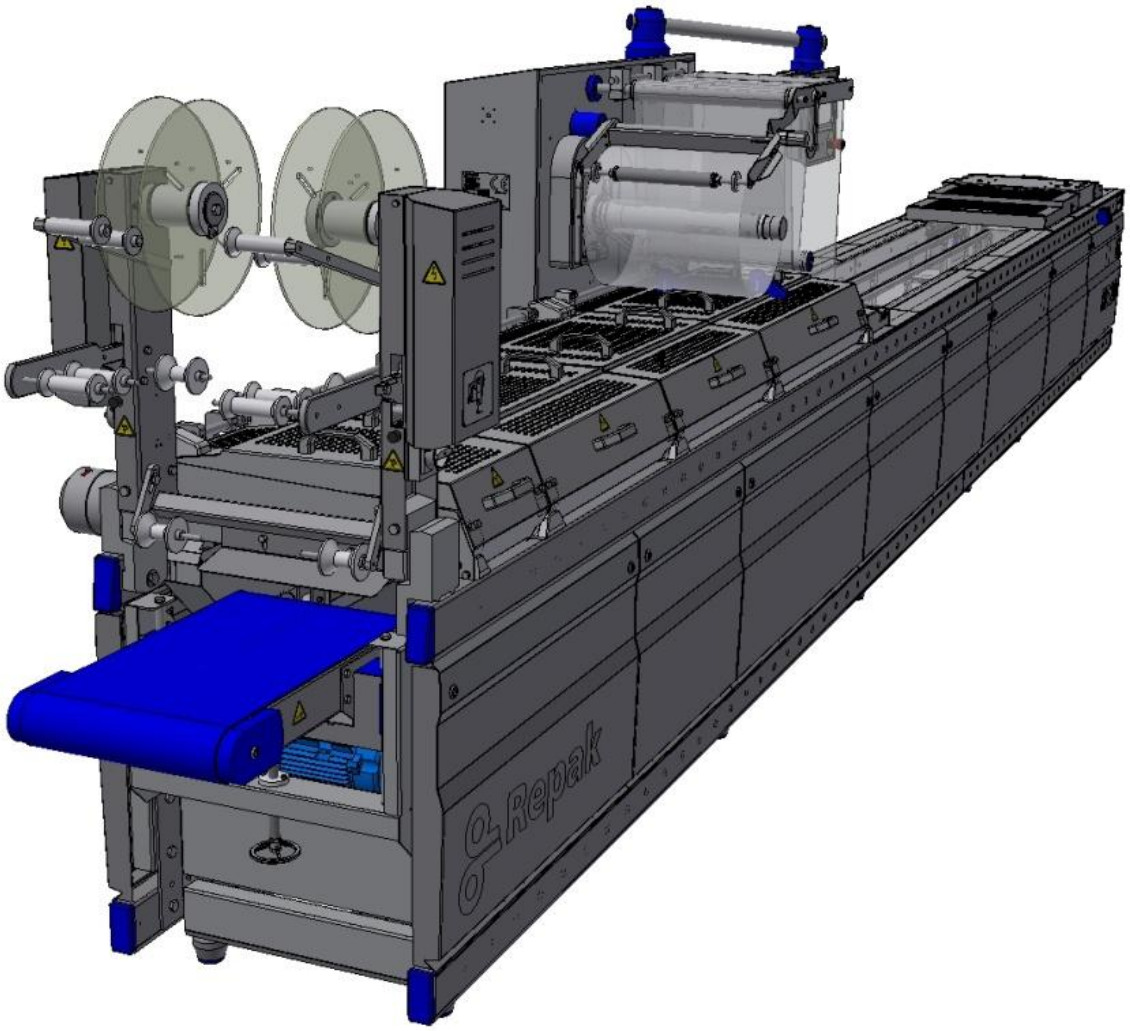
User Manual

for the start-up and operation of the
Thermoforming Packaging Machine

Repak RE20

SUPERIOR PACKAGING SOLUTIONS

part 1: operator



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Repak RE20 User Manual

part 1: operator

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User Manual for RE20

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Foreword

The Repak RE20 is a modern deep drawing packaging machine for large to very large numbers of packages. Its modular construction, designed for optimum hygiene, makes it capable of handling a wide variety of applications.

This manual is divided into three parts: the operator manual (chapter 1), the technical part with electrical and pneumatic diagrams (chapter 2 -11) and the spare parts list . (chapter 12). Part one contains all the information the operator requires to start the machine up and run it. These are activities that do not require tools of any kind. The technical part describes the electrical and pneumatic diagrams and the third part contains the parts lists and construction drawings relative to the machine.

The standards that the machine meets are listed in the “EC declaration of compliance for machines”.

In all cases and in case of dispute, the authoritative version remains the English version.

Repak-Holland
SUPERIOR PACKAGING SOLUTIONS

Declaration of Agreement

According to appendix II, part A of the Machinery Directive 2006/42/EG

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Hereby declares, completely under its own responsibility, in relation to the following machine:

Horizontal shaping, filling and sealing machine, Repak RE20, RE2080791

- That it meets the applicable essential requirements of the Machinery Directive (2006/42/EG)
- That, in addition to the abovementioned Directive, the machine meets the conditions in the following Directive (s):

EMC Directive (2004/108/EG)

Authorised author(s) of the technical dossier:

Repak BV
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Netherlands

The following European harmonised standards, or other normative documents, are applied:

- **Basis terms, general design principles:** Basic terms for design, risk evaluation and risk reduction, NEN-EN-ISO 12100:2010
- **Minimum distances.** To prevent the entrapment of parts of the human body, NEN-EN 349:1994+A1:2008.
- **Safety of packaging machines.** Section 3: Shaping, filling and sealing machines, NEN-EN 415-3:1999+A1:2009.
- **Safety of machines.** Safety distances to prevent the upper or lower parts of the human body from entering dangerous zones, NEN-EN-ISO 13857:2008.
- **Machine safety.** Emergency stop facilities, functional aspects, design principles NEN-EN-ISO 13850:2008.
- **Human body dimensions.** Part 1: principles for the determination of the required dimensions of access openings in machines for the entire body, NEN-EN 547-1:1997+A1:2008. Part 2: principles for the determination of the required dimensions of access openings, NEN-EN 547-2:1997+A1:2008. Part 3: anthropomorphic data, NEN-EN 547-3:1997+A1:2008.
- **Ergonomic design principles.** Part 1: terminology and general principles, NEN-EN 614-1: 2006+A1:2009. Part 2: interaction between the design of machines and work tasks, NEN-EN 614-2:2000+A1:2008.
- **Safety of machines.** General requirements for the design and the protection of screens (fixed and movable), NEN-EN 953: 1998+A1:2009.
- **Safety of machines.** Parts of control systems with a safety function - Part 1: general design principles NEN-EN 954-1:1997.
- **Safety of machines.** Parts of control systems with a safety function. Part 1: general design principles, NEN-EN-ISO 13849-1:2006.
- **Safety requirements for hydraulic and pneumatic systems and parts.** Pneumatics, NEN-EN 983:1997+A1:2008.
- **Safety of machines.** De-activation of the power supply and removal of power. Prevention of unintended starting, NEN-EN 1037:1996+A1:2008.
- **Safety of machines.** Blocking with or without blocking facilities. General basic principles for the design, NEN-EN 1088: 1996+A2:2008.
- **Conveyor belts for general use.** Requirements for the electrical safety and flammability, NEN-EN EN 12882:2008.
- **Electromagnetic compatibility (EMC).** General standards. Part 6-2: Immunity for industrial environments, NEN-EN-IEC 61000-6-2:2001. Part 6-3: Emissions standard for household, trade and light industrial environments, NEN-EN-IEC 61000-6-3: 2001.
- **Safety of machines.** Instructions, brands and operating principles. Part 1: requirements for visible, audible and tangible signals; NEN-EN 61310-1:2008.
- **Contact-free electrical safety features.** NEN-EN-IEC 61496-1:2004.
- **Points of departure for the coding of instruction features and operating organs.** NEN-EN 60073: 2002.
- **Safety of machines – electrical equipment of machines.** Part 1: General requirements: NEN-EN-IEC 60204-1: 2006.
- **Human-machine interface (MMI) – operating principles.** NEN-EN 60447: 2004
- **Low-Voltage switching and distribution equipment.** Part 1: General requirement - NEN-EN-IEC 61439-1:2009. Part 2: Voltage switching and distribution equipment. NEN-EN-IEC 61439-2:2009.

Netherlands, Emmen, 20-02-2020

Name and function R. Scholte, General Manager

Signature

Table of contents

1 Introduction

1.1 Function

The Repak RE20 is exclusively designed for the packaging of foodstuffs, consumables and officially registered drugs (both must meet the local recommendations and laws applicable locally) in hermetically sealed packs.

In order to achieve this the machine works as follows: film is held between two chains at the infeed of the machine. The first processing of the film takes place in the forming die. Here a shape is produced in the film by a combination of heat and pressure. In the next part of the machine, the loading area, the shaped film pockets are filled with the product to be packaged. In the next area, the sealing die, the top film is applied to the top of the pack and sealed to it. During the sealing process the pack can, if so desired, be sealed under vacuum or filled with gas. Subsequently the various packages are cut loose from one another and, if required, holes are made in the packaging so that it can be hung up on a rack. The packaged products are removed from the machine via a conveyor belt or a chute.

1.2 Most important parts

A diagrammatic figure of the machine is given below (Figure 1.1). The machine consists of the following main parts:

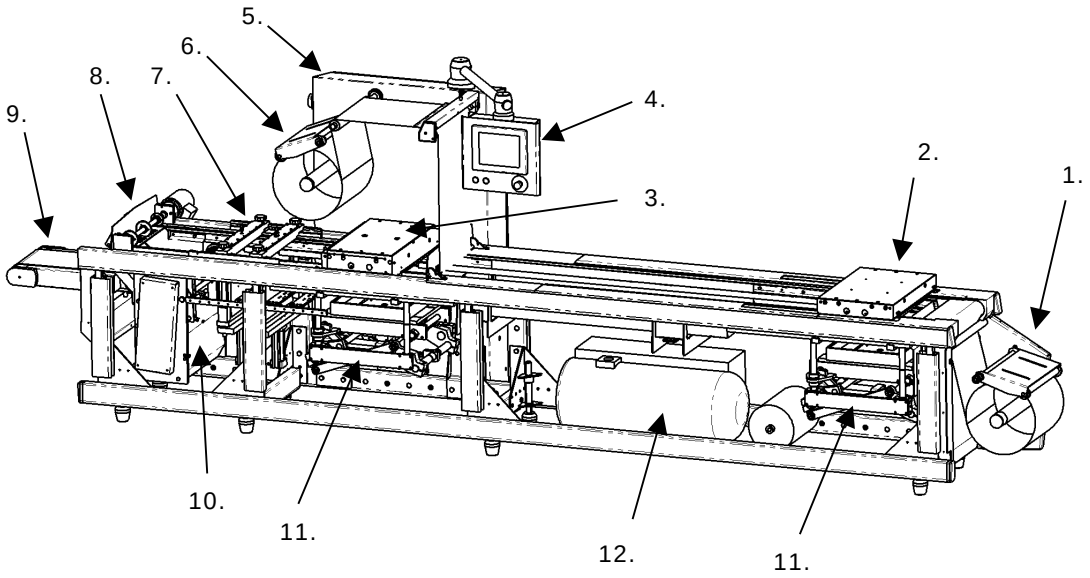


Figure 1.1

1. bottom film unwind unit
2. forming station
3. sealing station
4. control panel
5. control cabinet
6. top film unwind unit
7. cross cutting unit
8. longitudinal cutting unit
9. conveyor belt
10. drive system
11. lifting system
12. vacuum pump

In addition to the parts shown here, the machine can also be fitted with various kinds of peripheral equipment. This includes labeling equipment, filling machines, printing equipment etc. Please refer to the relevant manuals for the operation of such equipment.

1.3 Control equipment

The machine is mainly run from the control panel fitted to the control cabinet.
All the machine's functions, such as temperature or choice of packaging program, can be operated via a *touch screen* (see Figure 1.2).

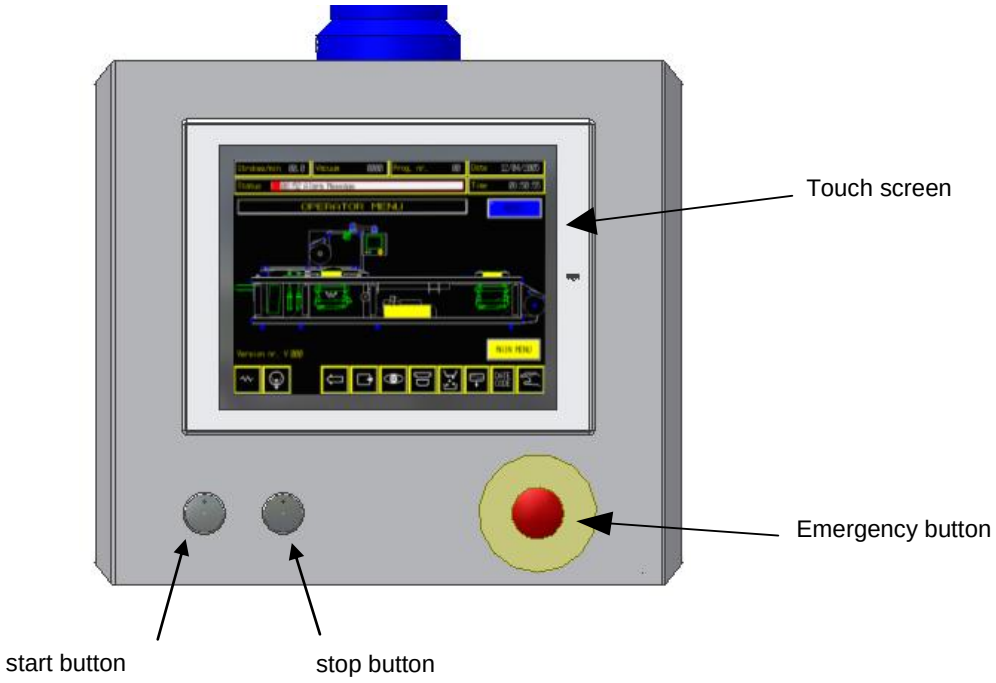


Figure 1.2 Touch panel

There is a complete description of the touch screen in the chapter entitled "Control Panel".
In addition to the control panel the machine also has a number of other control mechanisms. These are exclusively for the use of the technical department or the supplier and they are not dealt with in this part of the manual.

1.4 Technical specifications

The specifications dealt with in this manual are limited to the activities permitted at operator level. Extensive technical information, such as electrical and pneumatic diagrams, can be found in Part 2 of the manual. Some operational characteristics of the machine are given in Table 1.

Table 1 Operational characteristics

Electrical connection values and immediate environmental requirements			
	Value		Remarks
Current	3* 230/400 V 50-60Hz		3*230V 60HZ (USA,CA)
Phase	3Ph N PE		3 Ph PE (USA,CA)
Power	~15 kW*		
Nominal current	35 A (35 A fuses)*		
Noise level	70 dB		
	Minimum	Maximum	
Water	0.5 bar	3 bar	⅜ “, 60 liters/hr (20 Gallons/hour)
Pressed air (dry)	6 bar	7 bar	90PSI, 35 CFM
Gas	4 bar	6 bar	
Relative humidity	-	70%	
System characteristics			
Dimensions (l x w x h)	RE20: 4000-5000-6000 x 1050 x 1950 mm.		
Weight	ca. 2200-2600 kg (incl. Vacuum pump)		
Film unwind unit	single-sided suspension, passive braking		
Conveyor belt	drum motor, max. 1.2 m/s		
Free loading area	RE20: ~800-1800 mm		
Working height	950-1040 mm		
Film width	320-420-460 mm		
Max. stroke length	600 mm		
Max. packaging height	120 mm		

(*) depending on machinery configuration.

1.4.1 Performance

The performance of the machine is indicated for use under normal conditions. This implies the following:

- The machine is used in a roofed industrial hall that can be closed off so that both machine and operator are protected from the outside environment and from third-party activities;
- There is sufficient light for the operator to be able to follow the machine's processes, namely a minimum of 500 lux;
- The area is equipped with adequate climate control equipment that regulates the humidity levels, max. 70%, min. temperature 4 C (39 F) and max. temperature 40 C (104 F)
- The machine should not be exposed to extreme vibration levels, no more than 2 G
- The working area should comply with hygienic recommendations usual in the food processing industry, e.g. the HACCP in Europe

The machine capacity depends on the duration of the packaging program chosen. The machine can achieve an average of 12 cycles per minute. The duration of a program is affected by:

- The dimensions of the packaging (length, width and height);
- The type of film used;
- The safety pauses between the stages;
- The final vacuum required in the packaging;
- Etc.

For a machine to work optimally the program settings must be fine-tuned by trained staff.

Influences from the immediate environment

The principal condition for the machine to operate correctly is constant quality of water, compressed air, the vacuum equipment and the gas. This means, for example, that if the cooling water has a higher temperature this will lead to less cooling and badly shaped packaging. The condition of the air in the space where the machine is situated is also important. Deviation from these values can lead to breakdowns in the machine. Chapter 0 deals with these matters.

1.4.2 Contents of the order supplied

When the machine is delivered, the following are included:

- 1 packaging machine plus die sets;
- Manual.
- One toolbox.
- One transport crate and 4 transport blocks.
- Storage case for the longitudinal cutter blades.

1.4.3 Disposal of the Repak machine

Final decommissioning and disposal requires the complete disconnecting of the entire power supply system.

At the end of its service life, the machine should be dismantled properly and disposed of in accordance with national regulations.

Ensure the following while disposing of components of the machine:

- Send metal parts for recycling
- Send plastic parts for recycling
- Send electrical and electronic components for hazardous waste disposal

Recommendation:

- Contact a company specialised in disposal!

Contents

2 Preventive measures and safety instructions

This chapter lists the general safety instructions and explains the symbols used on the machine. The chapter makes clear the dangers that can arise in the various parts of the machine. The safety of the user is ensured by a variety of instructions and recommendations. Anyone working with or on the machine is obliged to observe all instructions and recommendations.

2.1 General safety instructions

The following general safety instructions apply to the use of the machine by the operator:

- Before using the machine, read and study the operator manual.
- Operating the machine is reserved to the authorised and trained operator.
- Never leave the machine turned on and unsupervised.
- Always take into account, without exception, all the warnings in this manual and posted on the machine.
- Always follow the factory recommendations applicable.
- In dangerous situations, always press the emergency button immediately. For further information on the emergency button, please refer to paragraph 5.2.
- After pressing the emergency button you should not turn on the machine again unless you are sure that the situation is no longer unsafe.
- When working on the machine, turn off the power and the air supply unless otherwise indicated. Shutting off the air supply immobilizes the moving parts and the blades.
- Repairs are to be carried out exclusively by Repak or by an expert trained by Repak.
- It is not allowed to make adjustments to the machine without written approval from Repak B.V.
- Use the built-in safety systems and maintain them. Making changes to or adding short circuits to these systems is strictly forbidden and cancels all warranties.
- Do not run the machine unless all protective safety covers and side plates are present and in place. If you have any doubts, consult the technical department.
- Never at any time must you remove the safety covers. This is never required when the machine is working appropriately.
- When moving heavy parts (mass > 25 kg), such as film rolls or forming dies, use an approved lifting device.
- The edges of the film can be very sharp and cause wounds. Wear protective clothing.
- When the machine is running the operator may carry out activities only in the zones indicated in Figure 2.1.

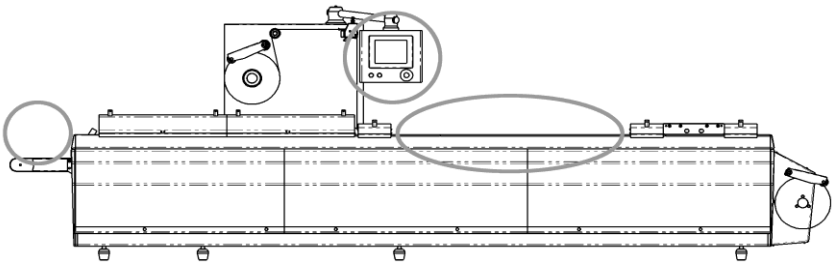


Figure 2.1 Operator's activity zones

- Ensure that used oil is disposed of appropriately. It should be placed with the chemical waste, as recommended by the government.
- Remains of film should be placed in the appropriate container as recommended by the government.
- Observe the rules of hygiene when handling foodstuffs.

- When turning off the main switch (see Figure 2.2) secure it with a lock in order to prevent unforeseen switching on or off by other persons.

Figure 2.2 Main switch

- Supplementary installations such as labelling equipment, filling machines, printing equipment etc. usually have their own power supply. This should be turned on and off separately during maintenance work according to the manuals applicable to the equipment.
- The cables connecting the control cabinet and the external equipment should be so arranged that nobody can trip over them.
- Observe the safety guidelines contained in the manuals for the supplementary equipment.
- Keep your body parts well away from rotating components such as the blades and film unwind units.
- Do not wear loose clothing.
- Do not wear chains.
- Do not have your hair long and loose.
- Never interfere with a machine while it is running.
- During operation of and maintenance to the machine be careful of projecting parts so that you do not bump against them.

2.2 Intended use and use not recommended

In the interests of the user's safety and in order to prevent damage to the machine the following rules should be strictly adhered to. Failure to follow these rules can lead to serious accidents. Repak BV cannot be held responsible for accidents resulting from a failure to follow these rules or any other warning stated in this manual.

- The machine may only be used for packaging foodstuffs, medicines and medical equipment. It is absolutely forbidden to package any livestock.
- The machine may only be used with packaging film approved by Repak B.V.
- The machine may only be used under conditions detailed in the technical specifications.
- Do not start the machine up without covers, side plates, roller conveyor and safety covers.
- Never use the machine without a support tray.
- Do not wear any rings on the hands nor a chain or wristwatch while the machine is running.
- Never interfere with the machine's moving parts.
- Use ear protection when the machine is running.
- Working with the machine is only permitted after user instructions have been received from Repak or one of its agencies.
- Unauthorized or uninstructed persons are not permitted to be within 1 meter of the machine.
- It is not permitted to run the machine if a defect has been noted.
- It is not permitted to lean on parts of the machine.
- It is not permitted to stand or sit on the machine.
- It is not permitted to place anything on the machine.
- It is not permitted to use high pressure spraying equipment on the machine.
- It is not permitted to change parts or systems on the machine or to change their function without written approval from Repak.

2.3 Meaning of the symbols

The machine has several danger zones. A danger zone is an area where various types of danger are present that can seriously wound the person using the machine. Figure 2.3 indicates the various danger zones and warnings.

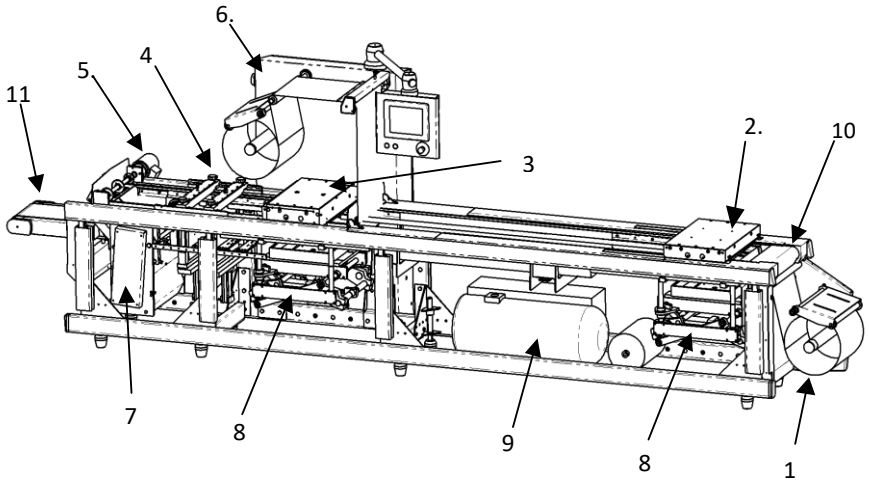


Figure 2.3 Danger Zones

No.:	Machine part:	Dangers:
1.	Film infeed	
2.	Forming station	
3.	Sealing station	
4.	Cross cutter	
5.	Longitudinal cutter	
6.	Control cabinet	
7.	Main motor	
8.	Lifting equipment	
9.	Vacuum pump	
10.	Drive chains	
11.	Conveyor belt	

Safety plates and covers make it impossible to come into direct contact with most of the danger zones. Warnings are given in this manual relative to specific dangers in each zone. These warnings are repeated on the safety covers (see Figure 2.4). The dangers existing within each zone are explained in Table 2.

Table 2 Explanation of the danger symbols

	
Meaning	Danger of death! High voltage
Danger	Live parts that can lead to electrocution.
Recommendation	Work on the switch box may only be carried out by an authorized electrician.
Can be found in:	control cabinet (6), main motor (7), longitudinal cutter motor (5), and vacuum pump (9).
	
Meaning	DANGEROUS! Rotating parts.
Danger	Among other things, rotating parts can crush limbs.
Recommendation	Approach rotating parts only when the machine is turned off. Do not wear loose clothing. Do not wear chains. Do not have your hair long and loose. Do not interfere with the lifting equipment.
Can be found in:	forming station (2), sealing station (3), film infeed (1), transport chains (10), longitudinal cutter (5), conveyor belt (11), chain drive (7)
	
Meaning	DANGEROUS! Component closes
Danger	Parts that close forcefully and can amputate limbs
Recommendation	Never interfere with the machine when it is turned on. Never remove the safety covers and never shut them down.
Can be found in:	Lifting equipment (8), longitudinal cutter (4).
	

Meaning	DANGEROUS! Rotating blades
Danger	(Rotating) blades can cause cuts or amputate limbs.
Recommendation	Do not carry out any activities within the reach of the blades. Never take hold of blades by the cutting edge. Always place blades in a safe place. NB! The sealing die bottom part has blades on the gas channels. Always take hold of the blade shaft of the longitudinal cutter on the outside. During maintenance work always place the blade shaft in the protective cover supplied.
Can be found in:	longitudinal cutter (4), longitudinal cutter (5), sealing station (3).

Meaning	DANGEROUS! Hot surface
Danger	Hot components can cause serious burns.
Recommendation	After the main switch has been turned off, hot components need a considerable amount of time to cool down (approximately 1 hour). Wear protective gloves. Take hold of hot components by the edge and place them in a safe place.
Can be found in:	sealing die bottom part (3), sealing die top part (3), forming die top part (2).

2.4 Safety systems

The machine is fitted with a number of safety systems. The systems consist mainly of plastic covers, metal covers and side plates (see Figure 2.4). In addition to the main switch, the pressure switches and the over-pressure valves are part of the safety system.

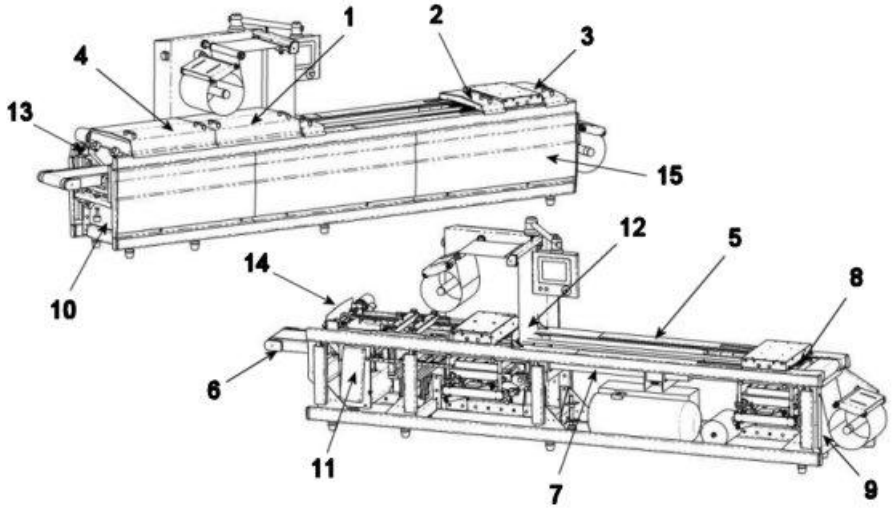


Figure 2.4 Safety systems

Removable safety covers:

1. sealing station;
2. forming station outfeed;
3. forming station infeed;
4. longitudinal cutter and cross cutter;
5. space between chain track and machine frame.

Fixed safety covers:

6. end parts of conveyor belt;
7. support tray;
8. forming station infeed;
9. film infeed;
10. underside of conveyor belt;
11. drive belt;
12. top film infeed;
13. chain cogs;
14. longitudinal cutter blades;
15. machine side plates.

2.4.1 Protection covers

The 5 cover plates on the machine screen dangerous components from the outside world (see Figure 2.5).

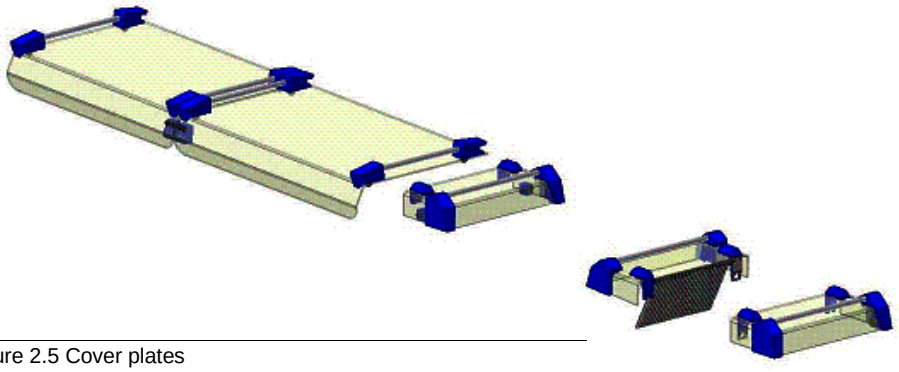


Figure 2.5 Cover plates

Because of this, the machine can only be switched on when all the plates are in place. To this end the removable plates are fitted with magnets and the machine has magnetic sensors. Lifting or removing a protective plate causes the machine's process to stop. In order to re-start the machine the plate must be replaced and the start-up procedure repeated (see paragraph 5.2.5.2). The plates on the machine are not interchangeable so always put them back in the correct place. If the plates are placed in the wrong place an error message is displayed in the control panel status line. In order to guarantee that the covers work properly, both they and the surfaces on which they rest must be clean. Damaged covers should be replaced immediately. The cover on the exit side of the forming station is fitted with fingers to prevent access to the lifting system.

2.4.2 Metal cover plates

Metal cover plates cover the space between the frame and the chain guide on the upper side of the frame. These plates must always be in place when the machine is in use. They may only be removed during cleaning operations. Each plate has a block that fits between the frame and the chain guide and prevents the plate from shifting. The 2 plates on the entrance side (see Figure 2.6) are fitted with a clip that fits around the shaft of the infeed roller.

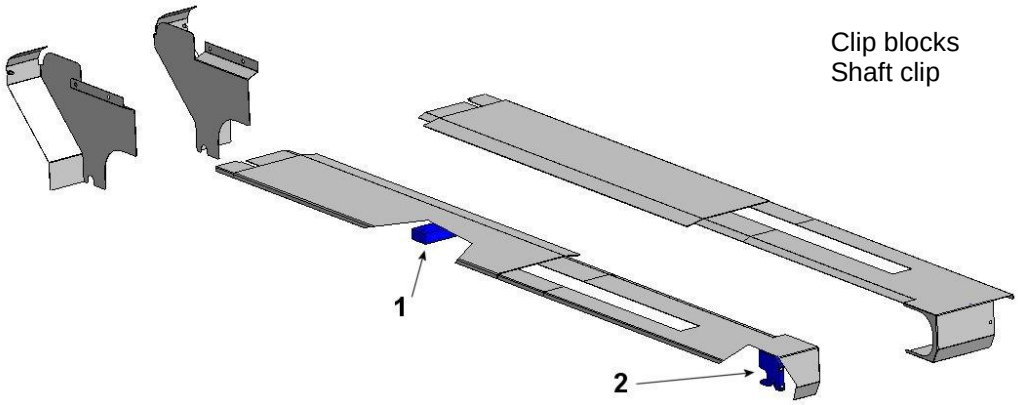


Figure 2.6 Metal cover plates

These plates have to be removed in a horizontal direction. The cover plates at the main drive are not removable.

2.4.3 Side plates

The sides of the machine are covered by a number of side plates. These thin metal plates are fitted on the underside with a number of clips for fixing them to the frame. The upper side of the plate fits into the hollow upper profile of the frame. The plates are placed as follows (see Figure 2.7):

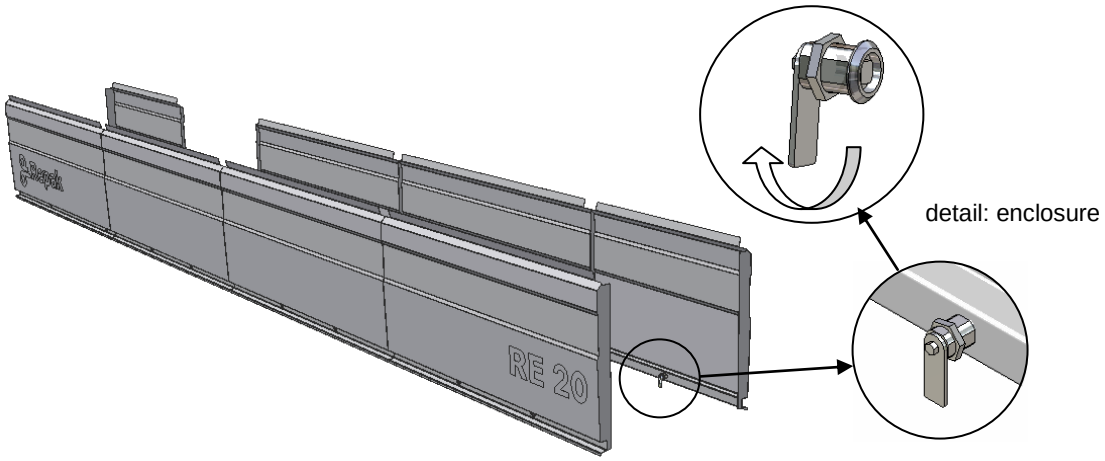


Figure 2.7 Side plates

- Open all the clip fasteners (so that they are horizontal).
- Slide the upper edge of the side plate into a beam of the upper frame.
- Place the oblique underside of the side plate on the lower frame.
- Press the side plate's contact edge against the lower frame.
- Lock the side plate in place by turning the clip fasteners a quarter turn to the right.

NB: When the clips are opened the plate falls out of the machine. Each plate has a unique position on the machine. Make sure that the plates are (re)placed correctly.

