Folding machine

Translation of the original operating manual

K 8
PERFECTION
Standard
Automatic

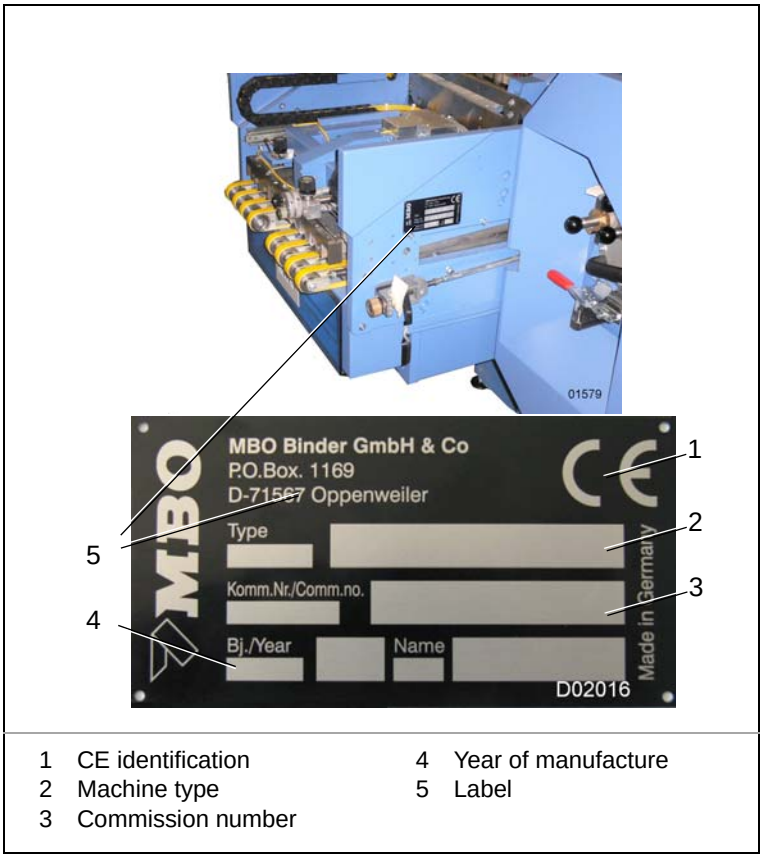
Retain for future use!

Machine type:	Folding machine		
Configuration:	K 8 PERFECTION Standard Automatic		
Type of document:	Translation of the original operating manual		
Version:	V1.2	**Author:**	Wolfgang Matzner
Status:	13. November 2012	**Machine No.:**	
Language:	English	**File name:**	BA_K8_NC-Standard-Automatik_V1.2_en
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		

Subject to change!

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.



1	CE identification	4	Year of manufacture
2	Machine type	5	Label
3	Commission number		

Figure 1: Label

Always provided these details for queries, service orders and spare part orders:

- Commission number
- Machine type

EC Declaration of Conformity

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

The manufacturer

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

hereby declares that the machinery described below

Commission no.	
Designation	Folding machine
Type	K 8
Year of manufacture	

conforms to the requirements of the following directives

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

Harmonised standards applied:

DIN EN ISO 12100:2011-03	DIN EN 1010-1:2011-06
DIN EN 1010-4:2012-12	DIN EN 1010-5/A1:2010-11
DIN EN 60204-1/2007	

Authorised representative for compiling the technical file:

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Oppenweiler, on November 13, 2012

_____

Frank Eckert, Managing Director

Table of contents

1 About this manual

This operating manual must be read by all persons who will either transport, set up, connect, putting into operation, adjust, operate, maintain, repair or dismantle this machine.

Only if the contents of the operating manual are understood by all persons and complied with in all aspects is the safe usage of the machine possible. This applies especially for the chapter about safety.

This operating manual contains important instructions on how to operate 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 operating manual should be supplemented by the owner/operator with instructions regarding national regulations pertinent to accident prevention and protection.

Keep:

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

In case of sale of the machine:

- Pass along this operating manual to all subsequent owners or operators of the machine.

We reserve the right to make technical modifications for the improvement of the machine, also if these have not yet been incorporated in this operating manual.

1.1 Additional documents and records

In addition to these operating manual, these documents also belong with the machine:

- Wiring diagram
- Spare parts lists
- Knive catalog
- Pneumatic diagram
- Supplier documentation
  - pressure vacuum pumps

1.2 Operating manual structure

The operating manual chapters 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/operators • Operating personnel • Maintenance personnel • Service technicians
1	About this manual	Important information about this manual.	• Owner/operators • Operating personnel • Maintenance personnel • Service technicians
2	Basic safety instructions	Details for: • Residual risks and hazards at intended use. • Foreseeable misuse • Avoiding of risks	• Owner/operators • Operating personnel • Maintenance personnel • Service technicians
3	Product description	• Important information about the product • Technical data	• Owner/operators • Operating personnel • Maintenance personnel
4	Structure and function	Description of: • Structure and functionality • Safety and protective devices	• Operating personnel • Maintenance personnel • Service technicians
5	Operating and display elements, operating modes	Description of: • Operating elements • Display elements • Operating modes	• Operating personnel • Maintenance personnel • Service technicians
6	Transport, interim storage	Details for: • Packaging • Transport • Interim storage	• Transport personnel • Maintenance personnel • Service technicians
7	Set-up and commissioning	Details for: • Set-up • Commissioning	• Maintenance personnel • Service technicians
8	Operation and adjustment	Details for: • Operation • Adjustment	• Operating personnel • Maintenance personnel • Service technicians
9	Maintenance	Details for: • Operational maintenance • Maintenance • Repair	• Operating personnel • Maintenance personnel • Service technicians

Table 1: Operating manual structure

No.	Chapter	Contents	Target group
10	Decommissioning, storage and recommissioning	Details for: • Decommissioning • Storage • Recommissioning	• Owner/operators • Operating personnel • Maintenance personnel • Service technicians
11	Disposal	Details for environmentally friendly disposal.	• Owners/operators • Maintenance personnel • Service technicians.

Table 1: Operating manual structure

1.3 Signs and symbols used

The signs and symbols in this manual should help you to quickly and safely use the manual and machine.

Symbol	Explanation
▷	Identifies an action step. The sequence is not specified.
1) ... 2) ... 3) ...	Numbered action step. The defined sequence of the action steps makes it easier for you to correctly and safely use the machine.
✓	Here you will find the result of a sequence of action steps.
< STOP >	Push button with the label that is between the brackets (e.g. Stop).
	Additional information for use of the machine.
	Important notice, please observe.

Table 2: Symbols, terms, and abbreviations

1.4 Description of safety messages

Safety messages are marked by a safety symbol and a signal word.

1.4.1 Signal words

The signal words draw your attention to the severity of the hazard. They are structured according to a classification system.

Signal word	Significance
DANGER	Meaning a direct imminent hazard that leads to severe bodily injuries or even to death.
WARNING	Meaning a possibly hazardous situation that may lead to severe bodily injuries or even to death.
CAUTION	Meaning a possibly hazardous situation that may lead to slight bodily injuries or to property damage

Table 3: Signal word meanings

1.4.2 Structure of safety messages

Each safety message is structured as follows:

- Safety symbol
- Signal word to identify the hazard level
- Type and source of the hazard
- Possible consequences of the hazard
- Measure(s) for avoiding the hazard

Example:

DANGER! WARNING! CAUTION! (signal word)
Type and source of the hazard.
Possible consequences of the hazard.
Measure(s) for avoiding the hazard

1.4.3 Safety symbols

Representation	Significance
	**Prohibition symbol** Red border, white background, black symbol. Safety symbol prohibiting certain behavior that could result in hazard.
	**Warning triangle** Yellow background, black symbol. Safety symbol that warns about a hazard.
	**Mandatory symbol** Blue background, white symbol. Safety symbol that prescribes a particular behavior.
	**Rescue symbol** Green background, white symbol. 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.
	**Fire protection symbol** Red background, white symbol. 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.

Table 4: Safety symbols

1.4.3.1 Warning-triangle

Representation	Significance
	**Warning of a general hazard.** This warning-triangle is in front of activities by which several causes could lead to endangerment.
	**Warning of hazardous electric voltage.** This warning-triangle is in front of activities by which there is a hazard of electrocution, possibly with fatal consequences.
	**Warning of crush injuries to bodily parts.** This warning-triangle is in front of activities by which there is a hazard of a crush injury, possibly with fatal consequences.
	**Warning of rotating rollers.** This warning-triangle is in front of activities by which there is a hazard of a crush injury, possibly with fatal consequences.
	**Warning of crush injuries to hands.** This warning-triangle is in front of activities by which there is a hazard of a crush injury to hands.
	**Warning of crush injuries due to noise-damping hoods.** This warning-triangle is in front of activities by which there is a hazard of a crush injury through the noise damping and safety hood, possibly with fatal consequences.
	**Warning of rotating machine parts.** This warning-triangle is in front of activities by which there is a hazard of cut wounds, possibly with fatal consequences.
	**Warning of lifting heavy machine parts.** This warning-triangle is in front of activities by which there is a hazard of excessive straining due to lifting heavy loads.
	**Warning of tipping machine parts.** This warning-triangle is in front of activities by which there is a hazard of crush injuries due to tipping loads.

Table 5: Warning-triangle

Representation	Significance
	**Warning of infeed points.** This warning-triangle is in front of activities by which there is a hazard due to infeed points.
	**Warning of sharp knives on the slitter shafts.** This warning-triangle is in front of activities by which there is a hazard of cut wounds, possibly with fatal consequences.
	**Warning of substances injurious to the health.** This warning-triangle is in front of activities by which there is a hazard of substances injurious to the health, possibly with fatal consequences.
	**Warning of oxidizing substances** This warning-triangle is in front of activities by which there is a hazard of flammable substances, possibly with fatal consequences.
	**Warning of hot surfaces.** This warning-triangle is in front of activities by which there is a hazard of a burns, possibly with lasting consequences.
	**Warning of tripping hazards.** This warning-triangle is in front of activities by which there is a hazard due to tripping, possibly with fatal consequences.

Table 5: Warning-triangle

1.4.3.2 Mandatory symbol

Representation	Significance
	**Use hand protection.** This mandatory symbol is in front of activities by which protective gloves should be worn.
	**Use foot protection.** This mandatory symbol is in front of activities by which safety shoes should be worn.
	**Use hearing protection.** This mandatory symbol is in front of activities by which hearing protection should be worn.
	**Use eye protection.** This mandatory symbol is in front of activities by which safety glasses should be worn.
	**Use help.** This mandatory symbol is in front of activities by which help from other persons should be sought.
	**Observe the operating manual.** This mandatory symbol is in front of activities by which the operating manual should be observed.
	**Observe the Maintenance chapter.** This mandatory symbol is in front of activities by which the Maintenance chapter should be observed.

Table 6: Mandatory symbol

1.4.3.3 Prohibition symbol

Representation	Significance
	**Treading on the surface is prohibited.** This prohibition symbol is affixed to objects that may not be stepped on.

Table 7: Prohibition symbol

1.4.3.4 Hazard warning

Permanent obstructions and hazard areas are identified by means of yellow and black stripes.

Representation	Significance
	**Pay heed to hazard area or obstruction.** This hazard warning is affixed to permanent hazard areas or obstructions.

Table 8: Hazard warning

1.5 User assessment of the operating manual

Our operating manuals are regularly updated. Please help us to make the manuals more user-friendly by providing your improvement suggestions.

2 Basic safety instructions

A basic requirements for the safety-compliant handling and problem-free operation of this machine is familiarity with the fundamental safety instructions and the safety regulations.

- 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 accessible to operating personnel and maintenance personnel.
- In addition, all locally applicable legal and other binding regulations for accident prevention and environmental protection must be complied with.

2.1 Intended use

- The machine is intended exclusively for processing flat paper.
  The specifications relative to format and grammage in the "Product description“ 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 personnel only.
- Troubleshooting, maintenance and service must be carried out by trained maintenance personnel only.
- Observe all instructions of this operating manual.
- Comply with the local safety regulations and accident prevention regulations.
- Heed the inspection intervals and maintenance intervals.
- Only use original wear 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 Reasonable foreseeable misuse

In case of reasonable foreseeable misuse of the machine, the manufacturer's EC Declaration of Conformity is rendered null and void, and hence automatically the operating permit too.

Reasonable foreseeable misuse are:

- Operation in a potentially explosive environment.
- Operation with protective devices removed.
- Exceeding the technical values specified for normal operation.
- Unauthorized modifications and changes.
- Noncompliance with maintenance intervals and cleaning intervals.
- Incorrectly performed maintenance works and repair works.
- Neglected replacement of wear parts.
- Non-intended use.

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

Therefore, do not undertake any additions or changes to the machine without first consulting with and obtaining the written consent of the manufacturer.

Spare parts and wear parts: The use of spare parts and wear parts from third parties can lead to risks. Use only original parts or parts approved by the manufacturer.

The manufacturer assumes no liability for damage incurred through the use of spare parts and wear 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.
  Malfunctions that have occurred, which could impair the safety, are immediately rectified.

2.4 Warranty

Our " General Sales Terms and Terms of Delivery " are applicable here. Warranty entitlements and liability claims regarding personal injury and property damage are hereby excluded, if they are attributable to one or more of the following causes:

- Non-intended use of the machine.
- Improper assembly, start-up, operation or maintenance of the machine.
- Operation of the machine with safety and protective devices that are not attached or defective.
- Non-observance of the instructions and notes in the operating manual with regard to the transport, installation, initial operation, operation, set-up, maintenance and storage of the machine.
- Individual constructional changes to the machine.
- Non-compliance with the maintenance intervals and cleaning intervals that avert stoppage of the machine.
- Faulty monitoring of machine parts subject to wear-off and tear, such as belts, tapes, brushes and couplings.
- The installation of spare parts and wear parts not obtained from the manufacturer.
- Cases of catastrophe and acts of God.

2.5 Residual risks

A risk analysis with risk assessment has been performed for this machine in accordance with DIN EN ISO 12100.

The design and model implementation of the machine conform with this analysis and correspond to the state of the art.

You can avoid the existent residual risks by observing and implementing these specifications:

- Warnings and safety instructions on the machine.
- General safety instructions and special safety messages in these operating manual.
- Operating manual of the machine manufacturer/system manufacturer.
- Operating instructions of the owner/operator.

The existent residual risks are, correspondent to the different service-life phases of the machine, listed in the following chapters.

2.5.1 Transport, intermediate storage

- Using unsuitable fork lifts.
- Tipping machine parts during the unloading procedure.
- Unsuitable substructure.
- Improper storage.

2.5.2 Installation, initial operation

- Hazardous voltage.
- Hazardous voltage when connecting to the mains power supply.
- Incorrect supply voltage.
- Use of unsuitable fork lifts.
- Tipping machine parts during the setting-up procedure.
- Insufficient properties and condition of the underfloor.
- Transport lock at threefold carriage.
- Transport lock at threefold (KTZ).
- Improper alignment of the machine components.
- Excessive operating pressure (compressed air).
- Exposed rotating foldrollers and slitter shafts due to pulling back/removing the buckle plates.
- Lifting heavy machine parts.
- Incorrect use of the power sockets.
- Leakage currents greater than 10 mA.
- Disconnected ground wire connections.
- Tripping over connecting cables lying about.
- Using multiple adapter boxes in one machinery.
- Incorrect rotational direction of the feeder motor.
- Incorrect rotational direction of the pressure vacuum pumps.

- Incorrect rotational direction of the driving motor.
- Dismantled protective devices.

2.5.3 Adjustment and operation

- Dismantling, bridging or bypassing safety and protective devices.
- Operation without protective covers.
- Independent lowering of the open noise damping and safety hood.
- Independent lowering of the open crossfold table.
- Independent lowering of the open guard (KTL).
- Crushing hazard when closing the crossfold table.
- Rotating machine parts.
- Exposed rotating foldrollers and slitter shafts due to pulling back/removing the buckle plates.
- Rotating machine parts in the set-up mode.
- Adjusting the pressure of fold rollers.
- Incorrect handling of the safety handwheels.
- High noise level.
- Crash hazard during automated format change.
- Infeed point at the end of the register table.
- Incorrectly fastened buckle plates.
- Misadjustment of the stop screws on the buckle plates.
- Cutting hazard due to slitter shafts.
- Canting of the threefold carriage.
- Folding knife is set too low.
- Paper jam.
- Tripping over connecting cables lying about.
- Using several adapter boxes in one machine network.

2.5.4 Maintenance

Operational maintenance:

- Exposed rotating foldrollers and slitter shafts due to pulling back/removing the buckle plates.
- Rotating machine parts.
- Lifting heavy machine parts.
- Heavy contamination.
- Improper cleaning.
- Unsuitable cleaning agents.
- Incorrect use of cleaning agents.
- Used cleaning cloth.
- Use of compressed air.
- Spiral foldrollers cleaned incorrectly.
- High-grip foldrollers cleaned incorrectly.
- False maintenance intervals, lubrication intervals and cleaning intervals in multi-shift operation.

Maintenance:

- Hazardous voltage.
- Dismantling, bridging or bypassing safety and protective devices.
- Operation without protective covers.
- Exposed rotating foldrollers and slitter shafts due to pulling back/removing the buckle plates.
- Rotating machine parts.
- Crush injuries.
- Being drawn in.
- False/poor maintenance tools.
- Improper maintenance.
- False maintenance intervals, lubrication intervals and cleaning intervals in multi-shift operation.

Repair:

- Improper repair.

2.5.5 Decommissioning, 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 time of the control system-related components

All components of the control system-related safety circuits have a life time 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 initial operation 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, 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 prior to beginning the equipping.
- If the machine has been switched off for equipping, it must be secured against unauthorized or unintentional 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 repair work may only be performed by specifically trained and authorized personnel.
- Inform operating personnel prior to beginning the maintenance and repair works. Secure the service area if necessary.
- During all maintenance and repair work, observe all switching-on and switching-off procedures according to the operating manual.
- Observe maintenance and repair intervals specified in the operating manual.
- If the machine has been switched off for maintenance works and/or repair work, it must be secured against unauthorized or unintentional 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 dismantling of the safety devices is necessary for maintenance and repair work, the safety devices must be reinstalled immediately after completion of the work and tested to ensure their operational reliability.
- 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 that are no longer needed, must be disposed of in a safe and environmentally-friendly manner.

2.7.6 Work on electrical equipment

- Work on the electrical equipment or operating resources may only be carried out by a qualified electrician, or a person instructed in electrical systems under the direction and supervision of a qualified electrician, in accordance with the standards DIN VDE 0105-100 / DIN EN 50110-1 and the German trade association regulation BGV A3.
- In case of any disruptions in the electrical power supply, the machine must be switched off immediately.
- Only use original fuses with the prescribed amperage.

2.8 Personnel, qualifications and obligations

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

The authorized personnel are a subdivided in several groups:

- Owner/operator
- Operating personnel
- Maintenance personnel

The authorized personnel must:

- Have reached the age of 16.
- 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 the operating manual with regard to his or her responsibilities, tasks and activities regarding the machine, and be able to practically carry these out.

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	-	-
Setup	-	-	X
Electrical connections	-	-	X
Power connection	-	-	X
Initial operation	-	-	X
Troubleshooting (mechanical/ electrical	-	-	X
Adjusting, equipping	X	X	-
Operating	-	X	-
Operational maintenance	-	X	-
Maintenance	X	-	X
Repair	-	-	X
Shutdown	-	-	X
Storage	X	-	-
Disposal	X	-	-

Table 9: Qualification of personnel
Legend: X permitted, - not permitted

2.8.2 Obligation 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 being safeguarded against unauthorized usage,
- 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,
- that the authorized personnel have read and understood the operating manual,
- the operating manual is always kept at the use area of the machine and is freely accessible to the operating personnel and maintenance personnel,
- the safety messages on the machine are in a clearly legible condition,
- a risk assessment of the entire machine system being carried out and its results being summarized in operating instructions,
- 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 Obligations 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,
- to have read and understood 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:

- The machine being safeguarded against unauthorized usage
- the machine being operated only when it is fully functional, safe and reliable,
- the cleaning being carried out according to the cleaning schedule.

2.8.4 Obligations 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:

- The machine being safeguarded against unauthorized usage
- the maintenance being carried out according to the maintenance schedule.

2.9 Personal protective equipment

2.9.1 Operation and adjusting

This personal protective equipment for the operation and adjusting of the machine must be provided and worn:

- Hearing protection
- Cut-resistant safety gloves
- Safety shoes

2.9.2 Operational maintenance (cleaning)

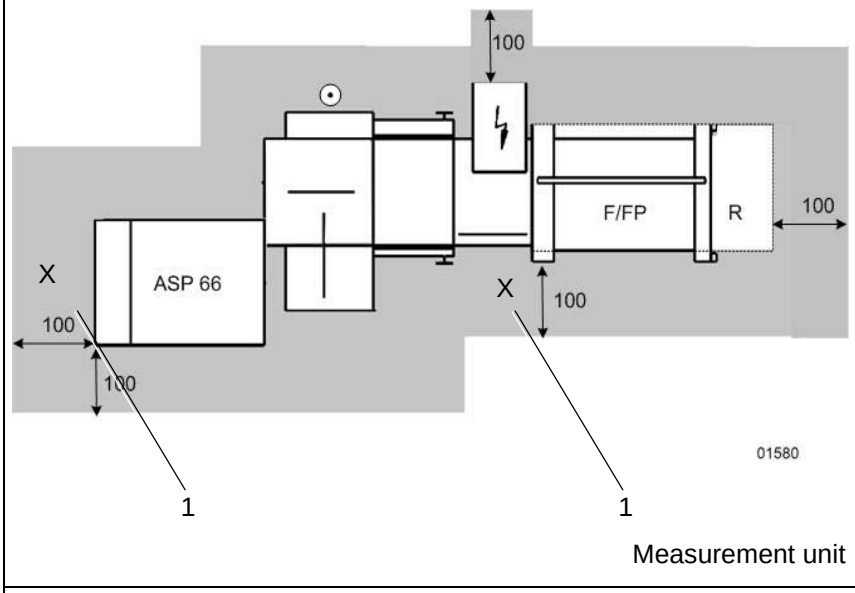
This personal protective equipment for the operationally-compliant maintenance (cleaning) of the machine must be provided and worn:

- Safety glasses
- Suitable safety gloves
- Safety shoes

2.10 Working areas and workplaces

- The machine is intended exclusively for operation by one person.
- The illustration shows the most important workplaces as well as the work area and service area of the machine.
- The necessary work areas for operation, installation, initial operation and maintenance are highlighted in gray and should be at least 100 cm.
- The service area is highlighted by hatched lines.
- The possible workplaces are marked with an "X".

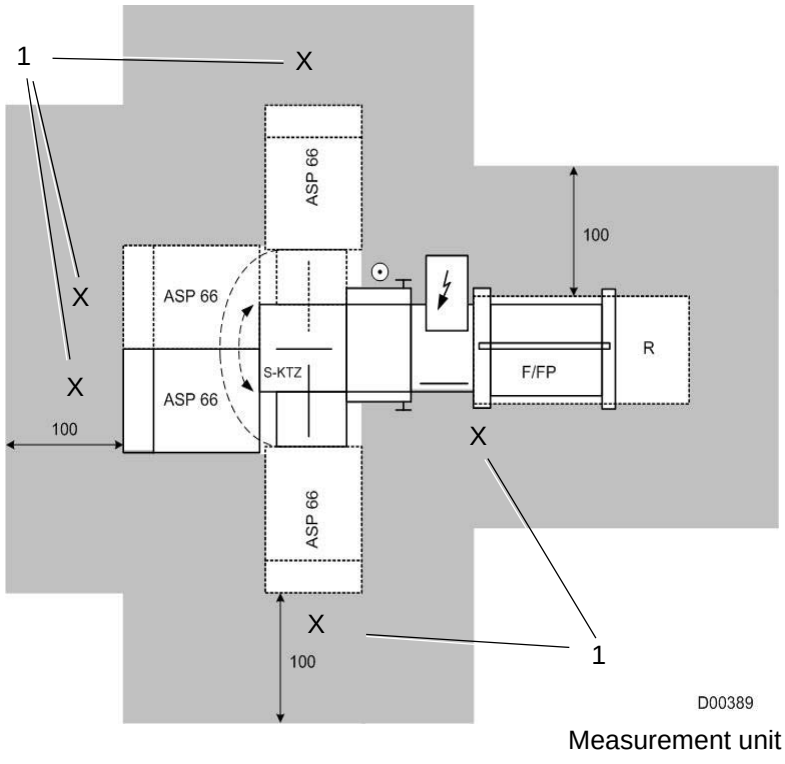
2.10.1 Models KL, S-KTL, S-KTLT



1 Workplaces

Illustration 1: Working areas and workplaces KL - S-KTLT

2.10.2 Model S-KTZ



1 Workplaces

Illustration 2: Working areas and workplaces S-KTZ

2.11 Markings on the machine

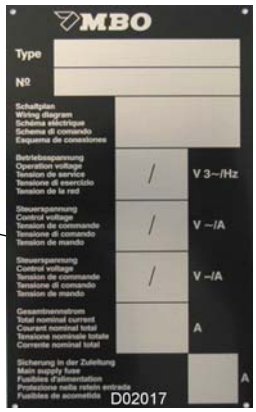
These markings must be affixed to the machine and in a clearly legible condition.
If they are damaged or illegible, they must be replaced.
The corresponding MBO part number can be found in Chapter “2.11.1 Position and meaning”.

2.11.1 Position and meaning

Pos. 1	MBO part number:10.5171.025

Meaning: <Type label>

Pos. 2	MBO part number: 10.5171.026



Meaning:<Electrical type label>

Pos. 3	MBO part number: 0128301

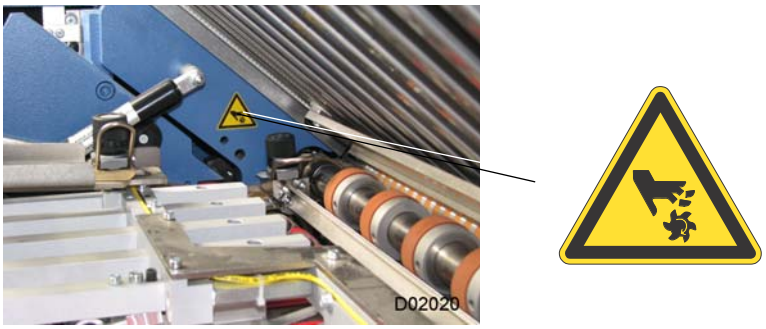
Meaning:

DANGER!

Hazardous voltage.

- **Non-observance will result in serious personal injury or death.**Work may only be carried out on the machine's electrical systems by a qualified electrician.
- Observe the local occupational safety regulations and electrotechnical regulations.
- On the supply terminals and on the terminals of the main switch, there is dangerous electric voltage even when the main switch is switched off (see wiring diagram).
- On the frequency inverter connecting terminals, there is dangerous residual voltage even when the main switch is switched off. (Observe the capacitor discharge time (KEB 5 min, Telemecanique 15 min)).

Pos. 4	MBO part number: 0128301



Meaning:

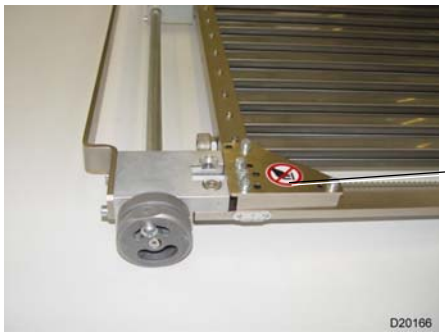
WARNING!

Cutting hazard due to slitter shafts.

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

- Never reach into the slitter shafts while the machine is running.
- For all work with the slitter shafts, wear cut-proof safety gloves and safety shoes.
- The removal/installation of the slitter shafts may only be performed on an idle machine that has been safeguarded against being switched on again.
- Always hold the slitter shafts by the shaft and not on the tool.

Pos. 05	MBO part number: 0101730



Meaning:

CAUTION!

Crash hazard during automated format change.

Non-observance could result in personal injuries.

When starting the automated format change, observe the following precautions:

- Do not reach into the machine.
- Make absolutely sure that there are no other people at the machine.

Pos. 6	MBO part number: 0751438

Meaning:

CAUTION!

Unsuitable cleaning agents.

Non-observance could result in damage to property.

Use the roller cleaning agent "Varn-Wash VM 111" or "VWM" only.

2.12 Directions for emergencies

The operating manual should be supplemented by the owner/operator with instructions regarding national regulations pertinent to accident prevention and protection.

3 Product description

3.1 Important notices about the product

3.1.1 Overall view

1 Register table 2 Parallel fold 3 Threefold	4 Crossfold 5 Noise damping and safety hood

Illustration 3: Overall view

3.1.2 Equipment

- Navigator Control machine controller, TOUCHSCREEN
- VIVAS, sheet feed system and alignment system
- 4 or 6 COMBIPLATE combination buckle plates
- Spiral foldrollers or high-grip foldrollers
- Slitter shaft cassette MWK
- Vacuknife, linear pneumatic, carbon folding knife
- Crossfold area can be swiveled up
- Threefold area can be pulled out
- Sheet stop in the crossfold for maculation discharge.
- Rapidset automation

3.2 Specifications

3.2.1 Floor plan

3.2.1.1 K 8 S-KTL, S-KTZ, S-KTLT continuous feeder

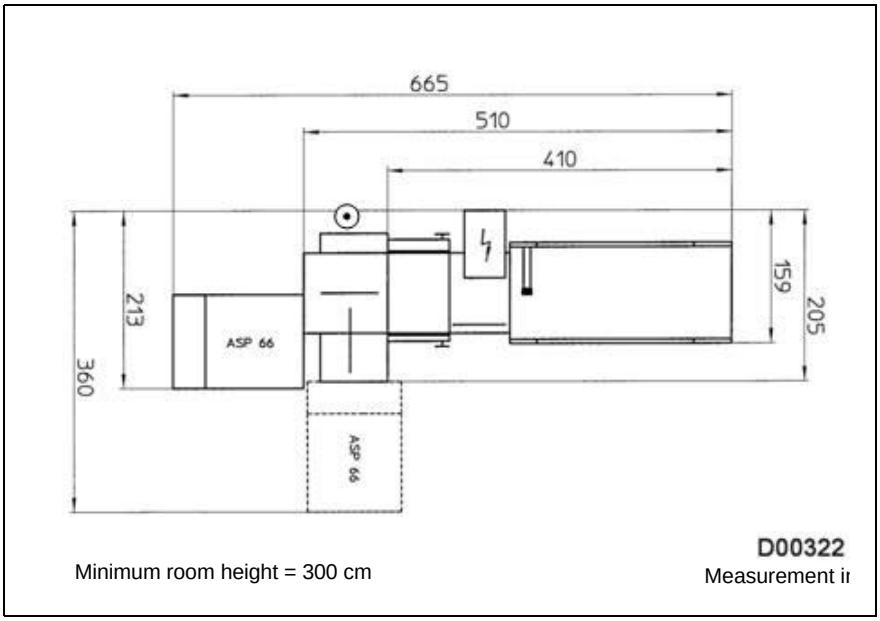


Illustration 4: Floor plan of S-KTL - S-KTLT continuous feeder

3.2.1.2 K 8 S-KTL, S-KTZ, S-KTLT flat pile feeder

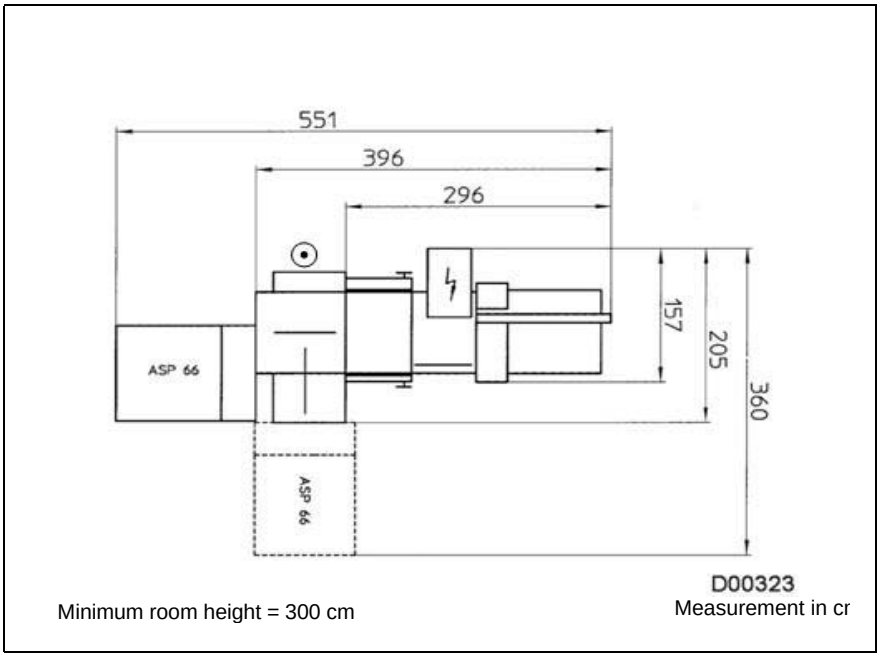


Illustration 5: Floor plan for S-KTL - S-KTLT pile feeder

3.2.1.3 K 8 S-KTL, S-KTZ, S-KTLT palletized feeder

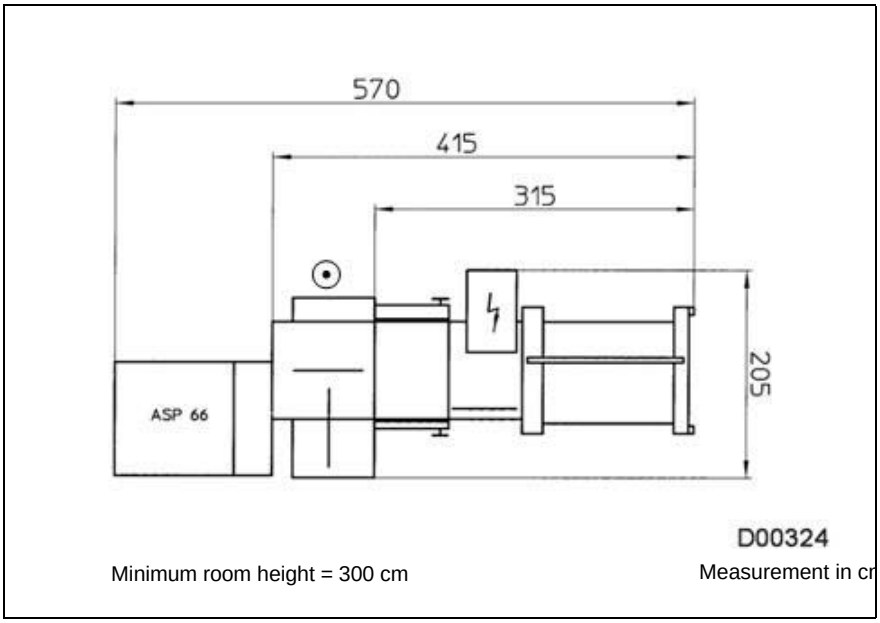


Illustration 6: Floor plan for S-KTL - S-KTLT FP feeder

3.2.1.4 K 8 S-KTL, S-KTZ, S-KTLT continuous feeder

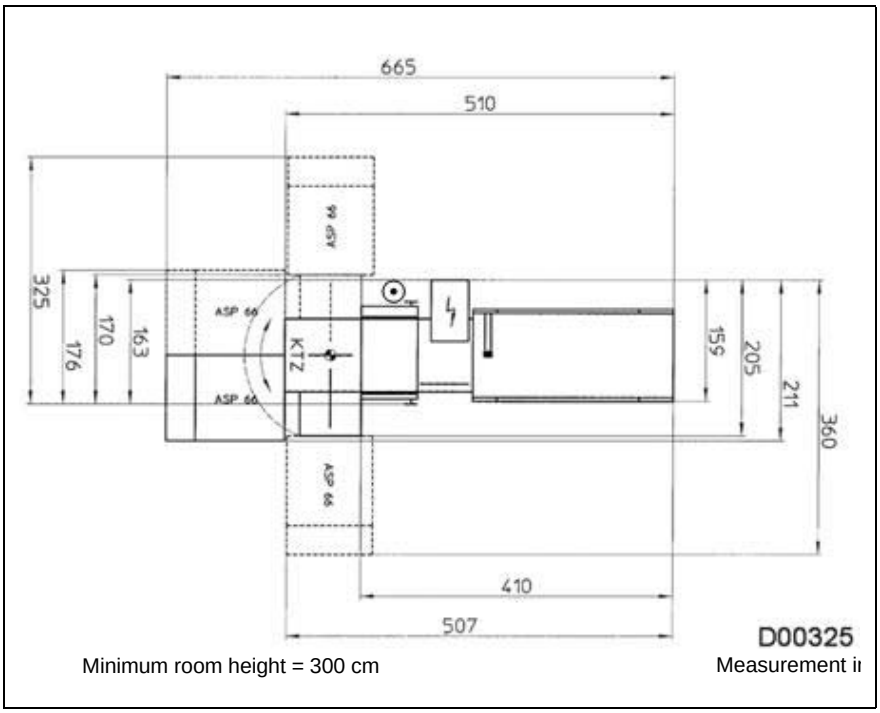


Illustration 7: Floor plan for S-KTL - S-KTL continuous feeder

3.2.1.5 K 8 S-KTZ flat pile feeder

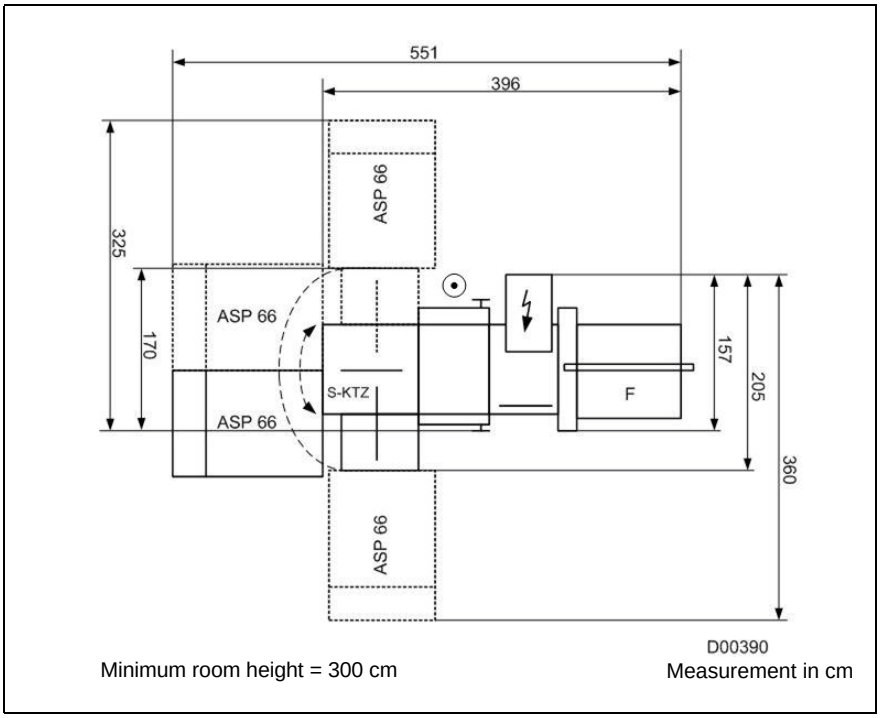


Illustration 8: Floor plan for S-KTZ pile feeder

3.2.1.6 K 8 S-KTZ palletized feeder

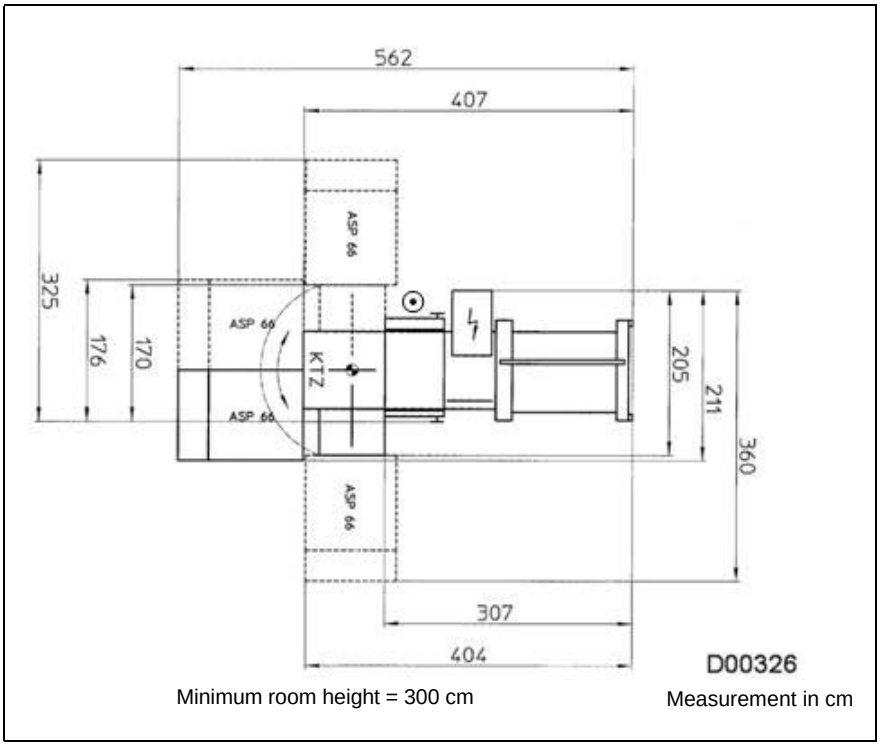


Illustration 9: Floor plan for S-KTZ FP feeder

3.2.2 Characteristics

Work speed		**Minimum**	**Maximum[1)]**
		10 m/min	235 m/min
Flat paper	**Format (length x width)**	**Minimum**	**Maximum**
	Round stack feeder	15 cm x 20 cm	78 x 120 (175) cm
	Flat pile feeder	17 cm x 25 cm	76 cm x 120 cm
	Palletized feeder	17 cm x 25 cm	78 cm x 120 cm
	Small sheet-size device:	17 cm x 17 cm	
	Crossfold	15 cm x 10 cm	78 cm x 53 cm
	Threefold unit	15 cm x 10 cm	53 cm x 39 cm
	Grammage [2)]	50 g/m^2	250 g/m2 1st fold 200 g/m2 2nd fold 175 g/m2 3rd fold 130 g/m2 4th fold
Buckle plates	**Fold length**	**Minimum**	**Maximum**
	Standard buckle plate	6 cm	70 cm
	Standard buckle plate 3 -	6 cm	49 cm
	Combi buckle plate 1 + 2	6 cm	64 cm
	Combi buckle plate 3 - 6	6 cm	43 cm
	Standard buckle plate	6 cm	31 cm
	Standard buckle plate	6 cm	20 cm
	Standard buckle plate	6 cm	16 cm
	Combi buckle plate KTL	6 cm	26 cm
	Combi buckle plate KTZ	6 cm	20 cm
	Combi buckle plate KTLT	6 cm	15 cm
Slitter shafts	Diameter:		35 mm
	Minimum cutting and perforating lengths	7,5 cm	
Foldrollers	Diameter:		43.7 mm

Table 10: Characteristics

1) 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.
2) All values refer to simple volume paper.

3.2.3 Transport data, fork lifts, and floor requirements

Weights [1)]		**Net**	**Gross**
S-KTL	With transport pallet With transport box	1800 kg 1800 kg	1950 kg 2230 kg
S-KTLT	With transport pallet With transport box	1800 kg 1800 kg	1950 kg 2230 kg
S-KTZ	With transport pallet With transport box	1950 kg 1950 kg	2100 kg 2390 kg
4 x buckle plates + KTL **6 x buckle plates + KTL** **1 x KTLT buckle plate** **1 x gatefold plate**	With transport box With transport box	155 kg 200 kg 14 kg 50 kg	205 kg 255 kg
Control cabinet	With transport pallet With transport box	215 kg 215 kg	255 kg 305 kg
Dimensions		**L x W x H**	
S-KTL, S-KTLT, S-KTZ	Without packaging Transport pallet Transport box	260 x 180 x 180 [2)](cm) 275 x 200 x 195 (cm) 280 x 205 x 205 (cm)	
4 x buckle plates + KTL **6 x buckle plates + KTL**	Transport box Transport box	115 x 115 x 50 (cm) 115 x 115 x 70 (cm)	
Control cabinet	Transport pallet Transport box	145 x 95 x 125 (cm) 150 x 100 x 130 (cm)	
Fork lift[3)]	Carrying capacity / load (Q) [4)]	Min. 4500 kg	
	Fork tine length	Min. 220 cm	
Floor requirements	Cargo[5)]	> 25 kN/m^2	
	Levelness[6)]	< 10 mm/m	

Table 11: Transport data, fork lift and floor requirements

1) All specifications are approximate values.
2) With closed noise damping and safety hood.
3) Minimum requirements of the fork lift
4) Observe the fork lift operating manual; the load-bearing capacity depends on the center of gravity of the load (c).
5) Minimum load-bearing capacity of the foundation at the installation location of the machine
6) In the area of the machine, the total height difference may not exceed 20 mm.

3.2.4 Supply

The machine was designed for one of the nominal voltages listed below.

Electrical power supply	Wiring diagram no.:		
Nominal voltage: 3 x 400 V + N + PE 1)	Required power system: 2)	TN - C - S - network TN - S - network	Clockwise rotating field required.
	Voltage:	400 V AC	+/-10 %
	Frequency:	50 Hz	+/-1 %
	Fuse:	50 A	
Power ratings:	KTL/KTLT with continuous feeder	5.9 kW	
	KTZ with continuous feeder	6.7 kW	
	KTL/KTLT with flat pile feeder	5.7 kW	
	KTZ with flat pile feeder	6.5 kW	
	KTL/KTLT with palletized feeder	9.0 kW	
	KTZ with palletized feeder	9.8 kW	
	With airstream table3)	1.5 kW	

Table 12: Electrical power supply, 400 V mains power supply

1) 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.
2) N - conductor is loaded; a ground fault circuit interrupter (GFCI) may not be utilized.
3) Add the power rating of the airstream table to the power rating of the corresponding machine.

Electrical power supply	Wiring diagram no.:		
Nominal voltage: **3 x 220 V + PE [1)]**	Required power system: [2)]	TN - C - network	Clockwise rotating field required
	Voltage	220 V AC	+/-10 %
	Frequency	60 Hz	+/-1 %
	Fuse:	50 A	
Power ratings:	KTL/KTLT with continuous feeder	6.5 kW	
	KTZ with continuous feeder	7.3 kW	
	KTL/KTLT with flat pile feeder	8.3 kW	
	KTZ with flat pile feeder	9.1 kW	
	KTL/KTLT with palletized feeder	10.1 kW	
	KTZ with palletized feeder	10.9 kW	
	With airstream table[3)]	1.8 kW	

Table 13: Electrical power supply, 220 V mains power supply

1) 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.
2) A ground fault circuit interrupter (GFCI) may not be utilized.
3) Add the power rating of the airstream table to the power rating of the corresponding machine.

Compressed air supply			
Power rating:	Necessary network pressure:	6 bar	+/-1 bar
	Average consumption:[1)]	25 m^3/h	

Table 14: Compressed air supply

1) Required volume flow according to ISO 1217 or DIN 1945

3.2.5 Emissions

Airborne sound emission	Emission sound pressure level (L_{pA})[1)]	Workstation at the register table	85,1 dB
		Workstation at the delivery	84,7 dB
	Sound power level (L_{WA})[2)]		103 dB

Table 15: Emissions

1) Noise measurement procedure according to EN13023:2004
2) Determination of the sound power level according to EN ISO 3746:1995.

3.2.6 Ambient conditions

Ambient temperature:		17 ... 35 °C [1)]
Storage temperature:		10 ... 35 °C
Relative humidity	Optimal Minimum Maximum	40 - 60 % 30 % 80 % (non-condensing)
Installation altitude [2)]		Max. 800 above sea level

Table 16: Ambient conditions

1) Special measures must be taken in case of temperatures below or above the permissible room temperature.
2) At an installation altitude of 800 above sea level and higher, special measures are necessary for the pressure vacuum pumps.
Learn more about this from the manufacturer.

4 Structure and function

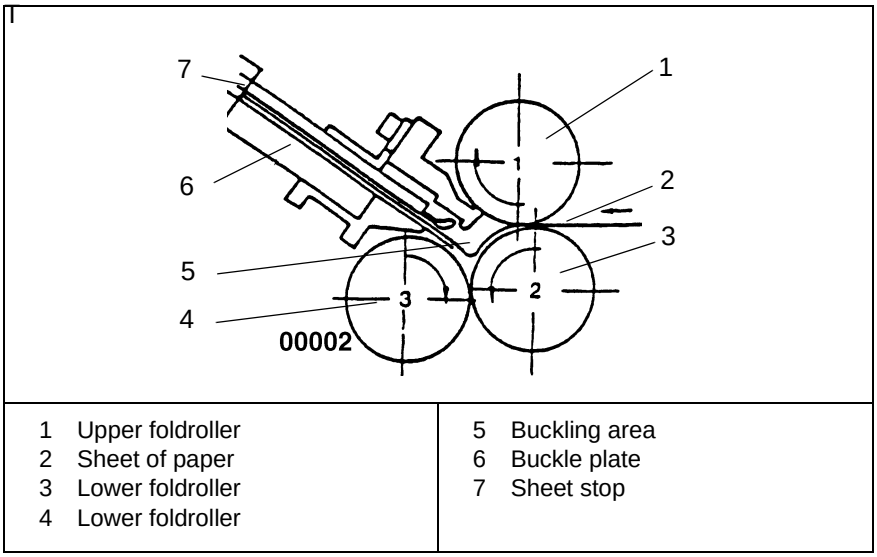
4.1 Introduction

4.1.1 What is folding?

Folding is the sharp-edged bending of a non-prepared or prepared bending point along a straight line, according to specified dimensions and a predetermined scheme, under pressure.
The folding line is referred to as a fold according to bookbinding terminology.

4.1.2 Folding principles

Buckle fold principle:



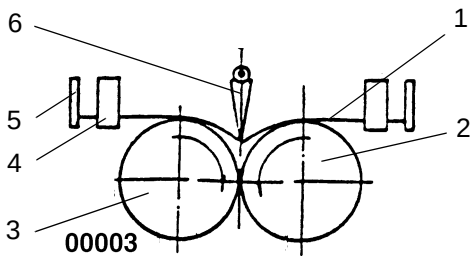
1 Upper foldroller	5 Buckling area
2 Sheet of paper	6 Buckle plate
3 Lower foldroller	7 Sheet stop
4 Lower foldroller	

Illustration 10: Buckle fold principle

Three foldrollers and a buckle plate are necessary to make a buckle fold.

- The foldrollers (1) and (3) transport the sheet of paper (2) in the buckle plate (6) up to the sheet stop (7).
- During further transport through the foldrollers (1) and (3), a buckle fold occurs in the buckling area (5).
- The sheet of paper (2) is grasped at the buckle fold by the foldrollers (3) and (4) and folded during its passage.

Knife fold principle:



1 Sheet of paper 2 Foldroller 3 Foldroller	4 Sheet stop 5 Lateral sheet stop 6 Folding knife

Illustration 11: Knife fold principle

To make a knife fold, two counterrotating foldrollers and a vertically movable folding knife are required.

- The sheet of paper (1) is transported under the folding knife (6) to the sheet stop (4) and aligned by the lateral sheet stop (5).
- After the knife movement has been triggered, the folding knife (4) transports the sheet of paper (1) in the direction of the foldrollers (2) and (3).
- The sheet of paper (1) is grasped by the foldrollers (2) and (3) and folded during its passage.

4.1.3 Combi folding machine

A combi folding machine works according to the buckle fold and knife fold principles.

It unites the following advantages of both folding principles:

- Small space requirement
- High folding output
- Great folding variability
- Short setting times and changeover times
- Processing of different types of paper.

Structure:

- The first folding unit is designed as a buckle folding unit (parallel fold = buckle fold principle).
- After this follow the cross fold unit and the threefold unit (knife fold principle), each arranged at an angle of 90°.
- To increase the folding variability, there are models with which a buckle plate is arranged parallel to each folding knife.

The sheet transport occurs via belts with:

- Rods fitted with balls above them.
- Segments with plastic balls or steel balls
- Brush units.

Delivery:

- After each folding unit.

Combi folding machines can be used for :

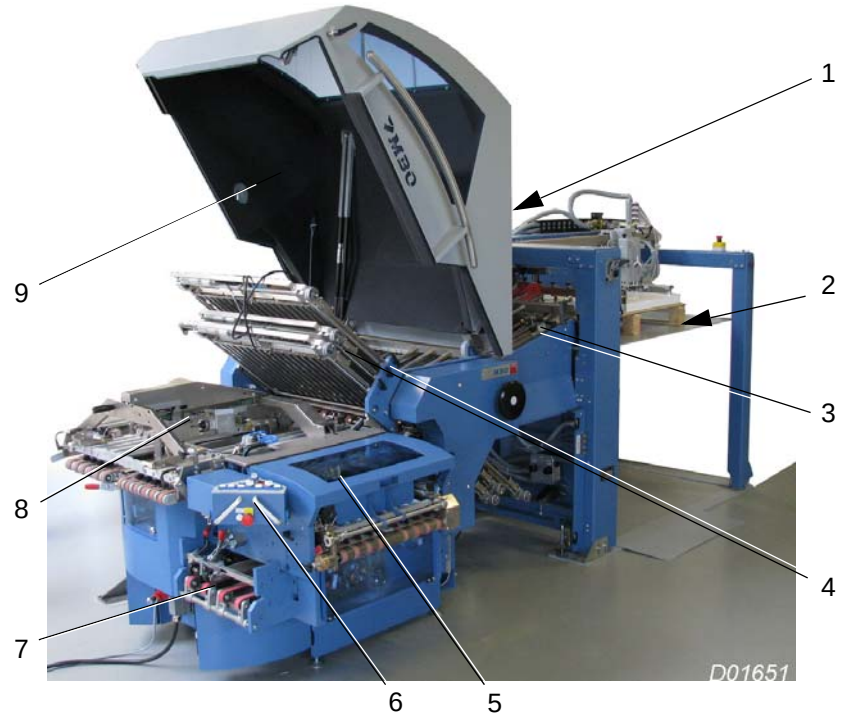
- Crossfolds with up to four fold creases for the production of books and brochures
- Various brochure folds.

Disadvantage:

- There is no possibility to do anything but a fixed crossfold.

4.2 Structure

4.2.1 Machine chart



1	Main control console	6	Manual control console
2	Feeder	7	Outlet
3	Register table	8	Crossfold
4	Parallel fold	9	Noise damping and safety hood
5	Threefold		

Illustration 12: Machine chart

4.2.2 Feeder

Continuous feeder: The continuous feeder is suitable for the processing of large to largest print runs and mid-sized sheets.
In contrast to the flat pile feeder, the continuous feeder requires somewhat more effort for adjustment operations and changeover work, which must be taken into account. There is also a larger space requirement.
Thanks to the low feeder table, the sheet feeding is much easier.
The sheets are laid on the feeder table and spread out a bit there, so that they pass continuously over the reversing drum to the suction wheel, at which point they are transferred to the register table.
The sheet feed takes place at regular intervals.
Production advantages are the high stack volume and the sheet feeding without production interruption.

Flat pile feeder: In case of continuously changing folding jobs, with small to mid-sized print runs, the flat pile feeder has the following advantages:

- Easy functioning
- Quick and easy adjustment and changeover
- Relatively great lack of sensitivity to difficult paper qualities
- Small space requirement.

The feeding of the pile occurs manually.
The feeder head height adjustment guarantees a constant distance between the feeder head and the back edge of the pile and thus reliable operation even in case of height differences among the paper pile.
The sheets are conveyed directly on the register table and pass leveled from there into the first folding unit.
There are particular downtimes associated with the sheet feeding of the pile table, and thus no continuous working is possible.

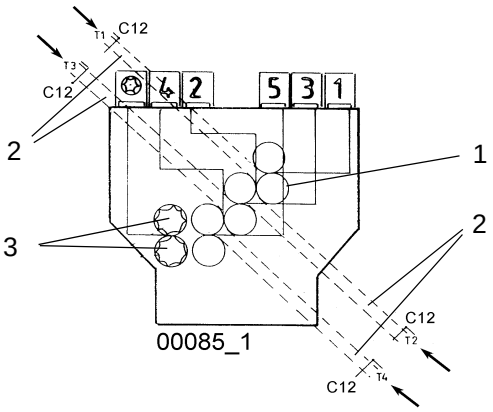
Palletized feeder: The palletized feeder is used primarily for larger editions and larger papers. Its functioning corresponds to that of the flat pile feeder.
Thanks to the quick pile change, however, things are easier for the operator and change-over times are much shorter. However, no continuous working is possible.

4.2.3 Register table

Before infeeding into the parallel folding unit, the sheet must be laterally aligned.
This is done by means of a diagonally running vacuum belt that aligns the sheet with an adjusting sidelay (VIVAS sheet feed system and alignment system).
Various adjusting elements serve to adapt to the paper to be processed.

4.2.4 Parallel folding unit

The parallel folding unit is always the first unit of the folding machine and works according to the principle of buckle folding.



1 Foldrollers
2 Buckle plates
3 Slitter shafts

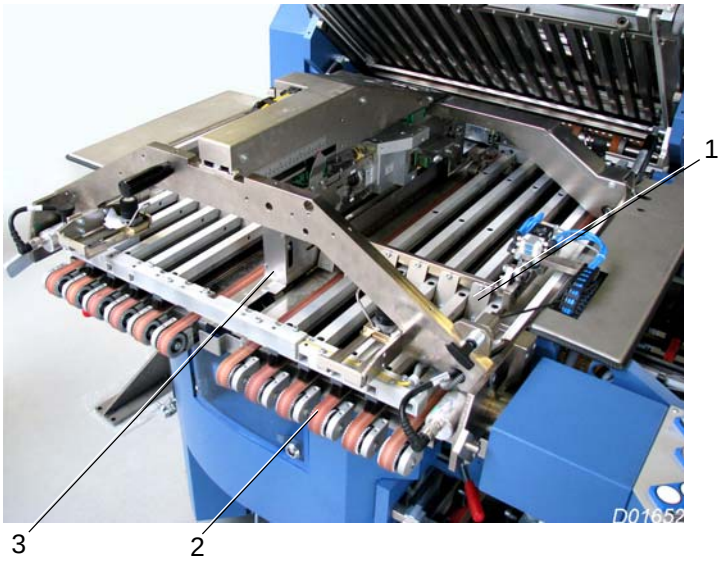
Illustration 13: Overview of parallel folding unit

The parallel folding unit alternatively has:

- 4 or 6 buckle plates with swing deflectors,
- Spiral foldrollers or high-grip foldrollers, adjustable by means of the quick-adjusting elements .
- Slitter shafts or slitter shaft cassette.

4.2.5 Crossfold folding unit

The crossfold folding unit is the first knife folding unit of the machine. There, the sheet of paper receives a fold offset by 90° (1st crossfold). The subsequent slitter shaft cuts, scores or perforates the sheet.



1	Swiveling sheet stop	3	Folding knife
2	Transport belts		

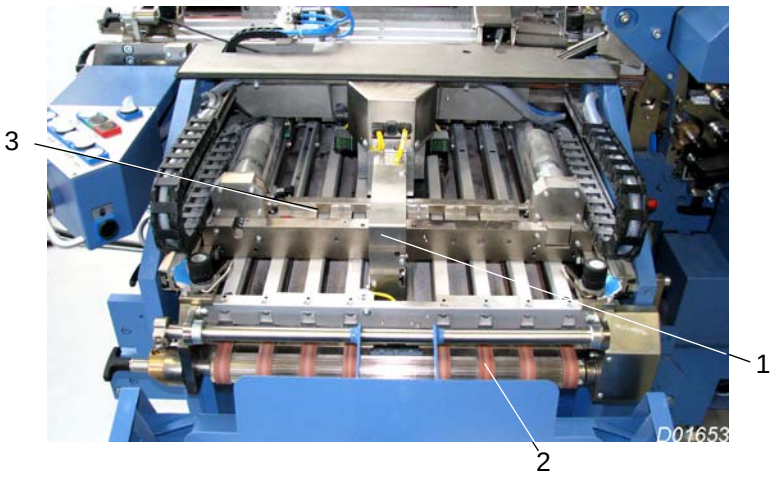
Illustration 14: Crossfold folding unit

The crossfold folding unit consists of:

- Transport table
- Folding knife
- Sheet stop, swiveling (option).
- Foldrollers
- Buckle plate for various fold types, parallel to the crossfold folding knife (models S-KTL, S-KTZ and SKTLT).
- Quick-change slitter shafts (standard).

4.2.6 Threefold folding unit

The threefold folding unit is the second knife folding unit of the machine. There, the sheet of paper receives another fold offset by 90° (2nd cross-fold).
The subsequent slitter shaft cuts, scores or perforates the sheet.



1	Folding knife	3	Swiveling sheet stop
2	Transport belts		

Illustration 15: Threefold folding unit

The threefold folding unit consists of:

- Transport table
- Folding knife
- Swiveling sheet stop
- Foldrollers
- Buckle plate for various fold types, parallel to the threefold folding knife (models S-KTLT).
- Quick-change slitter shafts.

4.2.7 Delivery systems

For the various demands with respect to format, fold type, and performance, MBO offers different delivery systems.
The corresponding descriptions can be found under the delivery systems of the enclosed operating manuals.

4.3 Models

The Combi folding machine K8 is available in the following models:

- Model S-KTL
- Model S-KTLT
- Model S-KTZ

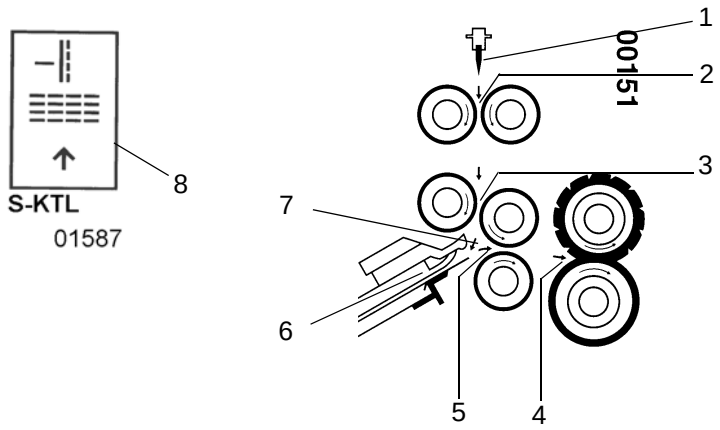
4.3.1 Model S-KTL

Explanation of terms:

The designation "K8 S-KTL" means:

K	Combi folding machine
8	Designation of type
S	Super = full slitter shaft after the buckle plate in the cross-fold
K	Crossfold
T	Buckle plate after the 1st folding knife (crossfold)
L	Threefold, left of the sheet feed direction

Schematic diagram:



1	Folding knife	5	Third roller pair
2	First roller pair	6	Buckle plate KTL
3	Second roller pair	7	Buckling area
4	Slitter shaft pair	8	Machine scheme

Illustration 16: Model S-KTL

Working method:

- The folding knife (1) conveys the sheet of paper into the first roller pair (2). There it is folded during its passage.
- The second roller pair (3) transports the sheet of paper into the buckle plate (6) (if this is open) up to the sheet stop.
  During further transport, a buckle fold arises in the buckling area (7).
  The sheet of paper is grasped at this buckle fold by the third roller pair (5) and folded during its passage.
- The following slitter shaft pair (4) scores, cuts, punch-perforates or perforates the sheet of paper.

