be converted, touch the <Conversion> button.
- ✓ The status display in the button lights up.
 - ✓ The manual downtime reason is activated.

4. Convert the machine.

4.20 Aligning the splice monitoring

4.20.1 Aligning the lower web splice monitoring

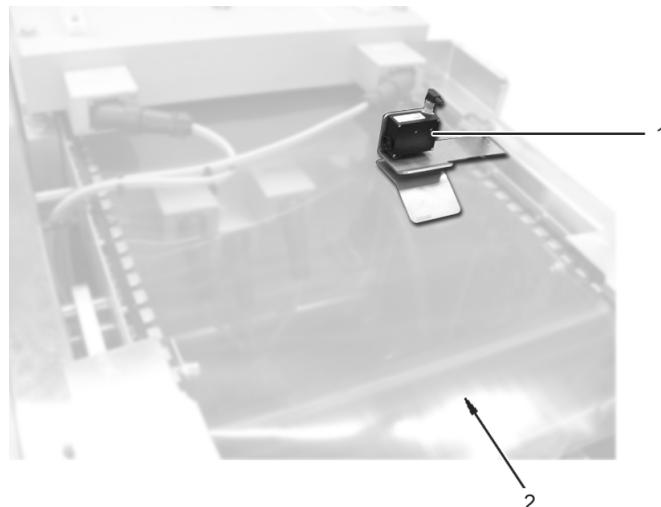


Fig. 291: Lower web splice monitoring

- 1 Photo scanning head
2 Film infeed lower web

1. Switch on the main switch.



2. Touch the <Main menu> button on the navigation bar.



3. Touch the <Monitors> button in the "main menu".
✓ The "Monitors" display appears.



4. Touch the <splice monitoring> tab.
✓ The display "monitors / splice monitoring tab" appears.

Main menu > Monitors > Splice monitoring

5. Activate lower web splice monitoring.

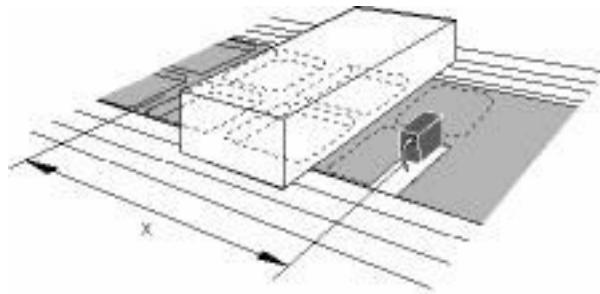
6. **DANGER** – The movements of the die are performed automatically and with great force. Reaching into the moving die can result in loss of limbs.

- Do NOT reach into the die.
- Do NOT reach under the safety guards.

7. Remove the safety guard between film infeed and forming station.

8. Remove the safety guard after the forming station.

-
9. Measure the distance (X) from the light beam of the photo scanning head to the next cycle limit following after the forming station.



-
10. Replace the safety guard between film infeed and forming station.
 11. Replace the safety guard after the forming station.
 12. Keep subtracting the amount of the *cut-off length* from measurement X until this value is smaller than the *cut-off length*.
 13. Enter the calculated value under *B: sensor distance*.
 14. Enter the monitoring area range under *A: distance*
 15. If required operate the consecutive error function.
-

4.20.2 Aligning the upper web splice monitoring

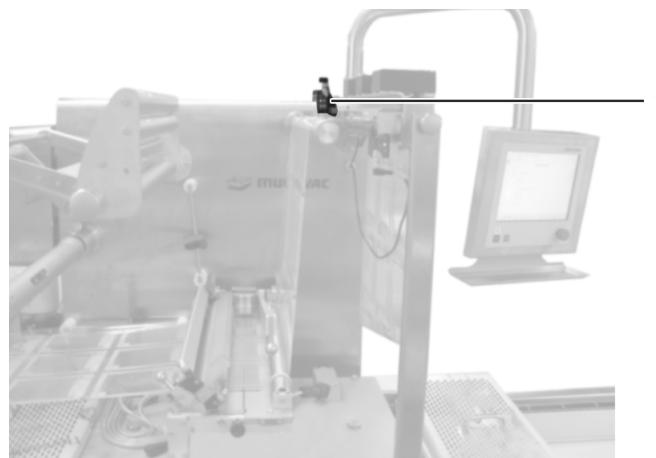


Fig. 292: Upper web splice monitoring

1 Photo scanning head

-
1. Switch on the main switch.
 2. Touch the <Main menu> button on the navigation bar.





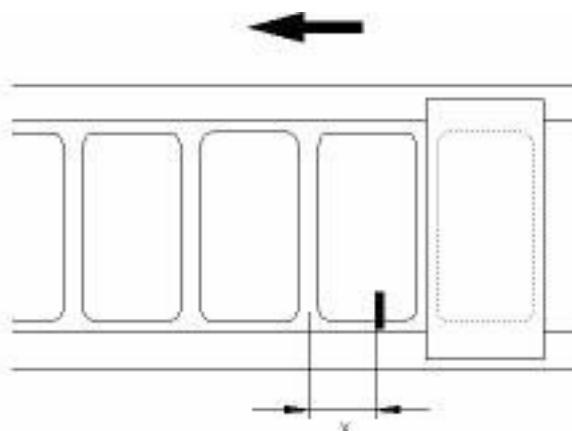
3. Touch the <Monitors> button in the "main menu".
✓ The "Monitors" display appears.



4. Touch the <splice monitoring> tab.
✓ The display "monitors / splice monitoring tab" appears.

Main menu Monitors Splice monitoring

5. Activate upper web splice monitoring.
6. Mark the position of the light beam from the photo scanning head on the film.
7. Continue to produce packs until the mark appears after the sealing station.
8. Measure the distance (X) between the mark and the end of the cycle limit within the same cycle after the sealing station.



9. Enter the calculated value under *B: sensor distance*.
10. Enter the monitoring area range under *A: distance*
11. If required operate the consecutive error function.

4.21 Edge trim winder

4.21.1 Switching the edge trim winder on and off

The edge trim winders are switched on and off individually.

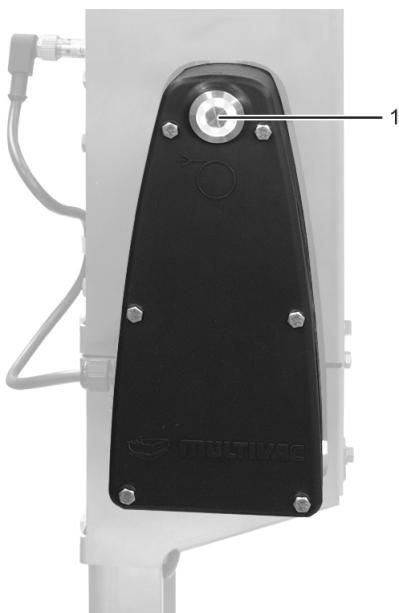


Fig. 293: Edge trim winder key

1 Key with status display

Switching on the edge trim winder



1. Touch the <Main menu> button on the navigation bar.



2. Touch the <Other settings> button in the "Main menu".



3. Touch the Film trim removal tab.

- ✓ The display for "Other settings / film trim removal tab" appears.

Main menu > Other settings > Film trim removal



4. Activate the *film trim winder*.



5. Touch the <Production> button on the navigation bar.

- ✓ The "Production" display appears.

Production



6. In the depiction of the machine switch on the <Film trim removal>.

7. Press the corresponding key on the edge trim winder.

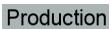
- ✓ The status display in the key lights up.
- ✓ The edge trim winder is switched on.
- ✓ Upon initial starting of the machine with the <I> key, the edge trim winder begins to turn.
- ✓ The edge trim monitoring is switched on.

Switching off the edge trim winder

-
1. Press the corresponding key on the edge trim winder.
 - ✓ The status display goes out.
 - ✓ The edge trim winder stops.
-

Switching off functions



1. Touch the <Production> button on the navigation bar.
 - ✓ The "Production" display appears.

-



2. In the depiction of the machine switch off the <film trim removal>.
 - ✓ The edge trim winders stop.
 - ✓ The edge trim monitoring is switched off.
-

4.21.2 Threading edge trim

-
1. Switch off the edge trim winder. See Section 4.21.1 "SWITCHING THE EDGE TRIM WINDER ON AND OFF " on page 347.
 2. **⚠ CAUTION** – The edge trim strips of the film have sharp contours. Contact with the edge trim can lead to injuries.
 - When performing any work wear personal protective equipment.
-



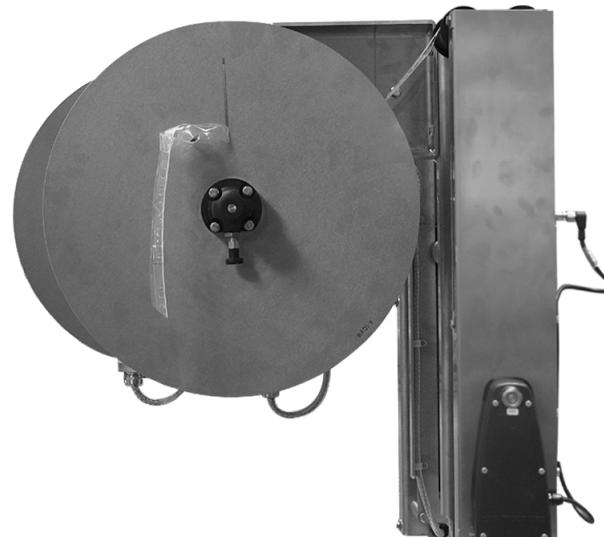
3. Press the <I> key.
-

- 3.1 Run the edge trim approx. 2 m (6.56 ft) out of the machine.
Ensure that the edge trim does not get into the machine.
-



4. Press the <O> key.
 - ✓ The machine stops.
 5. Thread the edge trim as shown in the feeding diagram of the edge trim winder.
-

-
6. Pull the end of the edge trim through the slit of the disc and knot the trim to secure it.



-
7. Cut off the protruding edge trim before the knot.
 8. **⚠️WARNING** – Rotating parts can easily catch on loose clothing, hair and objects. Reaching in between the edge trim and winding spool can lead to serious crushing injuries.
 - Do NOT reach between the edge trim and winding spool.
 - Do NOT wear any loose clothing.
 - Wear a hairnet.
 9. Switch on the edge trim winder. See Section 4.21.1 "SWITCHING THE EDGE TRIM WINDER ON AND OFF " on page 347.
-

4.21.3 Empty the edge trim winder

1. Switch off the edge trim winder. See Section 4.21.1 "SWITCHING THE EDGE TRIM WINDER ON AND OFF " on page 347.
 2. **⚠️CAUTION** – The edge trim strips of the film have sharp contours. Contact with the edge trim can lead to injuries.
 - When performing any work wear personal protective equipment.
 3. Cut off the edge trim.
 4. Remove disc:
-

- 4.1 **CAUTION** – When the locking bolt is unlocked, the washer of the edge trim winder can fall down. This can lead to injuries.
 - When performing any work wear personal protective equipment.
- 4.2 Unlock the locking bolt by pulling it.



- 4.3 At the same time remove disc.

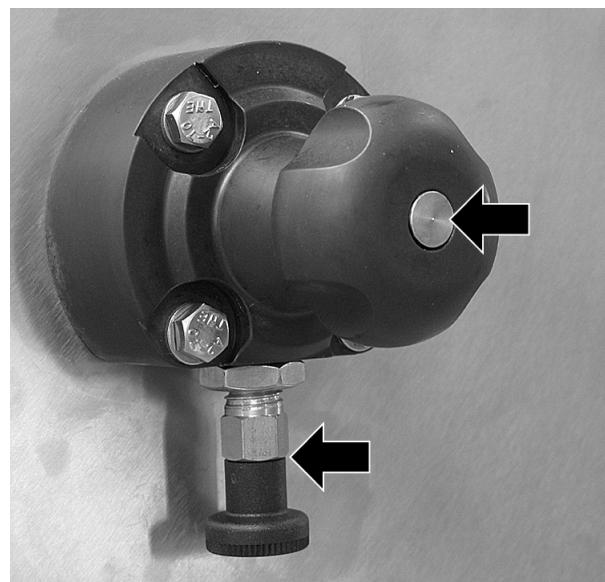


-
5. Empty the winding mandrel.
 6. Replace the disc:
 - 6.1 Unlock the locking bolt by pulling it and hold it in this position.
 - 6.2 Slide the disc on the guide shaft.
 - 6.3 Release the locking bolt.

-
- 6.4 Press in and turn the disc until the locking bolt latches.



- 6.5 Ensure that the locking bolt is locked and the guide shaft is flush with the handle.



-
7. Insert the edge trim.
-
8. **⚠️WARNING** – Rotating parts can easily catch on loose clothing, hair and objects. Reaching in between the edge trim and winding spool can lead to serious crushing injuries.
- Do NOT reach between the edge trim and winding spool.
 - Do NOT wear any loose clothing.
 - Wear a hairnet.

-
9. Switch on the edge trim winder. See Section 4.21.1 "SWITCHING THE EDGE TRIM WINDER ON AND OFF " on page 347.
-

4.22 Setting up the heat output measurement

4.22.1 Activating and deactivating the heat output measurement

Activating the heat output measurement



1. Touch the <maintenance menu> button on the navigation bar.
 2. Touch the <Heat output measurement> button in the "Maintenance menu".
 - ✓ The display "Heat output measurement / Main control cabinet / Heating current monitor 1 tab" appears.
Maintenance menu > Heat output measurement > Main control cabinet > Heating current monitoring
 3. Use the *On/Off* function to activate the heat output measurement.
-



Info

- In automatic mode, all activated heating zones are monitored.
- When a recipe is loaded all calibrated heat output target values for the installed die sets are loaded.

Deactivating the heat output measurement



1. Touch the <maintenance menu> button on the navigation bar.
 2. Touch the <Heat output measurement> button in the "Maintenance menu".
 - ✓ The display "Heat output measurement / Main control cabinet / Heating current monitor 1 tab" appears.
Maintenance menu > Heat output measurement > Main control cabinet > Heating current monitoring
 3. Use the *On/Off* function to deactivate the heat output measurement.
-

4.22.2 Calibrating the heating zones for the heat output measurement

Start calibration



Info

Calibration of the heat output measurement is required in the following cases:

- Machine start-up.
- Installation of a new die set.

1. Activate all heating zones which should be active for the installed dies and heat up to the target temperature, see Section 2.7.2 "TEMPERATURE AND TEMPERATURE MONITORING".



2. Touch the <maintenance menu> button on the navigation bar.



3. Touch the <Heat output measurement> button in the "Maintenance menu".

- ✓ The display "Heat output measurement / Main control cabinet / Heating current monitor 1 tab" appears.

Maintenance menu > Heat output measurement > Main control cabinet > Heating current monitoring

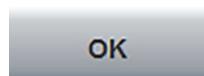
4. Use the *On/Off* function to activate the heat output measurement.

- ✓ If one of the activated heating zones is not yet calibrated, the diagnostic message "Calibration data missing" appears.

5. If necessary, acknowledge the pending diagnostic message.

6. Touch the <Calibration> button.

- ✓ The "Calibration" display appears.



7. Touch the <OK> button.

- ✓ After the calibration starts, all activated heating zones heat up to the set values (at least however to 80 °C (176 °F)). During the heating up phase the diagnostic message 1136 appears.

8. Wait until all heating zones are heated up.

- ✓ The calibration starts. The diagnostic message 1155 appears.



9. Touch the "Heating current monitor 2" tab.

Maintenance menu > Heat output measurement > Main control cabinet > Heating current monitoring

-
10. Compare the output values imprinted on the dies with the measured output values on the "heating current monitoring 2" tab.
 - ✓ If none of the measured output values deviates by more than 500 watts, then the heating zones are OK.
 - ✓ If the measured output value deviates by more than 500 watts, then the heater must be checked, see Section 8.1.7 "CHECKING THE HEATING OUTPUT (DIAGNOSTIC MESSAGE 1038)".
-

**Info**

Individual output measurement and calibration:

- Each heating zone is switched on individually and its calibration data adopted.
- The calibration can be tracked on the "Heating current monitoring 2" tab and, if available, on the "Heating current monitoring 3" tab.
- On the heating zone which has just been calibrated, the *target value* has a green background. The value changes.
- Once the calibration has been successfully completed, the diagnostic message disappears. The *target values* are stored in all activated heating zones.

Completing calibration

-
1. Save the recipe for this die set.
 2. Save the calibration of the heat output measurement for every die set with different heat outputs in your own recipe.
-

4.23 View temperature control

The values on the "Temperature validation" page give an overview of the control behaviour of the heating circuits.



-
1. Switch on the machine.
-



2. Touch the <maintenance menu> button on the navigation bar.
-

3. In the "Maintenance menu", touch the <Service menu> button.
-

4. Touch the <Temperature validation> button in the "Service menu".

Service menu > Temperature validation

-
5. If necessary, set the desired temperature for the heating elements and the control elements at *Target*.
-

6. Wait until the heating has reached the target temperature.



7. When the temperature displayed at *Actual* is stable, the heating is adjusted. Touch the <Reset> button.
 - ✓ The values *Min.* and *Max.* are set to 0.
8. Run the machine in automatic mode for some minutes.
 - ✓ The values *Min.* and *Max.* give an overview of the control behaviour and the heat output of the heating plates.
9. If required have this information ready for the service personnel.

5 Adjustment work and setup

5.1 Adjusting the compressed air

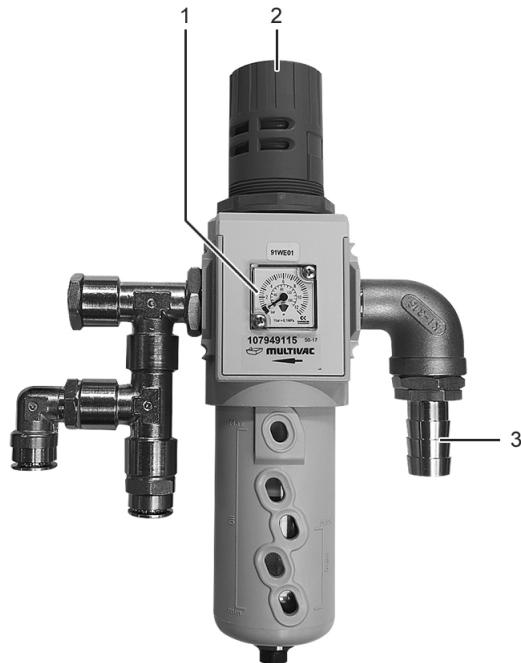


Fig. 294: Air preparation unit for compressed air

- 1 Manometer
- 2 Regulator
- 3 Compressed air connection

-
- 1. Pull the regulator upward.
 - ✓ The regulator can be set.
 - 2. Set the system pressure with the pressure regulator on the air preparation unit, see "Technical specifications".
 - 3. Press the regulator downwards.
 - ✓ The regulator is locked.
-

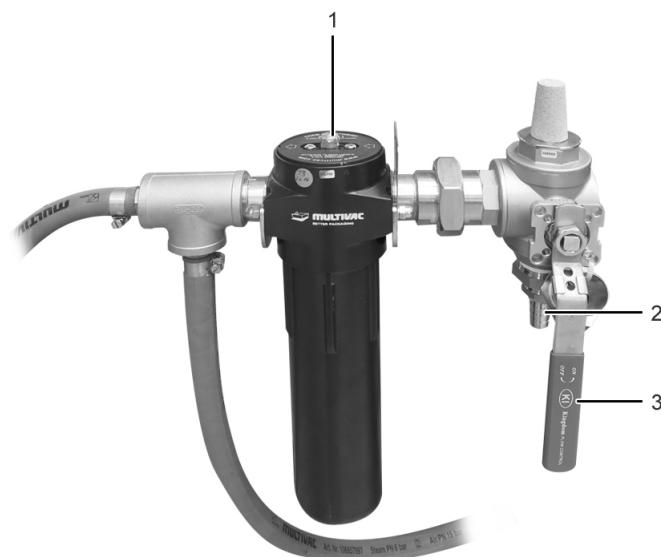


Fig. 295: Air preparation unit compressed air

- 1** Differential pressure indicator
- 2** Compressed air connection
- 3** Stop-cock

-
- 1. Open the stop-cock on the air preparation unit.
 - 2. Set the system pressure at the on-site compressed air supply, see "Technical specifications".
 - ✓ The set pressure is displayed on the manometer in the control cabinet.
-

SAFETY

INSTRUCTIONS

5.2 De-energising the machine



Fig. 296: Air preparation unit for compressed air

- 1 Manometer
- 2 Regulator
- 3 Compressed air connection

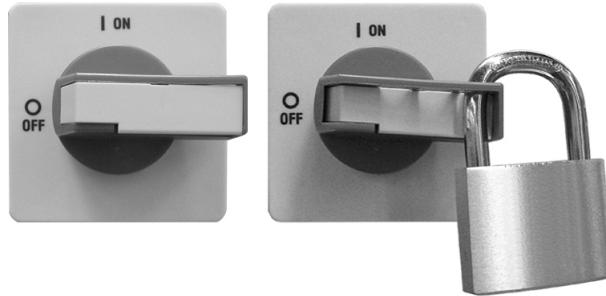
DANGER

Dangerous voltage!

The control cabinet contains live components. Various components are still under voltage even after the machine has been switched off. Touching live components will result in death or serious injury.

- Working on live components is prohibited. Electric lines marked in orange are live.
- Only trained electricians may work on electrical components.
- Do NOT touch damaged cables but have them replaced immediately by a qualified electrician.
- Perform the following steps before starting any work on electrical components:
 1. De-energise the electrical system.
 2. Secure the electrical system to prevent unauthorised start-up.
 3. Check that the electrical components are de-energised.

1. Switch off the main switch and attach a lock to prevent unauthorised start-up.



- ✓ The power supply, compressed air supply line and cooling water inlet are shut off.
- ✓ The control cabinet heater (optional) and service socket may still be live.

2. If necessary, note down the pressure set at the air preparation unit.
3. Close the stop-cock for the compressed air supply line and use a lock to secure it against unauthorised opening.
4. Pull the regulator upward and out.
 - ✓ The regulator can be set.
5. Turn the regulator anticlockwise until it reaches the end stop.
 - ✓ The manometer shows 0.0 bar (0.0 psi).
 - ✓ The compressed air system of the machine is depressurised.
6. Press the regulator downwards.
 - ✓ The regulator is locked.

5.3 Setting the pressure regulator

The pressure regulators are labelled with the symbols for their respective functions. Which pressure regulators are available will depend on the equipment of the machine. The locations of the individual pressure regulators can be seen in the pneumatic diagram.

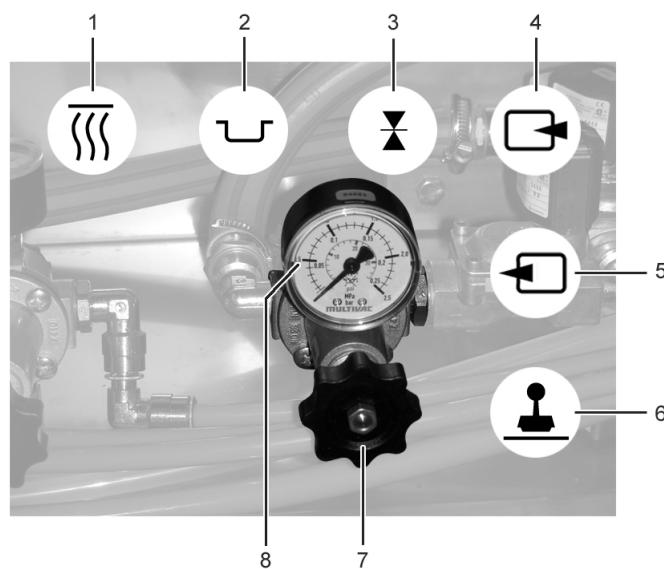


Fig. 297: Pressure regulator

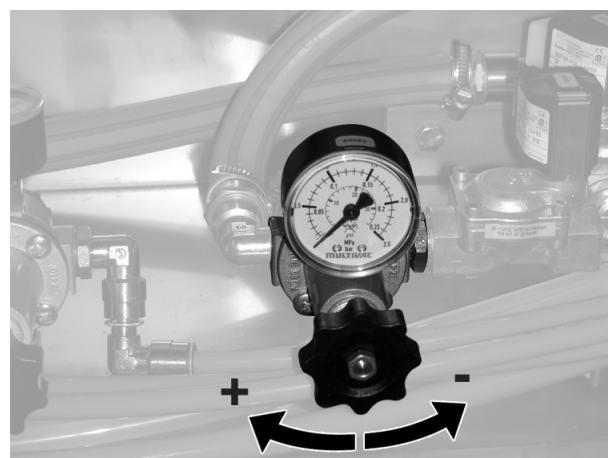
- 1 Heating
- 2 Forming
- 3 Sealing
- 4 Gas flushing
- 5 Evacuation
- 6 Print
- 7 Pressure regulator
- 8 Manometer

5.3.1 Setting the heating pressure


Info

The maximum possible pressure depends on the size of the die.

1. Set the heating pressure on the *heating* pressure regulator, see "Technical specifications".



-
2. Start the machine and run the machine for several test cycles. If necessary readjust the heating pressure.
-

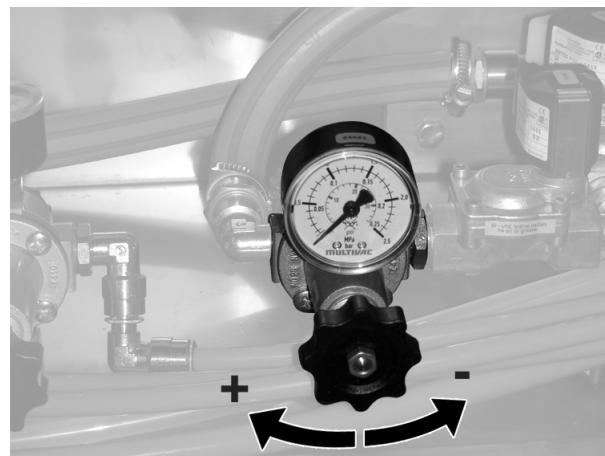
5.3.2 Setting the forming pressure



Info

The maximum possible pressure depends on the size of the die.

-
1. Set the forming pressure on the *forming* pressure regulator, see "Technical specifications".
-



5.3.3 Setting the sealing pressure

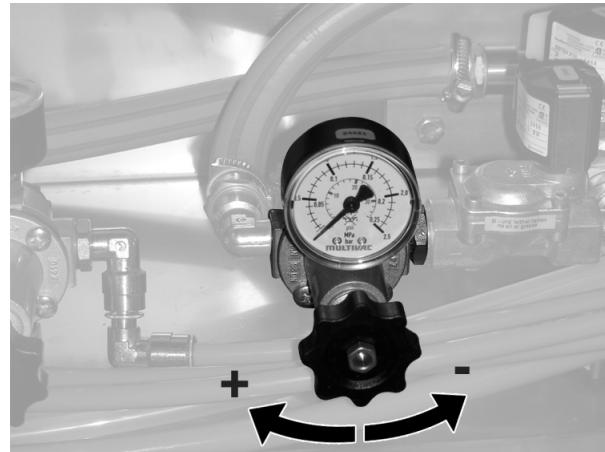


Info

The required sealing pressure depends on the total area of the seal seam and the thickness of the film.

- Single-row, single-track die with thin film: set a low pressure.
- Multiple-row, multiple-track die with thicker film: set a higher pressure.

-
1. Set the sealing pressure on the *sealing* pressure regulator, see "Technical specifications".

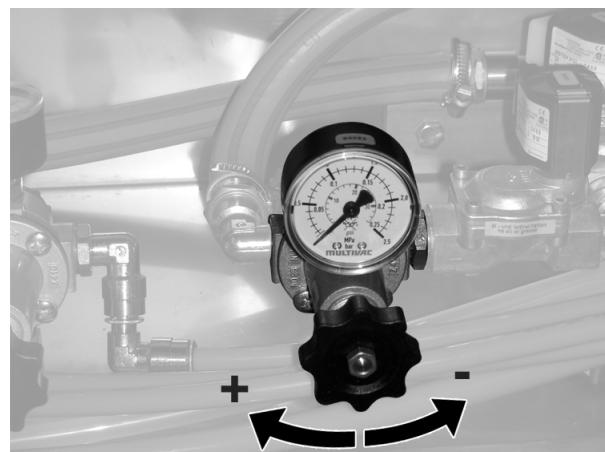


5.3.4 Setting the gas pressure

**Info**

The product and the pack size determine the required gas pressure.

-
1. Set the gas pressure with the pressure regulator *gas flushing*, see 'Technical Specification'.

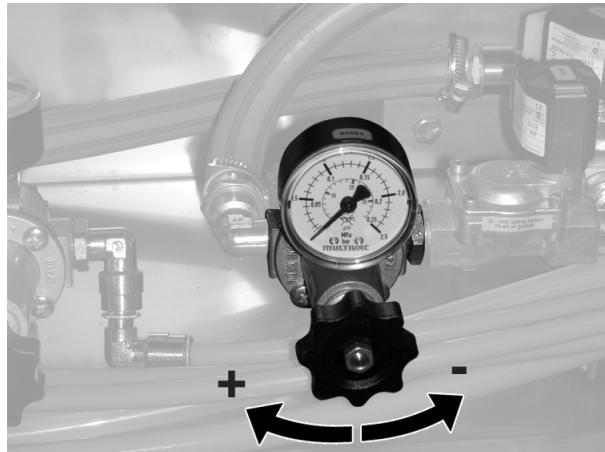


5.3.5 Setting the suction speed

**Info**

Reducing the suction speed reduces the risk of liquid or powdered products from being sucked out of the packet during evacuation, for example.

-
1. Set the suction speed with the pressure regulator *evacuation*, see 'Technical Specifications'.



5.4 Adjusting the cooling water flow



Info

- The cooling water flow rate is factory-set and matched to the machine
- The die top section during operation should only be at a temperature, which still allows it to be touched with bare hands (approx. 40 °C).
- If the *minimum flow* set in the display is not met, the machine stops.
- If the flow of cooling water is set too high, condensation water can form in the die.

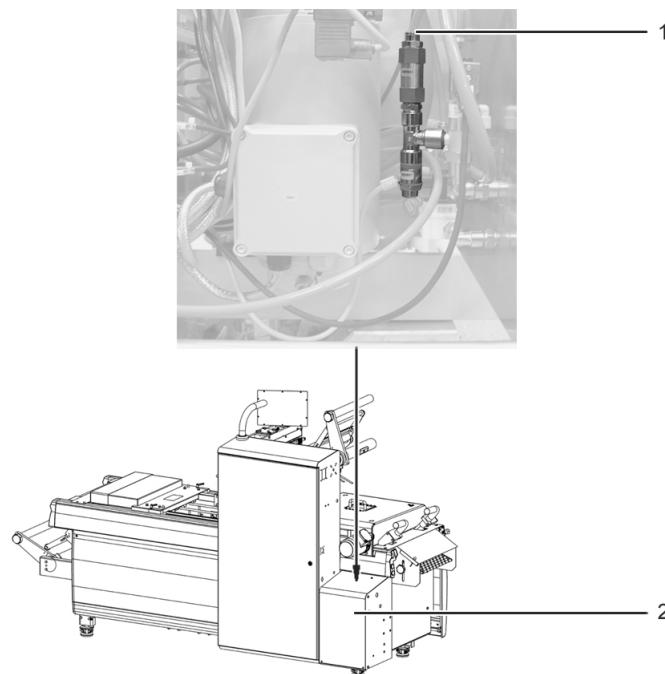


Fig. 298: Setting the cooling water flow

1 Screw

2 Cover

-
1. Check the *current flow rate* in the display "other settings / cooling water tab".

 2. Remove cover.

 3. Adjust the flow rate with the screw.
 - 3.1 Turn the screw clockwise:
✓ The flow rate is decreased.
 - 3.2 Turn the screw anticlockwise:
✓ The flow rate is increased.

 4. Fasten the cover.
-

5.5 Heating imprint

Function for testing the temperature distribution in the forming die and the temperature behaviour of the film.

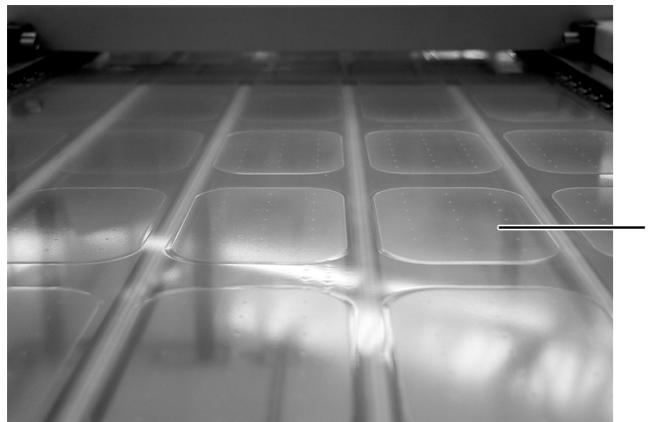


Fig. 299: Heating imprint

1 Heating imprint

- Temperature distribution in the forming die.
 - Even heating imprint:
The temperature distribution in the forming die is OK.
 - Uneven heating imprint:
The heaters in the forming die have different temperatures, or the forming die is not closing correctly.
- Temperature behaviour of the film.
 - The film is transparent and undamaged:
The film was not too hot.
 - The film is cloudy or damaged:
The film was too hot.

5.5.1 Producing the heating imprint

Start heating imprint



1. Touch the <Main menu> button on the navigation bar.



2. Touch the <Forming> button in the "main menu".



3. If the "Forming" menu appears, touch the required station.
 - ✓ The first tab of the selected station appears.

4. Touch the <Monitors> tab.

Main menu > Forming > Monitors



5. Enter the desired *number* of cycles under *Heating imprint*.

6. Touch the <Wizard> button on the navigation bar.



7. Touch the <Servicing> tab.
✓ The "Wizard/servicing tab" page appears.




8. Start the *Heating imprint* wizard.

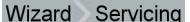
9. The machine stops after the set *number* of cycles with the *heating imprint* function have elapsed.
10. Check the heating imprints of the forming die in the loading area.

Stopping the heating imprint



1. Touch the <Wizard> button on the navigation bar.



2. Touch the <Servicing> tab.
✓ The "Wizard/servicing tab" page appears.




3. Stop the *Heating imprint* wizard.

5.6 Adapting the support system to the pack support



Info

If the length of the transport section is changed due to a different set-up, the support system must be matched to it.

- If the format is changed, e.g. from three to four packs in a pack row, the position of the support bars must be matched to it.
- If the pack depth is changed, the height of the pack support unit must be matched to it.
- If the length of the loading area is changed, the pack support unit must be exchanged.

5.6.1 Adapting the position of the support bars

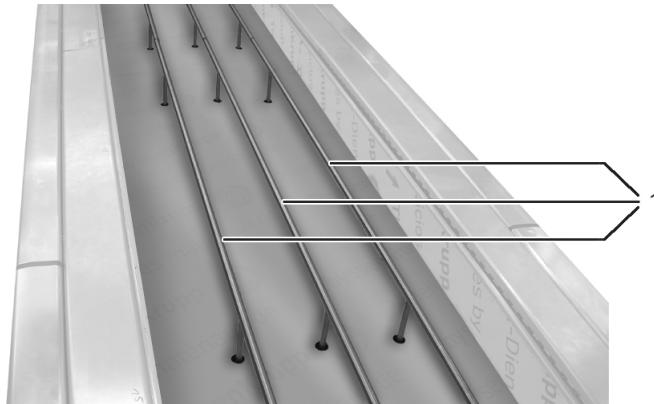


Fig. 300: Support bars for supporting packs

1 Support bars

1. Pull the support bars out toward the top.
2. Insert support bars appropriate for the die at the desired positions.

5.6.2 Adapting the support plate

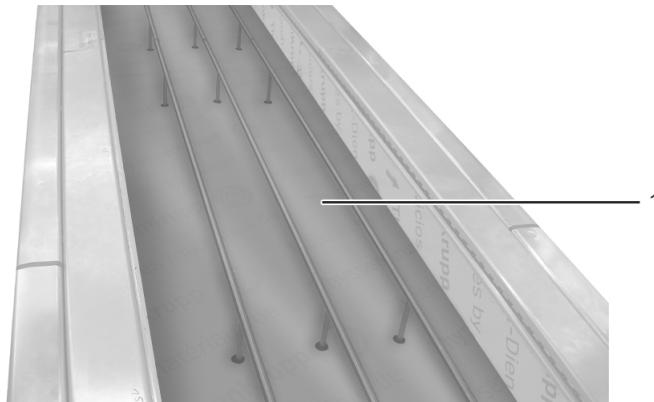


Fig. 301: Support plate for supporting the packs

1 Support plate

Exchanging the support plate

1. Switch off the main switch and attach a lock to prevent unauthorised start-up.
2. Pull the support bars out toward the top.
3. If necessary unscrew the screws on the support plate.

-
4. **DANGER** – If the support plate is removed, the lifting units are freely accessible. Reaching into the moving lifting units will lead to serious injuries.
- Do NOT reach into the lifting units.
 - When carrying out any work in the danger zone, do NOT allow other persons near the machine.
-
5. Lift out the support plate.
-
6. **WARNING** – An incorrectly applied support system results in unprotected danger zones. Reaching into unprotected danger zones can lead to serious injuries.
- The support system must completely cover the loading area.
 - Only use a support system that is appropriate for the equipment on the machine.
-
7. Insert a new support plate appropriate for the length of the loading area.
- 7.1 If necessary fasten the support plate with the screws.
-
8. Insert the accompanying support bars.
-

5.7 Setting the discharge unit

5.7.1 Setting the height of the discharge conveyor

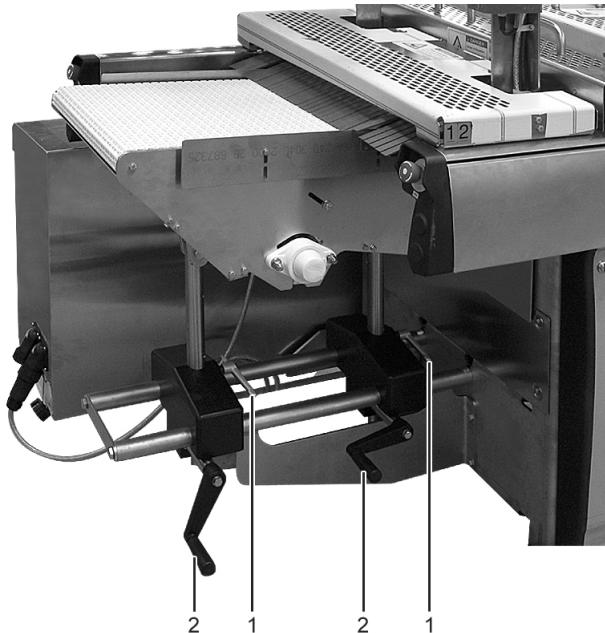


Fig. 302: Discharge conveyor

1 Clamping lever

2 Crank

1. Turn off the main switch and attach a lock to prevent unauthorised start-up.
2. **⚠️ WARNING** – If the friction brake is defective or incorrectly set, releasing the clamping lever could result in sudden lowering of the discharge unit. Standing under the discharge unit could lead to injuries.
 - When releasing the clamping levers, do NOT stand under the discharge unit.
 - Exercise the utmost caution when making adjustments
3. Release the clamping levers.
4. Adjust the height of the discharge conveyor with the cranks so as to match the pack height.
5. Tighten the clamping levers.

5.8 Side panel



Fig. 303: Side panel

- 1 Side panel
2 Lock mechanism

⚠️ WARNING

Injury hazard!

Missing side panels result in unprotected danger zones. Reaching into unprotected danger zones could result in death or serious injury.

- Do NOT put the machine into operation without the cladding.
- Ensure that all cladding is attached and undamaged.
- Check that all cladding is completely closed.

5.8.1 Removing the side panel

1. De-energise the machine, see Section 5.2 "DE-ENERGISING THE MACHINE".
2. Open the lock mechanisms.
3. Fold open the side panel and remove it.

5.8.2 Fastening the side cladding

1. Attach the side cladding.
2. Close the lock mechanisms.
3. Ensure that the cladding closes without gaps.

5.9 Positioning dies horizontally

5.9.1 Positioning the forming die



Fig. 304: Adjustment unit of the forming die

- 1 Counter
- 2 Square end of the adjustment unit
- 3 Hand crank

1. Run the film out of the machine, see Section 4.8.4 "RUNNING THE MACHINE EMPTY".
2. Switch off the main switch and attach a lock to prevent unauthorised start-up.
3. Place the hand crank on the square end of the adjustment unit.
4. Adjust the forming die to the desired position by turning the hand crank, see counting device.
5. Remove the hand crank.

5.9.2 Positioning the sealing die

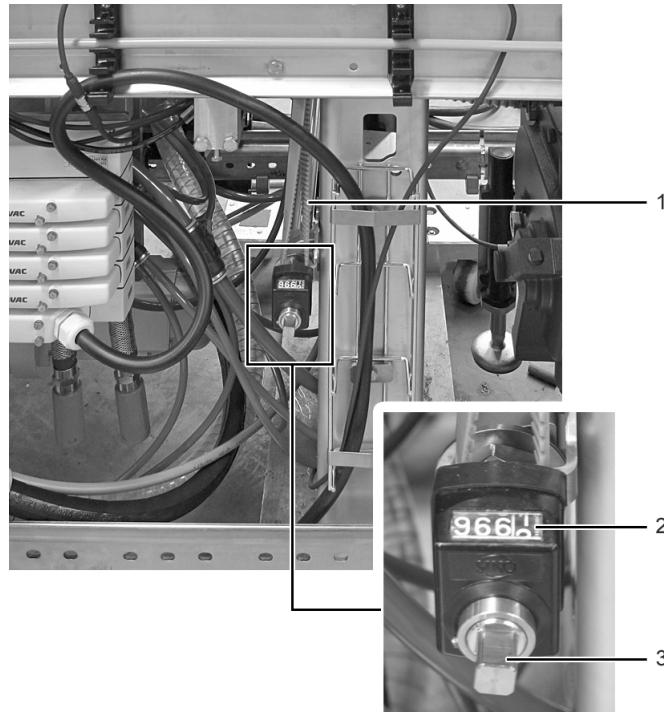
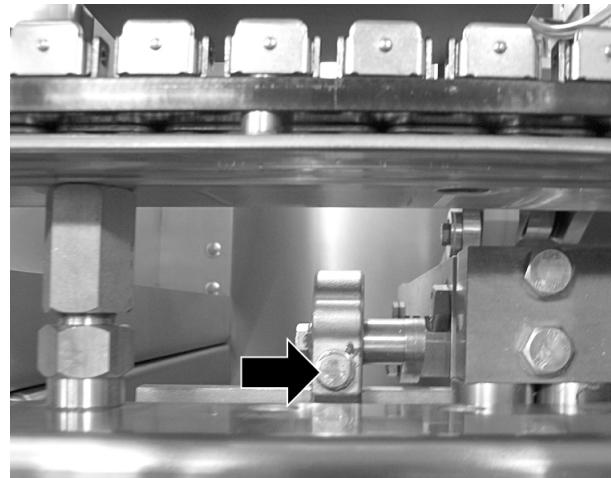


Fig. 305: Adjustment unit for sealing die

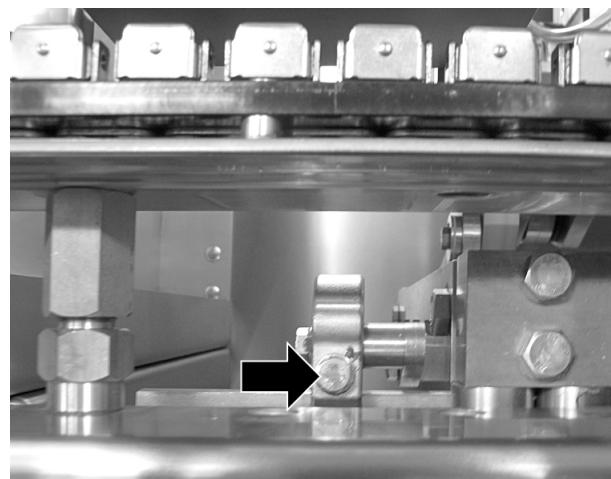
- 1** Adjustment unit for sealing die
- 2** Counter
- 3** Square end of the adjustment unit

-
- 1. Run the film out of the machine, see Section 4.8.4 "RUNNING THE MACHINE EMPTY".
 - 2. Switch off the main switch and attach a lock to prevent unauthorised start-up.
-

-
3. If the adjustment unit is equipped with a clamp on the machine frame, release the locking screws on both sides of the die.



