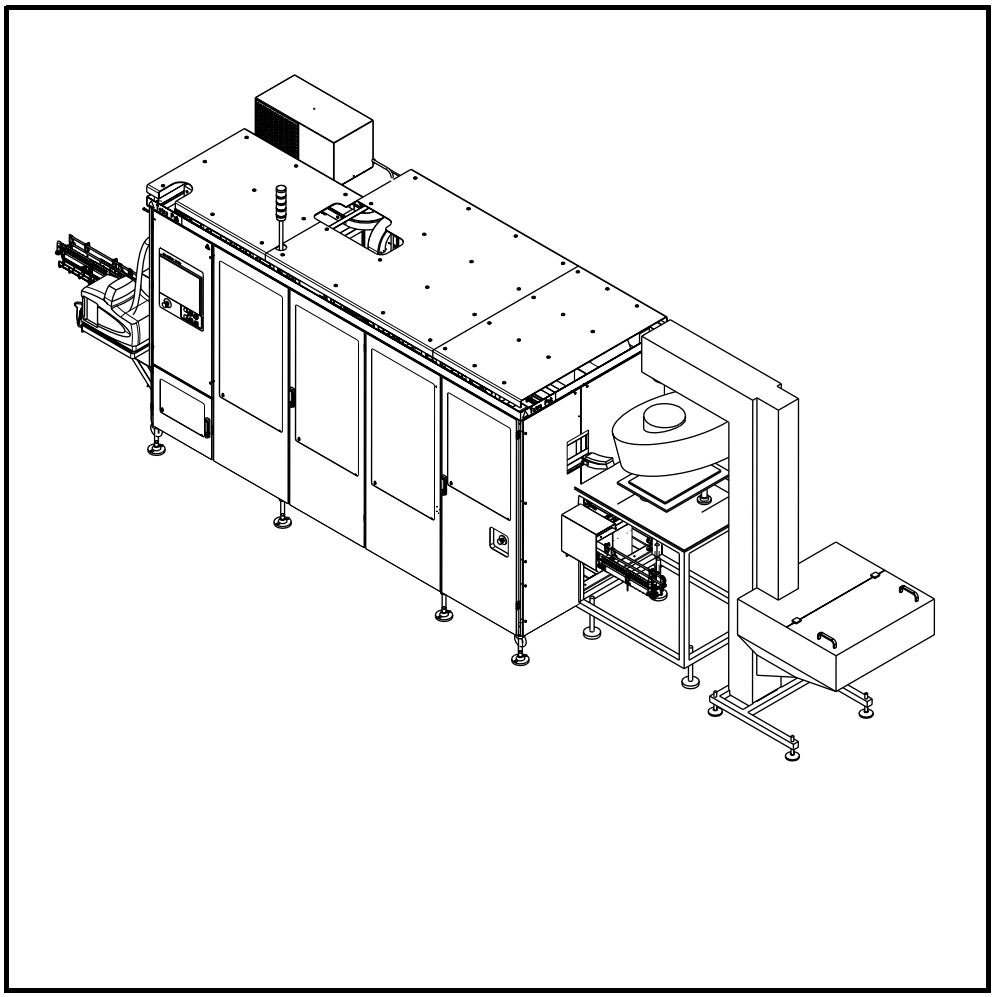
IM

Installation Manual

CAP 30/Flex

662950-0100

TechPub_2614345_0105 - IM-2852922-0101fro.fm



WARNING

Read and follow all safety precaution instructions throughout this manual and on safety signs attached to this equipment.

Failure to follow all safety precaution instructions could result in death or serious injury.

Tetra Pak

Doc. No. IM-2852922-0101

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The content of this manual is in accordance with the design and construction of the machine or equipment at the time of publishing. Tetra Pak reserves the right to introduce design modifications without prior notice.

The English version of this document is the original language version.

This document was produced by:

Tetra Pak Company S.p.A
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Italy

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Doc. No. IM-2852922-0101

Issue 2006-11

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This manual is valid for:

Series No./ Machine No. Sign.

IM

Installation Manual

CAP 30/Flex
662950-0100

i Introduction

ii Safety Precautions

1 Technical Data and Drawings

2 Preparation

3 Moving and Unpacking the Equipment

4 Positioning, Assembly and Connections

5 Final Installation Check

6 Preparation for Commissioning

7 Disassembly and Removal

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Machine or equipment configurations that this manual is valid for are described on the next page.

Doc. No. IM-2852922-0101

Issue 2006-11

Tetra Pak

Tetra Pak Company S.p.A

Valid for:

Name	Drawing Specification and Development Step	Additional Information
CAP 30/Flex	662950-0100	Optional Equipment: - Discharge photocell, 2 lines - Start infeed conveyor photocell

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i Introduction

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About the Introduction Chapter

This chapter contains basic information about this manual and the related Tetra Pak equipment.

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Manual Information . . . . . i - 7
Delivered Manuals . . . . . i - 7
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Abbreviations and Terminology

Abbreviation/ Terminology	Meaning	Translation
A	Ampere	
ANSI	American National Standards Institute	
CAP	Cap Applicator	
CE	Communautés Européennes/European Communities	
Cont'd	Continued	
dB	Decibel	
Deg.	Degree	
Doc.	Document	
EEA	European Economic Area	
EM	Electrical Manual	
ft	Foot / feet	
Hz	Hertz	
kg	kilogram	
kPa	kilopascal	
lbs	Pounds	
IM	Installation Manual	
in.	Inch	
ISO	International Organization for Standardization	
Max	Maximum	
m	Metre	
mm	Millimetre	
MM	Maintenance Manual	
min	Minimum	
N	Neutral	
nl/min		The flow in litres per minute
No.	Number	
O.E.	Optional Equipment	
OM	Operation Manual	

(Cont'd)

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(Cont'd)

Abbreviation/ Terminology	Meaning	Translation
PE	Positive Earth	
PLC	Programmable Logic Controller	
PLMS	Packaging Line Monitoring System	
Pos	Position	
psi	Pound per square inch	
PVC	Polyvinyl chloride	
S	Slim (package shape)	
sec.	Second	
SPC	Spare Parts Catalogue	
Sq	Square (package shape)	
TBA	Tetra Brik Aseptic	
TeM	Technical Manual	
TP	Tetra Pak	
TPA	Tetra Prisma Aseptic	
V	Volt	

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Manual Information

Tetra Pak recommends reading all delivered manuals carefully. Make sure that the delivered manuals are available to personnel who operate or maintain the equipment.

It is important to keep this manual for the lifetime of the equipment and to pass the manual on to any subsequent holder or user.

Tetra Pak will not be held responsible for any damage to the equipment caused by not following the instructions given in this manual.

Delivered Manuals

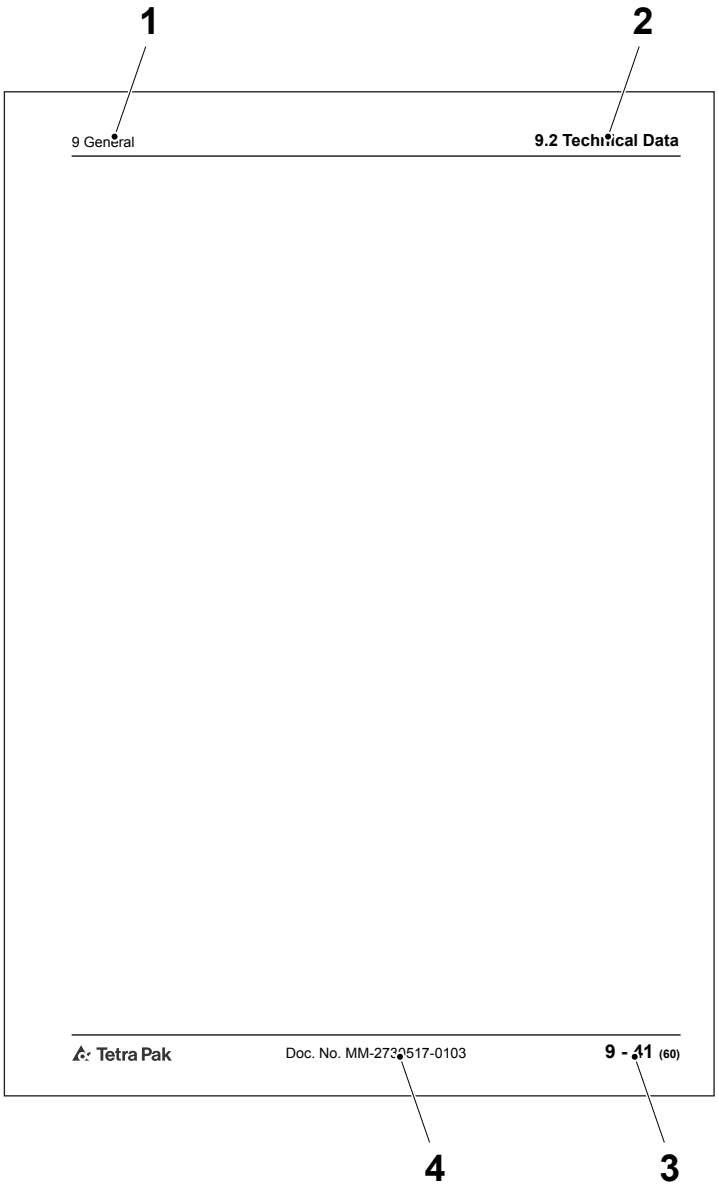
Manuals delivered with this equipment:

- The Conversion Manual (CM) provides technicians with information on converting the equipment between different production modes.
- The Electrical Manual (EM) provides technicians with information about the equipment's electrical system.
- The Installation Manual (IM) provides technicians with information required to safely install the equipment.
- The Maintenance Manual (MM) provides technicians with information on maintaining the equipment.
- The Operation Manual (OM) manual provides the operator with information on handling and operating the equipment before, during, and after production.
- The Spare Parts Catalogue (SPC) provides the information necessary to order spare parts from Tetra Pak
- The Technical Manual (TeM)
  - provides technicians with information required to safely install the equipment
  - provides technicians with information on maintaining the equipment
  - provides technicians with information about the machine's/ equipment's electrical system
  - provides the information necessary to order spare parts from Tetra Pak.

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Page Layout

Every main page in a manual contains a header and a footer. The page header contains the chapter name (1) and the section name (2). The page footer contains the page number (3), and the document number (4). See also the Page Numbering section.



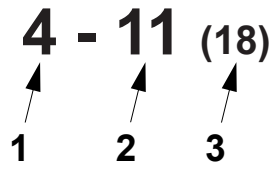
1 Chapter name
2 Section name
3 Page number
4 Document number

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Page Numbering

A page number has three parts:

- chapter number (1)
- consecutive page number (2) within the chapter
- total number of pages (3) in the chapter.



1 Chapter number
2 Consecutive page number
3 Total number of pages

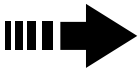
Typographical Conventions

Controls on the operator panel, emergency stop devices, and program steps are printed in CAPITAL LETTERS.

Cross-references are underlined.

Symbols

Symbols used in illustrations.

	A pointer arrow indicates the position of an object.
	A zoom arrow indicates that an object view is enlarged. The arrow points towards the enlarged view of the object.
	A rotation movement arrow indicates rotational movement of an object. The arrow points in the direction of rotation.
	A straight movement arrow indicates movement of an object. The arrow points in the direction of movement.

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Machine Introduction

Intended Use of the Equipment

The intended use of this Tetra Pak equipment is to apply a closure onto a package.

Tetra Brik Aseptic Slim packages must have opening tabs. The opening tabs are applied by a PullTab unit which is incorporated in to the filling machine. All other packages must have pre-laminated holes.

All other use is prohibited. Tetra Pak will not be held responsible for injury or damage if the equipment is used for any other purpose.

Manufacturer

This Tetra Pak equipment has been manufactured by

Tetra Pak Company S.p.A

Via Delfini 1

41100 Modena

Italy

Support and Feedback

If you encounter problems when operating this equipment or have other inquiries, comments, or suggestions for improvement, contact Tetra Pak.

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Identification

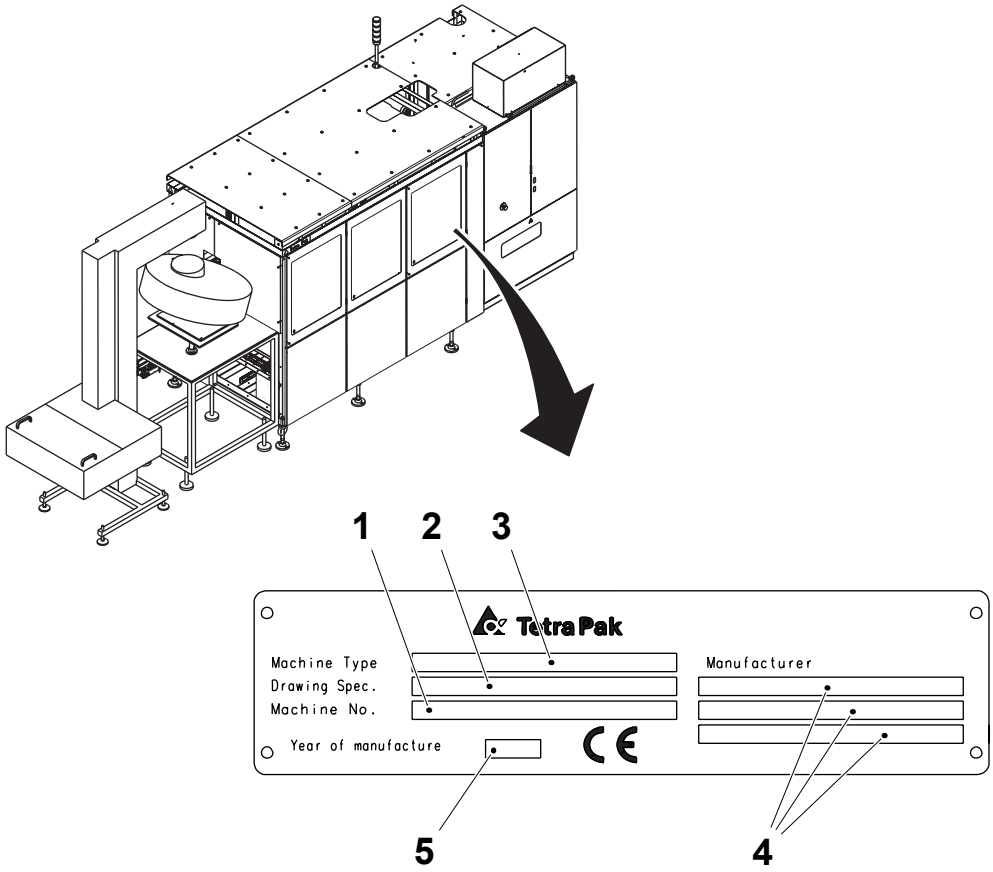
CE Classification

This equipment complies with the basic health and safety regulations of the European Economic Area (EEA).

Machine Plate

The illustration below shows an example of the machine plate and its location on the equipment. The machine plate carries data needed when contacting Tetra Pak concerning this specific equipment.

Make sure that the equipment data in the front pages of this manual corresponds to the machine plate data and the machine specification.

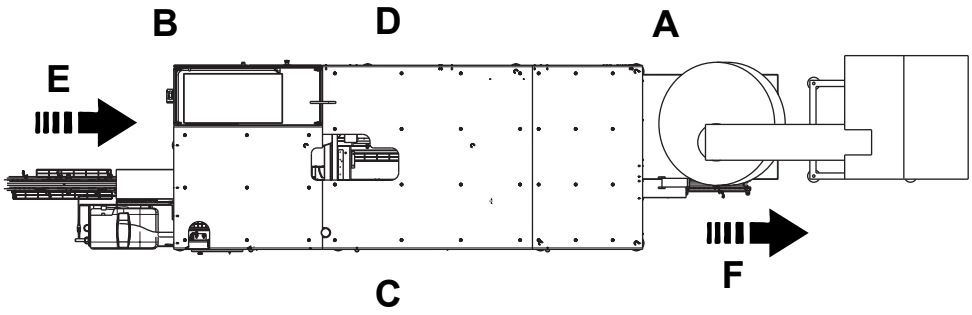


1 Machine number
2 Drawing specifications
3 Machine type
4 Manufactured by
5 Year of manufacture

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Orientation

The illustration below shows the orientation of the equipment. This orientation information will be used throughout this manual. The arrows indicate the flow of material.



A Front
B Back
C Left
D Right
E Infeed
F Outfeed

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Hygiene

Packaging Material

Avoid microbiological contamination of the packaging material:

- Always protect your packaging material against contamination. Do not let the caps come into contact with contaminated areas. Only use caps direct from their packaging material.
- Except when filling the cap sorter with caps, always keep the cap-sorter magazine door closed. Keep the transparent door panels clean.
- Always keep the doors to the applicator room (area) closed. To prevent contamination via air streams, never open a window when the machine is in production.
- Never clean the floors or the machine in the applicator room (area) when the machine is in production.
- Compressed air used for cleaning purposes is to be used only for cleaning filters and should only be used outside of the applicator room (area).
- Disinfect your hands before touching anything that may come into contact with the product. Use code H disinfectant. See the Technical Data chapter in the Maintenance Manual.
- Keep your hands clean.
- Always wear some type of hair protection (cap or hairnet) and clean clothes (preferably white).
- Do not wear a watch, ring, necklace, earrings, or any other exposed jewellery.

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ii Safety Precautions

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Safety Precaution Instructions

WARNING

Read all safety precaution instructions throughout this manual and on safety signs attached to this equipment.

Failure to follow all safety precaution instructions could result in death or serious injury.

Definition of Lockout Procedure

A lockout procedure is a procedure to put each necessary energy isolating device in its safe position to prevent the energisation of the equipment, such as when a maintenance procedure should be carried out.

A lockout is the use of a device, for example, a padlock, to make sure that an energy isolating device cannot be operated.

An energy isolating device is a mechanical device that physically prevents transmission or release of energy, such as a power supply disconnector.

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Safety Messages Description

A safety message is always accompanied by a safety alert symbol and a signal word.

The safety alert symbol is used to alert about potential personal injury hazards. To avoid hazards, obey all safety messages that follow this symbol.

The following safety alert symbols and signal words are used in this manual to inform the user of hazards.

DANGER	Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Warning indicates a potentially hazardous situation which, if not avoided, **could** result in **death or serious injury**.
CAUTION	Caution indicates a potentially hazardous situation which, if not avoided, **may** result in **minor or moderate injury.** It may also be used to alert against unsafe practices.
CAUTION	Caution without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, **may** result in **property damage**.

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Personnel Requirements

Note! Personnel includes all persons working on or near this equipment.

Only skilled or instructed persons are allowed to work with this equipment.

Skilled Person

A skilled person must have relevant education and experience to enable him or her to identify hazards, analyse risks, and avoid hazards which electricity, machinery, chemicals, other energies, and supply systems on this equipment can create.

Skilled persons must meet local regulations, such as certifications and qualifications for working with these energies and systems.

Instructed Person

An instructed person must be adequately advised or supervised by a skilled person. The skilled person enables the instructed person to identify hazards, analyse risks, and avoid hazards which electricity, machinery, chemicals, other energies, and supply systems on this equipment can create.

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Safety Signs

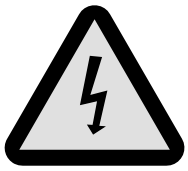
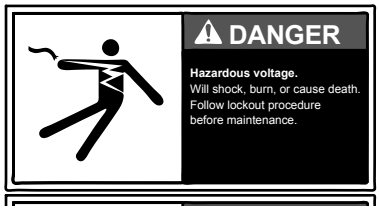
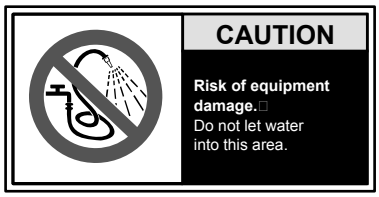
WARNING

Damaged or missing safety signs increase the risk of death or serious injury.

Replace all missing or damaged safety signs immediately.

Safety signs are attached to the equipment. The table below lists all the signs that are used, and illustrations show their locations on the equipment. Each position number refers to two variants of a safety sign in the table, but only one is used on the equipment.

- Make sure that each safety sign is legible and in its correct position after installation and maintenance.
- Replace all missing or damaged safety signs immediately.

Pos.	ISO sign	ANSI sign
1		
	Hazardous voltage. Will shock, burn, or cause death. Follow lockout procedure before maintenance.	
2		
	Risk of equipment damage. Do not let water into this area.	
3		
	Burn hazard. Trapped heat energy. Do not touch.	
4		
	Hot surface. Do not touch. Follow lockout procedure before maintenance.	

