

Delivery

Translation of the original operating manual



D01472



KAS 30ME

MC-Control

Keep for future use!

Machine type:	Delivery		
Configuration:	KAS 30ME, MC-Control,		
Type of document:	Translation of the original operating manual		
Version:	V1.2	Author:	Wolfgang Matzner
Status as of:	29.10.2012	Machine no.:	
Language:	U.S. English	File name:	BA_KAS30ME__MC_V 1.2_us
Manufacturer:	MBO Maschinenbau Oppenweiler Binder GmbH & Co. KG PO box 1169 71567 Oppenweiler GERMANY Tel.: +49 7191 46 0 Fax:+49 7191 46 34 http://www.mbo-folder.com info@mbo-folder.com		

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Label and CE Mark: For all questions relating to your machine, please contact your MBO agency.
You can find the address on our home page: www.mbo-folder.com.

Please gather the significant data for identification of the machine from the label on the machine.

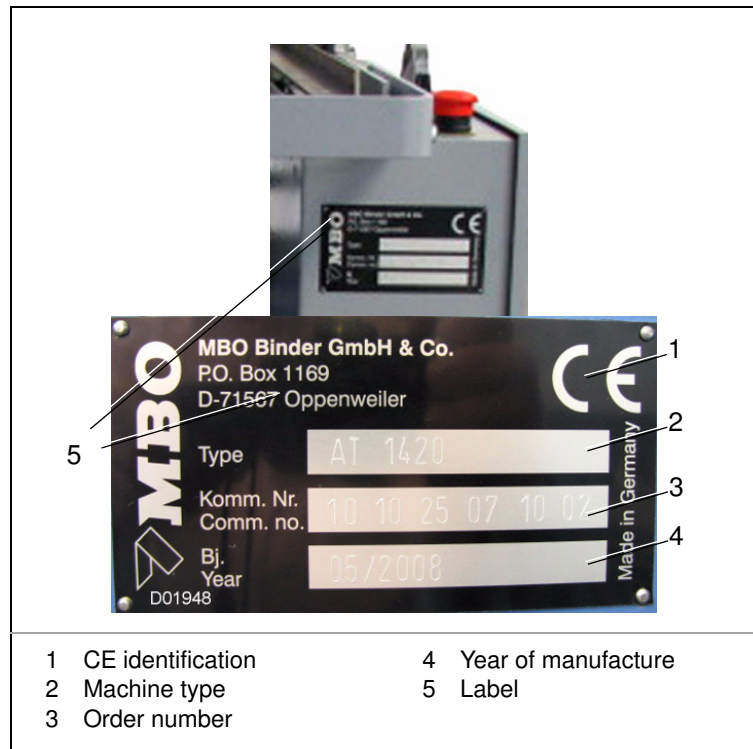


Figure 1: Label

Always specify these details for inquiries, service and spare parts orders:

- Order number
- Machine type

EC Declaration of Conformity

according to the EC Machinery Directive (2006/42/EC), Appendix IIA.

The manufacturer

MBO Maschinenbau Oppenweiler Binder GmbH & Co. KG
Grabenstraße 4-6
71570 Oppenweiler
GERMANY

hereby declares that the machine described below

Order no.

Designation	Delivery
Type	KAS 30ME

Year of manufacture

fulfills the provisions of the following EC directives

Machinery Directive	2006/42/EC
Low Voltage Directive	2006/95/EC
EMC Directive	2004/108/EC

Applied harmonized standards:

DIN EN ISO 12100:2011-03	DIN EN 1010-1:2011-06
DIN EN 1010-4:2010-12	DIN EN 60204-1:2007

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Oppenweiler, 10/29/2012

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List of contents

1	General remarks	
1.1	Important notes about the operating manual	7
1.2	Structure of the operating manual	8
1.3	Symbols, terms, and abbreviations	9
1.4	Description of safety messages	10
1.4.1	Safety messages	10
1.4.2	Safety alert symbol	10
1.4.3	Signal words	10
1.4.4	Components of a safety message	11
1.4.5	Components of a property damage message	11
1.4.6	Safety symbols	12
1.4.7	Warning triangle	13
1.5	User assessment of the operating manual	14
2	Basic safety instructions	
2.1	Intended use	15
2.2	Reasonably foreseeable misuse	16
2.3	Obligation and liability	17
2.4	Warranty	18
2.5	Residual risks	19
2.5.1	Transport, interim storage	19
2.5.2	Installation, initial operation	19
2.5.3	Adjustment and operation	19
2.5.4	Maintenance	19
2.5.5	Removing from operation, storage	20
2.5.6	Disposal	20
2.6	Life time	21
2.6.1	Life time of the machine	21
2.6.2	Life span of the safety-technical components	21
2.7	General safety instructions	22
2.7.1	Transport, interim storage	22
2.7.2	Installation, initial operation	22
2.7.3	Normal operation	22
2.7.4	Setting up/equipping	22
2.7.5	Maintenance and repair	23
2.7.6	Work on electrical equipment	23

2.8	Personnel, qualification, and duties	24
2.8.1	Qualification of the personnel	24
2.8.2	Duties of the operator	26
2.8.3	Duties of the operating personnel	27
2.8.4	Duties of the maintenance personnel	27
2.9	Personal protective kit	28
2.9.1	Operation and set-up	28
2.9.2	Operational maintenance (cleaning)	28
2.10	Work areas and work places	29
2.11	Markings on the machine	30
2.11.1	Overview	30
2.11.2	Position and meaning	31
2.12	Directions for emergencies	34
3	Product description	
3.1	Important notices about the product	35
3.1.1	Overall view	35
3.1.2	Equipment	35
3.2	Technical data	36
3.2.1	Floor plan	36
3.2.2	Characteristics	36
3.2.3	Emissions	36
3.2.4	Weights, fork lifts, and floor requirements	37
3.2.5	Ambient conditions	37
3.2.6	Supply	38
4	Structure and Function	
4.1	Structure of complete overview	39
4.1.1	Functioning description	39
4.2	Models	40
4.2.1	Explanation of term	40
4.3	Safety and protective devices	40
4.3.1	Overview	40
4.3.2	EMERGENCY STOP palm button	41
4.3.3	Additional protective devices	41
4.3.4	Faulty safety and protective devices	42
4.3.5	Check safety and protective devices	42
4.4	Checklist for safety and protective devices	42
5	Operating and display elements, operating modes	
5.1	Main control console	43

5.2	Operating modes	43
5.2.1	Machine control	44
5.2.2	Adapter boxes	44
5.2.3	Self-control	45
6	Transport/Set-up/Start-up	
6.1	Introduction	47
6.1.1	Qualification of personnel	47
6.1.2	Safety instructions	48
6.1.3	Property damage messages	48
6.2	Brief instructions	48
6.3	Transportation	49
6.4	Set-up	49
6.4.1	Unpacking the delivery	50
6.4.2	Setting up the delivery	50
6.5	Remove the rust preventing agents	50
6.6	Start-up	51
6.6.1	Brief instructions	51
6.6.2	Checking the supply voltage	51
6.6.3	Checking the control cabinet cover	51
6.6.4	Checking machine functions	51
6.7	Final check of the protective devices	52
6.8	Inspection after first start-up	52
7	Adjustment and operation	
7.1	Introduction	53
7.1.1	Qualification of personnel	53
7.1.2	Safety instructions	54
7.1.3	Property damage messages	55
7.2	Operating	56
7.2.1	EMERGENCY STOP palm button	56
7.2.2	Starting/stopping the machine	57
7.2.3	Sheet feed production/single sheet	57
7.2.4	Setting the speed	58
7.2.5	Preselection counter	58
7.2.6	Error messages	59
7.3	Adjustment	59
7.3.1	Overview of adjustment elements	59
7.3.2	Brief instructions	60
7.3.3	Positioning delivery	61
7.3.4	Adjusting the round belt	62
7.3.5	Setting multiple-up production	63

7.3.6	Setting marking device	64
7.3.7	Adjusting transport tapes to the sheet format	66
7.3.8	Setting stop to sheet length	67
7.3.9	Setting distance between the transport tapes	68
7.3.10	Adjusting the pile stop	69
7.4	Removing the paper jam	70
8	Maintenance	
8.1	Introduction	71
8.1.1	Qualification of personnel	71
8.1.2	Safety instructions	72
8.2	Service	74
8.2.1	Ordering spare and wear parts	74
8.3	Operational maintenance	75
8.3.1	Checking the safety devices	75
8.3.2	Cleaning	76
8.3.3	Cleaning agent recommendation	77
8.3.4	Cleaning of the machine	77
8.3.5	Cleaning the transport tapes	78
8.3.6	Cleaning the optical sensors	78
8.4	Maintenance	79
8.4.1	Checking the round belts	79
8.4.2	Checking the drive belt	80
8.4.3	Checking the transport tapes	81
8.5	Lubrication	82
8.6	Maintenance, lubrication, and cleaning plan	83
8.7	Repair	84
9	Shutdown, storage	
9.1	Introduction	85
9.1.1	Qualification of personnel	85
9.1.2	Property damage messages	85
9.2	Shutdown	85
9.2.1	Temporary shutdown:	85
9.2.2	Final decommissioning	86
9.3	Storage	86
10	Disposal	
10.1	Introduction	87
10.1.1	Qualification of personnel	87
10.1.2	Property damage messages	87

10.2 Disposal/recycling 88

1 General remarks

With this MBO product, you have acquired a high-quality industrial product with which you, if you follow the operating manual carefully, can achieve the highest reliability and productivity.

1.1 Important notes about the operating manual

This operating manual must be read by everybody who transports, sets up, connects, operates, maintains, repairs or dismantles this machine.

Only if the contents of the operating manual have been understood and followed in all points by all people is safe use of the machine possible. This applies especially for the chapter about safety.

This operating manual contains important notes about operating the machine safely, properly, and economically.

Following these notes helps:

- To avoid hazards.
- To minimize repair costs and downtimes.
- To increase the reliability and service life of the machine.

Completion:

- The owner/operator must complete this operating manual with information with respect to federal and national regulations concerning accident control and prevention.

Keep:

- This operating manual is part of the machine. It must be available on the machine throughout the machine's entire service life.

If you sell the machine:

- Be sure to give this operating manual to any subsequent owner or user of the machine.

We reserve the right to make technical modifications to improve the machine, even if they are not taken into account in this operating manual.

1.2 Structure of the operating manual

The chapters of the operating manual are listed in the table. It also describes the essential content of these chapters as well as the target groups at whom the chapters are directed.

No.	Chapter	Contents	Target group
	Table of contents	The detailed table of contents serves as a search tool.	Owner/operator Operating personnel Maintenance personnel Service technicians.
1	General	General instructions	Owner/operator Operating personnel Maintenance personnel Service technicians
2	Safety instructions	Safe handling, notes about hazards	Owner/operator Operating personnel Maintenance personnel Service technicians
3	Product description and product data	Machine description/technical data	Owner/operator Operating personnel Maintenance personnel
4	Structure and function	Structure and function	Operating personnel, Maintenance personnel Service technicians
5	Operating and display elements, operating modes	Operating elements and operating modes	Operating personnel Maintenance personnel Service technicians
6	Transport, interim storage, setup and commissioning	Specifications for transport, interim storage, setup and commissioning.	Transport personnel Maintenance personnel Service technicians
7	Adjustment and operation	Preparation for production	Operating personnel Maintenance personnel Service technicians
8	Maintenance	Maintenance and service	Operating personnel Maintenance personnel Service technicians
9	Shutdown, storage and putting the machine back into operation	Shutdown, storage conditions	Owner/operator Operating personnel Maintenance personnel Service technicians
10	Disposal	Dismantlement, environmentally-friendly disposal	Owner/operator Maintenance personnel Service technicians

Tabelle 1: Structure of the operating manual

1.3 Symbols, terms, and abbreviations



Symbol	Explanation
▷	Symbol indicates an instruction for action; sequence is not specified.
1) 2)	Numbered instruction for action; adhere to sequence.
< STOP >	Pushbutton with the label that is between the brackets (e.g. Stop).
	Additional information for use of the machine.
	Important notice, please observe.

Tabelle 2: Symbols, terms, and abbreviations

1.4 Description of safety messages

1.4.1 Safety messages

Word messages that provide information primarily about the nature of a hazardous situation, the consequences of not avoiding a hazardous situation, and/or method(s) for avoiding a hazardous situation.

1.4.2 Safety alert symbol



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

1.4.3 Signal words

A signal word calls attention to a safety message or messages, or a property damage message or messages, and designates a degree or level of hazard severity.





Signal word panel	Definition	Objective
	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.	Avoidance of personal injury.
	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.	Avoidance of personal injury.
	CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.	Avoidance of personal injury.
	NOTICE indicates a property damage message.	Avoidance of property damage.

Tabelle 3: Definition of signal words

1.4.4 Components of a safety message

A safety message contains the following components:

- Signal word panel.
- Type of hazard.
- Potential consequences of the hazard.
- Evasive/avoidance actions to be taken.

Example:

Safety message:



Type of hazard.

Potential consequences of the hazard.

Evasive/avoidance actions to be taken.

1.4.5 Components of a property damage message

A property damage message contains the following components:

- Signal word.
- Type of hazard.
- Potential consequences of the hazard.
- Evasive/avoidance actions to be taken.

Example:

Property damage message:



Type of hazard.

Potential consequences of the hazard.

Evasive/avoidance actions to be taken.

1.4.6 Safety symbols

A safety symbol representation intended to convey a message without the use of words.

It may represent a hazard, a hazardous situation, a precaution to avoid a hazard, a result of not avoiding a hazard, or any combination of these messages.




Description	Significance
	<p>Prohibition symbol Red border, white background, black symbol.</p> <p>Safety symbol that forbids a behavior that could cause hazard.</p>
	<p>Warning triangle Yellow background, black symbol.</p> <p>Safety symbol that warns about a hazard.</p>
	<p>Mandatory symbol Blue background, white symbol.</p> <p>Safety symbol that prescribes a particular behavior.</p>
	<p>Rescue symbol Green background, white symbol.</p> <p>Safety symbol that identifies the rescue path or the path to a place where you can get help or find rescue equipment in case of an emergency.</p>
	<p>Fire protection symbol Red background, white symbol.</p> <p>Safety symbol that identifies the location of fire alarm or fire extinguishing equipment and/or the path to this equipment in case of an emergency.</p>

Tabelle 4: Safety symbols

1.4.7 Warning triangle


Description	Significance
	Warning of a hazardous area, general.
	Warning of hazardous electric voltage.
	Warning of crushing of body parts.
	Warning of rotating rollers.
	Warning of hand injuries due to moving rollers.
	Warning of crushing of hand.
	Warning of crushing injuries due to noise damping hoods.
	Warning of rotating machine parts.
	Warning of lifting heavy machine parts.

Tabelle 5: Warning triangle








Description	Significance
	Warning of tipping machine parts.
	Warning of infeed points.
	Warning of sharp knives on the slitter shafts.
	Warning of falling tools.
	Warning of substances detrimental to health.
	Warning of oxidizing substances.
	Warning of hot surface.
	Warning of tripping hazards.

Tabelle 5: Warning triangle

1.5 User assessment of the operating manual

Our operating manuals are updated regularly. You are kindly requested to recommend any improvements to make the instructions user-friendly.

2 Basic safety instructions

Knowledge of the basic safety instructions and safety regulations is a basic requirement for the safe handling and fault-free operation of this machine.

- The operating manual must be heeded by all people who work on or at the machine.
- Read and understand the operating manual before working with the machine.
- Always keep the operating manual where the machine is being used.
- The operating manual must always be freely available to the operating and maintenance personnel.
- Also heed the applicable accident prevention and environment protection rules and regulations for the place where the machine is used.

2.1 Intended use

- The machine is intended exclusively for the processing of paper webs. The specifications relative to format and grammage in the "Specifications" chapter must be complied with.
- The machine is intended exclusively for one-man operation.
- The machine is intended exclusively for operation in a flawless technical state.
Any failures that may endanger safety must be remedied immediately by trained personnel, or a specialist from the manufacturer or supplier.
- The machine must be operated by specially trained and instructed technicians only.
- Troubleshooting, maintenance and service must be carried out by trained maintenance personnel only.
- Heed all notes in this operating manual.
- Heed the local safety regulations and accident prevention regulations.
- Adhere to the inspection and maintenance intervals.
- Use only original wearing parts and spare parts.



Use the machine only as intended and with the safety system in a flawless state.

This is the only way to guarantee the machine's operating safety.

2.2 Reasonably foreseeable misuse

In case of reasonably foreseeable misuses of the machine, the manufacturer's EU declaration of conformity is voided and thus automatically the operating permission.

Reasonably foreseeable misuses are:

- Operation in an area subject to explosion.
- Operation with the safety equipment removed.
- Exceeding of the technical values specified for normal operation.
- Individual changes and rebuilding.
- Maintenance and cleaning intervals not adhered to.
- Maintenance and repair work not done correctly.
- Wearing parts not replaced.
- Improper use.