-
4. Remove the side cladding in the area of the sealing die.
 5. Place the hand crank on the square end of the adjustment unit.
 6. Adjust the sealing die to the desired position by turning the hand crank, see counting device.
 7. Remove the hand crank.
 8. If the adjustment unit is equipped with a clamp on the machine frame, tighten the locking screws on both sides of the die.
-



-
9. Attach the side cladding.
-

5.10 Convert the dies for other package formats

5.10.1 Tightening torques for screws at die change



Info

The specified torques apply for the following conditions:

- Stainless steel screw, strength class A2-70
- The thread is cleaned and lightly lubricated, recommended lubricant: Universal-H1 grease, e.g. MULTIVAC Grease, material number: 107111650.
- The screw is tightened by hand with the torque wrench.
- Impact wrenches or cordless screwdrivers may not be used.

Stainless steel screw	Permitted torque
M5	4.7 Nm (3.47 lb/ft)
M6	8.2 Nm (6.05 lb/ft)
M8	19.6 Nm (14.46 lb/ft)
M10	39 Nm (28.77 lb/ft)
M12	67 Nm (49.42 lb/ft)
M14	106 Nm (78.19 lb/ft)
M16	162 Nm (119.49 lb/ft)
M18	225 Nm (165.96 lb/ft)
M20	316 Nm (233.08 lb/ft)

5.10.2 Draining the cooling water circuit



Info

- Depending on the pipe length, the water must possibly be expelled several times until the pipes are completely empty.

5.10.3 Open the dies completely

DANGER

Amputation hazard!

The movements of the lifting units are performed with great force. Reaching into the moving lifting units can result in loss of limbs.

- Only perform service work on the lifting units when they are in the lowest position.
- De-energise the machine to prevent dangerous movements.



1. Touch the <Wizard> button on the navigation bar.
✓ The "Wizard/production tab" display appears.



2. Touch the <Servicing> tab.
 - ✓ The "Wizard/servicing tab" display appears.
Wizard **Servicing**



3. Start the *Open die lifting* wizard.
 - ✓ Irrespective of the entered *opening width*, the dies of the forming station and sealing station open completely.
 - ✓ The dies remain in this position, until the machine is re-started.

5.10.4 Changing the forming die top section

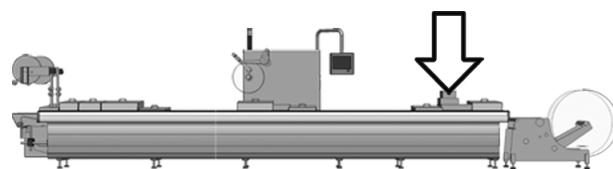


Fig. 306: Position on the machine

Preparing die change

1. Run the film out of the machine.
2. Empty the cooling water circuit. See Section 5.10.2 "DRAINING THE COOLING WATER CIRCUIT" on page 374.
3. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.

Removing the forming die top section

WARNING

Burn hazard!

The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off.

Touching the heating plates can lead to severe burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the heating plates.
- Before starting any work in the danger zone, allow the die to cool down.

⚠WARNING

Injury hazard!

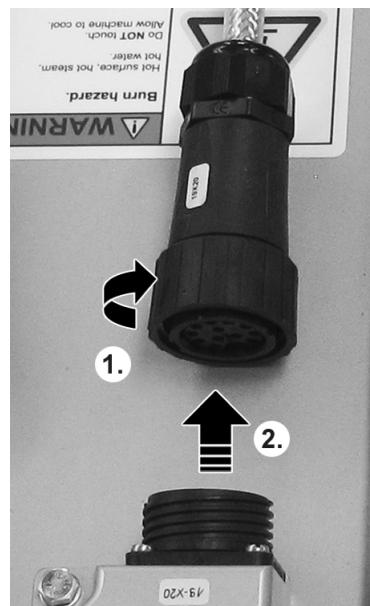
Dies are heavy and have sharp edges.
Carrying heavy dies can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

-
1. Remove the safety guards in the area of the forming die.
 2. If they are present, push the light barrier holders in the direction of the machine outfeed.

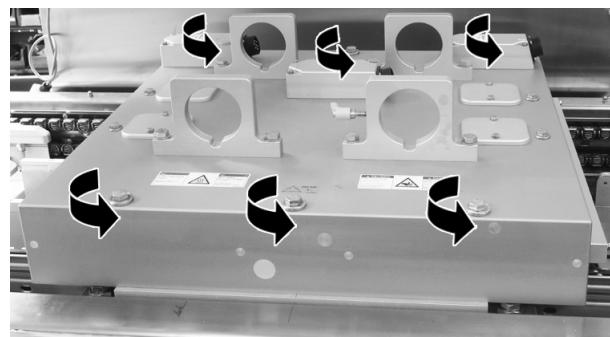


3. Release and disconnect all the plug connectors for the electrical connections on the die.

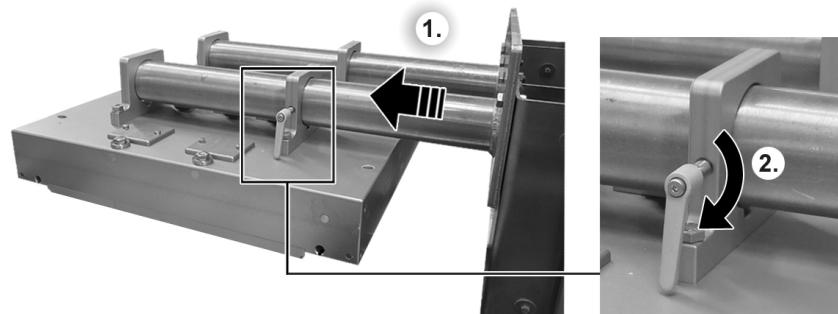


4. If there are other connections present on the die top section, unplug these connections.

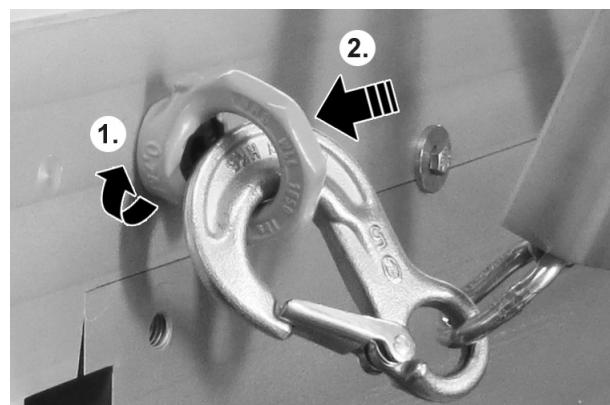
-
5. Unscrew the screws that fasten the die top section.



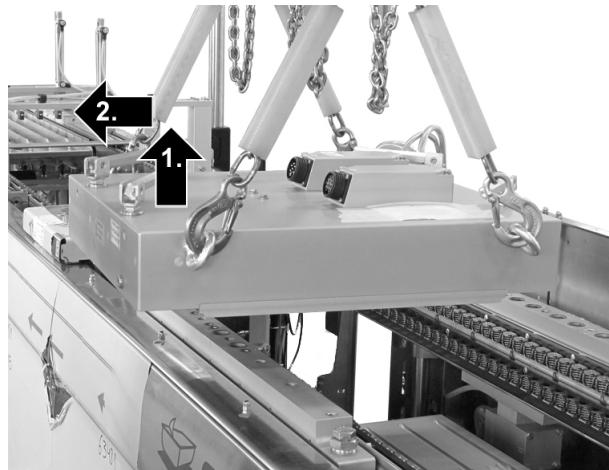
6. If the die is equipped with carrier devices for load lifting equipment, insert the load lifting equipment completely into the carrier devices and tighten the lever screw.



7. If the die is equipped with eyebolts for the load lifting equipment, unscrew the screw plugs.
 - 7.1 Tighten the eyebolts and hook the load lifting attachments on the load lifting equipment into the eyebolts.



-
8. Lift the die out of the machine using suitable load lifting equipment.



-
9. Remove the die from the machine with the load lifting equipment and set it down on an appropriate surface.
 10. Remove the load lifting equipment.
 11. If required, change the die bottom section.
-

Installing the forming die top section

WARNING

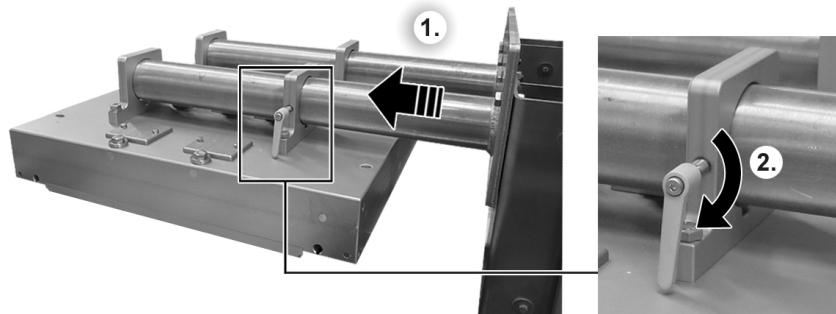
Injury hazard!

Dies are heavy and have sharp edges.
Carrying heavy dies can lead to injuries.

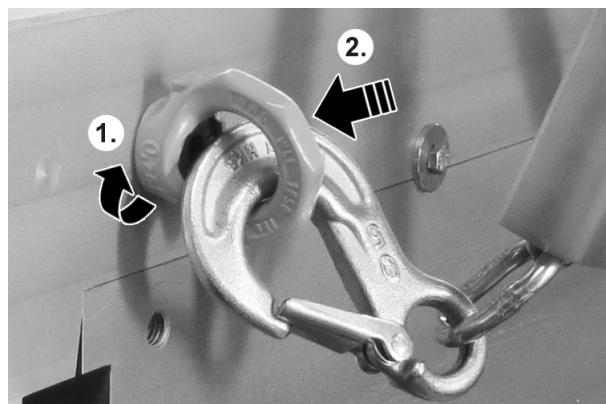
- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

-
1. **NOTICE** – Protruding components in the die bottom section will collide with the die top section when the die is being closed. This can cause damage to the die top section.
 - Ensure that no components are protruding above the die bottom section.
 2. Ensure that the forming die top section matches the forming die bottom section.
-

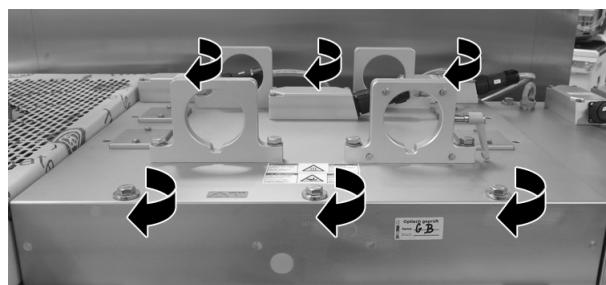
-
3. If the die is equipped with carrier devices for load lifting equipment, insert the load lifting equipment completely into the carrier devices and tighten the lever screw.



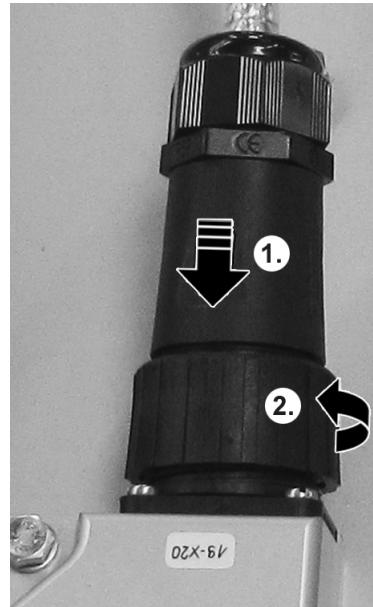
4. If the die is equipped with eyebolts for the load lifting equipment, unscrew the screw plugs.
- 4.1 Tighten the eyebolts and hook the load lifting attachments on the load lifting equipment into the eyebolts.



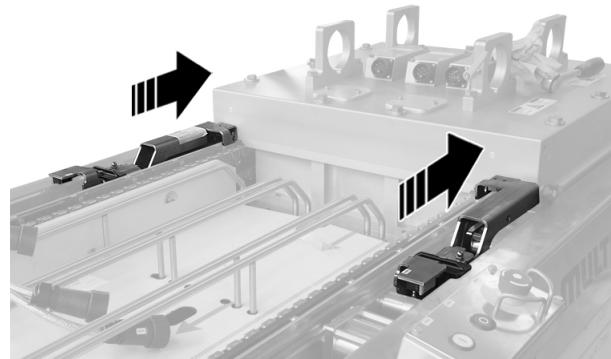
5. Lift the die with suitable load lifting equipment and move it towards the machine.
6. Align the die over the forming die bottom section and lower it.
7. Remove the load lifting equipment from the machine.
8. Tighten the screws that fasten the die top section.



-
9. Insert and lock all the plug connectors for the electrical connections on the die.



-
10. If there are other connections present on the die, insert these connections.
 11. If they are present, push the light barrier holders towards the die.



-
12. If required, unscrew the eyebolts from the die or remove the carrier devices for the load lifting equipment.
 13. Make sure that all screw plugs are tightened.
 14. Attach all safety guards.
-

5.10.5 Changing the forming die bottom section

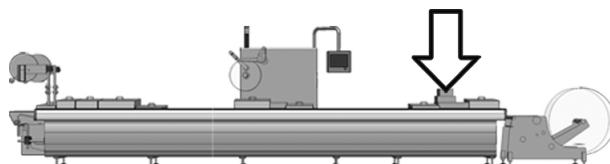


Fig. 307: Position on the machine

Removing the forming die bottom section

WARNING

Burn hazard!

The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off.

Touching the heating plates can lead to severe burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the heating plates.
- Before starting any work in the danger zone, allow the die to cool down.

WARNING

Injury hazard!

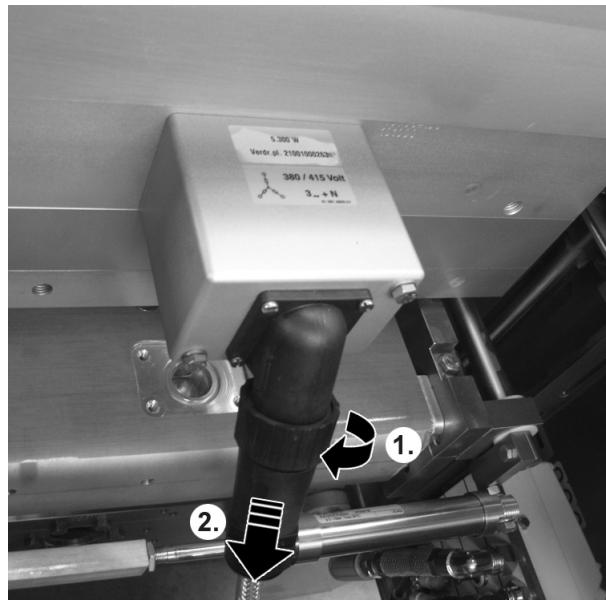
Dies are heavy and have sharp edges.

Carrying heavy dies can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

-
1. Remove the forming die top section, see Section 5.10.4 "CHANGING THE FORMING DIE TOP SECTION".
 2. Make sure the machine is de-energised.
-

-
3. Release and unplug all the plug connectors for the electrical connections on the die bottom section.



4. If there are other connections present on the die bottom section, unplug these connections.

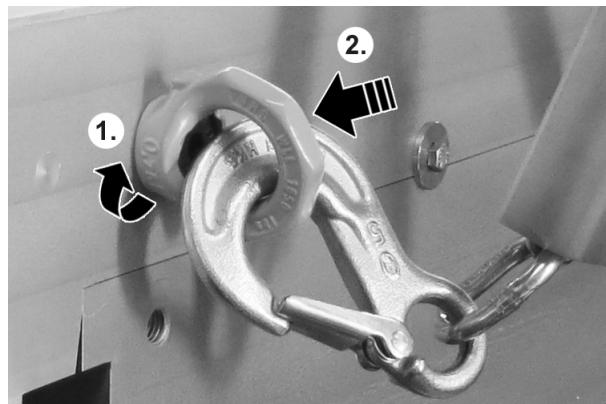


5. In the case of manually locked lifting units, release the lock mechanism on the die bottom section.

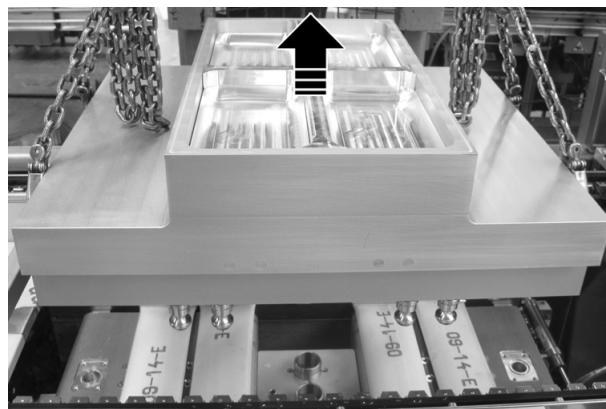


6. Unscrew the screw plugs for the eyebolts on the die bottom section.

-
7. Tighten the eyebolts on the die bottom section and hook the load lifting attachments on the load lifting equipment into the eyebolts.



-
8. Lift the die out of the machine using suitable load lifting equipment.



-
9. Remove the die from the machine with the load lifting equipment and set it down on an appropriate surface.
 10. Remove the load lifting equipment.
-

Installing the forming die bottom section

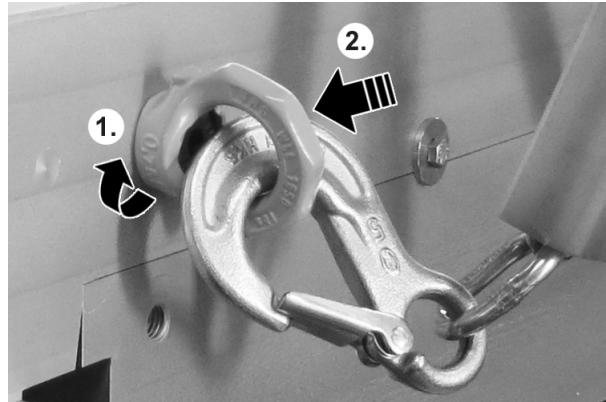
WARNING
Injury hazard!

Dies are heavy and have sharp edges.
Carrying heavy dies can lead to injuries.

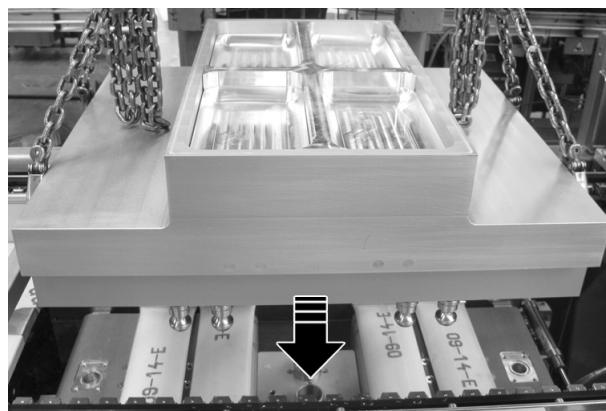
- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

-
1. Unscrew the screw plugs for the eyebolts on the die bottom section.

-
2. Tighten the eyebolts on the die bottom section and hook the load lifting attachments on the load lifting equipment into the eyebolts.

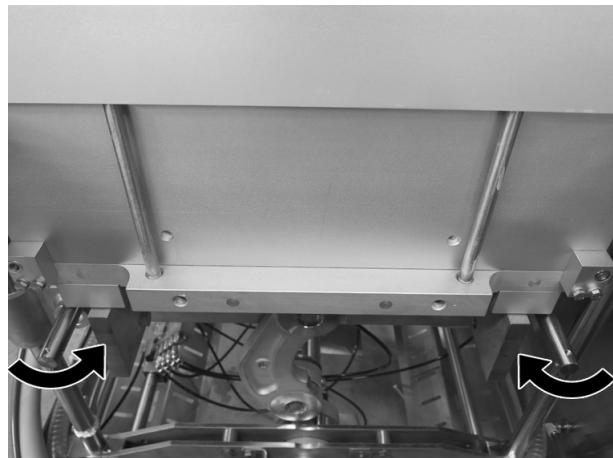


-
3. Lift the die bottom section with suitable load lifting equipment and move it towards the machine.
 4. Align the die over the machine and lower it.

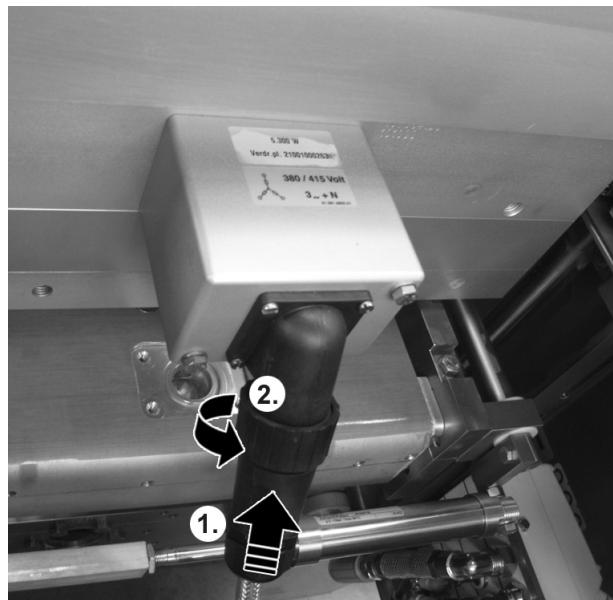


-
5. Remove the load lifting equipment from the machine.

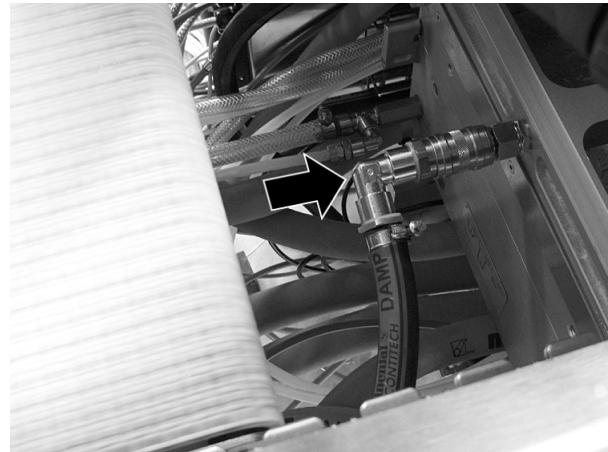
-
6. In the case of manually locked lifting units, close the lock mechanism on the die bottom section.



-
7. If required, unscrew the eyebolts from the die.
 8. Insert and lock all the plug connectors for the electrical connections on the die bottom section.



-
9. If there are other connections present on the die, insert these connections.



-
10. Insert the required filling plates for the forming depth.



-
11. Insert the radius plates.



-
12. Make sure that all screw plugs are tightened.

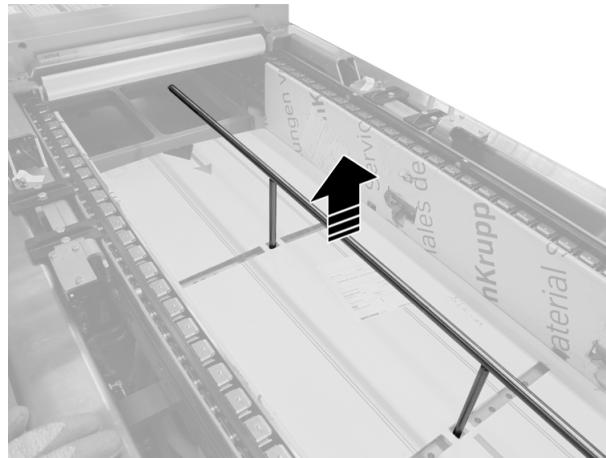
-
13. **NOTICE** – Protruding components in the die bottom section will collide with the die top section when the die is being closed. This can cause damage to the die top section.
 - Ensure that no components are protruding above the die bottom section.

 14. Install the matching forming die top section, see Section 5.10.4 "CHANGING THE FORMING DIE TOP SECTION".
-

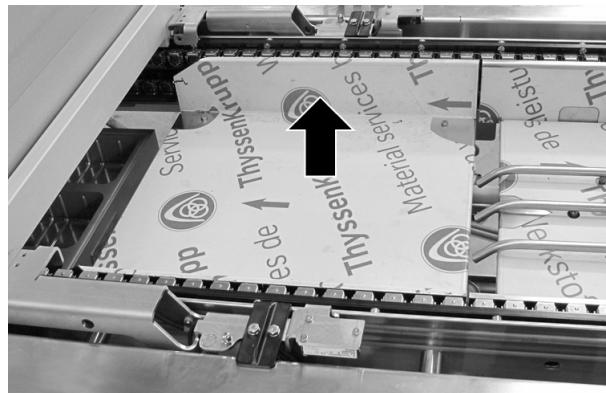
5.10.6 Changing the forming plate

Removing the forming plate

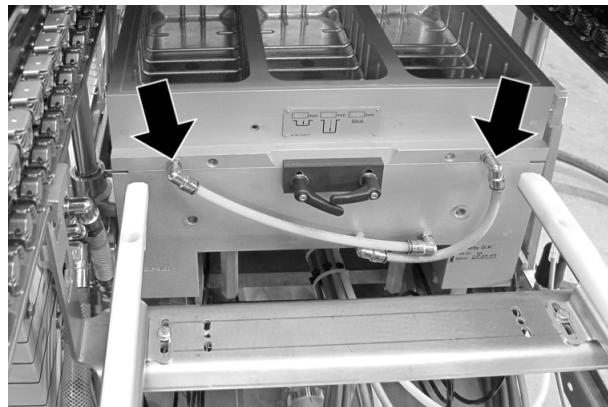
-
1. De-energise the machine, see Section 5.2 "DE-ENERGISING THE MACHINE".
 2. Remove the safety guard after the forming die.
 3. Pull the support bars out toward the top.
-



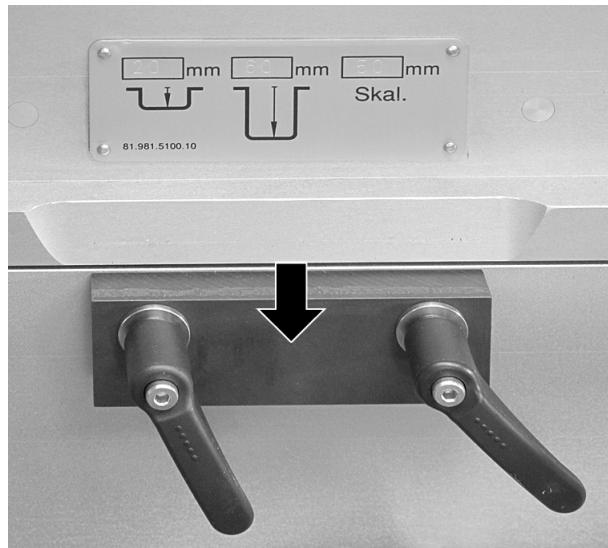
4. Lift out the support plate.
-



-
5. In the case of water-cooled forming plates, disconnect the cooling water lines at the forming plate.

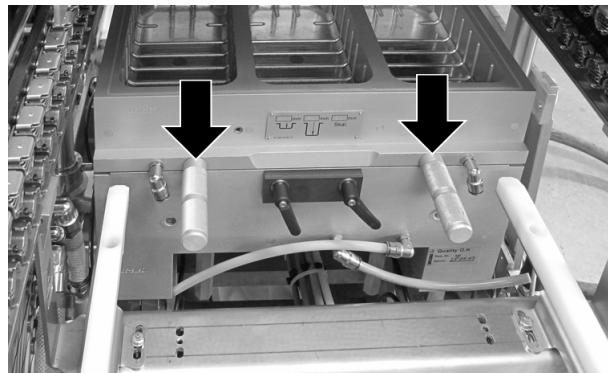


-
6. Release the clamps for securing it to the die.

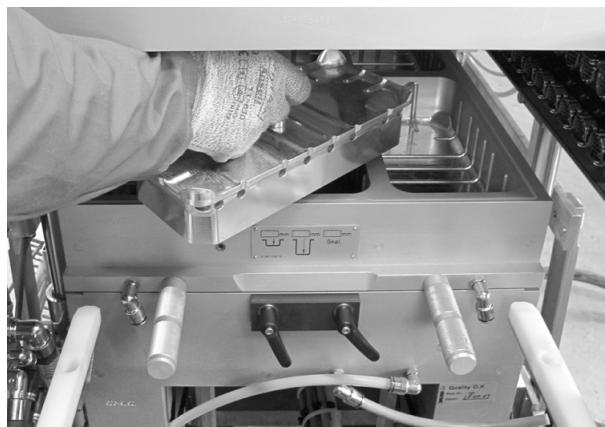


✓ The securing clamps slip down.

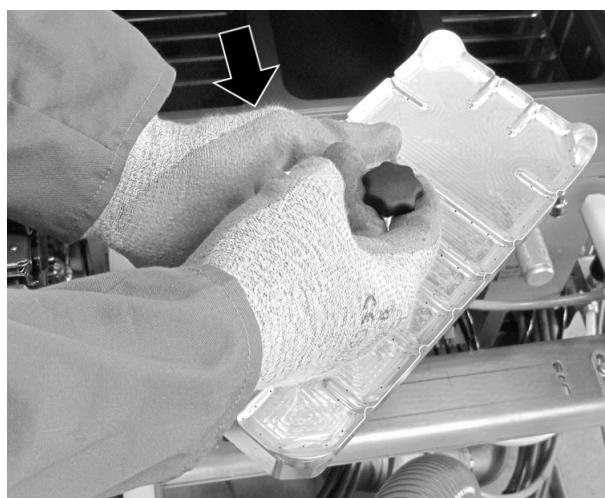
-
7. Unscrew the screw plugs and tighten two handles on the forming plate.



-
8. **⚠WARNING** – The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off. Touching the heating plates can lead to severe burns.
- When performing any work wear personal protective equipment.
 - Do NOT touch the heating plates.
 - Before starting any work in the danger zone, allow the die to cool down.
-
9. **⚠CAUTION** – Sharp slitting knives or hole punches can be installed in the die bottom section. Touching the sharp slitting knives or hole punches can lead to injuries.
- When performing any work wear personal protective equipment.
-
10. Take out the radius plates with a lifting tool.



- 10.1 When removing the forming radius plates, secure them with the other hand so that they do not fall.



- 10.2 If filling plates are present, take them out as well.

-
11. Remove the forming plate.



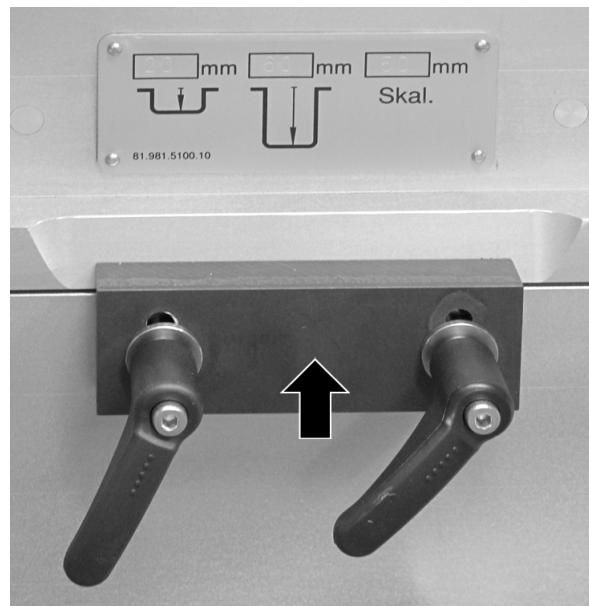
Installing the forming plate

1. Lay the forming plate on the forming die bottom section and slide it backwards as far as it will go.



2. If filling plates are required, insert the filling plates.
-

-
3. Slide up and tighten the clamps, which secure the forming plate to the die.

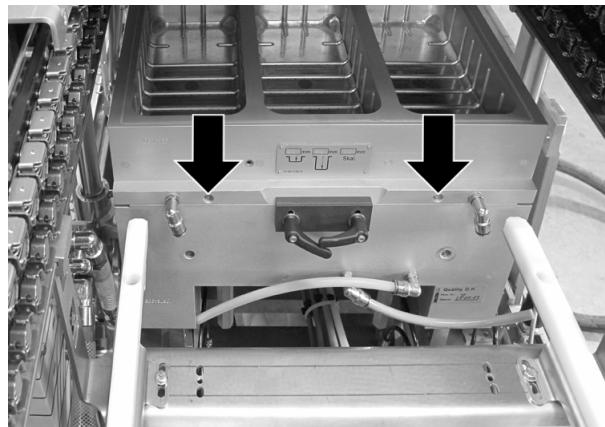


✓ The forming plate is now secured to the forming die bottom section.

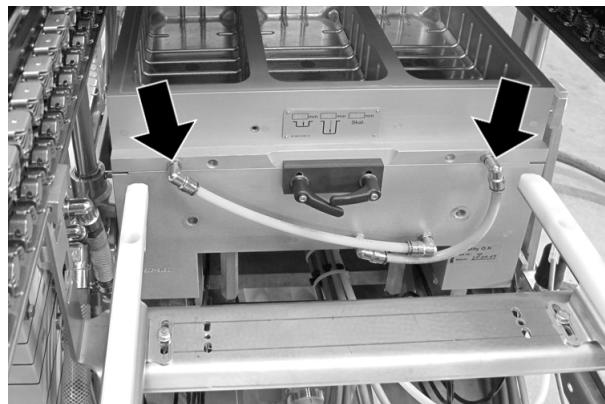
-
4. Insert the radius plates into the forming plate with a lifting tool. When inserting the radius plates, secure them with the other hand so that they do not fall.



-
5. Unscrew the handles on the forming plate and tighten the screw plugs.



6. In the case of water-cooled forming plates, connect the cooling water lines at the forming plate.

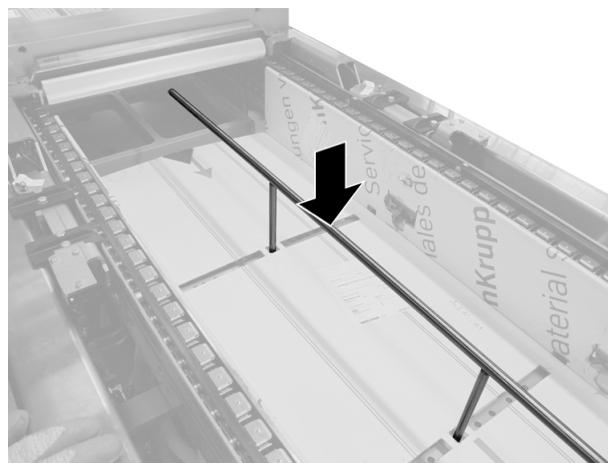


-
7. Replace the support plate.



- ✓ The angled side of the support plate should face the forming die.

-
8. Slot in the support bars.



-
9. Attach the safety guard.
-

5.10.7 Changing the sealing die top section

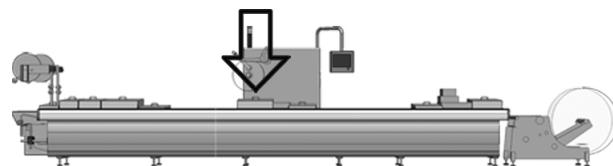


Fig. 308: Position on the machine

Preparing die change

-
1. Run the film out of the machine.
 2. Empty the cooling water circuit. See Section 5.10.2 "DRAINING THE COOLING WATER CIRCUIT " on page 374.
 3. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
-

Removing the sealing die top section

WARNING

Burn hazard!

The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off.

Touching the heating plates can lead to severe burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the heating plates.
- Before starting any work in the danger zone, allow the die to cool down.

⚠WARNING

Injury hazard!

Dies are heavy and have sharp edges.
Carrying heavy dies can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

⚠CAUTION

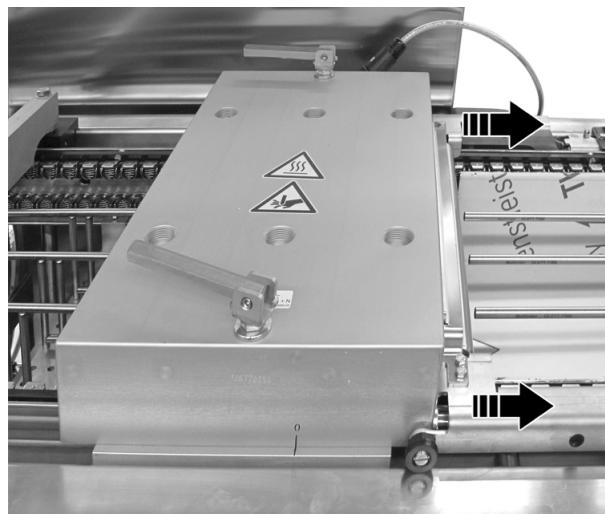
Injury hazard!

Sharp slitting knives or hole punches can be installed in the die bottom section.

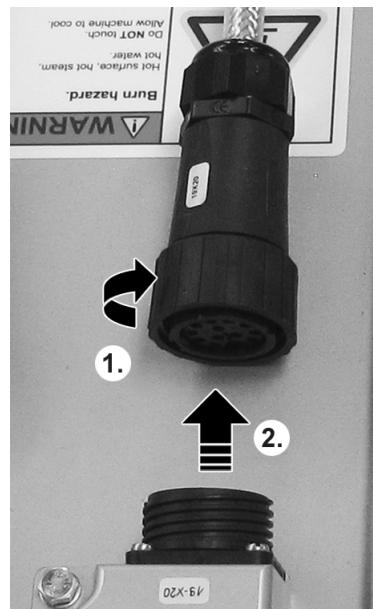
Touching the sharp slitting knives or hole punches can lead to injuries.

- When performing any work wear personal protective equipment.

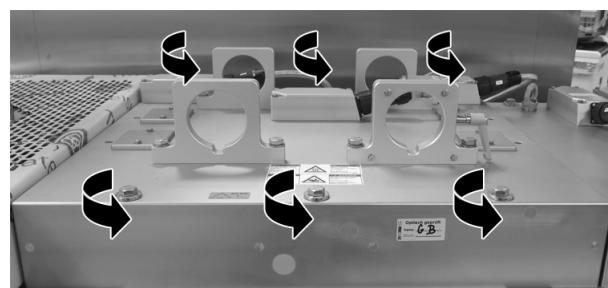
1. Remove the safety guards around the sealing die.
2. If they are present, push the light barrier holders in the direction of the machine infeed.



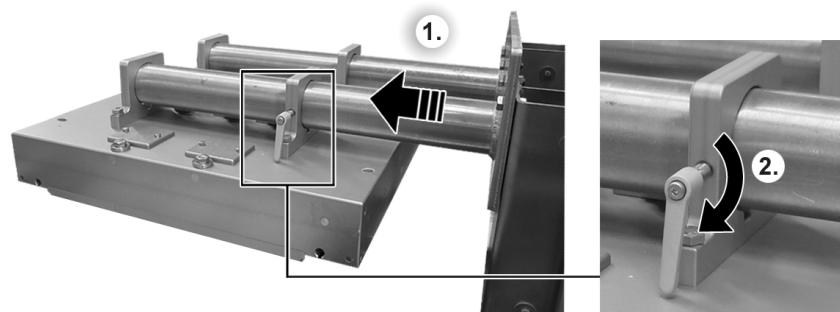
-
3. Release and disconnect all the plug connectors for the electrical connections on the die.



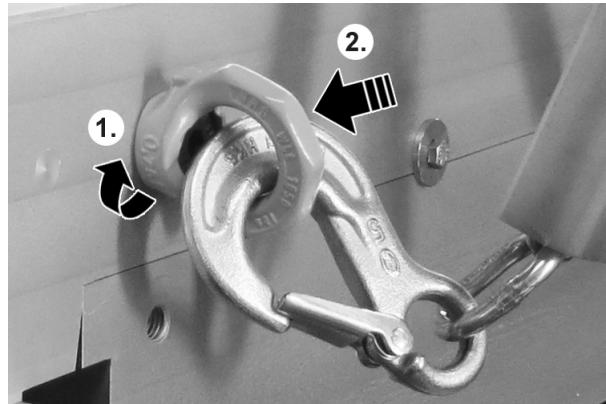
-
4. If there are other connections present on the die top section, unplug these connections.
 5. Unscrew the screws that fasten the die top section.



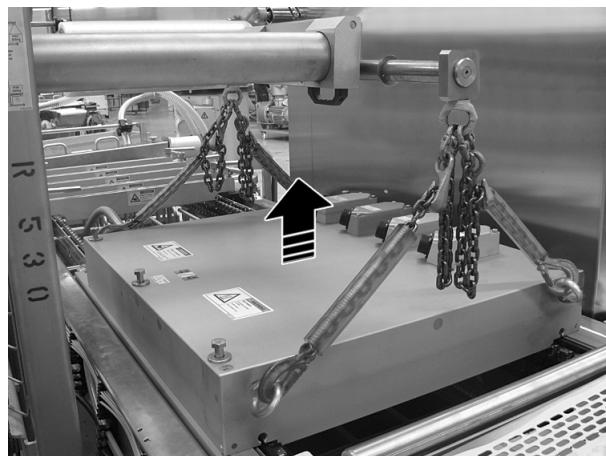
-
6. If the die is equipped with carrier devices for load lifting equipment, insert the load lifting equipment completely into the carrier devices and tighten the lever screw.



-
7. If the die is equipped with eyebolts for the load lifting equipment, unscrew the screw plugs.
 - 7.1 Tighten the eyebolts and hook the load lifting attachments on the load lifting equipment into the eyebolts.



-
8. Lift the die out of the machine using suitable load lifting equipment.



-
9. Remove the die from the machine with the load lifting equipment and set it down on an appropriate surface.
 10. Remove the load lifting equipment.
 11. If required, change the die bottom section.
-

Installing the sealing die top section

⚠WARNING**Injury hazard!**

Dies are heavy and have sharp edges.
Carrying heavy dies can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

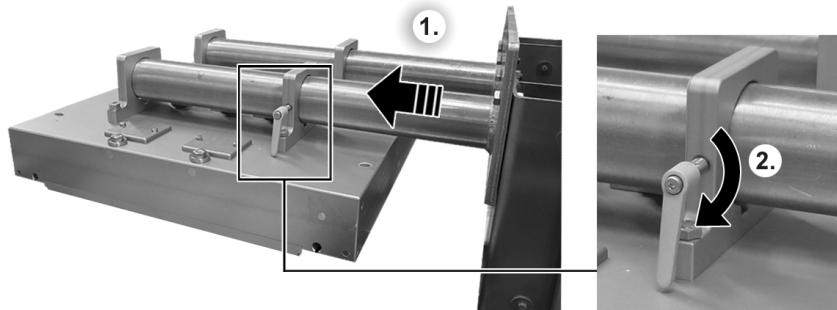
⚠CAUTION**Injury hazard!**

Sharp slitting knives or hole punches can be installed in the die bottom section.

Touching the sharp slitting knives or hole punches can lead to injuries.