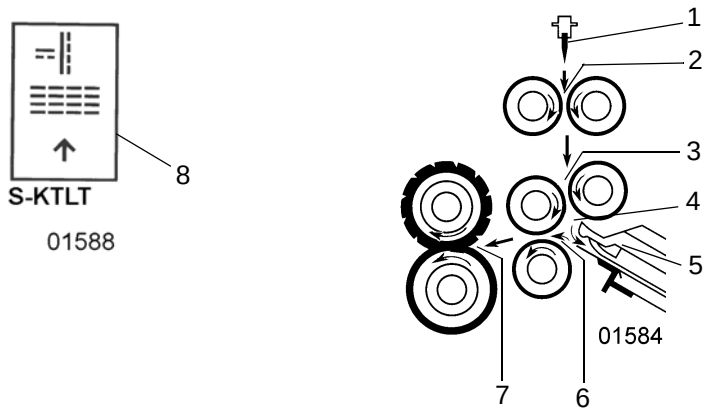
4.3.2 Model S-KTLT

Explanation of terms:

The designation "K8 S-KTLT" means:

K	Combi folding machine
8	Designation of type
S	Super = full slitter shaft after the buckle plate in the cross-fold and threefold
K	Crossfold
T	Buckle plate after the 1st folding knife
L	Threefold, left of the sheet feed direction
T	Buckle plate after the 2nd folding knife

Schematic diagram:



1	Folding knife	5	Buckle plate KTLT
2	First roller pair	6	Third roller pair
3	Second roller pair	7	Slitter shaft pair
4	Buckling area	8	Machine scheme

Illustration 17: Model S-KTLT

Working method:

- The folding knife (1) conveys the sheet of paper into the first roller pair (2). There it is folded during its passage.
- The second roller pair (3) transports the sheet of paper into the buckle plate (5) (if this is open) up to the sheet stop.
  During further transport, a buckle fold arises in the buckling area (4). The sheet of paper is grasped at this buckle fold by the third roller pair (6) and folded during its passage.
- The following slitter shaft pair (7) scores, cuts, punch-perforates or perforates the sheet of paper.

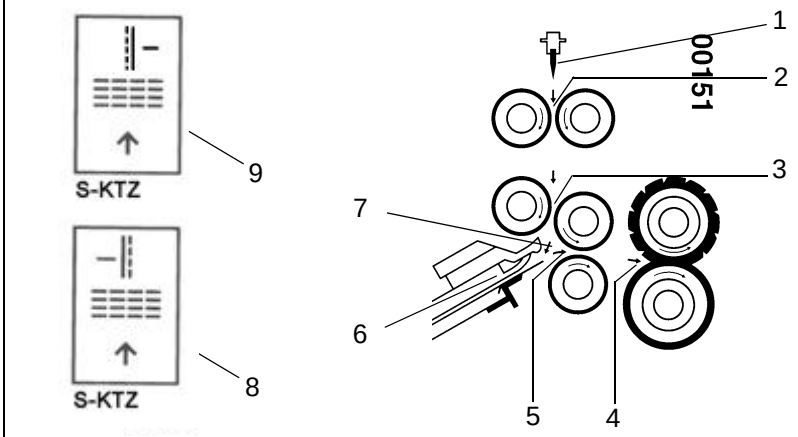
4.3.3 Model S-KTZ

Explanation of terms:

The designation "K8 S-KTZ" means:

K	Combi folding machine
8	Designation of type
S	Super = full slitter shaft after the buckle plate in the cross-fold
K	Crossfold
T	Buckle plate after the 1st folding knife
Z	Swiveling threefold area, optionally threefold to the left or the right of the sheet feed direction.

Schematic diagram:



1 Folding knife
2 First roller pair
3 Second roller pair
4 Slitter shaft pair
5 Third roller pair
6 Buckle plate KTZ
7 Buckling area
8 Machine scheme threefold left
9 Machine scheme threefold right

Illustration 18: Model S-KTZ

Working method:

- The folding knife (1) conveys the sheet of paper into the first roller pair (2). There it is folded during its passage.
- The second roller pair (3) transports the sheet of paper into the buckle plate (6) (if this is open) up to the sheet stop.
  During further transport, a buckle fold arises in the buckling area (7).
  The sheet of paper is grasped at this buckle fold by the third roller pair (5) and folded during its passage.
- The following slitter shaft pair (4) scores, cuts, punch-perforates or perforates the sheet of paper.

4.4 Machine control

4.4.1 NAVIGATOR Control

4.4.1.1 Standard equipment

- Automatic setting of sheet infeed, sheet gap and folding speed
- Cleanly stepped speed profile (with readjustment of all folding units)
- Folding unit-independent sheet monitoring (length control and target tracking through the entire machine).
- Integrated catalog of fold types
- Plain text display of errors and error location
- Operator diagnosis and service diagnostics
- Operation is possible from every control console in the entire machine system.
- Electromechanical double sheet detector.

4.4.2 TOUCHSCREEN (option)

High tech control unit, optional for buckle plate and combi folding machines.

Consisting of:

- TOUCHSCREEN for folding unit 1 (15 inch color monitor).
- Industrial PC with Windows operating system.

Additional functions of the TOUCHSCREEN are:

- Visual operator guidance with integrated catalog of fold types for simplification of the setup process.
- Job administration for production and machine statistics
- Integrated operating manuals, spare parts lists, wiring diagrams, and error diagnosis.
- Knowledge database for folding technology and operator help.

4.4.3 RAPIDSET automation (option)

With the electronic setup system RAPIDSET, partial automation and/or complete automation of the folding machine is possible.

It is possible to set the following automatically or with the motor:

- Feeder
- Register table
- Buckle plates/sheet deflectors in parallel junction
- Foldrollers/slitter shafts in parallel junction
- Horizontal adjustment of the crossfold folding knife to the format size
- Maculation discharge in crossfold
- Buckle plates/sheet deflectors in the crossfold and threefold
- Foldrollers/slitter shafts in the crossfold and threefold

4.4.4 DATAMANAGER (option)

The DATAMANAGER also enables:

- Job administration and machine presetting of an external PC.
- Connection with superordinated operating data systems and setting-data systems by means of CIP3/4 or JDF for the integration in a digital workflow.

4.4.5 MBO-RAS (option)

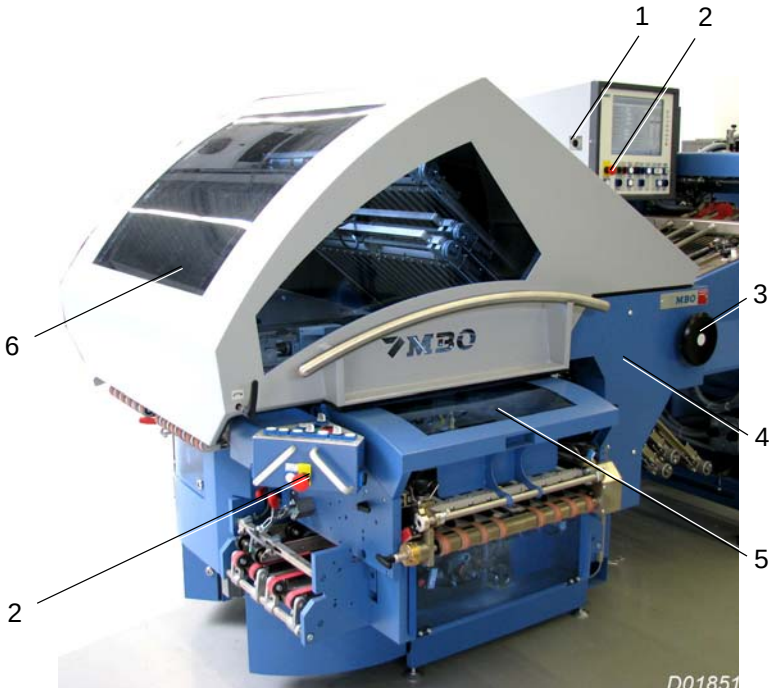
MBO-RAS (Remote Access Service) also enables remote diagnostics.

4.5 Safety and protective devices

4.5.1 Overview

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

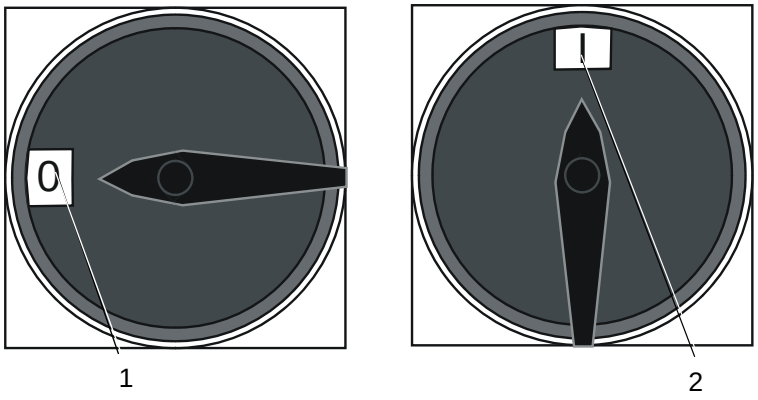
Only operate the machine if all safety and protective devices are completely installed and fully functional!



1	Main switch	4	Additional protective devices
2	EMERGENCY STOP palm button	5	Safety hood threefold
3	Safety handwheel	6	Noise damping and safety hood

Illustration 19: Overview

4.5.2 Main switch



1 Main switch OFF 2 Main switch ON

Illustration 20: Main switch

The main switch has the following properties:

- It disconnects the machine from the electrical power supply.
- It has just one OFF position and an ON position, which are labeled with O and I.
- It is fitted with a device that enables it to be secured in the OFF position (e.g. using a padlock).

When switching off the main switch during production:

- The machine is stopped.
- The drives come to a standstill.
- No emptying of the folding sheets takes place.

4.5.3 EMERGENCY STOP palm button

1 EMERGENCY STOP palm button

Illustration 21: 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 (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.
No emptying of the sheets takes place!

4.5.4 Noise damping and safety hood

1 Noise damping and safety hood
2 Grip
3 Safety hood threefold

Illustration 22: Noise damping and safety hoods

The noise damping and safety hood (1) covers the entire parallel fold section and crossfold section.
The safety hood (3) covers the threefold section.

▷ Only open and close the noise damping and safety hood using the handle (2).
▷ Always open noise damping and safety hood to the stop.

4.5.5 Safety switch

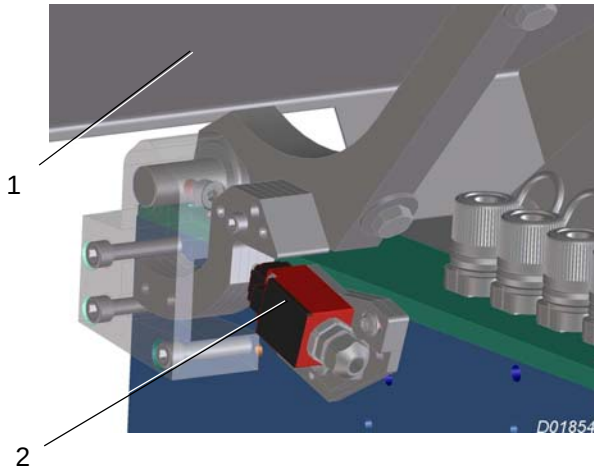
DANGER!

Dismantling, bridging or bypassing safety and protective devices.

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

- None of the machine's safety and protective devices may be dismantled, bridged or bypassed.
- Report any audible/visible safety-relevant change to the machine to the person responsible for the plant.

4.5.5.1 Noise damping and safety hood



1 Noise damping and safety hood
2 Safety switch

Illustration 23: Safety switch for noise damping and safety hood

- When opening the noise damping and safety hood (1) during production, the safety switch (2) drops the drive of the machine.
- With an open noise damping and safety hood, the machine can be operated in set-up mode.
  See Chapter “5.3.2 Set-up mode with open protective device”

4.5.5.2 Crossfold table

Illustration 24: Safety switch for crossfold table

The safety switch (1) stops the machine drive if the crossfold table is raised.

For the switch position, see Chapter“4.5.10 Checklists for safety and protective devices”

4.5.5.3 Threefold carriage

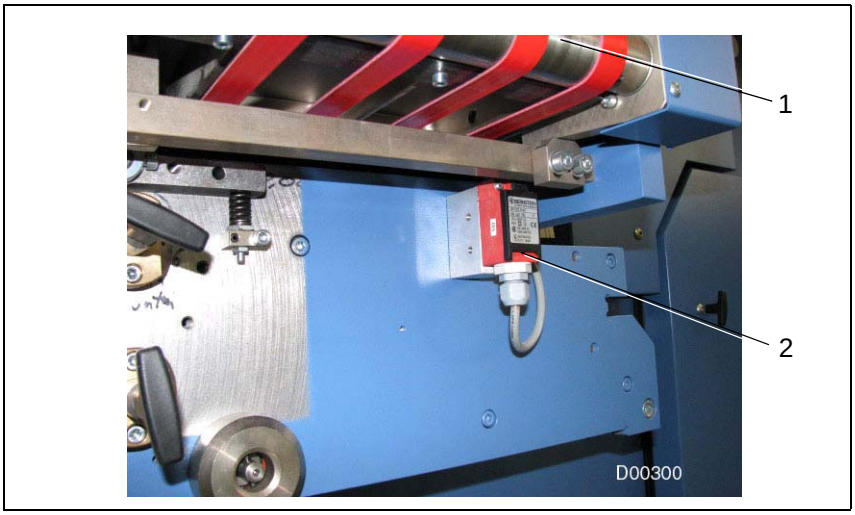


Illustration 25: Safety switch for threefold carriage

The safety switch (2) stops the machine drive if the threefold carriage (1) is pulled out.

For the switch position, see Chapter“4.5.10 Checklists for safety and protective devices”

4.5.5.4 Protection above the threefold

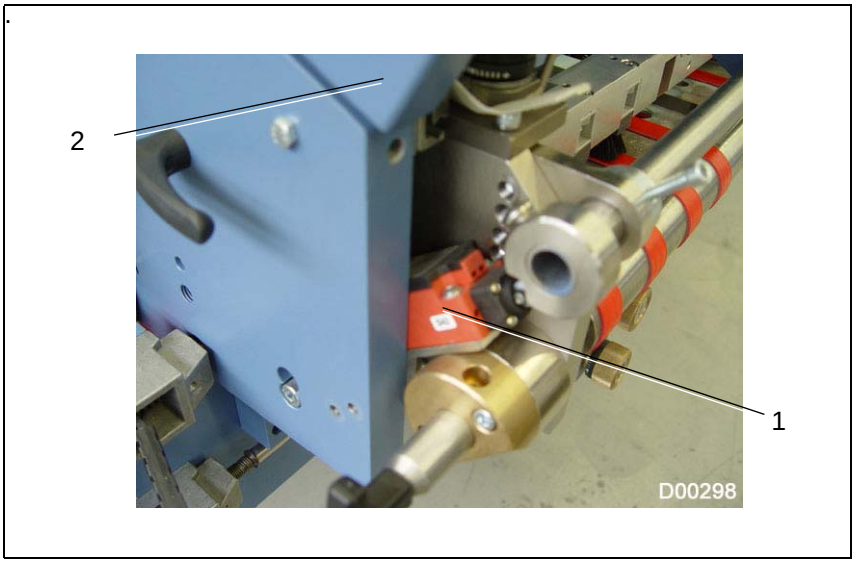


Illustration 26: Safety switch for the threefold guard hood

The safety switch (1) stops the machine drive if the guard hood (2) above the threefold is open.

4.5.6 Safety handwheel

WARNING!

Incorrect handling of the safety handwheels.

Non-observance may possibly result in severe personal injuries or even death.

- Turn the safety handwheel only when the machine is not moving.
- Press the EMERGENCY STOP palm button.
- Operate the machine only with safety handwheels installed. Otherwise there is danger of being drawn in.
- Replace defective safety handwheels only with new safety handwheels with an overrunning clutch.

1 Safety handwheel

Illustration 27: Safety handwheel

The safety handwheel has an overrunning clutch and is intended for turning the machine manually:

- During adjustment operations
- In case of a paper jam.

Procedure:

▷ Stop the machine.
▷ Press the EMERGENCY STOP palm button.
▷ Pull the safety handwheel towards you.
The overrunning clutch is released.
▷ Turn the safety handwheel.
Rotational direction:
clockwise = machine turns forwards.
Counterclockwise = Machine rotates backwards.
✓ The safety handwheel is being correctly operated.

4.5.7 Additional protective devices

Additional disconnect protective devices are present on the machine.

These protect the operator from hazard areas such as:

- Rotating 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 “4.5.10.1 Models S-KTL, S-KTLT”.

4.5.8 Incorrect safety and protective devices

Incorrect protective devices and safety equipment can lead to dangerous situations.

For this reason:

▷ Immediately switch off the machine with the main switch.
▷ Safeguard against it being switched on again.
▷ If necessary, disconnect the supply of compressed air and electrical current.
▷ Immediately repair incorrect safety and protective devices.

4.5.9 Checking safety and protective devices

All safety and protective devices must be checked regularly.

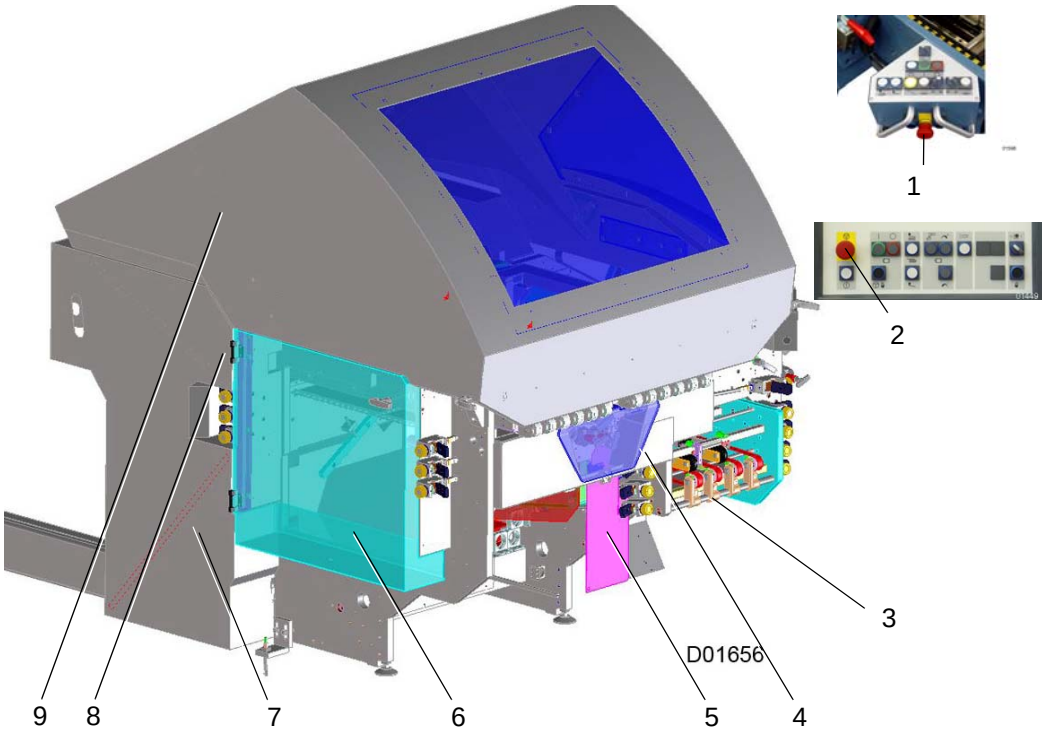
For the corresponding inspection intervals, see Chapter “4.5.10.1 Models S-KTL, S-KTLT” and “4.5.10.2 Model S-KTZ”

For the corresponding procedures, see Chapter "Maintenance".

4.5.10 Checklists for safety and protective devices

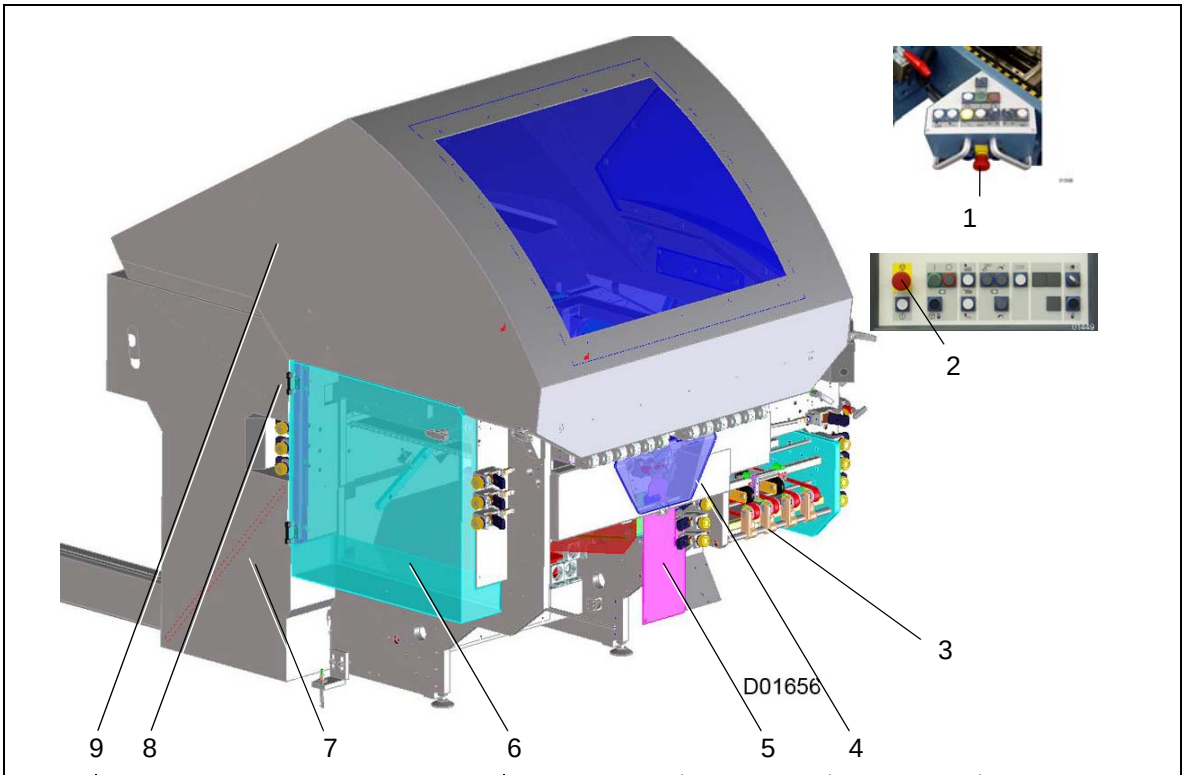
With these checklists, regularly inspect the safety and protective devices of the machine

4.5.10.1 Models S-KTL, S-KTLT



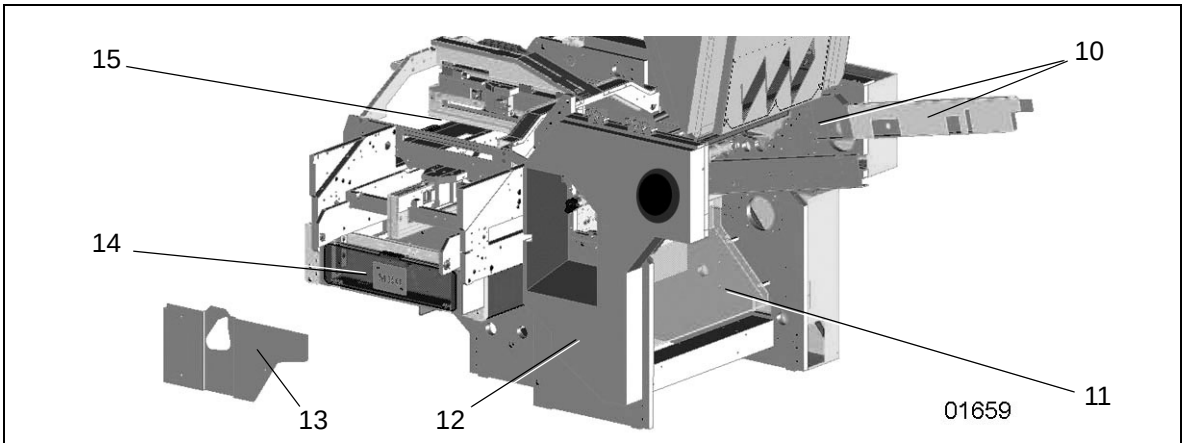
Pos.	Denomination	Functioning control	Visual inspection	Result	Inspection interval
1	EMERGENCY STOP palm button, control console crossfold and threefold				Daily
2	EMERGENCY STOP palm button on the Main control console				Daily
3	Protection, under threefold				Weekly
4	Protection against foldrollers and slitter shaft bearings				Weekly
5	Protection, threefold, drive				Weekly
6	Protection, KTL buckle plate				Weekly
7	Protection, parallel fold (drive side)				Weekly
8	Safety switch, crossfold table				Daily
9	Noise damping and safety hood above parallel fold and crossfold				Weekly

Table 17: Safety and protective devices checklist for models S-KTL, S-KTLT.



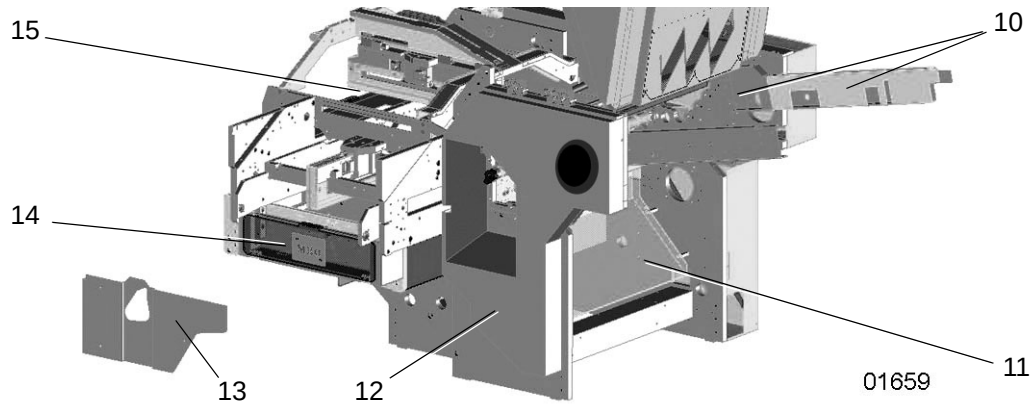
Pos.	Denomination	Function-ing control	Visual inspec-tion	Result	Inspection interval
Date:		Name:		Signature:	

Table 17: Safety and protective devices checklist for models S-KTL, S-KTLT.



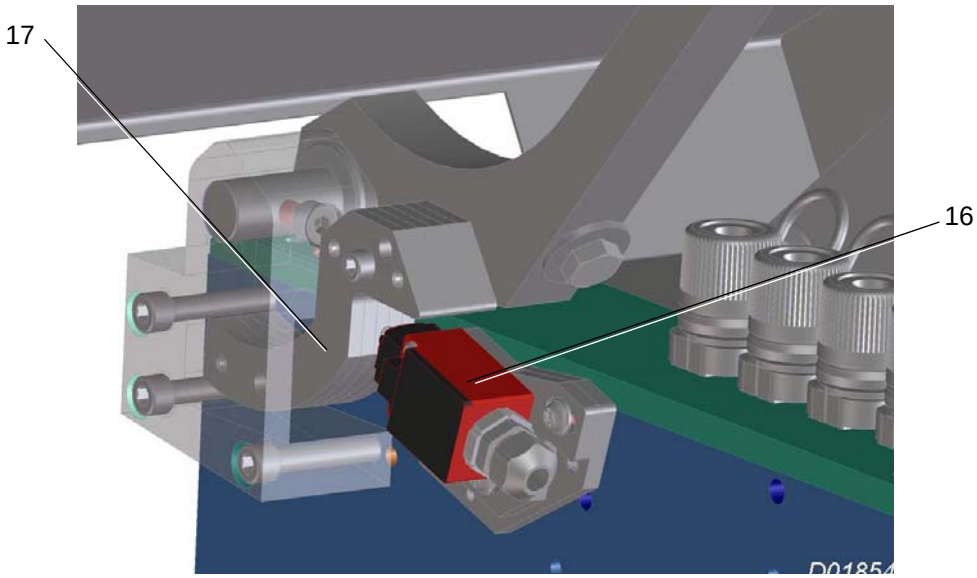
Pos.	Denomination	Function-ing control	Visual inspec-tion	Result	Inspection interval
10	Protection, register table drive (2-part)				Weekly

Table 18: Checklist for protective devices, configuration S-KTL, S-KTLT.



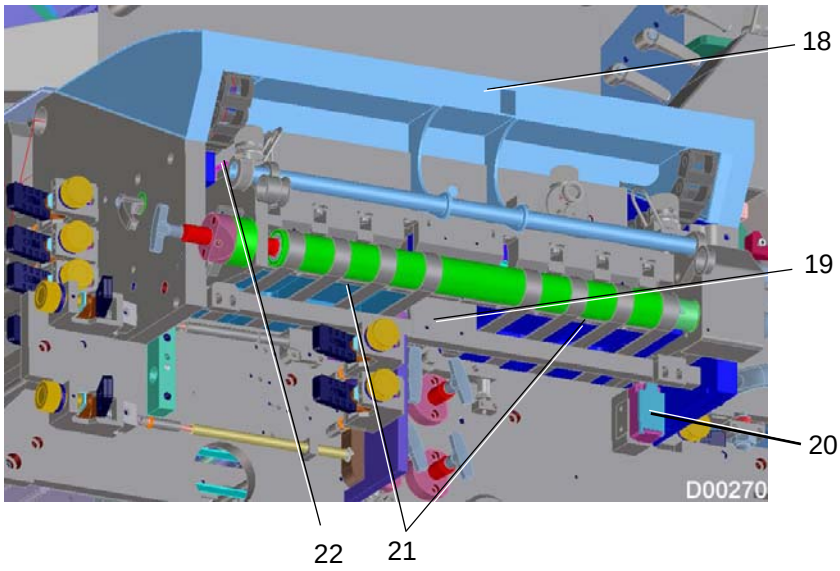
Pos.	Denomination	Function-ing control	Visual inspec-tion	Result	Inspection interval
11	Protection, combi section drive				Weekly
12	Protection, parallel fold (operator side)				Weekly
13	KTLT protection, foldrollers and slitter shafts, threefold				Weekly
14	KTL protection, foldrollers and slitter shafts, threefold				Weekly
15	Protection, crossfolds				Weekly
Date:		Name:		Signature:	

Table 18: Checklist for protective devices, configuration S-KTL, S-KTLT.



Pos.	Denomination	Function-ing control	Visual inspec-tion	Result	Inspection interval
16	Safety switch, noise damping and safety hood				Daily
17	Cam disc of the noise damping and safety hood. Form-closed.				
	All safety screws are secured with screw locking (e.g. Loctite 222). Not marked in the figure				
Date:		Name:		Signature:	

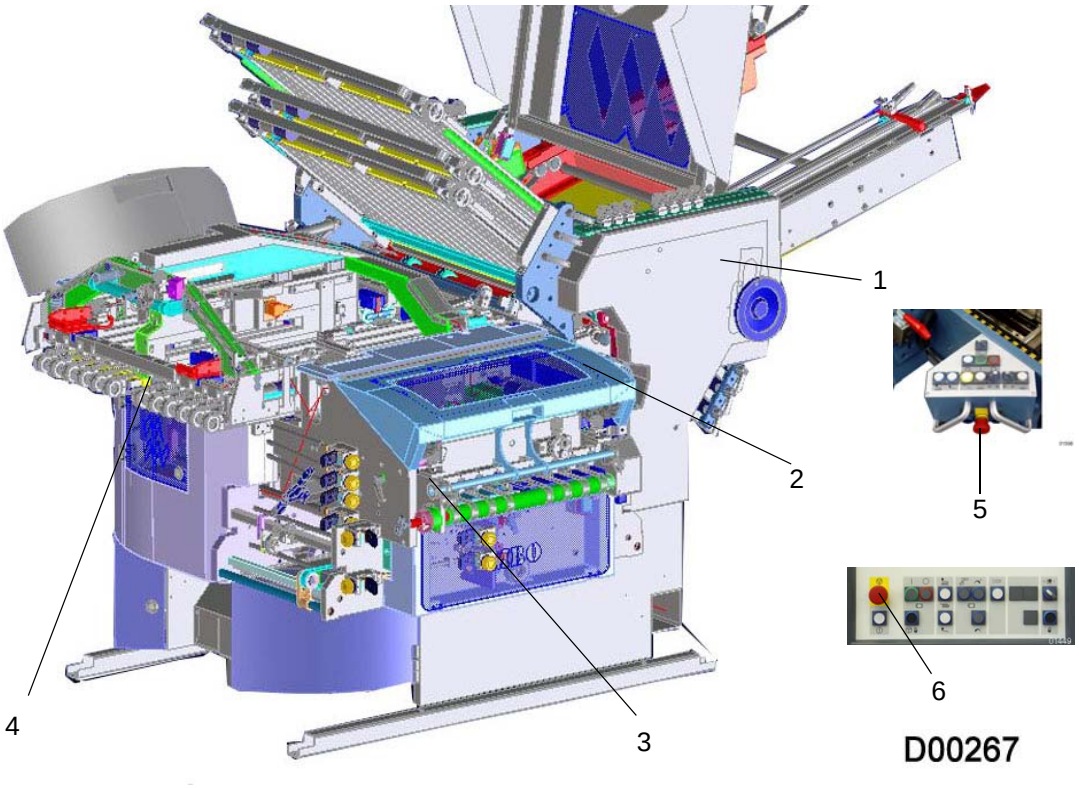
Table 19: Safety and protective devices checklist for models S-KTL, S-KTLT.



Pos.	Denomination	Functioning control	Visual inspection	Result	Inspection interval
18	Safety hood, threefold				Daily
19	Protection, threefold folding knife				Weekly
20	Safety switch, threefold carriage				Daily
21	Protection, threefold, tape roller				Weekly
22	Safety switch, safety hood, threefold				Daily
Date:		Name:		Signature:	

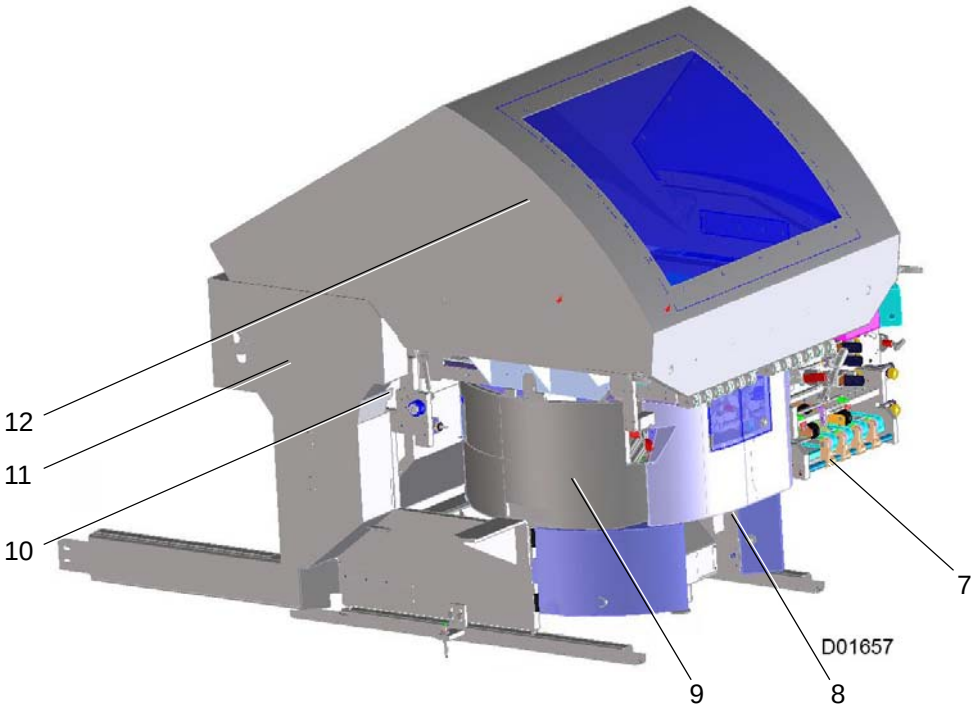
Table 20: Safety and protective devices checklist for models S-KTL, S-KTLT.

4.5.10.2 Model S-KTZ



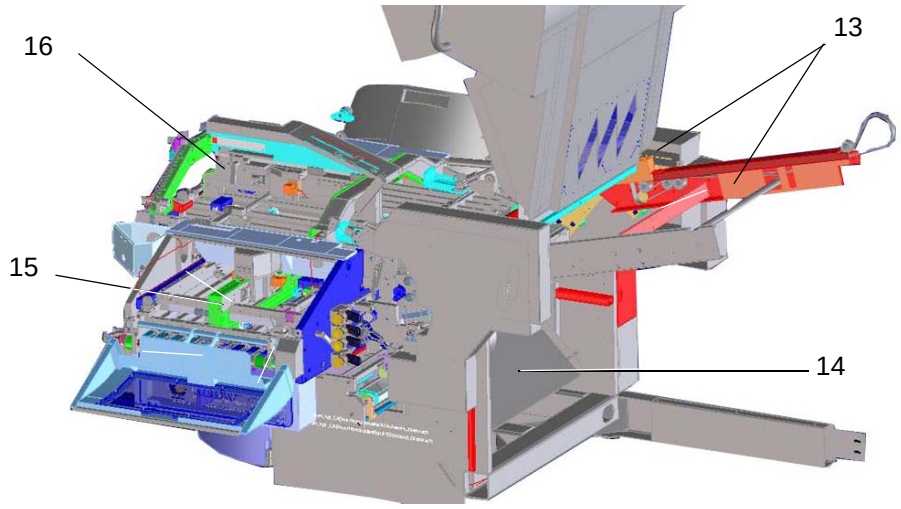
Pos.	Denomination	Functioning control	Visual inspection	Result	Inspection interval
1	Protection, parallel fold (operator side)				Weekly
2	Safety hood, threefold				Daily
3	Safety switch, safety hood for threefold				Daily
4	Protection, crossfolds				Weekly
5	EMERGENCY STOP palm button, control console crossfold and threefold				Daily
6	EMERGENCY STOP palm button, main control console				Daily
	All safety screws are secured with screw locking (e.g. Loctite 222). Not marked in the figure				
Date:		Name:		Signature:	

Table 21: Safety and protective devices checklist for models S-KTZ.



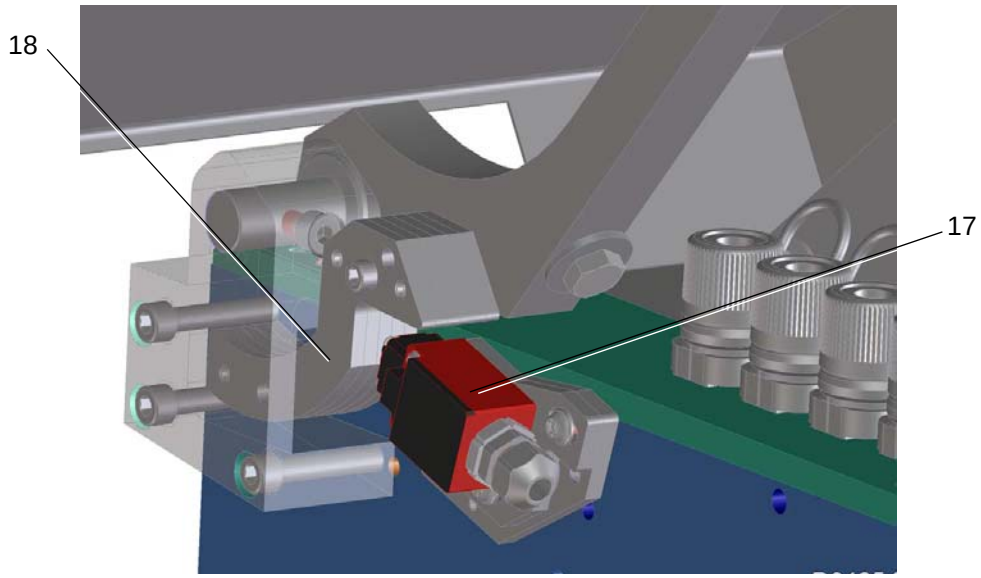
Pos.	Denomination	Function-ing control	Visual inspec-tion	Result	Inspection interval
7	Guard under threefold				Weekly
8	Protection, threefold drive				Weekly
9	Protection, KTZ buckle plate				Weekly
10	Protection, parallel fold (drive side)				Weekly
11	Safety switch, crossfold table				Daily
12	Noise damping and safety hood				Daily
Date:		Name:		Signature:	

Table 22: Safety and protective devices checklist for models S-KTZ.



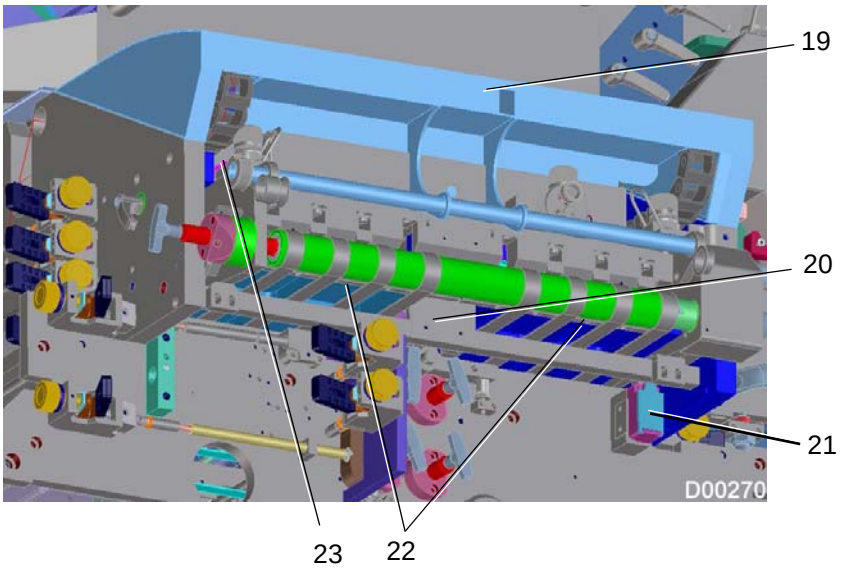
Pos.	Denomination	Function-ing control	Visual inspec-tion	Result	Inspection interval
13	Protection, register table drive				Weekly
14	Protection, combi section drive				Weekly
15	Protection, threefold folding knife				Weekly
16	Protection, crossfolds				Weekly
Date:		Name:		Signature:	

Table 23: Safety and protective devices checklist for models S-KTZ.



Pos.	Denomination	Functioning control	Visual inspection	Result	Inspection interval
17	Safety switch, noise damping and safety hood				Daily
18	Cam disc of the noise damping and safety hood. Form-closed. Tighten grub screw with tip; (size 9 Nm)				
Date:		Name:		Signature:	

Table 24: Safety and protective devices checklist for models S-KTZ.



Pos.	Denomination	Function-ing control	Visual inspec-tion	Result	Inspection interval
19	Safety hood, threefold				Daily
20	Protection, threefold pile divider				Weekly
21	Safety switch, threefold car-riage				Daily
22	Protection, threefold, tape roller				Weekly
23	Safety switch, safety hood, threefold				Daily
Date:		Name:		Signature:	

Table 25: Safety and protective devices checklist for models S-KTL, S-KTLT.

5 Operating and display elements, operating modes

5.1 Main control console

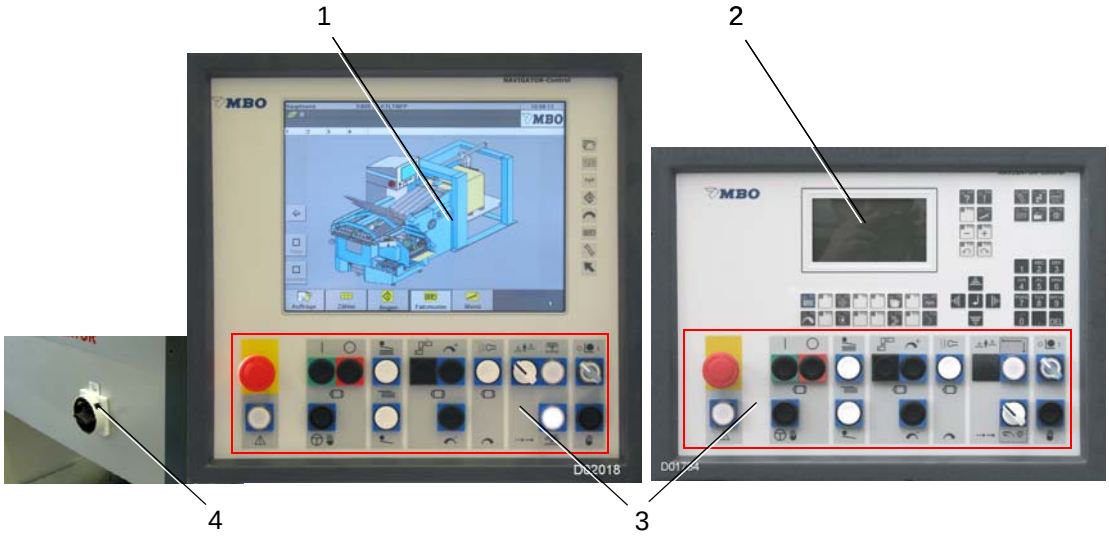


Illustration 28: Main control console

1 NAVIGATOR TOUCHSCREEN (option)
2 NAVIGATOR Standard
3 Key field <Machines Function>
4 <Main switch>

5.1.1 Key field <Machine Functions>

5.1.1.1 Flat pile feeder/palletized feeder

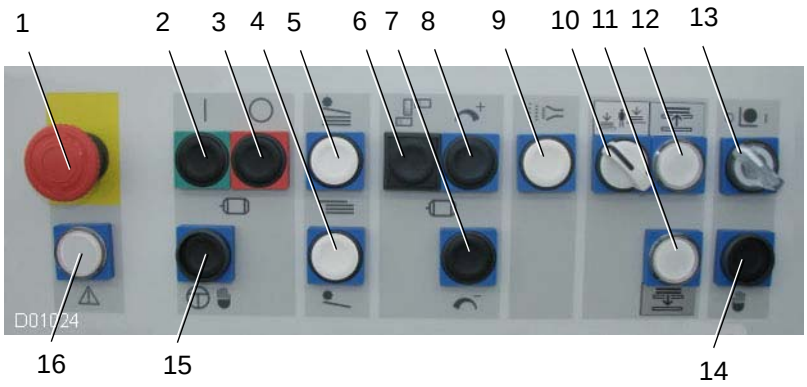


Illustration 29: Key field <Machine Functions>, Flat pile-/palletized feeder

1 <EMERGENCY STOP> palm button
2 <Machine start> button
3 <Machine stop> button
4 <Single sheet infeed> button
5 <Production sheet infeed> button
6 <Common speed change> button
7 <Speed reduction> button
8 <Increase of speed> button
9 <On/Off> button for pressure vacuum pump
10 <Palletized feeder> selecting switch
Left position = pallet mode
Right position = FLS mode, feeder loading system
11 <Pile table down> illuminated button
12 <Pile table up> illuminated button
13 <Set-up mode> illuminated selecting switch
Left position = Production mode
Right position = Set-up mode
14 <Two-hand operation> button
(simultaneous pressing of the buttons (14 and 15))
15 Button
<Inching>
<Two-hand operation>
16 Illuminated button
<Delete errors> (blinks slowly).
<Quality control> (blinks fast).

5.1.1.2 Continuous feeder

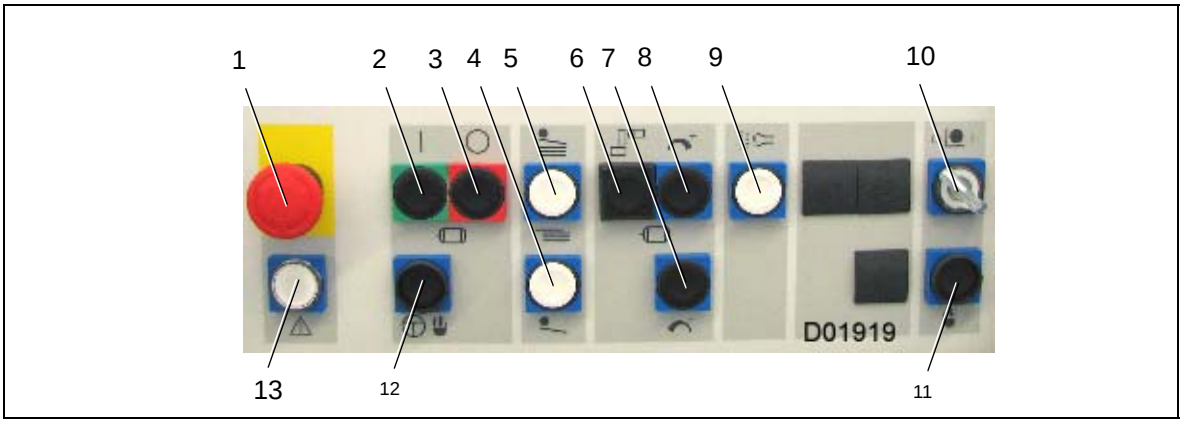


Illustration 30: Key field <Machine Functions>, continuous feeder

1 <EMERGENCY STOP> palm button
2 <Machine start> button
3 <Machine stop> button
4 <Single sheet infeed> button
5 Button
<Production sheet infeed>
<Feeder Start/Stop>
6 <Common speed change> button
7 <Speed reduction> button
8 <Increase of speed> button
9 <On/Off> button for pressure vacuum pump
10 <Set-up mode> illuminated selecting switch
Left position = Production mode
Right position = Set-up mode
11 <Two-hand operation> button.
Simultaneous pressing of the buttons (11 and 12).
12 Button
<Inching>
<Two-hand operation>
13 Illuminated button
<Delete errors> (blinks slowly).
<Quality control> (blinks fast).

5.1.2 Standard display

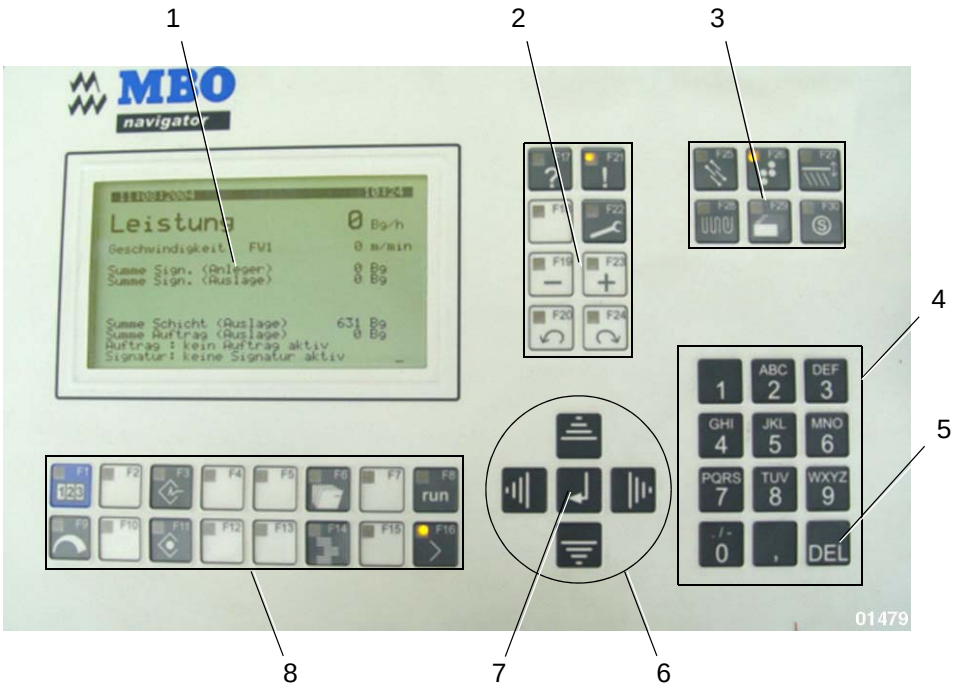


Illustration 31: Standard display

1 Display
2 Function buttons F17 to F24
3 Function buttons F25 to F30
4 Numerical keypad 0- 9
5 Delete button (DEL)
6 Buttons for cursor navigation
7 Enter button
8 Function buttons F1 to F16

5.1.2.1 Function buttons, standard display

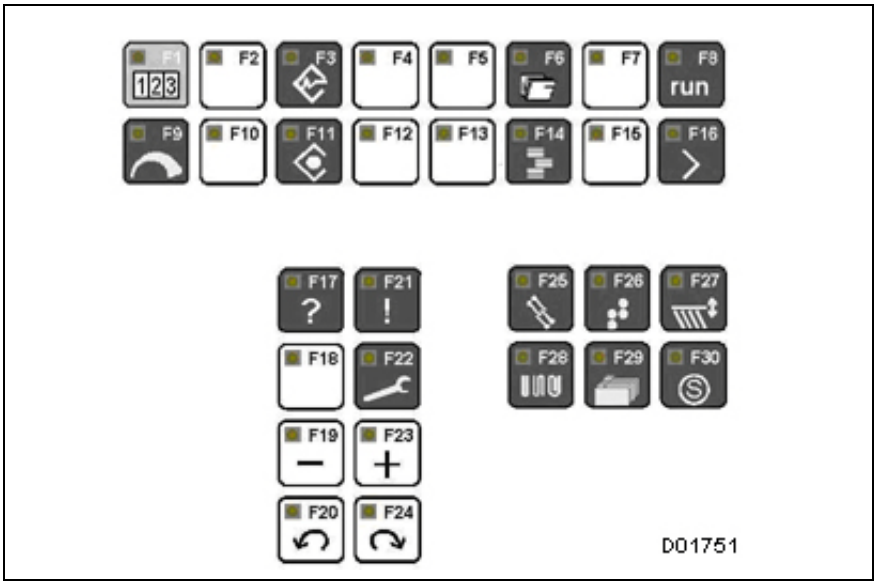


Illustration 32: Function buttons F1 to F30

F 1 = Counter settings
F 2 = Free
F 3 = Calibration
F 4 = Free
F 5 = Entries from DATAMANAGER (option)
F 6 = Job administration
F 7 = Change job status
F 8 = Current production speed (run)
F 9 = Speed settings
F 10 = Free
F 11 = Basic setting, folding unit 1
F 12 = Basic setting, folding unit 2
F 13 = Message from the DATAMANAGER (option)
F 14 = Marking settings and batch counter settings
F 15 = Change signature status
F 16 = Start positioning

F 17 = Unit combination
F 18 = Free
F 19 = "Minus" button
F 20 = "Page back" button
F 21 = Error list
F 22 = Diagnostics/service
F 23 = "Plus" button
F 24 = "Page forward" / "Select" button

F 25 = Current settings, buckle plates
F 26 = Current settings, foldrollers
F 27 = Current settings, sidelays
F 28 = Create a folding imposition
F 29 = Fold program administration
F 30 = Gatefold settings (only for the gatefold plate option)

5.1.3 TOUCHSCREEN

5.1.3.1 Handling the TOUCHSCREEN

- Only use your finger or a stylus pen to operate the TOUCHSCREEN.
- Ball-point pens or other metallic objects may damage the surface of the TOUCHSCREEN.

Only use your finger or a stylus pen (MBO part number 0131900) to operate the TOUCHSCREEN.

5.1.3.2 Main menu

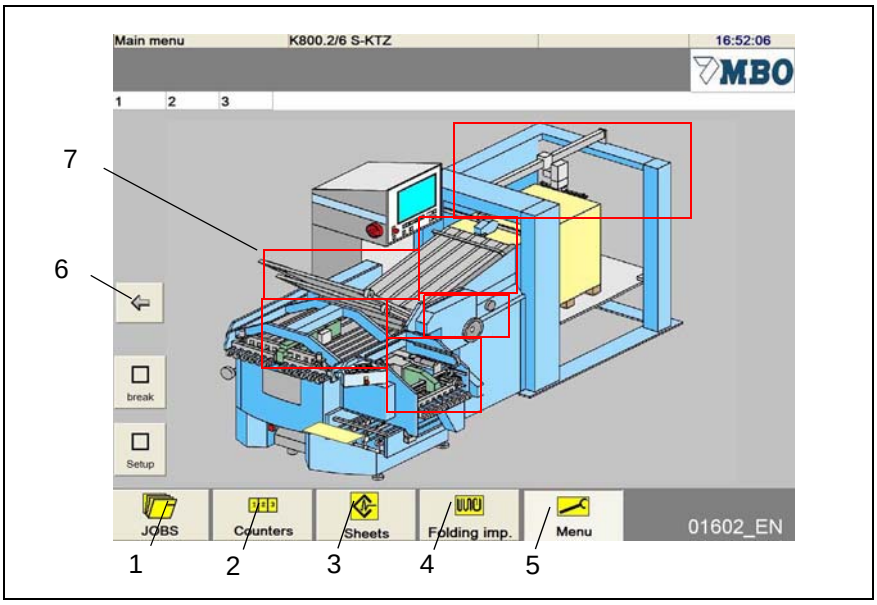


Illustration 33: Main menu

From the main menu, you can select the following menus:

- Job management (1)
  (see separate operating manual for DATAMANAGER)
- Counter settings and current counter data (2)
  (see Chapter “8.5.2 New job”).
- Sheet infeed data and speed data (3)
  (see Chapter “8.5.8 Changing sheet infeed data.”)
- Create folding imposition (4)
  (see Chapter “8.5.5 Folding imposition selection”)
- Menu For diagnosis, service, documentation and combination (5)
- Settings <subsequent folding units> (6)
- Hidden key fields (7) for settings for feeders, register table, buckle plates and folding rollers
  (see Chapter “5.1.3.3 Key fields”).

5.1.3.3 Key fields

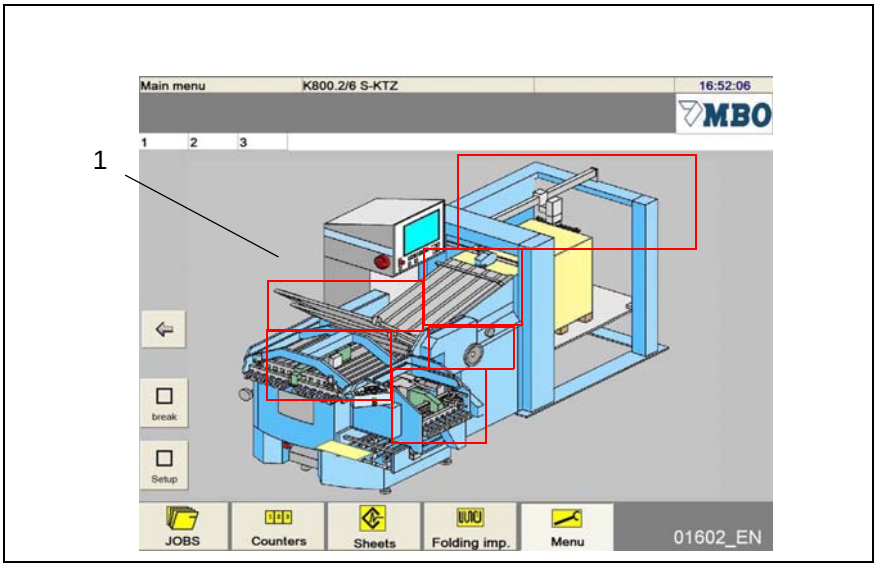


Illustration 34: Main menu

The key fields (1) on the TOUCHSCREEN (symbolized by the red square) serve for quick access to the settings menus for the current fold settings. These are positioned invisibly on the main menu and change automatically to the menus behind them when they are touched.

For a combi folding machine there are key fields (1) for:

- Feeder
- Register table
- Parallel fold, buckle plates
- Parallel fold, foldrollers
- Crossfold section
- Threefold section

5.1.3.4 Quick access keys

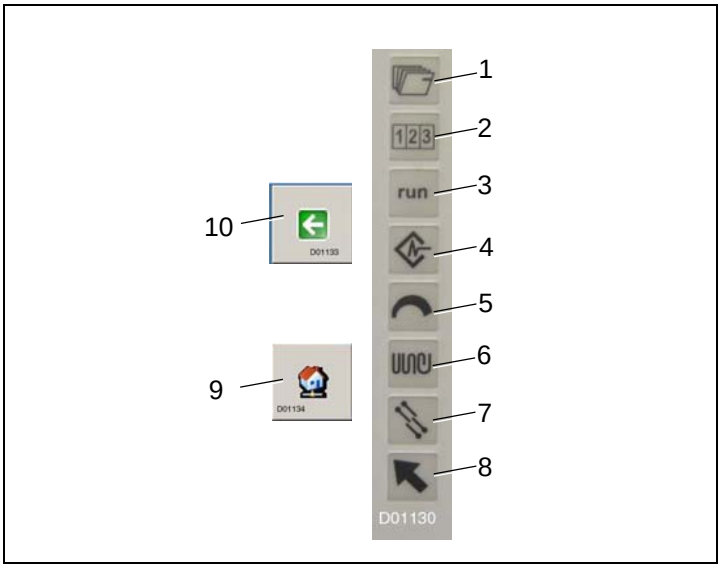
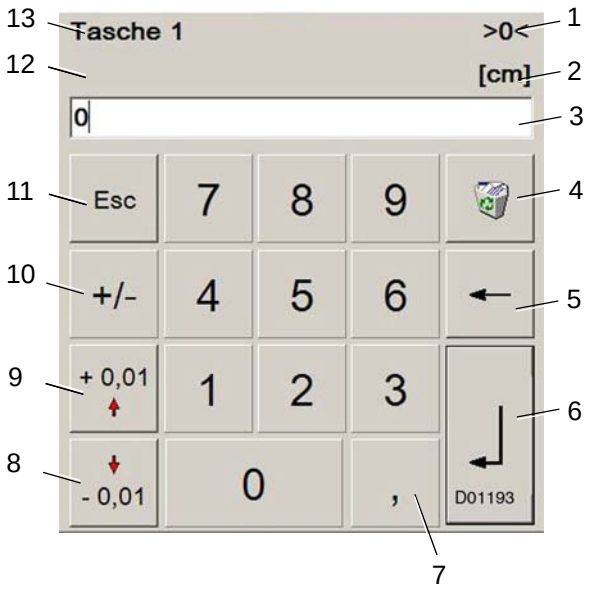


Illustration 35: Quick access keys

The following menus can be selected directly with the quick access keys:

- Job administration (1)
  (see separate operating manual for DATAMANAGER).
- Counter settings (2)
  (see Chapter “8.5.2 New job”).
- Current counter data (3) (Run)
  (see Chapter “8.5.10 Show <Current counter data> and <Enlarged display> menus”).
- Sheet infeed data (4)
  (see Chapter “8.5.8 Changing sheet infeed data.”).
- Speed data (5)
  (see Chapter “8.5.9 Changing the production speed”).
- Create and save a folding imposition (6)
  (see Chapter “8.5.6 Saving/loading/deleting folding imposition.”).
- Adjustments for rail, buckle plates, and foldrollers (7).
- Main menu (8) and (9)
  (see Chapter “5.1.3.2 Main menu”)
- Back to the previous menu (10).

5.1.3.5 Numeric input field



1 Current value
2 Measuring unit
3 Input field
4 Delete
5 Delete position.
6 Enter
7 Input comma
8 Fixed adjustment steps +
9 Fixed adjustment steps -
10 Sign
11 Cancel
12 Input area
13 Text input field

Illustration 36: Input menu

Depending on the input field, the structure of the numeric input can vary somewhat.