EMC behavior: The electromagnetic compatibility (EMC) of the machine can be impaired by additions or changes of any kind.

Therefore, do not make any additions or changes to the machine without consulting the manufacturer and procuring written permission.

Spare and wearing parts: The use of spare parts and wearing parts from third-party manufacturers can cause risks.

Use only original parts or parts approved by the manufacturer.

The manufacturer assumes no liability for damage from the use of spare parts and wearing parts not approved by the manufacturer.

2.3 Obligation and liability

The machine is built using the latest technology and according to acknowledged safety rules.

Nonetheless risks and damage can occur when using it:

- to the body and life of the operator or third parties,
- to the machine itself,
- to other property.

If the machine is:

- operated by untrained or uninstructed personnel,
- not used according to its intended use,
- not or improperly maintained or serviced.

The machine must only be used:

- For the intended use.
- If it is in perfect condition with respect to safety.
Faults that can compromise safety must be remedied immediately.

2.4 Warranty

Our "General sales and delivery conditions" apply here.

Warranty and liability claims for personal injury and property damage are excluded if they are due to one or more of the following causes:

- Improper use of the machine.
- Improper assembly, start-up, operation or maintenance of the machine.
- Operation of the machine with improperly-mounted or defective safety devices and equipment.
- Failure to heed the notes in the operating manual with respect to transport, set-up, start-up, operation, adjustment, maintenance, and storage of the machine.
- Individual constructional changes to the machine.
- Failure to adhere to maintenance and cleaning intervals that exclude a breakdown of the machine.
- Improper monitoring of machine parts that are subject to wear, such as belts, brushes, and couplings.
- Installation of spare and wearing parts that were not ordered from the manufacturer.
- Cases of catastrophe and acts of God.

2.5 Residual risks

A risk analysis with risk assessment according to DIN EN ISO 12100 was conducted for this machine.

The construction and model of the machine based on this analysis corresponds to the state of technology.

You can avoid residual risks by heeding and implementing these specifications:

- Warning and safety notes on the machine.
- General safety notes and special warning notes in this operating manual.
- Operating manual of the machine manufacturer/plant manufacturer.
- Operating manual of the owner/operator.

The existing residual risks are listed in the following chapters according to the various life phases of the machine.

2.5.1 Transport, interim storage

- Use of unsuitable fork lifts.
- Tipping machine parts during the unloading process.
- Insufficient properties and condition of the underfloor.
- Incorrect storage

2.5.2 Installation, initial operation

- Use of unsuitable fork lifts.
- Tipping machine parts during the unloading process.
- Insufficient properties and condition of the underfloor.
- Improper alignment of the machine components.
- Incorrect network voltage
- Dismounted safety equipment.
- Stumbling points due to cables lying around.

2.5.3 Adjustment and operation

- Dismounting, bridging or working around safety devices and equipment.
- Operation without protective covers.
- Rotating machine parts.
- Infeed points
- Stumbling points due to cables lying around.

2.5.4 Maintenance

Operational maintenance:

- Rotating machine parts.
- Operation without protective covers.

- Heavy contamination.
- Improper cleaning
- Unsuitable cleaning agents.
- Incorrect use of cleaning agents.
- Used cleaning cloths.
- Improper maintenance intervals, lubrication intervals, and cleaning intervals with multi-shift operation.

Maintenance:

- Hazardous electrical voltage.
- Dismounting, bridging or working around safety devices and equipment.
- Operation without protective covers.
- Rotating machine parts.
- Winding up.
- Incorrect/poor maintenance tools.
- Improper maintenance.
- Improper maintenance intervals, lubrication intervals, and cleaning intervals with multi-shift operation.

Repair:

- Improper repair.

2.5.5 Removing from operation, storage

- Incorrect storage.

2.5.6 Disposal

- Improper disposal.

2.6 Life time

2.6.1 Life time of the machine

The life time of this machine is designed for 20 years.

2.6.2 Life span of the safety-technical components

All components of the control-technical safety circuits have a life span of more than 20 years.

2.7 General safety instructions

2.7.1 Transport, interim storage

- Only specially-trained and authorized technicians may transport the machine.

2.7.2 Installation, initial operation

- Only specially-trained and authorized technicians may install and commission the machine.

2.7.3 Normal operation

- Only instructed operating personnel may operate the machine.
- The machine may be operated only if all safety devices, such as protective hoods and EMERGENCY STOP palm buttons, are present and fully functional.
- At least once per shift, the machine must also be checked for externally-visible damage. Changes, including to the operating behavior, must be reported immediately.
- Machine parts may not be used as climbing aids. If higher parts of the machine must be reached. If a suitable working stage or other platform must be used, it must correspond to the safety requirements, e.g. with respect to height, stability, etc.

2.7.4 Setting up/equipping

- Only specially-trained and authorized personnel may set up the machine.
- Inform operating personnel before starting set-up.
- If the machine is switched off for the set-up, it must be secured against unauthorized or inadvertent switching on again.
Use a padlock to secure the main switch against switching-on. If necessary, attach a danger sign on the main switch.
- Machine parts may not be used as climbing aids. If you need to reach higher-up machine parts, use a suitable working stage or other platform. Make sure that it corresponds to the safety requirements, e.g. with respect to height, stability, etc.
- If larger components or parts are replaced, corresponding lift equipment must be used to transport the components. Only use suitable and technically-perfect lift equipment and load suspension devices with sufficient carrying capacity. Secure components or parts so that they present no danger.
Do not linger or work under hanging loads.
- After completion of the work, do not leave any tools or other loose objects lying on the machine.

2.7.5 Maintenance and repair

- Maintenance and service work may only be performed by specially trained technical personnel.
- Inform operating personnel before beginning service and maintenance work. Secure the service area if necessary.
- For all service and maintenance work, heed the switch-on and switch-off procedures according to the operating manual.
- Heed the prescribed maintenance and service intervals according to the operating manual.
- If the machine is switched off for service and/or maintenance work, it must be secured against unauthorized or inadvertent switching on again.
Use a padlock to secure the main switch against switching-on. If necessary, attach a danger sign on the main switch.
- If the dismantling of safety equipment is necessary during maintenance and service work, it must be replaced and checked to make sure it is functional immediately after completion of the work.
- After completion of the work, do not leave any tools or other loose objects lying on the machine.
- All operating and auxiliary materials as well as spare parts no longer needed must be disposed of safely and in environmentally-appropriate fashion.

2.7.6 Work on electrical equipment

- Work on electrical systems or equipment may only be performed by an electrician or a trained person under the management and supervision of an electrician according to the standards DIN VDE 0105-100 / DIN EN 50110-1 and BGV A3.
- In case of faults in the electrical power supply, the machine must be switched off immediately.
- Only use original fuses with the prescribed amperage.

2.8 Personnel, qualification, and duties

All activities at or on the machine must be carried out by authorized personnel only.

Authorized personnel is divided into several groups:

- Operator
- Operating personnel
- maintenance personnel

The authorized personnel must:

- have reached the age of 18,
- know and be able to apply the accident prevention regulations and safety instructions for the machine,
- have read Chapter “2 Basic safety instructions” and be able to apply and implement it in practice,
- be trained and instructed according to the rules of conduct in the event of a fault,
- have the physical and mental abilities to carry out his or her responsibilities, tasks, and activities at or on the machine,
- be trained and instructed in accordance with his or her responsibilities, tasks, and activities at or on the machine,
- have understood and can implement practically the operating manual with respect to responsibilities, tasks, and activities for the machine.

2.8.1 Qualification of the personnel

This table lists the necessary qualification of the personnel related to the various activities at or on the machine.

	Specially trained personnel	Instructed operating personnel	Instructed personnel with specialized training (mechanical/ electrical engineering)
Transportation	X	-	-
Interim storage	X	-	-
Set-up	-	-	X
Electrical connections	-	-	X
Network connection	-	-	X
Start-up	-	-	X
Troubleshooting (mechanical/electrical)	-	-	X
Setting up, equipping	X	X	-
Operating	-	X	-
Cleaning	-	X	-
Maintenance	X	-	X
Repair	-	-	X
Shutdown	-	-	X
Bearing assembly	X	-	-
Disposal	X	-	-

Table 6: Qualification of personnel
 Legend: X authorized, - not authorized

2.8.2 Duties of the operator

The owner/operator is responsible for

- the machine being operated only as intended,
- the machine being operated only when it is fully functional, safe and reliable,
- the machine being maintained and cleaned according to the specifications in the maintenance and cleaning schedule,
- the machine is protected against unauthorized use,
- the necessary personal protective equipment being available,
- the necessary personal protective equipment being worn,
- only authorized personnel having access to the machine,
- the authorized personnel being adequately qualified,
- the authorized personnel being instructed in all applicable questions of workplace safety, accident prevention, and environmental protection,
- the authorized personnel has read and understood the operating manual,
- the operating manual is always kept where the machine is used and it is freely accessible to the operating and maintenance personnel,
- the safety and warning signs on the machine are kept in an easily legible condition,
- a risk assessment of the entire machine system being carried out and its results being summarized in operating manual,
- identified defects or abnormal operating states/malfunctions being remedied immediately,
- operation of the machine being ceased during troubleshooting.

The requirements of the EC Directive for use of equipment 2007/30/EC must be complied with.

2.8.3 Duties of the operating personnel

The operating personnel must:

- be trained and instructed,
- use the machine as intended,
- wear the necessary personal protective equipment,
- observe the basic regulations regarding workplace safety and accident prevention,
- read and heed the chapter “2 Basic safety instructions” and the safety instructions in this operating manual,
- immediately put the machine out of operation in the event of defects or abnormal operating states/malfunctions,
- immediately report any identified defects or abnormal operating states/malfunctions.

The operating personnel is responsible for

- protecting the machine against unauthorized use,
- operating the machine only when it is fully functional, safe and reliable,
- carrying out the cleaning according to the cleaning schedule.

2.8.4 Duties of the maintenance personnel

The maintenance personnel must:

- be trained and instructed,
- use the machine as intended,
- wear the necessary personal protective equipment.

The maintenance personnel is responsible for

- protecting the machine against unauthorized use,
- the maintenance being carried out according to the maintenance schedule.

2.9 Personal protective kit

2.9.1 Operation and set-up



This personal protective kit must be provided and worn for the operation and set-up of the machine:

- Safety shoes

2.9.2 Operational maintenance (cleaning)



This personal protective kit must be provided and worn for the proper maintenance (cleaning) of the machine:

- Safety glasses
- Suitable safety gloves
- Safety shoes



2.10 Work areas and work places

- The machine is intended exclusively for operation by one person.
- The figure shows the most important work places as well as the work area and service area of the machine.
- The necessary work areas for operation, assembly, start-up, and maintenance are highlighted in gray and should be at least 100 cm.
- The service area is highlighted shaded.
- The possible work places are marked with an "X."

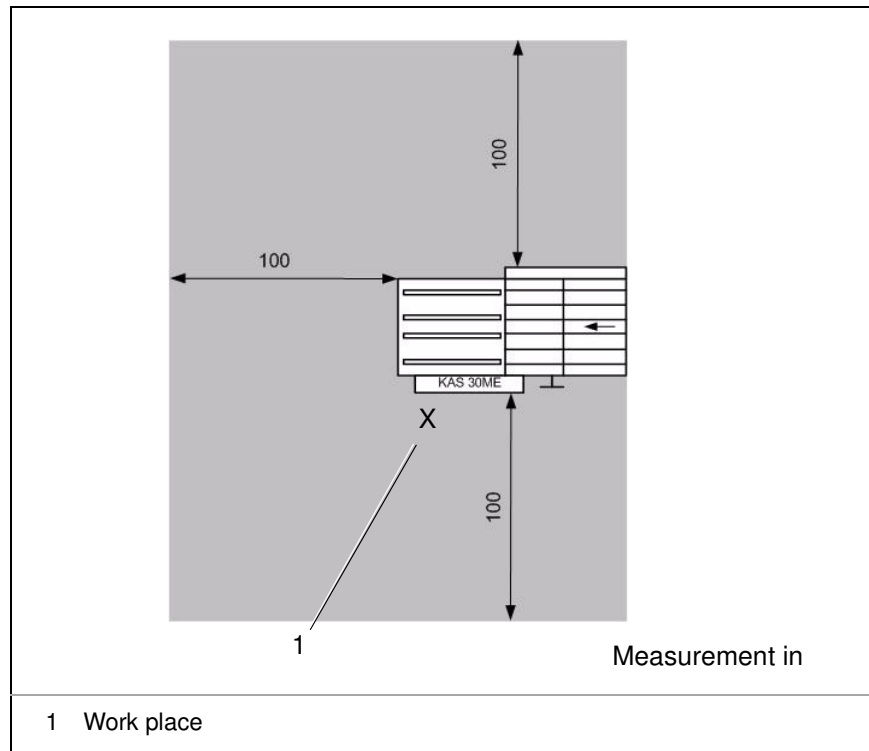


Figure 2: Work area and work place

2.11 Markings on the machine

These markings must be on the machine and in an easily legible condition. If the markings are damaged or illegible, they must be replaced. For the corresponding MBO part number, please see the chapter “2.11.2 Position and meaning”.

2.11.1 Overview

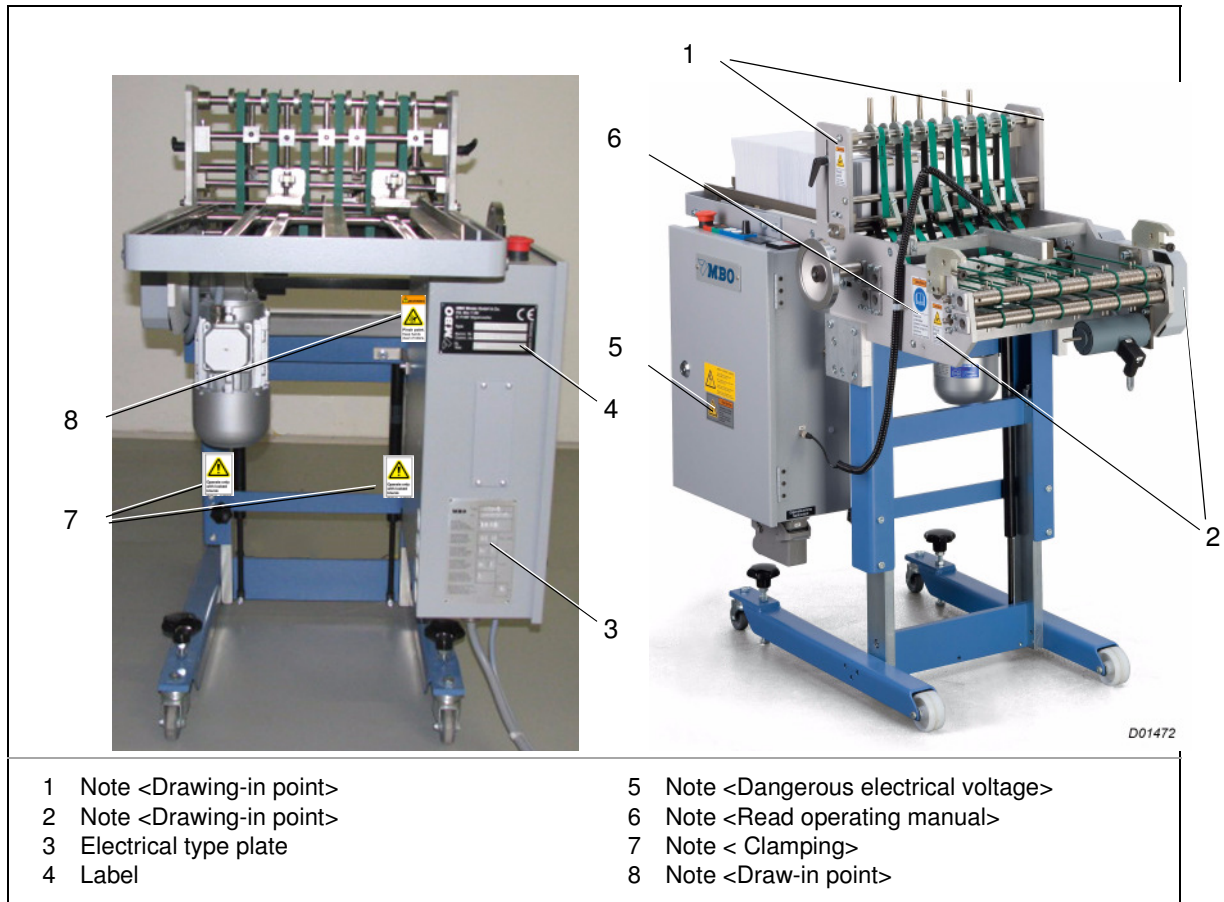
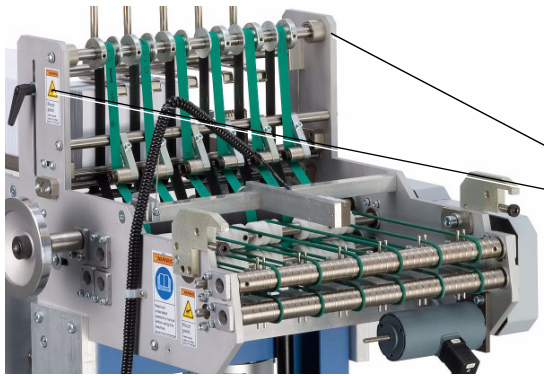

