Food Systems Design
Operator manual

Sheeting system for chips

Order number: 7193

Book I of III (Customer edition)

Rademaker *Specialists in food processing equipment*

Ronald P. Gates
President

RADEMAKER USA, INC.
5218 Hudson Dr.
Hudson, Ohio 44236
E-mail: rgates@rademakerusa.com

Tel: (330) 650-2345
Fax: (330) 656-2802
Mobile: (330) 714-5685

Rademaker *Specialists in food processing equipment*

Jim Bruce
Midwest Regional Sales Manager

RADEMAKER USA, INC.
9909 W. 145th St.
Overland Park, KS 66221
E-mail: jbruce@rademakerusa.com

Tel: (913) 681-1552
Fax: (330) 656-2802
Cell: (913) 680-8210

Rademaker *Specialists in food processing equipment*

Brett Holycross

RADEMAKER USA, INC.
5218 Hudson Dr.
Hudson, Ohio 44236
E-mail service@rademakerusa.com

Tel (330) 650-2345
Fax (330) 656-2802
Mobile (216) 554-3111

Rademaker *Specialists in food processing equipment*

Gerard van Lienden
Service Engineer

RADEMAKER USA, INC.
5218 Hudson Dr.
Hudson, Ohio 44236
E-mail: gvanlienden@rademakerusa.com

Tel: (330) 650-2345
Fax: (330) 656-2802
Mobile: (201) 247-2227

Rademaker *Specialists in food processing equipment*

OPERATOR MANUAL SHEETING SYSTEM FOR CHIPS

FOOD SYSTEMS DESIGN

Revision 00

RADEMAKER ORDER NUMBER 7193

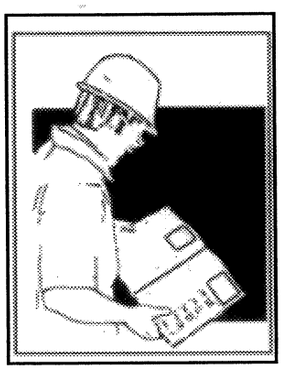
December 2008

CE

Rademaker B.V.
Plantijnweg 23
4104 BC CULEMBORG
HOLLAND

Telephone number: +31(0) 345 543 543
Service telephone number: +31(0) 345 543 555
Fax number: +31(0) 345 543 590
E mail address: office@rademaker.nl

PREFACE



ATTENTION:

This manual must be read by or to each person, before that person operates, cleans, repairs, adjusts, supervises the operation of, or uses this machine in any way.

ATENCIÓN:

Este manual debe ser leido por a cada persona antes de comenzar a operar, limpiar, reparar, ajustar, supervisar la operación de, o utilizar esta maquina de cualquier manera.

ATTENTION:

Ce manuel doit être lu par, ou a, toute personne avant qu'elle ne mette en route, nettoie, repare, regle, supervise le fonctionnement ou utilise cette machine, de quelque manière que ce soit.

ACHTUNG:

Jeder, der diese Maschine bedienen, reinigen, reparieren, einstellen, überwachen oder auf irgendeine Weise benutzen soll, muß vorher diese Hinweise lesen oder vorgelesen bekommen.

ATTENTIE:

Een ieder, die deze machine bedient, reinigt, repareert, instelt, controleert of op enige andere wijze gebruiken zal, dient vooraf deze bedieningsvoorschriften te lezen.

Liability

Rademaker cannot be held liable for any costs, damage or personal injury if the Rademaker system is not used in accordance with the instructions as described in this manual.
Though this manual has been put together with the utmost care, Rademaker cannot accept any liability for costs, damage or personal injury arising from any fault and/or incompleteness in the content of this document.

How to report faults in this manual

Every effort has been made to ensure that the information in this document is correct. If any fault, deviations or missing data are apparent appears during using this document, please report this by means of the form below.
Thank-you in advance for this service, as it will contribute to you, the customer, receiving the best possible quality in both information and service.

Manual title :
Manual No. : Revision No : .....

Sender :
Name :
Address : Company :
Postal code/Zip code : Location :
Date :

Notes:
Book :
Chapter :
Page :
Paragraph :
Incorrect text :

Suggestions :

Or affix an amended copy of the next concerned.
To:
Rademaker BV
Manual department
PO Box 416
4100 AK Culemborg NL
FAX number +31(0) 345 543 590

How to use this manual?

The manual is constructed to provide a maximum amount of information with a minimum amount of searching. The key to easy reference is the Table of contents. Familiarise yourself with it and you won't have any trouble locating information from any area of machine.

The manual is divided in 2 kind of books written for target groups;

- Operator manual
  (This book is written for the operator, cleaning personal and service engineers.)

This manual contains efficient and very important information concerning:

1. Introduction
2. Safety
3. Machine description
4. Transport & installation
5. Operation
6. Trouble shooting
7. Maintenance and cleaning for non- service engineers

Appendix A

- Service manual.
  (This book is written for the service engineers.)
  This manual contains efficient and very important information concerning:

8. Factory settings (meant for service engineers only)
9. Mechanical parts list
10. Electrical parts list
11. Electrical schemes

Appendix B

Safety regulations

Before starting operation, cleaning, maintaining the system or before remedying breakdowns first read this chapter and chapter Safety.

Summaries and definitions

Limit Switch:
A limit switch is a switch that will be activated during production and therefore will influence the production process.

Safety Switch:
A safety switch is a switch that will not be activated during normal production. These switches are fixed on covers and doors that shield off moving parts.
Opening those covers or doors will result in the immediate switching off of the system.

Emergency button:
An emergency button is a switch that will not be activated during normal production. Manually operating an emergency stop will result in the immediate switching off of the system.

H1 classified grease/oil:
These lubricants are conform the U.S. Food and Drug Administration (FDA) requirements and are classified as H1 lubricants by the U.S. Department of Agriculture (USDA). These lubricants have been approved for use in the food processing industry.

D4D:
System Designed for Dry cleaning.
At the actual main cleaning stage, clean equipment with a cloth moistened with warm water of maximum 60°C/140°F. Stubborn dirt on the equipment (dough, filling) must be removed by plastic scraper.

D4W:
System Designed for Wet cleaning.
(see wash down)

Wash down:
The use of a jet of water from a distance of at least 1 meter/ foot, with low pressure (maximum 25 bar/ 363 PSI and a water temperature up to 60°C/140°F max is allowed.

TARGET GROUPS

Owner:
The owner (contractor, concern) is the person that owns or hires the machine and puts this machine into production.

Operator:
The operator is the person who operates the system as ordered by the owner.

Cleaner:
The cleaner is the person who cleans the system as ordered by the owner.

Professional:
A professional is someone who can assess the duties appointed to him on account of his education, knowledge and experience and who can assess the dangers attached, thereby avoiding these dangers.

Maintenance engineer:
The maintenance engineer is the professional who is deemed qualified by the owner to perform certain duties. The qualification only applies to those assigned duties.

Service engineer:
The service engineer is a professional employed by Rademaker BV.

Service:
With service is meant: Rademaker service department or its official agencies.

The table below shows which user of the system should read and understand which chapters of this manual.

User:	Read and understand below chapters:
Operator	Preface, Introduction, Machine description, Safety, Transport & Installation, Operation, Trouble shooting, Maintenance
Cleaner	Preface, Introduction, Machine description, Safety, Maintenance
Service engineer	Preface, Introduction, Machine description, Safety, Transport & Installation, Operation, Trouble shooting, Maintenance, Appendix A, Factory settings, Mechanical parts list, Electrical parts list, Electrical schemes, Appendix B

Symbols

Symbols are used in the manual when special attention/caution is required while working on the system. The special symbols and their meaning are depicted below.

Danger symbol

	**DANGER!** This symbol is used in operation and maintenance instructions that should be followed to the letter. If not they may result in permanent personal injury or death.

Caution symbol

	**CAUTION!** This symbol is used in operation and maintenance instructions that should be followed to the letter. If not they may result in personal injury.

Attention symbol

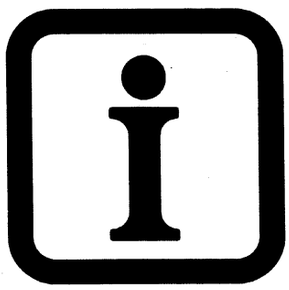
	**ATTENTION!** This symbol is used in operation and maintenance instructions that should be followed to the letter. If not they may cause damage to the system.

Tip symbol

	**TIP!** This symbol is used as a helpful hint to simplify the execution of certain tasks.

Table of contents operator manual

Table of contents service manual



1 INTRODUCTION

Table of contents

1.1 Address Rademaker BV.

Rademaker B.V.
Plantijnweg 23
4104 BC CULEMBORG
HOLLAND

Telephone number:	+31(0) 345 543 543
Service telephone number:	+31(0) 345 543 555
Fax number:	+31(0) 345 543 590
E mail address:	office@rademaker.nl
Website:	www.rademaker.nl

1.2 Representative in USA

Company name	Rademaker U.S.A. Inc.
Contact person	Mr. R. Gates
Company address	5218 Hudson Drive
Area code	Ohio: 330
Zipp code	OH 44236
Place	Hudson
Country	Verenigde Staten
Telephone number	00 1 330 650 23 45
Fax number	00 1 330 656 28 02
Email address	rgates@rademakerusa.com

1.3 Machine information

Machine type	:	Sheeting system for chips
Main order number	:	7193
Year of building	:	2008

1.4 Safety regulations

Before starting operation, cleaning, maintaining the system or before remedying breakdowns first read the Preface, Introduction and Safety.

For the safety of the installation and personnel, the following points are of importance:
- Use qualified and authorised personnel to carry out the transport and installation.
- Use approved tools, materials, hoisting- and lifting equipment.
- Use tools and materials that meet the measurement and weight of the parts.
- Use hoisting and lifting equipment that meet the format and the weight of the parts.
- Ensure that the paddles of fork trucks are of the right length and distance.
- Affix the paddles of the fork truck to the placed provided.
- Ensure that nothing can move unexpectedly.
- Make sure there is nobody under raised parts
- Some parts may have a high levelled centre of gravity and have the danger of tipping over.

1.5 Warning

ATTENTION!
Without dough **only** run the machine for a **short** time with a low speed.
Running the system without dough for a longer time and/or with a high speed will cause damage to rollers and scrapers.
When it is necessary to run the machine without dough for a longer time or with high speed, first remove all the scrapers from all the rollers.

1.6 Explanation of identification tags

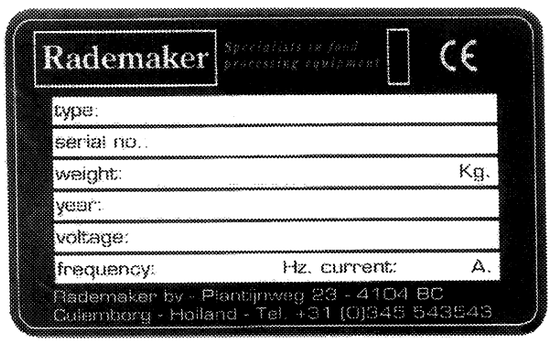


Fig. 1 Identification tag

Type:
The name of the unit or system.

Serial no.:
This number is the systems order number.
For removable units the serial number consists of the order number followed by the unit number. The unit number can be found on the customer drawing in the chapter mechanical parts list.

Weight:
This is the weight of the system or unit.

Year:
Construction year of the system.

Voltage:
The required supply voltage of the system.

Frequency:
The required frequency of the supply voltage.

Current:
The nominal current used by the system.

Weight tag:
This tag indicates that the parts should be lifted by hoisting equipment or multiple persons.

Fig. 2 Weight tag

1.7 Machine description

1. Special heavy duty three roll extruder to form a band of dough with a width of approx. 1000mm; the diameter of the three rollers is 300mm, shaft diameter is 100mm; the rollers will be ground and hard chromed. The extruder is equipped with two heavy duty variable speed drives, one for the top feeding roller and the other for the remaining top roller and the bottom roller that share a motor. The opening between the top rollers is adjustable as is the opening between the rear top roller and the bottom roller. Hopper executed with Teflon coating. The whole unit is mounted on a fixed frame. Including automatic gap adjustment of the rollers.

2. Conveyor with a length of approximately 3 metres to transport the dough to the two roll gauging station. Working width 1000mm. Provided with a sharp nose transfer. The drive roller is coated in vulcanised rubber. Driven by a frequency controlled speed drive; provided with a frequency controller mounted in the main electrical panel. The frequency controller is connected in a cascade system.

3. Two roll sheeter unit to further reduce and calibrate the thickness of a band of dough with a width of approximately 1020mm. Diameter of the rollers 400mm. Equipped with two AC frequency controlled speed drives. Designed and built in heavy duty execution. The rollers are of a twin tube construction of mild steel. The outer tube is hard chromed and precision ground. The opening between the rollers is independently adjustable via a wedge movement. Minimum opening 0.1 mm, maximum opening 2.8 mm. Mounted on a fixed frame. Thickness sensor will display gap opening on the operation panel for each side. Executed with "Direct Drive" system. The rollers are executed to allow connection to a chilled liquid supply. Bearing blocks are hydraulically pre-loaded. Including dual height adjustment and loop out feed control. This unit is mounted behind the gauging station and controls the tension in the dough sheet by adjusting speeds when necessary. The minimum cooling temperature of the rollers is 10°C (to avoid condensation; temperature to be discussed on order). Including automatic gap adjustment of the rollers.

4. Main conveyor with a length of approximately 4 metres. Working width 1000mm. Provided with a sharp nose transfer roller at the end of the conveyor for an accurate transfer of products. The drive roller is coated in vulcanised rubber. Driven by a frequency controlled speed drive. Provided with a frequency controller mounted in the main electrical panel. The frequency controller is connected in a cascade system. Height adjustment at the in feed by the adjustable legs.

5. Driven cutting roller base set. Working width 1000mm. Provided with universal supports to mount a roller in and to enable easy changeover of different cutting rollers. The roller (not included in this order) is driven by a frequency controlled drive. Provided with a frequency controller mounted in the main electrical panel. The frequency controller is connected in a cascade system. Either speeding up or slowing down the cutting roller can adjust the cutting length to compensate for possible shrinkage due to changing recipes of dough.

6. Return system to transport the scrap dough via in feed belt and cross conveyor to the sides of the line into a container. Executed with its own variable speed drive. Executed in stainless steel and other non-corrosive materials. Belt executed with quick release for easy cleaning.

7. Driven cutting roller. Working width 200mm. Provided with – and supports for – cutting roller to pre cut the scrap in more manageable chunks instead of a continuous scrap sheet.

8. Out feed transport conveyor with a length of 4 metres to transport the chips onto the oven. Executed with a plastic type of belt including belt tracking. Working width 1000mm. Driven by a frequency controlled speed drive. Provided with a frequency controller mounted in the main electrical panel. The frequency controller is connected in a cascade system. Provided with greasable bearings. Provided with a pneumatic operated retracting nose at the in feed with a length of approximately 50 - 100mm to allow during start up or emergency to dump the products. In- and out feed roller executed with a sharp nose. The out feed is manual hinge able. This conveyor is laterally adjustable with locating mechanism in order to fine tune chip position in relation to baking moulds.

Electrical cabinet.
Entire production line is provided with cable trays and main electrical switchboard, executed as stainless enclosure with hinged doors, enclosures mounted on foot. Including synchronisation and contacts with continuous feeding system and baking system. Power supply; 480 Volt, 3Ph, 60 Hz including earth and neutral (5-core wire).

1.8 Customer drawing according order conformation

2 SAFETY

Table of contents

2.1 General

Rademaker food processing systems are high quality machines.
When used and maintained correctly, the machine should function optimally for years.
The owner is responsible for the execution of cleaning and maintenance according to the directions and the intervals in this manual.

A Rademaker system meets the demands, mentioned in the European machine guideline (CE).

Only persons meeting the following requirements are authorised to work with the system. These persons should be:
- Skilled and specifically trained for their duties.
- Familiar with the contents of this manual.
- Familiar with the locations of the emergency buttons, emergency lines and emergency bars.
- 18 years old or above.
- Familiar with the national and regional regulations regarding safety.

The system is only to be used for the purpose it was designed for. See Machine description in chapter 3 of this manual.

2.2 Legal regulations

Along with the safety regulations in this chapter the instructions of the qualified trade organisation of your country must be observed to avoid accidents.

All safety devices, installed in the machine by the manufacturer and the indications mentioned in the user's guide are conditions to control the machine safely. The owner and his qualified personnel are in the end the ones responsible for the safe use of the machine.

All safety directions stated in this chapter must be observed and followed.

The owner is responsible for the ability of the qualified personnel to perform its duties according to the safety measures.

Technical changes, which influence the safety working of the machine, may only be executed by the service department of Rademaker BV.

Do not change controls, and/or PLC programs, without written permission from RADEMAKER BV because this may effect the safety of the machine.

Rademaker BV cannot be held responsible for any consequential damages to the system or other installations that were caused by technical changes, unprofessional maintenance and repairs on our system, which were executed by the customer.

Warranty becomes invalid when damages to the system were caused by technical changes, unprofessional maintenance and repairs, that were executed by the customer

Failure to obey safety regulations may result in physical injury or damage to the system!

2.3 Definitions of switches

Limit Switch:
A limit switch is a switch that will be activated during production and therefore will influence the production process.

Safety Switch:
A safety switch is a switch that will not be activated during normal production. These switches are fixed on covers and doors that shield off moving parts.
Opening those covers or doors will result in the immediate switching off of the system.

Emergency button:
An emergency button is a switch that will not be activated during normal production. Manually operating an emergency stop will result in the immediate switching off of the system.

2.4 Safety regulations

A. Do not use the system when safety devices have been removed. This system may contain sharp edged parts, moving parts, rotating parts and hot surfaces. When guards are removed, sharp edges and pinch points may be exposed. Use extreme caution and avoid touching or striking these areas with your hands or body because they may cause injuries.

B. Do not enter parts of your body or objects into openings in the system. This may lead to serious physical injury or damage to the system. It is dangerous to be in, on or under the system while it is operational.

C. Do not use a step or ladder at the hopper.

D. Do not stand or walk on any of the system parts.

E. Loosely hanging clothing, wide sleeved clothing, ties, chains or rings are prohibited. Long hair should be worn tied back.

F. To avoid capsizing, transport the mobile units slowly.

G Before starting to clean, maintain or inspect the machine or before remedying breakdowns, follow the steps mentioned below:
1. Switch off the machine and secure it against accidental switching on.
2. Post "Do not switch on" warning sign on the main switch:
3. Operate the nearest emergency button.
4. Make sure that no components are moving.
5. At least one other person should be present.

H. Before switching on the machine, the user must check the following:
1. All safety devices are in place and are functioning.
2. No other persons are underneath or above the system.
3. No other persons are at risk.

I. Do not use water (high-pressure hoses) to clean electricity cabinets, terminal boxes and other electronic components.

J. For save and easy operation keep the area and floor around the machine clean, free of oil, grease or obstacles. Remove superfluous fat and greasing oil after greasing duties.

K. Manual activation of regulating or safety switches is forbidden.

When the safety devices are put out of operation, the machine must first be switched off and secured against accidental switching on.

Do NOT operate the system during cleaning, maintenance or repairing work!

2.5 Warning

The Rademaker system contains moving parts. Physical contact with these parts is dangerous:

Rotating and tangentially moving surfaces:

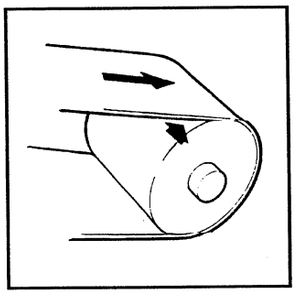


Fig. 1 Belt/ Roller

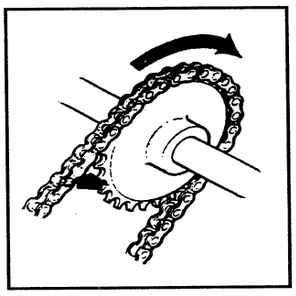


Fig. 2 Chain/ Sprocket

Counter-rotating parts:

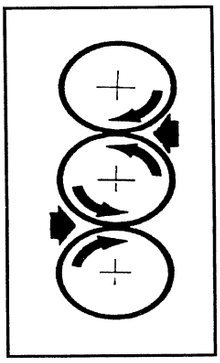


Fig. 3 Rollers

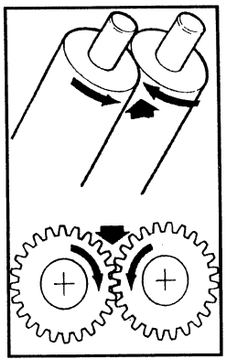


Fig.4 Gears

Rotating or tangentially moving parts in relation to fixed parts:

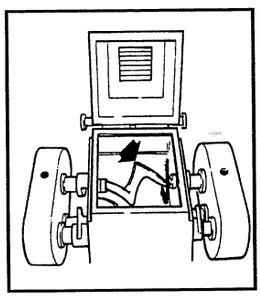


Fig. 5 Infeed screws

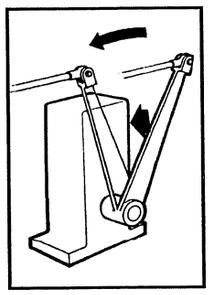


Fig. 6

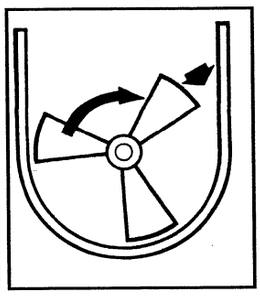


Fig. 7 Paddle wheel

Rotating or tangentially moving parts in relation to fixed parts:

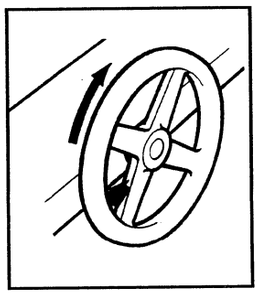


Fig. 8 Wheel

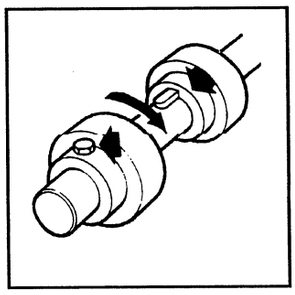
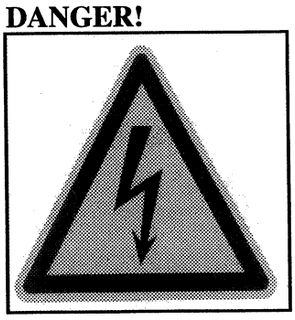


Fig. 9 Cams

2.6 Warning labels

The Rademaker system contains parts that are dangerous when they come in contact with the body. The following labels will be posted as a warning:

DANGER!



This label is used to warn for dangerous voltage. Contacting the part may result in permanent personal injury or death.

Fig. 1Dangerous voltage

DANGER!

This label is used to warn for the danger of the dismembering of limbs. Contacting the part may result in permanent personal injury or death.

Fig. 2 Sharp edge

DANGER!

This label is used to warn for the danger of limbs being pulled in. Contacting the part may result in permanent personal injury or death.

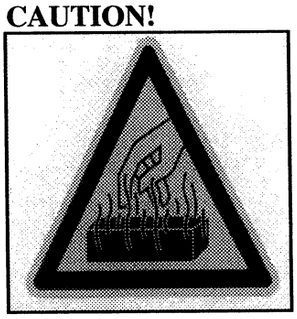
Fig. 3 Forced in

CAUTION!

This label is used to warn for crushing danger. Contacting the part may result in personal injury.

Fig. 4 Crushing danger

CAUTION!



This label is used to warn for hot surfaces. Contacting the part may result in personal injury.

Fig. 5 Hot surface

WARNING!

This label indicates that the use of hearing protection is imperative. Disregarding may result in permanent personal injury.

Fig. 6 Ear protection

FORBIDDEN!

This label indicates that entering the area is dangerous. Single entry is not allowed.

Fig. 7 No entrance

FORBIDDEN!

This label indicates that hosing down this section of the system is forbidden. Disobeying will cause damage to the system.

Fig. 8 **NOT** Wash-down

2.7 Risk assessment conclusions

The conclusions of the risk assessment, referring to the manual are listed below:

WHOLE SYSTEM:
It is not allowed to hose down the electrical parts of the system.
Conveyors with quick release unit must be released to clean the belts.
Special keys for disassembly of parts may only be in possession of a supervisor.
Special keys to open doors may only be in possession of a supervisor.
Do not enter/reach into the machine when it is running.
Machine may only be cleaned when the power supply is switched off.
Keep doors and covers closed when the machine is running.
Dismantle the parts that touch the product to clean them.
Wear gloves, when working with or near freezer units, or with frozen products.

EXTRUDER:
Do not stand on a platform to reach the hopper.
Machine may only be cleaned when the power supply is switched off.
Dismantle the parts that touch the product to clean them.
Do not remove the covers of the motors when cleaning this unit.

CONVEYORS:
Release quick release device to clean the belt.

GAUGING STATION:
Remove the scrapers when the power supply of the machine is switched off.
Machine may only be cleaned when the power supply is switched off.
Do not remove the covers of the motors when cleaning this unit.

CUTTING ROLLER:
According to the risk assessment, no details to report.

SCRAP RETURN SYSTEM:
According to the risk assessment, no details to report.

SCRAP CUTTING SYSTEM:
According to the risk assessment, no details to report.

WARNING PLATE AT ELECTRICAL CABINET:
See switch cabinet for warning plate underneath.

ATTENTION !
ISOLATE POWER SUPPLY
BEFORE OPENING
DOOR

2.8 Safety provisions

Safety switches are provided to prevent the operation of the machine when a protective cover or guard has been removed. Before production start of the machine, the safety devices must be checked for correct functioning. Also the cover plates and screening plates must be mounted before starting the system. Repair or replace safety devices before using the system if they do not work properly. Never rely solely on these safety switches!

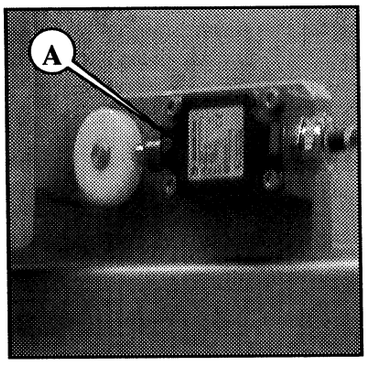


Fig. 1 Pin safety switch

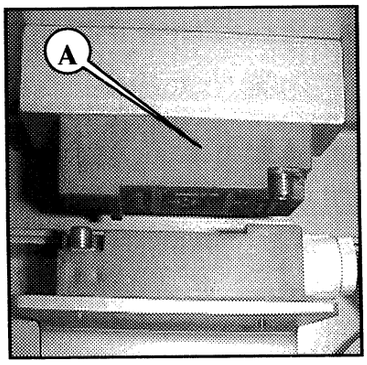


Fig. 2 Magnetic switch

A. Pin- and magnetic safety switches:
The safety switches are switches that will not be activated during normal production. These switches are fixed on covers and doors that shield off moving parts. Opening those covers or doors will result in the immediate switching off of the system. Which safety switch is used depends on the selection of the construction.

B. Emergency stop:
By pushing this button the machine will stop immediately. Only use this button in case of an emergency.

C. Line off:
By pushing this button the complete machine stops. All units will finish their movements. This way of stopping gives the least problems when the machine is restarted and improves the lifetime of the frequency controllers. Always push the "line off" button, then disconnect and lock up the power source with a padlock before removing any part from the machine.

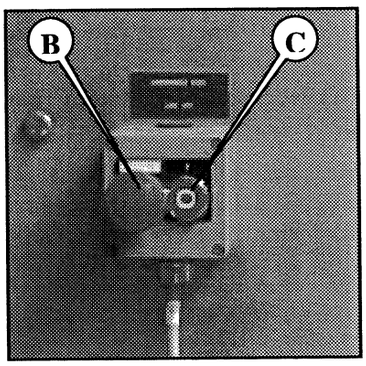


Fig. 3 Pin safety switch

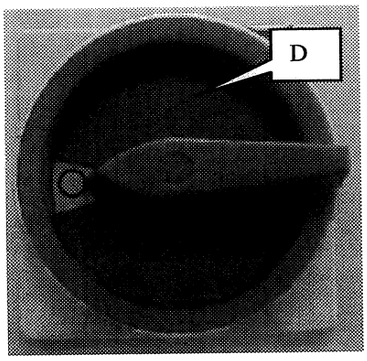


Fig. 4 Emergency stop

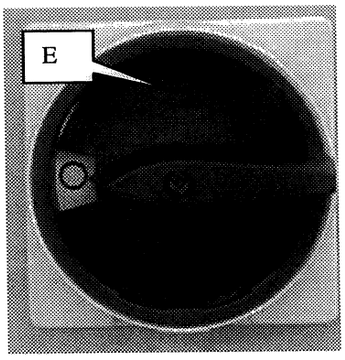


Fig. 5 Power disconnect

D. Emergency stop :
Is located on separate working units. Switch it to the OFF position when a emergency situation arises in the unit.

E. Power disconnect/lock up switch:
Is located on the electrical cabinet, will eliminate the danger of accidental start up when locked in the OFF-position.

F. Circuit-lock disconnect switch:
Is located on the unit, will eliminate the danger of accidental start up when locked in the OFF-position.

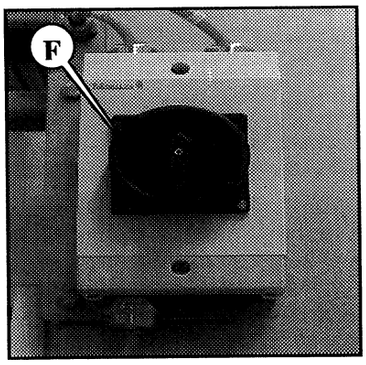


Fig. 6 Power disconnect

Covers and guards safeguard dangerous machine areas. These covers and guards are of utmost importance to operate the machine safely. Never operate the machine when covers or guards are removed because serious injury may occur! Covers and guards, safety signs and safety switches are standard equipment of all manufactured machines and are available for placement on older machines which weren't equipped with these. Contact Rademaker BV for complete information.

2.9 Safety inspection procedure

Before starting the machine all guards must be in place and safety switches must be operating, trained personnel must check safety switches to assure proper operation. See the safety switch inspection-drawing 0070000.07193 for all safety switches.

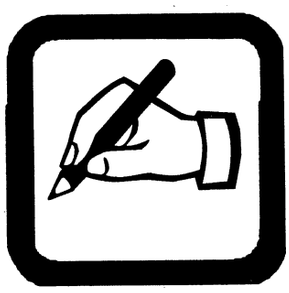
1. With all guards in place, start and stop machine.
2. With machine stopped, open or remove one guard.
3. Push start button, the machine should not start.
4. Close or replace guard.
5. Repeat the above. Open or remove one guard at a time, make sure that the machine does not start with any of the guards opened.

If the machine operates with any of the protective guards opened, this machine is not safe to operate. Immediately call a qualified technician to repair the defective safety switches.

Should the machine become overloaded or jammed, the following steps must be taken:

2. Turn the machine off, disconnect and lock up the power source.
3. Stop, look and listen! Be sure all rotating parts have stopped.
4. Remove guards from jammed area.
5. Resolve the problem.
6. Replace all guards.
7. Unlock power source.
8. Restart the machine.

2.10 Safety switches inspection drawing



3 MACHINE DESCRIPTION

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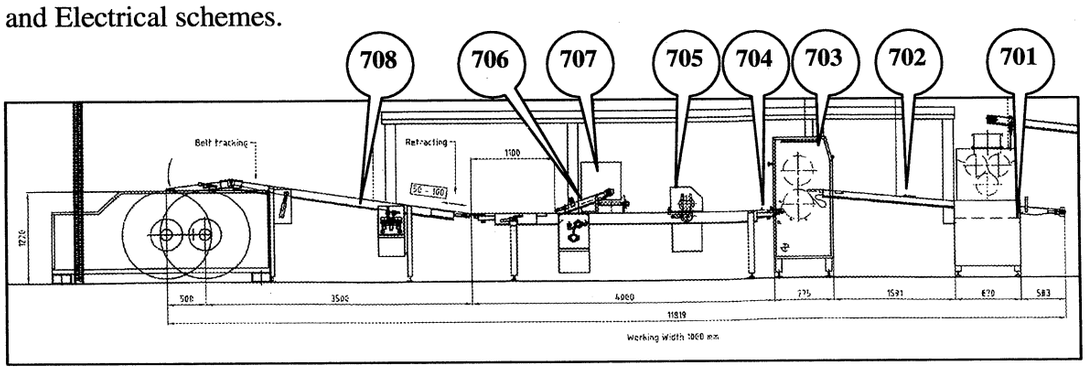
3.1. Safety regulations

Before starting operation, cleaning, maintaining the system or before remedying breakdowns first read the chapters Introduction and Safety.

3.2. Machine descriptions

The machine description gives detailed information about construction and working principle of each unit that makes part of the complete system.
More detailed information can be found at chapter Operation, Maintenance, Parts lists and Electrical schemes.

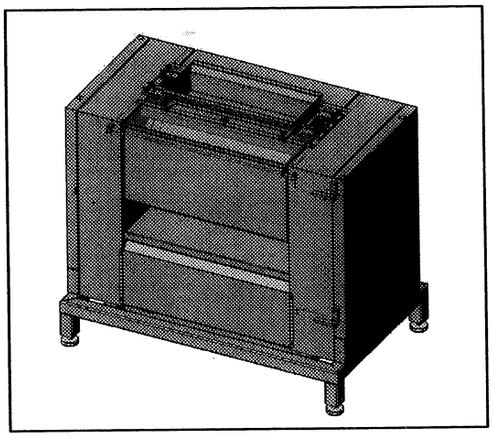


The production line consists of the following units:

701. Three roll extruder;
702. Transport conveyor;
703. Two roll sheeter unit;
704. Main conveyor;
705. Driven cutting roller base set;
706. Scrap return system to transport;
707. Driven cutting roller for scrap;
708. Out feed transport conveyor;

Electrical cabinet.
Entire production line is provided with cable trays and main electrical switchboard, executed as stainless enclosure with hinged doors, enclosures mounted on foot. Including synchronisation and contacts with continuous feeding system and baking system. Power supply; 480 Volt, 3Ph, 60 Hz including earth and neutral (5-core wire).

3.2.1. Unit description: Extruder (3 rollers)



Serial number : **7193 – 701**

Application:
The Extruder is designed to produce a continuous sheet of dough.

Technical data :

Working width	: 1000 mm
Hopper capacity	: 60 Litres
Roller opening	: From 0,1 to 2,5 mm
Execution	: D4D/ Basic/Variant B
Operation side	: Left
Roller diameter	: 295 mm
Drive	: See drive list

Construction:

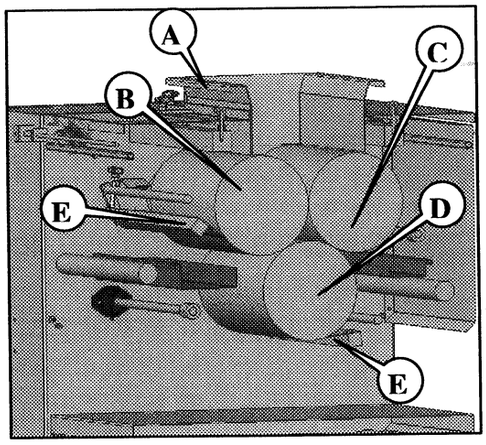


Fig. 1 Cross Section A-A

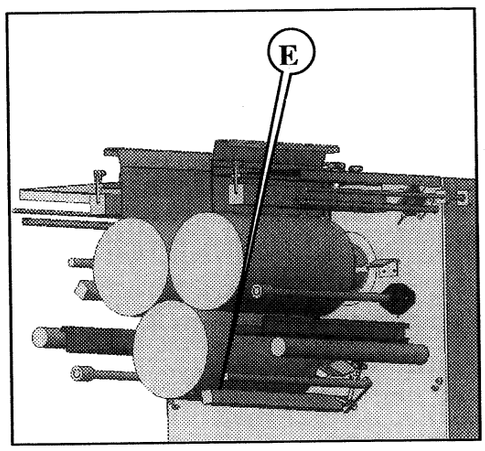


Fig. 2 Cross Section A-A

A. Hopper
B. Supply roller
C. Supply roller (adjustable)
D. Calibration roller (adjustable)
E. Scraper
F. Side plate (removable)

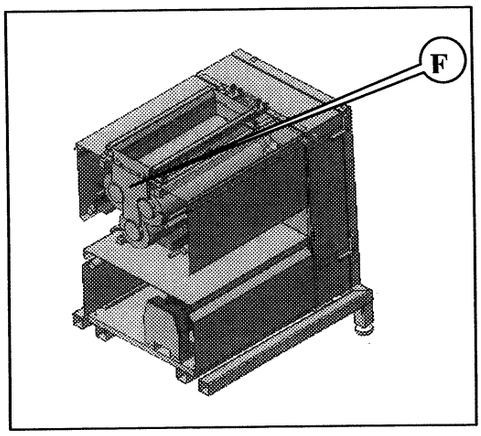


Fig. 3 Cross Section B-B

Drives

F. Drive supply and calibrate roller
G. Drive supply roller
H. Drives height adjustment rollers

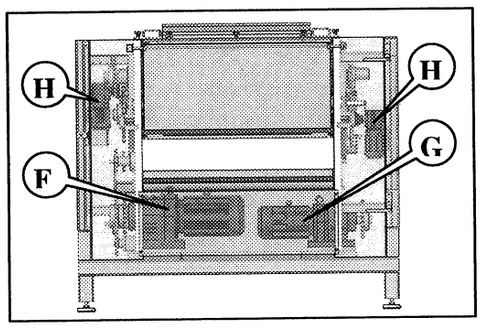


Fig. 4 Cross Section C-C

Variant A
Manual height adjustment of the roller is done by the wheel.