2.4.4 Emergency switch

The emergency switch is meant to be used in situations where dangers ensuing from the process or errors in the process itself occur, requiring the machine to be stopped immediately. In order to stop the machine for shorter or longer periods the relevant switch-off procedures must be followed. The emergency switch is mounted on the front of the control panel and can be recognized by its red color and yellow edge (see Figure 2.8).

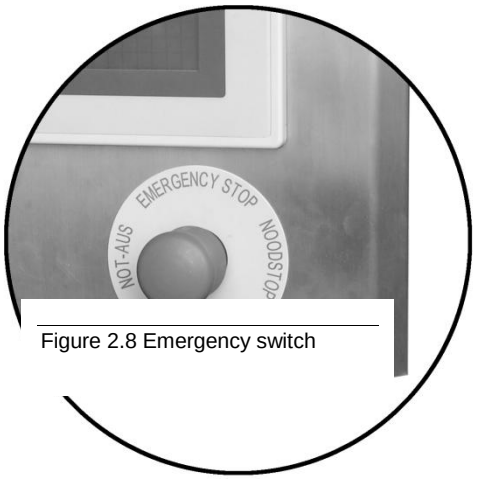


Figure 2.8 Emergency switch

When the emergency switch is pressed, the machine stops its cycle immediately, pressure drops in the equipment. Note: the cylinders of the lifting systems and the film punch keep their position when the emergency switch is activated! The technical department should be called in to solve any technical problems. To re-start the machine the emergency switch has to be re-set and the start-up procedure followed (see paragraph 5.2).

2.4.5 Pressure switches

The machine's electrical and pneumatic systems are fitted with a number of sensors that continuously monitor whether the pressures and tensions chosen are sufficient to have the machine function appropriately. When the air or water pressure is too low an error is reported in the status line on the touch screen. The machine switches off and the equipment opens. Once the error has been corrected the machine will once again function normally. Follow the start-up procedure to re-start the machine.

2.5 Transportation

When the machine has to be transported, contact your supplier for detailed information about the transportation of your machine. Due to the modular construction, the transport methods can be different for each machine.

IMPORTANT
Wrong handling of the machine during relocation could do serious damage to the machine and endanger present personnel.

Repak BV cannot be held responsible for accidents resulting from a failure to contact the supplier.

Contents

3 Description of the machine

The construction of the machine is based on modules. A rigid frame is used with suspension buses on which the modules are hung. In consequence the machine can easily be adapted to meet the customer's specific requirements. In addition, only the frame is in contact with the floor, which is an advantage as far as hygiene is concerned. Hygiene is taken into account just as it is in the construction of the separate components. The main components are described below as regards their technical characteristics and their functions.

3.1 Operation

A packaging consists of upper and bottom film (see Figure 3.1).

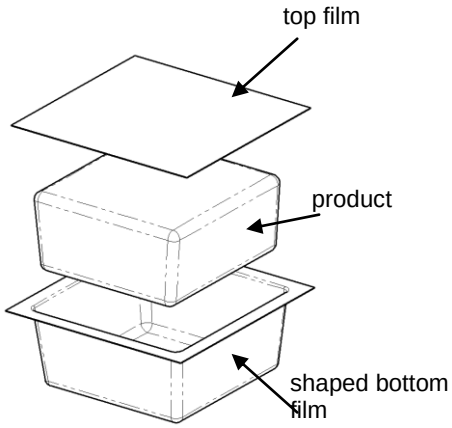


Figure 3.1 Packaging

The two sets of film are melted together along the edges to form a closed package.
The process starts when the film is fed in, with the bottom film being unrolled (see paragraph 3.3). The film is also stretched between the transport chains. The chain moves the film forward in stages, known as stroke lengths or advances. The first process in the machine is the forming stage (see paragraph 3.4). Here the film is first fixed between the top part of the mould and the bottom part. The upper plate has a temperature of between 80-120° C and 176-248° F and ensures that the film can be shaped. At that point, compressed air forces the film into the forming cavities in the bottom part. The bottom part is cooled and the packaging shape releases as the lifting system lowers to its original position.
The film is now transported one stroke length further and a following stroke is made for the forming die. The film that has just been shaped arrives at the loading area and is filled with the product to be packaged (see paragraph 3.5). An operator or an external machine is required for the filling process, during which the packaging is supported by product support bars (see paragraph 3.5).
The top film is unwound from the film roll at the control cabinet (see paragraph 3.6). Downstream of the loading area the top film is stretched over the product and is melted onto the bottom film at the sealing station. When the bottom film moves forward another stroke length, the top film is drawn along with it.
The packaged products are sealed closed in the sealing station (see paragraph 3.8) by the bottom and top part of the sealing die.

The following processes are carried out in the sealing station:

- Pressing the outer edges of the upper and bottom film together.
- Creating a vacuum in the packaging.
- Filling the packaging with a gas to prevent the packaged product from spoiling.
- Sealing the packaging by melting the upper and bottom film together.

The filled and sealed packaging is again moved forward one stroke length and arrives at the cross cutter (see paragraph 3.9). The packaged products remain supported between the sealing station and the cross cutter. At the cross cutter the packaged products are partially separated from one another and, if required, holes are made to enable the packages to be hung up if so desired. The packages are again supported and transported to the longitudinal cutter (see paragraph 3.10). Here rotating blades cut the packages loose. The separate packages land on a conveyor belt (see paragraph 3.11) and exit from the machine.

3.2 Description of machine frame

The parts are made of stainless steel, aluminum and plastic (HMPE 500). These materials were chosen to keep corrosion to a minimum. This is to the advantage of hygiene and the machine's lifespan. The previous paragraph described the entire process in simplified form. All the machine parts described there will be further described in the paragraphs below. The illustrations can vary depending on the machine's configuration.

The frame is made of stainless steel profiles (see Figure 3.2) that can vary in length depending on the design of the machine.

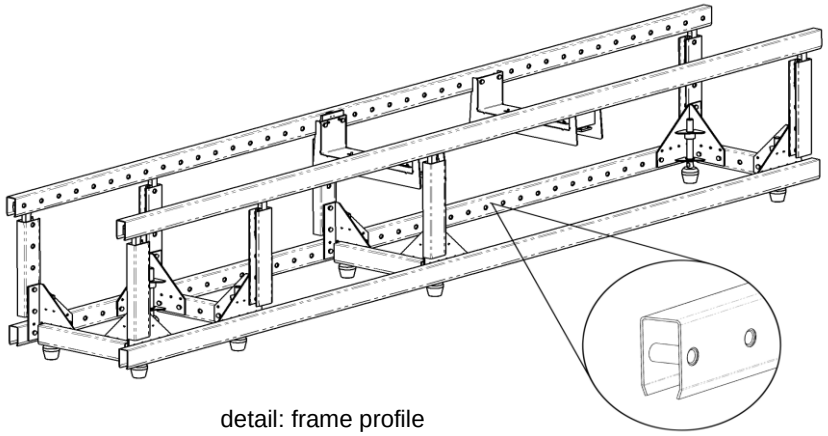


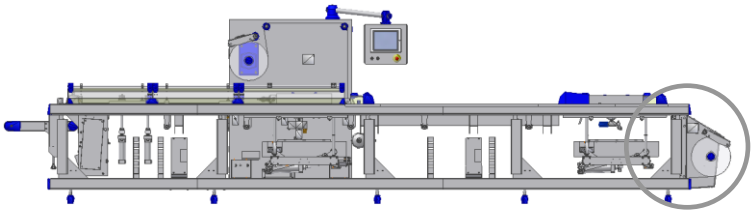
Figure 3.2 Frame

In order to enable the machine to package the maximum number of different products its construction is modular. The various modules can be fixed to the function buses in the frame. Function buses not in use can be closed off with a plastic stopper to prevent the accumulation of waste materials or water. The side of the machine is fitted with removable side plates to protect the various pieces of equipment. The machine stands on eight adjustable plastic feet made of HMPE 500.The frame is fitted with two chain tracks that guide the film through the various modules.

3.3 Description of bottom film unwind unit

Depending on the case of application the Repak RE20 can be equipped with different types of unwinders, all types are situated at the infeed side of the machine.

The unwinding systems can be divided in the following types:



- WP-400 unwind
- CK-400 unwind
- Jumbo unwind

The bottom film roll placed on the bottom unwinder will be unwound via different rollers to reach finally the chain wheels where the film is pulled into the machine.

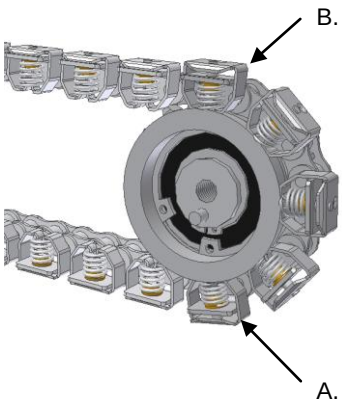


Figure 3.3 Film in feed

At point “A” the chain clips open, they close again at point “B” and clamp the film on both sides. An infeed roller is positioned between both chain wheels to guide the film properly into the chain clips.

3.3.1 Film tracking adjustment

Film tracking can be adjusted with the knob at the left side of the tracking frame with weight plate (WP-400 and CK-400), when turning this one turn clockwise, the film roll will be moved for 2 mm to the right, if turning one turn counter clockwise, the film roll will be moved for 2 mm to the left.
When a little adjustment is done wait for a few film advances to see what the result is.

TIP: Only make little adjustments at a time, it take some film advances before the result is visible.

3.3.2 WP-400 bottom unwinder

This is the most basic type of unwinding (see fig. 3.4). The film placed on the WP-400 unwinder can be routed via 3 rollers (see routing picture), appending of film type, the routing can be changed. The routing showed in this picture is best for rigid film types, this creates more tension during unwinding and results in a smoother film infeed. If flexible film is used, it is recommended to bypass roller “2” at machine side.

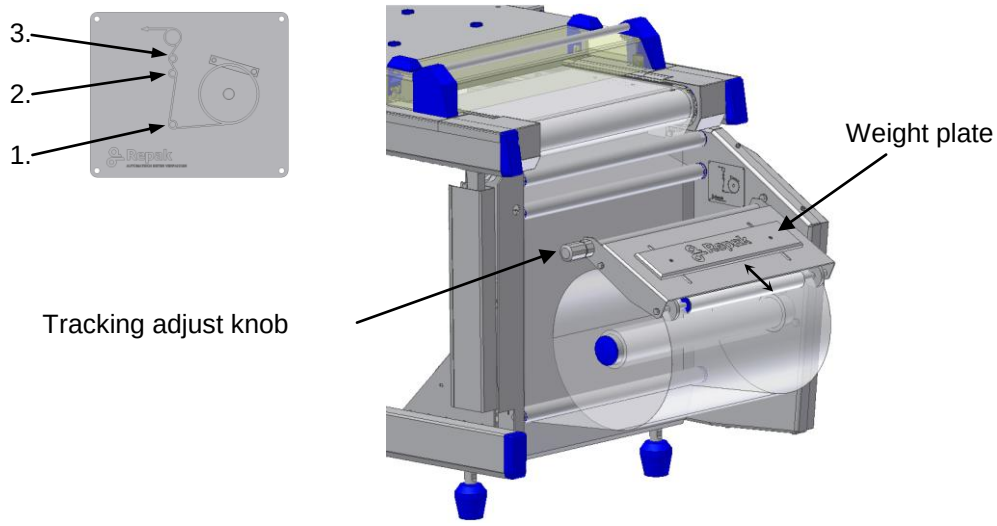


Figure 3.4 WP-400 unwind

Extra film tension during unwinding is created by the cover that rests on the film roll, which also prevents the fiilm unwinding by itself. The weight plate is mounted on two slots to enable changing of the weight on the film roll.
By moving up the weight plate, the weight on the film roll will be decreased. By pulling down the weight plate in its slots, the weight on the film roll will be increased.
The film roll has to stop unwinding simultaneoulsy as the film advance stops. Also we need just enough tension in the film during unwinding to avoid wrinkles in the film as it runs into the chains.

3.3.3 CK-400 bottom unwinder

The CK-400 unwinder is equipped with tension arm and brake system to ensure a constant film tension during unwinding (see fig 3.5). Place the film roll so far on the spindle till the core reaches the cone on the end of the spindle. Now activate the clamp system by turning the serrated knob to the right. This moves the three ridges out of the spindle to centre and clamp the film core. The film has to be placed on the spindle and routed as shown on the routing picture.

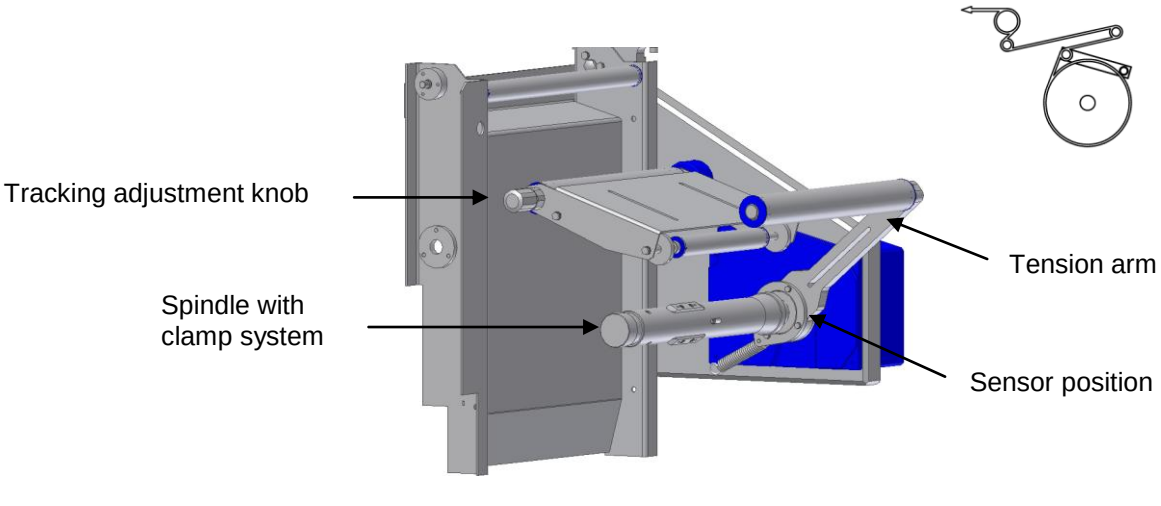


Figure 3.5 CK-400 unwind

In the rest position the spindle is held by the brake system. When the tension arm is pulled forward during unwinding the brake will be released to unroll the film. The tension arm is connected to a spring, which brings the arm back to its start position at the end of the film advance.
Each film advance of the machine will pull the tension arm forward. This will be checked by a sensor which is placed just behind the tension arm in the blue brake box. If the arm stays at its position during transport, the machine will stop with the message “running out of film”. If there is still film on the roll, than the core is slipping on the spindle and the clamp system needs more friction. Turn the ridged knob more to the right to create more friction to the film core.

3.3.4 Jumbo bottom unwind

The Jumbo unwind is meant for fast production lines with a high output. When the machine runs with thick and rigid film, the jumbo unwind is a great option.
The Jumbo can handle film reels with a diameter up to 1200mm!. This device will be delivered with two exchangeable carriages, on each a film reel can be placed, so a reel change can be carried out very quickly. By using large diameter reels the machine can run for longer periods before running out of film.
The detailed documentation and functioning of the Jumbo unwinder is placed in chapter 12 of the machine manual.

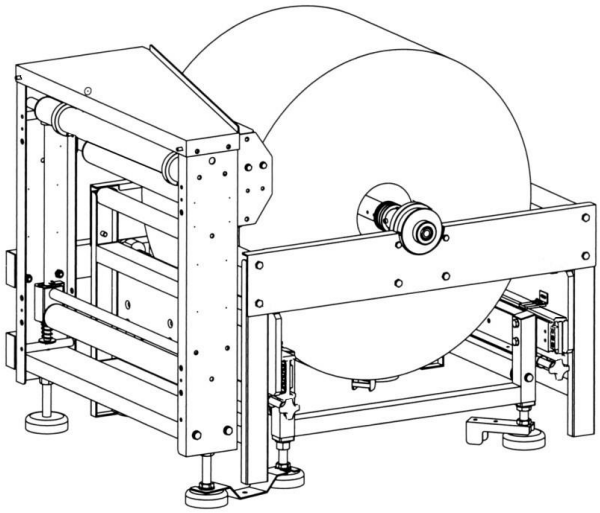


Figure 3.6 Jumbo unwinder

3.4 Description of forming station

The forming station is the place at the in-feed end of the machine frame (see figure 3.7)

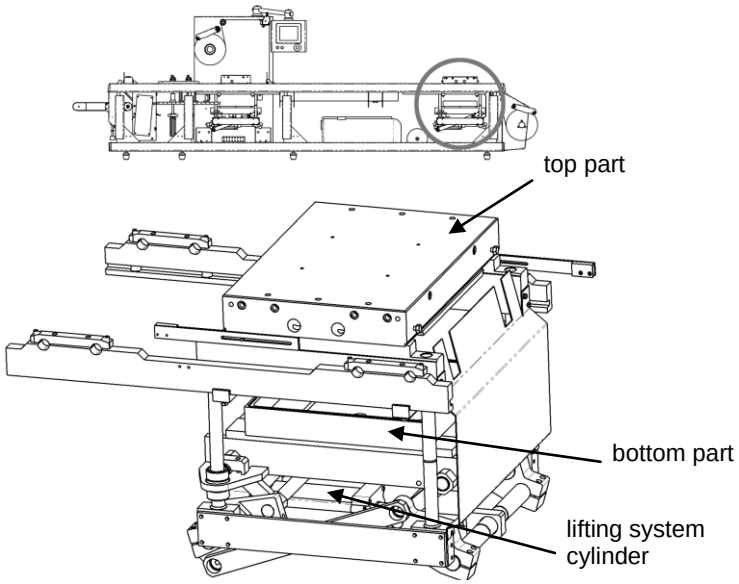


Figure 3.7 Forming station

This is a composite drawing showing the various components of the forming station. The film is situated between the forming die top part and the forming die bottom part and is ready for processing. The depth of the package(s) can be changed by varying the number of filling plates under the bottom plate(s). If many depth changes are needed each day, a forming device with automatic forming depth adjustment via the control panel can be delivered with the machine. Depending on the machine, the forming process can be done in a variety of ways.

The basic principle is as follows:

- Before the process starts the forming device closes.
- The film is pressed against a heating plate in the top part by compressed air.
- The hot and weak film is pressed and/or sucked (depending on the machine's configuration) into the cavity or cavities in the bottom part.
- The film cools and stiffens in the forming die bottom part. The package(s) has now been formed.
- Ventilation valves open to equalise the pressure inside and outside the forming chamber.
- The forming station opens.
- The chain transports the film on to the loading area.

This process description gives a general picture of what happens in the forming station. There are various designs of the forming station, described below.

3.4.1 Forming station top heating

The film is heated and shaped in a single advance as already described. In this device the heating plate is positioned in the forming die top part. When the device is closed, the film is pressed against the heating plate by compressed air. When the required pressure has been reached the film is weak enough and compressed air brings the heated film into the forming chamber with the appropriately designed bottom plates. When the film reaches the walls of the forming chamber it cools down and maintains its shape.
The forming bottom die is cooled by water so it will not heat up during the forming process. After the equalisation of the pressure in and outside the forming chamber by ventilation valves, the forming station opens and is ready for its next cycle.

3.4.2 Forming station with pre-heating

The bottom film is heated and shaped in two separate stroke lengths.
There is a heating plate at the front end of the forming die top part. The film is pressed against this plate when the device is closed. The forming die top part heats the film until it is weak enough to be formed. Then the forming station opens and the film is transported one stroke length forward. Here one stroke length is approximately half the length of the forming station. The forming station then closes again and the heated film is now in the second part of the device. Compressed air with or without vacuum support brings the heated film into the forming chamber with its designed bottom plates. The film stiffens when it touches the cooled forming bottom die and maintains its shape. At this forming station the warming up time and the forming time begin simultaneously, thereby shortening the forming cycle time.

3.4.3 Forming station with plug assist and pre-heating

This process has the same configuration as forming with pre-heat and has also takes place over two strokes. It is only used to create packages with an extreme depth.
Here the forming process is assist by a (heated)* plug to bring the heated film into the forming chamber. By using a plug, it results in thicker bottom and corners of the deep package. Plug assist is usually combined with vacuum or compressed air. The film is cooled by coming into contact with the cooled bottom part.

* Optional

3.5 Description of loading area

The loading area is the area between the forming and sealing station (see Figure 3.8).

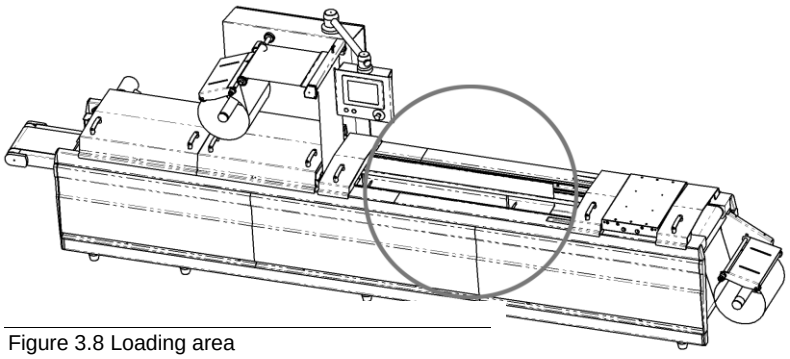


Figure 3.8 Loading area

This is a free area where the product to be packed is placed in the shaped package just produced. The product is put in the package by an operator or an external loading device. The operators may not put the limbs under the guards of the shape and sealstation.
By a film problem, remove the film when the machine is voltage and pressure less.

	Warning
	Caution `crushing danger!`

3.5.1 Product support bars

The product support bars are situated in the loading area and outfeed extension (see figure 3.9).

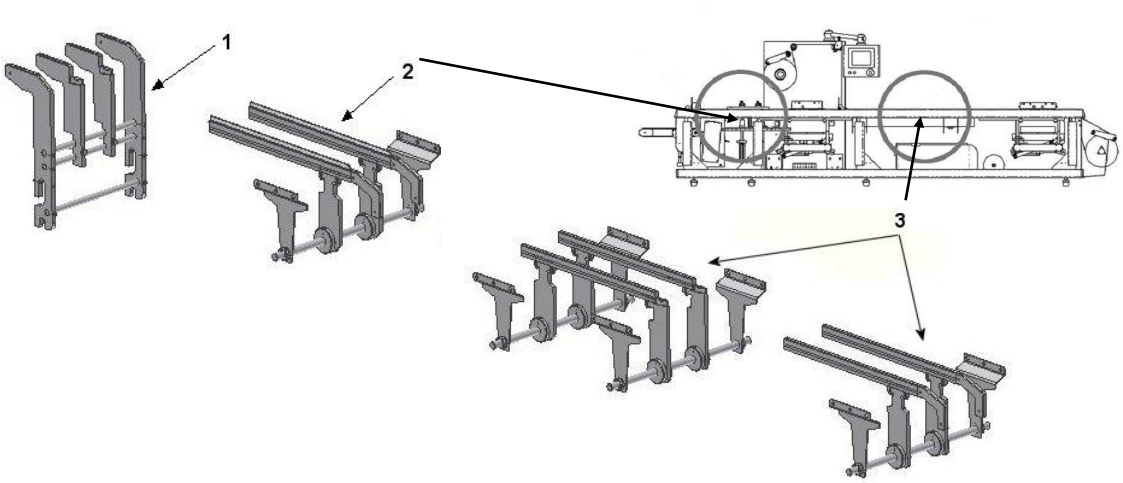


Figure 3.9 Product support bars

These aluminum profiles prevent the (filled) package from sagging too much.
The number of support bars are dependent on the index of the forming tools. The bars can be placed and removed easily by lifting up the infeed side and then pulling in the infeed direction. In the case of a cross cutting unit with servo positioning being mounted on the machine, it can be necessary to shift the puncher as far as possible to the outfeed direction

before the support bars can be removed. (To see how to shift the servo manually to another position see paragraph 4.4.12)

The packages also require support following the loading area. This is achieved with shorter product support bars (see figure 3.9, pos. 3.)
The crosscutting is situated on the outfeed extension. Support is needed especially before and after the cross cutting device (see figure 3.9 pos. 2.)
At the longitudinal cutter (no. 1) the product support bars have extra functions: providing protection from the blades and positioning the packages in accordance with the knives.

3.5.2 Confirmation station

The confirmation station is situated in the loading area, It is an optional device which is specially developed to support the formed packages during filling.(see figure 3.10).

The confirmation station can be (de)activated in menu option 2.

The unit consists of a lifting device (on which a synthetic box is placed with the same forming index as mounted in the forming station), a vacuum pump and a vacuum valve combined with ventilation valve.

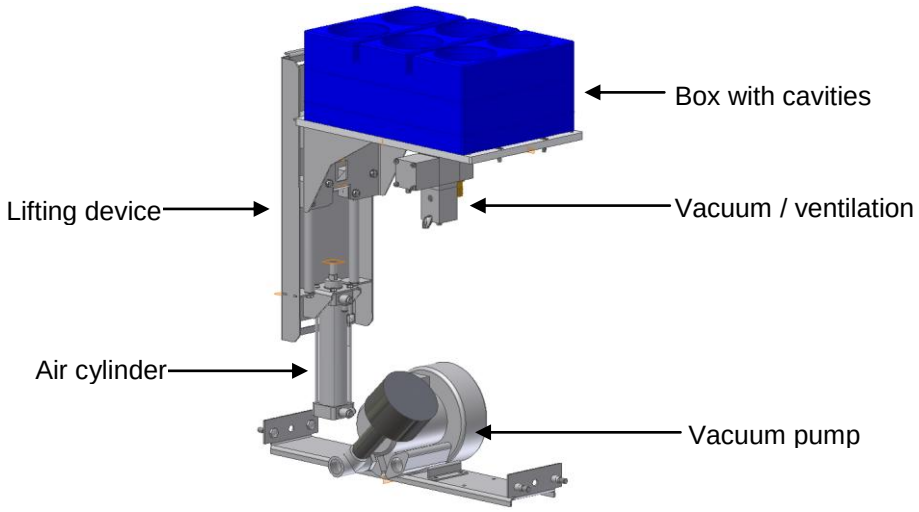


Figure 3.10 Confirmation station

After each film advance the air cylinder brings the confirmation box to its upper position. A sensor mounted on the cylinder opens the vacuum valve to create a vacuum in the box. As a result of this the empty packages, already formed in the forming station, will stay in their final form making it easier to fill the packages with products. After the forming station lifting system lowers, the confirmation station will stop its cycle; the vacuum valve will close, the ventilation valve will open and the box goes to its lower position.

3.5.3 Loading mask

The loading section can also be provided with a loading mask (see fig 3.11). This mask avoids moisture on the sealing area around the formed packages, providing a much better seal when a very wet product is to be packed.
This loading mask can be equipped with an automatic lifting system to lift the mask during film advance. In this way the loading mask will reach closer to the bottom film during filling.
During transport an air actuated membrane lifts the loading mask via four pins by about 20mm.

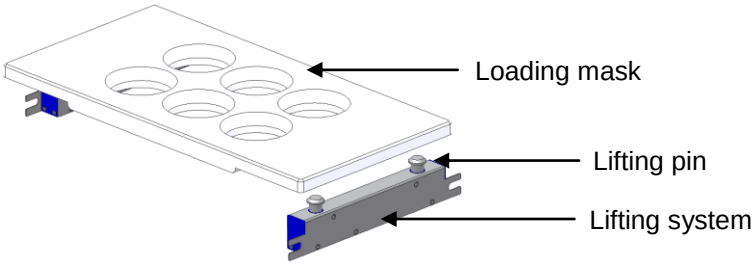


Figure 3.11 Loading mask

3.6 Top film unwinding unit

The top film unwinding unit is fitted to the control cabinet (see Figure 3.12).
There are two types of top film unwinds, the WP400 and the CK400.

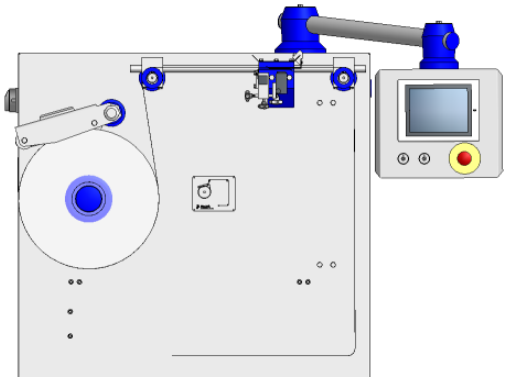


Figure 3.12 WP-400 top film unwind

The film that is unwound here travels via the top film infeed roll onto the bottom film. Its functioning is the same as described in paragraph 3.3.2

3.7 Photocell and film brake

When a printed top film is used a photocell and a film brake (see Figure 3.13) ensure that the print is in the correct position on the package.

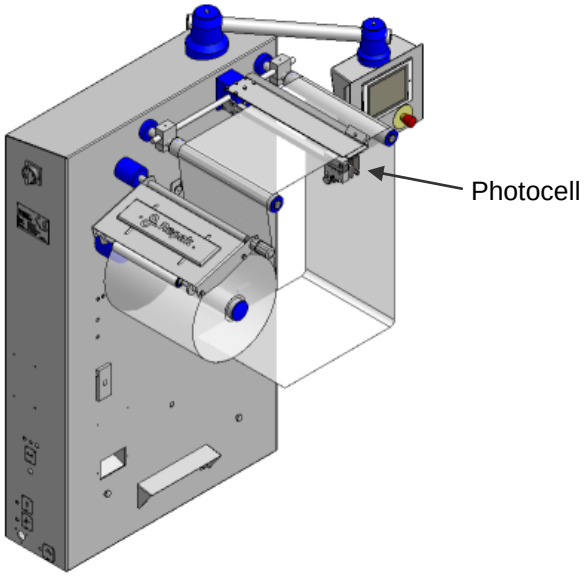


Figure 3.13 Photocell

The photocell detects the position of print marks and the film brake corrects the distance with reference to the bottom film.

3.7.1 Usage and application of printed top web

This discusses how the tolerance of the repeat print design on packaging material for Repak Roll stock machines is determined.
The tolerance is depending on the properties of the packaging material and the manner it is used on the machine.
The supplier of the packaging material is always responsible for the repeat of print design.

These data only applied to: **Repak Roll stock machines.**

on condition that:
- the machine is in good condition
- the machine is equipped with the following:
- suitable unwinding system, (core diameter, max roll diameter)
- suitable drive for film transport
- photocell with film brake

3.7.2 Explanations of notions

Repeat print — Print design with repeating distance between each print.

Repeat length "a" — Adjusted distance between two consecutive prints.
The repeat length "a" is identical to the stroke length in the format drawing.

Tolerance repeat length — Relative total deviation "Δ U" and absolute individual deviation "Δ a"

Relative total deviation

$$\Delta U = \frac{\text{actual value (mm)} - \text{adjusted value "a" (mm)}}{\text{adjusted value "a" (mm)}} \times 100\%$$

The actual value results as an average of:
- measurement of 3 or more repeat lengths, (at least over 1 meter).
- The measured value must be wholly divisible by the number of repeats.

Absolute individual deviation — Δ a = a (n) – a (n +1) (mm)
= Deviation between 2 consecutive repeats in mm

3.7.3 Print mark

3.7.3.1 Contrast:

The color of the print mark must contrast with the base colour of the film.

3.7.3.2 *Division, dimensions*.

We recommend placing the print marks at the outside (non sealing side) of the film.
For division and dimensions, see format drawing.
In case of transparent film the print marks must be placed at the outside (non sealing side) of the film.
The print marks on top web should be detectable by the photocell on the machine.

3.7.3.3 Print mark integrated in print design.

Important: There must be a minimum of 20 mm distance from print in the advance direction.

3.7.3.4 Adhesive tape seam.

The tape seam may not activate the photocell. So use adhesive tape with same color as base color of film material.

3.7.4 Tolerance of print marks by using film brake

(Film is pulled into the machine by stretching the film to a greater or lesser degree)

3.7.4.1 Non-stretchable packaging material.

for instance paper, cardboard, PVC, aluminum foil, etc.

relative total deviation Δ U: **0 up to -0,15 %**
(0 up to -1,5 mm on 1.000 mm)
Absolute individual deviation: **max. 1 mm**

3.7.4.2 Moderate stretchable packaging material.

for instance polyester bi-axial stretched, polyamide mono and bi-axial stretched, polypropylene bi-axial stretched, etc.

relative total deviation Δ U: **-0,1 up to -0,5 %**
(-1 up to -5 mm on 1.000 mm)
Absolute individual deviation: **max. 1,5 mm**

3.7.4.3 Good stretchable packaging material.

for instance PA/PE non stretching etc.

relative total deviation Δ U: **-0,2 up to -0,7 %**
(-2 up to -7 mm on 1.000 mm)
Absolute individual deviation: max. 2 mm

3.7.4.4 Highly stretchable packaging material.

for instance PP/PE combined non-stretched etc.

relative total deviation Δ U: **-0,3 up to -0,9 %** (-3 up to -9 mm on 1.000 mm)
Absolute individual deviation: **max. 2 mm**

3.8 Description of sealing station

In the sealing station the filled packages are sealed with top film (see Figure 3.14).

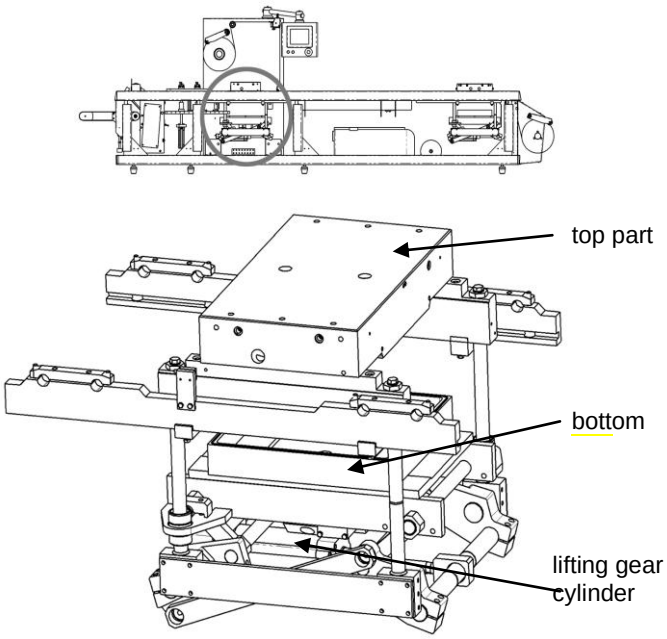


Figure 3.14 Sealing station

The filled packages are drawn into the sealing station and closed by the sealing die bottom part. The bottom part is raised by the same type of lifting system used in the forming station. The process starts when vacuum chamber is closed: - the vacuum valve opens and creates a vacuum outside and inside the packages to an adjustable value. Then, depending on the type of packaging, a preservative gas is blown into the package and the package is sealed. To achieve this a heating plate is pressed down on to the package(s) and the high temperature melts both top and bottom films together. Also it is possible to produce vacuum packages, then the sealing process will instead start directly after the vacuum process. This can be selected in the “Operation Sequence“ menu (see Paragraph 4.2.2). The sealing station opens and is ready for its next cycle.