5.2 Control console in the crossfold and threefold unit

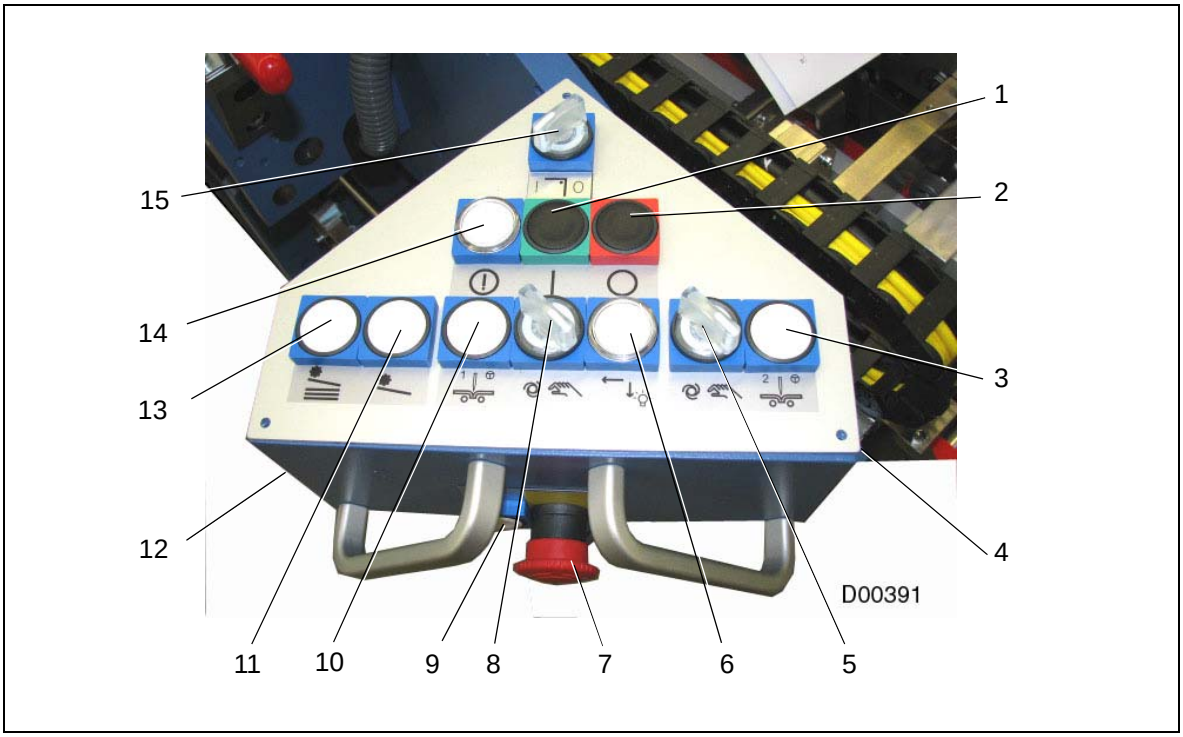


Illustration 37: Control console in the crossfold and threefold unit

1 <Machine start> button
2 <Machine stop> button
3 <Trigger single stroke folding knife 2> button
4 <Two-hand operation> button
5 <Folding knife 2> illuminated selecting switch

Continuous production
Single stroke combined with button (3)

6 Crossfold stop <Open/Closed> illuminated button (option)
7 Palm button <EMERGENCY STOP>
8 <Folding knife 1> illuminated selecting switch

Continuous production
Single stroke combined with button (9) or (10)

9 <Trigger single stroke folding knife 1> button
10 <Trigger single stroke folding knife 1> button
11 <Single sheet> button
12 <Inching mode> button
13 <Endless sheet> button
14 <Delete errors> illuminated button (blinks slowly)
<Quality control> (blinks fast).
15 Illuminated selecting switch <Set-up mode with open protective device>
Position 0 = Set-up mode OFF
Position 1 = Set-up mode ON.

5.3 Operating modes

The following operating modes are possible:

- Set-up mode of folding knives
- Set-up mode with open protective device
- Production mode
- Machine control
- Adapter box

WARNING!

Moving machine parts in case of opened protective devices during set-up mode.

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

In set-up mode, there is an increased hazard of injuries since dangerous points are accessible due to open protective devices and the machine can be operated up to production speed.

Make absolutely sure that there are **no** other people on the machine during when you are operating it in set-up mode.

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.

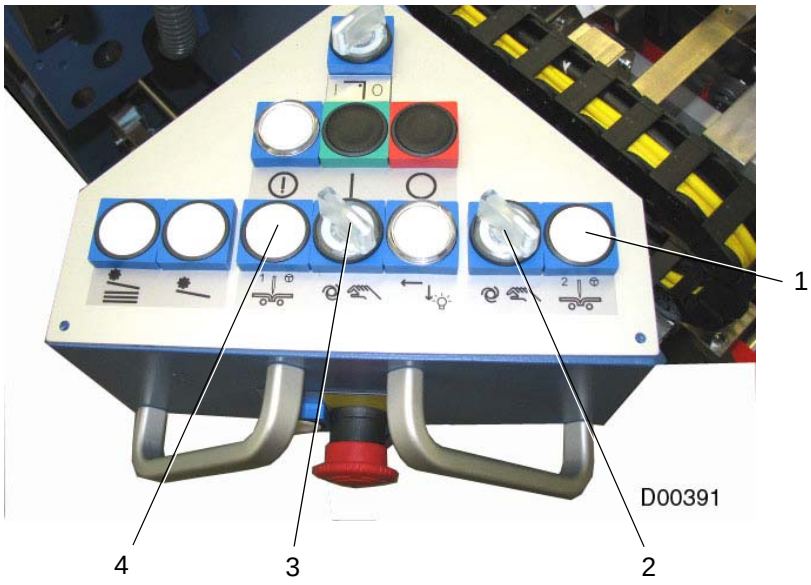
CAUTION!

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.

5.3.1 Set-up mode of folding knives



1 <Trigger single stroke folding knife 2> button
2 Folding knife 2 illuminated selecting switch
3 Folding knife 1 illuminated selecting switch
4 <Trigger single stroke folding knife 1> button

Illustration 38: Set-up mode of folding knives

Folding knife 1: Trigger knife stroke:

▷ Turn the illuminated selecting switch (3) to position  .
▷ Press the button (4).
✓ The knife stroke has been triggered.

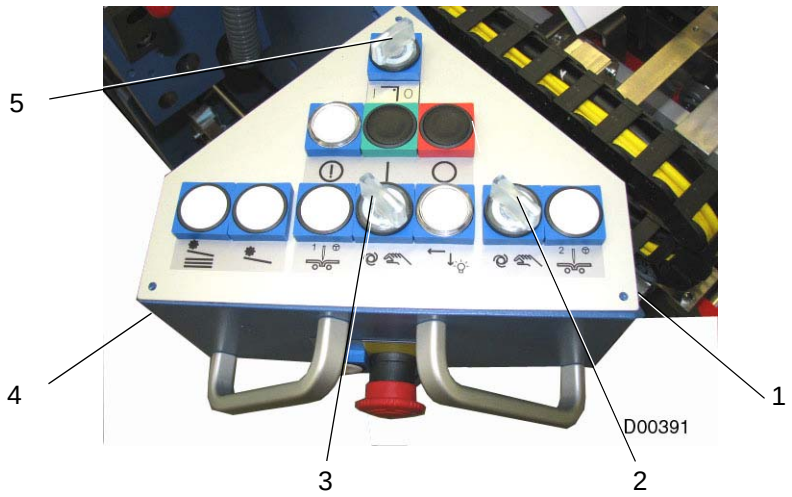
Folding knife 2: Trigger knife stroke:

▷ Turn the illuminated selecting switch (2) to position  .
▷ Press the button (1).
✓ The knife stroke has been triggered.

5.3.2 Set-up mode with open protective device

With an open protective device, the machine can be operated in set-up mode at the following speeds:

- Production speed (two-hand operation).
- 5 m/min (Inching mode).



1	<Two-hand operation> button	4	<Inching mode> button
2	Folding knife 2 illuminated selecting switch	5	Illuminated selecting switch <Set-up mode with open protective device>
3	Folding knife 1 illuminated selecting switch		

Illustration 39: Set-up mode with open protective device

WARNING!

Moving machine parts in case of opened protective devices during set-up mode.

Non-observance could result in serious injury or death.

In set-up mode, there is an increased hazard of injuries since dangerous points are accessible due to open protective devices and the machine can be operated up to production speed.

Make absolutely sure that there are **no** other people on the machine during when you are operating it in set-up mode.

Production speed setup operation:

Procedure:

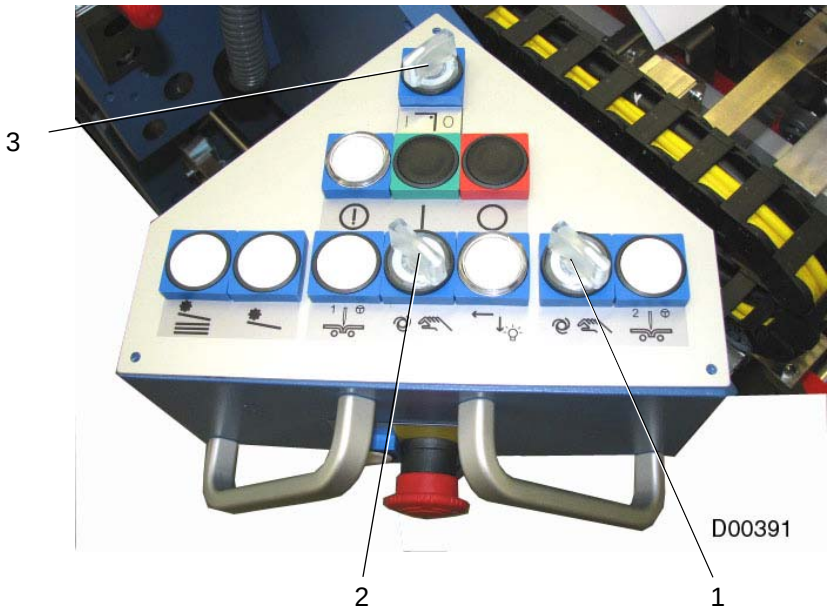
▷ Turn the illuminated selecting switch (5) to position 1.
▷ Simultaneously press the buttons (4) and (1).
✓ The machine runs at production speed now.

Setup operation 5 m/min:

Procedure:

▷ Turn the illuminated selecting switch (5) to position 0.
▷ Press the button (4).
✓ The machine now runs with 5 m/min.

5.3.3 Production mode



1	Folding knife 2 illuminated selecting switch	3	Illuminated selecting switch <Set-up mode with open protective device>
2	Folding knife 1 illuminated selecting switch		

Illustration 40: Production mode

Production mode

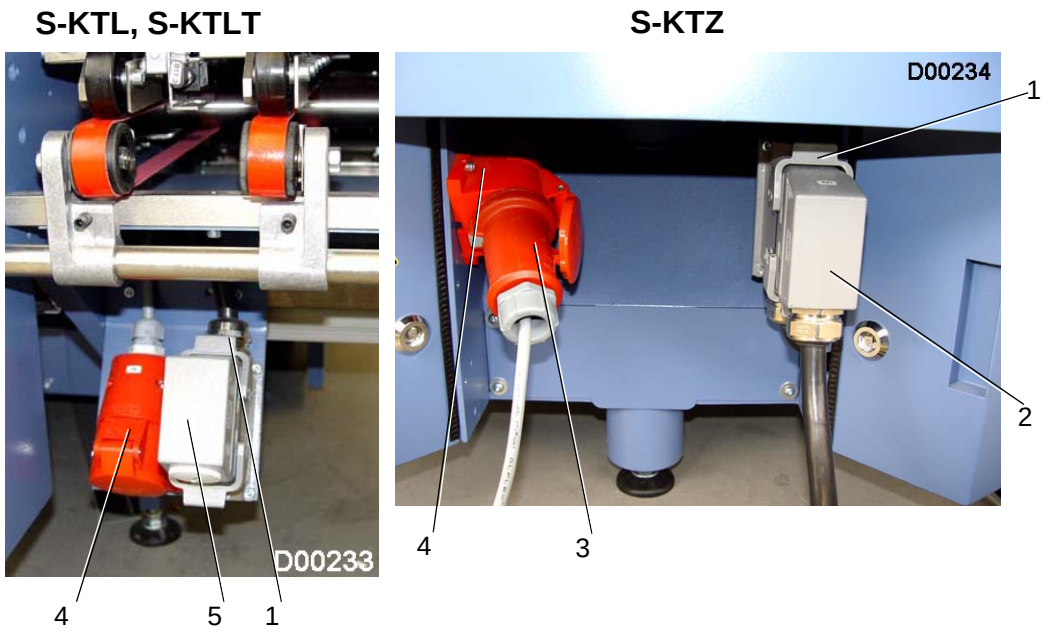
Procedure:

▷ Turn the illuminated selecting switch (3) to position  .

▷ Turn the illuminated selecting switches (1) and (2) to position  .

✓ The production mode is switched on.

5.3.4 Machine controller operating mode



1 Control socket for machine controller
2 Control plug
3 Power plug
4 Heavy-duty power socket
5 Dummy plug

Illustration 41: Electrical connection

Connecting of subsequent folding units or deliveries:

Procedure:

▷ Plug the power plug (3) of the subsequent folding unit or delivery into the heavy-duty power socket (4).

▷ Plug the control plug (2) of the subsequent folding unit or delivery into the control socket (1).

Working without subsequent folding unit or delivery:

▷ Plug the dummy plug (5) into the control socket (1).

5.3.5 Adapter box operating mode

WARNING!

Using multiple adapter boxes in a machine assembly.

Non-observance may possibly result in severe personal injuries or even 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. The corresponding adapter boxes are required for this.
Contact MBO Service or an authorized customer service representative to find out which adapter boxes can be used.

- Due to safety reasons, a maximum of **one adapter box** may be used in a machine assembly.
- Exceptions are only possible in consultation with the MBO electrical design department.

6 Transport, intermediate storage

6.1 Introduction

For transport/intermediate storage of the machine, also observe the following:

- The Safety instructions.
  See chapter “6.1.2 Safety instructions”.
- The Safety and protective devices.
  See chapter “4.5.9 Checking safety and protective devices”.
- The intended use.
  See chapter“2.1 Intended use”.
- Qualification of transport personnel.
  See chapter “6.1.1 Qualification of personnel”.

6.1.1 Qualification of personnel

This table shows the required qualifications for personnel responsible for transport and intermediate storage of the machine.

	Specially trained personnel	Instructed operating personnel	Instructed personnel with specialized training (mechanical/electrical engineering)
Transport	X	-	-
Intermediate storage	X	-	-

Table 26: Personnel qualification; Transport, intermediate storage
Key: X authorised, - not authorised

6.1.2 Safety instructions

WARNING!

Using unsuitable forklifts.

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

- When selecting a forklift, observe the relevant data such as load-bearing capacity, load centre of gravity, width of forklift carrier and length of forks.
- For information on the minimum requirements, refer to the Chapter "Technical data.“

WARNING!

Tipping machine parts during unloading and set-up.

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

- Use a forklift to transport the machine.
- No people must be in the unloading area.

WARNING!

Unsuitable substructure.

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

Check the characteristics and load-bearing capacity of the substructure on the installation site.

For the necessary minimum requirements, see Chapter "Technical data.“

6.2 Machine packaging

6.2.1 Machine

The machine is delivered as follows:

- On a transport platform (Europe),
- In a transport crate (overseas).

In addition, it is covered with a plastic film which is attached to the transport platform.

6.2.2 Buckle plates

The buckle plates are packed in a separate transport crate.

6.2.3 Control cabinet

If the control cabinet is dismantled for transport, it will delivered as follows:

- On a separate transport platform,
- On the transport platform of the feeder.

6.2.4 Pumps

The pumps will be delivered on the transport platform of the feeder.

6.2.5 Accessories/optional equipment

Standard accessories, tools, optional equipment and the documentation are included with the machine or packed in separate cases or containers.

Procedure:

▷ Please unpack carefully.

6.2.6 Inspection on receipt

Procedure:

▷ Check the packaging for transport damage immediately on delivery of the machine.
▷ Check the machine and accessories for transport damage.
▷ Check the consignment against the delivery note to ensure that it is complete.

6.2.7 In the event of damage

Procedure:

▷ Report any damage to the forwarding agent immediately.
▷ Contact your transport insurance company immediately.
▷ Protect the machine and its accessories against further damage.

6.3 Transporting the machine

WARNING!

Using unsuitable forklifts.

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

- When selecting a forklift, observe the relevant data such as load-bearing capacity, load centre of gravity, width of forklift carrier and length of forks.
- For information on the minimum requirements, refer to the Chapter "Technical data.“

1 Machine

Illustration 42: Transporting the machine

Procedure:

▷ Use a suitable forklift. (Requirements, see Chapter “3.2.3 Transport data, fork lifts, and floor requirements”).
▷ Raise the transport platform with the machine on it only as far as absolutely necessary for transport.
▷ Transport the transport platform to a position as close as possible to the intended installation location of the machine.
▷ Set the transport platform down carefully.

6.4 Intermediate storage of the machine

WARNING!

Improper storage.

Non-observance could result in serious damage to property.

Observe the prescribed storage conditions.

6.4.1 Outdoors

- The machine may be temporarily stored in the open air for a maximum of two weeks and providing the transport packaging is undamaged.
- The machine must be protected against moisture by a roof or a suitable tarpaulin.
- If condensation forms, the machine must be moved to a storage room (danger of corrosion).
- The plastic film should be detached from the transport platform to allow the air to circulate.

6.4.2 In a storage room

For storage conditions, see Chapter “3.2.6 Ambient conditions”

Intermediate storage of the machine

7 Installation, initial operation

7.1 Introduction

When setting up or commissioning the machine, also observe the following:

- The safety instructions.
  See Chapter “7.1.2 Safety instructions”.
- Safety and protective devices
  See Chapter “4.5.9 Checking safety and protective devices”.
- The intended use.
  See Chapter “2.1 Intended use”.
- Qualification of the service personnel.
  See Chapter “7.1.1 Qualification of personnel”.

7.1.1 Qualification of personnel

This table lists the necessary qualifications of personnel related to "Setup and initial operation" of the machine.

:	Specially trained personnel	Instructed operating personnel	Instructed personnel with specialized training (mechanical/electrical engineering)
Setup	-	-	X
Electrical connections	-	-	X
Power supply connection	-	-	X
Initial operation	-	-	X

Table 27: Qualification of personnel; setup, initial operation
legend: X permitted, - not permitted

7.1.2 Safety instructions

DANGER!

Hazardous voltage.

- **Non-observance will result in serious personal injury or death.**Work may only be carried out on the machine's electrical systems by a qualified electrician.
- Observe the local occupational safety regulations and electrotechnical regulations.
- On the supply terminals and on the terminals of the main switch, there is dangerous electric voltage even when the main switch is switched off (see wiring diagram).
- On the frequency inverter connecting terminals, there is dangerous residual voltage even when the main switch is switched off. (Observe the capacitor discharge time (KEB 5 min, Telemecanique 15 min)).

DANGER!

Hazardous voltage when connecting to the mains power supply.

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

- Connection of the mains power supply to the machine may only be carried out by a qualified electrician.
- Observe the local occupational safety regulations and electrotechnical regulations.
- 400 V power supply. If a neutral wire is lacking, electronic components – e.g. frequency inverters – can be destroyed.
- Due to the leakage currents of the controlled drives (frequency inverters), an equipotential bonding cable must be connected. See Chapter “7.5.4.2 Take heed of the installation of the stationary mains power supply” and “7.5.5 Connect additional protective equipotential bonding”

WARNING!

Incorrect supply voltage.

Non-observance may result in severe property damage.

- If the present nominal voltage deviates from the specifications on the type label, wiring diagram and "Specifications" of the operating manual, an isolating transformer must be used.
- You can get the necessary information from the manufacturer.

WARNING!

Use of unsuitable fork lifts.

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

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

WARNING!

Tipping machine parts while unloading and installing the machine.

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

- Use a fork lift for transportation.
- No persons may be present in the unloading area.

WARNING!

Insufficient properties and condition of the underfloor.

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

Check the condition and load-bearing capacity of the foundation at the installation location.

For the necessary minimum requirements, see Chapter "Specifications".

7.2 Brief instructions, setting up and initial operation

With these work steps, the machine is set up and commissioned:

- Unpack the machine.
  See Chapter “7.3.1 Unpack the machine”
- Setting up the machine.
  See Chapter “7.3.2 Setting up the machine”
- Leveling out the machine
  See Chapter “7.3.5 Leveling out and connecting the machine to the feeder”
- Remove the rust preventing agents.
  See Chapter “7.4 Removing the rust preventing agents”
- Make the electrical connection.
  See Chapter “7.5 Hooking up the electrical connections”
- Carrying out initial operation.
  See Chapter “7.6 Performing initial operation”
- Carrying out inspection after initial operation.
  See Chapter “7.7 Performing a verification inspection after the initial commissioning”

7.3 Unpack the machine and set it up

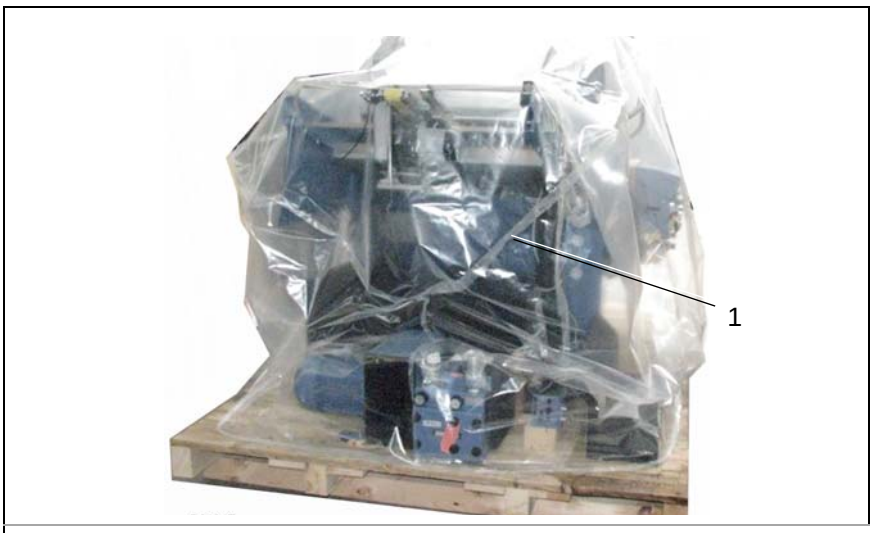
7.3.1 Unpack the machine

WARNING!

Tipping machine parts.

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

- Secure and support the machine when connecting it to the feeder.



1 Machine

Illustration 43: Unpacking

Procedure:

1) Remove the packing material from the machine
2) Dispose of the packing material in an environmentally friendly manner.
3) Remove the screws fastening the machine to the transport pallet.
4) Remove the transport brackets.

✓ The machine has been unpacked.

7.3.2 Setting up the machine

WARNING!

Tipping of the machine.

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

The machine has an asymmetrical distribution of weight (uneven three-fold load).

- Insert the forks of the fork lift so that there is an even distribution of the load.

1	Cross bar	3	Side frame left (operator side)
2	Cross bar	4	Fork lift direction of entry

Illustration 44: Setting up the machine

Procedure:

1) Use a suitable fork lift. (For requirements, see Chapter “3.2.3 Transport data, fork lifts, and floor requirements”)
2) Drive the fork lift under the cross bar (2) and the cross bar (1). See "Direction of entry for fork lifts" (4).
   Heed the asymmetrical distribution of weight (threefold load).
3) Lift up the machine
4) Screw the levelling screws into the corresponding retainers.
5) Transport the machine carefully to your intended location.

✓ The machine is positioned in its location.

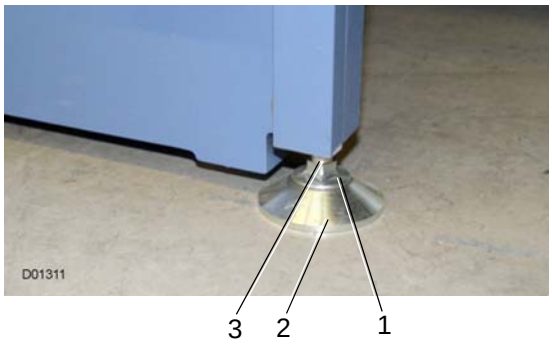
WARNING!

Insufficient properties and condition of the underfloor.

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

Check the condition and load-bearing capacity of the foundation at the installation location.

For the necessary minimum requirements, see Chapter "Specifications".



1	Adjustment screw	3	Lock nut
2	Plate feet		

Illustration 45: Setting up the machine

Procedure:

1) Place the plate feet (2) under the position of the levelling screws (1).
2) Set the machine carefully down with the levelling screws (1) on the plate feet (2).
3) Safeguard the machine against tipping at the register table.

7.3.3 Removing transport lock

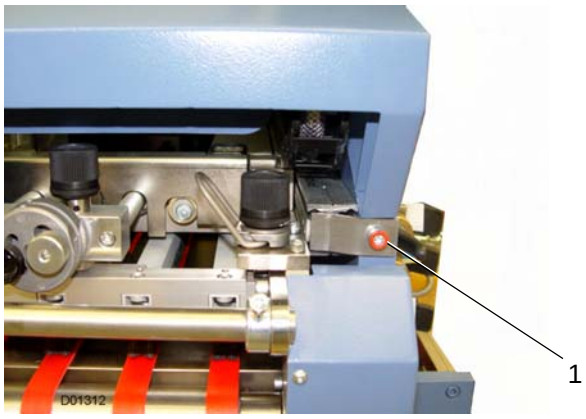
7.3.3.1 Threefold carriages

CAUTION!

Transport lock at threefold carriage.

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

- Before transporting, always secure the threefold carriage with the transport lock (1).
- Remove the transport lock (1) after the machine has been set up.



1 Transport lock

Illustration 46: Transport lock threefold carriages

The threefold carriage is secured for transport by a transport lock (1).

Procedure:

1) Remove the transport lock (1) from the threefold carriage as soon as the machine has reached its final set-up location.

✓ The transport lock has been removed.

- Keep the transport lock for future use.
- For any additional transport, secure the threefold carriage with the transport lock (1).

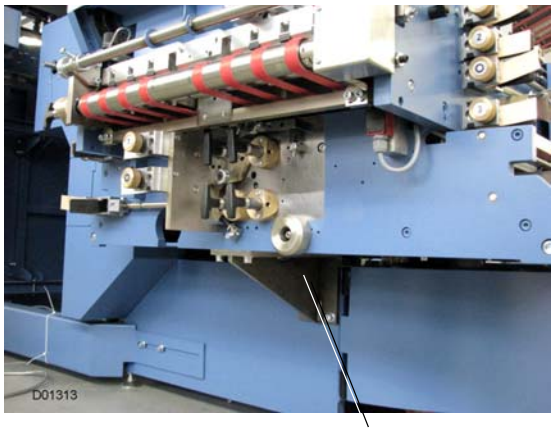
7.3.3.2 Threefold, model KTZ

CAUTION!

Transport lock at threefold (KTZ).

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

- Remove the transport lock after setting up the machine.
- Always secure the threefold with the transport lock before transport.



1 Transport lock

Illustration 47: Transport lock threefold

The pivotable threefold is secured for transport with a transport lock.

Procedure:

▷ Remove the transport lock (1) from the threefold carriage as soon as the machine has reached its final set-up location.

✓ The transport lock has been removed.

- Keep the transport lock for future use.
- Before transporting, secure the pivotable threefold unit with the transport lock (1).

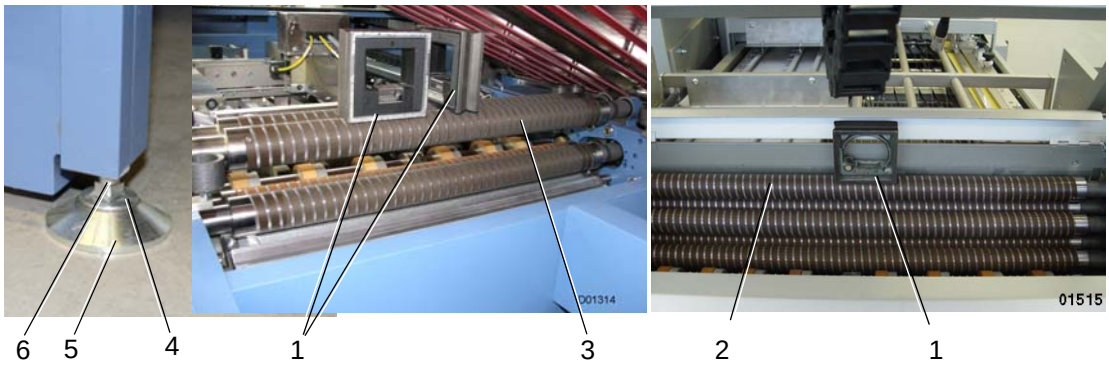
7.3.4 Leveling out the machine

CAUTION!

Improper alignment of the machine components.

Non-observance could result in damage to property.

When aligning the machine components, be sure to adhere to the details specified by the manufacturer.



1	Machine spirit level	4	Adjustment screw
2	Upper parallel fold foldroller	5	Plate feet
3	Crossfold foldrollers	6	Lock nut

Illustration 48: Leveling out the machine

Align the machine using the levelling screws (3) and a machine level (1).

Precision of the machine spirit level = 0.1 mm/m.
Alignment tolerance = +/- 0.1 mm/m.
Procedure:

Alignment in longitudinal direction:

1) Place the machine level (1) on a crossfold foldroller (3).

Alignment in transverse direction

2) Place the machine level (1) on the top parallel fold foldroller (2).
3) Place the machine level (1) on both crossfold rollers (3).
4) Level the machine with the levelling screws (4).
5) Counter the levelling screws (4) with the lock nuts (6).
6) Check the alignment again after countering and correct it if necessary.

✓ The machine is aligned.

The alignment tolerance is with a level precision of 0.1 mm/m = +/- 0.1 mm/m.

Checking the exit height:

▷ Check the exit height of the machine and correct it where appropriate.

Locking the levelling screws:

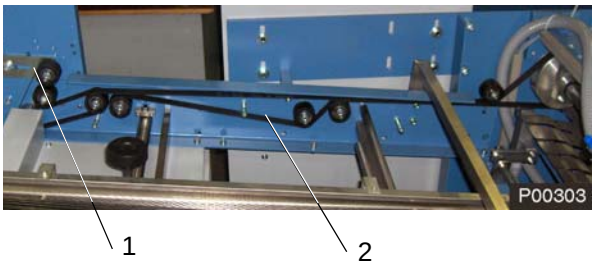
- ▷ On the feeder and the machine, secure the levelling screws (4) with the lock nuts (6).
- ▷ After locking the screws, recheck the alignment and exit height. Correct them if necessary.

7.3.5 Leveling out and connecting the machine to the feeder

For details for connecting the machine and the feeder, please consult the separate operating manual for the feeder.

7.3.6 Assembling the register table

7.3.6.1 Installing the drive belt



1 Belt tensioner
2 Drive belt

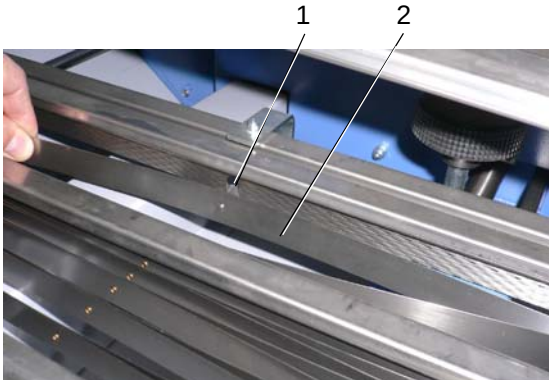
Illustration 49: Installing the drive belt

Procedure:

1) Remove the guard over the drive belt (2).
2) Place the drive belt (2) according to the belt course in the illustration.
3) Tension the drive belt with the belt tensioner (1).
4) Attach the guard over the drive belt (2) again.

✓ The drive belt is mounted.

7.3.6.2 Hook in the lattice grate



1	Mounting point	2	Lattice grate

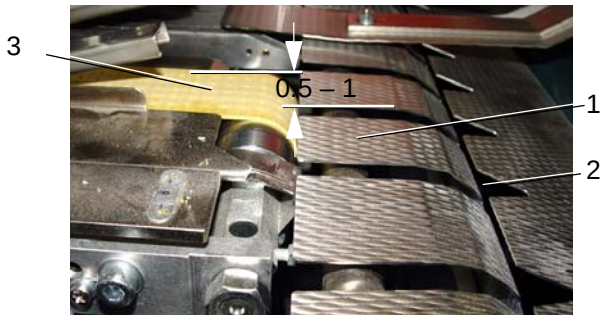
Illustration 50: Hook in the lattice grate

Procedure:

1) Set the lattice (2) into the register table.
   When doing so, pay attention to the mounting direction
2) Hook the lattice (2) on all four mounting points (1).

✓ The lattice grate is hung in.

7.3.6.3 Guide plate on the feeder, check the height adjustment



1	Feeder guide plate	3	Belt
2	Screws		

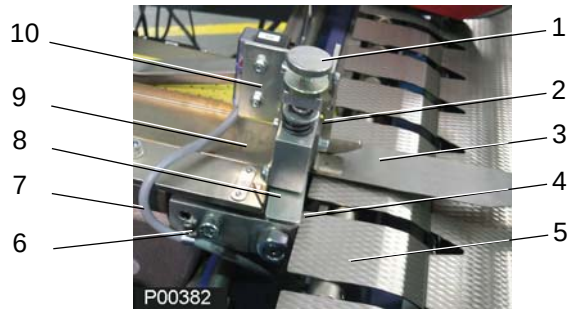
Illustration 51: Checking the height adjustment of the guide plate

Procedure:

1) The top edge of the guide plate (1) should lie 0.5 – 1 mm (0.02 – 0.04 in) lower than the top edge of the belt (3).
2) Correct if necessary.

✓ The height adjustment has been checked.

7.3.6.4 Assembling double sheet detector



1	Knurled screw	6	Strap
2	Adjusting disc	7	Cable
3	Smoother bar	8	Pressure lever
4	Screw	9	Sidelay
5	Guide plate	10	Double sheet detector

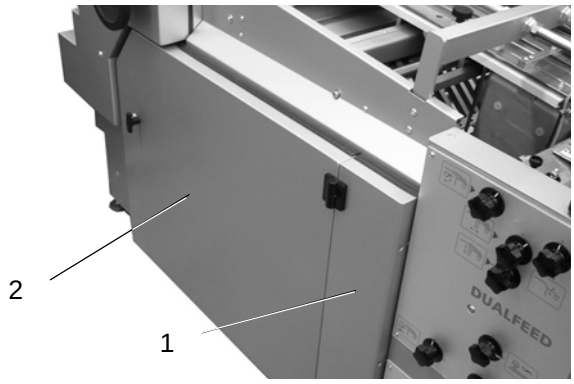
Illustration 52: Assembling double sheet detector

Procedure:

1) Remove the retainer (3)
2) Turn the knurled screw (1) counterclockwise until the pressure lever (8) lies flat.
3) Insert the double sheet detector (10) in the locating hole.
4) Activate the adjusting disc (2). It must clamp in the activated position by itself.
5) Fix the double sheet detector (10) with the screw (4).
6) Turn the knurled screw (1) clockwise until the adjusting disc (2) becomes free again.
7) Mount the smoother bar (3) so that it protrudes into the U-beam of the sidelay (9).
   The clearance to the guide plate (5) should be 1 to 2 mm in order that no jamming point occurs with the passing sheets.
8) Fix the cable (7) with the strap (6).

✓ The double sheet detector is mounted.

7.3.7 Mount the doors



1 Door frames
2 Door

Illustration 53: Mount the doors

Procedure:

1) Mount the door frames (1) on the feeder.
2) Hook in the doors (2) on door frames (1).

✓ The door is mounted.

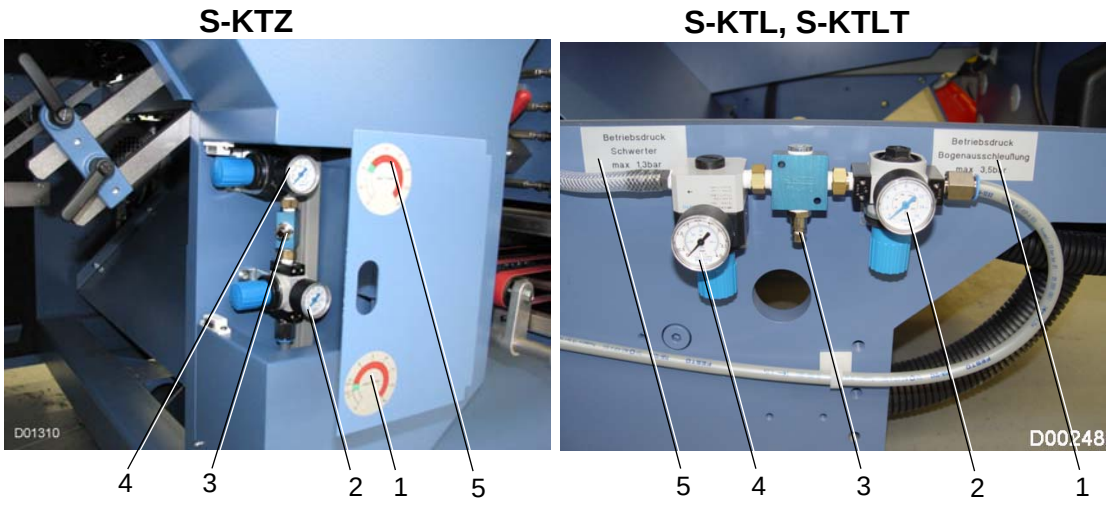
7.3.8 Mount the noise damping and safety hood

Illustration 54: Noise damping and safety hood

The noise damping and safety hood has been installed in the factory.

▷ Check to make sure that it is working properly.
See Chapter “9.3.1.2 Check noise damping and safety hood”

7.3.9 Connecting the compressed air supply



1 Plate maximum operating pressure for ejector
2 Pressure regulator for ejector
3 Compressed air connection
4 Pressure regulator for folding knives
5 Plate maximum operating pressure for folding knives

Illustration 55: Connecting the compressed air supply

Procedure:

▷ Connect the compressed air supply to the compressed air connection (3).
The operating pressure of the compressed air supply should be 6 bar.
See Chapter “3.2.4 Supply”

▷ Set the operating pressure for the ejector to 3.5 bar at the pressure regulator (2).

▷ Set the operating pressure for the folding knives to 1.3 bar at the pressure regulator (4).

✓ The compressed air supply is hooked up.

CAUTION!

Excessive operating pressure.

Non-observance could result in severe property damage to the folding knives and to the ejector.

It is absolutely imperative that you comply with the specified operating pressures.

Due to the closing of electrically-secured protective devices, unexpected pneumatic elements may be activated.

7.3.10 Inserting the buckle plates

1 Transport box 2 Buckle plates

Illustration 56: Inserting the buckle plates

Procedure:

▷ Open the transport box.
▷ Carefully remove the buckle plates.
▷ Carefully put the buckle plates in their respective positions. See Chapter “8.8.3 Buckle plate positions”
▷ Connect the corresponding connecting lines to the servomotors.
▷ Dispose of the transport box in an environmentally friendly manner.
✓ The buckle plates are installed in place.

7.4 Removing the rust preventing agents

After the machine has been set up, thoroughly clean all of the machine parts to remove rust preventing agents.

In doing so, please observe the cleaning agent recommendation in the following table and the detailed specifications on the roller cleaner "Varn" in Chapter "Cleaning".

Part of machine	Cleansing agent
Lacquered surfaces	Solvent-free cleansing agent
Foldrollers	"Varn-Wash VM 111". Refer also to the "Cleaning" chapter.
Unpainted plates	Degreaser of your choice

Table 28: Cleaning recommendation

7.5 Hooking up the electrical connections

DANGER!

Hazardous voltage.

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

- Work may only be carried out on the machine's electrical systems by a qualified electrician.
- Observe the local occupational safety regulations and electrotechnical regulations.
- On the supply terminals and on the clamps of the main switch, there is dangerous electric voltage even when the main switch is switched off. (See wiring diagram)
- On the frequency inverter connection bars, there is dangerous residual voltage even when the main switch is switched off. (Observe the capacitor discharge time (KEB 5 min, Telemecanique 15 min)).

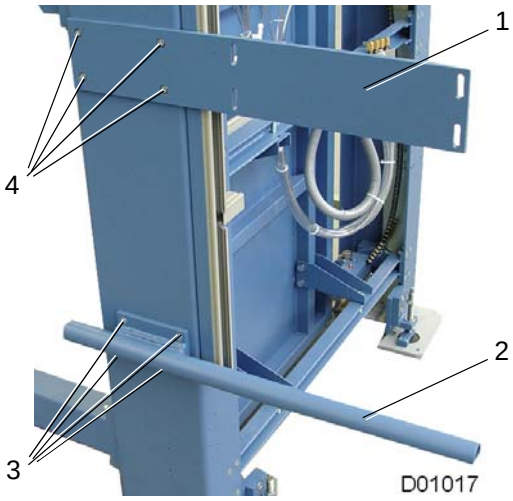
CAUTION!

Lifting heavy machine parts (buckle plates, slitter shafts, etc.)

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

Seek the assistance of other persons when lifting heavy machine parts, such as buckle plates, slitter shafts, etc.

7.5.1 Mounting the main control cabinet for the palletized feeder



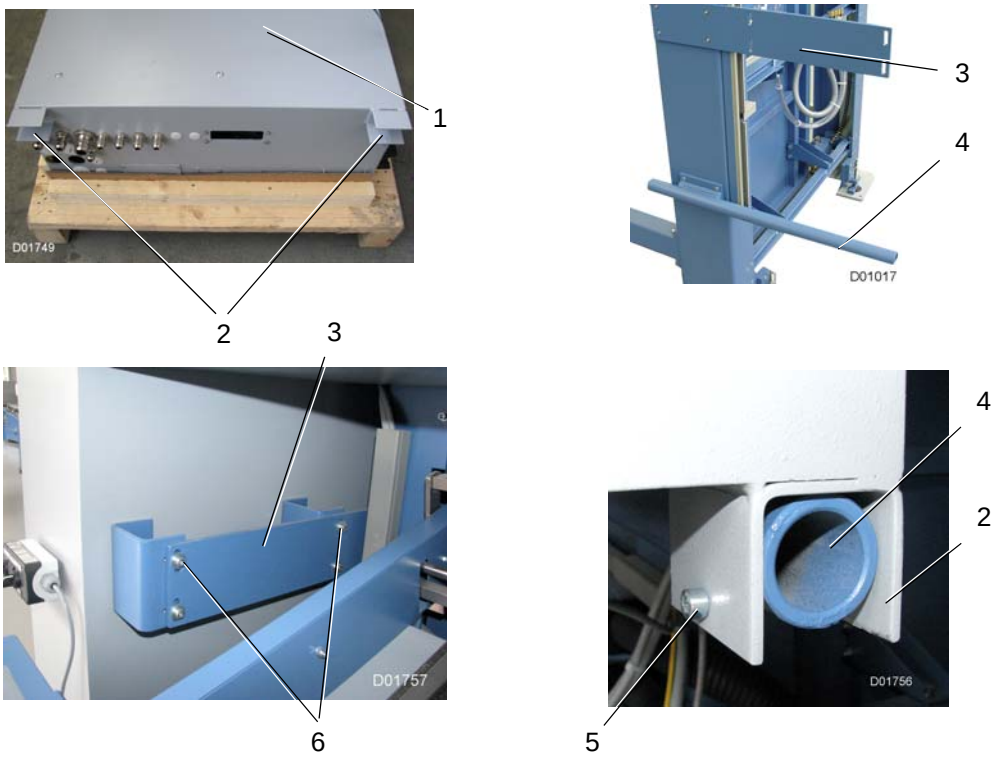
1	Top support	3	Screws
2	Bottom support	4	Screws

Illustration 57: Assembly of support for the main control cabinet

Procedure:

1) Fasten the "top support" (1) to the feeder with the four screws (4).
2) Fasten the "bottom support" (2) to the feeder with the four screws (3).

✓ The supports have been are mounted.



1	Main control cabinet	4	Bottom support
2	Guide piece	5	Safety screws
3	Upper support	6	Screws

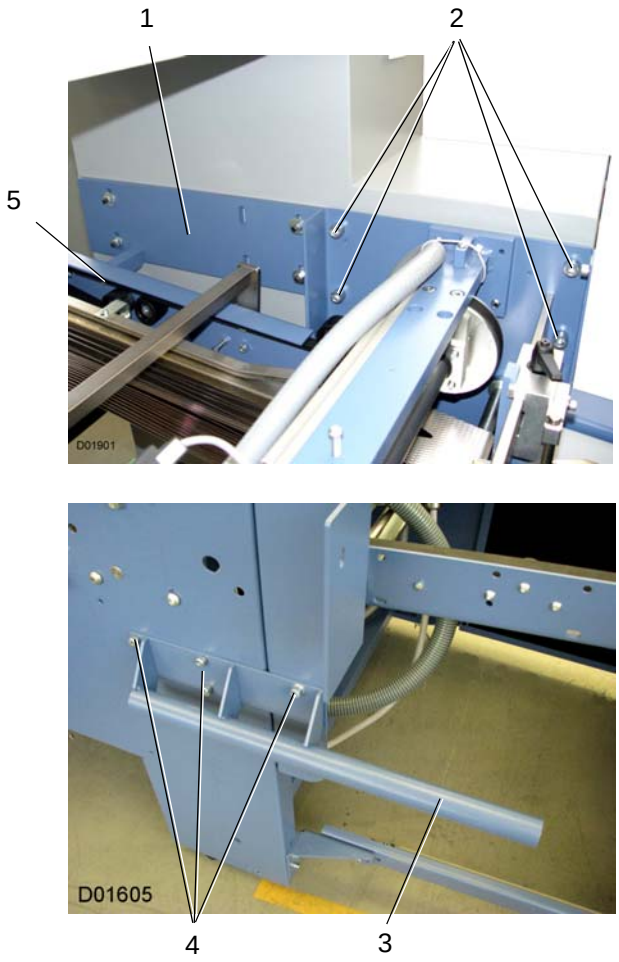
Illustration 58: Main control cabinet assembly, NAVIGATOR Control

Procedure:

1) Transport the main control cabinet (1) to the installation location on the transport pallet.
2) Remove the safety screws (5) from the guide pieces (2).
3) Summon at least 4 people to lift the main control cabinet (1).
4) Hook in the main control cabinet (1) with the guide pieces (2) on the bottom support (4).
5) Pivot the main control cabinet (1) upward.
6) Fasten the main control cabinet (1) to the top support (3) using the screws (6).
7) Secure the main control cabinet (1) to the bottom support (4) by tightening the safety screws (5) on the guide pieces (2).

✓ The control cabinet is mounted.

7.5.2 Mounting the main control cabinet for the continuous feeder

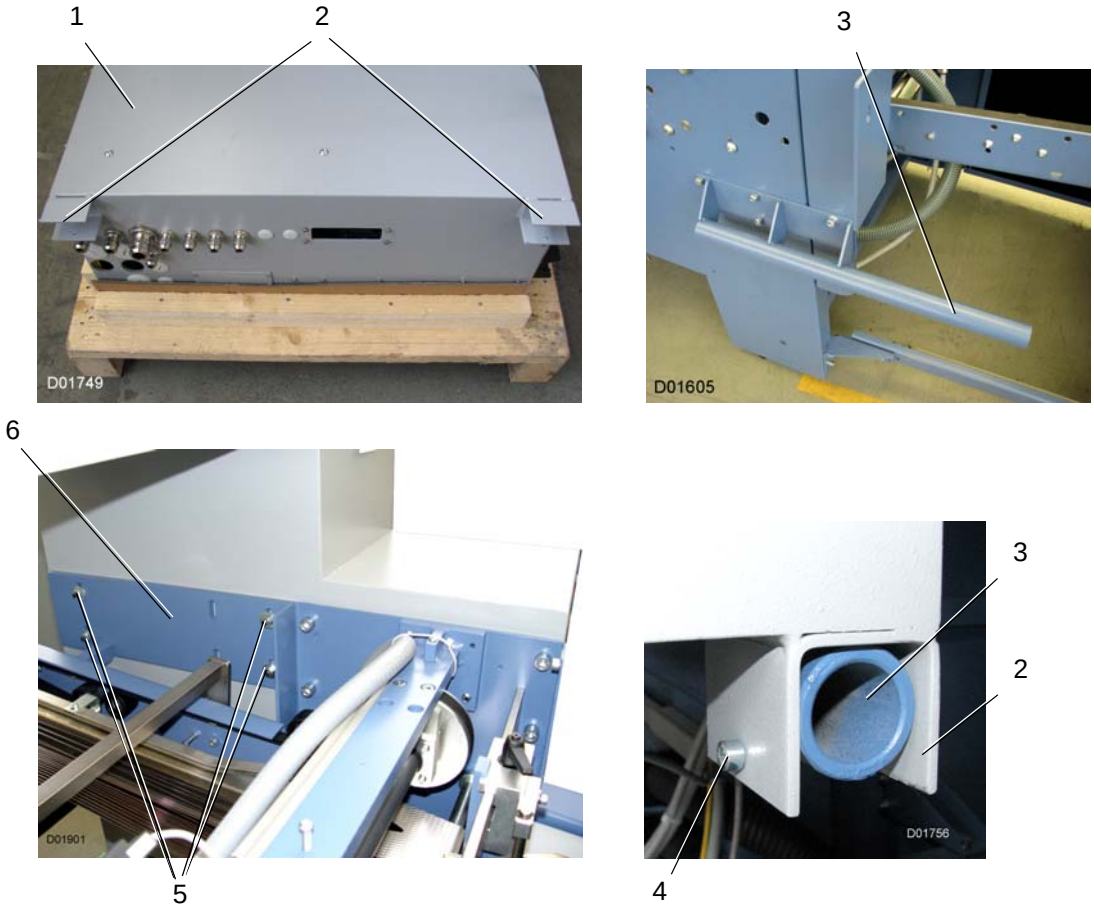


1	Top support	4	Screws
2	Screws	5	Screws
3	Bottom support		

Illustration 59: Assembly of support for the main control cabinet

Procedure for installing the supports for the main control cabinet:

▷ Fasten the "top support" (1) to the feeder with the four screws (2).
▷ Fasten the "top support" (1) with the screw (5) to the register table.
▷ Fasten the "bottom support" (3) to the feeder with the four screws (4).
✓ The supports have been mounted.



1	Main control cabinet	4	Safety screws
2	Guide piece	5	Nuts and shims
3	Bottom support	6	Top support

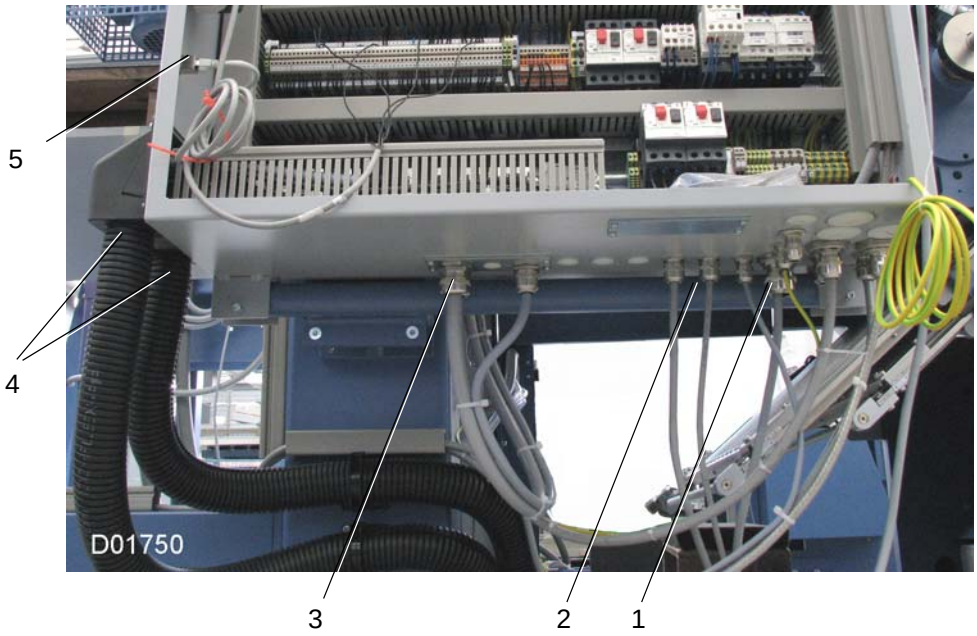
Illustration 60: Main control cabinet assembly, NAVIGATOR Control

Procedure:

1) Transport the main control cabinet (1) to the installation location on the transport pallet.
2) Remove the safety screws (4) from the guide pieces (2).
3) Summon at least 3 people to lift the main control cabinet (1).
4) Hook in the main control cabinet (1) with the guide pieces (2) on the support below (3).
5) Pivot the main control cabinet (1) upward.
6) Fasten the main control cabinet (1) to the top support (6) using the nuts (5).
7) Secure the main control cabinet (1) to the bottom support (3) by tightening the safety screws (4) on the guide pieces (2).

✓ The control cabinet is mounted.

7.5.3 Hook up connecting lines



1 Power cable
2 Connecting lines, pumps and motors
3 Control lines, feeder
4 Control lines, machine
5 Network outlet RAS X99

Illustration 61: Main control cabinet, connection overview

Procedure:

1) Open the cover on the rear of the main control cabinet.
2) All connecting lines are marked with their specific equipment identifier (EID).
3) Insert the connecting lines into the main control cabinet through the cable glands with the same marking.
4) Hook up the connecting lines in the main control cabinet according to the specifications of the BMK sticker and the wiring diagram.

✓ The connecting lines have been hooked up.

7.5.4 Make stationary connection to mains power supply

DANGER!

Hazardous voltage when connecting to the mains power supply.

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

- Connection of the mains power supply to the machine may only be carried out by a qualified electrician.
- Observe the local occupational safety regulations and electrotechnical regulations.
- 400 V power supply. If a neutral wire is lacking, electronic components – e.g. frequency inverters – can be destroyed.
- Due to the leakage currents of the controlled drives (frequency inverters), an equipotential bonding cable must be connected. See Chapter “7.5.4.2 Take heed of the installation of the stationary mains power supply” and “7.5.5 Connect additional protective equipotential bonding”

CAUTION

Incorrect supply voltage.

Non-observance may result in severe property damage.

- If the present nominal voltage deviates from the specifications on the type label, wiring diagram and "Specifications" of the operating manual, an isolating transformer must be used.
- You can get the necessary information from the manufacturer.

CAUTION

Leakage currents greater than 10 mA.

Non-observance may result in property damage.

- Connect an additional protective equipotential bonding strip to the PE clamps.
- Minimum cross-section = cross-section of the PE conductor of the power cable.

  Optimal = cross-section of 10 mm^2.

7.5.4.1 Take heed of network requirements

CAUTION

Incorrect supply voltage.

Non-observance may result in severe property damage.

- Verify that the specifications for supply voltage and frequency on the label match the power data for the current source.
- Connect the machine only if the supply voltage and frequency match.
- If the present nominal voltage deviates from the specifications on the type label, wiring diagram and "Specifications" of the operating manual, an isolating transformer must be used.
  You can get the necessary information from the manufacturer.

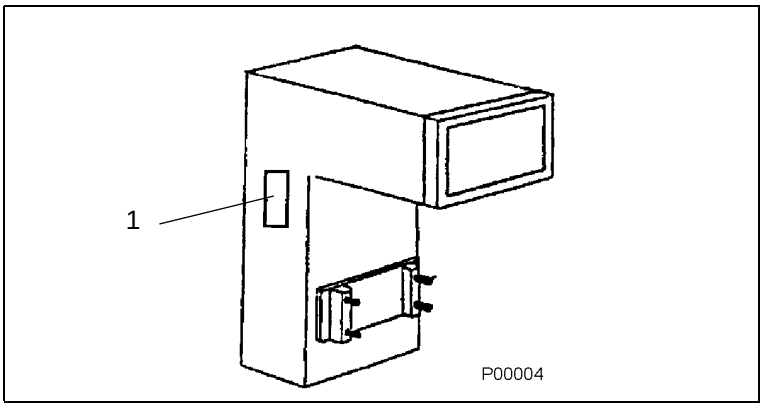


Illustration 62: Label

Regarding the stationary mains power supply, please observe that:

- That, as in Germany, connecting may only be carried out by an electrical installation firms that have been entered in the registry of electrical installers of the local power network provider.
- In Europe, this work must be generally carried out by a qualified electrician.
  This qualified electrician must be knowledgeable of the respective standards, especially EN IEC 60364, as well as the technical connection requirements of the local network provider.
- This work may ***not*** be carried out by an MBO technician or a customer service technician.
- That the electrical installation as per EN 60204-1, Item 6.3.3. "Protection through automatic switching off of the supply" is adhered to.
- A check of the impedance of the fault loop and the suitability of the assigned overcurrent protective device according to EN 60204-1, Item 18.2.2. is performed.
- The type of network, voltage, frequency, network cross-section and network safeguards must be in compliance with the specifications on the type label, wiring diagram and "Specifications" of the operating manual.
- Because of the leakage current of the EMC filters, the mains power supply must always be implemented stationary.

- Due to the leakage currents of the EMC filter, no power supply with a ground fault circuit interrupter (GFCI) or a voltage fluctuation relay can be used.
- Due to the leakage currents of the EMC filter, an additional protective equipotential bonding system according to EN 60204-1, Clause 8.2.8 must be connected.
- The customer's grounding system must have the lowest possible grounding resistance (an optimum value would be < 2 Ohm), as at relatively high grounding resistances (> 50 Ohm) the EMC filters barely have any filter effect any more.
- The N – conductor should be powered (in a 400 VAC network).
- That a right rotating field is absolutely required.
- The machine power sockets of the MBO machines may only be used exclusively for the connection of MBO folding units, units or 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.

7.5.4.2 Take heed of the installation of the stationary mains power supply

Electrical power supply:	**Connecting line**		
Nominal voltage: 3 x 400 V + N + PE	**Cable**	**Diameter**	**Protective ground conductor**
Construction according to DIN EN 60204-1, Clause 4.3.1	Five-line copper cable (L1, L2, L3, N, PE): single-wire or multiple-wire with connector sleeves, connection made touch-proof, right rotating field.	Implementation as per VDE 0100 Section 430 (IEC 60364-4-47)	Implementation as per VDE 0100 Section 540 (IEC 60364-5-54)
Nominal voltage: 3 x 220 V + PE	**Cable**	**Diameter**	**Protective ground conductor**
Construction according to DIN EN 60204-1, Clause 4.3.1	Four-line copper cable (L1, L2, L3, PE): single-wire or multiple-wire with connector sleeves, connection made touch-proof, right rotating field.	Implementation as per VDE 0100 Section 430 (IEC 60364-4-47)	Implementation as per VDE 0100 Section 540 (IEC 60364-5-54)
	Protective equipotential bonding strip(1 (Second, additional PE conductor)		
		Diameter	
		Implementation as per VDE 0100 Section 540 (IEC 60364-5-54) and EN 60204-1, Item. 8.2.8 Minimum cross-section = cross-section of the PE conductor of the power cable (Cu). Optimum cross-section = 10 mm^2 (Cu).	

Table 29: Stationary mains power supply installation

1) If the leakage current of the overall system is more than 10 mA, then according to EN 60204-1 a protective equipotential bonding cable must be connected.

7.5.4.3 Implement the stationary mains power supply connection to the main control cabinet

1 Mains power terminals	2 Cable gland, power supply

Illustration 63: Stationary mains power supply NAVIGATOR Control

Procedure:

1) Insert the power cable into the main control cabinet through the cable gland (2).
2) Connect the mains connection line to the power cables (1) according to the wiring diagram.
3) Safeguard the mains power terminals (1) with the yellow cover plate.

✓ The stationary mains power supply connection has been implemented.

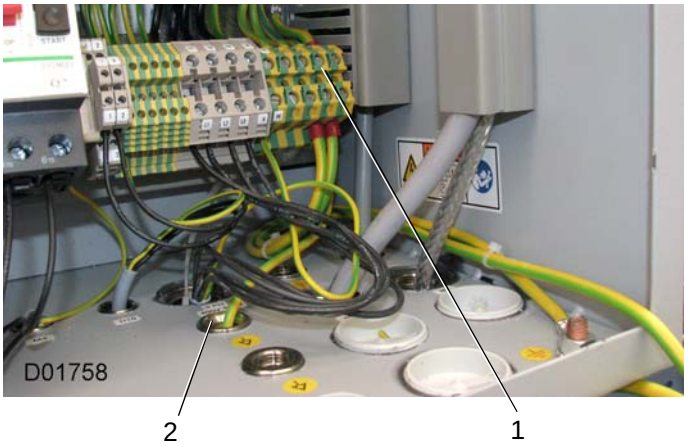
7.5.5 Connect additional protective equipotential bonding

CAUTION

Leakage currents greater than 10 mA.

Non-observance could result in serious personal injuries and property damage.

- Connect an additional protective equipotential bonding strip to the PE clamps.
- Minimum cross-section = cross-section of the PE conductor of the power cable (Cu).
  Optimal = cross-section of 10 mm^2 (Cu).



1 PE connection terminal strip	2 Cable gland, protective equipotential bonding cable

Illustration 64: Connecting the protective equipotential bonding

The radio interference voltage suppression filter of the installed frequency inverters generate a system-dependent ground leakage current.

As this can be more than 10 mA, in accordance with EN 60204-1 Item 8.2.8 an additional protective equipotential bond is necessary.

This should have at least the cross-section of the PE conductor of the connecting line.
Optimally, this should be a cross-section of 10 mm^2.

Procedure:

1) Insert the protective equipotential bonding cable through the cable gland (2) into the main control cabinet.
2) Connect the protective equipotential bonding cable to the PE connection terminal strip (1).

✓ The protective equipotential bonding cable is connected.

7.5.6 Checking the ground wire connections

WARNING!

Disconnected ground wire connections.

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

Reconnect all ground wire connections that were disconnected for transport.

Check that all ground wire connections that were disconnected for transport are reconnected correctly.

Procedure:

▷ Check this by visual inspection.

7.5.7 Implementing electrical connections between the folding units

CAUTION!

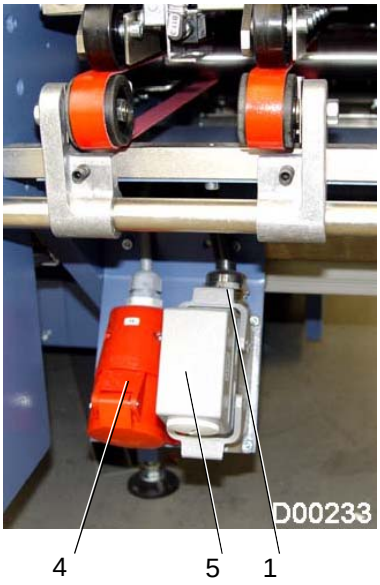
Tripping over connecting cables lying about.

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

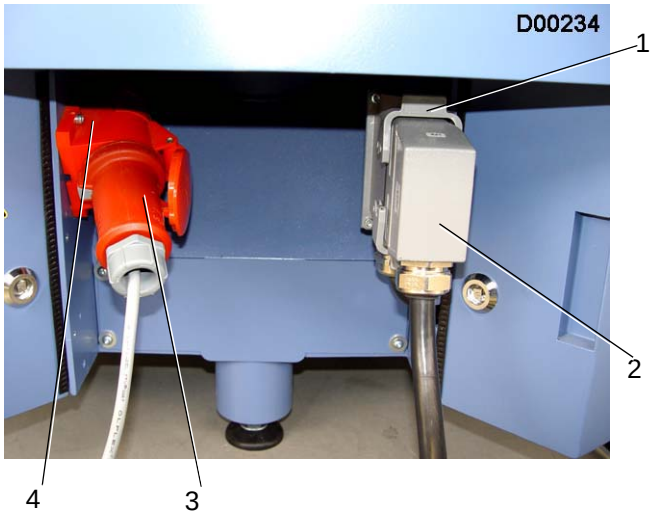
Route all machine connection lines (cables, hoses, pipes) so that they do not pose a tripping hazard.

7.5.7.1 Operating mode: machine control

S-KTL, S-KTLT



S-KTZ



1 Control socket for machine controller
2 Control plug
3 Power plug
4 Heavy-duty power socket
5 Dummy plug

Illustration 65: Electrical connection

Connecting of subsequent folding units or deliveries:

Procedure:

▷ Plug the power plug (3) of the subsequent folding unit or delivery into the heavy-duty power socket (4).

▷ Plug the control plug (2) of the subsequent folding unit or delivery into the control socket (1).

✓ Subsequent folding units or deliveries are connected.

Working without subsequent folding unit or delivery:

▷ Plug the dummy plug (5) into the control socket (1).

7.5.7.2 Operating mode: adapter box

WARNING!

Using multiple adapter boxes in a machinery.

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

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

It is possible to connect subsequent MBO folding units with different control systems into a machinery. The corresponding adapter boxes are required for this.
Contact MBO Service or an authorized customer service representative to find out which adapter boxes can be used.

- Due to safety reasons, a maximum of **one adapter box** may be used in a machinery.
- Exceptions are only possible in consultation with the MBO electrical design department.

7.6 Performing initial operation

DANGER!

Hazardous voltage.

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

- Work may only be carried out on the machine's electrical systems by a qualified electrician.
- Observe the local occupational safety regulations and electrotechnical regulations.
- On the supply terminals and on the clamps of the main switch, there is dangerous electric voltage even when the main switch is switched off. (See wiring diagram)
- On the frequency inverter connection bars, there is dangerous residual voltage even when the main switch is switched off. (Observe the capacitor discharge time (KEB 5 min, Telemecanique 15 min)).