Variant B
Automatic height adjustment of the roller is done by a second drive. Control of height must be done on the touch screen.

Working principle:
The hopper must be filled with small batches of dough (or different foodstuff). When the hopper is equipped with an optional level control, a sensor will detect a low level in the hopper and will send a signal to the unit upstream to fill the hopper. The supply roller will pull the dough towards the centre of the 3 rollers. From the centre the dough is pulled in between the upper roller and the lower roller. In between those 2 rollers the dough is calibrated to the final dough thickness.

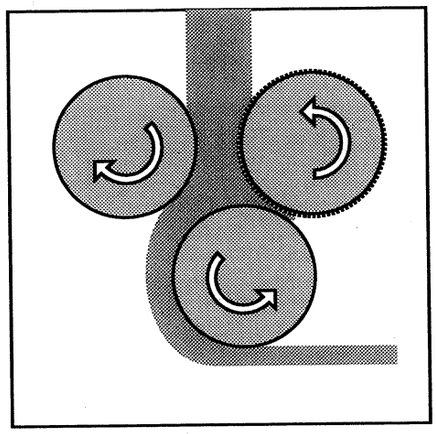
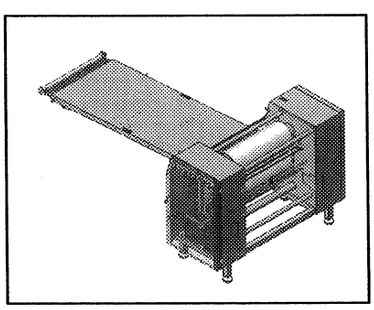
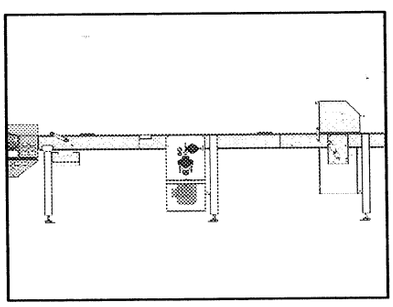
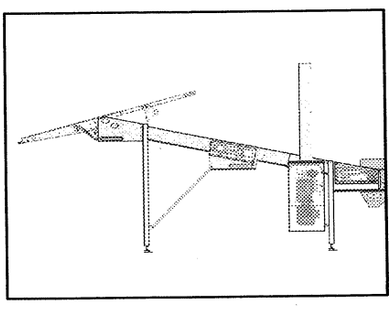


Fig. 5 Cross Section

3.2.2. Unit description: Conveyors

Serial number : **7193 – 702 and others**

Application:
The conveyor belts are designed to transport the dough sheet or dough products to the dough processing units.

Technical data :

Working width	: 1000 mm
Belt width	: 1050 mm
Speed control	: Frequency controlled
Execution	: D4D/Basic/Variant B
Drive	: See drive list

Construction:

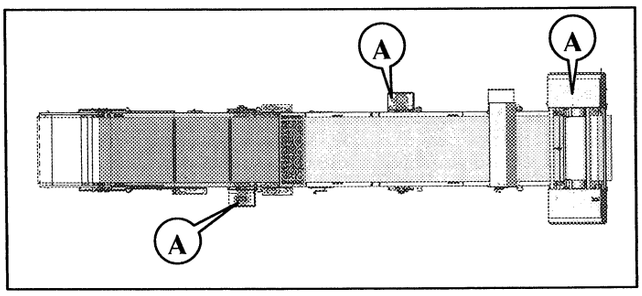


Fig 1 Section

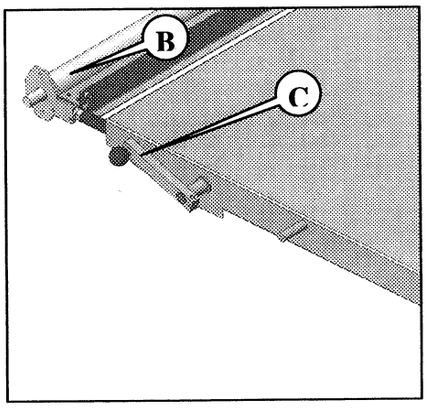
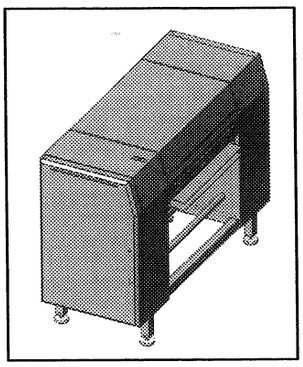


Fig 2 Section

A. Drives
B. Tension roller
C. Belt quick release device

The conveyor belts consists of conveyors that transport the dough to the dough processing units. The belts are driven by frequency controlled AC motors (A). The motors are situated in-side the cabinet of the next downstream dough processing unit or at the outside onto the frame of the conveyor (outside the production zone). The tension roller (B) is equipped with a quick release device (C) for the belt. This for easy cleaning.

3.2.3. Unit description: Two roll sheeter unit



Serial number : 7193 – 703

Application:
The Two roll sheeter is designed to reduce a dough sheet to an adjustable thickness with a maximum reduction of 2 to 1.

Technical data:

Working width	: 1000 mm
Roller opening	: From 0,1 to 2,5mm
Execution	: D4W/ Basic/Variant B
Operation-side	: Left
Drive	: See drive list

Construction:

A. In feed belt
B. Drive roller
C. Belt scraper (removable)
D. Upper roller
E. Upper roller scraper
F. Flour catch tray
G. Lower roller
H. Lower roller scraper (removable)
I. Dough out feed control
J. Cooling spirals

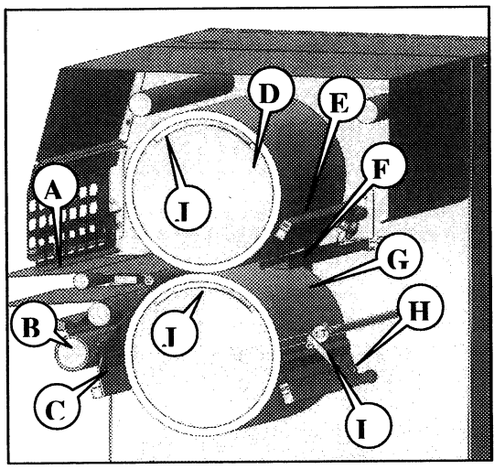


Fig. 1 Cross Section

The two roll sheeter consists of a frame with an upper roller (D) and a lower roller (G). At the infeed a belt (A) with drive roller (B) is placed to supply the two roll sheeter with a dough sheet. The rollers are driven by a frequency controlled AC motor. The motor is situated on the side of the two roll sheeter outside the production zone mounted directly on the lower roller. The upper roller is connected to the lower roller with a chain/sprocket connection. The two rollers will be cooled by cooling liquid this is done by cooling spirals (J) in the rollers. The distance between the upper and lower roller determines the thickness of the dough as it leaves the two roll sheeter. The rollers and belt are cleaned with removable scrapers (C,E,H). There are placed flour catch trays (F) underneath the scrapers. The unit can be equipped with a dough in feed control (DDIC) and is equipped with a dough out feed control (I) to obtain an even dough flow. The distance between the upper and the lower roller is adjustable. The method of thickness control depends on the execution of the unit (variant A or B).

Working principle:

A. In feed belt
B. DDIC (optional)
C. Two roll sheeter
D. Dough out feed control
E. Out feed belt

The dough sheet is supplied by a conveyor belt (A) to the two roll sheeter (C). The thickness of the dough sheet is reduced while passing through the rollers. The thickness shall be a little thicker, than the value set on the screen/wheel. The deviation in thickness depends on compounding of the mixture.

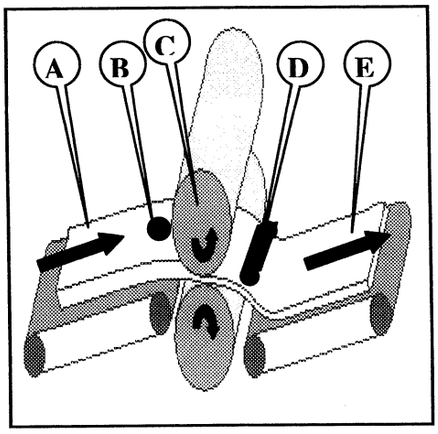
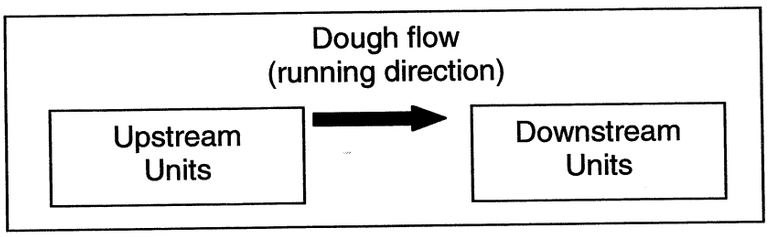


Fig. 2 Principle view

Variant A (optional):

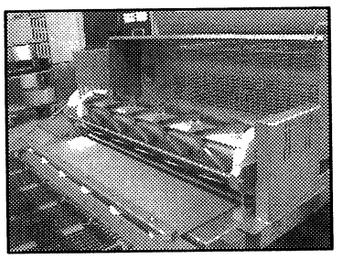
When the dough enters the two roll sheeter it will pass a DDIC Digital Dough In feed Control (B). The DDIC is a small lift able roller. The dough will roll and lift the DDIC. A signal is send to the PLC by lifting the DDIC. By this the PLC knows that dough is entering the two roll sheeter. A speed signal is produced by the rotating motion of the DDIC. This represents the speed of the dough. As soon as the controller receives the signal that the dough is entering the two roll sheeter it will compare the speed of the dough with the speed of the belt that transports the dough towards the two roll sheeter. When the speed of the DDIC dissimilar to the speed of the conveyor belt, the PLC will correct the speed of the conveyor belt.

While leaving the two roll sheeter, the dough sheet will pass the dough out feed control (D). Depending on the speed difference between the two roll sheeter and the next downstream conveyor belt (E), the dough sheet will change the position of the loop. This loop is hinged. At the hinge point an analogue sensor detects the angular displacement of the loop and sends a signal to the PLC that represents the degree of pull on the dough sheet. When this signal begins to deviate the PLC will correct the speed of the two roll sheeter and all upstream units.



Variant B (optional):
The gap between the upper and the lower roller will be adjusted automatically upon adjustment on the touch screen.

3.2.4. Unit description: Driven cutting roller



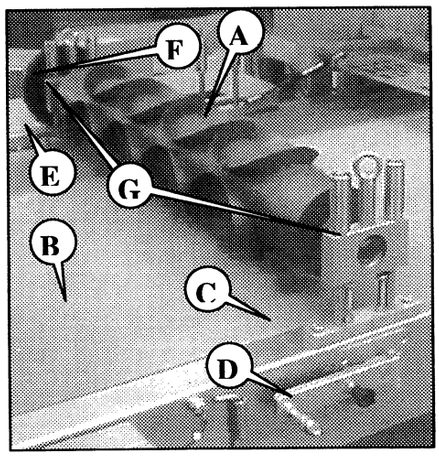
Serial number : **7193 – 705**

Application:
The rotary cutter is suitable for cutting dough shapes out of an endless sheet of dough.

Technical data : Working width : 1000 mm
Drives : See drive list

Construction:

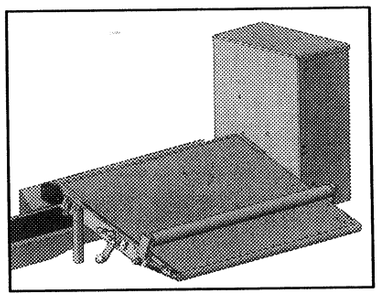
A. Rotary cutter
B. Conveyor
C. Contra roller (underneath transport belt)
D. Handle
E. Drive
F. Gear
G. Support



The rotary cutter (A) is mounted on the conveyor (B). A vulcanised rubber coated roller (contra-roller) (C) is mounted underneath the transport belt. This roller can be raised or lowered by the handle (D). A frequency controlled AC motor (E) is mounted at side. A drive gear for the exchangeable cutting roller is positioned underneath the guard. This gear is directly connected to the drive. The exchangeable rotary cutter with a gear (F) at one end of the shaft can be installed on the support (G). The gear of the rotary cutter will fit onto the drive-gear.

Working:
The transport belt supplies the sheet of dough. The rubber roller underneath the transport belt presses the transport belt with the dough onto the cutting roller. This way the sheet is sliced.

3.2.5. Unit description: Scrap return system



Serial number : **7193 – 706**

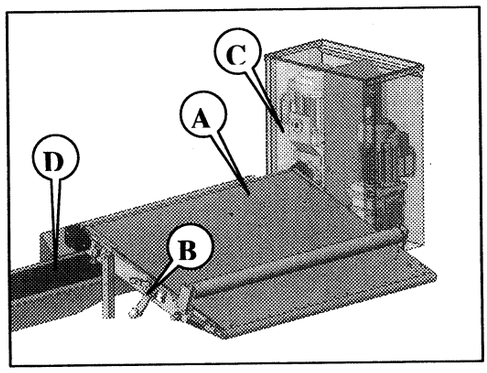
Application:
The unit is used to remove scrap dough from between the products. The scrap is transported to the side of the main conveyor.

Technical data :

Working width	: 1000 mm
Belt width	: 1050 mm
Out feed-side	: Right
Drive	: See drive list

Construction:

A. Parallel belt (inclining)
B. Belt tensioner
C. Drive
D. Cross conveyor



The unit consists of a parallel belt (A) above the main conveyor. The belt tensioner-side is right above the products where the belt tensioner (B) is placed and the scrap is been picked-up. This side is adjustable in height. The belt is mounted inclining. The drive (C) is mounted at the highest side of this belt. A cross conveyor is placed underneath the drive-side. This cross conveyor (D) can be pointed to the left or right. (depending on the customers wish).

Working principle:
The unit starts and stops with the line. The inclining belt must have the same speed as the production line. The cross conveyor transfers the dough scrap to the side away from the main conveyor.

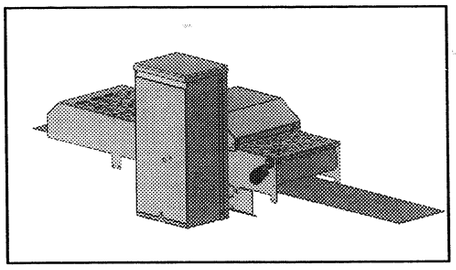
During production:
Watch the steering of the transport belts continuously during production. When one of the conveyor belts goes out of line act immediately to prevent damage of the belt. When steering is needed check the following first:

- Tension of belt.
- Contamination of the belt or the rollers. If the belt or rollers are contaminated, clean them first.

When the belt and the rollers are clean and it's tension is correct, adjust the steering of the belt. See the Maintenance: Conveyor belts in the Maintenance chapter for steering direction.

CAUTION!
Nevertheless never put an obstacle or hand into the machine. If not they may result in personal injury.

3.2.6. Unit description: Scrap cutting system



Serial number : **7193 – 707**

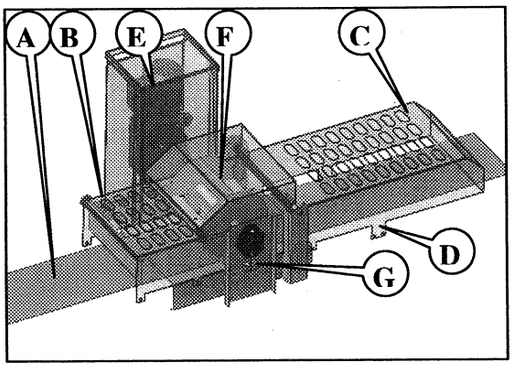
Application:
The unit is used to cutting scrap dough from the products in little pieces. The little scrap dough pieces are transported to the side of the main conveyor.

Technical data :

Working width	: 200 mm
Belt width	: 250 mm
Out feed-side	: Left
Drive	: See drive list

Construction:

A. Cross conveyor
B. In feed
C. Out feed
D. Belt tensioner
E. Drive
F. Cutting roller
G. Rubber coated roller



The unit consists of a cross conveyor (A) above the main conveyor. The in feed (B) is placed at the out feed of the incline conveyor of scrap return system. The belt tensioner (D) is placed at the right side at the out feed (C) side op the conveyor. The belt is mounted horizontal. The drive (E) is mounted at the left side at the in feed of this belt. A cutting roller (F) is placed above the cross conveyor. The cutting roller support is mounted on the conveyor. A vulcanised rubber coated roller (G) is mounted underneath the transport belt. This roller is fixed placed underneath the cutting roller.

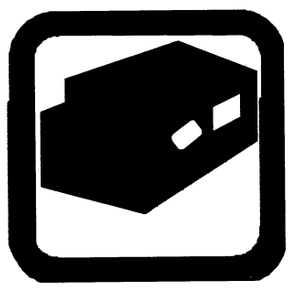
Working principle:
The unit starts and stops with the line. The cross conveyor must have the same speed as the scrap return system production line. The scrap comes from the upstream unit and transported underneath the cutting roller. The cutting roller cuts the scrap into smaller pieces. The smaller dough scrap pieces will be transported to the side away from the main conveyor.

During production:
Watch the steering of the transport belts continuously during production. When the conveyor belts goes out of line act immediately to prevent damage of the belt. When steering is needed check the following first:

- Tension of belt.
- Contamination of the belt or the rollers. If the belt or rollers are contaminated, clean them first.

When the belt and the rollers are clean and it's tension is correct, adjust the steering of the belt. See the Maintenance: Conveyor belts in the Maintenance chapter for steering direction.

CAUTION!
Nevertheless never put an obstacle or hand into the machine. If not they may result in personal injury.



4 TRANSPORT & INSTALLATION

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4.1 Safety regulations

Before starting operation, cleaning, maintaining the system or before remedying breakdowns first read the chapters Introduction and Safety.

For the safety of the installation and personnel, the following points are of importance:

- Use qualified and authorised personnel to carry out the transport and installation.
- Use approved tools, materials, hoisting- and lifting equipment.
- Use tools and materials that meet the measurement and weight of the parts.
- Use hoisting and lifting equipment that meet the format and the weight of the parts.
- Ensure that the paddles of fork trucks are of the right length and distance.
- Affix the paddles of the fork truck to the placed provided.
- Ensure that nothing can move unexpectedly.
- Make sure there is nobody under raised parts
- Some parts may have a high levelled centre of gravity and have the danger of tipping over.

4.2 Storage

The installation is delivered in modules and assembled parts. This is in containers, on pallets and in special crates.

On arrival the machine must be checked immediately for damages. Damages must be reported to the Transport Company and to the sales department. Remove the packing material environmentally friendly.

When the machine must be stored for some time, the following precautions must be taken:

- Store the machine in a dry room
- Use a covering suitable for the local weather conditions
- Close off any openings
- Ensure that the module or part is rigid and cannot be moved or fall
- Protect the machine against the possibility of collision
- Take preventive actions against vermin

After a period of storage, the following must be carried out:

- Thorough inspection of the machine
- Internal and external cleaning
- Visual inspection of heating components, motors, fans etcetera
- Inspection of whether moving/rotating parts are still moving/rotating
- Inspection of safety of the machine

4.3 Transport

Use tools, materials and equipment intended for inside and/or outside use.
Uncouple and disconnect any connections.
Transport the modules horizontally.
Avoid any damages.

4.4 Hoisting/lifting provisions

Use only approved types and models that meets with the suitable lifting capacity.
Ensure that the paddles of fork trucks are the right length and distance.

Connect them only to the placed provided.

4.5 Assembly and installation

4.5.1 General

The assembly and installation must be carried out by personnel of Rademaker, or by engineers assigned by Rademaker, trained for this purpose. They also see to initial operation of the installation. During installation and commissioning always follow the instructions of the Rademaker personnel to prevent unsafe situations.

4.5.2 Preparation

Before actual assembly and installation, the buyer must see to the proper preparations to facilitate correct installation.
The connection of the system to the electricity grid has to be done by a licensed electrician.
All activities must be carried out according to local and national regulations, the requirements of the company and the required provision for the installation.

Activities include:

- Foundations
- Wall passages
- Power supply
- Oil supply
- Gas supply
- Air supply
- Water supply
- Steam provision
- Pipelines
- Clean surroundings
- Safety precautions

4.5.3 Facilities

All facilities for gas, water, air, steam and oil must be in a clean condition.
The supplied gas, water, air, steam, oil must be clean and according the requirements.

4.6 Installation data

Lay-out : see drawing 0000000.07193

4.6.1 General

Environmental factors:
Working floor : Flat smooth floor with sufficient bearing power.
Climate : Normal bakery working temperature (±15°C) atmospheric humidity
Sound level : < 80 dBa

4.6.2 Electrical data

Connection voltage : 480V 3 phase +N+Pe 60Hz
Connection current : 57 Amp
Power (standard) : 37,9 kW
Maximum voltage deviation : 5%.
Electrical protection (IP degree) : IP55

4.6.3 Weight

Total weight of the system : 9500 kg

4.7 Warning at starting up moment

⚠	**ATTENTION!** Without dough **only** run the machine for a **short** time with a low speed. Running the system without dough for a longer time and/or with a high speed will cause damage to rollers and scrapers. When it is necessary to run the machine without dough for a longer time or with high speed, first remove all the scrapers from all the rollers.

4.8 Starting up

Always begin by first testing all safety provisions, such as emergency stop buttons, ropes and bars. If all safety precautions function correctly, the test run can be started.

After the installation had been correctly set up and connected, it must be adjusted/set to the correct settings.

All connection settings of e.g. the power supply, and compressed air pressure are checked, as is the motors' direction of turning. Also check the function of all electrical field components.

Oil pressure and level must be checked during the testing phase.

All provisions should be set/adjusted and their operation checked.

If everything is in good working order then the units can be used.

The running and controlling of the product transportation means (conveyor or mat) must be continuously observed during the testing. If necessary, it must be corrected.

There will be some changes in the configurations of the regulators during start-up and testing, so these have to be revised. Rademaker BV will submit these revised configurations as soon as they are available.

4.9 Baking good bearers

The used product bearers like straps, lids, sheets, pans, baking trays or other types of baking good bearers, must be in good condition; not crooked, folded, bend, dented, or in some way damaged and/or not use-able.
Their way through the production system must be without any hindrance.

4.10 Disassembly

If, for reasons of maintenance, service or alterations the installation or a part of it must be disassembled, we advise you to have this done by Rademaker personnel.

When disassembling parts and materials, take note of the applicable environmental regulations.

All activities must be carried out according to local and national regulations and company safety requirements.

First ensure that the power supply, water, gas, light and such have been correctly and safely disconnected.

Disassemble the parts in principle in the reverse order as to the assembly.

If necessary, note settings and positions, label cables, wires and connections.

5 OPERATION

Table of contents

Safety regulations

Before starting operation, cleaning, maintaining the system or before remedying breakdowns first read the chapters Introduction and Safety.

General

Any connections to other equipment, not supplied and installed by Rademaker BV must be responsibly carried out by the end user.

Rademaker BV strongly advises that personnel working with or on the installation read this manual carefully to become acquainted with:

- The safety precautions, instructions and warnings
- The entire working of the installation
- The settings and limits for electricity, pressure and temperature
- The production process requirements
- Possible faults
- Maintenance

Warning

⚠	**ATTENTION!** Without dough **only** run the machine for a **short** time with a low speed. Running the system without dough for a longer time and/or with a high speed will cause damage to rollers and scrapers. When it is necessary to run the machine without dough for a longer time or with high speed, first remove all the scrapers from all the rollers.

5.1. Starting up

Note:
Always begin by first testing all safety provisions, such as emergency stop buttons, ropes and bars. If all safety precautions function correctly, production may begin.

When starting-up, the following procedures should be carried out:
Turn on the main voltage on the switch box
Turn on the control current
Login
Start the equipment
Follow/use the screen menu's

5.2. Operation

After the start-up procedure all parameters, positions, etcetera can be adjusted as desired.
The installation is operated from the Operators Panel.

5.3. Stopping

When using the Stop menu, then:
Turn off the control current
Turn off the main voltage on the switch box

5.4. Emergency stop

After hitting an Emergency button proceeds as follows:
Check and cancel/solve the reason why
Reset emergency button
Reset emergency relay button
Reset failure message on the screen

5.5. Dough thickness diagram

This diagram gives you information about thicknesses of dough/fat and speed references at each unit for the production of a certain product

Klant: Food Systems Design	Naam : T.den Tek
Projectnummer: 719399	Datum : 29-2-2008
Tekeningnummer: 3201200.01479	Versienr.: 2
Benaming: SPEEDDIAGRAM	Gew. :
Rademaker *Specialists in food processing equipment*	

Min.frequency[Hz]	17,5	DH1S1-EX1		DH1S1-SG1			DH1S1-RC1
Max.frequency [Hz]	70	Ø 295 29,3 Ø 295 31,0 Ø 295 32,3 1,1					
N max. [ratio/min]							
Power factor							
Stretchfactor	1,2						
Produktion Speed [%]	85						
Specific gravity [kg/dm³]	1						
		1,5	1,5	1,5	1,5	1,5	1,2
Regulationfactor						0,8	
Increasefactor							
Individual regelationfactor							
Workingwidth [mm]		1000	1000	1000	1000	1000	1000
Item		Extruder(3-roll)		Gauging station	Upper	Bottom	Cutting
Detailname		Lower rollers	Upper rollers	Supply belt	roller	roller	roller
Width [mm]		1000	1000	1000	1000	1000	1000
Thickness [mm]		0,9		0,9	0,6	0,6	0,6
Speed [m/min]	Max.	16,33	17,96	13,61	24,50	24,50	23,48
Speed ref. signal [VDC]		5,3 VDC	5,6 VDC	6,2 VDC	6,5 VDC	6,5 VDC	7,3 VDC
Width [mm]		1000	1000	1000	1000	1000	1000
Thickness [mm]	Oven	0,9		0,9	0,6	0,6	0,6
Speed [m/min]	speed	14,40	15,84	12,00	21,60	21,60	20,70
Speed ref. signal [VDC]		4,6 VDC	4,9 VDC	5,5 VDC	5,7 VDC	5,7 VDC	6,4 VDC
Width [mm]		1000	1000	1000	1000	1000	1000
Thickness [mm]		1,1		1,1	0,9	0,9	0,9
Speed [m/min]	Min.	8,18	9,00	6,82	10,00	10,00	9,58
Speed ref. signal [VDC]		2,6 VDC	2,8 VDC	3,1 VDC	2,6 VDC	2,6 VDC	3 VDC
Width [mm]		1000	1000	1000	1000	1000	1000
Thickness [mm]				0,9	0,6	0,6	0,6
Speed [m/min]							
Speed ref. signal [VDC]		0 VDC	0 VDC	0 VDC	0 VDC	0 VDC	0 VDC
Width [mm]		1000	1000	1000	1000	1000	1000
Thickness [mm]				0,9	0,6	0,6	0,6
Speed [m/min]							
Speed ref. signal [VDC]		0 VDC	0 VDC	0 VDC	0 VDC	0 VDC	0 VDC
V speed [m/min]		24,52	26,97	20,44	36,79	36,79	28,19
V_{max} [m/min]		31,04	32,25	21,95	37,83	37,83	32,20
Max. Frequency [Hz]		70	70	70	70	70	70
Min. Frequency [Hz]		18,4	19,5	21,7	18,5	18,5	20,8

Rollerdiameter [mm]		295	295	86	400	400	200
Sprocket roller		34	38	1	32	32	1
Sprocket drive		24	24	1	19	19	1
Chain dimension		E1 1/4	E1 1/4		E1 1/2	E1 1/2	
F [N by mm workingwidth]		17,5	10	2	10	10	1
Torque roller [Nm]		2581	1475	86	2000	2000	100
Torque drive [Nm]		1822	932	86	1188	1188	100
i Calculated		54,2	44,1	26,8	41,2	41,2	45,2
P calculated [kW]		8,98	5,33	0,73	6,25	6,25	0,53

Pos. number		1	2	3	4	15	5
PAC number		701	701	703	703	703	705
(Part-)projectnumber		719301	719301	719303	719303	719303	719304
Quantity		1	1	1	1	1	1
Supplier	SEW	SEW	SEW	SEW	SEW	SEW	SEW
Reductortype		R97	R87	KA37	K77	K77	KF47
Motortype		DV132ML4	DV132S4	DT80N4	DV132M4	DV132M4	DT80K4
Mounting position gearbox		M1	M1	M4B	M1B	M1A	M2A
Mounting pos. terminalbox		0	0	0	0	180	270
UL / CSA norm	YES	YES	YES	YES	YES	YES	YES
N1 at 60 Hz [ratio/min]		1740	1720	1700	1740	1740	1700
N2 at 60 Hz [ratio/min]		40,7	46,7	68,0	43,5	43,5	42,9
i Supplier		42,78	36,84	24,99	40,04	40,04	39,61
P Supplier [kW]		9,2	5,5	0,75	7,5	7,5	0,55
External ventilation							
Clixon(TH)/Insulation class F		YES	YES	YES	YES	YES	YES
Voltage [V]	3x460	3x460	3x460	3x460	3x460	3x460	3x460
Frequency [Hz]	60	60	60	60	60	60	60
Enclosure (IP)	55	55	55	55	55	55	55
Remarks				Hollow shaft 30			
							Flange 200
All reducers filled with							
Food-grade oil (H1)		Z upper roller					
		36					

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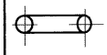
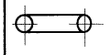
Min.frequency[Hz]	17,5	DH1S1-DR1		DH1S1-RC2	DH1S1-MC1	DH1S1-TB1		
Max.frequency [Hz]	70							
N max. [ratio/min]								
Power factor								
Stretchfactor	1,2							
Produktion Speed [%]	85							
Specific gravity [kg/dm³]	1							
		1,2	1,2	1,2	1,2	1,2		
Regulationfactor							0,98	
Increasefactor								
Individual regelationfactor								
Workingwidth [mm]		1000	200	200	1000	1000		
Item		Scrapremov.		Cutting	Main	Outfeed	SIGMA	
Detailname		system		roller	conveyor	conveyor	VARIANT B	
Width [mm]		1000		1000	1000	1000		
Thickness [mm]		0,6		0,6	0,6	0,6		
Speed [m/min]	Max.	23,48	17,61	23,48	20,42	20,42	Capacity	735
Speed ref. signal [VDC]		8,1 VDC	7,2 VDC	7,6 VDC	7,9 VDC	7,9 VDC		
Width [mm]		1000		1000	1000	1000		
Thickness [mm]	Oven	0,6		0,6	0,6	0,6		
Speed [m/min]	speed	20,70	15,53	20,70	18,00	18,00	Capacity	648
Speed ref. signal [VDC]		7,1 VDC	6,4 VDC	6,7 VDC	7 VDC	7 VDC		
Width [mm]		1000		1000	1000	1000		
Thickness [mm]		0,9		0,9	0,9	0,9		
Speed [m/min]	Min.	9,58	7,19	9,58	8,33	8,33	Capacity	450
Speed ref. signal [VDC]		3,3 VDC	2,9 VDC	3,1 VDC	3,2 VDC	3,2 VDC		
Width [mm]		1000		1000	1000	1000		
Thickness [mm]		0,6		0,6	0,6	0,6		
Speed [m/min]							Capacity	
Speed ref. signal [VDC]		0 VDC	0 VDC	0 VDC	0 VDC	0 VDC		
Width [mm]		1000		1000	1000	1000		
Thickness [mm]		0,6		0,6	0,6	0,6		
Speed [m/min]							Capacity	
Speed ref. signal [VDC]		0 VDC	0 VDC	0 VDC	0 VDC	0 VDC		
V speed [m/min]		28,19	21,14	28,19	24,51	24,51		
V_{max} [m/min]		29,16	24,38	30,74	25,76	25,76		
Max. Frequency [Hz]		70	70	70	70	70		
Min. Frequency [Hz]		23,0	20,6	21,8	22,6	22,6		
Rollerdiameter [mm]		70	50	240	160	160		
Sprocket roller		1	1	1	1	1		
Sprocket drive		1	1	1	1	1		
Chain dimension								
F [N by mm workingwidth]		1,3	1,3	1	3	3		
Torque roller [Nm]		46	7	24	240	240		
Torque drive [Nm]		46	7	24	240	240		
i Calculated		15,8	15,1	54,3	41,6	41,6		
P calculated [kW]		0,63	0,11	0,10	1,28	1,28		
Pos. number		6	7	8	9	10		
PAC number		706	706	707	704	708		
(Part-)projectnumber		719305	719305	719306	719302	719307		
Quantity		1	1	1	1	1		
Supplier	SEW	SEW	SEW	SEW	SEW	SEW		
Reductortype		KA37	KA37	KA37	KA47	KA47		
Motortype		DT80N4	DR63L4	DR63L4	DT90L4	DT90L4		
Mounting position gearbox		M4A	M4A	M4A	M2B	M2B		
Mounting pos. terminalbox		90	90	90	270	270		
UL / CSA norm	YES	YES	YES	YES	YES	YES		
N1 at 60 Hz [ratio/min]		1700	1720	1720	1720	1720		
N2 at 60 Hz [ratio/min]		111,0	131,5	34,5	43,4	43,4		
i Supplier		15,31	13,08	49,79	39,61	39,61		
P Supplier [kW]		0,75	0,25	0,25	1,5	1,5		
External ventilation								
Clixon(TH)/Insulation class F		YES	YES	YES	YES	YES		
Voltage [V]	3x460	3x460	3x460	3x460	3x460	3x460		
Frequency [Hz]	60	60	60	60	60	60		
Enclosure (IP)	55	55	55	55	55	55		
Remarks		Hollow shaft 30	Hollow shaft 30	Hollow shaft 25!	Hollow shaft 35	Hollow shaft 35		
All reducers filled with								
Food-grade oil (H1)								

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Min.frequency[Hz]	17,5		DH1S1-EX1	DH1S1-SG1	DH1S1-SG1
Max.frequency [Hz]	70				
N max. [ratio/min]					
Power factor					
Stretchfactor	1,2				
Produktion Speed [%]	85				
Specific gravity [kg/dm³]	1				
Regulationfactor					
Increasefactor					
Individual regelationfactor					
Workingwidth [mm]			Extruder(3-roll)	Gauging station	Gauging station
Item			Doughthickn.	Doughthickn.	Doughthickn.
Detailname			Adjustment	Adjustment	Adjustment
Width [mm]					
Thickness [mm]					
Speed [m/min]	Max.	kg/hr			
Speed ref. signal [VDC]					
Width [mm]					
Thickness [mm]	Oven				
Speed [m/min]	speed	kg/hr			
Speed ref. signal [VDC]					
Width [mm]					
Thickness [mm]					
Speed [m/min]	Min.	kg/hr			
Speed ref. signal [VDC]					
Width [mm]					
Thickness [mm]					
Speed [m/min]		kg/hr			
Speed ref. signal [VDC]					
Width [mm]					
Thickness [mm]					
Speed [m/min]		kg/hr			
Speed ref. signal [VDC]					
V speed [m/min]					
V_{max} [m/min]					
Max. Frequency [Hz]					
Min. Frequency [Hz]					

Rollerdiameter [mm]					
Sprocket roller			1	1	1
Sprocket drive			1	1	1
Chain dimension					
F [N by mm workingwidth]					
Torque roller [Nm]					
Torque drive [Nm]					
i Calculated					
P calculated [kW]					

Pos. number			11	12	13
PAC number			701	703	703
(Part-)projectnumber			719301	719303	719303
Quantity			2	2	1
Supplier	SEW		SEW	SEW	AXIS
Reductortype			WA30T	RF17	M4-V-L-TGS-50-G-0-0-0-0-Z
Motortype			DR63S4	DR63S4	Spindelreduktor
Mounting position gearbox			M2A	M4	Mounting pos.drive A
Mounting pos. terminalbox			180	0	
UL / CSA norm	YES		YES	YES	
N1 at 60 Hz [ratio/min]			1584	1650	
N2 at 60 Hz [ratio/min]			26,4	218,5	
i Supplier			60	7,55	28
P Supplier [kW]			0,12	0,12	
External ventilation					
Clixon(TH)/Insulation class F					
Voltage [V]	3x460		3x460	3x460	
Frequency [Hz]	60		60	60	
Enclosure (IP)	55		55	55	
Remarks			Hollow shaft 20		With RA 24/28 elastic
				Flange 120	coupling shaft 20mm
All reducers filled with					With MG MULI 4 cover
Food-grade oil (H1)					Flange 120

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Min.frequency[Hz]	17,5	DH1S1-SG1
Max.frequency [Hz]	70	
N max. [ratio/min]		
Power factor		
Stretchfactor	1,2	
Produktion Speed [%]	85	
Specific gravity [kg/dm³]	1	
Regulationfactor		
Increasefactor		
Individual regelationfactor		
Workingwidth [mm]		Gauging station
Item		Doughthickn.
Detailname		Adjustment
Width [mm]		
Thickness [mm]		
Speed [m/min]	Max.	
Speed ref. signal [VDC]		
Width [mm]		
Thickness [mm]	Oven	
Speed [m/min]	speed	
Speed ref. signal [VDC]		
Width [mm]		
Thickness [mm]		
Speed [m/min]	Min.	
Speed ref. signal [VDC]		
Width [mm]		
Thickness [mm]		
Speed [m/min]		
Speed ref. signal [VDC]		
Width [mm]		
Thickness [mm]		
Speed [m/min]		
Speed ref. signal [VDC]		
V speed [m/min]		
V_{max} [m/min]		
Max. Frequency [Hz]		
Min. Frequency [Hz]		

Rollerdiameter [mm]		
Sprocket roller		1
Sprocket drive		1
Chain dimension		
F [N by mm workingwidth]		
Torque roller [Nm]		
Torque drive [Nm]		
i Calculated		
P calculated [kW]		

Pos. number		14
PAC number		703
(Part-)projectnumber		719303
Quantity		1
Supplier	SEW	AXIS
Reductortype		M4-V-L-TGS-50-G-0-0-0-0-Z
Motortype		Spindelreduktor
Mounting position gearbox		Mounting pos.drive B
Mounting pos. terminalbox		
UL / CSA norm	YES	
N1 at 60 Hz [ratio/min]		
N2 at 60 Hz [ratio/min]		
i Supplier		28
P Supplier [kW]		
External ventilation		
Clixon(TH)/Insulation class F		
Voltage [V]	3x460	
Frequency [Hz]	60	
Enclosure (IP)	55	
Remarks		With RA 24/28 elastic
		coupling shaft 20mm
All reducers filled with		With MG MULI 4 cover
Food-grade oil (H1)		Flange 120

5.6. General explanation of hardware principle

The installation is controlled by a PLC (Programmable Logic Controller).
The communication with this PLC and simply operations must be done by the touch screen or so called HMI (Human Machine Interface) at the side of the installation.