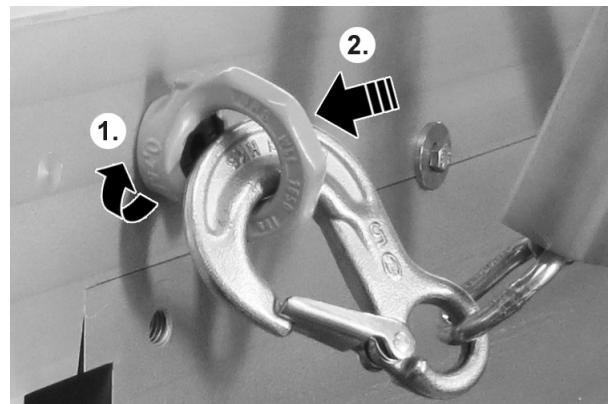
- When performing any work wear personal protective equipment.

1. Ensure that the sealing die top section matches the sealing die bottom section.
2. If the die is equipped with carrier devices for load lifting equipment, insert the load lifting equipment completely into the carrier devices and tighten the lever screw.

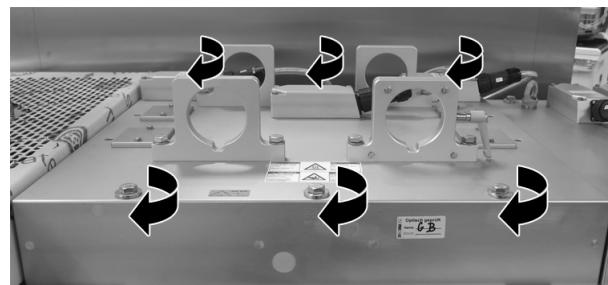


3. If the die is equipped with eyebolts for the load lifting equipment, unscrew the screw plugs.

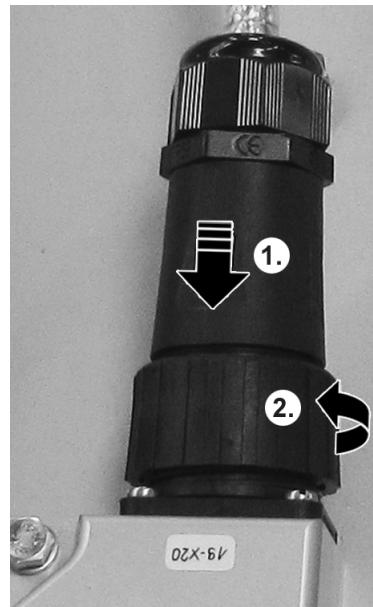
- 3.1 Tighten the eyebolts and hook the load lifting attachments on the load lifting equipment into the eyebolts.



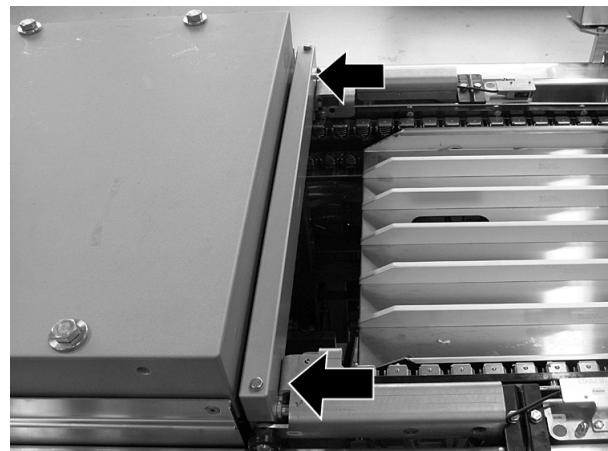
4. Lift the die with suitable load lifting equipment and move it towards the machine.
5. Align the die over the machine and lower it.
6. Remove the load lifting equipment from the machine.
7. Tighten the screws that fasten the die top section.



-
8. Insert and lock all the plug connectors for the electrical connections on the die.



-
9. If there are other connections present on the die, insert these connections.
 10. If they are present, push the light barrier holders towards the die.



-
11. If required, unscrew the eyebolts from the die or remove the carrier devices for the load lifting equipment.
 12. Make sure that all screw plugs are tightened.
 13. Attach all safety guards.
-

5.10.8 Changing the sealing die bottom section

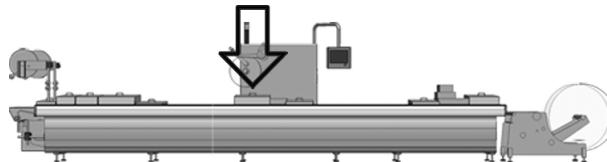


Fig. 309: Position on the machine

Removing the sealing die bottom section

WARNING

Burn hazard!

The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off.

Touching the heating plates can lead to severe burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the heating plates.
- Before starting any work in the danger zone, allow the die to cool down.

WARNING

Injury hazard!

Dies are heavy and have sharp edges.

Carrying heavy dies can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

CAUTION

Injury hazard!

Sharp slitting knives or hole punches can be installed in the die bottom section.

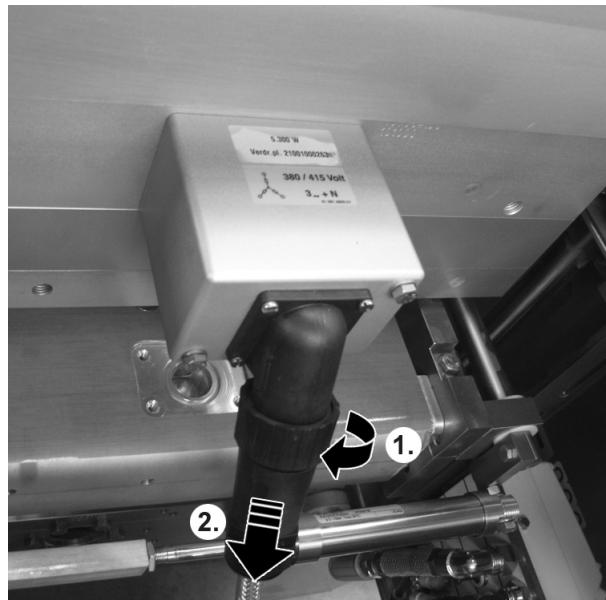
Touching the sharp slitting knives or hole punches can lead to injuries.

- When performing any work wear personal protective equipment.

1. Remove the sealing die top section, see Section 5.10.7 "CHANGING THE SEALING DIE TOP SECTION".

2. Make sure the machine is de-energised.

-
3. Release and unplug all the plug connectors for the electrical connections on the die bottom section.



4. If there are other connections present on the die bottom section, unplug these connections.

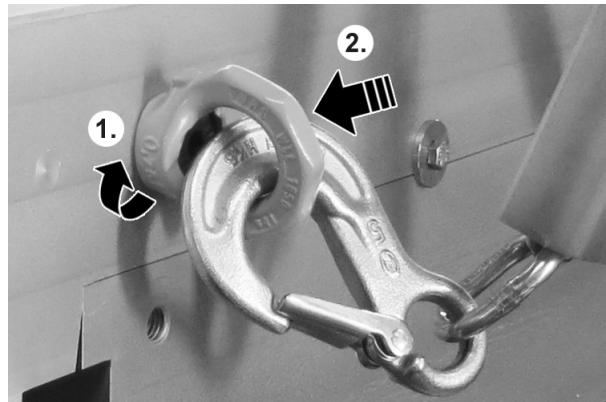


5. In the case of manually locked lifting units, release the lock mechanism on the die bottom section.



6. Unscrew the screw plugs for the eyebolts on the die bottom section.

-
7. Tighten the eyebolts on the die bottom section and hook the load lifting attachments on the load lifting equipment into the eyebolts.



-
8. Remove the die from the machine with the load lifting equipment and set it down on an appropriate surface.
 9. Remove the load lifting equipment.
-

Installing the sealing die bottom section

WARNING

Injury hazard!

Dies are heavy and have sharp edges.
Carrying heavy dies can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

CAUTION

Injury hazard!

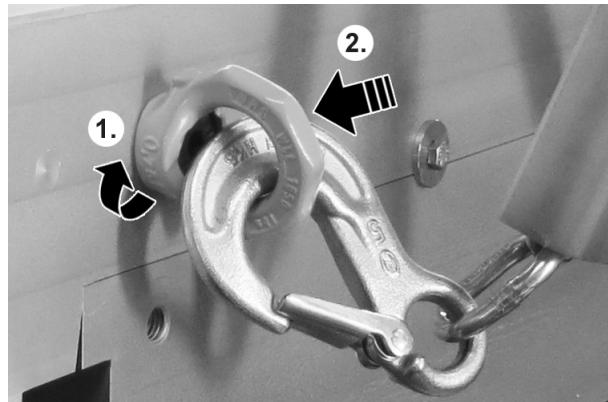
Sharp slitting knives or hole punches can be installed in the die bottom section.

Touching the sharp slitting knives or hole punches can lead to injuries.

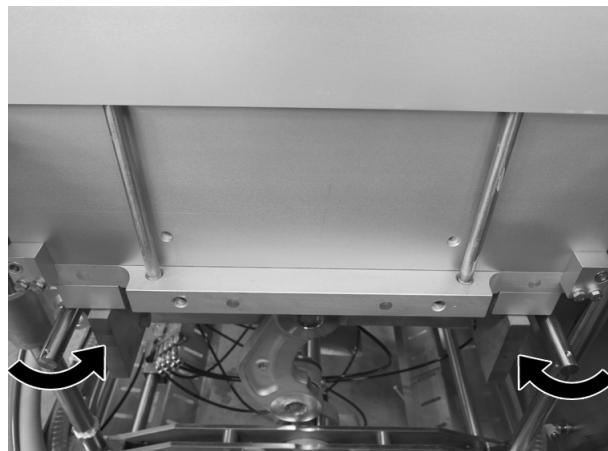
- When performing any work wear personal protective equipment.

-
1. Unscrew the screw plugs for the eyebolts on the die bottom section.

-
2. Tighten the eyebolts on the die bottom section and hook the load lifting attachments on the load lifting equipment into the eyebolts.

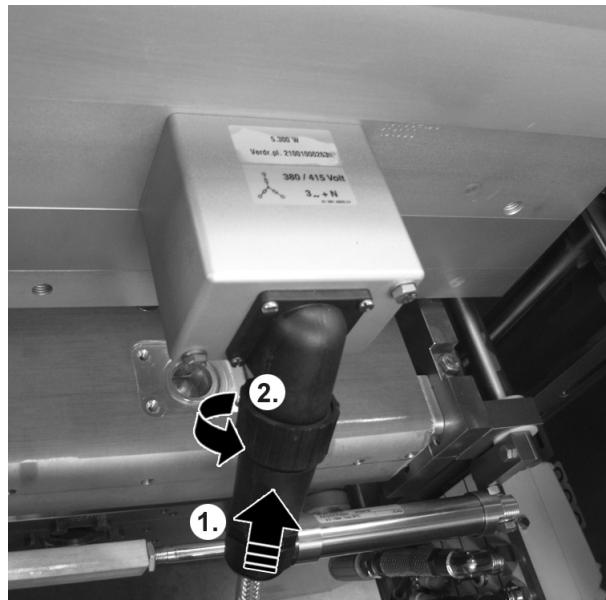


-
3. Align the die to the machine and lower it.
 4. Remove the load lifting equipment from the machine.
 5. In the case of manually locked lifting units, close the lock mechanism on the die bottom section.

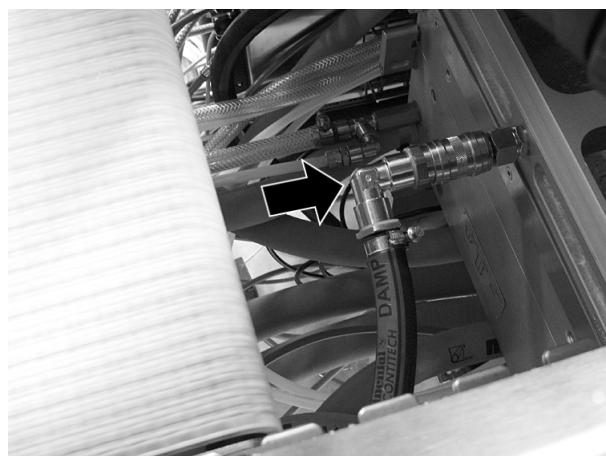


-
6. If necessary, unscrew the eyebolts on the die and tighten the screw plugs.

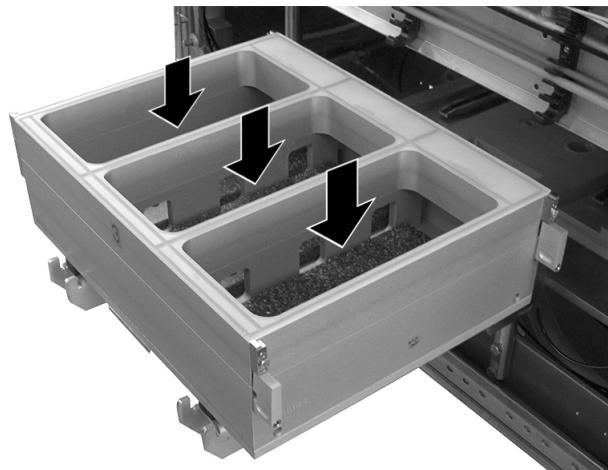
-
7. Insert and lock all the plug connectors for the electrical connections on the die bottom section.



-
8. If there are other connections present on the die, insert these connections.



-
9. Insert the required filling plates for the forming depth.



-
10. Install the matching sealing die top section, see Section 5.10.7 "CHANGING THE SEALING DIE TOP SECTION".
-

5.10.9 Changing sealing frame

Removing sealing frame

DANGER

Amputation hazard!

If the support plate is removed, the lifting units are freely accessible. Reaching into the moving lifting units will lead to serious injuries.

- Do NOT reach into the lifting units.
- When carrying out any work in the danger zone, do NOT allow other persons near the machine.
- Before starting any work in the danger zone, turn off the main switch and attach a lock to prevent unauthorised start-up.

WARNING

Burn hazard!

The built-in sealing plates can reach temperatures over 180 °C. Touching the sealing plates can lead to severe burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the sealing plates.

⚠ CAUTION

Injury hazard!

Sharp slitting knives or hole punches can be installed in the die bottom section.

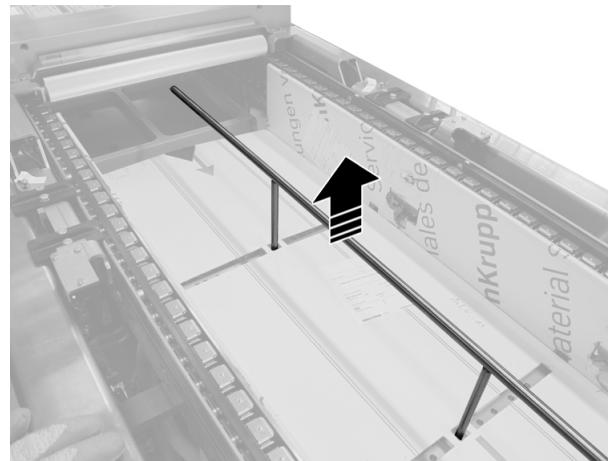
Touching the sharp slitting knives or hole punches can lead to injuries.

- When performing any work wear personal protective equipment.

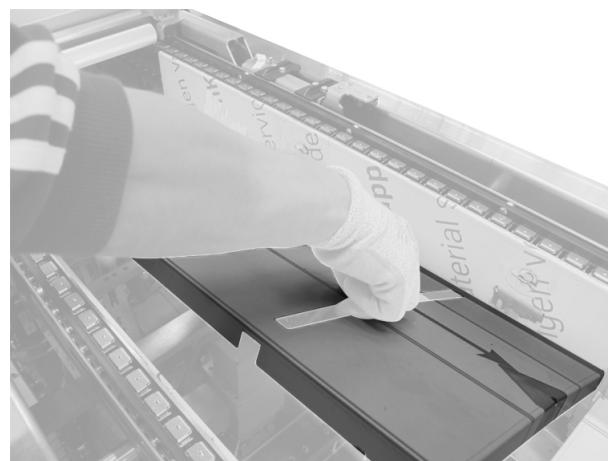
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.

2. Remove the safety guards in front of the sealing die.

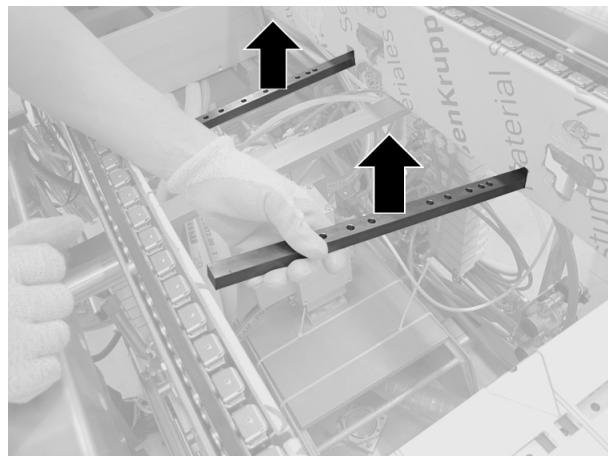
3. Pull the support bars out toward the top.



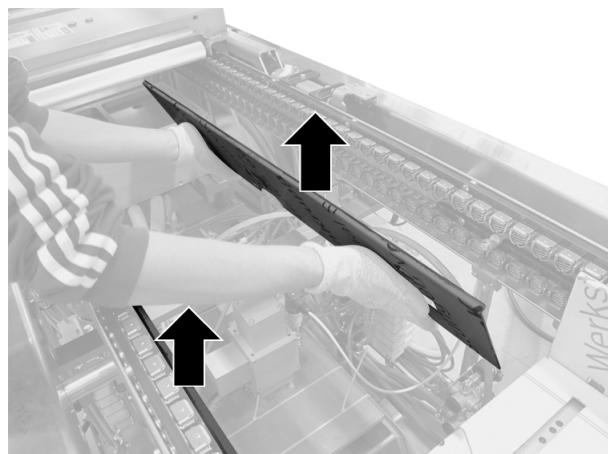
4. Lift out the support plate.



-
5. Unhook the cross beams.



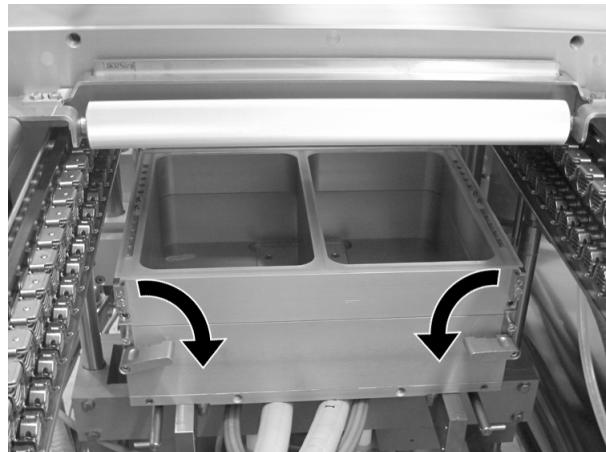
-
6. Unhook the cover plates for the transport chains on both sides.



-
7. Take the filling plates out of the sealing die bottom section.



-
8. Open the locking devices for the sealing frame.



-
9. Carefully take out the sealing frame.



Fitting the sealing frame

DANGER

Amputation hazard!

If the support plate is removed, the lifting units are freely accessible. Reaching into the moving lifting units will lead to serious injuries.

- Do NOT reach into the lifting units.
- When carrying out any work in the danger zone, do NOT allow other persons near the machine.
- Before starting any work in the danger zone, turn off the main switch and attach a lock to prevent unauthorised start-up.

⚠WARNING**Burn hazard!**

The built-in sealing plates can reach temperatures over 180 °C.
Touching the sealing plates can lead to severe burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the sealing plates.

⚠CAUTION**Injury hazard!**

Sharp slitting knives or hole punches can be installed in the die bottom section.

Touching the sharp slitting knives or hole punches can lead to injuries.

- When performing any work wear personal protective equipment.

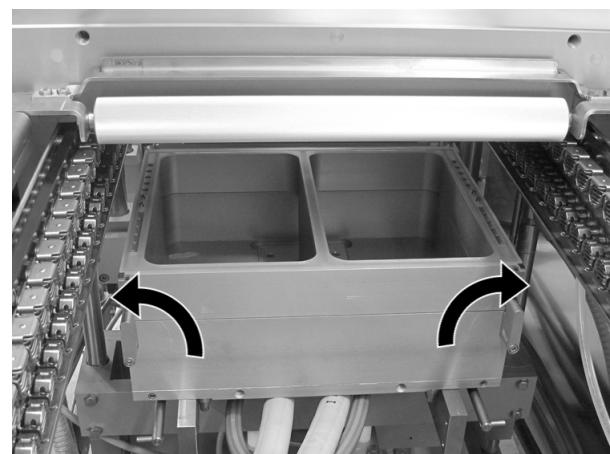
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
2. Place the sealing frame on the base plate of the sealing die bottom section.



-
- 2.1 Slide the guides of the sealing frame into the guides of the base plate.



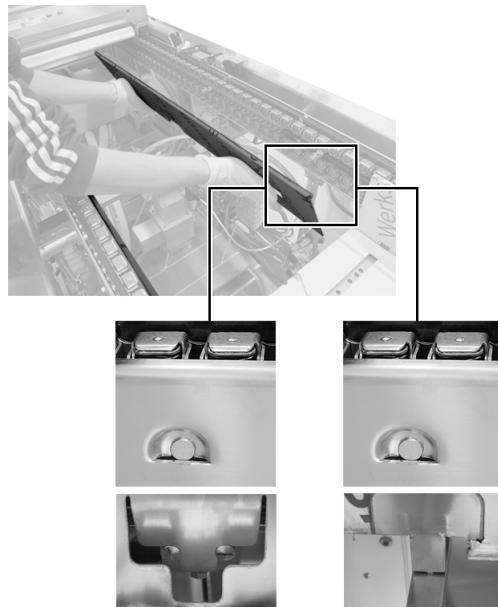
-
3. Close the locking catches on both sides.



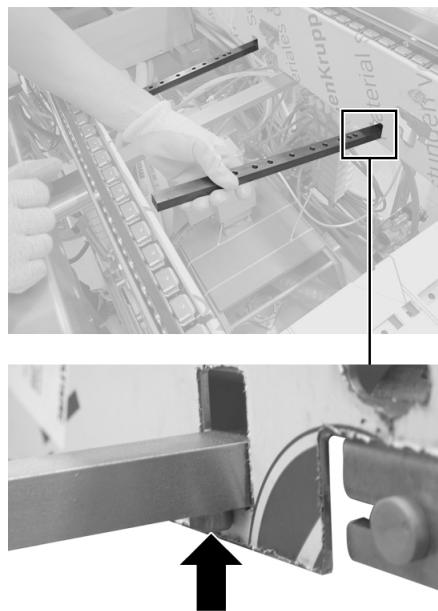
-
4. Place the filling plates into the sealing die bottom section.



-
5. Hook on the cover plates for the transport chains on both sides.

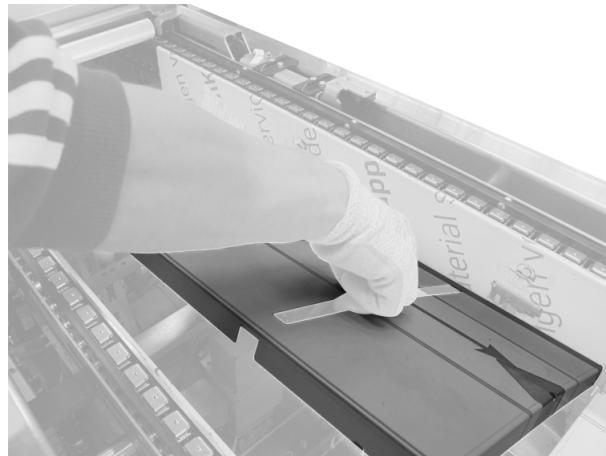


-
6. Insert the cross beams.

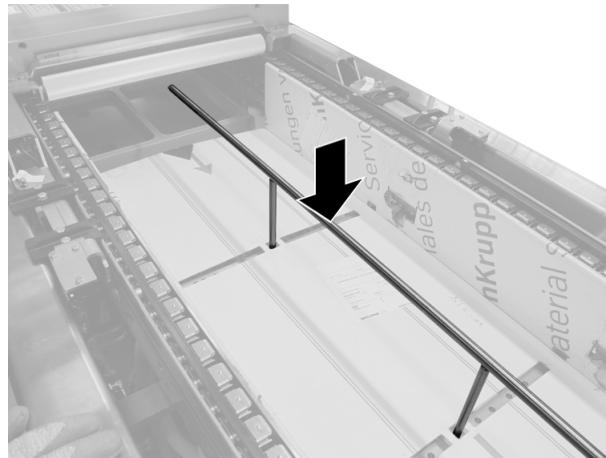


-
7. **⚠️ WARNING** – An incorrectly applied support system results in unprotected danger zones. Reaching into unprotected danger zones can lead to serious injuries.
 - The support system must completely cover the loading area.
 - Only use a support system that is appropriate for the equipment on the machine.

-
8. Replace the support plate.



-
9. Slot in the support bars.



-
10. Attach safety guards.

-
11. Open the stop-cock for the compressed air supply line.

-
12. Switch on the main switch.

5.11 Cross cutter

5.11.1 Check the cutting line of the cross cutter

-
1. Remove the finished packs at the machine outfeed.
 2. Lay the packs aside in the order they were removed from the machine. From this can be traced which cross cutter cut the individual packs.
 3. Check the position of the cutting lines.
 4. Measure and make a note of the deviations.
 5. For small deviations:

-
- 5.1 Check and correct the cut-off length. See Section 7 "SERVICING" on page 461.
 6. If no cut-off length correction is required or the format was changed:
 - 6.1 Position the cross cutters accordingly.
-

5.11.2 Manually positioning the cross cutter

Manually positioning the cross cutter with clamping nut

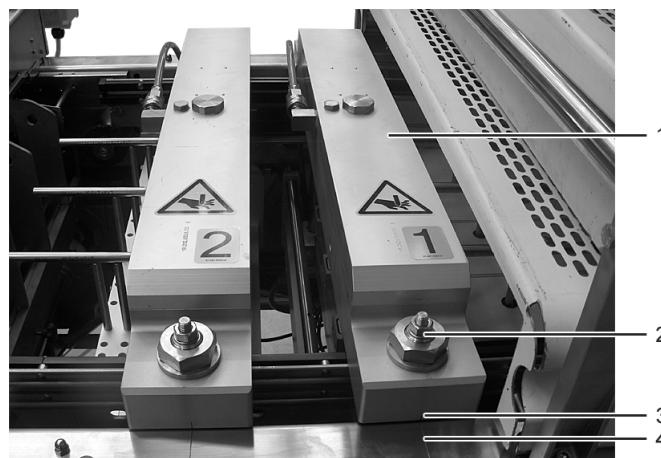


Fig. 310: Cross cutter clamping nut

- 1 Cross cutter
- 2 Clamping nut
- 3 Alignment mark, cross cutter
- 4 Alignment mark on machine frame

-
1. Run the film out of the machine. See Section 4.8.4 "RUNNING THE MACHINE EMPTY" on page 313.
 2. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
 3. Remove the safety guard over the cross cutter.
 4. Release the clamping nuts on both sides.
 5. Position the cross cutter in such a way, that its alignment mark lines up with the alignment mark on the machine frame.
 6. Tighten the clamping nuts on both sides.
 7. Attach the safety guard.
-

Positioning the cross cutter with locking screw



Fig. 311: Cross cutter locking screw

- 1 Cross cutter
- 2 Alignment mark, cross cutter
- 3 Locking screw
- 4 Alignment mark on machine frame

1. Run the film out of the machine. See Section 4.8.4 "RUNNING THE MACHINE EMPTY" on page 313.
2. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
3. Remove the safety guard over the cross cutter.
4. Release the locking screw on each side.
5. Position the cross cutter in such a way, that its alignment mark lines up with the alignment mark on the machine frame.
6. Tighten the locking screw on each side.
7. Attach the safety guard.

5.11.3 Positioning cross cutter with adjustment unit

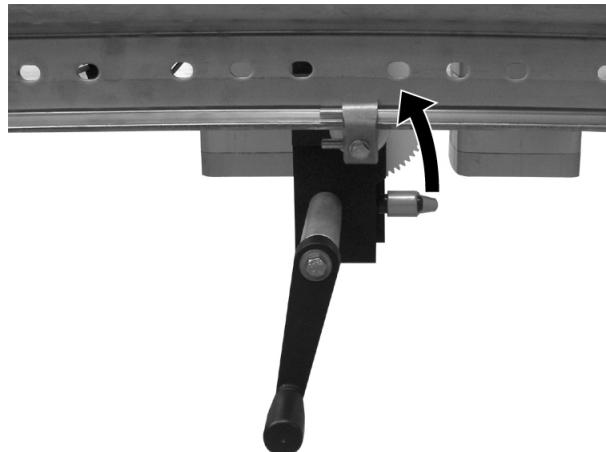


Fig. 312: Adjustment unit, cross cutter

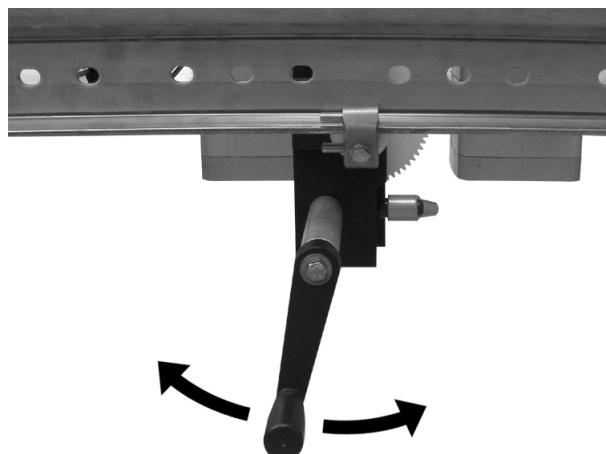
- 1 Cross cutter
- 2 Alignment mark, cross cutter
- 3 Locking Screw
- 4 Alignment mark on machine frame
- 5 Clamping lever
- 6 Hand crank, adjustment unit

-
1. Run the film out of the machine, see Section 4.8.4 "RUNNING THE MACHINE EMPTY".
 2. De-energise the machine, see Section 5.2 "DE-ENERGISING THE MACHINE".
 3. Remove the safety guard over the cross cutter.
 4. Release the locking screw on both sides.
-

-
5. Release the clamping lever.



6. Turn the hand crank so that the alignment mark of the cross cutter lines up with the alignment mark on the machine frame.



7. Tighten the clamping lever.
 8. Tighten the locking screws on both sides.
 9. Attach the safety guard.
-

5.12 User administration



Info

User administration is only possible with the *Administrator* access right. To avoid unauthorised access, the password should be changed by the authorised person.

5.12.1 Specifying password settings



1. Touch the <Access> button in the navigation bar.
 - ✓ The "Access/User menu" tab appears.

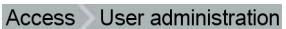


2. Touch the <Other settings> tab.
 - ✓ The "Access / Other settings" display appears.

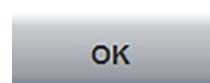
3. Under *password*, specify the component parts of the password.
4. If required set the access time under *Automatic logoff* and activate with *Active*.

5.12.2 Administering access rights

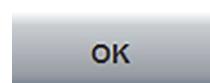


1. Touch the <Access> button in the navigation bar.
 - ✓ The "Access/User menu" tab appears.
2. Touch the <User administration> tab.
 - ✓ The display for "access/user administration tab" appears.


Resetting the password



1. In the list touch the access right for which the password is to be reset.
2. Touch the <change password> button.
 - ✓ The "change password" display appears.
3. Touch the *new password* input box.
4. Enter the new password and confirm with the <OK> button.



5. Touch the *repeat new password* input box.
6. Enter the new password again and confirm with the <OK> button.



7. If you wish, activate *Password change after the first log on*.
8. Touch the <OK> button.
 - ✓ The password is reset to the newly selected password.
 - ✓ If activated, the selected password and a new password are queried when the corresponding user logs in for the first time.

5.13 Production data acquisition

5.13.1 Viewing operating data



1. Touch the <Statistics> button on the navigation bar.



2. In the "Statistics menu", touch the <Production data acquisition> button.
 - ✓ The display for "Production data acquisition/machine effectiveness tab" appears.

Statistics > Production data acquisition > Machine effectiveness

Comparing time accounts



1. Touch the <Machine effectiveness> tab.
 - ✓ The display for "Production data acquisition/machine effectiveness tab" appears.
 - ✓ The diagram depicts the time accounts for the machine operating statuses, and in this way it shows the productivity of the machine.

Statistics > Production data acquisition > Machine effectiveness



2. Touch the <Update> button.
 - ✓ The content of the diagram is updated.

Checking messages



1. Touch the <Message overview> tab.
 - ✓ The display for "Production data acquisition/message overview tab" appears.
 - ✓ The depicted columns show the percentage proportion of each message in relation to the total time of messages.

Statistics > Production data acquisition > Message overview



2. Touch the <Update> button.
 - ✓ The content of the diagram is updated.

3. Touch the buttons for <Backwards> or <Forwards>.
 - ✓ The columns, which are depicted in the diagram, are scrolled through.



4. Touch the <Message list> tab.
 - ✓ The display for "Production data acquisition/message list tab" appears.

Statistics > Production data acquisition > Message list



5. Touch the <Update> button.
 - ✓ The content of the table is updated.

6. Touch a list entry.

-
7. Touch the <Troubleshooting> button.
 ✓ Troubleshooting on the selected list entry appears.
-

5.13.2 Filtering operating data



1. Touch the <Statistics> button on the navigation bar.



2. In the "Statistics menu", touch the <Production data acquisition> button.
 ✓ The display for "Production data acquisition/machine effectiveness tab" appears.

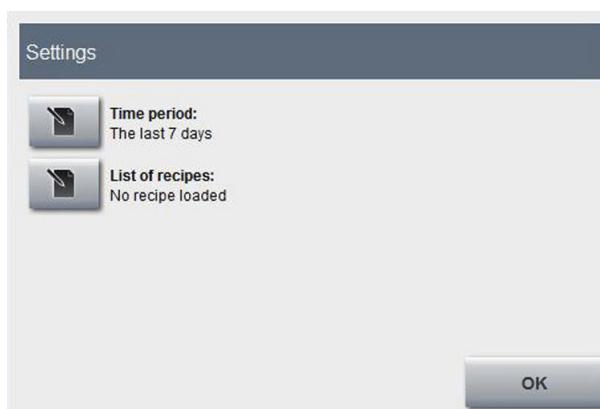
Statistics > Production data acquisition > Machine effectiveness

3. Touch the desired tab.
-

Configuring main filter



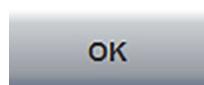
1. Touch the <Perform> button for *Time period* and *Recipe*.
 ✓ The "settings" display appears.



2. Touch the <Perform time period> button.
 ✓ The "Time period" display appears.



3. Select the desired time period for consideration.
 3.1 If *Individual time period* has been selected, touch the input boxes and enter the *starting time* and *finishing time*, and then confirm with the <OK> button.
-



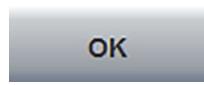
4. Touch the <OK> button.
 - ✓ The time period for consideration is specified.



5. Touch the <Perform recipe selection> button.
 - ✓ The "Recipe selection" display appears.



6. Select the desired recipes.
7. Touch the <OK> button.
 - ✓ The filter limits the data to the selected recipes.
 - ✓ If *Independent of shift* has been selected, the filter does not limit the data.
 - ✓ If *No recipe loaded* has been selected, the filter limits the data to the times, in which the machine was operated without a loaded recipe.

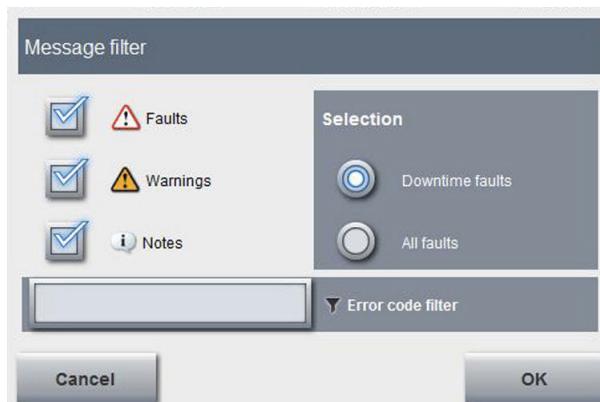


8. Touch the <OK> button again.
 - ✓ The main filter is configured.

Configuring message filters



1. Touch the <Filter> button.
 - ✓ The "Message filter" display appears.

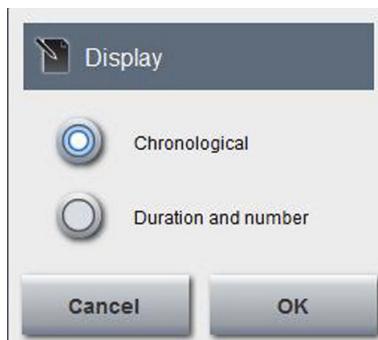


2. Select the desired types of message.
3. Select between *Downtime* and *All faults* in the *Selection* field.
4. Touch *Error code filter* input box.
 - ✓ A keypad appears.
5. Enter the sought error code, or part of the error code, on the keyboard.
6. Touch the <OK> button.
 - ✓ The message filter is configured.
 - ✓ The filter limits the data to the selected messages.

Selecting the depiction of the table for the message list



1. Touch the <Perform depiction display> button.
✓ The "Display" display appears.



2. Select the depiction of the table.



3. Touch the <OK> button.
✓ The table depiction is configured.

5.13.3 Configuring the database of production data acquisition (PDA)



1. Touch the <statistics> button on the navigation bar.



2. In the "Statistics menu", touch the <Production data acquisition> button.
✓ The display for "Production data acquisition/machine effectiveness tab" appears.



3. Touch the <Database settings> tab.
✓ The display for "Production data acquisition/database settings tab" appears.

Statistics > Production data acquisition > Database settings

4. If necessary, adjust the values in the *Configuration* field.

5.14 Configuring the forming process



Info

- The configuration of the forming process is only available with the Service access right.
- The configuration determines which forming process is activated for automatic mode.



1. Touch the <Main menu> button on the navigation bar.



2. Touch the <Forming> button in the "main menu".

✓ The first tab of the selected station appears.

Main menu > Forming



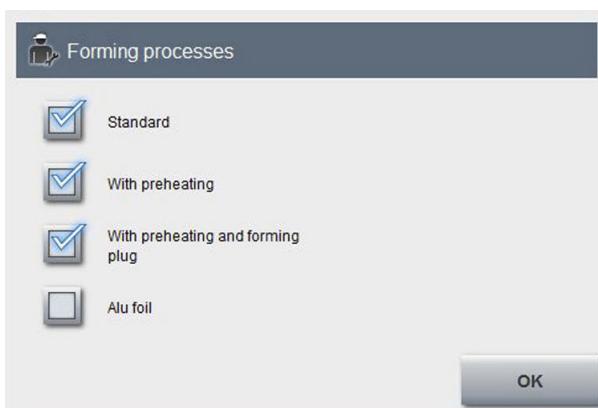
3. Touch the <Perform> button for *Forming process*.

✓ The forming processes enabled with the *Service access* right appear.



4. Touch the <Service> button.

✓ The display appears for configuring the forming process.



5. Select all required forming processes. See Section 2.4.2 "FORMING METHOD " on page 96.

OK

6. Touch the <OK> button.

✓ The display for the activated forming process is adapted to the new configuration.

OK

7. Touch the <OK> button again.

✓ The desired forming processes are configured.

5.15 Configuring the pack type



Info

- The configuration of the pack types is only available with the *Service access* right.
- The configuration determines which pack types are activated for automatic mode.



1. Touch the <Main menu> button on the navigation bar.



2. Touch the <Sealing> button in the "main menu".

✓ The first tab of the selected station appears.



3. Touch the <Perform> button for *Pack type*.

✓ The pack types enabled with the *Service access* right appear.



4. Touch the <Service> button.
 ✓ The display appears for configuring the pack types.



5. Select all required pack types.
 6. Touch the <OK> button.
 ✓ The display for the activated pack types is adapted to the new configuration.
 7. Touch the <OK> button again.
 ✓ The desired pack types are configured.

5.16 Configuring signal horn



1. Touch the <Main menu> button on the navigation bar.
 2. Touch the <Other settings> button in the "Main menu".
 ✓ The display for "Other settings / setting tab" appears.
 Main menu > Other settings > Settings

3. Under *Signal horn* touch the desired operating mode.

5.17 Enabling software components



Info

Enabling available software components is only possible with the Service access right. See Section 2.18.1 "MACHINE CONFIGURATION" on page 232.

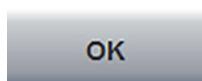


1. Touch the <maintenance menu> button on the navigation bar.
 2. In the "Maintenance menu", touch the <Service menu> button.

-
3. In the "service menu", touch the <Machine configuration> button.
 - ✓ The "Machine configuration" display appears.



4. Touch the empty box of the desired function, e.g. of synchronisation.



5. Touch the <OK> button.
 - ✓ The "Restart" message appears.



-
6. Touch the <Now> button.
 - ✓ The machine control performs a restart.
 - ✓ The function is enabled.

5.18 Changing the write and read authorisation

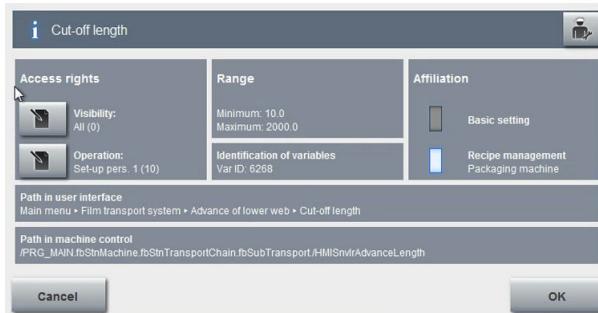
**Info**

Changing the write and read authorisation is only possible with the Service access right.



-
1. Call up the display with the operating component, for which the read or write authorisation is to be changed.
 2. Touch the <Information> button.
 - ✓ The Info mode is activated.
 - ✓ The specified read and write authorisation is shown.

3. Touch the operating component, which is to be changed.
 ✓ The "Information" display for the selected operating component appears.



4. If the read authorisation is to be changed, touch the <Edit visibility> button.
 ✓ The "Visibility" display appears.

5. Select the desired read authorisation.

OK

6. Touch the <OK> button.

- ✓ The read authorisation is changed and appears next to the button.



7. If the write authorisation is to be changed, touch the <Edit operation authorisation> button.
 ✓ The "Operation authorisation" display appears.

8. Select the desired write authorisation.

OK

9. Touch the <OK> button.

- ✓ The write authorisation is changed and appears next to the button.

OK

10. Touch the <OK> button.

- ✓ The "Information" display is hidden.



11. Touch the <Information> button.

- ✓ The Info mode is deactivated.

5.19 Basic setting



Info

- The machine control values, which are specific to the machine, are saved as the basic setting when the machine is delivered.
- The basic setting does not include any product-specific values.

- When a value is changed, which is a constituent part of the basic setting, a yellow warning icon appears on the <Maintenance menu> button in the navigation bar.



Fig. 313: Maintenance menu icon with warning

The warning icon goes out, when the basic setting is loaded or saved.

- The basic setting can only be loaded, saved or deleted with the Service access right.

5.19.1 Managing basic settings

Calling up basic setting



1. Touch the <maintenance menu> button on the navigation bar.
2. In the "Maintenance menu", touch the <Service menu> button.
3. Touch the <Basic setting> button in the "Service menu".
 - ✓ The "Basic setting" display appears.
Service menu > Basic setting

Loading basic setting



Info

When the basic setting is being loaded, all the inputs are overwritten by the basic setting. This means that all current inputs must be saved, before loading the basic setting.

1. Touch the basic setting, which is to be loaded, in the "Basic setting" display.
2. Touch the <Load> button.
 - ✓ The basic setting is loaded and appears in the *Loaded basic setting* box.

Saving basic setting

1. Touch the <Save> button in the "Basic setting" display.
 - ✓ The "Comment required" display appears.
2. Touch the input box.
 - ✓ A keypad appears.