7.6.1 Brief instructions

- Checking the supply voltage.
  See Chapter “7.6.2 Checking the supply voltage”.
- Switch on the main switch.
  See Chapter “8.2.1 Switching on/off the main switch”.
- Check the rotational direction of the pumps.
  See Chapter “7.6.3 Checking the rotation direction of the pumps”.
- Check the rotational direction of the feeder motor.
  See Chapter “7.6.4 Checking the rotation direction of the feeder motor”.
- Check the rotational direction of the driving motor folding machine.
  See Chapter “7.6.5 Checking the rotation direction of the folding machine's driving motor”.
- Check machine functions.
  See Chapter “7.6.7 Checking machine functions”.

7.6.2 Checking the supply voltage

CAUTION

Incorrect supply voltage.

Non-observance could result in serious property damage.

- Verify that the specifications for supply voltage and frequency on the label match the power data for the current source.
- Connect the machine only if the supply voltage and frequency match.
- If the present nominal voltage deviates from the specifications on the type label, wiring diagram and "Specifications" of the operating manual, an isolating transformer must be used.
  You can get the necessary information from the manufacturer.

Procedure:

▷ Check on the power supply terminals that the correct supply voltage is present.

▷ Only switch on the main switch when the correct supply voltage is present.

✓ The supply voltage is checked.

- Checking the rotating field of the heavy-duty power socket

Procedure:

▷ Check with a rotating field device that there is a right rotating field.

✓ The rotational field is checked.

If there is no right rotating field, during connection of a subsequent folding unit with AC drive, its rotation direction is incorrect.

7.6.3 Checking the rotation direction of the pumps

See the operating manual for the feeder.

7.6.4 Checking the rotation direction of the feeder motor

See the operating manual for the feeder.

7.6.5 Checking the rotation direction of the folding machine's driving motor

CAUTION!

Incorrect rotational direction of the driving motor.

Non-observance could result in property damage.

On initial operation, check the correct rotation direction of the driving motor of the folding machine.

- The suction wheel/suction belt must turn clockwise.
- If necessary, change the 2 phases of the motor connecting line in the main control cabinet.

Procedure:

▷ Press the <Machine start > button.
The suction wheel/suction belt must turn clockwise.

▷ Once you have detected the direction of movement of the suction wheel/suction belt, stop the machine by pressing the <Machine stop> button.

▷ If the suction wheel/suction belt turns counterclockwise, two phases of the connecting line of the driving motor in the control cabinet must be switched by a qualified electrician.

▷ Then repeat the check of the rotational direction.

✓ The rotational direction is checked.

7.6.6 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.

7.6.7 Checking machine functions

Procedure:

▷ Check the functionality of the entire machine by setting up a customer job / test job.

7.6.8 Checking protective devices

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

Procedure:

▷ Check that all coverings and safety and protective devices are installed and fully functional.
For this purpose, use the checklist for the safety and protective devices.
See Chapter “4.5.10 Checklists for safety and protective devices”

7.6.9 Setting the language

7.6.9.1 Standard display

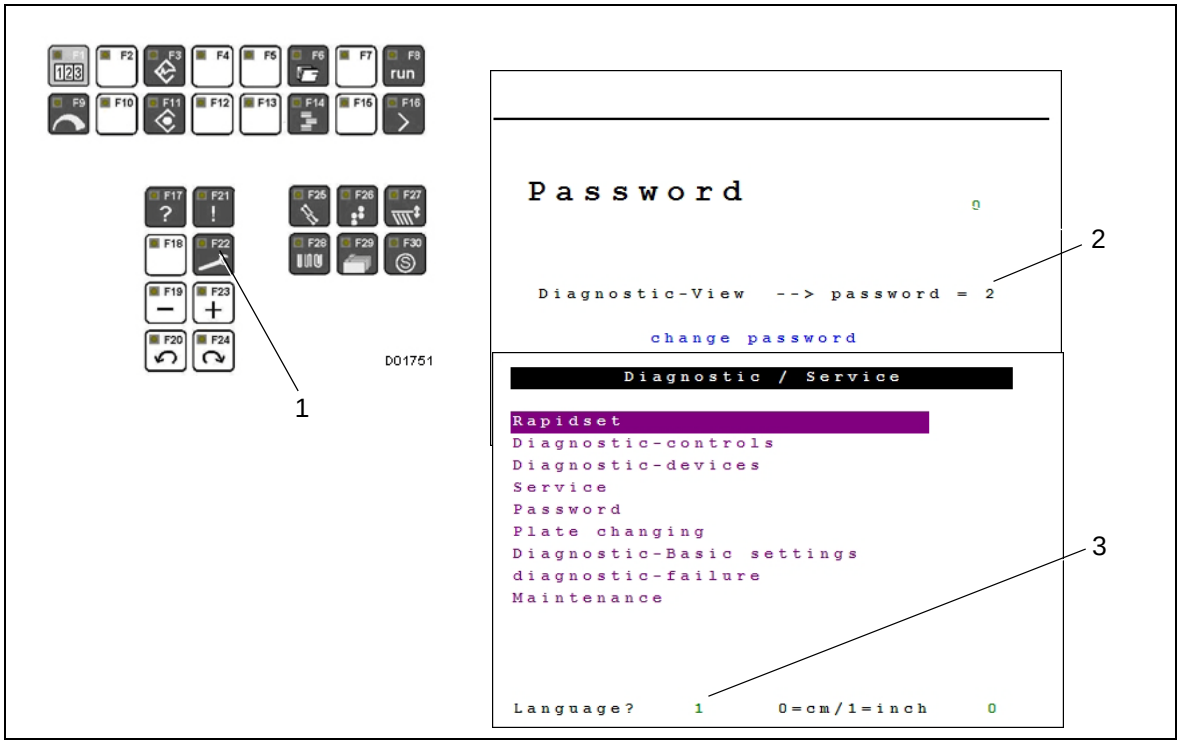


Illustration 66: Setting the language

The text of the standard display can be shown in various languages.

Procedure:

1) Press the <F22 Diagnostics/Service> button (1).
2) Enter the password <2> (2).
3) Press the "Enter" button.
4) Using the Up/Down buttons, select the <Language> (3) field.
5) Enter the corresponding number for the desired language.
   1 = German
   2 = English
   3 = Language is dependent on the software version.

✓ The language is set.

Changing the language means that:

- The texts are displayed in the selected language.
- The length details and temperature readings are shown country-specific.

7.6.9.2 TOUCHSCREEN option

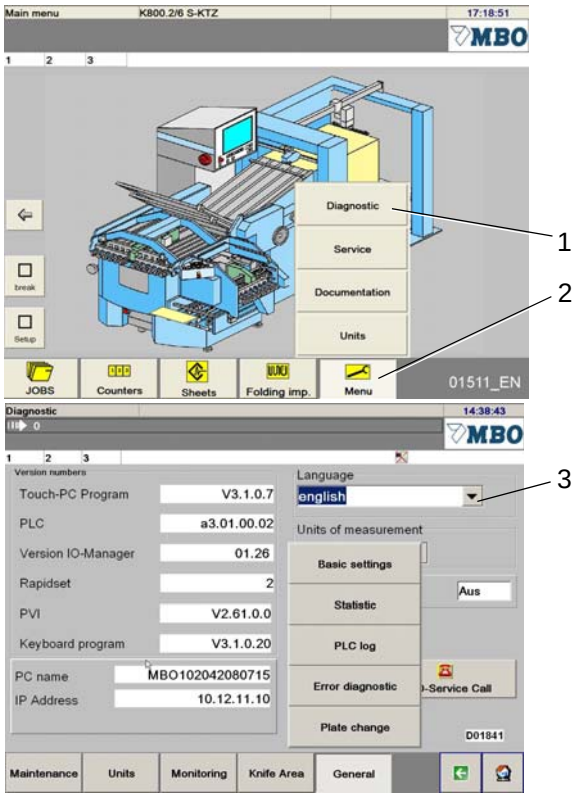


Illustration 67: Setting the language

The TOUCHSCREEN texts can be shown in different languages.

Procedure:

1) Press the <Menu> button (2).
2) In the selection list, press the <Diagnostics> button (1).
3) On the right of the <Language> field, press the selection bar (3).
4) Select the desired language in the opened selection window.

✓ The language is set.

Changing the language means that:

- The screen texts are displayed in the selected language.
- The length details and temperature readings are shown country-specific.

7.7 Performing a verification inspection after the initial commissioning

20 operating hours after the initial commissioning, it is necessary to perform a test of all drive belts and tapes.

Procedure:

▷ Check all tapes and drive belts for centered running and the necessary tension.
Readjust them if required.
See Chapter "Maintenance".

8 0peration and adjustment

8.1 Introduction

When adjusting and operating the machine, also observe the following:

- The safety instructions,
  see Chapter “8.1.2 Safety instructions”.
- The intended use,
  see Chapter “2.1 Intended use”.
- Qualification of the operating personnel,
  see Chapter “8.1.1 Qualification of personnel”.

8.1.1 Qualification of personnel

This table lists the necessary qualifications of 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 30: Qualification of personnel; operation, adjustment
legend: X permitted, - not permitted

8.1.2 Safety instructions

DANGER!

Dismantling, bridging or bypassing safety and protective devices.

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

- None of the machine's safety and protective devices may be dismantled, bridged or bypassed.
- Using the checklist for safety equipment and protective 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 plant.

WARNING!

Independent lowering of the open noise damping and safety hood.

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

Check the pneumatic springs after each production / daily to ensure they are functioning properly.

WARNING!

Independent lowering of the open crossfold table.

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

Check the pneumatic springs after each production / daily to ensure they are functioning properly.

WARNING!

Rotating machine parts.

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

- You must always keep your hair closely bound and protected.
- Remove and put aside your jewelry before operating and maintaining the machine.
- Only wear close-fitting garments when operating and maintaining the machine.

WARNING!

Rotating machine parts.

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

In case of sudden machine standstill, check the following before switching it on again:

- That there is no other person directly at the machine.
- That the machine is in an error-free condition.

WARNING!

Pulling back/removing the buckle plates during operation.

The exposed, rotating foldrollers and slitter shafts make up hazardous infeed points.

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

- All adjustment and inspection work may only be performed on an idle machine that has been safeguarded against being switched on again.
- Press the EMERGENCY STOP palm button.
- You should only permit adjustment and inspection work to be performed by a single person.
- When turning the machine with the safety handwheel, there is also a hazard of pinching and injury!

WARNING!

Rotating machine parts in case of opened protective devices during set-up mode.

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

In set-up mode, there is an increased hazard of injuries since dangerous points are accessible due to open protective devices and the machine can be operated up to production speed.

Make absolutely sure that there are **no** other people on the machine during when you are operating it in set-up mode.

WARNING!

Cutting hazard due to slitter shafts.

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

- Never reach into the slitter shafts while the machine is running.
- For all work with the slitter shafts, wear cut-proof safety gloves and safety shoes.
- The removal/installation of the slitter shafts may only be performed on an idle machine that has been safeguarded against being switched on again.
- Always hold the slitter shafts by the shaft and not on the tool.

WARNING!

Incorrect handling of the safety handwheels.

Non-observance could result in serious personal injury 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 danger of being drawn in).

CAUTION!

Lifting heavy machine parts (buckle plates, slitter shafts, etc.)

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

Seek the assistance of other persons when lifting heavy machine parts, such as buckle plates, slitter shafts, etc.

CAUTION!

High noise level.

Non-observance could result in hearing damage.

- Wear hearing protection when working on the machine.
- When working on the machine, close the noise damping and safety hoods.

CAUTION!

The tape roller at the end of the register table make up a hazardous infeed point.

Non-observance could result in personal injuries.

Do not reach into the register table when the machine is running.

CAUTION!

Incorrectly-fastened buckle plates.

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

Make sure that the buckle plates are fastened securely by the clamping lever.

CAUTION!

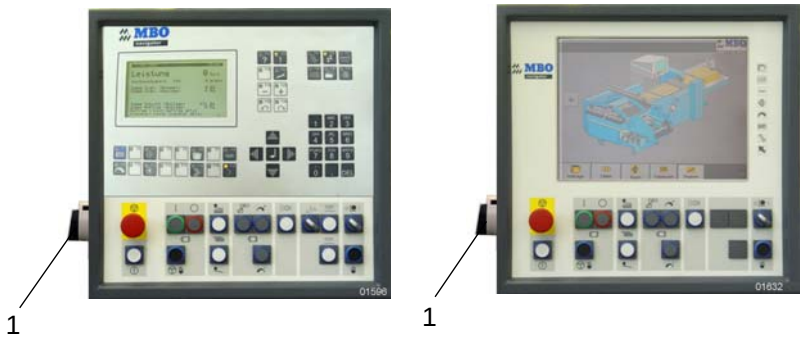
Paper jam.

Non-observance could result in property damage (drive belts, transport belts, foldrollers, etc.).

- When removing the paper jam, turn the machine using the safety handwheel only.
- The machine may be restarted only after removing the paper jam.

8.2 Operating the machine

8.2.1 Switching on/off the main switch



1 Main switch

Illustration 68: Switching on/off the main switch

Switching on

Procedure:

▷ Turn the main switch (1) to switch position 1.
The control system starts up.

✓ The machine is ready for operation.

Switching off

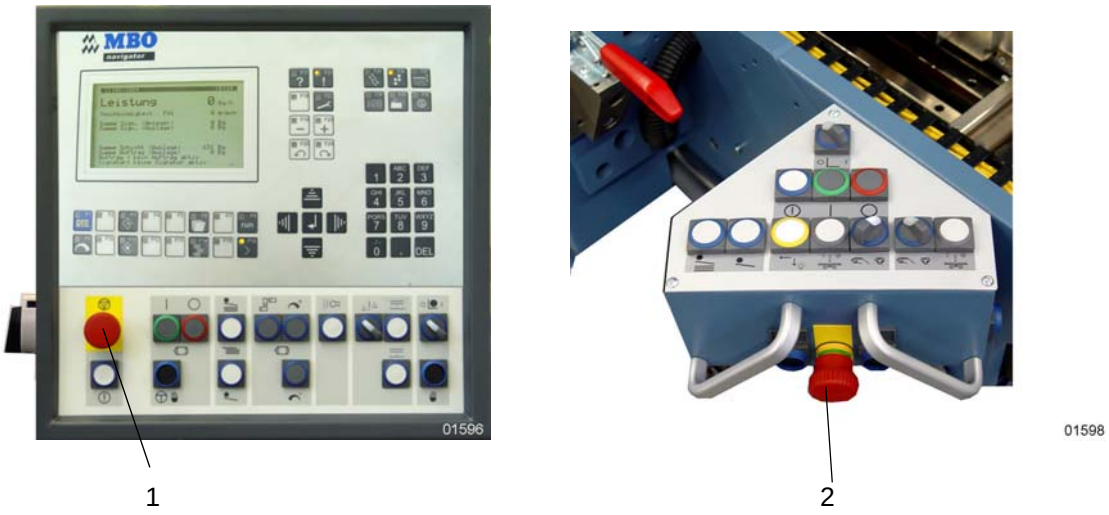
Procedure:

▷ Turn the main switch (1) to switch position 0.
The control system shuts down.
The display goes blank.

✓ The machine is switched off.

To save energy, a machine that is not being used should be switched off.

8.2.2 Press the EMERGENCY STOP palm button



1	EMERGENCY STOP palm button on the main control console	2	EMERGENCY STOP palm button on the control console crossfold and threefold

Illustration 69: 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 hazardous situation and the machine must be stopped quickly.

Procedure:

1) Press the EMERGENCY STOP palm button on the main control console (1) or on the crossfold and threefold unit control console (2).
2) Eliminate the problem.
3) Release the EMERGENCY STOP palm button by turning it to the right.

✓ The machine is ready for operation.

8.2.3 Starting/stopping the machine

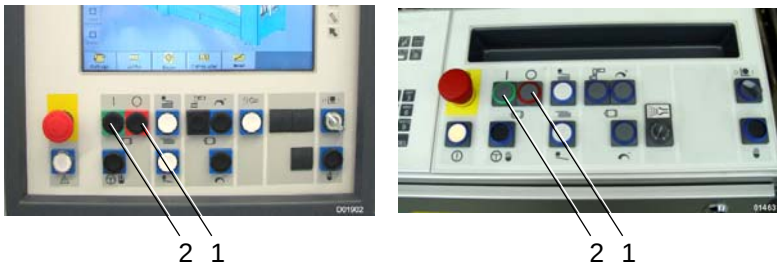


Illustration 70: Starting/stopping the machine

Starting the machine:

Procedure:

▷ Press the <Machine start> button (2).

✓ The machine starts.

Stopping the machine:

Procedure:

▷ Press the <Machine stop> button (1).

✓ The machine stops.

When the machine is stopped during production, the following occurs:

- The sheet feed stops.
- The machine runs until empty.
- The machine drive is stopped.

8.2.4 Starting/stopping the sheet feed

Illustration 71: Starting/stopping the sheet feed

When the sheet feed (1 + 2) is switched on, the air supply is started automatically.

Calling up single sheets:

Procedure:

▷ Press the <Single sheet infeed> button (2).

✓ A single sheet is fed.

Starting production:

Procedure:

▷ Press the <Production sheet infeed start/stop> button (1).

✓ Sheets are fed continuously.

Stopping production:

Procedure:

▷ Press the <Production sheet infeed> (1) button again.

✓ The sheet feed stops.

8.2.5 Switching on/off the air supply

The supply of air blast and suction air is handled through pressure vacuum pumps.

Illustration 72: Switching on/off the air supply

When the sheet feed is switched on, the air supply is started automatically.

Switch on air supply:

Procedure:

▷ Press the button (1).

✓ The air supply is switched on.

Switching off the air supply:

Procedure:

▷ Press the button (1) again.

✓ The air supply is switched off.

8.3 Brief instructions on adjusting the machine

The machine is adjusted in these work steps.

- Operating the machine.
  See Chapter “8.2 Operating the machine”
- Adjusting the folding imposition.
  See Chapter “8.4.5 Create a folding imposition (F28)”.
  See Chapter “8.5.5.2 Creating new folding imposition:”.
- Deleting the counter data.
  See Chapter “8.4.4 Start job/signature/shift anew (F1)”.
  See Chapter “8.5.2 New job”.
- Adjusting the counter.
  See Chapter “8.4.4 Start job/signature/shift anew (F1)”.
  See Chapter “8.5.2 New job”.
- Adjusting the feeder.
  See Chapter on the separate operating manual for the feeder.
- Adjusting the register table.
  See Chapter “8.7.3 Adjusting the register table”.
- Changing the sheet feed data if necessary.
  See Chapter “8.4.8 Change sheet infeed data (F11)”.
  See Chapter “8.5.8 Changing sheet infeed data.”.
- Adjusting the foldrollers/slitter shafts.
  See Chapter “8.8.1 Adjusting the pressure of foldrollers (standard)”.
- Adjusting the buckle plates.
  See Chapter “8.8.3 Buckle plate positions”.
- Placing the slitters on the slitter shafts.
  See Chapter “8.8.10 Installing/removing slitter shafts”.
- Paying attention to error messages.
  See Chapter “8.4.10 Error message display (F21)”.
  See Chapter “8.5.11 Touch screen error message”.
- Removing the paper jam.
  See Chapter “8.14 Removing the paper jam”.

8.4 Adjusting the standard controller

8.4.1 "Calibrate" machine, automatically activate

The prerequisite for the adjustment of the folding machine is that the machine controller is put into the state "Calibrate" machine.
- All sheet infeed data are deleted in the process.
- Note required data in advance.

"Calibrate" machine is activated automatically if:

- A new job is begun
  (see Chapter “8.4.4 Start job/signature/shift anew (F1)”).
- A new folding imposition is selected
  (see Chapter “8.4.5 Create a folding imposition (F28)”).
- There is a new job in the job administration
  (see the separate operating manual for the Navigator Control).

"Calibrate" machine can also be activated manually,
(see Chapter “8.4.7 "Calibrate" machine, manual (F3)”).

For "Calibrate" machine, the following data are measured automatically:

- Sheet length
- Sheet width
- Optimal suction length
- Minimal sheet gaps
- Speeds of all folding units
- Sheet monitoring of all folding units

These can be changed manually
(see chapter “8.4.8 Change sheet infeed data (F11)”).

"Calibrate" machine is automatically terminated after the first sheet has run through all photoelectric sensors of the completely configured Navigator combination.

8.4.2 Start menu

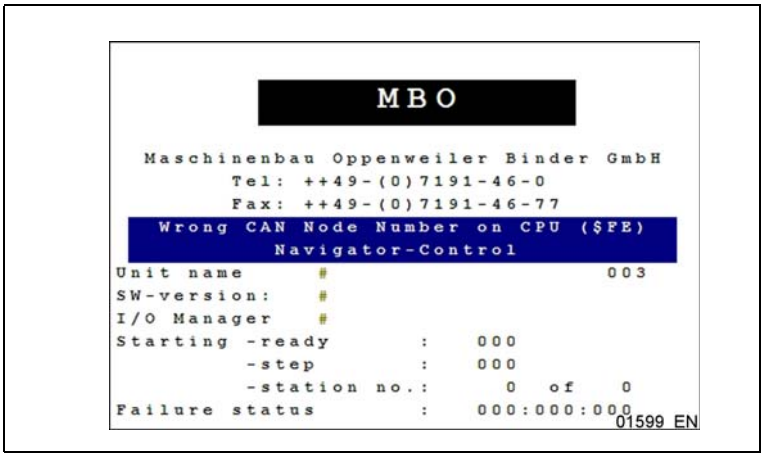


Illustration 73: Start menu

After switching the machine on using the main switch, the start menu appears with the following details:

Name of unit	Name of the unit
SW version	Current version no. of the software

Machine readiness

Startup-Ready	255
Step	255

If this data is displayed, the controller is ready for operation.

At <Error status> the error numbers are indicated in case of a start problem. In case of a service situation, please state all error numbers.

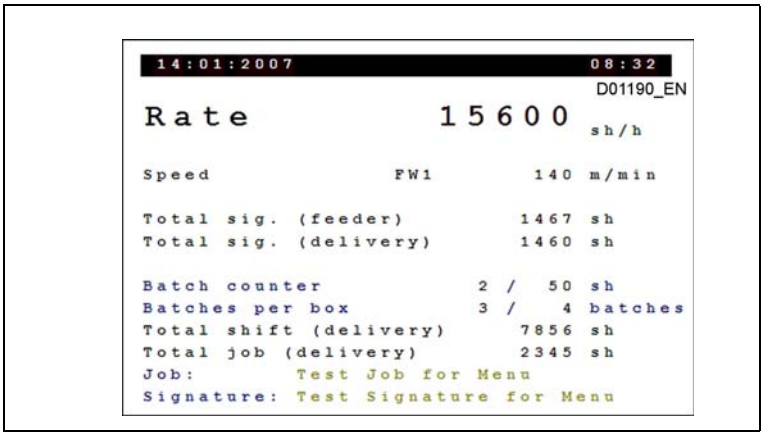
After approximately 10 seconds, there is an automatic change to the <Production speed> menu.

8.4.3 Production speed menu (F8)

All important rate data is displayed on the <Production speed> menu. No entries can be made here.

You can change to the <Production speed> menu by:

▷ Press the <F8> button.



Display of:

Rate: Current production speed in machine combination.

Speed FU1 : Current speed of folding unit 1.

Total signatures (feeder): Total of the sheets that have run from the feeder.

Total signatures (delivery): Total of the sheets that have run into the delivery.

Batch counter: Total of the batches.

Total shift: Total of all sheets produced in the shift.

Total job: Total of all sheets produced in the job.

Job: Display of the current job.

Signature: Display of the current signature.

8.4.4 Start job/signature/shift anew (F1)

On this menu:

- New job/shift/signature is started
- Counter adjustments are made.

You can change to the <New job/shift/signature> by:

▷ Press the <F1> button.

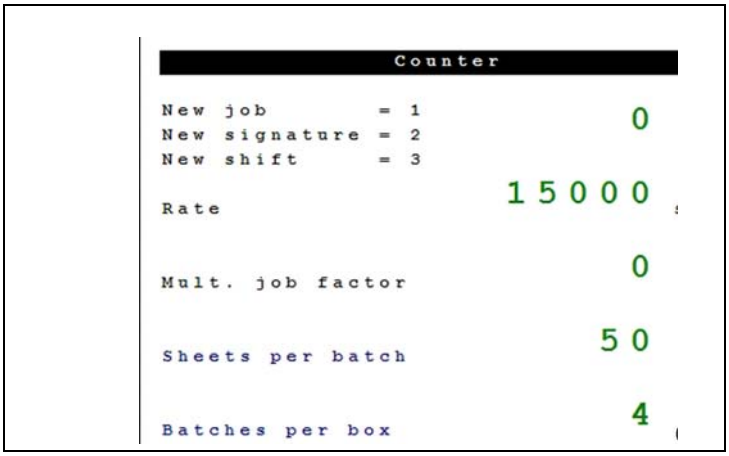


Illustration 74: New job/signature/shift

Perform settings:

▷ Select the desired function with the cursor <Up/Down>.
▷ Enter the desired number.
▷ Confirm the input with <ENTER>.

New job:

▷ Input of a <1>.
✓ <Calibrate> is now active. All job-related and signature-related counter data will be deleted.

New signature:

▷ Input of a <2>.
✓ The signature data is deleted. All job-related and shift-related counter data are continued.

New shift:

▷ Input of a <3>.
✓ The shift data is deleted. All job-related and signature-related counter data are continued.

Rate setpoint value:

▷ Numeric input or pressing of the keys <+/- > (250 sheets/ h per step).

Number of X-up production:

▷ Numeric input or pressing of the keys <+/- > (1 use per step).

Sheets per batch:

▷ Numeric input or pressing of the keys <+/- > (5 sheets per step).

Batches per box:

▷ Numeric input or pressing of the keys <+/- > (1 batch per step).
✓ After the desired number of batches, a double marking is made on the delivery.

8.4.5 Create a folding imposition (F28)

On this menu, the current fold types are displayed on the individual folding units and changed.
You can change to the <Create folding imposition> menu by:
▷ Press the <F28> button.

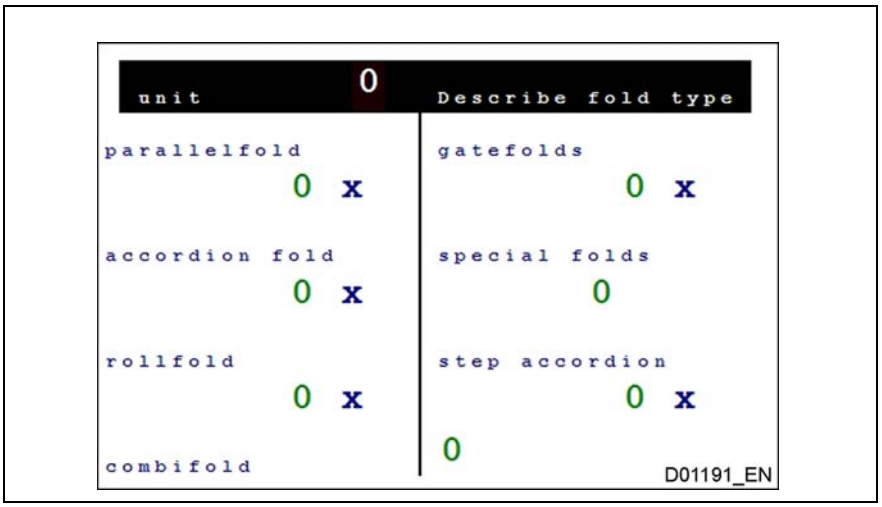


Illustration 75: Create a folding imposition

Perform settings:
▷ Select the desired function with the cursor <Up/Down>.
▷ Confirm selection by pressing the F24 button (LED in the button blinks)
✓ The displayed screen changes to the next input menu.

Next: Changes to additional menus on which settings for new folding impositions can be made.

Delete: Deletes all non-Navigator folding units and the displayed fold types.

F24: Changes to the <Determine folding unit(s), fold type> menu.

8.4.6 Folding program (F29)

Saved folding impositions are managed on this menu.
You can change to the <Fold program> menu by:
▷ Press the <F29> button.

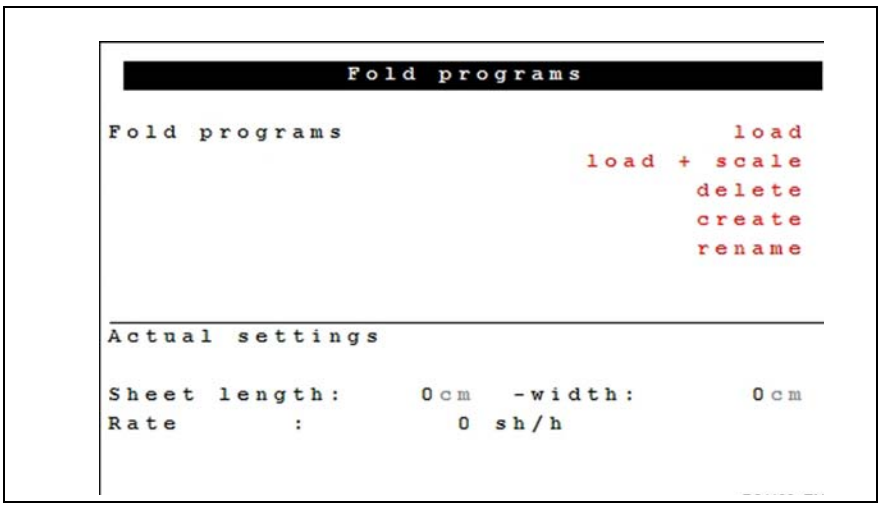


Illustration 76: Managing fold programs

Selecting functions:
▷ Select the desired function with the cursor <Up/Down>.
▷ Confirm the input with <ENTER>.

Load: Displays and loads saved folding impositions.

Load + scale: Changes saved folding impositions by inputting a new sheet format. (folding imposition is retained, fold lengths are adjusted to the new sheet format).

Delete: Deletes saved folding impositions.

Create:
- Saves the folding imposition currently in the machine.
- Distribution of name and order no.

Change name: Name change of already-saved folding impositions.

Overwrite: Overwrites saved folding impositions with folding impositions currently on the machine retaining the name already given.
(e.g. if the sheet format has changed slightly).

Info: Displays information for the saved folding imposition.

Current settings: Displays the current settings and formats in the machine.

8.4.7 "Calibrate" machine, manual (F3)

Settings for the calibration are made on this menu.

You can change to the <Calibrate machine> menu by:

▷ Press the <F3> button.

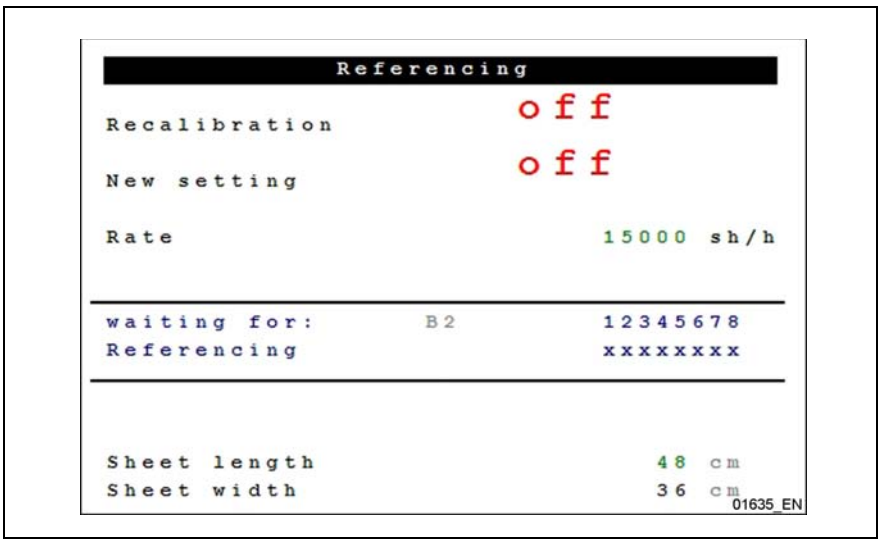


Illustration 77: Calibration of the machine

New calibration: With “New calibration”, the speeds, gaps, and sheet monitoring are calibrated anew and optimized. The counter states are maintained.

Procedure:

1) Select “New calibration” with cursor <Up/Down>.
2) Select using the keys <+/-> “Active”.
3) Confirm the input with <ENTER>.
4) Then call up a single sheet.

✓ Single sheets are automatically measured and the values are stored.

Recalibrating: “Recalibration” is necessary for a speed modification of 20 %. Only the sheet monitoring is recalculated; manually changed settings are taken over.

Procedure:

1) Select “New calibration” with cursor <Up/Down>.
2) Select using the keys <+/-> "Active".
3) Confirm the input with <ENTER>.
4) Then call up a single sheet.

✓ Single sheets are automatically measured and the values are stored.

Rate (setpoint value): ▷ Numeric input or pressing of the keys <+/- > (250 sheets/h per step).

Waiting for: Is only active during calibration and shows the next photoelectric sensor that should be calibrated.

Sheet length Measured sheet length at B 39.

Sheet width Measured sheet width at B 13 after the crossfold.

8.4.7.1 Emergency service in case of failure of a photoelectric sensor

Adjustment emergency service:

1) Cancel "New calibration".
   <Emergency service> menu opens automatically.
2) Select the photoelectric sensors to be bridged
   (B12 to be taken over by B39; B13 to be taken over by B12).
3) Input corresponding values.

✓ Emergency service is active.

- A manual enlargement of the sheet gap guarantees smooth emergency service.
- In emergency service, no sheet monitoring is active.

8.4.8 Change sheet infeed data (F11)

On this menu, you can make changes to basic settings for the sheet infeed.
You can change to the <Sheet infeed data> menu by:

▷ Press the <F11> button.

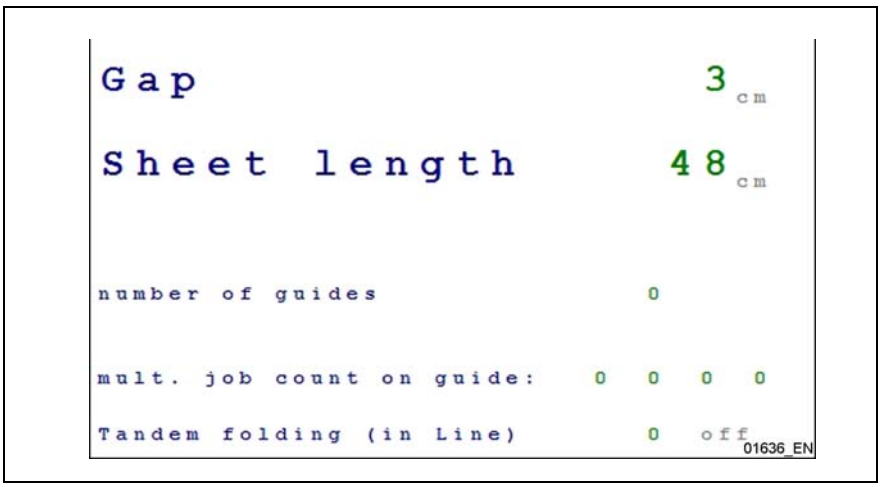


Illustration 78: Sheet infeed data

Perform settings:

1) Select the desired function with the cursor <Up/Down>.
2) Enter the desired number.
3) Confirm the input with <ENTER>.

✓ The setting has been performed.

Increasing sheet gap:

▷ Numeric input or pressing of the keys <+/- > (1 cm per step).

Reducing the sheet gap:

For certain fold types, it is possible that a too large fixed minimum sheet gap may arise.
For this case, the minimum sheet gap determined can be reduced manually (corresponds to the lower limit for the sheet gap).

▷ Numeric input or pressing of the keys <+/- > (1 cm per step).

Suction length:

Increase or decrease suction length:

▷ Numeric input or press the keys <+/- > (1 cm per step).

Suction cycle:

Switch suction cycle from <Automatic> to <Cycle>.
(Use of this function when processing punched or transparent materials.)

▷ Select cycles by pressing the keys <+/->.

In the suction cycle mode **"Cycle"** it is impossible to determine the sheet lengths of the folding units automatically. Therefore, all infeed lengths (sheet lengths in front of the folding unit infeed) must be input manually.

8.4.9 Change speeds (F9)

On this menu, you can make changes to the speed.
You can change to the <Speed> menu by:
▷ Press the <F9> button.

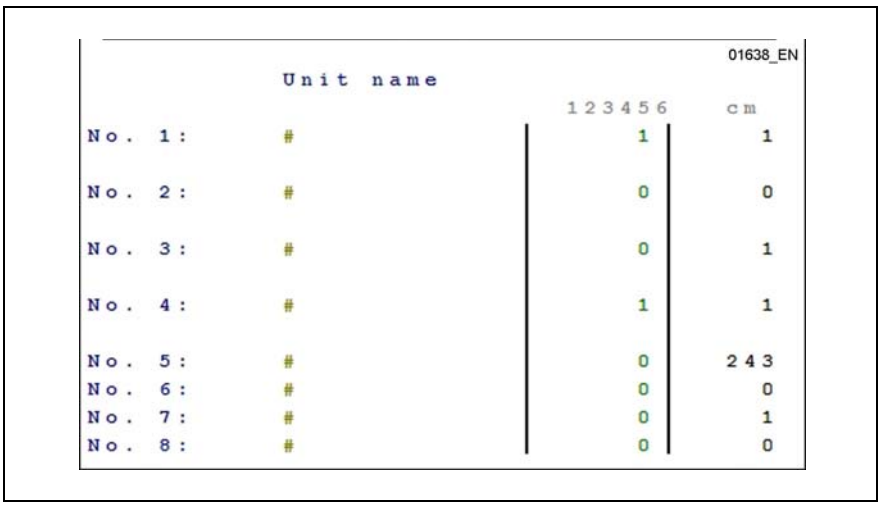


Illustration 79: Speed

Perform settings:
▷ Select the desired unit with cursor <Up/Down>.
▷ Numeric input or press the keys <+/- > (1 m/min per step).
▷ Confirm the input with <ENTER>.
✓ The setting has been performed.

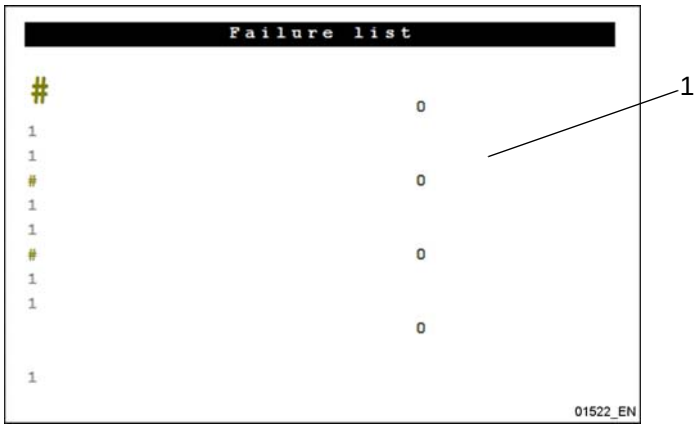
Machine is not calibrated:
▷ Possible input value from 30 m/min to 235 m/min.

Machine is calibrated:
▷ Input value must be greater than the calculated value.

- The sheet gap at this unit becomes bigger.
- A smaller input value than the one calculated will not be accepted.

8.4.10 Error message display (F21)

On this menu, you can display the error messages.
You can change to the <Error message> menu by:
▷ Press the <F21> button.



1 Error message

Illustration 80: Touch screen error message

The error message shows the type of error and the position of the jam.

8.5 Set the control system with the TOUCHSCREEN

8.5.1 "Calibrate" machine, automatically activate

The prerequisite for the adjustment of the folding machine is that the machine controller is put into the state "calibrate" machine.
- All sheet infeed data are deleted.
- Note required data in advance.

"Calibrate" machine is activated automatically if:

- A new job is begun
  (see Chapter “8.5.2 New job”).
- A new folding imposition is selected
  (see Chapter “8.5.6 Saving/loading/deleting folding imposition.”).
- A job is activated in the job administration,
  (see the separate operating manual for the DATAMANAGER).

"Calibrate" machine can also be activated manually,
(see Chapter “8.5.8 Changing sheet infeed data.”).

For "Calibrate" machine, the following data are measured automatically:

- Sheet length
- Sheet width
- Optimal suction length
- Minimal sheet gaps
- Speeds of all folding units
- Sheet monitoring of all folding units

These can be changed manually
(see chapter “8.5.8 Changing sheet infeed data.”).

"Calibrate" machine is automatically terminated after the first sheet has run through all photoelectric sensors of the completely configured Navigator combination.

8.5.2 New job

A job change means that:
- The job counter and the signature counter are deleted.
- The shift counter is retained.
- The machine adjustment data is retained.
- "Calibrate" machine is activated automatically.

Illustration 81: New job

Beginning a new job: Procedure:

1) On the main menu, press the <Counter> button (12).
2) In the <Current counter data > menu, press the <Counter settings> button (13).
3) In the <Counter settings> menu, press the <Job> button (9).
   The following selection window appears: <Delete counter settings - job?>
4) Press <Yes> button.

✓ The job counter (10) and the signature counter (11) are deleted.
The shift counter is retained.

"Calibrate" machine is activated automatically.

Entering new counter settings:

Procedure:

1) In the <Rate (target)> field (1), enter the desired folding productivity of the machine.
   If there is no specification, then the optimal speed will be specified automatically for the entire Navigator combination.
   If there is no specification, the current speed on the folding unit will be retained and adapted for all subsequent folding units.
2) In the <Print run> field (3), enter the quantity for the print run.
3) In field (2), enter the number of signatures.
   Field (3) x field (2) produces the value in the field <Folded sheets total> (4).
4) In the <Use number> field (5), enter the number of uses on a folding sheet.
5) In field (6) the shingle length of the delivery is displayed.
6) With the buttons (8), adjust the marking type.
   The set marking type is displayed in field (7).
   If a Navigator delivery is connected to the folding machine, the marking type is specified automatically.
   Corresponding to the marking type, prefix counter settings are displayed.

✓ New counter settings have been entered.

8.5.3 New signature

Illustration 82: New signature

The counter states of the current signature are displayed in the fields (1).

Deleting counter states:

Procedure:

▷ By pressing the <Signature> button (2), the selection window <Delete counter settings - signature?> appears

▷ Press the <Yes> button.

✓ The signature counter states are deleted.

.

"Calibrate machine" is **not** activated.

8.5.4 New shift

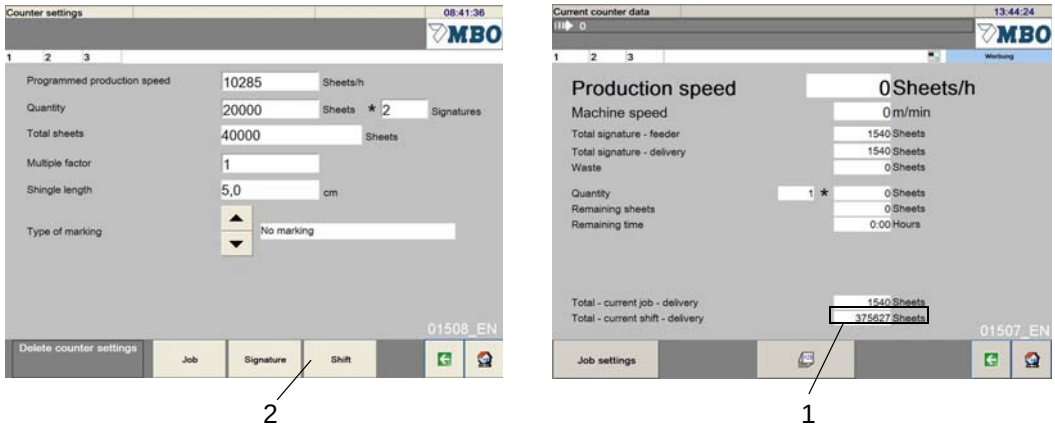


Illustration 83: New shift

In the <Total current shift delivery> field (1), the total of all folded sheets per shift is displayed.

Deleting counter states:

Procedure:

▷ By pressing the <Shift> button (2), the selection window <Delete counter settings - shift?> appears

▷ Press the <Yes> button.

✓ The shift counter states are deleted.

"Calibrate" machine is **not** activated.

8.5.5 Folding imposition selection

In order to create a folding imposition, the sheet to be folded must be measured.

The following measurements are necessary:

- Sheet length
- Sheet width
- Paper thickness.

8.5.5.1 Measuring the paper thickness

Illustration 84: Measuring paper thickness

Measurement of the paper thickness is performed with the attached micrometer.

Procedure:

▷ Clamp in 10 sheets of the paper to be processed in the micrometer using the knurled screw (1).

▷ Divide the value displayed by ten.
The result provides the individual paper thicknesses (in this case 113).

✓ The paper thickness is measured.

8.5.5.2 Creating new folding imposition:

A folding imposition change means that:
- The new folding imposition data is calculated and the previous folding imposition data is deleted.
  Back up the old folding imposition data beforehand.
- The machine automatically switches to the state "Calibrate" machine.

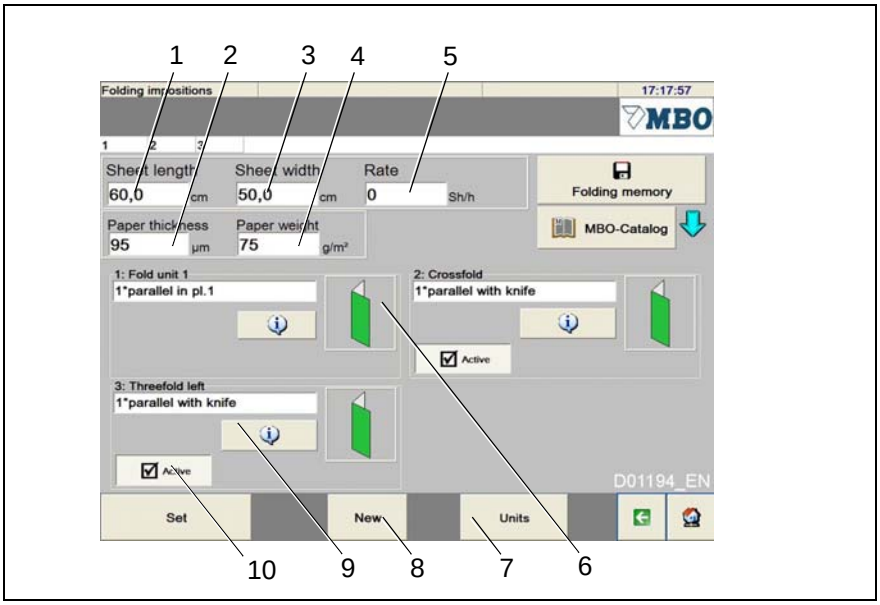


Illustration 85: Creating new folding imposition

Create new folding imposition:

Procedure:
1) Press the <New> button (8).
2) Input the sheet length in field (1).
3) Input of the sheet width in the field (3).
4) Input the rate (target) in field (5).
5) Input of the paper thickness in the field (2).
6) Input of the paper weight in the field (4).
7) Select the parallel fold folding type by pressing the button (6).
   The <Folding imposition selection> menu is shown.

- The parallel fold is always active, only the crossfold and threefold (10) can be deactivated.
- Pressing the <Info> (9) button shows the setting data.
- Pressing the <Combination> (7) button shows the specifications of the machine assembly.

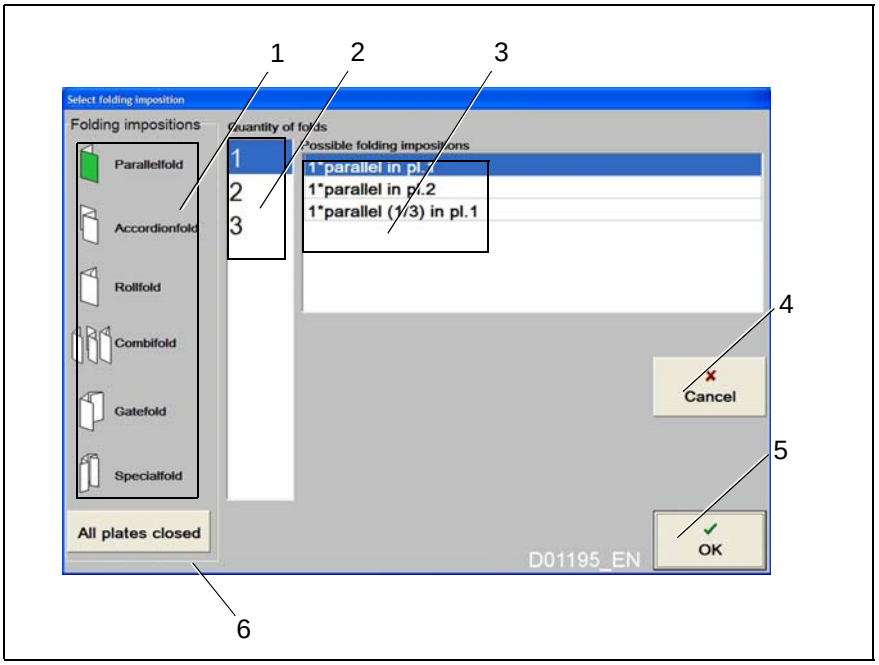


Illustration 86: Folding imposition selection

8) Select the fold type in field (1) (fold symbol turns green).
9) Select the number of folds in field (2).
10) Select the folding imposition in field (3).
11) Confirm selection by pressing the <OK> button (5) or cancel the procedure and return to the <Folding imposition selection> menu by pressing the <Cancel> button (4).
12) Perform settings for crossfold and threefold in equal measure.

CAUTION!

Crash hazard during automated format change.

Non-observance could result in personal injuries.

When starting the automated format change, observe the following precautions:

- Do not reach into the machine.
- Make absolutely sure that there are no other people at the machine.

13) Press the <Set> button (6)
14) Confirm the query with <Yes>.

✓ A new folding imposition is created.

By pressing the <Set> button (6), the values entered are recalculated, the current values are lost.
If necessary, store the current data before.

8.5.6 Saving/loading/deleting folding imposition.

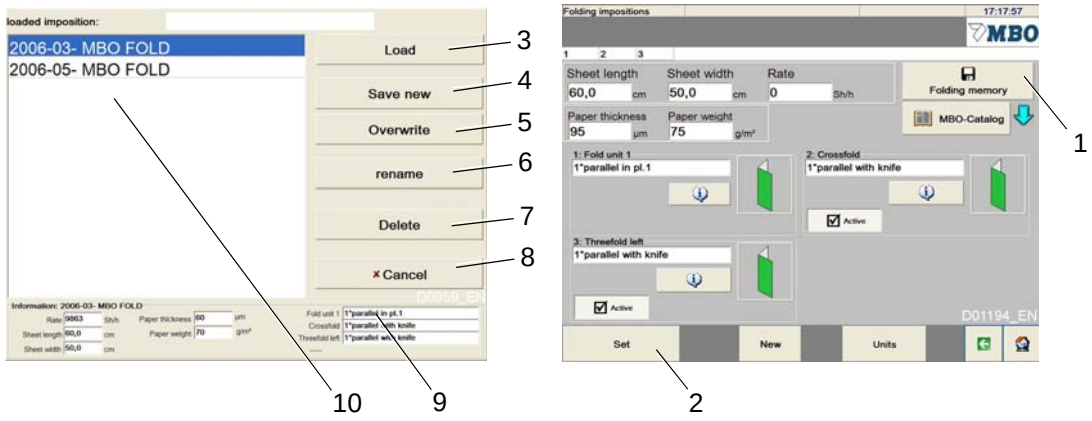


Illustration 87: Saving/loading/deleting folding imposition.

Saving a folding imposition:

Procedure:

1) Press the <Save new> button (1).
   The <Save folding imposition> menu (10) appears.
2) After pressing the "Save again" button (4), a keyboard appears.
3) Enter name of the folding imposition to save.
4) Pressing the <Enter**>** key saves the folding imposition in the folding imposition memory.

✓ The folding imposition is saved.

Loading a folding imposition:

Procedure:

1) Mark a folding imposition on the selection field (10)(highlighted in blue).
2) Pressing the <Load> button (3) causes the folding imposition data to be entered in the fields of the <Folding imposition selection> menu.
3) Pressing the <Set> button (2) transmits the folding imposition data to the machine.

✓ The folding imposition is loaded.

Deleting a folding imposition:

Procedure:

1) Mark a folding imposition on the selection field (10)(highlighted in blue).
2) Pressing the <Delete> button (7) deletes the folding imposition from the memory.

✓ The folding imposition is deleted.

8.5.7 "Calibrate" machine, manual

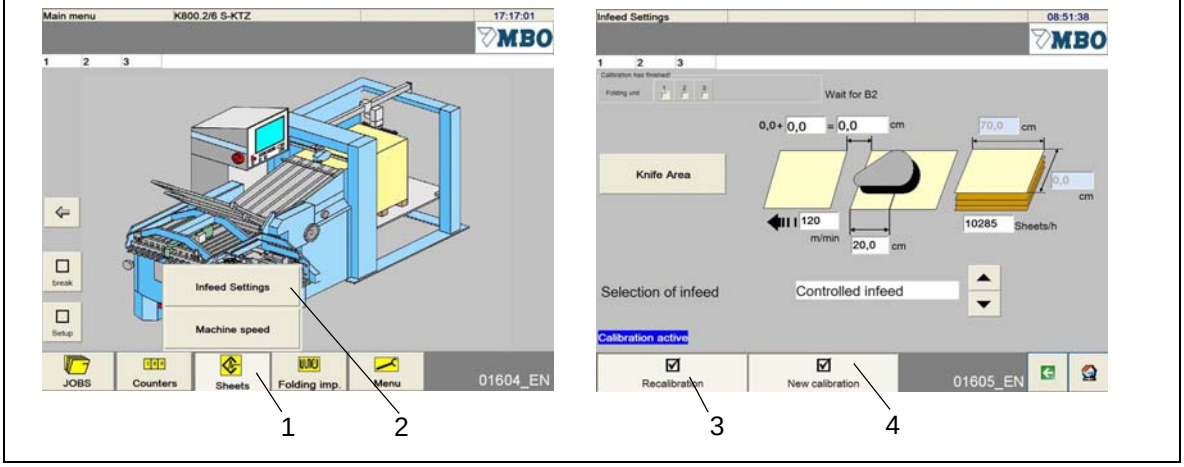


Illustration 88: Sheet infeed data

- After choosing <New job> or <New folding imposition>, <New calibration> (machine “Calibration“) is automatically active.
- <New calibration> and <Recalibration> can also be triggered manually.

Procedure:

1) On the main menu, press the <Sheet> button (1).
2) On the submenu, press the <Infeed data> button (2).

✓ The <Infeed data> menu appears.

New calibrate: With <New calibrate> (3), the following parameters are determined anew and optimized:

- Sheet length
- Sheet width
- Optimal suction length
- Minimal sheet gap
- Speed of all folding units in the combination
- Sheet monitoring of all folding units in the combination

These newly determined parameters can be manually changed.
(See Chapter “8.5.8 Changing sheet infeed data.”).

Recalibrating:

- The <Recalibration> (4) will be automatically performed as of a speed change 20%.
- With <Recalibration> (4), only the values for the sheet monitoring are recalculated.
  Manually-changed parameters are retained.

8.5.8 Changing sheet infeed data.

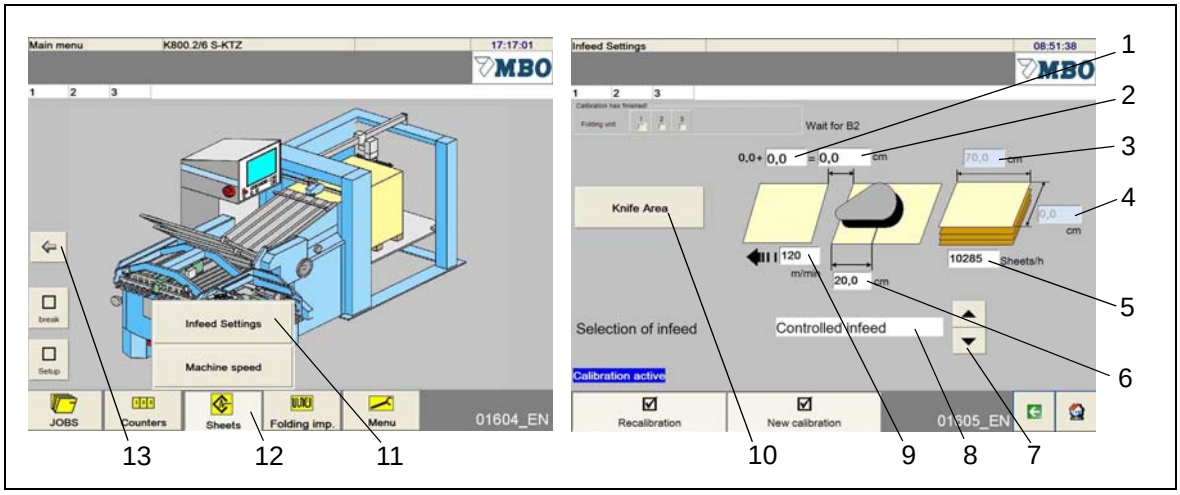


Illustration 89: Changing sheet infeed data.

Call up the menu:

Procedure:

1) On the main menu, press the <Sheet> button (12).
2) On the submenu, press the <Infeed data> button (11).

✓ The <Infeed data> menu appears.

Perform change:

Procedure:

1) Press on the input field to be changed on the TOUCHSCREEN.
2) The <Numeric input field> menu appears.
3) Inputting the desired value.
4) Confirming the input with the <ENTER> key.

✓ The changes have been performed.

Sheet gap (1):

- Is calculated automatically.
- Depends on the sheet format, the fold type, and the delay times of the sheets under the folding knives.
- Can only be increased.
  The speed is not changed this way.
  The sheet rate is reduced.

Actual sheet gap (2):

- Display of the current sheet gap.
  Arises from the basic gap 3 cm and the sheet gap (1).

Rate (5):

- Displays the specified or calculated sheet rate per hour.
- Can be increased and decreased.
  This causes a change to the speed of the Navigator combination.

Suction length (6):

- Is calculated automatically during <Calibrate> (approximately 1/3 of the sheet length).
- Can be increased and decreased.

Speed (9):

- Displays the current speed of the machine.
- Can only be increased.
  The sheet gap is increased.
  The sheet rate will not be changed.

Crossfold and threefold delay time:

▷ Pressing the combi section button (10) switches to the "Crossfold and threefold delay time" submenu.

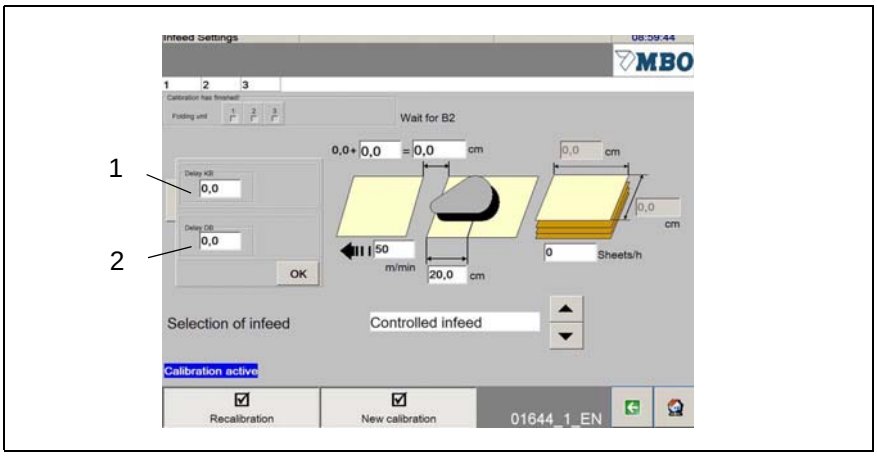


Illustration 90: Delay time

For <Calibrate> the machine, a delay time for the sheets under the folding knives is specified automatically.
However, this automatic delay time is not displayed.

Input of another delay time:

▷ Press the input field (1) for the double join.
▷ Press the input field (2) for threefold.

- The input of another delay time can change the sheet gap.
- If the machine has been calibrated, the delay time can only be increased.

Error during calibration:

During the calibration procedure, a sheet remains lying under the folding knife.

The calibration process is not carried out.

The automatically determined pre-switch-off time is too small.

▷ Remove the sheet from beneath folding knife.
▷ Demand one further sheet.
With the demanding of a new sheet, the machine determines the pre-switch-off time in the superior level (power of folding knife).
▷ If the sheet remains lying there, you can repeat this procedure up to three times until the control system finds the ideal value (dependent upon the paper and fold type).

8.5.8.1 Adjusting emergency service

Emergency service must be set if one of the photoelectric sensors B12 or B13 is defective. The machine can then continue to be operated with a reduced sheet rate until the defective photoelectric sensor has been replaced.

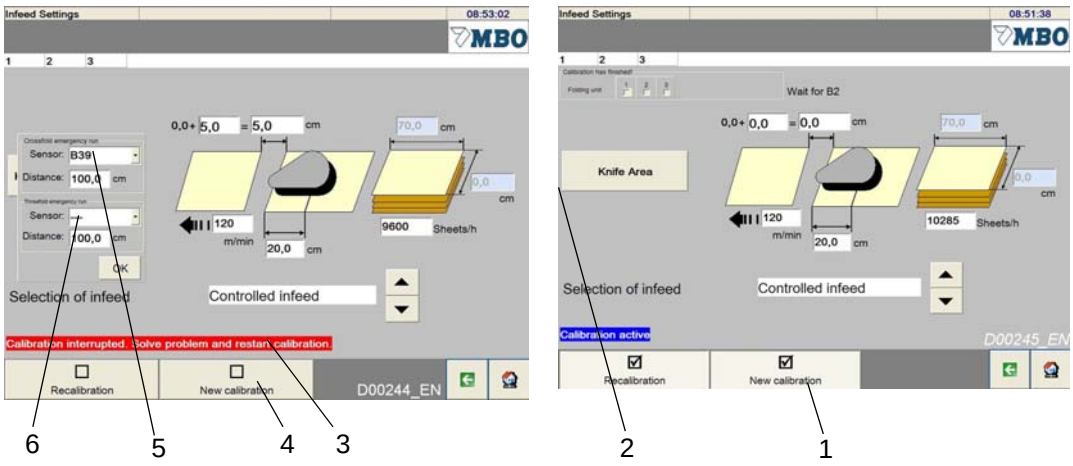


Illustration 91: Adjusting emergency service

The machine is in a calibrated state.

Adjusting emergency service

Procedure:

▷ Press the <Recalibration> button (4).
A checkmark is placed in the key field.

▷ Finally, press the <Cancel new calibration> button (1)

▷ A red bar (3) appears on the TOUCHSCREEN with the message <“Calibration“ failed, resolve problem and recalibrate>.

▷ The button (2) changes the text to <Combi emergency service>.
The photoelectric sensor B12 function is taken over by photoelectric sensor B39.
The photoelectric sensor B13 function is taken over by sensor B7.
In addition, the sheet gap is increased in order to guarantee smooth emergency service.

- In emergency service, no sheet monitoring is active.
- After the defective photoelectric sensor has been replaced, the machine must be manually calibrated.
  See Chapter “8.5.7 "Calibrate" machine, manual”.

8.5.9 Changing the production speed

All connected folding units and deliveries are listed on the "Speed" menu. In addition to the assembly name, the corresponding speed and the sheet gap are displayed.

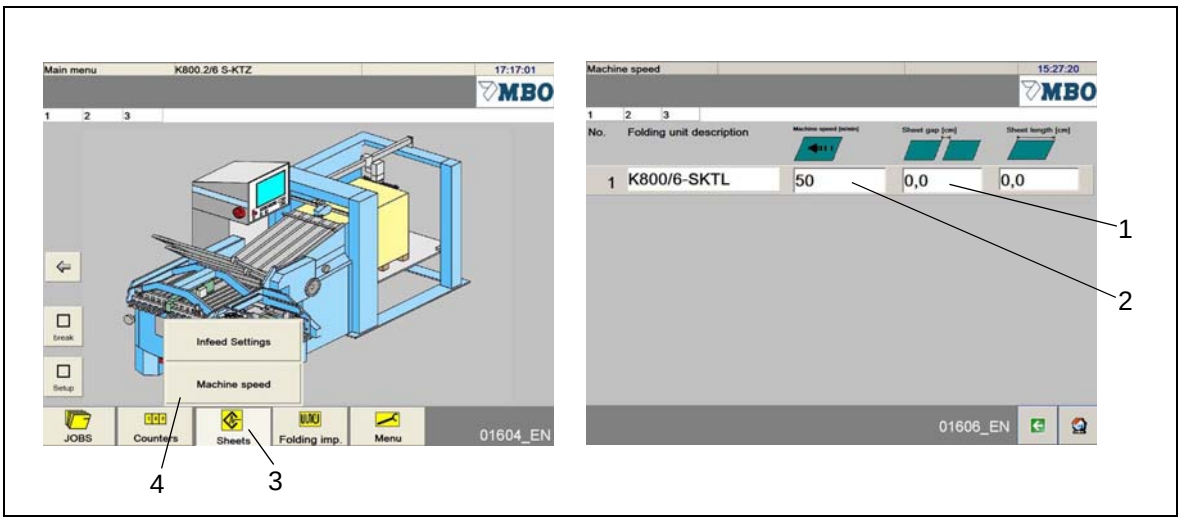


Illustration 92: Changing the speed.