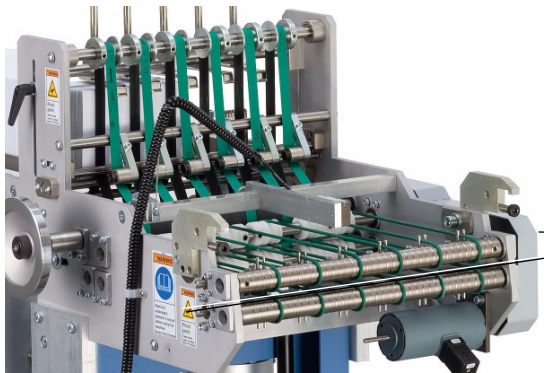


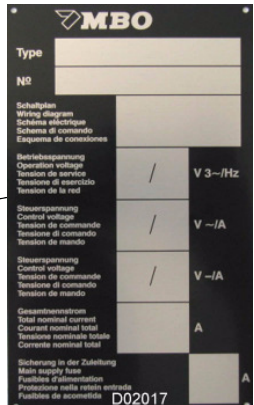




Figure 3: Overview

2.11.2 Position and meaning

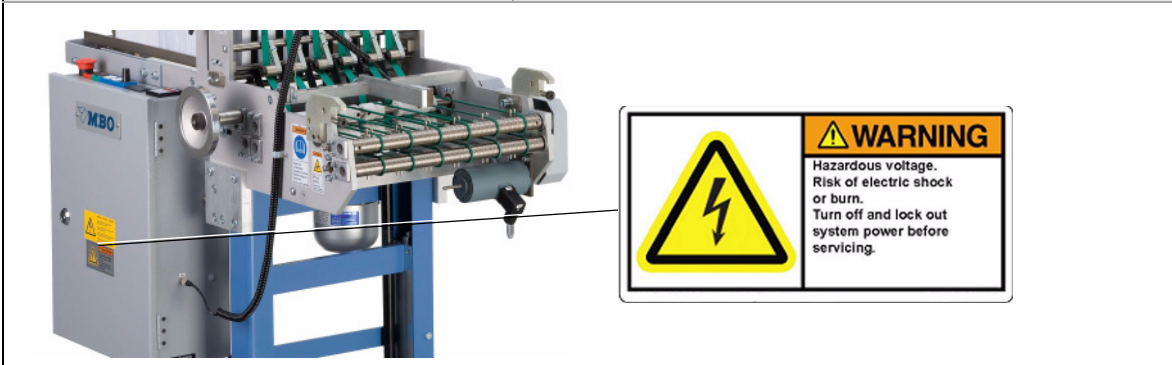
Pos. 1	MBO part number: 01310945
 	
<p>Meaning:</p> <p>Pinch point, rotating roller. Drawing-in and crush hazard. Never reach towards the shafts while the machine is running. (Operator side and drive side)</p>	

Pos. 2	MBO part number: 01310945
 	
<p>Meaning:</p> <p>Pinch point, rotating roller. Drawing-in and crush hazard. Never reach towards the shafts while the machine is running. (Operator side and drive side)</p>	

Pos. 3	MBO part number: 10.5171.026
	
<p>Meaning: Electrical type plate</p>	

Pos. 4	MBO part number: 10.5171.025
	
<p>Meaning: Label</p>	

Pos. 5	MBO part number: 1313998
---------------	---------------------------------

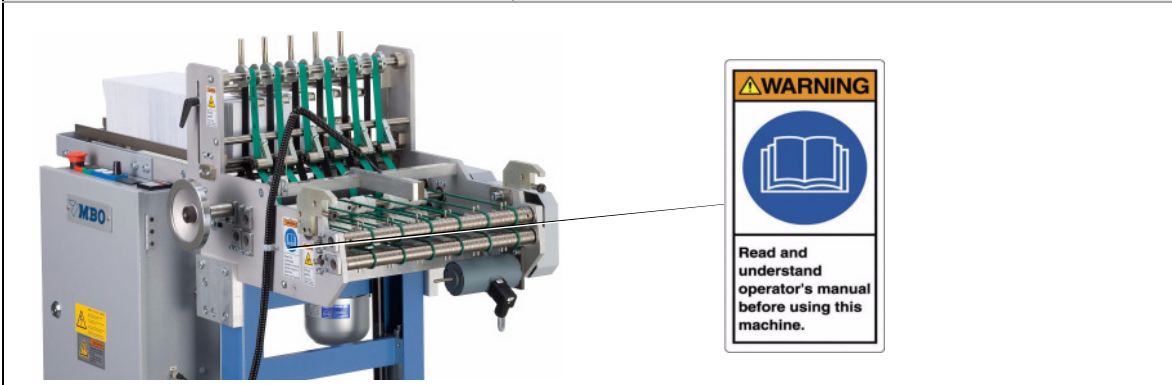


Meaning:

Hazardous voltage.
Risk of electrical shock or burn.

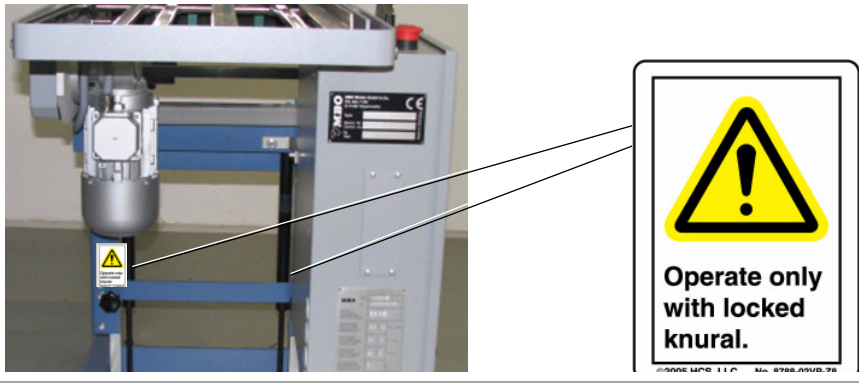
- Work on the electric components of the machine may be performed by a licensed electrician only.
- Observe the local occupational safety regulations and electrotechnical regulations.
- Turn the main switch to the position <0>.
- Use a padlock to secure the main switch from unintentionally switching on again.
- Even when the main switch is switched off, hazardous residual voltage is present at the terminals of the frequency converter. (Observe the capacitor discharge time (KEB 5 min, Telemecanique 15 min)).

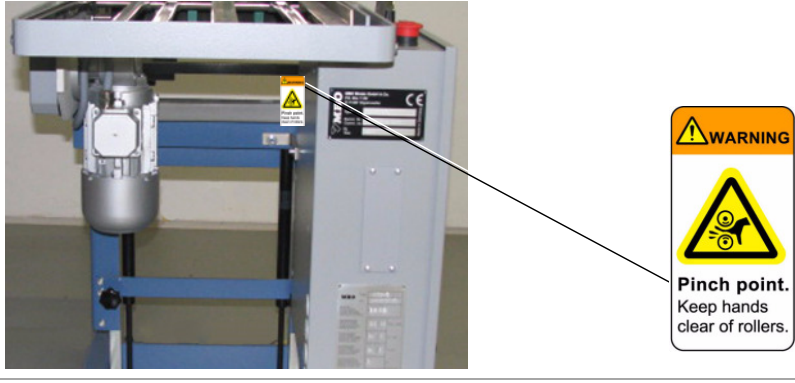
Pos. 6	MBO part number: 1310986
---------------	---------------------------------



Meaning:

- Read and understand this manual before using this machine to avoid injury.
- Improper use of the machine can result in serious injury or death.
- Follow the safety information in this manual.
- Follow the local accident prevention regulations and environmental regulations.
- Keep this manual.

Pos. 7	MBO part number: 01310895
	
<p>Meaning: Crushing hazard. Operate only with locked knural.</p>	

Pos. 8	MBO part number: 01310945
	
<p>Meaning: Pinch point, rotating roller. Drawing-in and crush hazard. Never reach towards the rollers while the machine is running.</p>	

2.12 Directions for emergencies

The operator must add notes with respect to national regulations concerning accident prevention and protection to the operating manual.

3 Product description

3.1 Important notices about the product

3.1.1 Overall view

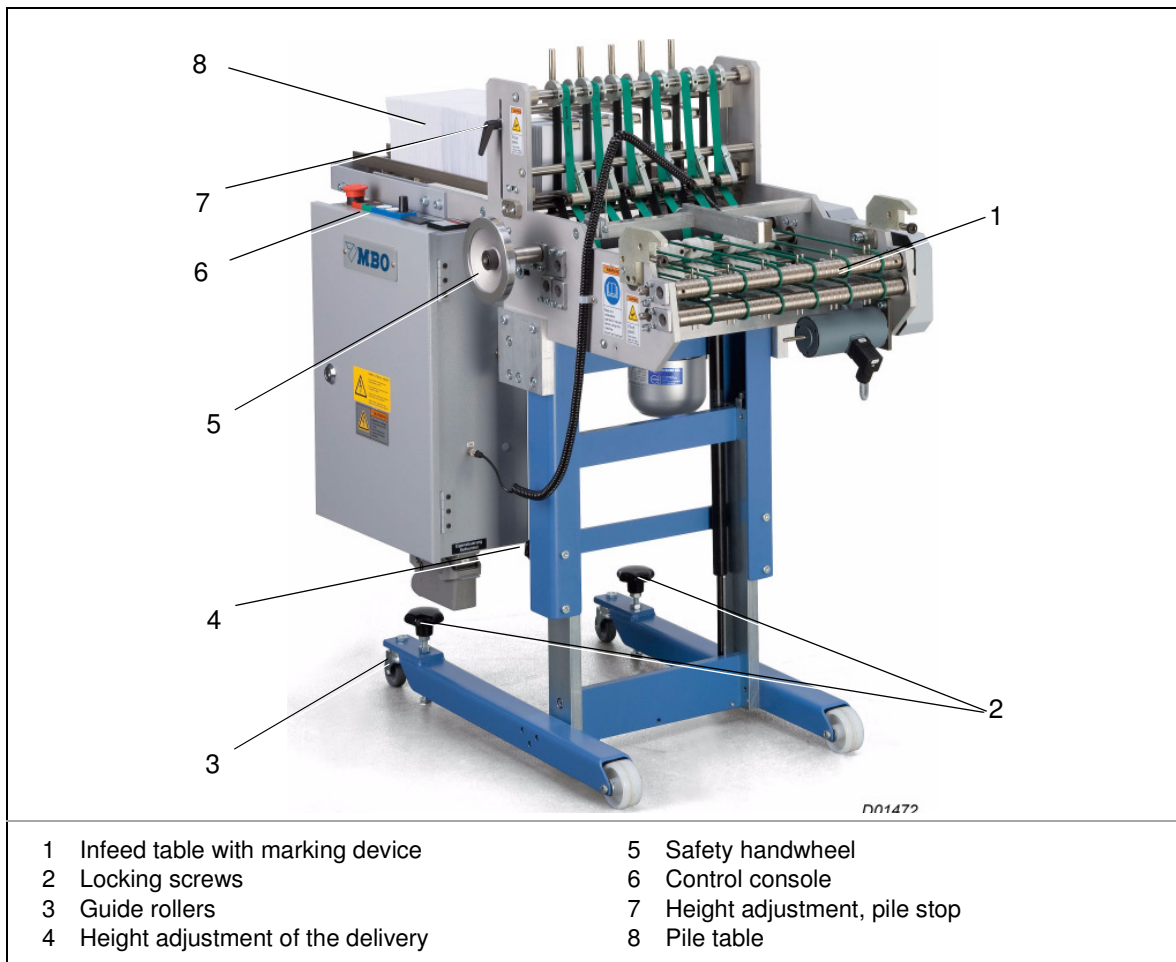


Figure 4: Overall view

3.1.2 Equipment

- Mobile discharge for one-up and two-up production.
- Special delivery technology for especially small-format products.
- Infeed table with round belt for spreading the products for multiple-up production.
- Marking device for shifting in package.
- Continuous shingle stream.
- Self-control
- Mobile

3.2 Technical data

3.2.1 Floor plan

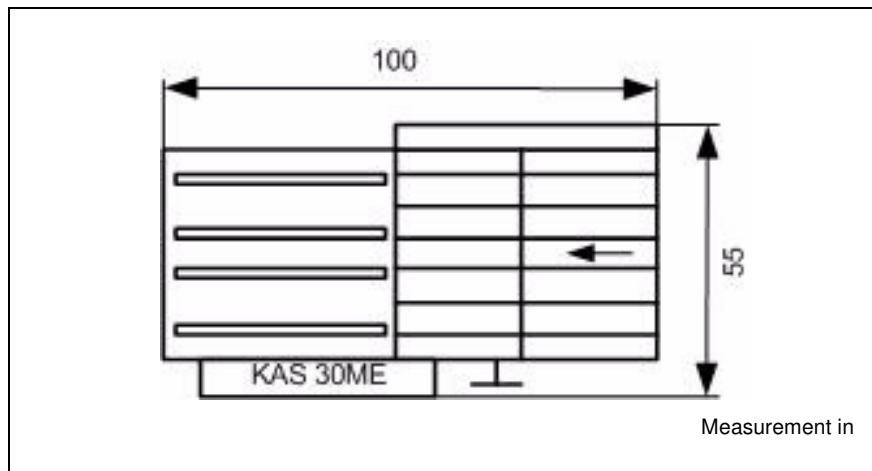


Figure 5: Basic plan KAS 30ME

3.2.2 Characteristics

Speed	Minimum	Maximum ^{a)}
MC-Control	20 m/min	120 m/min
Working width		30 cm
Sheet height	3 cm	12 cm
Pile length	0 cm	46 cm
Infeed height	59 cm	86 cm
Discharge height^{b)}	67 cm	94 cm

Table 7: Characteristics

a) The maximum work speed is influenced by paper properties, format, fold type, temperature, and humidity as well as various circumstances by the operator that the manufacturer cannot influence.

b) Depends on infeed speed.

3.2.3 Emissions

Airborne sound emission	Emission sound pressure level (L_{pA}) ^{a)}	Workstation at the delivery	< 80 dB(A)
	Sound power level (L_{WA}) ^{b)}		-

Table 8: Emissions

a) Noise measurement procedure according to EN 13023:2004

b) Determination of the sound power level according to EN ISO 3746:1995.

3.2.4 Weights, fork lifts, and floor requirements

Weight		Net	Gross ^{a)}
	KAS 30ME	110 kg	180 kg
Dimensions	L x W x H		
	Transport pallet	125 x 85 x 110 cm	
	Transport carton	130 x 90 x 140 cm	
Fork lift ^{b)}	Carrying capacity / load (Q) ^{c)}	Min. 1000 kg	
	Fork tine length	Min. 150 cm	
Floor requirements	Cargo ^{d)}	> 11 kN/m ²	
	Levelness ^{e)}	< 10 mm/m	

Table 9: Weights, fork lifts, and floor requirements

a) Machine with transport pallet/shipping crate

b) Minimum requirements of the fork lift

c) Heed operating manual for the fork lift, carrying capacity depends on the center of gravity (c).

d) Minimum carrying capacity of the underfloor where the machine is set up

e) In the area of the machine, the total height difference may not exceed 10 mm.

3.2.5 Ambient conditions

Operating temperature:	17 ... 35 °C ^{a)}	
Storage temperature:	10 ... 35 °C	
Relative humidity	Optimal	40 - 60 %
	Minimum	30 %
	Maximum	80 % (non-condensing)
Set-up height	Max. 1500 m over sea level.	

Table 10: Ambient conditions

a) At temperatures below or above the permissible room temperature, special measures must be taken.

3.2.6 Supply



- The machine was designed for one of the nominal voltages listed below.
- Even under load, the actual supply voltage must not deviate from the nominal voltage by more than the permitted tolerance.