OK

-
3. Enter the comment on the keypad and confirm with the <OK> button.
 - ✓ The current inputs are saved as the basic setting with the date, the set access right and the entered comment.
 - ✓ The basic setting appears in the *Loaded basic setting* box.
-

Deleting basic setting

OK

-
1. Touch the basic setting, which is to be deleted, in the "Basic setting" display.
 2. Touch the <Delete> button.
 - ✓ The "Delete" display appears.
 3. If the selected basic setting is no longer needed, touch the <OK> button.
 - ✓ The basic setting is moved to the recycle bin and disappears from the list.
-

5.19.2 Restoring basic setting



1. Touch the <maintenance menu> button on the navigation bar.
-



2. In the "Maintenance menu", touch the <Service menu> button.
-



3. Touch the <Basic setting> button in the "Service menu".
-

4. Touch the <Recycle bin> tab.
-

✓ The display for "Basic setting/Recycle bin tab" appears.
Service menu > Basic setting > Recycle bin

5. Touch the basic setting, which is to be restored, in the list.
-



6. Touch the <Restore> button.
-

✓ The basic setting disappears from the list.
✓ The basic setting appears in the list on the "Basic setting" tab.

5.19.3 Comparing basic settings



1. Touch the <maintenance menu> button on the navigation bar.
-



2. In the "Maintenance menu", touch the <Service menu> button.
-

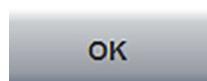
3. Touch the <Basic setting> button in the "Service menu".



4. Touch the <Compare> tab.
✓ The display for "Basic setting/Compare tab" appears.
Service menu > Basic setting > Comparison
-



5. Touch the top <Perform> button.
✓ The "Basic setting 1" display appears.
-



6. Select the desired basic setting for the comparison.
7. Touch the <OK> button.
-



8. Touch the bottom <Perform> button.
✓ The "Basic setting 2" display appears.
9. Select the desired basic setting for the comparison.
10. Touch the <OK> button.
✓ The values, which differ from each other, are displayed in the *Basic setting 1* and *Basic setting 2* table columns.
✓ The table column for *Designation of the variables* shows the variable, which has been altered.
-

5.19.4 Perform machine reset



1. Touch the <maintenance menu> button on the navigation bar.
-



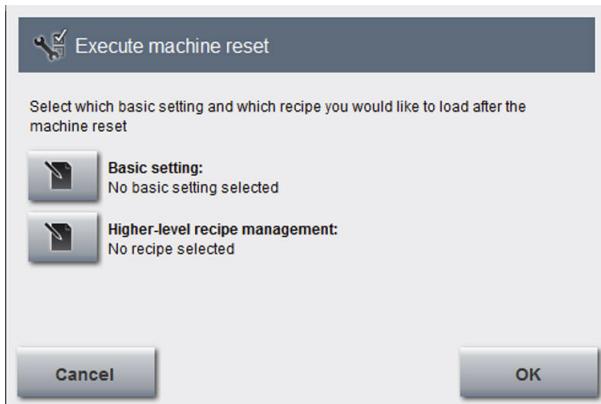
2. In the "Maintenance menu", touch the <Service menu> button.
-



3. Touch the <Basic setting> button in the "Service menu".
4. Touch the <Machine reset> tab.
✓ The display for "Basic setting/Machine reset tab" appears.

Service menu > Basic setting > Machine reset

-
5. Open the *Perform machine reset*wizard.
✓ The "Perform machine reset" display appears.



-
6. Touch the <Edit basic setting> button.
✓ The "Basic setting" display appears.
-
7. Select the basic setting that is to be loaded after the machine reset.
-
8. Touch the <OK> button.
-
9. Touch the <Edit recipe> button.
✓ The "Recipe" display appears.
-
10. Select the recipe that is to be loaded after the machine reset.
-
11. Touch the <OK> button.
-
12. If the machine reset is to be performed, touch the <OK> button again.
✓ The password is requested.
-
13. Touch the input box.
✓ A keypad appears.
-
14. Enter the password and touch the <OK> button.
✓ The "Restart" display appears.
✓ The machine control is restarted.
-

5.20 Integrating HLS server



Info

- The connection with the HLS server is only possible with the *Service* access right.

- The required IP address of the HLS server is notified by the IT department.



1. Touch the <Main menu> button on the navigation bar.



2. Touch the <Other settings> button in the "Main menu".



3. Touch the <Production data> tab.

- ✓ The display for "Other settings/production data tab" appears.

Main menu Other settings Production data



4. At *HLS production data acquisition*, touch the box *Active*.

- ✓ A check mark appears in the box.

5. Type *IP address HLS server* in the input box.

- ✓ A keypad appears.

6. Enter the IP address of the HLS server and touch the <OK> button.

- ✓ The HLS interface is established.



7. Touch the <Statistics> button on the navigation bar.

- ✓ The "Statistics" menu appears.



8. In the "Statistics menu", touch the <Production data acquisition> button.

input	info	PDA	Testline3
head state			
current:	5	set-up	
		set-up	cleaning
		maintenance	pause
		repair	off
employee			
log off shift			
current:	S2	late shift	
	early shift	late shift	night shift
shift foreman	1	Erich Mustermann	
No. of employees	2		
accept		cancel	
01.03.2011 16:19:13			

- ✓ The main screen of the HLS server is displayed.

5.21 FTP access

Accessing the databases of the audit trail

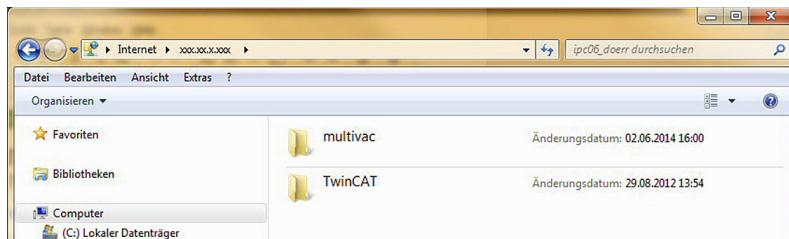
NOTICE

Material damage!

Data can be changed or deleted as a result of access for FTP. The saved recipes or machine software can be damaged or rendered unusable.

- Only allow access to the machine control to those persons, who have the necessary training.
- Only access the data in the specified directory.

1. Open Windows Explorer on a client, e.g. on a laptop.
2. Enter the IP address or name of the machine control. Select FTP as the protocol (example: `ftp://172.16.5.180`).
 - ✓ The FTP root directory of the machine control appears.



3. Open the directory with the audit trail data.
`F:\multivac\hmi\Application\appdata\logger\AuditTrail`
 - ✓ One file is stored for each calendar week.
4. Regularly back up and delete the weekly files.



Info

The required access data is:

- Username: anonymous
- Password: a@b

Accessing the data of the data backup

NOTICE

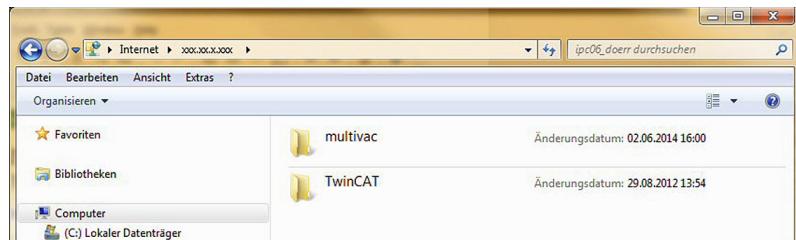
Material damage!

Data can be changed or deleted as a result of access for FTP. The saved recipes or machine software can be damaged or rendered unusable.

- Only allow access to the machine control to those persons, who have the necessary training.
- Only access the data in the specified directory.

1. Open Windows Explorer on a client, e.g. on a laptop.

-
2. Enter the IP address or name of the machine control. Select FTP as the protocol (example: ftp://172.16.5.180).
 - ✓ The FTP root directory of the machine control appears.



-
3. Open the directory with the data backup data.
F:\multivac\hmi\Application\export
\DataBackupLocal
 - ✓ All the data from the data backup is grouped in a zip archive.

5.22 Setting the sensors

5.22.1 Teaching the splice sensor

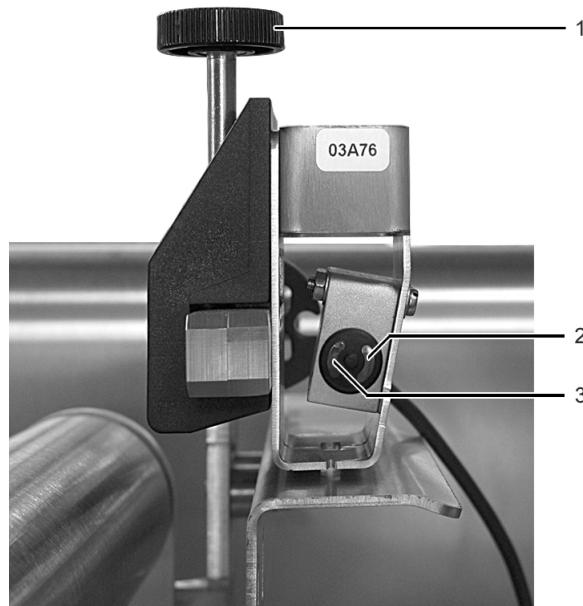


Fig. 314: Splice sensor

- 1 Clamp
- 2 Light emitting diode (yellow)
- 3 Light emitting diode (green)

-
1. Insert and advance the upper and lower webs according to the feeding diagram.

-
2. **DANGER** – The movements of the lifting units are performed automatically and with great force. When the main switch is turned off, the dies open automatically. Reaching into the moving lifting units can result in loss of limbs.

- Do NOT reach into the lifting units.
 - When carrying out any work in the danger zone, do NOT allow other persons near the machine.
-

3. With the lower web splice monitoring remove the safety guard between film infeed and forming station.
-

4. Release the clamp on the sensor.
-

5. Align the sensor crosswise.

- 5.1 For printed film, set the sensor so that the light beam does not hit the register marks or the print image during the advance.

- 5.2 For non-printed film, set the sensor so that the light beam hits the film.
-

6. Tighten the clamp on the sensor.
-



7. Touch the <Main menu> button on the navigation bar.
-



8. Touch the <Monitors> button in the "main menu".
-



9. Touch the <Sensor> tab.

- ✓ The display "Monitors / Sensor tab" appears.

Main menu > Monitors > Sensor

10. Under *Splice*, deactivate the box *Enable teaching key on sensor*.

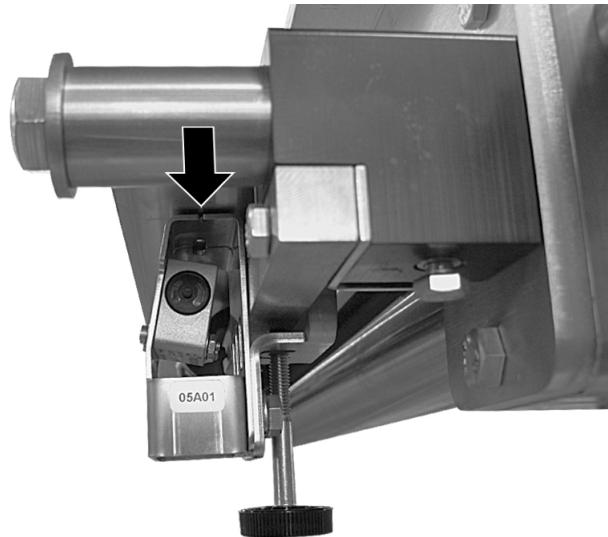
- ✓ The teaching function is enabled on the display.
-

11. Under *Splice*, activate the box *High sensitivity*.
-



12. Under *Splice*, call up the wizard for *Manual teaching* of the sensor.

-
13. Position the tape in the monitoring range of the sensor.



-
14. Under *Position splice under sensor*, touch the <Done> button.
 - ✓ The sensor is set to the colour of the tape.
 - ✓ Both LEDs flash.
 15. Position the film in the monitoring range of the sensor.
 16. Under *Position background under sensor*, touch the <Done> button.
 - ✓ The sensor is set to the basic colour of the film.
 - ✓ The yellow LED lights up.
 17. Touch the <Close> button.
 - ✓ The sensor is taught via the software.
 - ✓ The yellow LED lights up when the film is detected.
-

5.22.2 Teaching the sensor of the fill level monitor

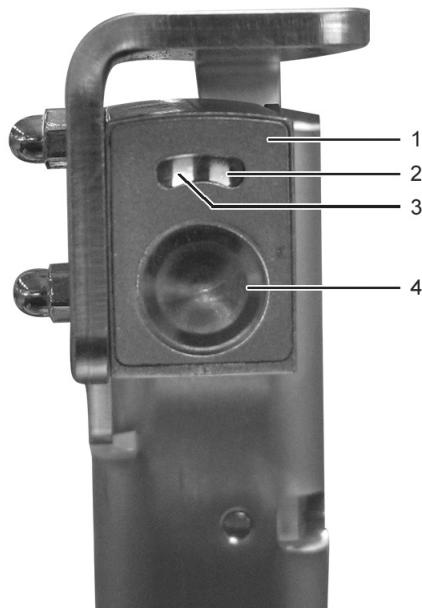
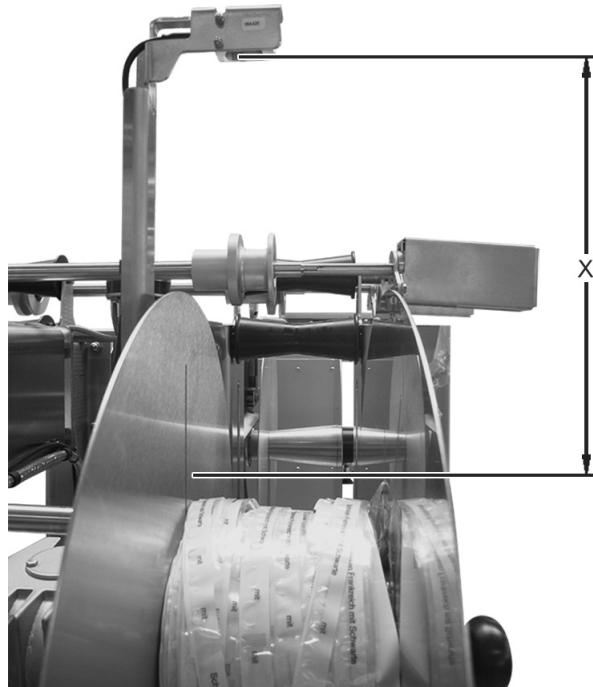


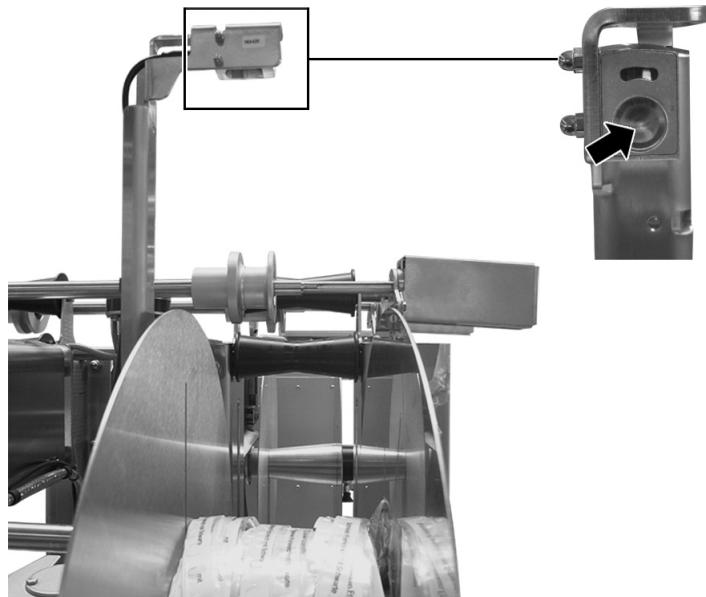
Fig. 315: Sensor of the fill level monitor

- 1 Sensor
- 2 Green LED
- 3 Yellow light emitting diode
- 4 Key

-
1. Run the machine until the desired amount of edge trim is wound on the edge trim winder.



-
2. Stop the machine. See Section 4.8.6 "STOPPING THE MACHINE" on page 313.
 3. Press the key on the sensor.
-



- ✓ The sensor is taught.
 - ✓ The sensor stores the desired amount as maximum amount of wound edge trim.
 - ✓ The green light emitting diode lights up as long as the desired amount is not reached.
 - ✓ The yellow light emitting diode lights up when the desired amount is reached.
-

5.23 Setting the heat exchanger

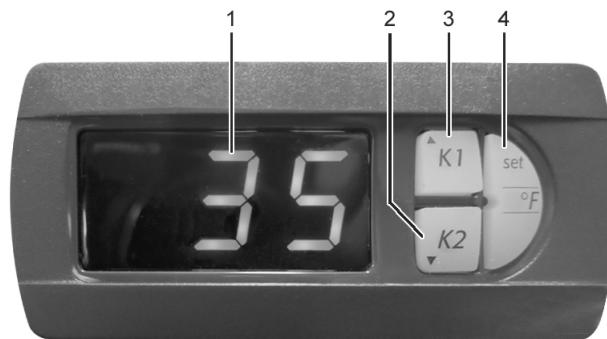


Fig. 316: Heat exchanger control devices

- 1 Display
- 2 <K2> key - Reduce value
- 3 <K1> key - Increase value
- 4 <Set/°F> key - Save value

The target temperature of the heat exchanger is set at the factory to 35 °C (95 °F).

1. Press the <K1> or <K2> key for one second, until 1 is displayed.
 2. Press the <Set/°F> key.
 3. Set the desired target temperature using the keys for <K1 - Increase value> or <K2 - Reduce value>. The setting range lies between 20 °C (68 °F) and 55 °C (131 °F).
 4. Press the <Set/°F> key for five seconds.
 - ✓ The new value is saved.
 - ✓ The currently measured internal temperature in the control cabinet is displayed.
-

6 Cleaning



Info

- Observe the safety instructions. See Section 1 "SAFETY" on page 16.
- Clean the machine after service work and repairs and disinfect it if necessary.
- For technical reasons it is not possible to eliminate all hygiene risks with design measures. You must therefore check the cleaning result thoroughly after each cleaning operation in areas that are difficult to clean, e.g. with a visual inspection or wipe test, and clean these again if required.
Examples of areas that are difficult to clean are:
 - Open threads
 - Open threads on proximity switches
 - Non-sealed contact surfaces
 - Large metal connections
 - Positive connections
 - Springs with small coil spacing
 - Internal edges
 - Hexagon socket screws
 - Locking bolt
 - Radii < 3 mm (0.12 in)
 - Plug connector for pneumatic lines
- The interior of the control cabinet is not a hygiene area. The control cabinet must remain closed during cleaning.

6.1 Notes on cleaning



Info

The duty of care obliges the operating company to create a cleaning plan for the machine, which is based on an analysis of hygiene and risk.

The cleaning sequence, which is recommended here, should be adapted to the particular packaging procedure, the environment of the procedure and the product which is being packaged.

-
1. Perform cleaning of upstream and downstream machines and units in accordance with the cleaning instructions of the manufacturer.
 2. Follow the instructions in the enclosed brochure "Stainless steel surfaces must be bright".
-

6.1.1 Rules of conduct

The objective of the cleaning work is to avoid risks to hygiene. If the cleaning is insufficient or not performed properly, this can result in the

contamination of the products and to health hazards for end consumers. In addition, the machine may be damaged. Assign only properly instructed and qualified personnel. Information on qualification and training can be obtained from MULTIVAC Service.

The ability to handle materials effectively and efficiently depends on:

- Proper dosage of care products
- Application time of the care products

Data sheets for the care products can be obtained from their manufacturers. The manufacturers also provide information on the maximum permissible dosages, which apply for the respective purpose of use.

6.1.2 Creating a company cleaning instructions

1. Specify the necessary cleaning intervals.
2. Specify the care products to be used. The recommended care products are listed in the Care products table.
3. Specify the dosage of care products.
4. Specify responsibilities for cleaning.
5. Specify first aid measures.

6.1.3 Measures for ensuring a long service life

NOTICE

Material damage!

Inappropriate work on anodized aluminium parts damages the anodized coating.

This will lead to aluminium corrosion.

- Do not use metal scraping dies.
- Do not use harsh cleansers.
- Do not use cleaning devices with abrasive surface.
- Residues of cleansers and other aggressive deposits must be removed immediately.

Regular and proper care helps to maintain the machine's value. The best protection against harmful influences is to clean and disinfect the machine on a regular basis. The longer product residue and other aggressive deposits remain on the machine, the more harmful their corrosive effects will be.

If used incorrectly, care products can damage components made of rubber or plastic. Before applying care products, please take time to read the instructions and warnings provided by the manufacturer.

6.1.4 Handling cleansers

WARNING

Chemical burn hazard!

Cleansers are caustic. Caustic effects are NOT noticed immediately. Contact with the skin can cause burns.

- Wear the prescribed personal protective equipment when handling cleansers.
- Observe the manufacturer's instructions.

NOTICE

Material damage!

Cleansers, which are too highly concentrated, will damage the machine.

This results in material damage and corrosion damage to the machine.

- Make the concentration of the cleanser in accordance with the cleanser manufacturer's instructions.
- Observe the type of cleanser. The recommended cleansers are listed in the Care products table.
- The quantity of cleanser is not the decisive factor for successful cleaning.
 - Applying amounts in excess of the proper dosage does not improve or accelerate cleaning efficiency.
- Dried cleanser residues make cleaning more difficult and prolonged.
 - Even the smallest residues can inhibit the effect of the disinfection.
- Insufficient cleaning cannot be compensated for by doubling the concentration of the disinfectants.

6.1.5 Use with disinfectant

WARNING

Danger of fire!

Alcohol-based disinfectants are highly flammable.

Fire, naked light or smoking ignites the disinfectant and can cause fires.

- When disinfecting the machine, flames or naked lights are prohibited.
- Smoking is prohibited.
- Observe the instructions of the disinfectant manufacturer.

⚠WARNING**Health hazard!**

Incorrect use of disinfectant can contaminate the product with chemicals or decrease the effectiveness of disinfection.

This can pose serious health hazards for end consumers.

- Follow the instructions of the disinfectant manufacturer.
- Only rinse after disinfection, if required by the disinfectant manufacturer.
- Always observe the regional hygiene regulations.
- Create company cleaning instructions.

-
1. Observe the type of disinfectant. The recommended disinfectants are listed in the Care products table.
 2. Only use alcohol-based disinfectants for *quick disinfection*.
-

6.1.6 Handling of cleaning devices

⚠WARNING**Health hazard!**

The cleaning devices will become sources of contamination if they are not cleaned often enough.

This can result in product contamination and to health hazards for end consumers.

- Use only plastic brushes and brooms.
- Clean the cleaning devices daily and apply disinfectant afterwards.

⚠WARNING**Health hazard!**

The vacuum cleaner spreads germs with its exhaust air.

This can result in product contamination and to health hazards for end consumers.

- Observe the specified limit values.
- Use suitable filter elements.

6.1.7 Corrosion protection and lubrication

⚠WARNING**Health hazard!**

Excess lubricants can accumulate at lubrication points.

Excess grease has no lubricating function; however, it can breed micro-organisms and contaminate the product.

- Check the lubrication points regularly for accumulation of excess lubricant.
- Remove any excess lubricant.

-
1. Observe the type of anti-corrosion agent. The recommended anti-corrosion agent is listed in the Care products table.
 2. Only use H1 or FDA-approved lubricants and anti-corrosion agents.
 3. Check the microbiological shelf life of the anti-corrosion agents and lubricants on a regular basis.
✓ This prevents the risk of product contamination.
-

6.1.8 Cleaning procedure

The manufacturer recommends the following cleaning procedures:

- Manual cleaning
- Quick disinfection
- Dry cleaning



Info

The procedure which is to be performed is noted in the respective step in the cleaning instructions.

Manual cleaning



Info

The company cleaning instructions specify which cleanser is to be used.

-
1. Perform manual cleaning with the cleaning solution and a soft cloth.
 2. Wait until the application time has elapsed; see instructions of cleanser manufacturer.
 3. If necessary, remove stubborn contamination and stains with a soft brush.
 4. Wipe with new cloth and water of drinking quality.
 5. Inspect for dirt and cleanser residues.
 6. If necessary, perform another manual cleaning and wipe it off.
-

Quick disinfection

-
1. Disinfect with alcohol-based disinfectant.
 2. Wait until the application time has elapsed; see instructions of disinfectant manufacturer.
-

Dry cleaning

-
1. Remove the dirt with a suitable vacuum cleaner.
-

-
2. Remove the contamination from difficult to reach areas with a soft brush. Do not whirl up the dirt.

 3. Once again, remove the contamination with a suitable vacuum cleaner.

 4. Check for dirt residues.

 5. If necessary, clean it again.
-

6.2 Cleaning packaging machine



Info

- Cleaning may only be performed by trained cleaning personnel. See Section 1.8.4 "MAKING THE SELECTION OF PERSONNEL" on page 27.
 - This chapter contains more detailed information about the particular cleaning procedure. See Section 6.1.8 "CLEANING PROCEDURE" on page 442.
-
1. Depending on the degree of dirt on the machine, supplement the daily cleaning recommended here with intensive cleaning. All components on which intensive cleaning has to be performed have to be controlled daily. Perform intensive cleaning on these components if they are dirty.

 2. If the machine is equipped with several similar pieces of equipment, carry out the work described for all equipment. Only perform steps that correspond to the equipment version of the machine.

 3. Always clean the machine from top to bottom.

 4. For all cleaning work, follow the safety instructions.

 5. When carrying out any cleaning work, always observe the instructions for cleaning. See Section 6.1 "NOTES ON CLEANING" on page 438.
-

6.2.1 Switching the cleaning position on and off

DANGER

Amputation hazard!

Lifting units can open unintentionally through vibrations even if in the cleaning position.

Reaching into the moving lifting units can result in loss of limbs.

- Do NOT carry out any work to the lifting units while the cleaning position is switched on.
- After completion of cleaning work switch off the cleaning position immediately.
- Do NOT reach into the lifting unit while the cleaning position is switched on.



Info

- The cleaning position is necessary to perform wet cleaning on the machine.
- The cleaning position keeps the dies closed during wet cleaning. This protects the sensitive dies from moisture.
- The tempering of the dies after cleaning prevents condensation from forming in the dies.

6.2.2 Performing an intermediate disinfection



Info

- Intermediate disinfection is a disinfection procedure during operation, e.g. after or immediately before short breaks, to reduce the growth of microorganisms. Quick disinfection is used for this.

WARNING

Health hazard!

If cleaning is performed inappropriately, the machine that has been cleaned previously can be contaminated again.

This can cause product contamination.

- The sequence of the described tasks is to be followed exactly.

1. If there is visible contamination, perform manual cleaning prior to quick disinfection.

Performing quick disinfection

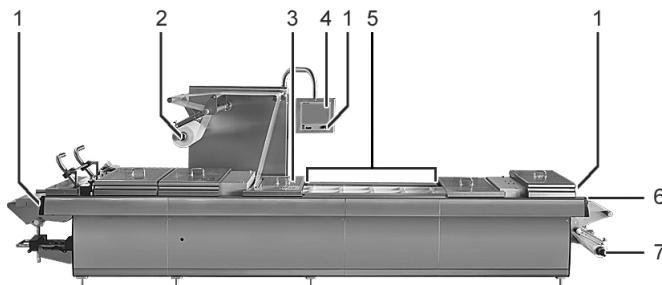


Fig. 317: Intermediate disinfection

- 1 EMERGENCY STOP
- 2 Control devices of the film unwind, upper web
- 3 Handle of safety guard on sealing die infeed
- 4 Control terminal
- 5 Loading area
- 6 <Advance> key
- 7 Operating devices of the film unwind, lower web

1. Perform quick disinfection of the EMERGENCY STOP.
2. Perform quick disinfection of the operating devices for the upper web film unwind.
3. Perform quick disinfection of the handle on the safety guard at the sealing die infeed.
4. Perform quick disinfection of the whole loading area.
5. Perform quick disinfection of the <Advance> key.
6. Perform quick disinfection of the control devices for the lower web film unwind.
7. If additional control devices are present on the machine, carry out a quick disinfection of these control devices.
8. If additional handles are present on the machine, carry out a quick disinfection of these handles.

6.2.3 Performing daily cleaning

 **WARNING**

Health hazard!

If cleaning is performed inappropriately, the machine that has been cleaned previously can be contaminated again.
This can cause product contamination.

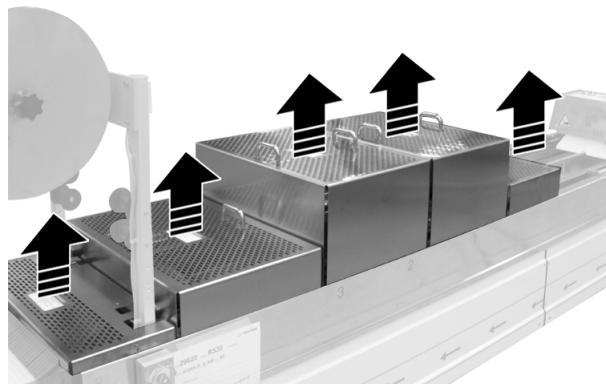
- The sequence of the described tasks is to be followed exactly.

Remove film and waste

1. Run the film out of the machine.
2. **WARNING** – The web rolls are heavy. Carrying heavy web rolls can lead to injuries.
 - Use suitable load lifting equipment.
 - Have a second person assist you.
3. Remove and wrap up the upper web roll and lower web roll, and store them outside the room in a clean, dry place during the cleaning procedure.
4. Empty the edge trim winder.
5. Remove all waste (e.g. product scraps, film trim) on or around the machine.
6. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.

Preparing for cleaning

1. Remove all the safety guards.



Cleaning and disinfecting the removed components

1. Perform quick disinfection of all the removed components. If there is visible contamination, first perform manual cleaning.

Clean the machine and the floor

1. Perform dry cleaning on the entire machine.
2. Remove the dirt from the floor using a suitable vacuum cleaner.

3. If there is visible contamination, perform manual cleaning of the machine.
4. Inspect the entire machine and the floor for dirt residues.
5. If necessary, clean it again.

Disinfecting the machine

1. Perform quick disinfection of the entire machine.

Completing the cleaning

1. Attach all safety guards.
2. **⚠WARNING** – The web rolls are heavy. Carrying heavy web rolls can lead to injuries.
 - Use suitable load lifting equipment.
 - Have a second person assist you.
3. Unpack the lower web roll and insert it.
4. Unpack the upper web roll and insert it.
5. Clean the cleaning devices, e.g. the brush.
6. Disinfect the cleaning devices.

6.2.4 Performing intensive cleaning



Info

- Intensive cleaning complements daily cleaning, which may require additional cleaning measures depending on the degree of contamination.
- Intensive cleaning may only be performed by trained cleaning personnel in conjunction with an authorised technician. See Section 1.8.4 "MAKING THE SELECTION OF PERSONNEL" on page 27.

⚠WARNING**Health hazard!**

If cleaning is performed inappropriately, the machine that has been cleaned previously can be contaminated again. This can cause product contamination.

- The sequence of the described tasks is to be followed exactly.

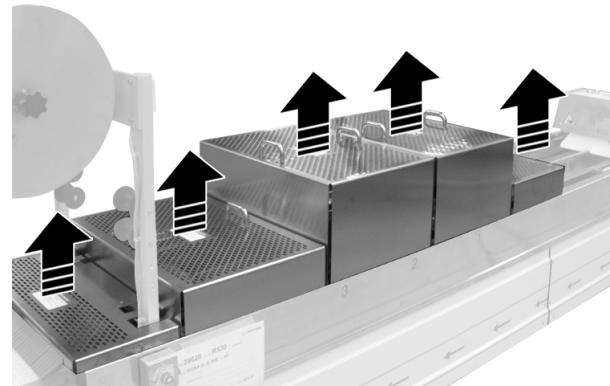
Remove film and waste

1. Run the film out of the machine.

-
2. **⚠️WARNING** – The web rolls are heavy. Carrying heavy web rolls can lead to injuries.
 - Use suitable load lifting equipment.
 - Have a second person assist you.
 3. Remove and wrap up the upper web roll and lower web roll, and store them outside the room in a clean, dry place during the cleaning procedure.
 4. Empty the edge trim winder.
 5. Remove all waste (e.g. product scraps, film trim) on or around the machine.
 6. Empty the cooling water circuit.
 7. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
-

Removing components

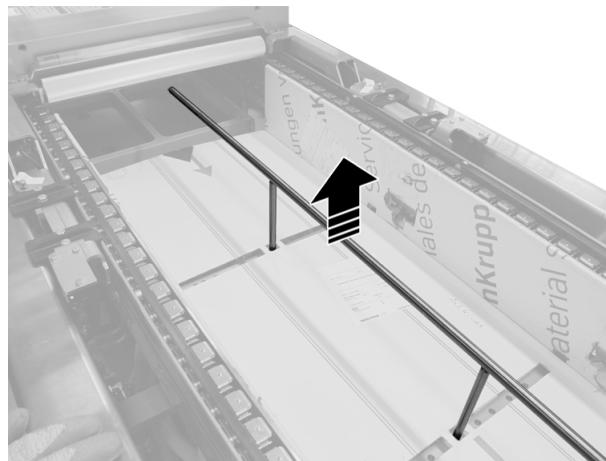
-
1. Remove all the safety guards.



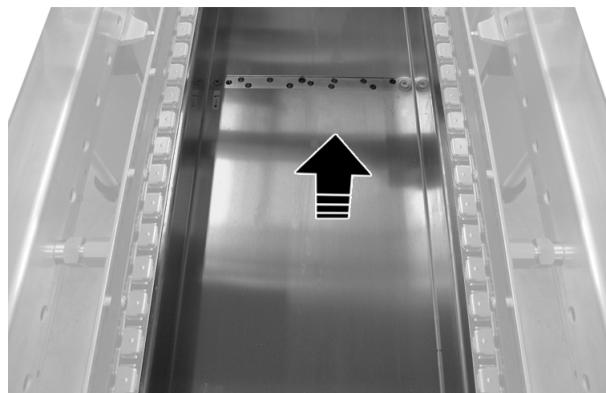
-
2. Remove the upper cover plates on the transport chains.



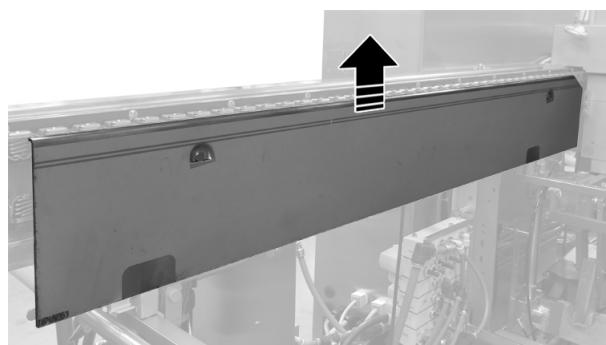
-
3. Remove the support bars.



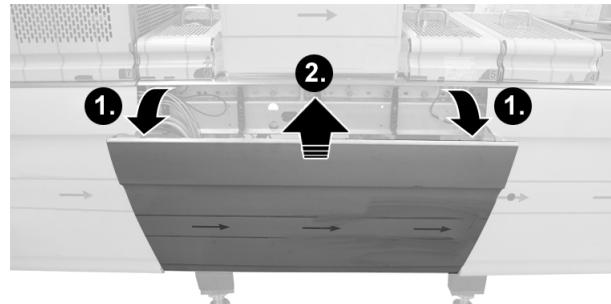
-
4. Remove the support plates.



-
5. Remove the side cover plates on the transport chains.



-
6. Remove all side panels.



-
7. Remove the side discs on the edge trim winder.



Cleaning and disinfecting the removed components

1. Perform quick disinfection of the removed components. If there is visible contamination, first perform manual cleaning.
-

Intensive cleaning of the sealing die

-
1. **⚠WARNING** – The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off. Touching the heating plates can lead to severe burns.
 - When performing any work wear personal protective equipment.
 - Do NOT touch the heating plates.
 - Before starting any work in the danger zone, allow the die to cool down.
 2. Remove the sealing die top section.
 3. Remove filling plates and dividers from the sealing die bottom section.
 4. If there is visible contamination, perform manual cleaning of the filling plates and dividers.
 5. Perform dry cleaning of the sealing die bottom section including the contact surfaces.
If there is visible contamination, also perform manual cleaning.
 6. Perform dry cleaning of the sealing die top section including the contact surfaces and the product side.
If there is visible contamination, also perform manual cleaning.
 7. Perform quick disinfection of the filling plates and dividers.
 8. Perform quick disinfection of the sealing die bottom section including the contact surfaces.
 9. Perform quick disinfection of the sealing die top section including the contact surfaces and the product side.
 10. Install the dividers and filling plates in the sealing die bottom section.
 11. Install the sealing die top section.
-

**Intensive cleaning of
the forming die**

-
1. **⚠WARNING** – The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off. Touching the heating plates can lead to severe burns.
 - When performing any work wear personal protective equipment.
 - Do NOT touch the heating plates.
 - Before starting any work in the danger zone, allow the die to cool down.
 2. Remove the forming die top section.
 3. Remove the filling plates and dividers from the forming die bottom section.
 4. Perform manual cleaning of the filling plates and dividers.
 5. Perform dry cleaning of the forming die bottom section including the contact surfaces.
If there is visible contamination, also perform manual cleaning.
 6. Perform dry cleaning of the forming die top section including the contact surfaces and the product side.
If there is visible contamination, also perform manual cleaning.
 7. Perform quick disinfection of the filling plates and dividers.
 8. Perform quick disinfection of the forming die bottom section including the contact surfaces.
 9. Perform quick disinfection of the forming die top section including the contact surfaces and the product side.
 10. Install the dividers and filling plates in the forming die bottom section.
 11. **NOTICE** – Protruding components in the die bottom section will collide with the die top section when the die is being closed. This can cause damage to the die top section.
 - Ensure that no components are protruding above the die bottom section.
 12. Install the forming die top section.
-

Cleaning and disinfecting the light barrier holders

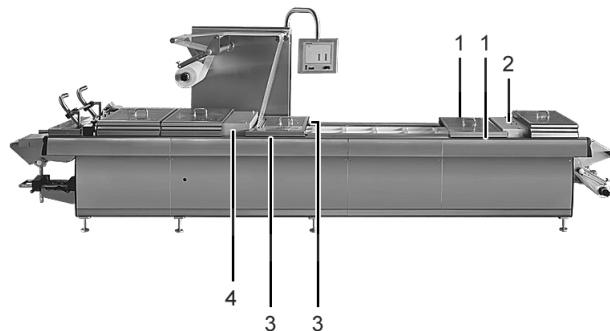


Fig. 318: Remove the light barrier holders

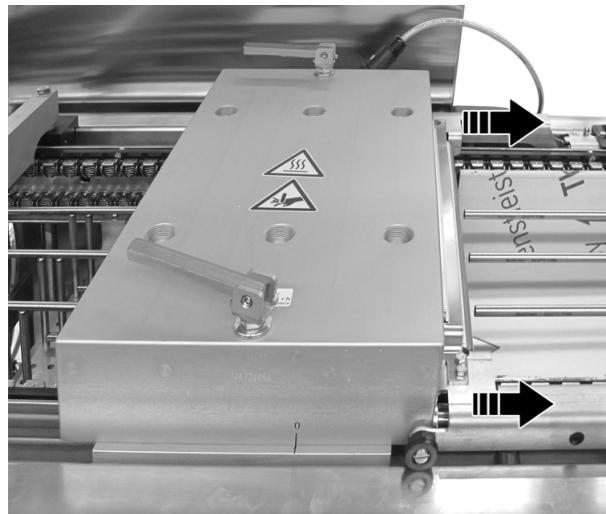
- 1** Forming die light barrier holders
- 2** Forming die
- 3** Sealing die light barrier holders
- 4** Sealing die

-
1. Remove the light barrier holders on both sides of the forming die.



2. Perform quick disinfection of the light barrier holders. If there is visible contamination, first perform manual cleaning.
 3. Refit the light barrier holders.
-

-
4. Remove the light barrier holders with the film deflection roller in front of the sealing die.



-
5. Perform quick disinfection of the light barrier holders and film deflection roller.
If there is visible contamination, first perform manual cleaning.
 6. Refit the light barrier holders and film deflection roller.
-

Clean the machine and the floor

-
1. Perform dry cleaning on the entire machine.
 2. Remove the dirt from the floor using a suitable vacuum cleaner.
 3. If there is visible contamination, perform manual cleaning of the machine.
 4. Inspect the entire machine and the floor for dirt residues.
 5. If necessary, clean it again.
-

Disinfecting the machine

-
1. Perform quick disinfection of the entire machine.
-

Disinfecting the cover plates of the sprockets

1. Remove the cover plates of the sprockets on the transport chains.



2. Perform quick disinfection of the cover plates.
3. Refit the cover plates of the sprockets on the transport chains.

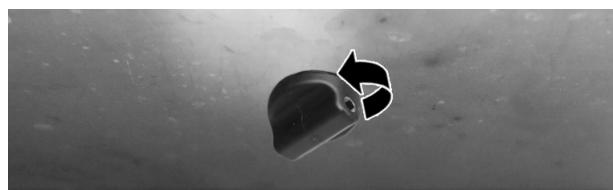
Disinfect the control cabinet

DANGER**Dangerous voltage!**

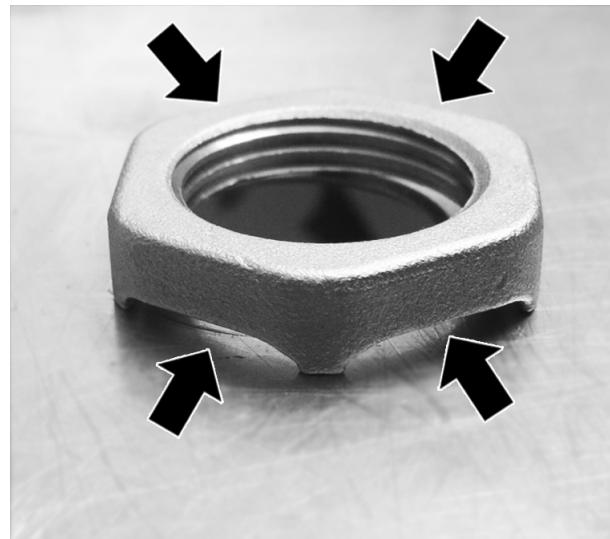
Switching off the machine does not rid it of electrical current. Touching live components will result in death or serious injury.

- Only qualified electricians are permitted to work on live components. Electric lines marked in orange are live.
- Before starting any cleaning work or service work, disconnect the machine's power supply from the mains electricity.

1. Open the control cabinet door.
2. If the interior of the control cabinet is dirty, perform manual cleaning on the inside of the control cabinet.
3. Perform quick disinfection on the inside of the control cabinet. Do not spray directly onto cables, contacts and electrical components.
4. Unscrew the condensate drain on the underside of the control cabinet.



-
5. Perform manual cleaning and quick disinfection of the nut for the condensate drain on the control cabinet floor.
 - 5.1 Ensure that the cut-outs in the nut are free of contamination.



-
6. Place the condensate drain in a cleanser.