Changing speed: Procedure:

1) On the main menu, press the <Sheet> button (3).
2) On the submenu, press the <Speed> button (4).

✓ The <Speed> menu appears.

3) Press the <Speed> field (2).

✓ The <Numeric input> menu appears.

4) Enter the desired speed.
5) Confirm the input with <ENTER>.

✓ The speed is changed.

- The increase of speed has no effect on rate. It only increases the sheet gap (1).
- Please note that after a calibration speeds can be increased but not reduced.

8.5.10 Show <Current counter data> and <Enlarged display> menus

In the <Current counter data > menu, all important counter data and performance data are shown.
Values cannot be changed.

In the <Enlarged display> menu, the sheet rate and speed are shown enlarged.

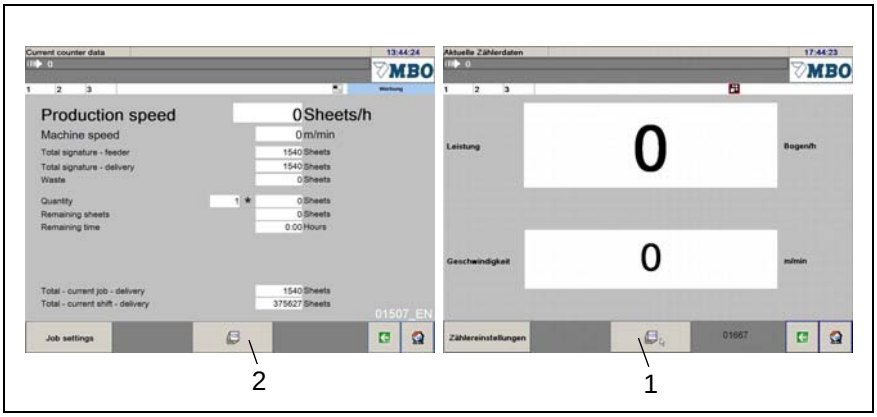


Illustration 93: Current counter data and enlarged display

Show enlarged display:

Procedure:

▷ Press the <Enlarged display> button (2).

✓ The <Enlarged display> menu is shown.

Show <Current counter data> menu:

Procedure:

▷ Renewed pressing of the <Enlarged display> button (1).

✓ The <Current counter data> menu is shown.

8.5.11 Touch screen error message

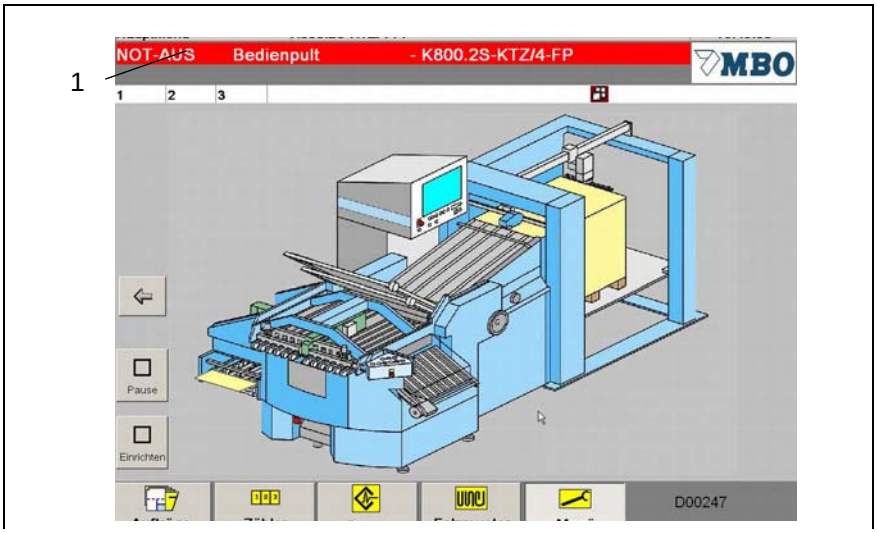


Illustration 94: Show error message

If an error occurs in the machine, the corresponding error message (1) appears as a red bar with white letters.

This is displayed in the same place on all menus.

Show error list: Procedure:

▷ Touch the error message (1).

✓ An error list with all current errors is shown.

8.5.12 Display notice

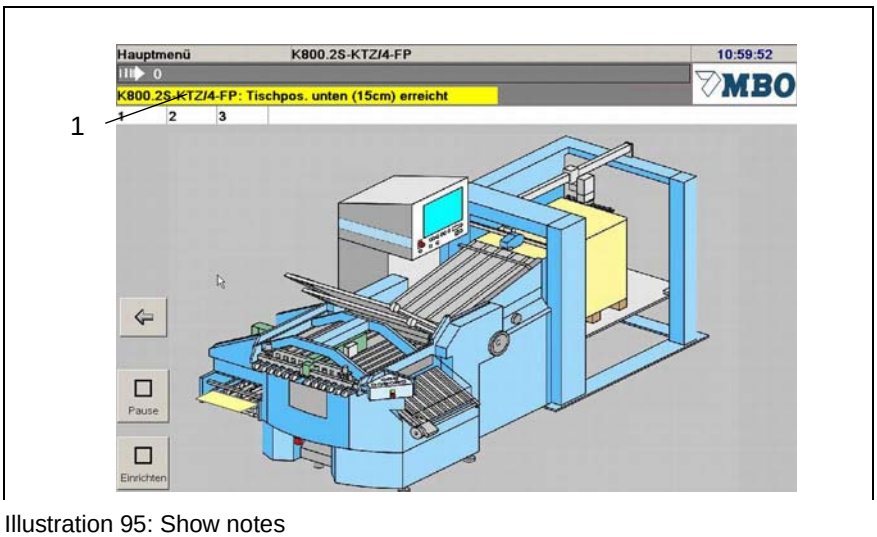
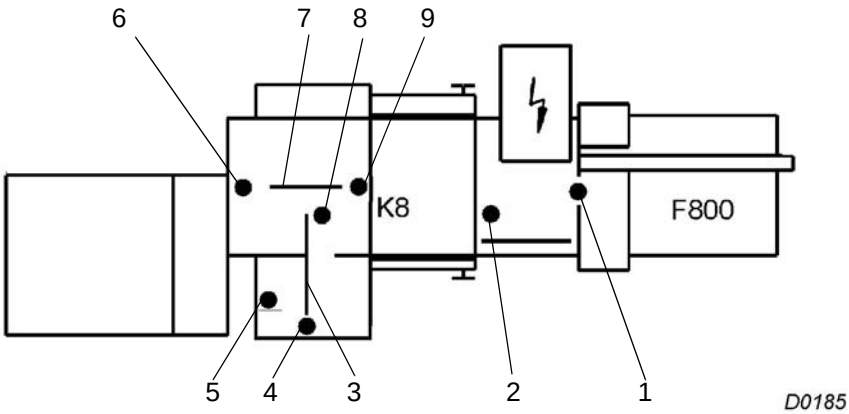


Illustration 95: Show notes

Notes (1) are shown as yellow bars with black characters.

8.6 Sheet monitoring of the machine



1 Photoelectric sensor B2 monitors the sheet infeed at the suction wheel/ Vacubelt and counts the sheets being fed in.
2 Photoelectric sensor B39 monitors the parallel fold entry point and calculates sheet length and suction length.
3 Folding knife threefold
4 Photoelectric sensor B11.2 monitors the sheet running between (8) and (4).
It will be automatically activated if (3) is not used.
5 Photoelectric sensor B11.3 monitors the sheet running between (8) and (5).
It will be automatically activated if (3) is used.
6 Photoelectric sensor B11.1 monitors the sheet running between (9) and (6).
It will be automatically activated if (7) is not used.
7 Folding knife crossfold
8 Photoelectric sensor B13 monitors the sheet running between (9) and (8) and is activated when (7) in use.
9 Photoelectric sensor B12 monitors the parallel fold outfeed.

Illustration 96: Main machine photoelectric sensors

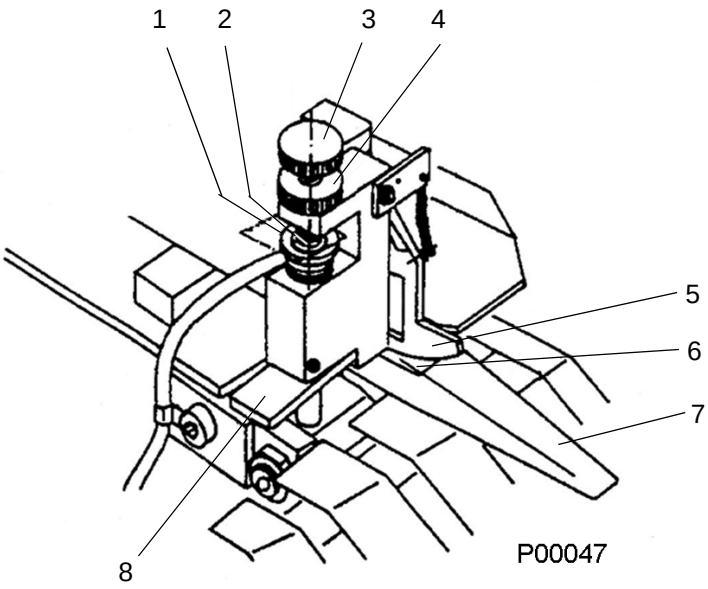
- During "Calibrate" the sheets are measured by the machine automatically on pass through.
- The photoelectric sensors collect the corresponding lengths and throughput times.
- These values are used for sheet control and sheet monitoring.
- After a complete passage through the machine, once a sheet has reached the photoelectric sensors of the delivery, the "calibration" is finished and the sheet monitoring activated.

If a sheet does not pass through one of these photoelectric sensors at the calculated point in time, then:
- The machine is stopped.
- The corresponding error message is shown in plain text.
See Chapter “8.5.11 Touch screen error message”.

8.7 Adjusting the register table

8.7.1 Double sheet detector

The double sheet detector detects sheets of paper that stick to one another.
If a double sheet occurs, it is held by this control segment. At the same time, an electrical signal is generated by the microswitch that stops the sheet feed immediately.
The sheets in the machine are folded to completion.
As soon as the last sheet has left the machine, the machine's drive is stopped.



1	Pin	5	Control segment
2	Gap	6	Transport roller
3	Knurled screw	7	Smoother bar
4	Lock nut	8	Lever

Illustration 97: Double sheet detector

Adjustment: Procedure:

1) Press the lever (8) downwards.
2) Insert a strip (simple paper thickness) of the paper to be processed in the gap (2) between pins (1) and knurled screw (3).
3) Release the lever (8) again.

✓ The double sheet detector is set.

Checking the function:

Procedure:

1) Start the machine
2) Push a strip of simple paper thickness under the retainer (7) until it is between the control segment (5) and the transport roller (6).
   The double sheet detector may not switch.
3) Push a strip of double paper thickness under the retainer (7) until it is between the control segment (5) and the transport roller (6).
   The double sheet detector must switch.
4) If one of the two points above does not apply, the double sheet detector must be adjusted using the knurled screw (3).

✓ The function has been checked.

Readjust:

Procedure:

1) Loosen the lock nut (4).
2) Adjust the gap (2) between the control segment and idler roller with the knurled screw (3).
3) Turn to the right = gap is increased.
4) Turn to the left = gap is decreased.
5) Tighten the lock nut (4).
   Hold onto the knurled screw (3) while doing this.
6) After securing, check the function of the double sheet detector again and readjust if necessary.

✓ The double sheet detector is readjusted.

To account for paper differences:

- Turn the knurled screw (3) up to 1/4 turn to the right (clockwise).

8.7.2 Ultrasound double sheet detector (option).

1 Ultrasound double sheet detector

Illustration 98: Ultrasound double sheet detector (option).

The machine can be optionally be equipped with an ultrasonic double sheet detector (B122). The ultrasound double sheet detector (1) detects an air gap between two sheets of paper.
With conventional paper types, it finds their usage and detects:

- No sheet
- Single sheet
- Double sheet

Double sheets are detected and discharged by the control system.
If no sheet is coming out, an error message will appear.

At different types of paper, error messages may arise through an air gap within the material.
This is possible for:

- Zigzag folding with more than 3 folds.
- Pre-folded products
- Coated products
- Laminated products
- Foil-clad products

Measure:

- Deactivate the ultrasound double sheet detector.
- Activate the <Manual double sheet detector>.

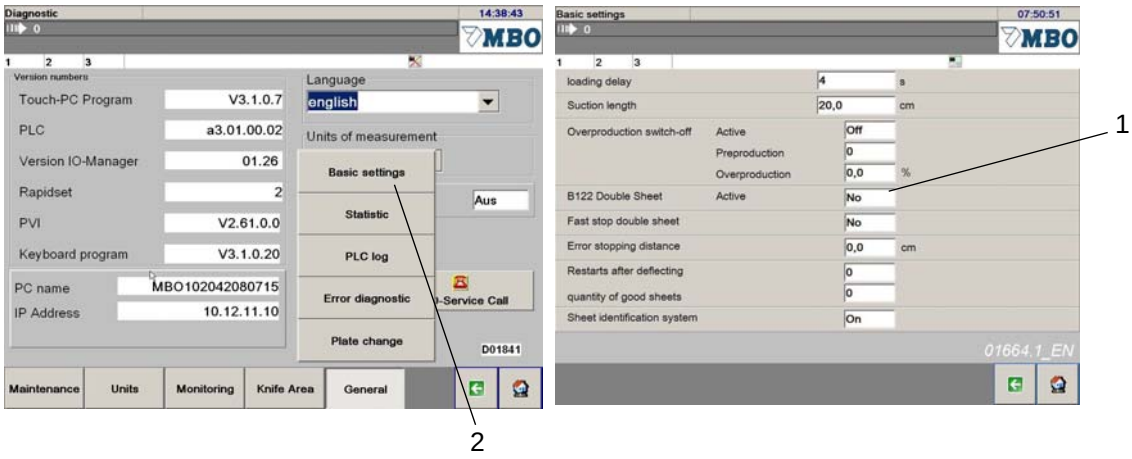


Illustration 99: Switch on ultrasonic double sheet detector B122

Switch on the ultrasonic double sheet detector:

Procedure:

1) Deactivate <Manual double sheet detector>.
   To do this, place several strips of the paper to be processed in the gap of the <Manual double sheet detector>.
2) Call up the <Basic settings> menu (2)
   (Main menu/Menu/Diagnostics/General/Basic settings).
3) Touch input field (1) and select <Yes>.

✓ The ultrasonic double sheet detector is switched on.

Switch off the ultrasonic double sheet detector:

Procedure:

1) Call up the <Basic settings> menu (2).
   (Main menu/Menu/Diagnostics/General/Basic settings).
2) Touch input field (1) and select <No>.
3) Activate <Manual double sheet detector>.
   Remove the multiple paper strips underneath.
   Setting, See Chapter “8.7.1 Double sheet detector”.

✓ The ultrasonic double sheet detector is switched off.

8.7.3 Adjusting the register table

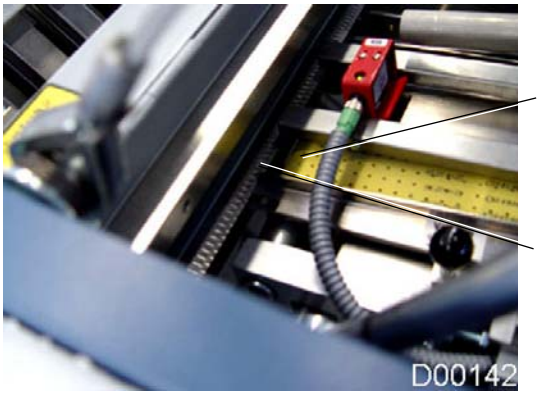
The register table aligns left-justified the sheets of paper being fed in through the inclined position of the transport tape.

CAUTION!

The tape roller at the end of the register table make up a hazardous infeed point.

Non-observance could result in personal injuries.

Do not reach into the register table when the machine is running.



1 Tape roller
2 Buckle fold unit infeed

Illustration 100: Tape roller hazardous infeed point

8.7.3.1 Standard

1	Control knob vacuum	5	Sidelay
2	Knurled screw	6	Knurled screw
3	Eccentric	7	Smoother bars
4	Control knob for precise adjustment	8	Knurled screw

Illustration 101: Adjusting the register table.

Adjusting sidelay:

Procedure:

1) Loosen the knurled screw (6).
2) Adjust the sidelay (5) with the help of the scale to half of the paper width.
3) Tighten the knurled screw (6).

✓ The adjusting sidelay is set.

Adjusting the precise adjustment:

Procedure:

1) The knurled screw (6) remains closed
2) Make precise adjustments by turning on the control knob (4).
   Turn to the right (+)
   The sidelay and guide rail move parallel to the operator side.
   Turn to the left (-)
   The sidelay and guide rail move parallel to the drive side.

✓ Precise adjustments have been made.

Adjusting the guide rail:

Procedure:

3) Loosen the knurled screw (8).
4) Adjust the guide rail so that the sheet edge runs in the middle of the guide rail.
5) Tighten the knurled screw (8).

✓ Guide rail is adjusted.

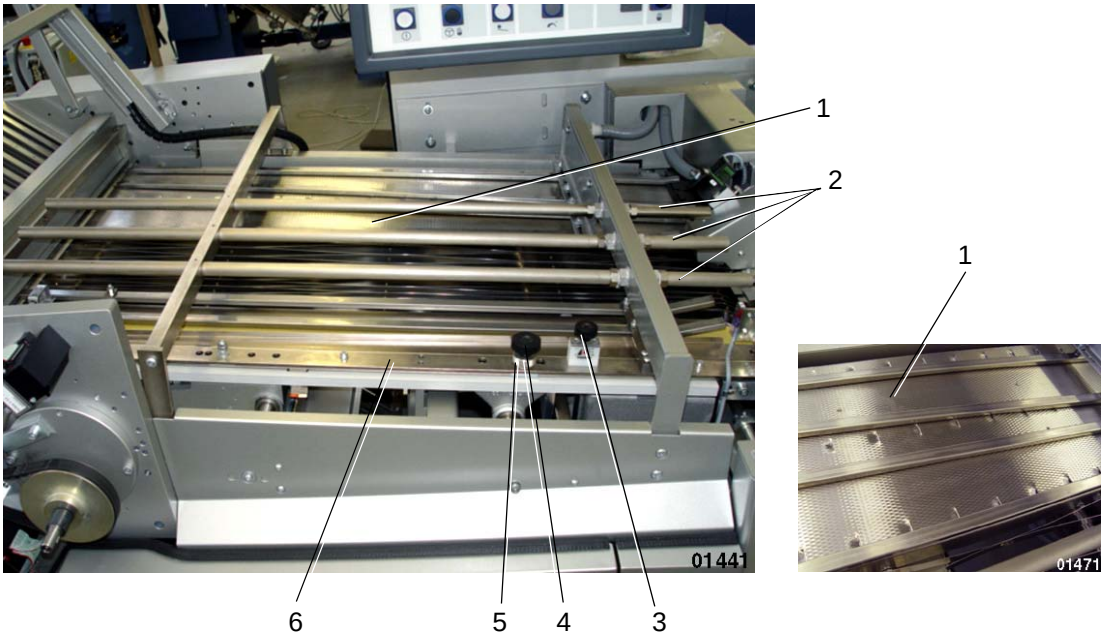
Distributing smoother bars:

Procedure:

1) Select the number of smoother bars (7) according to the paper format.
2) Open the knurled screws on the smoother bars (7).
3) Distribute the smoother bars evenly (7).
4) Hook the smoother bars (7) into the sheet guide plate of the parallel fold using the plate springs.
5) Tighten the knurled screws on the smoother bars (7).

✓ Smoother bars have been distributed.

8.7.3.2 Automatic



1 Airstream table (air table)
2 Air blast smoother bar
3 Control knob vacuum
4 Knurled screw
5 Eccentric
6 Sidelay

Illustration 102: Adjusting the register table.

Adjusting sidelay: The sidelay (1) is moved into position by the motor after selection of a new folding imposition.

8.7.3.3 Adjusting the angle for the foldrollers.

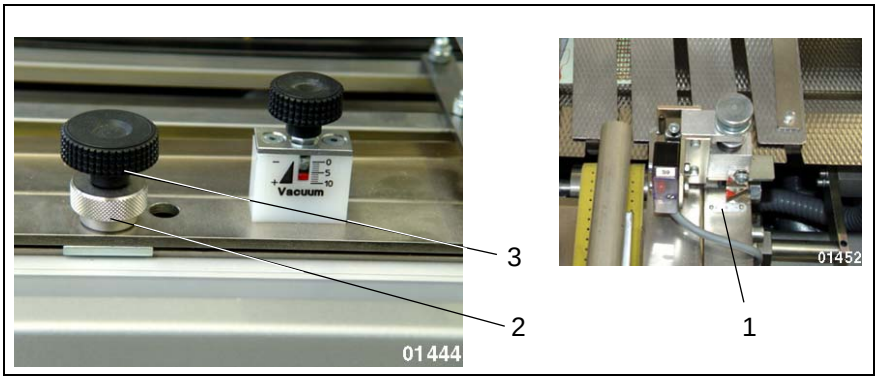


Illustration 103: Adjusting the angle for the foldrollers.

Basic setting of the angle:

Procedure:

1) Loosen the knurled screw (3).
2) Adjust the eccentric (2) so that the pointer of the scale (1) points to zero.
3) Tighten the knurled screw (3).

✓ The basic setting is made.

Adjustment for tilt of the fold:

Procedure:

▷ Loosen the knurled screw (3).
▷ Adjust the eccentric (2) using the scale (1) according to the tilt of the fold.
▷ Tighten the knurled screw (3).
▷ Check the fold.
▷ Correct if necessary.

✓ Angle is adjusted.

8.7.3.4 Switch on the vacuum for the register table

The register table has a separate vacuum pump.
This starts up automatically after the <Machine start> button has been pressed.

8.7.3.5 Adjusting the vacuum

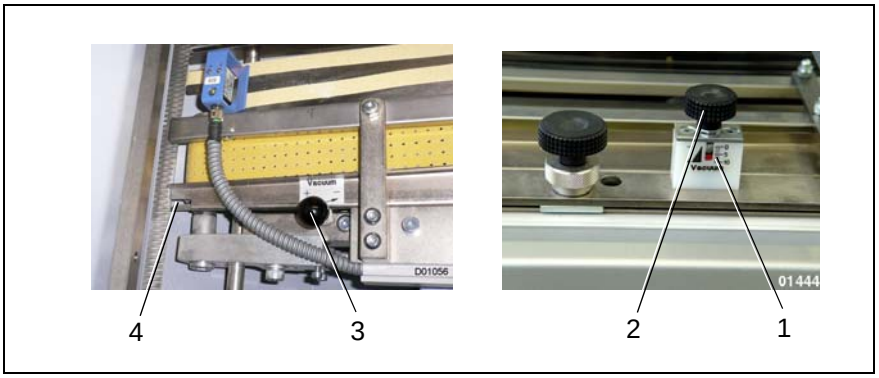


Illustration 104: Adjust vacuum

Adjust the vacuum:

Heavy/thick paper requires more vacuum than light/thin paper.

Procedure:

▷ Adjust the vacuum with the control knob (2) so that the sheet lies parallel to the register rail.
You can check this through the inspection window (4) at the end of the sidelay.
The scale (1) serves the purpose of rough orientation of the set vacuum.

✓ The vacuum is adjusted.

Reducing the vacuum:

The vacuum in the foldrollers transfer area can be reduced for large and long formats.

Procedure:

▷ Reduce vacuum by pushing the lever (3) in the direction <-> (feeder).

✓ The vacuum is reduced.

8.7.3.6 Setting the quantity of air blast for the air blast smoother bar

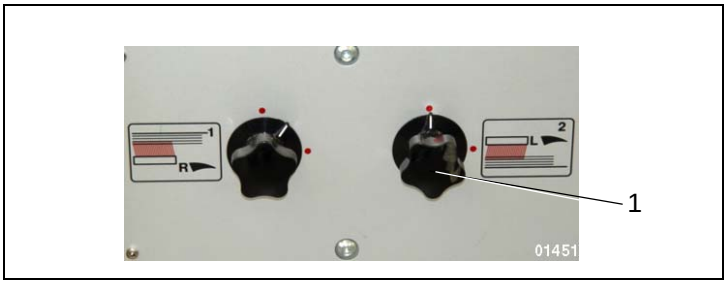


Illustration 105: Setting the quantity of air for the air blast smoother bar

Procedure:

▷ Adjust the quantity of air blast for the air blast smoother bar with the control knob (1).

8.7.3.7 Setting the quantity of air blast for the airstream table

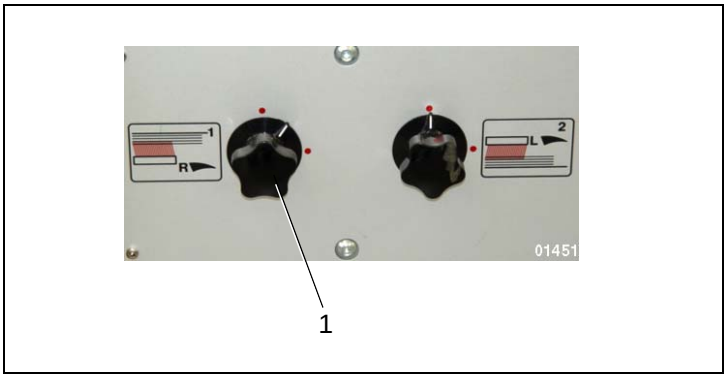


Illustration 106: Setting the quantity of air for the airstream table

Procedure:

▷ Adjust the quantity of air for the airstream table with the control knob (1).

8.8 Setting the parallel folding unit

The parallel fold takes over the aligned sheets of paper from the register table and makes the first fold.
The folding sheet passing through can also be processed with the rear slitter shafts.

WARNING!

Pulling back/removing the buckle plates during operation.

The exposed, rotating foldrollers and slitter shafts make up hazardous infeed points.

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

- All adjustment and inspection work may only be performed on an idle machine that has been safeguarded against being switched on again.
- Press the EMERGENCY STOP palm button.
- You should only permit adjustment and inspection work to be performed by a single person.
- When turning the machine with the safety handwheel, there is also a hazard of pinching and injury!

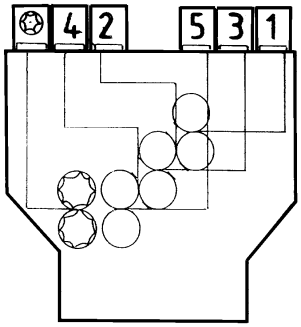
CAUTION!

Incorrectly-fastened buckle plates.

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

Make sure that the buckle plates are fastened securely by the clamping lever.

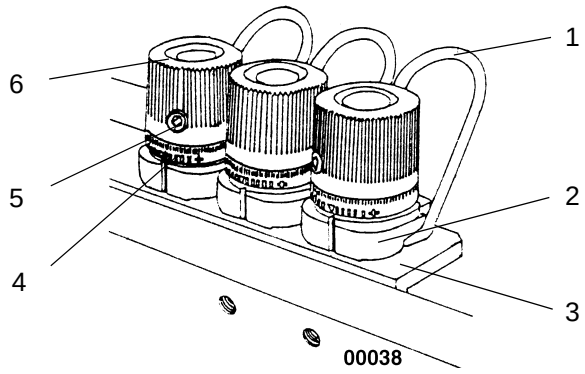
8.8.1 Adjusting the pressure of foldrollers (standard)



1 Foldroller pair 1	4 Foldroller pair 4
2 Foldroller pair 2	5 Slitter shaft pair
3 Foldroller pair 3	

Illustration 107: Parallel fold roller diagram

The roller diagram is on the side frame of the parallel fold and serves as an adjustment aid.
It shows the foldrollers and slitter shafts together with the associated setting elements.



1	Lever	4	Set collar
2	Thrust piece	5	Screw
3	Plate	6	Adjustment knob

Illustration 108: Adjusting the foldrollers and slitter shafts.

To attain a precise fold, the pressure of foldrollers must be correctly adjusted to the foldrollers and slitter shafts.

Pressure of foldrollers basic setting:

Procedure:

1) Stop machine and safeguard against being switched on again.
   Press EMERGENCY STOP palm button.
2) Pull back/remove buckle plates.
   See safety message under headline “8.8 Setting the parallel folding unit”.
3) Use the <Parallel fold> roller diagram to orient yourself.
4) Begin with the 1st roller pair.
5) Press the lever (1) downwards.
6) Place a strip of the paper to be processed between the thrust piece (2) and plate (3).
   Place under both sides equally.
7) Place a longer paper strip (format approx. 5 x 20 cm) on the roller gap to be set.
8) Hold the paper strip fast with your hand.
9) Use the safety handwheel to turn the machine forwards.
10) Inspect the pressure of foldrollers along the entire width of the roller pair.
11) Identically adjust the required pressure of foldrollers along the entire width of the roller pair by turning the adjustment knob (6) on both sides of the parallel fold.
    Turning clockwise (+) = pressure of foldrollers is reduced.
    Turning counterclockwise (-) = pressure of foldrollers increased.
12) Adjust the other roller pairs and the slitter shaft in the same way.
13) Insert the buckle plates again.
    See chapter “8.8.4 Inserting the buckle plates”

✓ The basic setting is made.

Always complete settings with a turn of the adjustment knob (6) clockwise (+). (Pressure of foldrollers becomes looser).
This ensures a consistent pressure of foldrollers for the next paper change.

Marking the basic setting:

For faster recreation of the basic setting, the set collar (4) should be put in the zero position.

Procedure

▷ Rotate the set collar (4), until the arrow lines up with the marking on the thrust piece (2).

✓ The basic position is marked.

Adjusting for fold type:

You can do this by placing the number of paper strips corresponding to the fold type of the sheet to be processed under the setting elements.
You must place underneath the setting elements on both sides equally.

Procedure:

▷ Use the <Parallel fold> roller diagram to orient yourself.
▷ Begin with the 1st roller pair.
▷ Press the lever (1) downwards.
▷ Place as many strips of the paper to be processed between the thrust piece (2) and plate (3) as the fold type requires.
Place under both sides equally.
▷ Adjust the other roller pairs and the slitter shaft in the same way.

✓ The fold type has been set.

The number of paper strips to place underneath depends on the fold type.

- Folding imposition calculation.
See Chapter “8.4.5 Create a folding imposition (F28)”.
See Chapter “8.5.5.2 Creating new folding imposition:”.
- Heed setting instructions for the parallel folding.
See Chapter “8.15 Setting details for fold types (standard)”.

Safeguard the adjustment knobs against turning:

Procedure:

▷ Tighten the screw (5) in the adjustment knob (6).

✓ The adjustment knob (6) is secured.

Do not tighten the screw (5) too tight, so as not to damage the adjustment knob (6).

8.8.2 Correct foldrollers setting (automatic)

The foldrollers setting automatically occurs when a new folding imposition is selected.
See Chapter “8.5.5 Folding imposition selection”

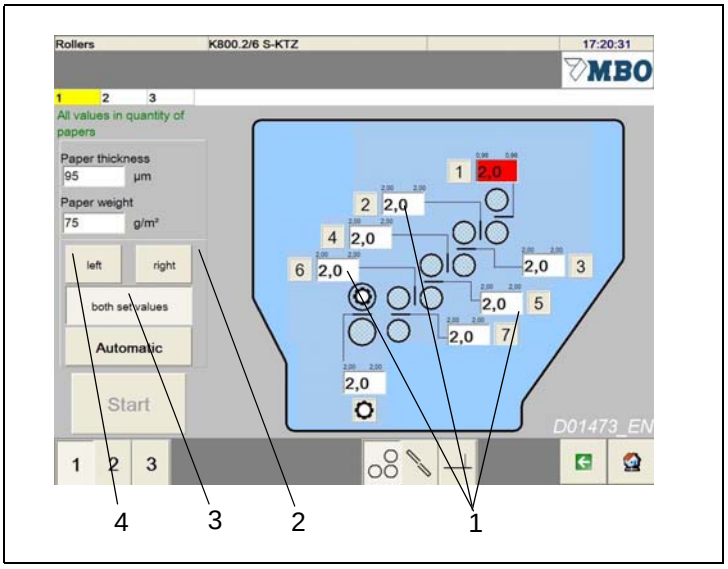


Illustration 109: Correct the foldrollers and slitter shafts settings

- All drives that are not in target position are marked in red in their input fields.
- If the drive is positioned correctly, then the input fields (1) are white.
- If only one side of the foldroller is in the target position, the field is yellow.

Correcting the roller position:

Procedure:

Correcting both sides at the same time:

▷ Press the button (3).
▷ Enter the new set point value in the field (1).

Correct the right side in the direction of paper travel:

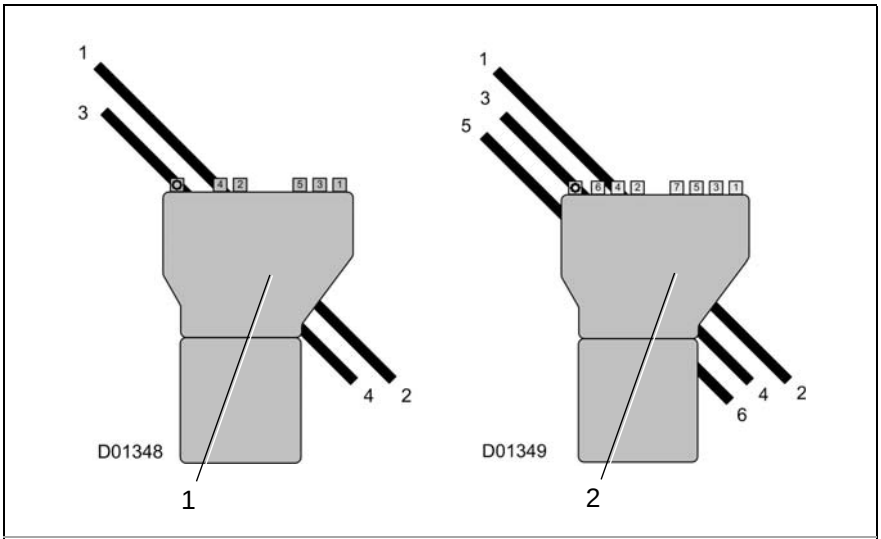
▷ Press the button (2).
▷ Enter the new set point value in the field (1).

Correct the left side in the direction of paper travel:

▷ Press the button (4).
▷ Enter the new set point value in the field (1).

The input changes first take effect when the machine is started.

8.8.3 Buckle plate positions



1	4 plate parallel fold	2	6 plate parallel fold

Illustration 110: Buckle plate positions

The upper buckle plates have an uneven numbering.

The lower buckle plates have an even numbering.

8.8.4 Inserting the buckle plates

WARNING!

Pulling back/removing the buckle plates during operation.

The exposed, rotating foldrollers and slitter shafts make up hazardous infeed points.

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

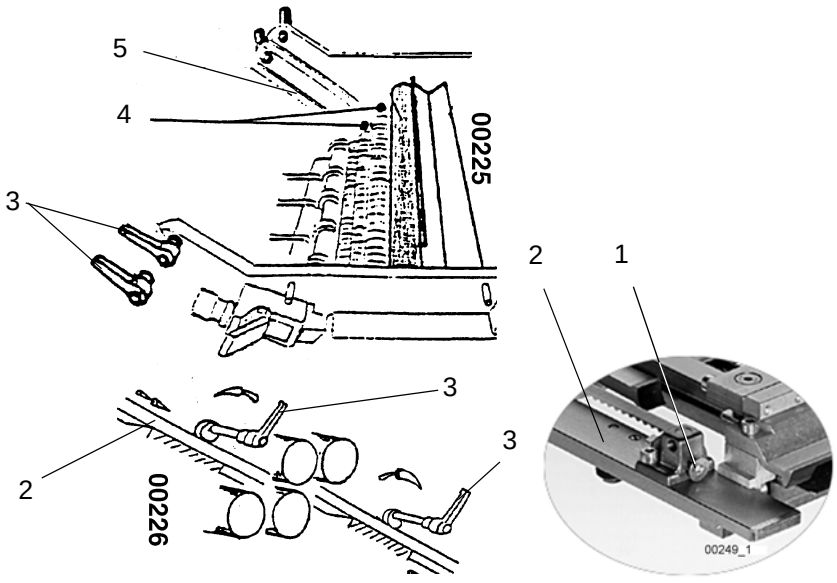
- All adjustment and inspection work may only be performed on an idle machine that has been safeguarded against being switched on again.
- Press the EMERGENCY STOP palm button.
- You should only permit adjustment and inspection work to be performed by a single person.
- When turning the machine with the safety handwheel, there is also a hazard of pinching and injury!

CAUTION!

Incorrectly-fastened buckle plates.

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

Make sure that the buckle plates are fastened securely by the clamping lever.



1 Stop screw
2 Buckle plate
3 Clamping lever
4 Stop pin
5 Support bars

Illustration 111: Buckle plates

Procedure:

1) Stop machine and safeguard against being switched on again.
   Press EMERGENCY STOP palm button.
▷ Pull the clamping lever (3) outwards.
▷ Insert the buckle plate (2) until the stop screw (1) abuts against the stop bolt (4).
▷ Firmly clamp the buckle plate (2) using the clamping lever (3).
✓ The buckle plate is installed in place.

- Press the buckle plates (2), using the clamping lever eccentric, in the direction of the rollers.
- The stop screw (1) must abut against the stop pin (4).
- Do not change the adjustment of the stop screws (factory setting).

8.8.5 Pull back/remove buckle plates

WARNING!

Pulling back/removing the buckle plates during operation.

The exposed, rotating foldrollers and slitter shafts make up hazardous infeed points.

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

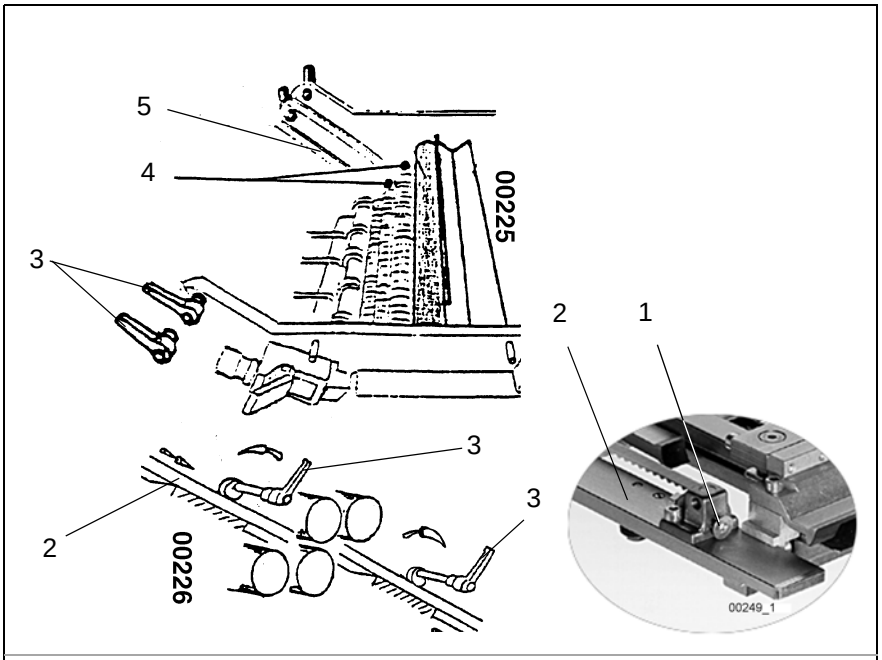
- All adjustment and inspection work may only be performed on an idle machine that has been safeguarded against being switched on again.
- Press the EMERGENCY STOP palm button.
- You should only permit adjustment and inspection work to be performed by a single person.
- When turning the machine with the safety handwheel, there is also a hazard of pinching and injury!

CAUTION!

Incorrectly-fastened buckle plates.

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

Make sure that the buckle plates are fastened securely by the clamping lever.



1 Stop screw
2 Buckle plate
3 Clamping lever
4 Stop pin
5 Support bars

Illustration 112: Pull back/remove buckle plates

Pulling back a buckle plate:

Procedure:

1) Stop machine and safeguard against being switched on again. Press EMERGENCY STOP palm button.
▷ Loosen clamping lever (3).
▷ Pull back the buckle plate (2) up to the stop.
▷ Firmly clamp the buckle plate (2) using the clamping lever (3).
✓ The buckle plate has been tightened.

Press the buckle plates (2), using the clamping lever eccentric, in the direction of the foldrollers.

Removing a buckle plate:

Procedure:

1) Stop machine and safeguard against being switched on again. Press EMERGENCY STOP palm button.
▷ Loosen clamping lever (3).
▷ Pull the clamping lever (3) outwards.
▷ Pull out the buckle plate (2).
▷ Properly set aside the buckle plate (2).
✓ The buckle plate is removed.

8.8.6 Setting the buckle plates (standard)

WARNING!

Pulling back/removing the buckle plates during operation.

The exposed, rotating foldrollers and slitter shafts make up hazardous infeed points.

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

- All adjustment and inspection work may only be performed on an idle machine that has been safeguarded against being switched on again.
- Press the EMERGENCY STOP palm button.
- You should only permit adjustment and inspection work to be performed by a single person.
- When turning the machine with the safety handwheel, there is also a hazard of pinching and injury!

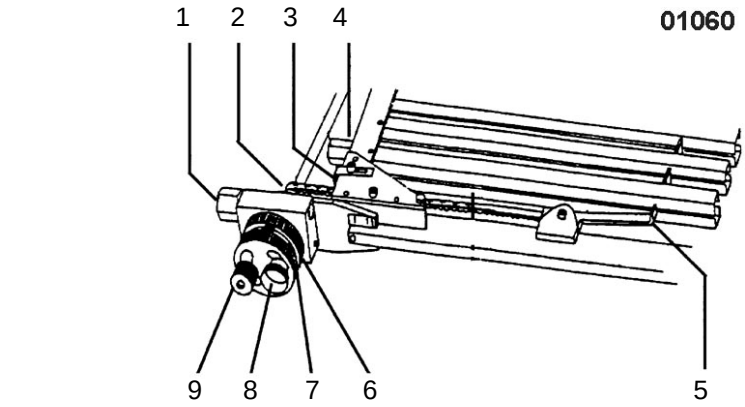
CAUTION!

Misadjustment of the stop screws.

Non-observance could result in serious property damage to the buckle plates and fold rollers.

The adjustment of the stop screws may not be changed (factory setting)

8.8.6.1 Set folding length (standard)



1	Precise adjustment	6	Rear adjusting wheel
2	Toothed belt with scale	7	Front adjusting wheel
3	Pointer	8	Knurled screw (plastic)
4	Hexagon	9	Knurled screw (metal)
5	Sheet stop		

Illustration 113: Adjusting the folding length.

Adjusting the folding length:

Procedure:

▷ Loosen the (metal) knurled screw (9).

▷ Adjust the folding length by turning the rear adjusting wheel (6).

Upper buckle plates 1, 3, 5.

Turn to the right = folding length is decreased.

Turn to the left = folding length is increased.

Lower buckle plates 2, 4, 6

Turn to the right = folding length is increased.

Turn to the left = folding length is decreased.

▷ Turn the adjusting wheel (4) until the red pointer (3) indicates the desired folding length on the scale of the toothed belt (2).

▷ Tighten the (metal) knurled screw (9).

✓ The folding length is set.

Precise adjustment

Procedure:

▷ The knurled screw (metal) (9) must be tightened completely.

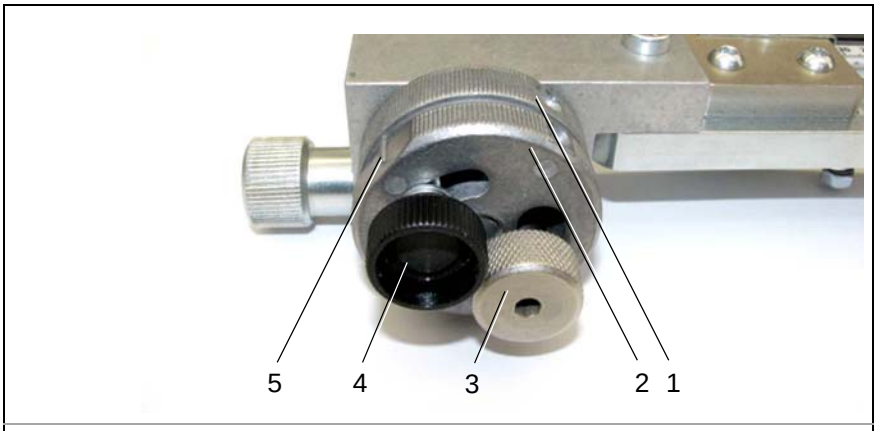
▷ Tighten the knurled screw (1).

Turn to the right = folding length is increased.

Turn to the left = folding length is decreased.

✓ Precise adjustments have been made.

8.8.6.2 Setting the sheet stop angle (standard)



1	Rear adjusting wheel	4	Knurled screw (plastic)
2	Front adjusting wheel	5	Marking
3	Knurled screw (metal)		

Illustration 114: Setting the sheet stop angle

Adjusting the angle:

By setting the sheet stop angle, it is possible to process some sheets that are not rectangular.

Procedure:

▷ Loosen the (plastic) knurled screw (4).

▷ By turning the front adjusting wheel (2), only the sheet stop on the drive side is adjusted.

Upper buckle plates 1, 3, 5.

Turn to the right = folding length on drive side is decreased.

Turn to the left = folding length on drive side is increased.

Lower buckle plates 2, 4, 6

Turn to the right = folding length on drive side is increased.

Turn to the left = folding length on drive side is decreased.

▷ The markings on the adjusting wheels provide a reference point for how far the adjustment was.

▷ Tighten the (plastic) knurled screw (4).

✓ The angle is set.

Basic position:

Procedure:

▷ Loosen the (plastic) knurled screw (4).

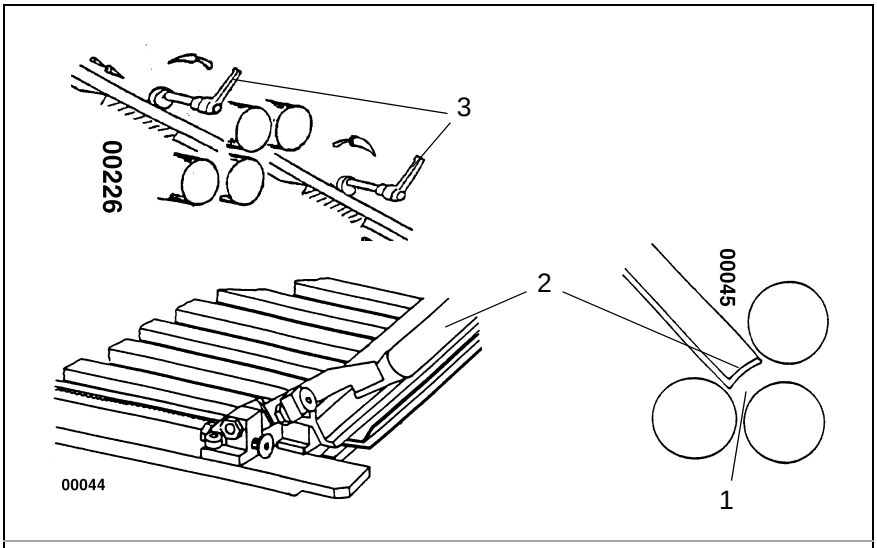
▷ Turn the front adjusting wheel (2) so that the markings (5) on both adjusting wheels are above one another.

▷ Tighten the (plastic) knurled screw (4).

✓ The basic setting is made.

Depending on the print mark, it may also be necessary to change the angle of the register table sidelay.

8.8.6.3 Activating the swing deflector (standard)



1	Deflecting area	3	Clamping lever
2	Swing deflector		

Illustration 115: Activating swing deflector.

The standard buckle plates are equipped with swing deflectors (2).

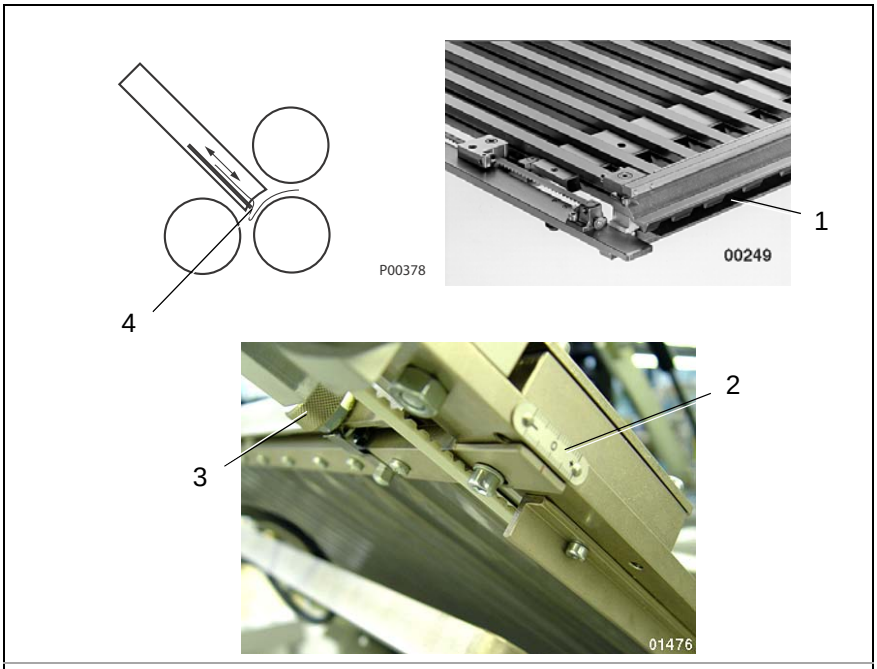
For buckle plates that are not needed, the swing deflectors (2) must be reversed.

Procedure:

1) Stop machine and safeguard against being switched on again.
   Press EMERGENCY STOP palm button.
   See safety message under headline “8.8.6 Setting the buckle plates (standard)”.
2) Loosen clamping lever (3).
3) Pull back unneeded buckle plates.
4) Reverse the installed swing deflector (1).
5) Push the buckle plate forward.
6) Tighten clamping lever (3).

✓ The swing deflector is activated.

8.8.6.4 Adjusting the lower plate lip



1	Lower plate lip	3	Knurled screw
2	Zero marking	4	Buckling area

Illustration 116: Adjusting the lower plate lip

Depending on the paper thickness, fold type and characteristics of the front edge of sheet, the buckling area (4) must be enlarged or made smaller.

You can do this by setting the lower plate lip (1).

Procedure:

▷ The adjustment must be made equally, in minor increments, on both sides.

▷ You can use the scales (2) on the right and left to check the adjustment.

▷ Turn the knurled screw (3).

Turning right = buckling area (4) becomes larger.

Turning left = buckling area (4) becomes smaller.

✓ The lower plate lip is set.

Adjustment for thick paper:
Reset lower plate lip (1) (away from the rollers)
Adjustment for thin paper and front edges of sheet bent downwards:

- Move lower plate lip (1) forward (towards the rollers).

Basic setting:

Procedure:

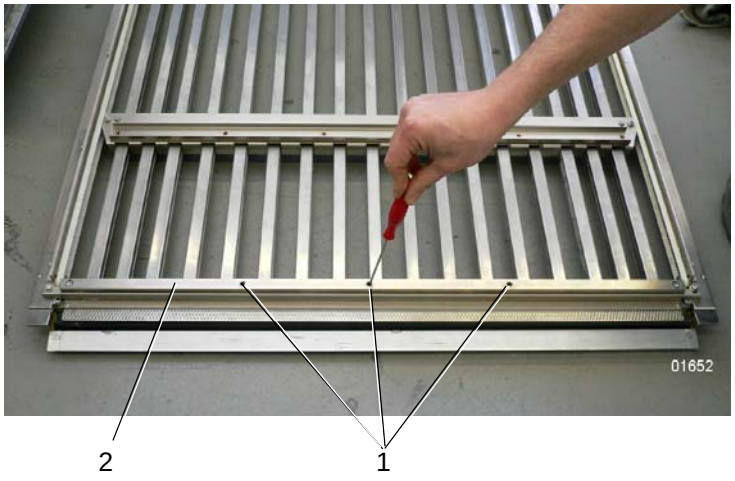
▷ The basic adjustment must be made equally, in minor increments, on both sides.

▷ Turn the knurled screws (3) until both scales (2) are at zero.

✓ The basic setting is made.

Pre-tensioning of the lower plate lip

The pretension is changed for unsteady perforations, dog-ears on the folding edge or round folding edges (paper tension).



1 Screws 2 Reinforcement bar

Illustration 117: Pre-tensioning of the lower plate lip

When setting the pretension, the lower plate lip bulges in the direction of the top plate lip.

Procedure:

1) Stop machine and safeguard against being switched on again. Press EMERGENCY STOP palm button.
2) Pull back/remove buckle plates. See safety message under headline “8.8.6 Setting the buckle plates (standard)”.
3) The adjustment must be made with the outer screws on both sides.
4) Turn the screws (1).
5) Turn to the right = pretension is increased.
6) Turn to the left = pretension is decreased.

✓ The pretension board has been set.

Basic setting

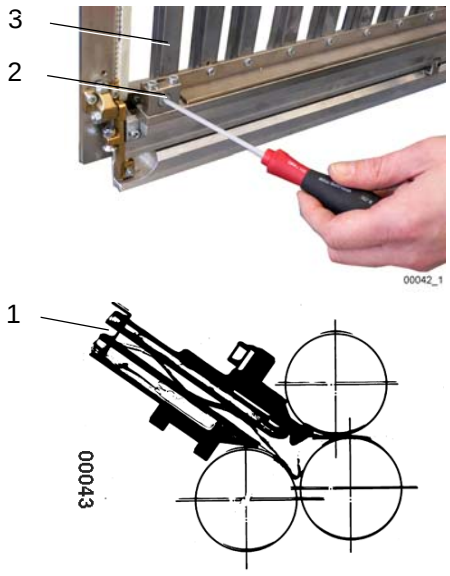
Procedure:

▷ Turn the screws (1) to the left until they are flush with the surface of the einforcement bar (2).

Visual inspection: the reinforcement bar (2) must be straight.

Also increase the „inner width“ if necessary.

8.8.6.5 Setting of the inner width



1	Inner width	3	Buckle rails
2	Screws		

Illustration 118: Setting of the inner width

The inner width (1) must be set depending on the paper properties, paper thickness, fold type and working speed.
The inner width (1) is the distance between the upper and lower buckle rails (3).

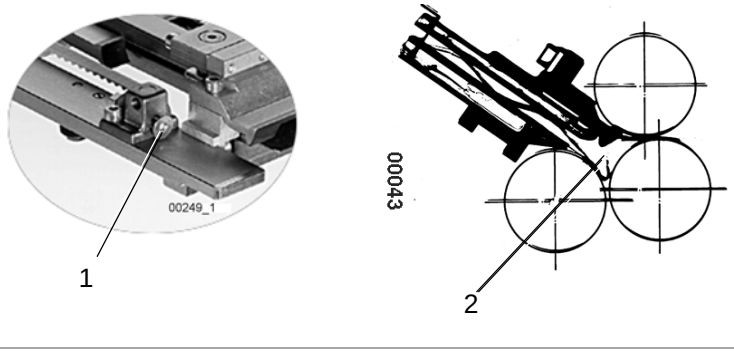
Procedure:

1) Stop machine and safeguard against being switched on again.
   Press EMERGENCY STOP palm button.
2) Pull back/remove buckle plates.
   See safety message under headline “8.8.6 Setting the buckle plates (standard)”.
3) Adjust both sides equally.
4) Turn both screws (2).
   Turn to the right = „inner width“ becomes greater.
   Turn to the left = „inner width“ becomes smaller.

✓ The inner width is set.

Basic setting: A basic setting is not required since the setting of the "inner width" must be made individually according to the properties of the paper to be processed.

8.8.6.6 Enlarging the buckling area/deflecting area



1	Stop screw	2	Buckling area

Illustration 119: Enlarging the buckling area.

Depending on the product thickness, the buckling area/deflecting area might possibly have to be enlarged.

CAUTION!

Misadjustment of the stop screws.

Non-observance could result in serious property damage to the buckle plates and fold rollers.

The adjustment of the stop screws may not be changed (factory setting)

Enlarging the buckling area/ deflecting area:

Procedure:

1) Stop machine and safeguard against being switched on again.
   Press EMERGENCY STOP palm button.
   See safety message under headline “8.8.6 Setting the buckle plates (standard)”.
2) Pull the buckle plate/deflector back a little or
   clamp strips of cartons or several paper thicknesses between the stop pins and stop screw (1).
3) Adjust both sides equally.

✓ The buckling area/deflecting area has been enlarged.

8.8.7 Setting the buckle plates (automatic)

WARNING!

Pulling back/removing the buckle plates during operation.

The exposed, rotating foldrollers and slitter shafts make up hazardous infeed points.

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

- All adjustment and inspection work may only be performed on an idle machine that has been safeguarded against being switched on again.
- Press the EMERGENCY STOP palm button.
- You should only permit adjustment and inspection work to be performed by a single person.
- When turning the machine with the safety handwheel, there is also a hazard of pinching and injury!

CAUTION!

Misadjustment of the stop screws.

Non-observance could result in serious property damage to the buckle plates and fold rollers.

The adjustment of the stop screws may not be changed (factory setting).

8.8.7.1 Correct the folding length (automatic)

The folding lengths of the buckle plates are set automatically when a new folding imposition is selected.
See Chapter“8.5.5 Folding imposition selection”

Manually correcting the calculated folding length:

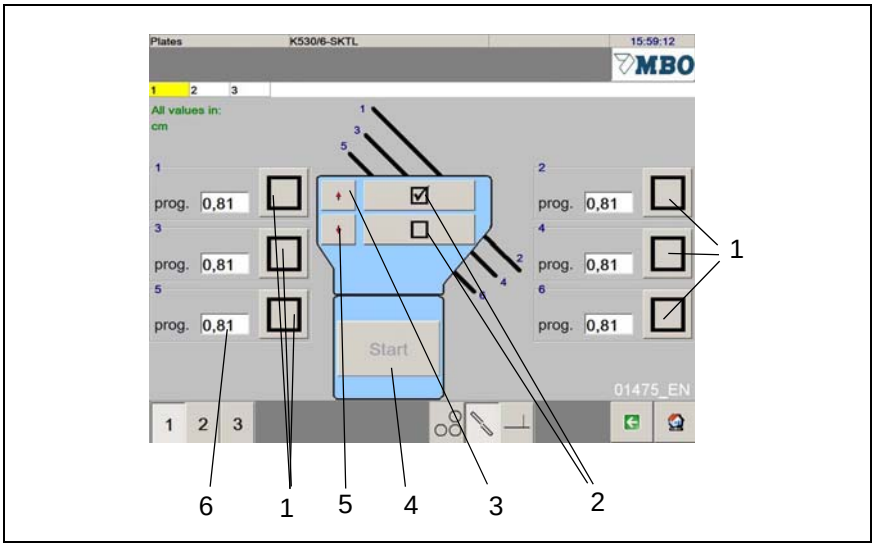


Illustration 120: Changing calculated folding lengths manually

Depending on the speed, inner width adjustment and the characteristics of the paper, the folding results can deviate from the calculated values.

For this reason, the folding lengths can be adapted manually.

Procedure:

Selecting buckle plates:

▷ Select one buckle plate each with the fields (1) or all buckle plates with the fields (2) to make a correction.

Increasing the set value:

▷ Press the button (3).
Each time the button (3) is pressed, the value increases by 0.1 mm.

Reducing the value setting:

▷ Press the button (5).
Each time the button (5) is pressed, the value decreases by 0.1 mm.

Large changes:

▷ Press the numerical field (6).
A numeric input field appears.
There you can enter larger change values.

Reposition sheet stops:

CAUTION!

Crash hazard during automated format change.

Non-observance could result in personal injuries.

When starting the automated format change, observe the following precautions:

- Do not reach into the machine.
- Make absolutely sure that there are no other people at the machine.

▷ Press the <Start> button (4).

✓ The buckle stops reposition themselves based on the changed values.

8.8.7.2 Setting the sheet stop angle (automatic)

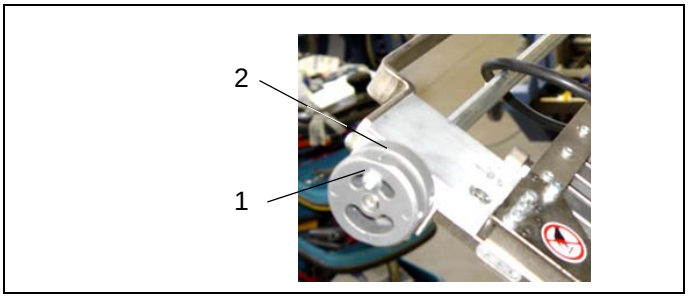


Illustration 121: Modification of the sheet stop angle

By setting the sheet stop angle, it is possible to process some sheets that are not rectangular.

Adjusting the angle:

Procedure:

▷ Loosen the screw (1).

▷ By turning the rear adjusting wheel (2), only the sheet stop on the operator side is moved.
The markings on the adjusting wheels provide a reference point for how far the adjustment was.

Upper buckle plates 1, 3, 5.

Turn to the right = folding length is decreased.

Turn to the left = folding length is increased.

Lower buckle plates 2, 4, 6

Turn to the right = folding length is increased.

Turn to the left = folding length is decreased.

▷ Tighten the screw (1).

✓ The angle is set.

Basic position:

Procedure:

▷ Loosen the screw (1).

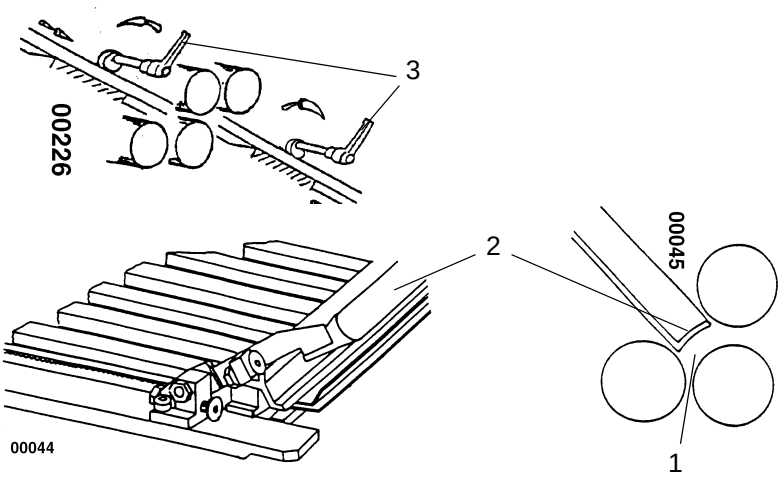
▷ Turn the rear adjusting wheel (2) so that the markings on both adjusting wheels are above one another.

▷ Tighten the screw (1).

✓ The basic setting is made.

Depending on the print mark, it may also be necessary to change the angle of the register table sidelay.

8.8.7.3 Activating the swing deflector (automatic)



1 Deflecting area	3 Clamping lever
2 Swing deflector	

Illustration 122: Activating swing deflector.

The first buckle plate is equipped with a swing deflector (2).
If the first buckle plate is not required, the swing deflector (2) must be reversed.