Electrical supply	Wiring diagram no.:		
Rated voltage: 3 x 400 V + N + PE ^{a)}	Required power system: ^{b)}	TN - C - S - network TN - S - network	Clockwise rotating field required.
	Voltage:	400 V AC	+/-10 %
	Frequency:	50 Hz	+/-1 %
	Fuse:	16 A	
Power ratings:	Total	0.5 kW	

Table 11: Electrical supply 400V network

- a) If the existing nominal voltage deviates from the supply voltage specified above, an isolating transformer must be installed.
If the nominal voltage is 380 V or 415 V at 50 Hz, the tolerance of the power supply must be checked.
If the tolerance is between 360 V - 440 V, an isolating transformer is not required.*
- b) Stationary network connection, N-conductor is loaded; a ground fault circuit interrupter may not be used.*

Electrical supply	Wiring diagram no.:		
Rated voltage: 3 x 220 V + PE ^{a)}	Required power system ^{b)}	TN - C - network	Clockwise rotating field required.
	Voltage	220 V AC	+/-10 %
	Frequency	60 Hz	+/-1 %
	Fuse:	16 A	
Power ratings:	Total	0.5 kW	

Table 12: Electrical supply 220V network

- a) If the existing nominal voltage deviates from the supply voltage specified above, an isolating transformer must be installed.
If the nominal voltage is 210 V or 230 V at 60 Hz, the tolerance of the power supply must be checked.
If the tolerance is between 200 V – 240 V, an isolating transformer is not required.*
- b) Stationary network connection, a ground fault circuit interrupter may not be used.*

4 Structure and Function

4.1 Structure of complete overview

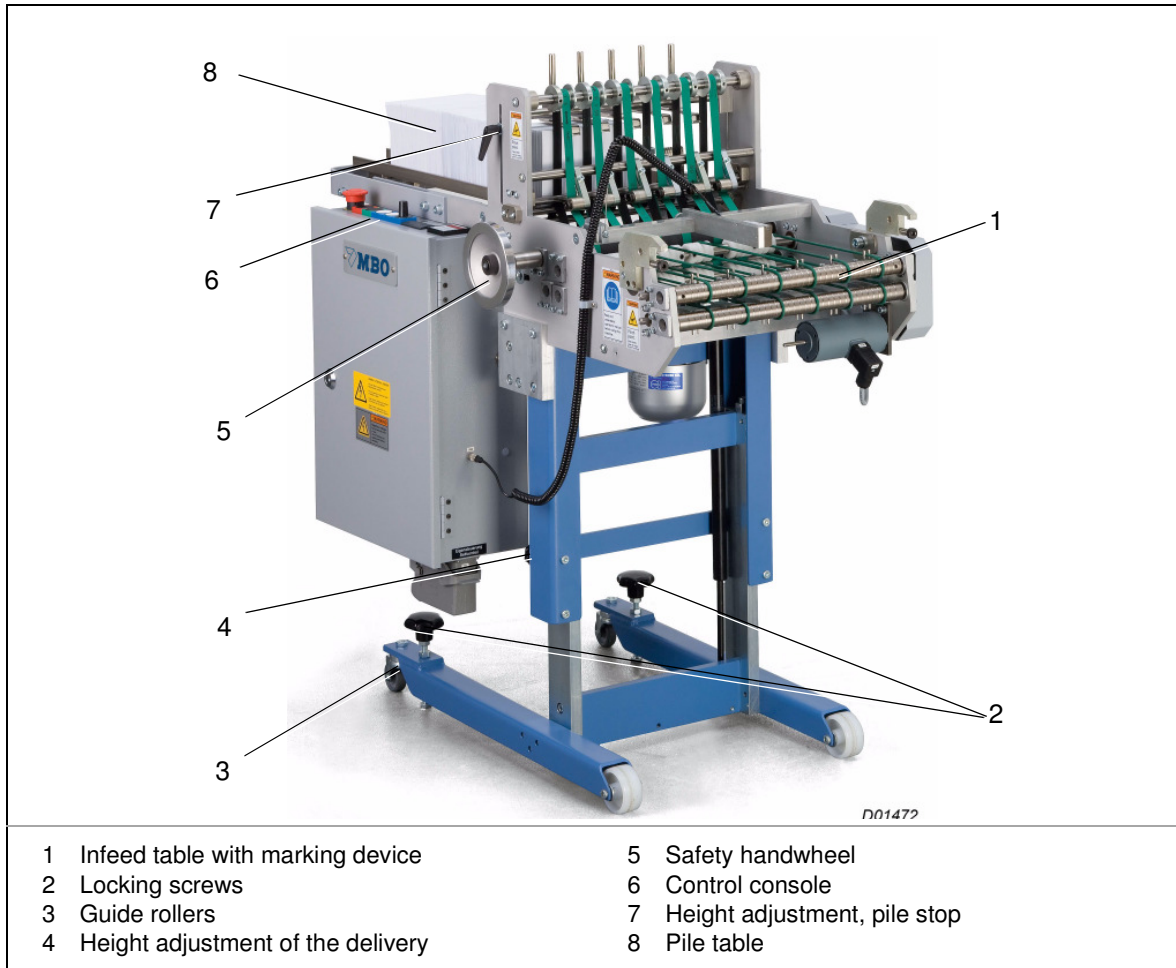


Figure 6: Overview

4.1.1 Functioning description

The small format delivery KAS 30 ME is ideal for small folding jobs with single-up and multiple-up production.

Infeed table with round belt for spreading the products for multiple-up production.

Marking device for shifting in package.

Thanks to the individual controller, use on older machines or third-party machines is also possible.

4.2 Models

4.2.1 Explanation of term

The designation "KAS 30ME" means:	
KAS	Type designation/small format delivery
30	Working width
ME	Marking device

4.3 Safety and protective devices

4.3.1 Overview

The following safety and protective devices are present at or on the machine.



Operate the machine only if all safety and protective devices are completely present and fully functional!

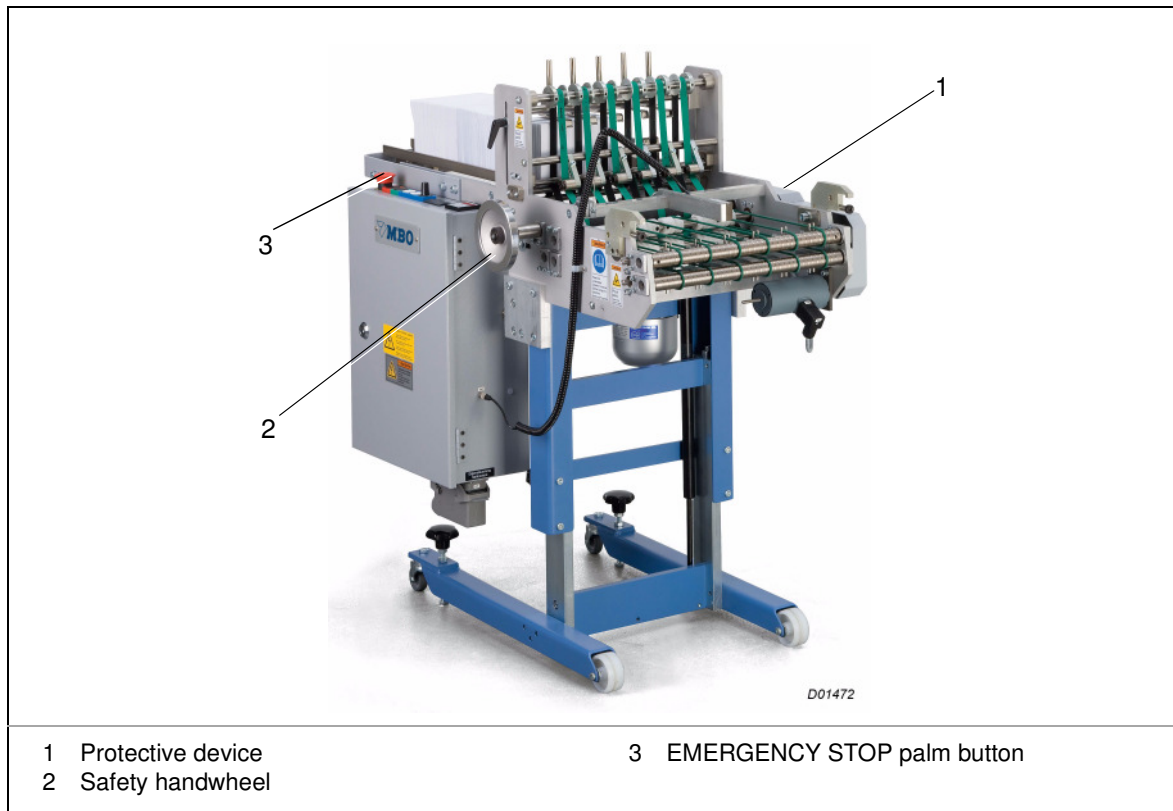


Figure 7: Overview

4.3.2 EMERGENCY STOP palm button

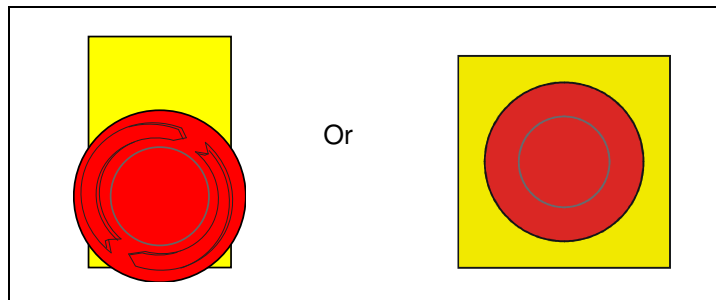


Figure 8: EMERGENCY STOP palm button



To prevent immediate or potential hazards, the machine is equipped with an EMERGENCY STOP shut-off device.

After the <EMERGENCY STOP> palm button is pressed, all electrical drives are switched off.

EMERGENCY STOP does not disconnect the machine from the electrical supply.

The machine is in operation.

There is a dangerous situation and the machine must be stopped quickly.

Procedure:

- ▷ Press the EMERGENCY STOP palm button.
- ▷ Eliminate the failure.
- ▷ Disengage the EMERGENCY STOP palm button by turning it towards the right.
The machine is ready for operation.



When the EMERGENCY STOP palm button is pressed, the machine is stopped immediately.

There is no idling of the sheets!

4.3.3 Additional protective devices

Additional disconnect safety devices are present on the machine.

These protect the operator from hazard areas such as:

- Turning machine parts, e.g. drives, shafts
- Infeed points
- pinch points
- Etc.

The function and position of the corresponding protective device is listed in the "Safety and protective devices" checklist.

See Chapter "4.4 Checklist for safety and protective devices".

4.3.4 Faulty safety and protective devices

Faulty safety and protective devices can lead to hazardous situations.

For this reason:

- ▷ Switch off the machine at the main switch immediately,
- ▷ secure against switching on again,
- ▷ if necessary, disconnect the supply of compressed air and electrical current.
- ▷ Immediately repair faulty safety and protective devices.

4.3.5 Check safety and protective devices

All safety and protective devices must be checked regularly.

For corresponding check intervals, see Chapter “4.4 Checklist for safety and protective devices”.

For the corresponding procedure, see the Maintenance chapter

4.4 Checklist for safety and protective devices

Use this checklist to check the safety and protective devices of the machine regularly.



Pos.	Description	Functioning control	Visual inspection	Result	Inspection interval
1	Guard over drive				Daily
2	Safety handwheel				Daily
3	EMERGENCY STOP palm button				Daily
Date:		Name:		Signature:	

Table 13: Checklist for safety and protective devices

5 Operating and display elements, operating modes

5.1 Main control console

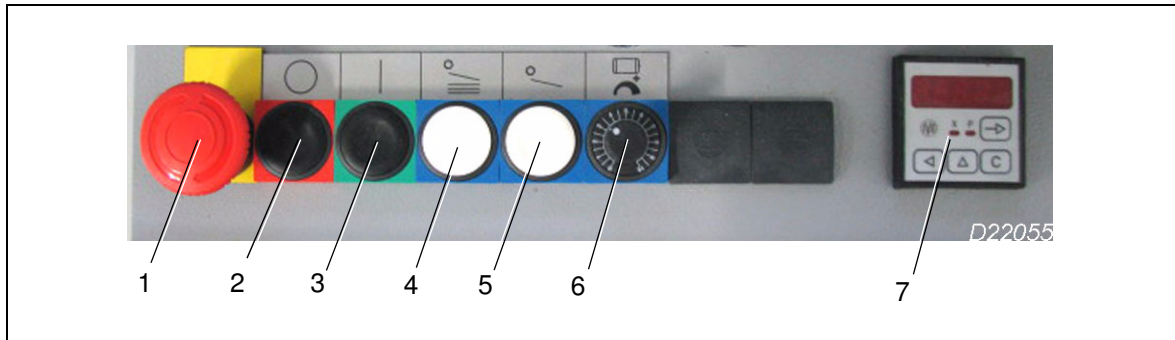


Figure 9: Main control console with MC control

- 1 Palm button <EMERGENCY STOP>
- 2 <Machine stop> button
- 3 <Machine start> button
- 4 <Sheet feed production> button
- 5 <Sheet feed single sheet> button
- 6 Potentiometer <Speed setting>
- 7 Preselection counter

5.2 Operating modes

WARNING

Incorrect use of the power sockets.

Non-observance could result in serious injury or death.

- The machine power sockets of the MBO machines may be used exclusively for the connection of MBO folding units, MBO units or MBO deliveries.
- The 230 VAC power sockets of the MBO machines may only be used exclusively for connecting the intended auxiliary equipment, such as gluing devices, for example.

All power sockets (400 VAC and 230 VAC power sockets) of the MBO machines must be monitored at all times according to the corresponding federal and local codes, guidelines and other regulations.

CAUTION

Tripping on cables lying about.

Non-observance could result in personal injury and damage to property.

Route all machine connection lines (cables, hoses, pipes) so that they do not pose a tripping hazard.

5.2.1 Machine control

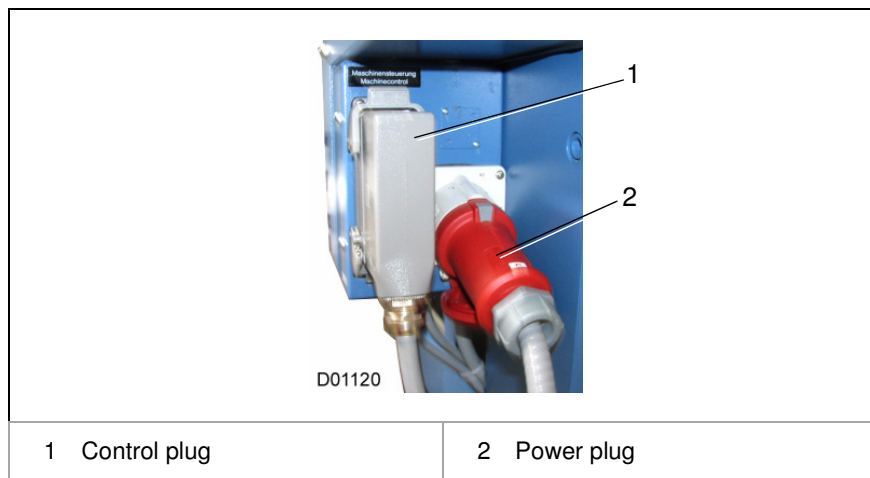


Figure 10: Machine controller operating mode

Connecting subsequent folding units

Procedure:

- ▷ Plug the power plug (2) into the power socket of the upline folding unit.
- ▷ Plug the control plug (1) into the control socket of the upline folding unit.

5.2.2 Adapter boxes



**Using multiple adapter boxes in a machine assembly.
Non-observance could result in serious injury or death.**

Due to safety reasons, only use a maximum of **one adapter box** in a machine assembly.

It is possible to connect subsequent MBO folding units with different control systems into one machine assembly. Appropriate coupling modules are required for this.

You can find out which coupling modules can be used from MBO Service or from authorized customer service.



For safety reasons, a maximum of **one adapter box** may be used on a machine assembly.

Exceptions only after consultation with MBO Electrical Design.

5.2.3 Self-control



"Self-control" operating mode.

Non-observance may possibly cause serious personal injuries or even death.

If an MBO unit is operated in "self-control" operating mode as part of an assembly including third-party machines, no shared safety shutoff is present.

- In case of a dangerous situation, each machine must be switched off separately.
- Safeguard yourself accordingly or use an appropriate MBO coupling module. You can get the necessary information from the manufacturer.



The manufacturer shall not be held liable for any damage caused by the lack of a shared safety shutoff.

The delivery and the third-party machine must be switched on and off separately!

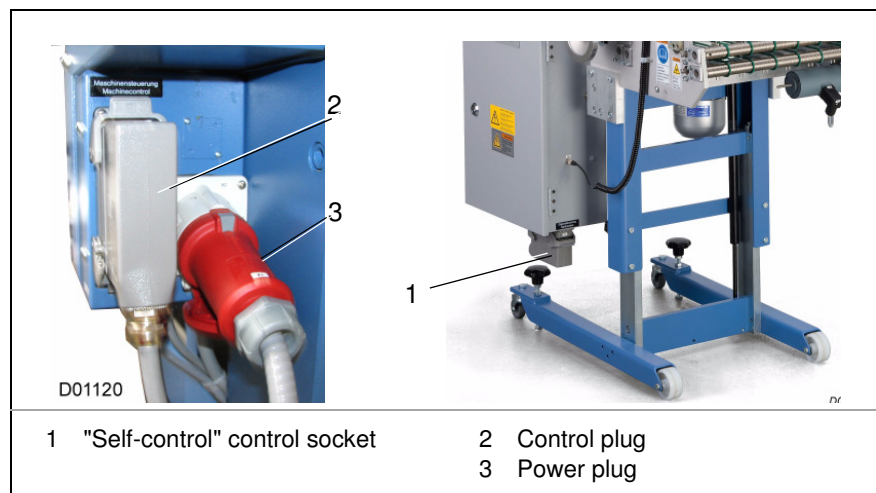


Figure 11: Electrical connection

The delivery can also be operated with the self-control on third-party machines.