5.7. General explanation of the touch screen

This paragraph describes the use of the touch screen in a control panel used for Rademaker equipment.

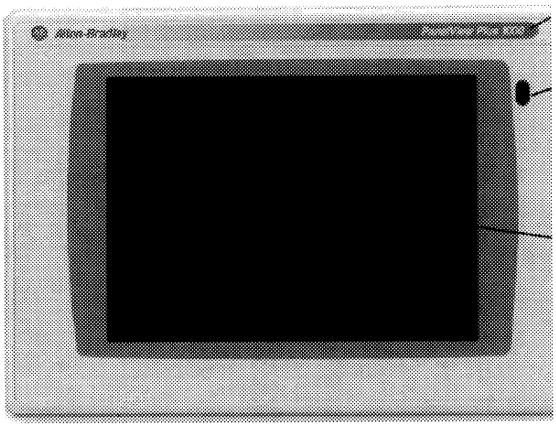


Fig. 1 Example of a touch screen (HMI)

All operator control objects required for operator input are displayed on the touch screen once the Rademaker equipment has started.

Note:
Always operate the HMI touch screen with your fingers or with a touch pen.

Warnings!
Unintentional Actions:
Always touch one operator control on the display. Never touch more than one operator control at a time, otherwise you may trigger unintentional actions.

Damage to the touch screen:
The use with sharp or pointed objects or applying excessive pressure when pressing the touch screen will substantially reduce its useful life and even lead to total failure.

The programming comprises the general control of the installation, the control of the product and troubleshooting.

The various stand-alone machines, which have their own control cabinet, are connected by the single network cable to each other and to the PLC.

Square keys are usually Operation keys, they will change colour when using.

Optical operation feedback:
The HMI outputs different views of the "Touched" and "Untouched" states, provided the configuration engineer has configured a 3D effect.

"Touched" state

"Untouched" state

Used buttons:
Graphic selector switch used for making selections out of different icons. Select with up and down button desired mode and confirm with touch on picture. See left a example selector switch of the sanitation production

Off state

On state

Manual jog button
(This button is only visible, when you are logged on as administrator as maintenance personal).

Information call button

or 

Line start button

or 

Line stop button

or 

Line reset button

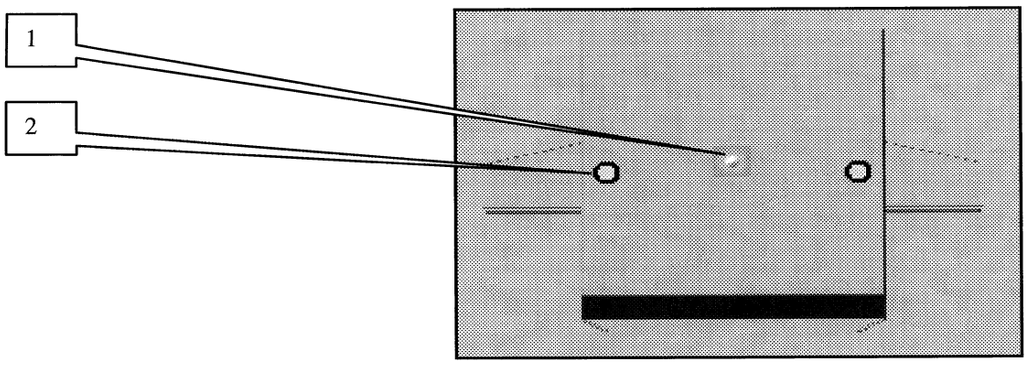


Fig. 2 Example of a unit with proximity switches

1

Unit status:
The status of the unit will be displayed by a coloured status point.

Line failure (Red). Only when a problem with the automatic gap control is present, the status point of the unit will colour red and a blue reset button will show up at the gap section. A gap control problem only results in warning and not in alarms so the line can still run production.

Selected, but not running (Yellow).

Running (Green).

2

Proximity switches status:
The status of the proximity switches will be displayed by a status point:
Yellow point displayed : switch active
Grey point displayed : switch not active

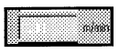
Input/output fields.

Parameter entry field with direct result. This parameter is part of the recipe structure and will be kept, when a save recipe operation is executed. Changing this value will result in a change of machine operation.

Parameter entry field with no direct result. This scratch parameter is part of the recipe structure and will be kept, when a save recipe operation is executed. Changing this value will not result in a change of machine operation. A manual operation is necessary when this value is changed.

Actual process value field. This value is a readout of the actual process value for example from a potentiometer or a set point value for a motor. This information is only visible, when the switch  is put ON at the maintenance control screen.

Constant entry field. This entry is not part of the recipe structure, so it will be kept but is the same for all recipes.



Constant entry field. This entry is not part of the recipe structure, so it will be kept but is the same for all recipes. If the speed get out of range the entry field becomes yellow.

After you touch an input/output field, a screen keyboard appears as optical operation feedback.

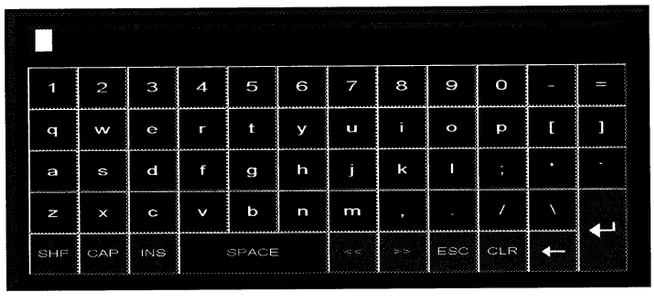


Fig. 3 Example of screen keyboard

5.7.1. Process overview screen

Button to call the process overview screen

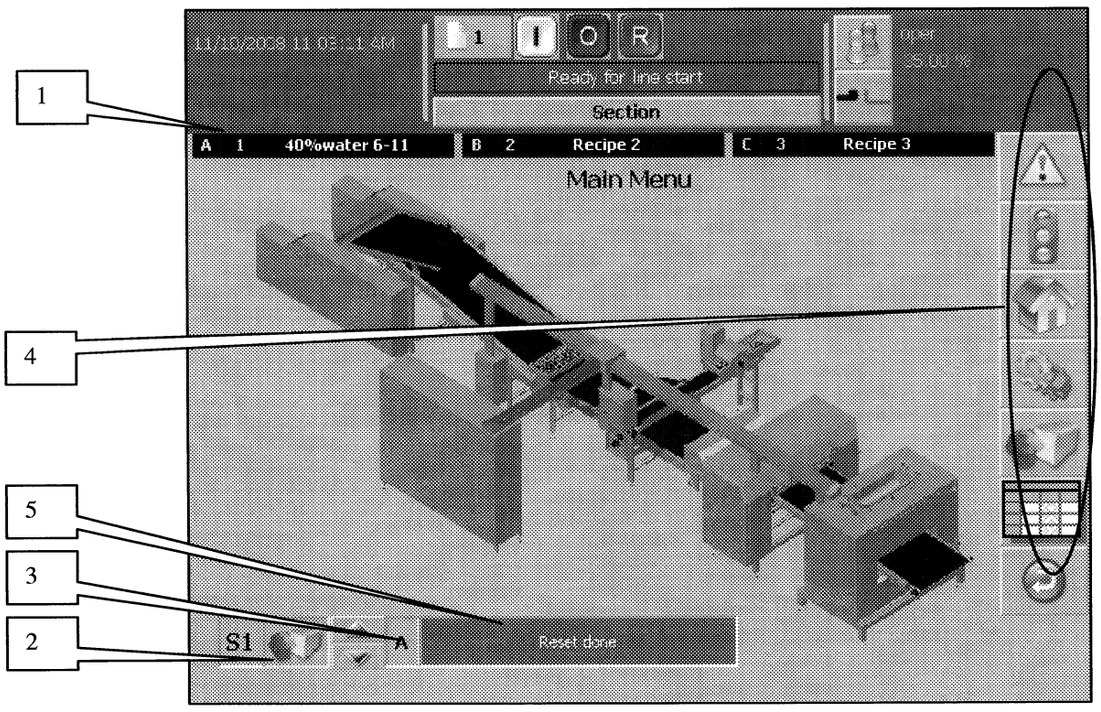


Fig 4 Example of process overview screen

1 On top of the screen the selected product program can be monitored. In the screen above "Croissant" is loaded in product program A . B is loaded with "Ciabatta 100x100" and C is loaded with "Pizza R250".

2 In the process overview screen a top view of the different sections is shown. By touching that section the particular section screen will be called. Near the section is shown if the particular section is in sanitation or in production mode. With this selector switch the mode can be changed as well.

Sanitation
For explanation see paragraph section screen.

Production
For explanation see paragraph section screen.

3 Also can be seen which product programs A, B or C are selected. In the above screen we see that product program A, recipe number 1 named "Croissant" is used on all 3 sections.

Example of application:
The production run of a product (for a example product program A) has been finished the first section. This means the first section may be switched to sanitation mode in case of end of production wile the production on other section of the line will not be disturbed (see also explanation sanitation mode).

Example of application:
In case of production of the next product can be started at the first section by selecting recipe mode B or C while running production A will be finished the end of the line. More information about running different production programs at the time will be explained at the section screen.

All automatic adjustments will start, after an other product program is selected in production mode at that particular section. Therefore it is more safe to change product program from sanitation mode. (all changes must be done at the section like gap adjustments, some manually depending execution.)

Do not start the first section too early with a new product program, when the speed of the new product program is higher.

4

From the process overview screen, different other screens can be called by pushing certain areas on the screen. (explanation follows in next page)

5

Furthermore is shown what the status of every section is. The various status are:
General breakdown (red).
Ready to reset (purple).
Release main relay (purple).
Ready to reset VFD's (Variable Frequency Drives) (purple).
Switch off main relay (purple).
Check if reset servo drive is required (blue).
Ready to recover or home (green flashing).
Ready to run (green).

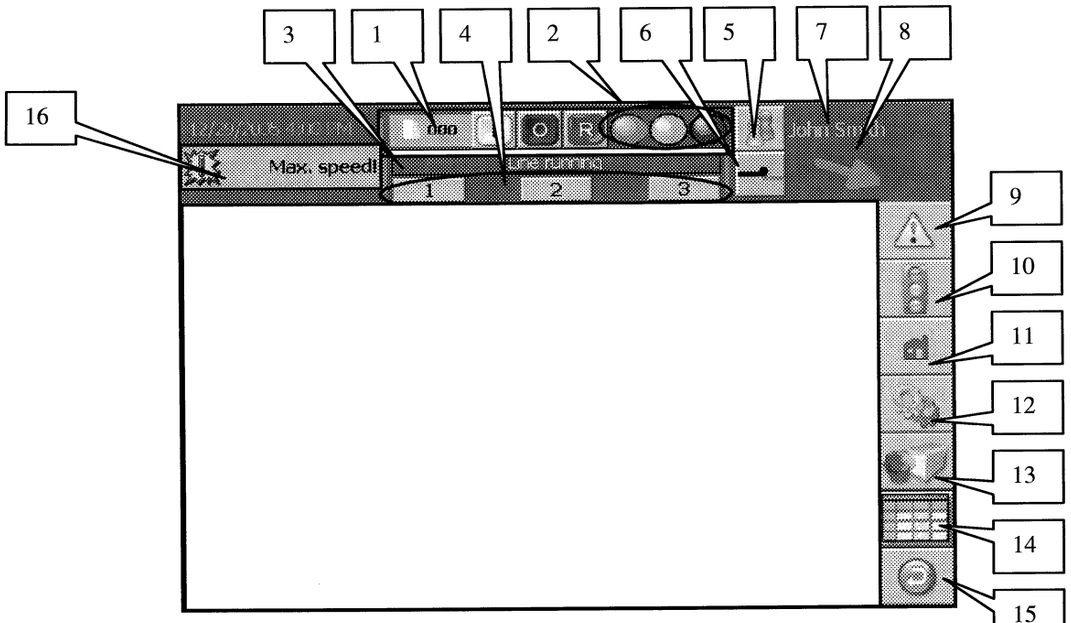


Fig. 5 Example of process overview screen

1 **Screen number**
The number shown at this particular screen is unique for this machine.

2 **Status signal lights:**
Orange steady on: a warning is present.
Green steady on: process in running.
Green flashing: process is being started or being stopped.
Red flashing: An alarm is present which can be reset.
Red steady on: An alarm is present which cannot be reset.

3 **Process status bar:**
This displays the status of the process:
General breakdown (red).
Ready to reset (purple).
Ready to recover or home (purple).
Warn for recover or home (purple).
Ready for line start (blue).
Warn for line start (green flashing).
Line running (green).
Cycle stop active (green flashing).
Extended line on time (green flashing).

Extended line on time is the time after a cycle stop that some modules may finish their operation on condition that the safety circuit stays safe. This time is limited to 5 seconds.

4 **Call section screen buttons (1, 2 and 3)**
(detailed information can be found at paragraph 5.7.2)

5 **Call password control screen**
(detailed information can be found at paragraph 5.7.3)

6 **Switch separate/combined (status of downstream equipment)**
Separate/combined switch equipment placed behind Rademaker plant.

This icon displays a tow bar which is connected to a trailer symbolizing combined. When combined the line can only be started when the downstream equipment is also ready to start.

This icon displays a not connected trailer to a tow bar. When separate the Rademaker plant can be started and be stopped independent from the status of the downstream equipment.

7 **Operator logged on status:**
The username is displayed here from the operator logged on. The administrator can define new usernames and passwords. When a recipe save is done the username and date and time are also saved.

8 **Status upstream equipment:**
Arrow illustrates manner of upstream control:
The status of the upstream equipment is symbolized by an arrow at the right and left side of the screen, and pointing down. The colours define the state:
White is selected
Yellow is ready to start
Green is running
Red is alarm is present

9 **Call Actual alarm screen**
(detailed information can be found at paragraph 5.7.4)

10 **Call Start/Stop/Reset screen**
(detailed information can be found at paragraph 5.7.5)

11 **Call Process overview screen**
(detailed information can be found at paragraph 5.7.1)

12 **Call maintenance control screen**
(detailed information can be found at paragraph 5.7.6)

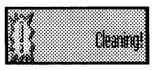
13 **Call recipe control screen**
(detailed information can be found at paragraph 5.7.11)

14 **Call capacity diagnose screen**
(detailed information can be found at paragraph 5.7.12)

15 **Call previous screen**
Push this button to go one step back.

16 **Warning messages**

Max. speed procedure is active warning message:
In the top bar a maximum speed active warning message can be shown to warn the operator that he cannot run production in this operation mode.



Cleaning speed procedure is active warning message (optional):
Procedure can be activated by key at the side of the main control touch screen cabinet. The belts and reducers will run at low speed. Operation of touch screen is restricted.

5.7.2. Section screen

A certain section of the line can be selected on the process overview screen. By touching that section the particular section screen will be called.

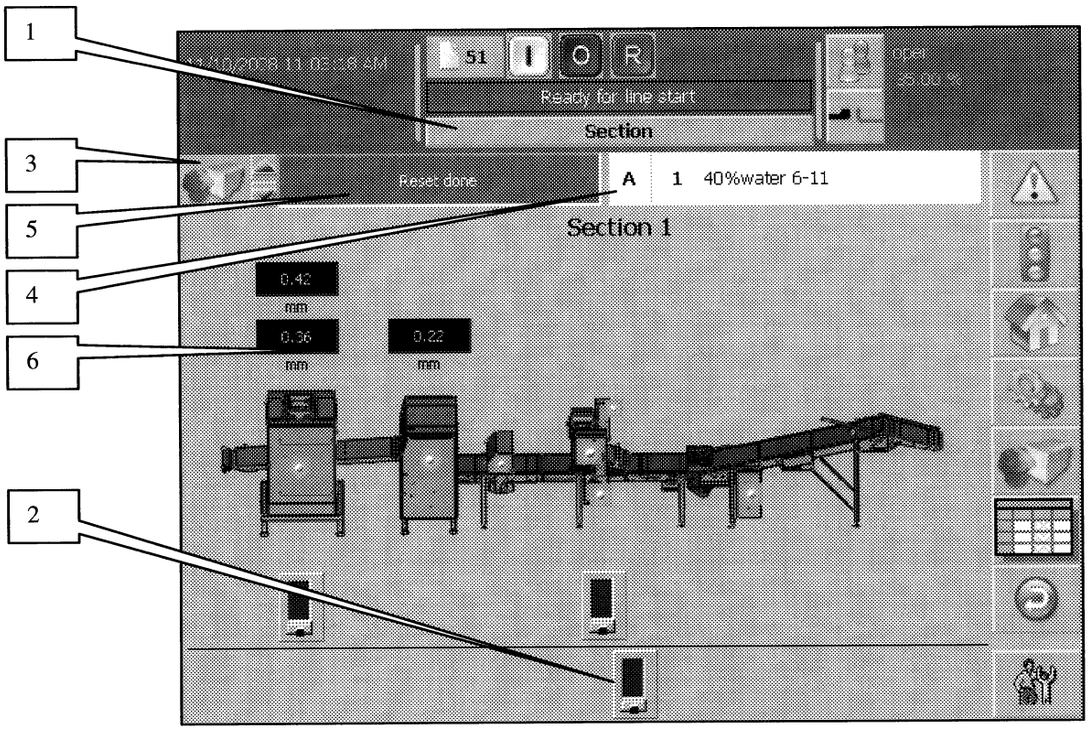


Fig. 6 Example of a section 1 screen

1 The number of the selected section. A section screen consists of a side view of the section.

2 With at top under the common bar the transport selection switch. The transport conveyors of the section can be start and stop with this selector switch.

3 Near the left upper corner is shown if the particular section is in sanitation or in production mode. With this selector switch the mode can be changed as well.

Sanitation
Each section can be stopped for cleaning by selecting this mode.
Safety racks and guards may be opened at this section in sanitation mode, without disturbing of the production of other sections.

Production
The production mode can be selected by selecting this mode.
All safety racks and guards are now active. This means the line will be shut-down, when one of these devices are operated. (see also process overview screen and recipe control screen)

4

The number after the A, B and C indicates the used recipe number at each section. In the above screen we see that product program A is used on this section. A recipe (see recipe number with name) is copied to product program. How to place a recipe as product program will be explained at paragraph recipe control. The icons with tow bar / trailer bar in the section screens indicates the manner of control.

All sections are automatically combined with each other when one single product program is in use. An icon of a tow bar connected to a trailer bar is a symbol of combined. This can be monitored on screen at lower left and right corners of every section screen. Combined means the speed of the downstream section is used so the speed entry will be greyed out. Settings of thickness set in product program is valid for whole line.

The control of sections will be automatically disconnected when a different production program is selected for one of the sections. When separate the speed of the downstream section is not used and the section can be given it's own pilot speed. If however it is desired to be connected (use speed control / thickness control of the other sections) those buttons must be selected. If however it is desired to be connected this may be done by the operator manually to limit the change-over time between two production runs.

More information of combined / separate will be discussed at next screen.

Note:
Use this option only if you understand its control.

5

Furthermore is shown what the status of every section is. The various status are:
General breakdown (red)
Ready to reset (purple)
Release main relay (purple)
Ready to reset VFD's (Variable Frequency Drives) (purple)
Switch off main relay (purple)
Check if reset servo drive is required (blue)
Ready to recover or home (green flashing)
Ready to run (green)

6

Further from the gaps is shown the actual gap (variant B) or the scratch value from the gap parameter value when it is still a manual gap adjustment.

An example of a section screen is shown to explain the connection to an upstream section.

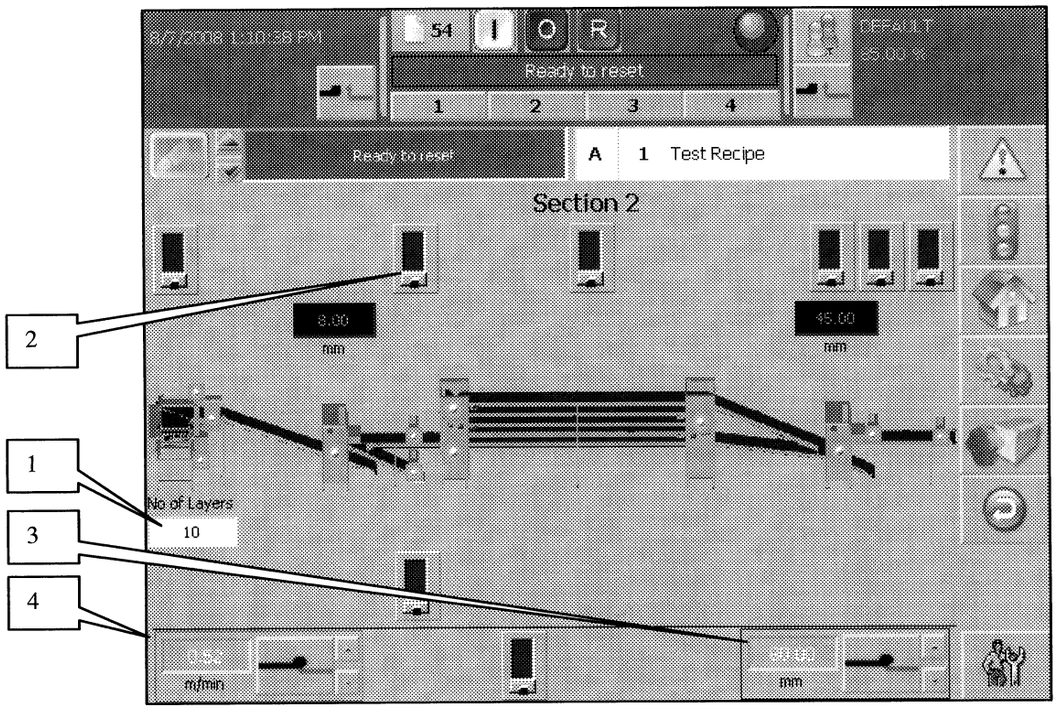


Fig. 8 Example of other section screen

1 The adjusted number of layers will be shown at this screen.

2 Selector switches are present for the modules which need this.

3 In the right lower corner we see if the speed of the downstream section is used or not

4 In the left lower corner we see if the thickness of the upstream section is used or not

This icon displays a tow bar which is connected to a trailer when symbolizing combined. When combined the thickness of the upstream section is used so the thickness entry will be greyed out.

This icon displays a not connected trailer and a tow bar. When separate the thickness of the upstream section is not used and the section can be given it's own pilot supply thickness. When a different product program is chosen for this section as for the upstream section, it will be disconnected. If however it is desired to be connected this may be done by the operator manually to limit the change-over time between two production runs.

Touch this button to call the maintenance section screen.

Button to call the maintenance screen.

Each section screen is provided with a maintenance screen. This to warn operator that section required maintenance.

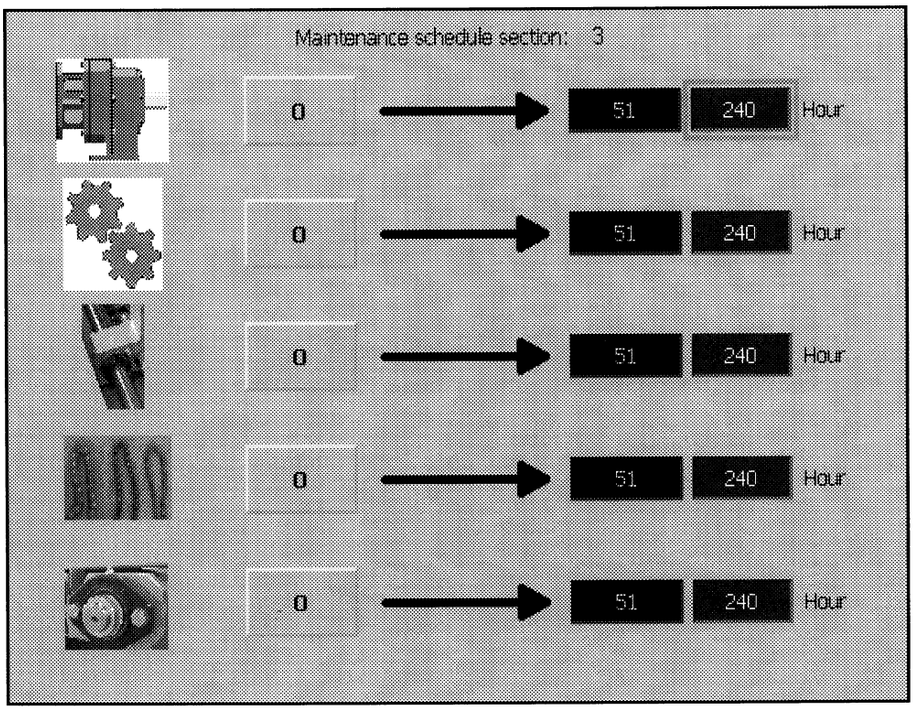


Fig. 8 Example of maintenance screen

This screen shown in the blue entry fields the run time maintenance intervals. In the yellow/black status field the actual run time. As soon as the actual run time exceeds the maintenance intervals warnings will be generated for the operator. The maintenance department can reset these actual run times when they fulfilled the maintenance procedure. They can do this with the zero-buttons.

5.7.3. Password control

Button to call the password control screen.

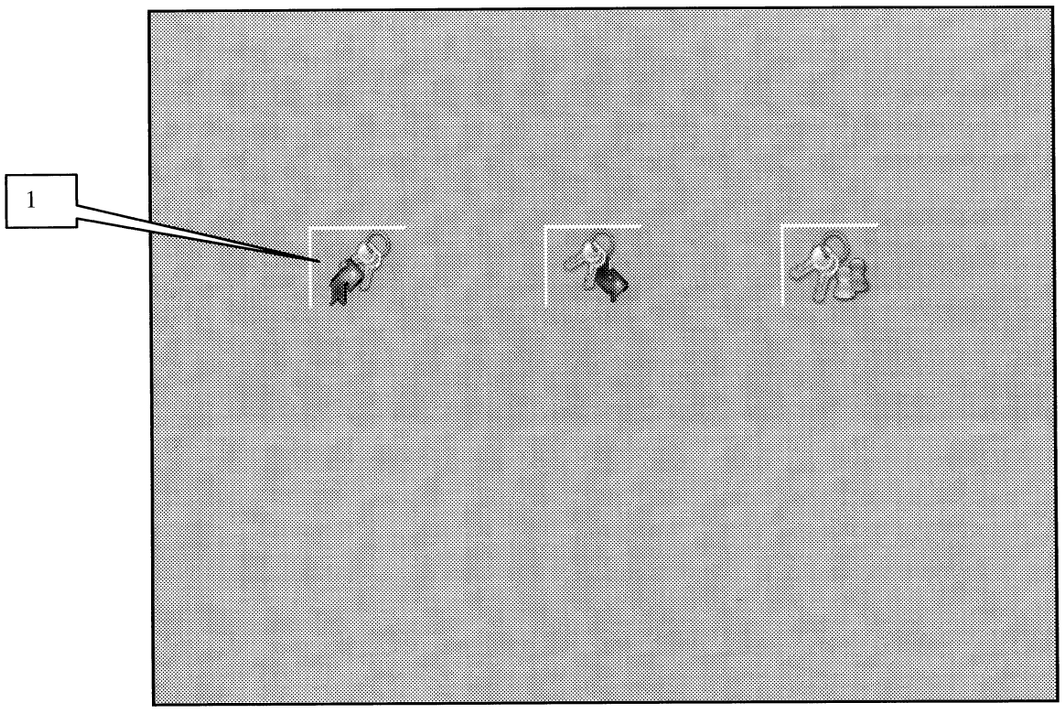


Fig 9 Password control screen

Button to call the logon popup screen.

Use the logon dialog and keyboard on screen to log into the security system of the HMI device. Enter username and password in the logon dialog.

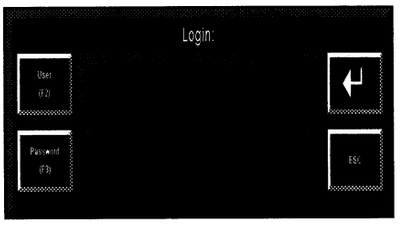


Fig. 10 Logon dialog

The operator can enter here his username and password. The username is displayed the in the right upper corner. After a certain time of no operation the user will be logged off.

Button to log off.

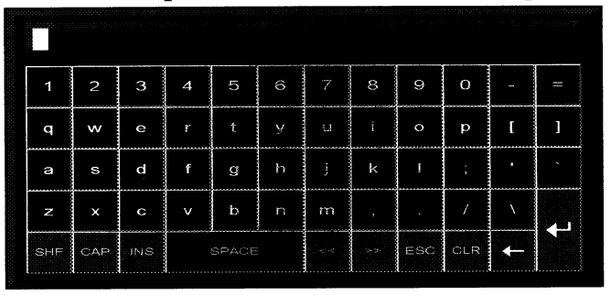


Fig 11 Example of keyboard

1

Button to call the screen shown below.

For system administrator and for the supervisor it is possible to add users as operators, maintenance etcetera. Also the automatic logoff time can be adjusted.

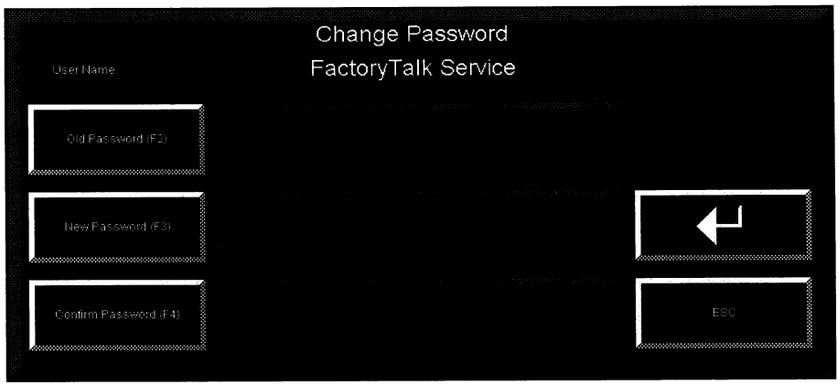


Fig 12 Example of change password screen

5.7.4. Alarm/warning screen

Button to call the actual alarm/warning screen.

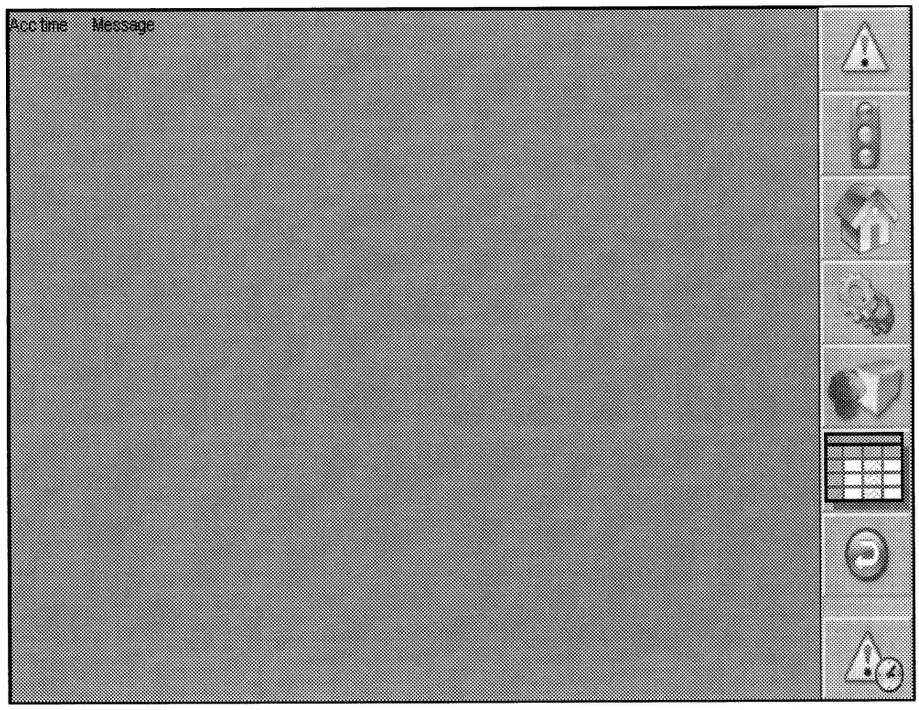


Fig. 13 Alarm screen (1)

Each active alarm or warning is displayed here with the date and time when it appeared. With the blue reset button alarms can be reset when the cause is removed. In this screen the alarm with number A0001 is shown where A stands for alarm. On next shown screen a warning example will be displayed. As you notice the red signal light comes on as well as an alarm is present.