-
7. Wait for the application time to expire. Follow the instructions of the cleanser manufacturer.
 8. Rinse off the condensate drain with water of drinking quality.
 - ✓ Ensure that the condensate drain is free of all cleaning solution.
 9. Place the condensate drain in disinfectant.
-

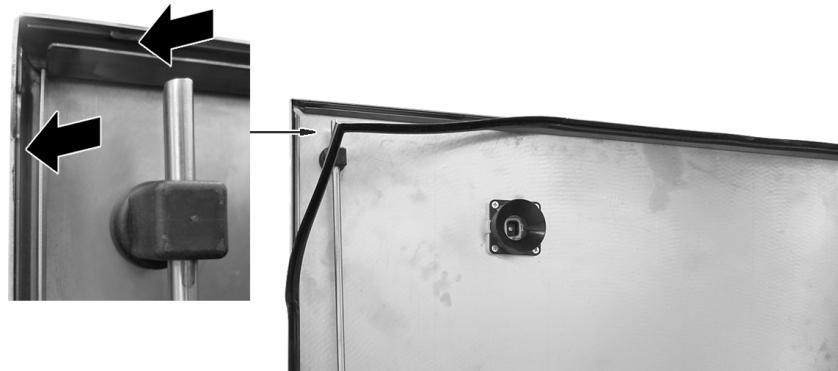
-
10. Wait for the application time to expire. Follow the instructions of the disinfectant manufacturer.
 11. If necessary, rinse off the condensate drain with water of drinking quality. Follow the instructions of the disinfectant manufacturer.
 12. **⚠️WARNING** – Small parts can be blown around by compressed air and accelerated quickly. This can lead to eye injuries.
 - When performing any work wear personal protective equipment.
 13. Dry the the condensate drain with sterile compressed air.
 14. Push the condensate drain and gasket from below through the hole in the control cabinet floor.
-



-
15. Tighten the condensate drain by hand.
 16. Pull out the gasket on the door of the control cabinet.
-



-
17. Perform quick disinfection on the U-profile of the control cabinet. If there is visible contamination, first perform manual cleaning.



-
18. Perform quick disinfection of the gasket.
 19. Dry the U-profile with sterile compressed air.
 20. Press the gasket into the U-profile of the control cabinet.



-
21. Air and dry out the control cabinet.
 22. Close the control cabinet door.

Cleaning work by trained personnel

Cleaning of the following listed components requires special training at MULTIVAC:

- Film infeed roller
- Cross cutter
- Film punches
- Strip punches
- Longitudinal cutters
- Complete cutting units

- Hole punching devices and slitting units
 - Lower web corner cutting device
 - Auxiliary units for the sealing die:
 - Heating plate for upper web
 - Knives with an inside-cut die
-
1. Perform quick disinfection of the listed components.
If there is visible contamination, first perform manual cleaning.
-

Completing the cleaning

1. Fit the side discs on the edge trim winder.
 2. Install the side cover plates on the transport chains.
 3. Fit the support plates
 4. Fit the support bars.
 5. Install the upper cover plates on the transport chains.
 6. Attach all safety guards.
 7. Attach all the side panels.
 8. **⚠️WARNING** – The web rolls are heavy. Carrying heavy web rolls can lead to injuries.
 - Use suitable load lifting equipment.
 - Have a second person assist you.
 9. Unpack the lower web roll and insert it.
 10. Unpack the upper web roll and insert it.
 11. Clean the cleaning devices, e.g. the brush.
 12. Disinfect the cleaning devices.
-

6.3 Care products table

Recommended care products:

Type	Manufacturer	Designation
Neutral cleansers	Johnson Diversey Europa	ClearKlens Plus VH5
Alkaline cleansers		ClearKlens Ultra VH4
Acidic cleansers		ClearKlens Brite VH3
Disinfectants		ClearKlens Tego 2000 SC VH25
Non-sterile disinfectants (alcohol based)		Divodes FG VT29

Type	Manufacturer	Designation
Sterile disinfectants (alcohol based)		ClearKlens IPA VH1 ClearKlens DE VH29
Decalcifier		ClearKlens Scale VH2
Decalcifiers (material protection)		ClearKlens Brite VH3
Anti-corrosion agents	Esso	Primol 352
	Castrol	Optimol F+D Fluid Spray
	Klüber Lubrication	Klüberfood NH1 K 32
Stainless steel care products	Ecolab Europa	P3-proguard CP

All recommended anti-corrosion agents and stainless steel care products are food compatible.

Buying source:

- Ecolab: www.ecolab.com
- Diversey: www.diversey.com
- Esso: www.exxonmobil.com
- Castrol: www.castrol.com
- Klüber Lubrication: www.klueber.com

7 Servicing



Info

- Observe the safety instructions, see Section 1 "SAFETY".
- The indicated service intervals are recommended values.
If necessary, adapt the service intervals to the operating conditions of the machine.
- Clean the machine after service work and repairs and disinfect if necessary.
- Use the right tool for all service work and maintenance work. The machine can be damaged by using unsuitable tools.
- MULTIVAC recommends that a servicing book is maintained for the servicing work performed. Document the following tasks:
 - Servicing work performed
 - Date
 - Machine's hours of operation
 - Name and signature of the technician

DANGER

Amputation hazard!

The movements of the lifting units are performed with great force. Reaching into the moving lifting units can result in loss of limbs.

- Only perform service work on the lifting units when they are in the lowest position.
- De-energise the machine to prevent dangerous movements.

DANGER

Dangerous voltage!

Turning off the machine with the main switch does not rid it of electrical current.

Touching live components will result in death or serious injury.

- Only qualified electricians are permitted to work on live components. Electric lines marked in orange are live.
- Before starting any work on live components, turn off the main switch and attach a lock to prevent unauthorised start-up.
- Before starting any work on live components, disconnect the machine's power supply from the mains electricity.

⚠WARNING

Health hazard!

Excess lubricants can accumulate at lubrication points.

Excess grease has no lubricating function; however, it can breed micro-organisms and contaminate the product.

- Check the lubrication points regularly for accumulation of excess lubricant.
- Remove any excess lubricant.

7.1 Maintenance schedule

As needed

Assembly	Activity	Page	Com- pleted
Entire machine	Performing intermediate disinfection	473	
Entire machine	Performing microbiological test	474	
Entire machine	Acidic cleaning and disinfection	474	
Entire machine	Intensive cleaning	474	
Entire machine	Decalcifying	474	
Air preparation unit	General reconditioning	492	
Vacuum system	Changing vacuum filter	494	
Vacuum pump Mink MM11xx	Changing the gear oil	499	
Vacuum pump Mink MM11xx	General reconditioning	499	
Cross cutter	Replacing springs	501	

Every 8 operating hours or daily

Assembly	Activity	Page	Com- pleted
Valve clusters	Visual inspection	465	
Entire machine	Visual inspection	466	
Entire machine	Alkaline cleaning and disinfection	473	
Basic setting	Checking, adjusting	474	
Film unwinds	Visual inspection	476	
Film unwinds	Cleaning	476	
Transport chains	Clean manually	477	

Assembly	Activity	Page	Com-	pleted
Transport chains	Lubricate with oil	477		
Sensors	Clean optical components	477		
Photo scanning heads	Cleaning optical components	477		
Forming die, sealing die	Checking the heating plates and sealing plates	498		
Cutting unit	Visual inspection	499		
Cutting unit	Cleaning	500		
Cutting unit	Applying anti-corrosion agents	500		

Every 50 operating hours or weekly

Assembly	Activity	Page	Com-	pleted
Control cabinet	Visual inspection	466		
Control cabinet	Checking the condensate drain	470		
Control cabinet	Check flange seals	473		
Connections	Visual inspection	474		
Light barriers	Cleaning	477		
Air preparation unit for compressed air	Visual inspection	489		
Lifting unit - pull rods and guide rods	Applying anti-corrosion agents	496		
Forming die, sealing die	Checking	498		
Vacuum pump MM 11xx	Visual inspection	498		
Discharge unit with belt conveyor (option)	Tensioning the belt	503		

Every 200 operating hours or monthly

Assembly	Activity	Page	Com-	pleted
Central lubrication of lifting unit	Lubrication	496		
Vacuum pump MM 11xx	Checking the vacuum filter	499		
Vacuum pump Mink MM11xx	Fill level of the gear oil checking the	499		

Assembly	Activity	Page	Com- pleted
Cross cutter	Lubrication	500	
Discharge unit	Adjusting friction brake	501	

Every 1000 hours of operation or every six months

Assembly	Activity	Page	Com- pleted
Activated carbon filter for compressed air	Replacement	481	
Film transport system	Checking, correcting cut-off length	492	
Vacuum pump Mink MM11xx	Cleaning	499	

Every 2400 operating hours or yearly

Assembly	Activity	Page	Com- pleted
Service socket	Checking	473	
Entire machine	Check the age	473	
Pedestal bearing	Lubrication	475	
Flange bearing	Lubrication	476	
Micro-filter for compressed air	Replacement	477	
Compressed air micro-filter with stainless steel housing	Replacement	480	
Compressed air carbon filter with stainless steel housing	Replacement	484	
Air preparation unit filter	Replacement	486	
Air preparation unit filter	Replacement	489	
Filter element in the dirt trap	Cleaning	492	
Lifting unit - spindle	Lubrication	497	
Vacuum pump Mink MM11xx	Cleaning the filter in the suction connection	499	

Every 4800 hours of operation or every two years

Assembly	Activity	Page	Com-
			pleted
Control cabinet	Replace the condensate drain.	471	

7.2 Opening and closing devices

7.2.1 Opening the electrical lifting units

1. Switch off the cleaning position. See Section 6.2.1 "SWITCHING THE CLEANING POSITION ON AND OFF" on page 444.

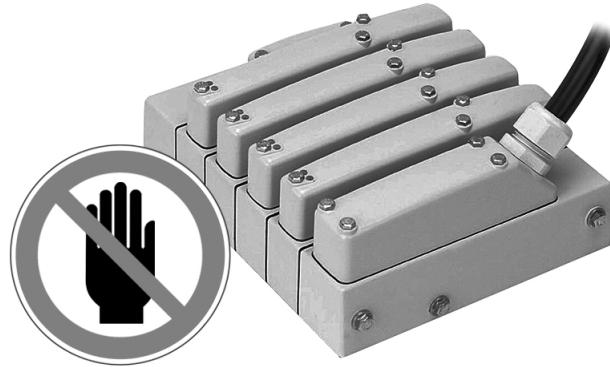
7.3 General service recommendation

7.3.1 Valve clusters - Visual inspection

 **DANGER**

Injury hazard!

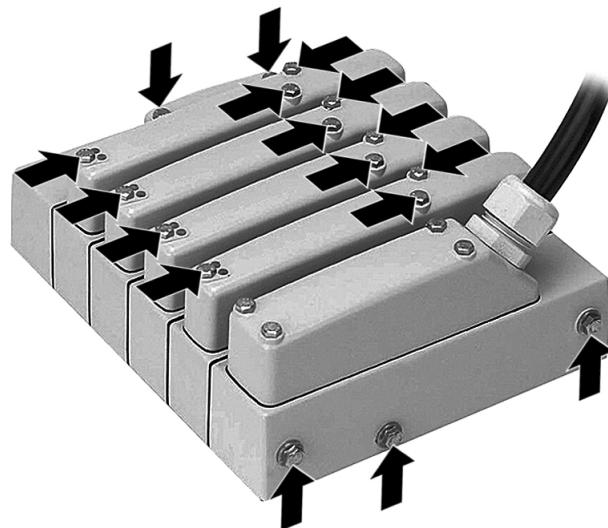
If valve clusters are not completely tight, humidity may get in and cause uncontrolled movements of the machine. This will lead to serious injuries.



- Valve clusters may only be opened by a trained technician.

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
2. Remove the side cladding in the area of the valve cluster.

-
3. Check the safety varnish on the screws.



- 3.1 If the varnish is damaged, notify a trained technician immediately. The screws of the valve cluster have been opened.
-

7.3.2 Entire machine - Visual inspection

1. Check the entire machine for any external signs of damage.
 2. Check that all the stickers are present.
 3. **DANGER** – Non-functioning or damaged safety devices lead to unprotected danger zones. Reaching into unprotected danger zones will lead to serious injuries or death.
 - Shut down the machine immediately.
 - Notify MULTIVAC Service without delay.
 4. Check that all safety devices are attached and undamaged.
-

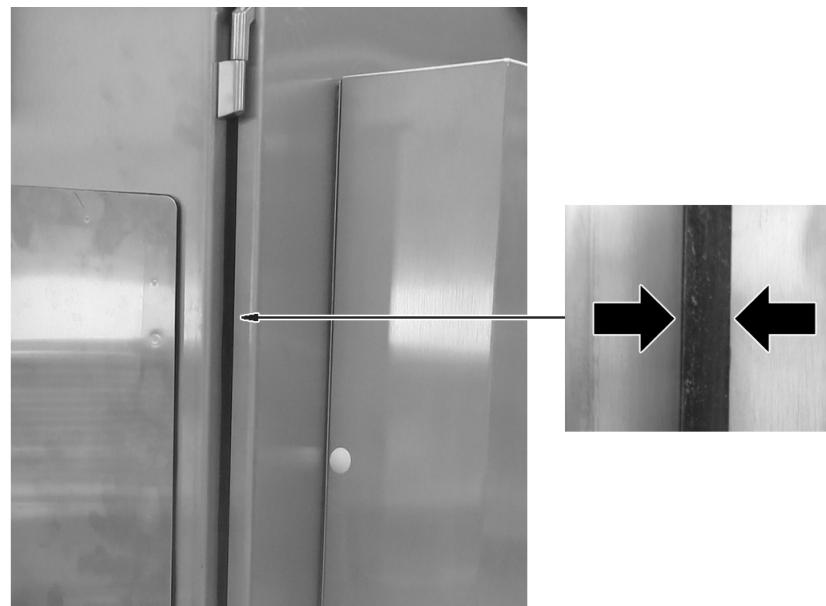
7.3.3 Control cabinet - Visual inspection

DANGER**Dangerous voltage!**

Switching off the machine does not rid it of electrical current. Touching live components will result in death or serious injury.

- Only qualified electricians are permitted to work on live components. Electric lines marked in orange are live.
- Before starting any cleaning work or service work, disconnect the machine's power supply from the mains electricity.

-
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
 2. Check whether the door gasket is damaged.
 - ✓ Replace a damaged door gasket.
 3. Check whether the door gasket is clean and clear of gaps all round, when the door is closed. If not, observe the following points.



-
4. Open the control cabinet door
 5. Check whether the interior of the control cabinet is dirty.
 - ✓ A dirty interior indicates that the door gasket is damaged.
 - ✓ Replace a damaged door gasket.

-
6. Check whether there is any contamination visible in the area of the flange plates.



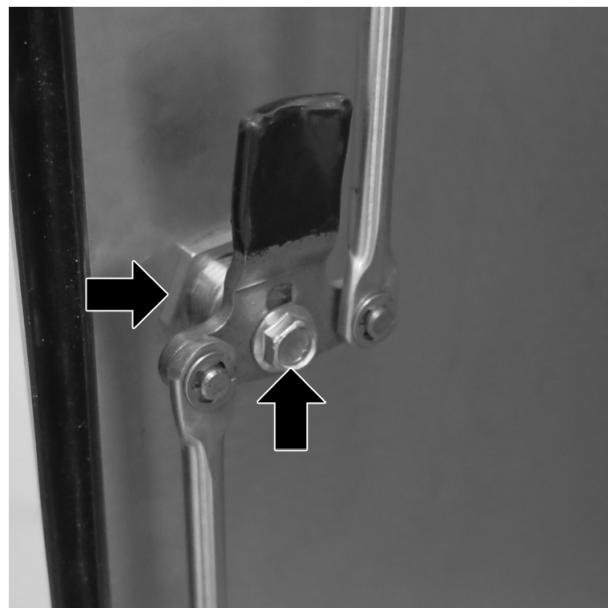
- ✓ Contamination indicates a damaged flange seal.
- ✓ Have a damaged flange seal replaced by MULTIVAC Service.

-
7. Check whether the door gasket is pressed correctly into the U-profile of the control cabinet door.



- ✓ If required, press it in.

-
8. Check whether the screw and nut on the closing mechanism are tightened, and that the closing mechanism functions.



✓ If necessary, tighten the screw and nut.

-
9. Check whether the guides for the rods are movable.



✓ If required, replace the guides.

-
10. Check whether the door is damaged or distorted.
 - ✓ If the door is damaged, notify MULTIVAC Service.
 11. Close the control cabinet door.
-

7.3.4 Control cabinet - Checking the condensate drain

DANGER

Dangerous voltage!

Switching off the machine does not rid it of electrical current.

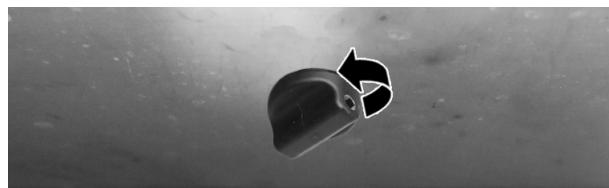
Touching live components will result in death or serious injury.

- Only qualified electricians are permitted to work on live components. Electric lines marked in orange are live.
- Before starting any cleaning work or service work, disconnect the machine's power supply from the mains electricity.

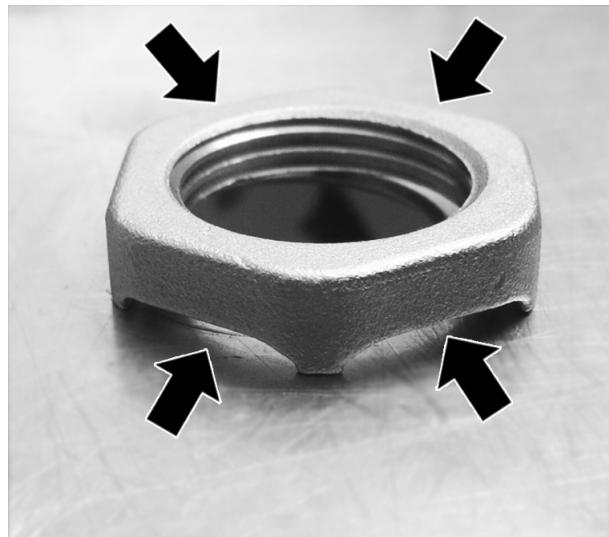
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
2. Open the control cabinet door.
3. Check whether there is water on the control cabinet floor.



4. If there is water on the control cabinet floor, replace the condensate drain:
 - 4.1 Unscrew the condensate drain on the underside of the control cabinet.



- 4.2 Ensure that the cut-outs in the nut on the control cabinet floor are free of contamination.
If necessary, perform manual cleaning of the nut.



- 4.3 Push the new condensate drain and gasket from below through the hole in the control cabinet floor.



- 4.4 Tighten the condensate drain by hand.

7.3.5 Control cabinet - Replace the condensate drain.

DANGER

Dangerous voltage!

Switching off the machine does not rid it of electrical current. Touching live components will result in death or serious injury.

- Only qualified electricians are permitted to work on live components. Electric lines marked in orange are live.
- Before starting any cleaning work or service work, disconnect the machine's power supply from the mains electricity.

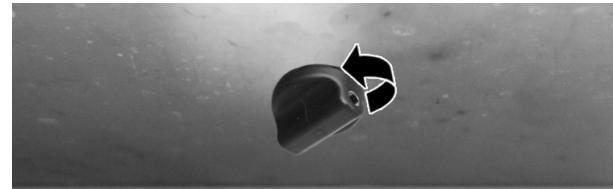
-
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
 2. Open the control cabinet door.
-

Servicing

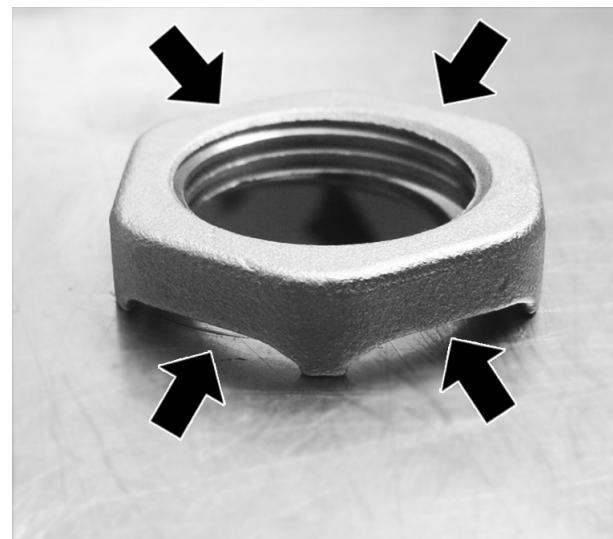
Control cabinet - Replace the condensate drain.



-
3. Unscrew the condensate drain on the underside of the control cabinet.



4. Ensure that the cut-outs in the nut on the control cabinet floor are free of contamination.
If necessary, perform manual cleaning of the nut.



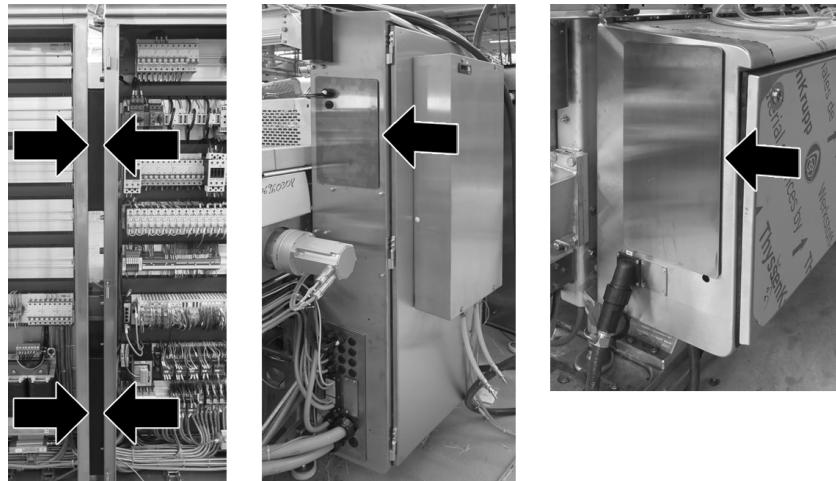
5. Push the new condensate drain and gasket from below through the hole in the control cabinet floor.



6. Tighten the condensate drain by hand.
-

7.3.6 Control cabinet - Check flange seals

1. Check whether damage is visible on the flange seals.
The flange seals can be sideways on the control cabinets or between docked control cabinets.



- ✓ Have a damaged flange seal replaced by MULTIVAC Service.

7.3.7 Service socket - Checking

1. Have the service socket in the control cabinet checked by a qualified electrician.

7.3.8 Entire machine - Check the age

1. Read the year of manufacture on the type plate.
2. If the machine is older than 19 years:
 - 2.1 Shut down the machine.
 - 2.2 Have the safety functions checked by MULTIVAC Service.

7.3.9 Entire machine - Performing intermediate disinfection

1. Perform intermediate disinfection regularly during operation (e.g. after or immediately before short breaks). See Section 6 "CLEANING" on page 438.

7.3.10 Entire machine - Alkaline cleaning and disinfection

1. Perform daily cleaning with an alkaline care product.

-
- 1.1 Observe the company cleaning instructions and the cleaning recommendations. See Section 6 "CLEANING" on page 438.
-

7.3.11 Entire machine - Performing microbiological test

-
1. Check the result of the cleaning and disinfection by means of a microbiological test.
 - 1.1 Observe the company cleaning instructions and the cleaning recommendations. See Section 6 "CLEANING" on page 438.
-

7.3.12 Entire machine - Acidic cleaning and disinfection

-
1. Perform cleaning with an acidic care product as described under daily cleaning.
 - 1.1 Observe the company cleaning instructions and the cleaning recommendations. See Section 6 "CLEANING" on page 438.
-

7.3.13 Entire machine - Intensive cleaning

-
1. Observe the company cleaning instructions and the cleaning recommendations. See Section 6 "CLEANING" on page 438.
-

7.3.14 Entire machine - Decalcifying

-
1. Have the machine decalcified by MULTIVAC Service.
-

7.3.15 Connections - Visual inspection

-
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
 2. Check power cable for damage.
 3. Check that the compressed air supply line is fitted tightly and undamaged.
 4. Check that the cooling water line is fitted tightly and undamaged.
 5. Check that the line for packaging gas (option) is fitted tightly and undamaged.
-

7.3.16 Basic setting - Checking, adjusting

-
1. Check the system pressure and adjust if necessary. See "Technical specifications".
-

-
2. Check the cooling water flow rate.
If necessary, set the cooling water flow rate.
 3. Check the gas pressure (option) and adjust if necessary.
See "Technical specifications".
 - 3.1 Check the setting on the gas cylinder or on the gas mixer,
adjust if necessary.
 - 3.2 Check the setting in the control cabinet, adjust if necessary.
-

7.3.17 Pedestal bearing - Lubrication

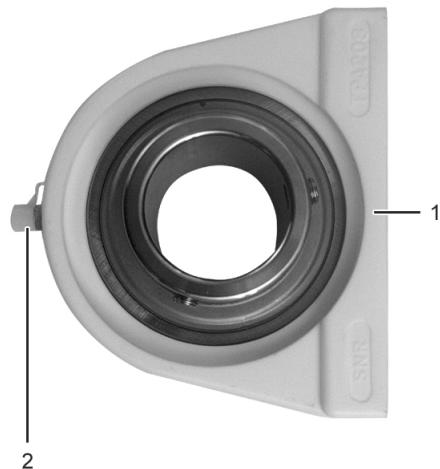


Fig. 319: Pedestal bearing

- 1** Pedestal bearing
2 Lubricating nipple

-
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
 2. Remove the respective covers.
 3. Lubricate the pedestal bearings at the lubricating nipples according to the machine configuration.
The recommended lubricant is listed in the "Lubricant table".
 - 3.1 Advance drive for transport chains, 2 in number.
 - 3.2 Chain deflector for transport chains in the case of a machine length greater than 12 m (39.37 ft), 2 in number.
 4. Remove any excess lubricants.
 5. Fit the respective covers.
-

7.3.18 Flange bearing - Lubrication

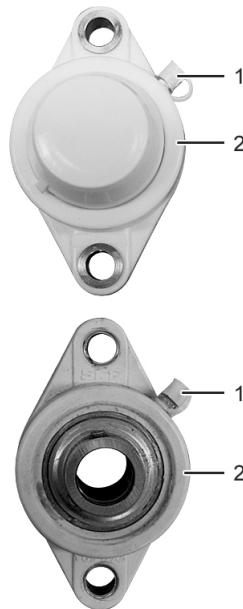


Fig. 320: Flange bearing

- 1 Lubricating nipple
- 2 Flange bearing

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
2. Remove the respective cover.
3. Lubricate the flange bearings at the lubricating nipples according to the machine configuration.
The recommended lubricant is listed in the "Lubricant table".
 - 3.1 Discharge unit
 - 3.2 Transport conveyor
 - 3.3 Stretching unit with servo motor
4. Remove any excess lubricants.
5. Fit the respective covers.

7.3.19 Film unwinds - Visual inspection

1. Check the film run of the films and correct if necessary.
See Section 4.9 "INSERTING FILM AND FEEDING FILM" on page 314.

7.3.20 Film unwinds - Cleaning

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.

2. Clean the film unwinds with their deflection rollers and in-feed rollers.
-

7.3.21 Transport chains - Clean manually

1. Remove film and product from the machine.
 2. Blow out the film transport chains at the film infeed or out-feed with the machine running.
-

7.3.22 Transport chains - Lubricate with oil

1. Clean transport chains.
 2. Lubricate transport chains.
The recommended lubricant is listed in the Lubricant table.
-

7.3.23 Sensors - Clean optical components

1. Clean optical components of the sensor with a mild cleanser.
-

7.3.24 Photo scanning heads - Cleaning optical components

1. Clean optical components of the photo scanning head with a mild cleanser.
-

7.3.25 Light barriers - Cleaning

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
 2. Clean photocells and reflectors with a mild cleanser.
-

7.3.26 Micro-filter for compressed air - Replacement

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
 2. Set the system pressure on the air preparation unit to 0 bar (0.0 psi).
-

-
3. Press the locking device into the filter housing and at the same time turn the filter housing anticlockwise as far as the end stop.



-
4. Remove the filter housing.
 5. Unscrew the filter element anticlockwise.



-
6. Insert and tighten the new filter element.

-
7. Replace the sealing ring on the filter housing.



-
8. Position the filter housing and turn it clockwise as far as the end stop.
 - ✓ The filter housing is secured.
 9. Open the stop-cock for the compressed air supply.
 10. Set the system pressure on the air preparation unit. See Section 5.1 "ADJUSTING THE COMPRESSED AIR" on page 357.
-

7.3.27 Compressed air micro-filter with stainless steel housing - Replacement

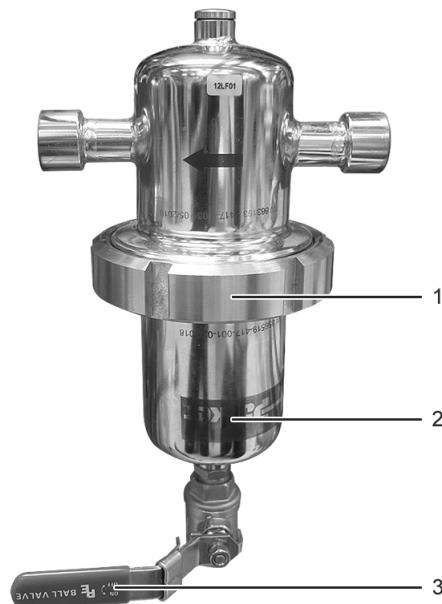


Fig. 321: Micro-filter with stainless steel housing

- 1 Nut
- 2 Filter housing
- 3 Stop-cock

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
2. Set the system pressure on the air preparation unit to 0 bar (0.0 psi).
3. Place a container under the micro-filter.
4. Open the stop-cock.
 - ✓ If there is liquid in the filter housing, the liquid is drained from the outlet.
5. When no more liquid drains from the outlet, close the stop-cock.
6. Remove the container under the micro-filter.
7. Open the nut on the filter housing and remove the filter housing and nut.

8. Turn the filter element anticlockwise and pull it out downwards.



9. Insert the new filter element.
 10. Attach the filter housing and tighten the nut.
 11. Open the stop-cock for the compressed air supply.
 12. Set the system pressure on the air preparation unit. See Section 5.1 "ADJUSTING THE COMPRESSED AIR" on page 357.
-

7.3.28 Activated carbon filter for compressed air - Replacement

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
 2. Set the system pressure on the air preparation unit to 0 bar (0.0 psi).
-

-
3. Press the locking device into the filter housing and at the same time turn the filter housing anticlockwise as far as the end stop.



-
4. Remove the filter housing.
 5. Unscrew the filter element anticlockwise.



-
6. Insert and tighten the new filter element.

-
7. Replace the sealing ring on the filter housing.



-
8. Position the filter housing and turn it clockwise as far as the end stop.
 - ✓ The filter housing is secured.
 9. Open the stop-cock for the compressed air supply.
 10. Set the system pressure on the air preparation unit. See Section 5.1 "ADJUSTING THE COMPRESSED AIR" on page 357.
-

7.3.29 Compressed air carbon filter with stainless steel housing - Replacement

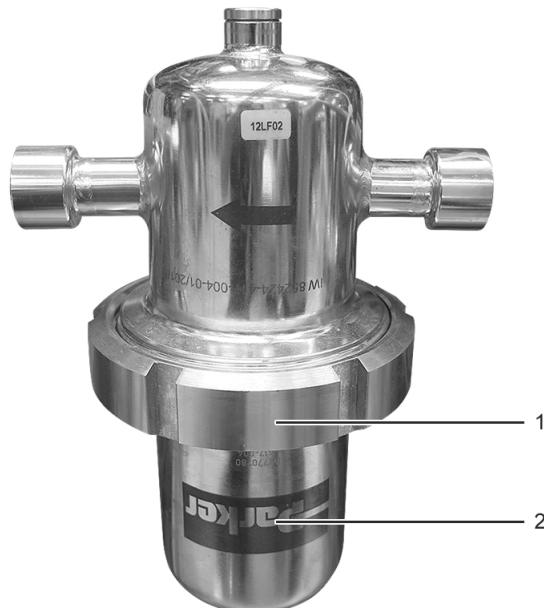


Fig. 322: Compressed air carbon filter with stainless steel housing

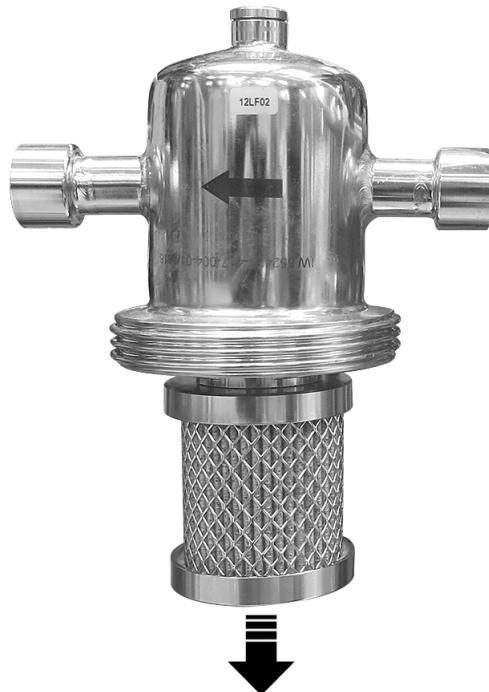
- 1** Nut
- 2** Filter housing

-
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.

 2. Set the system pressure on the air preparation unit to 0 bar (0.0 psi).

 3. Open the nut on the filter housing and remove the filter housing and nut.

4. Pull out the filter element downwards and remove it.



5. Insert the new filter element.
 6. Attach the filter housing and tighten the nut.
 7. Open the stop-cock for the compressed air supply.
 8. Set the system pressure on the air preparation unit. See Section 5.1 "ADJUSTING THE COMPRESSED AIR" on page 357.
-

7.3.30 Air preparation unit filter - Replacement

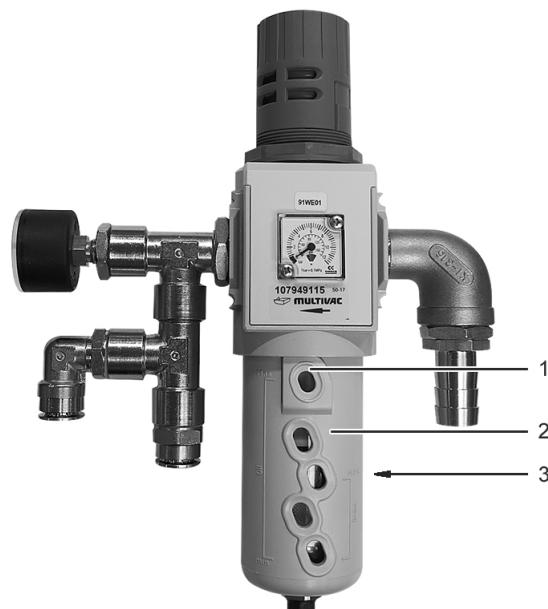
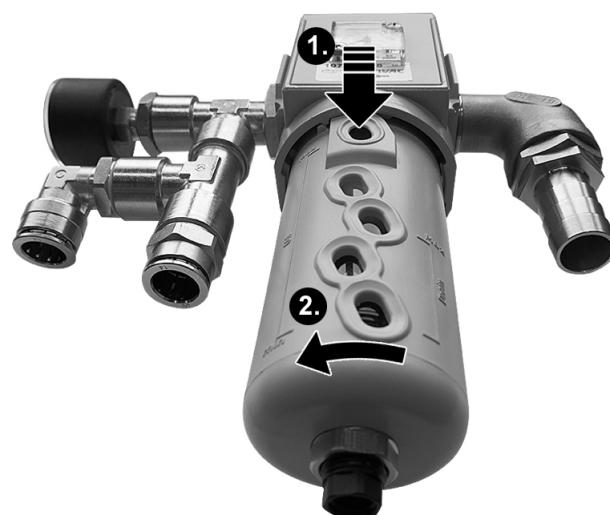


Fig. 323: Air preparation unit

- 1 Locking device
- 2 Filter housing
- 3 Filter element

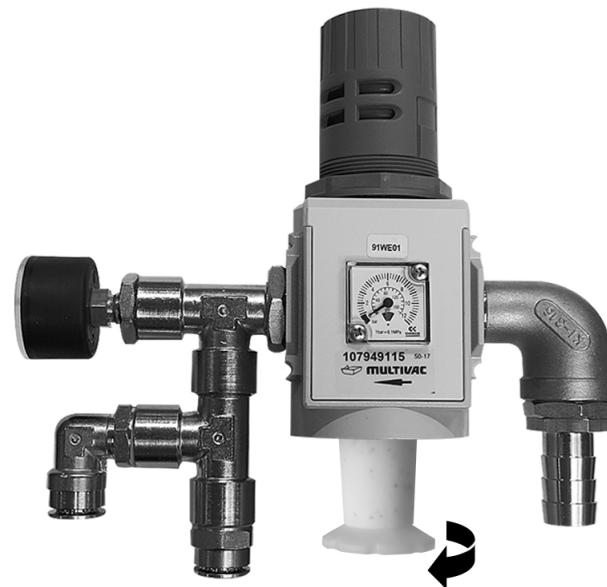
-
- 1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
 - 2. Press the locking device into the filter housing and at the same time turn the filter housing anticlockwise as far as the end stop.
-



-
3. Remove the filter housing.



-
4. Unscrew the knob nuts.



-
5. Replace the filter element.



-
6. Position the filter element on the air preparation unit and tighten the knob nuts.
 7. Replace the sealing ring on the filter housing.



-
8. Position the filter housing on the air preparation unit and turn it clockwise as far as it will go.
 - ✓ The filter housing is secured.
 9. Open the stop-cock for the compressed air supply.

-
10. Set the system pressure on the air preparation unit. See Section 5.1 "ADJUSTING THE COMPRESSED AIR" on page 357.
-

7.3.31 Air preparation unit for compressed air - Visual inspection



Fig. 324: Air preparation unit

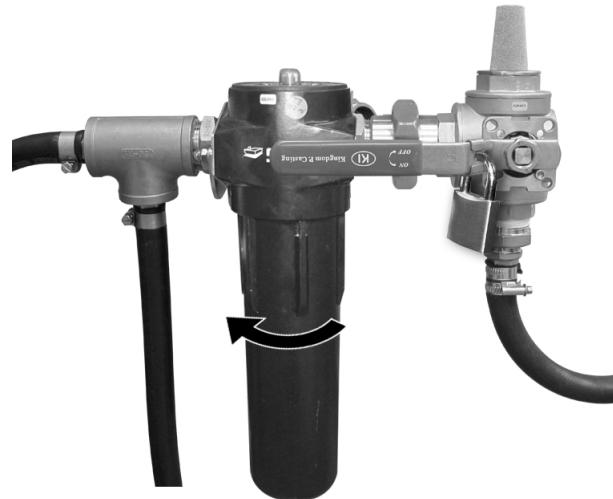
- 1 Differential pressure indicator
- 2 Air preparation unit

-
1. Check the differential pressure indicator on the air preparation unit.
 - 1.1 If the differential pressure indicator is green, the filter is OK.
 - 1.2 If the differential pressure indicator is red, replace the filter.
-

7.3.32 Air preparation unit filter - Replacement

-
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.

-
2. Unscrew the filter housing.



-
3. Unscrew the filter element.



-
4. Tighten the new filter element.



-
5. Clean the filter housing.
 6. Dry the filter housing.
 7. Tighten the filter housing.
-



7.3.33 Air preparation unit - General reconditioning



Fig. 325: Air preparation unit

-
1. Have MULTIVAC Service perform general reconditioning of the air preparation unit after 10 years.
-

7.3.34 Film transport system - Checking, correcting cut-off length

-
1. Check the cut-off length. See Section 7.10 "FILM TRANSPORT SYSTEM" on page 515.
-

7.3.35 Filter element in the dirt trap - Cleaning

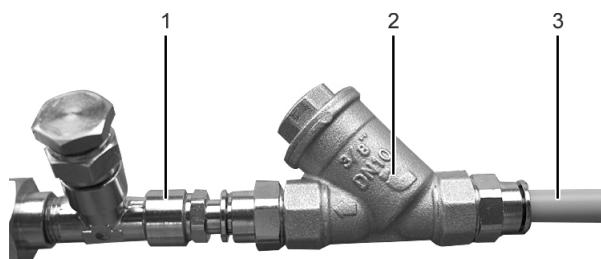


Fig. 326: Dirt trap filter element

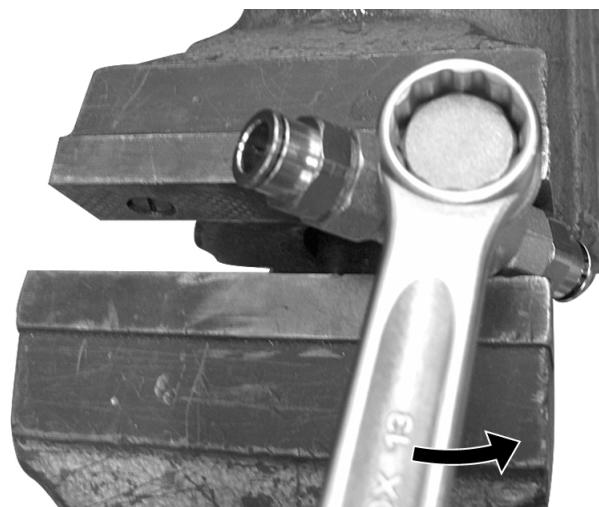
- 1 Cooling water connection
2 Dirt trap
3 Cooling water line

-
1. Empty the cooling water circuit. See Section 5.10.2 "DRAINING THE COOLING WATER CIRCUIT" on page 374.
 2. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
-

-
3. Open the control cabinet door.
 4. Unplug the cooling water line at the dirt trap.
 5. Unplug the dirt trap at the cooling water connection.
 6. Clamp the dirt trap in a bench vice.
-



-
7. Unscrew the filter element.
-



-
8. Remove the filter from the filter element and clean it.



-
9. Replace the gasket of the filter element.

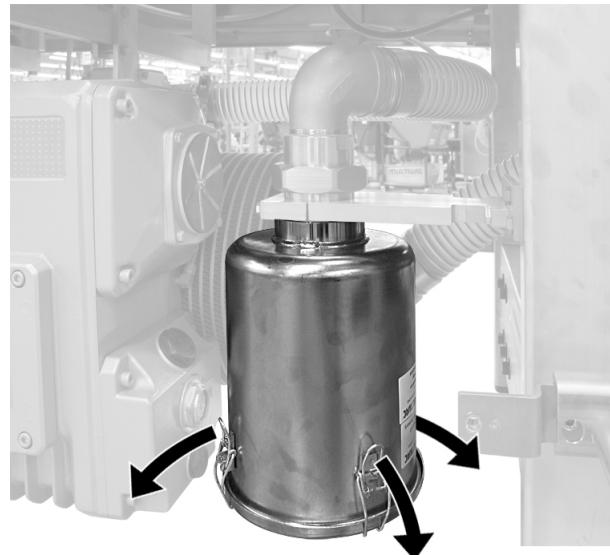


-
10. Insert the cleaned filter in the filter element.
 11. Tighten the filter element in the dirt trap.
 12. Connect the dirt trap at the cooling water connection.
 13. Connect the cooling water line at the dirt trap.
 14. Close the control cabinet door.
-

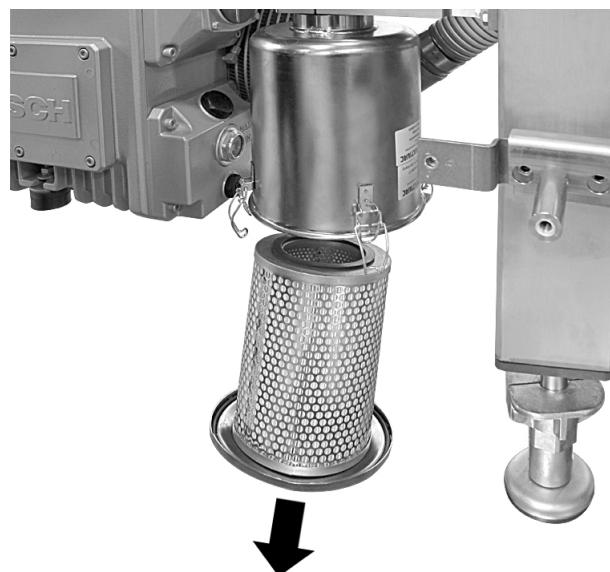
7.3.36 Vacuum system - Changing vacuum filter

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
2. Remove the side cladding in the area of the vacuum filter.

-
3. Open the clamping clips on the filter housing.



-
4. Remove the cover.
 5. Remove the vacuum filter.