3.9 Cross cutting

Depending on the application the Repak RE20 can be equipped with various cross cutting facilities.

The cross cutting systems can be divided in the following groups:

- Flexible film cutter
- Film puncher
- Strip puncher

3.9.1 Flexible film cutter

Cross cutting involves separating the sealed packages from one another in a crosswise direction.
The cross cutter works according to the principle of a guillotine.

The guillotine is mounted in the discharge end extension (see Figure 3.15) and is movable in the machine length to position the guillotine exactly in between two packages.

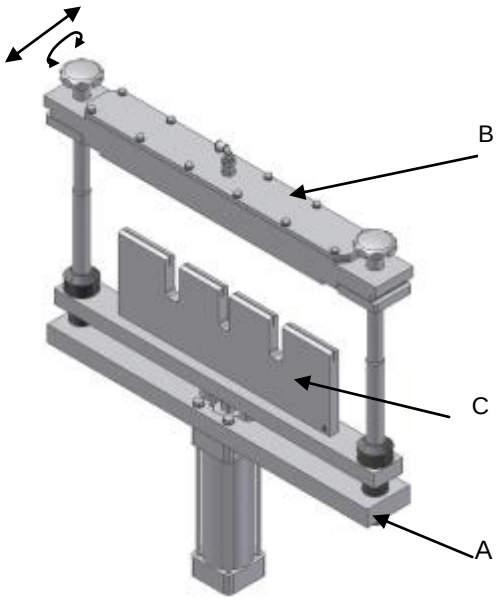


Figure 3.15 Cross cutting (guillotine-type)

The guillotine cutter consists of:

A. Base unit
B. Top half with knife
C. Cutting support

3.9.1.1 Method of operation

The cutting support lifts from below by pneumatic cylinder and clamps the film tight. Compressed air is injected into a membrane in the top half which pushes the blade holder and blade down to cut. After the cutting operation, the compressed air supply is cut off and the springs push the blade holder back. The cutting support returns to its original position. (see fig 3.16).

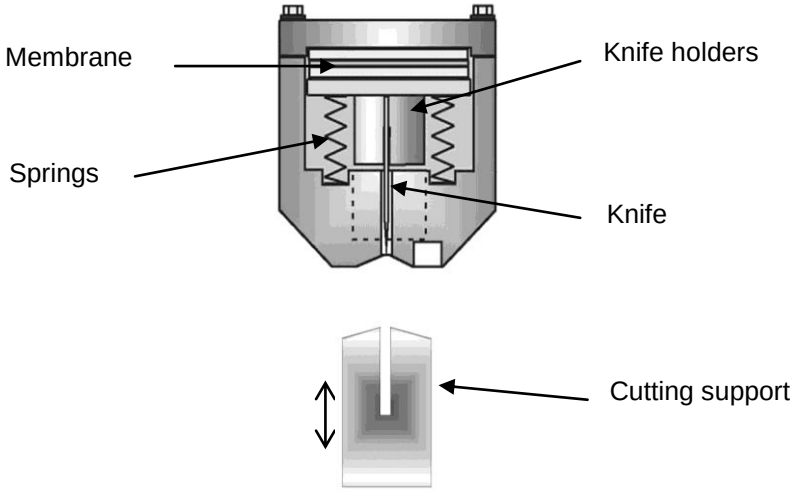


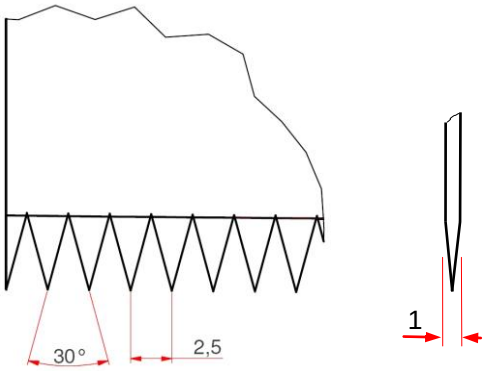
Figure 3.16 Cross cut Guillotine

3.9.1.2 Knife forms

Various knife forms are available for different applications.

Knife blade “straight cut”

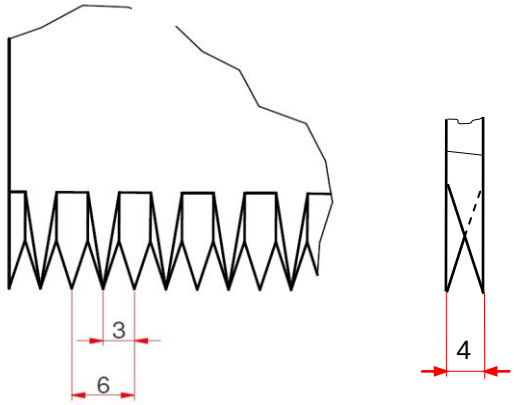
This knife is the



Knife blade “zigzag cut”

With this knife form it is possible to attach an opening aid to the packages.

Important: It is only possible to install knives of the same thickness into the knife assembly. If you, for example, would like to change a “straight” toothed knife against a “zigzag” knife, you have to change the complete top half assembly and the counter pressure plate



3.9.2 Film punch

The film punch (see fig. 3.17) separates the film in the across machine direction. It is used for packages with straight cuts, round corners, round holes and “Euro holes”.

The punch is suitable for any kind of film or combination (such as rigid films, multilayer aluminum films and flexible films).

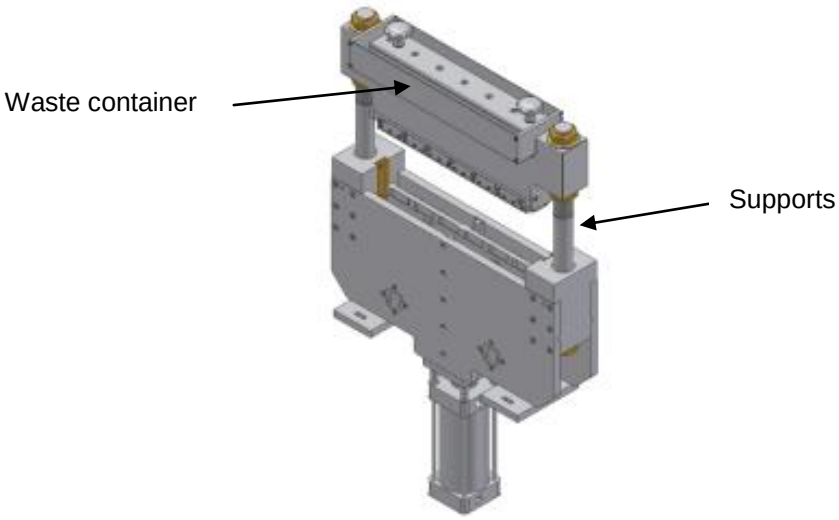


Figure 3.17 Film puncher

The basic top part is intended for use with vario cutting tools, this means that the same top part can be used for different package widths.

Vario cutting tools can be changed quickly.

After each cutting tool change there is no need to readjust the punch every time.

3.9.2.1 Method of operation

The cutting table with pressure bar which runs up and down in the punch bottom is pushed up against the interchangeable blade holder in the punch top. A rugged lever system, which locks automatically when the cutting table reaches its highest point, guarantees high and uniform cutting pressure.

The top part is attached to the supports with their fine pitched thread; this makes it possible to adjust the cutting tools precisely. The result is optimum cutting quality and tool life.
The film waste is collected in the film waste container on the punch top.

3.9.2.2 How to adjust the punch. (fig. 3.18)

1. Position the punch bottom part in the right position, in between 2 packages.
2. Level both nuts “A” to an equal height and place top part.

Important: Adjust nuts “A” only as deep as necessary, so when pressure bar “C” is in upper position, it does not touch the top part.

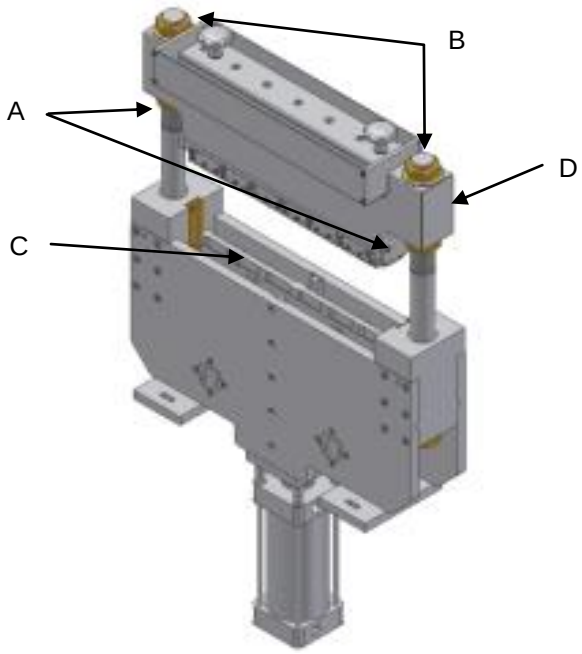


Figure 3.18 Rigid film punch

3. Connect punche to compressed air and move pressure bar “C” to its upper position.
4. Adjust nuts “A” to a lower level till top part “D” just touches the pressure bar “C”.
5. Fasten nuts “B” to keep top part on its place.
6. Run machine till film is in cutting section.
7. Fine adjustment by turning nuts ”A” 1/12 turn to a lower level till cutting is perfect over the whole width. Control the cut after each change !!

Important: After change always check all nuts and bolts!!

3.10 **Complete-cut punch** *(only available for RE25!)*

The complete-cut punch is situated in the machine extension and is mounted in the machine frame. (see fig. 3.20)
All packages which are made in one complete stroke will be punched completely out of the film. The residual film will be rewound by a skeletal waste film rewind unit.

The complete-cut punch is suitable for any kind of film or combination (such as rigid films, multilayer aluminum films and flexible films).
Almost any package shape can be cut. (see fig 3.19 for examples)

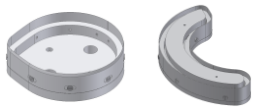
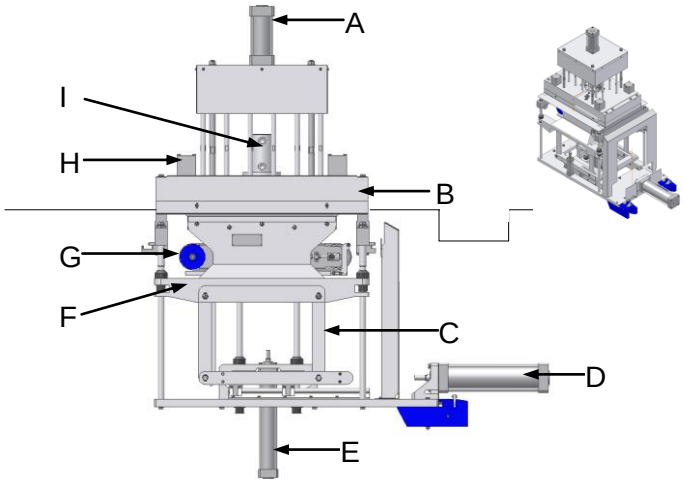


Figure 3.19 Complete cutting knives

3.10.1 Method of operation

The first step is to lift the counter plate with air cylinder “D” against the upper part. Now the film with formed packages will be clamped between counter plate and upper part. This is directly followed by air cylinder “E” which runs out and lifts up the integrated conveyor.
At this point the air cylinder “A” pushes down the product pushers. At the same time the hydraulic cylinder “I”, which is connected to the knife plate goes down to cut the packages out of the film.



A. Air cylinder, discharge pushers
B. Upper part / knife housing
C. Sheer-lifting system, counter plate
D. Air cylinder, counter plate
E. Air cylinder, conveyor
F. Vertical guide, counter plate
G. Integrated conveyor
H. Spring housing
I. Hydraulic cylinder

Figure 3.20 Complete-cut puncher

The pressure and the air speed to cylinder “A” is adjustable to a level just enough to strain the film a little during cutting. The knives goes smoothly through the film, and the air cylinder “A” brings the packages by product pushers through the counter plate to the integrated conveyor.
When the knife plate reaches the sensor for its bottom position, Cylinder “A” and cylinder “I” goes up to their start positions. Air cylinder “E” goes down to bring the conveyor down to a level where the packages can be transferred to the discharge conveyor.
When all products are transferred to the discharge conveyor, the air cylinder “D” will pull down the counter plate to its bottom position. Now next film advance can be done to cut the next complete stroke.

3.11 Longitudinal cutters

Depending on the application the Repak RE20 can be equipped with various longitudinal cutting facilities. The longitudinal cutting systems can be divided in the following groups:

- Rotary knives
- Squeezing knives
- Roll and shear strip cutter
- Roll and shear line cutter

3.11.1 Rotary knives

The rotary knife cutter separates the packages completely from each other in the longitudinal direction. (see Figure 3.21.) This is generally used for flexible films.

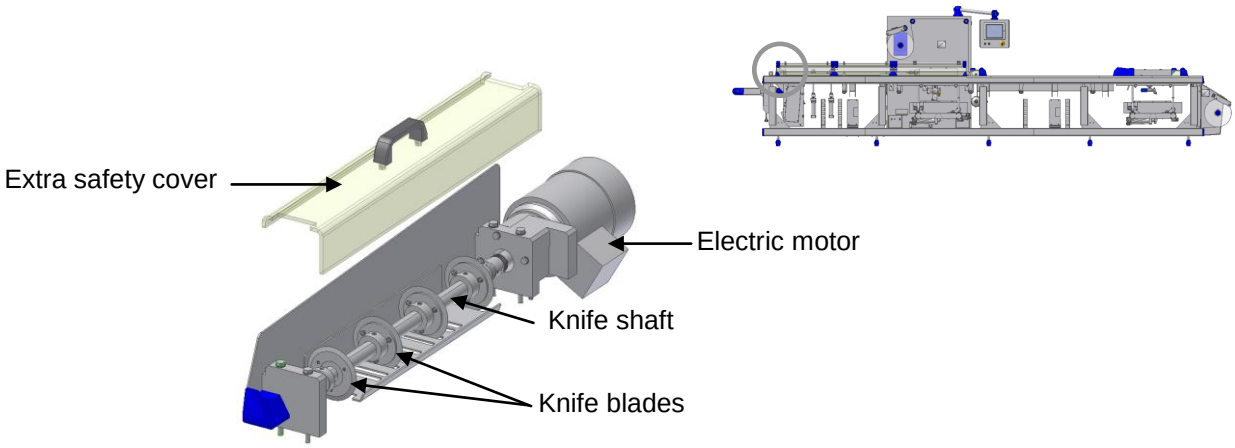


Figure 3.21 Longitudinal cutter

The cutting is performed by a number of rotating blades. The blades are adjustable along their axis and are mounted on a shaft which is driven by an electric motor.
A plate above the film and support bars below the film holds the film in the correct position during the cutting process.
The film edge trims can be removed by a film trim suction unit or the film trim rewind system.
When maintaining or cleaning the longitudinal cutter the following instructions should be followed:
Always store the spare shaft with blades in the wooden box delivered with the machine.

The blades are sharp and delicate cutting tools. Therefore, please observe the following:

Wear chain mess gloves when changing the roller shear knife sets. 

- Take care when replacing the blades. Even blunt blades can cause wounds.
- Always place the blade shaft in the protective covering supplied.
- Replace damaged or blunt blades

3.11.2 Squeezing knives (mash knives)

The squeezing knife cutter separates the packages completely from each other in the longitudinal direction (see Figure 3.22.)

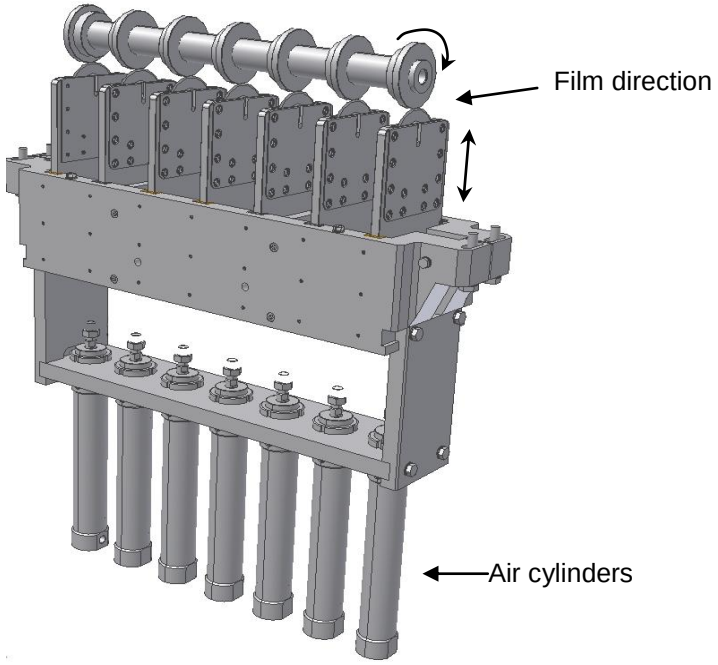


Figure 3.22 Squeezing knife assembly

This knife assembly is mounted on the discharge extension of the machine

The squeezing knife cutter is suitable for any kind of film or combination (such as rigid films, multilayer aluminum films and flexible films), and works fiber- and dust free.
Besides, perforation cuts for multi-packs are also possible, just by replacing the standard knife by a perforation knife.

3.11.2.1 Method of Operation

The cutting roller is turned synchronously with the film advance on the packaging machine by a gear which is driven by the drive of the transport chain.
The blades in the squeezing knife holders are pressed against the hardened cutting roller by pneumatic cylinder.

This kind of cutting simply presses into the film material and the remainder of the material breaks to complete the cut.

The cutting format can be easily changed by opening the tap according to the knife holders on the control unit which are needed for the format. (see Figure 3.23).

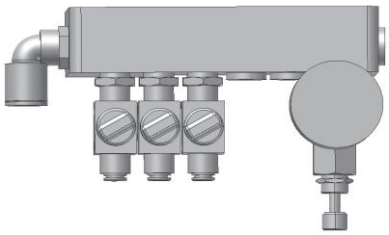


Figure 3.23 Control unit with taps

3.11.3 Roll and shear strip cutter

The roll and shear strip cutter separates the packages completely from each other in the longitudinal direction by removing a 4mm strip from between them. (see Figure 3.24.)
This longitudinal cutting device is mounted on the discharge extension of the machine.

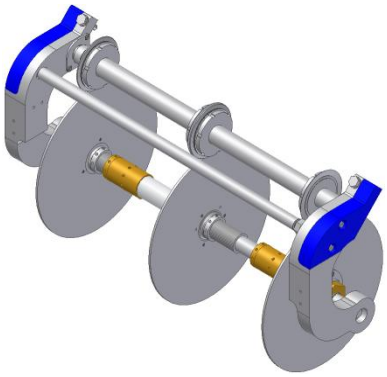


Figure 3.24 Roll and Shear exchange unit

The Roll and Shear strip cutter is suitable for any kind of film or combination (such as rigid films, multilayer aluminum films, paper and flexible films), and works almost fiber free. Film gauges up to 1000 µm for bottom web are possible.

3.11.3.1 Limitations

The packaging dept is limited at 120mm, perforation cutting is not possible.

3.11.3.2 Method of Operation

Two circular knives working in opposite directions which overlap at their circumference are mounted above and below the film level. (see Figure 3.25)

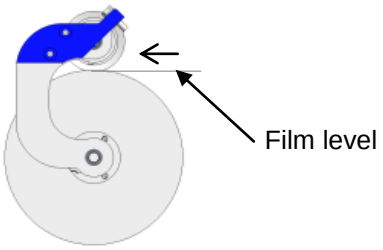


Figure 3.25 Film level

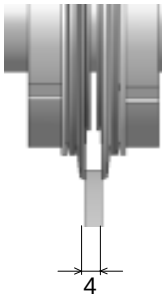


Figure 3.26 double blades for 4mm strip

They cut the film at their contact points in the manner of a pair of scissors.

A strip of film about 4 mm wide is cut out between the packages.
In combination with the rigid film puncher, this cutter produces a smooth transition to the rounded corners (see Figure 3.26)

The cutter is driven by the film transport chain by a chain gear. For the strips a separate suction unit is needed.

3.11.4 Roll and shear line cutter

The Roll and Shear line cutter separates the packages completely from each other in the longitudinal direction. (see Figure 3.27.)
This longitudinal cutting device is mounted on the discharge extension of the machine.

The Roll and Shear line cutter is suitable for any kind of film or combination (such as rigid films, multilayer aluminum films, paper and flexible films), and works almost fiber free. Film gauges up to 1000 µm for bottom web are possible.

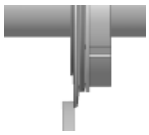


Figure 3.27 one blades for straight cut

3.11.4.1 Limitations

The packaging depth is limited at 120mm and perforation cutting is not possible. It is not suitable for vacuum skin packs.

3.11.4.2 Method of Operation

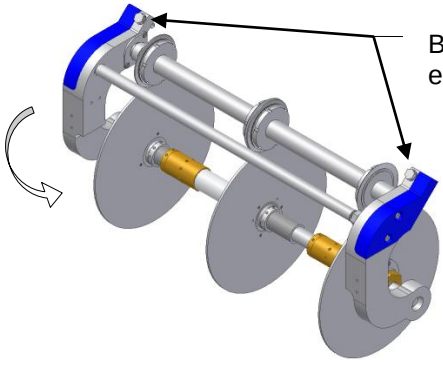
Two circular knives working in opposite directions which overlap at their circumference are mounted above and below the film level. They cut the film at their contact points in the manner of a pair of scissors. (see Figure 3.26 & 3.27)
There is a straight cut between the packages.
In combination with the rigid film puncher, this cutter produces a smooth transition to the rounded corners.

3.11.4.3 How to exchange the cutting units

Wear chain mess gloves when changing the roller shear knife sets 

The method can be described in four steps:
(for strip and line cutting units)

- Remove the safety covers.
- Move the outfeed conveyor as far as possible out of the machine extension.
- Loosen the two bolts as shown below. (figure 3.28)
- Turn over the cutting unit to the outfeed side of the machine, which allows the unit to come free of its sockets, now the complete unit can be removed easily. (~20kg unit)



By loosening these two bolts, the cutting unit is easily exchanged for another cutting configuration

Figure 3.28 Roll and Shear exchange unit

Warning
Be aware for sharp knifes!

3.12 **Discharge conveyor belt**

The conveyor is situated at the discharge extension of the machine (see Figure 3.29)

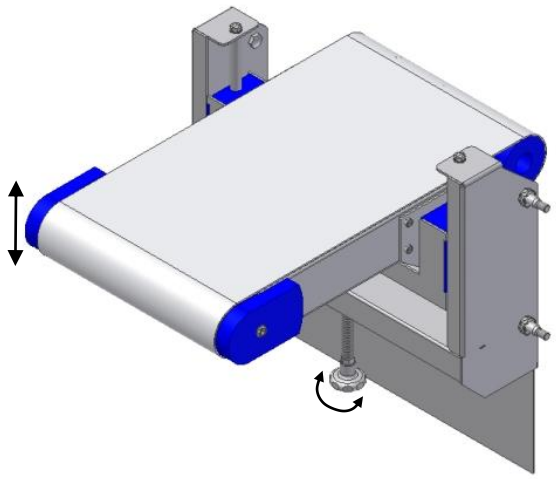


Figure 3.29 Discharge conveyor

It transports the packages that have been cut loose. The conveyor is adjustable for the height of the packages. The conveyor belt should not be adjusted while the machine is running. At the end of the conveyor the products have to be removed from the belt by another conveyor belt, a person or a robot.
Take care that body parts or hair do not become trapped between the belt and the guidance mechanism.

3.13 Control cabinet

The control cabinet is situated on the side of the machine (see Figure 3.30).

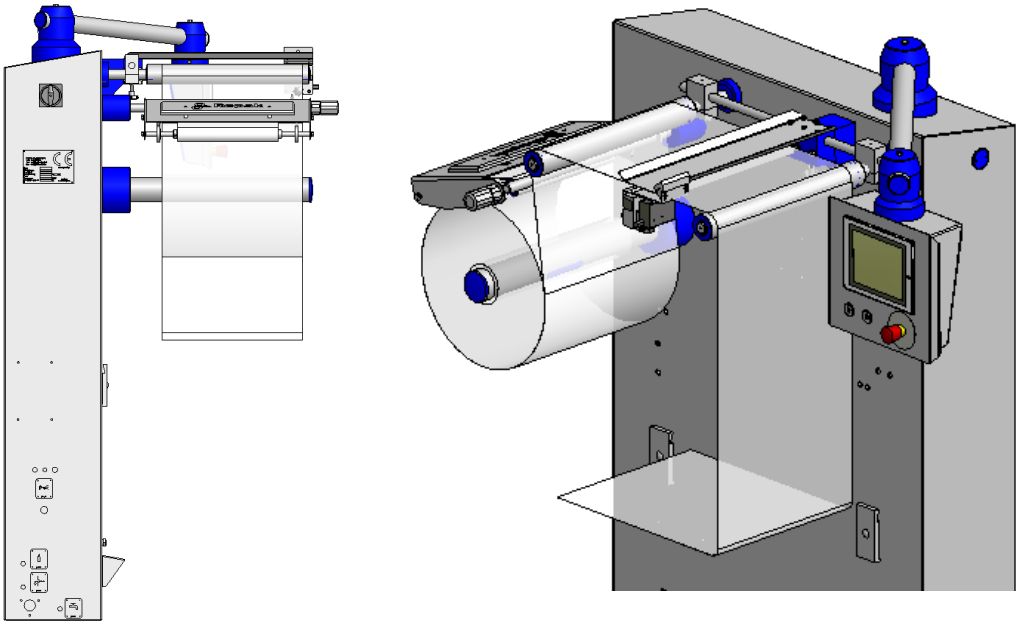
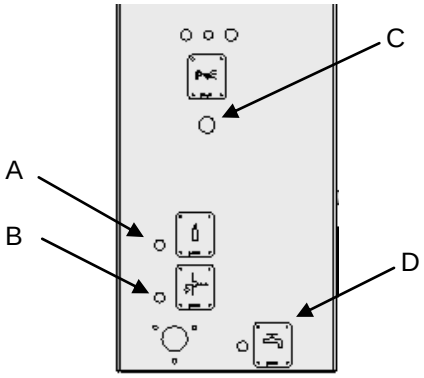


Figure 3.30 Control cabinet

The cabinet contains the operating equipment for the various systems and processes in the machine. The control cabinet has connections for compressed air, electricity, water and gas (see Figure 3.31). Make sure that the cables connected to the control cabinet are so arranged that no-one can trip over them. The control cabinet has a control panel that is discussed in Chapter 4. The entire machine can be run from this panel.



A. Gas connection
B. Water drain
C. Pressed air
D. Water-cooling

Figure 3.31 Connections

3.14 **Drive gear**

The drive chains are powered by an electric motor (see Figure 3.32).
The chain wheels are mounted on a shaft. This causes the chains always to run at the same speed. There are two chain tensors in the drive gear. If the chain tension is too high or too low, it can be easily adjusted with the adjusters. This procedure can be found in Part 2 of the Manual.

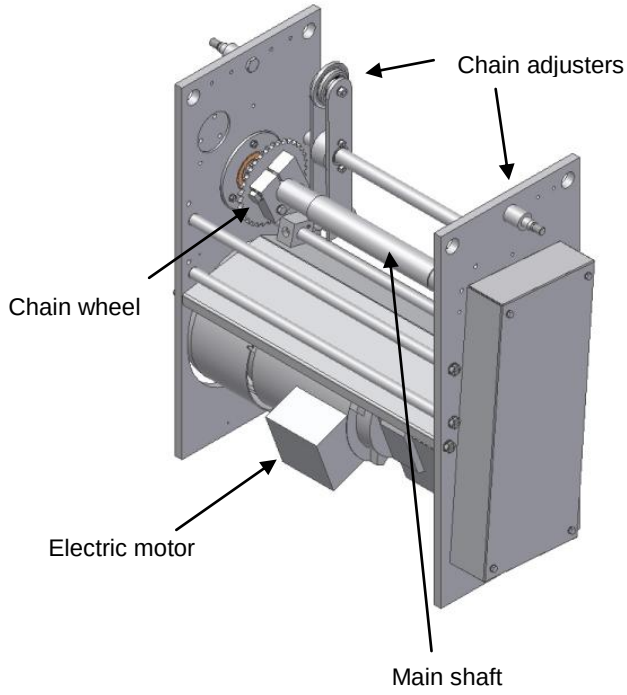


Figure 3.32 Drive gear

3.15 **Film edge trim removal**

Once the packages have been cut free by the longitudinal cutter, the film trims are left in the chain clips. These are removed by a film trim removal unit. The installation performing this task is part of the machine.

Depending on the application the Repak RE20 can be equipped with various film trim removals.

The edge trim removal systems can be divided in the following groups:

- Film edge trim suction unit (see Figure 3.33).
- Film edge trim rewind unit (see Figure 3.34).

3.15.1 Film edge trim suction unit

The film edge trim will be removed by vacuum through hoses which are connected to a suction unit. The film trim will be collected in the suction unit into a stainless steel drum which is removeable for emptying.

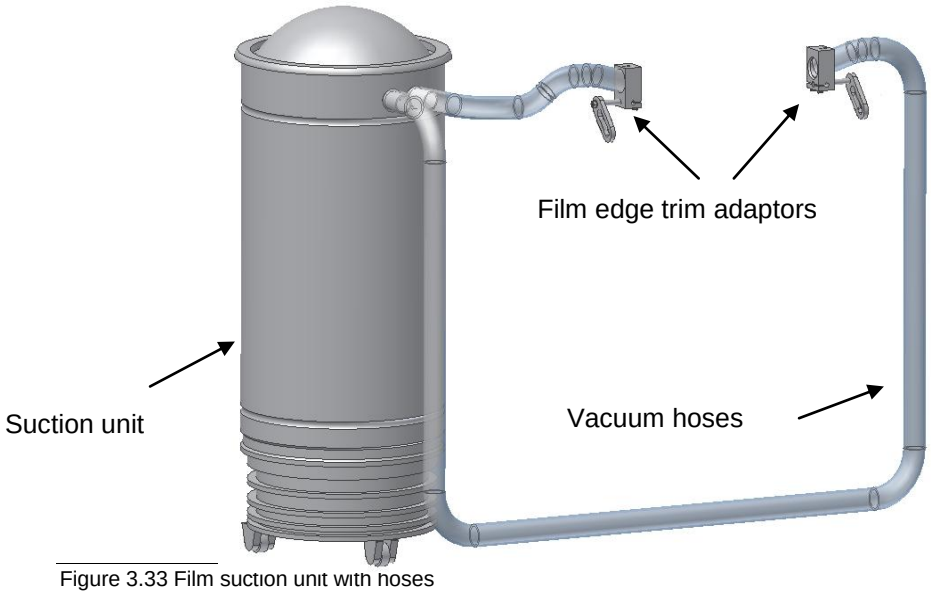


Figure 3.33 Film suction unit with hoses

The film edge trim adaptors are mounted at the discharge end extension of the machine, and are adjustable to optimise its functioning.
The vacuum hoses are connected at one end into the adaptors with the other end connected to the suction unit.

This unit is generally used for flexible film, but can also be used for rigid film up to 200-300µm and with a max width of 12mm, else we need to use the film edge trim rewind system.

3.15.2 Film edge trim rewind unit

This system can be used to remove the film trim strips from longitudinal cutting units which cannot be handled by the vacuum trim removal unit (see Paragraph 3.11.3.2).

3.15.2.1 Method of Operation

The film trim will be rewound by two electrically-driven motors. These motors will be controlled by a photoelectric sensor. The motors will start to rewind the trim when the sensor trips.
When the film advance stops, the tension arm lifts until the photoelectric sensor is deactivated and stops the motor. In this way the tension arm keeps constant tension on the strips.

The wound up trim is easy to dispose of, just take it off the removable reel disks.

3.15.2.2 Routing of edge trim

First run machine until the edge trim is out of the machine by ca. 2 metres then turn off each motor switch to stop the motors. Route the strip by following the arrows (see Figure 3.34), wrap up the strips by hand twice around each cone reel, switch on each motor and the motor will run till the tension arm comes up to release the photoelectric sensor.

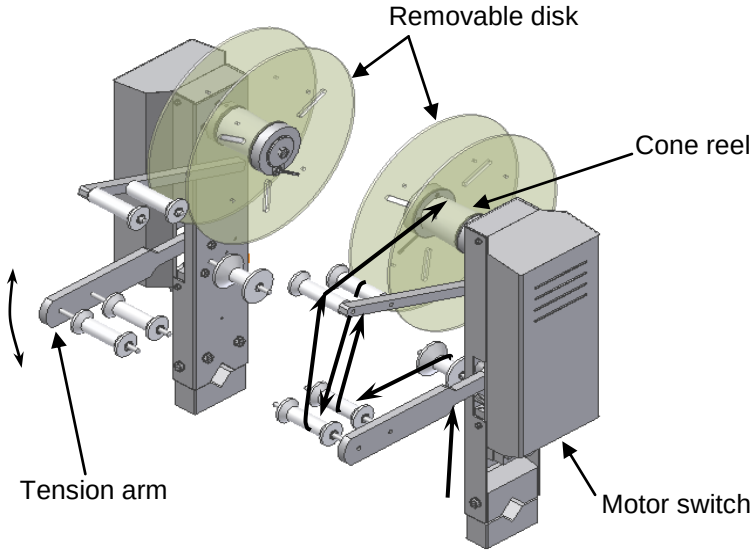


Figure 3.34 Film edge trim rewind unit

Contents

4 Control panel

The machine is fitted with a rotating control panel mounted on the control cabinet (see Figure 4.1).

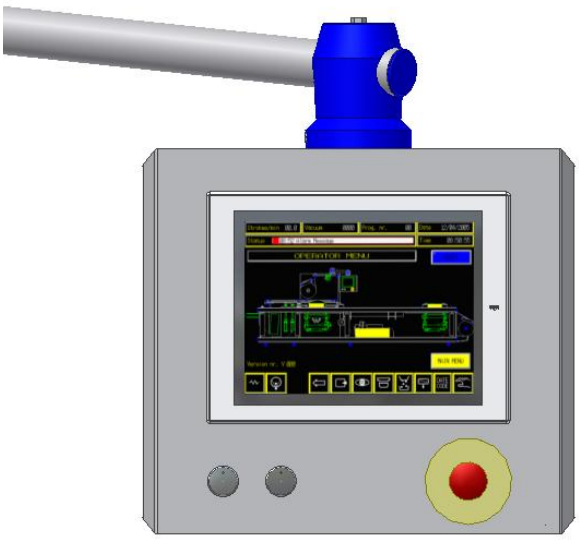


Figure 4.1 Control panel

The panel consists of a start switch, a stop switch, an emergency stop switch and a touch screen. Practically all the functions required for the packaging process are operated from the touch screen. The wide-ranging settings are discussed below.