Procedure:

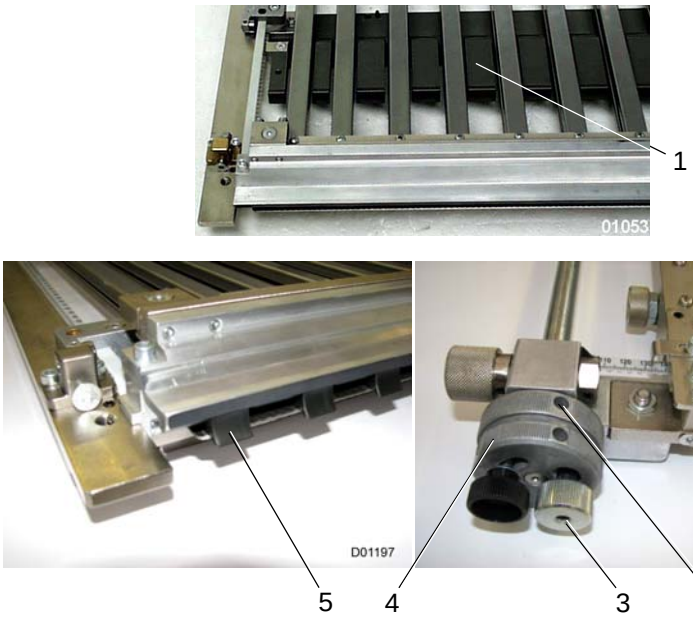
1) Stop machine and safeguard against being switched on again.
   Press EMERGENCY STOP palm button.
   See safety message under headline “8.8.7 Setting the buckle plates (automatic)”.
2) Loosen clamping lever (3).
3) Pull back the first buckle plate.
4) Reverse the installed swing deflector (1).
5) Push the buckle plate forward.
6) Tighten clamping lever (3).

✓ The swing deflector is activated.

8.8.7.4 Further adjustments of the buckle plates (automatic)

The further adjustments of the buckle plates (automatic) are identical to the adjustments of the buckle plates (standard).
See chapter “8.8.6 Setting the buckle plates (standard)”.

8.8.8 Setting the combination buckle plate FTK



1 Sheet stop
2 Rear adjusting disc
3 Knurled screw (metal)
4 Front adjusting disc
5 Sheet deflector position

Illustration 123: Combination buckle plate

With this buckle type, the swing deflector is eliminated.
The sheet stop (1) can be adjusted as far in the direction of the foldrollers that is assumes the deflector position (5).
This means that the buckle plate does not have to be pulled out to change to the sheet deflector.

Adjusting the buckle plate:

The various setting possibilities of the combination buckle plates are largely identical to those of the standard buckle plates.
See Chapter “8.8.3 Buckle plate positions”

Sheet deflector function:

Adjust sheet stop (1) up to the sheet deflector position (5).
Procedure:

▷ Loosen the (metal) knurled screw (4).
▷ Turn the rear adjusting disc (2) up to the sheet stop (1) is in sheet deflector position (5).

Upper buckle plates 1, 3, 5 = turn to the right

Lower buckle plates 2, 4, 6. = turn to the left

▷ Tighten the (metal) knurled screw (4).
✓ The sheet deflector is activated.

8.8.9 Correcting skewed perforation

WARNING!

Pulling back/removing the buckle plates during operation.

The exposed, rotating foldrollers and slitter shafts make up hazardous infeed points.

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

- All adjustment and inspection work may only be performed on an idle machine that has been safeguarded against being switched on again.
- Press the EMERGENCY STOP palm button.
- You should only permit adjustment and inspection work to be performed by a single person.
- When turning the machine with the safety handwheel, there is also a hazard of pinching and injury!

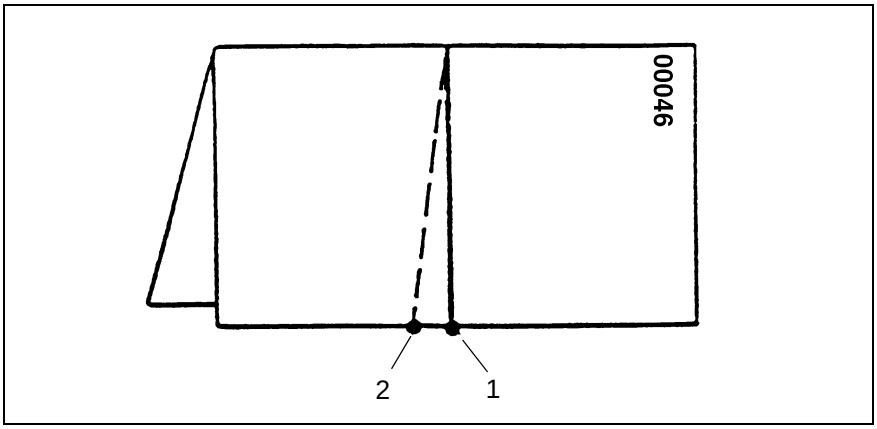


Illustration 124: Correct skewed perforation

Skewed perforation, scoring or cuts can be corrected by pulling out a sheet deflector on one side.

Procedure:

1) Stop machine and safeguard against being switched on again.
   Press EMERGENCY STOP palm button.
2) Pull the last sheet deflector out a little on one side.
   Check the result with a new folding sheet and correct again if necessary.

✓ The skewed perforation has been corrected.

- The adjustment of the stop screws may not be changed (factory setting).
- In case of deviations exceeding 5 mm, distribute the setting over two sheet deflectors.

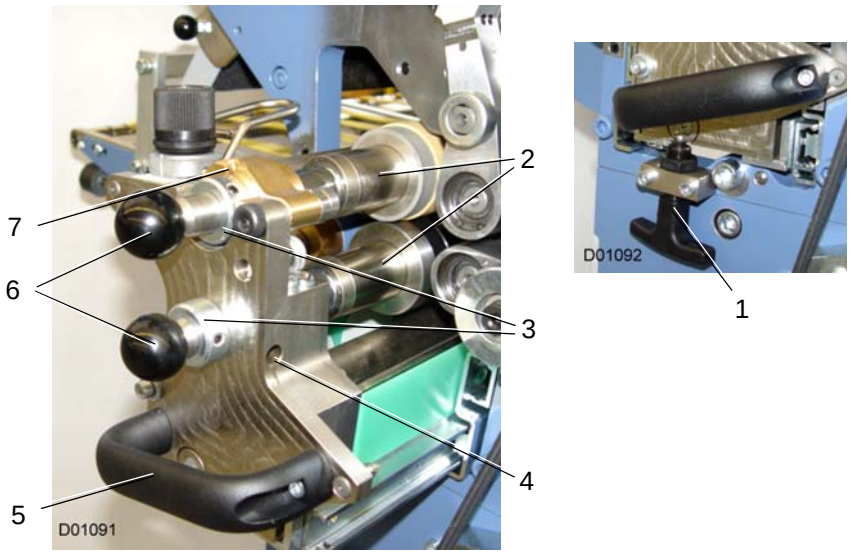
8.8.10 Installing/removing slitter shafts

WARNING!

Cutting hazard due to slitter shafts.

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

- Never reach into the slitter shafts while the machine is running.
- For all work with the slitter shafts, wear cut-proof safety gloves and safety shoes.
- The removal/installation of the slitter shafts may only be performed on an idle machine that has been safeguarded against being switched on again.
- Always hold the slitter shafts at the shaft and not at the tool.



1	Notch lever	5	Handle
2	Slitter shaft	6	Plug bearings
3	Set collar	7	Grub screw
4	Grub screw		

Illustration 125: Slitter shaft cassette

The slitter shafts (2) located in the slitter shaft cassette serve to retain tools for perforating, scoring or cutting.

The slitter shafts are stored in a removable cassette. The cassette simplifies the removal of slitter shafts and the remounting.

Removing slitter shaft:

Procedure:

▷ Unlock the slitter shaft cassette with the notch lever (1).
▷ Pull out the slitter shaft cassette with the handle (5).
▷ Loosen the grub screws (4) and (7) with the MBO ball Allen wrench SW4.
▷ Pull out the plug bearings (6).

▷ Remove the slitter shafts (2).

✓ The slitter shafts are removed.

Installing of slitter shaft

Procedure:

▷ Use the slitter shafts (2) in their original position.

▷ Insert the plug bearing (6) into the slitter shaft (2).

▷ Make sure that the plug bearings (6) are inserted completely into the slitter shaft.
The set collars (3) must life flush.

▷ Fasten the slitter shafts (2) with the grub screws (4) and (7).
To do this, use only the MBO ball Allen wrench SW4.

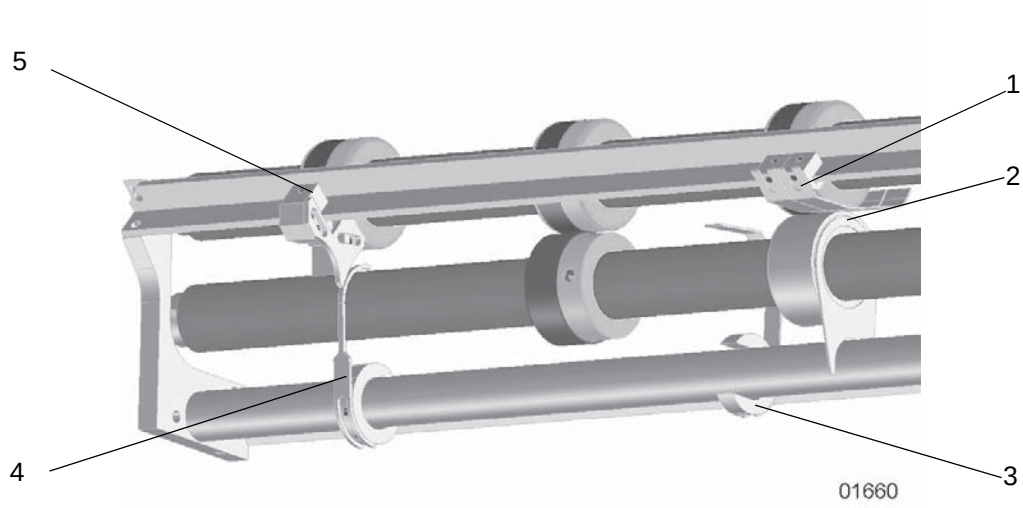
▷ Push the slitter shaft cassette in with the handle (1) until it snaps in.
The notch lever (1) must completely be snapped in.

✓ The slitter shafts are installed.

The slitter shaft cassette is secured electrically.

- The slitter shaft cassette cannot be pulled out when the machine is running.
- The machine cannot be operated when the slitter shaft cassette is pulled out.

8.8.10.1 Stripper cutting device



1 Upper stripper

2 Lower stripper

Illustration 126: Stripper cutting device

Please consult the illustration for the installation position for the stripper of the cutting device for the slitter shaft cassette.

8.8.11 Scoring, cutting and perforating devices

WARNING!

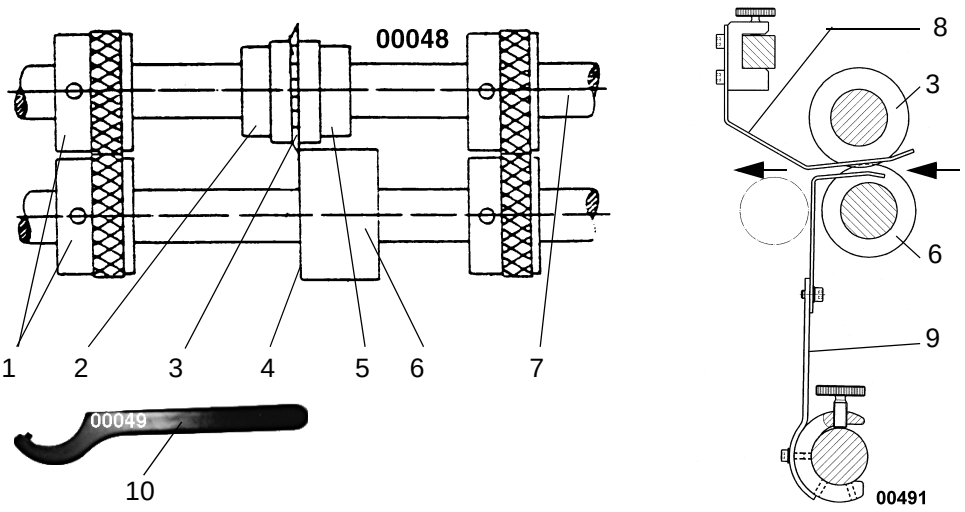
Cutting hazard due to slitter shafts.

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

- Never reach into the slitter shafts while the machine is running.
- For all work with the slitter shafts, wear cut-proof safety gloves and safety shoes.
- The removal/installation of the slitter shafts may only be performed on an idle machine that has been safeguarded against being switched on again.
- Always hold the slitter shafts at the shaft and not at the tool.

8.8.11.1 Perforating device

The perforation is used for crossfolds in order to avoid wrinkles on the "head". „“Back spine“ perforations are only applied for perfect binding. The slitter shaft must be equipped with the necessary tools for perforating.



1	Transport role pair	6	Counter-knife
2	Nut	7	Slitter shaft
3	Perforating knife	8	Upper stripper
4	Counter-knife edge of the counter knife	9	Lower stripper
5	Knife holder	10	Hook wrench

Illustration 127: Using perforating knife.

Procedure:

▷ Loosen the nuts (2) with the hook wrench (10).

▷ Insert the perforating knife (3) into the knife holder (5).
When using slotted knives it is not necessary to remove the slitter shafts.
When mounting the perforating knives (3) the smooth side of the knife must be directed towards the beveled edges (4).
The blunted angle of the tooth must get into the paper first.

During installation, make sure that the nuts (2) are tightened against the rotation direction of the machine.
This could result in damage to property, if the knife holder opens while the machine is running,.

▷ Insert the upper stripper (8).
▷ Make sure that sufficient transport roll pairs (1) are used for the perforation.
This guarantees clean paper transport.
▷ Use the additional lower stripper (9) if the perforating knife is on the lower slitter shaft.

Different types of perforating knives are required for certain types of paper and folding impositions.
- Heed the attached TM 32/2 list of knives.

Types of blades

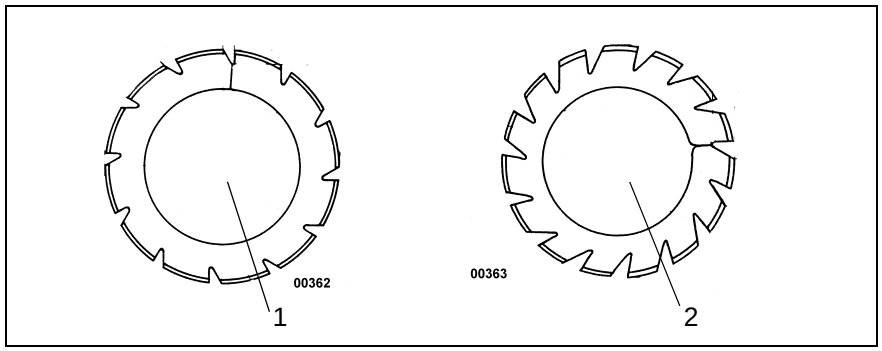
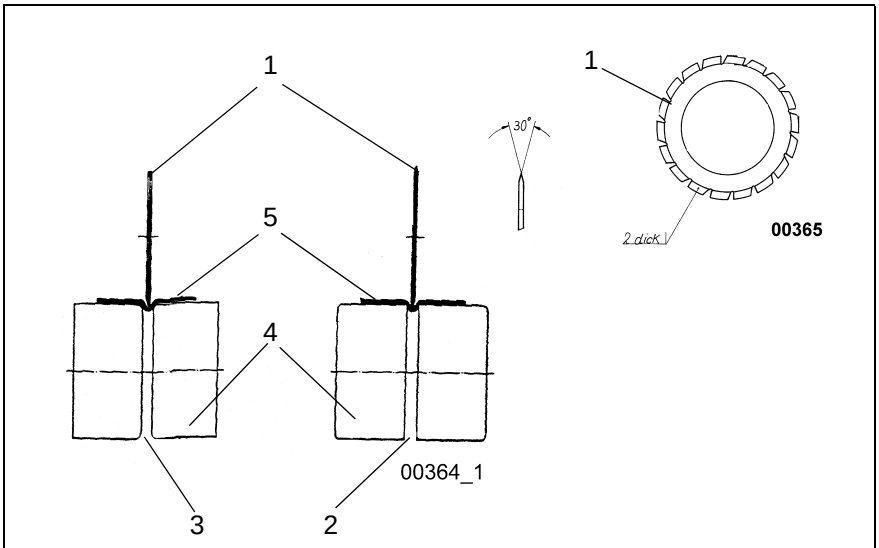


Illustration 128: Types of blades

▷ Use type of blade (1) for the 1st and 3rd folding unit.
▷ Use type of blade (2) for the 2nd folding unit.

8.8.11.2 V-shaped special perforating knife (option)



1	Perforating knife	4	Cutting rollers
2	Variant 1: between the cutting edges	5	Folding sheet
3	Variant 2: between the scoring edges		

Illustration 129: V-shaped special perforating knives

The V-shaped special perforating knife is used on the slitter shafts in folding unit I.
The perforating knife (1) is 1.6 mm thick, non-slotted and with wedge-shaped honing on both sides. The folding sheet is simultaneously pre-scored during perforating.
This avoids dog-ears on the edges of the head side in the crossfold (2nd folding unit). However, the perforation cut will not be as sharp as a normal perforation.

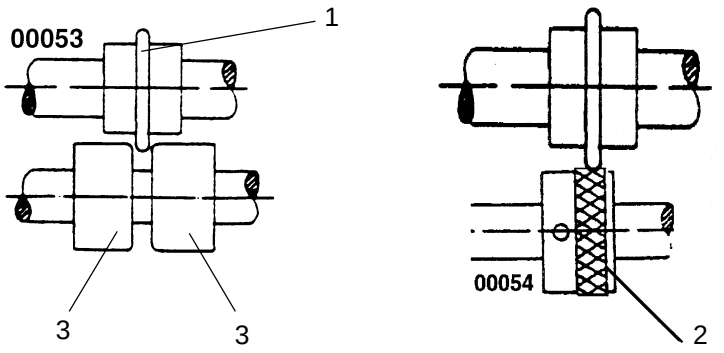
1st mounting variant: Between the cutting edges (2).

2nd mounting variant: Between the scoring edges (3).

- Match the gap and installation method to the product to be processed.
- Cutting edges and scoring edges may not under any circumstances contact the perforating knife.
- However, the perforation cut of this knives will not be as sharp as a normal perforation.

8.8.11.3 Scoring

Prescoring is used for crossfolds with buckle plates if there are not supposed to be any perforations. Scoring guarantees that the fold is made exactly where it should be made. Special scoring devices may also be applied on request.



1 Scoring knife
2 Transport roller with rubber insert
3 Counter-knife

Illustration 130: Setting up the scoring.

Setting up

Procedure:

▷ Set up the scoring knives (1) on the slitter shaft so that these are between two transport rolls or between the rounded-off sides of two counter-knives (3).

✓ The scoring is set.

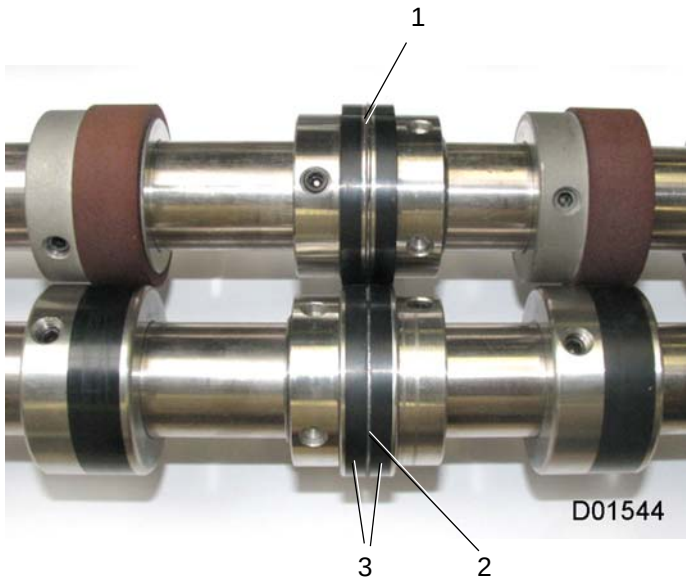
Scoring brittle paper:

Procedure:

▷ With brittle paper surfaces, score the paper on the rubber insert of a transport roller (2).

▷ Use a scoring knife with a smaller diameter.

8.8.11.4 Super score device



1 Scoring knife 2 Distance pieces 0,5 mm + 1,0 mm	3 Rubber rings

Illustration 131: Super score device

Procedure:

▷ Set up the Super Score device as shown in the illustration.

- Use fewer distance pieces (2) if the rubber rings are worn.
- Use more distance pieces if the paper is cut during scoring.

8.8.11.5 Cutting device

Folded sheets can be cut with the cutting device.

Separator cut for multiple-up production:

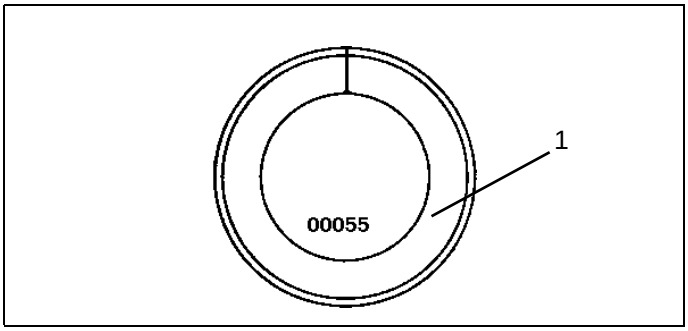
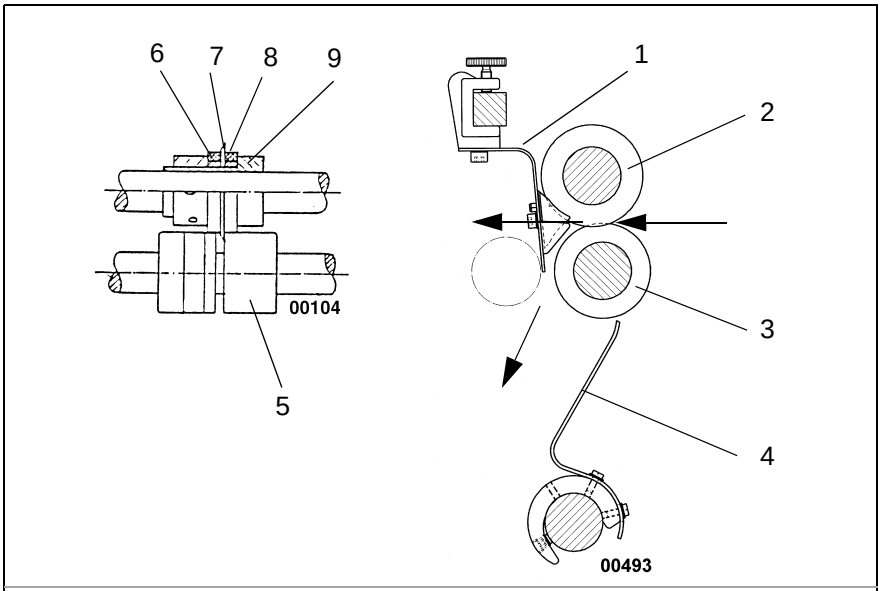


Illustration 132: Cutting knife

Procedure:

▷ Use one or several cutting knives (1).
▷ Install cutting knives (1) according to the principle of the perforating knives.

Edge trim:



1	Stripper	6	Rubber ring
2	Cutting knife	7	Cutting knife
3	Bottom slitter shaft	8	Rubber roller
4	Stripper	9	Knife holder
5	Counter-knife		

Illustration 133: Strippers for edge trimming

Procedure:

▷ Insert the knife holder (9) with the rubber rings (6) and (8) as well as the cutting knife (7) into the upper slitter shaft.
▷ Make sure that there is a distance washer (0.5 mm) between the rubber ring (83) and cutting knife (7).
▷ Adjust the counter-knife (5) on the bottom slitter shaft.
Please follow the illustration for the proper position.

▷ Inserting the strippers (1).
▷ Discharge the paper bits between the stripper (1) and rubber rings (6).
▷ Inserting the strippers (4)

Angled cut or badly guided paper trim-off:

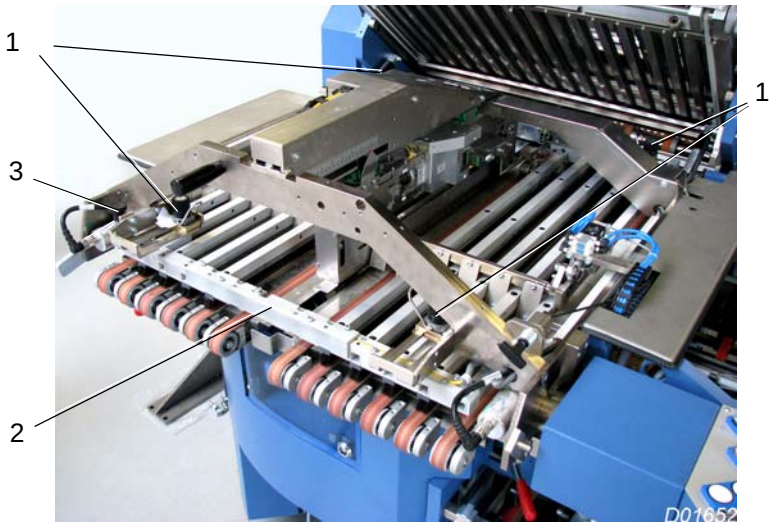
Procedure:

▷ Install the knife holder (9) on the lower slitter shaft,
the slitting knife (2) with the cutting surface towards the inside (direction of folding product).
The precise mounting position of (5) - (8) depends on the paper thickness and paper grain.

The best result is achieved with this mounting variant:
- Position (2) on the top, position (3) at the bottom.
- Knife cutting edge (2) towards the paper trim guided by the rubber ring (6).

8.9 Setting the cross fold unit

8.9.1 Setting of transport brushes



1	Setting element	3	Index bolt
2	Frame, brush unit		

Illustration 134: Setting of transport brushes

The transport belts carry the sheet in the crossfold section through the pressure of brushes. The brushes hold the sheet down and avoid the returning of the sheet to the stop. The lower the brushes are on the sheet, the more forceful the feed power is.

Adjusting transport brushes

Procedure:

▷ Place the number of paper thicknesses of the sheet to be transported underneath all four adjusting elements (1).

In case of tensions or waves on the stop:

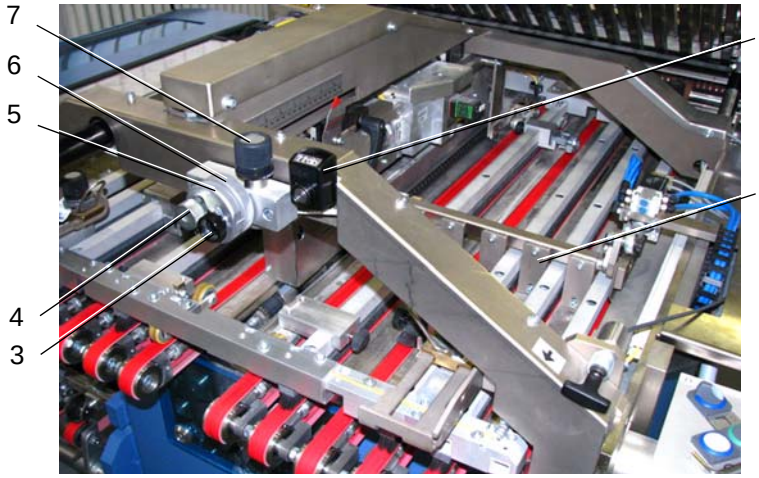
- Reduce the pressure by placing several paper strips under the adjusting elements (1).
- The sheet should lie flat at the stop (fold type-dependent and paper-dependent).

Removing the brush unit:

▷ Pull out index bolts (3).
▷ Pull the entire brush unit forward using the frame (2).

Mis-folded sheets can more easily be taken out this way.

8.9.2 Setting the crossfold stop (standard)



1	Display	5	Front adjusting wheel
2	Crossfold stop	6	Rear adjusting wheel
3	Plastic knurled screw	7	Fine adjustment
4	Metal knurled screw		

Illustration 135: Adjusting the crossfold stop

Adjusting the cross-fold stop:

Procedure:

▷ Loosen the metal knurled screw (4).
▷ Adjust the crossfold stop (2) to the corresponding measurement using the back adjusting wheel (6).
The display (1) can assist you with the adjustment.
Turn to the right = folding length is increased.
Turn to the left = folding length is decreased.
▷ Tighten the metal knurled screw (4).
▷ Make a precise adjustment (7).

If a folding imposition was calculated by the Navigator control system, the adjustment values can be read off the "Current settings crossfold" menu.

Adjusting the angle:

By setting the stop angle, it is possible to process some sheets that are not rectangular.

Procedure:

▷ Loosen the plastic knurled screw (3).
▷ By turning the front adjusting wheel (5), only the sheet stop on the drive side is adjusted.
Turn to the right = folding length is increased.
Turn to the left = folding length is decreased.
▷ The markings on the adjusting wheels provide a reference point for how far the adjustment was.
▷ Tighten the plastic knurled screw (3).

Angle basic setting:

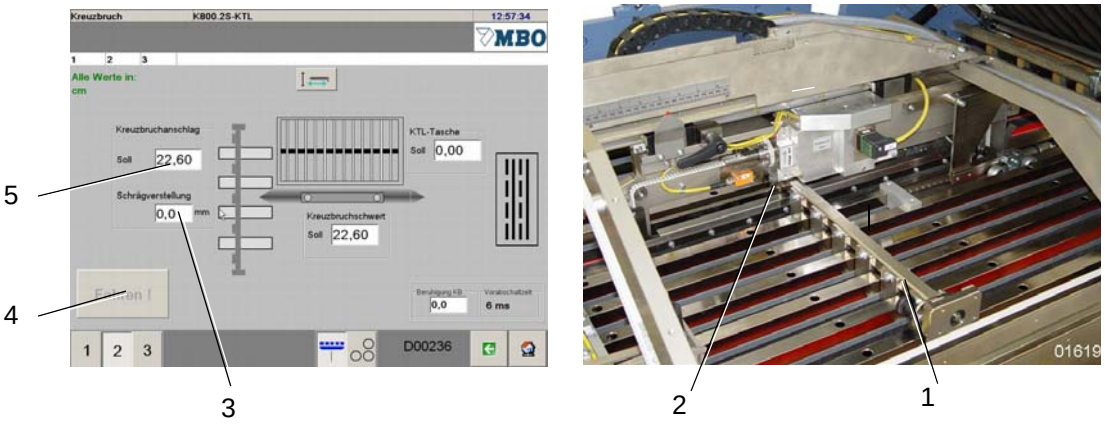
Procedure:

▷ Loosen the plastic knurled screw (3).
▷ Turn the front adjusting wheel (5) so that the markings on both adjusting wheels are above one another.
▷ Tighten the plastic knurled screw (3).

Also use the crossfold stop to change the longitudinal position of the folding knife.
This way the transport rolls remain in the right position.
See Chapter “8.9.7 Adjusting the folding knife in the longitudinal position (automatic)”.

8.9.3 Setting the crossfold stop (automatic)

The crossfold stop is set automatically when a new folding imposition is selected.
See Chapter “8.5.5 Folding imposition selection”



1 Crossfold stop
2 Crossfold knive
3 Field for angle correction
4 Pushbutton <Move>
5 Field <Crossfold stop position>

Illustration 136: Crossfold stop

Correcting the value setting:

Procedure:

▷ Press the field (5).
A numeric input field appears.
▷ Enter a new value for the position of the crossfold stop (1).

Diagonal adjustment:

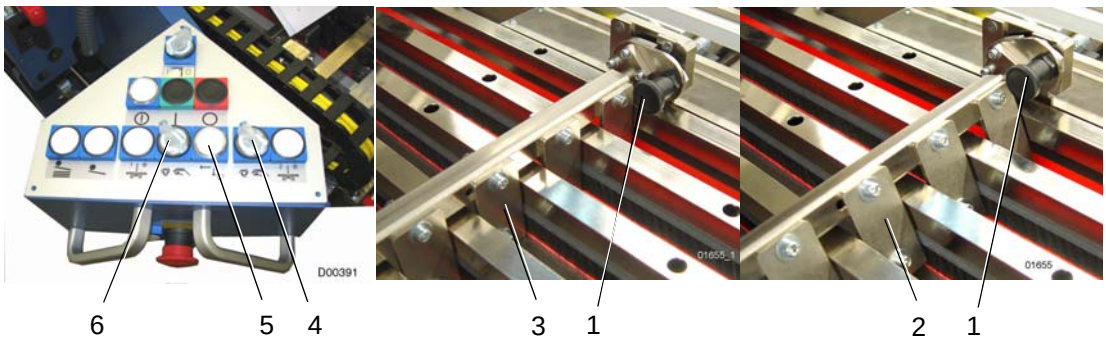
▷ Press the field (3).
A numeric input field appears.
▷ Enter a value for the diagonal adjustment of the crossfold stop (1).
✓ It is only positioned in the direction of travel on the right side of the stop.

When calculating a new folding imposition, the diagonal adjustment is automatically set again to 0.0 mm.

Stop repositioning:

▷ After changing a value, always press the <Move> button (4).
✓ The crossfold stop is repositioned.

8.9.4 Opening/closing the crossfold stop



1	Index bolt	4	<Folding knife 2> illuminated selecting switch
2	Crossfold stop open	5	Illuminated button
3	Crossfold stop closed	6	<Folding knife 1> illuminated selecting switch

Illustration 137: Opening/closing the crossfold stop.

Opening the cross-fold stop:

Procedure:

▷ Pull out the Index bolt (1).
▷ Pull the crossfold stop on the index bolt (1) upwards.
▷ Engage the index bolt (1) back in place.

Prerequisite: the illuminated selecting switches (4 and 6) are in the production mode.

- When opening the crossfold stop (2), the crossfold knife and threefold knife are deactivated automatically.
- The integrated lamps (4 to 6) do not light up.

Closing the cross-fold stop:

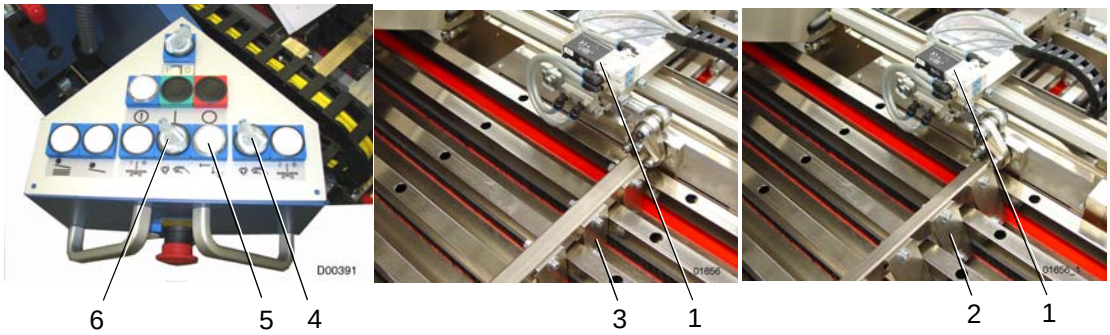
Procedure:

▷ Pull out the index bolt (1).
▷ Pull the crossfold stop on the index bolt (1) downwards.
▷ Engage the index bolt (1) back in place.

Prerequisite: the illuminated selecting switches (4 and 6) are in the production mode.

- When closing the crossfold stop (2), the crossfold knife and threefold knife are activated automatically.
- The integrated lamps (4 to 6) light up.

8.9.5 Open/close pneumatic crossfold stop (option)



1	Pneumatic unit	4	<Folding knife 2> illuminated selecting switch
2	Crossfold stop open	5	Illuminated button
3	Crossfold stop closed	6	<Folding knife 1> illuminated selecting switch

Illustration 138: Opening/closing the crossfold stop.

Opening the cross-fold stop:

Procedure:

▷ Press the illuminated button (5).

✓ The crossfold stop (2) is opened.

Prerequisite: the illuminated selecting switches (4 and 6) are in the production mode.

- When opening the crossfold stop (2), the crossfold knife and threefold knife are deactivated automatically.
- The integrated lamps (4 to 6) do not light up.

Closing the cross-fold stop:

Procedure:

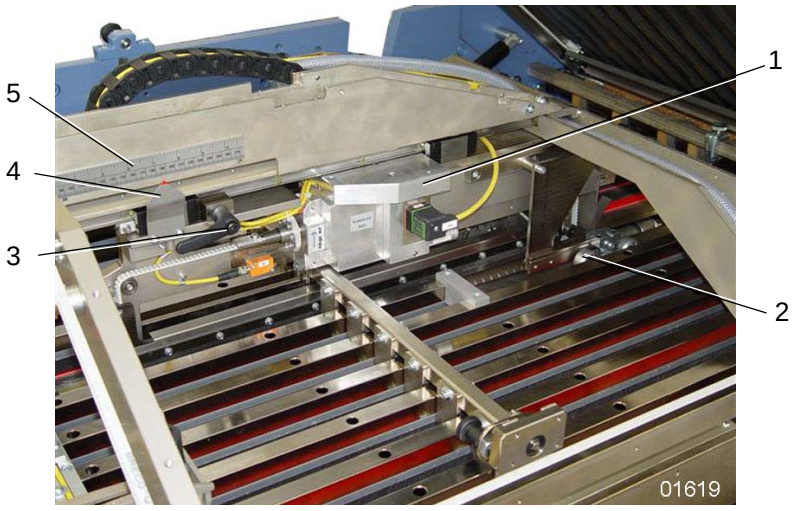
▷ Renewed pressing of the illuminated button (5).

✓ The crossfold stop (3) is closed.
The illuminated selecting switches (4 to 6) light up.

Prerequisite: the illuminated selecting switches (4 and 6) are in the production mode.

- When closing the crossfold stop (2), the crossfold knife and threefold knife are activated automatically.
- The integrated lamps (4 to 6) light up.

8.9.6 Adjusting the folding knife in the longitudinal position (standard)



1	Folding knife carrier	4	Pointer
2	Transport rolls	5	Scale
3	Clamping lever		

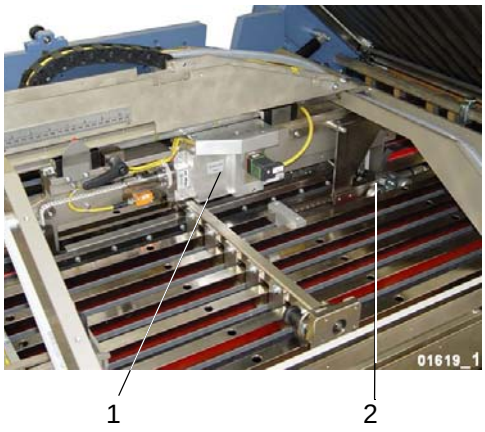
Illustration 139: Adjusting the folding knife in the longitudinal position

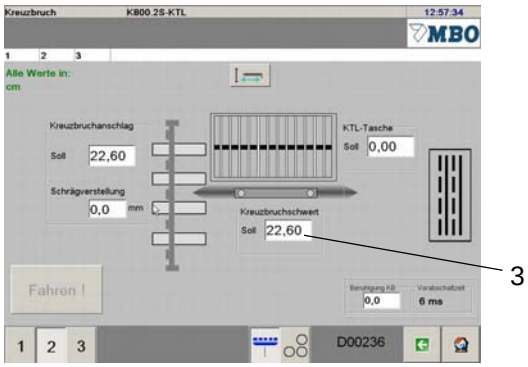
Procedure:

▷ Open the clamping lever (3).
▷ Slide the complete folding knife carrier (1) to the required measurement. The scale (5) with pointer (4) serves as an adjustment aid.
▷ Perform the precise adjustment as such that the transport rolls (2) slightly contact the rear edge of the sheet.
▷ Tighten the clamping lever (3).

- The transport rolls (2) firmly aligned to the folding knife are automatically adjusted with the folding knife carrier (1).
- The transport rolls are aligned at the factory in a fixed position and they should not be moved.

8.9.7 Adjusting the folding knife in the longitudinal position (automatic)





1 Crossfold knife
2 Transport rolls

3 Position field crossfold knife

For the folding imposition calculation, the crossfold knife is automatically set in its longitudinal position.
The transport rolls (2) firmly aligned to the crossfold knife are thereby automatically adjusted with the crossfold knife (1).
The transport rolls are set up in a fixed position and should only be moved separately for very small formats.

Correcting the value setting:

Procedure:

▷ Press the field (3).
A numeric input field appears.

▷ Enter a new value for the longitudinal position of the crossfold knife (1).

✓ The value setting has been corrected.

- Also use the crossfold stop to always change the longitudinal position of the crossfold knife.
  This way the transport rolls always remain in the right position.
- In order to not tightly clamp the sheet, the transport rolls (2) must be approx. 1 mm behind the rear edge of the sheet!

8.9.8 Opening/closing the crossfold table

WARNING!

Independent lowering of the open crossfold table.

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

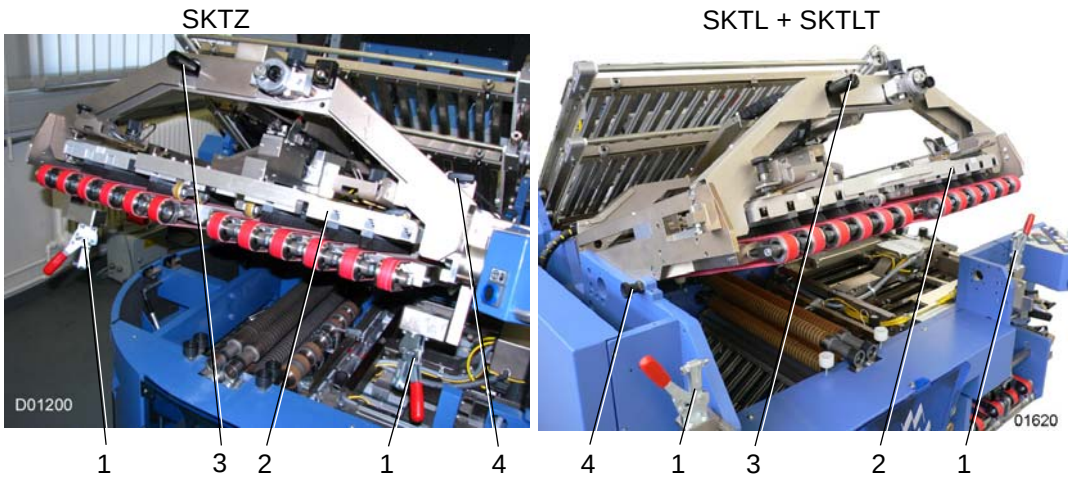
- Check the pneumatic springs after each production / daily to ensure they are functioning properly.
- Make sure that the safety bolt snaps in securely in the top position.

CAUTION!

Crushing hazard when closing the crossfold table.

Non-observance could result in serious personal injuries.

- Make sure that when closing the crossfold table, there are no body parts between the side frame and the crossfold table.
- Secure the crossfold table by pressing up the handle (3).



1 Clamping lever
2 Crossfold table
3 Handle
4 Safety bolt

Illustration 140: Opening/closing the crossfold table

The crossfold table can be opened for adjustment work and cleaning.

Procedure:

Opening the crossfold table:

▷ Open the clamping lever (1).
▷ Press the crossfold table (2) upwards using the handle (3).
▷ Make sure that the safety bolt (4) snaps in securely.
✓ You now have free access to the foldrollers and the slitter shafts.

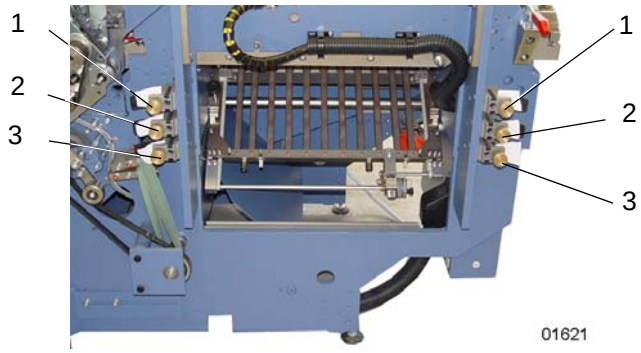
Closing the crossfold table:

▷ Secure the crossfold table by pressing up the handle (3).
▷ Tighten the safety bolt (4).
▷ Close the crossfold table (2) using the handle (3).
▷ Close the clamping lever (1).
The crossfold table (2) is thus fixed in its working position.
✓ The crossfold table is closed.

8.9.9 Setting the foldrollers and slitter shafts (standard)

Setting the foldrollers and slitter shafts to the number of sheets passing in the crossfold unit.

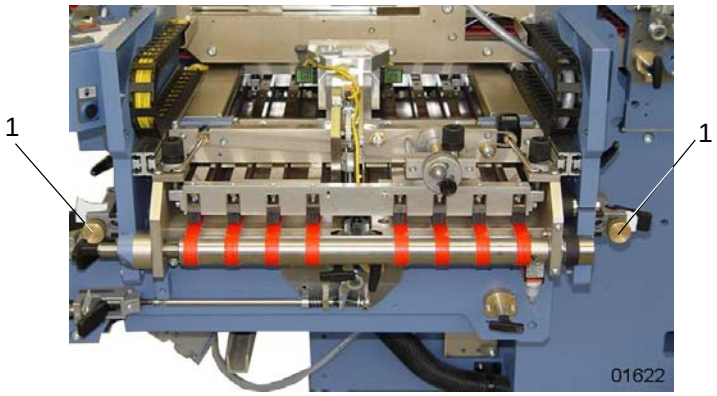
Setting elements for foldrollers:



1 Setting elements foldroller at crossfold
2 Setting elements at exit of crossfold buckle plate
3 Setting elements infeeding foldroller of crossfold buckle plate

Illustration 141: Setting elements foldrollers

Setting elements for slitter shafts:



1 Setting elements for slitter shafts at crossfold

Illustration 142: Setting elements slitter shafts

For additional details for the set-up of setting elements, see Chapter “8.8.1 Adjusting the pressure of foldrollers (standard)”

8.9.10 Setting the foldrollers and slitter shafts (automatic)

The crossfold rollers and slitter shafts are set automatically when a new folding imposition is selected.
See Chapter “8.5.5 Folding imposition selection”

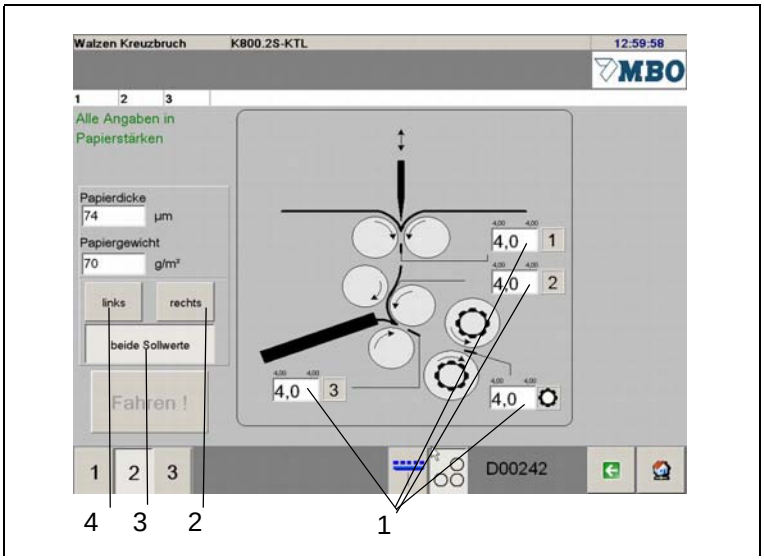


Illustration 143: Setting crossfold rollers and slitter shafts

Correcting the roller position:

Procedure:

Correcting both sides at the same time.

▷ Press the button (3).
▷ Enter the new set point value in the field (1).

Correct the right side in the direction of paper travel:

▷ Press the button (2).
▷ Enter the new set point value in the field (1).

Correct the left side in the direction of paper travel:

▷ Press the button (4).
▷ Enter the new set point value in the field (1).

The input changes first take effect when the machine is started.

8.9.11 Installing/removing slitter shafts

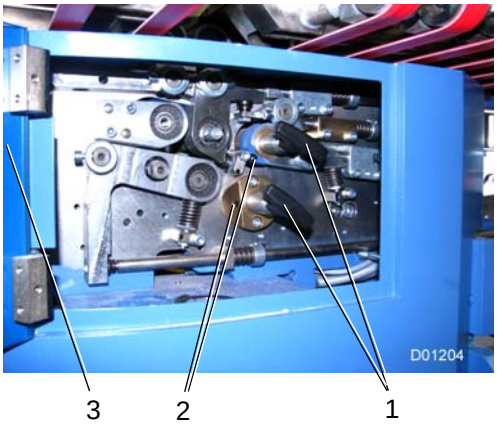
WARNING!

Cutting hazard due to slitter shafts.

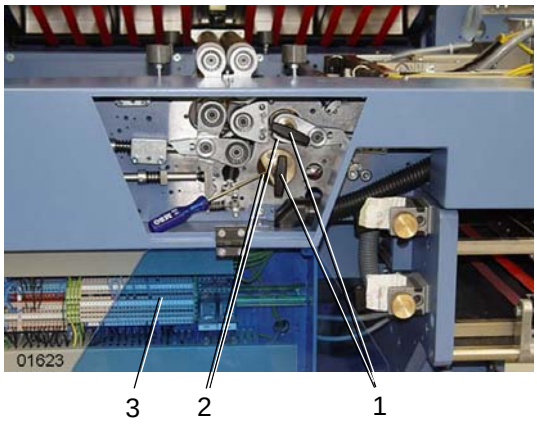
Non-observance could result in serious personal injury or death.

- Never reach into the slitter shafts while the machine is running.
- For all work with the slitter shafts, wear cut-proof safety gloves and safety shoes.
- The removal/installation of the slitter shafts may only be performed on an idle machine that has been safeguarded against being switched on again.
- Always hold the slitter shafts at the shaft and not at the tool.

SKTZ



SKTL + SKTLT



1 Plug bearing
2 Screws
3 Flap

Illustration 144: Installing/removing slitter shafts

Removing slitter shafts:

Procedure:

▷ Opening the crossfold table.
See Chapter “8.9.8”
▷ Open the flap (2).
▷ Remove the strippers that prevent removal.
▷ Loosen the screws (3) with an MBO ball Allen wrench SW4.
▷ Firmly hold the slitter shafts.
If necessary, seek the help of a second person.
▷ Pull out the plug bearings (1).
▷ Pull out the slitter shafts.
✓ The slitter shafts are removed.

Installing the slitter shafts:

Procedure:

▷ Place slitter shafts inside.

▷ Insert the plug bearings (1) in hole of the slitter shaft butt.
▷ Tighten the screws (3) with an MBO ball Allen wrench SW4.
While doing this, press the plug bearings (1) against the slitter shafts.
Axial play is thus avoided.
▷ Use all required strippers.
▷ Close the flap (2).
▷ Close the crossfold table.
See Chapter “8.9.8”
✓ The slitter shafts are installed.

With the S-KTZ model, the slitter shafts can only be removed in the threefold position left.

8.9.12 Setting the KTL buckle plate (standard)

WARNING!

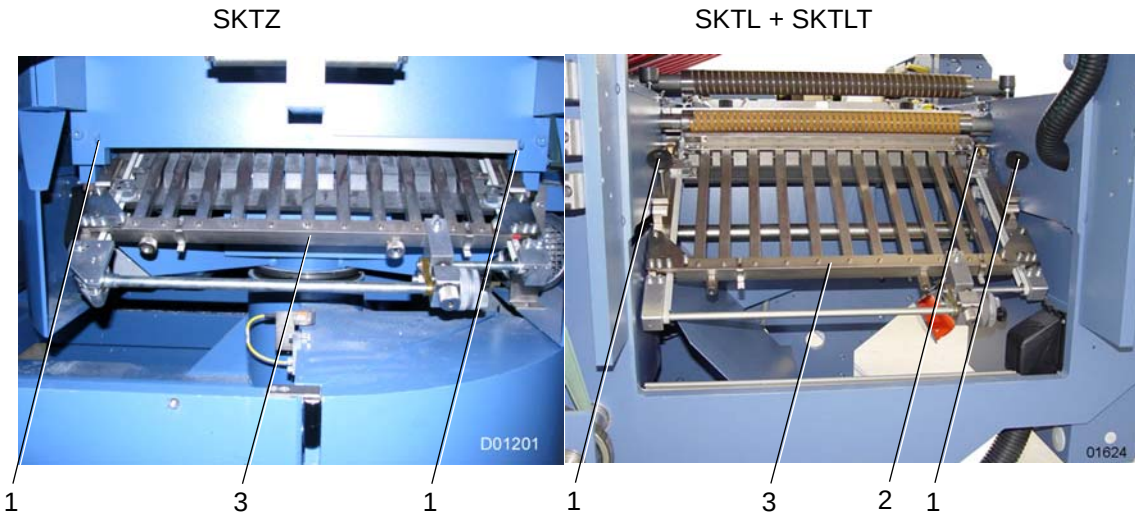
Pulling back/removing the buckle plates during operation.

The exposed, rotating foldrollers and slitter shafts make up hazardous infeed points.

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

- All adjustment and inspection work may only be performed on an idle machine that has been safeguarded against being switched on again.
- Press the EMERGENCY STOP palm button.
- You should only permit adjustment and inspection work to be performed by a single person.
- When turning the machine with the safety handwheel, there is also a hazard of pinching and injury!

8.9.12.1 Standard buckle plate with swing deflector



1 Screws
2 Stop
3 Buckle plate

Illustration 145: Change function "buckle plate" to "sheet deflector"

Activating the sheet deflector:

Change from function "buckle plate" to "sheet deflector" or vice-versa.

Procedure:

▷ Loosen both screws (1).
▷ Pull out the buckle plate (3) a little.
▷ Fold down the attached sheet deflector.
▷ Push the buckle plate (3) in up to the stop (2).
▷ Tighten the screws (1).

Adjusting the buckle plate.

See Chapter “8.8.3 Buckle plate positions”

8.9.12.2 Combination buckle plate FTK

For settings, see Chapter “8.8.8 Setting the combination buckle plate FTK”.

8.9.13 Setting the KTL buckle plate (automatic)

The folding length of the KTL buckle plate is set automatically when a new folding imposition is selected.
See Chapter “8.5.5 Folding imposition selection”

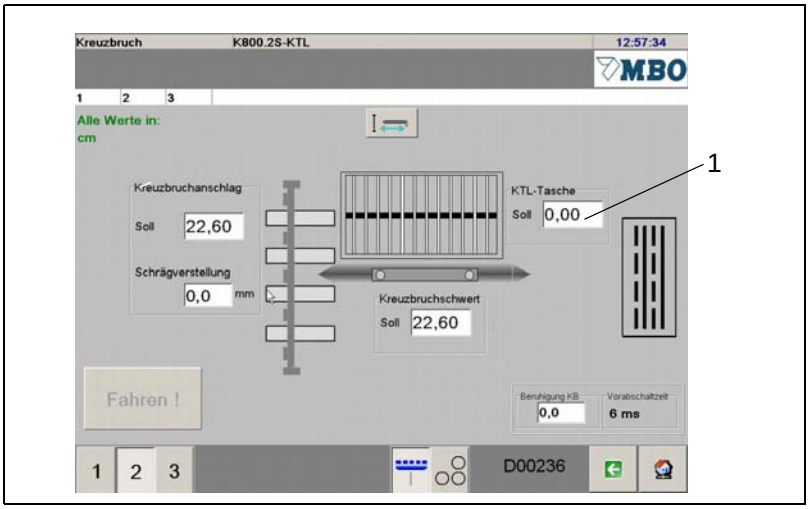


Illustration 146: Buckle plate to sheet deflector

Correcting the calculated folding length:

Procedure:

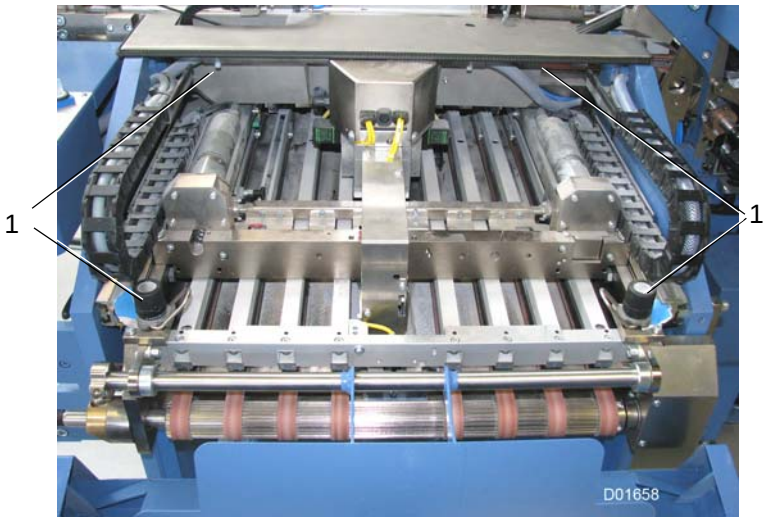
▷ Press the <KTL buckle plate> field (1).
A numeric input field appears.
▷ Enter a new value for the folding length (1).
▷ Press the <Move> button (2).
✓ The buckle stop is repositioned.

8.9.13.1 Adjusting the angle of the sheet stop

See Chapter “8.8.6.4 Adjusting the lower plate lip”

8.10 Setting the threefold unit

8.10.1 Set-up of transport brushes



1 Setting element

Illustration 147: Set-up of transport brushes

The transport belts carry the sheet in the threefold section through the pressure of brushes. The brushes hold the sheet down and avoid the returning of the sheet to the stop. The lower the brushes are on the sheet, the more power of feed is carried out.

Adjusting transport brushes

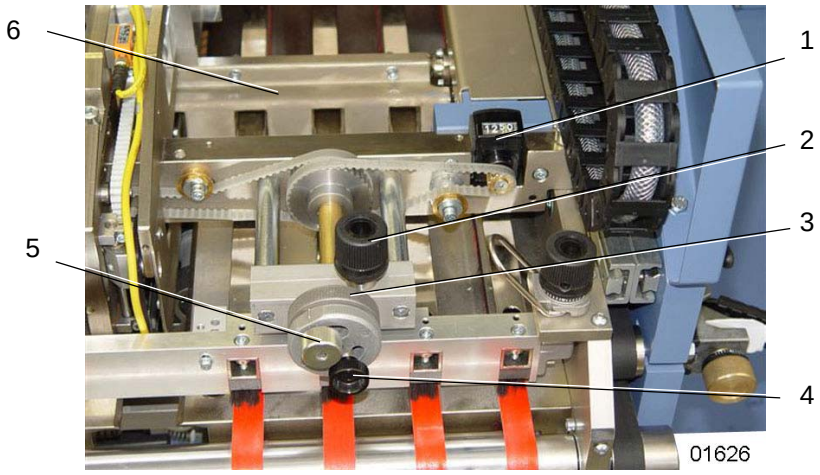
Procedure:

▷ Place the number of paper thicknesses of the sheet to be transported underneath all four adjusting elements (1).

In case of tensions or waves on the stop:

- Reduce the pressure by placing several paper strips under the adjusting elements (1).
- The sheet should lie flat at the stop (fold type-dependent and paper-dependent).

8.10.2 Setting the threefold stop (standard)



1	Display	5	Metal knurled screw
2	Fine adjustment	6	threefold stop
3	Central adjustment		
4	Plastic knurled screw		

Illustration 148: Setting the threefold stop

Adjusting the threefold stop:

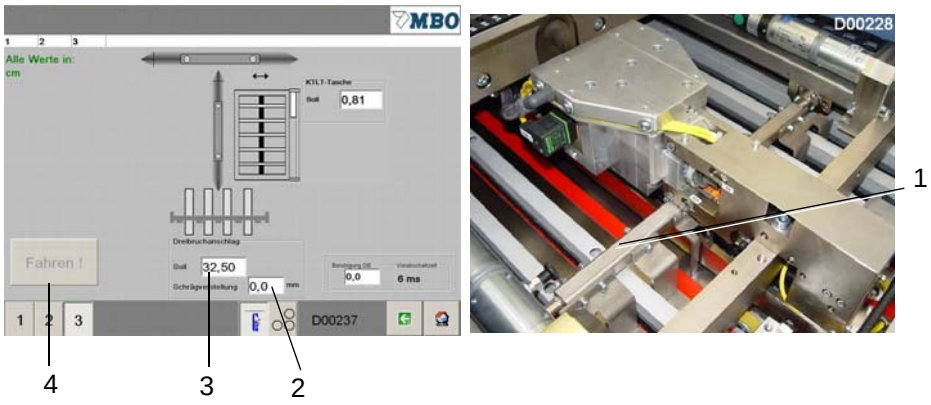
- ▷ Loosen the knurled screw (metal) (5).
- ▷ Adjust the threefold stop (7) to the corresponding measurement using the central adjustment (3).
  The display (1) can assist you with the adjustment.
  Turn to the right = folding length is increased.
  Turn to the left = folding length is decreased.
- ▷ Tighten the knurled screw (metal) (5).
- ▷ Make a precise adjustment (2).

If a folding imposition was calculated by the Navigator control system, the adjustment values can be read off the "Current settings threefold" menu.

Adjusting the angle:

- ▷ Loosen the knurled screw (plastic) (4).
- ▷ The sheet stop is adjusted on one side by turning the front adjusting wheel (3).
  Turn to the right = folding length is increased.
  Turn to the left = folding length is decreased.
- ▷ The markings on the adjusting wheels provide a reference point for how far the adjustment was.
- ▷ Tighten the knurled screw (plastic) (4).

8.10.3 Setting the threefold stop (automatic)



1 threefold stop	3 Set point value threefold stop
2 Angle adjustment threefold stop	4 Pushbutton <Move>

Illustration 149: threefold stop

Correcting the value setting:

Procedure:

▷ Press the field (3).
A numeric input field appears.
▷ Enter a new value for the position of the threefold stop (1).

Diagonal adjustment:

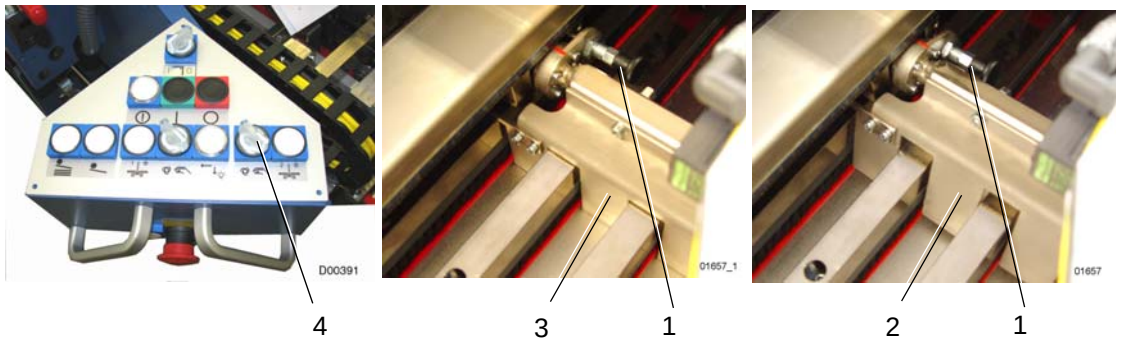
▷ Press the field (2).
A numeric input field appears.
▷ Enter a value for the diagonal adjustment of the threefold stop (1).
✓ It is only positioned in the direction of travel on the right side of the stop.

When calculating a new folding imposition, the diagonal adjustment is automatically set again to 0.0 mm.

Stop repositioning:

▷ After changing a value, always press the <Move> button (4).
▷ The threefold stop is repositioned.

8.10.4 Open/close threefold unit stop



1	Index bolt	3	Closed threefold stop
2	Open threefold stop	4	Illuminated selecting switch

Illustration 150: Opening/closing the threefold table.

Opening the threefold stop:

Procedure:

▷ Pull out index bolt (1).
▷ Pull the threefold stop upward on the index bolt (1).
▷ Engage the index bolt (1) into place.

- When opening the threefold stop (2), the threefold knife is deactivated automatically.
- The illuminated selecting switch (4) does not light up.

Closing the threefold stop:

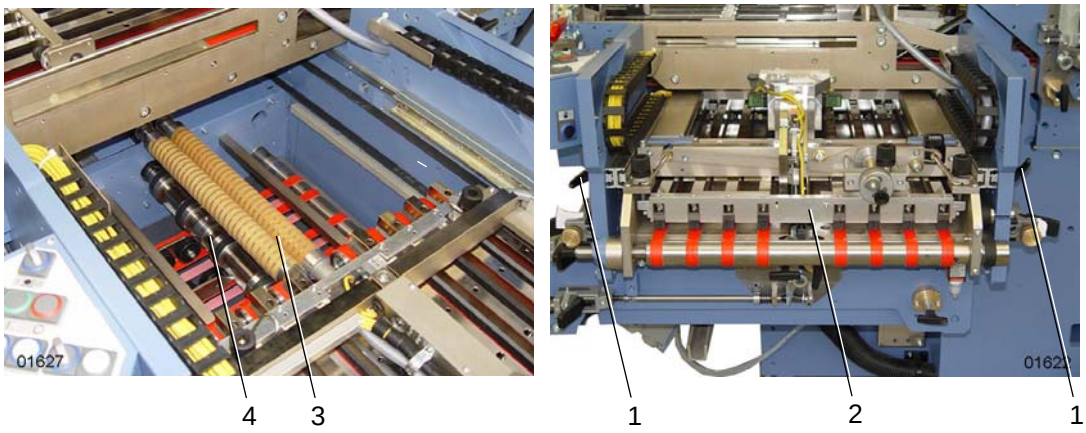
Procedure:

▷ Pull out index bolt (1).
▷ Press the threefold stop downward on the index bolt (1).
▷ Engage the index bolt (1) into place.