Procedure:

- ▷ Plug the power plug (3) into the power socket of the third-party machine or the power socket of the power supply.
- ▷ Plug the control plug (2) into the "self-control" control socket (1) of the delivery.

6 Transport/Set-up/Start-up

6.1 Introduction

6.1.1 Qualification of personnel

This table lists the necessary qualification of the personnel related to "Transport and interim storage" of the machine.

	Specially trained personnel	Instructed operating personnel	Instructed personnel with specialized training (mechanical/ electrical engineering)
Transportation	X	-	-
Interim storage	X	-	-
Set-up	-	-	X
Electrical connections	-	-	X
Power supply connection	-	-	X

Table 14: Qualification of personnel; transport, interim storage
 Legend: X authorized, - not authorized

6.1.2 Safety instructions

⚠ WARNING**Use of unsuitable fork lifts.**

Non-observance may possibly cause serious personal injuries and damage to property.

- When selecting a fork lift, observe the relevant data such as load-bearing capacity, load center of gravity, width of fork lift carrier and length of forks.
 - For details about the minimum requirements, please see the "Technical data" chapter.
-

⚠ WARNING**Tipping machine parts while unloading and installing the machine.**

Non-observance may possibly cause serious personal injuries and damage to property.

- Use a fork lift for transportation.
 - Make sure that there are no people in the loading area.
-

⚠ WARNING**Insufficient properties and condition of the underfloor.**

Non-observance may possibly cause serious personal injuries and damage to property.

- Check the properties and condition and carrying capacity of the underfloor in the set-up location.
 - Observe the necessary minimum requirements; see the "Specifications" chapter.
-

6.1.3 Property damage messages

NOTICE

Incorrect supply voltage.

Non-observance may cause severe property damage.

If the existing nominal voltage deviates from the details on the label, wiring diagram, and "the "Technical data" in the operating manual, an isolating transformer must be used.

You can get the necessary information from the manufacturer.

6.2 Brief instructions

The delivery is transported, set up, and started up in these steps:

- Transport delivery.
See chapter "6.3 Transportation"

- Unpack the delivery.
See chapter "6.4.1 Unpacking the delivery"
- Set up delivery.
See chapter "6.4.2 Setting up the delivery"
- Remove the rust preventing agents.
See chapter "6.5 Remove the rust preventing agents"
- Start up.
See chapter "6.6 Start-up"
- Carry out inspection after initial start-up.
See chapter "6.8 Inspection after first start-up"

6.3 Transportation



Use of unsuitable fork lifts.

Non-observance may possibly cause serious personal injuries and damage to property.

- When selecting a fork lift, observe the relevant data such as load-bearing capacity, load center of gravity, width of fork lift carrier and length of forks.
- For details about the minimum requirements, please see the "Technical data" chapter.

The delivery is delivered on a transport pallet/in a transport carton.

Procedure:

- ▷ Use a suitable fork lift. (For requirements, see Chapter "3.2.4 Weights, fork lifts, and floor requirements")
- ▷ Lift the transport pallet with the delivery only as far as is absolutely necessary for the transport.
- ▷ Transport the transport pallet as close as possible to the intended location.
- ▷ Set the transport pallet down carefully.

6.4 Set-up



Insufficient properties and condition of the underfloor.

Non-observance may possibly cause serious personal injuries and damage to property.

- Check the properties and condition and carrying capacity of the underfloor in the set-up location.
- Observe the necessary minimum requirements; see the "Specifications" chapter.

6.4.1 Unpacking the delivery

Procedure:

- ▷ Remove the packaging material.
- ▷ Dispose of the packaging material in an environmentally-responsible fashion.
- ▷ Remove the fastening screws.
- ▷ Remove the transport bracket.

6.4.2 Setting up the delivery

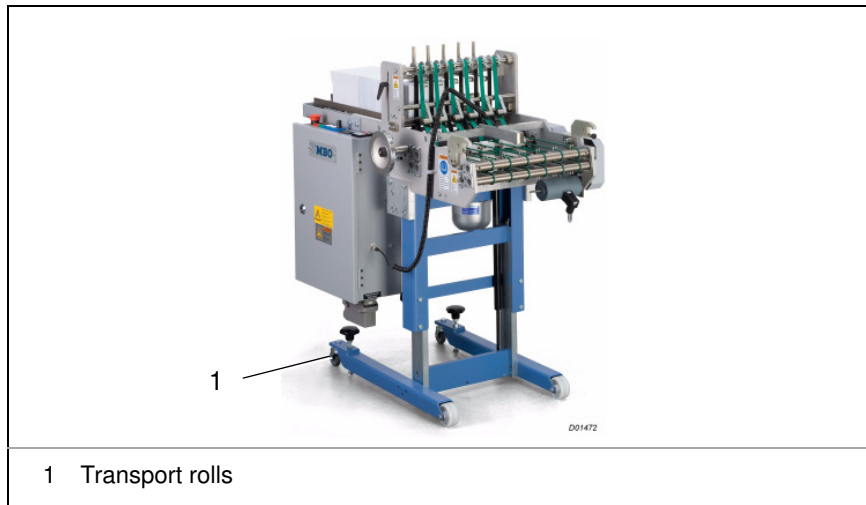


Figure 12: Setting up the delivery

Procedure:

- ▷ Lift the delivery from the transport pallet. To do this, use a fork lift with appropriate transport tapes.
- ▷ Set the delivery down carefully.
Do not damage the transport rollers (1) while doing this
- ▷ Transport the delivery carefully to the intended location.

6.5 Remove the rust preventing agents

After setting up the machine, clean the rust preventing agents thoroughly from all machine parts.

Heed the cleaning recommendation in the following table as well as the detailed instructions about the "Varn" roller cleaner in the "Cleaning" chapter.

Part of machine	Cleansing agent
Lacquered surfaces	Solvent-free cleansing agent
Rollers	"Varn-Wash VM 111". See "Cleaning" chapter

Table 15: Cleaning recommendation

6.6 Start-up

6.6.1 Brief instructions

- Check the supply voltage
See Chapter "6.6.2 Checking the supply voltage".
- Check the control cabinet cover.
See chapter "6.6.3 Checking the control cabinet cover"
- Check machine functions.
See chapter "6.6.4 Checking machine functions"
- Final check of the protective devices
See Chapter "6.7 Final check of the protective devices".
- Inspection after initial start-up
See Chapter "6.8 Inspection after first start-up".

6.6.2 Checking the supply voltage

NOTICE

Incorrect supply voltage.

Non-observance may cause severe property damage.

If the existing nominal voltage deviates from the details on the label, wiring diagram, and "the "Technical data" in the operating manual, an isolating transformer must be used.

You can get the necessary information from the manufacturer.

Procedure:

- ▷ First check that the correct supply voltage is present.
See Chapter "3.2.6 Supply".
- ▷ Only then plug the power plug into the preceding folding unit.

6.6.3 Checking the control cabinet cover

Check that the covers on all control cabinets are grounded and closed according to regulations.

Procedure:

- ▷ Check this by visual inspection.

6.6.4 Checking machine functions

Procedure:

- ▷ Check the complete machine function by setting up a customer job/test job.

6.7 Final check of the protective devices

After installing the machine, be absolutely certain to carry out a final check of the protective devices.

Procedure:

- ▷ Check that all covers and safety and protective devices are installed and fully functional.

For this purpose, use the checklist for the safety and protective devices. See Chapter "4.4 Checklist for safety and protective devices".

6.8 Inspection after first start-up

After 20 hours of operation after the initial set-up, it is necessary to check all belts and tapes.

Procedure:

- ▷ Check the belts and tapes on correct center running and on correct tension.

If necessary, readjust these.

See chapter service/maintenance plan.

7 Adjustment and operation

7.1 Introduction

For the operation of the machine, also observe:

- The safety instructions
"7.1.2 Safety instructions".
- The intended use
"2.1 Intended use"
- Qualification of the operating personnel.
"7.1.1 Qualification of personnel"

7.1.1 Qualification of personnel

This table lists the necessary qualification of the personnel related to "Adjustment and operation" of the machine.

	Specially trained personnel	Instructed operating personnel	Instructed personnel with specialized training (mechanical/ electrical engineering)
Adjustment	X	X	-
Operating	-	X	-

Table 16: Qualification of personnel, adjustment and operation
Legend: X authorized, - not authorized

7.1.2 Safety instructions

 DANGER

**Dismantling, bridging or bypassing safety and protective devices.
Non-observance may cause serious injuries or death.**

- No safety or protective devices of the machine may be dismantled, bridged or bypassed.
 - Using the checklist for protective equipment and safety devices, check that all protective devices are on the machine.
 - Report any audible/visible safety-relevant change to the machine to the person responsible for the system in your operation.
-

 WARNING

Moving machine parts

Drawing-in and crush hazard

- Make sure that you always tie back your hair and keep it protected.
 - Do not wear jewelry.
 - Wear close-fitting clothing only.
-

 WARNING

Moving machine parts

Drawing-in and crush hazard

With sudden machine stops and before you re-connect the machine, make sure:

- There is no other person on the machine.
 - The machine is working perfectly.
-

 WARNING

Incorrect handling of the safety handwheels.

Non-observance may possibly cause serious personal injuries or death.

- Turn the safety handwheel only when the machine is not moving.
 - Press the EMERGENCY STOP palm button.
 - Operate the machine with safety handwheels only (otherwise, there is a hazard of being drawn in).
-

7.1.3 Property damage messages

NOTICE

Paper jam.

The machine may be restarted only after removing the paper jam.

Non-compliance may possible cause property damage (drive belts, transport tapes, foldrollers etc.).

When removing the paper jam, turn the machine using the safety hand-wheel only.

7.2 Operating

7.2.1 EMERGENCY STOP palm button

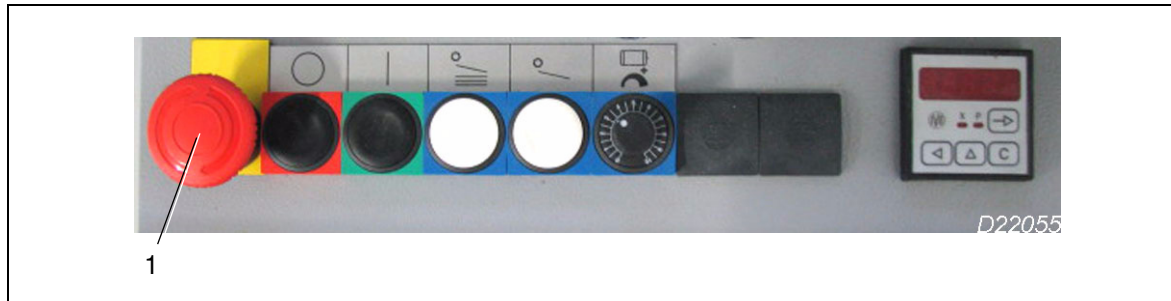


Figure 13: EMERGENCY STOP palm button



To prevent immediate or potential hazards, the machine is equipped with an EMERGENCY STOP shut-off device.

After the <EMERGENCY STOP> palm button is pressed, all electrical drives are switched off.

EMERGENCY STOP does not disconnect the machine from the electrical supply.

The machine is in operation.

There is a dangerous situation and the machine must be stopped quickly.

Procedure:

- ▷ Press the EMERGENCY STOP palm button on the main control console (1).
- ▷ Eliminate the failure.
- ▷ Disengage the EMERGENCY STOP palm button by turning it towards the right.

The machine is ready for operation.



When the EMERGENCY STOP palm button is pressed, the machine is stopped immediately.

There is no idling of the sheets!

7.2.2 Starting/stopping the machine

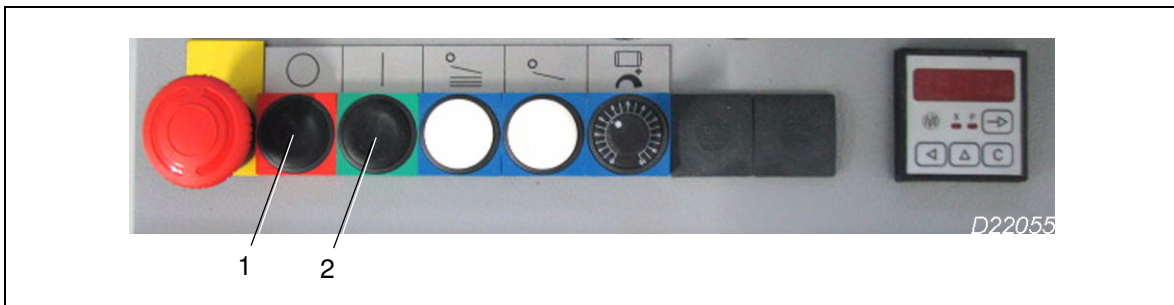


Figure 14: Starting/stopping the machine

Starting the machine: Procedure:
 ▷ Press the <Machine start> button (2).

Stopping the machine: Procedure:
 ▷ Press the <Stop machine> pushbutton (1).

7.2.3 Sheet feed production/single sheet

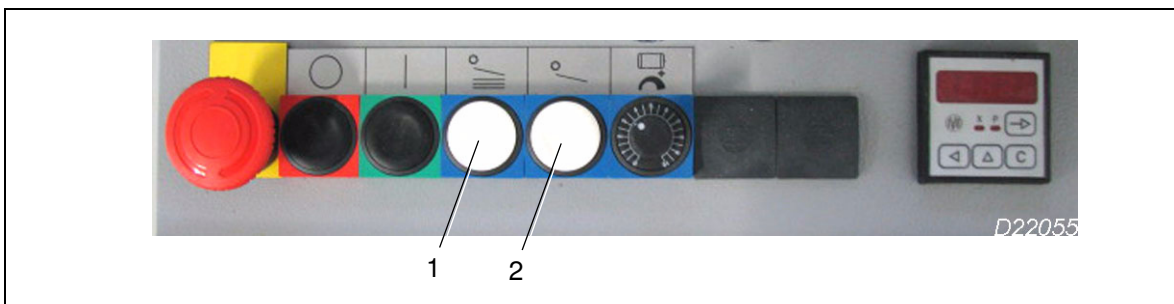


Figure 15: Sheet feed production/single sheet



U Before switching on the sheet feed, the air supply must be started.

Starting production: Procedure:
 ▷ Press the <Production sheet infeed> button (1).
 Sheets are fed continuously.

Stopping production: Procedure:
 ▷ Press the <Production sheet infeed> (1) button again.
 The sheet feed stops.

Calling up single sheets: Procedure:
 ▷ Press the <Single sheet infeed> (2).
 A single sheet is called up.

7.2.4 Setting the speed

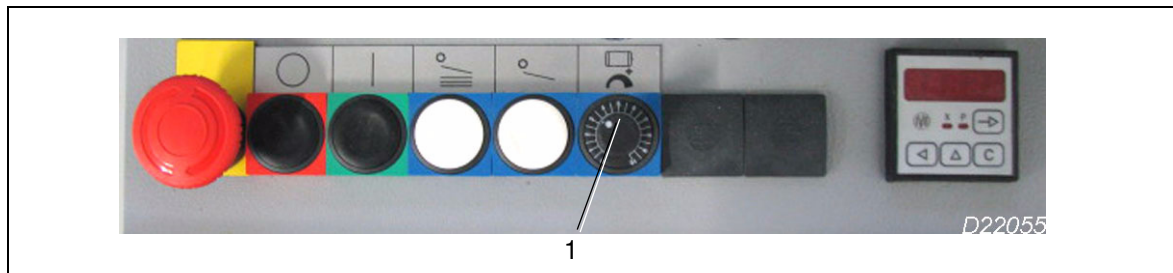


Figure 16: Setting the speed

Procedure:

- ▷ Turning the potentiometer <Speed> (1) causes a local acceleration or deceleration of the speed.



Depending on the product, the speed should be set so that:

- There is no great distance between sheets
- The sheets do not overlap.