4.1 How the touch screen works

A touch screen is a VDU that can display all manner of figures and text, just like a PC monitor. Instead of having a separate keyboard however the touch screen allows the user to operate the machine simply by touching the icons displayed on screen.

	**Careful**
	Only use your hands to operate the touch screen. Hard or sharp objects can damage the screen.

The machine has a great many functions and settings, all of which are organised in menus to provide a logical overview. A menu is a collection of buttons and data displayed on the touch screen. The machine's menus are put together as shown in the matrix below (Figure 4.2).

4.1.1 Picture matrix

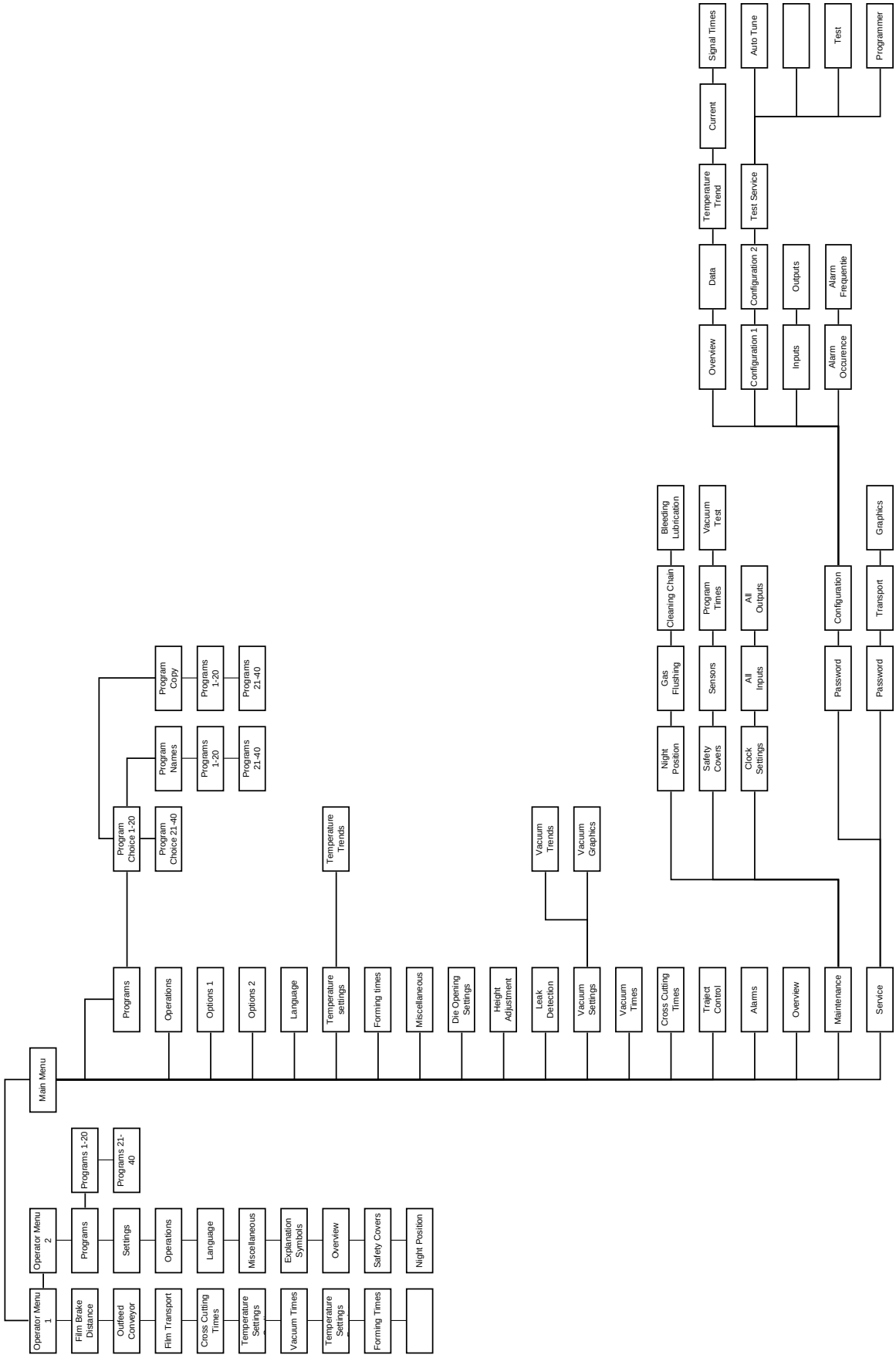


Figure 4.1 Picture matrix

4.2 Machine operating menus

The operator menu is the first to be displayed when the machine is turned on (see Figure 4.3).

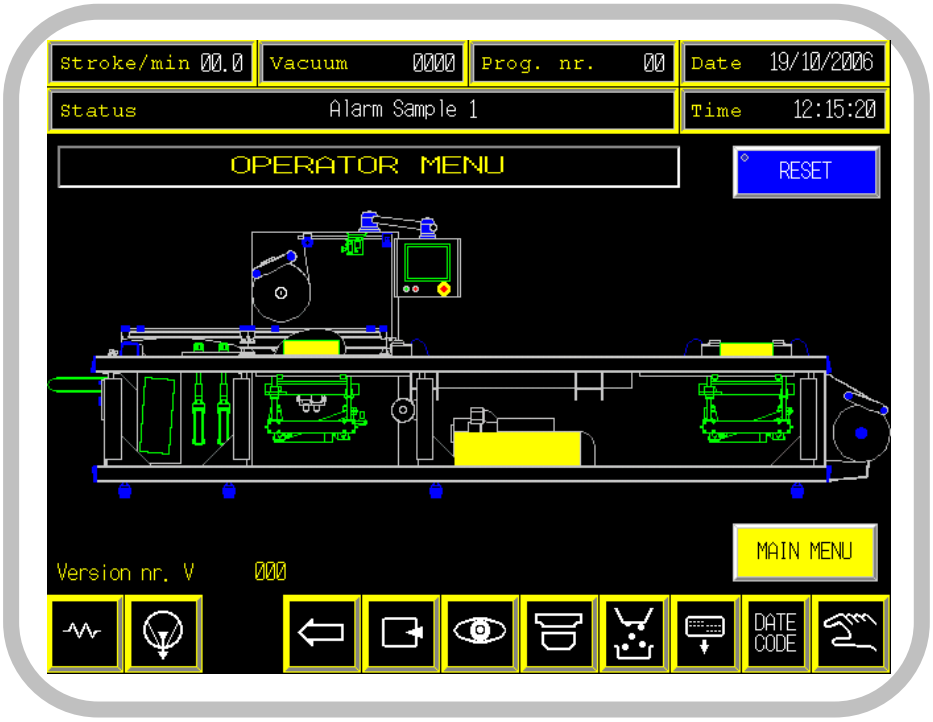


Figure 4.3 Operator menu

All submenus can be accessed from the operator menu simply by touching the green areas in the menu of your choice on the touch screen. A menu consists of a combination of the following 4 groups:

1. Read-out functions, such as the machine status bar: these provide information about the machine's current status.

2. The retrieval functions such as the green areas: after touching them the user gains access to the chosen information.

3. The write functions, such as the inputting of parameters (temperature, times etc.): after touching these, parameters can be changed using the keypad.

4. On/off functions, such as the function keys: these work like a normal switch and show by a change of color the status of the function (on-off). Buttons with a yellow edging are 'off' and buttons that are completely green are 'on'.

The buttons displayed in a particular group depend on the menu chosen.

4.2.1 Read-out functions

The read-out functions are displayed in the top part of the screen (see Figure 4.4).

Figure 4.4 Read-out functions

In this part the following information is displayed:

- Strokes/min: the number of production strokes that the machine is performing per minute.
- Vacuum: the current vacuum value in mbar.
- Prog. nr.: the packaging program chosen.
- Date: the current date.
- Time: the current time.
- Status: this status line indicates the status of the machine, also all presented failure messages are displayed here as a walking massage, behind each other. The possible causes of and solutions to the failures displayed can be found in paragraph 7.2.

4.2.2 Retrieval and write functions

By pressing the buttons in the operator menu (see Figure 4.5) the relevant menu is displayed.

If you press on the spot where the arrow is pointing at, the screen will go to the relevant menu.

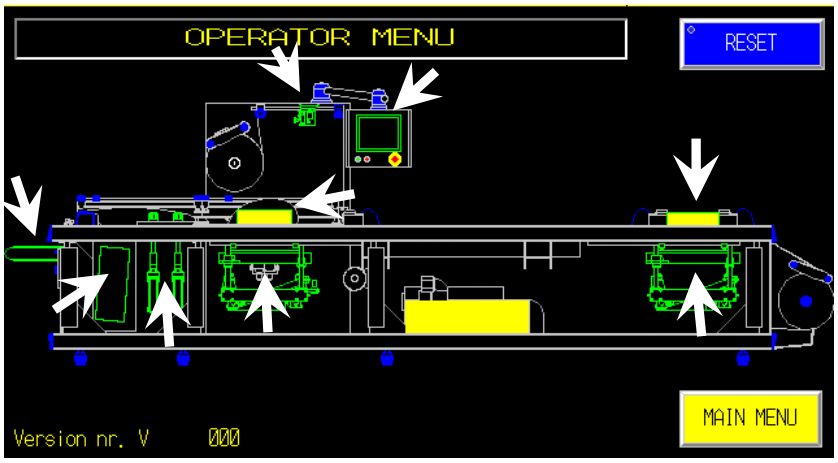


Figure 4.5 Retrieval and write functions

4.2.2.1 Numeric Keypad

In addition to the main menu, the Keypad is available in every menu where numeric input is required. When this button is pressed, the keypad shown below is displayed (see Figure 4.6).

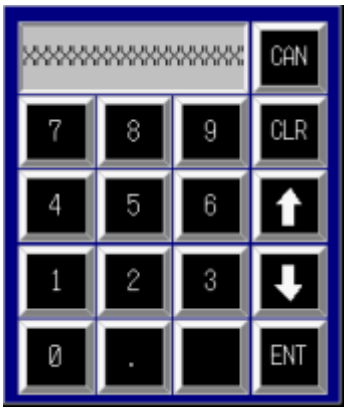


Figure 4.6 Numeric keypad

The value displayed in the input field selected can now be changed. The arrow keys enable the user to navigate from the current input field to other input fields. ‘CLR’ deletes the last shown value; ‘Enter’ gives to the input field the value displayed and the keypad disappears.

4.2.2.2 QWERTY Keypad

In different menus you can change names or descriptions for example, the program names can be changed this way, and therefore the QWERTY keypad can be used. (See Figure 4.7)

Figure 4.7 Qwerty keypad

4.2.3 Switching functions

The buttons in group D (see Figure 4.8.) are similar to main switches.

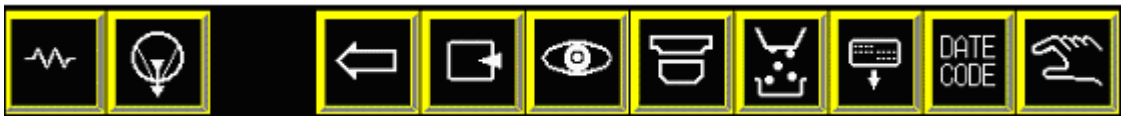


Figure 4.8 Switching functions

A number of functions such as adding gas to a package or automatic filling can be turned on and off centrally here. Some functions can only be switched on if the packaging program chosen permits this, so that a function cannot be switched on unintentionally. The functions of the buttons are shown in table 3:

Table 3 Button functions

Button	Name	Function
	Heating	Switches the heating elements in the forming and sealing stations.
	Pumps and motors	Starts and stops the internal vacuum pump.
	Transport once	Transports the film one stroke length further. All other systems are deactivated. This function can be applied only if the Automatic function is switched off.
	Gas Flush	Switches on or off the insertion of gas into the packaging. (This only functions if the packaging program chosen supports it.)
	Plug assist	Plug assist in forming station can be turned on and off with this button.
	Marking detection	Here the photocell has to be switched on for packaging with printed top film. This only functions on a machine fitted with a photocell and a film brake.
	Cross cutter	This button is used to turn the cross cutter on and off for all programs.
	Filler	If the machine is connected up to an automatic filler, the filler can be turned on and off with this button.
	Print	External labellers on the machine can be turned on and off with this button.
	Date coder	External coder on the machine can be turned on and off with this button
	Manual mode	This button is turned on when the machine is being manually operated, such as during washing or lubricating the chain.

4.3 Operator menu

The Operator menu (see Figure 4.9) is in the lowest level in the menu structure. In this level the operator can only see the values but is not allowed to change them, except the parameters listed below:

- Program change
- Pause time
- Switch point Vacuum
- Switch point Gas

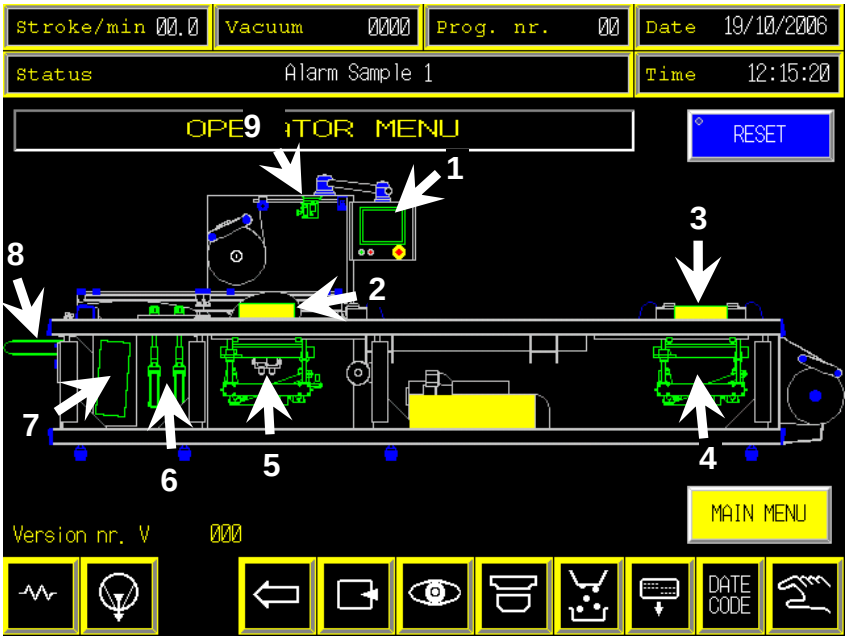


Figure 4.9 Operator menu

This screen is prepared with 9 active areas, when touched a submenu opens with

1. Operator submenu.
2. Sealing temperature settings.
3. Forming temperature settings.
4. Forming times.
5. Vacuum times.
6. Crosscut settings
7. Transport settings
8. Discharge
9. Film brake with photocell

The main menu can be accessed by pressing “MAIN MENU” after which a little password screen will appear, press the white spot and a keypad will appear. After you fill in the right code press “ENTER”, it will go back to password screen, press “OK” and you have entered the main menu (see paragraph 4.4).

4.3.1 Operator submenu

The operator submenu (see Figure 4.10) appears when you press on the spot where arrow “1” is pointing at the touch screen.

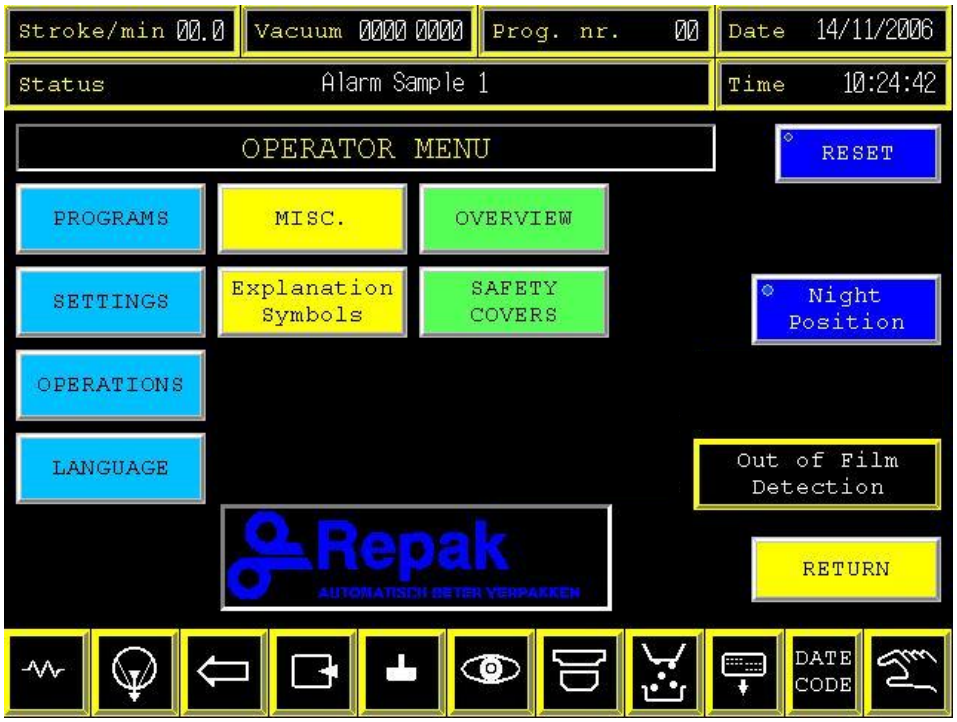


Figure 4.10 Operator submenu

You are still in operator level. Here the operator finds all the info and settings he needs to run the machine for daily production. In this menu you can go to several submenus and functions.

Programs	: Change to another program.
Settings	: Pause and pressure settings.
Operations	: Machine operation sequence.
Language	: Change language.
Misc(ellaneous)	: Running times.
Explanation Symbol	: Explanation of function symbols.
Overview	: Overview of most important PLC I/O’s.
Safety covers	: Top view of machine with all used safety covers.
Reset	: Reset for all alarm messages.
Night position	: Set machine to night position (wash position).
Out of film detection	: Option to activate the end of film detection.

4.3.1.1 Night position

To put machine into night position; run the film out of the machine, switch off all functions, activate “MANUAL MODE” and after this activate “Night Position”. Now the die sets are closed, the temperature goes to 30°C. to prevent condensation and ingress of cleaning water in the die sets.

IMPORTANT: Don’t switch off the power!!
(use this function only after production)

Next production can start again after deactivating the “night position”. The dies will go to the lower position, activate the functions you need and the machine is ready for production.

4.3.2 Program choice

This menu is accessed by pressing the ‘PROGRAMS’ button in the operator submenu (see Figure 4.11).

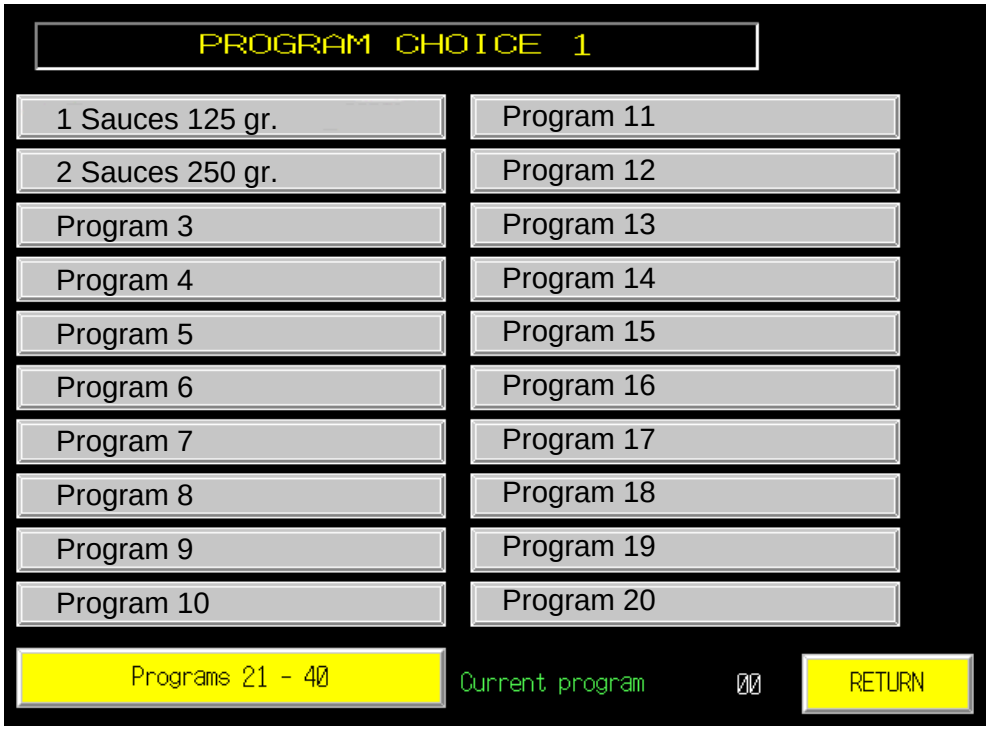


Figure. 4.11 Program choice"

In this screen (see Figure 4.11) you have the possibility to choose a program out of different programs from 1 to 20.
Press button Programs 21-40 and this will give you access to programs 21 to 40.
This is the list of the programs which are stored in the machine memory. Each program contains the machine settings relative to the packaging of a particular product. The memory can contain a maximum of 40.

The product to be packaged is chosen by touching the program name on the screen. Take care that the correct format parts of the chosen program have been installed into the machine. If this is not the case, the correct packaging cannot be produced and the technical department must be called in to set the machine correctly. The retrieved and current program number is displayed in the ‘machine status’ field.

4.3.3 Settings menu

This menu is accessed by pressing the ‘SETTINGS’ button in the operator submenu (see Figure 4.12).

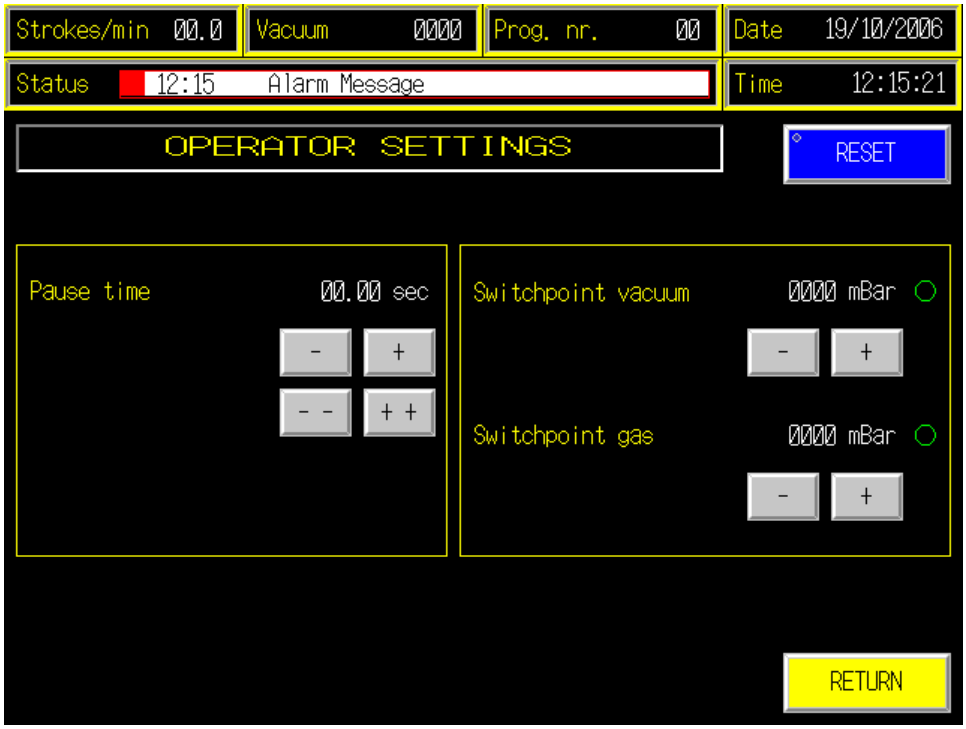


Figure. 4.12 Settings menu"

In this menu the pause times between the machine production strokes can be set by pressing the “**-**” or “**+**” button.
By pressing next buttons

or


pause time will be changed with 0,01 sec.

or


pause time will be changed with 0,1 sec.

To change the switch points for vacuum and or gas works in the same way.
By pressing the button:

or


the pressure will be changed with1 mbar each time.

Changes made in this screen will not be stored in the current program, after a restart the program will start with the original values.

To change these values for permanent you have to login into main menu. (See paragraph 4.4.11).

4.3.4 Operation sequence

This menu is accessed by pressing the ‘OPERATIONS’ button in the operator submenu (see Figure 4.13).

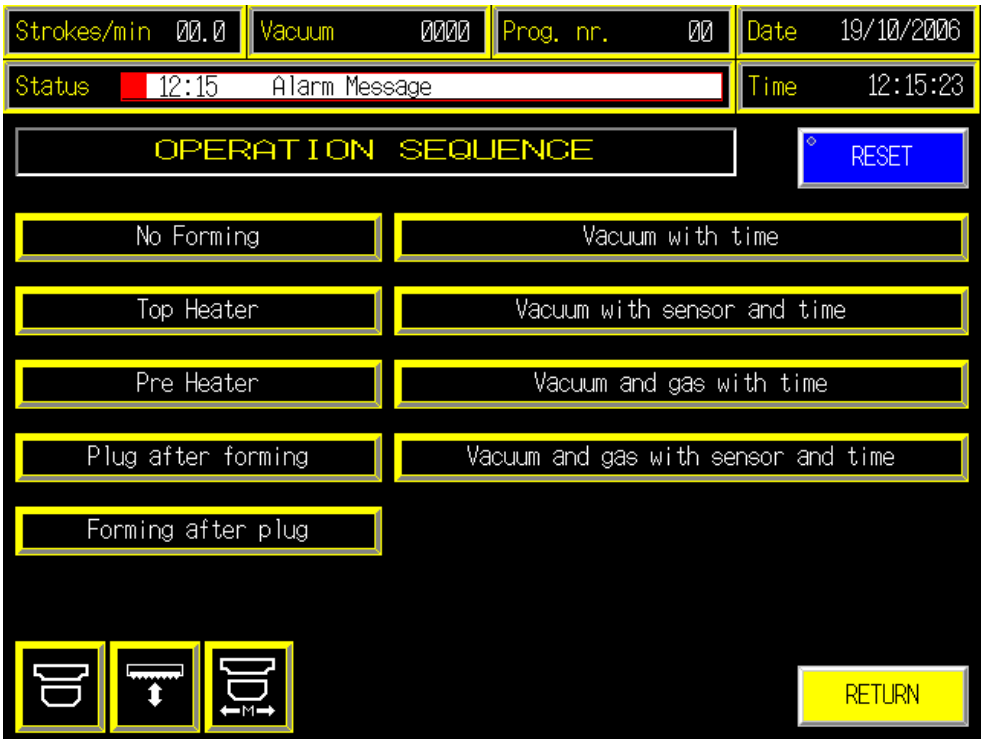


Figure 4.13 Operations sequence

This screen gives the operator the information how the machine is configured, nothing can be changed in this menu it is just for information.
The selected operation sequence will be lit up with a green background.

The standard settings will be:

- “Top Heater” for forming station
- “Vacuum with Sensor and Time” for sealing station and vacuum packs
- “Vacuum and gas with sensor and time” for sealing station and gas packs

Also the type of cross cutting the machine is configured with is visible.

The left collumn shows the possible sequences for the forming station, on the right the sealing station sequence will be found.
The configuration can only be changed in a secured menu level and is only accessible by qualified persons with the right code. More detailed information can be found in paragraph 4.4.2.

4.3.5 Language menu

This menu is accessed by pressing the ‘LANGUAGE’ button in the operator submenu (see Figure 4.14).

Figure 4.14 Language menu

In this screen you can change the language for the touch screen.

The flag symbol stands for the relative country.

Press one of the symbols, and the relative language will be active.

4.3.6 Miscellaneous menu

This menu is accessed by pressing the ‘MISC’ button in the operator submenu (see Figure 4.15).

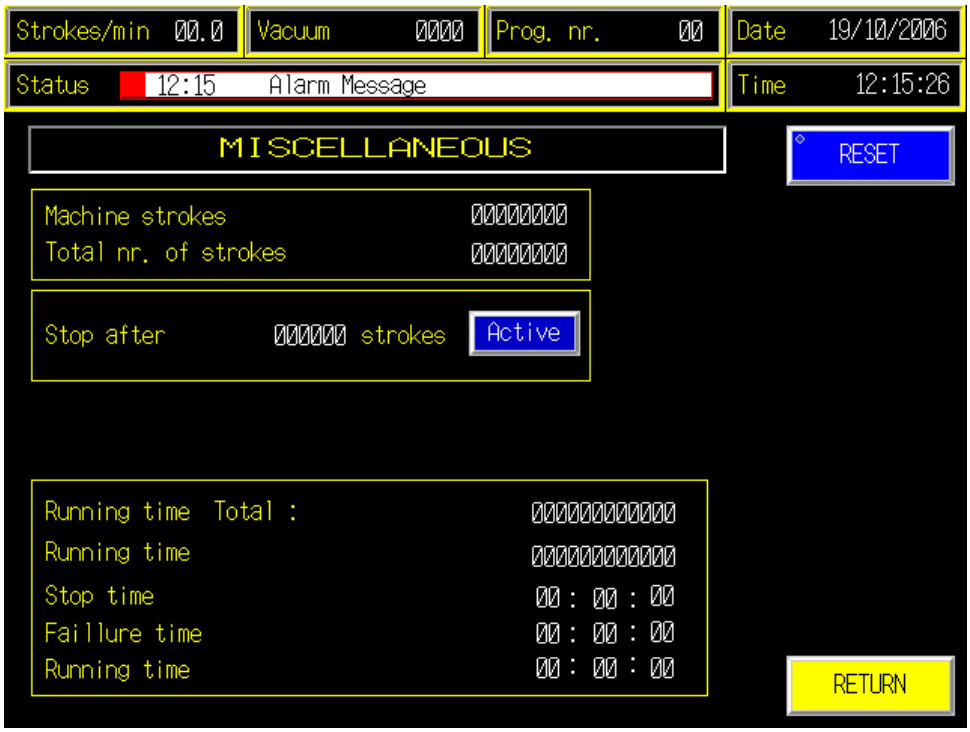


Figure 4.15 Menu miscellaneous

The ‘Miscellaneous’ menu (see Figure 4.15) displays the number of strokes in the current production session and the total number of strokes performed by the machine.

The numeric keypad (see Figure 4.6) can be used to set the number of production strokes in the current production session. The machine stops automatically after the set number of strokes has been reached.

The machine total production time and the duration of the current production session are displayed in the bottom field. In addition the stop time, the total time that the machine failed and the time per production stroke are all displayed.

4.3.7 Symbol explanation

This menu is accessed by pressing the ‘Explanation Symbols’ button in the operator submenu (see Figure 4.16).

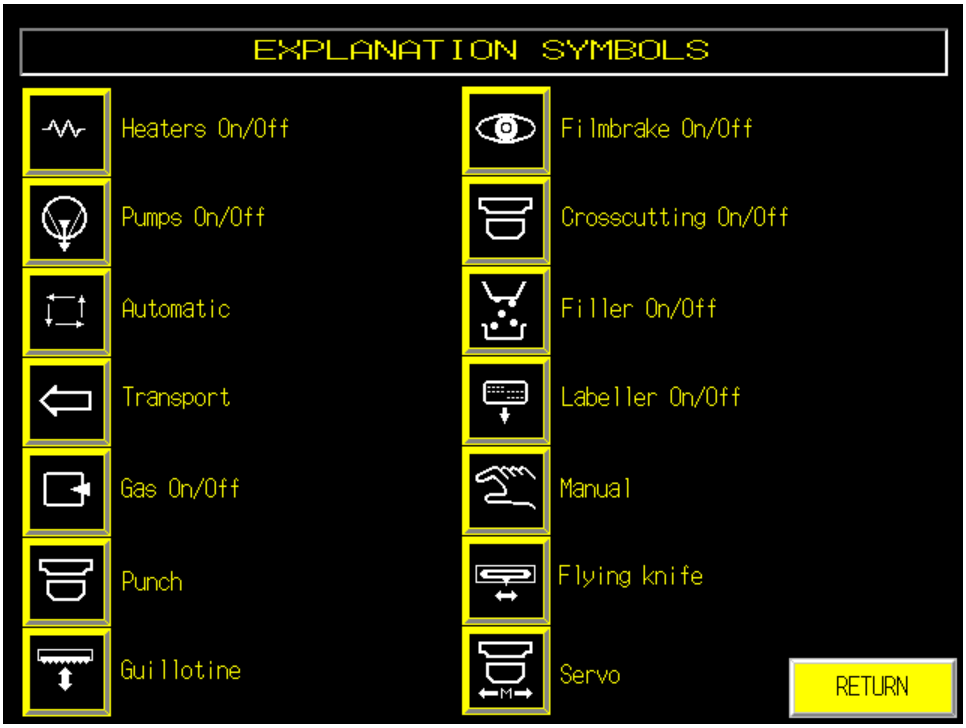


Figure 4.16 Explanation of Symbols

This screen shows you the explanation of the symbols which are used and is just for operator information, nothing can be changed in this menu.

4.3.8 Overview menu

This menu is accessed by pressing the ‘OVERVIEW’ button in the operator submenu and in the main menu(see Figure 4.17).

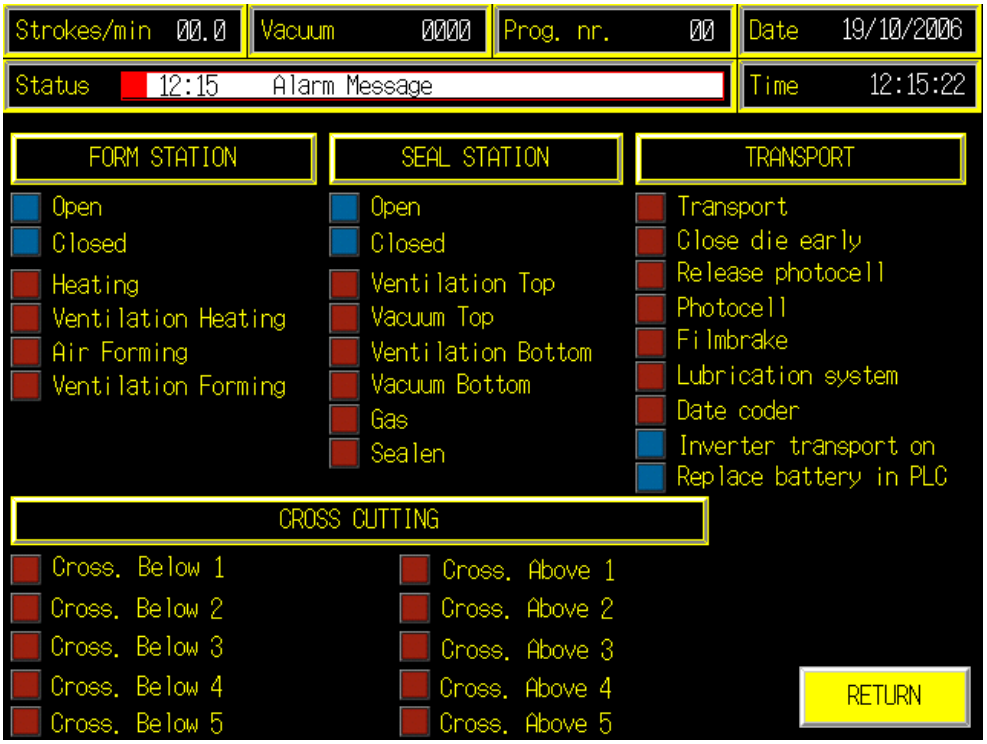


Figure 4.17 Overview menu

The Overview menu (see Figure 4.17) shows the status of the forming station, the sealing station, the cross cutter and the film transport.