Example of an actual warning:

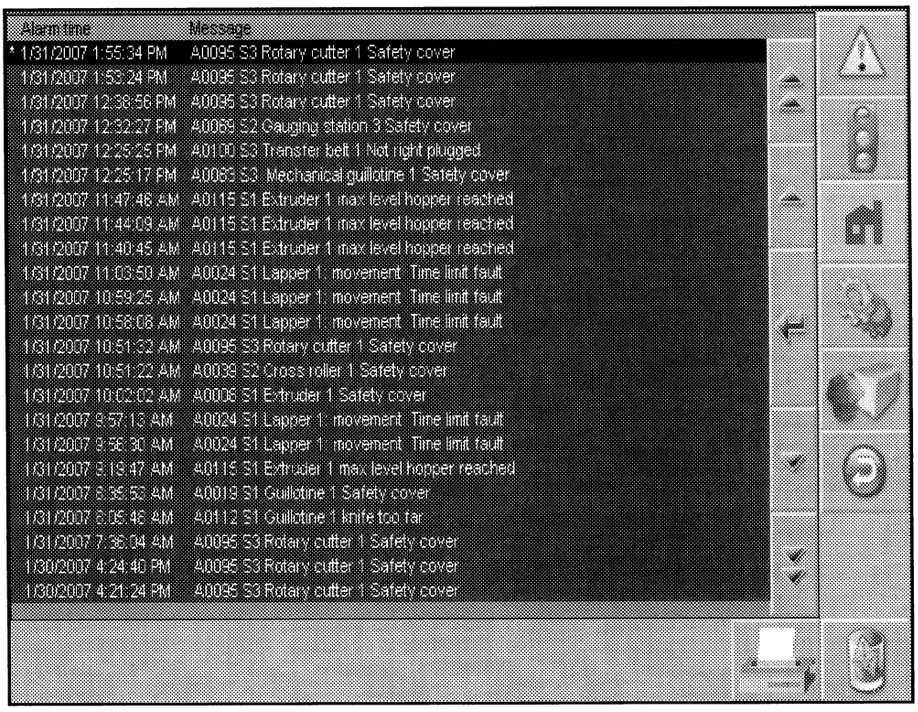


Fig. 14 Alarm screen (2)

As you notice the orange warning light is on and the warning number is W0004 where W represents warning. As you notice the line keeps running while warnings are present.

Button to call the alarm buffer screen.

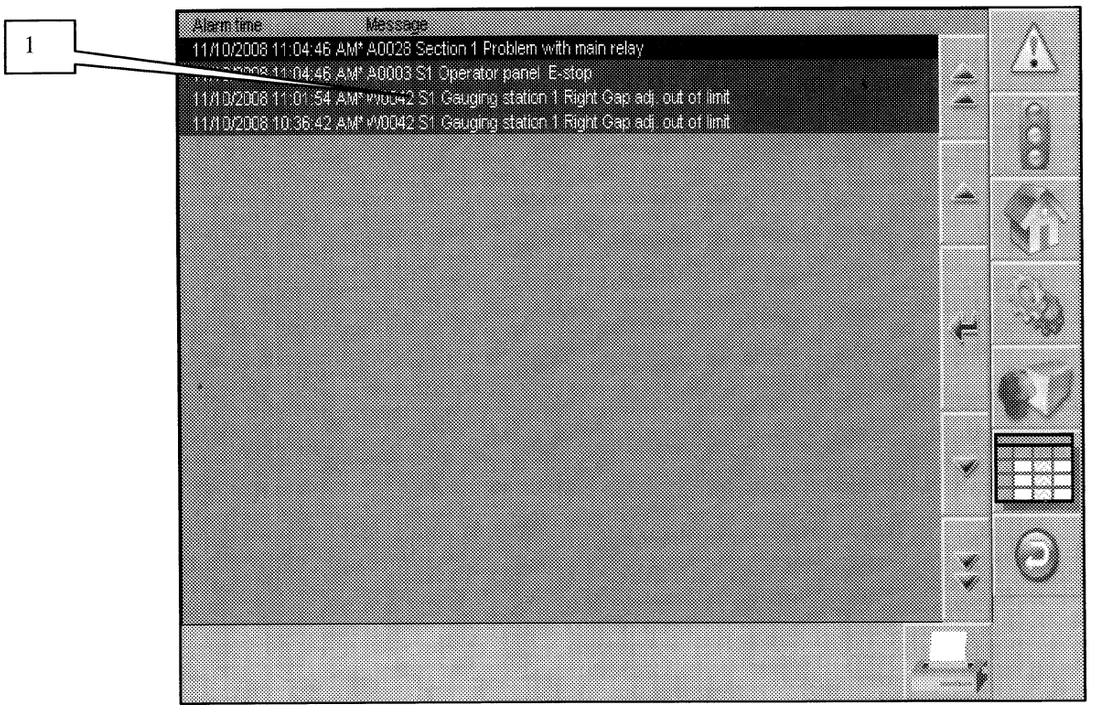


Fig. 15 Alarm buffer screen (1)

1

In the alarm buffer screen alarms are stored with time and date when they come up (c). Also is stored when alarms disappear (d). The alarm buffer will be cleared on power off.

It can also be cleared manually by pushing the button. A print can be made when is printer is hooked up with the printer button.

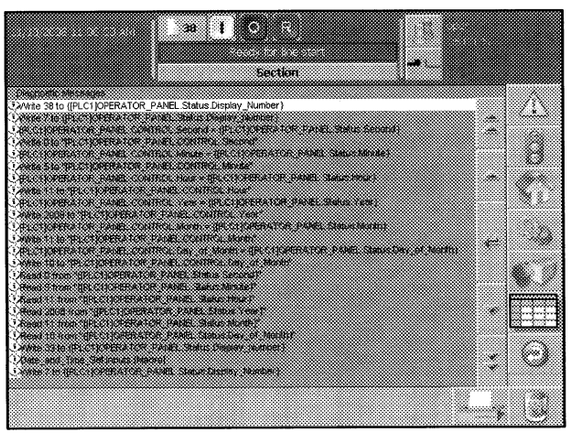


Fig. 16 Alarm buffer screen (2)

5.7.5. Start/stop/reset screen

Button to call the Start/stop/reset screen.

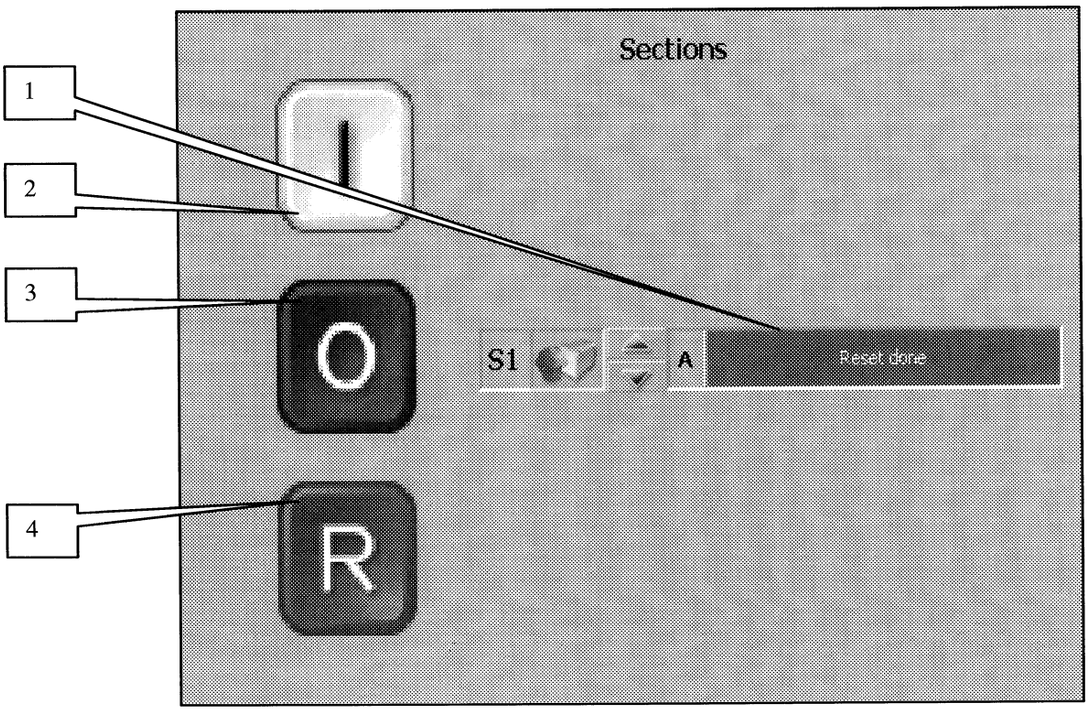


Fig. 17 Start/Stop/Reset screen

1 On this screen an overview of the status from the sections is shown.

2 Also a white line start button is present, which is only active when the process is ready to start. Keep the white line start button pressed until the line is running, because a warning (horn) is generated before the line starts running.

3 A black cycle stop button is present.

4 A blue reset/start recover/home button is present. In case of recover/home the blue button must be kept pressed until homing is started. This because a warning (horn) is generated before homing is started.

5.7.6. Maintenance control screen

Button to call the maintenance control screen.

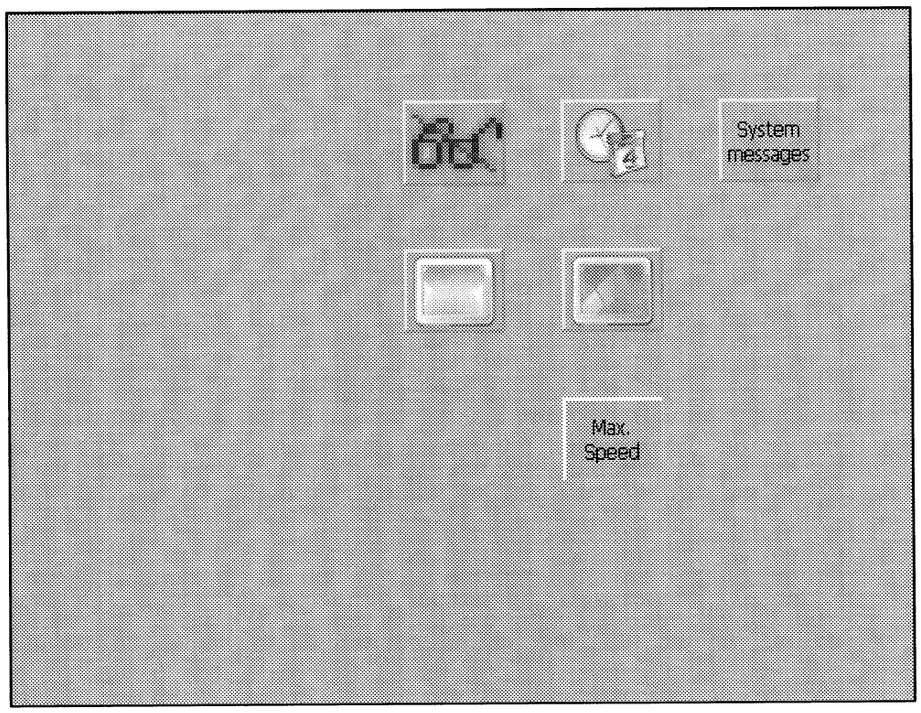


Fig. 18 Maintenance control screen

From this screen different settings can be made.

With the switch  and  , you can choose if dynamic process variables must be shown in the module screen yes or no. On powering the electrical cabinet these variables won't be shown to simplify the operation of the machine. In case more technical information is desired the switch can be put to  make the dynamic process values visible.

5.7.7. Setting date and time

With the button the screen with date and time appears.

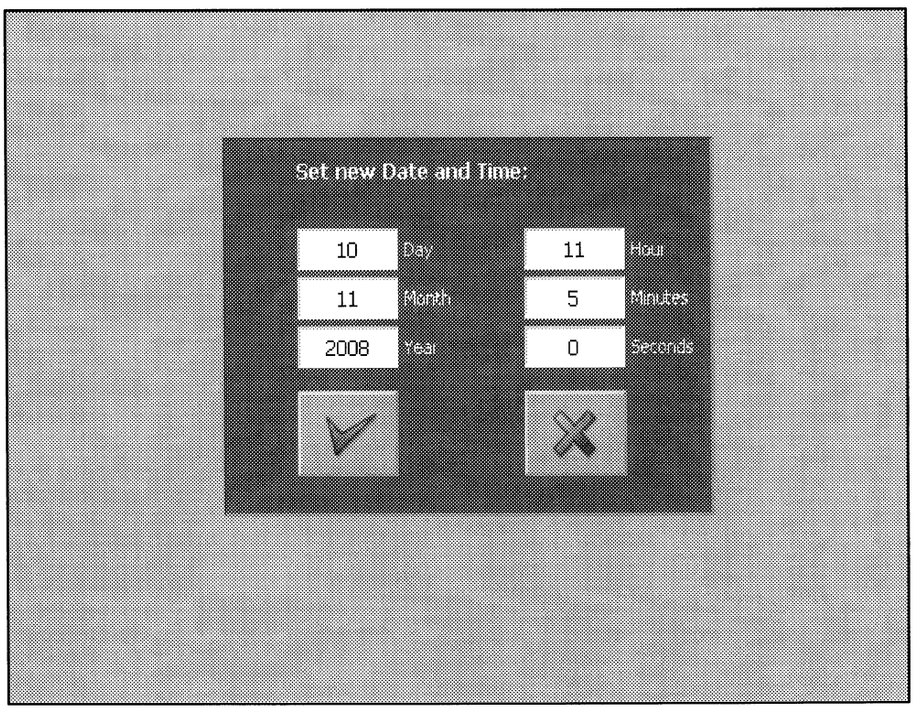


Fig.20 Date and time screen

5.7.8. Clean screen

Button to deactivate screen for 30 seconds. This gives the operator the opportunity to wipe the screen clean.

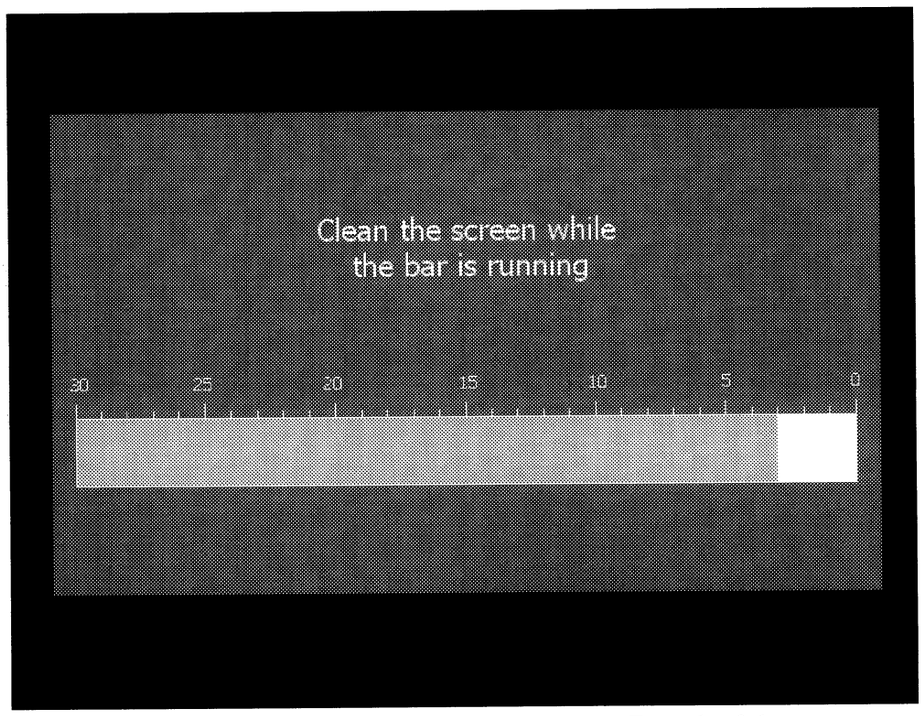


Fig. 21 Example of clean screen

5.7.9. Settings display screen

Button to call settings display screen.

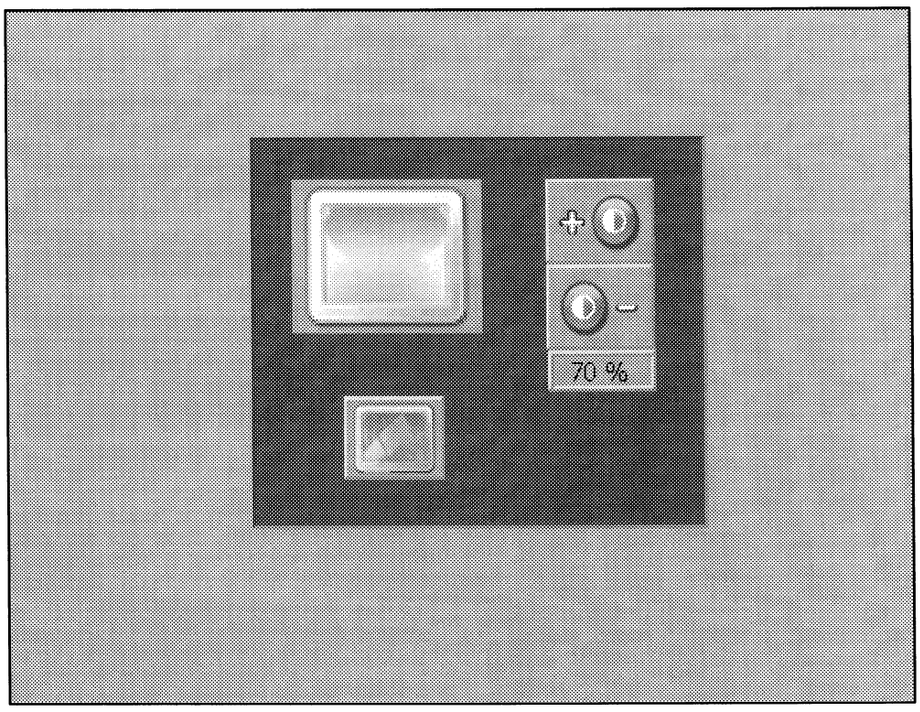


Fig. 24 Settings display screen

Button to create a higher contrast value.

Button to create a lower contrast value.

Button to deactivate screen for 30 seconds. This gives the operator the opportunity to wipe the screen clean.

5.7.10. Maximum speed screen

Button to call the maximum speed screen.
This screen however may only be used by authorized people. In this case at least maintenance people.

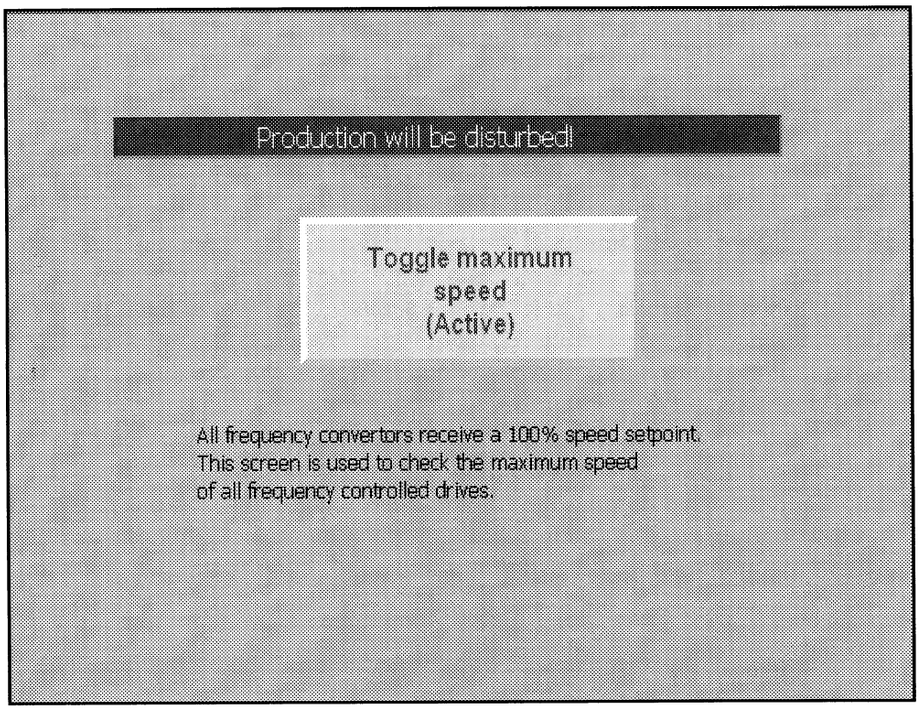


Fig. 22 Maximum speed screen

The goal for this screen is to be able to check max. speed from motors on start up or when a VFD (Variable Frequency Drive) has been exchanged. With the toggle button all the motors running will run at maximum frequency. A warning is placed at the left upper corner that this speed control mode is active.

5.7.11. The recipe structure

What is a recipe?
A recipe is a summary of parameters like speeds of the modules and adjustments like gap adjustments of Gauging stations set in a program.
Example of parameters see section screen (paragraph 5.7.2).

Structure of recipe
The recipes are stored at flash prom. They can be accessed by opening the recipe control screen. From here maximum 3 recipes can be copied from the memory to the a temporarily area and placed on position A, B and C. The copied recipes are called Product program. The reason of other name lays in the case that the product programs are placed in not stored areas.

During production you are using only the product program area. At the beginning the product program is a copies of a recipe. Modifications in product program during production (to improve production process) are not automatically stored. (see explanation save product program).

Button to call the recipe control screen.

If an other operator panel is at a recipe control screen further recipe buttons will be blocked like is shown underneath.

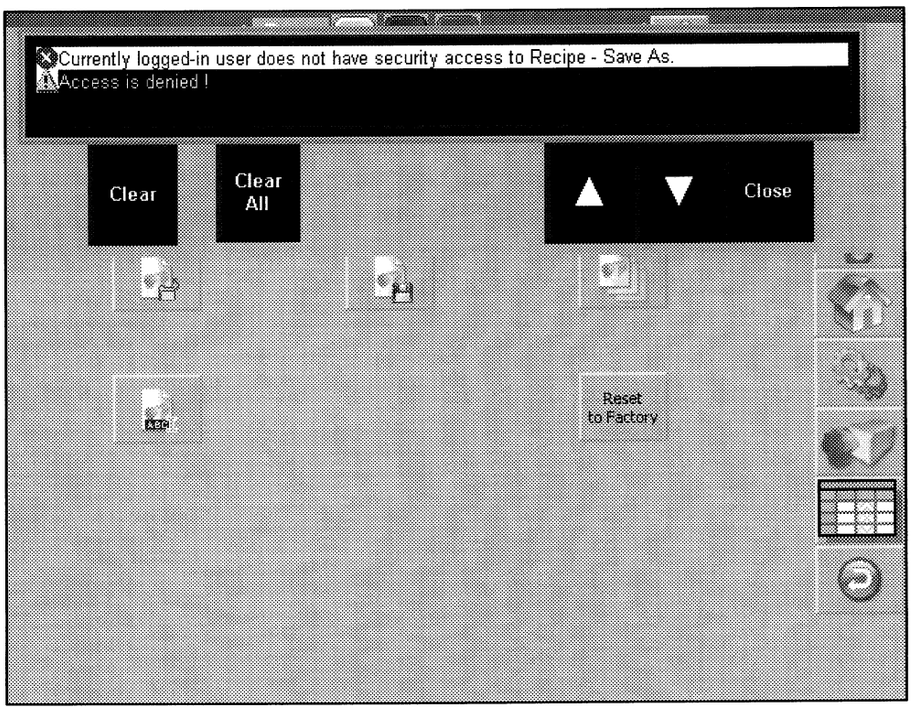


Fig. 23 Recipe control screen

When no other screen is at a recipe control screen the next screen will be shown:

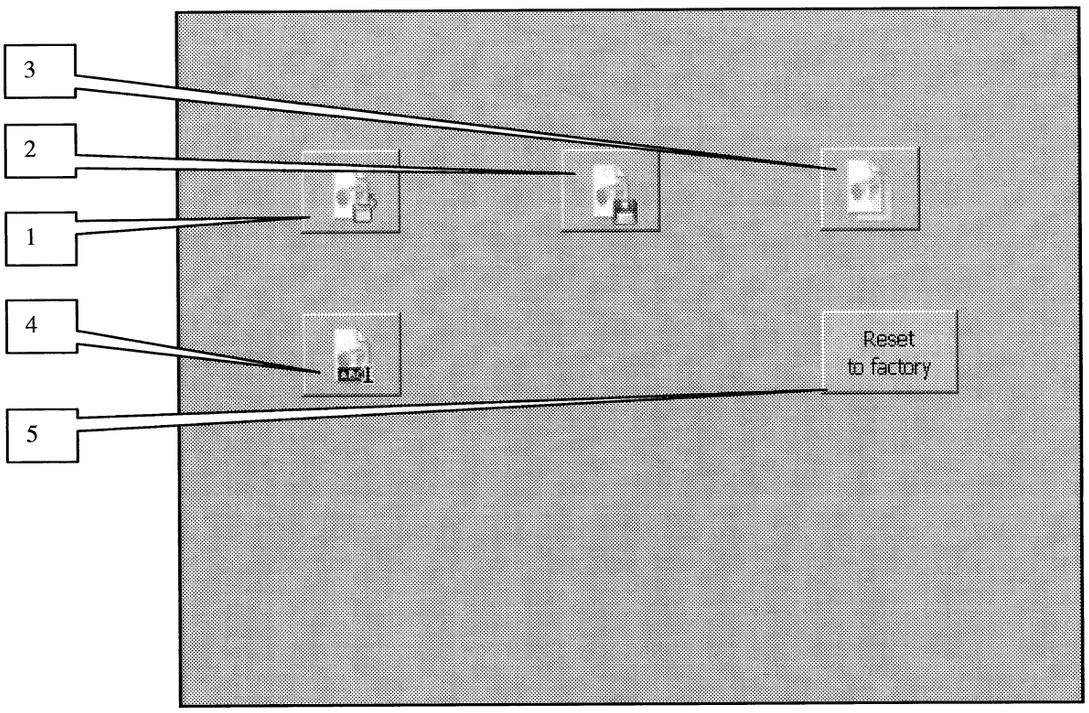


Fig. 24 Sub recipe control screen

Explanation of the icons on the recipe control screen will be explained at the next chapters.

1 Transfer recipe to product program

With this button a new recipe can be selected to be transferred from the save file to the product program and when applicable to the modules. This is shown at the screen underneath. However first a warning appears because recipe settings may be overwritten. This screen can only be called when users belong to at least the group of supervisor.

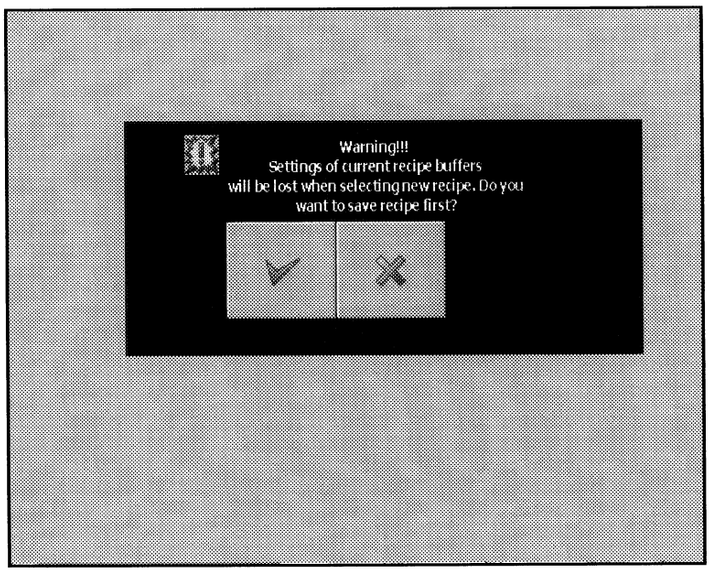


Fig. 25 Warning screen

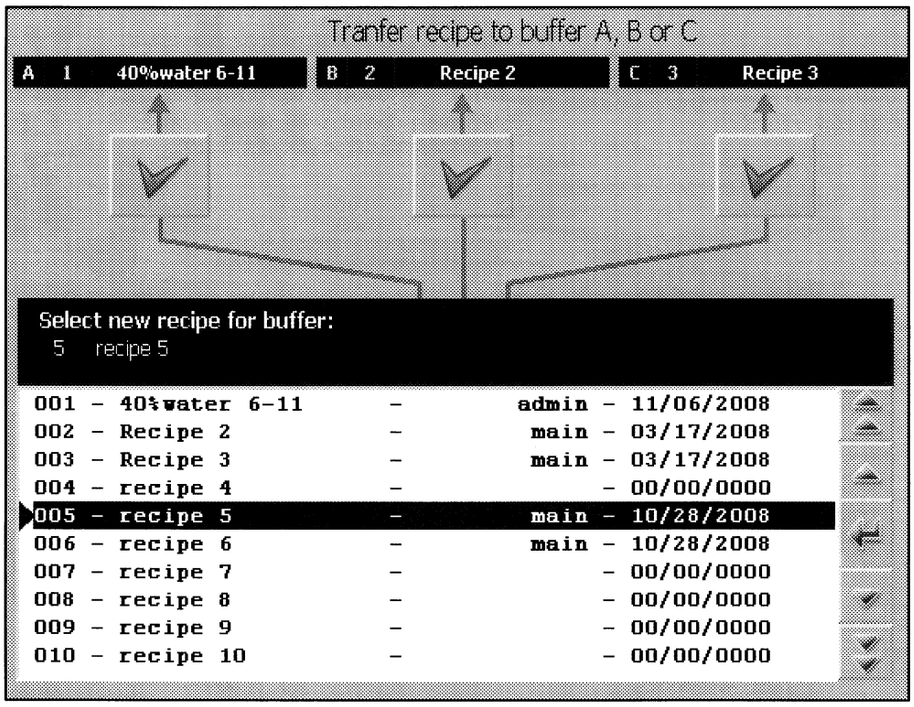


Fig. 26 Example: New recipe screen

Here a new recipe can be selected, for example recipe 5 “main”. After selection you get the possibility to transfer this to product program A, B or C as shown on the next page.

As you can see it is possible to transfer the “main” recipe to product program A, B or C. It is not possible to transfer 1 recipe to more than 1 product programs. In this screen we see that the username and date and time are stored at the moment the recipe was saved.

2 Transfer recipe to product program

Button to save the active parameters in the product programs A, B or C.

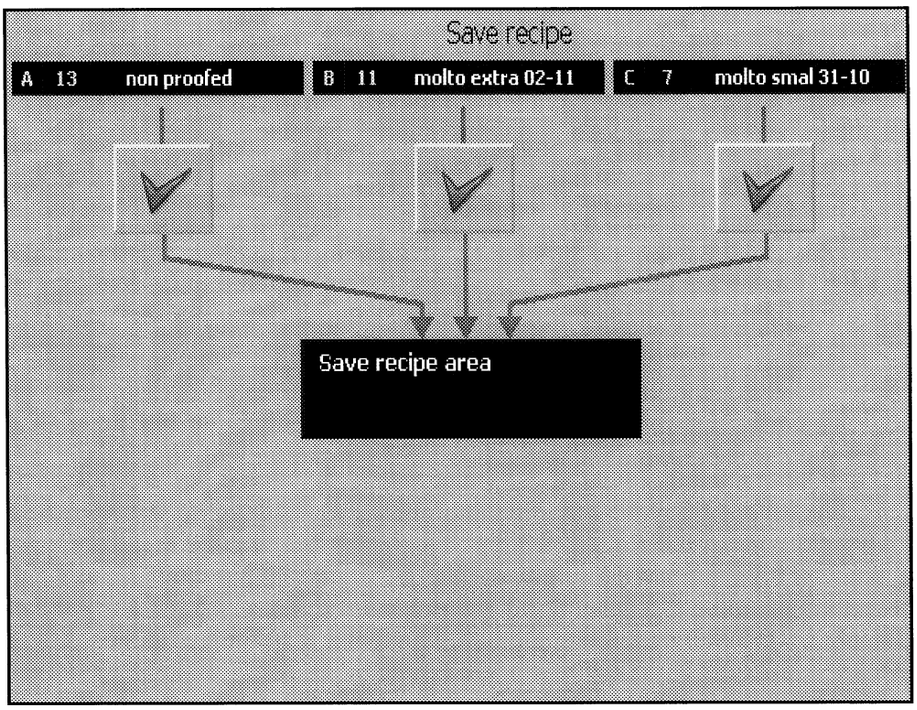


Fig. 27 Example: Product program save screen

This can be done by pushing the confirmation button belonging to the product program. After the button is pushed a message will confirm that the saving is done. Also the username, date and time are stored. All modifications are saved of the selected product program to the recipe number. This screen can only be called when the current user belongs at least toe the group of supervisors.

3 Save recipe as

Button to save recipes as.

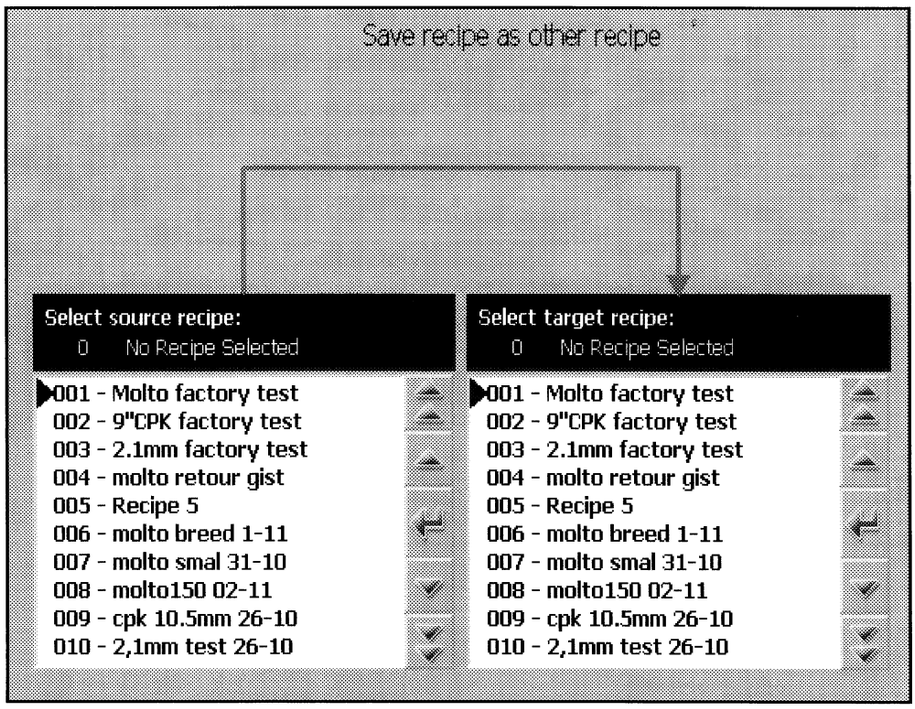


Fig. 28 Example: Product program save as screen

First select the source recipe and then select the target recipe. In this example the source selected is recipe 4 “Open Pocket” an the target recipe is recipe 6 “Saucage Roll 150”. After the button is pushed a message will confirm that the saving is done. Also the username and date and time are stored. This screen can only be called when the current user belongs at least to the group of supervisor.

4 Change recipe name

Button to call the change recipe name screen.