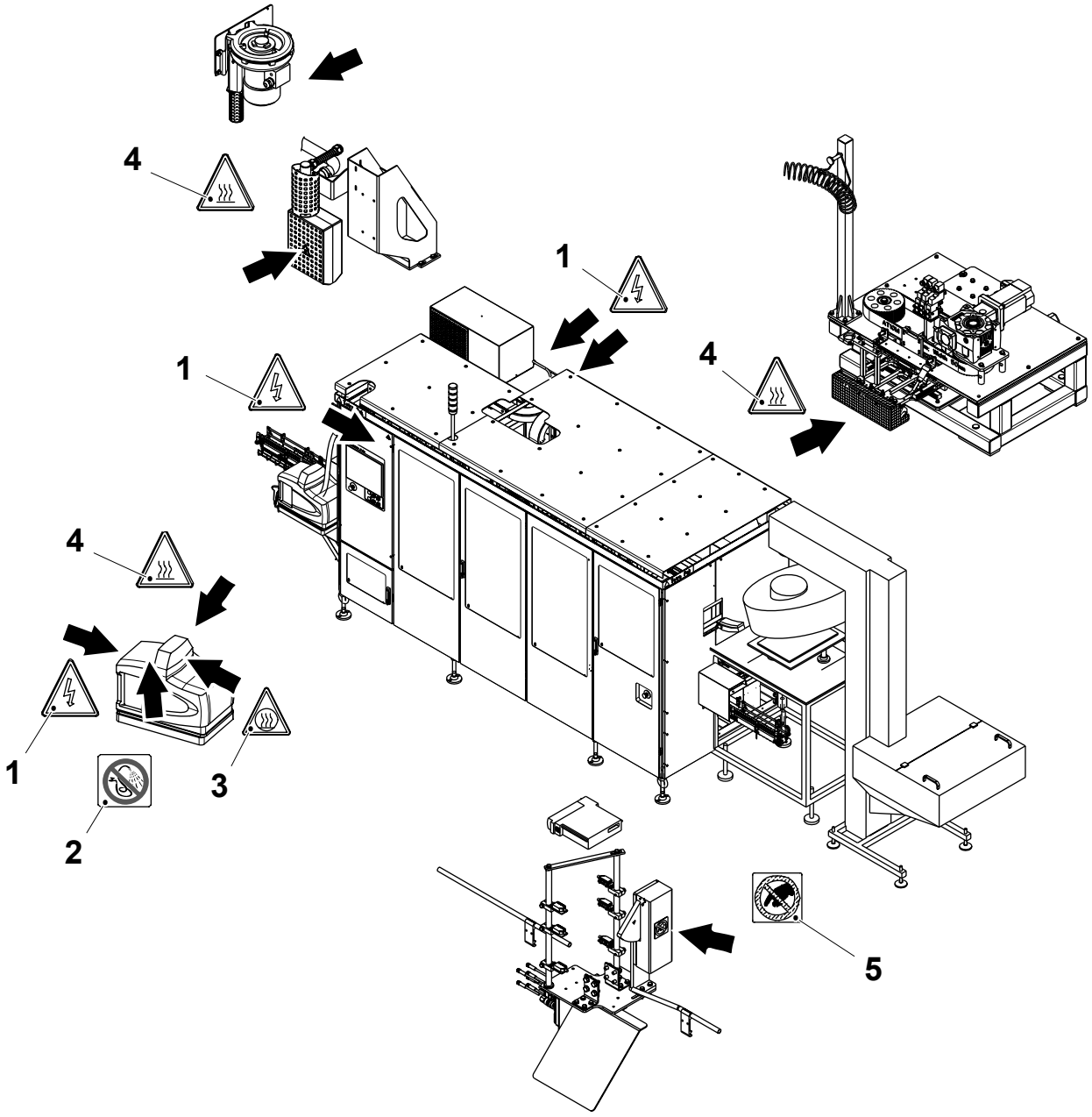
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Pos.	ISO sign	ANSI sign
5		
	Blade hazard. **Do not touch the sharp knife.**	

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Location of Safety Signs

The illustration shows where the safety signs are located. The position numbers refer to the table in the Safety Signs section.



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Protective Devices

WARNING

Hazardous zones.

Hazardous zones are safeguarded and provided with protective devices. Do not inch or run this equipment if any protective device is inoperative.

Change inoperative components of the safety system immediately.

WARNING

Hazardous voltage.

Hazardous voltage remains on this equipment after activating an EMERGENCY STOP or an interlocking device.

Emergency Stop

Emergency stop devices are used to stop this equipment immediately in an hazardous situation. Learn the positions of all emergency stop devices and how to use them.

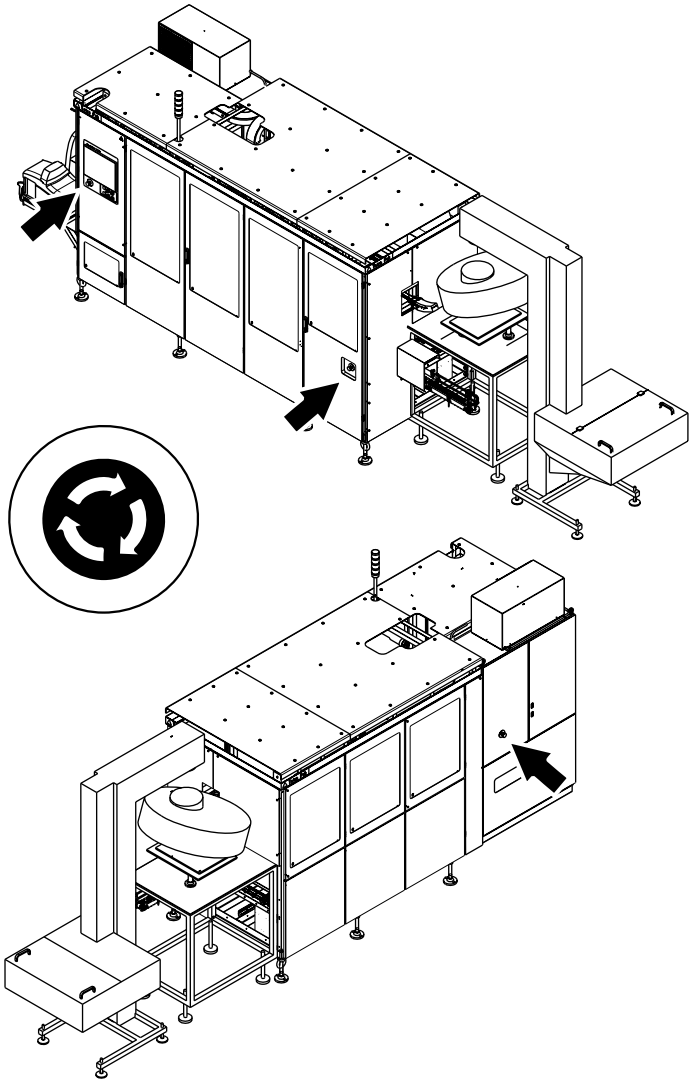
Instructions for a normal production stop are included in the Stop chapter of the Operation Manual.

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Emergency Stop Push-Buttons

Press one of the EMERGENCY STOP push-buttons to stop this equipment immediately.

The location of each EMERGENCY STOP push-button is shown by an arrow.



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Safeguards

WARNING
Moving machinery.
Never defeat or bypass the interlocking devices.

Movable guards, for example, doors and covers leading to hazardous zones, are fitted with interlock devices where required. These devices are usually electric safety switches that are part of the safety system and must never be defeated, bypassed, or otherwise made inoperative.

Where a moveable door is not allowed to be opened and must remain locked when the machine is in production, an electromagnetic door lock is installed or, the safety switches have a locking device incorporated. The movable guard can only open when the machine is in a safe condition.

WARNING
Corners and edges.
To prevent injury from corners and edges of open doors and covers, close them unless they must be open during such work. Be careful when working under an open door, cover or elsewhere below parts of the equipment with corners and edges.

CAUTION
Burn hazard.
Parts of this equipment may be hot after operation.

After installation and maintenance, and before this equipment is inched or run, check that all safeguards are in place and that they operate correctly.

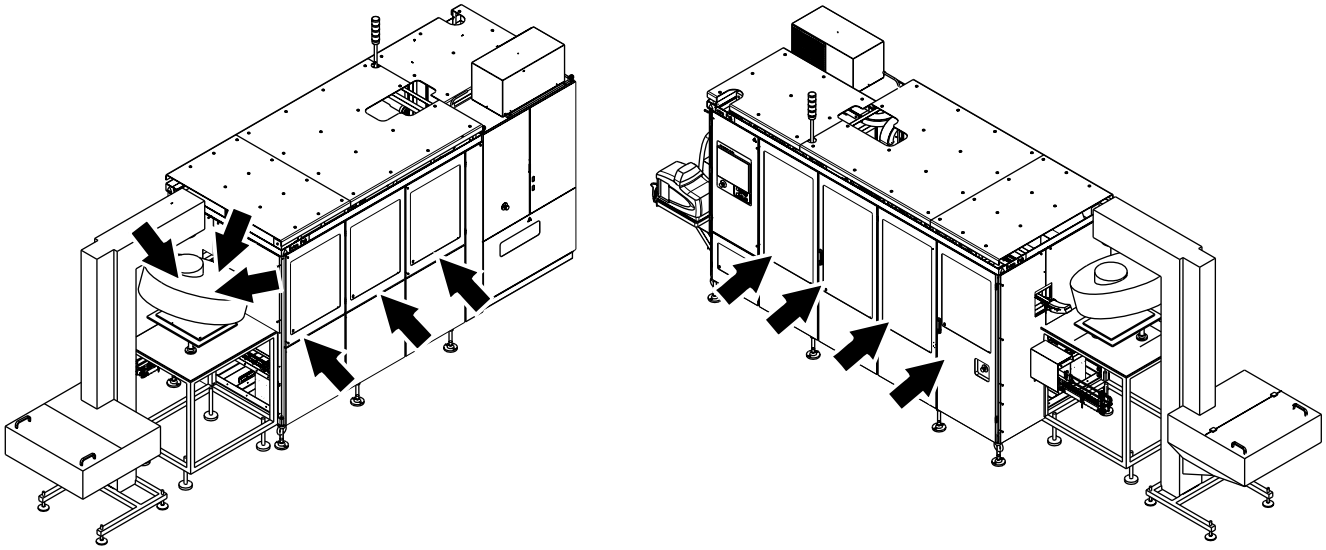
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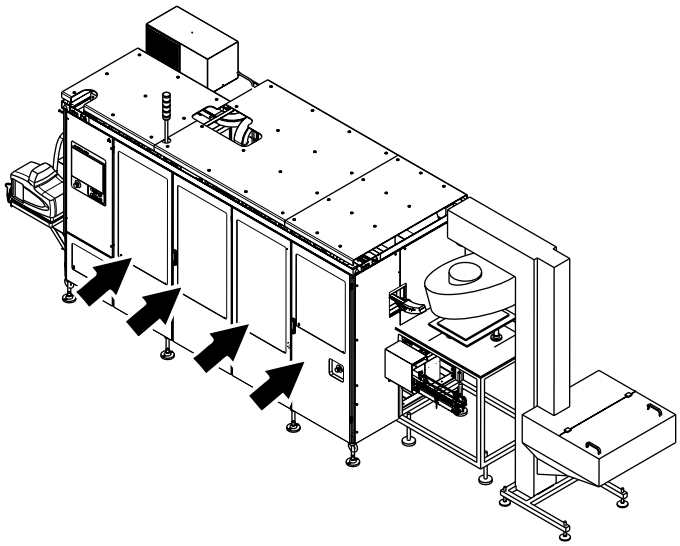
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CAUTION
Equipment damage.
Never stop this equipment by opening a movable guard with an interlock device installed.

Movable guards with safety switches installed are shown by an arrow.



Movable guards with an electromagnetic door lock installed are shown by an arrow.



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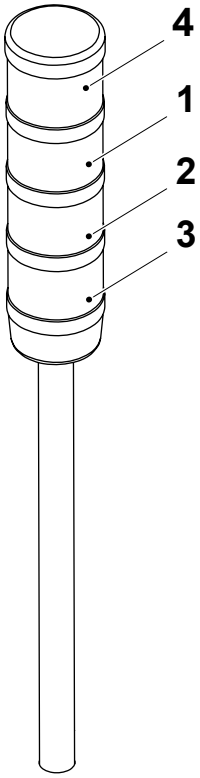
Warning Lamp

A warning lamp is a column of warning lights:

- A red light (1) indicates a hazardous condition. This is a situation that requires immediate action.
- A yellow light (2) indicates an abnormal or impending critical condition. This is a condition calling for action by the operator.
- A blue light (3) indicates information or that operator action is required.

Audible Alarm

The audible alarm (4) produces a warning signal every time this equipment is about to start. The warning signal sounds for approximately three seconds prior to starting to alert personnel.



1 Red
2 Yellow
3 Blue
4 Audible alarm

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Personal Protection

This section applies to all personnel at all times when this equipment is in operation. For special personal protection required when handling hazardous substances, see the Hazardous Substances section.

Noise Hazard

WARNING

Hazardous noise.

Risk of impaired hearing. Wear hearing protection whenever this equipment is in operation.

Entanglement Hazard

WARNING

Risk of entanglement.

Do not wear jewellery or loose clothing when working on or near this equipment. Long hair may not be loose.

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Hazardous Substances

WARNING

Contact with chemicals can cause death, serious injury, or illness.
Always read and follow the instructions in the safety data sheet supplied by the manufacturer or local supplier, when handling chemicals.

Make sure that

- The safety data sheet is available
- The showers work
- An eyewash device, movable or wall-mounted, is available and operational
- Additional washing facilities are nearby.

Note! Learn the locations of all washing facilities in order to act immediately in case of an accident.



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Determelt 3

WARNING
Risk of personal injury.
Wear personal protective equipment.

Determelt 3 is a blend of orange oils, mineral spirits and antioxidant. Determelt 3 is used to remove hotmelt from metal machine parts, such as, the cap holders and should only be used neat.

Contact with eyes will cause redness and discomfort. Repeated or prolonged contact may cause the skin to become dry, cracking and dermatitis. In case of accident, immediately call for medical attention.

Although classified as non-dangerous, always wear personal protective equipment when using chemicals, see Personal Protection.

Before use, always read the manufacture's instructions on the label of the tank or container.

Emergency Procedures

If there is an accident involving Determelt 3, rinse the affected area as soon as possible with large amounts of water.

If Determelt 3 is swallowed:

- Do not attempt to cause vomiting
- Drink large amounts of lukewarm water
- Call for medical attention immediately.

If splashes or vapour from Determelt 3 comes in contact with the eyes:

- Wash the eyes thoroughly with clean water until the pain is relieved
- Call for medical attention immediately.

If Determelt 3 comes into contact with skin and clothes:

- Wash immediately with soap and water
- Call for medical attention immediately if skin burns appear
- Thoroughly wash the clothes before wearing them again.

If irritation or pain is experienced due to having **inhaled** Determelt vapour:

- Leave the affected area and get some fresh air
- Call for medical attention if the symptoms get worse.

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(Cont'd)

Handling

WARNING

Risk of Self-ignition.

Self-ignition can occur at temperature more than 200°C (392°F).

Determelt 3 can only be used neat and used cold. Never pour on hot surfaces or turn on hotmelt applications.

Ensure that equipment to be cleaned is cool and all supplies to the equipment are OFF.

If Determelt 3 is spilled, use sand, earth or any absorbent material. Put waste into a container ready for disposal.

Storage

Keep the container upright and fitted with its proper seal. Determelt 3 **must** be stored in the **original container** delivered by the supplier. Make sure that the container is always properly closed.

Make sure that the area used for storage of Determelt 3 is:

- At room temperature, clean, and well ventilated
- Free from frost
- Shielded from direct sunlight
- Kept from open sources of ignition.

Shelf life is one year.

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Disposal of Chemical Substances

Always read and follow the disposal instructions in the safety data sheet supplied by the manufacturer or local supplier.

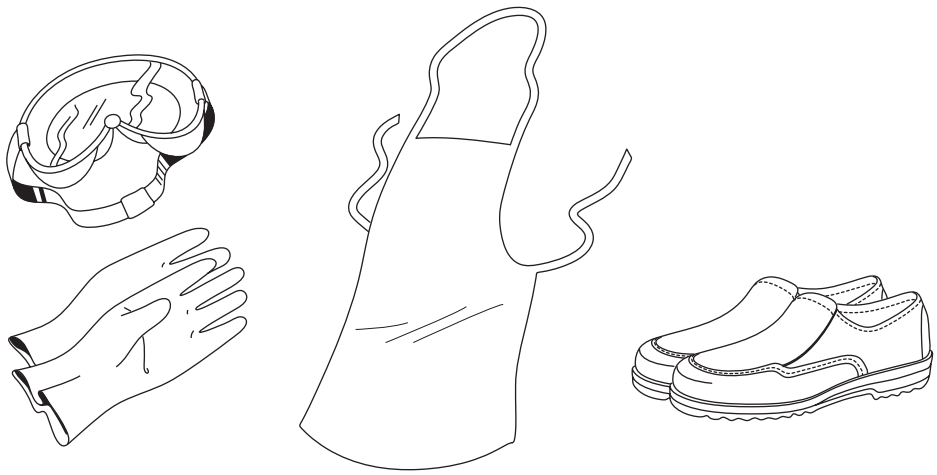
It is strongly recommended that used chemical containers are

- Disposed of according to the instructions immediately after use
- Not used as disposal containers for other chemicals in order to avoid uncontrolled chemical reactions within the container.

Personal Protective Equipment

Wear personal protective equipment when working with this equipment. The following equipment is required:

- Protective goggles (TP No. 90303-11)
- Heat protective gloves
- Protective apron (TP No. 90303-13)
- Protective shoes made of PVC or rubber.



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Supply Systems

Power Supply

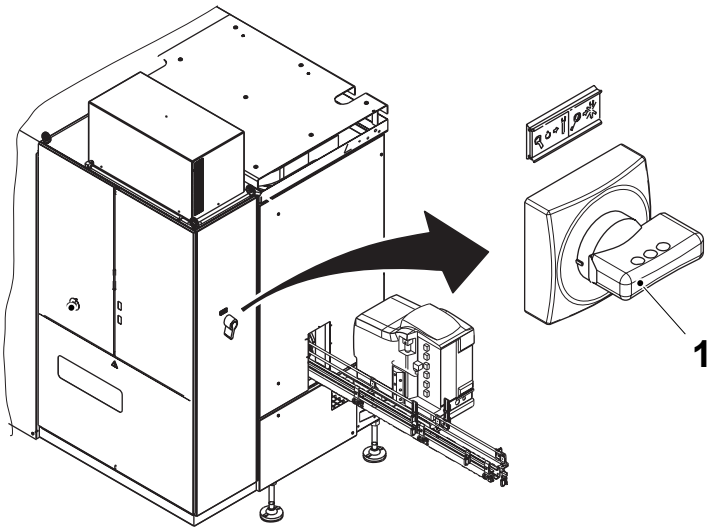
DANGER

Hazardous voltage and moving machinery.
The power supply disconnector must be turned off and secured with a lock before any maintenance.

Note! The key to the lock must be removed by the technician and retained in his/her possession until all work is completed.

Certain maintenance procedures may require power supply systems to be on. These exceptions are clearly stated in the Maintenance Manual.

The illustration shows the power supply disconnector (1) and its location.



1 Power supply disconnector

Residual Voltage

DANGER

Hazardous voltage.
Do not touch any terminals immediately after the power supply disconnector is turned off. Ensure that no residual voltage remains on the capacitors before touching. Wait five minutes. Failure to observe this information will cause death or serious injury.

After the power supply disconnector is turned off, residual voltage remains in the capacitor circuits.

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Electrical Cabinet

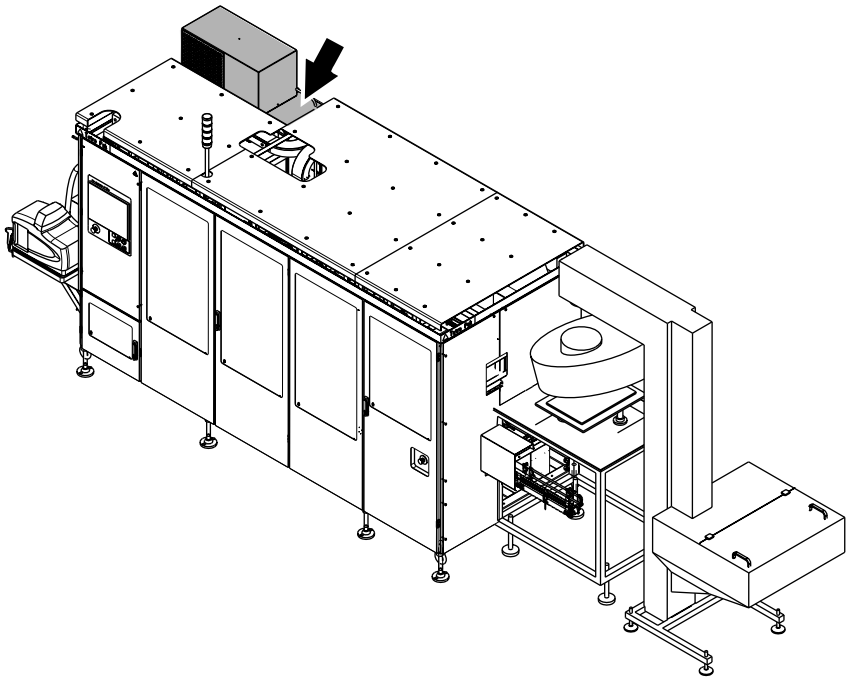
DANGER

Hazardous voltage.
Will shock, burn, or cause death. The power supply disconnector must be turned off and secured with a lock before maintenance inside the electrical cabinet.