-
6. Insert a new vacuum filter.
 7. Attach the cover.
 8. Close the filter housing with the clamping clips.
 9. Attach the side cladding.
-

7.4 Service recommendation for lifting units and dies.

DANGER

Amputation hazard!

The movements of the lifting units are performed with great force. Reaching into the moving lifting units can result in loss of limbs.

- Only perform service work on the lifting units when they are in the lowest position.
- De-energise the machine to prevent dangerous movements.

7.4.1 Lifting unit - pull rods and guide rods - Applying anti-corrosion agents

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
2. Apply the anti-corrosion agent. The recommended anti-corrosion agent is listed in the Care products table.

7.4.2 Central lubrication of lifting unit - Lubrication

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
2. Lubricate the lubricating nipples on the lubrication plate in the area of the lifting unit. The recommended lubricant is listed in the "Lubricant table".



3. Remove excessive lubricant from the lubricating nipples and lubrication points of the lifting unit.

7.4.3 Lifting unit - spindle - Lubrication

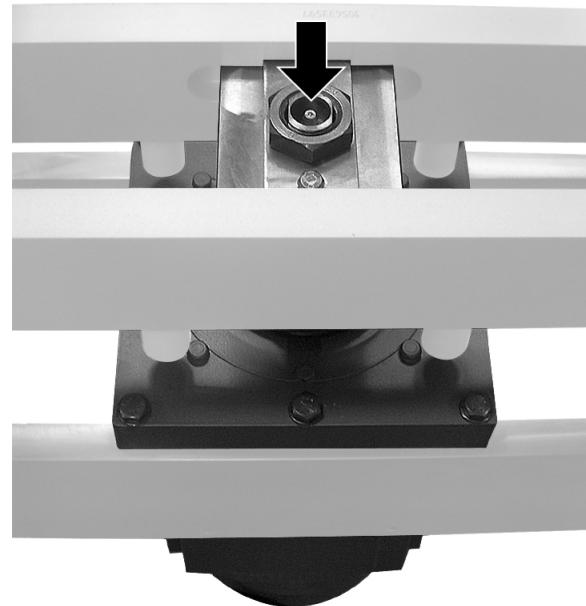
⚠WARNING**Burn hazard!**

The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off.

Touching the heating plates can lead to severe burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the heating plates.
- Before starting any work in the danger zone, allow the die to cool down.

1. Empty the cooling water circuit.
2. Close the stop-cock for the water inlet.
3. Hold the <drain cooling water> key depressed until no more water flows out at the water outlet.
4. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
5. Remove the dies.
6. Remove the covers on the spindles of the lifting units.
7. Lubricate the lubricating nipples on the spindles. The recommended lubricant is listed in the "Lubricant table".
Grease quantity: 0.01 kg (0.02 lb) (6 presses of the grease gun).



8. Remove excessive lubricant from the lubricating nipples and lubrication points of the lifting unit.

-
9. Put the covers back on the spindles.
 10. Fit the dies.
-

7.4.4 Forming die, sealing die - Checking the heating plates and sealing plates

⚠WARNING

Burn hazard!

The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off.

Touching the heating plates can lead to severe burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the heating plates.
- Before starting any work in the danger zone, allow the die to cool down.

-
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
 2. Allow the dies to cool down.
 3. Check the die seals.
 4. Check whether there are film deposits on the heating plates of the forming die or on the sealing plate of the sealing die. If necessary, remove, see Section 7.13.1 "REMOVING FILM RESIDUES".
-

7.4.5 Forming die, sealing die - Checking

-
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
 2. Check the die fastenings, tighten the screws if required.
 3. Perform the vacuum test see Section 7.9 "PERFORMING THE VACUUM TEST".
-

7.5 Service recommendation for vacuum pumps

7.5.1 Vacuum pump MM 11xx - Visual inspection

-
1. Perform the visual inspection of the vacuum pump. See Section 7.11 "VACUUM PUMPS" on page 515.
-

7.5.2 Vacuum pump MM 11xx - Checking the vacuum filter

-
1. Check the vacuum filter. See Section 7.3 "GENERAL SERVICE RECOMMENDATION" on page 465.
 2. If necessary, replace the vacuum filter.
-

7.5.3 Vacuum pump Mink MM11xx - Fill level of the gear oil checking the

-
1. Check the fill level of the gear oil. See Section 7.11 "VACUUM PUMPS" on page 515.
-

7.5.4 Vacuum pump Mink MM11xx - Changing the gear oil

-
1. Have the gear oil changed by MULTIVAC Service every 6 years or after 20000 operating hours.
-

7.5.5 Vacuum pump Mink MM11xx - Cleaning the filter in the suction connection

-
1. Clean the filter in the suction connection. See Section 7.11 "VACUUM PUMPS" on page 515.
-

7.5.6 Vacuum pump Mink MM11xx - Cleaning

-
1. Clean the vacuum pump. See Section 7.11 "VACUUM PUMPS" on page 515.
-

7.5.7 Vacuum pump Mink MM11xx - General re-conditioning

-
1. Have the vacuum pump subjected to a general overhaul by MULTIVAC Service every 6 years.
-

7.6 Service recommendation for cutting units**7.6.1 Cutting unit - Visual inspection**

-
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
 2. Check the cut edges of the packs.
 3. Check the knife and cutting anvil for wear.
-

7.6.2 Cutting unit - Cleaning

1. If necessary, run the film out of the machine. See Section 4.8.4 "RUNNING THE MACHINE EMPTY" on page 313.
2. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
3. Clean film trim from the cutting units.

7.6.3 Cutting unit - Applying anti-corrosion agents

1. If necessary, run the film out of the machine. See Section 4.8.4 "RUNNING THE MACHINE EMPTY" on page 313.
2. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
3. Apply anti-corrosion agent to the knife and guides. The recommended anti-corrosion agent is listed in the "Care products table".

7.6.4 Cross cutter - Lubrication

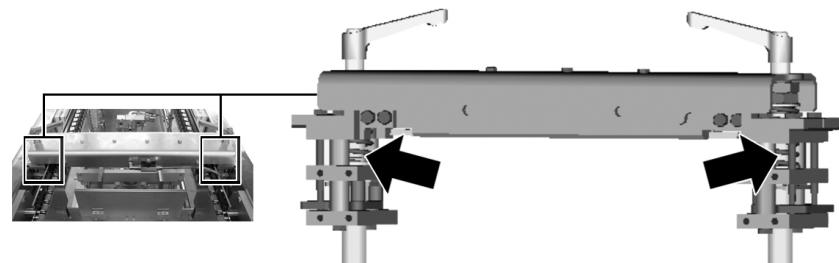
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
2. Remove the side cladding in the area of the cross cutter.
3. Lubricate the conical grease nipples on the guides on both sides. The recommended lubricant is listed in the "Lubricant table".



4. Remove excessive lubricant from the lubrication points.
5. Attach all the side panels.

7.6.5 Cross cutter - Replacing springs

1. Have the springs on the suspension mountings replaced by MULTIVAC Service every 5000 hours of operation.



7.7 Service recommendation for discharge units and transport conveyors

7.7.1 Discharge unit - Adjusting friction brake

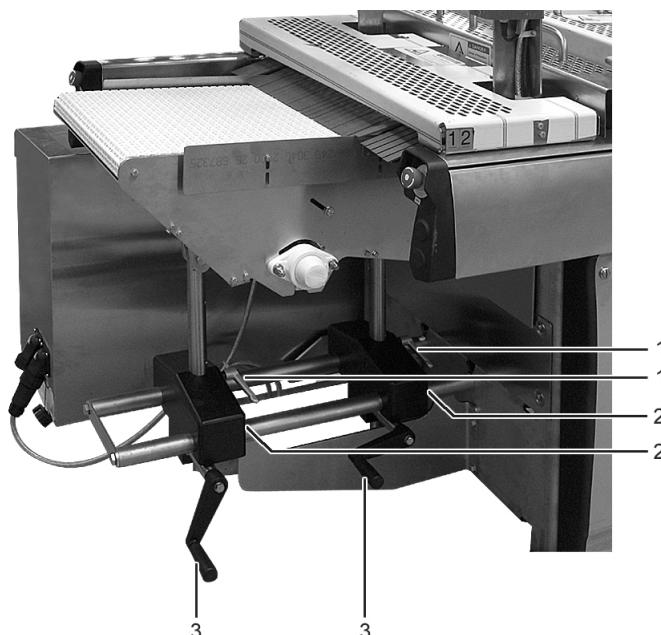
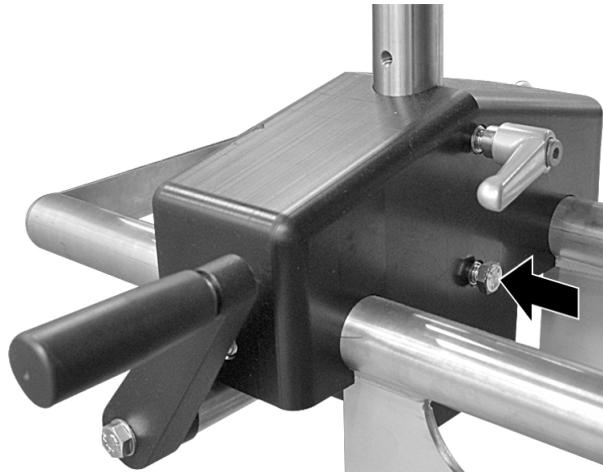


Fig. 327: Discharge unit

- 1 Clamping lever
- 2 Adjustment screw
- 3 Crank

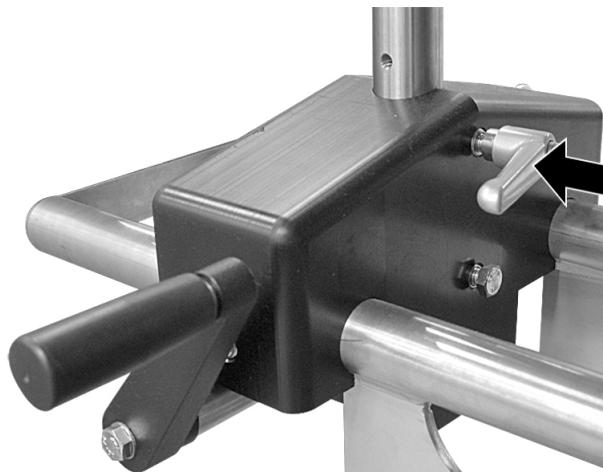
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.

-
2. Tighten adjustment screws.



3. **⚠️WARNING** – If the friction brake is defective or incorrectly set, releasing the clamping lever could result in sudden lowering of the discharge unit. Standing under the discharge unit could lead to injuries.
 - When releasing the clamping levers, do NOT stand under the discharge unit.
 - Exercise the utmost caution when making adjustments

4. Release the clamping lever.

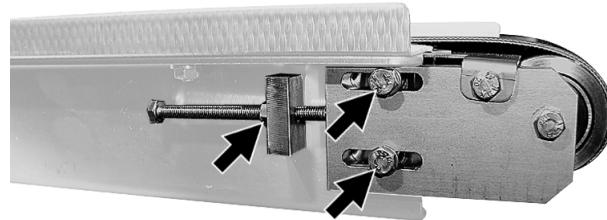


5. Slowly release adjustment screws.
 - ✓ The discharge conveyor moves down.
6. Slowly tighten the adjustment screws until the discharge conveyor stops.
7. Adjust the height of the discharge conveyor.
 - 7.1 Turn the crank clockwise.
 - ✓ The discharge conveyor moves down.
 - 7.2 Turn the crank anticlockwise.
 - ✓ The discharge conveyor moves up.

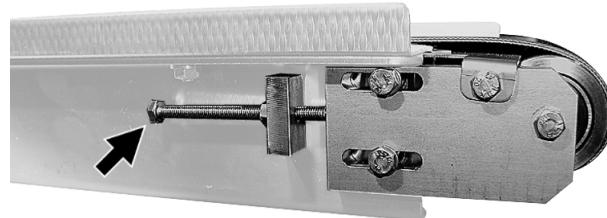
-
8. Tighten the clamping lever.
-

7.7.2 Discharge unit with belt conveyor (option) - Tensioning the belt

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
 2. Release lock nuts and locking screws on both sides.
-



3. Turn the adjustment screw clockwise on both sides by the same amount.
-



✓ The belt is tensioned.

4. Tighten lock nuts and locking screws on both sides.
-

7.8 Testing safety devices

DANGER

Injury hazard!

Non-functioning or damaged safety devices lead to unprotected danger zones.

Reaching into unprotected danger zones will lead to serious injuries or death.

- Shut down the machine immediately.
- Notify MULTIVAC Service without delay.

-
1. Document the testing of the safety devices:
 - 1.1 Note down the date of the test.
 - 1.2 Document the designation of each safety device.
 - 1.3 Document the result of the test.
 - 1.4 Note down the name of the person carrying out the test.
-

7.8.1 Check EMERGENCY STOP

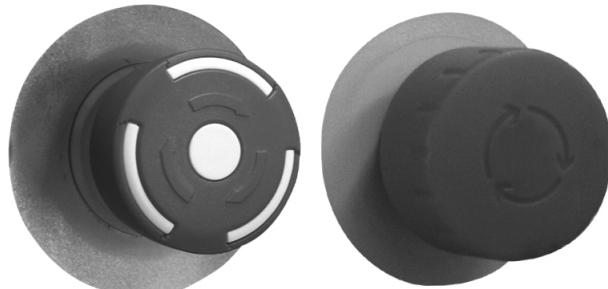


Fig. 328: EMERGENCY STOP

WARNING

Injury hazard!

Operation starts when the machine is switched on.
Reaching into danger zones can lead to serious injuries or death.

- Do NOT reach into danger zones.
- Exercise the greatest caution when checking safety devices.

1. Check that all the safety devices are attached in such a way, that they prevent operators from reaching into the danger zones behind them.
2. Switch on the machine.
3. Press EMERGENCY STOP.
 - ✓ **Correct function:** If the safety device is functioning correctly, a diagnostic message appears on the display.
 - ✓ **Fault:** If the safety device is not functioning correctly, no diagnostic message appears on the display.
4. Perform a test on all EMERGENCY STOP buttons.
The behaviour of the machine, when the EMERGENCY STOP is pressed, is described in the Safety section. See Section 1.10 "SAFETY DEVICES" on page 55.
5. If the safety device does not function correctly, take the machine out of service.

7.8.2 Testing signalling device



Info

The functions of the signalling device depend on the machine configuration.

Test all the signal lights and signal horns on the machine.

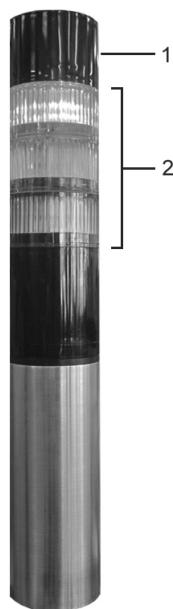


Fig. 329: Signal tower

- 1 Signal horn
- 2 Signal lights

⚠WARNING**Injury hazard!**

Operation starts when the machine is switched on.
Reaching into danger zones can lead to serious injuries or death.

- Do NOT reach into danger zones.
- Exercise the greatest caution when checking safety devices.



1. Touch the <Wizard> button on the navigation bar.
 - ✓ The "Wizard/production tab" page appears.



2. Touch the <Servicing> tab.
 - ✓ The "Wizard/servicing tab" page appears.

Wizard ➤ Servicing



3. Start the wizard for *Signal tower functional test*.
 - ✓ The signal lights light up.
 - ✓ The signal horns sound with 1 s continuous tone, then there follows a pause of 3 s.
 - ✓ A diagnostic message referring to the active functional tests appears on the info line.

4. Test whether all the signal lights on the machine are functioning.

- 4.1 Replace defective signal lights immediately.

5. Test whether all the signal horns on the machine are functioning.

- 5.1 Replace defective signal horns immediately.



6. End the test.
- 6.1 Stop the wizard for *Signal tower functional test*.
The functional test is also ended, when the machine is started.

7.8.3 Checking guard plates

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
2. Check that all the guard plates are undamaged.
3. Check that all the screw connections on the guard plates are tight and undamaged.
4. Check that all the guard plates are attached in such a way, that they prevent operators from reaching into the danger zones behind them.
5. If reaching into the danger zones can not be prevented, take the machine out of service.

7.8.4 Checking the support plates

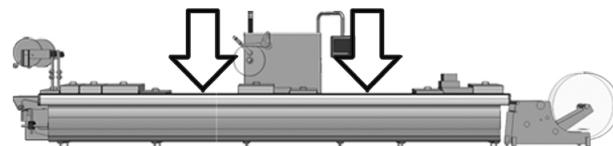


Fig. 330: Position on the machine



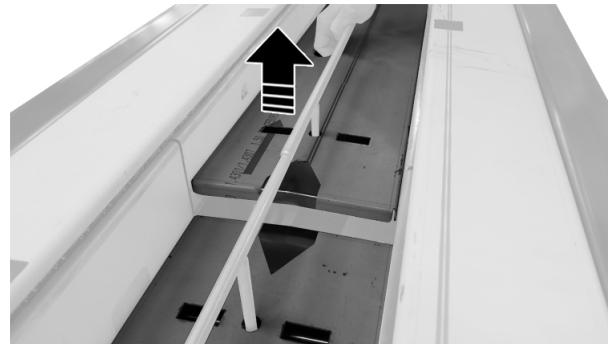
Fig. 331: Support plate

⚠WARNING**Injury hazard!**

Operation starts when the machine is switched on.
Reaching into danger zones can lead to serious injuries or death.

- Do NOT reach into danger zones.
- Exercise the greatest caution when checking safety devices.

1. Check that all the support plates are undamaged.
2. Check that all the support plate are attached in such a way, that they prevent operators from reaching into the danger zones behind them.
3. Switch on the machine. See Section 4.2 "SWITCHING ON THE MACHINE" on page 295.
4. Raise the support plate briefly with your hand.



- ✓ **Correct function:** If the safety device is functioning correctly, a diagnostic message appears on the display.
 - ✓ **Fault:** If the safety device is not functioning correctly, no diagnostic message appears on the display.
5. If the safety device does not function correctly, take the machine out of service.

7.8.5 Checking safety light barriers

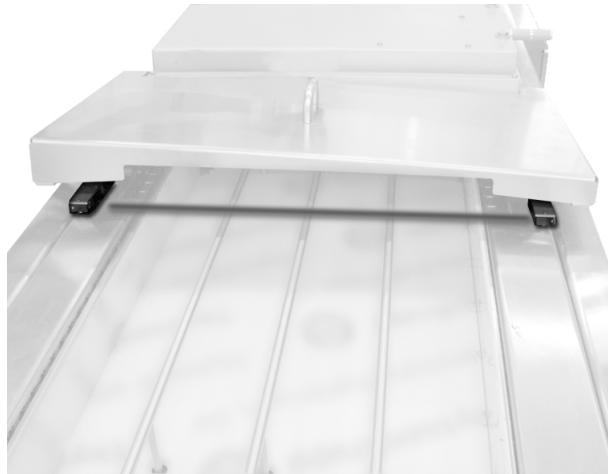
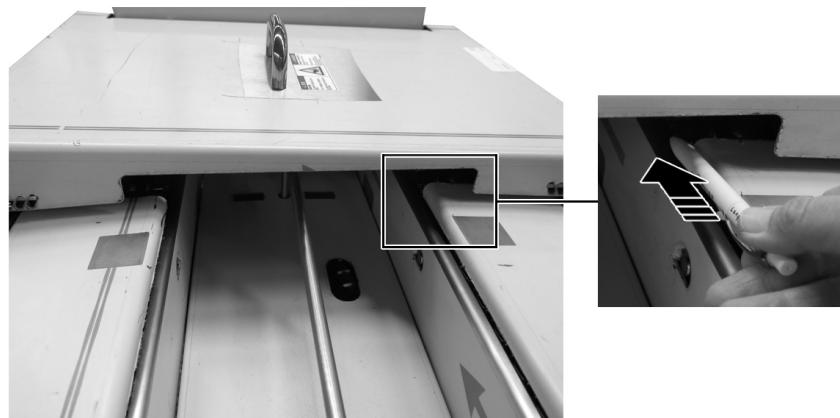


Fig. 332: Safety light barrier

The safety light barriers can be attached to the machine at different positions.

1. **⚠️WARNING** – Operation starts when the machine is switched on. Reaching into danger zones can lead to serious injuries or death.
 - Do NOT reach into danger zones.
 - Exercise the greatest caution when checking safety devices.
2. Prepare an object with a length of 150 mm (6 in) and a width of 15 mm (0.6 in).
3. Switch on the machine. See Section 4.2 "SWITCHING ON THE MACHINE" on page 295.
4. Using the object, briefly interrupt the light beam at the light barrier.



- ✓ **Correct function:** If the safety device is functioning correctly, a diagnostic message appears on the display.
- ✓ **Fault:** If the safety device is not functioning correctly, no diagnostic message appears on the display.

-
5. If the safety device does not function correctly, take the machine out of service.
-

7.8.6 Checking the safety guards



Fig. 333: Example of safety guards

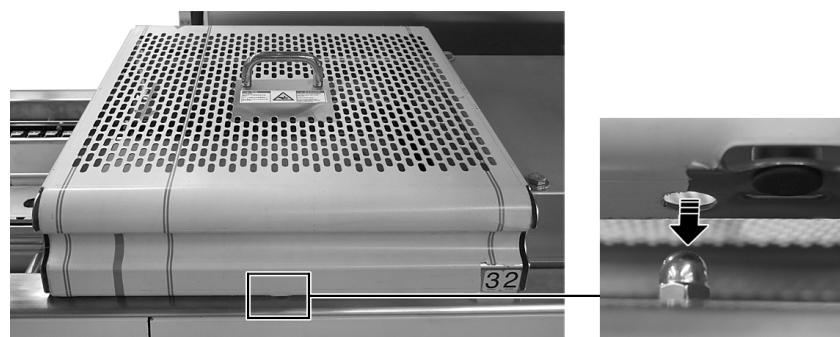
WARNING

Injury hazard!

Operation starts when the machine is switched on.
Reaching into danger zones can lead to serious injuries or death.

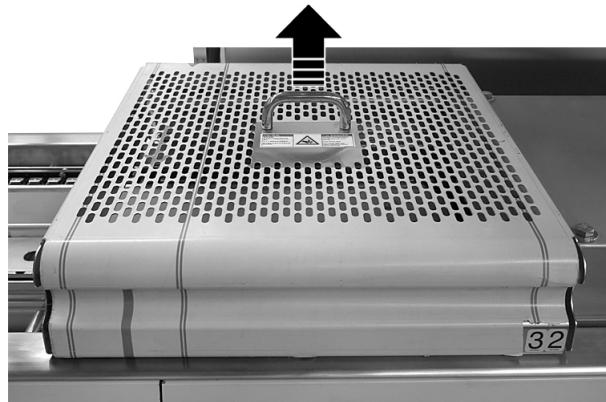
- Do NOT reach into danger zones.
- Exercise the greatest caution when checking safety devices.

-
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
 2. Check that all the safety guards are undamaged.
 3. Check that all the safety guards are attached in such a way, that they prevent operators from reaching into the danger zones behind them.
-



-
4. Switch on the machine. See Section 4.2 "SWITCHING ON THE MACHINE" on page 295.
-

-
5. Raise the safety guard briefly with the handle.



- ✓ **Correct function:** If the safety device is functioning correctly, a diagnostic message appears on the display.
- ✓ **Fault:** If the safety device is not functioning correctly, no diagnostic message appears on the display.

-
6. Perform the test on all the safety guards.
 7. If the safety device does not function correctly, take the machine out of service.
-

7.8.7 Checking the deflection roller at the sealing station

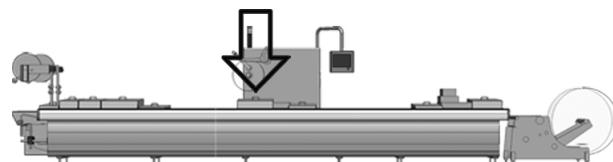


Fig. 334: Position on the machine

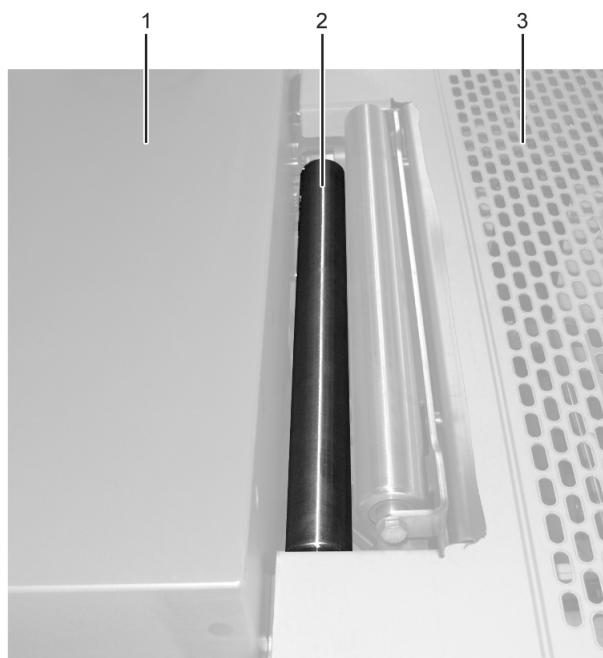


Fig. 335: Deflection roller at sealing station

- 1 Sealing station
- 2 Deflection roller
- 3 Safety guard

-
1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.

 2. Check that the deflection roller is undamaged.

 3. Check that the deflection roller is attached in such a way, that it prevents operators from reaching into the danger zones behind it.

 4. If reaching into the danger zones can not be prevented, take the machine out of service.

7.8.8 Checking the cladding

Cladding, which is either subject to a query by the machine control or not subject to a query, may be installed in the machine:

- Cladding, which is not subject to a query, can only be opened with a tool.
- Cladding, which is subject to a query, can be opened without a tool.

Checking the cladding varies and is described as follows.

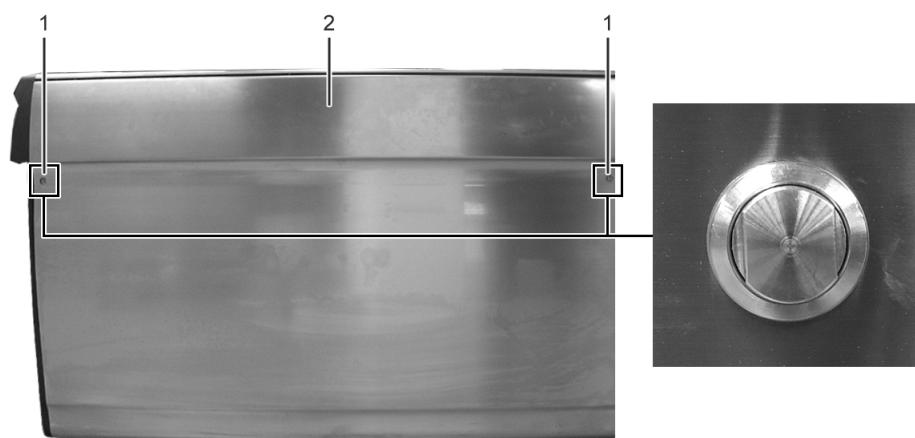


Fig. 336: Cladding that is not subject to a query

- 1** Tool-activated lock mechanism
- 2** Cladding

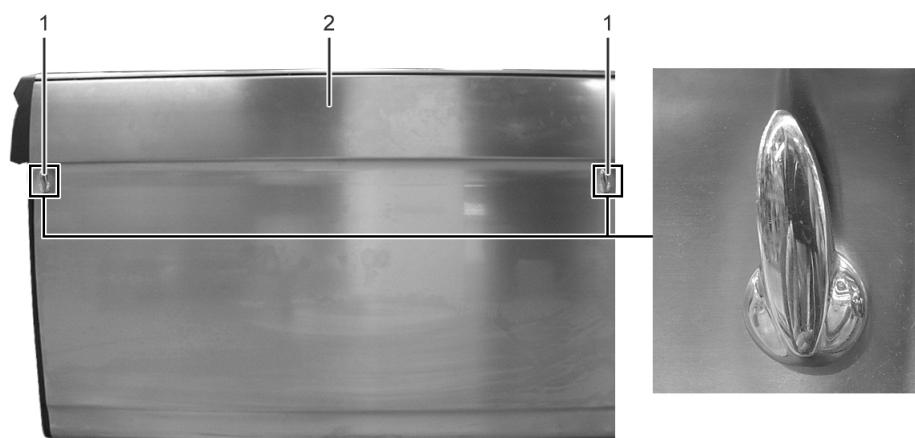


Fig. 337: Cladding that is subject to a query

- 1** Manually activated lock mechanism
- 2** Cladding

Checking cladding that is not subject to a query

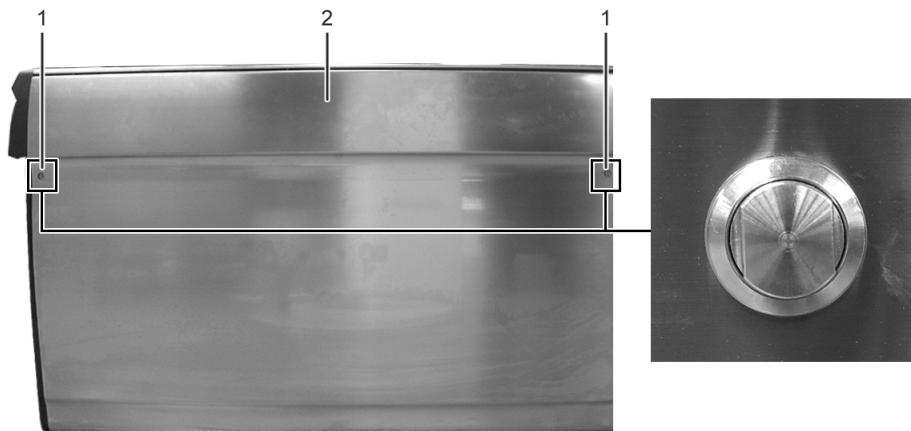


Fig. 338: Cladding that is not subject to a query

- 1** Tool-activated lock mechanism
2 Cladding

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE " on page 359.
2. Check that all the cladding is undamaged.
3. Check that all the cladding is attached in such a way, that it prevents operators from reaching into the danger zones behind it.
4. If reaching into the danger zones can not be prevented, take the machine out of service

Checking cladding that is subject to a query

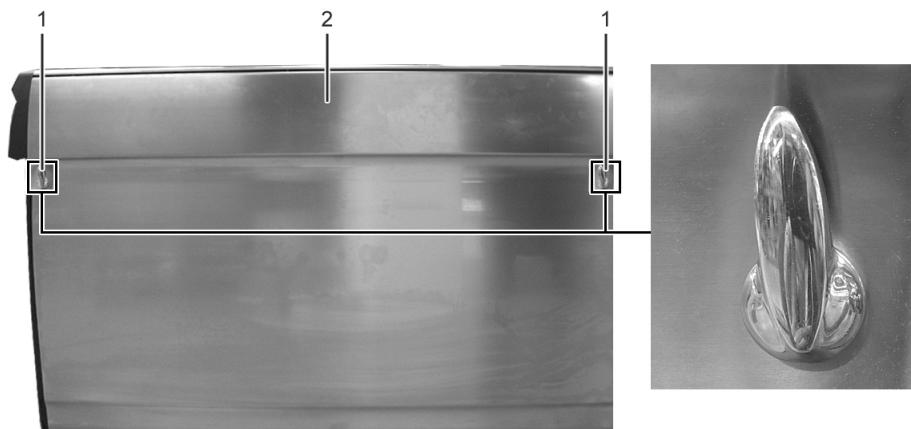


Fig. 339: Cladding that is subject to a query

- 1 Manually activated lock mechanism
- 2 Cladding

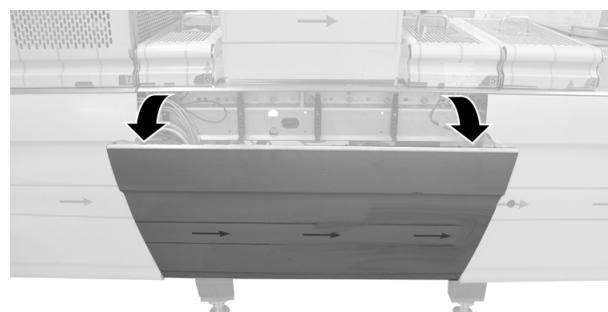
⚠️WARNING

Injury hazard!

Operation starts when the machine is switched on.
Reaching into danger zones can lead to serious injuries or death.

- Do NOT reach into danger zones.
- Exercise the greatest caution when checking safety devices.

1. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
2. Check that all the cladding is undamaged.
3. Check that all the cladding is attached in such a way, that it prevents operators from reaching into the danger zones behind it.
4. Switch on the machine. See Section 4.2 "SWITCHING ON THE MACHINE" on page 295.
5. Open the lock mechanisms on the cladding.
6. Briefly open the cladding and then close it again.



- ✓ **Correct function:** If the safety device is functioning correctly, a diagnostic message appears on the display.
- ✓ **Fault:** If the safety device is not functioning correctly, no diagnostic message appears on the display.

7. Close the lock mechanisms on the cladding.
8. Perform the test on all cladding sections.
9. If the safety device does not function correctly, take the machine out of service.

7.9 Performing the vacuum test

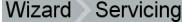
7.9.1 Checking the vacuum system and sealing diaphragm

-
1. Run the upper web and lower web out of the machine, see Section 4.8.4 "RUNNING THE MACHINE EMPTY".

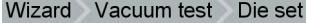


2. Touch the <Wizard> button on the navigation bar.
 - ✓ The "Wizard/production tab" display appears.



3. Touch the <Servicing> tab.
 - ✓ The "Wizard/servicing tab" display appears.




4. Call up the *Vacuum test* wizard.
 - ✓ The display for "Vacuum test/die set tab" appears.




5. Start the *Vacuum test* wizard.

 - 5.1 If the "Vacuum test" display appears, reduce the sealing pressure to the stated value.
 - 5.2 Touch the <OK> button.
 - ✓ The vacuum test is performed.
 - ✓ The result is displayed in the info line.
 - ✓ A diagnostic message appears.
 6. If the "Vacuum test" display appears once more, set the original sealing pressure again and touch the <OK> button.
-

7.10 Film transport system

7.10.1 Checking the cut-off length

7.11 Vacuum pumps

7.11.1 Mink MM xxxx vacuump pump

Performing visual inspection

-
1. De-energise the machine.

-
2. **⚠️WARNING** – The surface of the vacuum pump can reach temperatures of over 70 °C during operation. Touching the vacuum pump can lead to burns.
- When performing any work wear personal protective equipment.
 - Before starting any work in the danger zone, allow the vacuum pump to cool down.
-
3. Check that all connections are fitted tightly and undamaged.
-
4. Check for oil leaks or leaking cooling water.
- ✓ If oil or water has leaked from the vacuum pump, please consult MULTIVAC Service.
-

Cleaning

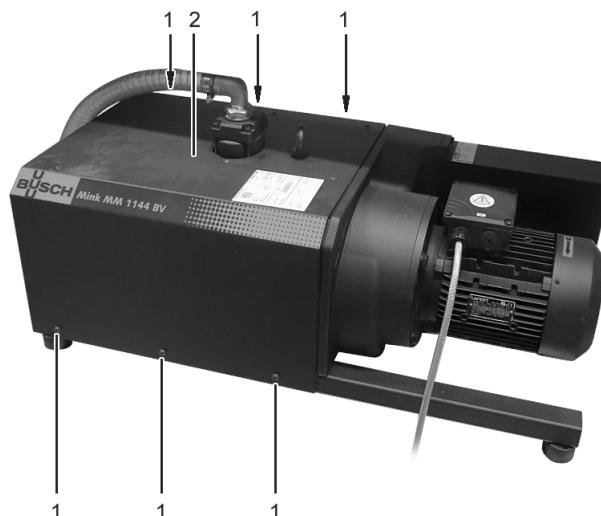


Fig. 340: Mink MM xxxx vacuum pump

- 1 Screws
2 Housing cover

⚠️WARNING**Burn hazard!**

The surface of the vacuum pump can reach temperatures of over 70 °C during operation.

Touching the vacuum pump can lead to burns.

- When performing any work wear personal protective equipment.
- Before starting any work in the danger zone, allow the vacuum pump to cool down.

-
1. De-energise the machine.
-
2. Unscrew the screws on the housing cover.
-
3. Remove the housing cover.

4. Perform manual cleaning of the airflow directional covers.
5. Perform manual cleaning of the fan wheels.
6. Perform manual cleaning of the fan grilles.
7. Perform manual cleaning of the cooling fins.
8. Perform manual cleaning of the housing.
9. Replace the housing cover.
10. Tighten the screws.

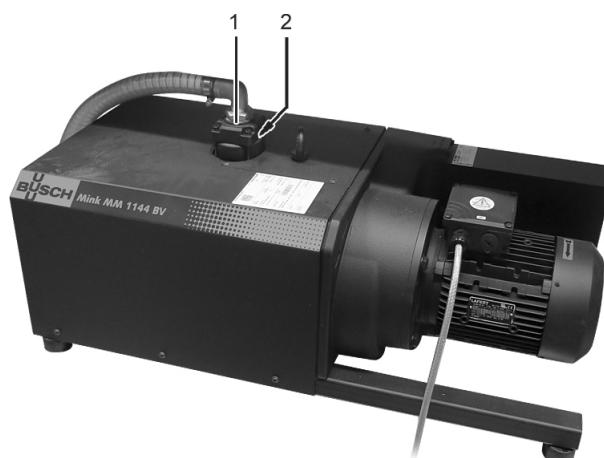
**Cleaning the filter in
the suction connection**

Fig. 341: Mink MM xxxx vacuum pump

1 Suction connection

2 Filter

⚠WARNING**Burn hazard!**

The surface of the vacuum pump can reach temperatures of over 70 °C during operation.

Touching the vacuum pump can lead to burns.

- When performing any work wear personal protective equipment.
- Before starting any work in the danger zone, allow the vacuum pump to cool down.

1. De-energise the machine.
2. Remove the suction connection.
3. Remove the filter and clean with compressed air, replace if necessary.
4. Check the gaskets, and replace if necessary.
5. Install the filter in the suction connection.

Checking the gear oil level

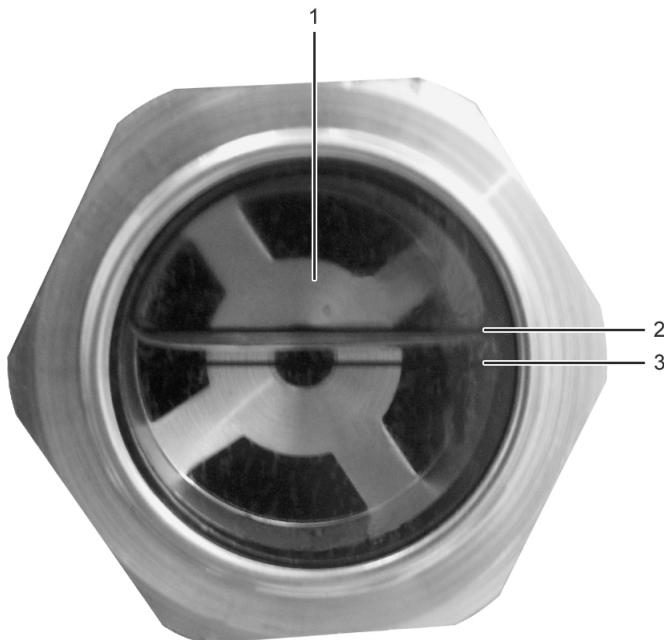


Fig. 342: Oil sight glass on vacuum pump

- 1 Oil sight glass
- 2 Maximum oil level
- 3 Minimum oil level

WARNING

Burn hazard!

The surface of the vacuum pump can reach temperatures of over 70 °C during operation.

Touching the vacuum pump can lead to burns.

- When performing any work wear personal protective equipment.
- Before starting any work in the danger zone, allow the vacuum pump to cool down.

1. De-energise the machine.
2. Check the oil level through the sight glass.
3. If the oil level is too low, please consult MULTIVAC Service.
4. If the oil level is too high, please consult MULTIVAC Service.
5. If there is water in the oil, please consult MULTIVAC Service.

7.12 Lubrication of the transport chains

NOTICE

Material damage!

The use of unsuitable lubricants can increase the wear of the machine and lead to corrosion of the transport chains.

This damages the machine.

- Only use recommended lubricants for the transport chains.

The chain grease recommended by MULTIVAC is ideally matched to the mechanical load of the transport chains. If the chains are lubricated regularly, there will be very small wear on the chain parts.

In addition to the required technical features, it also fulfils the following quality criteria:

- Resistance to ageing
- Oxidation stability
- Shear stability (quality of the oil film under load)

7.13 Format tool

7.13.1 Removing film residues

Preparing format tools



Info

Depending on the design of the die, one or more heating plates can be installed in the forming die.

- Standard die:
The heating plate is in the forming die top section.
- Preheating die with standard heating:
The heating plate is in the forming die bottom section.
- Preheating die with sandwich heating:
The heating plates are in the forming die top section and forming die bottom section.

The film residues can be more easily moved with warm heating plates and sealing plates.

⚠WARNING

Burn hazard!

The heating plate becomes very hot during operation and remains hot for some time after the machine has been switched off.

Touching the hot heating plate can lead to burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the heating plate.
- Before starting any work in the danger zone, allow the heating plate to cool down.
- Before starting any work in the danger zone, turn off the mains switch.

1. Preheat the forming die and sealing die in the range of 60 °C (140 °F) to 80 °C (176 °F).

2. Switch off the main switch and attach a lock to prevent unauthorised start-up.

3. **⚠WARNING** – Dies are heavy and have sharp edges. Carrying heavy dies can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

4. Remove the format tools from the machine with suitable lifting equipment, see Section 5.10 "CONVERT THE DIES FOR OTHER PACKAGE FORMATS".

5. Store the format tools so that the bottom is accessible, that is, on two stable blocks or on a suitable support.

Cleaning the heating plate

NOTICE

Material damage!

Improper cleaning can damage the sensitive Teflon-coated surface. The film adheres. The packaging procedure is impaired.

- Only clean the Teflon coating with a soft cloth.
- Do NOT clean the Teflon coating with hard objects.
- Do not use any cleansers on the basis of strong solvents.

1. Carefully remove the film residues on the heating plate in the forming die top section and forming die bottom section with a plastic scraper.

2. Carefully drill the holes in the heating plate by hand using a drill, diameter 0.7 mm (0.028 in). Make sure that the Teflon coating is not damaged.

-
3. Remove the remaining adhesive with a disposable cloth.
 4. Carry out manual cleaning on the heating plate with a neutral cleanser.
 5. Perform quick disinfection of the heating plate.
Make sure that no disinfectant runs into the die.
-

Cleaning the sealing plate

NOTICE

Material damage!

Improper cleaning can damage the sensitive Teflon-coated surface. The film adheres. The packaging procedure is impaired.

- Only clean the Teflon coating with a soft cloth.
- Do NOT clean the Teflon coating with hard objects.
- Do not use any cleansers on the basis of strong solvents.