7.2.5 Preselection counter

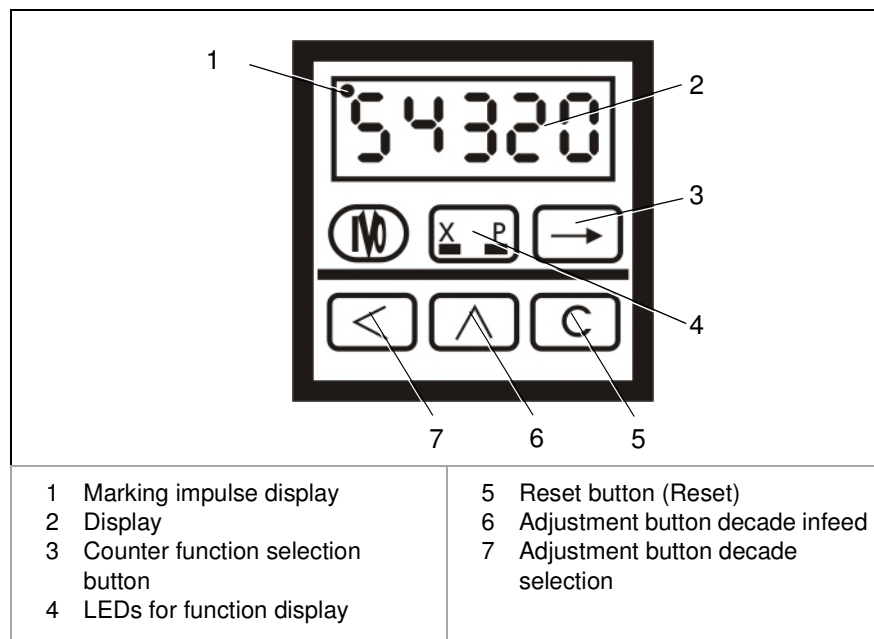


Figure 17: Preselection counter

The preselection counter has the following functions:

- Current preselection counter
- Preselection input
- Total counter

The detailed operation is described in the separate operating manual for the preselection counter.

7.2.6 Error messages

Error messages are displayed on the machine control of folding unit 1.

See operating manual for the machine control of folding unit 1.

7.3 Adjustment

7.3.1 Overview of adjustment elements

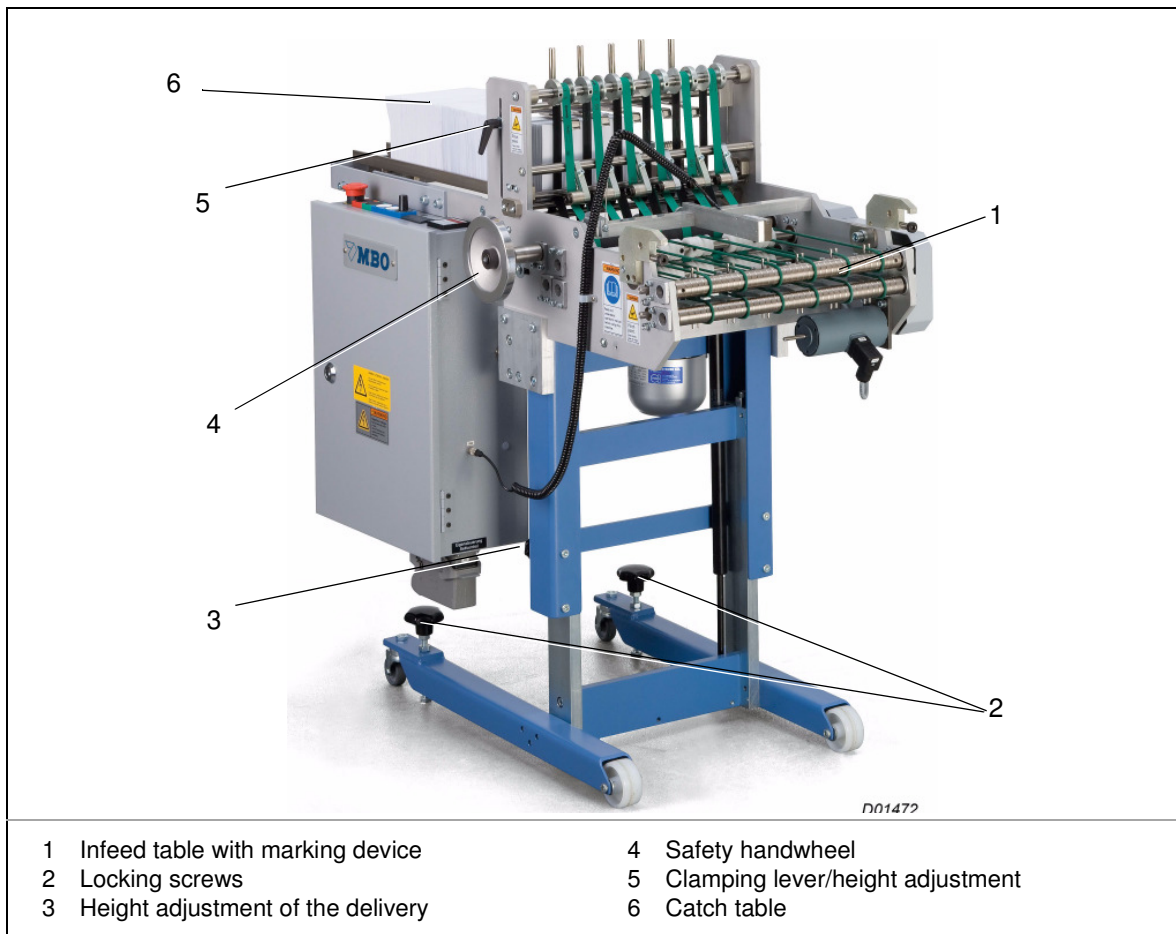


Figure 18: Overall view

7.3.2 Brief instructions

- Position delivery.
See Chapter “7.3.3 Positioning delivery”.
- Adjust round belt of the infeed table.
See Chapter “7.3.4 Adjusting the round belt”.
- Set multiple-up production.
See Chapter “7.3.5 Setting multiple-up production”.
- Set marking device.
See Chapter “7.3.6 Setting marking device”.
- Adjust transport tapes to the sheet format.
See Chapter “7.3.7 Adjusting transport tapes to the sheet format”.
- Set stop to sheet length.
See Chapter “7.3.8 Setting stop to sheet length”.
- Set distance between the transport tapes.
See Chapter “7.3.9 Setting distance between the transport tapes”.
- Adjust pile stops.
See Chapter “7.3.10 Adjusting the pile stop”.

7.3.3 Positioning delivery

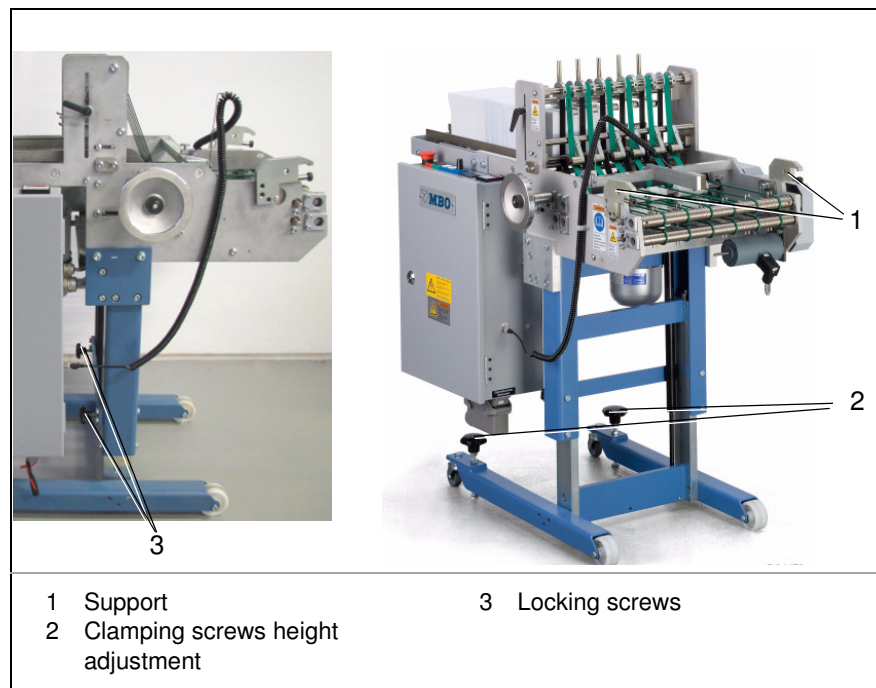


Figure 19: Positioning delivery

Procedure:

- ▷ Remove the screws from both brackets (1).
- ▷ Position the delivery in the middle behind the previous folding unit.
The middle of the sheet coming out should be the middle of the delivery.
- ▷ Loosen the clamping screws (2) for the height adjustment on both sides.
- ▷ Hook the delivery with the brackets (1) into the square traverse of the previous folding unit.
- ▷ Reinsert the screws into both brackets (1).
- ▷ Tighten the screws again.
- ▷ Tighten the clamping screws (2) for the height adjustment on both sides.
- ▷ Fix the position by turning the locking screws in (3).

7.3.4 Adjusting the round belt

⚠ WARNING

Moving machine parts

Drawing-in and crush hazard.

- All adjustment may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.

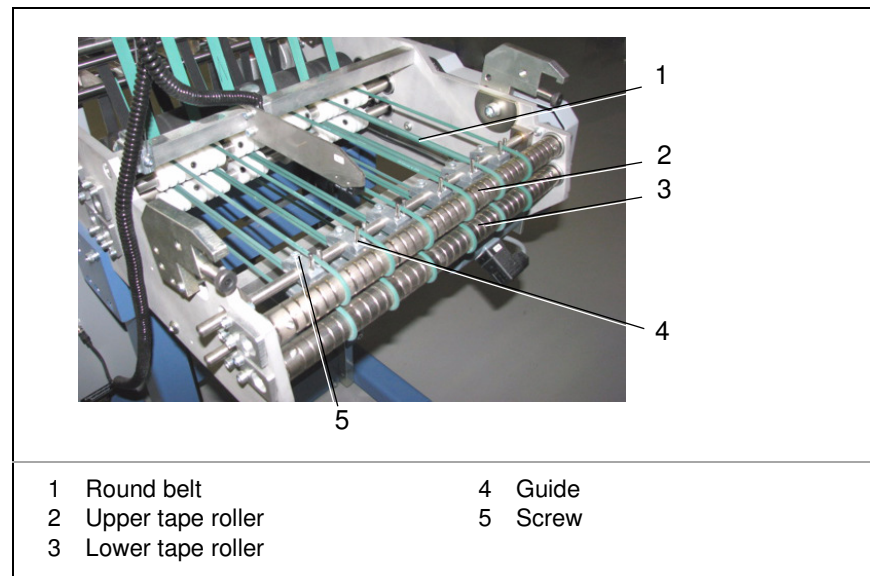


Figure 20: Adjusting the round belt

Adjusting the round belts:

The round belts (1) must be positioned, according to the paper format and up-count, on the upper and lower tape rollers (2 + 3).

Procedure:

- ▷ Loosen the screws (5).
- ▷ Move the guides (4) to the desired position.
- ▷ The tapes must run in the clearance grooves of the tape rollers (2+3).
- ▷ Tighten the screws (5) again.

7.3.5 Setting multiple-up production

⚠ WARNING

Moving machine parts

Drawing-in and crush hazard.

- All adjustment may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.

If folded products are cut in the folding machine in two or three-ups, proceed as follows:

- ▷ Set the respective groups diagonally to one another from the round belt (1, 2, 3) or spread them out.
- ▷ Change the position of the round belt only laterally at the entry or the discharge of the infeed table.
- ▷ Two round belts are required per up.

Two-up:

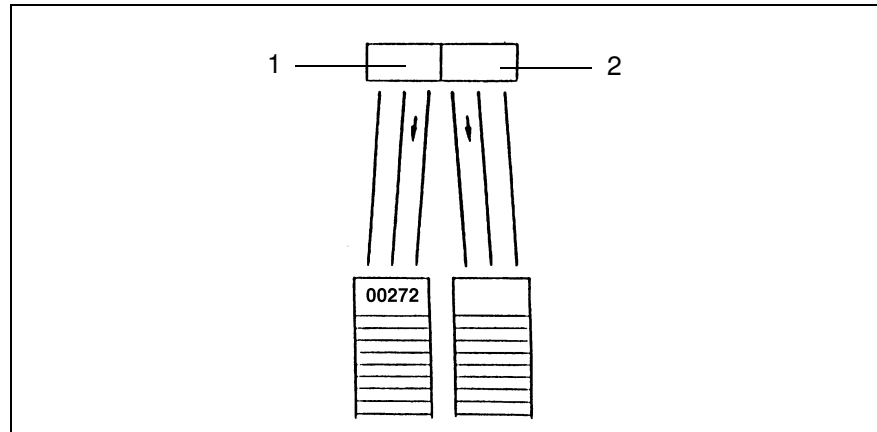


Figure 21: Two-up

Three-up:

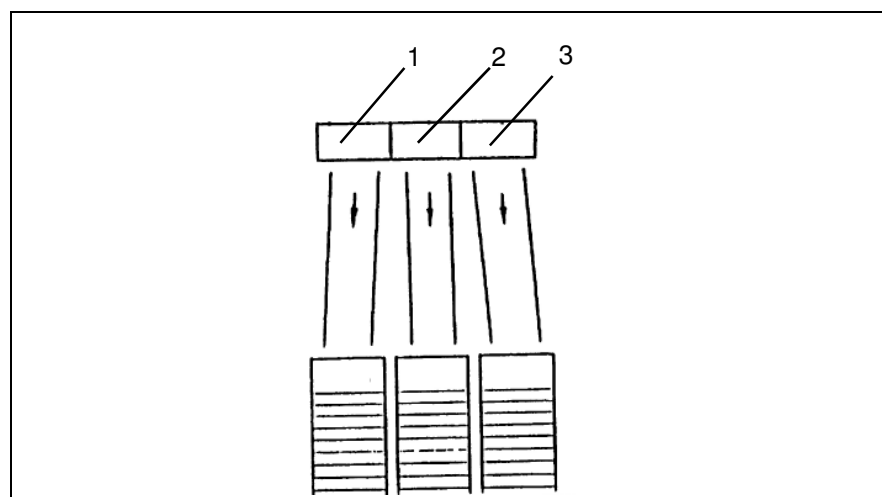


Figure 22: Three-up

7.3.6 Setting marking device



In order to guarantee precise removal from always equal batches, batches can be counted to the desired quantity and offset with respect to one another (1).

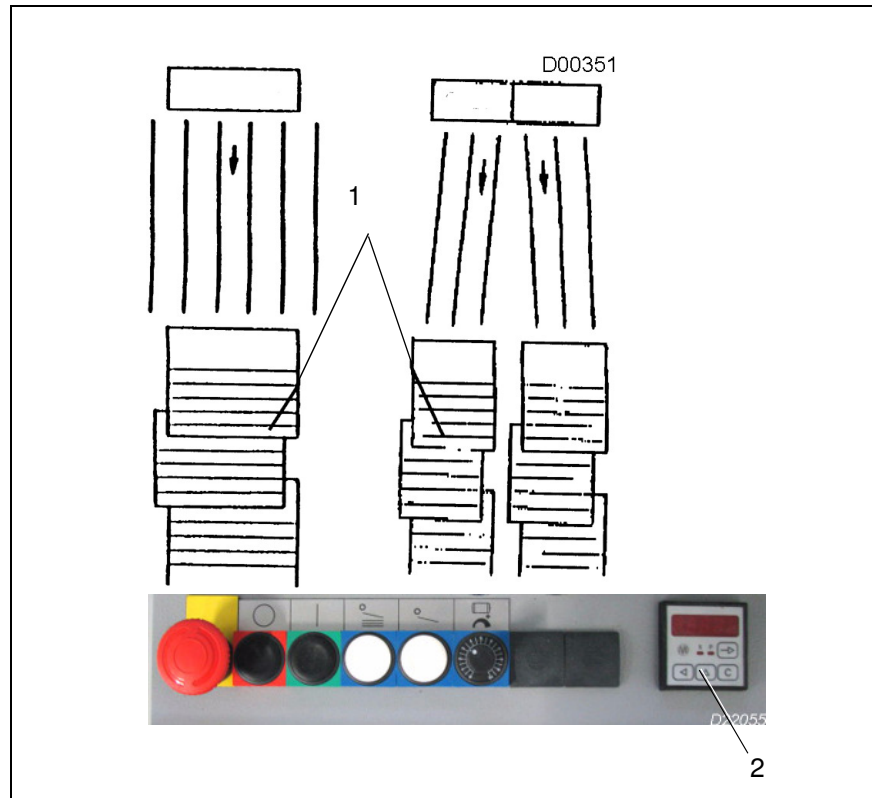


Figure 23: Marking device

The desired number of sheets per batch is entered in the built-in preselection counter (2).

See separate operating manual for preselection counter.