Note! The key to the lock must be removed by the technician and retained in his/her possession until all work is completed.

Make sure that the electrical cabinet doors are closed after working inside the electrical cabinet. Doors with a lock must be locked.

The location of the electrical cabinet is shown by an arrow.



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Socket Outlet

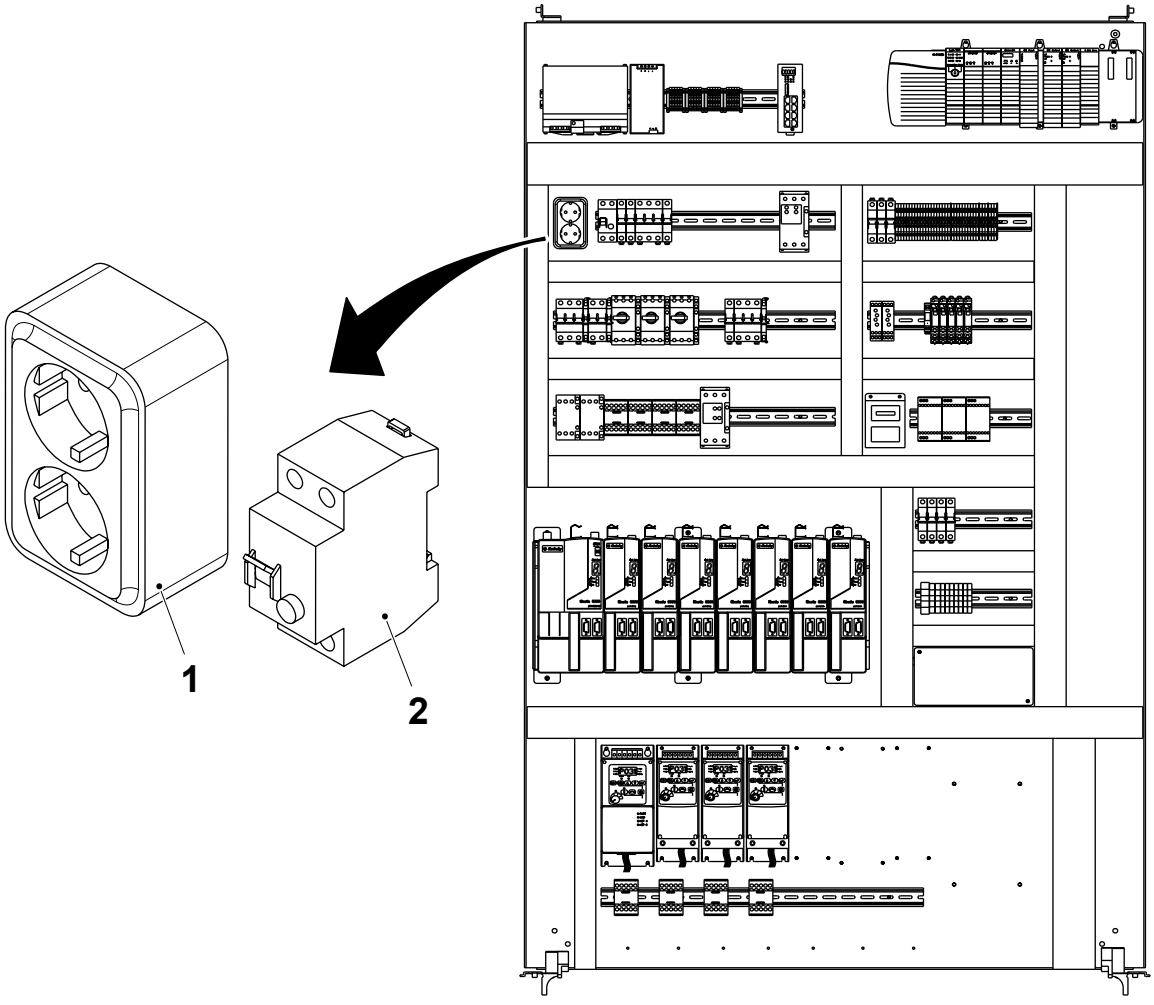
WARNING

Hazardous voltage.

Can shock, burn, or cause death. Read the Maintenance Manual before using this socket outlet.

The socket outlet (1) is connected to a residual current device (2) to protect users against electrical shock if there is an earth fault in the connected equipment. The residual current device shall be tested each time before the socket outlet is being used. See the MM for test procedure.

The illustration shows the socket outlet (1), the residual current device (2), and their location.



1 Socket outlet
2 Residual current device

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Air Supply

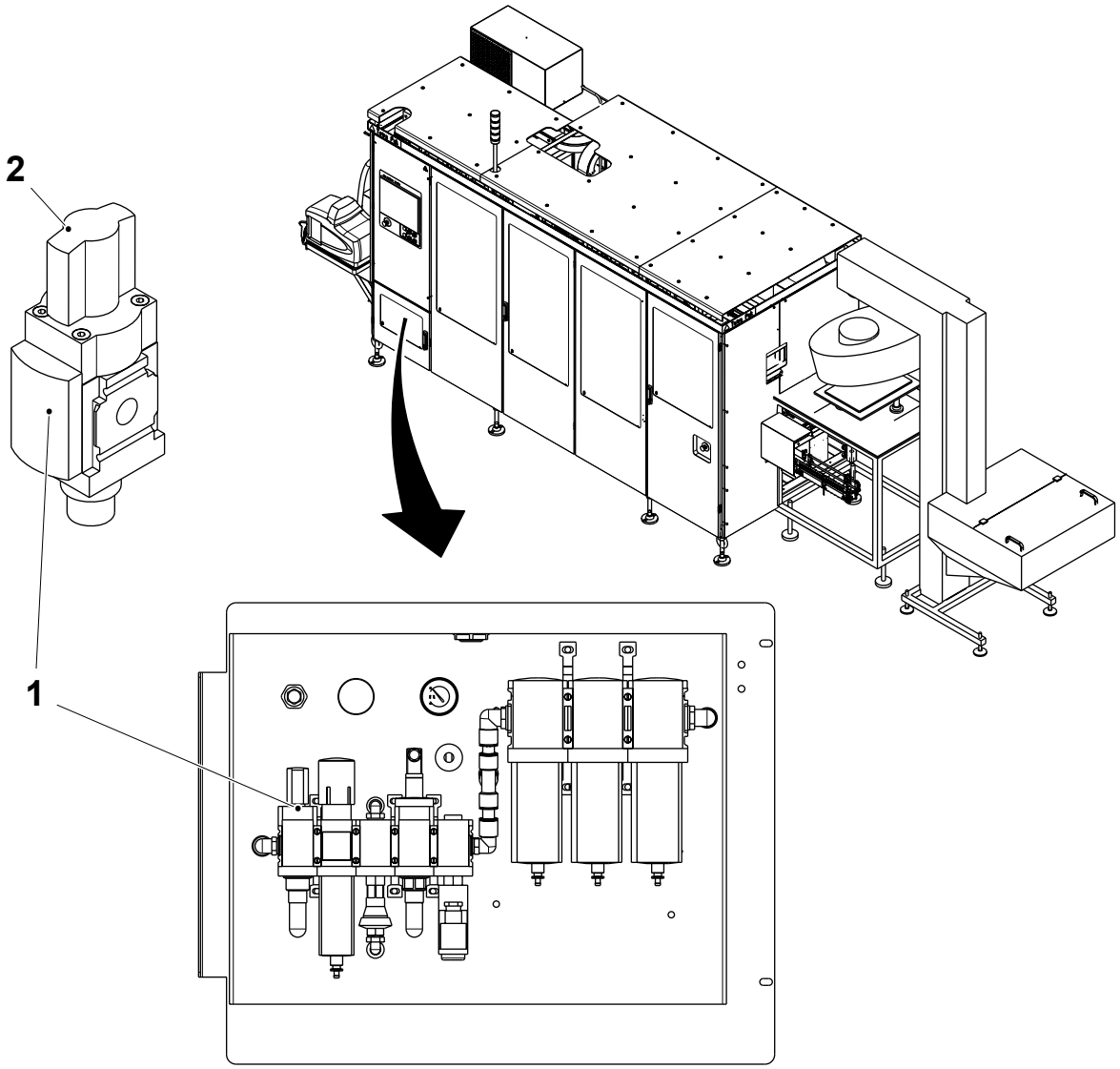
WARNING

Compressed air and moving machinery.
Close the main air valve and secure it with a lock before any maintenance.

Note! The key to the lock must be removed by the technician and retained in his/her possession until all work is completed.

Certain maintenance procedures may require air supply systems to be ON. These exceptions are clearly stated in the Maintenance Manual.

The illustration shows the shut-off valve (1). The shut-off handle (2) is used to close the air supply.



1 Shut-off valve
2 Shut-off handle

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Hotmelt Equipment

General

DANGER

Risk of electrical shock.
The voltage is 400V inside the hotmelt unit. Risk of immediate danger to life from electrical shock.

WARNING

Risk of personal injury.
All service work on the hotmelt unit must be carried out by authorized personnel. Always wear safety glasses, protective gloves, and other protective clothing to avoid injuries caused by splashing hotmelt material.

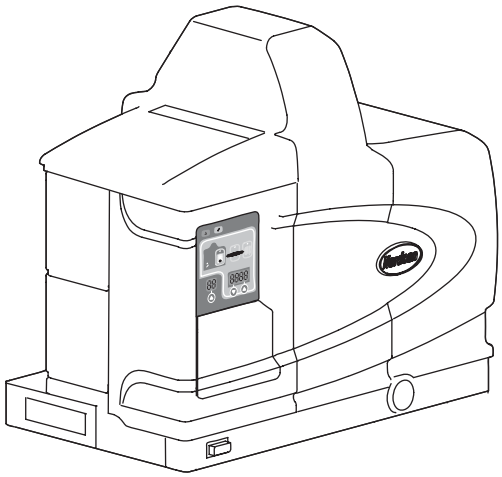
Failure to relieve any air or adhesive pressure could cause serious injuries from burning when the hotmelt filter is detached or flushed.

Never remove any part or component until the air and the electrical supply to the machine have been disconnected and the pressure of the hotmelt in the system has been relieved.

WARNING

Risk of hotmelt vapours.
When the tank lid is open, hotmelt vapours could be released. Vent the application area or wear a respirator.

Note! Always refer to the documentation provided from Nordson Corporation before doing any kind of work on the hotmelt equipment. The Nordson hotmelt manual is included with the delivery from Tetra Pak. The information in this manual only deals with what is specific for this machine.



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Hotmelt Unit

CAUTION

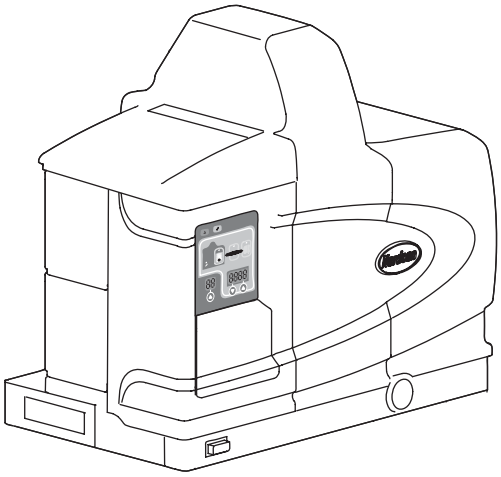
Risk of damage to the equipment.

Never flush water or any other liquid towards the hotmelt unit when cleaning the machine. Failure to obey could result in damage to equipment.

WARNING

Risk of burns.

During PREHEATING and PREPARTION the hotmelt unit becomes hot. Do not touch the hotmelt unit and beware of the entrapped heat inside the unit when service is performed.



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Hotmelt Guns

WARNING

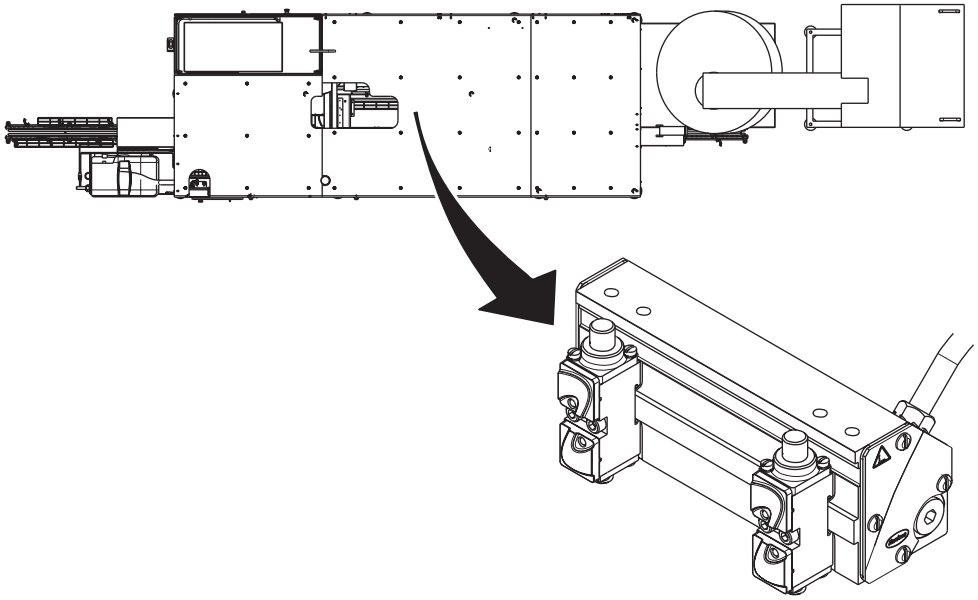
Risk of burns.

During PREHEATING, PREPARTION and PRODUCTION the hotmelt guns are hot. There is risk of severe burns. Do not touch the hotmelt guns and beware of the entrapped heat when service is performed.

CAUTION

Risk of damage to the equipment.

Never flush water or any other liquid towards the hotmelt guns when cleaning the machine. Failure to obey could result in damage to equipment.



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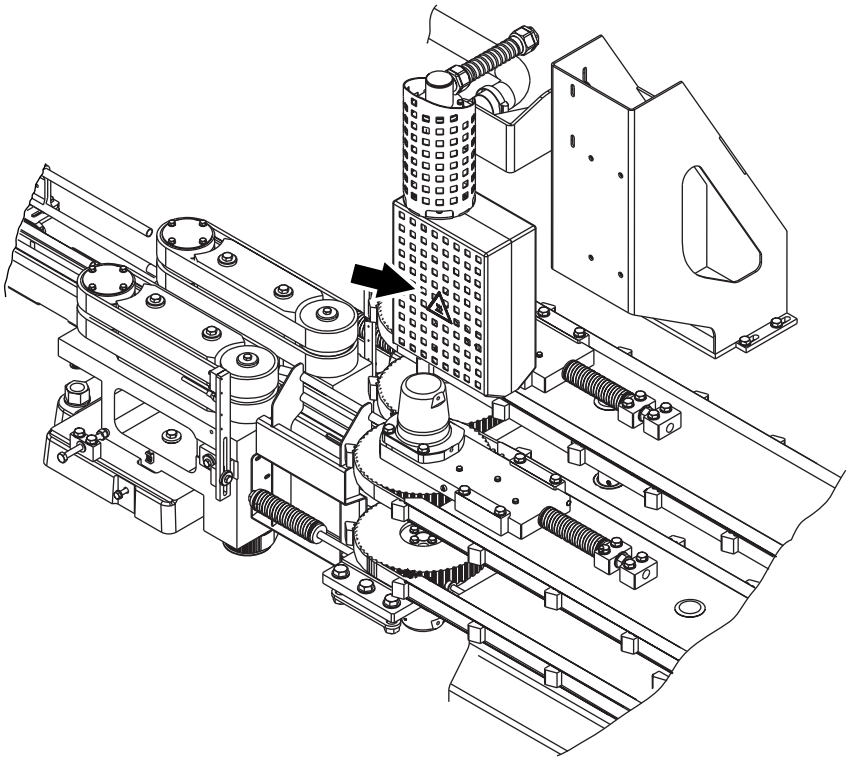
Additional Information

Package Heater

WARNING

Risk of burns.

The package heater is very hot and there is risk of severe burns. Never touch the package heater.



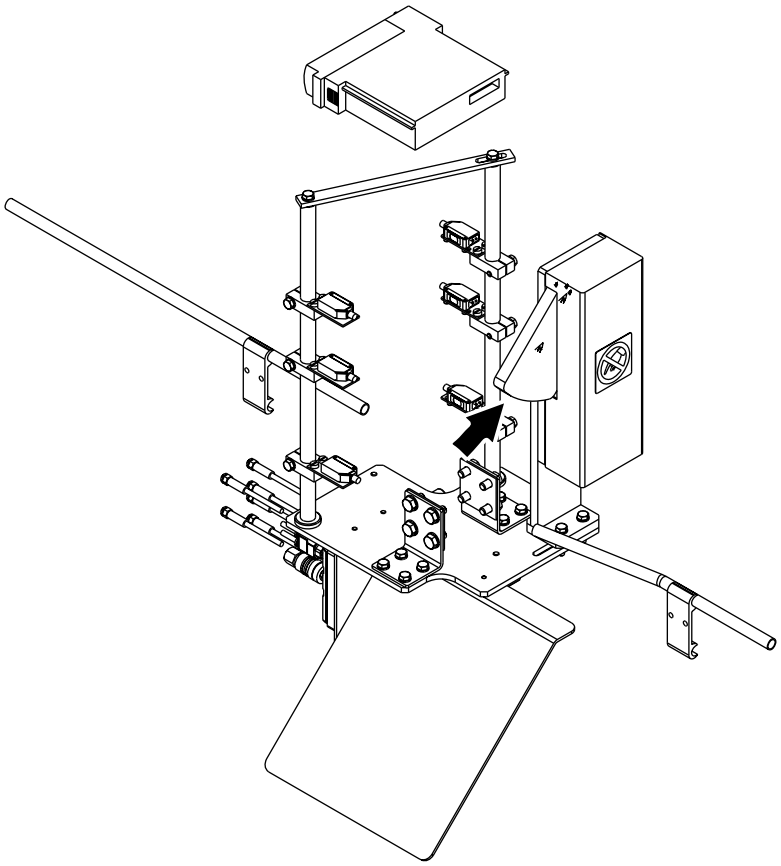
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Cap Detector

WARNING

Risk of personal injury.

Never put any part of the body, such as a hand, near the cap detector when the machine is working. There is a risk of injury caused by the movable pusher.



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Equipment for Lifting and Moving Loads

WARNING

Risk of crushing injury.

Make sure that the capacity of the lifting equipment is adequate and that the equipment itself is in good working order.

If lifting tackle has to be joined to make up the necessary length, make sure that the joints are secure and have the same lifting capacity as the rest of the lifting tackle.

Always engage safety clips fitted to lifting hooks to prevent the lifting tackle from slipping off.

Use ropes or poles to steady and manoeuvre suspended loads. Do not use hands or feet.

Make sure that the route and destination are free from obstacles before moving a suspended load. It must be possible to quickly and safely lower the load to the floor in an emergency.

When depositing loads, keep lifting tackle in place until the stability of the load has been substantiated.

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1 Technical Data and Drawings

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Technical Data and Drawings - Description

This chapter includes drawings showing overall dimensions. Values are in millimetres unless otherwise stated. All dimensions are the minimum and approximate. Dimensions must be respected.