In addition the menu states whether the inverter is turned on and whether the PLC battery needs to be changed. This screen is intended to check the machine’s functions. If there are any problems, the technical department should be contacted.

4.3.9 Safety guards

This menu is accessed by pressing the ‘SAFETY COVERS’ button in the operator submenu (see Figure 4.18).

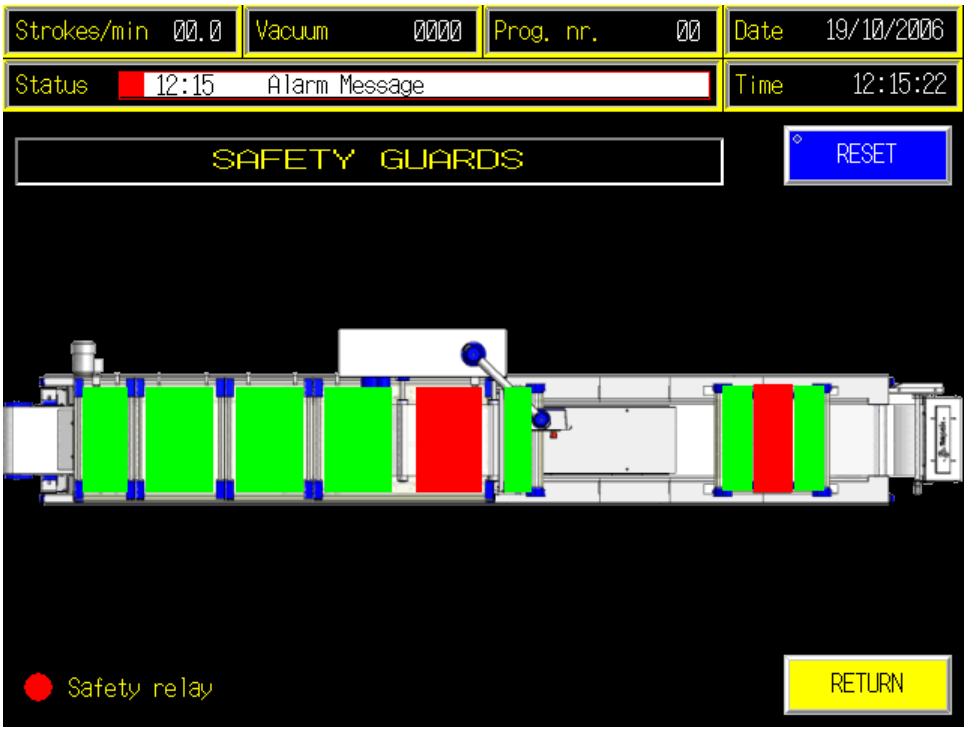


Figure 4.18 Safety guards

The Safety covers menu has indicators showing the various safety guards. When an indicator lights up green, this means that the guard is properly in place.

If a guard has been incorrectly placed, the machine displays an error message, which signals which guard it is. Once the guard has been properly placed the error can be corrected with the reset button.

4.4 Main menu

The main menu can be accessed by pressing, in the operator menu, the button “MAIN MENU” a little password screen will appear, press the white spot and a keypad will appear. After you fill in the right code press “ENTER”, it will go back to password screen, press “OK” and you’ve

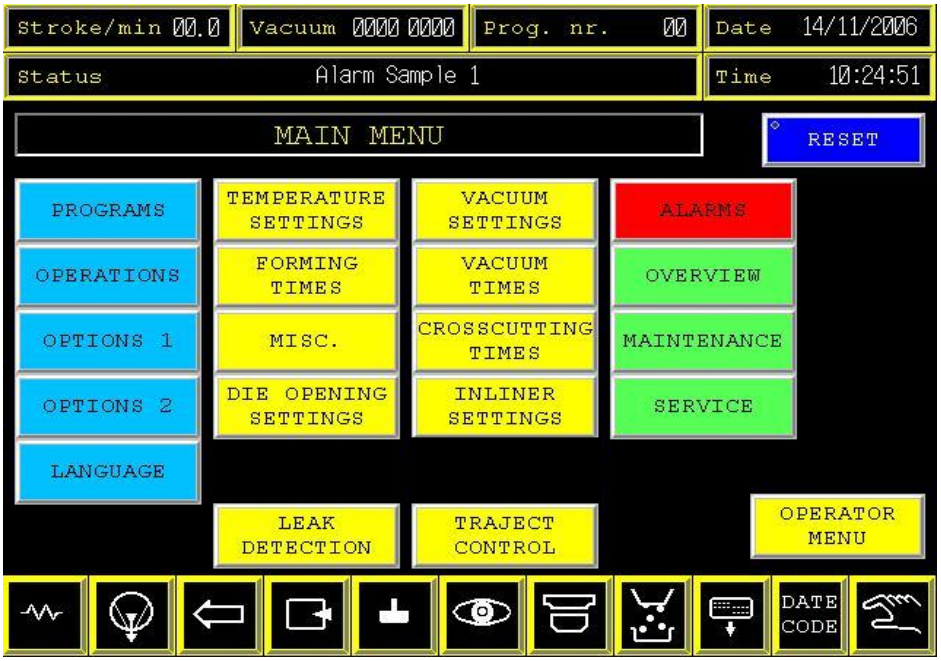


Figure 4.19 Main Menu

entered the main menu.(see Figure 4.19).
You are now logged in into level 2 of the menu structure of the touch screen, and this gives you access to the most related settings.

Programs: = Change to another program.
Operations: = Change machine operation sequence.
Options 1: = Menu for all cutting options.
Options 2: = Menu for all other options.
Language: = Change language.
Temperature: = Temperature settings for form and sealing station.
Forming times: = Time settings for forming station.
Miscellaneous: = Running times, chain lubrication.
Die opening settings: = Menu for die opening (leveling die bottom part)
Height adjustment: = Menu for automatic package depth adjustments.
Leak detection: = Leak detection in forming station.
Vacuum settings: = Vacuum settings for sealing station.
Vacuum times: = Time settings for sealing station.
Cross cutting times: = Time setting for cross cut unit.
In-liner settings: = Menu for in-liner settings (output conveyor)
Servo cross cutting: = Settings for cutting positions.
Traject control: = Control of packages all through the machine.
Alarms: = Alarm history.
Overview: = Time settings for sealing station.
Maintenance: = Maintenance and vacuum test.
Service: = Service info, transport and machine test functions.

With the button “OPERATOR MENU” you leave main menu and return to operator menu, to enter “Main Menu” once more you need to log in again.

NOTE: The access to level 2 is accepted for only 15 minutes, after this time you go back automatically to operator menu.

4.4.1 Programs

This menu is accessed by pressing the 'PROGRAM' button in the main menu (see Figure 4.20)

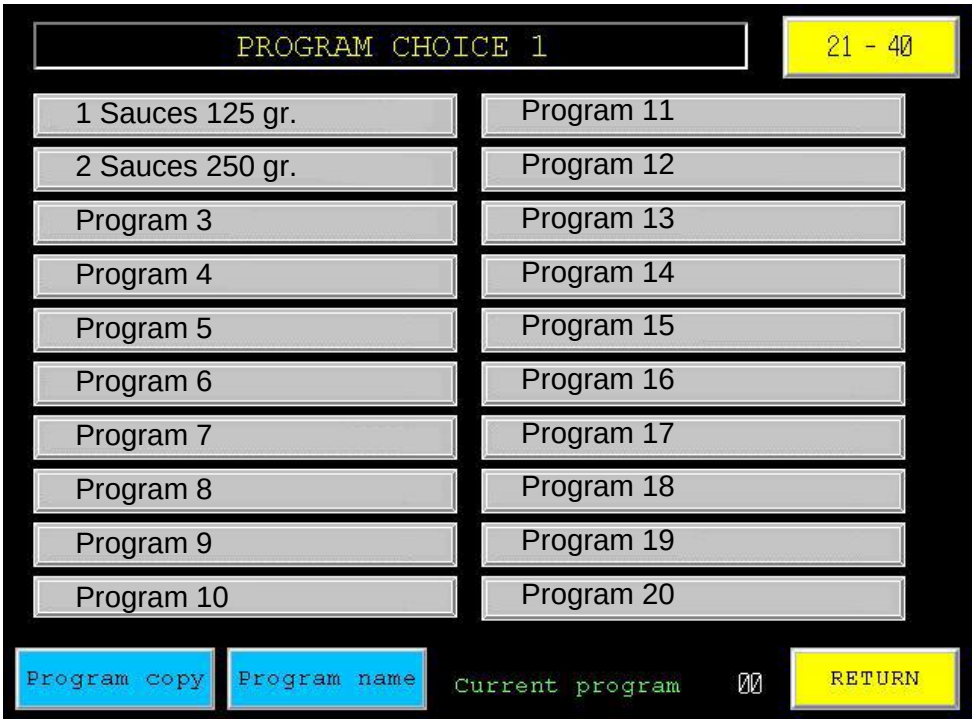


Figure 4.20 Programs

In this screen (see Figure 4.11) you have the possibility to choose a program for different programs from 1 to 20.

Press button "21- 40" and this will give you access to the programs 21 to 40.

More info see also paragraph 4.3.2

The button "Program copy" gives entrance to a menu where you can copy one program to another program number, just by selecting the current program number which you want to copy, now select the desired program number where you want to paste the current program. Now the program is copied!!

NOTE: You can only copy the current program. If you want to copy another program number, select in program choice 1 or in program choice 2 the program number you want to copy.

The button "Program name" gives entrance to a menu where all program numbers can be renamed, just by selecting the program number you want to rename. When the qwerty keypad (Figure 4.7) appears press button "CLR" which will clear the existing text and numbers.

Fill in the desired text and numbers, then press "enter" - the keypad will disappear and the new text and numbers appear.

TIP! If you rename always start with the program number followed by text and / or numbers.

4.4.2 Operations

This menu is accessed by pressing the 'PROGRAM' button in the main menu (see Figure 4.21)
Here various programs can be chosen.

Figure 4.21 Operations sequence

The programs can only be chosen when they are valid for the type of machine.

4.4.2.1 Forming programs

No Forming: = no forming of bottom web.
Top Heater: = heating from above in the same stroke as forming.
Pre Heater: = heating 1 stroke before forming.
Plug after forming: = forming first and after a delay the plug.
Forming after plug: = plug first and after a delay the forming.

4.4.2.2 Sealing programs

Vacuum with time: = evacuation only with time.
Vacuum with sensor and time: = evacuation with pressure and time.
Vacuum and gas with time: = evacuation and gas only with time.
Vacuum and gas with sensor and time: = evacuation and gas with pressure and time.

4.4.2.3 Cross cuttings

Punch: = rigid film puncher.
Guillotine: = flexible film cutter type guillotine.
Servo driven punch: = Servo driven punch for ridged and flexible film, applied for more than 2 positions.
Pneumatic driven punch: = Pneumatic driven punch only for 2 positions.

4.4.3 Options 1

This menu is accessed by pressing the ‘OPTIONS 1’ button in the main menu (see Figure 4.22)
The option menu is divided in two pages, “Options 1” and “Options 2”.

Figure 4.22 Options 1

Here all availible cutting options can be selected,

1 Position	= To be able to cut on position with the crosscut positioned with pneumatic activated cylinder.
Long cutting continuous	= Rotary knife blades will turn continuously or only during transport.
Cross cutting 1; 2; 3 & 4	= The selected cross cutting(s) will be active during production, if button  in operator menu is activated.

4.4.4 Options 2

Here various options can be activated

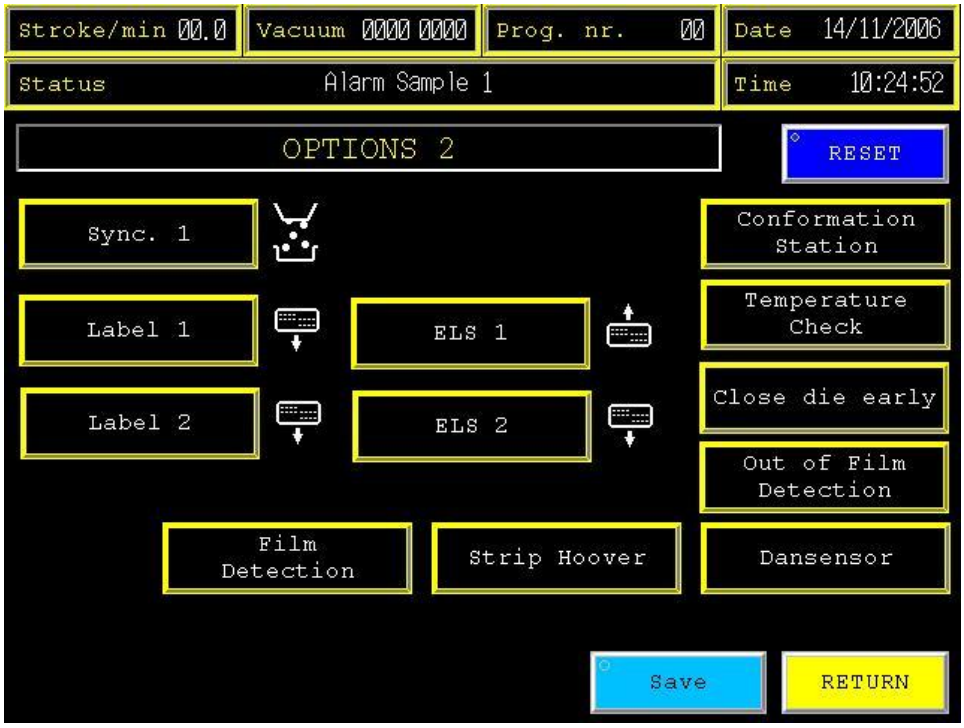


Figure 4.23 Options 2

In this menu you can select the options you need in the current program, the selected function lights up when activated.

If not selected, the function buttons on operator menu will not function.

Label 1 = Process with filler, (synchronised)
Label 2 = Process with labeler, (synchronised)
E.L.S 1 = Process with ELS labeler, (synchronised)
E.L.S 2 = Process with ELS labeler, (synchronised)
Confirmation station = Process with confirmation station (inlay support device)
Temperature Check = Temperature control on / off (machine will not run if the temperature is out of range)
Close die early = Die set will close earlier before end of transport distance, or the die set close at the end of transport.
Out of film detection = If selected machine will stop when running out of film.
Dansensor = Process with Dansensor gas-analyser.
Strip Hoover = If selected strip trim bin is active during process.
Film detection = If selected end of film detection can be activated in the operator menu.

4.4.5 Temperature settings

This menu is accessed by pressing the 'TEMPERATURE' button in the main menu (see Figure 4.24)

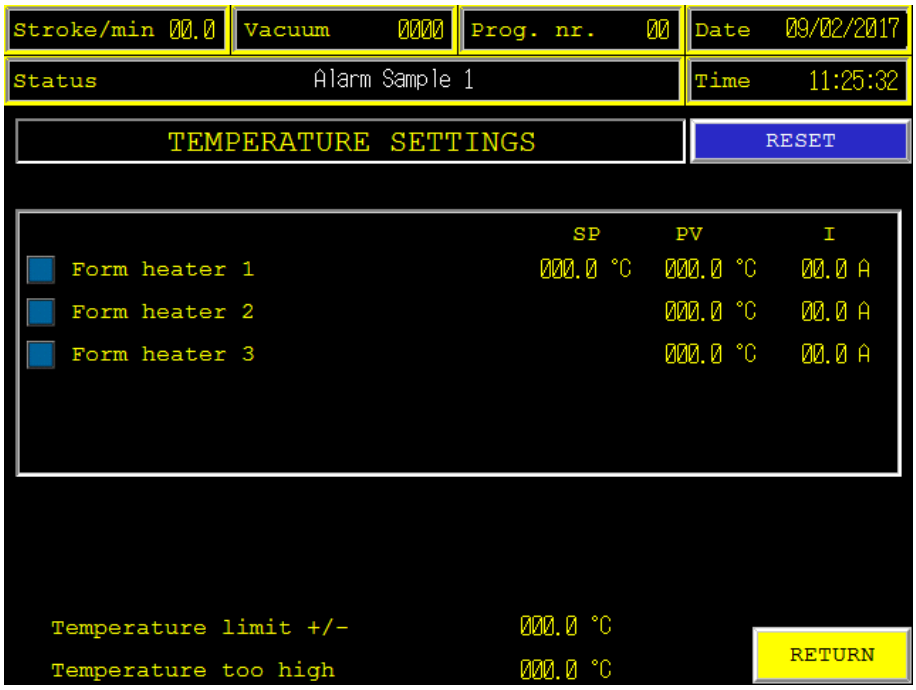


Figure 4.24 Temperature

In this sc[illegible]perature of sealing and forming station

The values under '**SP**' (Set Point) are the temperatures set for the current program. The values under '**PV**' (Present Value) indicate the current temperatures.
The value under '**I**" (Current) indicates the current through the heating elements and is displayed in amperes.

The temperature can be changed by pressing the numbers under **SP** (white arrow). Once this happens a small numeric keypad (Figure 4.6) will appear on which you can fill in the desired value. Press enter and the numeric keypad will disappear. The value for the **SP** has changed. Press **Save** to store the settings into the current program.

Temperature limit : here a tolerance can be set for the **SP** value. If temperature check in Options menu is activated the machine will not run when the temperature is out of range.

Temperature too high : This temperature can only be changed in level 3. When the temperature rises above this value the power for heater elements will be disconnected by a contactor.

These are control values. When the values permitted are exceeded, the machine displays an error message.

4.4.6 Forming times

This menu is accessed by pressing the 'FORMING TIMES' button in the main menu (See Figure 4.25)

Figure 4.25 Forming times

In this screen you can see the time **set points (SP)**, and the pressure **set points** for the forming chamber (forming station)
The value of the **set points** can be changed by pressing the numbers in the left column; a numeric keypad (Figure 4.6) will appear, fill in the desired settings, press enter, now the numeric keypad will disappear and the value for the SP has changed.

Press **Save** to store the settings in the current program.

Warming pressure = pressure needed to warm up the bottom film. After reaching the "SP" the warming time will start.

Warming time = time needed to warm up the film throughout. When the time has passed the forming valve will open.

Forming pressure = pressure needed to bring the heated film as fast as possible down to the forming plate. After reaching the "SP" the film cooling time will start.

Film cooling time = time needed to cool down the film. The bottom die is cooled so the heat can be transferred quickly to the forming plates until the temperature is decreased by ~30°C to freeze the shape into the film.

Ventilation pressure = before we can open the die set, we need to balance the inside and outside pressure by ventilating, here the pressure level for opening can be set.

Ventilation time = ventilation controlled by time.

Air pressure from below* = Compressed air from below to release the formed package out of the forming chamber.

*Optional function!

4.4.7 Forming times (with plug assist)

This menu is accessed by pressing the 'FORMING TIMES' button in the main menu (See Figure 4.26)

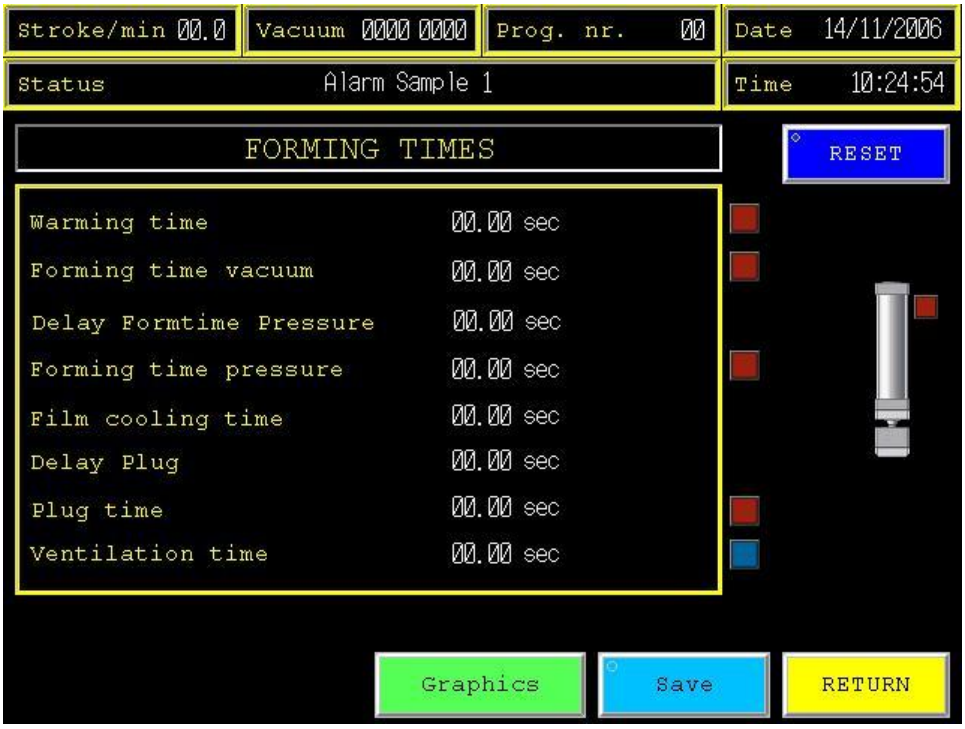


Figure 4.26 Forming times

In this screen you can see and change all time **set points (SP)**, for a forming chamber (forming station) with plug assist.
By pressing the numbers in the column, a numeric keypad (fig. 4.6) will appear, fill in the desired settings, press enter, now the numeric keypad will disappear and the value for the SP has changed.
The LEDs indicates when the corresponding time is active.

Press **Save** to store the settings in the current program.

Warming time = Time needed to warm up the bottom film.
Forming time vacuum = Time for which the forming vacuum valve(s) will be open
Delay forming pressure = Time delay before compressed air assists the forming process. After this will forming time pressure start.
Forming time pressure = Time that compressed air iassists the forming process.
Film cooling time = Time needed to cool down the film. The bottom die is cooled by water so the heat can be transferred quickly to the forming plates till the temperature is decreased by ~30°C to freeze the shape into the film.
Delay plug = Time delay to delay the plug starting time. Time is started when vacuum valve opens.
Plug time = Time that the plug assists the forming process.
Ventilation time = Time needed to ventilate the forming station.

4.4.8 Miscellaneous

This menu is accessed by pressing the 'MISCELLANEOUS' button in the main menu (see Figure 4.27)

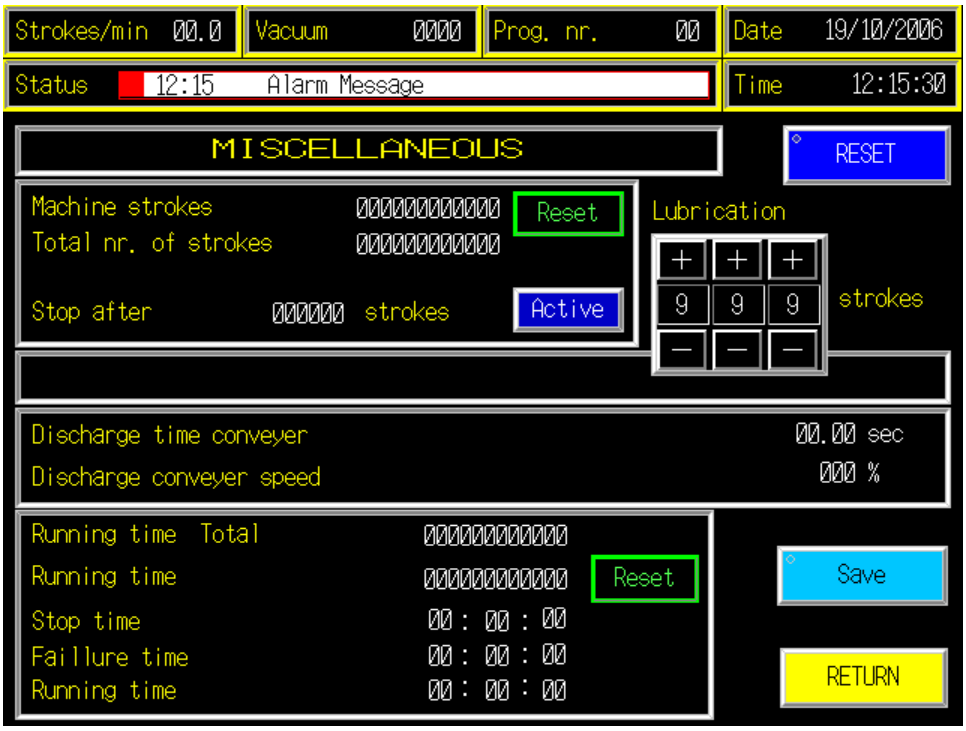


Figure 4.27 miscellaneous

This screen allows you to view indexes or advances (strokes) per day and life of the machine.

You can reset the **machine strokes**; you can not reset the **total nr. of strokes**

Stop after XX strokes: If active then machine will stop after set value.

You can reset the **Running time**, you can not reset the **Running time total**

The running time for the **Discharge time conveyor** after film advance can be set here for what is optimal during the process.**
For example: to create a situation of an empty conveyor after film advance, adjust this time to a certain value for an acceptable result.

Also the speed for the **discharge conveyor** after film advance can be changed**.

You can change the value of the **set points**, by pressing the numbers for change, a numeric keypad (Figure 4.6) will appear, fill in the desired settings, press enter, now the numeric keypad will disappear and the value for the SP has changed.

Press **Save** to store the settings into the current program.

To increase or decrease the **Chain Lubrication**, press the + or – buttons.
The number indicates after how many strokes the lubrication system will oil the chain.

** Not needed with complete cutting device

4.4.9 Die opening

This menu is accessed by pressing the ‘DIE OPENING’ button in the main menu (see Figure 4.28)

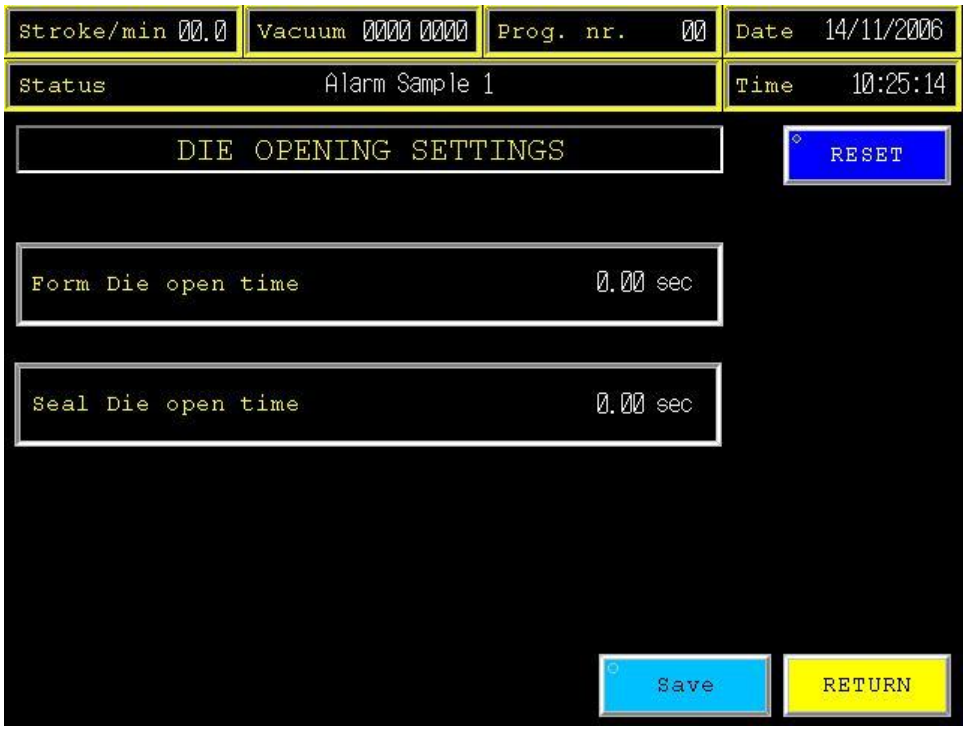


Figure 4.28 Die opening

To speed up the process time, the RE20 has the possibility to adjust the opening of each die,. As standard the lifting stations return to their lowest positions however when a time which is entered is shorter then the time needed to open completely, the opening distance will be shorter.
Now the time needs to close the die again is also shorter, thus resulting in a faster process time.

Both lifting stations are working individually, the time for each station can be adjusted independently. The speed of the lifting cylinder will effect the timing of these function.

Be careful, always take note of the pack height, do not shorten this time so much that the formed packages can not pass through the opening between upper die part and bottom die part..

The value of the **set points** can be changed by pressing the numbers. A numeric keypad (Figure 4.6) will appear, fill in the desired settings, press enter, now the numeric keypad will disappear and the value for the SP has changed.

When the changes are satisfactory **save** the settings to store them into the current program.

4.4.10 Depth adjustment*

This menu is accessed by pressing the ‘DEPTH ADJUSTMENT’ button in the main menu (see Figure 4.29)

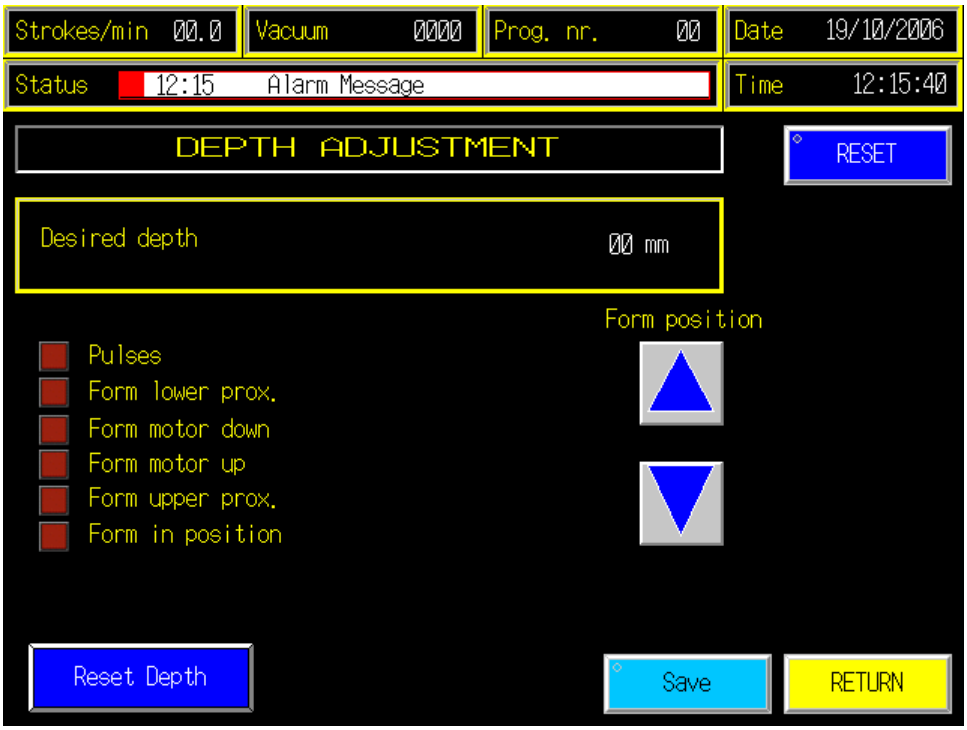


Figure 4.29 Depth adjustment

Here the desired depth of the forming chamber can be established. The set value has a tolerance of ±2 mm. A new value entered for the desired depth has to be saved, then the value is stored into the recent program.

The value of the **set points** can be changed by pressing the numbers. A numeric keypad (Figure 4.6) will appear, fill in the desired settings, press enter, now the numeric keypad will disappear and the value for the SP has changed.

If needed, the depth can be changed manually by the arrow keys. The set value in the display is not connected to the manual mode and these changes will not be stored into the recent program.

With “reset Depth” the bottom plates comes to their upper position for initialization, and then return to the desired depth established as a set value. The minimum depth is dependent on the design of the bottom plates. The difference between minimum and maximum depth is limited to 65 mm.

The walls or corners of the plates are not allowed out of the forming chambers due to the possibilityof damage to the teflonised heating plate in the die top part, therefore the minimum depth is limited in the factory program by default.

For each individual program another depth can be stored, so when another program selected in the program menu, the depth goes automatically to the desired depth stored in that program.

* Optional function!

4.4.11 Leak detection*

This menu is accessed by pressing the ‘LEAK DETECTION’ button in the main menu (see Figure 4.30)

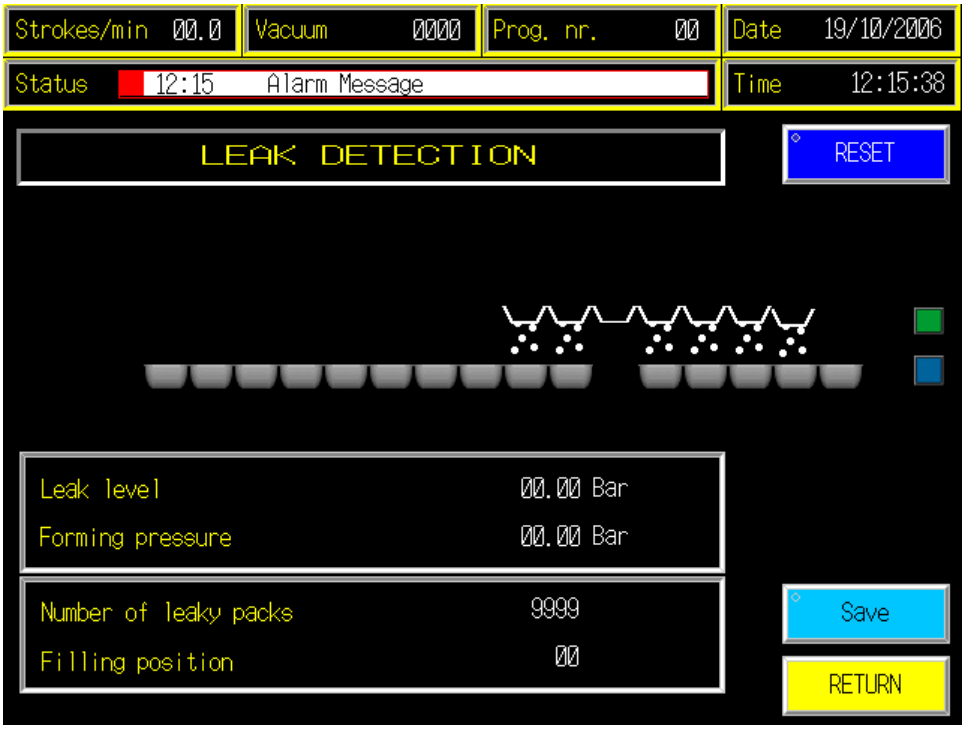


Figure 4.30 Leak detection

The machine can be supplied with leak detection in the forming station. Leak detection works together with the filler synchronisation. Upon the detection of a leaking package the filling signal to the filler is prevented so no product is filled into it.