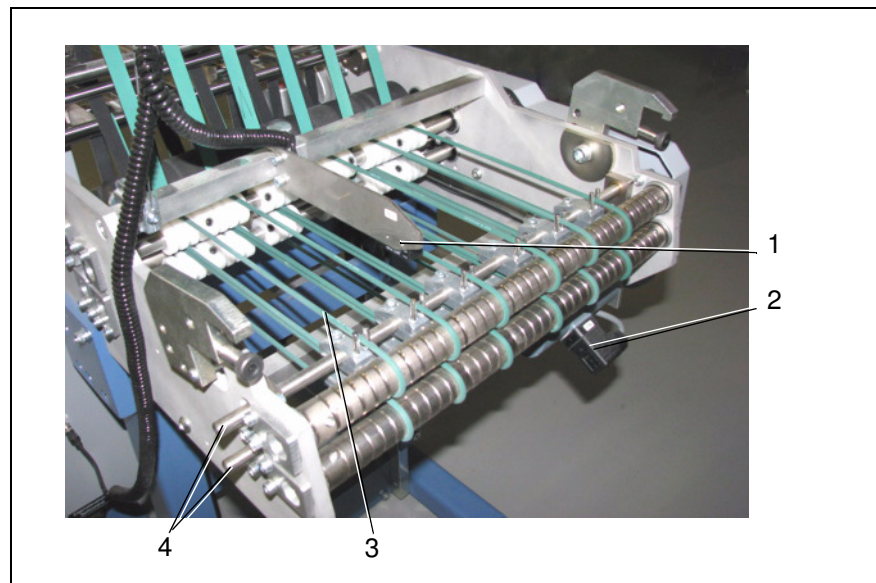


Figure 24: Positioning the photoelectric sensor

Procedure:

- ▷ Position the photoelectric sensor (1) over a sheet stream.
(function check: the green diode lights up if a sheet passes the photoelectric sensor).



Position the photoelectric sensor (1) so that it is not influenced by the marking rods (4) or by the round belts (3).

When the preselected quantity of a batch is reached, the round belt (3) is offset to the left or right by the electromagnet (2) and the marking rods (4).

7.3.7 Adjusting transport tapes to the sheet format

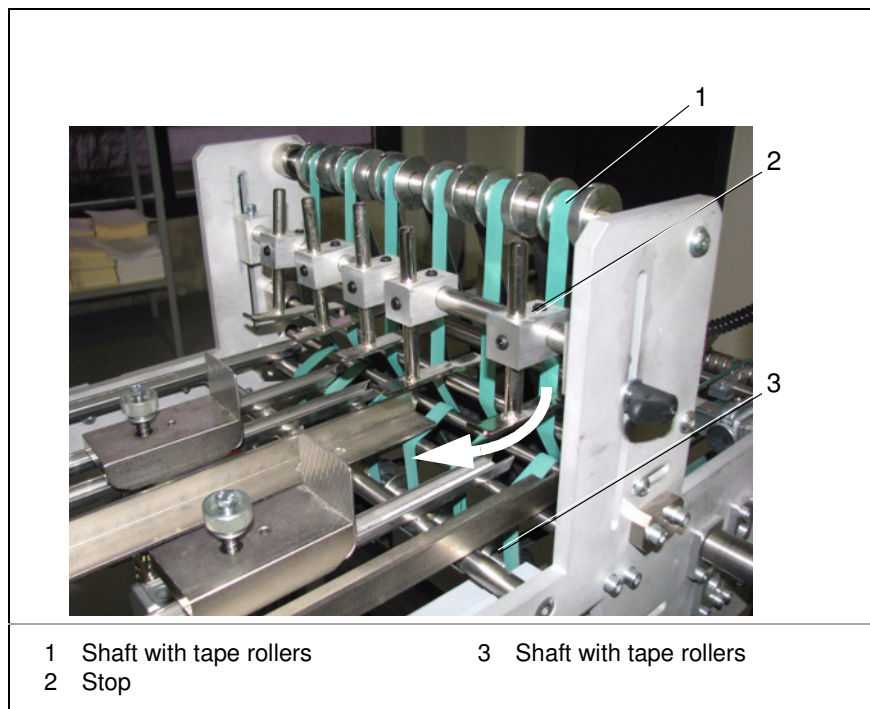


Figure 25: Adjusting transport tapes

Adjust the transport tapes to the sheet format being fed in.

The upper transport tapes are fed by tape rollers on the shaft (1).

The lower transport tapes are fed by tape rollers on the shaft (3).

Procedure:

- 1) Swivel the stops (2) toward the rear so that these do not prevent the off-setting of the transport tapes.
- 2) Loosen the clamping screws on the tape rollers of the upper transport tapes.
- 3) Move the tape rollers with the upper transport tapes.
- 4) Tighten the clamping screws again.
- 5) Loosen the clamping screws on the tape rollers of the lower transport tapes.
- 6) Move the tape rollers with the lower transport tapes. To get a fault-free transport of the sheets, the upper and lower transport tapes must always be over one another.
- 7) Tighten the clamping screws again.
- 8) Swivel the stops into a horizontal position once again.

7.3.8 Setting stop to sheet length

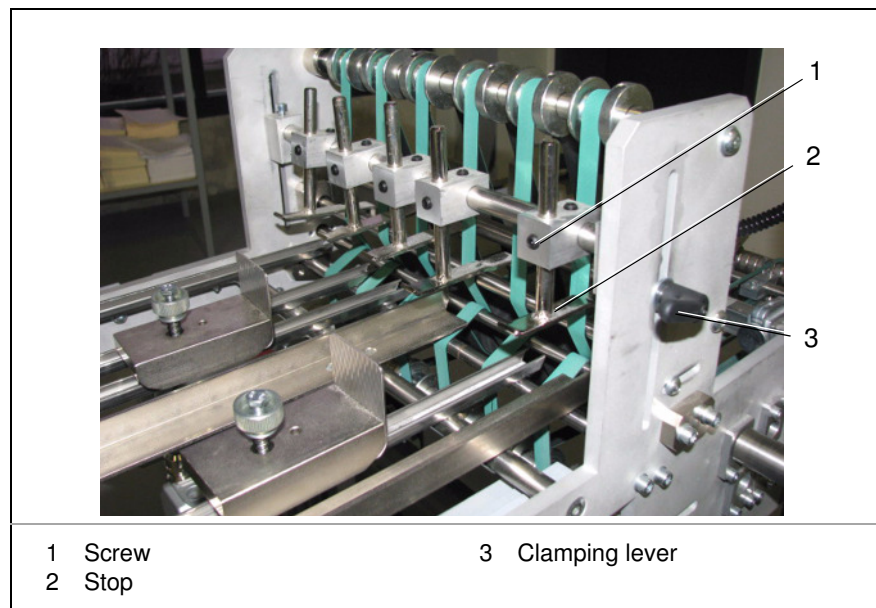


Figure 26: Setting stop

Set the stops (2) to the length of the sheet being fed in.

Basic setting Set the stops to the same height.

Procedure:

- ▷ Loosen the screw (1).
- ▷ Set the stops to the same height.
- ▷ Tighten the screw (1) again.

Overall adjustment All stops can now be set collectively to the length of the sheet being fed in.

Procedure:

- ▷ Loosen the clamping levers (3) on both sides.
- ▷ Set the stop (2) to the length of the sheet being fed in. The sheet may not be clamped.
- ▷ Tighten the clamping levers (3) again on both sides.

7.3.9 Setting distance between the transport tapes

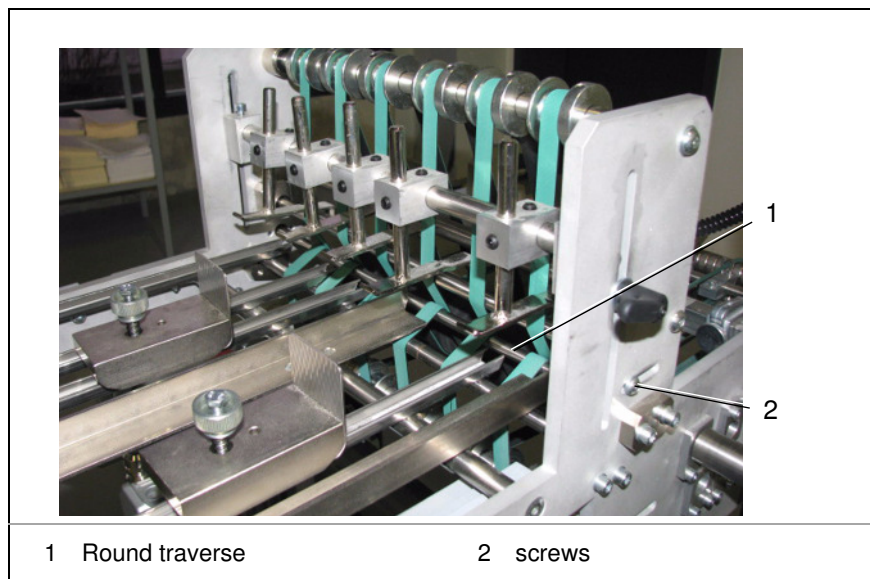


Figure 27: Adjusting the distance

Adjust the distance between the lower and upper transport tapes by moving the round traverse (1).

Procedure:

- ▷ Loosen the screws (2) on both sides.
- ▷ Move the round traverse (1) so that the desired distance between the transport tapes results.
- ▷ Tighten the screws (2) again on both sides.

7.3.10 Adjusting the pile stop

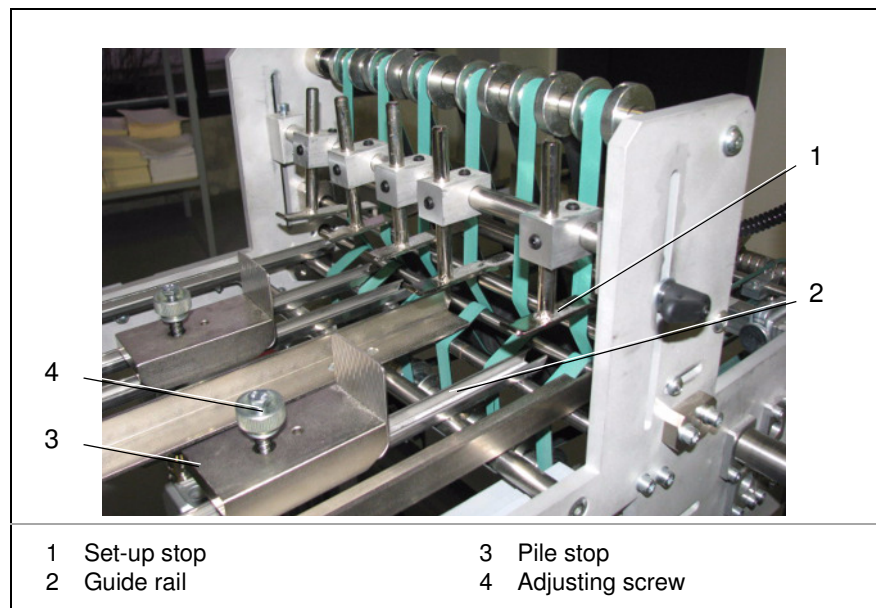


Figure 28: Adjusting the pile stop

The pile stop (3) prevents the sheets set up from tipping over. It is guided in the guide rail (2).

The resistance is set using the adjusting screw (4).

Procedure:

- ▷ Position the guide rail (2) in the middle of the set-up sheet.
- ▷ Position the pile stop (3) under the stop (1).
- ▷ Adjust the resistance with the adjusting screw (3).
 Turn clockwise = resistance increases.
 Turn counter-clockwise = resistance decreases.

7.4 Removing the paper jam

NOTICE

Paper jam.

The machine may be restarted only after removing the paper jam.

Non-compliance may possible cause property damage (drive belts, transport tapes, foldrollers etc.).

When removing the paper jam, turn the machine using the safety hand-wheel only.

Procedure:

- ▷ Press the EMERGENCY STOP palm button.
- ▷ Try to determine the cause of the paper jam and eliminate it (to prevent other malfunctions downline).
- ▷ If necessary, remove any smoother bars, strippers etc. that get in the way.
- ▷ Carefully remove the jammed paper.
- ▷ Check that no torn-off pieces of paper remain in the machine (to prevent other malfunctions downline).
- ▷ Reinstall the removed smoother bars, strippers etc.
- ▷ Disengage the EMERGENCY STOP palm button.
- ▷ Start the machine
- ▷ Feed a single sheet to check the correct function of the machine.
- ▷ If OK, start production.
- ▷ If not OK, determine and eliminate the cause.



Turning the machine forwards/backwards using the safety handwheel makes it easier to remove the paper jam.

8 Maintenance

8.1 Introduction

For the maintenance of the machine, also observe:

- The safety instructions.
See Chapter "8.1.2 Safety instructions".
- Safety and protective devices
See Chapter "8.3.1 Checking the safety devices".
- The intended use.
See Chapter "2.1 Intended use".
- Qualification of maintenance personnel.
See Chapter "8.1.1 Qualification of personnel".

8.1.1 Qualification of personnel

This table lists the necessary qualification of the personnel related to "Maintenance" of the machine.

	Specially trained personnel	Instructed operating personnel	Instructed personnel with specialized training (mechanical/ electrical engineering)
Operational maintenance	-	X	-
Maintenance	X	-	X
Repair	-	-	X

Table 17: Qualification of personnel
Legend: X authorized, - not authorized

8.1.2 Safety instructions

 DANGER**Hazardous voltage.****Risk of electrical shock or burn.**

- Work on the electric components of the machine may only be performed by a licensed electrician.
 - Observe the local occupational safety regulations and electrotechnical regulations.
 - Turn the main switch to the position <0>.
 - Use a padlock to secure the main switch from unintentionally switching on again.
 - Even when the main switch is switched off, a hazardous voltage is present at the terminals of the main switch. (See wiring diagram)
 - Even when the main switch is switched off, a hazardous residual voltage is present at the terminals of the frequency converter. (Observe the capacitor discharge time (KEB 5 min, Telemecanique 15 min)).
-

 DANGER**Dismantling, bridging or bypassing safety and protective devices.****Non-observance may cause serious injuries or death.**

- No safety or protective devices of the machine may be dismantled, bridged or avoided.
 - Using the checklist for protective equipment and safety devices, check that all protective devices are on the machine.
 - Report any audible/visible safety-relevant change to the machine to the person responsible for the system in your operation.
-

 WARNING**Improper maintenance.****Non-observance may possibly cause serious personal injuries and damage to property.**

- Maintenance work must be carried out by trained and authorized personnel with specialized technical skills and knowledge only.
 - Maintenance work must be carried out by one person only.
 - Observe the local occupational safety regulations.
 - Observe the maintenance, service, and cleaning plan.
-

⚠ WARNING**Rotating machine parts during maintenance.**

Non-observance may possibly cause serious personal injuries or even death.

- Maintenance work must be carried out by trained and authorized personnel with specialized technical skills and knowledge only.
 - Observe all local work safety regulations and electrical engineering rules.
 - Turn the main switch to the position <0>.
 - Use a padlock to secure the main switch from unintentionally switching on again.
-

⚠ WARNING**Crush injuries during maintenance works.**

Non-observance could result in serious personal injury or death.

Maintenance work must be carried out by one person only.

⚠ WARNING**Unsuitable maintenance tools.**

Non-observance may possibly cause serious personal injuries and damage to property.

- You should only use tools that are in perfect condition.
 - Make sure that after adjustment or maintenance work, there are no tools left on or in the machine.
-

⚠ WARNING**Drawn-in hazard when removing the safety handwheel.**

Non-observance could result in serious personal injury or death.

- Turn the main switch to the position <0>.
 - Use a padlock to secure the main switch from unintentionally switching on again.
-

8.2 Service

WARNING

Using of unauthorized safety components.

Non-observance could result in serious personal injury or death.

- Only approved safety components may be used.
- Use only original parts.

8.2.1 Ordering spare and wear parts

You can obtain the spare and wear parts worldwide via the corresponding MBO agency near you.

For all questions relating to your machine, please also contact your MBO agency.

You can find the address on our home page: www.mbo-folder.com.

Please gather the significant data for identification of the machine from the label on the machine.

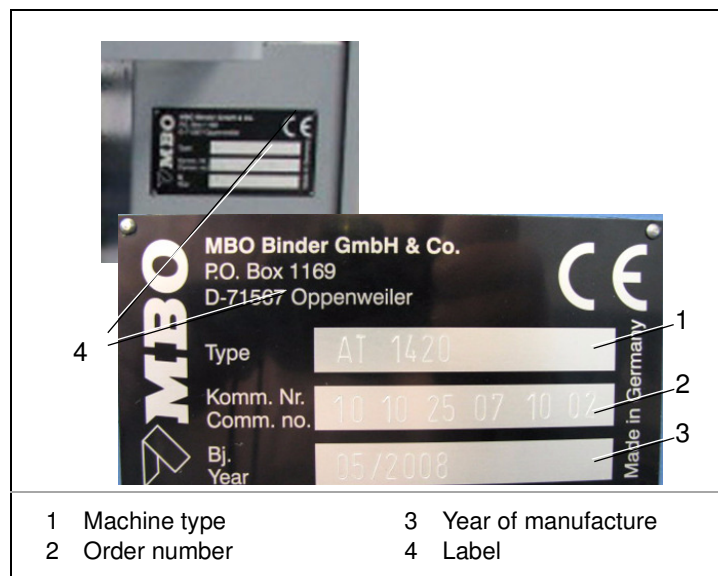


Figure 29: Label

Always provide this information for service requirements and procurement of spare parts:

- Order number
- Machine type



Please use only spare parts that are delivered and recommend by the manufacturer!