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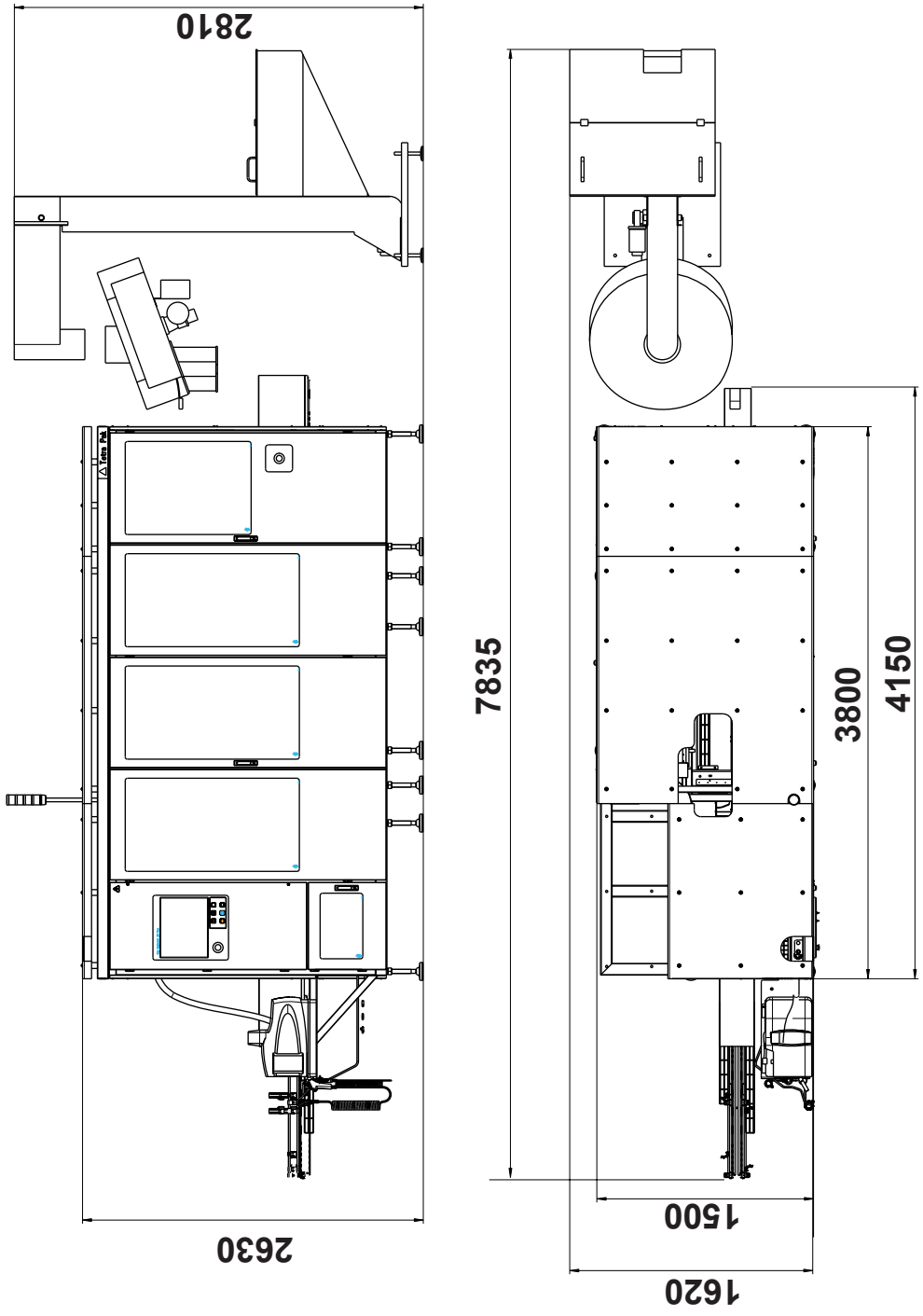
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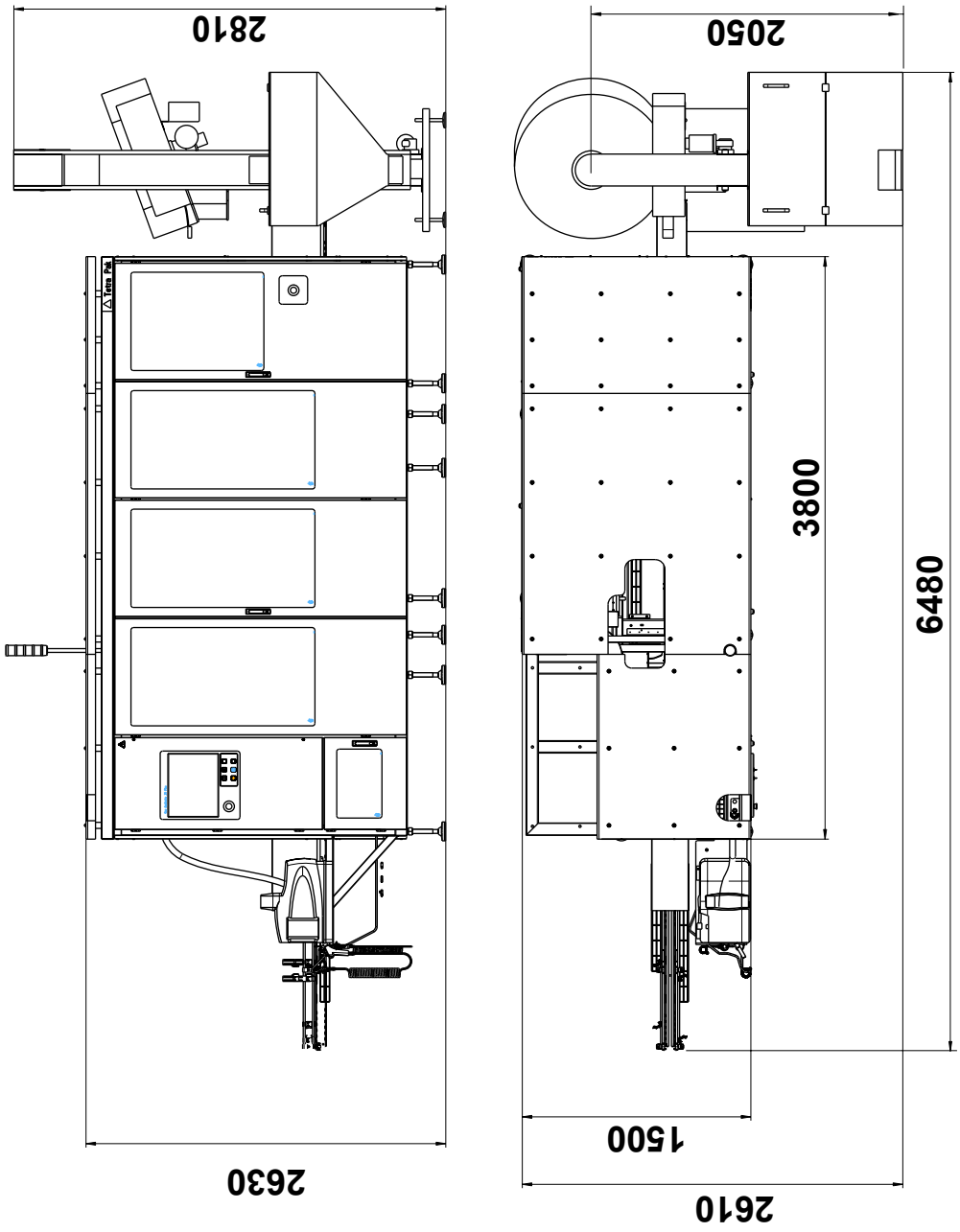
1.1 Installation Drawings

1.1.1 Left View - Cap Sorter Lengthways



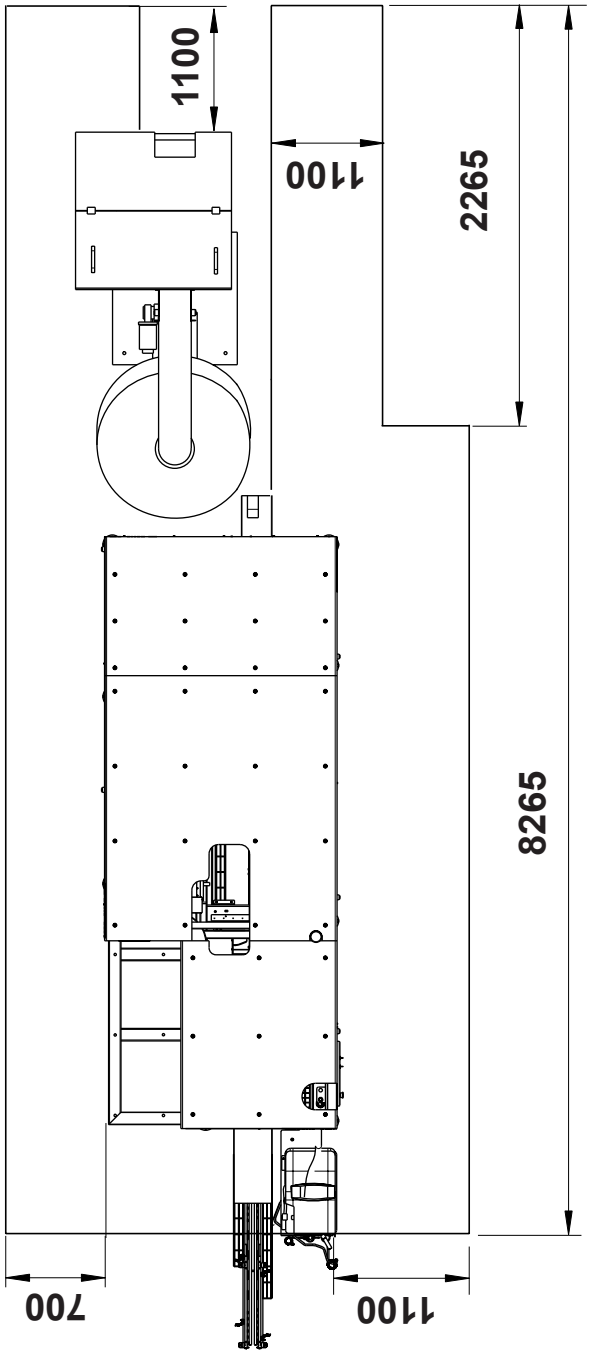
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1.1.2 Left View - Cap Sorter Sideways



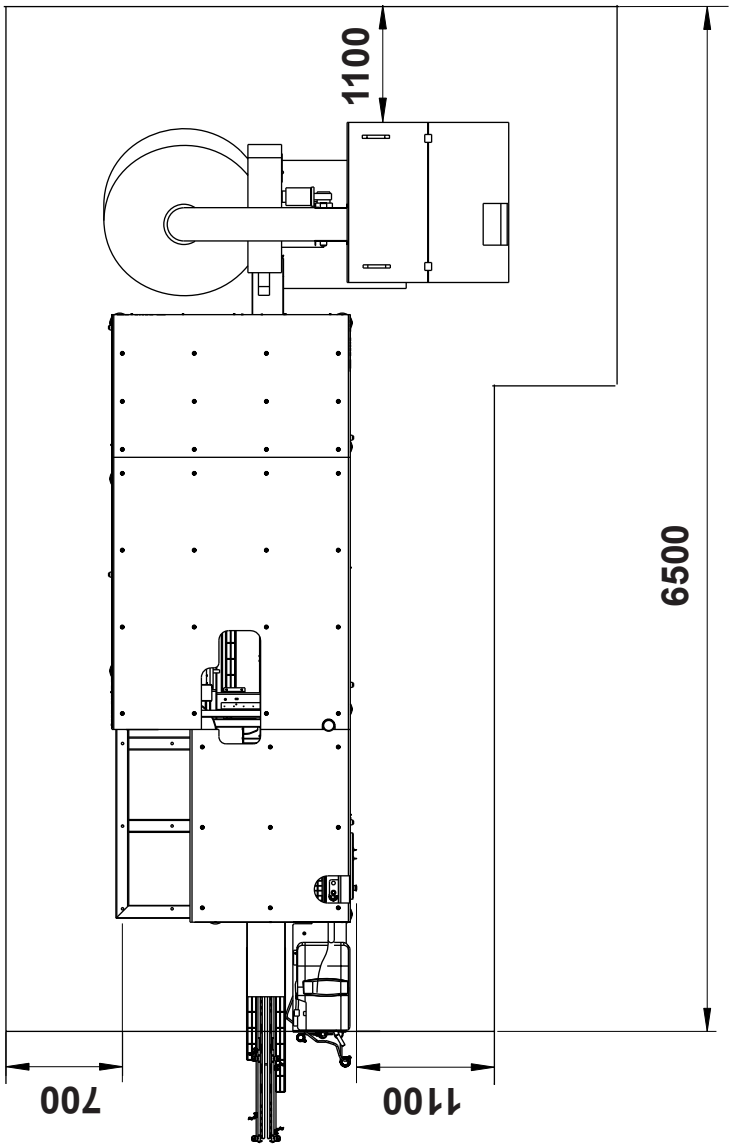
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1.1.3 Working Area - Cap Sorter Lengthways



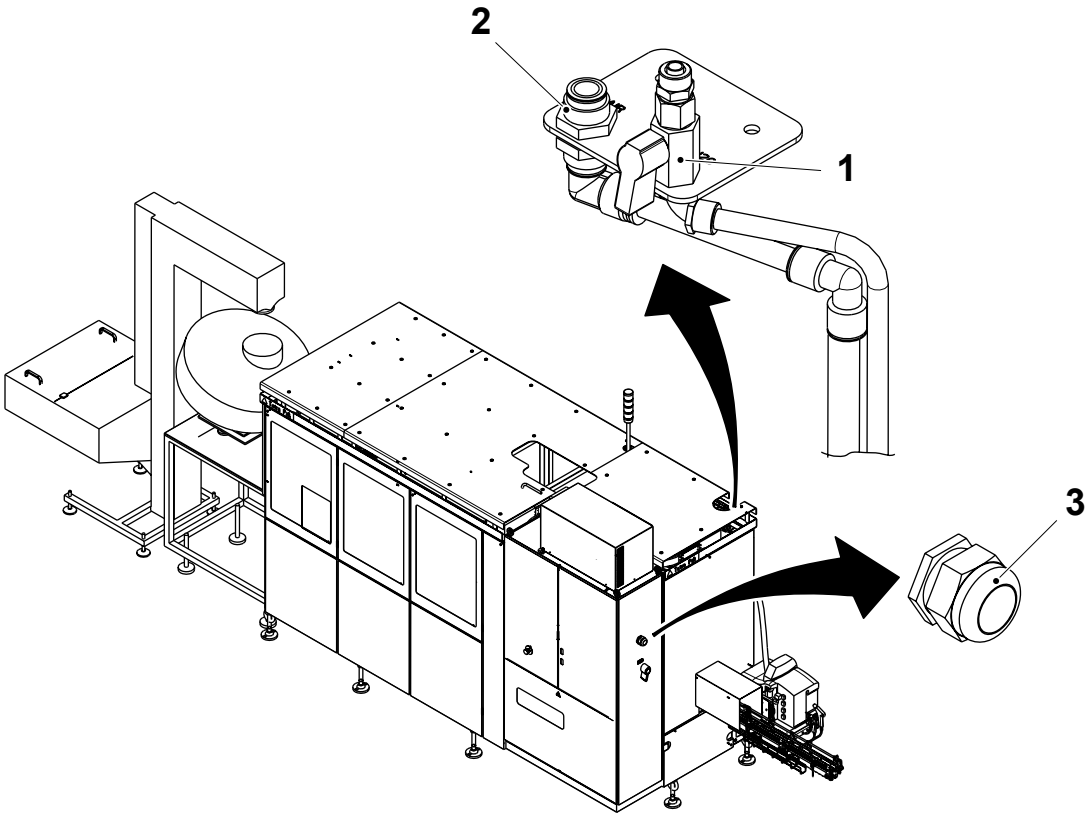
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1.1.4 Working Area - Cap Sorter Sideways



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1.1.5 Service Connection



1 Water connection
2 Air connection
3 Electrical connection

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1.1.6 System Drawings

System drawings are located in the electrical cabinet. System drawings are as follows:

- Installation drawings
- Pneumatic diagram
- Lubrication diagram
- Extra equipment (if relevant).

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1.2 Mass (Weight)

1.2.1 Weight and Dimensions

All weights are estimates.

Machine Configuration	Mass (weight)	Notes
Cap Applicator 30/Flex	2800 kg (6175 lbs)	
Cap sorter Flex	387 kg (835 lbs)	

1.2.2 Centre of Gravity and Lifting Points

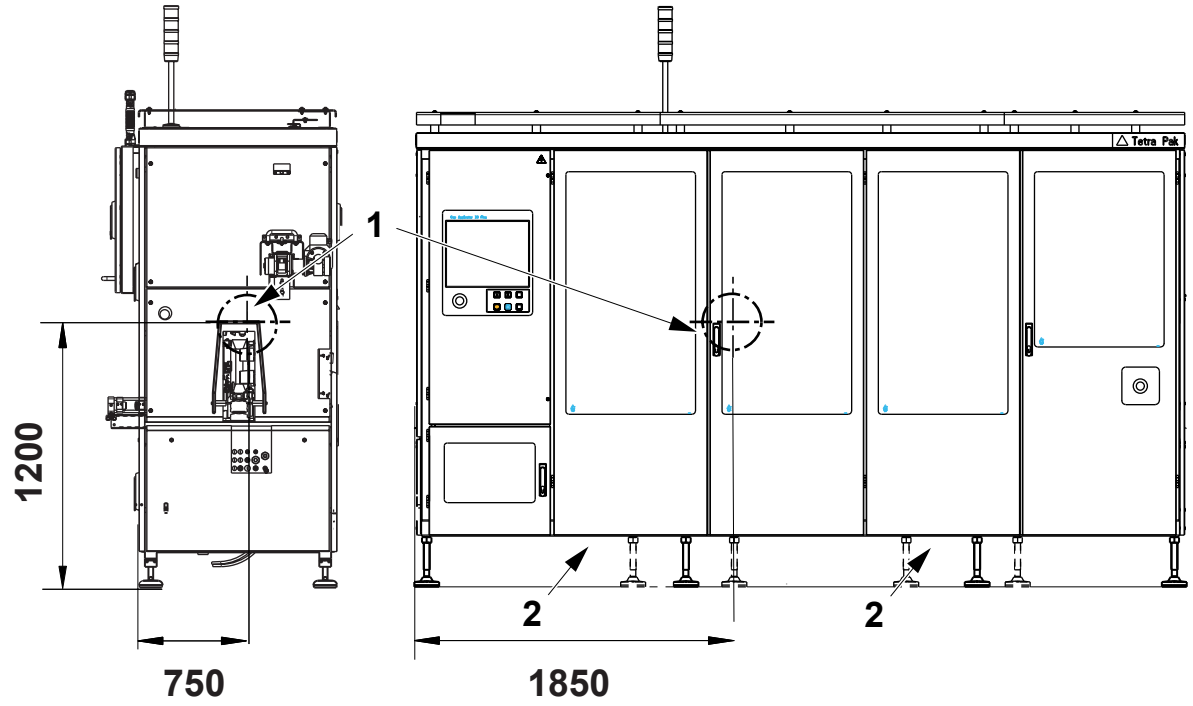
Cap Applicator

WARNING

Risk of serious personal injury.

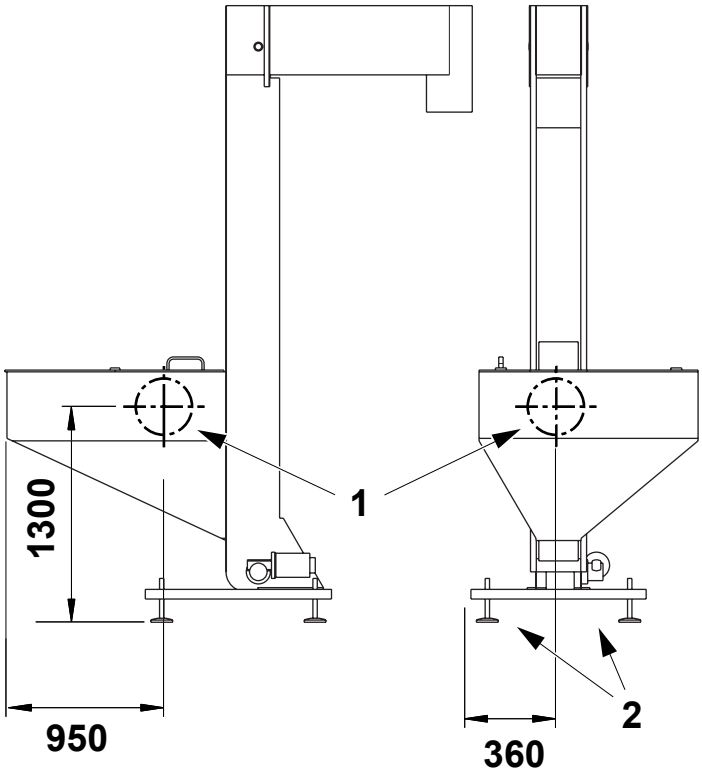
The machine can tilt if not observing the centre of gravity points (1). Always use the recommended fork lift points (2) to avoid personnel injury and/or major damage to the equipment. Be careful not to hit the inner feet with the lifting forks.