The sensitivity can be adjusted with the leak level, the lower this value the higher the sensitivity.

Also the filling position has to be set. The input value has to be the number of strokes between forming chamber and filler position, with the countstarting at the first stroke after the forming station.

The value of the **set points** can be changed by pressing the numbers. A numeric keypad (Figure 4.6) will appear, fill in the desired settings, press enter, now the numeric keypad will disappear and the value for the SP has changed.

*Optional function!

4.4.12 Traject control*

This menu is accessed by pressing the ‘TRAJECT CONTROL’ button in the main menu (see Figure 4.31)

Figure 4.31 Alarm History

Traject control is a special option in the RE20 to control the packages all through the machine It starts at the forming station in combination with “Leak detection” (see Figure 4.30).

In this menu the positions for filler and sealing station has to be set, the input value has to be the number of strokes between forming chamber and filler position, and forming chamber and sealing station. The count starts with the first stroke after forming station.

This function is only active if button “Traject Control” is activated, (lights up in green color).

If activated, the filler signal will be blocked when a leaking pack is at the filler position to prevent filling and the sealing station will only seal the pack. The pack will not be vacuumed and no gas will be injected.

***** Optional

4.4.13 Vacuum Settings

This menu is accessed by pressing the 'VACUUM SETTINGS' button in the main menu (see Figure 4.32)

Figure 4.32 vacuum settings

Here you can change all vacuum settings for sealing station.

Switch point vacuum: =The vacuum pressure switch level in **mbar** for machine operation. 0 mbar is absolute vacuum, which means a pressure of ~1013 mbar below atmosphere pressure.

Vacuum time: =Extra time after switch point vacuum is reached. This will be used in combination with switch point vacuum if selected for vacuum sensor and time in operation menu.

Switch point gas: =The gas pressure switch level in **mba**r that is injected into the package. Only used for gas packages. The higher the number, the higher the gas pressure into the package.

Gas time: =Extra time after switch point gas is reached. This will be used in combination with switch point gas.

Switch point pre/fine: =This is used with a two way central vacuum system.

Control time vacuum: =If the vacuum pressure does not reach the switch point vacuum level within this time, the machine will give an alarm and stop.

Control time gas: =If the gas does not reach the achieved pressure within this time, the machine will give an alarm and stop.

The value of the **set points** can be changed by pressing the numbers. A numeric keypad (Figure 4.6) will appear, fill in the desired settings, press enter, now the numeric keypad will disappear and the value for the SP has changed.

Press **Save** to store the settings in the current program.

Press **return** and the screen goes back to the previous menu.

4.4.13.1 Vacuum Graphic

This menu is accessed by pressing the 'VACUUM GRAPHICS' button in the vacuum settings menu (see Figure 4.33)

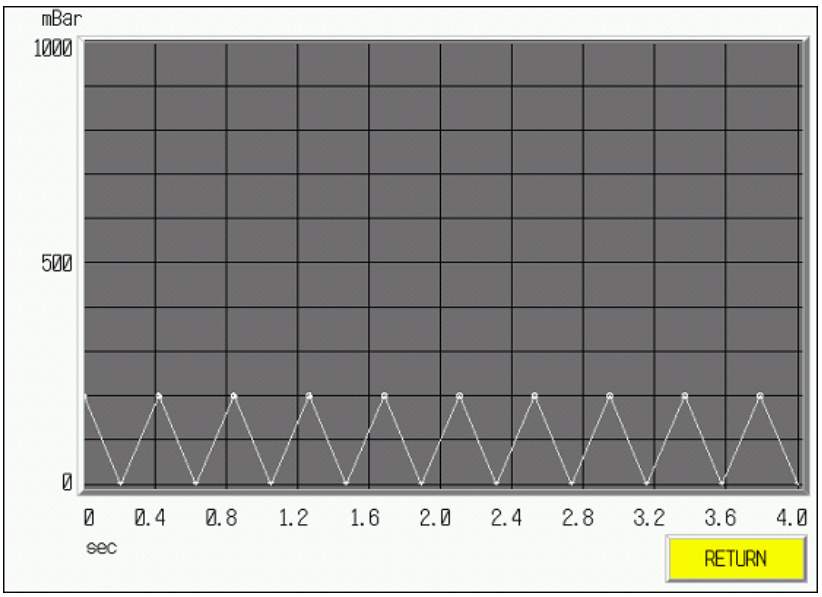


Figure 4.33 Vacuum Graphic

This screen shows you a real time vacuum curve of each vacuum and gas process.

Press button **return** and the screen goes back to the screen vacuum settings.

4.4.13.2 Vacuum Trends

This menu is accessed by pressing the 'VACUUM TRENDS' button in the vacuum settings menu (see Figure 4.34)

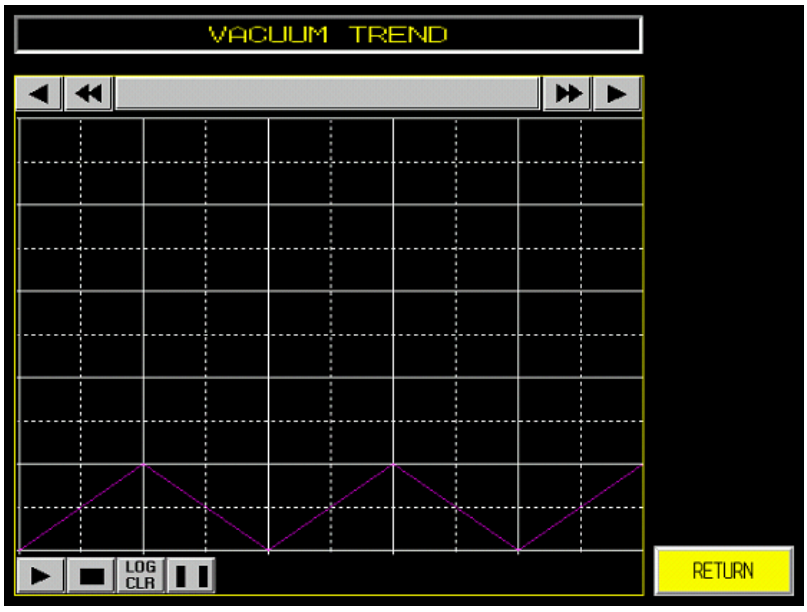


Figure 4.34 Vacuum Trends

This screen shows you a real time vacuum curve and a stationary curve. With the arrows you can look back at the vacuum characteristics.

Press button **return** and the screen goes back to the screen vacuum settings.

4.4.14 Vacuum times

This menu is accessed by pressing the 'VACUUM TIMES' button in the main menu (see Figure 4.35)

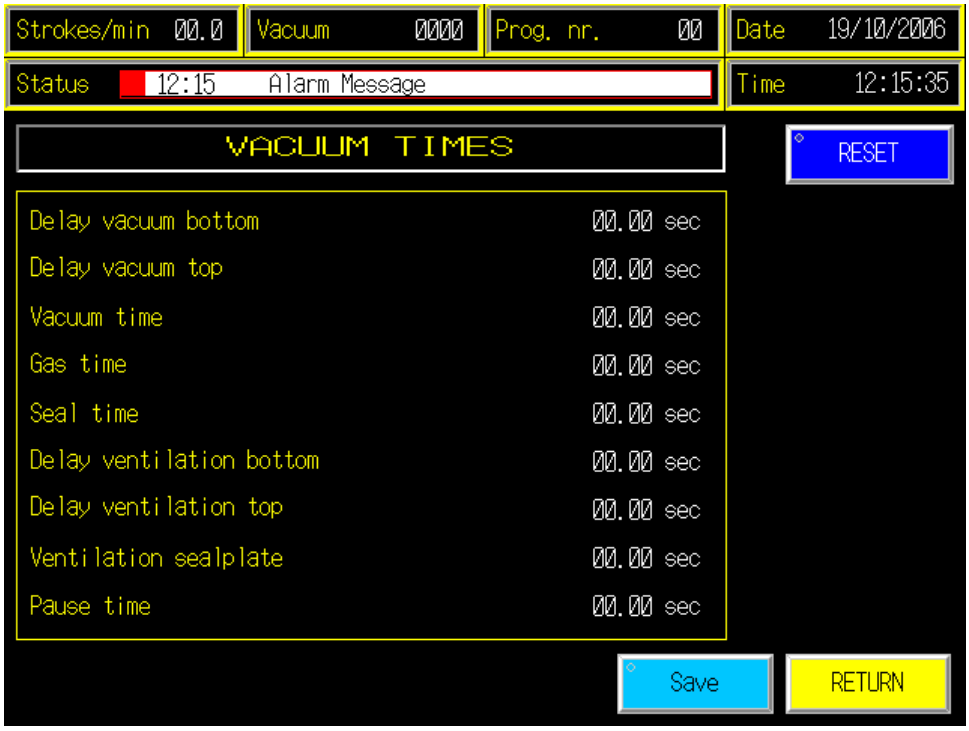


Figure 4.35 Vacuum times

This screen shows you all time settings for the vacuum chamber (seal station).

Delay vacuum bottom: = Waiting time before the bottom vacuum start its process.
Delay vacuum top: = Waiting time before the top vacuum start its process.
Vacuum time: = Extra time, starts after the vacuum switch point is reached.
Gas time: = Extra time, starts after the gas switch point is reached.
Seal time: = Time that the seal plate is active.
Delay ventilation bottom: = Waiting time before the bottom ventilation valves opens.
Delay ventilation top: = Waiting time before the top ventilation valves opens.
Ventilation seal plate: = Time needed to ventilate the membrane for the sealing plate.
Pause time: = Process pause time beginning after the forming process. This enables the possibility to synchronize the machine speed, for example, with a conveyor for product supply.

The value of the **set points** can be changed by pressing the numbers. A numeric keypad (Figure 4.6) will appear, fill in the desired settings, press enter, now the numeric keypad will disappear and the value for the SP has changed.

Press **Save** to store the settings in the current program.

Press **return** and the screen goes back to the previous menu.

4.4.15 Cross Cutting Times

This menu is accessed by pressing the ‘CROSS CUTTING TIMES’ button in the main menu (see Figure 4.36)

Figure 4.36 Cross Cutting Times

This screen shows you all time settings needed for the cross cuttings process.

4.4.15.1 Guillotine

This cutting process can be divided into 3 steps with a delay time in between.

Cross cutting up: = Step 1; Cutting support goes up.
Delay 1: = Waiting time before step 2 will start.
Cutting time: = Step 2; Knife action time.
Delay 2: = Waiting time before step 3 will start.
Cross cutting down: = Step 3; Cutting support goes down, after this time the film transport can start with the next transport cycle.

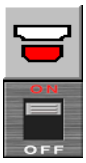
4.4.15.2 Punch

Operate the “change of punch anvil” by pressing the “punch up/down”button.

Remark: its only posible to operate this function with covers closed.

Delay cross cutting up: = Waiting time before cross cut process will start.
Cross cutting up: = Within this time the pressure bar will going up.
Cross cutting down: = Pressure bar will go down, after this time the film transport can start with the next transport cycle.

Punch up/down button is only visible when in configuration one or more punches are selected and when in configuration/"invert sensors (see figure" the button has been released.



Button "change of punch anvil" has been released.

Button "change of punch anvil" is not released.

The value of the **set points** can be changed by pressing the numbers. A numeric keypad (Figure 4.6) will appear, fill in the desired settings, press enter, now the numeric keypad will disappear and the value for the SP has changed.

Press **Save** to store the settings in the current program.

Press **return** and the screen goes back to the previous menu.

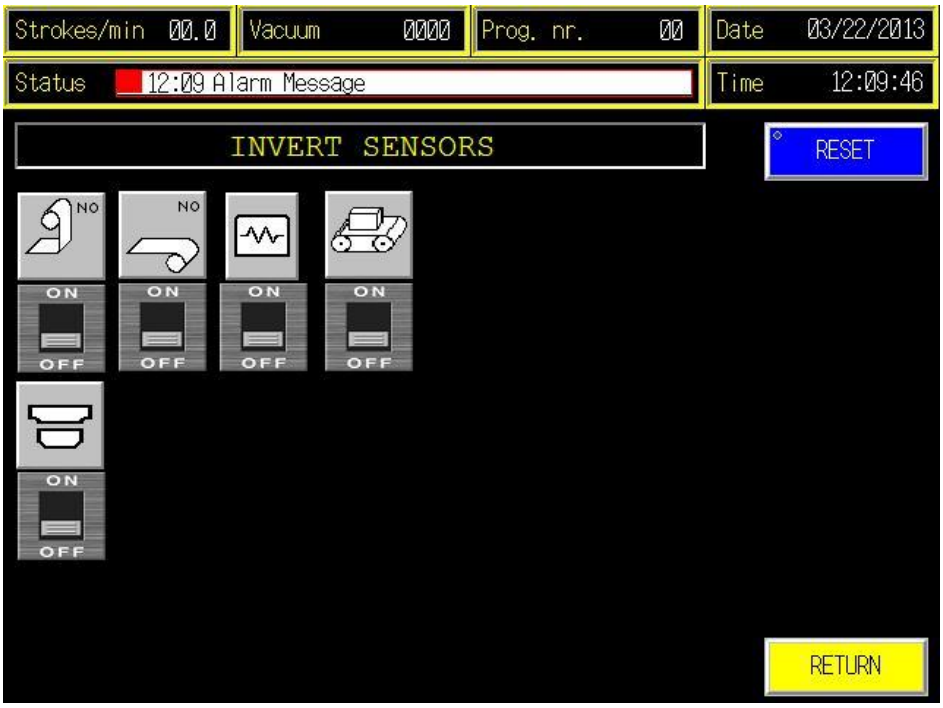


Figure 4.36a Invert sensors screen

4.4.16 In-liner*

This menu is accessed by pressing the 'INLINER' button in the main menu (see Figure 4.37)

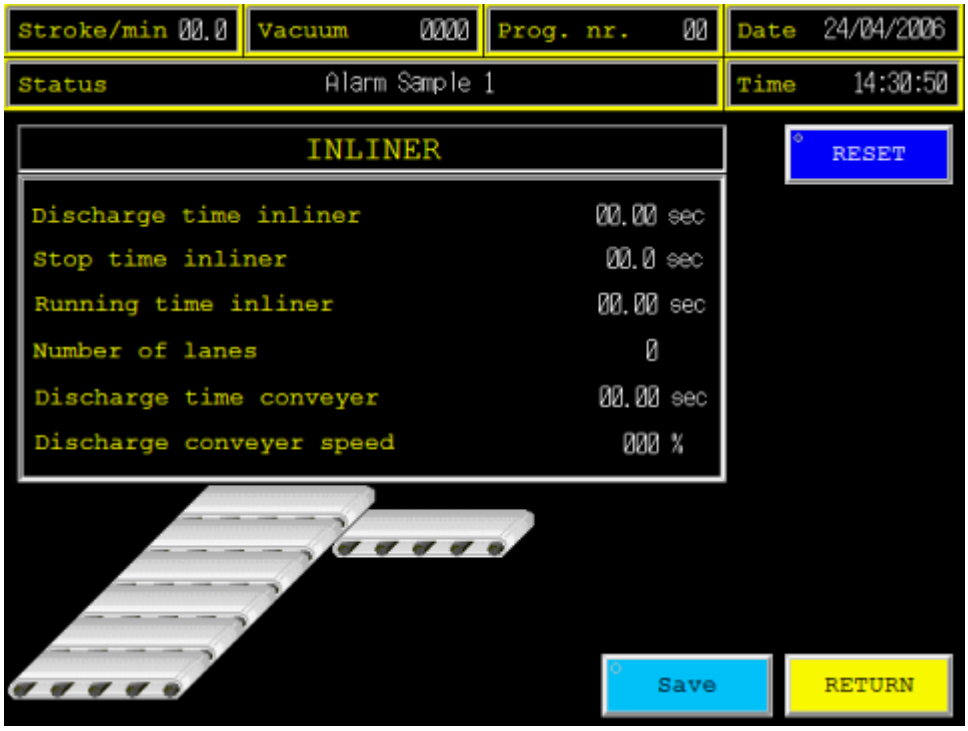


Figure 4.37 In-liner

This screen shows you all time settings needed for the in-liner process.

Discharge time in-liner: = Running time overall When there are no packages to detect or photocell is out of order, the lanes will run for this set time.
Stop time in-liner: = Pause time between each lane.
Running time in-liner: = Lane running time after packaging detection by the photocell mounted at the end of the lanes.
Number of lanes: = Number of lanes mounted in the machine.
Discharge time conveyor: = Running time that discharge conveyor will run.
Discharge conveyor speed: = Running speed for the discharge conveyor.

You can change the value of the **set points** by pressing the numbers for change, a numeric keypad (Figure 4.6) will appear, fill in the desired settings, press enter, now the numeric keypad will disappear and the value for the SP has changed.

Press **Save** to store the settings in the current program.

Press **return** and the screen goes back to the previous menu.

***Optional function!**

4.4.17 Servo Cross Cutting*

This menu is accessed by pressing the 'SERVO CROSS CUTTING' button in the main menu (see Figure 4.38)

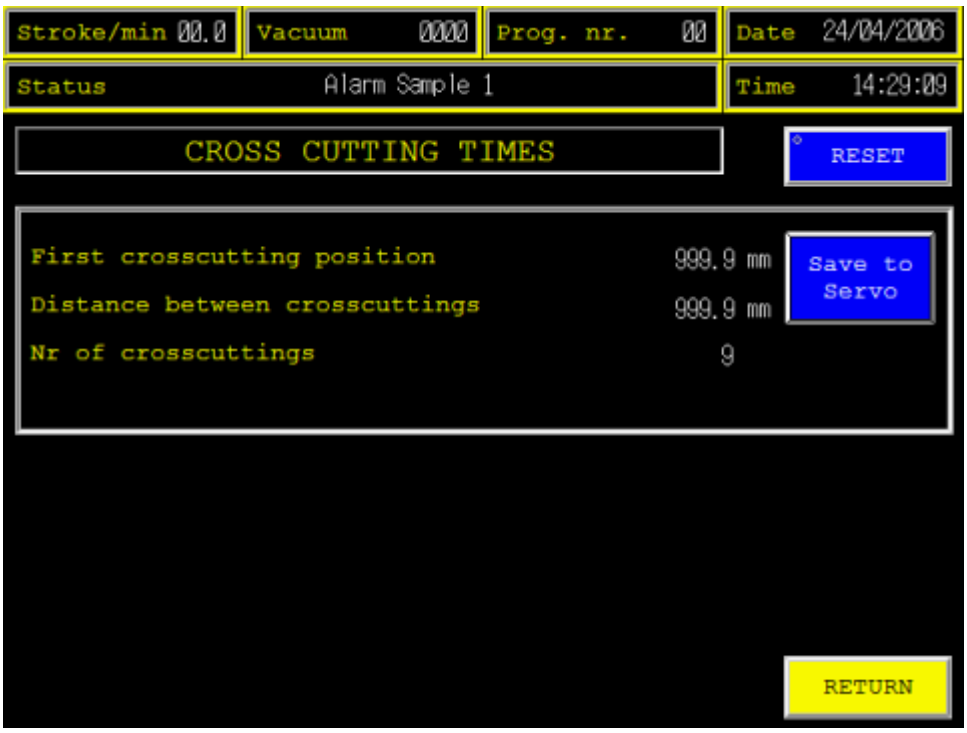


Figure 4.38 Servo Cross Cutting

This screen shows you all settings needed for the servo cross cuttings.

First crosscut position = Distance in mm. between zero point (sensor) to the first cutting position.

Distance between cross cuttings: = Distance in mm. between each cross cut.

Nr of cross cuttings = Number of cross cuts in one stroke.distance before film advance stops.

With button "**Save to Servo**", the data will be stored into the current program.

***Optional function!

4.4.18 Complete cutting

This menu is accessed by pressing the ‘SERVO CROSS CUTTING’ button in the main menu (see Figure 4.39)

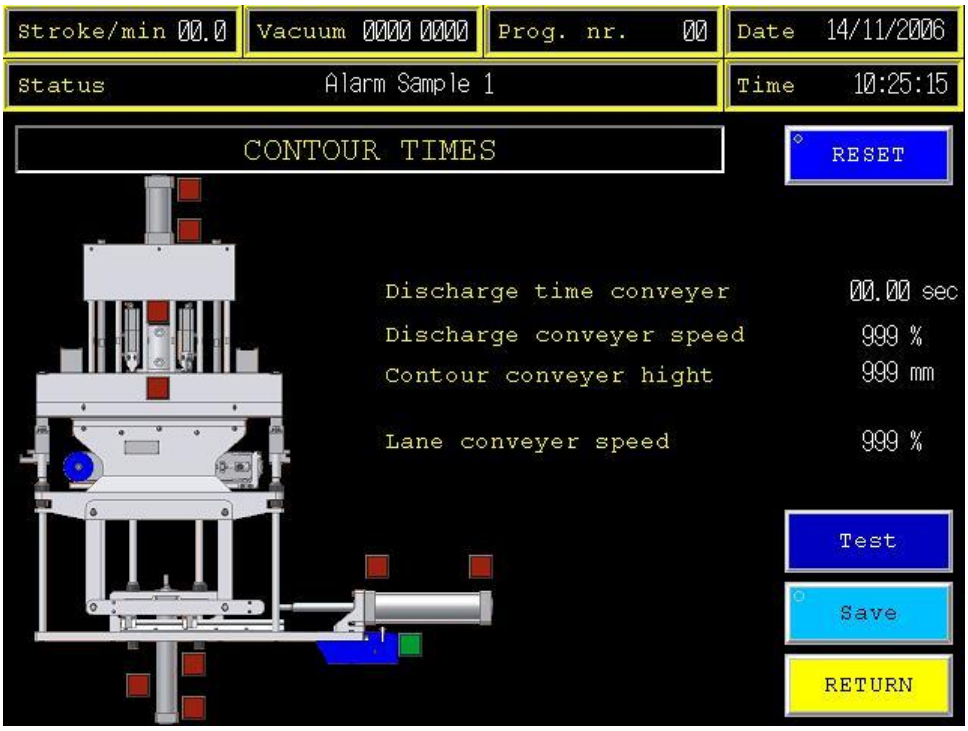


Figure 4.39 Complete Cutting

This screen shows you all settings needed for the complete cutting device.

Discharge time conveyor : The running time for the integrated conveyor after film advance. Can be set here for what is optimal during process This ensures that all products are out of the complete cutting device.
Discharge conveyor speed : The speed for the integrated conveyor after film advance.
Contour conveyor height : The height of the integrated conveyor can be changed to be level with the discharge conveyor.
Lane conveyor speed : Speed for the discharge conveyor.
Test : Complete cutter makes a complete cycle to control its functions.

All red LEDs indicate their corresponding position of the cylinder movements.

The green LED indicates if the discharge conveyor is in place. When the discharge conveyor is not in place the machine is not able to start.

The working of this complete cutter is described in paragraph 3.10.1

Press **Save** to store the settings in the current program.

Press **return** and the screen goes back to the previous menu.

4.4.19 Alarms

This menu is accessed by pressing the ‘ALARMS’ button in the main menu (see Figure 4.40)

Figure 4.40 Alarm History

This screen shows the last 1000 alarms with a time span.

4.4.20 Maintenance

This menu is accessed by pressing the ‘MAINTENANCE’ button in the main menu (see Figure 4.41)

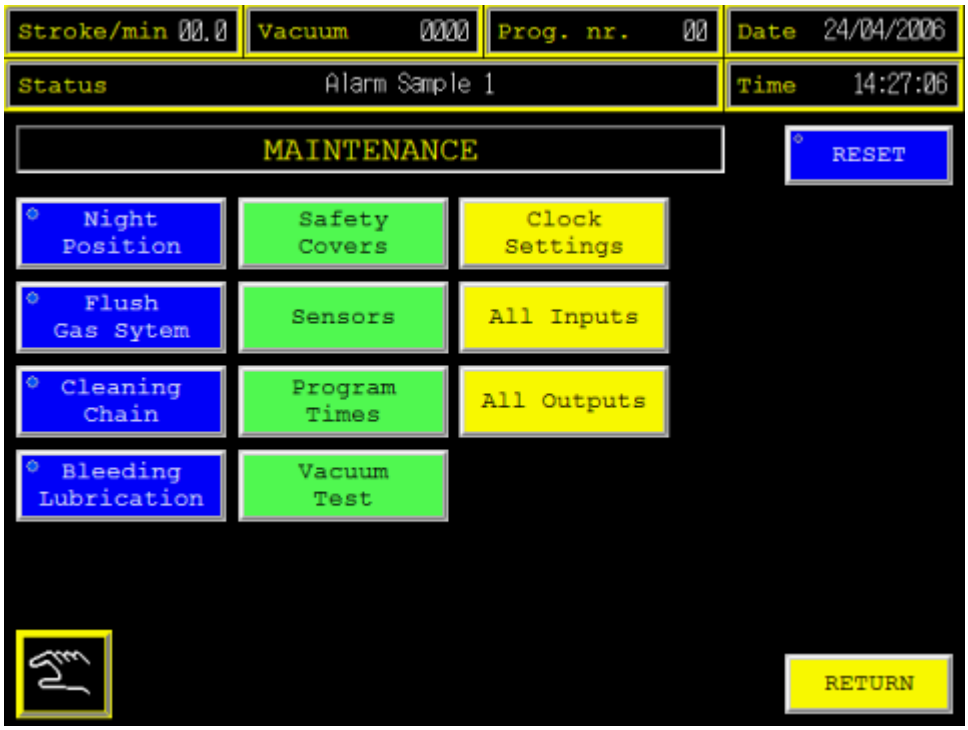


Figure 4.41 Maintenance

This scr

Night position: = The die sets close and the temperature goes to 30°C. to prevent condensation and cleaning water in the die sets (use this function after production). Can also be activated in the Operator submenu (see Paragraph 4.3.1)

Flush gas system: = This function opens the gas valve to flush the gas tank (use this function when the gas tank has been disconnected).

Cleaning chain: = This function activates the chain cleaning program (this is a option).

Bleeding lubrication: = By pressing this button it repeatedly activates the chain lubrication cycle to get rid of air in the oil tubes.

Press button **return** and the screen goes back to the Main Menu.

4.4.20.1 Chain cleaning

When the machine is operating in a very wet and/or salty area, the machine can equipped with a Chain Cleaning System, therefore a cleaning program is added to the software. When this system is installed into the machine this function will start by activating “Cleaning chain” button in the maintenance menu.
The program sequence will take 10 minutes for the total cleaning cycle and will be described into next 5 steps:

Step 1:	Die sets close and chain transport starts running in low speed.
Step 2:	Chain washing starts and will run for 2.5 minutes.
Step 3:	After washing, the program will start to dry the chain for 5 minutes with compressed air.
Step 4:	Chain will be lubricated for 2.5 minutes after drying cycle.
Step 5:	Dies will stay closed, program will automatically select the night position after the cleaning cycle.

At any moment “Chain Cleaning Cycle” can be interrupted by deactivating the function button in maintenance menu. In this case the die sets open to their lower position and the machine will be ready for operation.

BE AWARE! When “Chain Cleaning Cycle” has not finished its complete cycle, the chain is not lubricated enough, so only stop cleaning cycle when absolutely necessary.

4.4.20.2 Vacuum test

This menu is accessed by pressing the 'VACUUM TEST"' button in the maintenance menu (see Figure 4.42)

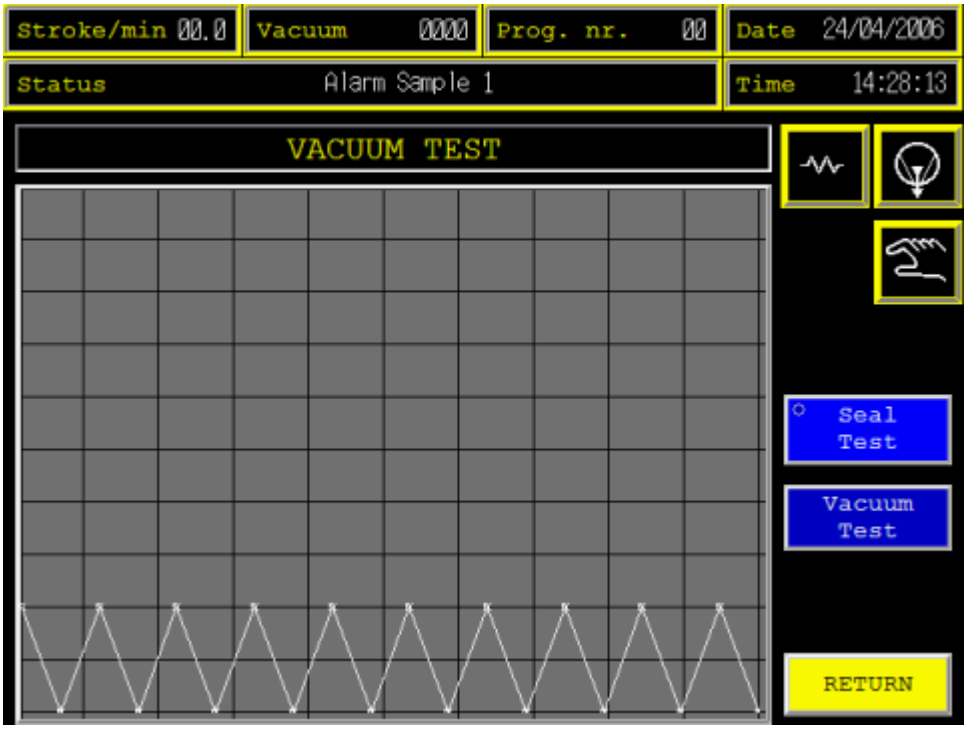


Figure 4.42 Service

Here the vacuum process is shown in a graphic.
Machine has to be set into manual mode,  and also the pump must be in run.

Touching the "vacuum test" button for 1 sec. each next step can be executed:
The vacuum test is divided into 6 steps.

Step 1:	Die systems close
Step 2:	Air intake valves close
Step 3:	Vacuum valves open > vacuum in sealing station
Step 4:	Vacuum valves close > vacuum test
Step 5:	Air intake valves open
Step 6:	Die systems open

Touching the "Seal test" button during step 4 gives a good picture about the condition of the sealing membranes and the adjustment of the sealing die.

Touching the "Return" button gives entrance to the maintenance-screen.

4.4.20.3 Service

This menu is accessed by pressing the ‘SERVICE’ button in the main menu (see Figure 4.43)

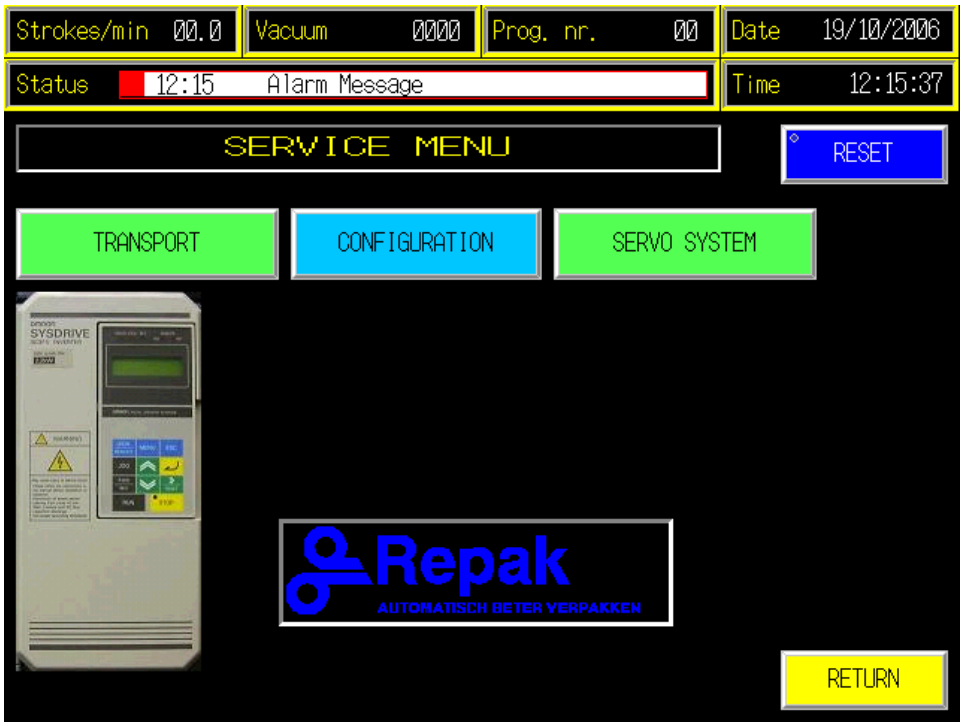


Figure 4.43 Service

If you press **Transport, Configuration** or **Servo System** button in **Service menu**, you will be asked for a password, type the right password to enter the other menus.
After you fill in the right code press enter, it will go back to password screen, press ok and you are in the relative menu.

Press button **return** and the screen goes back to the Main Menu.

4.5 Access code

The ‘Access code’ button enables the user to input a code for access to the Main Menu, where changes can be made to the machine and the packaging program settings. This code may be used only by staff authorised to change the settings.

Contents

5 Operating the machine

This chapter describes how the machine should be used. Use of the control panel has already been described in Chapter 4. The present chapter goes into greater detail regarding the steps to be taken to get the production process running and how to stop it.
For each part of the machine the user is referred to the general safety regulations (see Chapter 2) and specific recommendations that are given. Anyone working with the machine is expected to study and adhere to these recommendations. This chapter deals with the following matters in the order given below:

- Using the emergency switch (see paragraph 5.1)
- Preparations for the production process (see paragraph 5.2). The various start-up procedures made clear in a staged plan.
- Placing the lower and top film and how the film unwinds work (see paragraph 5.3)
- Adjusting the photocell for packaging with printed top film (see paragraph 5.4)
- Procedures for turning the machine off (see paragraph 5.6)
- The position assumed by the user (see paragraph 5.7)
- Finally a number of tips for improving the machine's energy consumption (see paragraph 5.8).