Prerequisite: the illuminated selecting switch (4) is in the production mode.

- When closing the threefold stop (3), the threefold knife is activated automatically.
- The illuminated selecting switch (4) lights up.

8.10.5 Pulling out the threefold carriage



1 Clamping lever	3 Foldrollers
2 Threefold carriage	4 Slitter shafts

Illustration 151: Pulling out the threefold carriage.

The threefold carriage (2) can be pulled out for adjustment work and cleaning.

Pulling out the threefold carriage:

Procedure:

▷ Open and pull the clamping lever (1) out to the side.
▷ Pull out the threefold carriage.
The clamping levers (1) must remain pulled out.
✓ You now have free access to the foldrollers (3) and the slitter shafts (4).

CAUTION!

Canting of the threefold carriage.

Non-observance could result in property damage!

Make sure that the clamping levers (1) remain pulled out until the threefold carriage (2) is pushed back into its basic position.

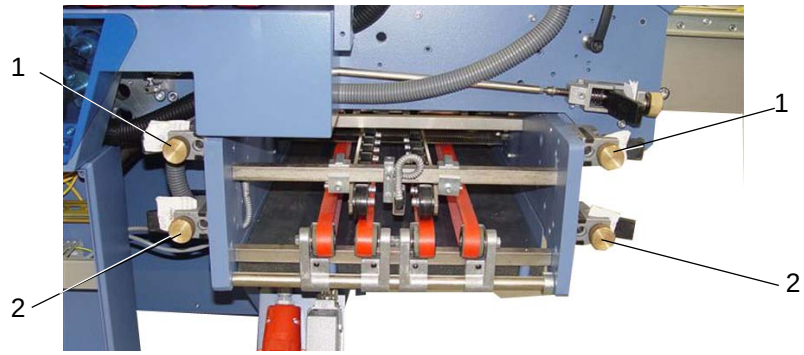
Pushing in the threefold carriage:

Procedure:

▷ The clamping levers (1) must remain pulled out.
▷ Push the threefold carriage (2) in.
▷ Press the clamping lever (1) in firmly.
▷ Clamp the clamping levers (1) counterclockwise.

8.10.6 Setting foldroller (standard)

8.10.6.1 Model S-KTL



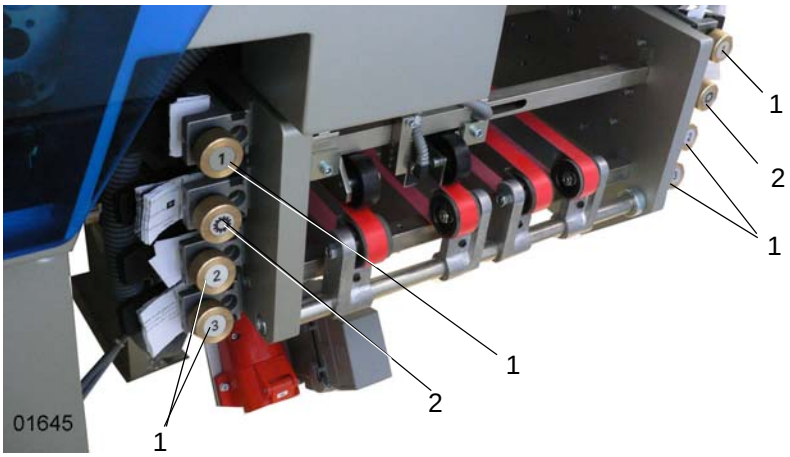
1	Setting element for foldrollers	2	Setting element for slitter shafts (optional)

Illustration 152: Threefold foldroller (S-KTL)

Adjust the foldrollers and slitter shafts to the number of sheets to run through using the setting elements (1) and (2).

For additional details for the set-up of setting elements:
See Chapter .“8.8.1 Adjusting the pressure of foldrollers (standard)”.

8.10.6.2 Model S-KTLT



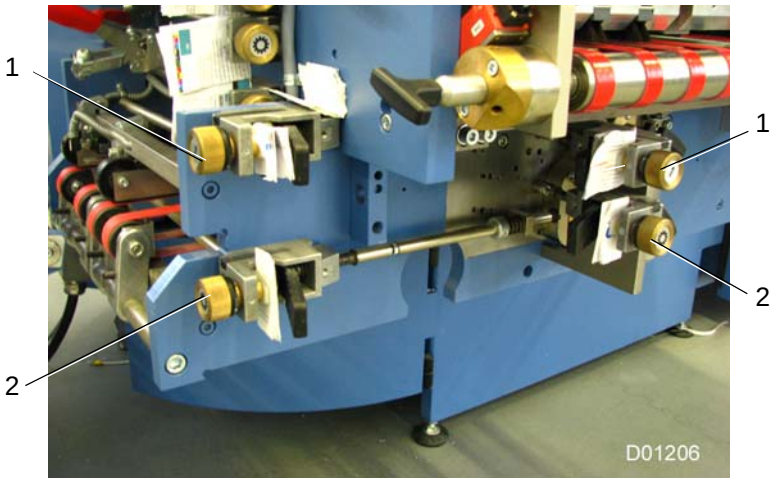
1	Setting elements for foldrollers	2	Setting elements for slitter shafts

Illustration 153: Foldrollers at threefold (S-KTLT)

Adjust the foldrollers and slitter shafts to the number of sheets to run through using the setting elements (1) and (2).

For additional details for the set-up of setting elements:
See Chapter .“8.8.1 Adjusting the pressure of foldrollers (standard)”.

8.10.6.3 Model S-KTZ



1 Setting elements for foldrollers 2 Setting elements for slitter shafts

Illustration 154: Foldrollers threefold (S-KTZ)

Adjust the foldrollers and slitter shafts to the number of sheets to run through using the setting elements (1) and (2).

For additional details for the set-up of setting elements:
See Chapter .“8.8.1 Adjusting the pressure of foldrollers (standard)”.

8.10.7 Setting the foldrollers (automatic)

The threefold foldrollers and slitter shafts are set automatically when a new folding imposition is selected.
See Chapter “8.5.5 Folding imposition selection”

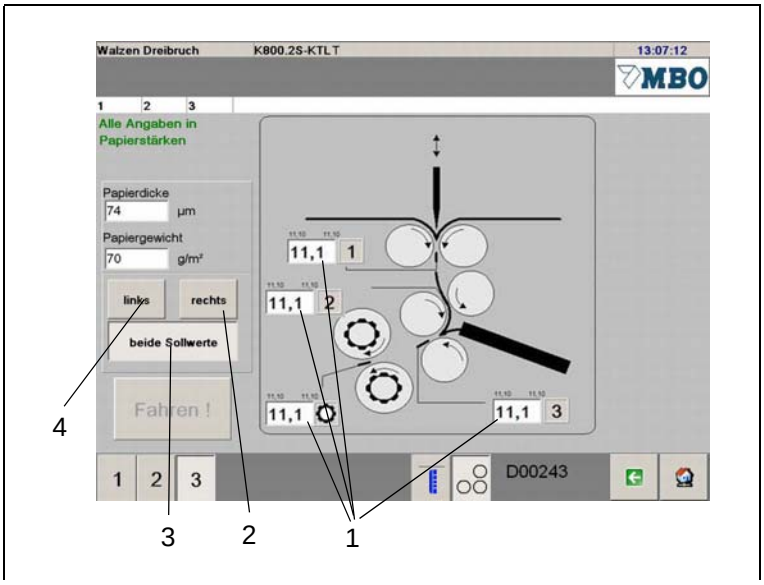


Illustration 155: Setting threefold rollers and slitter shafts

Depending on the models – S-KTL, S-KTLT and S-KTZ – there are different settings menus for the threefold foldrollers and slitter shafts.
The S-KTLT model is shown in the illustration.

Correcting the roller position:

Procedure:

Correcting both sides at the same time:

▷ Press the button (3).
▷ Enter the new set point value in the field (1).

Correct the right side in the direction of paper travel:

▷ Press the button (2).
▷ Enter the new set point value in the field (1).

Correct the left side in the direction of paper travel:

▷ Press the button (4).
▷ Enter the new set point value in the field (1).

The input changes first take effect when the machine is started.

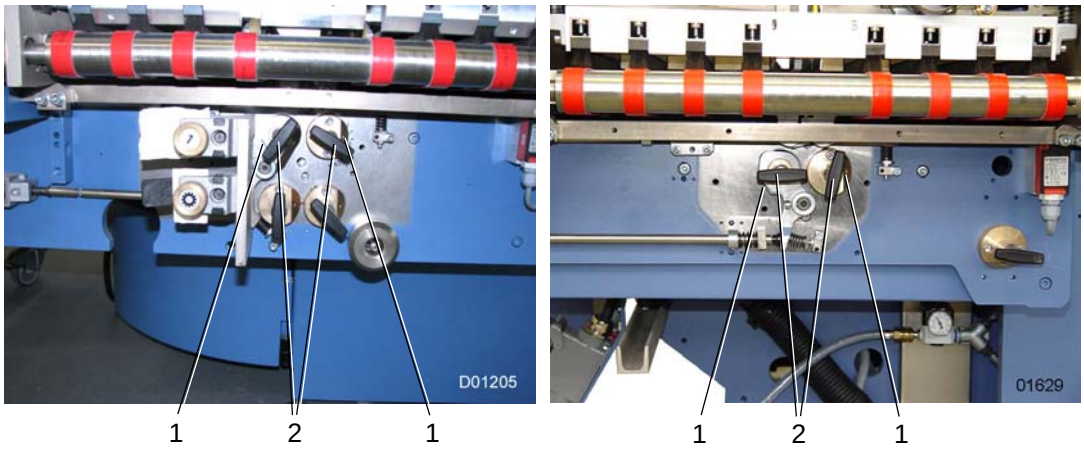
8.10.8 Installing/removing slitter shafts

WARNING!

Cutting hazard due to slitter shafts.

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

- Never reach into the slitter shafts while the machine is running.
- For all work with the slitter shafts, wear cut-proof safety gloves and safety shoes.
- The removal/installation of the slitter shafts may only be performed on an idle machine that has been safeguarded against being switched on again.
- Always hold the slitter shafts at the shaft and not at the tool.



1 Screws
2 Plug bearing

Illustration 156: Removing slitter shafts.

Procedure:

Removing slitter shafts:

▷ Pull out the threefold carriage.
See Chapter “8.10.5 Pulling out the threefold carriage”
▷ Remove the stripper that prevents removal.
▷ Loosen the screws (1) with the MBO ball Allen wrench SW4.
▷ Firmly hold the slitter shafts.
If necessary, seek the help of a second person.
▷ Pull out the plug bearings (2).
▷ Remove the slitter shafts.
✓ The slitter shafts are removed.

Installing the slitter shafts:

▷ Insert the slitter shafts in their original position.
▷ Insert the plug bearings (2) into the holes of the slitter shaft butt.

▷ Tighten the screws (1) using the MBO ball Allen wrench SW4.
While doing this, press the plug bearings (2) against the slitter shafts.
Axle play is thus avoided.
▷ Use all required strippers.
▷ Push in the threefold carriage.
▷ Fix the threefold carriage with the clamping lever.
✓ The slitter shafts are installed.

8.10.9 Setting the KTLT buckle plate (standard)

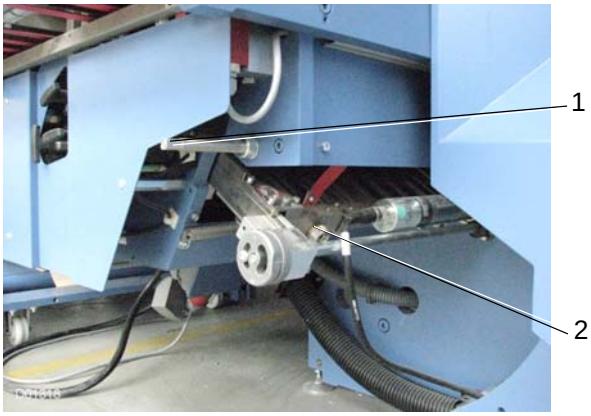
WARNING!

Pulling back/removing the buckle plates during operation.

The exposed, rotating foldrollers and slitter shafts make up hazardous infeed points.

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

- All adjustment and inspection work may only be performed on an idle machine that has been safeguarded against being switched on again.
- Press the EMERGENCY STOP palm button.
- You should only permit adjustment and inspection work to be performed by a single person.
- When turning the machine with the safety handwheel, there is also a hazard of pinching and injury!



1 Crank 2 Buckle plate

Illustration 157: Buckle plate to sheet deflector

Change from function "buckle plate" to "sheet deflector" or vice-versa.

Procedure:

▷ Pull out the buckle plate (2) with the crank (1).
▷ Fold down the attached sheet deflector.
▷ Push in the buckle plate (2) with the crank (1).

Adjusting the buckle plate:

▷ See Chapter “8.8.3 Buckle plate positions”

8.10.9.1 Combination buckle plate FTK

Settings, see Chapter “8.8.8 Setting the combination buckle plate FTK”.

8.10.10 Setting the KTLT buckle plate (automatic)

The folding length of the KTLT buckle plate is set automatically when a new folding imposition is selected.
See Chapter “8.5.5 Folding imposition selection”

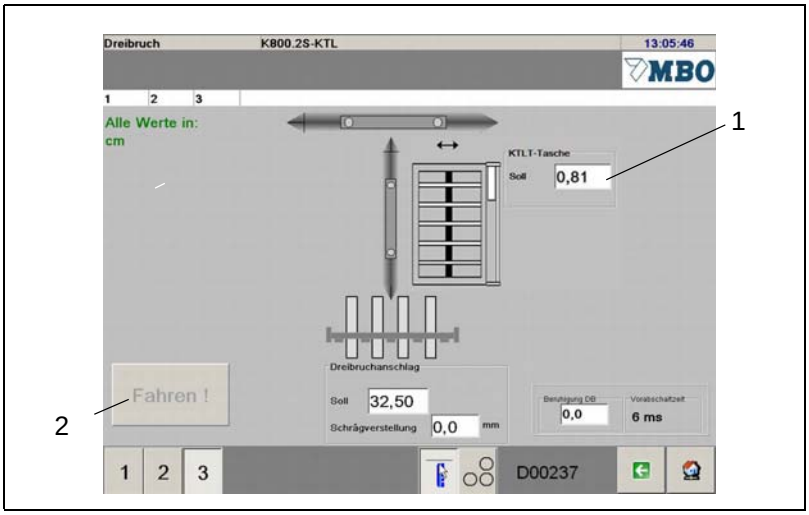


Illustration 158: Setting the buckle plate

Correcting the calculated folding length:

Procedure:

▷ Press the <KTLT buckle plate> field (1).
A numeric input field appears.
▷ Enter a new value for the folding length (1).
▷ Press the <Move> button (2).
✓ The buckle stop is repositioned.

8.10.10.1 Adjusting the angle of the sheet stop

See Chapter “8.8.6.4 Adjusting the lower plate lip”.

8.11 Adjusting the folding knife

8.11.1 Setting the height

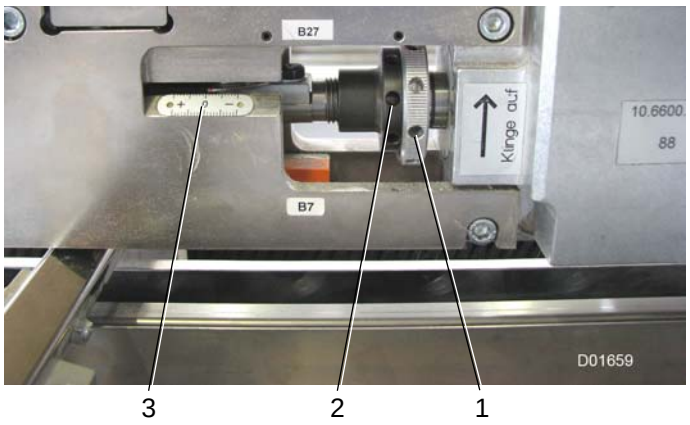
CAUTION!

Folding knife is set too low.

The folding knife can be pulled into the foldrollers.

Non-observance could result in property damage.

- When adjusting, make sure that the folding knife is not set too low.
- For an extreme cant adjustment, it may be necessary to set the folding knife a bit higher.



1 Setting wheel
2 Lock nut
3 Scale

Illustration 159: Height adjustment folding knife

Basic setting: Red marking must be on zero (3).

Height adjustment: ▷ Loosen the lock nuts (2) with the MBO ball Allen wrench SW4.

Setting the folding knife higher:
▷ Turn the adjusting wheel (1) counterclockwise.
▷ Loosen the lock nuts (2) with the MBO ball Allen wrench SW4.

Setting the folding knife lower:
▷ Turn the adjusting wheel (1) clockwise.
▷ Loosen the lock nuts (2) with the MBO ball Allen wrench SW4.

The sheet will not be taken over by the foldrollers.

The folding knife is placed too high.

▷ Request single sheet.
The sheet remains lying under the folding knife.
▷ Use the adjusting wheel (1) to set the folding knife half a turn lower.
▷ Trigger single stroke.
▷ Lower folding knife until the sheet is taken over by the foldrollers.
▷ Then set the folding knife another quarter-turn lower so that the folding sheet is taken over securely by the foldrollers.

8.11.2 Setting the incline angle

The inclination adjustment influences the irregular pulling-in of the sheets into the foldrollers as well as the following perforation, scoring or cutting.

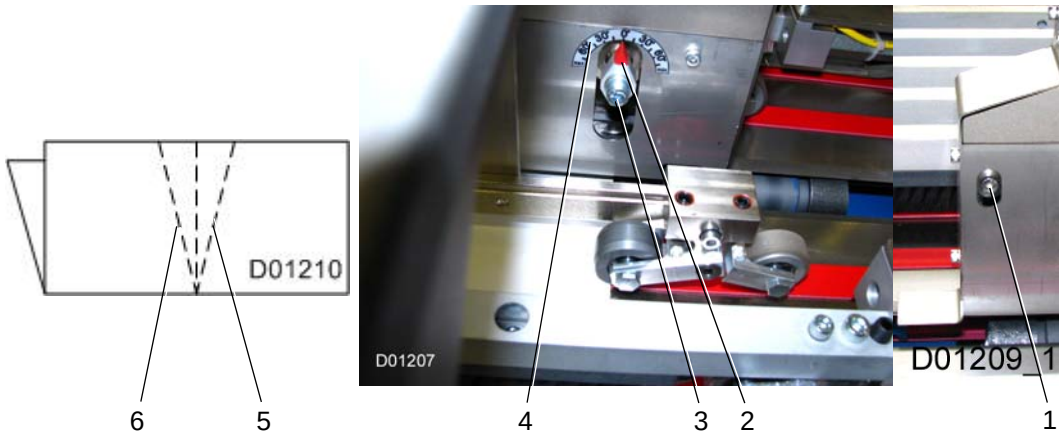
CAUTION!

Folding knife is set too low.

The folding knife can be pulled into the foldrollers.

Non-observance could result in property damage.

- When adjusting, make sure that the folding knife is not set too low.
- For an extreme cant adjustment, it may be necessary to set the folding knife a bit higher.



1 Screw	4 Scale
2 Eccentric	5 Perforation askew
3 Screw	6 Perforation askew

Illustration 160: Setting the folding knife incline angle.

Basic setting:
▷ The red point of the eccentrics (2) must be on zero.

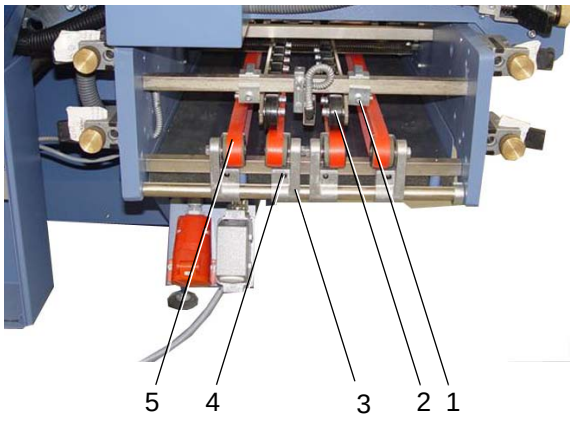
Setting the incline angle:
Procedure:
▷ Unscrew the screws (1) using the MBO ball Allen wrench SW4. (relieve tension of the toothed belt).
▷ Open the screw (3) with the MBO Allen wrench SW5
▷ Adjust the eccentric (2) by hand.
The scale (4) is an adjustment aid.

Skewed perforation (5):
The sheet moves forward at the stop side:
▷ Adjust the infeed tip of the folding knife lower by turning the eccentrics (2) to the left.

Skewed perforation (6):
The sheet runs after on the stop side (6):
▷ Adjust the infeed tip of the folding knife higher by turning the eccentrics (2) to the right.
▷ Fix the cam position (2).
▷ Tighten the screw (3) with the MBO Allen wrench SW5
▷ Tighten the screw (1) with the MBO ball Allen wrench SW4.

- In case of extreme inclination canting, it may be necessary to set the folding knife higher.
- An evenly-deep perforation is achieved fastest by pulling out the KTL bag on one side.

8.12 Adjusting the outfeed transport



1	Transport rolls	3	Screw
2	Transport belts	4	Support

Illustration 161: Adjusting outfeed transport.

Adjusting transport belts:

Procedure:

▷ Loosen the screws (4) with the MBO ball Allen wrench SW4.
▷ Position the supports (3) with transport belts (5) according to the paper format.
▷ Tighten the screws (4) with the MBO ball Allen wrench SW4.
✓ The transport belts have been adjusted.

Adjusting transport rolls:

Procedure:

▷ Loosen the screws (1).
▷ Position the transport rolls (2) over the transport belts according to the paper format.
▷ Tighten the screws (1).
✓ The transport rolls have been adjusted.

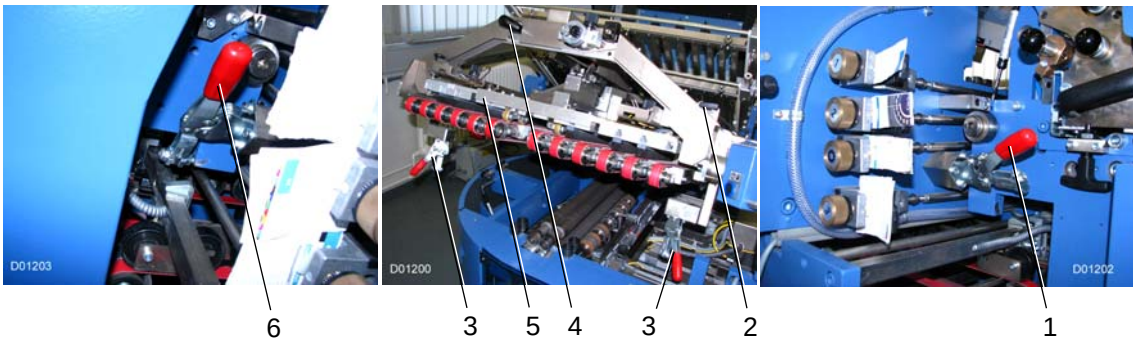
8.13 Turn the crossfold and threefold unit (model S-KTZ)

WARNING!

Independent lowering of the open crossfold table.

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

Check the pneumatic springs after each production / daily to ensure they are functioning properly.



1	Clamping lever <threefold left>	4	Handle
2	Safety bolt	5	Crossfold table
3	Clamping lever <Crossfold table>	6	Clamping lever <threefold right>

For certain fold types, it is necessary to turn the cross fold unit and threefold unit.

- Position <threefold unit left>.
- Position <threefold unit right>.

Opening fixing:

▷ Open the clamping lever (1).
(The clamping lever must be completely opened).

Opening the crossfold table:

▷ Open the clamping lever (3)
(The clamping lever must be opened completely.)
▷ Press the crossfold table (5) upwards using the handle (4).
▷ Make sure that the safety bolt (2) snaps in securely.

Turning the folding unit:

▷ Turn the folding unit slowly under the crossfold table (5) until the stop <threefold right>.

Fixing the folding unit:

▷ Close the clamping lever (6).
Position <threefold right> is thus fixed.

Closing the crossfold table:

▷ Secure the crossfold table (5) by pressing up the handle (4).
▷ Tighten the safety bolts (2).
▷ Close the crossfold table (5) using the handle (4).
▷ Close the clamping lever (3).
The crossfold table (5) is thus fixed in its working position.

The sheet deflector for the outfeed transport is switched automatically when the folding unit is turned.

8.14 Removing the paper jam

CAUTION!

Paper jam.

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

Non-observance could damage/destroy the drive belts.

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

Procedure:

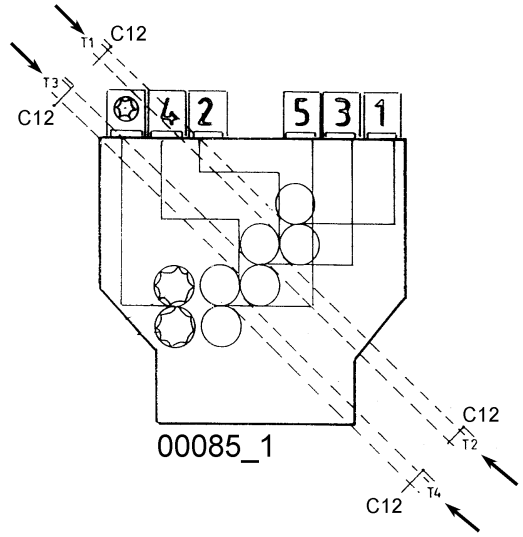
- ▷ Press the EMERGENCY STOP palm button.
- ▷ Try to determine the cause of the paper jam and eliminate it (to prevent other malfunctions downline).
- ▷ If necessary, remove any smoother bars, strippers etc. that get in the way.
- ▷ Carefully remove the jammed paper.
- ▷ Check that no torn-off pieces 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.
- ✓ The paper jam has been cleared.

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

8.15 Setting details for fold types (standard)

In this chapter you will find the most common fold types, subdivided in:

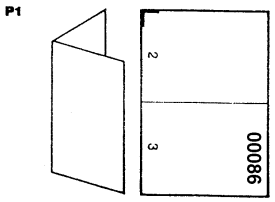
- Parallel fold
- Crossfold
- Threefold



1	Foldroller pair 1	4	Foldroller pair 4
2	Foldroller pair 2	5	Slitter shaft pair
3	Foldroller pair 3		

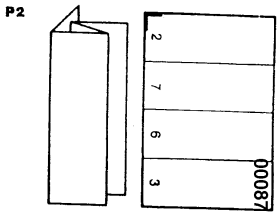
8.15.1 Parallel fold

P1	1 x parallel middle fold = 4 pages



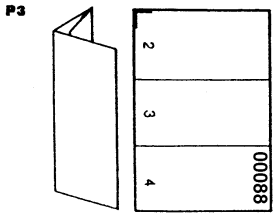
- ▷ Set roller pair 1 for simple paper thickness.
- ▷ Set roller pairs 2-5 for double paper thickness.
- ▷ Set the sheet stop at the 1st buckle plate to 1/2 of the sheet length.
- ▷ The buckle plates 2 to 4 are replaced by sheet deflectors (buckle plates are closed).

P2	2 x parallel middle folds = 8 pages



- ▷ Set roller pair 1 for simple paper thickness.
- ▷ Set roller pairs 2 for double paper thickness.
- ▷ Set roller pairs 3-5 for fourfold paper thickness.
- ▷ Set the sheet stop at the 1st buckle plate to 1/2 of the sheet length.
- ▷ Set the sheet stop at the 2nd buckle plate to 1/4 of the sheet length.
- ▷ The buckle plates 3 and 4 are replaced by sheet deflectors (buckle plates are closed).

P3	2 x parallel folds (letter fold) = 6 pages



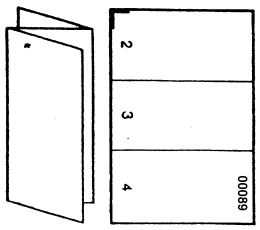
With two top buckle plates (T1 and T3)

- ▷ Set roller pair 1-3 for simple paper thickness.
- ▷ Set roller pairs 4-5 for threefold paper thickness.
- ▷ Set the sheet stop at the 1st and 3rd buckle plates to 1/3 of the sheet length.
- ▷ The buckle plates 2 and 4 are replaced by sheet deflectors (buckle plates are closed).

With one top (T1) and one bottom (T2) buckle plate:

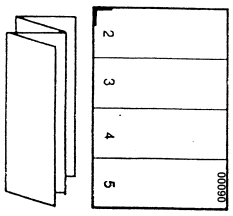
- ▷ Set roller pairs 1-2 for simple paper thickness.
- ▷ Set roller pairs 3-5 for threefold paper thickness.
- ▷ For the first buckle plate, set the sheet stop to 2/3 sheet length; for the second buckle plate, set to 1/3 sheet length.
- ▷ The buckle plates 3 and 4 are replaced by sheet deflectors (buckle plates are closed).

P4	2 x parallel folds (zigzag fold) = 6 pages



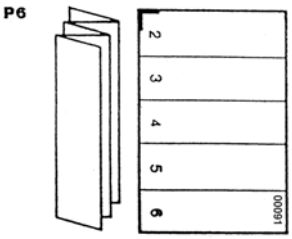
- ▷ Set roller pairs 1-2 for simple paper thickness.
- ▷ Set roller pairs 3-5 for threefold paper thickness.
- ▷ Set the sheet stop at the 1st and 2nd buckle plates to 1/3 of the sheet length.
- ▷ The buckle plates 3 and 4 are replaced by sheet deflectors (buckle plates are closed).

P5	3 x parallel folds (zigzag fold) = 8 pages



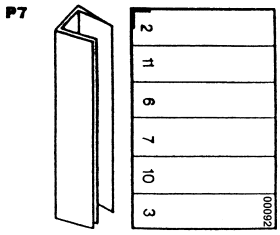
- ▷ Set roller pair 1 -3 for simple paper thickness.
- ▷ Set roller pairs 4-5 for fourfold paper thickness.
- ▷ Set the sheet stop for the 1st to 3rd buckle plates to 1/4 of the sheet length.
- ▷ Buckle plate 4 will be replaced by a sheet deflector (buckle plate closed).

P6	4 x parallel fold (zigzag fold) = 10 pages



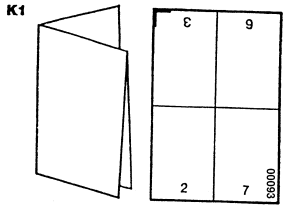
- ▷ Set roller pairs 1-4 for simple paper thickness.
- ▷ Set roller pair 5 for fivefold paper thickness.
- ▷ Set the sheet stop at the 1st to 4th buckle plates to 1/5 of the sheet length.

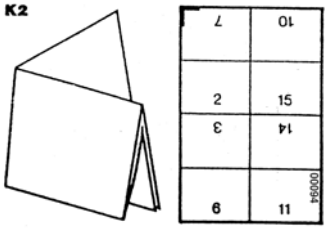
P7	3 x parallel fold (1 x parallel middle fold + 2 x letter fold) = 12 pages



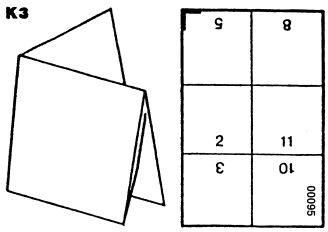
- ▷ Set roller pair 1 for simple paper thickness.
- ▷ Set roller pairs 2-4 for double paper thickness.
- ▷ Set roller pair 5 for sixfold paper thickness.
- ▷ Set the sheet stop of the 1st buckle plate to 1/2 of the sheet length.
- ▷ Set the sheet stop of the 2nd and 4th buckle plates to 1/6 of the sheet length.
- ▷ The 3rd buckle plate will be replaced by a sheet deflector (buckle plate closed).

8.15.2 Crossfold

K1	1 x parallel fold and 1 x crossfold = 8 pages
	**Parallel fold setting:** ▷ Set roller pair 1 for simple paper thickness. ▷ Set roller pairs 2-5 for double paper thickness. ▷ Set the sheet stop at the 1st buckle plate to 1/2 of the sheet length. ▷ The buckle plates 2 to 4 are replaced by sheet deflectors (buckle plates are closed). **Double join setting:** ▷ Set foldrollers 1 to 3 to four-fold paper thickness. ▷ Set the sheet stop at crossfold to 1/4 of the sheet length. ▷ Adjust the pile divider with transport rolls in vertical position at the rear edge of the sheet.

K2	2 x parallel middle folds and 1 x crossfold = 16 pages
	**Parallel fold setting:** ▷ Set roller pair 1 for simple paper thickness. ▷ Set roller pairs 2 for double paper thickness. ▷ Set roller pairs 3 -5 for fourfold paper thickness. ▷ Set the sheet stop at the 1st buckle plate to 1/2 of the sheet length. ▷ Set the sheet stop at the 2nd buckle plate to 1/4 of the sheet length. ▷ The buckle plates 3 and 4 are replaced by sheet deflectors (buckle plates are closed). **Double join setting:** ▷ Set foldrollers 1 to 3 and the slitter shaft to eight-fold paper thickness. ▷ Set the sheet stop at crossfold to 1/8 of the sheet length. ▷ Adjust the pile divider with transport rolls in vertical position at the rear edge of the sheet.

K3	2 x parallel fold (letter fold) and 1 x crossfold = 12 pages



Parallel fold setting with two top buckle plates (T1 and T3):

- ▷ Set roller pair 1 -3 for simple paper thickness.
- ▷ Set roller pairs 4 -5 for threefold paper thickness.
- ▷ Set the sheet stop at the 1st and 3rd buckle plates to 1/3 of the sheet length.
- ▷ The buckle plates 2 and 4 are replaced by sheet deflectors (buckle plates are closed).

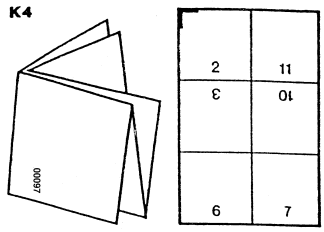
Parallel fold setting with one top (T1) and one bottom (T2) buckle plate:

- ▷ Set roller pairs 1-2 for simple paper thickness.
- ▷ Set roller pairs 3-5 for threefold paper thickness.
- ▷ Set the sheet stop at the 1st buckle plate to 2/3 of the sheet length.
- ▷ Set the sheet stop at the 2nd buckle plate to 1/3 of the sheet length.
- ▷ The buckle plates 3 and 4 are replaced by sheet deflectors (buckle plates are closed).

Double join setting:

- ▷ Set foldrollers 1-3 at crossfold to six-fold paper thickness.
- ▷ Set the sheet stop at crossfold to 1/6 of the sheet length.
- ▷ Adjust the pile divider with transport rolls in vertical position at the rear edge of the sheet.

K4	2 x parallel fold (zigzag fold) and 1 x crossfold = 12 pages



Parallel fold setting:

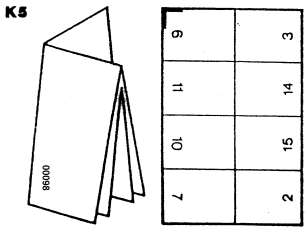
- ▷ Set roller pairs 1-2 for simple paper thickness.
- ▷ Set roller pairs 3-5 for threefold paper thickness.
- ▷ Set the sheet stop at the 1st and 2nd buckle plates to 1/3 of the sheet length.
- ▷ The buckle plates 3 and 4 are replaced by sheet deflectors (buckle plates are closed).

Double join setting:

- ▷ Set foldrollers 1-3 at crossfold to six-fold paper thickness.
- ▷ Set the sheet stop at crossfold to 1/6 of the sheet length.
- ▷ Adjust the pile divider with transport rolls in vertical position at the rear edge of the sheet.

8.15.3 Threefold

K5	**1 x parallel fold, 1 x crossfold and 1 x threefold = 16 pages**

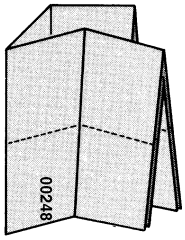


Parallel fold setting:
- ▷ Set roller pair 1 for simple paper thickness.
- ▷ Set roller pairs 2-5 for double paper thickness.
- ▷ Set the sheet stop at the 1st buckle plate to 1/2 of the sheet length.
- ▷ The buckle plates 2 to 4 are replaced by sheet deflectors (buckle plates are closed).

Double join setting:
- ▷ Set foldrollers 1 to 3 to four-fold paper thickness.
- ▷ Set the sheet stop of the buckle plate at crossfold to 1/2 of the sheet length.
- ▷ Adjust the pile divider with transport rolls in vertical position at the rear edge of the sheet.

Settings of threefold:
- ▷ Set threefold foldrollers 1 to 2 to eight-fold paper thickness.
- ▷ Set threefold stop to 1/4 (1/3) sheet width.
- ▷ The transport rolls shall be placed at the rear edge of the sheet.

K6	**1 x parallel fold, 1 x crossfold and 2 x threefold = 2 x 32 pages (two-up production), S-KTLT model**



Parallel fold setting:
- ▷ Set roller pair 1 for simple paper thickness.
- ▷ Set roller pairs 2-5 for double paper thickness.
- ▷ Set the sheet stop at the 1st buckle plate to 1/2 of the sheet length.
- ▷ Replace the buckle plates 2 to 4 by sheet deflectors (buckle plates are closed).

Double join setting:
- ▷ Set foldrollers 1 to 3 to four-fold paper thickness.
- ▷ Set the sheet stop of the buckle plate at crossfold to 1/2 of the sheet length.
- ▷ Adjust the pile divider with transport rolls in vertical position at the rear edge of the sheet.

threefold setting:
- ▷ Set roller pairs 1 and 2 for eightfold paper thickness.
- ▷ Set roller pair 3 and slitter shaft for sixteenfold paper thickness.
- ▷ Set threefold stop to 1/4 (1/3) sheet width.
- ▷ Set S-KTLT buckle plate to 1/8 sheet length.

8.16 Identification and handling of malfunctions

8.16.1 Continuous feeder

Failure	Cause	Rectification
Double sheet at the continuous feeder	Too much air in the pile, i.e.: sheets form a wave and are thus drawn back too far under suction belt. Suction belt can pull off two sheets.	• Reduce air. • Install fingers on baffle plate. • Reduce vacuum on the suction belt.
	Porous sheets or the air is too deep in the pile (as a result, the top sheets are pressed together again).	• Blow in fewer sheets. • Install fingers on baffle plate. • Set front blower higher. • Reduce vacuum on the suction belt.
	Sheets overrun the sensor finger.	• Set sensor finger higher. • Set transition plate lower. • Reduce vacuum on the suction belt.
	Retaining rolls and brushes wrongly positioned.	Position properly. The middle of the roller is the rear edge of the sheet.
Break in shingle	Too much air in the pile at inserting.	Press out air.
	The middle transport tape is too tight.	Relieve tension of tape by means of the knurled screw.
	Springs are too tight at the conveyor table.	Relieve tension by varying the springs; if necessary, release a spring.
	The infeed angle in front of the drum is too narrow.	Increase infeed angle by means of the adjustment screw.
Overstreaming	White transport tape is too loose.	Tension the tape by means of knurled screw.
	Lower table does not transport.	Re-tension the tapes by means of Allen wrench 6 (possibility to tension under the machine, above the pumps)
Formation of waves on lower table	Lower table does not transport.	Re-tension the tapes by means of Allen wrench 6 (possibility to tension under the machine, above the pumps)
	Conveyor table too loose.	Tension the springs by varying.
Dog-ears	Missing or wrong positioned Teflon tapes.	Apply Teflon tapes at the conveyor table (at sheet edges).

Table 31: Failure/cause/rectification at continuous feeder

8.16.2 Pile feeder/palletized feeder

Failure	Cause	Rectification
Double sheet at the flat pile/ palletized feeder	Pile stands too high.	Lower the capacitive sensor using the knurled screw on the side of the suction belt.
	Front air is switched on (causes the sheet to float).	Switch off frontal air.
	Suckers are set too low (suck through).	Increase suckers (approx. 2 mm above pile).
	Vacuum at VIVAS too strong.	Reduce vacuum (red screw, underneath of valve to the left).
	Pre-blower is set too low (air cushion breaks down).	Aerate stronger.
	Vaculift is in the wrong position (too far backwards).	Adjust Vaculift properly (pressure foot must stand approx. 8-9 mm on the sheet).
	Brushes are in the wrong position.	Place brushes approx. 2-3 mm above the pile and 5-6 mm in the pile.
	Sheets stick.	Aerate the pile (roll...)
	Sheet is aerated too strong from backside and is broken away from the sucker, plunges ahead.	Reduce air at separation blower.
Bad, stagnant feeding	Too less air at separation blowers at heavy, big sheets.	Blow harder (install possible lateral air supply).
	Smoother bar too deep, sheet is clamped.	Set smoother bars higher.
	Pile stands too deep.	Set capacitative sensor higher with knurled screw (pile approx. 3-4 mm below suction belt).
	Corners hang downwards, sheets are canted.	Straighten pile by means of wedges, or blow-up edges by means of lateral frontal aeration.
	Vacuum too low at VIVAS.	Increase vacuum (turn red screw to the right below valve).
	Vaculift is placed too far into the pile, the pressure foot pushes down the lifted sheet.	Adjust pressure foot properly (pressure foot must stand approx. 8-9 mm on the sheet).
	Brushes stand too high or not far enough into the pile, sheets can plunge away.	Brushes shall stand approx. 2-3 mm above the pile and 5-6 mm in the pile.
	Vaculift runs steadily up and down during machine running	Defective height control? Check basic settings.

Table 32: Failure/cause/rectification at flat pile feeder/palletized feeder

8.16.3 Register table

Failure	Cause	Rectification
First fold is skew.	Sheet forms a wave on the left or drifts with its rear edge from sidelay, sidelay is not angled.	Set sidelay to right angle.
	Sheet is pulled too strong into the sidelay, forms a wave, too much vacuum.	Reduce vacuum generally, knurled screw to the left.
	Sheet is pulled too strong into the sidelay, forms a wave, too much vacuum.	Reduce vacuum by means of sliding bar at infeed
	Sheet tips over to the right, too less vacuum at infeed.	Increase vacuum by means of sliding bar.
	Sheet stutters on sidelay at the transfer and tips over to the right, generally too less vacuum.	Increase vacuum, turn knurled screw to the right.

Table 33: Error/cause/rectification on the register table

8.16.4 Parallel fold

Failure	Cause	Rectification
First fold is skew.	Foldrollers do not have a parallel tension.	Adjust foldrollers evenly. Thick products: strong tension Thin products: weak tension
	Sheet stop is not angled	Adjust the buckle stop in the right angle; caution: check the neutral position of the adjusting wheel by completely turning down the stop, and fine-tune if necessary.
	The lower plate lip is skew or too deep. The sheet is thus stopped.	Straightening out. Sensible: start with the neutral position.
	Inner width is too narrow on one side, sheet is stopped	Enlarge evenly.
	Sheet edge runs inside the u-shaped bar and gets hooked in there.	Move the buckle plates laterally until edge of sheet is recognizable.
Skewed or unsteady perforations, scores, cutting	Too much vacuum or too many heavy balls/conical rollers on the sidelay.	Use less vacuum or lighter balls; Adjust conical rollers looser.
	Infeed sidelay is not angled.	Set infeed sidelay to the right angle.
	Too little vacuum or ball/cone rolling too easy, sheet runs away from the rail.	Increase the vacuum or use heavier balls/conical rollers.
	A lower buckle plate/ or sheet deflector is not properly positioned in the folding space.	Position and clamp the buckle plate/ sheet deflector properly.

Table 34: Failure/cause/rectification at parallel fold

8.16.5 Double fold in the first fold

Failure	Cause	Rectification
Double fold in the first fold	After the crossfold: round, plate-like fold	Pretension plate in the previous machine. Reinforcement bar on the bottom (lower lip).
	After the letter fold	• Open foldrollers at exit • Use hold-down springs in buckle plate 3.
		• Lower lip deeper in the folding space, thus there is an excessive fold that functions as a sheet deflector. (Only works at a distance of approx. 3-8 mm before the fold). • Use hold-down springs in buckle plate 3.
		• Fold downward, e.g. in buckle plate 2+4. open foldrollers at exit, set more underneath • Use hold-down springs in buckle plate 3.
	At open gatefold	• open foldrollers at exit, set more underneath • Use hold-down springs in buckle plate 3.
		Fold downward, e.g. in buckle plate 2+4. Open foldrollers at exit, set more underneath
	With a closed gatefold (option)	Do not use gatefold plate yet. Let the sheet fall to the floor. If double fold appears, set foldrollers 4 or 6 looser. Use hold-down springs in buckle plate 3 and/or 5.
		Use now gatefold plate. If double fold appears again, open foldrollers at exit up to 12 paper thicknesses.

Table 35: Failure/cause/rectification at first fold

8.16.6 Edges/dog ears at letter fold and gatefold

Failure	Cause	Rectification
Edges/dog ears at letter fold, gate-fold	Letter fold: Corners of the incoming sheet hang down.	• Upwardly pre-bend the sheet. • Use hold-down springs in buckle plate 3. • Turn sheet and fold downwards, e.g. in buckle plates 2+4. • Open foldrollers at exit, up to 6 paper thicknesses. • Use hold-down springs in buckle plate 3.
	Inner width in buckle plate 3 is too big	• Set the inner width more narrowly. • Use hold-down springs in buckle plate 3.
		• Upwardly pre-bend the sheet. • Use hold-down springs in buckle plate 3. • Turn sheet over and fold downwards, e.g. in buckle plates 2 + 4. • Open foldrollers at exit, up to 6 paper thicknesses. • Use hold-down springs in buckle plate 3.

Table 36: Error/cause/rectification at letter fold and gatefold

9 Maintenance

9.1 Introduction

For the maintenance of the machine, also observe:

- The safety instructions.
  See Chapter “9.1.2 Safety instructions”.
- Safety and protective devices
  See Chapter “4.5.9 Checking safety and protective devices”.
- The intended use.
  See Chapter “2.1 Intended use”.
- Qualification of the maintenance personnel.
  See Chapter “9.1.1 Qualification of personnel”.

9.1.1 Qualification of personnel

This table lists the necessary qualifications of 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 37: Qualification of personnel
Legend: X permitted, - not permitted

9.1.2 Safety instructions

DANGER!

Hazardous voltage.

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

- Work may only be carried out on the machine's electrical systems by a qualified electrician.
- Observe the local occupational safety regulations and electrotechnical regulations.
- On the supply terminals and on the terminals of the main switch, there is dangerous electric voltage even when the main switch is switched off. (See wiring diagram)
- On the frequency inverter connection bars, there is dangerous residual voltage even when the main switch is switched off. (Heed condenser discharge time (KEB 5 min, Telemecanique 15 min))

DANGER!

Dismantling, bridging or bypassing of safety and protective devices.

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

- None of the machine's safety and protective devices may be dismantled, bridged or bypassed.
- Using the checklist for protective equipment and protective 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 plant.

WARNING!

Improper maintenance.

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

- Cleaning works may only be performed by trained and authorized personnel.
- Observe the local occupational safety regulations and electrotechnical regulations.
- Observe the maintenance, lubrication, and cleaning plan.

WARNING!

Crush injuries during cleaning works.

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

Cleaning works must be carried out by one person only.

WARNING!

Operation without protective covers.

Non-observance could result in serious personal 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.

WARNING!

Moving machine parts during maintenance and cleaning work.

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

- Maintenance and cleaning work must be carried out by one person only.
- Turn the main switch to the position <0>.
- Use a padlock to secure the main switch from unintentionally switching on again.
- Make absolutely sure that before the machine is switched back on, all persons are in the secured area.

WARNING!

Unsuitable maintenance tool.

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

- You should only use tools that are in perfect condition.
- Make sure that after adjustment or maintenance works, 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.

CAUTION!

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

Non-observance could result in damage to property.

All indicated maintenance, greasing and cleaning intervals are designed for a one-shift operation.

Convert the indicated intervals for multi-shift operation accordingly.

9.2 Service

WARNING!

Using of unauthorized safety components.

Non-observance could result in serious personal injury.

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

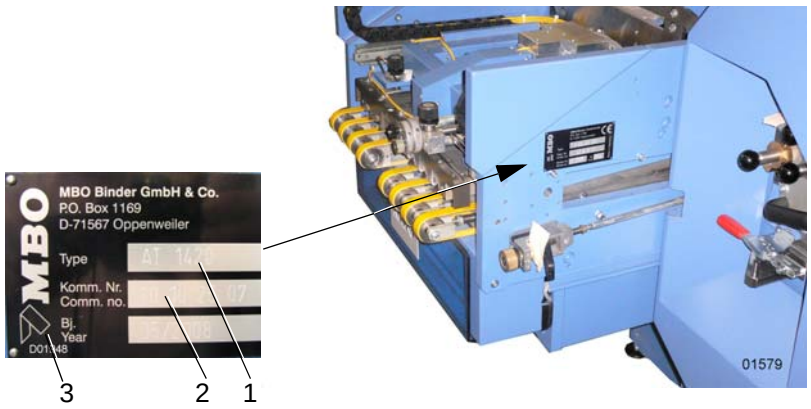
9.2.1 Ordering spare and wear parts

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.



1 Machine type
2 Commission no.
3 Label

Illustration 162: Label

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

- Commission no.
- Machine type

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

9.3 Operational maintenance

WARNING!

Moving machine parts during operational maintenance.

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

Operational maintenance works must be carried out only:

- By trained and authorized personnel.
- By one person.

- Turn the main switch to the position <0>.
- Use a padlock to secure the main switch from unintentionally switching on again.
- Make absolutely sure that before the machine is switched back on, all persons are in the secured area.

CAUTION!

Improper cleaning.

Non-observance could result in damage to property.

- Clean the machine after each job (at least once per week).
- Especially clean dirt (paper dust, printing powder, etc.) from moving parts.
- Do not use any aggressive chemical cleaning agents.
- Never clean the machine using compressed air (bearing damage).

9.3.1 Checking safety and protective devices

WARNING!

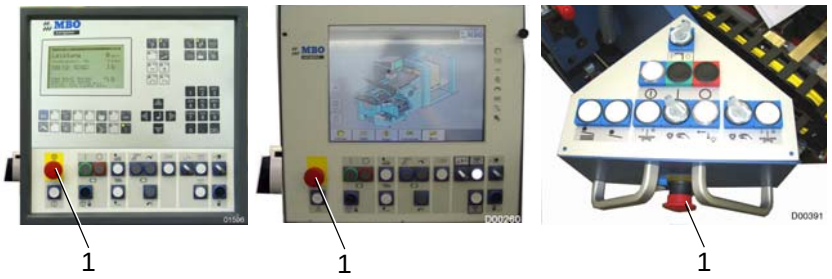
Incorrectly-set of safety switches.

Non-observance could result in serious injury or death.

- Make sure that the specifications for the respective gap are adhered to.
- If a gap is too large, it must be readjusted by MBO Service or authorized customer service.
- Never dismantle, bridge or bypass safety switches.

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

9.3.1.1 Checking the EMERGENCY STOP palm button



1 EMERGENCY STOP palm button

Illustration 163: EMERGENCY STOP palm button

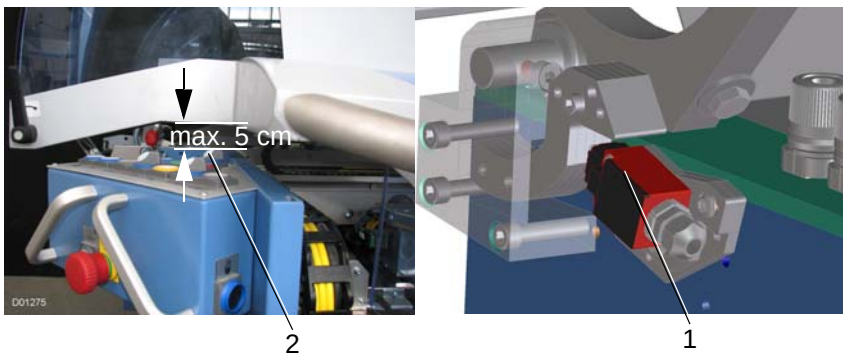
To prevent immediate or potential hazards, the machine is equipped with an EMERGENCY STOP shut-off device.
After the <EMERGENCY STOP> palm button is pressed, all electrical drives are switched off.
EMERGENCY STOP does not disconnect the machine from the electrical supply.

Procedure:

1) Start the machine.
2) 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.
3) Press the <Machine start> button.
   The machine may not start up.
4) Disengage the EMERGENCY STOP palm button after the inspection is completed.

✓ EMERGENCY STOP palm button has been tested.

9.3.1.2 Check noise damping and safety hood



1 Safety switch 2 Gap max. 5 cm

Illustration 164: Gap noise damping and safety hood

Check the correct functioning of the safety switch.

Procedure:

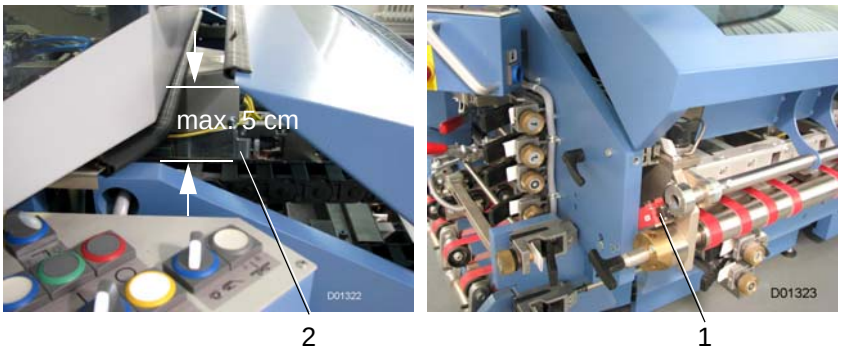
▷ Slowly close the noise damping and safety hood.

✓ The safety switch must, after reaching a gap of maximum 5 cm, switch on safely.

- If the safe switching on/off of the safety switch is not ensured, the safety switch must be reset.
- For safety reasons, the safety switch must be adjusted by MBO Service or an authorized customer service agent.

See also Chapter“4.5.10 Checklists for safety and protective devices”

9.3.1.3 Check the safety hood above threefold



1	Safety switch	2	Gap max. 5 cm

Illustration 165: Gap safety hood, model SKTZ

Check the correct functioning of the safety switch (1).

Procedure:

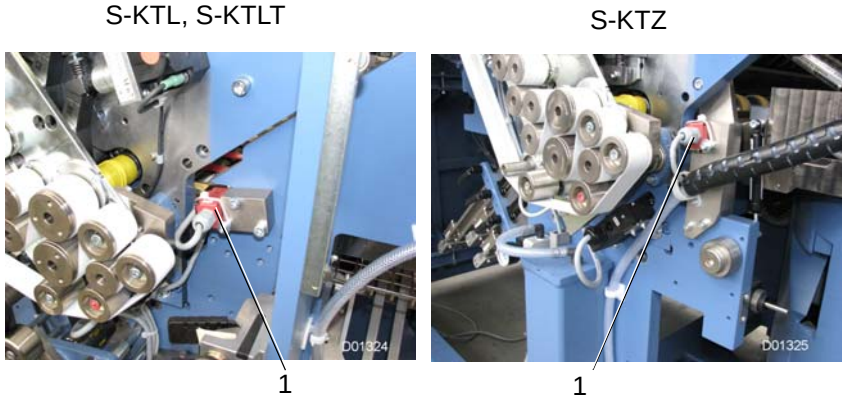
▷ Close the safety hood slowly.

✓ The safety switch (1) must, after reaching a gap of maximum 5 cm, switch on safely.

- If the safe switching on/off of the safety switch is not ensured, the safety switch must be reset.
- For safety reasons, the safety switch must be adjusted by MBO Service or an authorized customer service agent.

See also Chapter “4.5.10 Checklists for safety and protective devices”.

9.3.1.4 Check crossfold table



1 Safety switch

Illustration 166: Safety switch, crossfold

Check the correct functioning of the safety switch (1).

Procedure:

▷ Lift the crossfold table slowly.

✓ The safety switch (1) must switch off safely shortly after lifting.

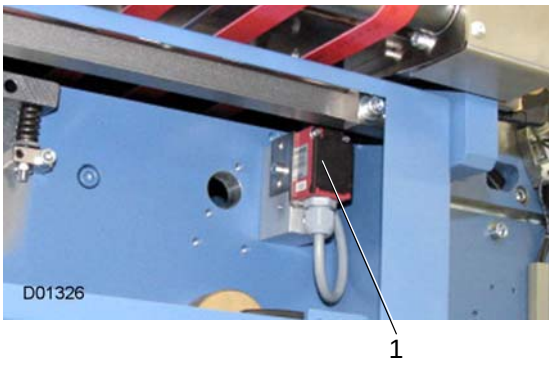
▷ Close the crossfold table slowly.

✓ The safety switch (1) must switch on safely shortly before the lower end position is reached.

- If the safe switching on/off of the safety switch is not ensured, the safety switch must be reset.
- For safety reasons, the safety switch must be adjusted by MBO Service or an authorized customer service agent.

See also Chapter “4.5.10 Checklists for safety and protective devices”.

9.3.1.5 Check threefold carriage



1 Safety switch

Illustration 167: Safety switch, threefold

Check the correct functioning of the safety switch (1).

Procedure:

▷ Pull the threefold carriage out slowly.

✓ The safety switch (1) must, after approx. 3 cm, switch off safely.

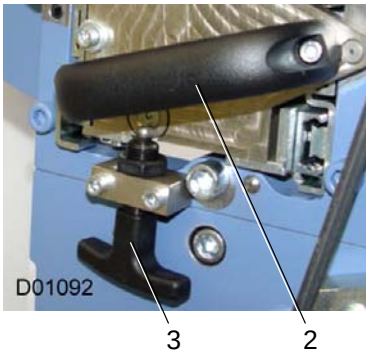
▷ Push the threefold carriage in slowly.

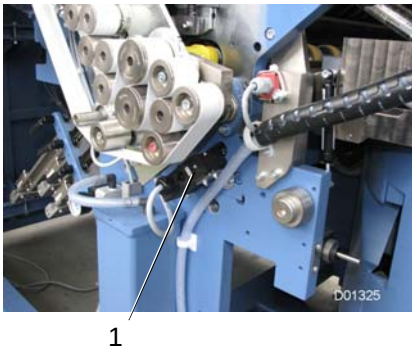
✓ The safety switch (1) must switch on safely shortly before reaching the end position.

- If the safe switching on/off of the safety switch is not ensured, the safety switch must be reset.
- For safety reasons, the safety switch must be adjusted by MBO Service or an authorized customer service agent.

See also Chapter “4.5.10 Checklists for safety and protective devices”.

9.3.1.6 Checking the slitter shaft cassette.





1 Safety switch
2 Handle
3 Notch lever

Illustration 168: Safety switch slitter shaft cassette

The safety switch of the slitter shaft cassette is equipped with an interlock. this means that the slitter shaft cassette cannot be opened during running of the machine.
For safety reasons, the correct functioning of the safety switch (1) must be checked daily.

Procedure:

Checking interlock function:

▷ Start the machine.
▷ Unlock the notch lever (3).
▷ Try to pull out the slitter shaft cassette by using the handle (2).
✓ The slitter shaft cassette must not be pulled out during ru.nning of the machine

Checking switch off function:

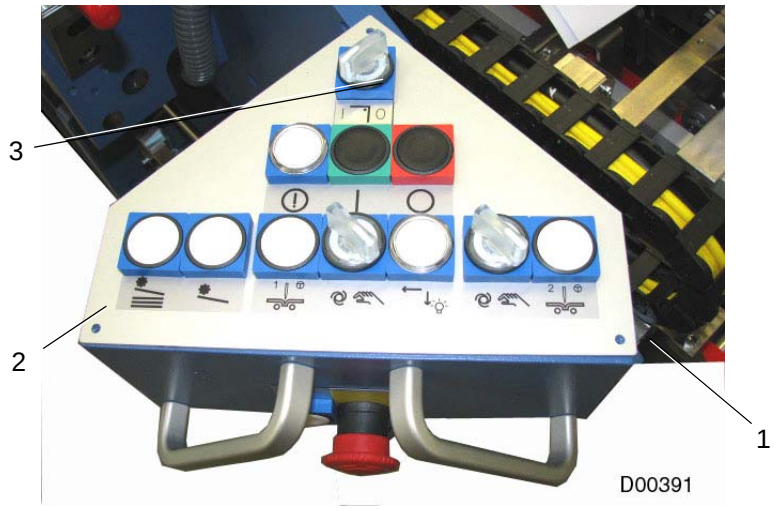
▷ Stop the machine.
▷ Unlock the notch lever (3).
▷ Pull out the slitter shaft cassette by using the handle (2).
✓ The machine must not be started when the slitter shaft cassette is pulled out.

Checking switch on function:

▷ Push the slitter shaft cassette in slowly.
▷ The slitter shaft cassette must snap in safely.
▷ The notch lever (3) must snap in safely.
✓ The machine may only be started if the slitter shaft cassette is snapped in correctly.

- If the safety function of the safety switch is not ensured, the safety switch must be set-up new or replaced.
- For safety reasons, this must be done by MBO Service or an authorized customer service agent.

9.3.1.7 Check inching mode and two-hand operation function



1 Pushbutton <Two-hand operation>
2 Pushbutton <Inching mode>
3 Illuminated selecting switch <Set-up mode with open protective device>
Position 0 = Set-up mode OFF
Position 1 = Set-up mode ON.

Illustration 169: Check inching mode and two-hand operation

Checking inching mode:

Procedure:

▷ Set the illuminated selecting switch (3) to position 0.
▷ Open the noise damping and safety hood.
▷ Press the <Inching mode> pushbutton (2).
The machine rotates with:
S-KTL and S-KTLT approx. 20 m/min
S-KTZ approx. 5 m/min.

Checking two-hand operation:

Procedure:

▷ Set the illuminated selecting switch (3) to position 1.
▷ Open the noise damping and safety hood.
▷ Press the <Inching mode> pushbutton (2).
✓ The machine rotates with:
S-KTL and S-KTLT approx. 20 m/min
S-KTZ approx. 5 m/min.
▷ Press the <Two-hand operation> pushbutton (1).
✓ The machine turns at production speed now.

If the function does not match the description, have it checked by MBO Service or an authorized customer service agent.

9.3.1.8 Check protective coverings

WARNING!

Operation without protective covers.

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

The protective covers protect against danger spots.

- Operation of the machine without protective covers is forbidden.
- Make sure that all protective covers are reattached after maintenance or repair work.

Procedure:

▷ Check to ensure that all protective coverings are present and properly mounted.

For positions of the protective covers, see Chapter “4.5.10 Checklists for safety and protective devices”.

9.3.2 Cleaning of the machine

WARNING!

Moving machine parts during operational maintenance.

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

- Work at or on the machine must be carried out by trained and authorized personnel only.
- De-energize the machine and secure it against being switched on again by a third party:
- Observe the local occupational safety regulations and electrotechnical regulations.

CAUTION!

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).

CAUTION!

Lifting heavy machine parts (buckle plates, slitter shafts, etc.)

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

Seek the assistance of other persons when lifting heavy machine parts, such as buckle plates, slitter shafts, etc.

CAUTION!

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.

CAUTION!

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.

9.3.2.1 Cleaning agent recommendation

Surfaces and hollow spaces:	Suck up or sweep out
For deposits that adhere to finished surfaces:	Solvent-free cleansing agent
Roller cleaning:	MBO Binder GmbH & Co. KG recommends the cleanser from "Varn“ with the designation: “VMM 111 or VWM Wash.“ "Varn" supplies the print industry around the world. Therefore, it cannot be ruled out that in different countries others names are used. Thus, consult the technical data sheets from the manufacturer "Varn" for the respective order number.

Be sure to follow the manufacturer's safety instructions.

9.3.2.2 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.