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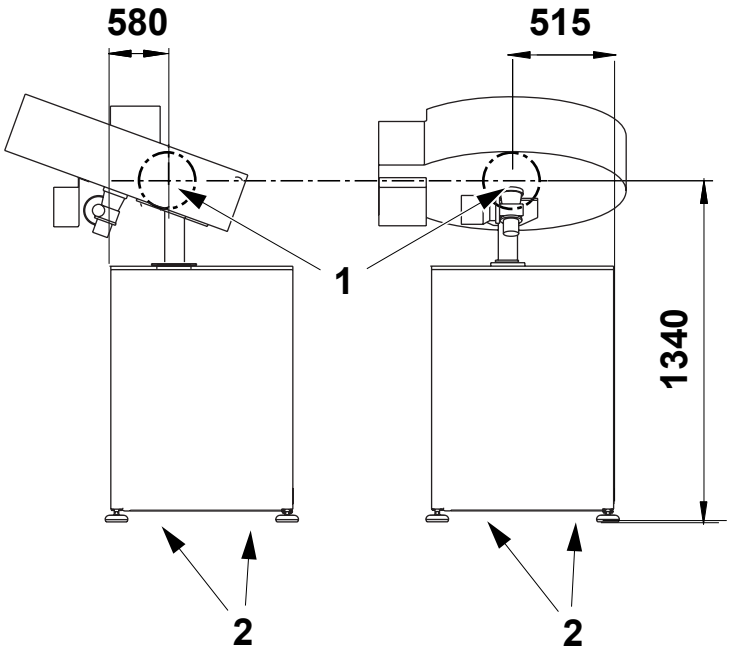
1 Centre of gravity
2 Recommended fork lift points

Cap Sorter



1 Centre of gravity
2 Recommended fork lift points

Infeeder



1 Centre of gravity. * 420 mm when horizontal for transporting
2 Recommended fork lift points

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1.3 Utility Connection Data

1.3.1 Electrical Power

1.3.1.1 Electrical Power Specification

Note! For more information, see the Mains Connection Diagrams in the EM.

Characteristic	Value	Notes
Supply voltage	400 VAC, 3 phase + N + PE	
Max. voltage fluctuation	±10%	
Frequency	50 Hz ±2%	
Fuse dimension	20 A	
Control system	Rockwell Automation	
Control voltage	24 VDC	
PLMS software is installed in the machine.		

1.3.1.2 Electrical Power Consumption

Machine configuration	Value	Notes
Cap Applicator 30/Flex	6.7 kWh	

1.3.2 Compressed Air

1.3.2.1 Compressed Air Specification

Characteristic	Value	Notes
Connection Inlet	16 mm	
Supply pressure	(600 to 800 kPa) (6 to 8 bar)	
Static pressure	5.7 bar (570 kPa)	5.7±0.1 bar
Max particle content	5 microns	
Max particle density	5 mg/m^3	

1.3.2.2 Compressed Air Consumption

Machine configuration	Average consumption during production	Peak consumption (duration < 2 sec.)
Cap Applicator 30/Flex	500 ±16 nl/min	680 ±18 nl/min

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1.3.3 Water

1.3.3.1 Cold Water Supply

Characteristic	Value	Notes
Type	Potable water	For cleaning purposes only
Supply connection	1/2 inch diameter	
Supply pressure	300 to 450 kPa, (3 to 4.5 bar)	
Max inlet temperature range	14 to 20°C (57 to 68°F)	

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1.4 Noise

The tables below gives the noise level measurements for the machine under the following conditions:

- Machine on a concrete floor supported by standard feet
- Production under normal operating conditions.

Note! Emission sound pressure / power values in accordance with ISO 4871.

1.4.1 Sound Pressure Level

Characteristic	Symbol	Value	Notes
Declared maximum emitted sound pressure level, operator position	LpA	76 dB(A)	Determined according to ISO 11204 (Engineering method)
Uncertainty factor	KpA	2.5 dB(A)	

1.4.2 Sound Power Level

Characteristic	Symbol	Value dB(A)	Notes
Declared maximum emitted sound power level, operator position	LwA	96.5 dB(A)	Determined according to ISO 3744 (Engineering method)
Uncertainty factor	KwA	2.5 dB(A)	

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1.5 Product Data

1.5.1 Machine Capacity

Machine capacity is cap and package dependent.

Machine configuration	Production Capacity (pack/hour)	Notes
Cap Applicator 30/Flex	6600 7200 8400 9600	The applicator capacity is 20% of the filling machine.

1.5.2 Hotmelt Adhesive Consumption

Characteristic	Value StreamCap	Value SlimCap
Consumption	Approximately 150 grams/ 1000 caps	Approximately 250 grams/1000 caps

1.5.3 Ambient Temperature

Characteristic	Value	Notes
Minimum ambient temperature	5°C (41°F)	
Maximum ambient temperature	40°C (104°F)	
Recommended ambient temperature	15°C to 30°C (59°F to 86°F)	

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1.6 Conveyor

1.6.1 Data

1.6.1.1 Infeed/Discharge

Characteristic	Value
Type	Package Conveyor PC23
Width	40 to 78 mm (adjustable)
Height	825 ±50 mm

1.6.1.2 Conveyor Speed

If necessary to change the speed of the conveyor, go to the System Setting window in the control panel and select the PACKAGE TRANSFER UNIT (PTU) button., see the OM. Conveyor speed is shown in Hz. For the speed values, see the MM.

1.6.2 Installation Requirements

a) To obey the safety regulations, a Drive and End unit must drive the conveyor. **The electrical power for the Drive and End unit must be supplied and controlled** from the machine. See the EM for connecting the electrical cable to the Drive and End unit.

b) Conveyor lubrication must be used, see 1.7.1 Conveyor Lubrication.

c) The machine must always be connected to at least 1 m uncut conveyor at the infeed end due to the mounting of an infeed tunnel.

d) A curve can be placed directly in front of the infeed tunnel.

e) The conveyor shall not be longer than 15 m.

1.6.3 Distance Queue Discharge Photocell

The queue discharge photocell shall be placed after the Drive and End station, see 1.1 Installation Drawings.

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1.7 Additional Information

1.7.1 Conveyor Lubrication

1.7.1.1 Lubricants

DICOLUBE KB (TP No. 90459-0822)	This lubricant is for all types of packages and conveyors except the following; TB/TBA 200 S, TB/TBA 250 S, TBA 1000 Sq, all TPA -packages, all Tetra Top packages, all Tetra Rex packages and all packages printed with water soluble colours.
DICOLUBE TP (TP No. 90296-0088)	This lubricant is for the following; TB/TBA 200 S, TB/TBA 250 S, TBA 1000 Sq, all TPA -packages, all Tetra Top packages, all Tetra Rex packages and all packages printed with water soluble colours.

1.7.1.2 General settings

Note! These are the general settings recommended for TP production lines.

KB (VL32 DiverseyLever Denomination):

- lubricant/water Ratio 1:300
- time: 12 to 15 sec. ON, 40 to 45 sec. OFF.
  - valid for 6 m conveyor 21 m/min. If longer conveyor, longer ON time.
- the optimum value for friction is 0.14 to 0.18 depending on which package type and the conveyor speed. Friction calculation = push force on one package/weight on the package (in unit kilogram).
  - to measure push force, place one package on a straight piece of conveyor, start the conveyor and measure the push force with a dynamometer or equivalent tool (in unit kilogram).
- use minimum 2 lubrication points/valve with TP 30 and 6 lubrication points/valve with TP 85.
- one lubrication nozzle for each Drive and End unit. Type of nozzle:
  - Green, flow 0.05 l/min. Part 534270-101
  - Yellow, flow 0.08 l/min. Part 534270-102
  - Blue, flow 0.11 l/min. Part 534270-103.

(Cont'd)

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(Cont'd)

TP (VL 6 DiverseyLever Denomination)

- lubricant/water ratio 1:250
- time: 9 to 14 sec. ON, 70 to 75 sec. OFF.
  - valid for 6 m conveyor 21 m/min. If longer conveyor, longer ON time.
- the optimum value for friction is 0.10 to 0.15 depending on which package type and the conveyor speed. Friction calculation = push force on one package/weight on the package (in unit kilogram).
  - to measure push force, place one package on a straight piece of conveyor, start the conveyor and measure the push force with a dynamometer or equivalent tool (in unit kilogram).
- use minimum 2 lubrication points/valve with TP 30 and 6 lubrication points/valve with TP 85.
- one lubrication nozzle for each Drive & End unit. Type of nozzle: Green, flow 0.05 l/min. Part 534270-101.

Note! Conveyor lubricants can be ordered from Tetra Pak Parts AB or directly from the Diversely company.

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2 Preparation

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Preparation - Description

This chapter describes the preparation requirements for the installation of the equipment.

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2.1 Requirements

2.1.1 General Requirements

The choice of site location should be determined with regard to the utilities and supplies required by the machine and access limitations. The space requirements for this machine are given in the installation drawings shown in Chapter 1 Technical Data and Drawings.

The installation site must be prepared in advance by the customer. No special foundation work is required for the machine. The floor should be strong enough to support the full weight of the machine. Access is required for a fork lift or lifting equipment.

2.1.1.1 Personnel

Only skilled or instructed Tetra Pak installation personnel are allowed to assemble the machine.

2.1.2 Space Requirements

WARNING

Risk of personal injury.

Make sure there is sufficient room to move safely around the installation site. If machines around the site cannot be stopped, place guards around these machine to prevent accidental contact.

2.1.2.1 Unpacking Area

The minimum unpacking area must be at least twice the size of the main crate. This only allows an area large enough for one crate to be unpacked at a time.

The ideal unpacking area allows all crates to be unpacked together.

(Cont'd)

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(Cont'd)

2.1.2.2 Installation Area

a) Make sure that all customer preparation work has been completed to prepare the site for the machine.

b) Make sure that all the necessary utility supplies are available, see section 1 Technical Data and Drawings.

c) Clear all obstacles away from the installation site and, if necessary, clean the floor of the site before starting to install the machine.

d) Leave the protective packing on parts until they are required during the machine assembly procedure.

e) Make sure that the lighting is adequate. Arrange additional portable lights if required, making sure that the cables are routed safely.

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2.2 Special Tools, Auxiliary Equipment and Information

2.2.1 Tools and Materials

The following tools and materials are needed to move and install the equipment:

- two hydraulic jacks, min capacity 3 tons
- pallet trolley, capacity 800 kg (1765 lbs)
- spirit level, TP No. 90243-163
- 2 m (7 ft) step ladder
- pneumatic or electric powered wrench
- crowbar or strong lever
- large rubber coated mallet
- cable ties
- insulating tape.

2.2.2 Equipment for Lifting and Moving

2.2.2.1 Types of Lifting Equipment

The following types of equipment can be used to lift and move the crates:

- overhead gantry
- mobile crane
- fork lift.

(Cont'd)

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(Cont'd)

2.2.2.2 Lifting Equipment Specification for Crated Equipment

Make sure that the lifting equipment complies with the specifications given in the following table.

Equipment or lifting tackle	**Lifting capacity kg (lbs)**	**Notes**
Fork lift	5000 (11025)	A higher capacity fork lift truck allows the centre of gravity of the crate to be raised safely to a height of 1500 mm (4 ft 11 in.).
Lifting forks	5000 (11025)	Min. length: – Main crate: 2000 mm ((6 ft 6 in.) – Second crate: 2000 mm (6 ft 6 in.) Recommended setting width: – Main crate: 2000 mm (6 ft 6 in.)) – Second crate: 2000 mm (6 ft 6 in.).
Lifting chains, cables, ropes or hoist slings	5000 (11025)	Main crate **Two pieces:** Min. length: 8900 mm (30 ft) hook to hook.

2.2.2.3 Lifting Equipment Specifications for Uncrated Equipment

Make sure that the lifting equipment used to move the uncrated equipment complies with the specifications given in the following table.

Note! Do not use chains, ropes or hoist slings to lift or move the equipment.

Equipment or lifting tackle	**Min. lifting capacity kg (lbs)**	**Notes**
Lifting forks	5000 (11025)	**Cap Applicator** Min. length 1500 mm (4 ft 11in.) Recommended setting width = 1500 to 1600 mm (4 ft 11 in. to 5 ft 3 in.)
Lifting forks	1500 (3307)	Cap sorter Recommended setting width = 500 mm (1 ft 7 in.) Elevator Recommended setting width = 600 mm (2 ft)

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3 Moving and Unpacking the Equipment

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Moving and Unpacking the Equipment - Description

This chapter describes the safest way to transport, store and unpack the crated equipment before installation.

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3.1 Crate Handling

3.1.1 Crate Data

Note! The Cap Applicator 30 Flex is delivered in one crate. See the packing list for a complete list of all parts included in the crate.

Note! The weight of the crate will increase significantly if the crate becomes wet.

3.1.1.1 Main Crate

Weight and Dimensions

Machine type	Gross weight kg (lbs)	Net weight* kg (lbs)	Length mm (ft in.)	Width mm (ft in.)	Height mm (ft in.)
CAP 30/Flex	4400 (9700)	3220 (7100)	5300 (17 ft 5 in.)	2260 (7 ft 5 in.)	2260 (7 ft 5 in.)

*The net weight is equal to the contents of the crate.

Contents

Machine type	Contents
CAP 30/Flex	Applicator Cap sorter Start up kit Spare parts Machine manuals

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3.1.2 Lifting and Unloading

WARNING

Risk of personal injury.

To ensure safe and efficient handling of the crate, carefully study the following instructions.

3.1.2.1 Equipment for Lifting and Moving

For the type of lifting and moving equipment required, see 2.2 Special Tools, Auxiliary Equipment and Information.

3.1.2.2 Labels, Symbols and Warning Placards

Labels, symbols and warning placards are located on the external surfaces of the transit crates and outline the handling principles which must be observed.

- do not subject the crates to sudden shocks or movement.
- the crates are not load bearing and must not be stacked or have other items placed on them.
- keep the crates in the upright position as indicated.

Symbol	Meaning
	Centre of gravity
	Lifting points for chains, cables, ropes, or slings
	This way up
	Fragile
	Keep dry
↑TOP↑	Top of crate
FRAGILE	‘Fragile’ warning
HANDLE WITH CARE	‘Handle with care’ warning
NOT TO BE DROPPED	‘Not to be dropped’ warning
GROSS KG.	‘Gross weight’ value
NET KG.	‘Net weight’ value

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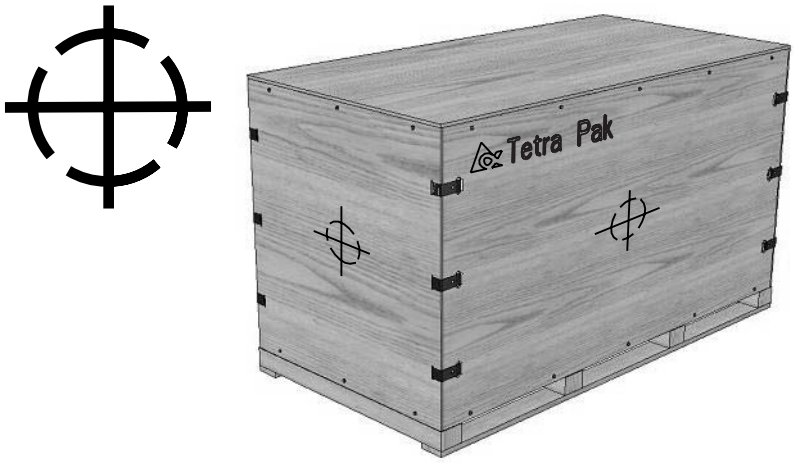
3.1.2.3 Centre of Gravity

WARNING

Risk of personal injury.

The crate may tilt if you do not observe the centre of gravity symbol. Failure to observe may result in personal injury and/or major damage to equipment.

The purpose of the illustration below is to give an example of how the centre of gravity is indicated on a crate. For information on the location of the centre of gravity for a specific crate, see the actual marks on the crate.



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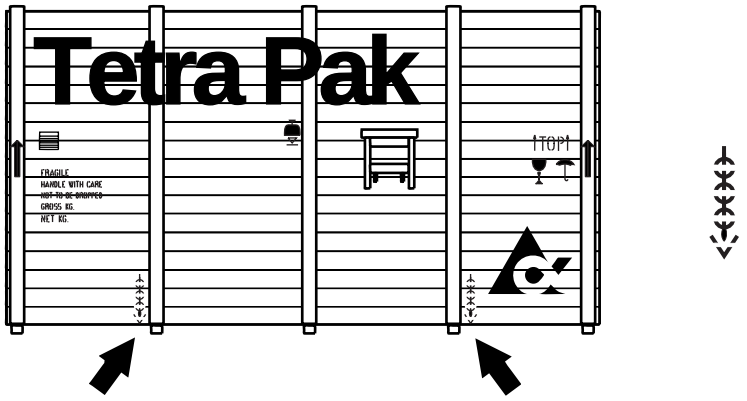
3.1.2.4 Using an Overhead Gantry or Mobile Crane

The crates are marked with lifting tackle symbols.

The lifting tackle must be passed under and fixed at these points when lifting the crate.

For capacity and length of the lifting tackle, see 2.2.2 Equipment for Lifting and Moving.

Use ropes or poles to steady and manoeuvre loads. Do **not** use hands or feet.



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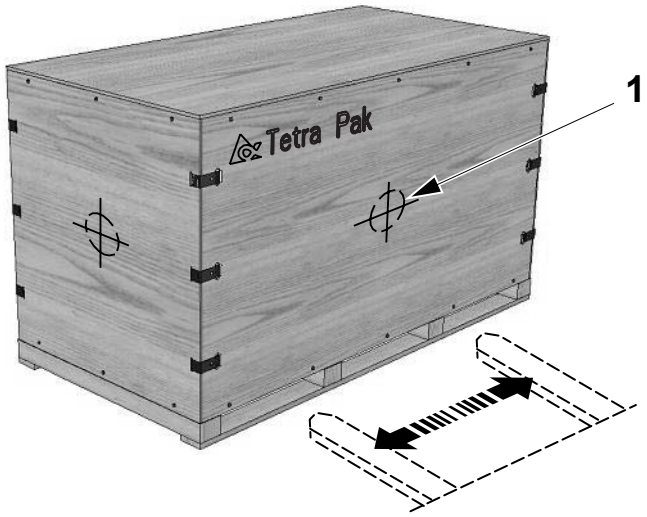
3.1.2.5 Using a Fork Lift

WARNING

Risk of personal injury.

The crate may tilt if you do not observe the centre of gravity symbol. Failure to observe may result in personal injury and/or major damage to equipment.

The crates are marked with centre of gravity symbols. The lifting forks must be positioned equal distance from the centre of gravity symbol (1) when lifting the crate. For fork lift lifting capacity, see 2.2.2 Equipment for Lifting and Moving.



1 Centre of gravity

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3.1.3 Moving the Crated Equipment

WARNING
Risk of personal injury.
Make sure the equipment can be lifted in accordance with the instruction in 3.1.2.3 Centre of Gravity.

WARNING
Risk of personal injury.
The crate may tilt if you do not observe the centre of gravity symbol. Failure to observe may result in personal injury and/or major damage to equipment. Use the fork lift in accordance with the instruction in 3.1.2.5 Using a Fork Lift.

3.1.3.1 Inspection

Before moving the crate, examine the outside of the crate. Record any damage. This information must later be recorded on the **Transport Damage Report** (a section of the Start-up Machine Quality report).

Record the readings of the humidity indicators and tipping indicators attached to the outside of the crates (if present). This information must later be recorded on the **Transport Damage Report** (a section of the Start-up Machine Quality report).

3.1.3.2 Guidelines for Moving

CAUTION
Move the crate slowly and gently.

a) Check that the machine can be moved to the storage or installation site without any problems regarding ceiling heights, doors, passages, etc.
b) Look through the customs inspection panel to see which way the contents are facing.
c) Lift the crate **only** enough to clear the floor.
d) Make sure the crate remains stable on the lifting equipment.
e) Lower the crate gently to the floor, leaving enough room around it for easy access to all sides.
f) Make sure the crate is firmly supported. Put blocks or plates under the crate, if required.

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3.1.4 Storing the Crated Equipment

CAUTION
Risk of damage to the equipment.
Do not stack the crates on top of each other. Store the crates indoors. Exposure to damp or to high or low temperatures may damage the equipment.

a) Make sure that the storage environment respects the conditions specified in the table below.

b) Store the crates with about 1000 mm (3 ft) of free access space around and above for access and ventilation.

c) If the floor under the crates is uneven, place blocks or plates under them to provide a steady support.

Contents	Recommended Storage Temperature	Recommended Storage Humidity	Notes
Main Crate	10 to 30°C (50 to 86°F)	< 80%	
Caps	10 to 30°C (50 to 86°F)	< 80%	
Hotmelt adhesive	10 to 30°C (50 to 86°F)		Hotmelt adhesive shelf life is one year. Avoid dust and damp in the storage facility.

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3.2 Unpacking Sequence

WARNING

Risk of personal injury.

Make sure there is sufficient room to move safely around the installation site. If machines around the site cannot be stopped, place guards around them to prevent accidental contact.