5.1 Preventive measures and safety instructions

A wide-ranging description of the preventive measures and safety instructions can be found in Chapter 2. The most important instructions for using the machine are repeated again below.

5.1.1 Instructions

- Everyone working with machine must first read this manual.
- Observe the warnings contained in this manual and posted on the machine.
- Always follow the factory instructions.
- In dangerous situations always press the emergency switch immediately. You can find more information about the functioning of the emergency switch in paragraph 5.2.
- Once the emergency switch has been pressed, the machine may not be turned on again until the unsafe situation has been corrected.
- Before starting to use the machine place all the protective covers and side plates in their correct positions.
- Use lifting gear when moving heavy components (mass > 25 kg), such as rolls of film, sealing or forming equipment.
- The bolts of the seal/form top parts first have to be removed before mounting the levers with the roller to the top part. After positioning the top part back, first the rollers have to be dismounted from the top part, before fixing the bolts again.
- Only an operator may perform activities in the loading area, as indicated in Figure 2.1 (figure accompanying description of the machine).
- Dispose of used oil in a responsible manner. Such oil should be placed with chemical waste, as instructed in government recommendations.
- Remains of film should be placed in the appropriate waste container as instructed in government recommendations.
- Observe the rules of hygiene when working with foodstuffs.
- When turning off the main switch (see Figure 2.2) secure it with a lock in order to prevent unforeseen switching on or off by other persons.
- Additional equipment such as labellers, filling machines, printing equipment etc. usually have their own power supply. This should be switched on and off separately during maintenance work. Use the manuals supplied with these machines.
- Always observe the safety guidelines contained in the manuals for the supplementary equipment.

- The next lubricants for the machines must be used:

Lubrication of Transportchain;	**Bell Ray No Tox Food Grade Waterproof Chain Lubricant 2 OL Vat**
Vacuumpump Busch;	**Bush VM 100 (Öl nach DIN 51506,Schmierölgruppe VM)**
Grease lubricant (Liftingsystem and Vario die cutter);	***Anderol 783-2 food grade grease, Anderol Item* #ANO7832039 Canada**

5.1.2 Emergency switch

When danger threatens, always press the emergency switch immediately. The emergency switch is on the front of the control panel and can be recognized by its red color with a yellow edge below (see Figure 5.1). There may also be emergency switches at other points on the machine. You should familiarise yourself with their locations.

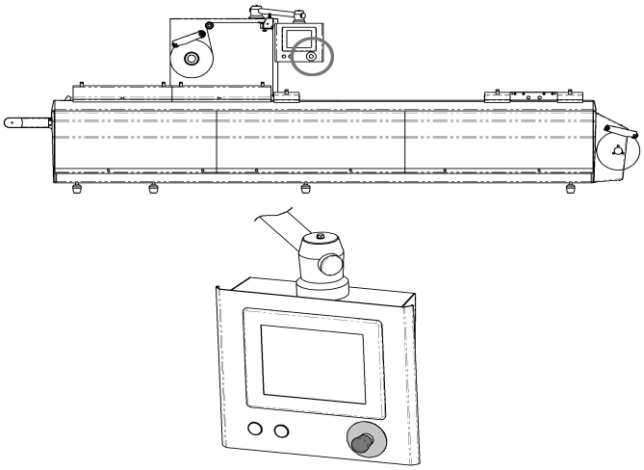


Figure 5.1 Emergency switch

When the emergency switch is pressed, The machine process is immediately halted and all equipment opens. Note: the cylinders of the lifting systems and the film punch keep their position when the emergency switch is activated! Once the dangerous situation has been corrected, the machine can be re-set by turning the red button of the emergency switch to the right. Then re-start the machine, using the start-up procedure specific for after an emergency stop (see paragraph 5.2.5).

	WARNING
	When the emergency switch halts the machine. The machine main power is not switched off

5.2 Turning on the machine

Staged plans have been drawn up for turning the machine off and on. The plans include all the actions that have to be performed for turning the machine on. The machine has 2 operational modes:

- Automatic operation. The machine repeats the packaging process continuously and stops when a set number of strokes have been performed or the process is terminated manually.
- Manual film infeed. This mode is used when a new roll of bottom or top film is being put in position. In this mode only the chain transport is active.

The staged plans are divided up according to step number, description of action and remarks. The remarks note the consequences of an action or the relevant safety recommendations.

	**WARNING**
	Never leave the machine unattended when turned on.

5.2.1 General points to be checked

Table 4 states general points that have to be checked before the machine is turned on. This helps prevent problems in starting up and running the machine.

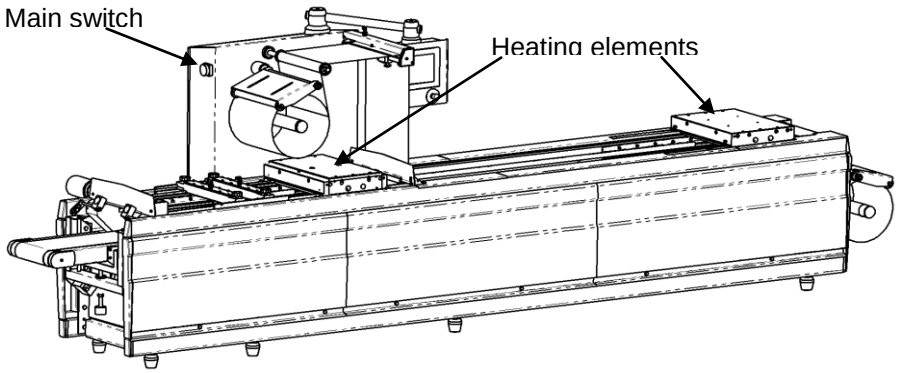
Table 4 Points to check when turning the machine on

No.	Action	Remark
1.	Format parts must be in place.	Check the connections for the format parts.
2.	Cover plates must be in place.	Each plate has its own unique place and can only be positioned in a certain way.
3.	Check cooling water supply: the tap must be turned on.	Open external supply taps if necessary.
4.	Check compressed air supply: the tap must be turned on.	
5.	Check protective gas supply: the tap must be turned on.	
6.	Check that there is film present.	Never lift the rolls of film without help. To position the film: see paragraph 5.3
7.	The waste film removal system must be properly aimed.	Adjustable by the technical department.
8.	Carry out a visual and manual check to see that the plugs and other couplings are properly fitted in the sockets.	-
9.	Adjust the height of the conveyor belt to suit the packaging.	Adjust the height using the rotating knob under the belt. Also use the lock nut.
10.	Activate the required modules and peripherals via the control panel.	Description in paragraph 4.
11.	Ensure that the peripherals are ready and, if necessary, are connected up.	See also manuals supplied with peripherals.
12.	Is the control panel displaying error messages?	First correct the errors. For the meaning of the error messages see paragraph 1.1.

5.2.2 Automatic operation

This paragraph describes how an automatic packaging process can be started up (see Table 5). However the procedure does not apply if the machine has been turned off in an unconventional manner, e.g. by using the emergency switch. Other procedures apply when starting up the machine in this situation. For this, see paragraph 5.2.5.

Table 5 Starting up automatic operation

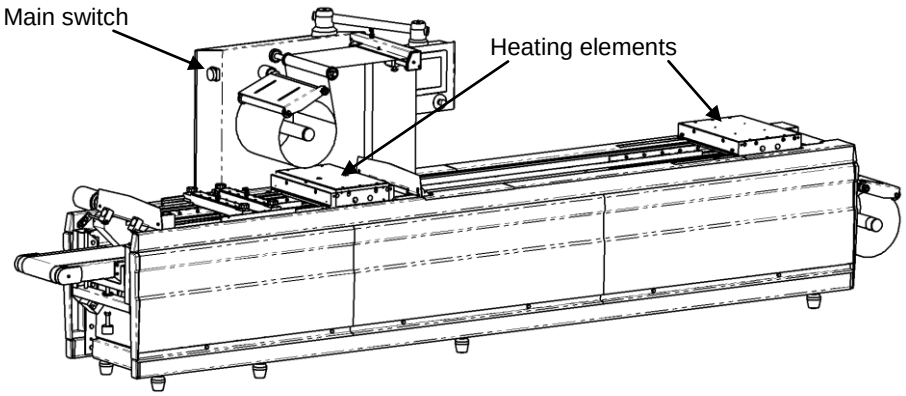


No.	Action	Remark
1.	Check that no-one else is working on or with the machine.	Go on to the next stage only when the machine is free.
2.	Go through the steps indicated in Table 4 (see paragraph 5.2.1.)	-
3.	Turn the main switch on, position, “1”.	See Figure 5.2,
4.	Be sure that manual function is deactivated	Deactivate this button 
4.	Using the operator menu, turn the heating elements on and allow the machine 15 minutes to come up to temperature.	Use the button on the control panel: 
5.	Use the main menu to turn the vacuum pump on.	Use the button on the control panel: 
6.	Re-set the machine with the button on the touch screen or use the stop button.	Status line indicates ‘ready to start”
7.	Use the function buttons to turn on the options of the machine which required, such as the photocell, the forming station and the cross cutting equipment etc.	The buttons are in the operator menu, such as:  
8.	Turn on any peripherals required such as the filler, labellers and the waste film removal equipment.	Use the button on the control panel: 
9	Choose a program for the product to be packed.	See paragraph 4.3.2 for the choice of product.
10	Any other process settings can be made via the touch screen.	-
12	Now start up the process using the starting button on the control panel.	The packaging process starts up.

5.2.3 Film infeed

The staged plan for the Film infeed operational mode is described in Table 6.

Table 6 Start film indeed

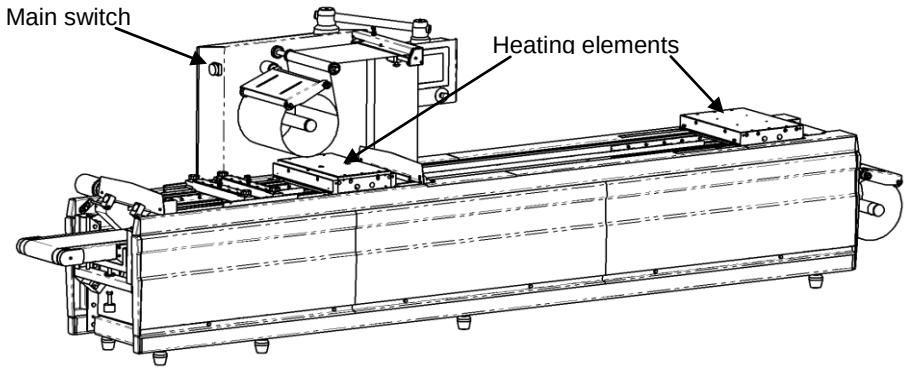


No.	Action	Remark
1.	Check that no-one else is working on or with the machine.	Go on to the next stage only when the machine is free.
2.	Go through the steps indicated in Table 4 (see paragraph 5.2.1.)	-
3.	Turn the main switch on, position, “1”.	See Figure 5.2,
4.	Using the operator menu, turn the heating elements on and allow the machine 15 minutes to come up to temperature.	Use the button on the control panel: 
5.	Use the main menu to turn the vacuum pump on.	Use the button on the control panel: 
6.	Re-set the machine with the button on the touch screen.	Status line indicates ‘single stroke’.
7.	Put the machine in manual mode	Use the button on the control panel 
8.	Now start up the process using the film in feed button and/or button on the control panel.	Use the button on the control panel or machines in feed side 
9.	The film infeed process starts up.	

5.2.4 Single stroke

The staged plan for the Single Stroke operational mode is described in table 7.

Table 7 Starting up single stroke



No.	Action	Remark
1.	Check that no-one else is working on or with the machine.	Go on to the next stage only when the machine is free.
2.	Go through the steps indicated in Table 4 (see paragraph 5.2.1.)	-
3.	Turn the main switch on, position, “1”.	See Figure 5.2,
4.	Using the operator menu, turn the heating elements on and allow the machine 15 minutes to come up to temperature.	Use the button on the control panel: 
5.	Use the main menu to turn the vacuum pump on.	Use the button on the control panel: 
6.	Re-set the machine with the button on the touch screen.	Status line indicates ‘single stroke’.
7.	Use the function buttons to turn on the parts of the machine required, such as the photocell, the forming station and the cross cutting equipment etc.	The buttons are in the operator menu, such as:  
8.	Turn on any peripherals required such as the filler and the waste film removal equipment.	Use the button on the control panel: 
9.	Choose a program for the product to be packed.	See paragraph 4.3.2 for the choice of product.
10.	Any other process settings can be made via the touch screen.	-
12	Now start up the process using the start button on the control panel.	The machine makes a single stroke.

5.2.5 Re-starting the machine

There are four situations whereby the machine has (been) stopped and a re-start is possible. The stages to be gone through to re-start the machine depend on the way the production process was interrupted. To re-start the machine appropriately, follow the staged plan applicable to the type of interruption that has taken place.

5.2.5.1 'Machine stop' button pressed

Once the 'stop' button on the control panel has been pressed, the machine stops, the forming die remains closed and its parts remain active. The program settings also remain active (stop "LED" will flash). The process can be resumed by pressing the 'start' button. To stop the program, press 'stop' button twice. (stop "LED" stays on)

5.2.5.2 Failure in the safety circuit

All failures are displayed on the touch screen: the type and location of the failure is indicated. Since safety is in jeopardy, the cause of the failure needs first to be traced and corrected before production is continued. Chapter 7.2 gives information for correcting failures. When the failure has been corrected, press the 'reset' or 'stop' button.
To bring the machine back to ready mode, activate the 'stop' button twice with an interval of 2 sec. or more. The process can be re-started by pressing the 'start' button.

5.2.5.3 Emergency stop when a format part is closed

An 'emergency stop" when a format part is closed implies that during the forming of the underside or the sealing of the packaging an 'emergency stop' has been made. The heating and vacuum pump(s) will be shut down and the format parts stay at their current position. Since safety is in jeopardy, the cause of the failure needs first to be traced and corrected before production is continued. Then take the following steps:

- Release the "emergency switch" by turning the red button to the left. The "emergency switch" will than be in it's 'on' position.
- Press the 'reset' button or press 'stop' once.
- Turn on the heating.
- Turn on the internal vacuum pump
- Press 'stop' button twice with interval of 2 sec. or more, to initialise the die positions.
- The process can be resumed with the 'start' button.

5.2.5.4 Emergency stop during film transport

Finally there is the situation that occurs when the emergency switch is activated during film transport or halfway through a cutting process. In this situation all parts stop moving and the products to be packaged are not yet fully inside the machine. In this case take the following steps:

- Inform the technical department advising them of the cause of the problem to be solved.
- Release the "emergency switch" by turning the red button to the left. The "emergency switch" will than be in it's 'on' position.
- Press the re-set button or press 'stop' once.
- Turn on the heating.
- Turn on the internal vacuum pump.
- Press the transport button to initialise the transport movement. When transport is not initialised the background of the button will flashing in red.
- Machine is ready to run, restart the process with the 'start machine' button.

5.3 Fitting the rolls of film

The machine uses 2 rolls of film for packaging the products: a lower and an top film. First a description is given of the step-by-step procedure for fitting the bottom film and then for fitting the top film. During these procedures the cover plates must be fitted to the machine.

	WARNING	
	At each stage take care not to trap any body parts.	

5.3.1 Bottom film

A step-by-step description of how to fit a new roll of bottom film is given in table 8. The main switch must be turned on but no packaging process may be performed.

Table 8 Staged plan for fitting the bottom film

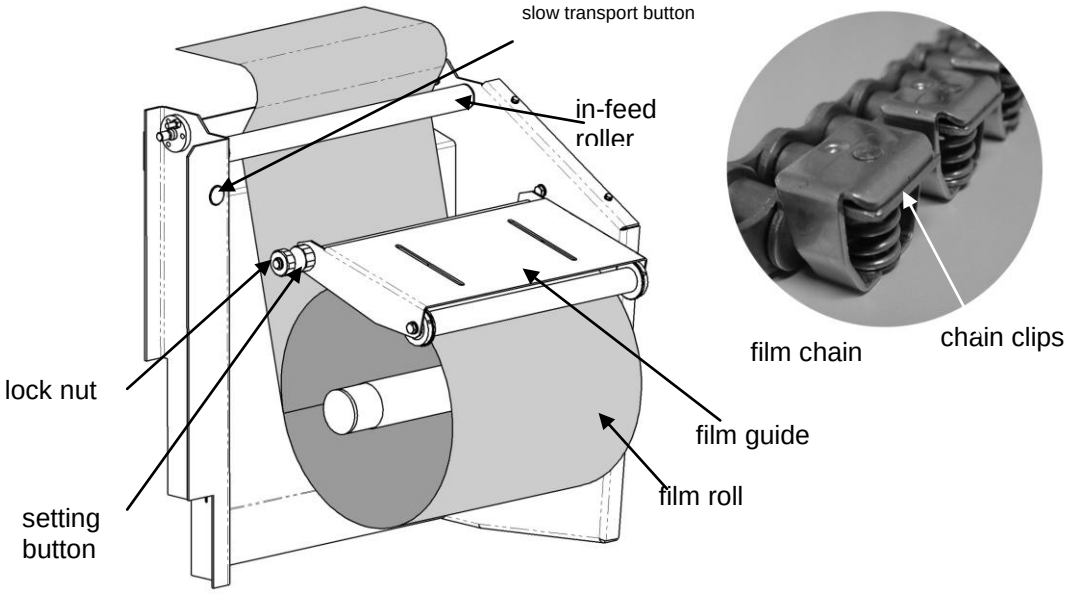


Figure 5.5 Bottom film with film chain

No.	Action	Remark
1.	Makes sure you execute all steps according to paragraph 5.2.3, put machine in film infeed mode	Via the operator menu.
2.	Raise the film guide against the infeed roller.	Make sure it does not fall back.

3.	Place the roll of film on its shaft.	See Figure 5.5. Get help with lifting the roll of film.
4.	Replace the film guide on the film roll.	-
5.	Line up the film roll.	Use the setting button (see Figure 5.5) and fix it with the lock nut. Make sure that the setting button does not turn while being locked.
6.	Weigh the film guide down, if needs be, using extra weights.	Use help when lifting heavy weights.
7.	Place the film along the film rollers.	For the sequence, see Figure 5.5. Roll out sufficient film.
8.	Place the film in the chain clips.	Draw the film tight when positioning it (see illustration 5.5, bottom film).
9.	Feed the film into the machine a few strokes.	Check that the film is not running crooked in the machine. Use the button next to the film infeed roller to feed the film in slowly (see Figure 5.5).
10.	Choose the required operational mode and activate the machine.	See paragraph 5.2

Remark: Never allow the bottom film to be fed into an activated seal station without any top film. If you do, the bottom film will stick fast to the seal plate.

5.3.2 Top film

Table 9 gives a step-by-step description of how the top film should be positioned. The main switch must be turned on but no packaging process may be performed.

Avoid bumping against the projecting parts of the control cabinet by taking care during work on the top film. You should also take care that you do not cut yourself on the film since its edges can be very sharp.

Table 9 Staged plan for fitting the top film

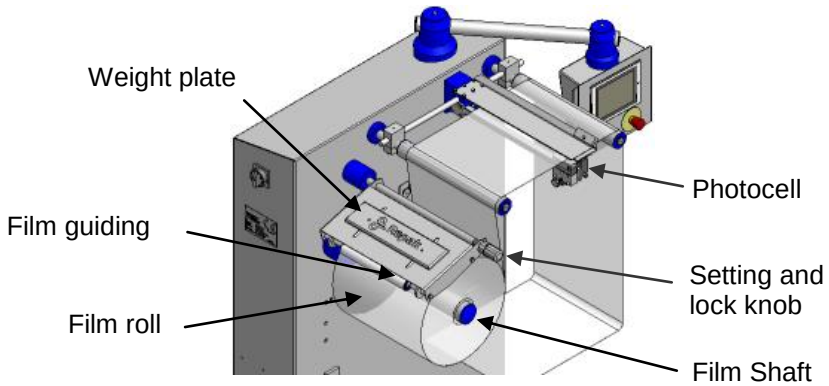


Figure 5.6 Top film

No.	Action	Remark
1.	Makes sure you execute all steps according to paragraph 5.2.3, put machine in film infeed mode	Via operator menu.
2.	Raise the film guide against the film shaft indicated.	Ensure that it does not fall down.
3.	Place the film roll on its shaft.	See Figure 5.6. Use help when lifting heavy weights.
4.	Replace the film guide on the film roll.	-
5.	Line up the film roll.	Use the setting button (see Figure 5.6) and fix it in place with the lock nut.
7.	Weigh down the film guide, if required, with extra weights.	Use help when lifting heavy weights.
8.	Position the film through the film shafts, photocell and film brake to the bottom film.	Sequence: see Figure 5.6. Roll out sufficient film.
9.	Fix the start of the top film to the bottom film with a piece of adhesive tape. Do this on the infeed side of the top film infeed shaft. Avoid making folds in tape or film.	Position printed top film in the correct position with respect to the formed bottom film. The film must be shifted approximately 5 cm in the direction of the out-feed.
10.	Allow the adhesive tape to be transported to beyond the sealing station. The top film must now be stretched tightly.	Use the transport button (figure 5.6).
11.	Perform a single stroke. The top film is now sealed to the bottom film	See paragraph 5.2.4
12.	Set the automatic film synchronisation by activating and setting the photocell if needed	See paragraph 5.4
13.	Choose the required operational mode and activate the machine.	See paragraph 5.2

5.4 Setting the photocell

The machine can be equipped with a photocell that is used for packaging with a printed top film (see Figure 5.7).

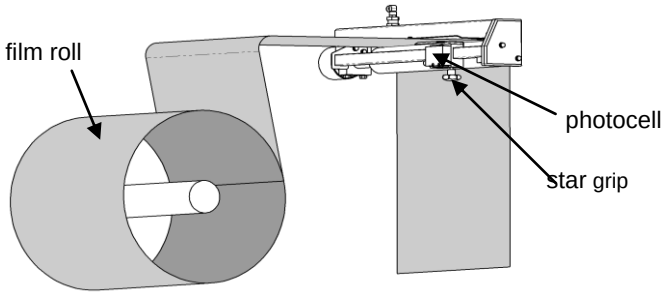


Figure 5.7 Setting the photocell

During transport of the film the top film passes a photocell that detects marks on the film. Usually a top film packaging length is slightly shorter than the stroke length (see also paragraph 3.2.9). The top film is stretched into register by a film brake so that the top film always can be positioned above the package. As soon as the photocell detects the mark during transport, the brake will be activated.
The extent of the correction is determined by the measurements taken by the photocell.
This means that the photocell needs to be appropriately adjusted.
Follow the adjusting steps below:

- Ensure that both upper and bottom films are placed in the machine as described in paragraph 5.3.
- Turn the photocell on via the touch screen.
- Loosen the star grip (see Figure 5.7) and aim the photocell at the marking across the machine. Set the position by tightening the star grip again.
- Calibrate the photocell see paragraph 5.5.
- After tensioning the top film by rolling it up manually, let the machine run a few strokes, check the position of printed top film and re-position the photocell if necessary. Re-position to the right for braking later, or to the left for braking earlier.
- Machine is ready for run.

5.5 Calibrate the photocell

The photocell must be calibrated by using the following steps (see Figure 5.8)

Setting the photocell for mark and background,

A two-step setup procedure adjusts the switching threshold and the LIGHT/DARK mode. Using the procedure below, the sensor output is set to be ON when a mark is detected.

Output ON state acquisition (MARK)

Place the target mark into the emission spot and press the MARK button until the green LED turns OFF.

The sensor acquires the switching point for the red and green emissions; don't move the mark during this phase.

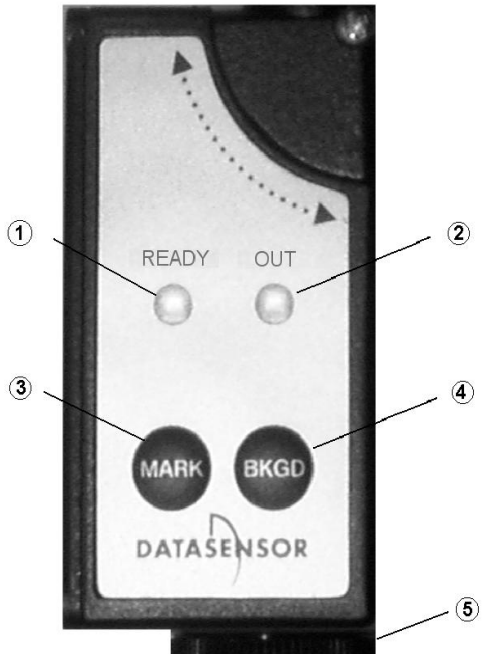
Output OFF state acquisition (BKGD)

Place the background into the emission spot and press the BKGD button; the green LED blinks once.

The sensor acquires the switching point for red and green emissions; don't move the background during this phase.

If the green LED lights permanently ON, a safe operation has been obtained; if it flashes at a low rate the setup procedure has failed due to insufficient contrast; repeat the procedure from the beginning.

Operating distance 9 mm max.



1. Ready led (green)
2. Output led (red)
3. Mark (button)
4. Background (button)
5. Lens

Figure 5.8 Photocell

5.6 Turning the machine off

Depending on the time that the machine needs to be shut down, various procedures apply as regards turning it off.
In Table 10 a distinction is made between three shutdown periods:

- Turning off for a brief period, e.g. to replace film, means that the machine is on standby.
- Turning off for longer periods, e.g. in order to carry out maintenance work on the machine.
- Complete shutdown of the machine, e.g. a break in the production process of more than 8 hours.

Table 10 Machine shutdown procedures

No.	Brief interruption	Lengthy interruption	Complete shut-down
1.	Stop the machine with the 'stop machine' button on the control panel.		
2.	-	Stop the vacuum pump via the touch screen.	
3.	-	Stop the waste film disposal unit via the touch screen.	
4.	-	-	Turn off the heating via the touch screen.
5.	-	-	Set the main switch to "0"
6.	-	-	Close off compressed air, cooling water and gas supplies.

5.7 Operating the machine while it is running

If the machine is running the operator has a number of control tasks. Despite the presence of a safety system, it is desirable that the entire process should be monitored. Then if a failure occurs, corrective measures can be taken quickly and the cause of the problem is easier to trace.
A number of important points on the machine are the film rolls, the formed packages, the filled packages and the waste film removal unit.

- The lower and top films must be firmly stretched and more or less equal lengths must be clamped in the chain on both sides.
- The formed packages must have identical shapes.
- Filled packages must also have identical shapes and may have absolutely no leaks. Samples should be checked to see if vacuum-treated packages are indeed properly closed off.
- Remains of film out of reach of the waste film removal unit should be removed once the machine has been shut down.

The machine's fine-tuning to the peripherals must also be monitored and corrected where necessary. You should be continually alert to potential problems and checks should be carried out at least every ten strokes.
When tasks involving filling are being carried out manually, the height of the machine must be such that the operators are in a comfortable working position. Best is a height that does not involve bending down to place the product in the packaging. In some situations it is useful to have a raised platform next to the machine for the operator to stand on.

When filling the packages, the operator may work only in the area indicated between the covers (see Figure 5.9). It is not permitted to have body parts under the covers.

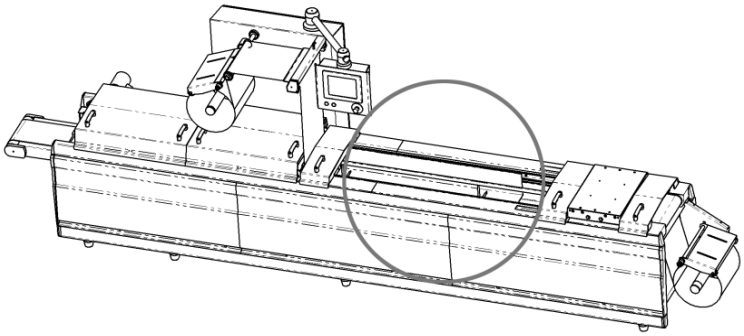


Figure 5.9 Loading area

5.8 Energy-saving operation

In order to lessen the burden on the environment, it is a good idea not to leave the machine turned on needlessly. Use every opportunity to shut the machine down partially or completely.

Contents

6 Cleaning and maintenance

The machine becomes dirty through use. The waste materials can have an effect on the appropriate functioning of the machine and, moreover, constitute a risk to hygiene. In order to exclude any dangers due to lack of hygiene and to make it possible for the machine to function properly, it is important to carry out maintenance work regularly and carefully. This chapter deals with preventive measures and procedures relative to maintenance.

6.1 Guidelines and methods

In order to clean the machine in a safe and responsible manner the following guidelines must be closely followed.

	**WARNING**
	Failure to observe these guidelines can result in serious bodily injury and damage to the machine.

6.1.1 Cleansers

Cleansers are used to clean the machine. Not all cleansers are suitable for the machine. So follow the guidelines below during cleaning activities:

- Read the supplier's instructions before use.
- Use cleansers with a pH value between 6 and 9.5. Acid cleansers can discolor the surface of components.
- Use a low-pressure foam-cleaning unit (max. 6 bar water pressure) with warm running water (40 to 50°C/104 to122°F).
- It is not permitted to use a high pressure or steam cleaner.
- To get rid of calcium deposits only cleansers based on citric acid may be used.
- Use disinfectants only based on alcohol.
- The use of cleansers or disinfectants based on chlorine is not permitted.

If you have questions about cleansers, please consult your Repak agent.

	**WARNING**
	When using cleansers, avoid skin contact and wear protective garments as described on the packaging.

6.1.2 Washing setting

The machine has a special setting for cleaning purposes. You can select this setting from the main menu. It has the following characteristics:

- The format parts are closed. This protects them from cleansers and flooding.
- The heating plates cool down to 30° C/ 86° F

	**WARNING** The format parts can remain hot up to 1 hour after being turned off.	

In the washing setting the machine is suitable for cleaning. Do not aim running water at parts where electricity works, such as motors, the cabinet and the control panel (see Figure 1.1).

6.1.3 Disinfecting and removing calcium deposits

Some cleaning activities involve the use of disinfectants and calcium deposit removers. Excess use of these cleansers can have a negative effect on the machine. Disinfectants contain metal, which can cause induced rust. If this happens, take the following measures:

- Remove the rust with an anti-corrosive.
- Disinfect the de-rusted part once again, using an alcohol-based disinfectant.
- Restore the grease film on the metal with an anti-corrosive. Use only 'Food Grade' anti-corrosives or medicinal oil.

6.2 Maintenance procedures

The maintenance system consists of two parts:

- 3 procedures that describe the actions to be undertaken.
  Each procedure describes a number of activities that have to be carried out.
- A logbook.
  A record is kept in the logbook of who carried out a particular activity. The logbook also has space for remarks, e.g. activities not performed or parts exchanged.
-

The 3 procedures must be carried out at the end of each production day. A procedure consists of a number of activities, sometimes accompanied by a remark. Read these and follow them. The activities must be performed in the numerical order indicated.

Three columns are added in Procedure 2 (Cleaning and Maintenance): Daily, Weekly and Monthly. In the columns an X marks the action that must be carried out in a specific period. NB: the X's in the Weekly and Monthly columns are supplementary to the Daily activities: if there is one X per week the activities in the column must be carried out daily and weekly; One X per month all activities must be carried out. The logbook should record what maintenance work has been carried out.

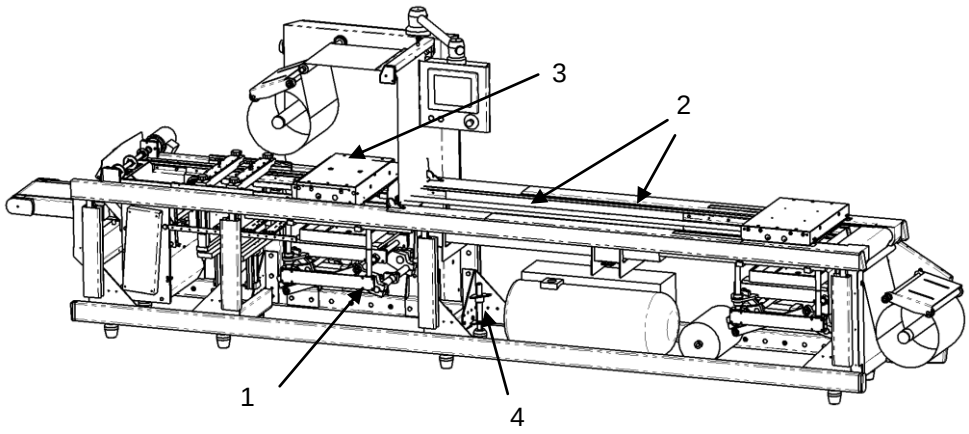
Tip: If the machine is not running on Saturdays and Sundays, the weekly maintenance can best be carried out on the preceding Friday.

	WARNING
	Serious neglect in carrying out the recommended maintenance work causes the machine's warranty to lapse.

	WARNING
	Take care that nobody unexpectedly turns the machine on during cleaning operations.

A number of parts of the machine carry a higher hygiene risk (see Figure 6.1):

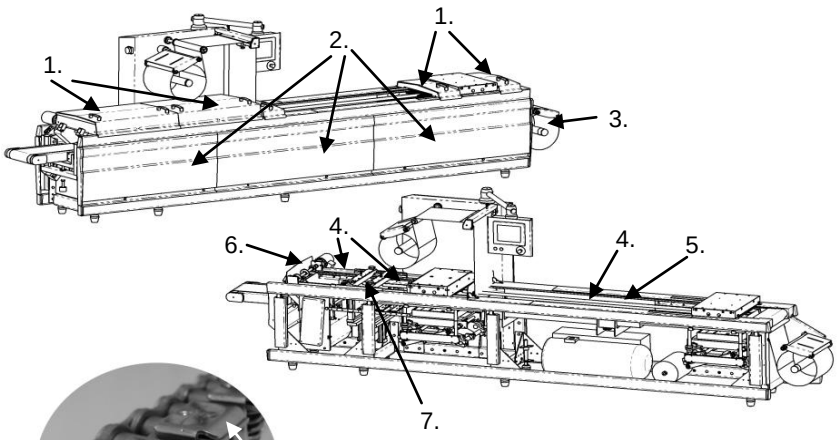
Always clean these very carefully!