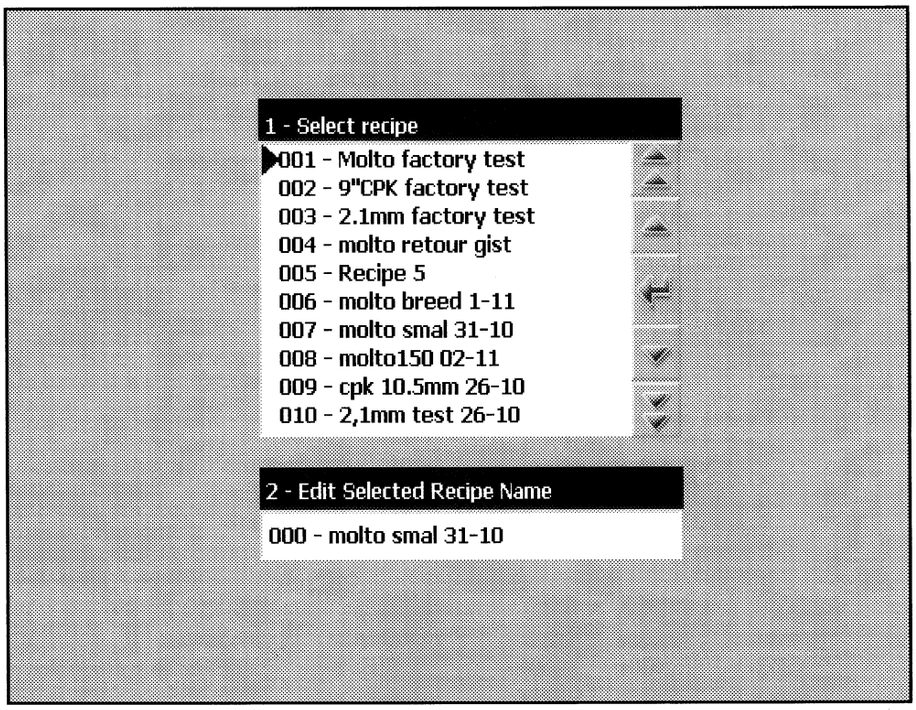


Fig. 29 Example: Select recipe screen

This screen can only be called when users belong to at least the group of supervisor.

5 Reset recipe to factory settings

Reset to factory Button to call the reset recipe to factory settings screen.

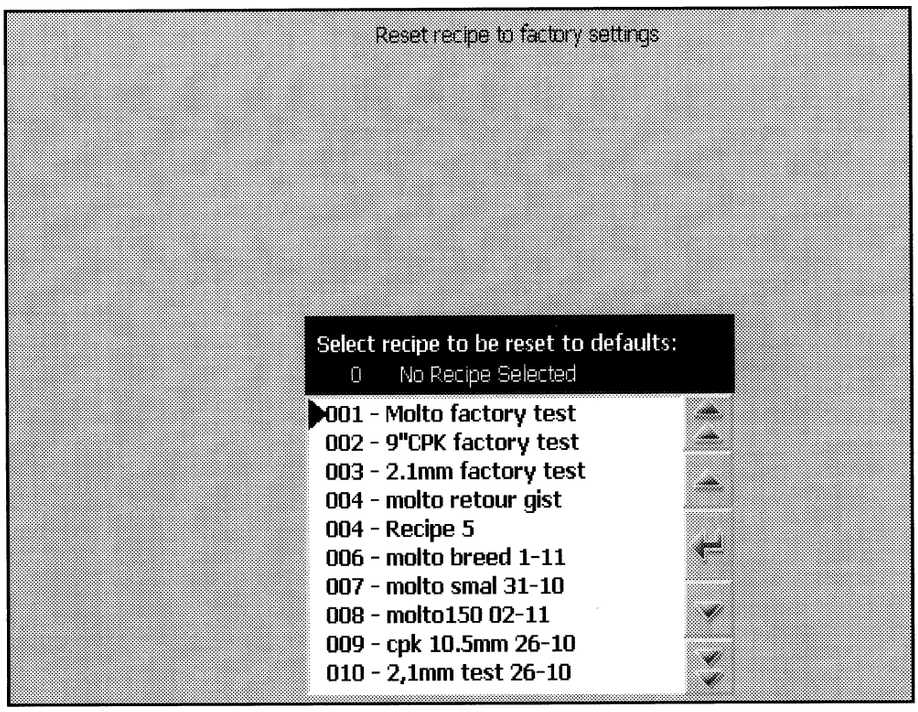


Fig. 30 Example: Reset recipe to factory settings screen

After selection of a recipe which need to overwritten by the Rademaker factory settings a confirmation and cancel button appear. On confirmation the recipe selected will be overwritten with the factory settings.

5.7.12. Capacity settings

(This option is only available for machines executed in variant B)

Button to call the capacity diagnose screen:

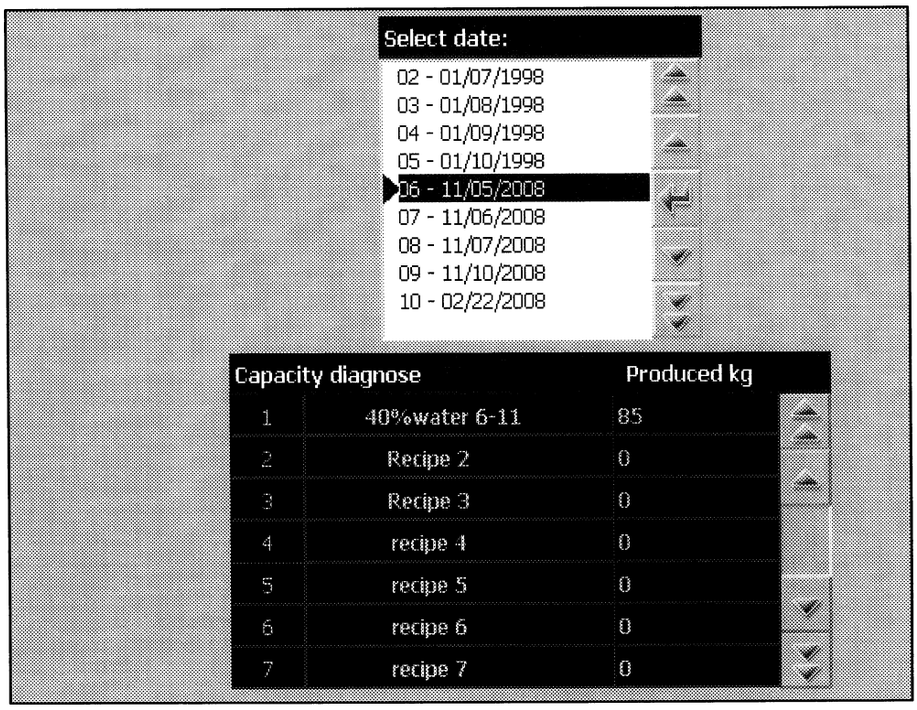


Fig. 31 Example: Capacity screen

In this screen the operator can select the desired date from which the calculated produced kg of dough become visible then. In this example the selected date is 11 – 05 – 2008, on which 85 kg of 40% water 6-11 dough has been produced. This screen is only available when variant B of controls is applicable. Calculation takes place with parameters belonging to the process end module.

5.7.13. Process end module

Button to call the process end module settings screen.

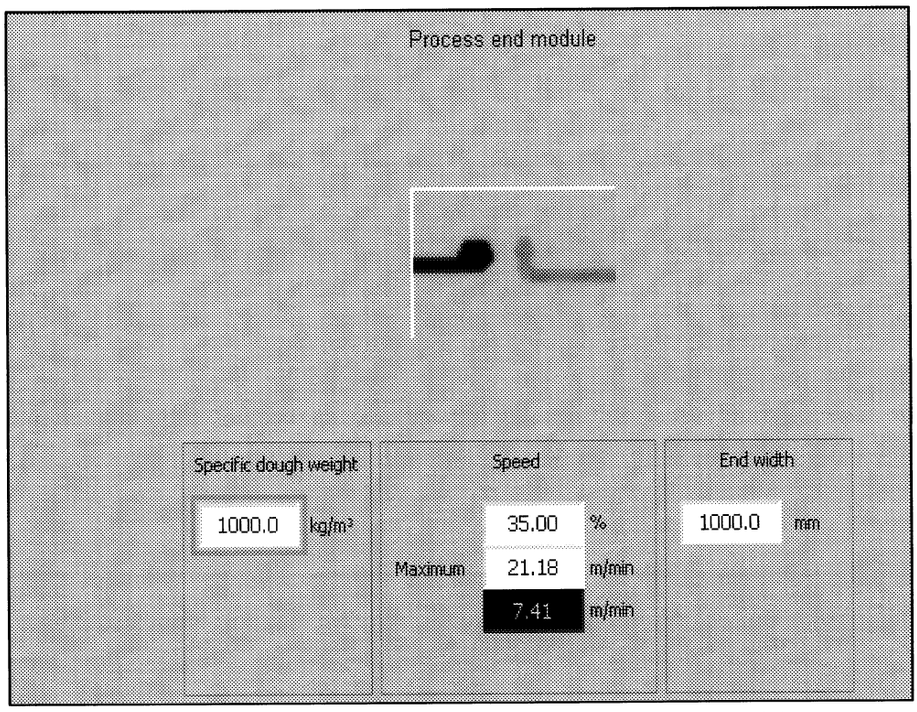


Fig. 38 Process module screen

Specific dough weight:
This parameter is used to calculate the lines capacity. Here the dough's specific weight (kg/m3) has to be entered. At the last gauging station the line controller knows the width (meter), the thickness (meter) and the speed (meter/minute) of the dough sheet. The controller multiplies this information resulting in the capacity (m^3/minute). Multiplying this number with the dough's specific weight (kg/m^3) will give you the capacity in kg/minute.

Speed:
With this parameter the production speed can be altered (if the system is not running combined with a downstream system). Altering the production speed will alter the speed of all drives controlled in cascade. The parameter underneath is read only information. Here you can read out the speed of the production line in m/min.

End width:
This parameter determines the end width of the dough sheet at the end of the production line.

5.8. Explanation of the operation from the units

5.8.1. Extruder (3 rollers)

Serial number : 7193 – 701

Safety:

⚠	**Attention!** Do not stand on a platform to reach the hopper. Do not adapt the cable of the Extruder.

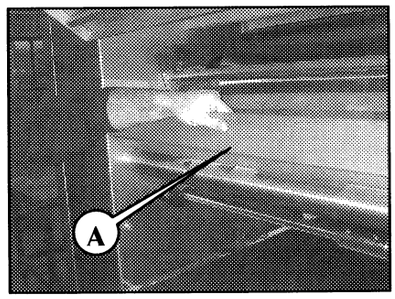
Before starting-up:

- Choice which product you want to produce.
- Place all detachable parts.
- Explanation how to place the change-over parts can be found at chapter cleaning.
- Grease the unit (see greasing diagram).
- Remove superfluous grease.
- Fill up the hopper with dough.

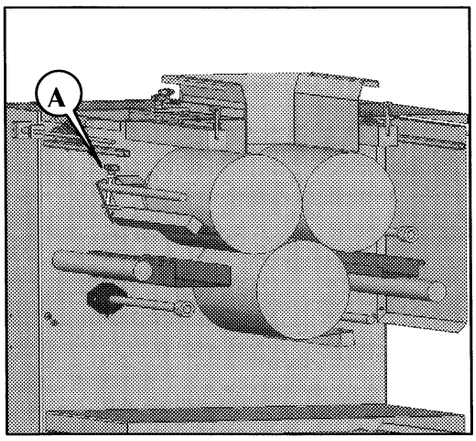
i	**TIP!** Too much dough in the hopper may cause bridge connections resulting in holes in the dough sheet or no dough sheet at all.

Place the scrap bins of the roller scrapers in the correct position.

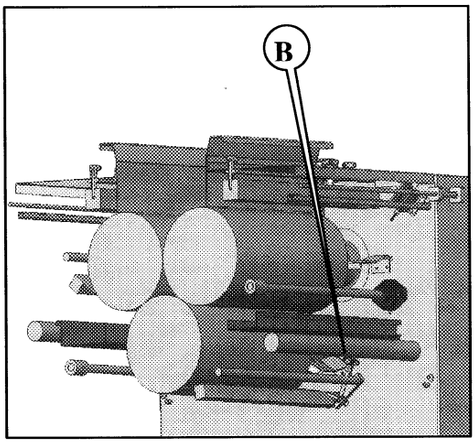
A. Scrap bin



Install scrapers:



Cross Section A-A Fig. 2



Cross Section A-A Fig. 3

A. Scraper bottom roller
B. Scraper supply roller
C. Support pin for scraper holder

Procedure
1. Place scraper holder on the support pins
2. Tighten the star grips

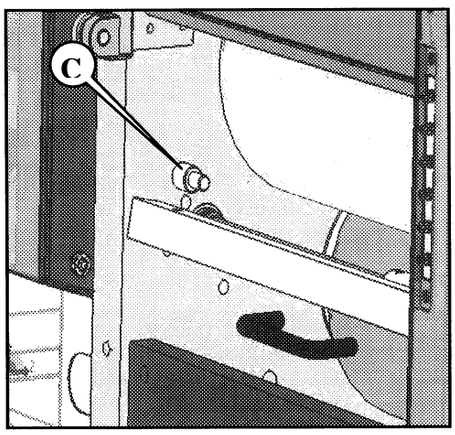


Fig. 4

Starting up:
When the unit is selected to run in the section screen, the unit starts at the same time that the complete production line starts to run.

Stopping:
The unit stops when the complete production line stops or when the unit is switched off on the operating panel (not selected to run).

Explanation of unit parameter screen:
The screen underneath shows the layout used for the extruder control.

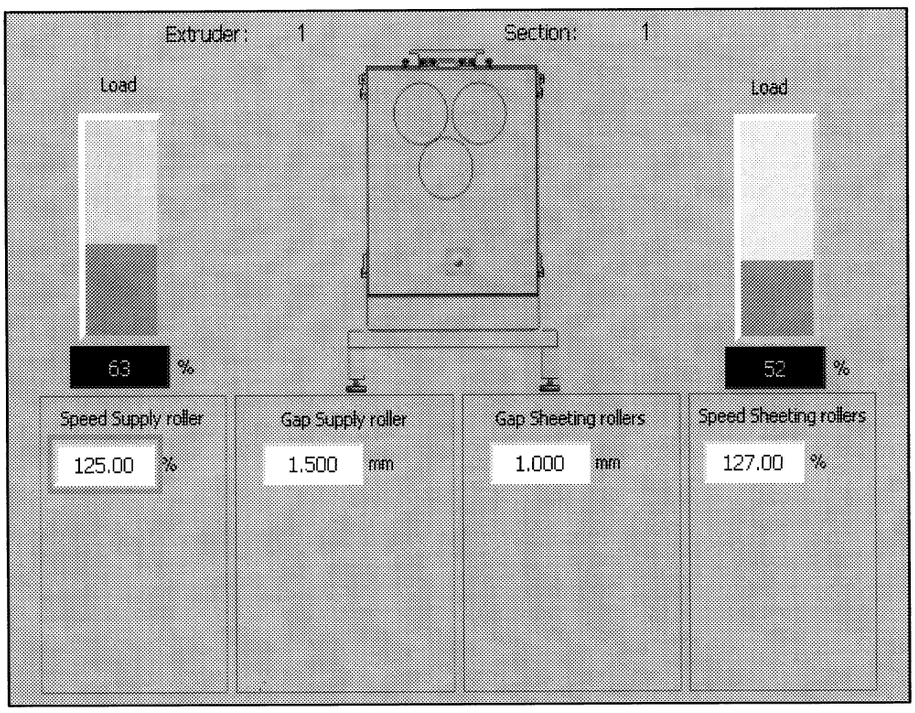


Fig. 1 Extruder maintenance/administrator screen

Load:
Read only information. (0-150%)
Here the information of the motor load can be read out (in %). The bars change from colour. Three colours are used:
Green : 0-75%
Green/yellow : 75-100%
Green/yellow/red : 100-150%

⚠	**Attention!** When the percentage is few seconds above the 100% (green/yellow/red colours) the motor will stop. A alarm failure appears on the operator screen. And the machine will stop. To restart the machine press on the reset button. The alarm message disappears and the machine can be start by pressing the start button.

Supply roller:
The supply roller has also its own speed setting parameter. This parameter adjusts the speed of the supply roller in relation to the speed of the sheeting rollers.

The status of the Extruder (selected, alarm, running) is represented by the status point at the hopper.

Gap supply/sheeting roller:

A white entry field indicates a automatic gap adjustment. The gap entry field can be used to fill in the desired gap between the lower roll and upper rollers. As this value is changed the automatic gap adjustment will adjust the gap when all safety conditions are met. This parameter is part of the recipe structure and will be kept, when a save recipe operation is executed.

Sheeting rollers:

The parameter speed of the sheeting rollers can be set in the sheeting rollers control part. When set at 100.0 % the speed of the sheeting rollers is equal to the speed of the conveyor underneath. When the speed of the sheeting rollers is increased with 10 % also the speed of the supply roller increases with 10 %.

All here above mention parameters are part from the recipe structure.

5.8.2. Conveyors

Serial number : 7193 – 702 and others

Before operation:
See to it that the belt is dry.

i	**TIP!** When the bottom side of the belt is wet it will slip resulting in uncontrolled dough transport

Mechanical settings:

A. Belt
B. Quick release system

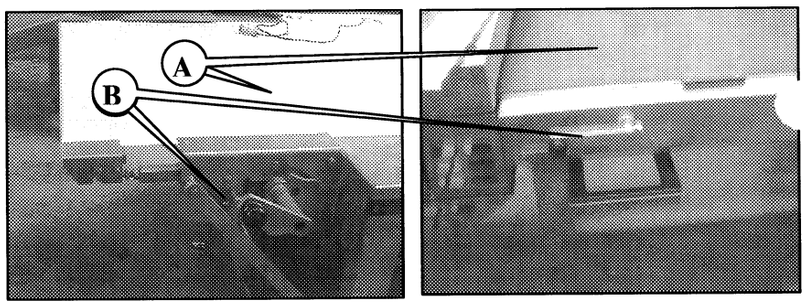


Fig. 1 Side views

Make sure the conveyor belt (A) is tightened up. Tension the belt using the quick release system (B).

Height adjustment out feed conveyor:

A. Locking
B. Handle

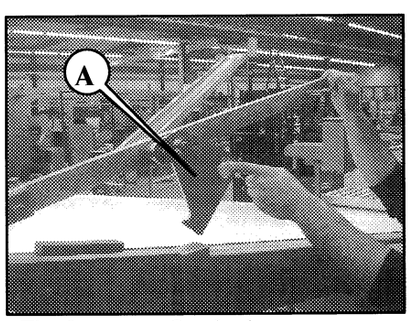


Fig. 2 Out feed conveyor

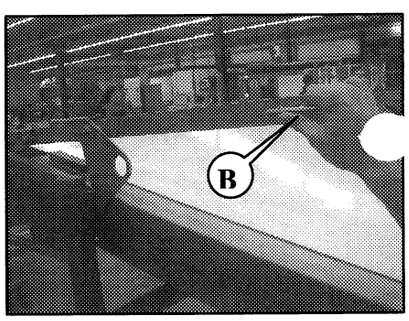


Fig. 3 Out feed conveyor

The out feed conveyor is adjustable.
Procedure:
1. Take locking away
2. Take handle
3. Push the handle down or up wards
4. Place locking back and place the out feed conveyor in upper position
5. Or let locking loose and place the out feed conveyor in down position

Start:
When the unit is selected to run, (on screen in the section screen, the complete transfer of the section is selected to run) all the units of the section will start when the complete machine starts to run.

Stop:
The unit will stop when the complete machine stops, or when the section is switched off on the operating panel.

During production:
Watch the steering of all the conveyor belts continuously during production. When one of the conveyor belts goes out of line, act immediately to prevent damage of the belt. When steering is needed, check the following first:
- Tension of belt.
- Contamination of the belt or the rollers. If the belt or rollers are contaminated, clean them first.

When the belt and the rollers are clean and the tension is correct, adjust the steering of the belt. See the Maintenance : Conveyor belts in the Maintenance and Cleaning chapter or conveyor belts trouble shooting for steering direction.

ATTENTION!
Regularly check the belt position after the adjustment. Allowing the belt to run against the side causes irreparable belt damage.

ATTENTION!
Do not stand or walk on conveyor belts, or rollers. This will damage the belt.

TIP!
Too much belt tension will result in an uncontrollable belt.

Explanation of unit parameter screen:
The screen underneath shows the layout used for the conveyor belt.

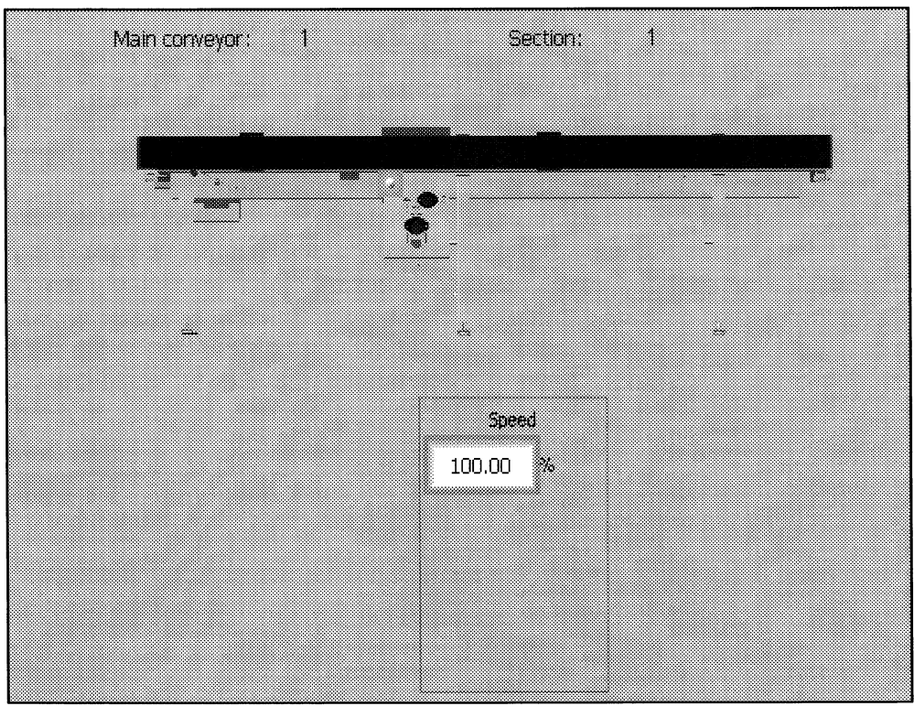


Fig. 1 Example of conveyor belt maintenance/administrator screen

Speed:
This information is visible for all users.
This parameter determines the speed of a conveyor in relation to the speed of the other units in the line. Changing this parameter will change the speed of all upstream units with the same ratio.

Explanation of unit parameter screen:
The screen underneath shows the layout used for the out feed conveyor.

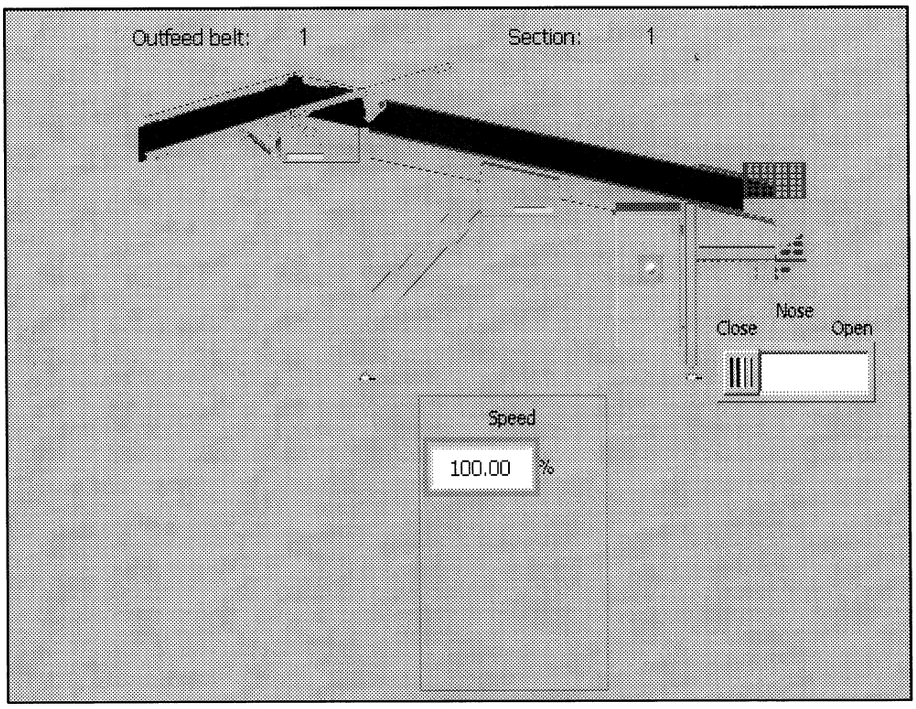


Fig. 1 Example of conveyor belt maintenance/administrator screen

Speed:
This information is visible for all users.
This parameter determines the speed of a conveyor in relation to the speed of the other units in the line. Changing this parameter will change the speed of all upstream units with the same ratio.

Close/open nose:
This switch can be used to set the nose of the main conveyor forwards or backwards.
Nose forwards (close) : The nose is in closed position, so the dough sheet will be transported to the next down stream unit the out feed conveyor.
Nose backwards (open) : The nose is in open position, so the dough sheet will be dumped of the main conveyor.

5.8.3. Two roll sheeter

Serial number : 7193 – 703

Safety:

- Machine may only be cleaned when the power supply is switched off.
- Do not remove the covers of the motors when cleaning this unit.

Before starting-up:

- Place all detachable parts.

Explanation of unit parameter screen:
The screen underneath shows the layout used for the supply belt and two roll sheeter control.

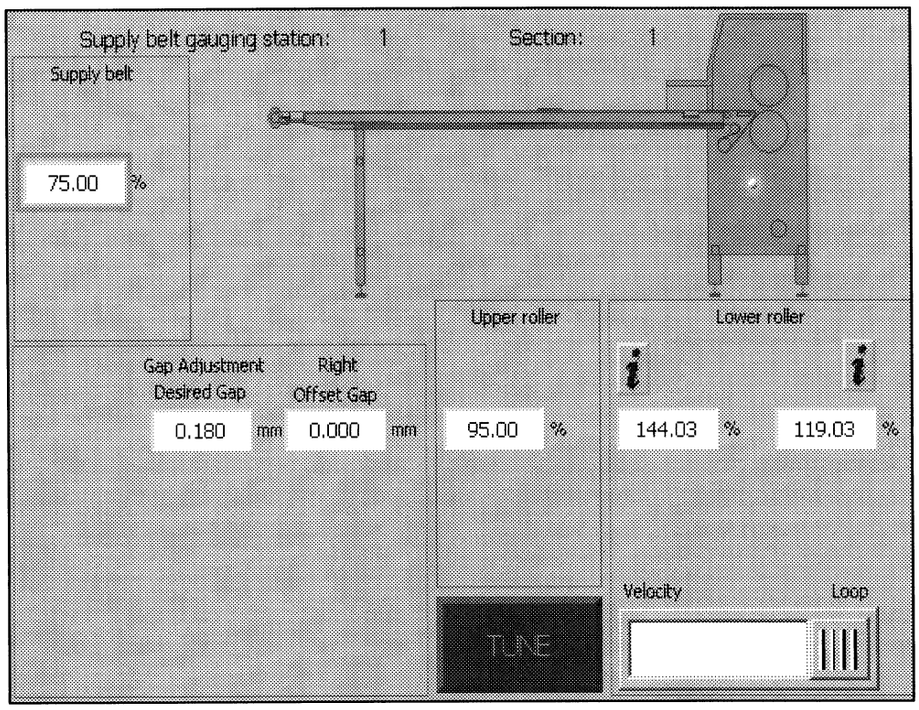


Fig. 1 Gauging station maintenance/administrator screen

The supply belt:
The supply belt is controlled with the parameter speed supply belt. Incrementing this parameter will take more dough to the Gauging station.

Desired gap:
An automatic gap adjustment. The gap entry field can be used to fill in the desired gap between the lower roll and upper roller. As this value is changed the automatic gap adjustment will adjust the gap when all safety conditions are met. This parameter is part of the recipe structure and will be kept, when a save recipe operation is executed.

Right offset gap:
The gap entry field can be used to fill in the desired gap between the lower roll and upper roller. As this value is changed the automatic gap adjustment will adjust the gap when all safety conditions are met. This parameter is part of the recipe structure and will be kept, when a save recipe operation is executed. (maximum of 0,1 millimetre).

Velocity/loop:
The parameter velocity/loop switch determines if velocity cascade speed is used or if the loop position control is used.

When running on loop position control and dough is present, the position of the loop is measured with a sensor and compared with the parameter desired loop position. Increasing this parameter will bring up the loop higher so bring more tension in the dough.

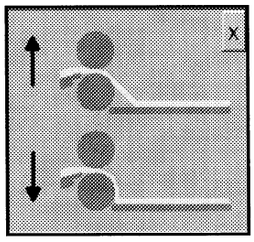


Fig. 2 Loop mode

When running on velocity mode or when no dough is present the speed of the gauge rolls will be controlled in relation to the speed of the downstream conveyor. Increasing this parameter will decrease the loop as you can see in the image below.

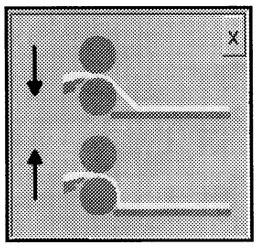


Fig. 3 Velocity mode

The auto tune button can be used when running at LOOP mode to copy the actual process speed of the supply belt to the velocity mode speed parameter. This has the advantage that the production line runs smoother on start up of stop from production.

Speed upper roller:
The parameter speed upper rollers control the speed of the upper rollers in relation to the speed of the lower roller, however the upper rollers always have a minimum speed of 40 %.

Speed lower roller:
This information is visible for all users.
With the parameter speed, the speed of the lower roller can be adjusted in relation to the belt underneath. At 100 % the speed of the lower roller is the same as the speed from the belt underneath. Increasing the parameter will increase the speed of the lower roller.

All here above mention parameters are part from the recipe structure.

Tune:
The auto tune button can be used when running at DDIC mode to copy the actual process speed of the supply belt to the velocity mode speed parameter. This has the advantage that the production line runs smoother on start up or stop from production.

Supply belt:
With the parameter speed supply belt the speed of the supply belt can be adjusted in relation to the speed of the Gauging station. At 100 % the speed of the supply belt matches the speed calculated from the supply thickness, thickness and speed of the Gauging station.

The information buttons  will show additional information about the parameters shown at the screen.

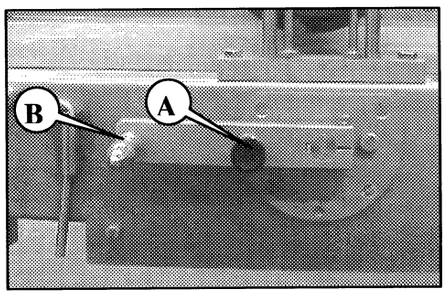
5.8.4. Driven cutting roller

Serial number : 7193 - 705

Before starting-up:
Start-up conditions:
1. Counter roller top side is levelled and protrudes 2 mm above conveyor.
2. Cutter conform product size.
3. Cutter roller adjusted with the transfer belt (paper sheet between cutting roller and belt must show the imprints of the cutter pattern.
4. All other change-over parts of the croissant machine are placed and adjusted
5. All parts are clean and conveyor belt is clear of any tool or material.
6. PLC conversion for all change-over parts is completed.
7. Start croissant machine when the dough sheet approaches the croissant machine.

Mechanical settings:

A. Knob
B. Lever



Let the dough sheet pass the cutting roller completely. Pull the knob (A) and turn the lever (B) to raise the roller towards the cutting roller. Push the knob when the transport belt above the roller is touching the cutting roller.

i	**TIP!** Wait until the dough sheet has passed the cutting roller before raising the dough sheet towards the roller.

Start-up procedure after a recipe change:
Refer to paragraph "Maintenance menu"

Recipe change measures:
Removing existing cutting roller:
1. Open cover
2. Unscrew blind nuts (B)
3. Connect hoist equipment to hoisting eye
4. Lift cutting roller (A)
5. Put cutting roller aside with side bearing blocks (D) on wooden blocks to prevent damaging the cutter knives.

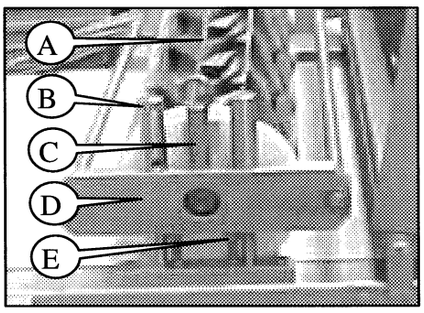


Fig. 1 Side view cutting roller

Installing the next recipe depending cutting roller:
1. Choose the right cutting roller from the PLC recipe change screen
2. Place a sheet of paper on the belt part of the cutting roller mounting position
3. Connect hoisting device onto hoisting eye (C)
4. Lower the cutting roller in position above its original running place
5. Using the key, screw the extended nuts (4x) sideward the hoisting eye onto their guide bars. Remove the hoisting device.
6. Run the cutting belt a short time to check the cutting force onto the paper sheet. Slight imprints means the cutting roller cutting force onto the belt is acceptable.
7. Too much force or no force at all must be corrected with the set bolts (4x E).

⚠	**ATTENTION:** A too low adjustment of the cutting roller may damage the transport belt.

Adjustment of drive gear and sensor distance:
In general both gear wheel and sensor are adjusted for a long period of time. In case of service or overhaul the next procedures must be followed.

A. Driven cutting roller gear wheel
B. Cam disc
C. Sensor
D. Drive motor gear wheel
E. Drive

Procedure for sensor:
1. Position one of the cams above the sensor eye (C).
2. An acceptable gap is 1-2 mm, if not correct sensor gap with the screw nuts.

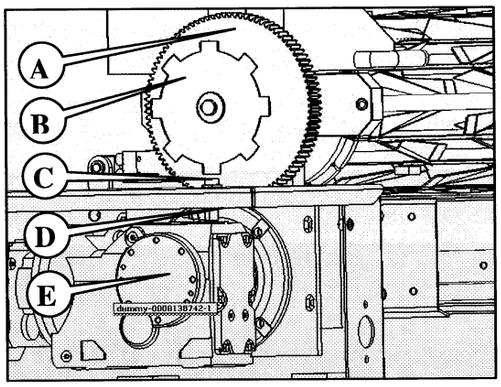


Fig. 2 View drive side

Procedure for gear wheel (with installed cutting roller):
1. Loosen the 4 nuts (E) a full turn.
2. Using the 2 adjuster bolts, slide the motor towards the cutter roller gear wheel (A).
3. A play between the tooth of 0.1 mm will satisfy.
4. Secure this adjustment with the lock nuts.

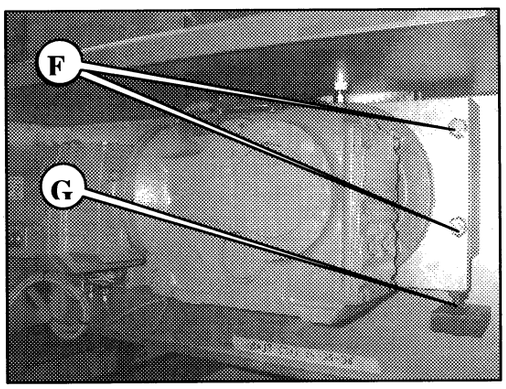
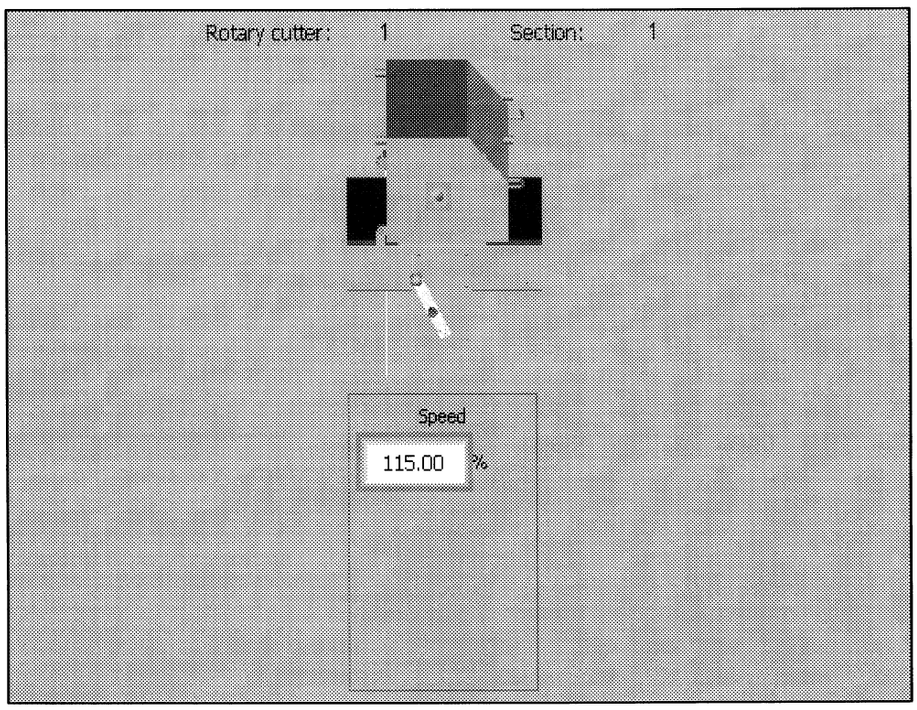


Fig. 3 View uncovered drive motor

Explanation of unit parameter screen:
The screen underneath shows the layout used for the rotary cutters control.