3.2.1 Unpacking Area

The minimum unpacking area must be at least twice the size of the Crate 1. This only allows an area large enough for one crate to be unpacked at a time.

3.2.2 Opening the Crate

WARNING

Risk of personal injury.

Take care when opening the crate. Panels can fall when the bolts are removed.

a) Loosen the screws (1) for the lid (2).

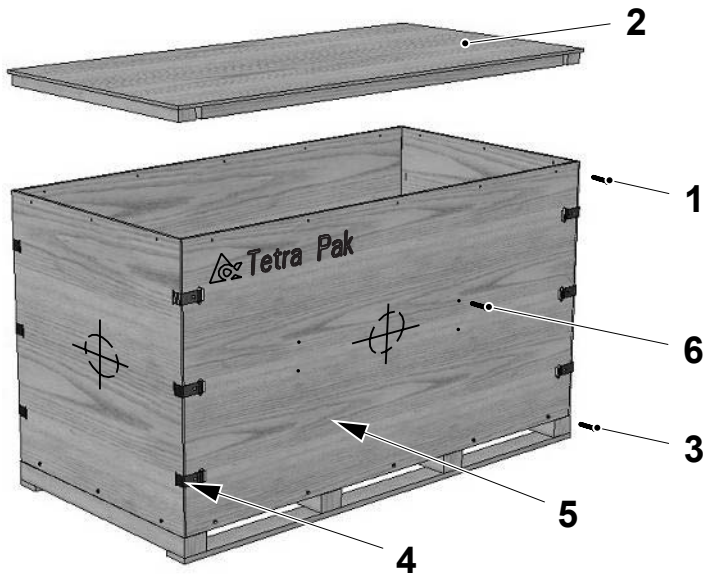
b) Remove the lid (2).

c) Loosen the screws (3) to the pallet.

d) When the clamps (4) are loosened, the front (5) must be handled with caution because the front will fall out from the crate.

e) The crate containing the infeeder has an extra screws (6) on the middle of the front.

f) Before removing the machine from the crate, see 1.2 Mass (Weight).



1 Screw
2 Lid
3 Screw
4 Clamp
5 Front
6 Screw

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3.2.3 Inspection

Examine the equipment for damage.

Record any damage. This information must be recorded on the **Transport Damage Report** (a section of the Start-up Machine Quality report), see 3.2.4 Inspection Documentation for more information.

3.2.4 Inspection Documentation

Note! No claims will be accepted for machines in commercial production if the **Start-Up Machine Quality Report** (SUMQR) has not been returned to the manufacturer. Compile the:

- Transport Damage Report (a section of the SUMQR). If no damage has occurred during transport, state “NO TRANSPORT DAMAGE”.
- Feedback from MC form only in case of claims on the equipment. For further information about claims see the Claim and Complaint Handling procedure, available from the local Service Organisation

3.2.5 Disposal of Reusable Materials and Waste

3.2.5.1 Reusable packing materials and structures

Reusable packing materials and structures should be collected and reused in accordance with the local regulations.

3.2.5.2 Non reusable packing materials and structures

Non reusable packing materials and structures should be collected and disposed of in accordance with the local regulations.

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4 Positioning, Assembly and Connections

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Positioning, Assembly and Connections - Description

This chapter describes the main activities to install the equipment.

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4.1 Transporting the Uncrated Machine

4.1.1 General

Before moving the machine into position for assembly and installation, check that the machine can be moved without problems regarding ceiling heights, doors, passages, etc.

Obey the following warnings:

WARNING

Risk of personal injury.

The machine can tilt if not observing the centre of gravity or the fork lift points, see 1.2 Mass (Weight). Failure to observe may result in personal injury and/or major damage to equipment.

WARNING

Risk of personal injury.

Make sure the equipment can be lifted in accordance with the instruction in 1.2 Mass (Weight).

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4.2 Positioning

WARNING

Risk of personal injury.

The machine can tilt if not observing the centre of gravity or the fork lift points, see 1.2 Mass (Weight). Failure to observe may result in personal injury and/or major damage to equipment.

Move the machine to its final position. Respect the minimum distances around the machine. For minimum distances, see 1.1 Installation Drawings.

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4.3 Level the Equipment

4.3.1 Install the Machine Feet

Install the machine feet (1) to the machine body. Set the feet to the initial distance of 250 mm.

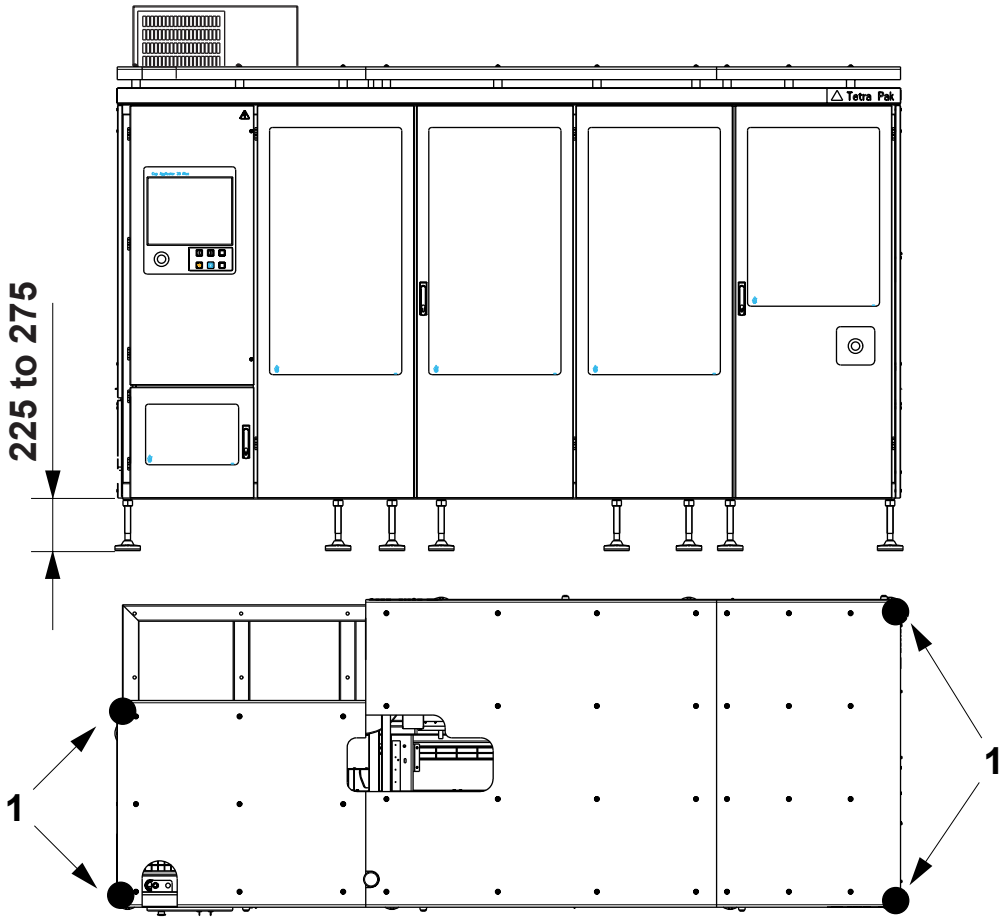
4.3.2 Set the Machine Body Height

Adjust the four feet (1) to set the machine body to the correct height. For installations with existing conveyor equipment, the machine's outfeed conveyor should be adjusted to the same height as the conveyor equipment.

4.3.3 Level the Machine Body

To obtain correct production it is important that the machine is level. Put a spirit level on the cross beam and on the longitudinal beam in the machine. If necessary, turn the machine feet (1) to make the machine level.

When the machine is level, turn the remaining feet so that the feet touch the floor and support the weight of the machine.



1 Machine feet

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4.4 Assembly

This section gives the correct procedure for assembling the machine components.

4.4.1 Cooling Unit

WARNING

Risk of personal injury.

Carefully follow the supplier’s instructions for handling the cooling unit. The cooling unit contains the refrigerant R134e (Freon). If a compressor leakage occurs in the cooling system this may cause serious freezing injuries if it comes in contact with bare skin.

In the case of compressor leakages, only trained personnel are allowed to handle the unit. Ensure good ventilation. Keep the container well closed and in a cool and dry place away from any sources of heat. Avoid direct contact with the product. Wear suitable protective clothing, gloves, goggles, face and eye protection.

In case of contact with eyes, rinse immediately with plenty of water for 15 minutes and call for medical attention. Inhalation of a high concentration can cause shortage of breath and unconsciousness. In case of inhalation move into fresh air. If needed, use an oxygen or artificial respiration.

WARNING

Risk of personal injury.

The weight of the cooling unit is 54 kg (119 lbs). The cooling unit is heavy. Use lifting equipment to move the unit into position.

CAUTION

Damage to the equipment.

Be careful when lowering the cooling unit on to the electrical cabinet. Make sure the gasket is installed and the electrical cable goes through the prepared hole in the top of the electrical cabinet.

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a) Put the gasket (1) in position.

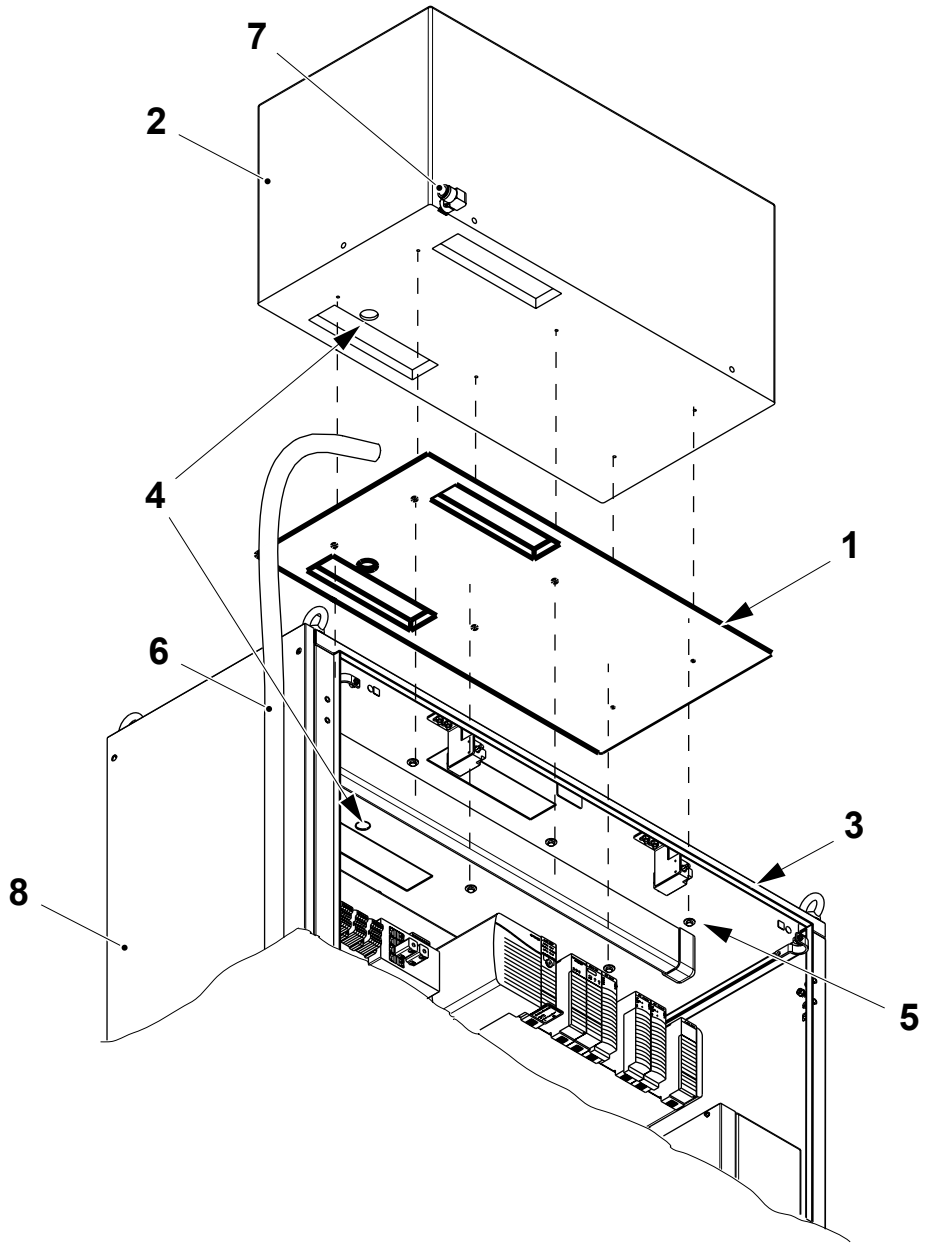
b) Use the lifting equipment and lift the cooling unit (2) so that it is above the electrical cabinet (3).

c) Put the electrical cable through the prepared hole (4) in the electrical cabinet (3). Make sure the electrical cable is free and the electrical connector is not damaged.

d) Lower the cooling unit (2) and install the six screws (5) to attach the cooling unit to the electrical cabinet (3).

e) Connect the cables, see the EM for more information.

f) Connect the drain pipe(6) to the connector (7) and run the pipe along the side panel (8).

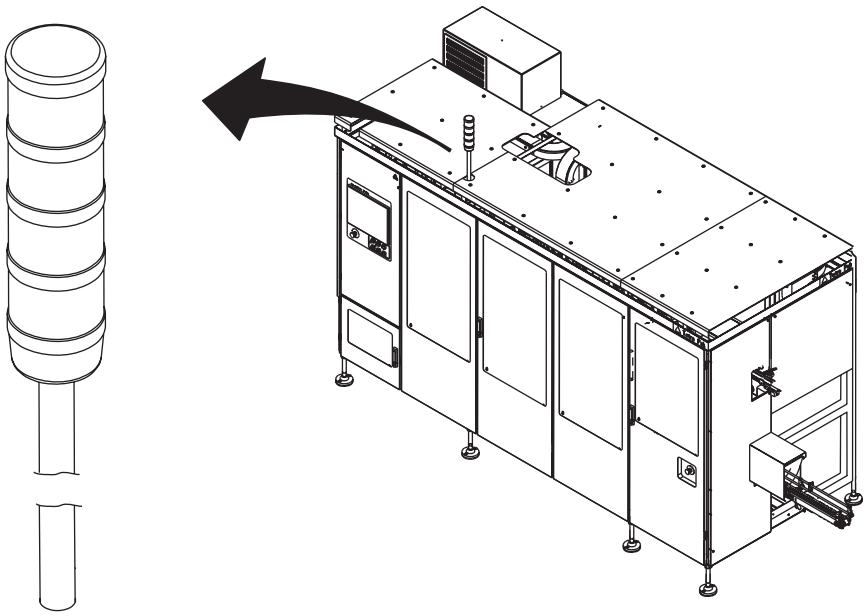


1 Gasket
2 Cooling unit
3 Electrical cabinet
4 Prepared hole
5 Screw
6 Drain pipe
7 Connector
8 Side panel

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4.4.2 Warning Lamp

Install the warning lamp.



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4.4.3 Hotmelt Unit

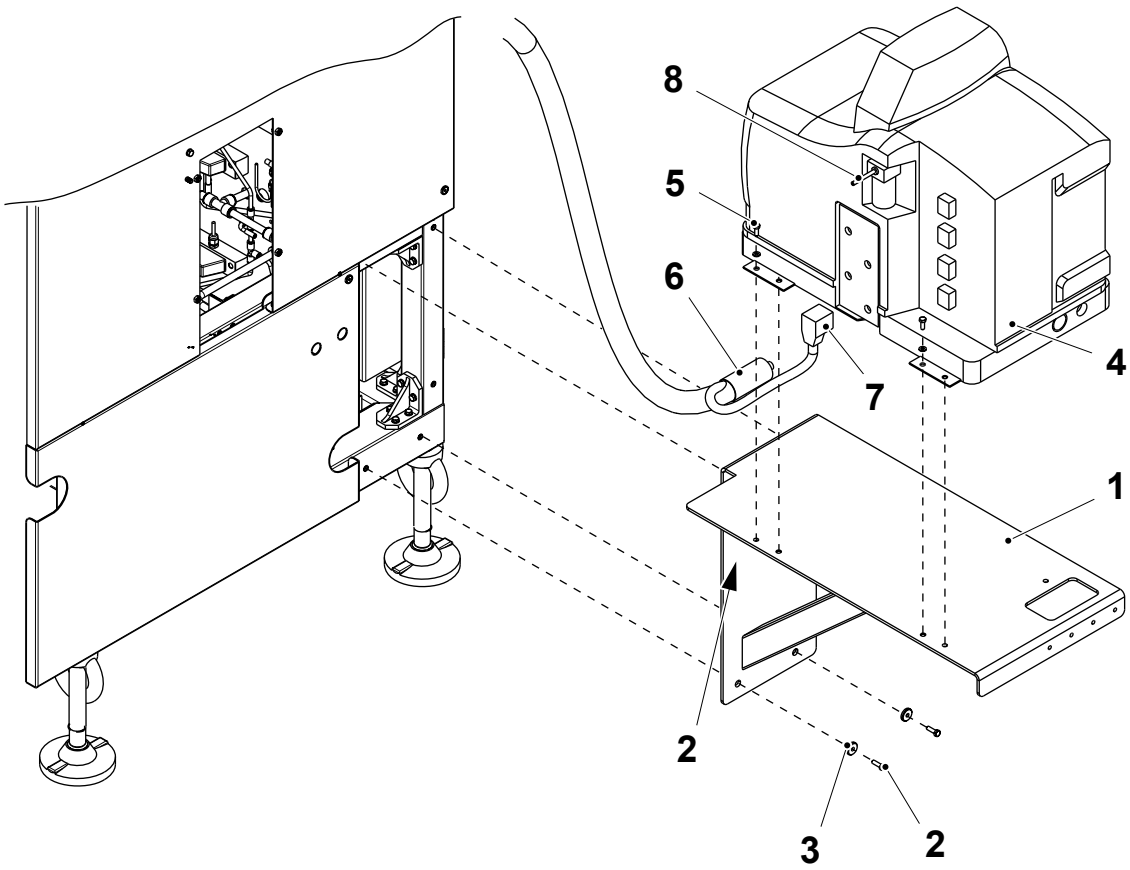
a) Put the support (1) in position and install the four screws (2) and washers (3).

b) Put the hotmelt unit (4) on the support (1) and install the screws (5).

c) Connect the hotmelt hose (6) to the hotmelt unit (4).

d) Connect the electrical plug (7) to the hotmelt unit (4).

e) Connect the air pipe (8) to the filter.



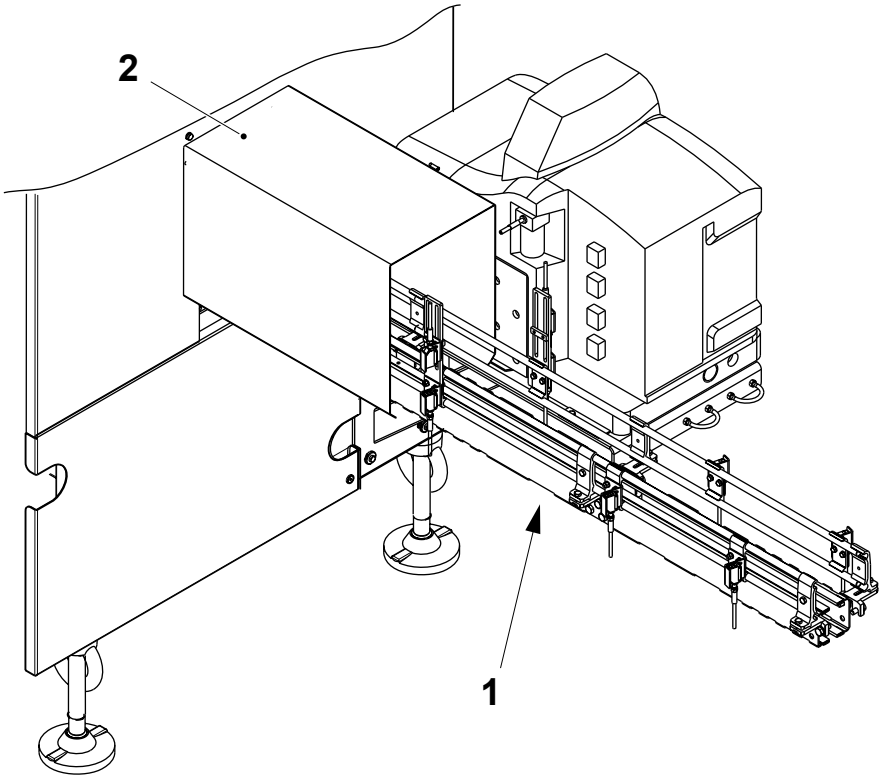
1 Support
2 Screw
3 Washer
4 Hotmelt unit
5 Screw
6 Hose
7 Electrical plug
8 Air pipe

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4.4.4 Package Conveyor

a) Install the infeed package conveyor (1).

b) Install the conveyor tunnel (2).