-
1. Carefully remove the film residues on the sealing plate with a plastic scraper.
 2. Remove the remaining adhesive with a disposable cloth.
 3. Carry out manual cleaning on the sealing plate with a neutral cleanser.
 4. Perform quick disinfection of the sealing plate.
Make sure that no disinfectant runs into the die.
-

Installing format tools

-
1. Switch off the main switch and attach a lock to prevent unauthorised start-up.
 2. **⚠️ WARNING** – Dies are heavy and have sharp edges. Carrying heavy dies can lead to injuries.
 - Use suitable load lifting equipment.
 - Have a second person assist you.
 - When performing any work wear personal protective equipment.
 3. Move the format tool to the machine with suitable lifting equipment and install it, see Section 5.10 "CONVERT THE DIES FOR OTHER PACKAGE FORMATS".
-

7.14 Cross cutter

7.14.1 Changing the cross cutter knife

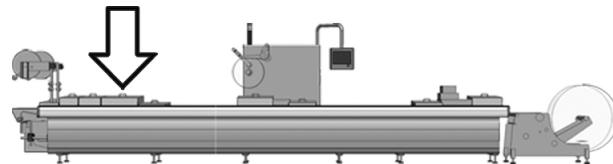


Fig. 343: Position on the machine

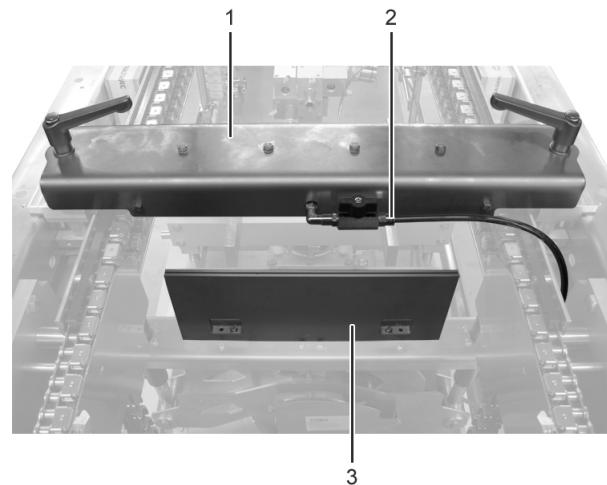
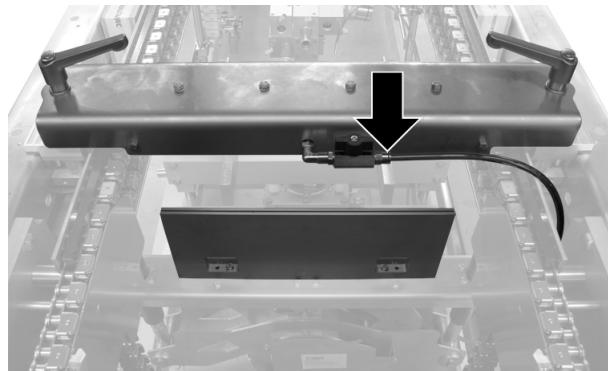


Fig. 344: Cross cutter

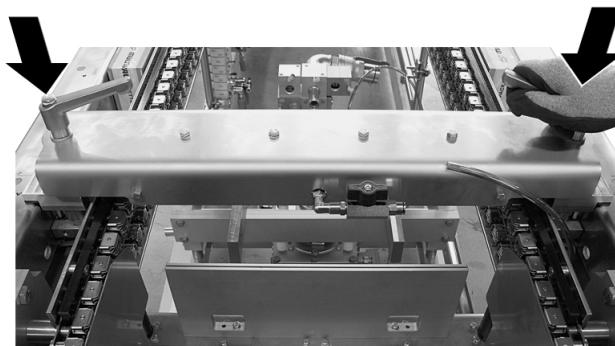
- 1 Cross cutter top section
- 2 Pneumatic connection
- 3 Cutting support

-
- 1. Run the film out of the machine, see Section 4.8.4 "RUNNING THE MACHINE EMPTY".
 - 2. De-energise the machine, see Section 5.2 "DE-ENERGISING THE MACHINE".
 - 3. Remove the safety guards above the cutting unit.
-

-
4. Unplug the pneumatic connection on the cross cutter upper part.



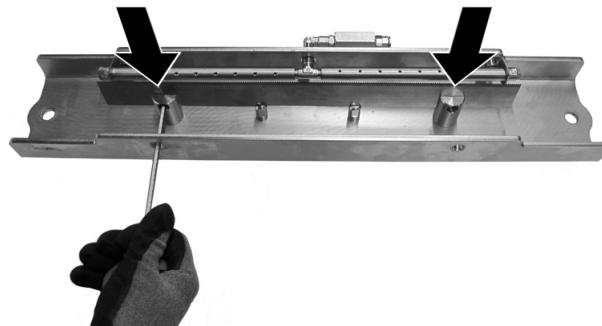
-
5. Unscrew the lever screws.



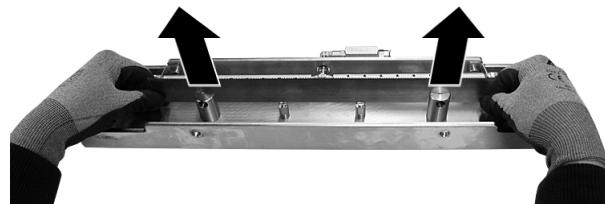
-
6. **CAUTION** – The knives of the cutting unit are sharp. Touching the sharp knives can lead to injuries.
 - When performing any work wear personal protective equipment.
 7. Remove the cross cutter top section and lay it upside down on a suitable surface.
-



-
8. Unscrew the two screws on the knife holder.

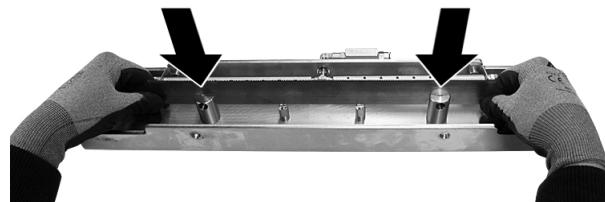


-
9. Remove the knife.



-
10. Clean the inside of the cross cutter upper part and the knife holder.

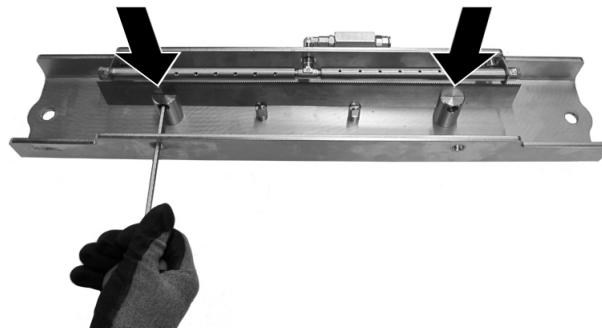
11. Insert the new knife in the knife holder and align it.



-
12. Apply thread-locking fluid to the screws for the knife holder, e.g. Loctite 245 (medium strength).



-
13. Tighten the screws on the knife holder.



-
14. Place the cross cutter top section on the guide rods and align it.

-
15. Tighten the lever screws.



-
16. Reconnect the pneumatic connection on the cross cutter upper part.

-
17. Attach all safety guards.

7.15 Longitudinal cutting unit

7.15.1 Changing, setting squeezing knives

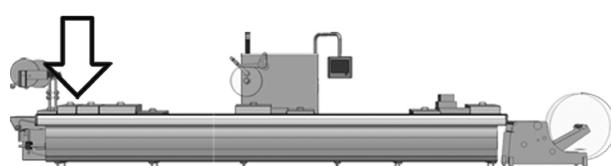


Fig. 345: Position on the machine

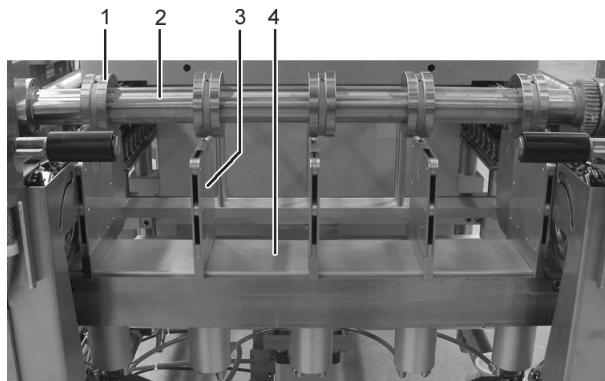
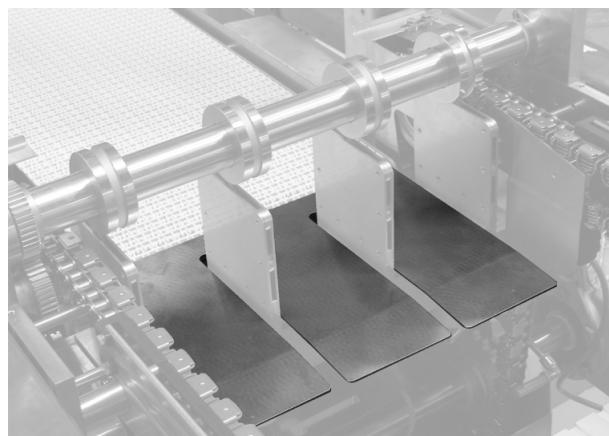


Fig. 346: Squeezing knife unit

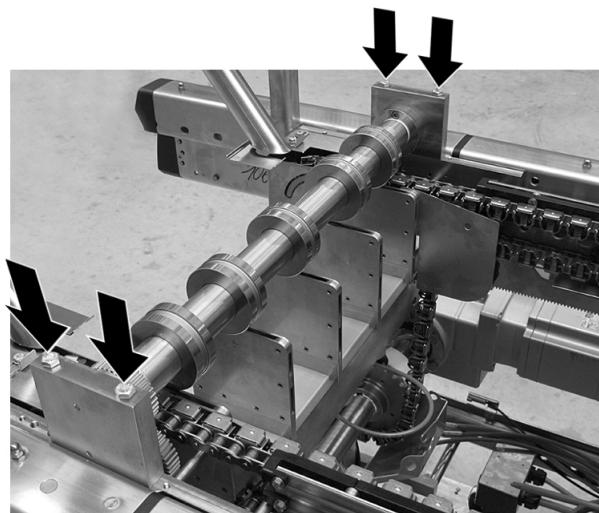
- 1 Cutting ring
- 2 Upper shaft
- 3 Squeezing knife holders
- 4 Spacer piece

Disassembling the upper shaft

1. Run the film out of the machine, see Section 4.8.4 "RUNNING THE MACHINE EMPTY".
2. De-energise the machine, see Section 5.2 "DE-ENERGISING THE MACHINE".
3. Remove the safety guard on the squeezing knife unit.
4. Pull the support plate upwards out of the holding device and remove it.

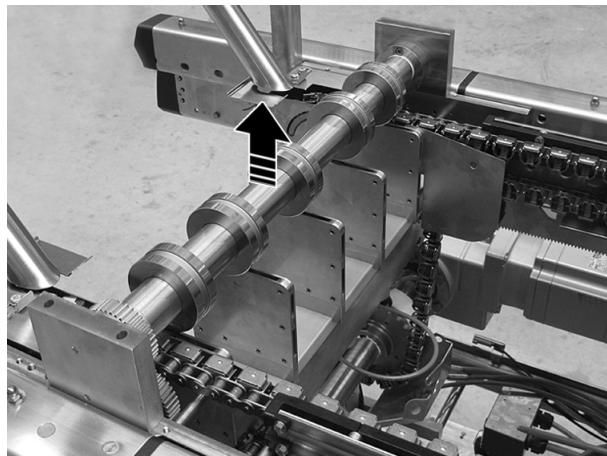


-
5. Unscrew the screws on both bearing blocks.



-
6. **NOTICE** – The squeezing knives and cutting rings are sensitive. Incorrect handling will cause corrosion.
 - Touch the squeezing knives and cutting rings only with protective gloves.

-
7. Remove the upper shaft with the bearing blocks.

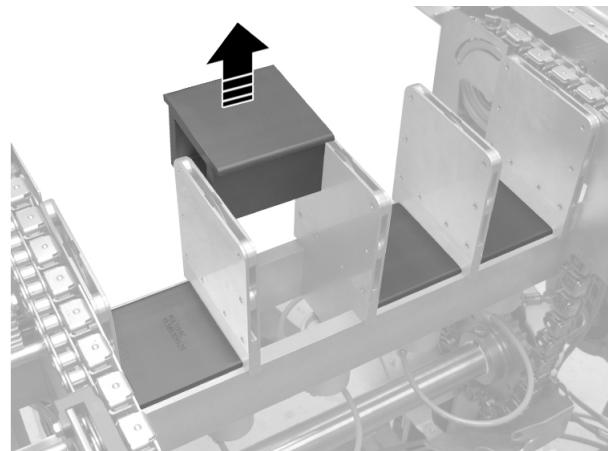


Disassembling the squeezing knife holders

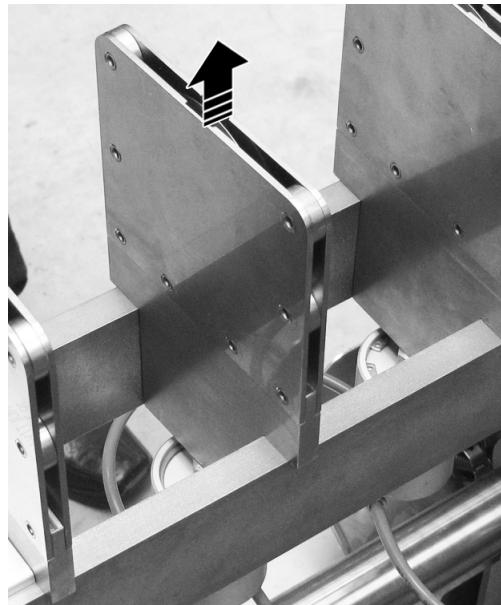
1. Mark the pneumatic lines and pull them out of the pressure cylinders.



2. Remove the spacer pieces between the squeezing knife holders.



-
3. Remove the squeezing knife holders from the holder.



Changing squeezing knives

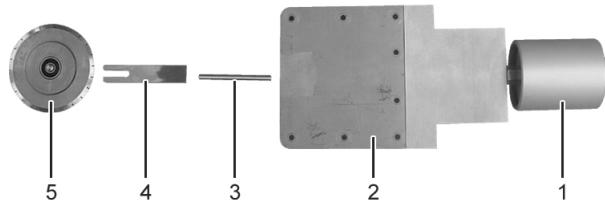


Fig. 347: Squeezing knife holders

- 1 Press-on cylinders
- 2 Squeezing knife holders
- 3 Metal pin
- 4 Squeezing knife guide
- 5 Squeezing knives

⚠ CAUTION

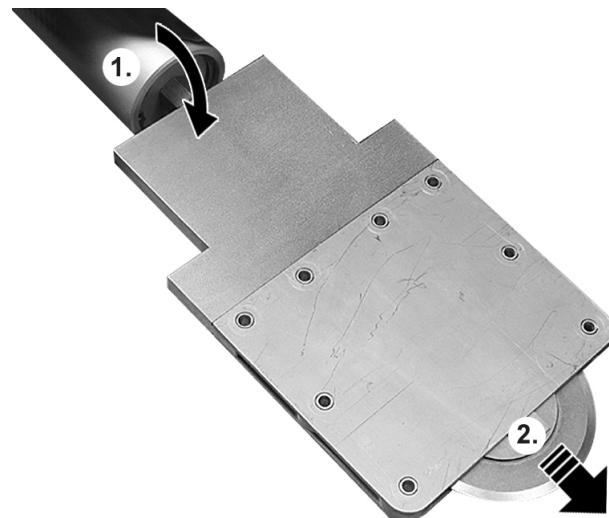
Injury hazard!

The knives of the cutting unit are sharp.
Touching the sharp knives can lead to injuries.

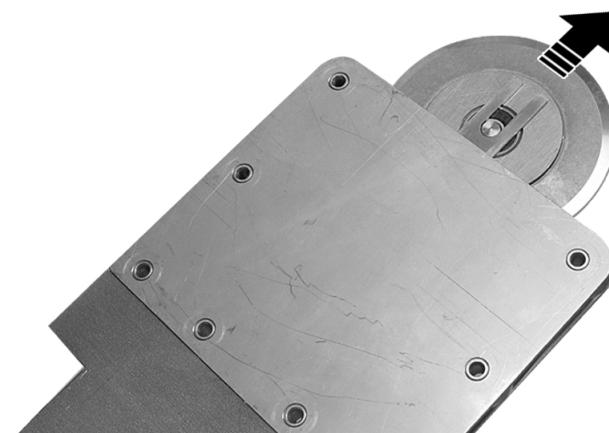
- When performing any work wear personal protective equipment.

-
1. Remove the squeezing knives with the squeezing knife guide.

- 1.1 Tilt the squeezing knife holder forwards briefly until the squeezing knife slides out slightly and can be held.



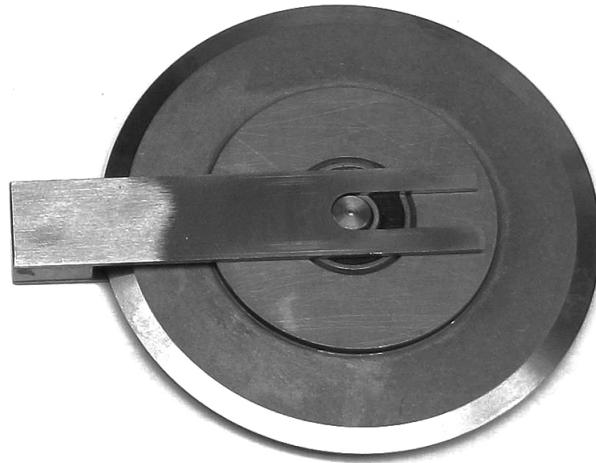
- 1.2 Hold the squeezing knife firmly and turn the squeezing knife holder back into the vertical position.



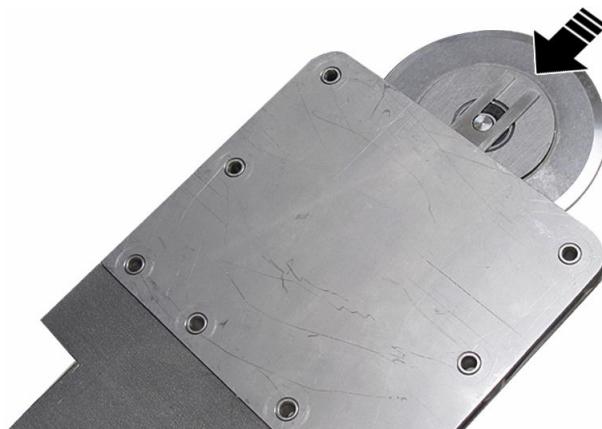
- 1.3 Remove the squeezing knife with the squeezing knife guide.

Make sure the metal pin does not fall out.

-
2. Insert new squeezing knife into the squeezing knife guide.



-
3. Check the squeezing knife guide for ease of movement.
 4. Place the squeezing knife guide with the squeezing knife in the squeezing knife holder.



Assembling the squeezing knife holders and upper shaft

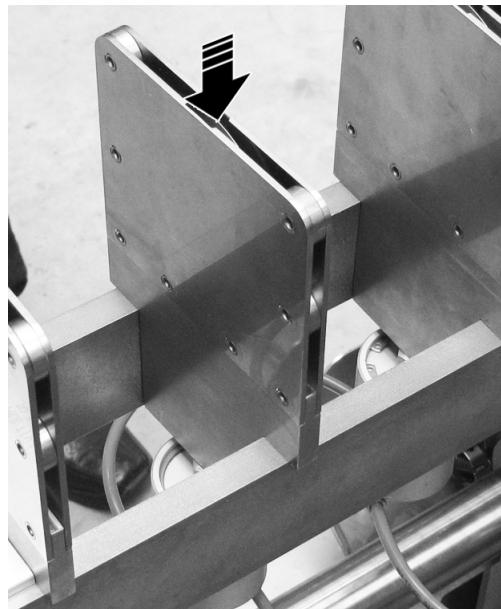
⚠ CAUTION

Injury hazard!

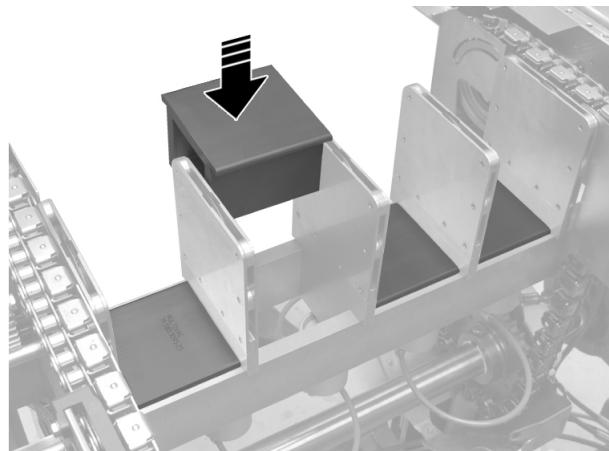
The knives of the cutting unit are sharp.
Touching the sharp knives can lead to injuries.

- When performing any work wear personal protective equipment.

-
1. Insert all the squeezing knife holders into the holding attachment.



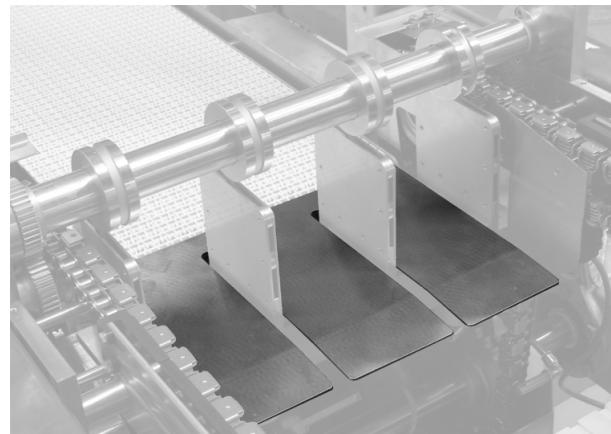
2. Insert the spacer pieces between the squeezing knife holders.



-
3. Connect the press-on cylinders to the pneumatic lines in sequence, see pneumatic diagram.



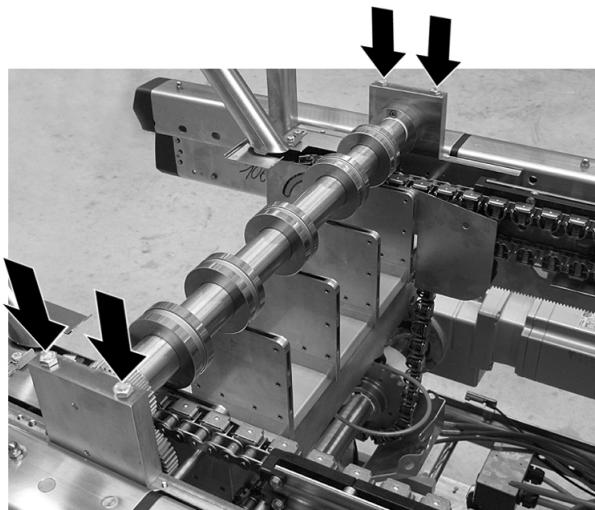
-
4. Replace the support plate.



-
5. Apply the thread-locking fluid to the screws of the bearing blocks.



-
6. Replace the upper shaft with the bearing blocks and tighten the screws.



-
7. Adjust the pressure on the pressure regulator.
 8. For new squeezing knives start the pressure setting with small values.
Maximum pressure: 3.5 bar (50.76 psi).
 9. Attach all safety guards.
-

Setting the number of tracks

⚠ CAUTION**Injury hazard!**

The knives of the cutting unit are sharp.
Touching the sharp knives can lead to injuries.

- When performing any work wear personal protective equipment.

-
1. Remove the upper shaft and the spacer pieces between the knife holders.
 2. Add or remove the correct number of knife holders required for the tracks.
 3. Insert spacer pieces according to the number of tracks.
 4. Install the upper shaft.
 5. Attach all safety guards.
 6. Turn on the main switch.
 - ✓ The squeezing knife holders and the spacer pieces are clamped.
 7. Switch off the main switch.
 8. Remove the safety guard on the squeezing knife unit.
-

-
9. **NOTICE** – The squeezing knives and cutting rings are sensitive. Incorrect handling will cause corrosion.
 - Touch the squeezing knives and cutting rings only with protective gloves.

10. Release the screws on the cutting rings.



-
11. Shift the cutting rings on the upper shaft so that the squeezing knives are centred on the ground surfaces. If there are two running surfaces available then set the squeezing knives on the same side of the cutting rings.



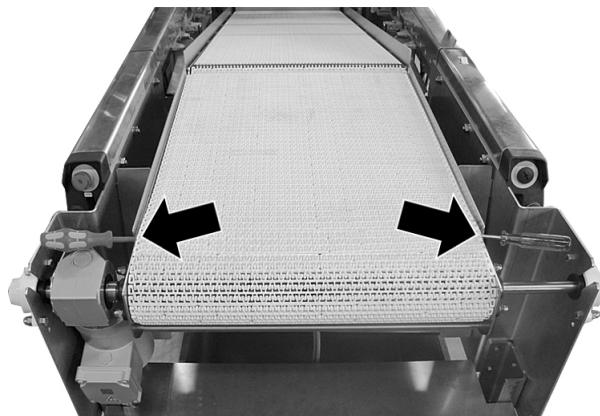
-
12. Tighten the screws.
 13. Attach all safety guards.
-

7.16 Conveyor unit

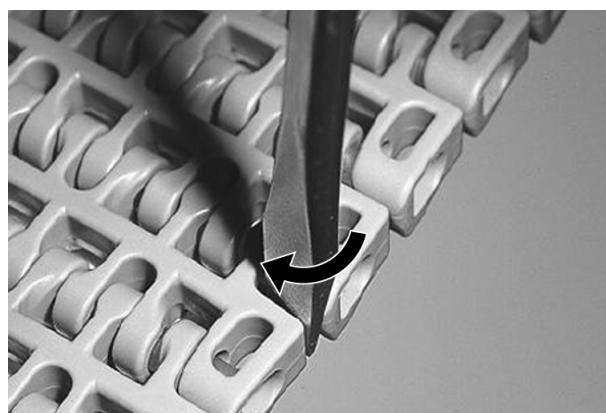
7.16.1 Changing the modular plastic belt

Removing the modular plastic belt

1. De-energise the machine.
2. Raise the top of the modular plastic belt and place a suitable object under it at each side.

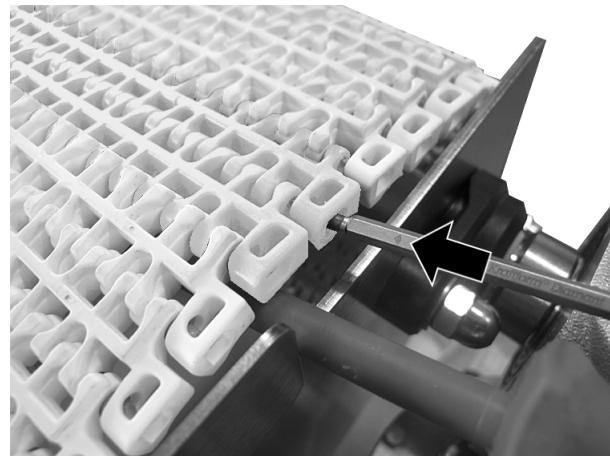


- ✓ The top of the modular plastic belt is above the frame of the discharge unit.
- 3. Insert the screwdriver at the edge between two links and turn it clockwise.

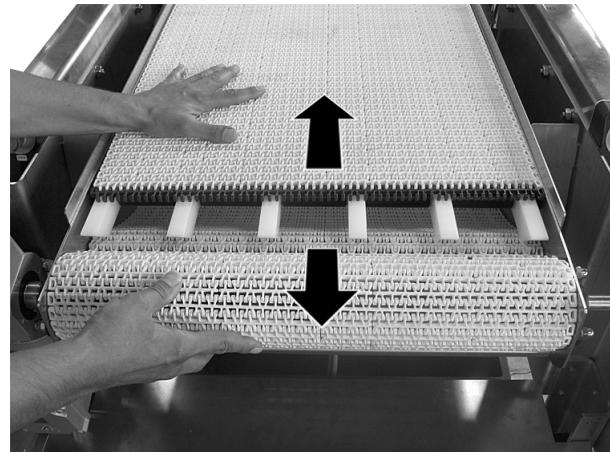


- ✓ The connector rod detaches from the snap closure.

-
4. Press out the connector rod from the opposite side with a blunt object.



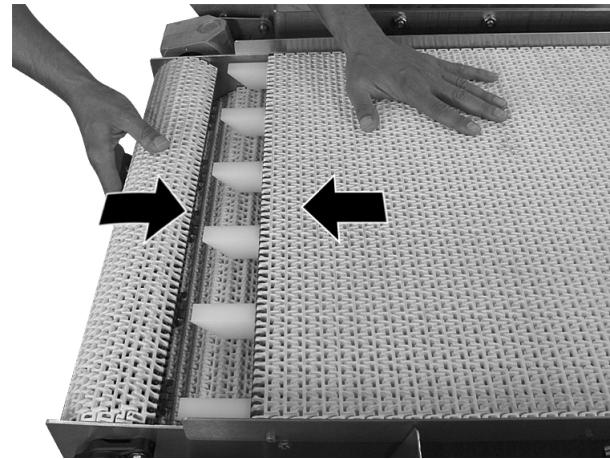
-
5. Pull out the connector rod.
 6. Remove the screwdriver.
 7. Pull the modular plastic belt out of the discharge unit.
-



Installing the modular plastic belt

1. De-energise the machine.
2. Remove the safety guard on the underside of the discharge unit.

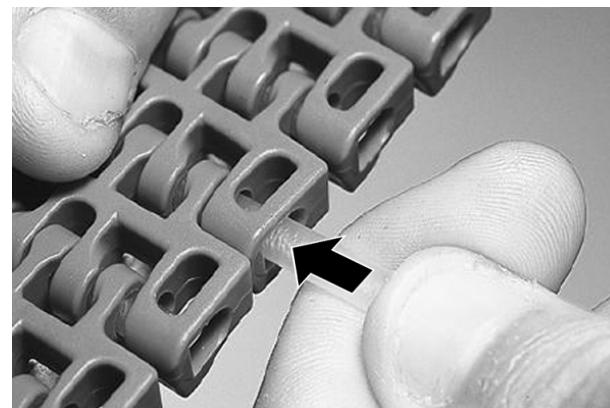
3. Insert a new modular plastic belt in the discharge unit.



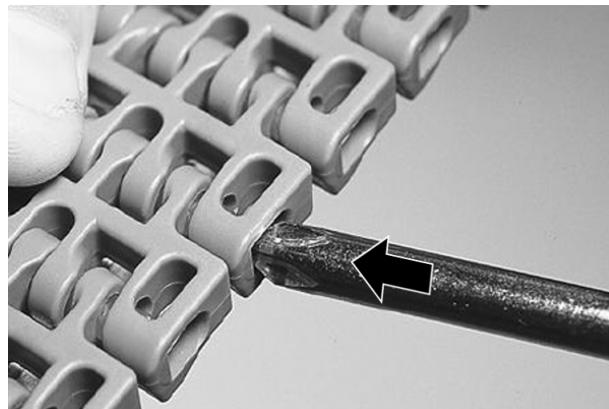
- 3.1 Ensure that the beginning and end of the modular plastic belt are at the top.
- 3.2 Ensure that the links of the modular plastic belt lie exactly in the drive wheels of the conveyor drive.

4. Push the links together so that the openings of the links are flush.

5. Insert the connector rod manually.



-
6. Push the remaining part of the connector rod with a blunt object until it is behind the snap closure.



-
7. Attach the safety guard.
-

7.17 Specifying and acknowledging service intervals

7.17.1 Specifying the service schedule

**Info**

The service schedule can only be specified with the Service access right.

Manually entering the service schedule



1. Touch the <Statistics> button on the navigation bar.



2. In the "Statistics" menu touch the <Production data> button.
 - ✓ The display for "Statistics/production data tab" appears.



3. Touch the <service interval> tab.
 - ✓ The display for "Production data/service interval tab" appears.

Statistics > Production data > Service interval



4. Touch the desired input box for *Service schedule*.
 - ✓ A keypad appears.

5. Enter the service schedule using the keypad.
 - 5.1 Enter the entire service schedule for this interval stage.
 - 5.2 Touch the <OK> button.

- ✓ The service schedule is adopted in the input box.

Importing the service schedule

1. Remove the cover for the USB connection on the underside of the control terminal.

2. **NOTICE** – Missing data protection measures can damage the machine control software. This can result in reject packs and loss of production.
 - Use only virus-scanned USB sticks.

3. Plug the USB stick with TXT file into the USB connection.



4. Touch the <Statistics> button on the navigation bar.



5. In the "Statistics" menu touch the <Production data> button.

✓ The display for "Statistics/production data tab" appears.



6. Touch the <Service interval> tab.

✓ The display for "Production data/service interval tab" appears.

Statistics > Production data > Service interval



7. Touch the <Load data> button for the desired service schedule.

✓ The "service schedule" display appears.

8. Select the desired file.



9. Touch the <OK> button.

✓ The selected file is adopted into the input box as the service schedule.



10. Touch the button for <Safely remove USB stick>.

11. Remove the USB stick.

12. Attach the cover for the USB connection.

7.17.2 Specifying service intervals



1. Touch the <statistics> button on the navigation bar.



2. In the "Statistics" menu touch the <Production data> button.

✓ The display for "Statistics/production data tab" appears.



3. Touch the <service interval> tab.

✓ The display for "Production data/service interval tab" appears.

Statistics > Production data > Service interval

-
4. Under *setting*, enter the desired number of operating hours for the particular step.
 5. To switch off a step, enter "0" under *setting*.
-

7.17.3 Acknowledging service intervals



1. Touch the <statistics> button on the navigation bar.
 2. In the "Statistics" menu touch the <Production data> button.
 - ✓ The display for "Statistics/production data tab" appears.
 3. Touch the <service interval> tab.
 - ✓ The display for "Production data/service interval tab" appears.

Statistics > Production data > Service interval
 4. For the desired step, enter "0" under *actual value*.
 - ✓ The diagnostic message is acknowledged and the hour counter for this step is reset.
-

7.18 Allocating variables for access from an overriding control


Info

Allocating the variables is only possible with the Service access right.

7.18.1 Table for adapting identification of variables



1. Touch the <maintenance menu> button on the navigation bar.
 2. In the "Maintenance menu", touch the <Service menu> button.
 3. Touch the <Identification of variables> button in the "Service menu".
 - ✓ The "Identification of variables" display appears.

Service menu > Identification of variables
-

Sorting the table

-
1. Call up the "Identification of variables" display.

Service menu > Identification of variables

-
2. Touch the caption button for the desired table column.
 - ✓ The table content relating to the selected column appears, sorted so that it is counting upwards.
 3. Touch the same caption button again.
 - ✓ The table content relating to the selected column appears, sorted so that it is counting downwards.
-

Filtering table content



1. Call up the "Identification of variables" display.
 2. Touch the <Other settings> tab.
 - ✓ The display for "Identification of variables/other settings tab" appears.
Service menu > Identification of variables > Other settings
 3. Under *Filter* touch the desired input box.
 - ✓ A keypad appears.
 4. On the keypad touch the required number sequence or the required word section and touch the <OK> button.
 5. Touch the <Identification of variables> tab.
 - ✓ In the table only the variables still appear, which contain the entered search term in the relevant column.
-



Info

The filters for *Variable ID*, *Item ID* and *Group* are simultaneously active. By combining the three filters, the content of the table for identification of variables can be localized precisely.

7.18.2 Saving variables on the USB stick.



1. Remove the cover for the USB connection on the underside of the control terminal.
 2. **NOTICE** – Missing data protection measures can damage the machine control software. This can result in reject packs and loss of production.
 - Use only virus-scanned USB sticks.
 3. Insert the USB stick into the USB connection.
 4. Touch the <Maintenance menu> button on the navigation bar.
 5. In the "Maintenance menu", touch the <Service menu> button.
 6. Touch the <Identification of variables> button in the "Service menu".
-





7. Touch the <Other settings> tab.
 - ✓ The display for "Identification of variables/other settings tab" appears.

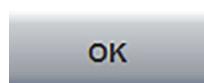
Service menu > Identification of variables > Other settings

8. Under *output* select which variables are to be saved on the USB stick.
 - 8.1 If all variables are to be saved, touch *All*.
 - 8.2 If only the recipe variables are to be saved, ensure that the desired recipe is loaded and touch *Only recipe values*.
 - 8.3 If only certain variables are to be saved, enter the corresponding filters under *Filter* and touch *Filtered*.



9. Touch the <Save data> button.
 - ✓ The selected variables are saved on the USB stick.

10. Wait until the saving procedure is ended.



11. Touch the <OK> button.



12. Touch the button for <Safely remove USB stick>.

13. Remove the USB stick.
 - ✓ The button for <Safely remove USB stick> disappears.

14. Attach the cover for the USB connection.

7.18.3 Identifying variables for OPC interface



1. Touch the <maintenance menu> button on the navigation bar.



2. In the "Maintenance menu", touch the <Service menu> button.



3. Touch the <Identification of variables> button in the "Service menu".

4. Touch the <Other settings> tab.

- ✓ The display for "Identification of variables/other settings tab" appears.

Service menu > Identification of variables > Other settings

5. Activate *ID mode*.

- ✓ In the display the respective *Variable ID* for all switches and parameters is displayed.

6. Call up the displays with the desired variables and note down the respective *Variable ID*.



7. Touch the <maintenance menu> button on the navigation bar.



8. In the "Maintenance menu", touch the <Service menu> button.
9. Touch the <Identification of variables> button in the "Service menu".
10. Search the table for the Variable IDs noted down and record the associated *Item ID* and *Group*.
 - 10.1 If necessary use the *filters* in the display for "Control of variables/other settings tab" to search the Variable IDs.
11. Enter the *Item ID* and *Group* at the corresponding position in the OPC client.

7.19 Performing data saving

7.19.1 Backing up data



Info

The data backup contains the following data:

- Recipes
- Message list
- User data.
- Cause and solution for troubleshooting
- Data of the audit trail
- Diagnostic data
- Control program of the machine

Back up data on a USB stick

1. Remove the cover for the USB connection on the underside of the control terminal.
2. **NOTICE** – Missing data protection measures can damage the machine control software. This can result in reject packs and loss of production.
 - Use only virus-scanned USB sticks.
3. Insert the USB stick into the USB connection.
4. Touch the <maintenance menu> button on the navigation bar.
5. Touch the "Data backup" button in the <Maintenance menu>.
 - ✓ The page for "Data backup/create data backup tab" appears.



Maintenance menu Data backup Create data backup

-
6. Touch the <Create data backup> button.
 - ✓ The "Create data backup" page appears.
 - ✓ All the data is grouped in a zip archive and saved on the USB stick.



7. Touch the button for <Safely remove USB stick>.

-
8. Remove the USB stick.
 - ✓ The button for <Safely remove USB stick> disappears.
 9. Attach the cover for the USB connection.
-

Backing up data without USB stick

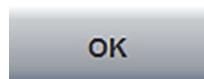


1. Touch the <maintenance menu> button on the navigation bar.



2. Touch the "Data backup" button in the <Maintenance menu>.
 - ✓ The page for "Data backup/create data backup tab" appears.

Maintenance menu > Data backup > Create data backup



-
3. Touch the <Create data backup> button.
 - ✓ The "Data backup" page appears with the target directory on the local machine control drive.
 4. Touch the <OK> button.
 - ✓ All the data is grouped in a zip archive and saved on the given target directory.
 - ✓ The access to the data is gained via File Transfer Protocol (FTP).
-

7.19.2 Backing up the database of production data acquisition (PDA)



Info

The data backup contains all the PDA data.

-
1. Remove the cover for the USB connection on the underside of the control terminal.

2. **NOTICE** – Missing data protection measures can damage the machine control software. This can result in reject packs and loss of production.
 - Use only virus-scanned USB sticks.

3. Insert the USB stick into the USB connection.



4. Touch the <maintenance menu> button on the navigation bar.



5. Touch the "Data backup" button in the <Maintenance menu>.
 - ✓ The display for "Data backup/create data backup tab" appears.
- Maintenance menu Data backup Create data backup
6. Touch the button for <Create PDA database backup>.
 - ✓ The display for "Create PDA database backup" appears.
 - ✓ All the PDA data is copied onto the USB stick and saved in a corresponding folder.



7. Touch the button for <Safely remove USB stick>.
8. Remove the USB stick.
 - ✓ The button for <Safely remove USB stick> disappears.
9. Attach the cover for the USB connection.

7.19.3 Load recipes

1. Remove the cover for the USB connection at the bottom of the control terminal.
2. **NOTICE** – Missing data protection measures can damage the machine control software. This can result in reject packs and loss of production.
 - Use only virus-scanned USB sticks.
3. Plug the USB stick with the saved recipes into the USB connection.
4. Touch the <Maintenance menu> button on the navigation bar.
5. Touch the "Data backup" button in the <Maintenance menu>.
 - ✓ The display for "Data backup/create data backup tab" appears.



6. Touch the <Load data backup> tab.
 - ✓ The display for "Data backup/load data backup tab" appears.
- Maintenance menu Data backup Load data backup



7. Touch the <Load recipes> button.
 - ✓ The display "install data backup" appears.
8. If several data backups are saved on the USB stick, select the required backup by means of the date.
9. Touch the <OK> button.
 - ✓ The recipes on the USB stick are copied to the machine control's industrial PC.

OK

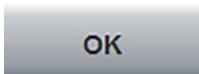
-
10. Load the desired recipe, which is to be used for production.
 11. Touch the button for <Safely remove USB stick>.
 12. Remove the USB stick.
 - ✓ The button for <Safely remove USB stick> disappears.
 13. Attach the cover for the USB connection.
-

7.19.4 Loading the data of production data acquisition (PDA)

1. Remove the cover for the USB connection on the underside of the control terminal.
 2. **NOTICE** – Missing data protection measures can damage the machine control software. This can result in reject packs and loss of production.
 - Use only virus-scanned USB sticks.
 3. Plug the USB stick with the saved PDA database into the USB connection.
 4.  Touch the <maintenance menu> button on the navigation bar.
 5.  Touch the "Data backup" button in the <Maintenance menu>.
 - ✓ The display for "Data backup/create data backup tab" appears.
 6.  Touch the <Load data backup> tab.
 - ✓ The display for "Data backup/load data backup tab" appears.
Maintenance menu > Data backup > Load data backup
 7. Touch the button for <Load PDA database backup>.
 - 7.1 If several PDA database backups are saved on the USB stick, select the required database backup by means of the date.
 - ✓ The display "install data backup" appears.
 8.  Touch the <OK> button.
 - ✓ The data on the industrial PC of the machine control is overwritten with the data on the USB stick.
 9.  Touch the button for <Safely remove USB stick>.
 10. Remove the USB stick.
 - ✓ The button for <Safely remove USB stick> disappears.
 11. Attach the cover for the USB connection.
-

7.19.5 Save images

1. Remove the cover for the USB connection on the underside of the control terminal.
2. **NOTICE** – Missing data protection measures can damage the machine control software. This can result in reject packs and loss of production.
 - Use only virus-scanned USB sticks.
3. Insert the USB stick into the USB connection.
4.  Touch the <Maintenance menu> button on the navigation bar.
5.  Touch the "Data backup" button in the <Maintenance menu>.✓ The display for "Data backup/create data backup tab" appears.

Maintenance menu Data backup Create data backup
6. Touch the <Save images> button.✓ The "Create data backup" display appears.
7.  Touch the <OK> button.
 - ✓ All images of the display are copied to the USB stick in the selected language.
 - ✓ If all screens are saved, the display "Save screenshots" appears.
8.  Touch the <OK> button.
9.  Touch the <maintenance menu> button on the navigation bar.
10.  Touch the "Data backup" button in the <Maintenance menu>.✓ The display for "Data backup/create data backup tab" appears.

Maintenance menu Data backup Create data backup
11. Touch the button for <Safely remove USB stick>.
12. Remove the USB stick.
 - ✓ The button for <Safely remove USB stick> disappears.
13. Attach the cover for the USB connection.

Cancel save images



1. Touch the <maintenance menu> button on the navigation bar.



2. Touch the "Data backup" button in the <Maintenance menu>.✓ The display for "Data backup/create data backup tab" appears.
Maintenance menu Data backup Create data backup
3. Touch the <Cancel save images> button.✓ The "Save screenshots" display with the *Really abort?* message appears.
4. Touch the <OK> button.✓ No further images are copied on the USB stick.
5. Touch the button for <Safely remove USB stick>.
6. Remove the USB stick.✓ The button for <Safely remove USB stick> disappears.
7. Attach the cover for the USB connection.