Rollers speed:
This information is visible for all users.
This parameter determines the speed of the rollers in relation to the speed of the main conveyor. Changing this parameter will change the speed of this unit only.

5.8.5. Scrap return system

Serial number : 7193 – 706

Before operation:
See to it that the belt is dry.
Make sure there is a scrap container at the side of the main conveyor underneath the cross conveyor.

Mechanical settings:
Regular check:
Tensioning of the belts.
Steering of the belts.

Height adjustment pick up point:
The height of the pick up point is adjustable with the height adjustment bolt. The height must be adjusted on both sides of the main conveyor. Make sure the pick up height is the same over the complete width of the main conveyor.

A. Distance A
B. Tensioning bolt
C. Height adjustment bolt
D. Steering bolt

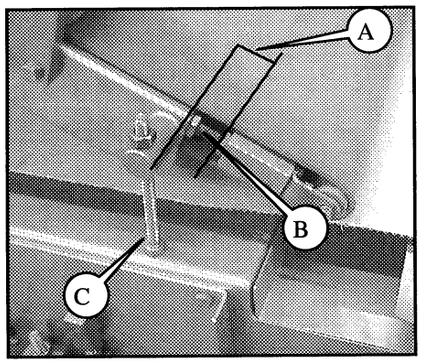


Fig. 1 Height adjustment pic-up point

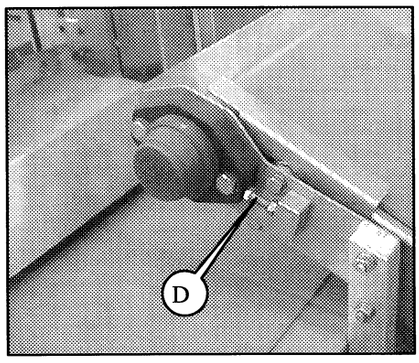


Fig. 2 Height adjustment pic-up point

Belt tension adjustment:
Check the belts for sufficient tension. When the belt tension is not correct adjusts this with the tensioning bolts. Distance A must be the same at both sides of the tensioning roller.

⚠	**ATTENTION!** Regularly check the steering of the belts. Allowing the belt to run against the side causes irreparable belt damage.

⚠	**ATTENTION!** Do not stand or walk on conveyor belts, or rollers. This will damage the belt.

Start:
When in the section screen, the unit is selected to run, it will start when the complete machine starts. The dough scrap must be placed on the inclining conveyor by hand. Lift it from the main conveyor and place it underneath the pressing roller. Guide it towards the cross conveyor.

Stop:
The unit stops when the complete machine stops, or when the unit is switched off on the operating panel. When the belt and the rollers are clean and its tension is correct, adjust the steering of the belt. See the Maintenance: Conveyor belts in the Maintenance chapter for steering direction.

Explanation of unit parameter screen:
The screen underneath shows the layout used for the scrap return system.

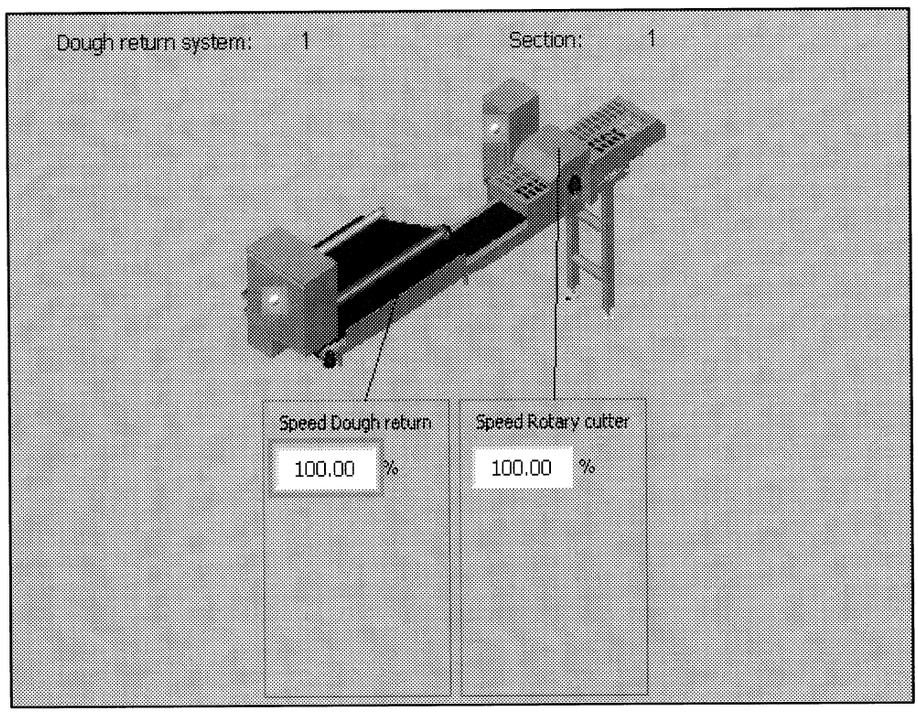


Fig. 1 Dough return maintenance/administrator screen

Speed dough system:
This parameter determines the speed of the Scrap return conveyor in relation to the speed of the main conveyor.
Lower this parameter when the scrap is pulling the products on the main conveyor.
Raise this parameter when the scrap is piling up on the main conveyor.

5.8.6. Scrap cutting system

Serial number : 7193 – 707

Before operation:
See to it that the belt is dry.
Make sure there is a scrap container at the side of the main conveyor underneath the cross conveyor.

Mechanical settings:
Regular check:
Tensioning of the belts.
Steering of the belts.

Belt tension adjustment:
Check the belts for sufficient tension. When the belt tension is not correct adjusts this with the tensioning bolts. Distance A must be the same at both sides of the tensioning roller.

⚠	**ATTENTION!** Regularly check the steering of the belts. Allowing the belt to run against the side causes irreparable belt damage.

⚠	**ATTENTION!** Do not stand or walk on conveyor belts, or rollers. This will damage the belt.

Start:
When in the section screen, the unit is selected to run, it will start when the complete machine starts.

Stop:
The unit stops when the complete machine stops, or when the unit is switched off on the operating panel. When the belt and the roller are clean and its tension is correct, adjust the steering of the belt. see the maintenance.

Explanation of unit parameter screen
The screen underneath shows the layout used for the scrap cutter system.

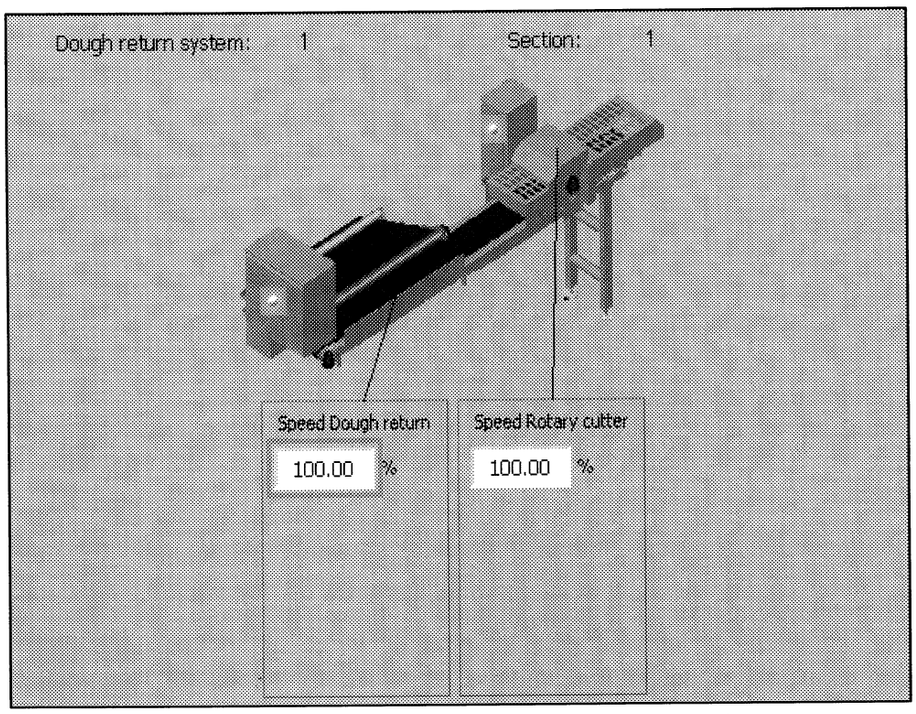


Fig. 1 Scrap cutter maintenance/administrator screen

Speed rotary cutter:
This information is visible for all users.
This parameter determines the speed of the rotary cutter in relation to the speed of the cross conveyor. Changing this parameter will change the speed of this unit only.

6 TROUBLE SHOOTING

Contents

6.1. Safety regulations

Before starting operation, cleaning, maintaining the system or before remedying breakdowns first read the chapters Introduction and Safety.

6.2. Alarms/failures in general

Mainly all descriptions shown below, give information to solve problems in general.

6.2.1. General

POSSIBLE CAUSE	ACTION
Human cause.	Make sure that you are familiar with the system concerning its operation and maintenance and ensure that you are familiar with the contents of the user manual. This prevents operating failures and/or incorrect use of the machine or installation. Untimely cleaning of dirt (e.g. on spraying machines, grease machines, etcetera.) may result in certain detectors no longer functioning correctly. Cleaning electronic components using high-pressure water sprays will not promote trouble-free operation of the installation. Work activities may only be carried out on the installation by authorised personnel. Work according to national and regional safety instructions. See also the Safety chapter in the manual.
Electronic cause.	Due to vibrations or other causes there is a chance that cable loaders may work loose or detectors get damaged. Cables can become damaged due to unforeseen mechanical reasons. Detectors can also malfunction in the course of time. At all times make sure that failures are not only resolved, but are also avoided as far as possible. For example, by establishing the cause of a failure and ensuring that it no longer occurs. If a failure occurs often, contact Rademaker BV. Work activities may only be carried out on the installation by authorised personnel. Work according to national and regional safety instructions. See also the Safety chapter in the manual.
Mechanical cause.	Ensure as little wear as possible to the motors,

POSSIBLE CAUSE	ACTION
	reducers, chains, etcetera. by using the correct lubrication. Damaged baking good bearers (crooked, bend, dented, etcetera), may cause blockages or detection failures. This can result in a jam, or other parts getting damaged. Therefore always check that no hindrances are present during conveyance on the baking goods conveyor belt. Also applicable here is that prevention is better than cure. Works may only be carried out on the installation by authorised personnel. Work according to national and regional safety instructions. See also the Safety chapter in the manual.
External factors.	As a result of peaks in voltage (for example with lightning) from the grid or from other switch boxes of the Rademaker BV installation or parts thereof, the installation or parts of it can fail. Make sure that the installation or parts of it are never reset without first ensuring that there are no personnel or obstacles in or near the machine. Work activities may only be carried out on the installation by authorised personnel. Work according to national and regional safety instructions. See also the Safety chapter in the manual.
Unknown problem.	If this problem occurs frequently please contact Rademaker BV.

Back-up battery PLC empty !!!
Do not switch off the power supply !!!!!

POSSIBLE CAUSE	ACTION
Battery is run down.	Do not switch off the main power supply to the switch box! Replace battery and Contact Rademaker BV.
Defective battery.	Do not switch off the main power supply to the switch box! Replace battery and Contact Rademaker BV.
Power supply unit failure.	Replace the power supply unit. Contact Rademaker BV.

Emergency stop (relay) Active / Pushed

POSSIBLE CAUSE	ACTION
The emergency stop relay has been tripped; an emergency stop may have been pressed.	Establish why the emergency stop has been activated. Never reset an emergency stop without first ensuring that there are no personnel or obstacles in or near the machine.
The switch box power supply has been interrupted.	Check that there are no personnel or obstacles in or near the machine. Then reset the emergency stop relay.
Failure in emergency stop relay.	The machine should be switched off and not be re-started before the failure has been repaired. Contact Rademaker BV.
Break in cable to emergency stop button.	The machine should be switched off and not be re-started before the failure has been repaired. Replace damaged cable. Check that there are no personnel or obstacles in or near the machine. Then reset the emergency stop relay.

Emergency stop button

POSSIBLE CAUSE	ACTION
An emergency stop near the oven infeed has been activated.	Establish why the emergency stop has been activated. Never reset an emergency stop without first ensuring that there are no personnel or obstacles in or near the machine.
Break in cable to emergency stop button.	The machine should be switched off and not be re-started before the failure has been repaired. Replace damaged cable. Check that there are no personnel or obstacles in or near the machine. Then reset the emergency stop relay.

Overloaded motor

POSSIBLE CAUSE	ACTION
Seized bearing on one of the axles.	Check that no other parts have been damaged. Replace bearing.
Defective bearing in the drive unit.	Check that no other parts have been damaged. Replace bearing.
Defective bearing in the reduction gear.	Check that no other parts have been damaged. Replace bearing.
Driving chain lubricated insufficiently.	Check that no other parts have been damaged. Ensure sufficient lubrication.
Failure of one of the three phases.	Check the cable, cable connections and fuses. If the cable is broken, it should be replaced. In the event of a break or failure in the motor winding, contact Rademaker BV.
Defective motor relay or thermal unit.	Replace motor relay or thermal protection.
Loose contact in the motor connecting cable.	Reconnect.
Insufficient lubrication of reduction gear.	Ensure sufficient lubrication.
Steel belt is stuck.	Ensure that the steel belt can run freely. Keep return path and steel band supports clean and free from obstacles.

Overheating, motor

POSSIBLE CAUSE	ACTION
Circulation fan not running (blockage or something similar)	Establish why the circulation fan is not running.
Defective motor relay or thermal unit.	Replace motor relay or thermal protection.
Defective depressure switch.	Replace depressure switch.
Defective electrical cable.	Replace damaged cable. Establish the cause of this.
Defective bearing.	Check that no other parts have been damaged. Replace bearing.

Gen. failure, frequency regulator

POSSIBLE CAUSE	ACTION
The frequency regulator indicates a fault.	Establish the reason for the fault and remedy it. See also the operations guideline for the frequency regulator.
Defective trip frequency converter.	Replace trip frequency converter. Contact Rademaker BV.
Motor blocked by dirt.	Clean motor and keep it clean.
Defective relay or thermal package.	Replace relay or thermal package.
Failure of one of the three phases.	Check the cable, cable connections and fuses. If the cable is broken, it should be replaced. In the event of a break or failure in the motor winding, contact Rademaker BV.
Defective bearing.	Check that no other parts have been damaged. Replace bearing.

6.2.2. General motor failures

Motor runs in wrong direction

POSSIBLE CAUSE	ACTION
Motor is connected incorrectly.	Change 2 phases around.

Motor hums and has high current consumption

POSSIBLE CAUSE	ACTION
Faulty winding.	Repair motor.
Rotor dragging.	Repair motor.

Motor too hot
(Can only be established through measurement)

POSSIBLE CAUSE	ACTION
Motor switched in delta instead of projected star configuration.	Correct connection switching.
Supply voltage deviates more than 5% from rated motor voltage. Higher voltage has a negative effect with high-poled motors, as the current running through these motors, at rated voltage and not under load, is equal to the rated current.	Ensure correct supply voltage.
Not enough cooling air, cooling air passage blocked.	Ensure good cooling air intake and extraction. If the fan and/or motor are dirty clean them.
Cooling air is preheated.	Ensure fresh air supply.
Overload, at rated supply voltage, current too high and number of revolutions too low.	Install larger drive (determined by power measurement).
Operation sort (S1 to S8, DIN 57 530) exceeded. If for example, the motor overheats due to frequent starting, the use of a larger type of motor would not solve the problem. The effect would still be the same.	Adapt duty type. Consult Rademaker BV.
Poor cable connection (temporary single-phase operation). Blown fuse.	Check cable connections and repair failures. Replace fuse.

Motor does not start

POSSIBLE CAUSE	ACTION
Motor protection switch operates.	Check and adjust motor protection switch.
Motor magnetic switch does not switch, failure in controls.	Check and repair motor magnetic switch controls.

Motor safety switch switches off directly

POSSIBLE CAUSE	ACTION
Short circuit in motor or supply.	Repair short circuit.
Short circuit between rotor and stator or short circuit in windings.	Repair short circuit. Contact Rademaker BV.
Motor is connected incorrectly.	Connect motor correctly.

Motor does not respond in star configuration, only in delta

POSSIBLE CAUSE	ACTION
Torque not adequate in star configuration.	If delta starting current is not too high, start direct. Otherwise install larger motor or consult Rademaker BV about a special motor.
Star delta switch does not make contact.	Check and, if necessary, repair star delta switch.

Windings damaged

POSSIBLE CAUSE	ACTION
	Contact Rademaker BV.

Motor does not start or starts with difficulty

POSSIBLE CAUSE	ACTION
Motor is wound for delta starting but connected for star configuration.	Check switching.
Voltage or frequency deviates considerably from rated value when switching on.	Ensure better supply.

General brake failure

MOTOR DOES NOT BRAKE

POSSIBLE CAUSE	ACTION
Brake lining worn.	Replace entire brake plate/fan.
Brake not properly adjusted	Check and re-adjust

BRAKE DOES NOT RELEASE

POSSIBLE CAUSE	ACTION
Incorrect voltage on the brake rectifier.	Connect the brake rectifier to the correct voltage (see type plate).
Defective brake rectifier.	Replace brake rectifier.
Maximum permissible air gap exceeded because brake lining is worn.	Re-adjust brake. If the brake lining is completely worn, the complete brake plate/fan must be replaced.
Voltage drop in the supply lines is larger than 10%.	Check cable diameter and connection voltage.
Insufficient cooling, too great a heating of the brake.	Replace brake rectifier by a type that must be located in the switch box.

BRAKE OPERATION DELAY

POSSIBLE CAUSE	ACTION
Brake has switched alternating current side.	Switch DC/AC at the brake.

6.3. Messages on the operating panel.

Alarm and warnings message area.
The top line in every screen is used to displays alarms and/or warnings when present in the machine. When more than 1 message is present the messages are scrolling on a time base. Warnings are only displayed if no alarm messages present. Pushing on this area will call up the alarm and event history screen for the operator.

6.3.1. General explanation alarm messages

Emergency stop YYYYYYYYYYYYYYY

If an emergency stop is pressed this message appears, YYY contains information where to find the unit who is coursing the message.

Safety switch YYYYYYYYYYYYYYY

If a safety guard is opened this message appears, YYY information where to find the unit who is coursing the message.

Outfeed conveyor not in place.

To avoid dangerous situations the units of the Rademaker line must be in place to enable the line. If a unit is not in place then above message appears. The Rademaker line cannot start if the units are connected and not in place. A unit which is not in place while the Rademaker line is running causes a immediate stop.

Problem with YYYYYYYYYYY

All frequency-controlled drives are having a build in thermal switch. This contact goes directly to the frequency converter of that motor. In the PLC we check the "happy" contact of those frequency converters which are receiving a run command. If there is a problem with one of the drives we then show on the display which converter is causing the problem. We leave the power on the machine to make it possible to read out the actual status of the converters. To reset the converters press the reset button. Main power is now removed for a fixed time to reset the converters. If the problem still exists, after restarting, then this message returns on the screen.

Problem with YYYYYYYYYYY

All motors, which are started with a motor starter, are checked ass well. For every motor there is a read-back contact to the PLC. If we start a motor the read back contact is checked. If the status of the read-back contact is not correct we then show on the display which motor is causing the problem. We leave the power on the machine in this situation. To reset the problem check the thermal overload etc. and if solved then press the reset button. Main power is now removed for a fixed time. If the problem still exists, after restarting, then this message returns on the screen.

6.3.2. Alarm messages

A0001 Dough Handling 1 No air pressure
A0002 Downstream process caused stop
A0003 S1 Operator panel E-stop
A0004 S1 Extruder 1 Upper roller Drive/motor problem
A0005 S1 Extruder 1 Upper roller Comm. Problem
A0006 S1 Extruder 1 Lower rollers Drive/motor problem
A0007 S1 Extruder 1 Lower rollers Comm. Problem
A0008 S1 Extruder 1 Safety cover
A0009 S1 Gauging station 1 Supply belt Drive/motor problem
A0010 S1 Gauging station 1 Supply belt Comm. Problem
A0011 S1 Gauging station 1 Upper roller Drive/motor problem
A0012 S1 Gauging station 1 Upper roller Comm. Problem
A0013 S1 Gauging station 1 Lower roller Drive/motor problem
A0014 S1 Gauging station 1 Lower roller Comm. Problem
A0015 S1 Gauging station 1 Safety cover
A0016 Main conveyor 1 Drive/motor problem
A0017 Main conveyor 1 Comm. Problem
A0018 Rotary cutter 1 Drive/motor problem
A0019 Rotary cutter 1 Comm. Problem
A0020 Rotary cutter 1 Safety cover
A0021 Dough return 1 Drive/motor problem
A0022 Dough return 1 Comm. Problem
A0023 Rotary cutter 2 Drive/motor problem
A0024 Rotary cutter 2 Comm. Problem
A0025 Rotary cutter 2 Safety cover
A0026 S1 Transfer belt 1 Drive/motor problem
A0027 S1 Transfer belt 1 Comm. Problem
A0028 Section 1 Problem with main relay
A0029 Section 1 Problem with safety relay
A0030 Alarm text
A0031 Alarm text
A0032 Alarm text
A0033 Alarm text
A0034 Alarm text
A0035 Alarm text
A0036 Alarm text
A0037 Alarm text
A0038 Alarm text
A0039 Alarm text
A0040 Alarm text
A0041 Alarm text
A0042 Alarm text
A0043 Alarm text
A0044 Alarm text

6.3.3. General explanation event messages

Line off button pressed! Cannot start line

If the line-off button is pressed this message appears. While this button is pressed the Rademaker line cannot start.

Main air-pressure too low

Air-pressure too low at roll-up unit.
If the air pressure is too low for the belt tracking then one or both message are on the screen. Until the pressure is correct the line cannot start.

Out feed conveyor not plugged

When the out feed conveyor is selected but not all plugs are connected this message appears. Deselect unit or connect the plugs and this message will disappear.

Out feed conveyor not in top position

If the out feed conveyor is not in the top position and not correct plugged this message will appear.

Press reset for jogging mode

To enable the jogging mode all servo's need to be reset. If the status for all servo's is correct to reset then this message is on the screen. This messages is normally followed by de message " JOGGING MODE"

!!! JOGGING MODE !!!

The line is set in Jog mode. In this mode all servo's can start and stop separately. See chapter Maintenance for detailed explanation.

Retract movement not ready!!

When the next start signal is given and the retract system is not in the front position this message will appear.
If the speed of the retracting belt is decreased then this message will disappear

Line before stopped

Cutting stacking is ready to run and combined with the line before. Line before is not ready to run. Check line before. When line before is ready to run or combined is not selected this message will disappear

Fault servo YYYYYYYYY faultnr.:□□□□

If there is a fault in one of the servo drives above message is on the screen. Refer to the servo controller manual for the explanation of that fault.

Communic. fault to servo YYYYYYYYYY

If there is a communication fault between a servo controller and the PLC then above message is on the screen. Check all the Profibus cables (the blue or purple cables) in the switchbox.

Servo YYYYYYYY not ready to reset

One of the servo drives is not ready to reset. Usually the reason is given is a other message in the scrolling message line. If no reason can be found switch off main power for 30 seconds. If the problem reoccurs maintenance is needed to locate the problem.

Servo YYYYYYY ready to reset. Press reset.

If this message is on the screen then one or more servo's are ready to make a homing cycle. If the homing cycle is interrupted by a breakdown (emergency stop) then the complete homing cycle starts again after the breakdown is solved and the reset button is pressed again.

Servo YYYYYYYY resetting.

Reset of the servo drive in progress.

Servo YYYYYY not safe for homing

If the servo is not ready to receive a home command above message is on the screen. By pressing a emergency stop and repower the servo drives can solve this problem. If the problem reoccurs maintenance is needed to locate the problem.

Servo YYYYYY wait for home seq.

Above message is on the screen if the home signal is given from the PLC to the servo, but the servo has not yet started with the home cycle because it has to wait for another unit to home first.
Sequence of homing in this line:

1. cutting conveyor.
2. cutting roller.
3. rotate unit.
4. all other units.

Servo YYYYYY homing.

Above message is on the screen if the home signal is given from the PLC to the servo, and the servo has started with the home cycle.

Too low speed YYYYYYYYYY !
Too high speed YYYYYYYYYY!

The speed setting of the frequency-controlled drives are set at the operating panel and calculated in the PLC. If a speed setting becomes too high or too low then these messages are on the screen. The PLC is automatically limiting the output to protect the motor from overheating. The line is, from the moment the messages appearing, not linear anymore.
To correct this you have to change the speed setting. If that is not acceptable a different solution must be found.

6.3.4. Warning/event messages

W0001 Dough Handling 1 Battery low
W0002 Dough Handling 1 Check 10 Vdc power supply
W0003 Process Begin Module Upstream process caused stop
W0004 Process End Module Downstream process caused stop
W0005 S1 Extruder 1 Upper rollers Lim. at max. speed
W0006 S1 Extruder 1 Upper rollers Lim. at min. speed
W0007 S1 Extruder 1 Lower rollers Lim. at max. speed
W0008 S1 Extruder 1 Lower rollers Lim. at min. speed
W0009 S1 Extruder 1 Upper rollers Gap adj. timed out
W0010 S1 Extruder 1 Upper rollers Bad gap sensor
W0011 S1 Extruder 1 Upper rollers Gap adjusts false
W0012 S1 Extruder 1 Lower rollers Gap adj. timed out
W0013 S1 Extruder 1 Lower rollers Bad gap sensor
W0014 S1 Extruder 1 Lower rollers Gap adjusts false
W0015 S1 Gauging station 1 Supply belt Lim. at max. speed
W0016 S1 Gauging station 1 Supply belt Lim. at min. speed
W0017 S1 Gauging station 1 Upper roller Lim. at max. speed
W0018 S1 Gauging station 1 Upper roller Lim. at min. speed
W0019 S1 Gauging station 1 Lower roller Lim. at max. speed
W0020 S1 Gauging station 1 Lower roller Lim. at min. speed
W0021 S1 Gauging station 1 Left Gap adj. timed out
W0022 S1 Gauging station 1 Left Bad gap sensor
W0023 S1 Gauging station 1 Left Gap adjusts false
W0024 S1 Gauging station 1 Right Gap adj. timed out
W0025 S1 Gauging station 1 Right Bad gap sensor
W0026 S1 Gauging station 1 Right Gap adjusts false
W0027 Main conveyor 1 Lim. at max. speed
W0028 Main conveyor 1 Lim. at min. speed
W0029 Rotary cutter 1 Lim. at max. speed
W0030 Rotary cutter 1 Lim. at min. speed
W0031 Dough return 1 Lim. at max. speed
W0032 Dough return 1 Lim. at min. speed
W0033 Rotary cutter 2 Lim. at max. speed
W0034 Rotary cutter 2 Lim. at min. speed
W0035 S1 Transfer belt 1 Lim. at max. speed
W0036 S1 Transfer belt 1 Lim. at min. speed
W0037 S1 Check bearings
W0038 S1 Check chains
W0039 S1 Check gearwheels
W0040 S1 Check guidings
W0041 S1 Check reductors
W0042 S1 Gauging station 1 Right Gap adj. out of limit

6.4. Trouble shooting guide of the units

6.4.1. Extruder (3 rollers)

Seriennummer : 7193 –701

Alarm and events list

Problem:	Cause:	Remedy:
Alarm		
Safety cover opened.		Close safety cover and reset.
Supply roller drive/motor problem.		Check variable frequency drive (alarm number).
Supply roller communication problem.		Check variable frequency drive.
Sheeting rollers drive/motor problem.		Check variable frequency drive (alarm number).
Sheeting rollers communication problem.		Check variable frequency drive.
Not right plugged.		Deselect extruder on operator panel or plug extruder well.
Warning		
Supply roller limit at max. speed.		Check parameters speed control.
Supply roller limit at min. speed.		Check parameters speed control.
Sheeting rollers limit at max. speed.		Check parameters speed control.
Sheeting rollers limit at min. speed.		Check parameters speed control.
Gap adjusts timed out.		Check mechanical movement is blocked.
Bad gap sensor.		Check if gap sensor is defect.
Gap adjusts false.		Check run direction of motor gap adjustment.

Dough-flow problem chart

Problem:	Cause:	Remedy:
No dough coming out of the extruder.	Bridge connections in the hopper.	Remove dough from hopper. Throw less dough in the hopper.
Holes in the dough sheet.	Bridge connections in the hopper.	Remove dough from hopper. Throw less dough in the hopper.
	Not enough dough supply.	Raise the speed of the upper rollers.
Dough flows out between the upper and lower rollers.	Speed of the upper rollers is set too high.	Lower the speed of the upper rollers.
Dough sheet is too wide.	Speed lower rollers is set too high.	Lower the speed of the lower

Problem:	Cause:	Remedy:
		rollers.
Dough sheet is too narrow.	Speed lower rollers is set too low.	Raise the speed of the lower rollers.
Too much stress in the dough.	May be too high speed of the upper rollers (among many other possible causes).	Lower the speed of the upper rollers.
Serious contamination of extruder.	Scrapers not parallel on the scraper holders.	Position the scrapers parallel on the scraper holder (pressing evenly on the rollers).
	Incorrect scraper tension.	Adjust the scraper tension.
	Bend or crooked scraper.	Replace scraper.

6.4.2. Conveyors

Serial number : 7193 - 702 and others

Problem:	Cause:	Action:
Uncontrollable belt steering	Dirt on the inside of the belt	Release the belt tension and clean the inside of the belt
	Dirt on the rollers	Release the belt tension and clean the rollers
	Belt is not dry	Release the belt tension and make the inside of the belt dry
	Belt tension is too high	Decrease the tension of the belt with the belt tensioners
	Belt tension is too low	Make sure the belt was tensioned after cleaning
		Increase the tension of the belt with the belt tensioners
	Roller is running out of true (sometimes rotating, sometimes not)	Find the roller and find cause of roller not running true (damaged bearing, dirt between scraper and roller)
	Rollers are not positioned 1 mm above the conveyor	Check and adjust the rollers, all rollers should be at least 1 mm above the conveyor
	Too much rollers do not have a straight position to the belt	Adjust all the rollers straight, start to steer with 1 roller.
Belt is continuously running to 1 side and is not steerable	Position of the load (dough) is not evenly spread over the belt.	Operate the system in such a way that the dough is always evenly spread over the belt
	After cleaning, the belt was not in the middle position of the rollers before tensioning	Release tension of the belt and position the belt in the middle of the rollers, tens up the belt
	Belt is running over the finger protection plates (this may damage the belt)	Release tension of the belt, position the belt correct, tens up the belt
	Conveyor is not levelled	Level the conveyor
	Conveyor is not straight in line with the rest of the machine	Position all conveyors and conveyor parts straight in line
	One of the rollers is not rotating	Find the roller and find cause of roller not running true (damaged bearing, dirt between scraper and roller)
	Too much rollers do not have straight position to the belt	Adjust all the rollers straight, start to steer with 1 roller.
	One of the rollers is not positioned at least 1 mm above the conveyor	Check all rollers and adjust (or fix bended rollers) roller height
	Knife transfer not straight to the belt	Adjust knife transfer straight to the belt
Belt is dirty	Transport belts are not cleaned for a long time	Clean the transport belt
	Scraper is not at the correct position to the belt	Adjust the scraper to the correct position
	Not enough flour on the belt	Check flour duster functioning
		Increase the speed of the flour duster
Belt is slipping	Belt tension is too low	Make sure the belt was tensioned after cleaning
		Increase the tension of the belt with the belt tensioners
	Inside of the belt is wet, conveyor is wet	Release the belt tension and make the inside of the belt and the conveyor dry

6.4.3. Two roll sheeter

Serial number : 7193 – 703

Alarm and events list

Problem:	Cause:	Remedy:
Alarm		
Supply belt drive/motor problem.		Check variable frequency drive (alarm number).
Supply belt communication problem.		Check variable frequency drive (alarm number).
Gauging station drive/motor problem.		Check variable frequency drive (alarm number).
Gauging station communication problem.		Check variable frequency drive (alarm number).
Safety cover.		Close safety cover and reset.
Warning		
Supply belt limit at max. speed.		Check parameters speed control.
Supply belt limit at min. speed.		Check parameters speed control.
Gauge rolls limit at max. speed.		Check parameters speed control.
Gauge rolls limit at min. speed.		Check parameters speed control.
Gap adjusts timed out.		Check mechanical movement is blocked.
Bad gap sensor.		Check if gap sensor is defect.
Gap adjusts false.		Check run direction of motor gap adjustment.

Dough-flow problem chart

Problem:	Cause:	Remedy:
Dough sheet is too wide.	Dough supply speed is too high.	Lower the dough supply speed.
	Automatic infeed is too high.	Lower the automatic infeed.
Dough sheet is too narrow.	Dough supply speed is too low.	Raise the dough supply speed.
	Automatic infeed is too high.	Raise the automatic infeed.
Too much stress in the dough.	May be too low speed of the dough supply (among many other possible causes).	Raise the speed of the dough supply.
	May be too low outfeed speed (among many other possible causes).	Raise the outfeed speed.
	May be too high desired loop position (among many other possible causes).	Lower the desired loop position.
Serious contamination of the Gauging station.	Scraper not parallel on the scraper holder.	Position the scrapers parallel on the scraper holder (pressing evenly on the rollers).

Problem:	Cause:	Remedy:
	Incorrect scraper tension.	Adjust the scraper tension.
	Bend or crooked scraper.	Replace the scraper.
	Not enough flour.	Check flour duster functioning.
		Increase speed of the flour duster.
		Adjust knife transfer parallel to bottom roller, 0,8mm distance between knife transfer and bottom roller.
Folds in dough coming out of the Gauging station.	Dough supply speed too high.	Lower the dough supply speed.
	Outfeed speed too high.	Lower the outfeed speed.
	Desired loop position too low.	Raise the desired loop position.
Dough sheet sides split coming out of the Gauging station.	Dough supply speed too low.	Raise the dough supply speed.
	Outfeed speed too low.	Raise the outfeed speed.
	Desired loop position too high.	Lower the desired loop position.
Weight differences over the width of the dough sheet.	Top roller not parallel to the bottom roller.	Adjust the top roller parallel to the bottom roller.
Dough supply speed very low during automatic infeed.	DDIC does not touch the dough sheet.	Move the counter weight closer to the lever.
	DDIC is turned over (for example during cleaning).	Push the DDIC towards the belt/dough.
	Dough detection sensor malfunction	Replace the sensor.
	DDIC encoder malfunction.	Replace the encoder.
	Supply transport belt encoder malfunction.	Replace the encoder.
Speed of the dough is fluctuating.	DDIC does not firmly touch the dough.	Move the counter weight closer to the lever.
Gap stays in the minimum or maximum position	Gap detection sensor malfunction	Replace the sensor

7 MAINTENANCE & CLEANING

Table of contents

General

Only professionals who are familiar with the installation and its operation may perform maintenance, repairs and replacement of defective or worn out parts.