1 Infeed package conveyor
2 Conveyor tunnel

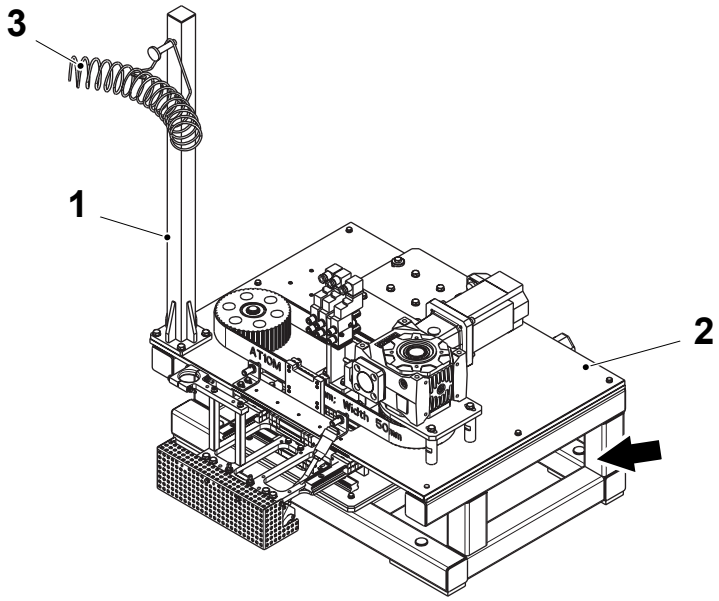
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4.4.5 Hotmelt Hose

a) Remove the bracket (1) from the side of the screwcap hotmelt applicator (2).

a) Install the bracket (1) to the screwcap hotmelt applicator (2).

b) Use the spring (3) to hold the hotmelt hose to the bracket (1).



1 Bracket
2 Screwcap hotmelt applicator
3 Spring

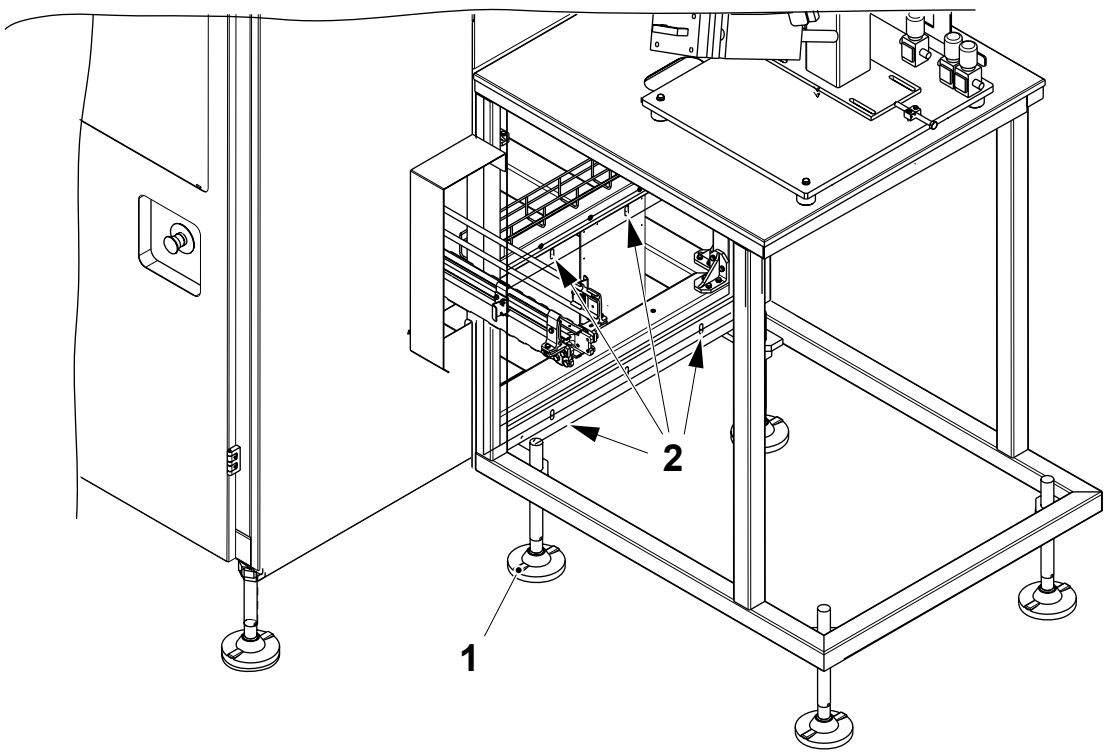
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4.4.6 Cap Sorter

a) Install the cap sorter feet (1) to the cap sorter frame. Set the feet to the initial distance of 250 mm.

b) Put the cap sorter in position. Adjust the four feet (1) to give the same height as the machine body.

c) Put a spirit level on the cross beam and on the longitudinal beam. If necessary, turn the cap sorter feet (1) to make the cap sorter level. Install the four screws (2) to connect the cap sorter frame to the machine body.



1 Feet
2 Screw

(Cont'd)

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(Cont'd)

d) Turn the handle (3) to move the infeeder (4) to give the correct height to the cap conveyor (5). For additional information, see the MM.

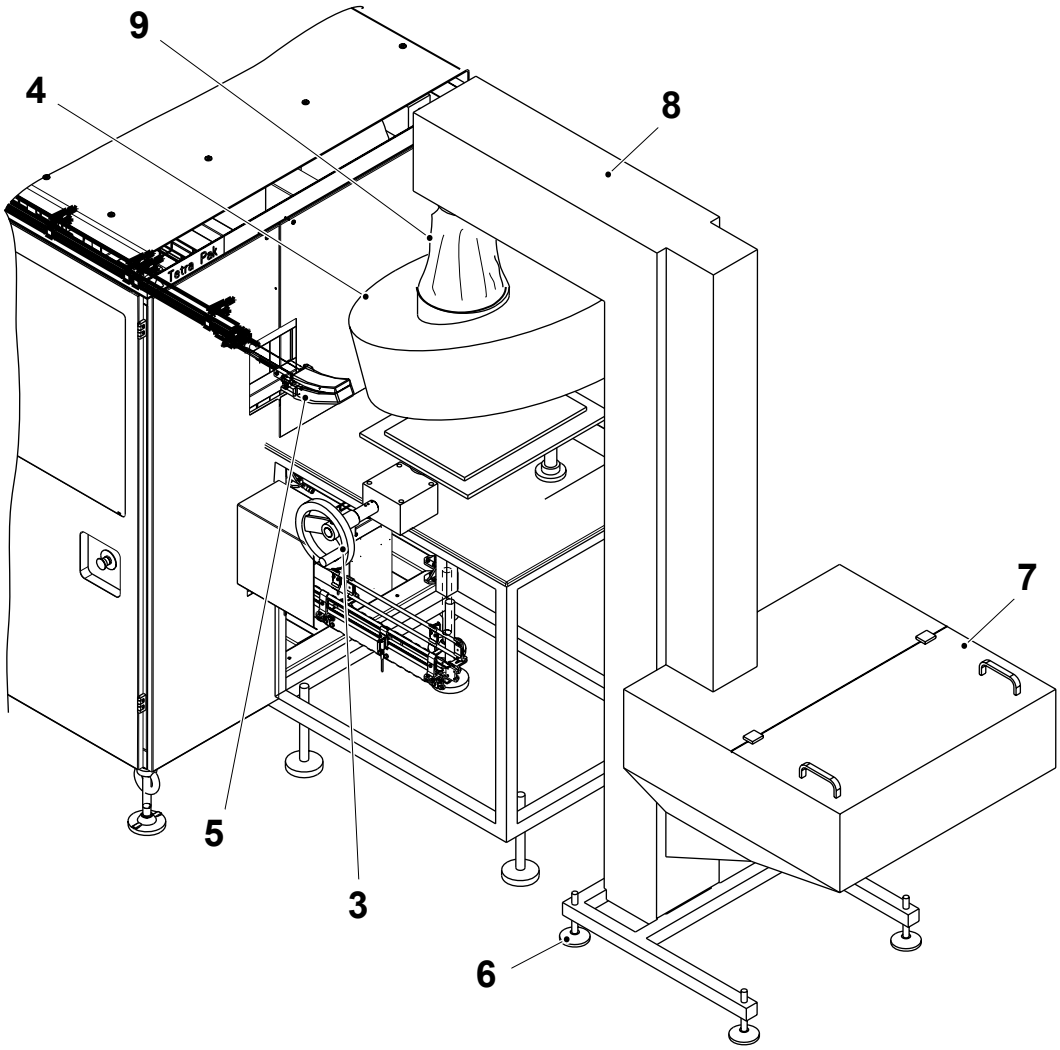
e) Install the feet (6) to the elevator frame.

f) Put the hopper (7) and the elevator (8) in position.

g) Put a spirit level on frame. If necessary, turn the feet (6) to make the elevator level.

h) Use the fabric sleeve (9) to connect the elevator (8) to the infeeder (4).

i) To connect the electrical cables to the cap sorter, see 4.5.1 Electrical Connection on page 4-18.



3 Handle
4 Infeeder
5 Cap conveyor
6 Feet
7 Hopper
8 Elevator
9 Fabric sleeve

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4.4.7 Conveyor and Cap Detector

WARNING

Moving parts could cause serious injuries.

The conveyor must be driven by a Drive and End unit with the electrical power supplied and controlled from the machine. Connected in any other way the conveyor could cause serious injuries to personnel.

Note! The Drive and End unit for the conveyor is not part of the machine.

Note! Conveyor lubrication has to be used.

4.4.7.1 Cap Detector

WARNING

Risk of personal injury.

Never put any part of the body, such as a hand, near the cap detector when the machine is working. There is a risk of injury caused by the movable pusher. Make sure the protection cover is installed

The cap detector removes from the conveyor fallen packages, loose caps that fall onto the conveyor or packages without caps. The cap detector also removes the three last packages at a restart after an emergency stop. The cap detector is installed at the end of the discharge (front) machine conveyor.

(Cont'd)

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(Cont'd)

4.4.7.2 Install

a) Remove the screw (1) and move the support bar (2) to one side.

b) Put the conveyor (3) in position.

c) Put the cap detector (4) in position and install the screws (5) to attach the cap detector (4) to the conveyors.

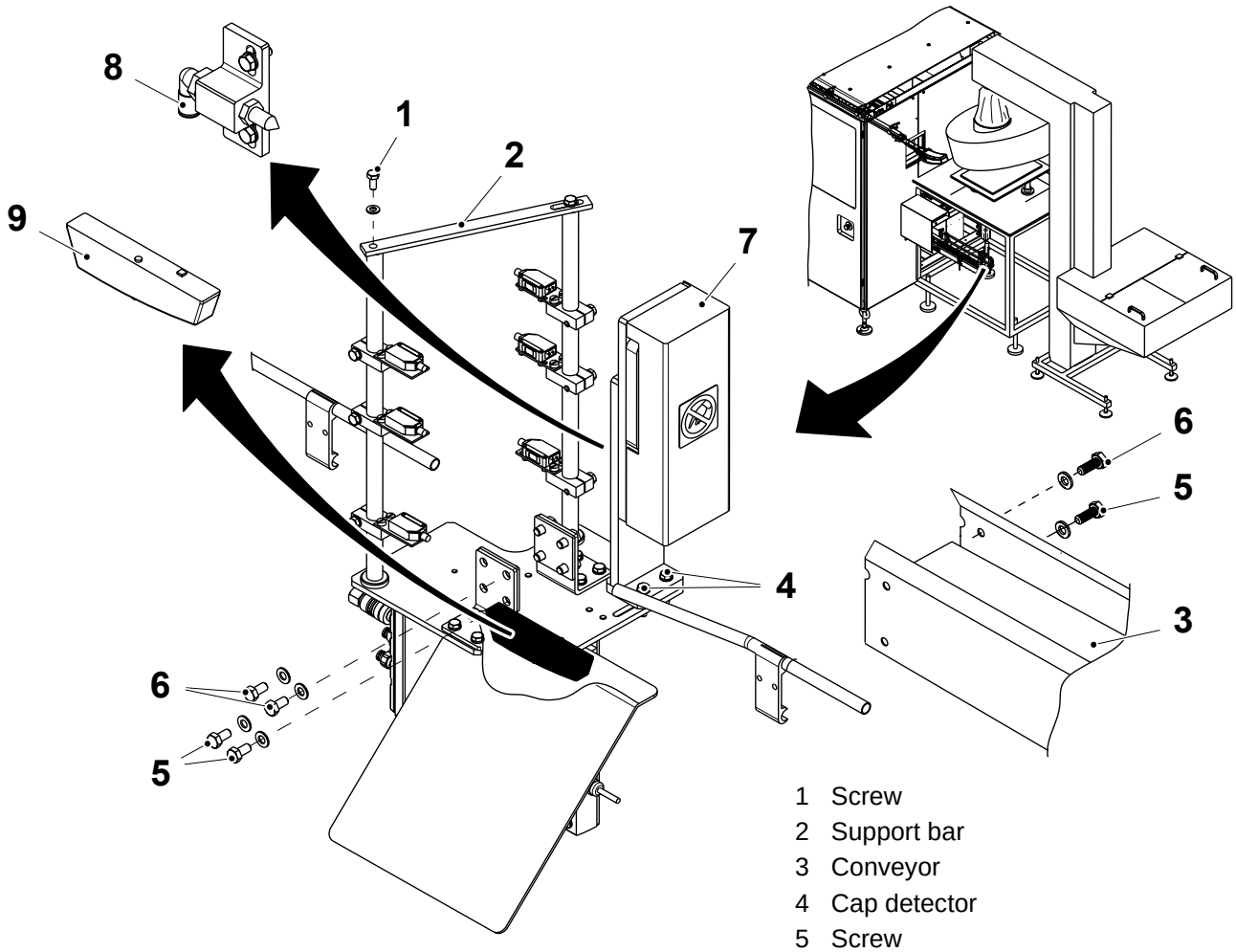
d) Move the support bar (2) and install the screw (1).

e) Put the package rails in position and install the screws (6). Make sure the protection cover (7) is installed.

f) Install the conveyor chain through the machine.

g) Connect the pneumatic pipe to the air blow (8) and to the pneumatic valve (9).

h) The position of the photocells depends on the package. For photocell settings, see the MM.



1 Screw
2 Support bar
3 Conveyor
4 Cap detector
5 Screw
6 Screw
7 Cover
8 Air blow
9 Pneumatic valve

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4.5 Connections

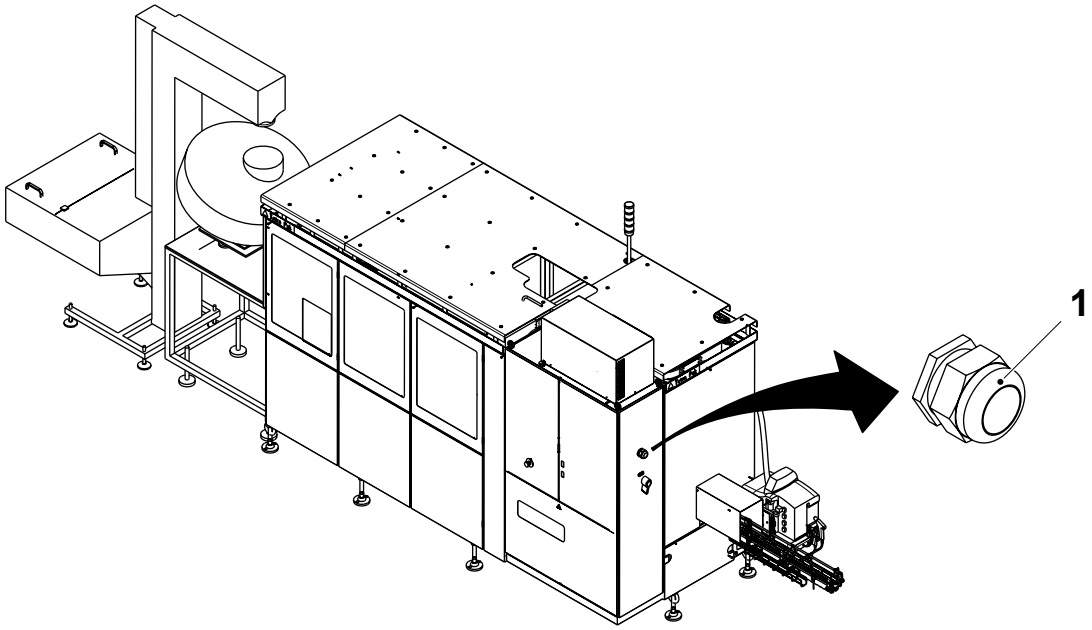
4.5.1 Electrical Connection

4.5.1.1 Power Supply

DANGER

Hazardous voltage.
The voltage is 400V inside the electrical cabinet. This can cause electrical shock or serious injury. In case of accident, immediately call for medical attention.

The figure below shows the electrical cable lead-in (1). The main electrical connection must be done according to the Main Connection Diagrams contained in the EM.



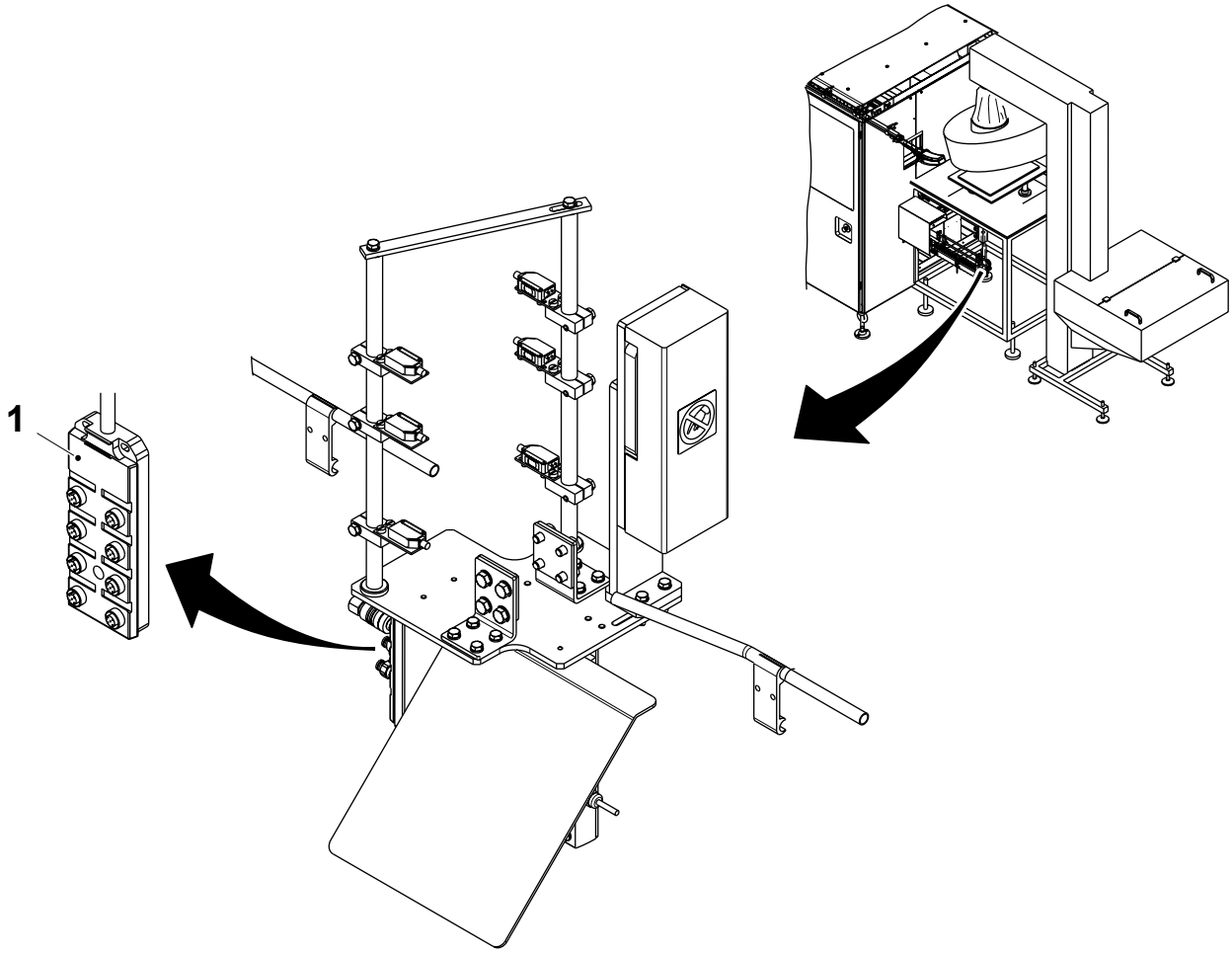
1 Electrical cable lead-in

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4.5.1.2 Cap Detector

a) Connect the electrical cables to the electrical block (1), see the EM.

b) To connect the electrical cable to the Drive and End unit, see the EM.