8.3 Operational maintenance

8.3.1 Checking the safety devices



- All devices for shutting down the machine in an emergency and all protecting doors must be checked individually and separately from each other.
- If any safety devices malfunction, shut down the machine immediately and secure it against being switched on again.

8.3.1.1 Functional test of the EMERGENCY STOP palm button

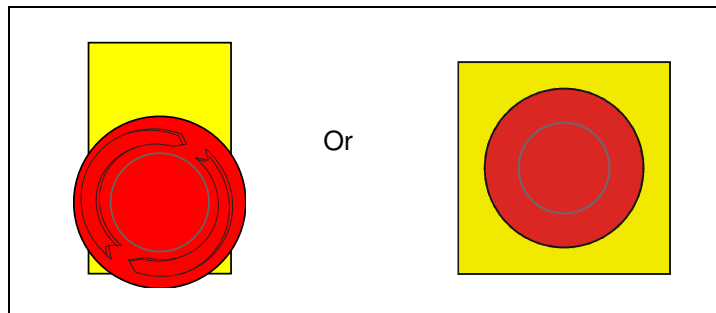


Figure 30: EMERGENCY STOP palm button

For safety reasons, the function of the EMERGENCY STOP palm button must be checked daily.

Procedure:



To prevent immediate or potential hazards, the machine is equipped with an EMERGENCY STOP shut-off device.

After the <EMERGENCY STOP> palm button is pressed, all electrical drives are switched off.

EMERGENCY STOP does not disconnect the machine from the electrical supply.

Press the EMERGENCY STOP palm button.

- ▷ Switch the machine on.
- ▷ Press the EMERGENCY STOP palm button so that it remains engaged and in an actuated state.
Pressing the EMERGENCY STOP palm button must cause all machine functions to shut down.
- ▷ Disengage the EMERGENCY STOP palm button when the test is finished.

8.3.1.2 Checking protective covers

⚠ WARNING

Operation without protective covers.

Non-observance could result in serious injury or death.

The protective covers protect against hazard spots:

- Never operate the machine without protective covers.
- Note that after maintenance or repair work, all protective covers have to be reinstalled.

Proceed as follows to check the protective devices.

Prerequisites These prerequisites must be fulfilled:

- The machine is ready for operation.

Checking protective devices Here's how to check the protective devices:

- ▷ Check all covers and protective devices to make sure they are present and functional.

See Chapter "4.4 Checklist for safety and protective devices".

The protective devices are checked.

8.3.2 Cleaning

8.3.2.1 Safety instructions

⚠ WARNING

False usage of cleaning agents.

Non-observance could result in personal injury.

- Be sure to follow the manufacturer's safety instructions.
- Avoid skin contact.
- Wear suitable safety gloves.
- Wear safety glasses.

⚠ WARNING

Cleaning cloth used.

Non-observance could result in personal injury or damage to property.

- Observe fire hazards resulting from the inflammability of the cleansing agent.
 - Dispose of the cleaning cloth in an environmentally friendly manner.
 - Contact your cleaning agent manufacturer to find out about any residual danger as well as about disposal in an environmentally friendly manner.
-

8.3.2.2 Property damage messages

NOTICE

*Heavy contamination can impair the functioning of the machine.
Non-observance could result in property damage.*

- Clean the machine after each job (at least once per week).
- The dust layer may never be more than 1 mm.
- Especially clean dirt (paper dust, printing powder, etc.) from moving parts.
- Do not use any aggressive chemical detergents or cleaning agents. If unsuitable detergents or cleaning agents are used, they can attack lacquered surfaces or cause the foldroller coating to swell.
- Never clean the machine using compressed air (bearing damage).

8.3.3 Cleaning agent recommendation

Flat surfaces and cavities	Suction clean or sweep out.
For deposits that adhere to finished surfaces	Solvent-free cleansing agent.
Transport tapes	MBO Binder GmbH & Co. KG recommends the cleaning agent from "Varn" with the no.: "Varn-Wash VM 111 or VWM." "Varn" supplies the printing industry around the world. It is therefore not impossible that other names are used in different countries. Therefore, see the technical data sheets from "Varn" for the appropriate order no.

8.3.4 Cleaning of the machine

Clean the machine at least once per week.

The dust layer must never exceed 1 mm (0.039 in.).

Especially clean dirt (paper dust, printing powder, etc.) from moving parts.

Heavy contamination can impair the functioning of the machine.

Procedure:

- ▷ Suck up the dirt.
 - ▷ Use a brush for hard-to-reach areas.
 - ▷ Wipe down the surfaces using a dry cloth.
 - ▷ Do not use any aggressive chemical detergents or cleaning agents.
 - ▷ Never clean the machine using compressed air, as ingress of dirt destroys the bearings.
- Clean the machine at least once per week.
 - The dust layer must never exceed 1 mm (0.039 in.).
 - Never clean the machine using compressed air, as ingress of dirt destroys the bearings.



8.3.5 Cleaning the transport tapes



Accumulations of printing powder and/or printing ink on the transport tapes can cause a reduction in the quality of the sheets.
Clean the transport tapes weekly and as needed.

Procedure:

- ▷ Before cleaning the machine, switch it off using the main switch and secure it against switching on again.
- ▷ For cleaning, use the cleaning agent "Varn-Wash VM 111 or VWM."
- ▷ Use only linen cloths as cleaning cloths.
- ▷ Moisten the linen cloth using the roller cleaning agent.
Never immerse transport tapes in the roller cleaning agent.
Penetrating roller cleaning agent can destroy the bearings.
- ▷ Remove accumulations on the press rollers with a linen cloth.
- ▷ Apply only a little pressure when rubbing.
- ▷ Dry the transport tapes with a dry linen cloth.

8.3.6 Cleaning the optical sensors

The optical sensors of the machine get dirty during production due to paper dust and printing powder.

Therefore, they should be cleaned after each job (at least once per week).

Procedure:

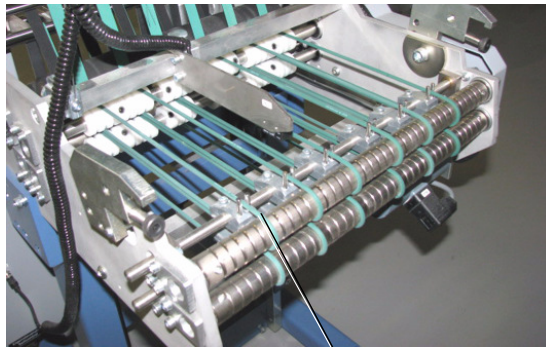
- ▷ Clean the optical elements of the sensors with a dry, lint-free cloth.

8.4 Maintenance

8.4.1 Checking the round belts



Check the round belts monthly for its running properties, tension, condition, and soiling. If the required tension declines or if the general state is poor, it must be replaced.



1 Round belts

Figure 31: Checking the round belt



The round belts cannot be tightened after the fact. Only have the round belts replaced by MBO Service or by an authorized customer service agent.

8.4.2 Checking the drive belt



Check the drive belt monthly for its running properties, tension, condition, and soiling.

If the required tension can no longer be adjusted or if the general state is poor, it must be replaced.

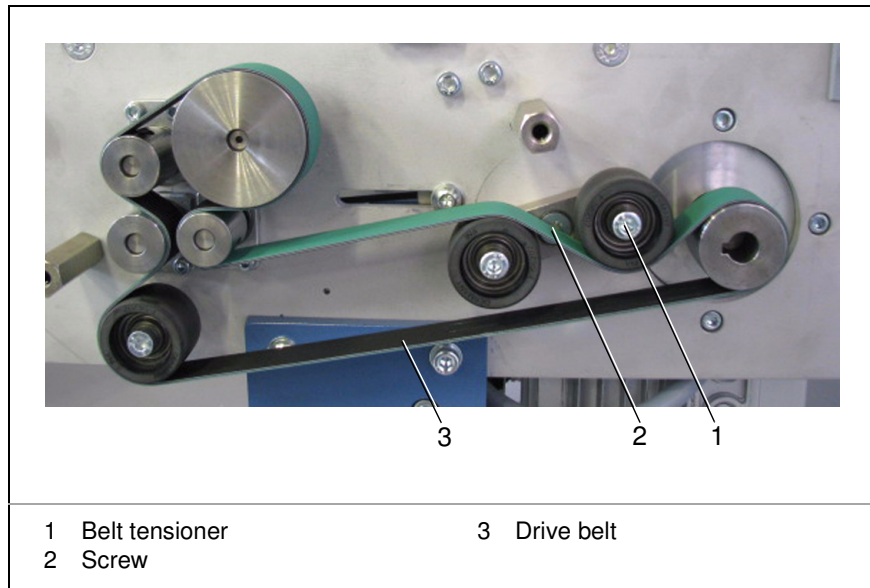


Figure 32: Checking the drive belt

Removing the guard:

Procedure:

- ▷ Remove the fastening screws.
- ▷ Remove the guard.

Tensioning the drive belt:

Procedure:

- ▷ Loosen the screw (2) of the belt tensioner (1).
- ▷ Tension the drive belt (3) with the belt tensioner (1).
- ▷ Tighten the screw (2) again.

Replacing the drive belt:

Procedure:

- ▷ Loosen the screw (2) of the belt tensioner (1).
- ▷ Remove the old drive belt (3).
- ▷ Insert the new drive belt (3).
- ▷ Tension the drive belt (3) with the belt tensioner (1).
- ▷ Tighten the screw (2) again.

Attaching the guard:

Procedure:

- ▷ Attach the guard again.
- ▷ Insert the fastening screws and tighten them.

8.4.3 Checking the transport tapes



Check the transport tapes monthly for their running properties, tension, condition, and soiling.

If the required tension can no longer be adjusted or if the general state is poor, it must be replaced.

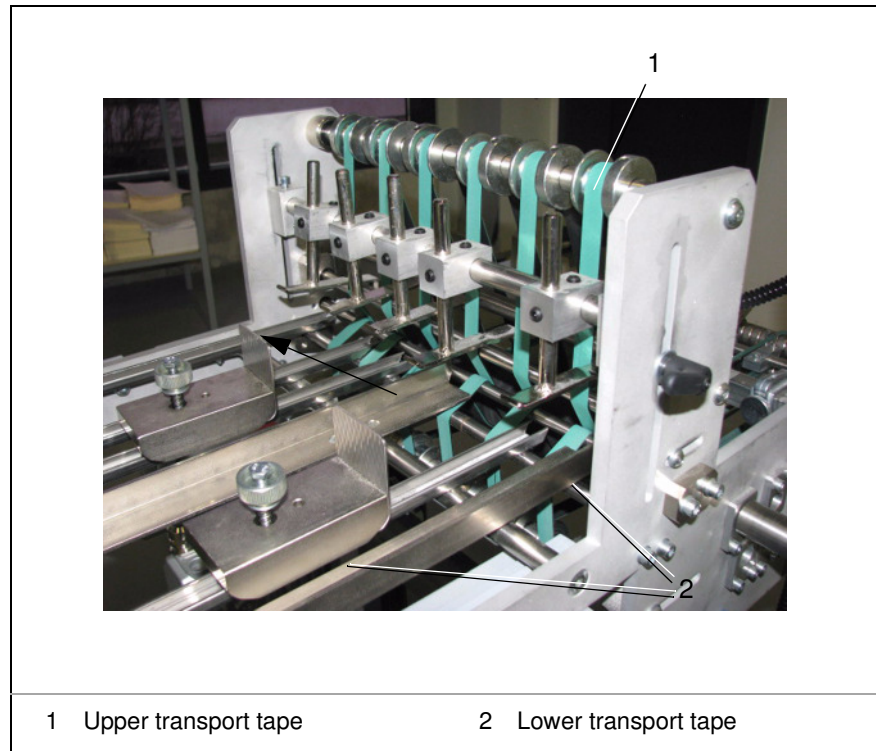


Figure 33: Checking the transport tapes



Only have the transport belts replaced by MBO Service or by an authorized customer service agent.

8.5 Lubrication



Figure 34: Lubrication

Procedure:

- ▷ Use a grease gun to grease the safety handwheel (1) on the grease nipple monthly.

8.6 Maintenance, lubrication, and cleaning plan

NOTICE

Incorrect maintenance, lubrication and cleaning intervals for multi-shift operation.

Non-observance may result in property damage.

- All specified maintenance, lubrication and cleaning intervals apply to single-shift operation.
- Convert the indicated intervals for multi-shift operation accordingly

	Chapter No.:	Working process	Interval	Date	Signature
Operational maintenance	8.3.1	“Checking the safety devices”	Daily		
	8.3.4	“Cleaning of the machine”	Weekly		
	8.3.5	“Cleaning the transport tapes”	Weekly		
	8.3.6	“Cleaning the optical sensors”	Weekly		
Lubrication	8.5	“Lubrication”	Monthly		
Maintenance	8.4.1	“Checking the round belts”	Monthly		
	8.4.2	“Checking the drive belt”	Monthly		
	8.4.3	“Checking the transport tapes”	Monthly		

Table 18: Maintenance, lubrication, and cleaning plan



MBO recommends attaching a copy of this maintenance, lubrication, and cleaning plan to the machine.

8.7 Repair

 **WARNING**

Improper repair.

Non-observance may possibly cause serious personal injuries and damage to property.

- Repair work must be carried out by trained and authorized personnel with specialized technical skills and knowledge only.
 - Observe the local occupational safety regulations.
 - Carry out a function test after the repair.
-



Only have repair work performed by MBO Service or by an authorized customer service agent.

9 Shutdown, storage

9.1 Introduction

9.1.1 Qualification of personnel

This table lists the necessary qualification of the personnel related to "Shutdown and storage" of the machine.

	Specially trained personnel	Instructed operating personnel	Instructed personnel with specialized training (mechanical/electrical engineering)
Shutdown	-	-	X
Storage	X	-	-
Putting the machine back into operation	-	-	X

Tabelle 19: Qualification of personnel; Shutdown, storage
Key: X permitted, - not permitted

9.1.2 Property damage messages

NOTICE

Incorrect storage.

Non-observance could result in property damage.

Observe the corresponding storage conditions.

9.2 Shutdown

9.2.1 Temporary shutdown:

Procedure:

- ▷ Shut down machine.
- ▷ Stop compressed air supply to the machine.
- ▷ Remove products, tools from the machine.
- ▷ Clean and maintain machine.
See Chapter "8 Maintenance".



After a temporary shutdown, the machine must be commissioned again.
See Chapter "6 Transport/Set-up/Start-up".

9.2.2 Final decommissioning

Procedure:

- ▷ Shut down machine.
- ▷ Have the machine disconnected from the power supply by a licensed electrician.
- ▷ Disconnect the machine from the compressed air supply.
- ▷ Remove products, tools from the machine.
- ▷ Dismantle the machine by following the installation steps in the opposite sequence.
 - For transport, observe the instructions in Chapter "6 Transport/Set-up/Start-up".

9.3 Storage

- ▷ Check the premises with respect to temperature and humidity.
See Chapter "3.2.5 Ambient conditions".
The higher the humidity, the greater the danger of corrosion.
- ▷ For long-term storage, measures for corrosion protection must be taken.
- ▷ Observe the specifications regarding the weight and size of the machine when selecting the premises.
See Chapter "3.2 Technical data"
- ▷ Use a suitable fork lift for transport.
See Chapter "3.2.4 Weights, fork lifts, and floor requirements".
- ▷ Cover the machine with foil.

10 Disposal

10.1 Introduction

10.1.1 Qualification of personnel

This table lists the necessary qualification of the personnel related to "Disposal" of the machine.

	Specially trained personnel	Instructed operating personnel	Instructed personne with specialized training (mechanical/ electrical engineering)
Disposal	X	-	-

Tabelle 20: Qualification of personnel; Disposal
 Legend: X permitted, - not permitted

10.1.2 Property damage messages

NOTICE

Improper disposal.

Non-observance could result in environmental damage.

Comply with the corresponding federal and regional regulations, laws and directives.

10.2 Disposal/recycling

The environmentally compatible and professional disassembly and disposal of the machine is the responsibility of the owner/operator.

**European
Community member
countries:**

- Comply with the corresponding European directives.
- Comply with the corresponding federal and regional laws and regulations.

Non-EU countries:

- Comply with the corresponding federal and regional regulations, laws and directives.

Disposal/recycling:

Procedure:

- Decommission the machine prior to disposal.
See Chapter "9 Shutdown, storage".
- For transport, observe the instructions in Chapter "6 Transport/Set-up/Start-up"
- Separate machine parts and electrical components by type and dispose of them properly.



All parts, consumables and supplies of the machine:

- Separate by type
- Dispose of in accordance with local regulations, laws and directives



If you have any further questions regarding disposal, please contact the manufacturer!

The MBO group worldwide:

MBO Germany



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71567 Oppenweiler
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Tel.: +49 7191 46 0
Fax: +49 7191 46 34
<http://www.mbo-folder.com>
info@mbo-folder.com

MBO Portugal



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