In case of difficult or special repairs consult the Service Department of RADEMAKER BV.

Inspections must be carried out before, during and after operation of the machine. Mechanical flaws, such as loose bolts and ball bearings must be repaired upon discovery.

The operator is responsible for noticing and locating abnormal noises and other unusual signs indicating flaws. If the operator can not locate the flaw, he must stop the installation and inform his superior.

Take preventive actions against vermin as they may cause failures to the electrical cables and such.

Safety regulations

Before starting operation, cleaning, maintaining the system or before remedying breakdowns first read the chapters Introduction and Safety.

7.1 Tools

The picture below shows only the shape of all mentioned tools at the instructions.

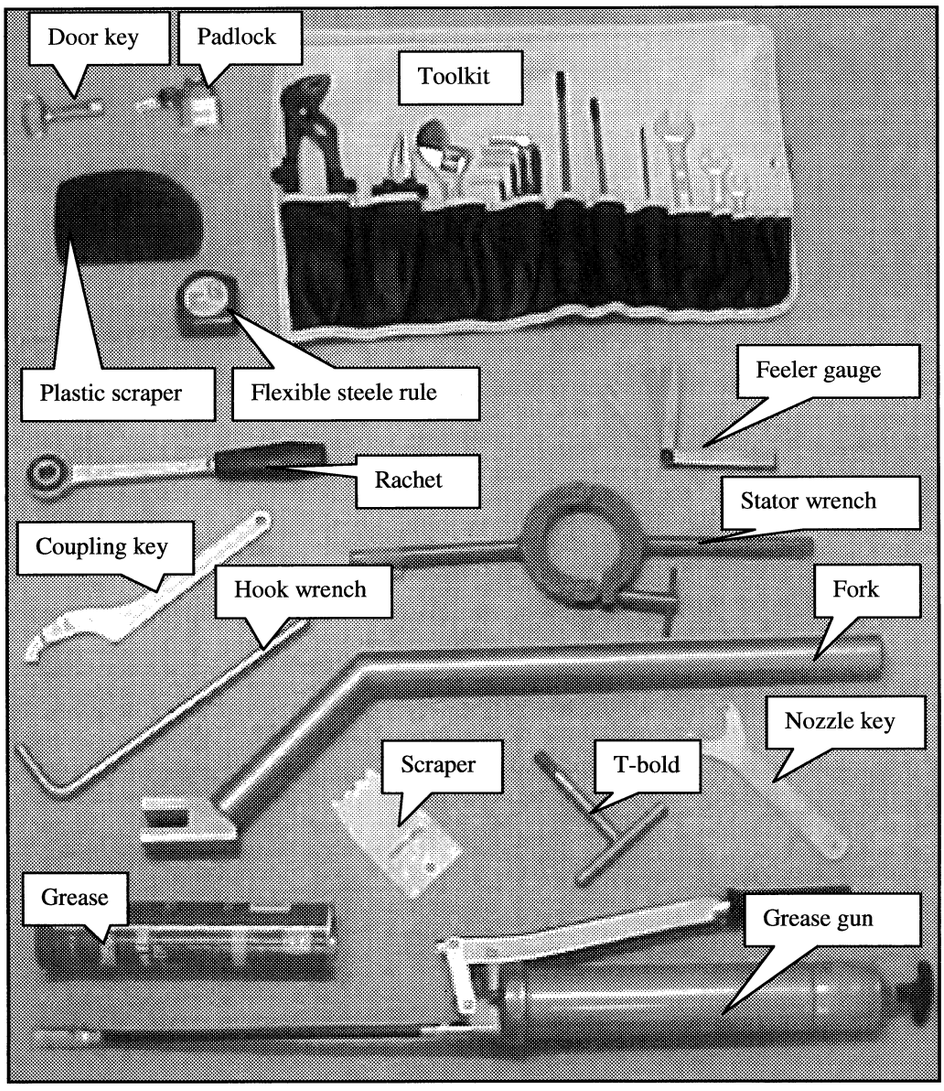


Fig. 1

⚠	**ATTENTION:** Special tools will be delivered with the Rademaker equipment.

⚠	**ATTENTION:** Use Lubricators, which are conform the U.S. Food and Drug Administration (FDA) requirements and are classified as H1 lubricators by the U.S. Department of Agriculture (USDA). These lubricants have been approved for use in the food processing industry. Special tools will be delivered with the Rademaker equipment.

7.2 Components

7.2.1 Bearings

In the Rademaker systems different executions of bearings are used.
Bearings without a grease nipple have a life time lubrication. No lubrication is needed.

Systems Designed for Dry cleaning (D4D) may have bearings with grease nipples.
Grease those bearings after every 40 hours running production.

Systems Designed for Wet cleaning (D4W) always has bearings with grease nipples.
Lubricate these grease nipples directly after the wet cleaning of the system.

Use H1 classified grease. These lubricants have been approved for use in the food processing industry. Rademaker advice: Use Chevron FM Grease EP or Kluber UH1 14-151, which meets the above mentioned requirements.

i	**TIP!** When you want to use a different type of grease, make sure that the specifications of this grease is the same, and forms no harmful product when in contact with the lubricants used by Rademaker.

Wipe clean the grease nipples, use the grease gun and apply grease slowly until the grease comes out of the bearings (see below photos). When the grease that comes out of the bearings is black or dirty, keep applying grease until no more black or dirty grease comes out of the bearings. Remove superfluous fat and greasing oil after greasing duties.

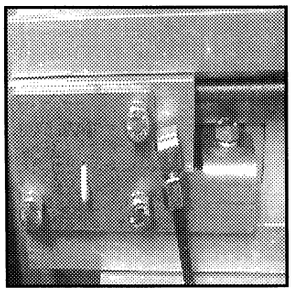


Fig. 1

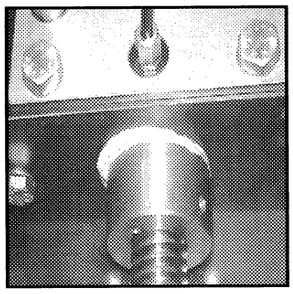


Fig. 2

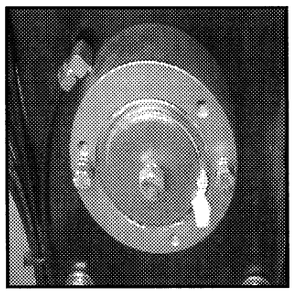


Fig. 3

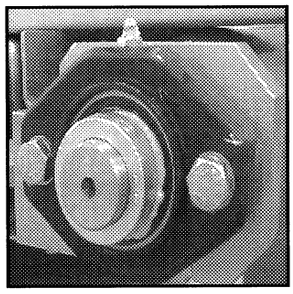


Fig. 4

7.2.2 Guiding

Rademaker uses a variety of guidings, sliding sleeves and ball bearing guidings. See below pictures for examples.
Do not lubricate those guidings. Instead of lubricating them they should be cleaned with a cloth moistened in water of maximum 60 degrees Celsius. Clean those guidings after every 40 hours running production.

The only exception is the ball bearing guidings with grease nipples. See Bearings with grease nipples for details.

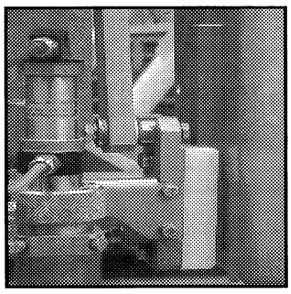


Fig. 1

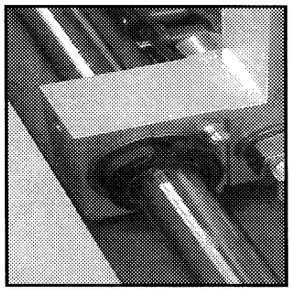


Fig. 2

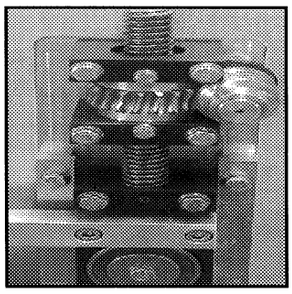


Fig. 3

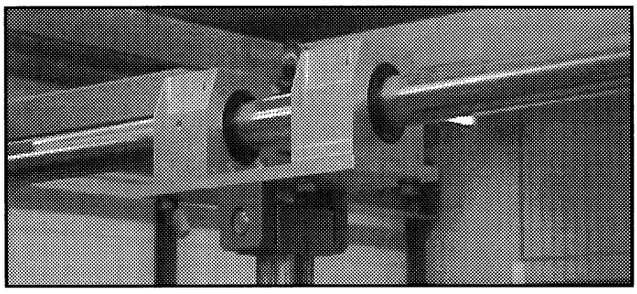


Fig. 4

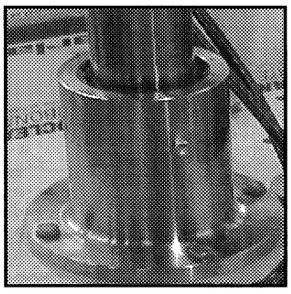


Fig. 5

7.2.3 Gears and worm wheels

Plastic gears do not need lubrication.
The metal gears and the worm wheels need lubrication.

Wipe clean the gears and worm wheels and apply a little grease with a brush on the gears and the worm wheels. Remove superfluous grease afterwards.
Lubricate gears and worm wheels after every 160 hours running production.
Gears and worm wheels that are cleaned with water during the wet cleaning of the system need to be greased directly after cleaning.

Use H1 classified grease. These lubricants have been approved for use in the food processing industry. Rademaker advice: Use Chevron FM Grease EP or Kluber UH1 14-151, which meets the above mentioned requirements.

i	**TIP!** When you want to use a different type of grease, make sure that the specifications of this grease is the same, and forms no harmful product when in contact with the lubricants used by Rademaker.

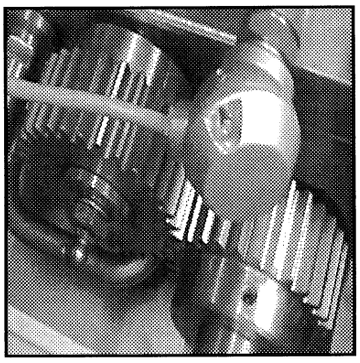


Fig. 1

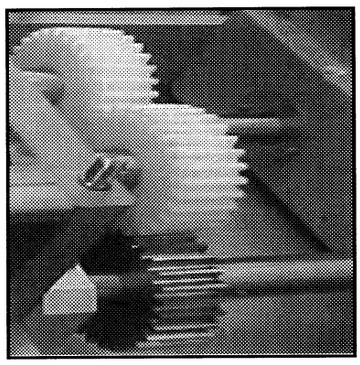


Fig. 2

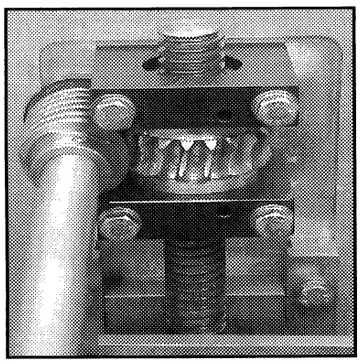


Fig. 3

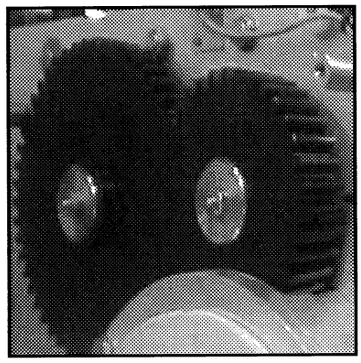


Fig. 4

7.2.4 Chains

In the Rademaker systems different executions of chains are used. See below table for most used chain types:

Chain	Lubricate	Grease:	WaterProof	As:
Tsubaki Lambda WP	NO*		Yes	Transport chain
Tsubaki Lambda	NO*		No	Drive chain
Tsubaki WP	Automatic**	Rhenus Vitanor HS 46	Yes	Transport chain
Tsubaki WP	YES***	Kluber 4UH1-1500	Yes	Transport chain
Coated	YES***	Kluber 4UH1-1500	Yes	Transport chain
StainlessSteel	YES***	Kluber 4UH1-1500	Yes	Drive chain
Smaller chains *	YES****	Kluber 4UH1-15	No	Drive chain

* Tsubaki Lambda chains have a lifetime lubrication.

** Chains that have an automatic oil dripping system are automatically lubricated with oil.

*** Chains that need to be lubricated are marked on the greasing diagram. Grease those chains after every 160 hours running production oar at least after every wet cleaning.

**** Chains smaller than ½ inch (12.7 mm). Grease those chains after every 600 hours running production.

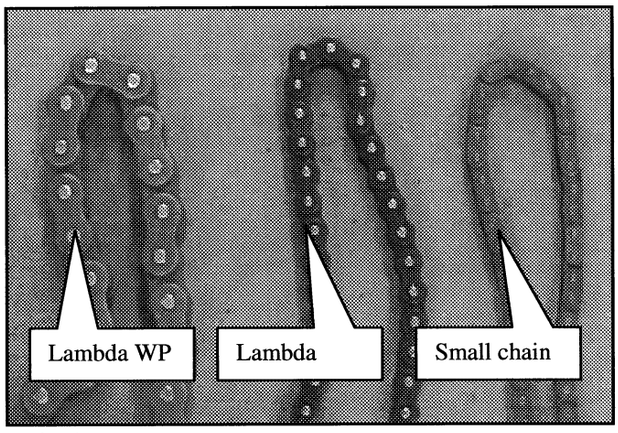


Fig. 1

⚠	**ATTENTION:** Lubricating lifetime lubricated chains will shorten the life span of these chains.

Use H1 classified grease and oil. These lubricants are conform the U.S. Food and Drug Administration (FDA) requirements and are classified as H1 lubricants by the U.S. Department of Agriculture (USDA). These lubricants have been approved for use in the food processing industry.

	**TIP!** When you want to use a different type of grease or oil, make sure that the specifications of this grease or oil is the same, and forms no harmful product when in contact with the lubricants used by Rademaker.

Chains need to have a correct tension. In the Rademaker system this is mostly done automatically. Only chains that are running discontinuously and/or chains that are running back and forth may need manual adjustment of the tension. Check the tension of these chains after every 80 hours running production. For tensioning of chains, see the specific information in the maintenance instructions per unit in this chapter.

	**ATTENTION:** Too much tension will shorten the life span of the chains.

7.2.5 Motors and reductors

The oil in the reductors needs to be changed occasionally under normal circumstances.

Use the oil as specified by the suppliers of the motors and reductors. The specifications are included in the documentation of the suppliers, which is added in the chapter documentation.

	**TIP!** When you want to use a different type of oil, make sure that the specifications of this oil is the same, and forms no harmful product when in contact with the oils as specified by the suppliers of the motors and reductors.

7.2.6 Air supply

The most harmful elements in compressed air of the pneumatic installations are:

- Water or condensation
- Pollution.

Therefore the compressed air, that arrives at the connecting point of our pneumatic installations, must be dry and clean.
The air supply coming into the Rademaker systems goes through a primary filter. This filter separates the liquids and the pollution, that has mixed with the air flowing through the air distribution pipes. In case that air comes in contact with the product (dough, filling), this air must be very clean. For this an extra Micro filter and an extra Carbon filter is installed.
Replace the primary and secondary filter once a year.

The air regulators/filters are executed with an automatic drain-off system.

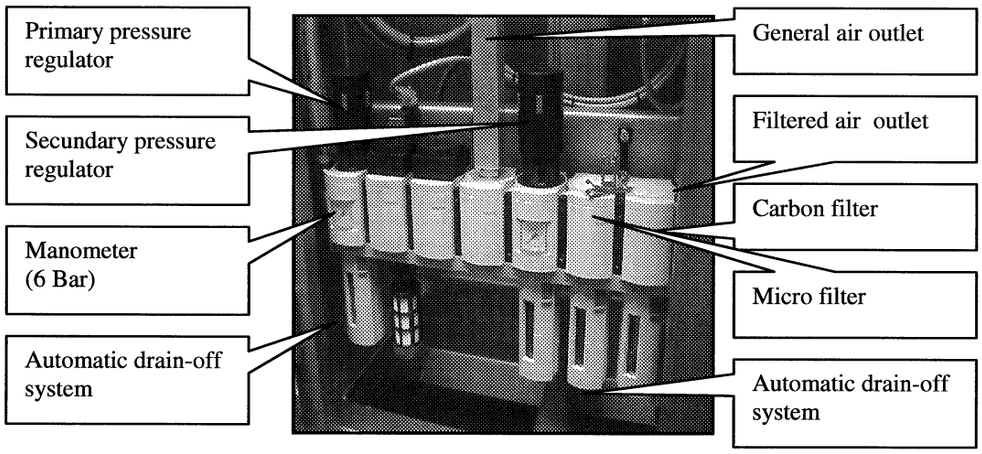


Fig. 1

In exceptional cases the air needs lubrication, for example when an air driven motor is used.
Check the oil level regularly.
Use oil that is conform the U.S. Food and Drug Administration (FDA) requirements and is classified as an H1 oil by the U.S. Department of Agriculture (USDA). These lubricants have been approved for use in the food processing industry.
Rademaker advice: Use Rhenusn Vitanor HS-32 oil for the air lubricator.

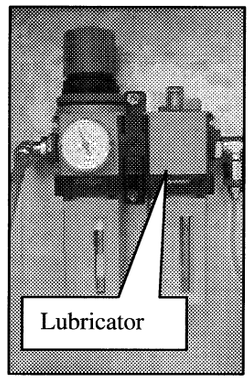


Fig. 2

i	**TIP!** When you want to use a different type of oil, make sure that the specifications of this oil is the same, and forms no harmful product when in contact with the lubricants used by Rademaker.

See also added Festo information in the documentation chapter.

7.3 Automatic lubrication systems

Check regular the levels of the automatic lubrication systems. Refill the reservoir before the oil or grease level is below the minimum level indication.

Use H1 classified grease and oil. These lubricants are conform the U.S. Food and Drug Administration (FDA) requirements and are classified as H1 lubricants by the U.S. Department of Agriculture (USDA). These lubricants have been approved for use in the food processing industry. Rademaker advice:
Use Rhenus Vitanor HS46 for the oil dripping system.
Use Chevron FM Grease EP **NLGI 0** for the greasing system.

⚠	**ATTENTION:** Use only Rhenus Norplex AFD grease for the automatic greasing systems. With different grease the grease pipelines will clog up resulting in no lubrication of the machine and damage of the complete automatic greasing system.

i	**TIP!** When you want to use a different type of grease/oil, make sure that the specifications of this grease/oil is the same, and forms no harmful product when in contact with the lubricants used by Rademaker.

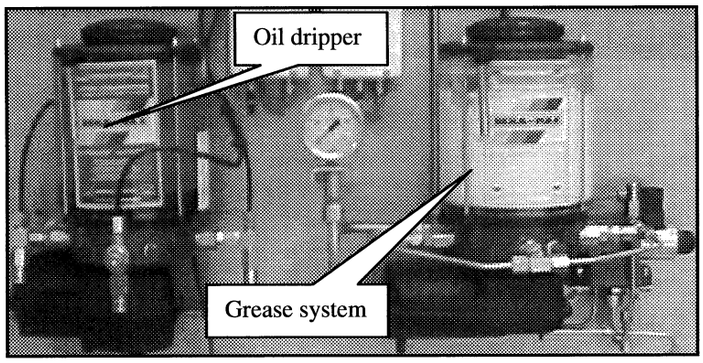


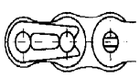
Fig. 1

Fig. 2

7.4 Greasing diagram

7.5 Maintenance instructions of the units

General explanation of the preventive maintenance schedule and lubrication points of the units:

Symbol	Maintenance intervals	Maintenance work required	Tool
	Every 40 hours of operation or before each daily start-up	Lubricate grease nipples, bearing bushes and guidings	Greasegun & oil can
	Every 160 hours of operation	Lubricate worm/wormwheels	Brush
	Every 160 hours of operation	Lubricate sprockets/chains and check tension drive belts/chains	Brush / spray-can
	Before each daily start-up	Check oil level of mechanical variable speed drives	See documentation manufacturer (See Appendix B)
	Every 15000 hours of operation	Renew oil/grease of Reductors & Gearboxes	See service manual of manufacturer (See appendix B)

Note:
See the added greasing diagram in this chapter and the preventive maintenance tables of the unit for further information.

7.5.1 Extruder (3 rollers)

Serial number : 7193 – 701

Safety:

	**Attention!** Do **not** clean electrical parts such as motors, switches, and plugs with water.

	**Danger!** Do **not** insert objects or limbs into the area of the unit, when it is switched on.

Required tools:

A. Grease-gun (fig. 1)
B. Plastic scraper (fig. 2)

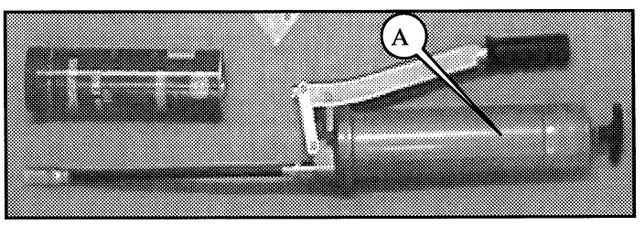


Fig. 1

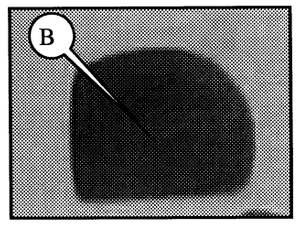


Fig. 2

Preventive maintenance schedule:

WEEKLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Check for vibrations, ticking, oil leakage	Repair or replace motor
Greasable bearings		Grease according grease diagram

MONTHLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors		Clean the motor and area around

YEARLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Read documentation added in this manual	Replace lubrication if necessary

Lubrication points:
All positions that needs to be lubricated are marked with:

Explanation of the labels can be found at the preventive maintenance schedule.

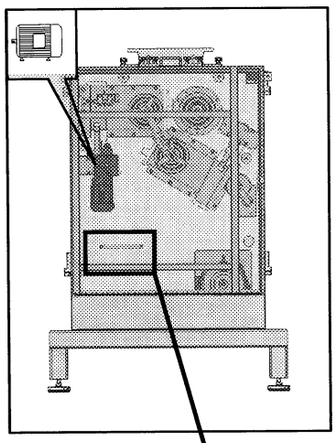


Fig. 4 Side

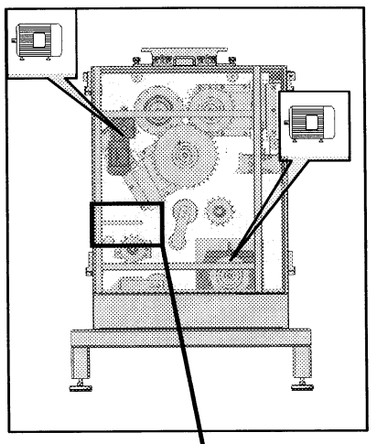
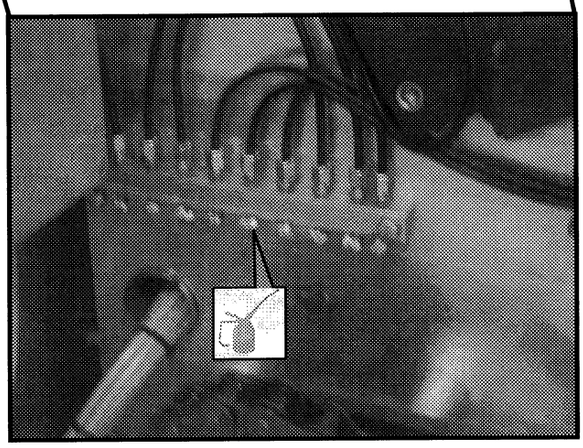


Fig. 5 Side



7.5.2 Conveyors

Serial number : 7193 – 702 and others

Safety:

⚠	**WARNING!** Do not stand or walk on conveyors or rollers. This will damage the installation and may cause tripping or stumbling hazard.

⚠	**DANGER!** Do not touch the conveyor belt with objects or through body contact during operation.

Required tools :

A. Plastic scraper (fig. 1)
B. Grease-gun (fig. 2)

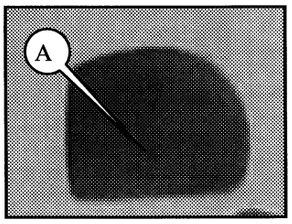


Fig. 1

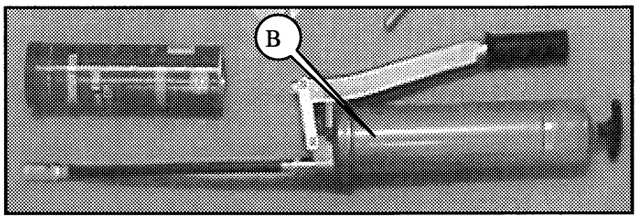


Fig. 2

Preventive maintenance schedule:

DAILY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Belts	Check for slipping of the belt.	See chapter Trouble shooting.
	Check for controllability of the belt.	See chapter Trouble shooting.
	Check for damages.	Replace the belt

WEEKLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Check for vibrations, ticking, oil leakage	Repair or replace motor
Greasable bearings		Grease according grease diagram

MONTHLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors		Clean the motor and area around

YEARLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Read documentation added in this manual	Replace lubrication if necessary

Lubrication points:
All positions that needs to be lubricated are marked with:

Explanation of the labels can be found at the preventive maintenance schedule.

(Grease the bearing blocks).

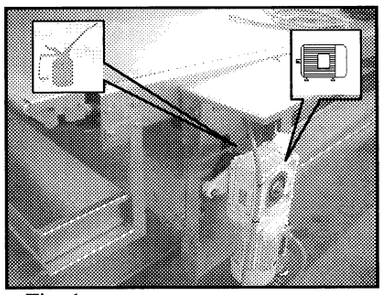


Fig. 1

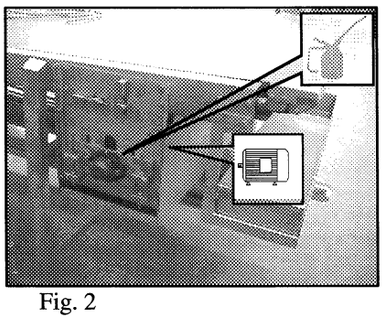


Fig. 2

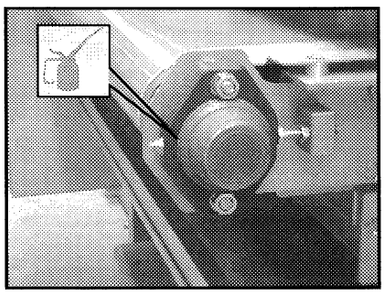


Fig. 3

Fig. 3

7.5.3 Two roll sheeter

Serial number : 7193 – 703

Safety:
All turning and moving parts are secured with guards or covers and are protected by safety switches with exception of the doors at the side. When the covers are opened during production, the production line/unit will stop immediately.

⚠	**Attention!** Machine may only be cleaned when the power supply is switched off. Do not remove the covers of the motors when cleaning this unit.

Required tools:
A. Door key (fig. 1)
B. Plastic scraper (fig. 2)
C. Grease-gun (fig. 3)

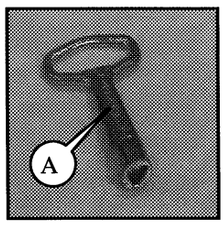


Fig. 1

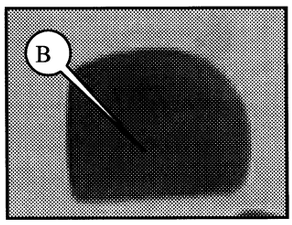


Fig. 2

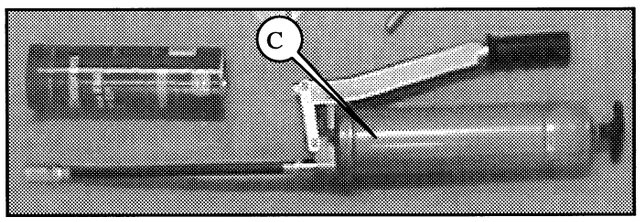


Fig. 3

Preventive maintenance schedule:

DAILY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Belts	Check for slipping of the belt.	See chapter Trouble shooting.
	Check for controllability of the belt.	See chapter Trouble shooting.
	Check for damages.	Replace the belt

WEEKLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Check for vibrations, ticking, oil leakage	Repair or replace motor
Greasable bearings		Grease according grease diagram

MONTHLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors		Clean the motor and area around
Dough thickness	Check thickness across dough sheet	Adjust rollers parallel
Chain	Check chain tension	Adjust chain tension
Gap	Check gap detection sensor	Adjust gap detection sensor

YEARLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Read documentation added in this manual	Replace lubrication if necessary

Lubrication points:
All positions that needs to be lubricated are marked with:

Explanation of the labels can be found at the preventive maintenance schedule.

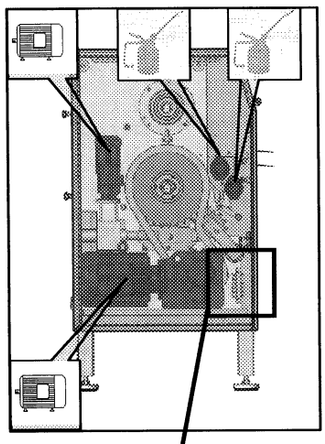


Fig. 4 Left side door opened

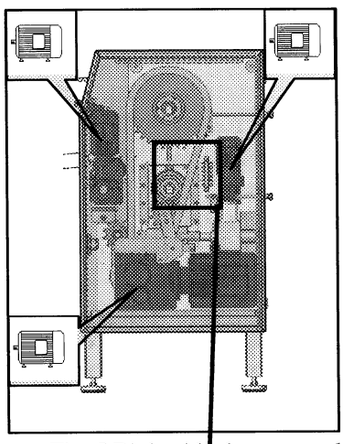
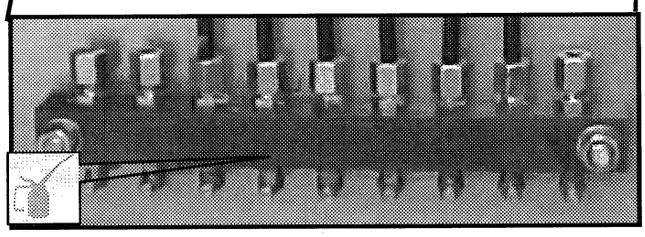


Fig. 5 Right side door opened



7.5.4 Driven cutting roller

Serial number : 7193 – 705

Safety :
All the rotary and mobile parts are as much as possible protected. Nevertheless, of the dangerous situations are conceivable between the roller and the conveyor.

	**CAUTION!** Do not touch the sharp side of the cutting roller!

	**ATTENTION:** The sharp edges of the cutting roller damages easily.

Required tools :

A. Plastic scraper (fig. 1)
B. Grease-gun (fig. 2)

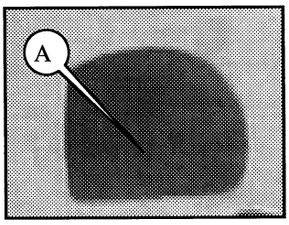


Fig. 1

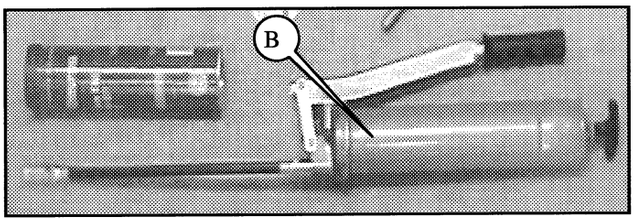


Fig. 2

Preventive maintenance schedule:

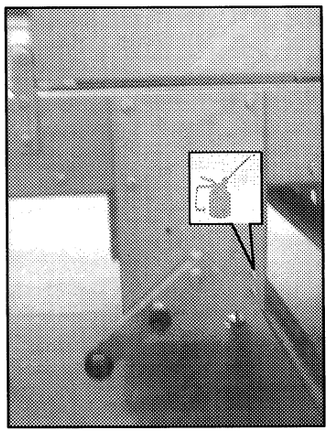
WEEKLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Check for vibrations, ticking, oil leakage	Repair or replace motor
Greasable bearings		Grease according grease diagram

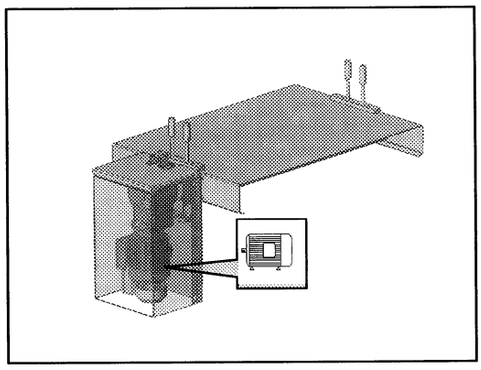
MONTHLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors		Clean the motor and area around

YEARLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Read documentation added in this manual	Replace lubrication if necessary

Lubrication points:
All positions that needs to be lubricated are marked with:

Explanation of the labels can be found at the preventive maintenance schedule.





7.5.5 Scrap return system

Serial number : 7193 – 706

Safety:
All moving parts like drives are covered. When the unit is delivered with a complete installation, this unit is also a part of the total safety system. Nevertheless there are still dangerous situations thinkable: such as crushing danger between pressing roller on inclining conveyor belt.

Required tools:

A. Plastic scraper (fig. 1)
B. Grease-gun (fig. 2)

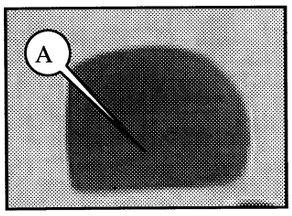


Fig. 1

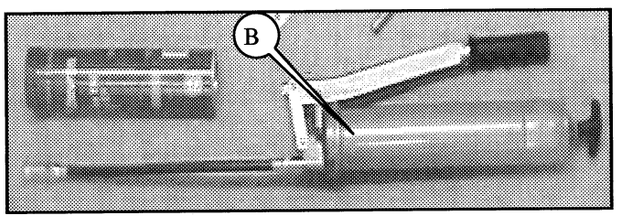


Fig. 2

Preventive maintenance schedule:

DAILY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Belts	Check for slipping of the belt.	See chapter Trouble shooting.
	Check for controllability of the belt.	See chapter Trouble shooting.
	Check for damages.	Replace the belt

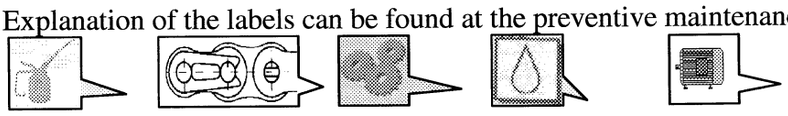
WEEKLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Check for vibrations, ticking, oil leakage	Repair or replace motor
Greasable bearings		Grease according grease diagram

MONTLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors		Clean the motor and area around

YEARLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Read documentation added in this manual	Replace lubrication if necessary

Lubrication points:
All positions that needs to be lubricated are marked with:

Explanation of the labels can be found at the preventive maintenance schedule.



(Grease the bearing blocks).

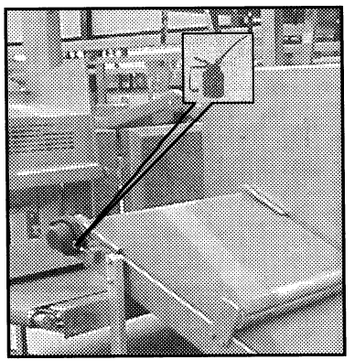


Fig. 4

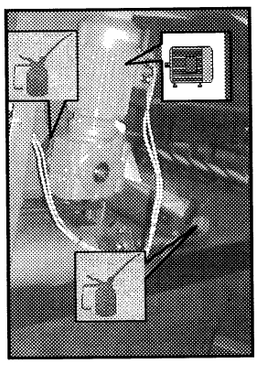


Fig. 5

7.5.6 Scrap cutting system

Serial number : 7193 – 707

Safety :
All the rotary and mobile parts are as much as possible protected. Nevertheless, of the dangerous situations are conceivable between the roller and the conveyor.