1 Electrical block

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4.5.1.3 Cap Sorter

a) Connect the electrical cable, 50W000 from the motor (1) to the connector (2) 50X000. The route of this cable is under the cap sorter and in the cable ducting.

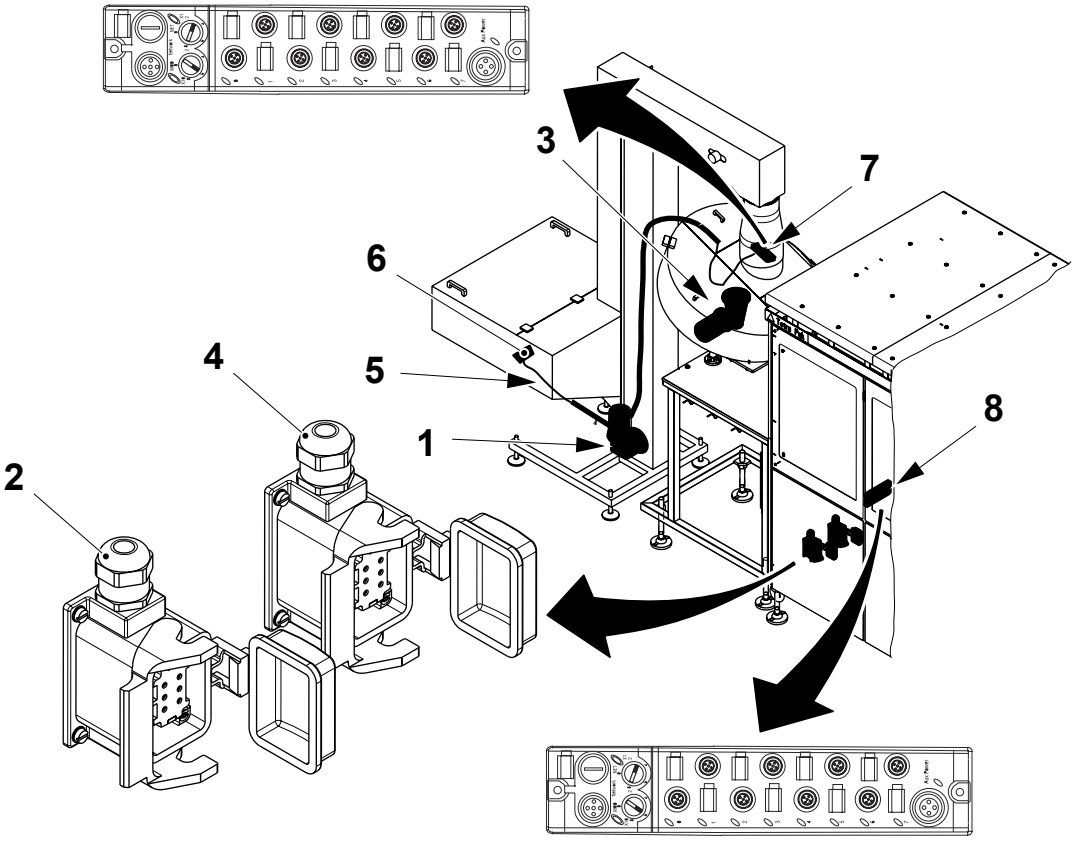
b) Connect the electrical cable, 50W100 from the motor (3) to the connector (4) 50X110. The route of this cable is under the cap sorter and in the cable ducting.

c) Connect the single cable (5) 50W012 from the sensor (6) to the connector No 2 on the armor block (7) 01K340. The armor block is on the underside of the drum.

d) Connect the Device Net cable, 81W421 to the armor block (8), 81K420.

e) Connect the cable, 09W203 from the safety switch to the cable 09W203.

f) Attach the earth cable to a suitable metal point.



1 Motor
2 Connector
3 Motor
4 Connector
5 Cable
6 Sensor
7 Armor block
8 Armor block

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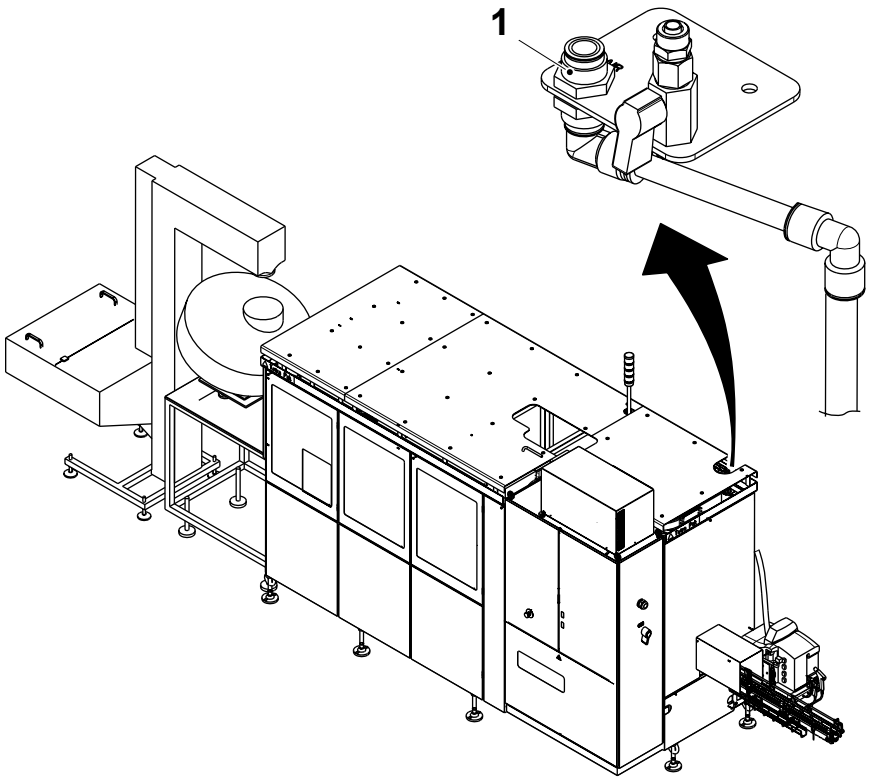
4.5.2 Compressed Air

WARNING

Risk of personal injury.

Make sure that the air supply is OFF before performing any connection work.

Connect the compressed air (1) as illustrated.

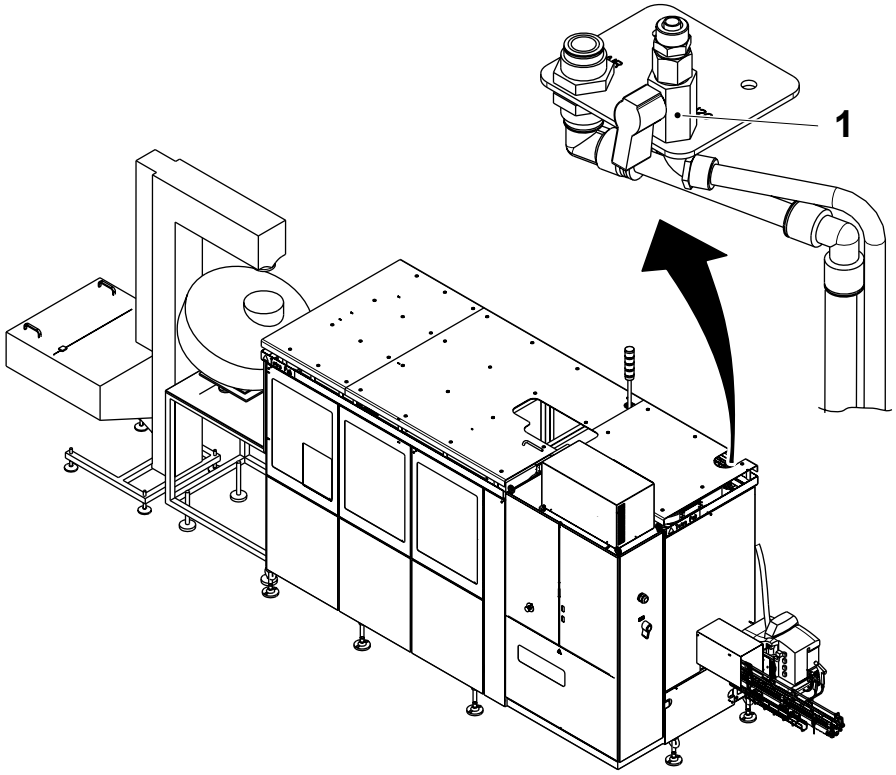


1 Compressed air connection

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4.5.3 Water

Connect the water connection (1) as illustrated.



1 Water connection

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4.6 Auxiliary Equipment

4.6.1 General

For the machine to work at its optimal efficiency, photocells, package traps and curves must be installed according to our recommendations, see 1.1 Installation Drawings.

4.6.2 Discharge Photocells, 2 lines (O.E.)

Install the discharge photocells according to 1.1 Installation Drawings.

4.6.3 Start Infeed Conveyor Photocell (O.E.)

For placement of the start infeed conveyor photocell see 1.1 Installation Drawings.

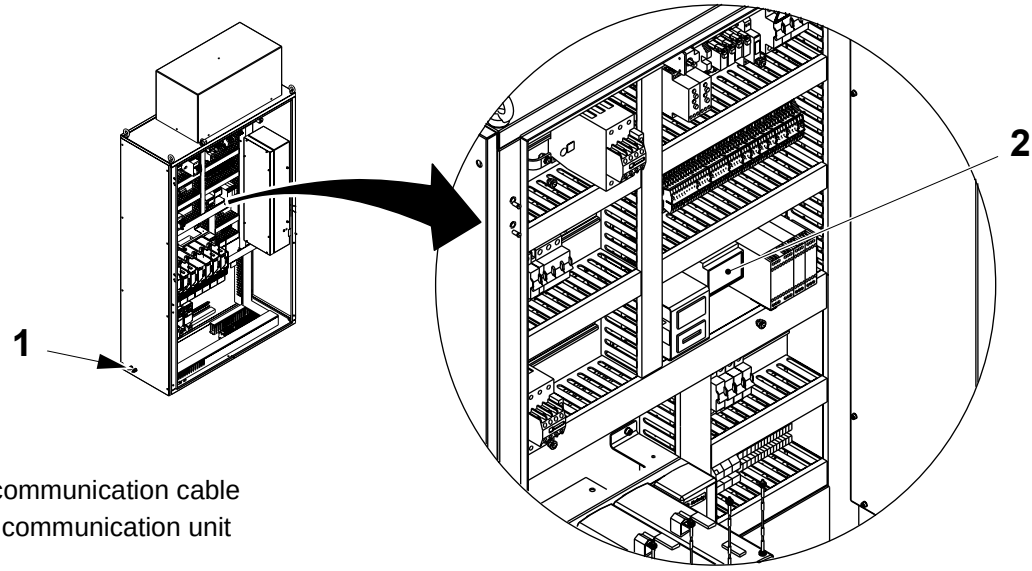
4.6.4 PLMS

PLMS software is installed in the machine. If PLMS data is required, it is necessary to connect a cable from the filling machine to the applicator power supply in the electrical cabinet. This cable requires the cable screen to be clamped to the chassis of the electrical cabinet, see the EM and the filling machine IM.

4.6.5 Line Communication (Gateway Communication)

Refer to the Circuit Diagram 2858294-0003, see the EM. The communication cable enters the electrical cabinet through a hole (1) on the left side of the electrical cabinet. The cable connects to the Gateway communication unit (2). If required, a cable is connected from the module to the next inline machine.

Note! If a cable hole in the electrical cabinet is not used, make sure the hole is sealed to stop the entry of liquids.



1 Hole for communication cable
2 Gateway communication unit

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5 Final Installation Check

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Final Installation Check - Description

This chapter describes the checks to do after installation work is completed and before commissioning this equipment.

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5.2 Lubricant Level Checks . . . . . 5 - 6

5.3 Safety Checks . . . . . 5 - 7

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5.1 Installation and Connection Checks

Use this check list to verify the completion of the installation work.

No.	Check	Done
1	Machine is level transversally and longitudinally.	
2	Utility connections work is done.	
3	Inspect the compressed air connection.	
4	Conveyor equipment is connected.	
5	Cap sorter connection work is complete.	
6	Electrical power cables are correctly connected. Make sure the PLMS cable, if installed, is clamped to the chassis of the electrical cabinet.	
7	All machine covers are fitted.	
8	Infeed and discharge tunnels are fitted.	
9	Cap sorter hopper is filled with caps.	
10	Check the hotmelt level is at least 50% of its tank capacity. Fill with adhesive if necessary.	
11	Upstream valves/switches are open and ON: – electrical power – cold water – compressed air.	
12	There are no leaks from the utility connections.	
13	Production line is flushed with water to eliminate residues.	
14	All crates and other packing martial is removed from the area and disposed of as agreed with the customer.	
15	All tools are removed from the machine.	

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5.2 Lubricant Level Checks

See the MM for details on the following lubricant level checks.

No.	Check	Done
1	Machine body - Lubrication system	

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5.3 Safety Checks

No.	Check	Done
1	All doors open and close correctly.	
2	All safety covers are secured.	
3	Operation of the EMERGENCY STOP push-buttons. See the Safety Precautions for details of location and use. Push each EMERGENCY STOP push-button. Make sure that the machine steps down to STEP 0. Make sure that the operating panel and the warning lamp show the correct alarm, see the OM.	
4	Open safeguards. Make sure that the operating panel and the warning lamp show the correct alarm. For location of safeguards see ii Safety Precautions, Safeguards.	
5	Safety signs are undamaged, are in the correct position and visible. Replace any missing or damaged safety signs. See ii Safety Precautions, Location of Safety Signs for details.	

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6 Preparation for Commissioning

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Preparation for Commissioning - Description

This chapter describes how to prepare and run the equipment for the first time.

Note! Commissioning covers only the functioning of the individual machine. A line performance test is required to check the functioning of the machine as part of a complete line. Check with the local service organisation as to what arrangements have been made for a line performance test.

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6.2 Utility Value Checks . . . . . 6 - 6
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6.3.1 Preparation . . . . . 6 - 7
6.3.2 Set-up Checks . . . . . 6 - 7
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6.1 Presence and Correctness Checks

No.	Check	Done
1	The TP No. on the program CD-ROM corresponds to the TP No. in the EM.	
2	The spare parts have been deposited in the spare parts stores.	
3	The protective equipment is available to the operator: – safety goggles – heat protective gloves – protective apron – shoes.	
4	All the documents correspond to the specific machine: – EM – IM – OM – MM – SPC – System drawings – Machine Specification Document – Final Inspection Report – Machine Deviation Report (if relevant).	
5	Caps and hotmelt supplies are of the correct type and are available in sufficient quantities for the purpose of commissioning and production.	
6	The key for the operator panel is present.	
7	The key for the electrical cabinet is present.	

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6.2 Utility Value Checks

Make sure that the utility values are set correctly. Ask for the assistance of the customer technical personnel if required. If values are incorrect, inform the customer technical personnel, see 1.3 Utility Connection Data.

No.	Check	Done
1	Electrical power supply: – voltage – max voltage fluctuation – frequency – fuse rating.	
2	Cold water supply: – pressure.	
3	Compressed air supply: – pressure.	

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6.3 Function Checks

6.3.1 Preparation

a) Make sure that the PLC program on the CD-ROM corresponds with that in the machine PLC. See the EM for further details.

b) Put the power supply disconnector to the ON position. Make sure that all electrical motors have the correct direction of rotation. See the EM for further details.

c) Prepare the machine for production. See the OM for further details.

d) Start up the package outfeed conveyor.

e) Step up the machine to PRODUCTION (STEP 3) according to the OM.

6.3.2 Set-up Checks

Do these set-up checks with the final package to make sure the machine is set for the package size. If this is done, it will improve the working efficiency of the machine. Refer to the MM for all the checks and settings listed in the table below.

No.	Check	Done
1	Set the outer belt position	
2	Set the package transfer X distance	
3	Set the package transfer Y distance	
4	Check the conveyor is parallel	
5	Set package conveyor height adjustment - fine setting (Flex)	
6	Check hotmelt glue bead position	

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6.3.3 Normal Operating Checks

No.	Check	Done
1	The package outfeed conveyor speed is set properly. To change the speed of the conveyor, go to the System Setting window in the control panel and select the PACKAGE TRANSFER UNIT (PTU) button, see the OM. Conveyor speed is shown in Hz. The packages must enter in the carrier chain smoothly and without problems.	
2	During the start sequence, check the hotmelt unit reaches working temperature within 40 minutes.	
3	During the start sequence, packages must enter the belt brake correctly.	
4	Caps must travel along the infeed conveyor smoothly and without causing any stops.	
5	Caps must enter the cap sequencer and the cap holders without problems.	
6	All pressures values are correct, see the MM for further details.	
7	There are no fluid leaks.	
8	There are no unusual noises which could indicate loose or misaligned parts.	
9	There are no unusual smells which could indicate internal leaks or burning of electrical circuits.	
10	Defective packages are ejected. Check that packages without caps are also ejected.	
11	Perform the package check procedure, see the OM for further details.	
12	Cap infeed empty function, see the OM for further details.	
13	Stop methods. Stop the machine according to the OM to verify the different stop functions.	
14	Perform external cleaning.	

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6.3.4 PLC Parameters

Note! Only skilled or instructed persons are allowed to make changes to the PLC parameters.

If necessary, see the MM for the PLC setup.

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6.4 Health and Safety Checks

No.	Check	Done
1	EMERGENCY STOP push-buttons. Press each EMERGENCY STOP push-button and make sure that the machine steps down to OFF (STEP 0).	
2	All doors, covers and guards. **Note:** Doors with electromagnetic switches cannot be opened when the machine is in production. For each door, cover or guard which has a safety switch installed, open the door, cover and guard and make sure that the control panel shows an alarm.	
3	Machine signs. Make sure that each safety sign on the equipment is undamaged and in the correct position. Replace any missing or damaged safety signs. See the Safety Precautions for further details.	

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7 Disassembly and Removal

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Disassembly and Removal - Description

This chapter contains information about how to safely disassemble and remove the machine for reuse in another location or for final disposal.

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7.1 General

WARNING

Risk of personal injury.

The cap applicator and the cap sorter must never be lifted as one unit. The assembled groups are unstable when lifted together and could cause personal injury. Disconnect the two units and lift separately.

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7.2 Disconnect Utilities

7.2.1 Compressed Air

WARNING

Risk of personal injury.

Make sure that air supply to the machine is switched OFF before performing any disconnection work.

a) Shut off the compressed air supplies.

b) Disconnect the compressed air, 4.5.2 Compressed Air

7.2.2 Electrical Connection

DANGER

Hazardous voltage.

Make sure that the electrical power is switched OFF upstream before performing any work on cables and electrical components.

a) Shut off the electrical power supplies.

b) Disconnect the electrical cables in accordance with the EM.

7.2.3 Water Connection

a) Shut off the cold water supply.

b) Operate the water gun to release the residual pressure.

c) Disconnect the cold water inlet supply. For location, see 4.5.3 Water.

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7.3 Disassemble Machine

WARNING

Risk of personal injury.

Before disassembling the machine, read the Safety precautions. If the safety precautions are not followed, there is risk of personal injury.

To disassemble the machine, follow the assembly instructions in the reverse order, see 4.4 Assembly.

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7.4 Storage Preparation

Note! If the machine is to be stored, make sure the storage conditions are followed, see 3.1.4 Storing the Crated Equipment

a) Follow the safety instructions in 4.1 Transporting the Uncrated Machine.

b) Move the equipment to its new position.

c) Level the equipment even if it is not going to be used.

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7.5 Lifting and Moving

WARNING

Risk of personal injury.

The machine may tilt if not observing the centre of gravity or the fork lift points. Failure to observe will result in personal injury.

a) Before lifting and moving the machine from its production site, do the following:

- check that the machine can be transported without any problems with the ceiling height, doors, passages, etc.
- make sure that the machine is lifted and moved in accordance with 1.2 Mass (Weight).

b) Move the equipment to its new position.

c) Level the equipment even if it is not going to be used.

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7.6 Return to the Manufacturer

Contact the local service organisation for further instructions and to arrange shipment.

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7.7 Disposal

If the equipment has to be permanently disposed of, perform the following operations.

a) Drain the central lubrication tank. Follow the manufacturer´s instructions for disposal of the liquid.

b) Disassemble the machine as far as possible and separate the following materials:
   - stainless steel (panels and doors)
   - cast iron
   - aluminium
   - glass (windows, etc.)
   - rubber (seals, O-rings, etc.)
   - nylon and other plastics
   - electrical cables
   - lubrication and pneumatic hoses
   - electrical components (batteries, etc.).

c) Recycle or dispose of all materials, groups and machine components according to the local regulations.

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Tetra Pak

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