OK

7.20 Connect the machine with the MULTIVAC network

**Info**

- The Service access right is required to connect with the network.
- Only establish the connection with the network in consultation with MULTIVAC Service. See Section 1.8.3 "TAKING PRECAUTIONARY MEASURES FOR DATA PROTECTION" on page 26.



1. Touch the <maintenance menu> button on the navigation bar.



2. Touch the <Diagnosis> button in the "Maintenance menu".

3. Touch the <Remote Assistance> button in the "Diagnosis" menu.
 - ✓ The display "Remote Assistance/Remote assistance tab" appears.
 - ✓ The status of the connection is displayed in *Status*.

Diagnosis Remote Assistance

-
4. Touch the <Connect> button.
- ✓ The info line is coloured blue.
 - ✓ The access indicator on the navigation bar displays the symbol *Remote Assistance*.
 - ✓ “Connection active” appears in *Status*.
 - ✓ MULTIVAC Service can access the machine control.



-
5. To sever the connection, touch the <Disconnect> button.
-

7.21 Lubricant table



Info

The lubricants, which are recommended by MULTIVAC, are tailored ideally to the purpose and use. Damage to equipment or impairment of performance, e.g. increased wear and corrosion or similar, which is caused by use of inappropriate lubricants, is not covered by our warranty.

NOTICE

Material damage!

The use of unsuitable lubricants can increase the wear of the machine and lead to corrosion of the transport chains.

This damages the machine.

- Only use recommended lubricants for the transport chains.

Recommended lubricants:

Lubrication point	Type	Manufacturer	Designation	Marking and labelling	MULTIVAC material number
Transport chains	Oil	Klüber Lubrication	Klüberoil 4 UH1-150N	H 1	91111112041
Flange bearing	Grease	MULTIVAC	MULTIVAC grease	H 1	107111650
Pedestal bearing	Grease	MULTIVAC	MULTIVAC grease	H 1	107111650
Linear ball bearing	Grease	MULTIVAC	MULTIVAC grease	H 1	107111650
Lifting unit or lifting device	Grease	MULTIVAC	MULTIVAC grease	H 1	107111650

Lifting unit	Grease	Klüber Lubrication	Isoflex Topas NB 52	-	105924234
Cross cutter	Grease	MULTIVAC	MULTIVAC grease	H 1	107111650

8 Troubleshooting

WARNING

Injury hazard!

Ignorance of proper machine handling is very dangerous.
Improper handling can lead to serious injuries.

- Make sure you observe the safety instructions and accident prevention regulations.
- Only qualified electricians are permitted to work on electrical modules.
- Service and repair work should be carried out by authorised technicians only.
- When carrying out any service work or repairs, disconnect the power supply from the mains electricity.

8.1 Faults with diagnostic message

Diagnostic messages

Diagnostic messages appear in the info line and consist of a diagnostic number and a diagnostic text.

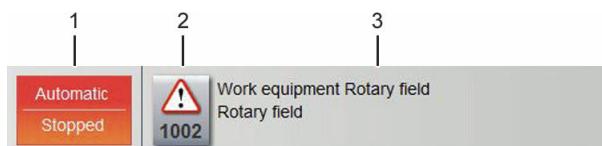


Fig. 348: Diagnostic message

- 1 Operating status of the machine
- 2 <Help> button with diagnostic number
- 3 Diagnostics text

Diagnostic number

The diagnostic number consists of five parts which are separated from each other with dots.

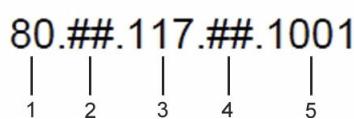


Fig. 349: Diagnostic number

- 1 Station
- 2 Station number
- 3 Subsystem
- 4 Sub system number
- 5 Error number

**Info**

Diagnostic messages in paper form are sorted in ascending order by the error number.

8.1.1 Acknowledging diagnostic message

**Info**

If a warning or fault occurs, the display of the operating status in the info line changes. A diagnostic message appears.

-
1. Rectify cause of malfunction.
-

8.1.2 Calling up cause and solution

Calling up solution for current diagnostic messages



1. **Without QR code:** Touch the <Help> button in the navigation bar.
 - ✓ The "troubleshooting" display for the current diagnostic message appears.
-



2. **With QR code:** Touch the button with the fault icon in the info line.
 - ✓ The "Troubleshooting" display for the current diagnostic message appears with the <QR code> button.
 3. Touch the tabs <1> to <xx>.
 - ✓ A known cause appears on each tab with the corresponding possible solution.
-

Calling up help from the message list



1. Touch the <maintenance menu> button on the navigation bar.
-



2. Touch the <Diagnosis> button in the "Maintenance menu".
 - ✓ The "Diagnosis" menu appears.
 3. Touch the <Message list> button in the "Diagnosis" menu.
 - ✓ The "Message list" display appears with the last displayed diagnostic messages.
Diagnosis > Message list
-

4. Touch the desired diagnostic message.
5. Touch the <Troubleshooting> button.
 - ✓ The "Troubleshooting" display for the selected diagnostic message appears.

-
6. Touch the tabs <1> to <xx>.
 - ✓ A known cause appears on each tab with the corresponding possible solution.
-

**Calling up help from
the message list of
production data ac-
quisition**



1. Touch the <Statistics> button on the navigation bar.
-



2. In the "Statistics menu", touch the <Production data acquisition> button.
 - ✓ The display for "Production data acquisition/machine effectiveness tab" appears.
-



3. Touch the <Message list> tab.
 - ✓ The "Message list" tab appears with the last displayed diagnostic messages.
-

Statistics > Production data acquisition > Message list

4. If required, limit the number of displayed messages with the filter settings.
-

5. Touch the desired diagnostic message.
-

6. Touch the <Troubleshooting> button.

- ✓ The "Troubleshooting" display for the selected diagnostic message appears.
-

7. Touch the tabs <1> to <xx>.

- ✓ A known cause appears on each tab with the corresponding possible solution.
-

8.1.3 Assessing cause and solution

1. Call up the "troubleshooting" display, see Section 8.1.2 "CALLING UP CAUSE AND SOLUTION".
-

2. Touch the desired tab with cause and solution.
-

3. Touch the <Increase value> or <Decrease value> button.

- ✓ With each positive or negative assessment, the *assessment number* increases or decreases.
 - ✓ The tabs are sorted according to their *assessment number* in descending order.
 - ✓ The tab with the highest *assessment number* is in position 1.
-

8.1.4 Inputting causes and solutions


Info

When inputting causes and solutions, the following options are available:

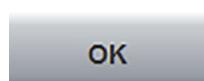
- Enter a new cause and new solution.
- Use existing causes and existing solutions.
- Combine an existing cause with a new solution.
- Combine a new cause with an existing solution.

**Inputting new causes
and new solutions**


1. Call up the "troubleshooting" display, see Section 8.1.2 "CALLING UP CAUSE AND SOLUTION".
2. Touch the <Perform> button.
✓ The "add cause and solution" display appears.



- ✓ Under *Cause* there appears *Create new cause* next to the <Edit> button.
- ✓ Under *Solution* there appears *Create new solution* next to the <Edit> button.

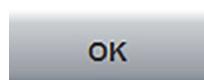


3. Touch the *Cause* input box.
✓ A keypad appears.

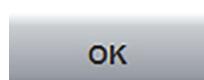
4. Enter the new cause on the keypad and confirm with the <OK> button.
✓ The new cause is adopted in the input box.



5. Touch the *Solution* input box.
✓ A keypad appears.



6. Enter the new solution on the keypad and confirm with the <OK> button.
✓ The new solution is adopted in the input box.



7. Touch the <OK> button.

- 7.1 If the display language is not English, process the prompt as follows.
- 7.2 If the cause and solution are also to be created in English, touch the <Yes> button, enter the English cause and solution and confirm with <OK>.
- 7.3 If the cause and solution are not to be created in English, touch the <No> button.
 - ✓ The new cause and solution are adopted in the "troubleshooting" display on the last tab.

Using existing causes and existing solutions

1. Call up the "troubleshooting" display, see Section 8.1.2 "CALLING UP CAUSE AND SOLUTION".
2. Touch the <Perform> button.
 - ✓ The "add cause and solution" display appears.



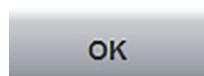
3. Under *Cause* touch the <Edit> button.

4. Select *Use existing cause* and confirm with the <OK> button.

5. Using the arrow keys next to the list, search for the desired cause under *Cause*.
6. Touch the desired cause.
7. Under *Solution* touch the <Edit> button.

8. Select *Use existing solution* and confirm with the <OK> button.

9. Using the arrow keys next to the list, search for the desired solution under *Solution*.



10. Touch the desired solution.
11. Touch the <OK> button.
 - ✓ The selected cause and the selected solution are adopted in the "Troubleshooting" display on the last tab.

8.1.5 Sending current fault as e-mail

As soon as a fault occurs on the packaging machine, the information about this fault is collected and shown as a QR code. This QR code can be scanned with the camera of a smartphone and sent as an e-mail.



Info

A QR code can only be produced for the current fault present.

- The QR code contains a fault description for the current fault.
- In the case of further faults, only the error code, date and time are given.

Preparing the smartphone for the QR code

1. Ensure that the smartphone has an Internet connection.
2. Download an app for scanning QR codes.
 - ✓ The app used must have MATMSG e-mail support.

Scanning and sending the QR code



1. Touch the button with the Fault icon in the info line.
 - ✓ The "troubleshooting" display for the current diagnostic message appears.



2. Touch the <QR code> button.
 - ✓ The "QR code" display appears.



-
3. Scan the QR code with the smartphone.
- ✓ An e-mail is automatically generated on the smartphone.
 - ✓ The type and serial number of the packaging machine, as shown in the example, should be given as the reference.



-
4. Send the created e-mail to MULTIVAC Service.

OK

-
5. Touch the <OK> button.

- ✓ The "Troubleshooting" display appears.
-

8.1.6 Muting the signal horn



Fig. 350: Resetting the acoustic signal button.

The depicted icon appears in the information line on the <OK> button, if the signal horn sounds.



-
1. Touch the button for Reset acoustic signal.
- ✓ The acoustic signal is off.
-

8.1.7 Checking the heating output (diagnostic message 1038)

The sum of the target values of all activated heating zones gives the target value on the "Heating current monitor 1" tab. The deviation between the measured actual value and the target value is displayed under *Output difference*. If this value is greater than that set for *Max. deviation*, the diagnostic message 1038 appears.

Next, the defective heating zone is determined by means of an individual output measurement of all heating zones. The individual output measurement stops at the affected heating zone. On the "Heating

current monitor 2" tab, the target value of the defective heating zone is shown with a red background.



Fig. 351: Heating current monitors 1 and 2

- 1 Sum of the target values
- 2 Electrical output difference of the "defective" heating zones (highlighted in red)
- 3 Maximum deviation
- 4 Electrical current values of the calibration
- 5 Electrical output difference of the "defective" heating zone (highlighted in red)
- 6 Target values of the individual heating zones
- 7 Status display of heater

Possible causes of the identified deviation:

- The present target values are not valid.
 - A heater has been replaced.
 - One heater is defective.
-
1. Ensure that the present target values are valid.
 - 1.1 Check whether the correct recipe is loaded.
 - 1.2 If necessary, load the correct recipe.
 2. Check whether a heater was replaced by another heater with a higher or lower heat output.
 - 2.1 If that was the case, recalibrate the heating zone, see Section 4.22.2 "CALIBRATING THE HEATING ZONES FOR THE HEAT OUTPUT MEASUREMENT".
 3. Check the heater of the defective heating zone.
-

Check the heater

1. Carry out individual output measurement of each heating zone **without** the function *Adopt as target value*.
 - 1.1 Activate the heat output measurement, see Section 4.22.1 "ACTIVATING AND DEACTIVATING THE HEAT OUTPUT MEASUREMENT".
 - 1.2 Touch the <Calibration> button.
 - ✓ The "Calibration" display appears.
 - 1.3 Touch the <Cancel> button.
 - ✓ The individual output measurement starts without the function *Adopt as target value*.
2. Using the output values imprinted on the dies, check whether the determined output target values correspond to the heat outputs installed.
 - 2.1 If the electrical output deviates by more than 500 watts, have the heating zone checked by a qualified electrician authorized by the company.
3. If the heating zone exhibits no fault, have the measurement of the electrical output by the EL3403 terminal checked by an electrician authorised by the operating company.

8.2 Faults without diagnostic message

Symptom	Cause	Solution
Cavities are not fully shaped or have creases.	<ul style="list-style-type: none">• The <i>heating</i> time or <i>forming</i> time is set too short.• Forming pressure is too low.• The temperature during forming heating is too high or too low.	<ul style="list-style-type: none">• Check, reset if necessary.• Check, reset if necessary.• Check, reset if necessary.
	<ul style="list-style-type: none">• The silencer of the quick ventilation valve for the forming die bottom section is dirty.	<ul style="list-style-type: none">• Replace silencer.
	<ul style="list-style-type: none">• Film infeed is not parallel.• The film is not tensioned enough.	<ul style="list-style-type: none">• Check, reset if necessary.• Check, reset if necessary.
	<ul style="list-style-type: none">• Holes in the heating plate are clogged.	<ul style="list-style-type: none">• Redrill the holes.
	<ul style="list-style-type: none">• Heating plate is too far down.	<ul style="list-style-type: none">• Move heating plate back somewhat, remove spacer bushings.

Symptom	Cause	Solution
	<ul style="list-style-type: none"> Hose line in the forming die is damaged. The forming die is insufficiently cooled. Die is furred. Closing diaphragm not airtight. 	<ul style="list-style-type: none"> Check, replace if necessary. Set the cooling water flow rate higher. Decalcify the die. Check, replace if necessary.
The film is not heated up in the preheating device.	<ul style="list-style-type: none"> Compressed air and a diaphragm are configured in the hardware configuration of the preheating unit and a diaphragm is built in. The diaphragm in the preheating die is not activated. 	<ul style="list-style-type: none"> Activate the diaphragm in the "Forming / Other settings tab" page.
Film is not properly gripped by the chain grippers.	<ul style="list-style-type: none"> Film does not run symmetrically into the transport chains. Film does not run centred into the transport chains. Transport chains are not sufficiently tensioned. 	<ul style="list-style-type: none"> Adjust the <i>film run handwheel</i> accordingly while the web roll is turning. Adjust the <i>film run handwheel</i> accordingly while the web roll is turning. Have the transport chains tensioned only by a specialist authorised by the manufacturer.
Creases appear across the film.	<ul style="list-style-type: none"> Machine is not properly aligned. Transport chains are unevenly tensioned. Transport chains are not sufficiently tensioned. 	<ul style="list-style-type: none"> Have the machine aligned only by a technician authorised by the manufacturer. Have the transport chains tensioned only by a specialist authorised by the manufacturer. Have the transport chains tensioned only by a specialist authorised by the manufacturer.
Pack cavities are damaged.	<ul style="list-style-type: none"> The radius plates are missing. The radius plates are damaged. 	<ul style="list-style-type: none"> Insert the radius plates. Smooth the radius plates.
Forming die whistles.	<ul style="list-style-type: none"> The round cord in the forming die is defective. <i>Forming</i> time set too long. The <i>heating/pressure increase</i> time is set too long. 	<ul style="list-style-type: none"> Check, replace if necessary. Check, reset if necessary. Check, reset if necessary.

Symptom	Cause	Solution
Poor vacuum	<ul style="list-style-type: none"> • Vacuum is set too low. • <i>Vacuum</i> time set too low (depending on programme). • Filter for vacuum pump is clogged. • The sealing valve is leaky. The sealing plate presses down. • The solenoid valve <i>Lower sealing plate</i> on the sealing valve is defective. The sealing diaphragm is vented in the vacuum system. • Sealing diaphragm defective. 	<ul style="list-style-type: none"> • Check, reset if necessary. • Check, reset if necessary. • Exchange the filter. • Replace the sealing valve. • Replace the solenoid valve <i>Lower sealing plate</i>. • Check, replace if necessary.
Unsatisfactory gas flushing	<ul style="list-style-type: none"> • Inert gas nozzle is dirty. • The value of the <i>gas switch point</i> is too short for the <i>gas flushing time</i>. • The gas pressure is too high. • The gas mixer is set incorrectly. 	<ul style="list-style-type: none"> • Clean the inert gas nozzle. • Check, reset if necessary. • Check, reset if necessary. • Check, reset if necessary.
Pack not airtight, poor seal	<ul style="list-style-type: none"> • Film incorrectly inserted. • Sealing heating temperature is too high or too low. • <i>Sealing</i> time is too short or too long. • Set sealing pressure is too low. • Sealing gasket in the die bottom section is worn. • Diaphragm in the sealing die top section is defective. • Sealing plate damaged. 	<ul style="list-style-type: none"> • Insert film correctly. The sealing layers of the upper and lower web must lie directly on top of one another. • Check, reset if necessary. • Check, reset if necessary. • Increase the sealing pressure on the pressure regulator in the control cabinet. • Check, replace if necessary. For a purchase order, provide the complete material number. • Check, replace if necessary. • Check, replace if necessary.

Symptom	Cause	Solution
	<ul style="list-style-type: none"> Check valve on sealing die is defective. Film runs asymmetrically. Heating element defective. Polyethylene has melted behind the sealing plate. 	<ul style="list-style-type: none"> Check, replace if necessary. Adjust the film guide. Check, replace if necessary. Carefully clean the sealing plate.
No cutting; cross cutter	<ul style="list-style-type: none"> Cutting unit not switched on or wrong cutting unit selected. The <i>cutting</i> time is too short. Power lifting (with punch) is switched off. Pneumatic line loose or defective. Solenoid valve does not switch on. Guides are dry. 	<ul style="list-style-type: none"> Switch on cutting unit. Check, reset if necessary. Switch on power lifting (for punch) in the machine control unit. Check, replace if necessary. Measure the voltage at the solenoid valve. Lubricate guides.
No cutting; longitudinal cutter	<ul style="list-style-type: none"> Cable on electric motor defective. Motor circuit breaker tripped. 	<ul style="list-style-type: none"> Check, replace if necessary. Check motor circuit breaker, eliminate cause of overload.
Faulty cutting; longitudinal cutter	<ul style="list-style-type: none"> Knife loose. Knife blunt. Cutting line outside the centre. 	<ul style="list-style-type: none"> Clamp knife firmly in place. Check, replace if necessary. Reset the position of the knife.
Water leaks from the cladding or in the die.	<ul style="list-style-type: none"> O-ring between machine frame and die top section is missing or defective. The gasket is defective. Water hose in the machine is defective. 	<ul style="list-style-type: none"> Check, replace if necessary. Check, replace if necessary. Check, replace if necessary.
The die top section becomes hot.	<ul style="list-style-type: none"> Die is furred. 	<ul style="list-style-type: none"> Decalcify the die.
Cooling water continues to flow through the machine despite main switch being turned off.	<ul style="list-style-type: none"> The valve at the cooling water inlet does not close. 	<ul style="list-style-type: none"> Clean, decalcify.

Symptom	Cause	Solution
Compressed air blowing out.	• Hose is damaged.	• Check, replace if necessary.
	• O-ring is damaged.	• Check, replace if necessary.
	• Diaphragm in the quick ventilation valve has hardened.	• Check, replace if necessary.

8.3 Faults of vacuum pump MM xxxx

**Info**

If faults arise which are not listed, contact MULTIVAC Service.

Symptom	Cause	Solution
The vacuum pump does not run.	• The mains frequency or mains voltage is outside the tolerance limits.	• Check the power supply.
	• The motor is defective.	• Contact MULTIVAC Service.
	• The clutch is defective.	• Contact MULTIVAC Service.
The vacuum pump does not achieve the indicated vacuum.	• The filter in the suction connection is clogged.	• Clean or replace the filter in the suction connection.
	• If the vacuum pump has an additional filter on the suction connection, the filter is clogged.	• Replace the filter on the suction connection.
	• Components in the vacuum pump are damaged.	• Have MULTIVAC Service repair the vacuum pump.
The vacuum pump is too loud.	• The clutch is defective.	• Have MULTIVAC Service repair the vacuum pump.
	• There is too little oil in the vacuum pump.	• Contact MULTIVAC Service.
	• The bearings of the vacuum pump are defective.	• Have MULTIVAC Service repair the vacuum pump.
The vacuum pump gets too hot.	• The vacuum pump is dirty.	• Clean the vacuum pump.
	• The ambient temperature is too high.	• Observe the maximum ambient temperature.
	• The temperature of the packaging gas drawn in is too high.	• Adjust the packaging process.
	• There is too little oil in the vacuum pump.	• Contact MULTIVAC Service.

8.4 Unblocking moveable parts

**Info**

If parts of the machine are jammed, e.g. transport chains, pneumatic cylinders or conveyors, please notify MULTIVAC Service.

9 Shutdown, transport, storage



Info

Observe the safety instructions, see Section 1 "SAFETY".

9.1 Shutting down the machine

9.1.1 Removing film from the machine

1. Run the film out of the machine, see Section 4.8.4 "RUNNING THE MACHINE EMPTY".
2. Turn off the main switch and attach a lock to prevent unauthorised start-up.
3. If installed, empty the spools of the edge trim winder.
4. **WARNING** – The web rolls are heavy. Carrying heavy web rolls can lead to injuries.
 - Use suitable load lifting equipment.
 - Have a second person assist you.
5. Take out the upper and lower film rolls.

9.1.2 Cleaning the machine

1. Perform intensive cleaning of the machine.

9.1.3 Closing and disconnecting supply lines

1. Remove film from the machine. See Section 4.8.4 "RUNNING THE MACHINE EMPTY" on page 313.
2. Close the stop valve of the gas cylinder, if available.
3. Drain the cooling water circuit. See Section 5.10.2 "DRAINING THE COOLING WATER CIRCUIT" on page 374.
4. If it is present, close the stop-cock of the water inlet for the water rinsing of the chain.
5. De-energise the machine. See Section 5.2 "DE-ENERGISING THE MACHINE" on page 359.
6. Set the system pressure on the air preparation unit to 0 bar (0.0 psi).
7. Disconnect any optional and customer-supplied devices such as suction unit, central vacuum system, etc. from the machine.
 - 7.1 Unplug or detach cables at the machine.
 - 7.2 Remove hose connections to the machine.
8. Remove the gas hose from the inert gas connection.

-
9. Remove the compressed air hose from the compressed air connection.
 10. Remove cooling water inlet and cooling water return flow hoses from the cooling water connections.
 11. Remove the hose for the "chain water rinsing" function.
 12. Disconnect the machine from the mains electricity.
 - 12.1 Release the cable strain relief on the supply cable.
 - 12.2 Detach the supply cable and carefully pull it out of the control cabinet.
-

9.1.4 Preserving the machine

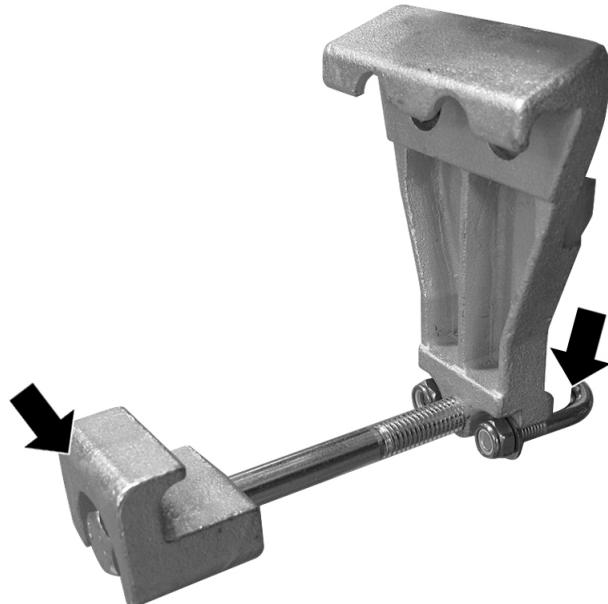
-
1. Lubricate the transport chains. See Section 7.12 "LUBRICATION OF THE TRANSPORT CHAINS" on page 519.
 2. Preserve the machine. See Section 6.1.7 "CORROSION PROTECTION AND LUBRICATION" on page 441.
-

9.2 Transporting the machine

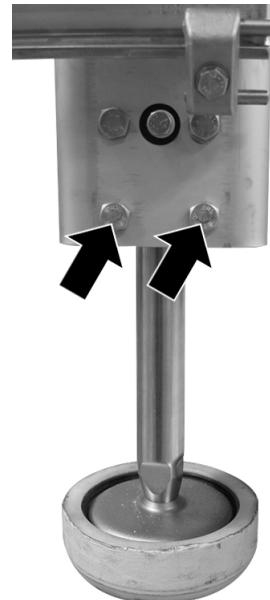
9.2.1 Attaching transport rails

Attaching holding device

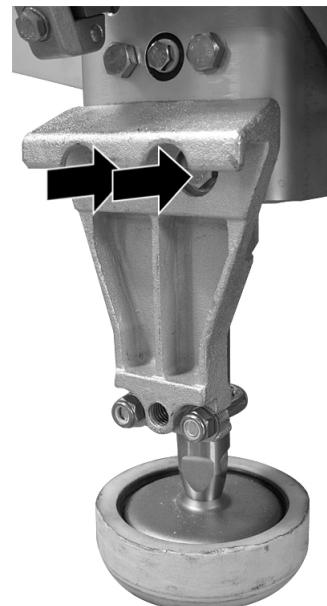
-
1. Remove the hook and the bracket screw.



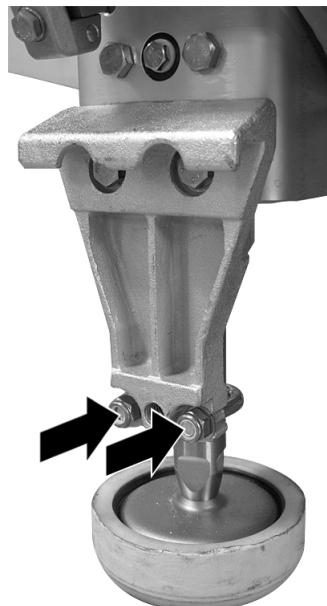
-
2. Unscrew screws on the machine foot.



3. Fasten the holding device onto the machine foot using the screws. Do not tighten the screws, the machine foot should remain rotatable.

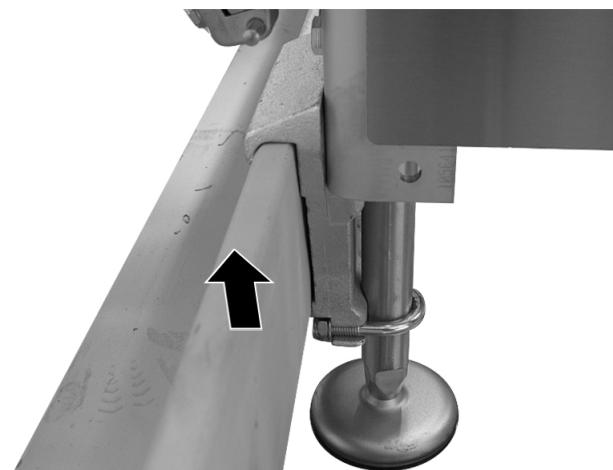


-
4. Fasten the bracket screw with both nuts to the holding device. Do not tighten the nuts, the machine foot should remain rotatable.



Attaching transport rails

1. Push the transport rail with lifting trolley onto the holding device.
2. Raise the transport rail with lifting trolley until the top of the transport rail is in the holding devices.



-
3. Insert the hook in the transport rail and tighten the screws.



- ✓ The transport rail is attached to the machine foot.
-

9.2.2 Transporting the machine (with forklift)



Info

Machines with disconnection points may only be transported when separated into their constituent parts. If necessary, have the machine disconnected by authorised service personnel.

DANGER

Injury hazard!

Incorrect transport can cause the machine to fall or tip over. Standing in the danger zone will lead to serious injuries or even death.

- Do NOT stand under suspended loads.
- Only lift the machine at the designated points.
- Take the machine weight into account.

NOTICE

Material damage!

Incorrect transport can damage the machine. Damage can cause faults in the machine, which in turn can result in reject packs.

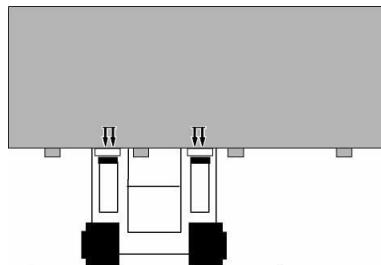
- Only transport the machine with the transport rails fitted.
- Do NOT lift the machine at the machine ends.
- Only lift the machine at the designated points.

NOTICE**Material damage!**

At an inclination of more than 15°, the oil in the vacuum pump shifts. The air de-oiling elements will get wet from the oil and become ineffective. This will damage the vacuum pump.

- Transport and set the machine down as horizontally as possible.
- Do NOT tilt the machine.

1. Wear personal protective equipment.
2. Close and disconnect the supply lines, see Section 9.1.3 "CLOSING AND DISCONNECTING SUPPLY LINES".
3. Use suitable and adequately sized load lifting equipment.
4. Note machine dimensions and weight, see the shipping documents.
5. Set the forklift to the widest setting.
6. Secure the machine against tilting and falling over by using acceptable transport safety attachments.
7. When lifting the machine, note the centre of gravity. The centre of gravity can lie outside the centre point of the machine.



8. Lift the machine with wooden base at the designated points.



9. Transporting the machine.

9.3 Storing the machine

1. Taking the machine out of service
2. Select a suitable storage site.
 - 2.1 Observe the ambient conditions for storing the machine, see Technical specifications.
 - 2.2 Ensure that the location site is of adequate load-bearing capacity and keep the weight of the unit in mind, see Technical specifications.

-
3. If necessary, cover the machine with film.
 4. Make a note of the date on which the machine was put into storage.

Machines that have been stored for more than six months must be examined by MULTIVAC Service prior to being put into service.

9.4 Disposal and environmental protection

9.4.1 Disposing of the vacuum pump

Disposal of Mink MM xxxx vacuum pump

⚠ DANGER

Dangerous voltage!

Inside are live components.

Touching live components will result in death or serious injury.

- Disconnect the vacuum pump from the mains electricity before opening the cover.
- Only qualified electricians are permitted to work on live components.
- Do NOT touch damaged electrical lines. Have them replaced immediately by a qualified electrician.
- Do not put the vacuum pump into operation without the cover of the terminal box.

⚠ WARNING

Burn hazard!

The surface of the vacuum pump can reach temperatures of over 70 °C during operation.

Touching the vacuum pump can lead to burns.

- When performing any work wear personal protective equipment.
- Before starting any work in the danger zone, allow the vacuum pump to cool down.

⚠ CAUTION

Injury hazard!

The vacuum pump generates negative pressure during operation. Touching the open suction connection can lead to injuries.

- Do not touch the suction connection during operation.
- Ventilate the vacuum pump before reaching into it.

-
1. De-energise the machine.
 2. Allow the vacuum pump to cool down.
-

-
3. Drain the oil.
For this, contact MULTIVAC Service.
 4. Sort and properly dispose of the materials. Observe all legal and company regulations in regard to environmental protection.
-

9.4.2 Disposing of the machine

WARNING

Burn hazard!

The built-in heating plates can reach temperatures over 180 °C. The heating plates remain hot for some time after the machine has been switched off.

Touching the heating plates can lead to severe burns.

- When performing any work wear personal protective equipment.
- Do NOT touch the heating plates.
- Before starting any work in the danger zone, allow the die to cool down.

WARNING

Injury hazard!

Dies are heavy and have sharp edges.

Carrying heavy dies can lead to injuries.

- Use suitable load lifting equipment.
- Have a second person assist you.
- When performing any work wear personal protective equipment.

CAUTION

Injury hazard!

The knives of the cutting unit are sharp.

Touching the sharp knives can lead to injuries.

- When performing any work wear personal protective equipment.
- Do NOT touch the knives.

CAUTION

Injury hazard!

Sharp knives are installed in the die top section.

Touching them can lead to injuries.

- When performing any work wear personal protective equipment.
- Do NOT touch the knives.



Info

- Dies can be reused on other machines of the same series.
- If disposal of the machine is not handled by the manufacturer, dispose of the machine as described below.

1. Remove the film rolls, see Section 9.1.1 "REMOVING FILM FROM THE MACHINE".
2. Drain the cooling water and disconnect the machine from the mains electricity, see Section 9.1.3 "CLOSING AND DISCONNECTING SUPPLY LINES".
3. Dismantle the machine.
4. Sort and properly dispose of the materials. Observe all legal and company regulations in regard to environmental protection.

9.4.3 Disposal of operating materials

NOTICE

Protect the environment!

Operating materials are hazardous to the environment.

Improper disposal is harmful to the environment.

- Handle operating materials properly.
- Dispose of operating materials at suitable collection points.
- Observe environmental directives.

Disposing of oil and grease



Info

Excerpt from the disposal directive:

- It is forbidden to mix oil with other waste.
- Different oils must NOT be mixed with each other.
- The used oil filters should be collected, stored, transported and disposed of separately from other waste.

1. Handle and dispose of the oil properly.

2. Handle and dispose of the grease properly.

Disposing of packaging materials



Info

Packaging materials are resource materials that can be recycled.

- Improper disposal is harmful to the environment.
- Films should be collected for recycling.
- Follow the manufacturer's disposal instructions.

1. Handle and dispose of packaging materials properly.

Disposing of chemicals**⚠WARNING****Chemical burn hazard!**

Cleansers are caustic. Caustic effects are NOT noticed immediately. Contact with the skin can cause burns.

- Wear the prescribed personal protective equipment when handling cleansers.
- Observe the manufacturer's instructions.

⚠WARNING**Danger of fire!**

Alcohol-based disinfectants are highly flammable.

Fire, naked light or smoking ignites the disinfectant and can cause fires.

- When disinfecting the machine, flames or naked lights are prohibited.
- Smoking is prohibited.
- Observe the instructions of the disinfectant manufacturer.

**Info**

Improper disposal is harmful to the environment.

- Observe the manufacturer's safety data sheets.
- Follow the manufacturer's disposal instructions.
- Observe the disposal regulations that apply regionally.

1. Handle and dispose of the chemicals properly.

2. If the cooling water is mixed with a corrosion inhibitor or with other chemicals, handle the cooling water properly and dispose of it in a professional manner.

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MULTIVAC branch offices

GERMANY

MULTIVAC Sepp Haggenmüller SE & Co. KG
Tel.:+49 83 34 601 0
Fax:+49 83 34 601 199
multivac@multivac.de
www.multivac.com

SWITZERLAND

MULTIVAC EXPORT AG
Tel.:+41 41 785 65 65
Fax:+41 41 785 65 10
meag@multivac.ch
www.multivac.com

GERMANY

MULTIVAC Marking & Inspection GmbH & Co. KG
Tel.:+49 5224 931-0
Fax:+49 5224 931-299
multivac-mi@multivac.com
www.multivac.com

GERMANY

MULTIVAC Resale & Service GmbH
Tel.:+49 2157 8197 0
Fax:+49 2157 8197 22
info@multivacresale.de
www.multivac.com

ARGENTINA

MULTIVAC Argentina S.A.
Tel.:+54 11 4723 3766
Fax:+54 11 4723 4098
info@multivac.com.ar
www.multivac.com

AUSTRALIA

MULTIVAC Australia PTY. LTD.
Tel.:+61 3 8331 2800
Fax:+61 3 8331 2810
info@multivac.com.au
www.multivac.com

BELGIUM

Multivac N.V.
Tel.:+32 15 569 50 9
Fax:+32 15 569 50 1
mub@multivac.be
www.multivac.com

BRAZIL

MULTIVAC do Brasil
Antônio Lacerda Braga, 421
Cidade Industrial, 81170-240
Curitiba / PR Brazil, CNPJ:
10.259.645/0001-05
Tel.:+55 19 3795-0818
Fax:
suporte.tecnico@br.multivac.com
at@br.multivac.com
www.multivac.com

BULGARIA

MULTIVAC Bulgaria EOOD
Tel.:+359 2 988-55-00
Fax:+359 2 988-55-88
service@bg.multivac.com
www.multivac.bg

CHILE

MULTIVAC CHILE S.A.
Tel.:+56 27 996 00 0
Fax:+56 27 996 00 1
mucl@cl.multivac.com
www.multivac.com

CHINA

MULTIVAC (Shanghai) Trading Co.
Building 7, Lane 195, Qianpu Road (Shanghai)
Tel.:+86 21 3701 8118
Fax:+86 21 3766 0051
info@cn.multivac.com
www.multivac.cn

DENMARK

MULTIVAC A/S
 Tel.:+45 75 853 42 2
 Fax:+45 75 853 45 4
 mudk@multivac.dk
www.multivac.com

ESTONIA

MULTIVAC Oy Estonia
 Branch
 Tel.:+372 622 8258
 Fax:+372 622 8259
 margus.kupp@ee.multivac.com
www.multivac.com

FINLAND

MULTIVAC Oy
 Tel.:+358 20 792 13 00
 Fax:+358 20 792 13 71
 multivac@fi.multivac.com
www.multivac.com

FRANCE

MULTIVAC FRANCE S.A.S.
 Tel.:+33 16 412 13 14
 Fax:+33 16 412 75 30
 muf@multivac.fr
www.multivac.com

GREECE

MULTIVAC Hellas Mepe
 Tel.:+30 21 066 19 621
 Tel.:+30 21 066 19 622
 Fax:+30 21 066 19 662
 info@gr.multivac.com
www.multivac.com

GREAT BRITAIN

MULTIVAC UK Ltd.
 Tel.:+44 1793 425800
 Fax:+44 1793 616219
 sales@multivac.co.uk
www.multivac.com

INDIA

MULTIVAC Laraon India Private Limited
 Tel.:+91 12 446 10 000
 Fax:
 info@multivac.co.in
www.multivac.com

IRELAND

MULTIVAC Ireland Ltd.
 Tel.:00 353 1 4133200
 Fax:00 353 1 4133205
 info@ie.multivac.com
www.multivac.com

ISRAEL

MULTIVAC B.P.S. Ltd.
 Tel.:+972 46 344 68 1
 Fax:+972 46 344 67 8
 muil@multivac.co.il
 il.multivac.com

ITALY

MULTIVAC Italia Service S.R.L.
 Tel.:+39 02 450 32 08
 Fax:+39 02 458 63 819
 muit@it.multivac.com
www.multivac.com

JAPAN

Tokyo Foods Machinery Co. Ltd.
 Tel.:+81 33 663 40 06
 Fax:+81 33 662 49 41
 t.orimi@tokyofoods.co.jp
www.multivac.com

CANADA

MULTIVAC Canada Inc.
 Tel.:+1 905 264 1170
 Fax:+1 905 264 9647
 info@ca.multivac.com
www.multivac.com

COLUMBIA

Corporación MULTIVAC
 S.A.S. Oficinas
 Tel.:+57 1 547 5241
 Fax:+57 1 547 4276
 info@co.multivac.com
www.multivac.com

CROATIA

MULTIVAC d.o.o.
 Tel.:+385 14 855 20 5
 Fax:+385 14 855 20 4
 multivac@zg.t-com.hr
www.multivac.com

LATVIA

MULTIVAC Oy Latvia Branch
 Tel.:+371 67 623 121
 Fax:+371 67 622 602
 multivac@lv.multivac.com
www.multivac.com

LITHUANIA

MULTIVAC Oy filialas Bukiškės
 Tel.:+370 52 105 03 6
 Fax:+370 52 336 41 3
 multivac@lt.multivac.com
www.multivac.com

MEXICO

MULTIVAC Mexico S.A. de C.V.
 Tel.:+52 55 502 05 555
 Fax:+52 55 502 05 560
 contacto@multivac.com
www.multivac.com

NEW ZEALAND

MULTIVAC New Zealand Ltd.
 Tel.:+64 9 238-3055
 Tel.:+64 2 146-0807
 Fax:+64 9 238-3054
 info@multivac.co.nz
www.multivac.com

NETHERLANDS

MULTIVAC BV
Tel.:(+31) 0348 436570
Fax:(+31) 0348 436580
munl@multivac.nl
www.multivac.com

NORTH AFRICA

MULTIVAC Afrique du Nord
Tel.:+216 71 963 963
Tel.:+216 71 860 128
Fax:+216 71 860 230
munaf@multivac.fr
www.multivac.com

NORWAY

MULTIVAC AS
Tel.:+47 33 445 25 0
Fax:+47 33 445 25 1
mun@multivac.no
www.multivac.com

AUSTRIA

MULTIVAC Vertriebsgesellschaft mbH
Tel.:+43 (0)1 698 1300
Fax:+43 (0)1 698 1300-99
info@multivac.at
www.multivac.com

POLAND

MULTIVAC Sp. z o. o.
Tel.:+48 81 746 67 00
Fax:+48 81 746 67 01
mupl@multivac.pl
www.multivac.com

PORTUGAL

Multi Vacuo - Sistemas de Embalagens Lda.
Tel.:+351 21 41 95 541
Tel.:+351 93 77 74 355
Fax:+351 21 41 95 543
geral@pt.multivac.com
www.multivac.com

ROMANIA

MULTIVAC Romania S.R.L
Tel.:+40 21 345 34 61
Fax:+40 21 345 34 61
adrian.dobre@multivac.ro
www.multivac.com

RUSSIA

MULTIVAC Rus / Moscow
127254 Moscow
Tel.:+7 495 604 4902
Fax:+7 495 604 4903
office@ru.multivac.com
www.multivac.com

SWEDEN

MULTIVAC Sverige
Tel.:+46 46 31 17 00
Fax:+46 46 15 03 00
mus@multivac.se
www.multivac.com

SERBIA

MULTIVAC d.o.o.
Tel.:+381 21 4721 144
Fax:+381 21 4721 146
info@multivac.rs
www.multivac.com

SINGAPORE

MULTIVAC Pte. Ltd.
Tel.:+65 6565 3919
Fax:+65 6566 9798
multivac@sg.multivac.com
www.multivac.com

SLOVAKIA

MULTIVAC Export AG organizačná zložka Slovakia
Ges.m.b.H & Co. KG
Tel.:+421 24 446 40 70
Fax:+421 24 446 40 72
info@sk.multivac.com
www.multivac.com

SPAIN

MULTIVAC Production Spain S.L.U.
E - 08396 Sant Cebrià de Vallalta (Barcelona)
Tel.:+34 90 229 09 09
Fax:+34 93 763 08 85
info@es.multivac.com
www.multivac.com

SOUTH AFRICA

MULTIVAC Southern Africa PTY. (LTD.)
Tel.:+27 16 340 5800
Fax:+27 16 340 5819
alex.ferguson@multivac-sa.com
www.multivac.com

SOUTH KOREA

MULTIVAC KOREA CO., LTD
Tel.:+82-70-4895-4041
Fax:+82-70-8244-4050
info@kr.multivac.com
www.multivac.com

CZECH REPUBLIC

MULTIVAC Packing Machines, Ceska Republika S.R.O.
Tel.:+420 26 126 05 16
Fax:+420 26 126 05 18
mucz@cz.multivac.com
www.multivac.com

TURKEY

MULTIVAC Ambalaj Makine-iyeri San. ve Tic. A.Ş.
Tel.:+90 216 526 00 33
Fax:+90 216 526 03 83
info@tr.multivac.com
www.multivac.com

UKRAINE

MULTIVAC Ukraine LLC
Tel.:+380 44 499 90 70
Fax:+380 44 499 90 67
office@ua.multivac.com
www.multivac.com

HUNGARY

MULTIVAC Hungária Kft.
Tel.:+36 23 500 28 7
Fax:+36 23 500 28 8
info@hu.multivac.com
www.multivac.com

USA

MULTIVAC, Inc.
Tel.:+800 877 5200
Tel.:+1 816 891 0555
Fax:+800 347 6164
Fax:+1 816 891 0622
muinc@multivac.com
www.multivac.com

UNITED ARAB EMIRATES

MULTIVAC Middle East (FZE), Amir Sotoudeh
Tel.:+971 4 299 1980
Fax:+971 4 299 1981
service@ae.multivac.com
www.multivac.com