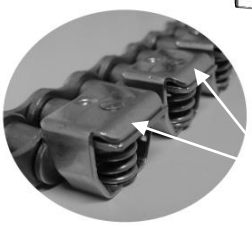


1. The angled connections at the support legs
2. The chain guide
3. The edges where the cabinet connects to the frame
4. Flat (horizontal) parts of the machine

Figure 6.1 Points requiring special attention

Procedure 1: Preparations





Chain clips

Transport chain

Tools required:

- scissors/knife
- lifting gear for film rolls
- waste bin
- adhesive tape
- protection film

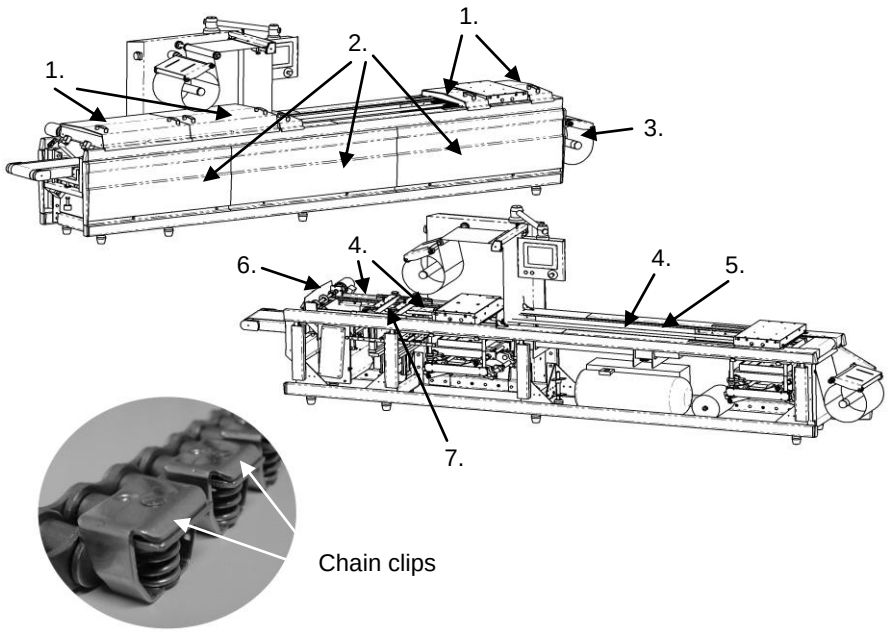
No.	Action	Remark
1	Remove any film still in the machine by using the transport button on the control panel.	See paragraph 5.3. Save the remains of film for point 13.
2	Remove the film rolls from the machine. When heavy rolls are involved (>20 kg) two persons should do the lifting or lifting gear should be used.	-
3	Switch off the machine by stopping the machine and switch the main switch to zero	-
4	Check the machines internally for remains of product and film; remove manually if necessary. Remove protective covers and side plates if so required.	WARNING: format parts remain hot up to 1 hour after being shut down!
5	Check the seals between upper and lower dies for defects. Remove the covers if necessary.	Inspect visually. If a defect is found, call the Technical Department in.
6	Set the main switch on the control cabinet to 1.	
7	Replace all protective covers and side plates on the machine.	See paragraph 4.2.1. for the locations of the covers.
8	Set the machine to washing setting.	See paragraph 6.1.2 Note: the machines close automatically
9	Ensure that the control cabinet door is securely shut.	Visual check.

10	Use film to cover parts sensitive to water, such as motors, control panel, labeling machines and vacuum pump. Fix the film in place with adhesive tape if necessary, but ensure that the parts cannot flood.	Avoid as far as possible any direct contact with water.

Procedure 2: Cleaning and maintenance

Tools required:

- soft sponge
- warm running water
- cleansers
- skin protection against cleansers
- compressed air
- waste bin
- chain oil
- small brush
- screw driver



Chain clips

Transport chain

Figure 6.3 RE20

1. protective plates
2. side plates
3. bottom film infeed roller
4. product support bars
5. support tray
6. longitudinal cutter
7. crosswise cutting

6.3 Maintenance instructions

Before working on the machine, first ensure that the machine is switched off (disconnect the power cable and remove the safety cover). Take care with the pneumatic installation! Read the manual for the safety instructions. Work can be started as soon as all necessary precautions have been taken. Only qualified mechanics may work on the machine!
After the activities, ensure that the machine is in proper condition. All safety facilities must also be present (replaced) and must function properly before the machine is restarted.

6.3.1 Conveyor chain

Chain
After assembling the chain, it is always pre-loaded by the chain manufacturer. Pre-loading approximates the maximum allowable load and is applied to ensure that all chain components such as pins, bushes and plates are properly in place. By pre-loading a chain, initial stretch is minimized. As this increases the service life of the chain, this is an important part of the production process.
Chain extension is not caused by deformation of the plates, but by wear of the pin and the bush. For a chain to still function without any problems with chain wheels having less than 60 teeth, the maximum permissible extension is 1.5%. A roller chain will extend somewhat after installation of the chain. This is normal, the initial extension amounting to about 0.05%. This initial extension must be compensated with the chain tensioner.

Preliminary activities
Before carrying out maintenance work to the conveyor chain, check the entire chain (both sides), for damage, contamination and corrosion. Remove any film and / or product residue. In case of damage, restore the chain (claws and/or springs) If corrosion has (started to) set in, reconsider the lubricating intervals and make use of aggressive cleaning agents. If in doubt, consult the distributor.

Chain tension adjustment
The chain tends to stretch a certain amount immediately after installation of the chain. This is caused by running-in of the components. After this initial extension (about 0.05%), the chain will (uniformly) extend somewhat, as a result of normal wear. This must be compensated by, for instance, a chain tensioner. In order to maintain correct chain tension, it is necessary to check it regularly and if necessary take corrective action. The following inspection scheme is advised based on 8 working hours per day. The application, or the environmental conditions, can necessitate a different (shorter) interval. If the scheme is not adhered to, this will increase the chance of premature wear, damage and / or accidents.

- For the first week after installation of the chain: 1 x per day.
- From the second up to and including the fourth week after installation of the chain: 2 x per week.
- After the first month: 1 x per week.

If the chain tensioners have insufficient span, then at least 2 links must be removed (always on both sides). Because the 2 chains are tensioned in the machine in parallel by 2 individually operating tensioners, extra attention must be paid to an identical tension for both chains. Unequal adjustment can cause overload of the chain (damage / wear), or poor functioning of the machine.

Correct chain tension is very important. If it is not correct, it can cause various problems. For instance: too little chain tensioning can cause poorly aligned cross-cutting or printed top film. Unequal chain tensioning on both chains may cause creases in the film. If the chain tension is too high, this will lead to premature extension (wear) of the chain and / or damage the machine.
An exact value for the chain tension cannot be given because this depends on various factors. Keep the chain tension as low as possible, so that the machine still functions properly. As a rule of thumb, the chain section between the drive chain wheel and the chain tensioner should be able to be depressed by hand between 2 mm and 8 mm.

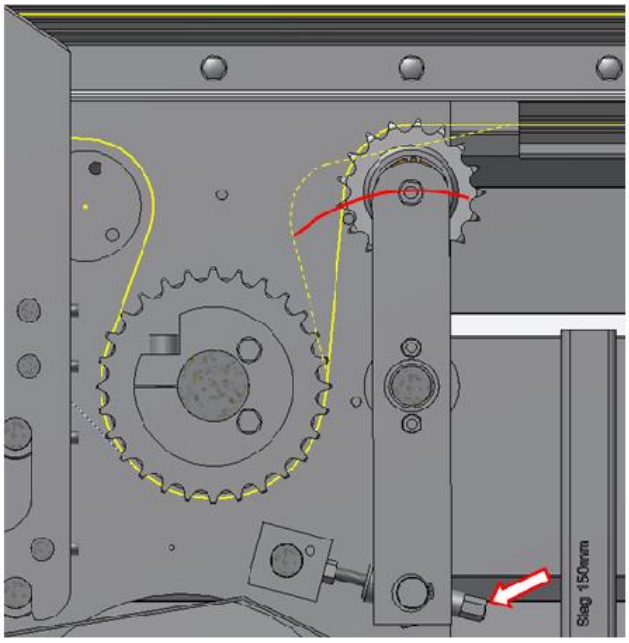


Figure 1Chain tensioner

Chain lubrication

The most important reasons for lubrication are to decrease wear and to protect against corrosion. Chain extension is not caused by deformation of the plates, but by wear of the pin and the bush. The two most common causes of premature wear are poor lubrication and overloading. For this reason, proper lubrication is essential for trouble-free operation. The lubricating agent and interval must be chosen ith respect to the local conditions and intensity of use. Our automatic chain lubrication is supplied with BEL-RAY NO-TOX® FOOD GRADE WATERPROOF CHAIN LUBRICANT. This lubricant has specific lubricating and corrosion resistant properties, especially for the food processing industry industry. We advise the use of this lubricant. Lubricant present on components of the chain, may not be removed with a cloth or cleaning agent. If the machine and / or chain have been cleaned, then the chain must always be lubricated again. Bear in mind that after cleaning, moisture and cleaning agents can have penetrated the chain guide. This can be removed by running the chain for a period. The chain can then be lubricated. The conveyor chain can be lubricated in two ways:

- Manually, with a brush or oil can. The lubricant must penetrate between the pin / bush and bush / roller. Apply the lubricant to the slack part of the chain. This must be done every 8 working hours (or after the machine and / or chain have been cleaned).
- Automatically with the (optional) automatic chain lubrication installation. The oil pump is set ex-factory to 1 lubrication pulse per 100 strokes of the machine. Lubricate the chain again after the machine and / or chain have been cleaned.

The above scheme applies for machines operating under normal operating conditions. The lubricating intervals must be adapted, depending on conditions and operating intensity. For this reason, Repak advises weekly visual inspection of the chain. If in doubt, consult the distributor.

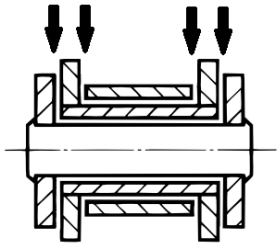


Figure 2 Lubricating locations

6.3.2 Lifting stations

Lifting stations

As a rule, two lifting stations are fitted in a machine. One for the forming station and one for the sealing station. These lifting stations require little maintenance. There are two kinds of lifting stations. A standard aluminium lifting station, and a heavy duty stainless steel lifting station.

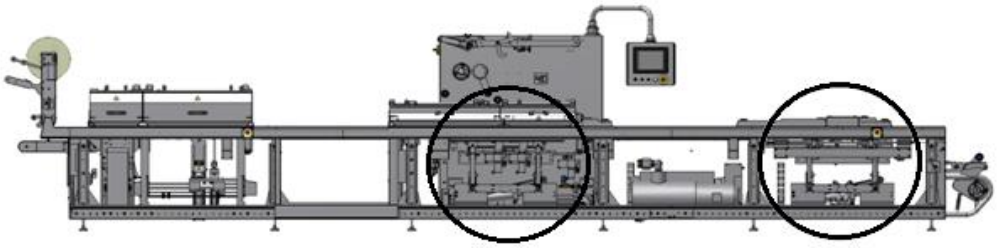


Figure 3 Lifting stations

Lubrication

Before carrying our maintenance work, check the lifting station for damage, contamination and corrosion. Remove any film and / or product residue.

Both types of lifting station are fitted with synthetic sleeve bearings for linear (vertical) guidance. These sleeve bearings are maintenance-free. Only the guide shafts need checking for contamination and/or damage. Each lifting station has twelve lubrication nipples. A lifting station can be fitted with a central lubrication system as an option. In this case, all lubrication points are connected by lubrication nipples to a central mounting plate on the side of the lifting station.

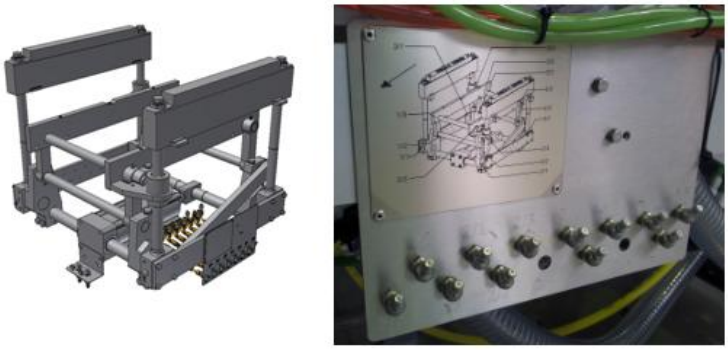


Figure 4 Lifting station central lubrication

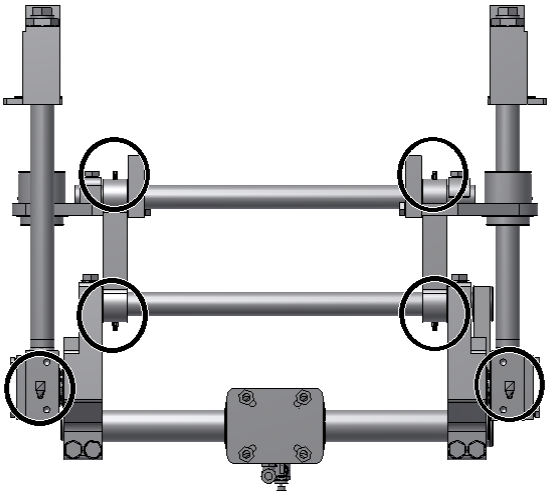


Figure 5 Lifting station lubrication points

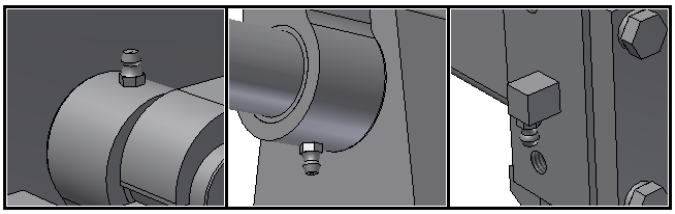


Figure 6 Aluminium lifting station lubrication nipples

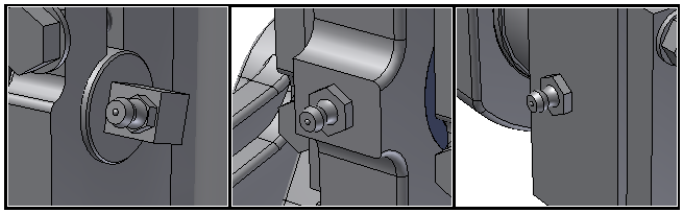


Figure 7 Stainless steel lifting station lubrication nipples

Repak advises lubricating the entire lifting station once a week. This lubricating scheme applies for machines operating under normal operating conditions. The lubricating intervals must be adapted, depending on conditions and operating intensity. If in doubt, consult the distributor.

Lubricant specifications
The bearings are lubricated with Anderol 783-2 (food grade) ex-factory.

6.3.3 Hard foil stamp

Preparatory activities

Before carrying our maintenance work, check the hard foil stamp for damage, contamination and corrosion. Remove any film and / or product residue. If applicable, use the key switch for safe operation of the hard foil syamp. Read the instructions for more information on the key switch. If in doubt, consult the distributor.

Hard foil stamp

The hard foil stamp has ten lubricating nipples. The following figures show where the the lubricating nipples are located.

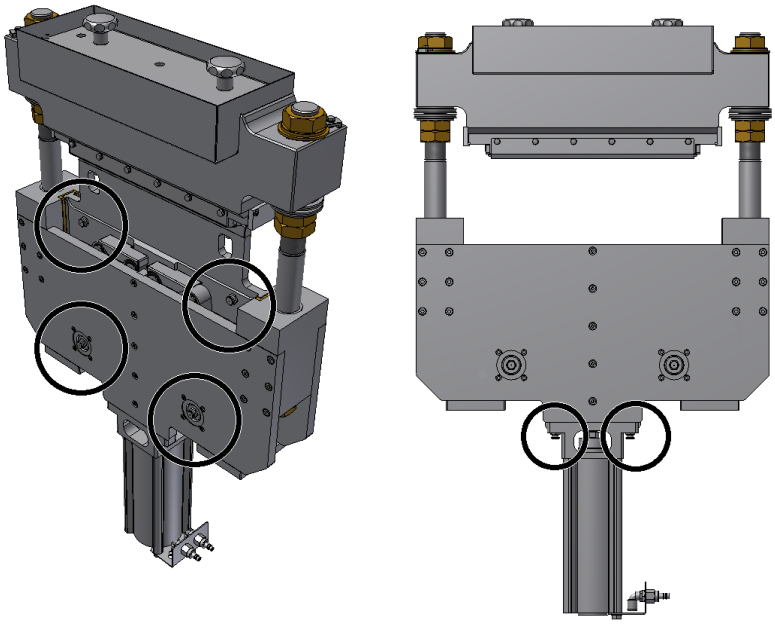


Figure 8 Stamp lubrication points

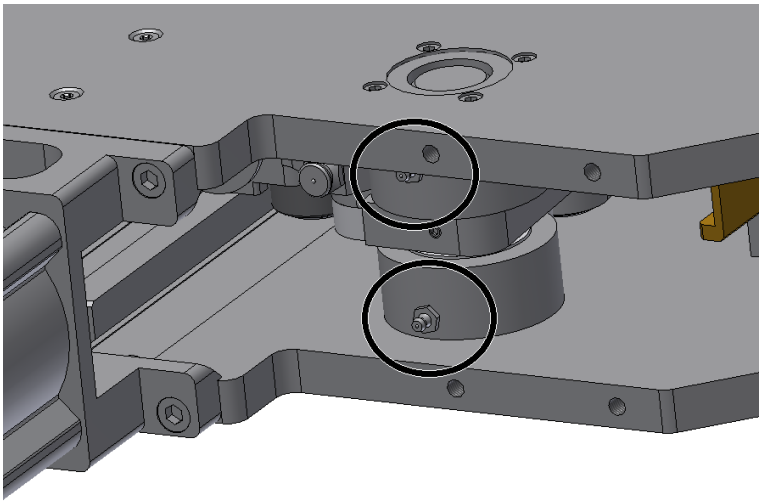


Figure 9 Bearing bush lubrication points

To reach the two lubricating nipples located on the stamp arm, it must be in the highest position. To reach the two lubricating nipples on the pressure block of the cylinder, the stamp arm must be in the lowest position.

	**Warning**	
	Take care, dangerous movement.	

A semi-central lubrication system can also be fitted as an option. The four lubricating nipples for the SS bearing bushes are then moved to the side of the hard foil stamp, two of these lubricating nipples are visible on Figure 9. Take note: the other six lubricating nipples must still be lubricated in the normal manner, ie. manually.

Lubrication
Repak advises fully lubricating the stamps once a week. This lubricating scheme applies for machines operating under normal operating conditions. The lubricating intervals must be adapted, depending on conditions and operating intensity. If in doubt, consult the distributor.

No.	daily	weekly	monthly	Action	Remark
1	X			Remove the protective covers from the machine.	Place the covers on the ground because they are fragile.
2		X		Remove the side plates from the machine. Place the plates on the ground because they are fragile.	See paragraph 2.4.3 for removing the side plates.
3		X		Remove the product support bars and support tray from the machine.	-
4		X		Clean the product support bars covers and plates manually with warm water and cleanser.	Follow the instructions on the cleanser packaging.
5		X		Blow-dry the product support bars, covers and plates with compressed air.	Make sure that remains of waste or water are not blown into anyone's face.
6	X			Remove large pieces of waste materials manually from the machine and the immediate vicinity.	-
7	X			Remove any waste film from the cutters.	-
		X		Treat the entire machine with foam and allow it to work in for 15 minutes.	Follow the instructions on the cleanser packaging.
8	X			Rinse the machine carefully inside and out with warm water.	Manually or mechanically.
9	X			Use the sponge to remove remains of waste materials from the machine and rinse the spots once again.	-
10			X	Remove calcium deposits from parts affected. Use only moderate amounts of decalcifier.	Follow the instructions given in paragraph 6.1.
11			X	Clean the decalcified parts thoroughly with water.	
12	X			Remove the film used for cleaning purposes.	See procedure 6.1, step 11.
13	X			Dry the entire machine with compressed air.	
14	X			Allow the transport system to run.	See Chapter 4.
15	X			Blow-dry the transport chain at the bottom film infeed roll with compressed air.	-
16	X			Check the chain clips for defects. Advise the Technical Department if necessary.	Visual check.
17	X			Oil the chain with a small brush. If available, use the automatic chain lubrication system.	See Chapter 4.
18	X			Check the blades in the longitudinal and cross cutters for breaks, damage and rust.	Visual inspection. Call in the technical department if defects are noted.
19	X			Lubricate corrosion-sensitive parts such as the cutter blades with oil.	Use a small brush.
20		X		Cutting tool : Clean the cutting tool unit.	Use manual of the detergent.See chapter 12.
21	X			Cutting tool : clean the guide columns and put a touch of oil on it use FIN FOOD Lube + Teflon van Fa. Interflon only	Never take LIPID. See chapter 12.

No.	daily	weekly	monthly	Action	Remark
22	X			Spray the machine with an alcohol-based disinfectant.	Follow the instructions in paragraph 6.1.
23	X			Check the machine for induced rust and remove it if present.	See paragraph 6.1.

Procedure 3: Preparing the machine for operation

Tools required:
- Screw driver

1. safety covers
2. side plates

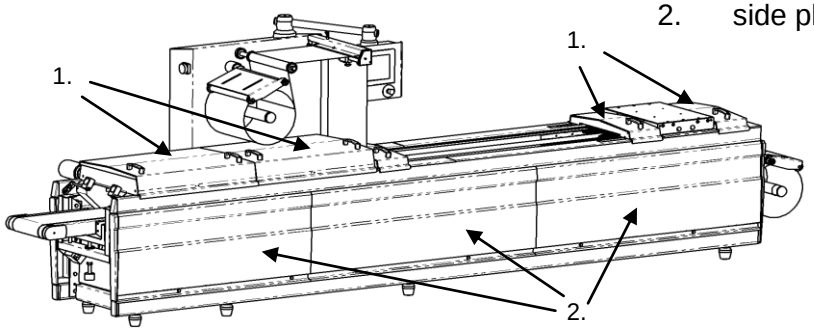


Figure 6.4 RE20

No.	Action	Remark
1	Replace all components that have been removed.	-
2	Replace all safety covers and protective systems.	See paragraph 2.4.3 for positioning the side plates.
3	Press the Re-set button.	-
4	Press the 'washing setting' button. The machine turns the washing procedure off. The working systems open automatically.	See paragraph 6.1.2.
5	The machine is now ready to operate. If so desired, the machine can now be turned on.	See paragraph 5.2.

6.4 Recording the maintenance and cleaning logbook

Type of maintenance			Date	Name	Signature	Remarks
Daily	weekly	monthly				

Contents

7 Overview of status lines

There can be various causes of failure in the machine. Regular performance of maintenance procedures can prevent a great number of problems from arising, ranging from crumpled packaging and mechanical defects to sudden shutdown of machine systems. Solving most of the problems related to packaging quality is a matter for the technical department however a number of problems can also be solved by the operator. This is dealt with in detail in the next paragraph. Always turn the machine off when attempting to correct a machine failure or a fault in the supply systems. This is further explained in the next paragraph. If in doubt, or if the problems are not included in this chapter, always call in the technical department. Whatever the case, never attempt to repair the machine yourself.

7.1 Environmental factors

The machine may work inappropriately as a consequence of negative influences in the immediate environment. A number of frequently occurring problems are detailed in Table 11. Check whether the problem in question is, indeed, mentioned and then solve the problem. The machine specifications, paragraph 1.4, list the environmental conditions required to have the machine function properly.

Table 11 Environmental factors

Characteristic	Possible problem	Cause	Solution
The status line reports overheated components.	The surrounding temperature is over 40°C / 104°F.	Some parts of the machine are over-heating.	Ensure that the surrounding temperature is lower.
The touch screen or another electrical systems fails.	There is too much humidity in the immediate vicinity.	Condensation is causing failures in electrical components.	Ensure that the room is better ventilated or remove the source of the humidity.
The packaging process shows defects or parts of the machine are not moving smoothly.	The supply of electricity, water or compressed air is not constant.	Unstable supply is interfering with machine processes.	Check that tubes/pipes/hoses are not squeezed shut. If so, remove the cause.
The status line reports open covers.	The surfaces on which the covers rest are dirty.	The dirt causes failure in the magnetic sensors fitted to the covers.	Turn the machine off and remove the dirt from the cover and cover plate.
The packaging process shows defects or parts of the machine are not moving smoothly.	The machine is not level. This leads to the frame being distorted.	Parts of the machine are in the wrong position relative to one another.	Have the Technical Department correct the positioning of the machine.

7.2 Overview of status lines

A machine failure causes an error message to be displayed on the touch screen status line. Table 12 lists possible messages, their causes and the solutions.

Table 12 Overview of status lines

No:	Message	Cause	Solution
01	EMERGENCY STOP	The emergency switch has been pressed.	Start the machine according to the procedure described in paragraph 5.2.5.
02	In Night Position	The machine is switched into night position.	This is normal. See paragraph 4.3.1.1 for turning off the night-time status.
03	Form tool not in position *1	The form tool is not properly mounted on the lifting system.	Push bottom die in position
04	Servo system is resetting	Servo cross cutting is moving to zero position.	Every time with new startup
05	Servo system failure	Servo system in failure	Try to reset the servo system
06	Heater burnout Heating plate	The heating element in the forming die top part is broken.	Call in the technical department.
07	Heater burnout Seal plate	The heating element in the seal plate is broken.	
08	Temperature outside limit	The sealing or forming unit has exceeded the temperature sensor's range.	
09	Temperature much too high	The temperature of the sealing or forming units is too high.	
11	No air pressure	The compressed air system is not under pressure.	Check that the supply hose is properly connected. If not, call in the technical department.
12	No water pressure	The cooling water system is not under pressure.	
14	No central vacuum present	The machine has no vacuum.	Call in the technical department
15	Gas pressure too low	The gas pressure for injecting gas into the packs has failed.	
18	No oil in lubrication system	The chain lubrication system has run out of oil.	
20	Transport Inverter Error	The motor inverter is showing a failure.	
21	Small Inverter in Error	The motor inverter is showing a failure.	
23	Thermal overload motors	One of the motors has over-heated.	
25	Forming die not connected	Top die is not (properly) connected to the electrical circuit.	
26	Vacuum die not connected		
27	Lifting systems not down	One of the lifting systems is failing to reach the lowest position.	
28	Form die doesn't close	The bottom die is not coming to its upper position.	
29	Seal die doesn't close		
31	Out of Lower film	Bottom unwind is running out of film.	Place new roll
32	Out of Top film	Top unwind is running out of film.	Place new roll Attach the film again to rewind
33	Broken film trim	Film trim is broken (only rewind)	

No:	Message	Cause	Solution
35	PT100 Sensor Form defect	The temperature sensor of the forming unit has failed.	Call in the technical department.
36	PT100 Sensor Seal defect	The temperature sensor of the sealing unit has failed.	
37	Analog input sensor 1	Analog input sensor 1 has failed.	Check wiring and connectors.
38	Analog input sensor 2	Analog input sensor 1 has failed.	Check wiring and connectors.
41	RE20 stopped after number of strokes.	The machine has reached the number of strokes set.	This is normal. See paragraph 4.4.7 for setting the number of strokes.
45	No signal from AUX. 1	AUX. 1 is giving no signal.	Call in the technical department.
46	No signal from Filler 2	Filler 2 is giving no signal.	
47	Waiting for AUX.1 signal	The machine is waiting for a signal from the AUX.1 before proceeding	This is normal. Wait for the message to disappear.
48	AUX.1 failure	AUX.1 is not working.	Call in the technical department.
49	AUX.2 failure	AUX.2 is not working.	
50	Waiting for AUX. 2 signal	The machine is waiting for a signal from the AUX. 2 before proceeding.	This is normal. Wait for the message to disappear.
52	Vacuum takes too long	It takes too long to reach the set value, for vacuum pressure.	Call in the technical department.
53	Gas takes too long	It is taking too long to reach the set value, for gas pressure.	Check gas pressure in system, or contact technician.
54	Dansensor *1	Dansensor has failed.	Call in the technical department.
64	Safety Cover Form station rear is open	The safety cover at the back of the forming station (the infeed side) is open.	Place the cover in its proper position (see paragraph 4.2.1) and start the machine up as specified in paragraph 5.2.5.2.
65	Safety Cover Form station front is open	The safety cover at the front of the forming station (the out-feed side) is open.	
66 67	Safety Cover Seal station rear is open	The safety cover at the back of the sealing station (the infeed side) is open.	
68	Safety Cover Seal station front is open	The safety cover at the front of the sealing station (the out-feed side) is open.	
69	Safety Cover Cross cutting rear is open	The safety cover at the back of the cross cutting unit (the infeed side) is open.	
70	Safety Cover Cross cutting mid is open	The safety cover in the middle of the cross cutting unit is open.	
71	Safety Cover Cross cutting front is open	The safety cover at the front of the cross cutting unit (the out-feed side) is open.	
73	Safety Cover rotating knives is open	The safety cover over the rotating knives is open.	
75	Safety cover is open	One of the safety covers is open.	
76	Press reset and transport button	The film transport has stopped before end of index length.	Control safety covers, if necessary remove product or film where it is touching a cover,

No:	Message	Cause	Solution
			press Reset and then the transport button.
78	Servo drive on CW end switch	Servo Crosscutting has activated the switch for max end position.	Call in the technical department to reset the servo position.
	Servo drive on CCW end switch.		
Vacuum test			
Step 1	Vacuum test: Vacuum die closed	The machine is running the vacuum test. Test is divided into 5 steps!	This is normal. The message disappears after completion of the test. Always run the Vacuum test till die box is back in bottom position!!
Step 2	Vacuum test: Vacuum		
Step 3	Vacuum test: Vacuum check		
Step 4	Vacuum test: Air intake open		
Step 5	Vacuum test: Lifting system down		
	Stop: Turn on Heaters	The heating system is not turned on.	Turn the heating system on.
	Stop: Turn on Pumps	The pump is not turned on	Turn the pump on.
	Stop: Manual mode	The machine cannot run the function as requested because the manual operating mode is turned on.	This mode can be switched off in the main menu.
	Standby: Ready to start	The machine is ready to start automatic operation.	This is normal. For more information on this mode see paragraph 5.2.2.
	Run: RE20 in motion	The machine is running.	This is normal. See paragraph 5.6 to stop the machine.

*1 are optional functions.

7.3 Defects affecting the film

A defect or failure not reported on screen is when the film breaks or becomes loose. If a break occurs or the film slips out of the chain, the following actions should be undertaken:

- stop the machine with the stop button;
- cut away any film hanging loose;
- if necessary, remove any waste film and remains of packaged material;
- if parts of the machine have been damaged, the technical department should be called in;
- first remove all unusable film completely from the machine (do not use the waste film disposal unit for large pieces because these can cause blockages).

Only when all the problems have been solved and a good new film has been inserted can the machine be re-started.

8 Explanatory list of words

Chain guide:
Combination of metal and plastic profiles that guides the transport chain.

Compressed air:
Air at a pressure greater than 1 bar.

Control panel:
This panel enables the operator to run the entire machine. To this end the panel has a start and stop button, an emergency switch and a touch screen.

Conveyor belt:
Belt that removes the filled packages from the machine.

Cross cutting unit:
Module that cuts the packages loose in a crosswise direction.

Danger zone:
Defined zone in the machine where special safety instructions apply.

Drive cabinet:
Closed cabinet containing all the electronic and pneumatic systems required for powering the machine's processes.

Drive module:
This module contains the film chain drive.

E.L.S. 1: cross web labeler brand name ELS

E.L.S. 2: cross web labeler brand name ELS

Emergency switch (module: control panel):
Red button on the control that stops the machine instantly when pressed.

Exit side:
The side of the machine where the packages exit.

Filler:
Machine that automatically places the product in the formed film.

Filler plates (module: forming/sealing station):
Plates used to adjust the height of the form.

Film brake:
Pneumatic brake that tensions the top film before the sealing process.

Film unwinding unit:
Unwinds the film and ensures that it remains tensioned. The upper and bottom films have their own unwinding units.

Forming die:
A component supplied in various types, used to clamp and heat the fim. It is the place where the packaging is formed.

Forming die top part (module: forming station):
A component supplied in various types, used to clamp the film in. It can also be heated to melt the film and can even be fitted with a plug for forming the bottom film.

Forming module (or forming station):
Module where the bottom film is formed.

Frame:
System supporting the modules.

Gas:
Preservative gas introduced into the packages to increase the shelf life of the food.

Guillotine (module: cross cutting unit):
Cross cutter for flexible and semi-rigid packaging materials.

Infeed roller:
Wheel that guides the chain on the infeed side of the machine. The specific design of this wheel causes the transport chain clips to open here so that the bottom film can be fed into the machine.

Infeed side:
The side of the machine where the bottom film is fed in.

Inverters:
Frequency regulator for the main drive.

Lifting system (or lifting gear):
System that raises and lowers the seal die and vacuum die to and from the film.

Machine:
This indicates the RE20 deep drawing packaging machine to which this manual refers.

Magnetic switch:
Consists of two magnets, one in the protective cover and one on the machine. Whenever contact between the two magnets is interrupted, the machine stops.

Main switch:
Rotating switch that turns the power supply to the machine on and off.

Module:
Functional unit with a specific task or function in the machine.

Stroke length (also known as the advance length or index):
The length of film transported per stroke. This can be equal to the package length.

Operating side:
This is the side of the machine opposite the control cabinet.

Operator:
A person authorized and trained by Repak, its agents or distributors to run the machine.

Over-pressure valve:
Valve that lets in air if the pressure rises too high.

Photocell:
Sensor that detects markings on the top film and guides the film using this information as a basis.

PLC (Programmable Logic Controller):
Electrical operating system.

Product:
The foodstuff or medication to be packaged.

Protective cover (= safety cover):
Cover on the outside of the machine designed to prevent a person being wounded by a moving part.

PV (Present Value):
This is the current value.

Rotating blades:
Module that cuts the packages loose in a lengthwise direction.

Safety cover:
Fixed and removable covers on the outside of the machine that protect the operator from moving parts.

Seal module (or seal station):
Module where the packaging is sealed.

Sealing:
Melting the top film to the bottom film so that the packaging is airtight

Sealing mask (grid):
Static or moving grid which helps to reduce package seal area contamination during product loading.

SP (Set Point):
This point is a set switchover point.

Status line:
Line on the touch screen indicating the machine's status.

Stroke:
A particular period in the program chosen in which the various modules in the machine go through their process stages.

Support tray:
Tray used to support the film.

Support zone:
Place on the machine where the product to be packaged is placed in the drawn-down bottom film.

System cabinet:
Cabinet containing the pneumatic and electrical parts that drive the machine. Only the technical department has access to these drives.

Touch screen:
Screen on which buttons can be activated by touch. The touch screen is part of the control panel.

Transport chain:
Chain fitted with clips that clamp the film fast. Feeds the film through the machine. This chain is on the cabinet side and the operation side of the machine.

Top film infeed shafts:
This is the shaft onto which the film roll is placed and along which the film is guided into the machine.

Vacuum:
Low pressure in a space.

Vacuum pump:
Pump for producing a vacuum.

Washing setting:
Setting to which the machine is switched for cleaning purposes.

9 Appendix

- TI-14-025 Vacuum pump (warm up and after running)
- TI-14-032 Declaration of compliance for food contact