	**CAUTION!** Do not touch the sharp side of the cutting roller!

	**ATTENTION:** The sharp edges of the cutting roller damages easily.

Required tools:

A. Plastic scraper (fig. 1)
B. Grease-gun (fig. 2)

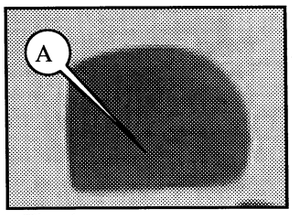


Fig. 1

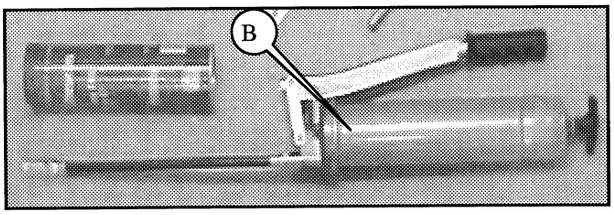


Fig. 2

Preventive maintenance schedule:

DAILY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Belts	Check for slipping of the belt.	See chapter Trouble shooting.
	Check for controllability of the belt.	See chapter Trouble shooting.
	Check for damages.	Replace the belt

WEEKLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Check for vibrations, ticking, oil leakage	Repair or replace motor
Greasable bearings		Grease according grease diagram

MONTLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors		Clean the motor and area around

YEARLY MAINTENANCE		
Item:	**Maintenance advise:**	**Maintenance action:**
Motors + Reductors	Read documentation added in this manual	Replace lubrication if necessary

Lubrication points:
All positions that needs to be lubricated are marked with:

Explanation of the labels can be found at the preventive maintenance schedule.

(Grease the bearing blocks).

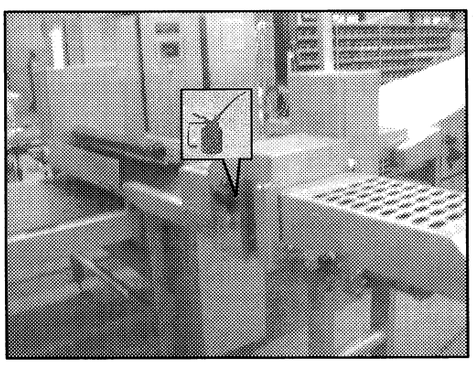


Fig. 4

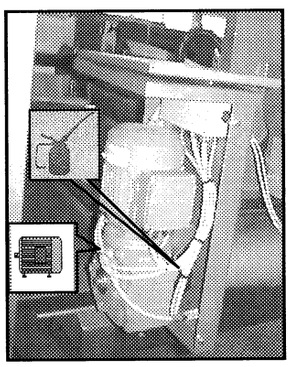


Fig. 5

7.6 General cleaning procedures

Check manual for the right cleaning procedure, Before actually starting to clean the Rademaker equipment:(The required information can be found at the specific cleaning instructions at the next paragraph).

Important;
The line can be build up in D4D and/or D4W execution.
Clean only those units wet, that are executed as D4W

7.6.1 General recommendations for cleaning Rademaker D4D equipment.

Rademaker recommends the following steps to clean the D4D equipment:

Procedure.

1. Run the line empty
2. Switch off all power supply of the equipment like electric, compressed air etc, and secure it against accidental switching on.
3. Remove all scrap from the line
4. Wheel-out all mobile units.
5. Remove all detachable parts from the units (see the cleaning method per unit for the specific parts).
6. Clean the line dry as much as possible by vacuum cleaner, cloth
7. Place all plugs in dummy sockets if applicable.

⚠	**ATTENTION:** Do **not** clean electrical parts such as motors, switches, and plugs with water

8. Cleaning
   At the actual main cleaning stage, clean equipment with a cloth moistened with warm water of maximum 60°C/140°F. Stubborn dirt on the equipment (dough, filling) must be removed by plastic scraper.

⚠	Attention: Do not use abrasive cleaning tools on Teflon parts.

9. Check cleaning result
   Check all critical areas e.g. visually. Re-clean if necessary.
10. Check the condition of the detachable parts before replacing them into the units.
11. When questions about the condition of these parts arise, consult your maintenance engineer.
12. Replace worn-out detachable parts.
13. Place all detachable parts back (see the cleaning method per unit for the specific parts).
14. The system must be absolutely dry before putting it back into operation.
15. The equipment is now ready for use.

7.6.2 General recommendations for cleaning Rademaker D4W equipment.

Rademaker recommends the following steps to clean the D4W equipment:

Basic rules of chemicals for Cleaning and Sanitizing of Food Processing and/or food-handling equipment:
Chemicals and the initial period must meet the instruction for use of the detergents and cleaning material supplier. The detergents and cleaning compounds must be applicable with the used materials of the Rademaker construction.
Therefore a material list of the Rademaker equipment is added at the end of chapter maintenance and cleaning.
Your detergents and cleaning material supplier must be able to give you advice.

Procedure.
1. Run the line empty
2. Switch off all power supply of the equipment like electric, compressed air etc, and secure it against accidental switching on.
3. Remove all scrap from the line
4. Wheel-out all mobile units.
5. Remove all detachable parts from the units (see the cleaning method per unit for the specific parts).
6. Clean the line dry as much as possible by vacuum cleaner, cloth
7. Release tension of all conveyor-belts if applicable
   (place objects between belts and conveyor, so it is possible to clean underneath the belt. Keep object between till belts are completely dry).
8. Place all plugs in dummy sockets or seal all electric connectors for wet cleaning.
9. Pre-rinsing
   with pre-rinsing, coarse dirt is rinsed off or detached with water
   Use a jet of water from a distance of at least 1 meter/ foot, with low pressure (maximum 25 bar/ 363 PSI and a water temperature up to 60°C/140°F max.

⚠	**ATTENTION:** Do **not** clean electrical parts such as motors, switches, and plugs with water

⚠	**ATTENTION!** Make sure not to aim direct the water jet too electrical parts such as motors, switches, sensor, and plugs.

10. Cleaning
    At the actual main cleaning stage, stubborn dirt on the equipment (dough, filling) must be removed by plastic scraper or dissolved with the aid of chemical cleaning agents. Cleaning agents are generally applied as foam or gel . In practice however cleaning with water must be sufficient for removing the dirt.

⚠	Attention: Do not use abrasive cleaning detergents or utensils on Teflon parts.

11. Rinsing off
    In this stage, dirt previously detached or dissolved is rinsed off equipment with the aid of warm water (up to 60°C/140°F) and low pressure.
12. Check cleaning result
    Check all critical areas e.g. visually. Re-clean if necessary.
13. Disinfecting
    Disinfection is recommended in all hygiene relevant areas of food processing equipment.
    Rademaker equipment can also be identified as written in the existing HACCP system.
    Therefore it should be in consideration that also surfaces without direct food contact could cause hygiene risks regard to cross contamination.
14. Final rinsing off with potable water
    After cleaning, and if required, the equipment is rinsed off with portable water using low pressure.(All residue from cleaning agents or disinfectants should be removed from the equipment before it is used again).
15. Lubricate all units immediately after they are rinsed off.

	**ATTENTION!** Make sure to apply edible grease on parts that may contact the product.

16. Remove excess grease after lubrication.
17. Check
    Disinfection result is checked using the appropriate for particular method (e.g. microbiologically method or contact plate).
18. Check the condition of the detachable parts before replacing them into the units.
19. When questions about the condition of these parts arise, consult your maintenance engineer.
20. Replace worn-out detachable parts.
21. Place all detachable parts back (see the cleaning method per unit for the specific parts).
22. The system must be absolutely dry before putting it back into operation.
23. The equipment is now ready for use.

7.6.3 Inspection notes:

Clean the inside of drive compartment monthly.
(This job must be done by a service engineer, because tools are required).

Check regular the condition for proper cleaning. Contamination can cause damage to the system and loss of production.

Check all corrodible parts like axle journals of gearboxes and flanges. they are covered by a non sticking rust-preventing spray from the factory.

7.7 Cleaning instructions of the units

7.7.1 Extruder (3 rollers)

Serial number : 7193 – 701

Safety:

Attention!
Do **not** clean electrical parts such as motors, switches, and plugs with water.

Danger!
Do **not** insert objects or limbs into the area of the unit, when it is switched on.

This unit is D4D executed, and is designed for dry cleaning.

Cleaning advise:
Clean the unit dry as much as possible. Remove persisting scrap with a cloth moistened with warm water of maximum 60°C. We advise **not** to clean the inside of the motor compartment with water.

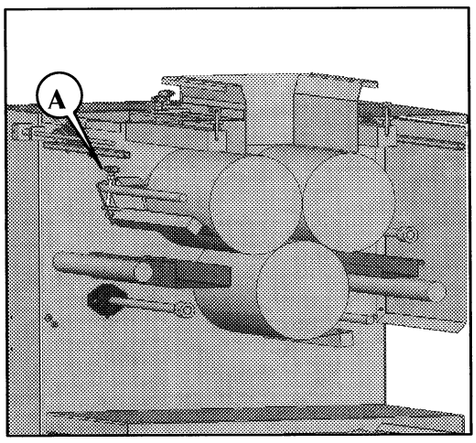
Cleaning interval:
- Check for pollution every hour.
- Clean the Extruder after every 8 hours running production.

Before cleaning:
Procedure:
1. Remove the dough from the Extruder.
2. Remove the detachable parts.
   (see disassembly instructions).

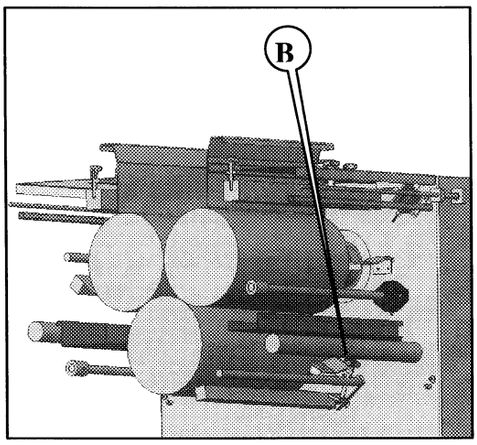
Detachable parts:
- Side shields
- Scraper supply roller
- Scraper lower roller
- Hopper

Disassembly for cleaning of the unit:

Remove the 2 scrapers:



Cross Section A-A Fig. 2



Cross Section A-A Fig. 3

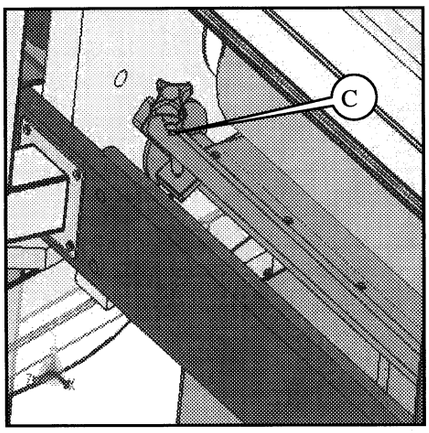


Fig. 3 Installed scraper

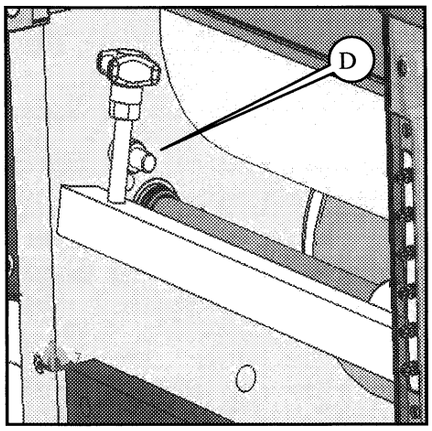


Fig. 4 Removed scraper

Fig. 4

A. Scraper supply roller
B. Scraper lower roller
C. Star grip
D. Support pin for scraper holder

	CAUTION! Do not touch the sharp side of the scraper!

	ATTENTION: The sharp side of the scraper damages easily.

Procedure:
1. Open the 2 hinged covers.
2. Loosen up the star grips (C) 2x.
3. Press or pull the lever to release the scrapers (A,B) from the roller.
4. Remove the scraper from the scraper holder.

Remove the side shields:

A. Side shield
B. Star grips
C. Ejector holes

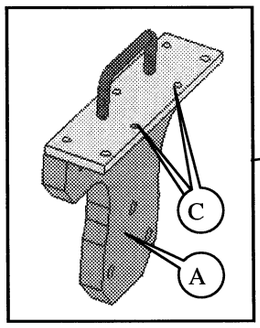


Fig. 6 Side shield

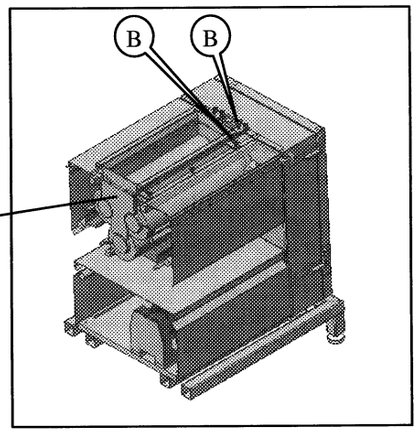


Fig. 5 Side top view

Procedure:
1. Remove the star grips (B)
2. Pull the side shields (A) out of the Extruder.
   (Screw star grips (B) in ejector holes (C), when the side shields won't come out).

Remove the hopper:

⚠	**ATTENTION:** Lift hopper with at least 2 persons, due to the hoppers weight.

A. Fastening nuts for hopper (6x)

Procedure:
1. Remove the 4 nuts (A) of the hopper.
2. Lift the hopper from the Extruder.

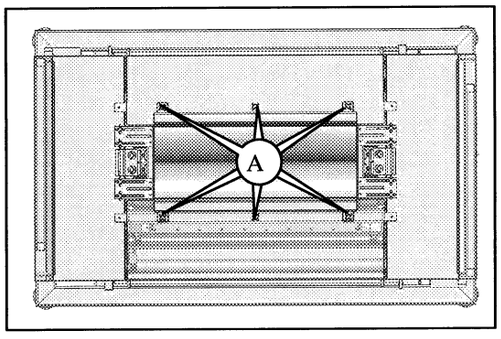


Fig. 8 Upper view hopper

Reassembly of the unit:

Reassemble the unit in opposite direction, when none procedure is available.

7.7.2 Conveyors

Serial number : 7193 – 702 and others

Safety:

	**WARNING!** Do not stand or walk on conveyors or rollers. This will damage the installation and may cause tripping or stumbling hazard.

	**DANGER!** Do not touch the conveyor belt with objects or through body contact during operation.

This unit is D4D executed, and is designed for dry cleaning.

Cleaning advise:
Clean the unit dry as much as possible. Remove persisting scrap with a cloth moistened with warm water of maximum 60°C. We advise **not** to clean the inside of the motor compartment with water.

	**DANGER!** Do **not** insert objects or limbs into the area of the unit, when it is switched on.

	**ATTENTION!** Do not stand or walk on conveyor belts or rollers. This will damage the belt.

Cleaning interval:
- Check for pollution every hour.
- Clean the complete conveyor every 24 hours.

	**ATTENTION:** Do **not** clean electrical parts such as motors, switches, and plugs with water

Before cleaning:
- Take out all detachable parts.
- Remove the dough from the conveyor belt.
- Remove the scrap.
- Release the tension of the belts using the quick release system.
- Clean the unit dry as much as possible with a vacuum cleaner, a dry cloth and a plastic scraper.

Detachable parts:
Scrap bin.

Procedure releasing tension of the belt by quick belt release device:

- Turn handle in a way the locking-strip can be turned away from the handle.
- Turn locking strip away.
- Turn handle in a way the end roller is going towards the handle.

A. Locking strip
B. Handle
C. End roller

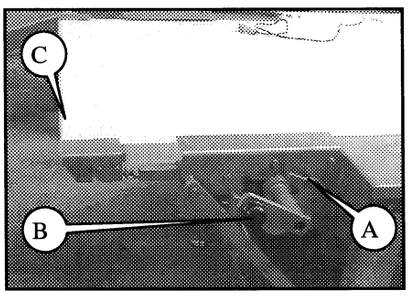


Fig. 4

After cleaning the complete conveyor:

- Wait until the belts are completely dry. Make sure the belt is positioned in the middle of the conveyor and underneath the finger protection plates.
- Tens-up the belt
- Make sure the scrapers(if any) are pressing evenly against the belts.

Note: After cleaning with water, the unit must be greased immediately according the maintenance instructions of the conveyor.

	**ATTENTION!** Make sure to apply edible grease on parts that may contact the product.

7.7.3 Two roll sheeter

Serial number : 7193 – 703

Safety:
All turning and moving parts are secured with guards or covers and are protected by safety switches with exception of the doors at the side. When the covers are opened during production, the production line/unit will stop immediately.

Attention!
Machine may only be cleaned when the power supply is switched off.
Do not remove the covers of the motors when cleaning this unit.

This unit is D4D executed, and is designed for dry cleaning.

Cleaning advice:
Clean the unit dry as much as possible. Remove persisting scrap with a cloth moistened with warm water of maximum 60°C. We advise **not** to clean the inside of the motor compartment with water.

Danger!
Do **not** insert objects or limbs into the area of the unit, when it is switched on.

Cleaning interval:
- Check for pollution every hour.
- Clean the scrap bin of the top roller scraper every hour.
- Clean the scrapers every 8 hours.
- Clean the complete Gauging station every 24 hours.

Before cleaning:
- Open all guards/covers
- Remove the dough from the Gauging station.
- Place flour catch trays in cleaning position (see procedure further on).
- Take out the detachable parts (see Disassembly procedure) .
- Clean inside as much as possible with a vacuum cleaner, a dry cloth and a plastic scraper.

Detachable parts:
- Scraper upper roller
- Scraper lower roller
- Belt scraper

Note: Cleaning the loop control assembly (optional):

During cleaning;
It is important to pull the roller of the loop control too the stop blocks (X)for cleaning.

Clean the roller assembly carefully without excessive force.

This to prevent twisting if the roller assembly.

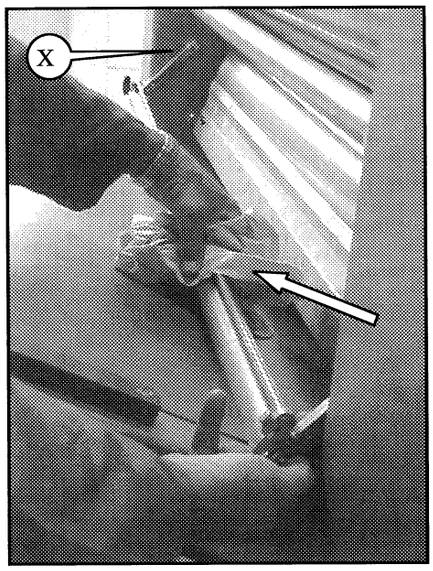


Fig. 1 Loop control assembly

Disassembly for cleaning of the unit:

Disassembly the unit for cleaning only if needed!

Removing of the roller scrapers:

A. Scraper upper roller
B. Scraper lower roller
C. Star grip to adjust intensity of scraper
D. Star grip fastening scraper upper roller

Procedure:
1. Release tension of the scrapers by turning the star grips (C).
2. The scraper of the lower roller can be taken out now,
3. Release fastening star grips (D) of scraper upper roller.

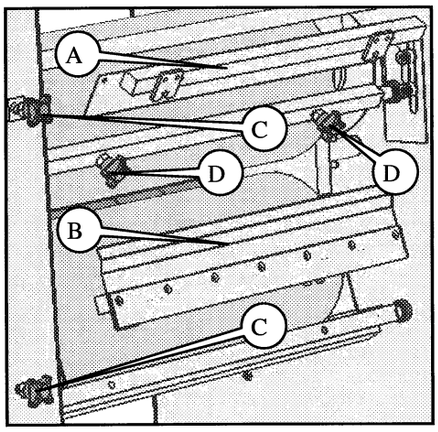


Fig. 2 Outfeed side

	**CAUTION!** Do not touch the sharp side of the scraper!

	**ATTENTION:** The sharp side of the scraper damages easily.

Removing of belt scraper:

K. Locking pin
L. Scraper
M. Scraper beam

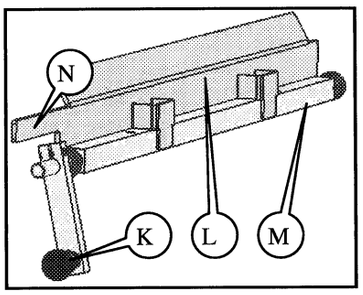


Fig. 4 Belt scraper assembly

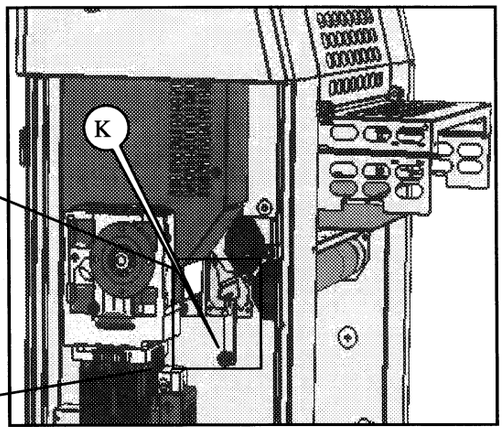


Fig. 3 Left side opened door

Procedure:
1. Open door with door key (see required tools).
2. Pull knob (K) (fig. 3)
3. Turn knob (K) counter clock-wise (approx. 45°).
4. Lift scraper (L) at point (N) and take it out (Fig. 4).

Reassembly of the unit:

Reassemble the unit in opposite direction, when none procedure is available.

Install roller scrapers:

A. Scraper upper roller
B. Scraper lower roller

The scrapers must be positioned evenly against the rollers. The tension of the scrapers on the roller must be adjusted with the star grips (C).

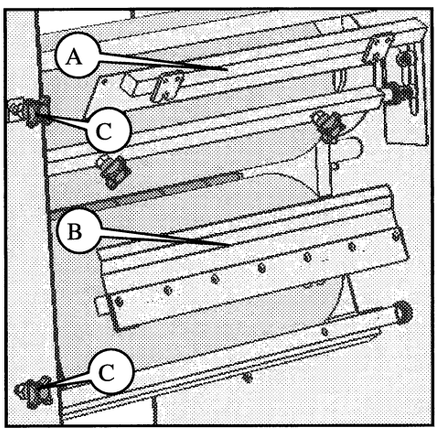


Fig. 5

⚠	**Attention!** Too much tension will shorten the life span of the scrapers

Install belt scraper:

K. Locking pin
L. Scraper
M. Scraper beam

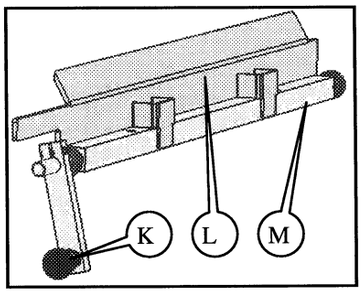


Fig. 7

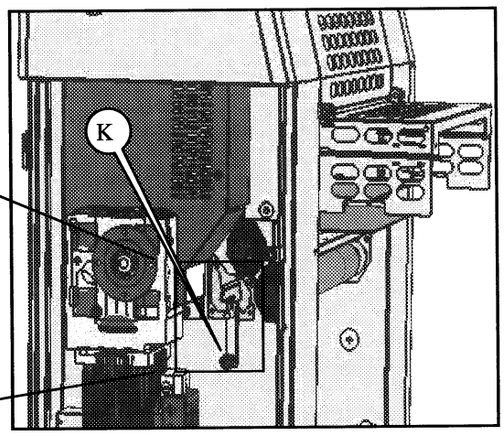


Fig. 6

Procedure:

1. Open door with door key (see required tools)
2. Place scraper on scraper beam (M)
   (the scrapers must be positioned evenly against the rollers).
3. Turn handle with knob (K) clock-wise, till locking-pin meets hole.

Flour catch tray position

Place the flour catch tray of the top roller scraper in the correct position.

A. Flour catch tray in cleaning position

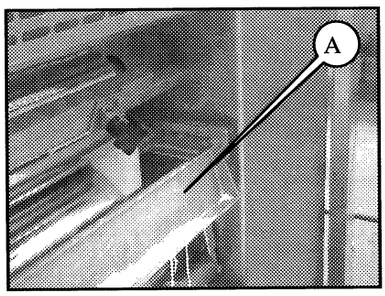


Fig. 8 Outfeed side

Cleaning:
The rollers are now easy to reach.

- Remove persisting dough on rollers with a plastic scraper.

After cleaning the complete unit:

- After installation of the scraper on the scraper holder turn the star grip Counter Clockwise to tens the scraper to the roller.
- Make sure the scraper presses evenly against the roller.

Note: After cleaning with water, the unit must be greased immediately according the maintenance instructions of the unit.

	ATTENTION! Make sure to apply edible grease on parts that may contact the product.

7.7.4 Driven cutting roller

Serial number : 7193 – 705

Safety :
All the rotary and mobile parts are as much as possible protected. Nevertheless, of the dangerous situations are conceivable between the roller and the conveyor.

CAUTION!
Do not touch the sharp side of the cutting roller!

ATTENTION:
The sharp edges of the cutting roller damages easily.

This unit is D4D executed, and is designed for dry cleaning.

Cleaning advise:
Clean the docking roller with a vacuum cleaner, dry cloth and a plastic scraper. Remove persisting scrap with a cloth moistened with warm water of maximum 60°C. We advise **not** to clean the inside of the motor compartment with water.

DANGER!
Do **not** insert objects or limbs into the infeed side of the holder of the docking roller during operation.

Cleaning interval:
- Check for pollution every hour
- Clean the cutting roller directly after a production run or after 8 hours running production.

Before cleaning:
Procedure;
1. Open guard.
2. Remove the dough from the cutting roller.
3. Clean the unit with a vacuum cleaner.

Detachable parts:
- Cutting roller

Cleaning:

- Wipe the debris away as much as possible.
- If reflectors are mounted inside the cover, clean them. Clean also the sensor.

After cleaning the unit:

- Wait until the belt is completely dry.
- Remove obstacles underneath the belt.

Remove rotary cutter for recipe change:

Parts involved:

A. Cutting roller
B. Bearing block
C. Hoist eye for lifting the cutting roller
D. Blind nut
E. Set bolt (for height adjustment of cutting roller)
F. Belt

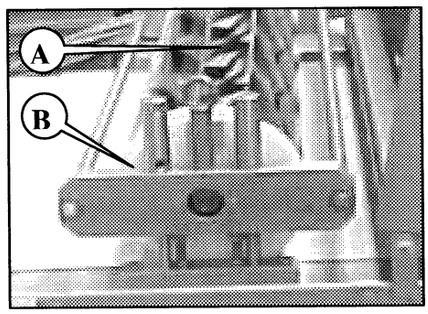


Fig. 1 View cutting roller

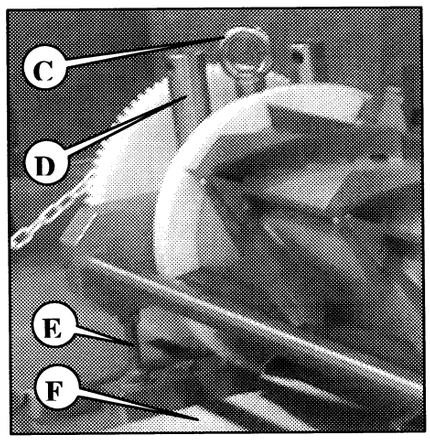


Fig. 2 View open cover

Procedure:

1. Open guard
2. Remove blind nuts (4x) with the supplied T-bolt
3. Connect hoist equipment to hoisting eyes
4. Lift cutting roller
   Place cutting roller on wooden blocks underneath the bearing blocks to prevent damage to the knives of the roller.

Reassembly of the unit: after a recipe change:

1. Take cutting roller with code as shown in the PLC recipe change screen.
2. Connect hoisting equipment to hoist eyes and move above mounting position.
3. Lower cutting roller across the 2x2 M8-bolts onto the set bolts (E).
4. Remove hoist equipment.
5. Tighten all blind nuts (D) with hook wrench.
6. Close safety cover.

7.7.5 Scrap return system

Serial number : 7193 – 706

Safety:
All moving parts like drives are covered. When the unit is delivered with a complete installation, this unit is also a part of the total safety system. Nevertheless there are still dangerous situations thinkable: such as crushing danger between pressing roller on inclining conveyor belt.

This unit is D4D executed, and is designed for dry cleaning.

Cleaning advise:
First clean the Scrap return system dry as much as possible. Remove persisting scrap with a cloth moistened with warm water of maximum 60°C. We advise **not** to clean the inside of the motor compartment with water.

Danger!
Do **not** insert objects or limbs into the infeed or outfeed side of the Scrap return system during production.

ATTENTION!
Do not stand or walk on conveyor belts, or rollers. This will damage the belt.

Cleaning interval:
- Check for pollution every hour.
- Clean the complete Scrap return system every 24 hours.

ATTENTION:
Do **not** clean electrical parts such as motors, switches, and plugs with water

Before cleaning:
- Take out all detachable parts.
- Remove the dough from the conveyor belt.
- Remove the scrap.
- Release the tension of the belts using the quick release system.
- Clean the unit dry as much as possible with a vacuum cleaner, a dry cloth and a plastic scraper.

Detachable parts:
Pressing roller.

Procedure releasing tension of the belt by quick belt release device:

- Turn handle in a way the locking-strip can be turned away from the handle.
- Turn locking strip away.
- Turn handle in a way the end roller is going towards the handle.

A. Locking strip
B. Handle
C. End roller

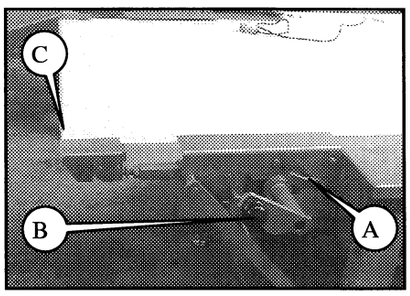


Fig. 4

After cleaning the complete Scrap return system:

- Wait until the belts are completely dry. Make sure the belt is positioned in the middle of the conveyor and underneath the finger protection plates.
- Tens-up the belt.
- Make sure the scrapers(if any) are pressing evenly against the belts.

Note: After cleaning with water, the unit must be greased immediately according the maintenance instructions of the Scrap return system.

	ATTENTION! Make sure to apply edible grease on parts that may contact the product.

7.7.6 Scrap cutting system

Serial number : 7193 – 707

Safety :
All the rotary and mobile parts are as much as possible protected. Nevertheless, of the dangerous situations are conceivable between the roller and the conveyor.

CAUTION!
Do not touch the sharp side of the cutting roller!

ATTENTION:
The sharp edges of the cutting roller damages easily.

This unit is D4D executed, and is designed for dry cleaning.

Cleaning advise:
First clean the Scrap return system dry as much as possible. Remove persisting scrap with a cloth moistened with warm water of maximum 60°C. We advise **not** to clean the inside of the motor compartment with water.

Danger!
Do **not** insert objects or limbs into the in feed or out feed side of the Scrap return system during production.

ATTENTION!
Do not stand or walk on conveyor belts, or rollers. This will damage the belt.

Cleaning interval:
- Check for pollution every hour.
- Clean the complete Scrap return system every 24 hours.

ATTENTION:
Do **not** clean electrical parts such as motors, switches, and plugs with water

Before cleaning:
Procedure;
- Remove the dough from the conveyor belt.
- Open guard.
- Remove the dough from the cutting roller.
- Clean the unit with a vacuum cleaner.
- Release the tension of the belts using the quick release system.
- Clean the unit dry as much as possible with a vacuum cleaner, a dry cloth and a plastic scraper.
- Clean the cutting roller directly after a production run or after 8 hours running production.

Detachable parts:
None.

Procedure releasing tension of the belt by quick belt release device:

- Turn handle in a way the locking-strip can be turned away from the handle.
- Turn locking strip away.
- Turn handle in a way the end roller is going towards the handle.

A. Locking strip
B. Handle
C. End roller

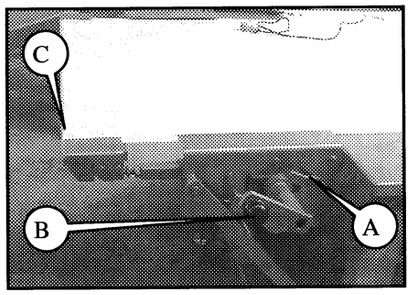


Fig. 4

After cleaning the complete Scrap return system:

- Wait until the belts are completely dry. Make sure the belt is positioned in the middle of the conveyor and underneath the finger protection plates.
- Tens-up the belt.
- Make sure the scrapers(if any) are pressing evenly against the belts.

Note: After cleaning with water, the unit must be greased immediately according the maintenance instructions of the Scrap return system.

ATTENTION!
Make sure to apply edible grease on parts that may contact the product.

7.8 Material list of Rademaker equipment

Mechanical components

Components	Standard	North America + Canada
Drives	Lenze/Grosshop/sew	Lenze/Grosshop/sew
Reductors	Lenze/Grosshop/sew	Lenze/Grosshop/sew
Full servo drives	Sew	Sew
Full servo reductors	Rockwell/sew	Rockwell/sew
Frequentie controlled servo	Lenze	Lenze/Sew
Chains and chain sprockets Transmission Chains with flights or connection with machine parts etc....	European standard Behind covers, steel. Production zone, stainless steel Or tsubakilambda wp (water proof) Specific, no standard	European standard Behind covers, steel. Production zone, stainless steel Or tsubakilambda wp (water proof) Specific, no standard
Gears	Behind covers, steel Production zone, stainless steel / plastic	Behind covers, steel Production zone, stainless steel / plastic
Timing belts, drive wheels	Plastic (reinforced with fibers) Aluminium (anodised in production zone)	Plastic (reinforced with fibers) Aluminium (anodised in production zone)
Friction material drive rollers	Pu / natural rubber	Pu / natural rubber
Clamping bush	Steel	Steel
Bearings (rolling)	Skf/ina /fag/systemplast Ina heavy duty (cast iron)	Skf/ina /fag/systemplast Ina heavy duty (cast iron)
Bearings (linear, sliding)	Bronze (outside product zone) Plastic Ina with ina shafts	Bronze (outside product zone) Plastic Ina with ina shafts
Seals	O-rings, quality nbr Simmerings, quality nbr V-rings, quality nbr	O-rings, quality nbr Simmerings, quality nbr V-rings, quality nbr
Wiremesh	Stainless steel Mild steel	Stainless steel Mild steel
Transport belts	Ammeraal, material pu (blue colour) / pe - habasit, intralox	Ammeraal, material pu (blue colour) / pe - habasit, intralox
Transport cords	Ø- type material pu, blue colour V-type, material pu, blue	Ø- type material pu, blue colour V-type, material pu, blue
Mounting material	Stainless steel, mild steel	Stainless steel, mild steel
Adjustable legs	Stainless steel (rubber)	Stainless steel (rubber)
Castors	Stainless steel /plastic-rubber 200 or 375 kg Stainless steel/plastic 800 kg (protempo)	Stainless steel /plastic-rubber 200 or 375 kg Stainless steel/plastic 800 kg (protempo)
Brushes	Plastic fibers (blue colour)	Plastic fibers (blue colour)

Components	Standard	North America + Canada
Hydraulic units	Bosch rexroth	Bosch rexroth
Pumps	Daurex mohno type Rotor, stainless steel Stator, stainless steel sleeve, rubber inlayer	Daurex mohno type Rotor, stainless steel Stator, stainless steel sleeve, rubber inlayer
Air service units	Festo	Festo
Pneumatic ciilinders	Festo	Festo
Pneumatic fixing material	Steel/alu coated or treated	Steel/alu coated or treated
Pneumatic cilinders special	Bosch - rexroth	Bosch - rexroth
Materials	Sheets, shafts made of st/st 304/303/corten a Aluminium type 51 (possible anodised) Delrin, colour white Hmpe, colour blue, construction Hmpe,(mata), colour blue, sliding Bronze, bearings	Sheets, shafts made of st/st 304/303/corten a Aluminium type 51 (possible anodised) Delrin, colour white Hmpe, colour blue, construction Hmpe,(mata), colour blue, sliding Bronze, bearings