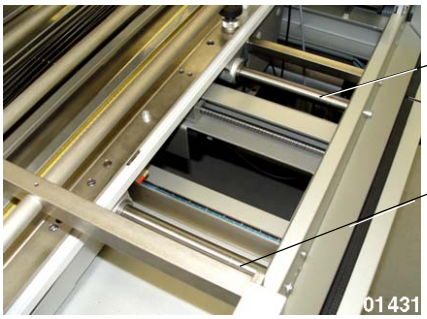
Heavy contamination can impair the functioning of the machine.

Procedure:

▷ Suck up the dirt.
▷ Use a paint brush for hard-to-reach areas.
▷ Wipe down the surfaces using a dry cloth.
▷ Do not use any aggressive chemical detergents or cleaning agents.
✓ The machine is clean.

- 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. (Could cause bearing damage)

9.3.2.3 Clean the guide shafts on the register table



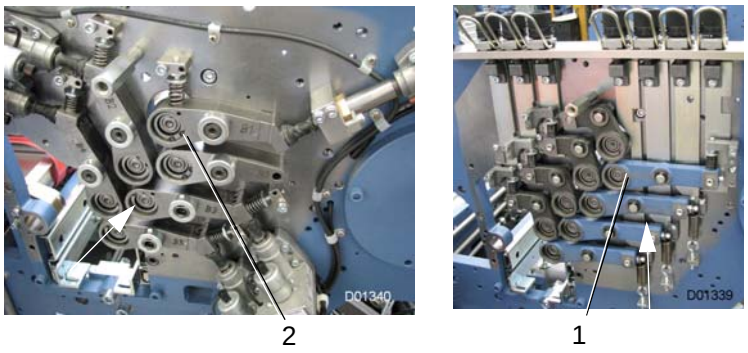
1 Drive shaft
2 Guide bars

Illustration 170: Cleaning the register table

Clean the drive shaft (1) and guide bars (2) weekly to prevent paper dust and printing powder accumulation.

- Never clean the machine using compressed air (bearing damage).
- Use only paint brushes and a vacuum cleaner.
- The shafts and guide bars may not be greased.

9.3.2.4 Cleaning swivelling lever and side frames



1 Standard swivelling lever
2 Automatic swivelling lever

Illustration 171: Cleaning swivelling lever and side frames.

Clean the swivelling levers and the respective side frame gaps of paper dust and printing powder on a monthly basis.

- Never clean the machine using compressed air. (Could cause bearing damage)
- Use only paint brushes and a vacuum cleaner.

9.3.2.5 Cleaning foldrollers

CAUTION!

False usage of cleaning agents.

Non-observance could result in personal injuries.

- Avoid skin contact.
- Wear suitable safety gloves.
- Wear safety glasses.
- Contact your cleaning agent manufacturer to find out about any residual danger regarding skin-tolerance.

CAUTION!

Used cleaning cloth.

Non-observance could result in personal injuries and 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.

CAUTION!

Unsuitable cleaning agents.

Non-observance could result in damage to property.

Use the roller cleaning agent "Varn-Wash VM 111" or "VWM" only.

CAUTION!

Incorrectly cleaning of the spiral foldrollers.

Non-observance could result in damage to property.

Be absolutely certain to observe the special cleaning instructions for the spiral foldrollers.

CAUTION!

Incorrectly cleaning of the high-grip foldrollers.

Non-observance could result in damage to property.

Be absolutely certain to observe the special cleaning instructions for the high-grip foldrollers.

- Deposits of printing powder and/or printing ink on the foldrollers can lead to quality degradation of the folded material.
- Clean the foldrollers weekly and as needed.

Spiral foldrollers

Procedure:

1) Turn the main switch to the position <0>.
   Use a padlock to secure the main switch from unintentionally switching on again.
2) To clean the foldrollers, only use the roller cleaning agent "Varn-Wash VM 111" or "VWM“.
3) Use only linen cloths as cleaning cloths.
4) Moisten the linen cloth using the roller cleaning agent.
   Never soak foldrollers with the roller cleaning agent.
   Penetrating roller cleaning agent can destroy the bearings.
5) Using a linen cloth, remove the deposits on the foldrollers.
   Apply only a little pressure when rubbing.
6) Rub the foldrollers dry with a linen cloth.
7) Remove the padlock on the main switch.
   Ensure that all persons are in the secured area.
   Turn the main switch to the position <1>.

✓ Spiral foldrollers have been cleaned.

High-grip foldrollers

· High-grip foldrollers have an open-pored surface.
If small particles or divergent printing ink or printing powder penetrate this surface during cleaning, these can then harden and the high-grip foldrollers become unusable.

Procedure:

1) Turn the main switch to the position <0>.
   Use a padlock to secure the main switch from unintentionally switching on again.
2) To clean the high-grip foldrollers, only use the roller cleaning agent "Varn-Wash VM 111" or "VWM“.
3) Use only linen cloths as cleaning cloths.
4) Moisten the linen cloth using the roller cleaning agent.
   Never soak the high-grip foldrollers with the roller cleaning agent.
   Penetrating roller cleaning agent can destroy the bearings.
5) Using a linen cloth, remove the deposits on the high-grip foldrollers.
   Exert only slight pressure.
6) Remove the padlock on the main switch.
   Ensure that all persons are in the secured area.
   Turn the main switch to the position <1>.
7) Start the folding machine and set the speed to the maximum value.
8) The centrifugal force produced will fling the partially dissolved ink and powder particles as well as absorbed roller soap from the roller surface covering.
9) Stop the folding machine.
   Turn the main switch to the position <0>.
   Use a padlock to secure the main switch from unintentionally switching on again.
10) Rub the high-grip foldrollers dry with a linen cloth. Exert only slight pressure.
11) Remove the ink and powder particles thus flung out from the machine.
12) Remove the padlock on the main switch.
    Ensure that all persons are in the secured area.
    Turn the main switch to the position <1>.

✓ The high-grip foldrollers are clean.

9.3.2.6 Cleaning the buckle plates

CAUTION!

Lifting heavy machine parts.

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

Seek the assistance of other persons when lifting heavy machine parts, such as buckle plates, slitter shafts, etc.

Clean the buckle plates at least once per week.

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

Heavy contamination can impair the functioning of the machine.

Procedure:

▷ Remove the buckle plates.
▷ Vacuum them with a vacuum cleaner.
▷ Put the buckle plates back in place.
✓ The buckle plates are clean.

9.3.2.7 Clean the spindles and guide shafts of the RAPIDSET drives.

Paper dust and printing powder significantly influence the function of the spindle and guide shafts.
Clean the spindles and guide shafts weekly.

- Use only paint brushes and a vacuum cleaner for this.
- The shafts and guide bars may not be greased.

9.3.2.8 Cleaning the optical sensors

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

They must therefore be cleaned away after each job (daily).

Procedure

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

9.3.2.9 Cleaning the sensors in the folding knife

The optical sensors in the folding knives get dirty during production due to paper dust and printing powder. This can impair their function.

They must therefore be cleaned away after each job (daily).

Procedure

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

✓ The sensors are clean.

9.3.2.10 Cleaning the slitter shaft cassette

Paper dust and printing powder influence the function of the slitter shaft cassette significantly.

Clean and grease the slitter shaft cassette monthly.

Procedure:

1) Clean the slitter shaft cassette with a paint brush.
2) Vacuum out the paper dust with an industrial vacuum cleaner.
3) Parts that require particular attention are:
   telescopic rails – all travel guides,
   roller adjustment elements,
   index bolts,
   barrel bolts and bushings
4) Clean the telescopic rails with a degreaser.
5) Rub the telescopic rails dry with a linen cloth.
6) Lubricate the travel surfaces of the telescopic rails lightly with a resin-free grease.

✓ The slitter shaft cassette is clean.

Under no circumstances should you use silicone spray or WD40. Otherwise, the residue could bond with the accumulating paper dust to form a sticky, tough substance.

9.3.2.11 Cleaning threefold carriage guide shafts

Paper dust and printing powder influence the function of the guide shafts significantly.
Clean and grease the guide shafts monthly.

Procedure:

1) Vacuum out the paper dust with an industrial vacuum cleaner.
2) Clean the telescopic rails with a degreaser.
3) Rub the telescopic rails dry with a linen cloth.
4) Lubricate the travel surfaces of the telescopic rails lightly with a resin-free grease.

✓ The guide shafts are clean.

Under no circumstances should you use silicone spray or WD40. Otherwise, the residue could bond with the accumulating paper dust to form a sticky, tough substance.

9.3.2.12 Cleaning the crossfold folding knife guide shafts

Paper dust and printing powder influence the function of the guide shafts significantly.
Clean the guide shafts monthly.

Procedure:

1) Vacuum out the paper dust with an industrial vacuum cleaner.
2) Rub the guide shafts dry with a linen cloth.

✓ The guide shafts are clean.

9.3.3 Cleaning/renewing the pressure vacuum pump air filters

See also the separate pressure vacuum pump operating manual.

9.3.3.1 Continuous feeder

CAUTION!

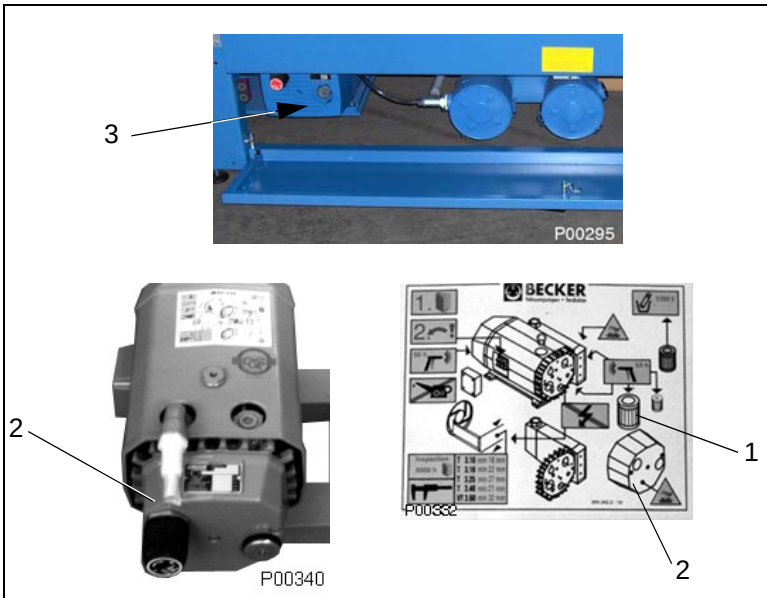
Penetration of foreign substances.

Non-observance could result in property damage.

- Switch off the pressure vacuum pumps for maintenance works.
- Do not start up the pressure vacuum pumps without filter cartridges.
- Replace stopped-up or damaged filter cartridges.

To guarantee full output capacity the filter cartridges must be cleaned after every 50 hours of operation, and replaced annually. For this, the message <Pump maintenance> appears on the TOUCHSCREEN.
Change the filters every six months.

Vacuum pump



1 Filter
2 Cover
3 Vacuum pump

Illustration 172: Vacuum pump filter

To ensure the best performance, the filter cartridge must be checked and cleaned every 50 operating hours.

Cleaning the filters:

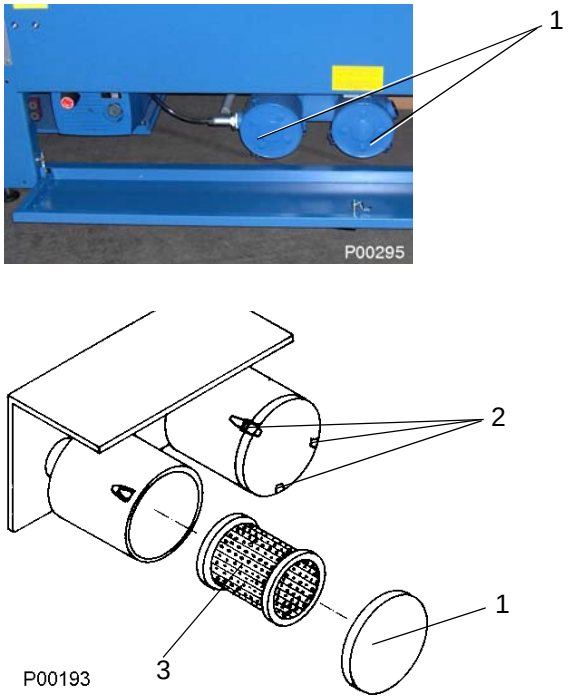
Procedure:

▷ Remove the cover (2).
▷ Remove the filter cartridge (1).
▷ Remove the coarsest dust with a paint brush.
▷ Remove the remaining dust by blowing it out with compressed air from the inside to the outside.
▷ Replace the cover (2).

▷ Confirm the maintenance on the display.
See Chapter “9.3.3.3 Confirm the cleaning of the filter/maintenance at the display”

Replacing the filters: ▷ Replace the filter cartridges (1) every six months.

Compressed air pump



1	Cover	3	Filter cartridges
2	Clips		

Illustration 173: Compressed air pump filter

To ensure the best performance, the filter cartridges must be checked and cleaned every 50 operating hours.

Cleaning the filters: Procedure:

▷ Open the clips (2).
▷ Remove the cover (1).
▷ Remove both filter cartridges (3).
▷ Remove the coarsest dust with a paint brush.
▷ Remove the remaining dust by blowing it out with compressed air from the inside to the outside.
▷ Insert the filter cartridges (3).
▷ Replace the cover (1).
▷ Close the clips (2).
▷ Confirm the maintenance on the display.
See Chapter “9.3.3.3 Confirm the cleaning of the filter/maintenance at the display”

Replacing the filters: ▷ Replace the filter cartridges (3) every six months.

9.3.3.2 Pile feeder and palletized feeder

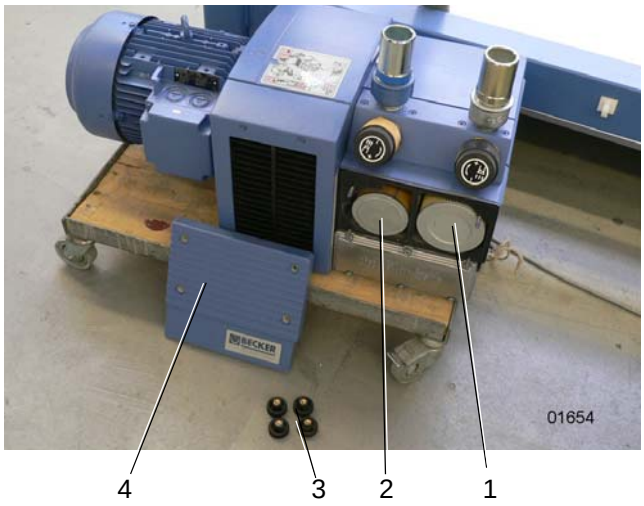
To guarantee full output capacity the filter cartridges must be cleaned after every 50 hours of operation, and replaced annually. For this, the message <Pump maintenance> appears on the TOUCHSCREEN.
Change the filters every six months.

CAUTION!

Penetration of foreign substances.

Non-observance could result in property damage.

- Switch off the pressure vacuum pump for maintenance works.
- Do not start up the pressure vacuum pump without a filter cartridge.
- Replace stopped-up or damaged filter cartridges.



1	Vacuum air filter	3	Knurled nuts
2	Blast air filter	4	Cover

Illustration 174: Pressure vacuum pump filter

Cleaning the filters:

Procedure:

▷ Loosen and remove the knurled nuts (3).
▷ Remove the cover (4).
▷ Remove the filter cartridges (1) and(2).
▷ Remove the coarsest dust with a paint brush.
▷ Remove the remaining dust by blowing it out with compressed air from the inside to the outside.
▷ Replace the filter cartridges (1) and(2).
▷ Replace the cover (2).
▷ Tighten the knurled nuts (3) again.
▷ Confirm the maintenance on the display.
See Chapter “9.3.3.3 Confirm the cleaning of the filter/maintenance at the display”

Replacing the filters:

▷ Replace the filter cartridges (3) every six months.

9.3.3.3 Confirm the cleaning of the filter/maintenance at the display

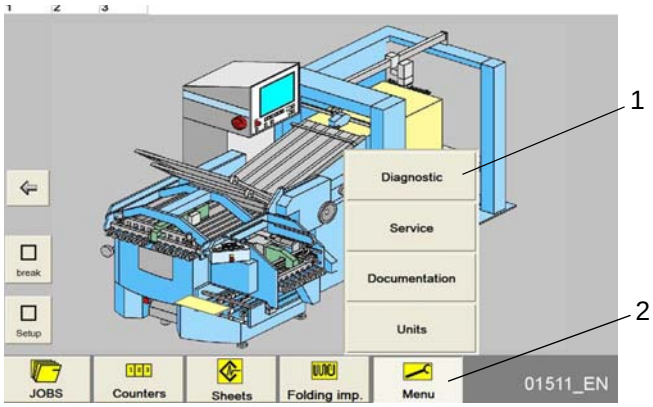
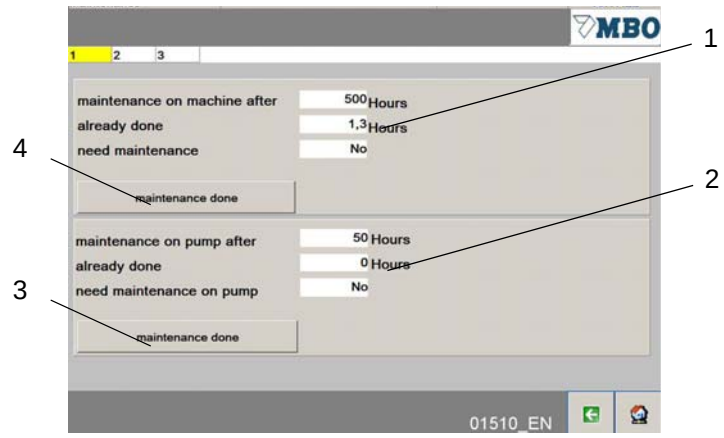


Illustration 175: Call up the <Maintenance> menu.

How to confirm the maintenance of the machine/pump:

▷ Press the <Menu> button (2) in the main menu.
▷ Press the <Diagnostics> button (1).
▷ In the <Diagnostics> menu, press the <Maintenance> button.



1 Machine operating hours.
2 Pump operating hours.
3 <Confirm maintenance> button for the pump.
4 <Confirm maintenance> button for the machine.

Illustration 176: Confirming maintenance.

Confirming maintenance of the pump:

▷ Press the <Maintenance completed> button (3).
The hour indicator in field (2) is set to zero.
✓ Maintenance is confirmed.

Confirming maintenance of the machine:

▷ Press the <Maintenance completed> button (4).
The hour indicator in field (1) is set to zero.
✓ Maintenance is confirmed.

9.4 Maintenance

9.4.1 Checking the register table

9.4.1.1 Checking the suction belt drive belt

- Check the drive belt monthly for its running properties, tension, condition, and contamination.
- If it is no longer possible to adjust centered running or achieve the necessary tension or if the general condition of the belt is poor, it must be replaced.

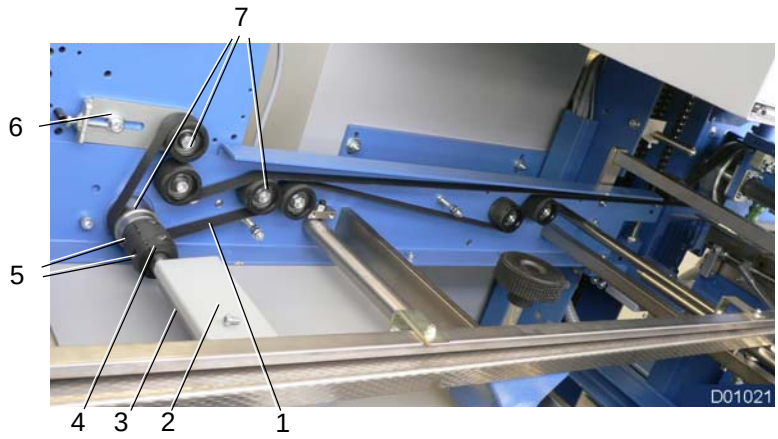


Illustration 177: Drive belt for suction belt

Procedure:

Removing the guard:
▷ Remove the guards from the drive belt and the handwheel shaft (3)

Centering the belt:
▷ The centering occurs automatically thanks to the crowned tape rollers (6).

Tensioning the belt:
▷ Tighten the drive belt (1) with the tension lever (7).

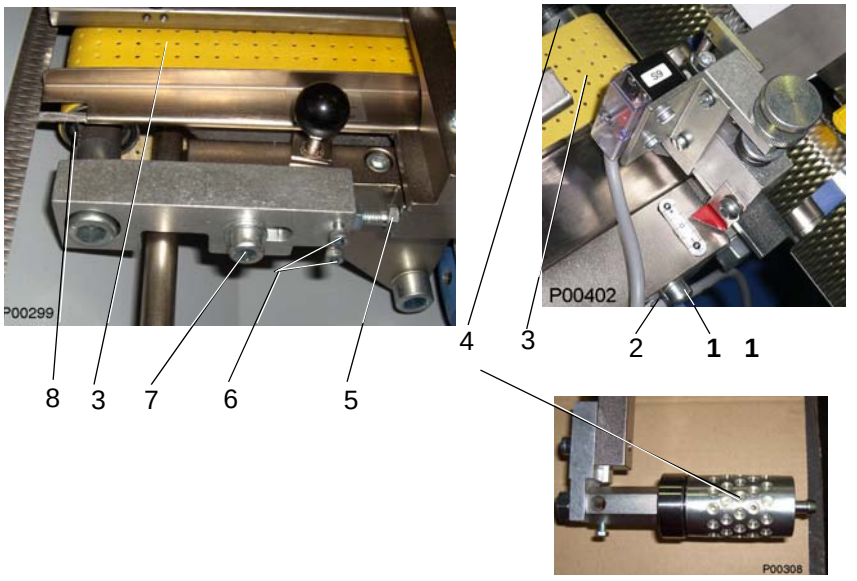
Replacing the belt:
1) Relieve the tension of the drive belt (1) with the tension lever (7).
2) Loosen both screws (5) at the coupling (4).
3) Move the coupling (4) in the direction of the operator side.
4) Thread out the drive belt (1).
5) Insert the new drive belt (1).
6) Place the coupling (4) in its position.
7) Fix the coupling (4) with the screws (5).
8) Tighten the drive belt (1) with the tension lever (7).
9) Check the centric running of the belt.

✓ The drive belt has been renewed.

Attaching the guard:
▷ Mount the guards on the drive belt and the handwheel shaft (3)

9.4.1.2 Check the alignment belt

- Check the drive belt monthly for its running properties, tension, condition, and contamination.
- If it is no longer possible to adjust centered running or achieve the necessary tension or if the general condition of the belt is poor, it must be replaced.



1	Screw	6	Screws
2	Screw	7	Screw
3	Alignment belt	8	Roller
4	Suction roller		
5	Screw with lock nut		

Illustration 178: Adjusting the alignment belt.

Procedure:

Adjusting the alignment belt on the roller (8):

▷ Loosen the screw (7).
▷ Set the position of the alignment belt (3) with the screws (6) so that it runs with a distance of approx. 2-3 mm to the left edge of the roller (8). The punched tapes on the alignment belt (3) must match the punched tapes on the sidelay.
▷ Tighten the screw (7).
▷ Check the position of the alignment belt again and readjust it if necessary.
✓ The alignment belt has been adjusted.

Adjusting the alignment belt on the suction roller (4):

▷ Loosen the screw (7).
▷ Adjust the position of the alignment belt with the screw (2) so that the punched tapes on the alignment belt (3) matches the punched tapes on the suction roller.
▷ Tighten the screw (1).

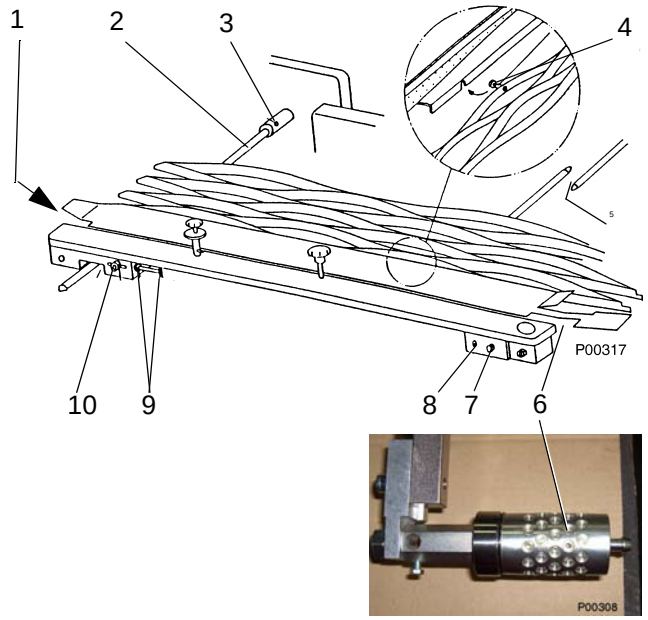
▷ Check the position of the alignment belt again and readjust it if necessary.

✓ The alignment belt has been adjusted.

Checking the vacuum suction roller:

▷ Switch the pressure vacuum pump on.
▷ Use a paper strip to check whether there is vacuum on the suction roller (4).
▷ If necessary, correct the position of the punched tapes on the alignment belt (3) with respect to the holes on the suction roller (4).

✓ The vacuum has been checked.



1	Alignment belt	6	Suction roller
2	Rod	7	Screw
3	Screw	8	Screw
4	Position to take off its hinges	9	Screw with lock nut
5	Rod	10	Screw

Illustration 179: Replacing the alignment belt.

Procedure:

Removing the alignment belt:

▷ Loosen the screw (10)
▷ Relax the tension on the alignment belt (1) by loosening the screw (9).
▷ Unhook the lattice from the hooking points (4).
▷ Loosen the screw (3).
▷ Remove the rod (2).
▷ Remove the old alignment belt (1).

✓ The alignment belt has been taken out.

Installing the alignment belt:

▷ Insert the new alignment belt.
▷ Insert the rod (2).
▷ Tighten the screw (3).

▷ Hook the lattice into the hooking points (4).
▷ Lay the alignment belt (1) on the suction disc (6) so that the punched tapes lie over the holes on the suction disc.
▷ Tension the alignment belt (1) by tightening the screws (9).
▷ Adjust the alignment belt (1).
✓ The alignment belt is installed.

9.4.2 Checking the parallel fold

9.4.2.1 Removing/attaching the guard over the drive

WARNING!

Operation without protective covers.

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

The protective covers protect against hazard spots:

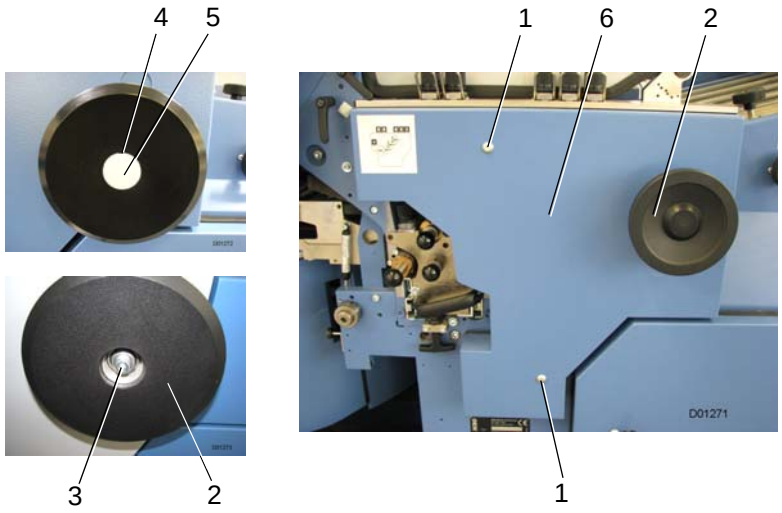
- Never operate the machine without protective covers.
- Note that after maintenance or repair work, all protective covers have to be reinstalled.

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.



1	Screws	4	Gap
2	Handwheel	5	End cover
3	Screw	6	Guard

Illustration 180: Removing the guards

Removing the guard:

Procedure:

1) Insert the flat-head screwdriver in the gap (4).
2) Remove the end cover (5) on the handwheel (2).
3) Pull the handwheel towards you and, at the same time, loosen the screw (3) with an inside spanner SW6.
4) Pull the handwheel (2) from the handwheel shaft.
5) Remove the key and keep it somewhere safe.
6) Remove the screws (1).
   The positions of the retaining screws are dependent on the model.
7) Remove the guard (6).

✓ The guard is removed.

Attaching the guard:

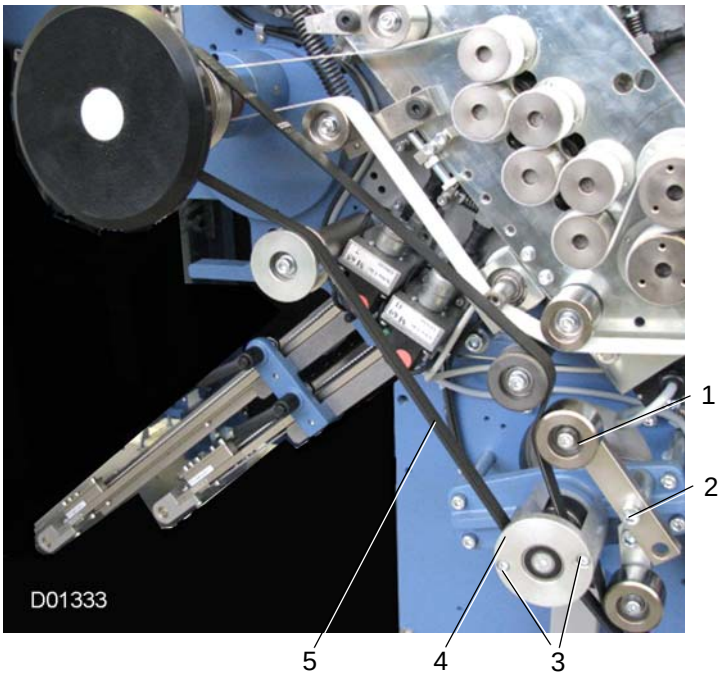
Procedure:

1) Insert the guard (5).
2) Fasten the guard (5) with the screws (1).
   The positions of the retaining screws are dependent on the model.
3) Insert the key.
4) Put the handwheel (2) on the handwheel shaft.
   Make sure that the key is seated properly.
5) Pull the handwheel towards you and, at the same time, tighten the screw (2) with an inside spanner SW6.
6) Replace the end cover (5) on the handwheel (2).

✓ The guard is attached.

9.4.2.2 Checking the drive belt, S-KTL and S-KTLT models

- Check the drive belt monthly for its running properties, tension, condition, and contamination.
- If it is no longer possible to adjust centered running or achieve the necessary tension or if the general condition of the belt is poor, it must be replaced.



1	Tension roller	4	Flange
2	Screw	5	Poly-V belt
3	Screws		

Illustration 181: Replacing the drive belt

Procedure:

Tensioning the belt:

▷ Tension the Poly-V belt (5) with the tensioning roller (1) and tighten the screw (2).

Replacing the belt:

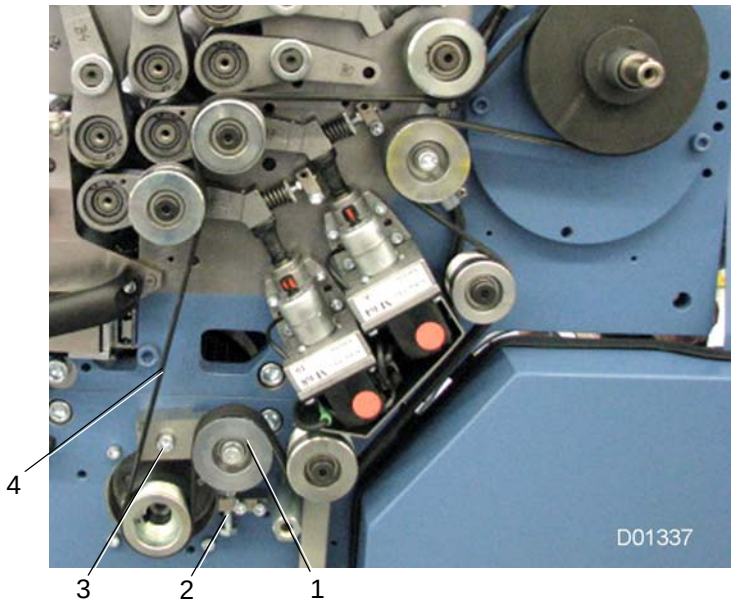
Procedure:

1) Loosen the screw (2) of the tensioning roller (1).
   The tension on the Poly-V belt (5) is relaxed.
2) Loosen the screws (3) and remove the flange (4).
3) Remove the old Poly-V belt (5).
4) Insert the new Poly-V belt (5).
5) Insert the flange (4) and fasten it with the screws (3).
6) Tension the Poly-V belt (5) with the tensioning roller (1) and tighten the screw (2).

✓ Belt has been replaced.

9.4.2.3 Checking the drive belt, model S-KTZ

- Check the drive belt monthly for its running properties, tension, condition, and contamination.
- If it is no longer possible to adjust centered running or achieve the necessary tension or if the general condition of the belt is poor, it must be replaced.



1	Tension roller	3	Screw
2	Adjustment screw	4	Poly-V belt

Illustration 182: Replacing the drive belt.

Procedure:

Tensioning the belt:

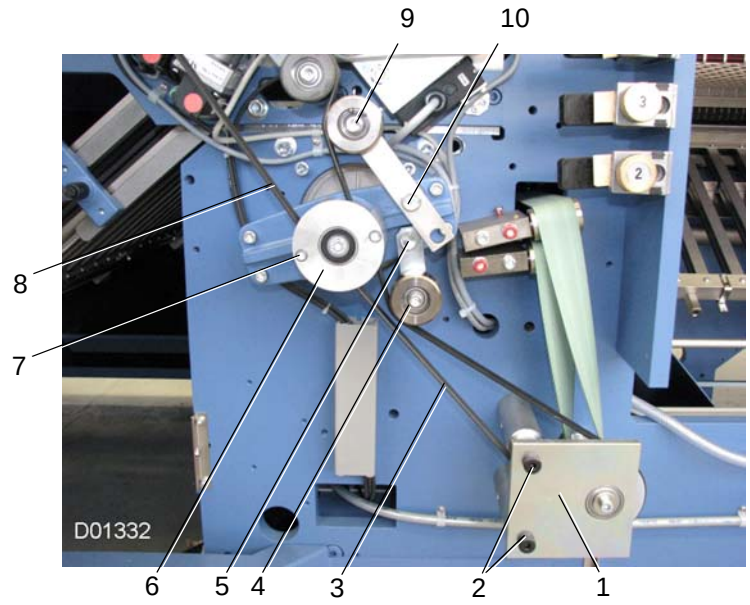
- ▷ Loosen the screw (3) of the tensioning roller (1).
- ▷ Loosen the lock nut at the adjustment screw (2).
- ▷ Tension the Poly-V belt (4) by tightening the adjustment screw (2).
- ▷ Tighten the lock nut at the adjustment screw (2).
- ▷ Tighten the screw (3) of the tensioning roller (1).
- ✓ The belt is tensioned.

Replacing the belt:

- ▷ Loosen the screw (3) of the tensioning roller (1).
- ▷ Loosen the lock nut at the adjustment screw (2).
- ▷ Unscrew the adjustment screw (2) until the Poly-V belt (4) is loose.
- ▷ Remove the old Poly-V belt (4).
- ▷ Insert the new Poly-V belt (4).
- ▷ Tension the Poly-V belt (4) by tightening the adjustment screw (2).
- ▷ Tighten the lock nut at the adjustment screw (2).
- ▷ Tighten the screw (3) of the tensioning roller (1).
- ✓ The belt is replaced.

9.4.2.4 Checking the drive belt for the K area, S-KTL and S-KTLT models.

- Check the drive belt monthly for its running properties, tension, condition, and contamination.
- If it is no longer possible to adjust centered running or achieve the necessary tension or if the general condition of the belt is poor, it must be replaced.



1	Flange	6	Flange
2	Screws	7	Screws
3	Poly-V belt	8	Poly-V belt
4	Tension roller	9	Tension roller
5	Screw	10	Screw

Illustration 183: Replacing the drive belt for the K area.

Procedure:

Tensioning the belt:

▷ Loosen the screw (5) of the tensioning roller (4).
The tension on the Poly-V belt (3) is relaxed.
▷ Tension the Poly-V belt (3) with the tensioning roller (4) and tighten the screw (5).
✓ The belt is tensioned.

Replacing the belt:

▷ Loosen the screw (10) of the tensioning roller (9).
The tension on the Poly-V belt (8) is relaxed.
▷ Loosen the screw (5) of the tensioning roller (4).
The tension on the Poly-V belt (3) is relaxed.
▷ Loosen the screws (7) and remove the flange (6).
▷ Loosen the screws (2) and swivel the flange (1) downwards.
▷ Remove the old Poly-V belt (3).
▷ Insert the new Poly-V belt (3).
▷ Swivel the flange (1) upwards and fasten it with the screws (2).

▷ Insert the flange (6) and fasten it with the screws (7).
▷ Tension the Poly-V belt (3) with the tensioning roller (4) and tighten the screw (5).
▷ Tension the Poly-V belt (8) with the tensioning roller (9) and tighten the screw (10).
✓ Belt has been replaced.

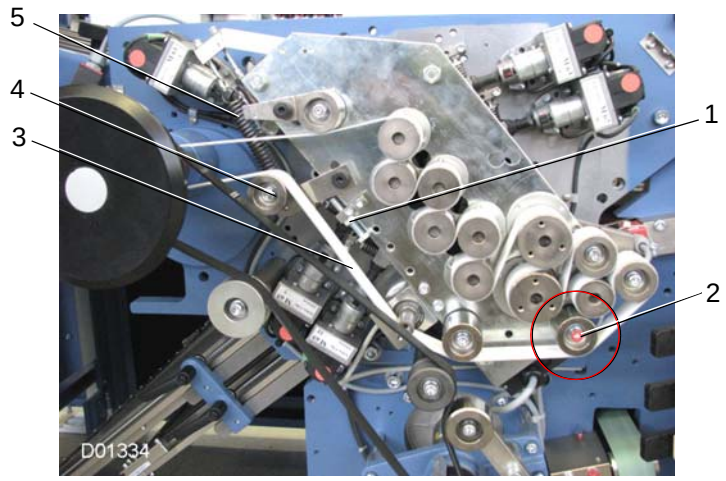
9.4.2.5 Checking the drive belt of the foldrollers

- Check the drive belt monthly for its running properties, tension, condition, and contamination.
- If it is no longer possible to adjust centered running or achieve the necessary tension or if the general condition of the belt is poor, it must be replaced.

MBO recommends having MBO Service or an authorized customer service agent change the drive belt.

To replace the drive belt for the foldrollers, the following steps are required:

- Remove the guard and handwheel.
  See Chapter “9.4.2.1 Removing/attaching the guard over the drive”
- Relax the tension on the belt of the main drive.
  See Chapter “9.4.2.2 Checking the drive belt, S-KTL and S-KTLT models”
- Replace the drive belt for foldrollers.
- Tension the belt of the main drive.
  See Chapter “9.4.2.2 Checking the drive belt, S-KTL and S-KTLT models”
- Attach the guard and handwheel.
  See Chapter “9.4.2.1 Removing/attaching the guard over the drive”



1	Adjustment screw	4	Tension roller
2	Adjustment roller	5	Springs
3	Drive belt		

Illustration 184: Replacing the drive belts in the K area.

Tensioning the drive belt:

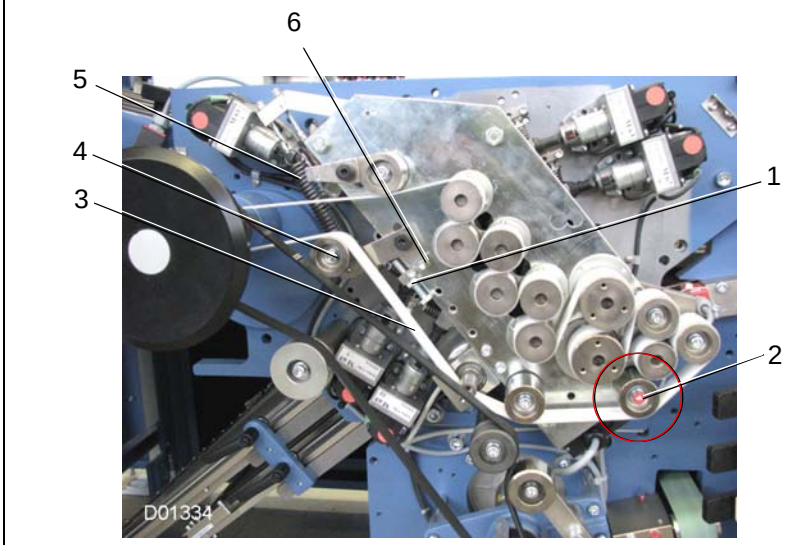
Procedure:

1) Loosen the lock nut at the adjustment screw (1).
2) Unscrew the adjustment screw (1) a little bit.
3) Turn the adjustment screw (1) a little bit by hand until it lies on the tension lever with slight pressure.
4) Turn the adjustment screw (1) using a fork wrench size 10 one more turn inwards.
5) Counter the adjustment screw (1).

✓ The drive belt is tensioned.

- Check the belt tensioning monthly.
  Turn the machine through by hand.
  Here, the foldrollers may not be stopped by hand.
- The center rollers on the drive belt have red markings on them.

Replacing the drive belt:



1	Adjustment screw	4	Tension roller
2	Adjustment roller	5	Springs
3	Drive belt	6	Support

Illustration 185: Replacing the drive belt.

CAUTION!

High spring tension.

Non-observance could result in personal injury.

The belt tension device is under high spring tension.

- Wear safety gloves when replacing.
- When replacing the drive belt, call another person to help you.

CAUTION!

Material break.

Non-observance could result in damage to property.

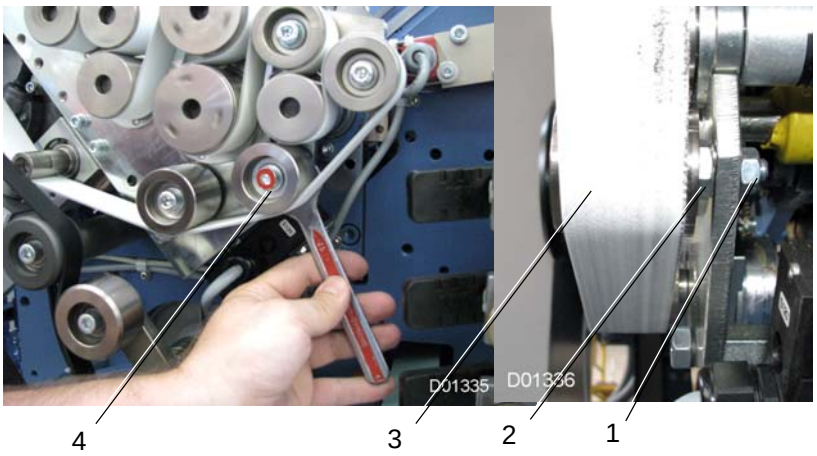
Never pull the drive belt over edges during installation!

Procedure:

1) Loosen the lock nut at the adjustment screw (1).
2) Unscrew the adjustment screw (1) a little bit.
3) Remove the support (6) with the adjustment screw (1).
4) Relax the tension of the drive belt by pressing the tensioning roller (4) downward.
5) Use a cropped ring spanner for this or a pipe bowl wrench size 13.
6) Note the belt course and remove the old drive belt (3).
7) Insert the new drive belt (3) according to the belt course.
8) Turn the handwheel until the belt runs centrically on all tape rollers.
9) Attach the support (6) with the adjustment screw (1).
10) Tighten the adjustment screw (1) a little bit by hand until it lies on the tension lever with slight pressure.
11) Turn the adjustment screw using a fork wrench size 10 one more turn inwards.
12) Counter the adjustment screw (1).
13) Adjust the centric running of the drive belt (3).

✓ The drive belt is tensioned.

Adjusting the centric running:



1	Nut	3	Drive belt
2	Eccentric	4	Adjustment roller

Illustration 186: Adjusting the drive belt of the foldrollers.

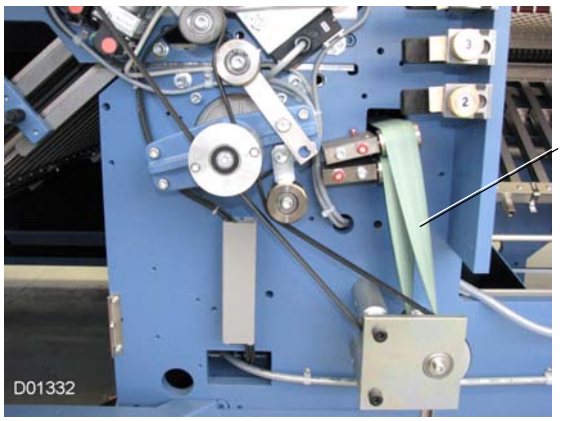
The adjustment roller for the drive belt is marked with red.

▷ Loosen the nuts (1) at the adjustment roller (4).
▷ Adjust the centric running of the drive belt (3) by turning the eccentric (2).
Use a flat fork wrench size 17 for this.
▷ Retighten the nut (1).

✓ The belt running path has been centered.

9.4.2.6 Checking the drive belt for foldrollers in the crossfold and threefold unit

- Check the drive belt monthly for its running properties, tension, condition, and contamination.
- If it is no longer possible to adjust centered running or achieve the necessary tension or if the general condition of the belt is poor, it must be replaced.



1 Drive belt for foldrollers in the crossfold and threefold unit

Illustration 187: Drive belt for foldrollers in the crossfold and threefold unit

Only have the drive belt replaced by MBO Service or by an authorized customer service agent.

9.4.2.7 Checking the drive belt crossfold, model S-KTZ.

- Check the drive belt monthly for its running properties, tension, condition, and contamination.
- If it is no longer possible to adjust centered running or achieve the necessary tension or if the general condition of the belt is poor, it must be replaced.

MBO recommends having MBO Service or an authorized customer service agent change the drive belt.

CAUTION!

High spring tension.

Non-observance could result in personal injury.

The belt tension device is under high spring tension.

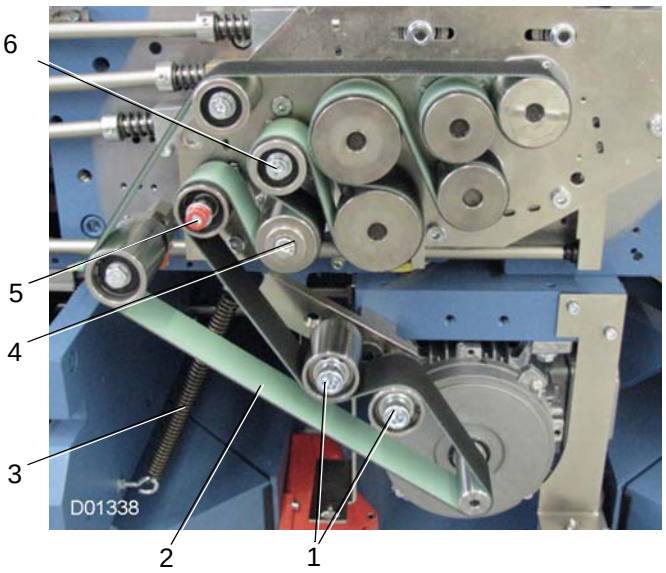
- Wear safety gloves when replacing.
- When replacing the drive belt, call another person to help you.

CAUTION!

Material break.

Non-observance could result in damage to property.

Never pull the drive belt over edges during installation!



1	Tensioning rollers	4	Band length adjustment roller
2	Drive belt	5	Adjustment roller
3	Spring	6	Band length adjustment roller

Illustration 188: Replacing the drive belt crossfold.

Procedure:

Removing the guard:

▷ Remove the guard over the drive.

Tensioning the drive belt:

▷ The drive belt is tensions using a self-tensioning device.

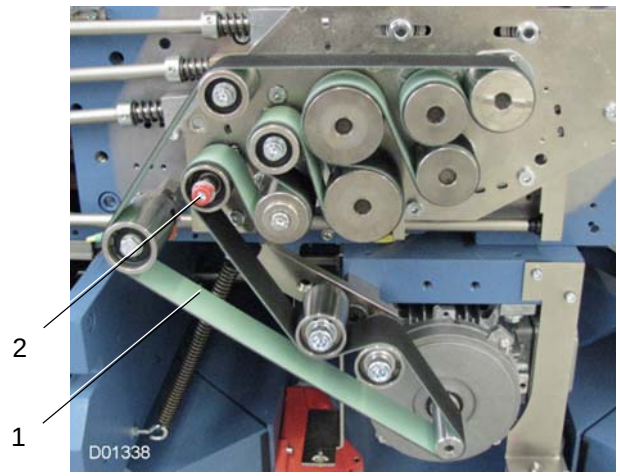
Replacing the drive belt:

▷ Relax the tension of the drive belt (2) with the tensioning roller (1).
▷ Remove the old drive belt (2).
▷ Insert the new drive belt (2).
▷ Tension the drive belt (2) using the tension roller (1).

Checking the spring length:

▷ Measure the spring length (3) from eye to eye when the springs are installed. The spring length should be 190 mm.
▷ If the spring length is not correct, the correct length must be set with the belt length adjustment rollers.

Adjusting the centric running:



1	Drive belt	2	Adjustment roller

Illustration 189: Adjusting the drive belt of the foldrollers.

The adjustment roller for the drive belt is marked with red.

▷ Loosen the red-marked screw on the adjustment roller (2).

▷ Adjust the centric running of the drive belt (1) by turning the eccentrics behind the red-marked screw.
Use a flat fork wrench size 17 for this.

▷ Tighten the red-marked screw again.

Attaching the guard:

▷ Attach the guard over the drive again.

9.4.2.8 Checking the drive belt threefold, model S-KTZ

- Check the drive belt monthly for its running properties, tension, condition, and contamination.
- If it is no longer possible to adjust centered running or achieve the necessary tension or if the general condition of the belt is poor, it must be replaced.

MBO recommends having MBO Service or an authorized customer service agent change the drive belt.

9.4.3 Checking the foldrollers and slitter shafts

Check the foldrollers and slitter shafts in the:

- Parallel fold
- Crossfold
- Threefold

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

9.4.3.1 Contamination and damage

Check the foldrollers and slitter shafts weekly for contamination and damage:

- Clean foldrollers and slitter shafts if necessary.
  See Chapter “9.3.2.5 Cleaning foldrollers”
- If the foldrollers or slitter shafts are damaged, they must be replaced.

9.4.3.2 Pressure and wear-off

Inspect the foldrollers and slitter shafts half-yearly for pressure and for wear-off:
See Chapter “8.8.1 Adjusting the pressure of foldrollers (standard)”

- If evenly distributed traction can no longer be adjusted, the foldrollers and/or slitter shafts must be replaced.

9.4.4 Checking the buckle plates

Check the buckle plates monthly for wear-off and damage.

Special attention should be paid to:

- Sheet stop
- Lower plate lip
- Top plate lip
- Visual check of the screws

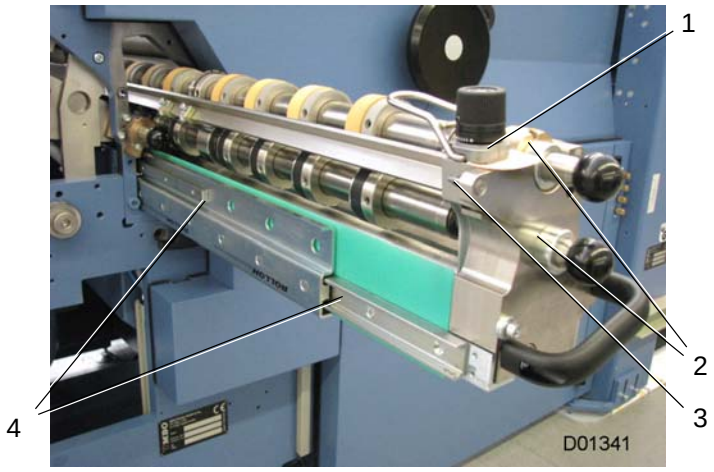
See Chapter “8.8.3 Buckle plate positions”

Only have any damage repaired by MBO Service or by an authorized customer service agent.

9.4.5 Checking the slitter shaft cassette.

Check the slitter shaft cassette monthly for function and damage.
Special attention should be paid to:

- Soft running of the telescopic rails.
- The slitter shaft bearing assembly.
- Soft running of the roller adjustment elements.
- Soft running of the index bolt.
- Barrel bolts and bushings.



1	Roller adjustment elements	3	Barrel bolts
2	Bearing assembly	4	Telescopic rails

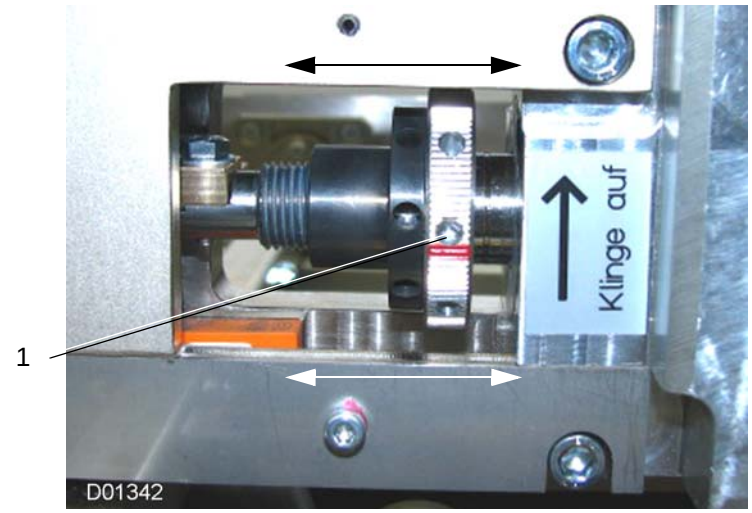
Illustration 190: Checking the slitter shaft cassette.

If the function is compromised, clean the slitter shaft cassette. See Chapter “9.3.2.10 Cleaning the slitter shaft cassette”

Only have any damage repaired by MBO Service or by an authorized customer service agent.

9.4.6 Checking the folding knives

9.4.6.1 Checking the soft running



1 Adjusting wheel

Illustration 191: Checking the soft running

Check the folding knives weekly to make sure they run smoothly.

Procedure:

▷ Press the EMERGENCY STOP palm button.
▷ Open the sheet stop in the crossfold (this guarantees no compressed air).
▷ Move the adjusting wheel forwards and backwards with both hands. The folding knife must move smoothly.

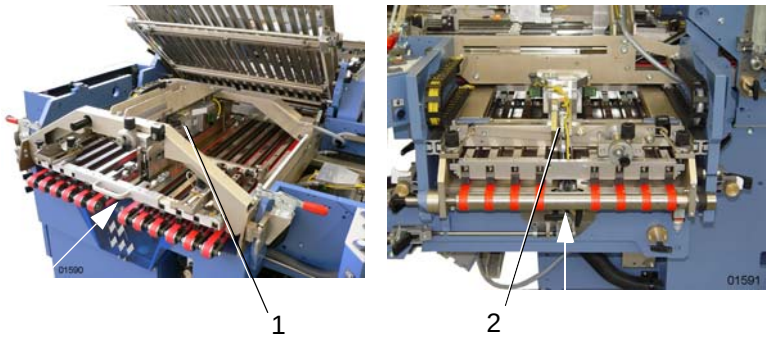
Only have the soft running restored by MBO Service or by an authorized customer service agent.

9.4.6.2 Checking the tension of toothed belts

Check the toothed belts in the folding knife units monthly for tension and their state and replace these if necessary.

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

9.4.6.3 Checking the blades of the folding knives



1	Folding knife at crossfold	2	Folding knife at threefold

Illustration 192: Checking the folding knives.

Check the blades of the folding knives daily for damage such as deformation, notches, etc.

Procedure:

▷ Open the crossfold stop.
▷ Swivel the crossfold table upwards.
▷ Pulling out the threefold carriage.
▷ Perform a visual check on the folding knives. See arrow direction.

Only have the blades of the folding knives replaced by MBO Service or by an authorized customer service agent.

9.4.7 Checking the crossfold table and threefold carriage

9.4.7.1 Check crossfold table

Check the crossfold table monthly for function and soft running.
Special attention should be paid to:

- Swivel mechanism
- Locking device

9.4.7.2 Check threefold carriage

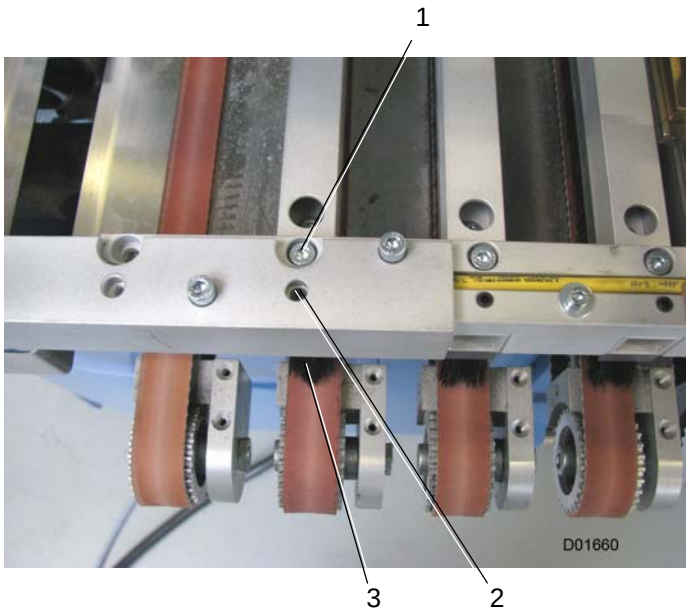
Check the threefold table monthly for function and soft running.
Special attention should be paid to:

- Soft running of the telescopic rails
- Locking device

If the function is compromised, clean the telescopic rails. See Chapter “9.3.2.11 Cleaning threefold carriage guide shafts”.

9.4.7.3 Checking the brushes in the crossfold and threefold unit

Check the brushes monthly for wear-off.
If necessary, readjust the brushes or replace them.



1 Screw
2 Adjusting screw
3 Brush

Illustration 193: Adjusting the brushes

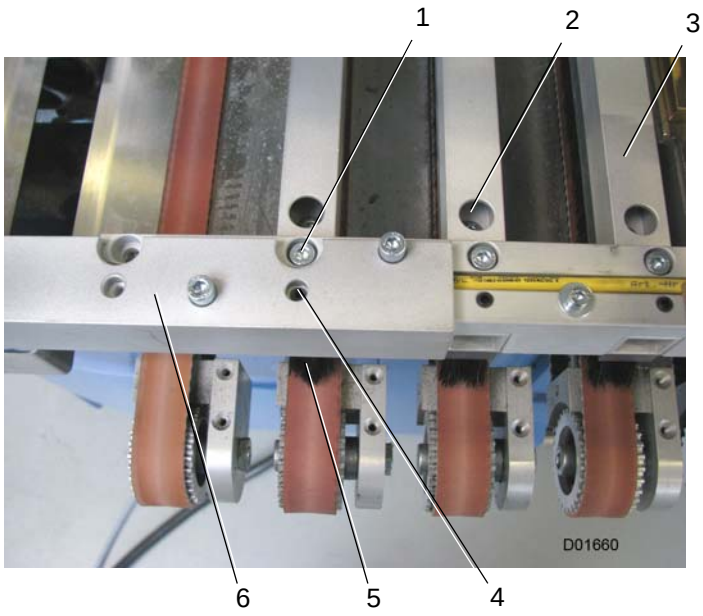
Adjusting the brushes:

Procedure:

▷ Loosen the screw (1).
▷ Turn the adjusting screws (2) inward using an allen key SW 4.
▷ Check with a piece of paper whether there is uniform traction over the entire length of the brushes.
▷ Tighten the screw (1) again.
▷ Perform the adjustment on all brushes (3).
✓ The brushes are adjusted.

- Ensure that the height setting of all brushes vis-à-vis the belt table is uniform.
- Check with a piece of paper whether there is uniform traction across the entire surface.

Replacing the brushes:



1	Screw	4	Adjusting screw
2	Screw	5	Brush
3	Brush holder	6	Cross bar

Illustration 194: Replacing the brushes

Procedure

1) Remove the screws (1).
2) Pull out the brush holder (3).
3) On each brush holder (3), loosen the screws (2) and take off the brushes (5).
4) Put the new brushes (5) in place and fasten these to the brush holder (3) with the screws (2).
5) Position the brush holders (3) on the cross bar (6).
6) Fasten the brush holders (3) with the screws (1).
7) Uniformly adjust the brushes (5) with the screws (4); see above <Brush adjustment>.

✓ The brushes are renewed.

With new brushes, the distance from the <top edge of the brush holder to the belt surface> is approx. 51 mm.

9.4.7.4 Checking the high-speed rollers

Inspect the high-speed rollers in the crossfold and threefold unit on a monthly basis.

Special attention should be paid to:

- Function
- Soft running
- Damage
- Wear-off

If necessary, clean and spray high-speed rollers with silicon spray.

9.4.7.5 Checking the transport belts

Check the transport belts, belt running, guide rolls, belt tightener, and bearing monthly.

Special attention should be paid to:

- Function
- Soft running
- Damage
- Wear-off

If necessary, clean transport belts with “Varn-Wash VM 111 or VWM“ and reapply silicon carefully with silicon spray.

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

9.4.8 Checking the pneumatic springs

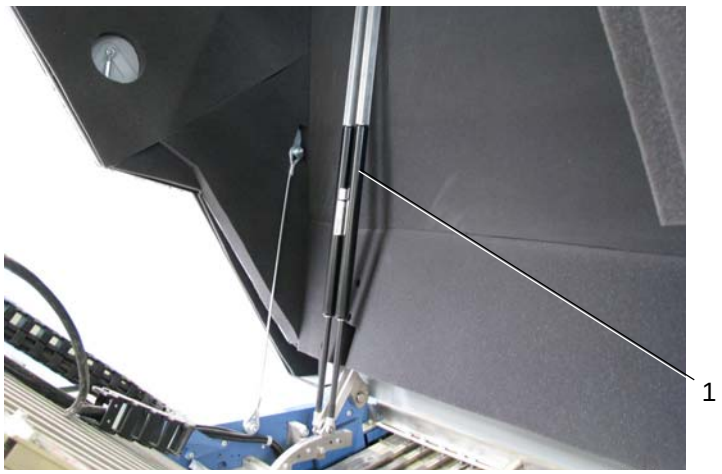
9.4.8.1 Noise damping and safety hood

WARNING!

Independent lowering of the open noise damping and safety hood.

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

Check the pneumatic springs after each production / daily to ensure they are functioning properly.



1 2 x pneumatic springs

Illustration 195: Pneumatic springs on the noise damping and safety hood

Check the condition of the pneumatic springs after every production (daily).

Procedure:

▷ Completely open the noise damping and safety hood.

▷ The pneumatic springs must be replaced if the noise damping and safety hood independently lowers itself from the completely opened position.

✓ The pneumatic springs have been checked.

Only have the pneumatic springs replaced by MBO Service or by an authorized customer service agent.

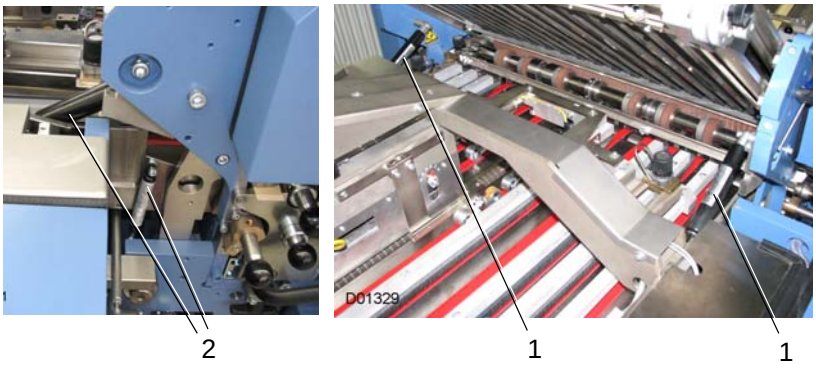
9.4.8.2 Crossfold table

WARNING!

Independent lowering of the open crossfold table.

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

Check the pneumatic springs after each production / daily to ensure they are functioning properly.



1 2 x pneumatic springs S-KTL, S-KTLT
2 4 x pneumatic springs S-KTZ

Illustration 196: Pneumatic springs on the crossfold table

Check the condition of the pneumatic springs after every production (daily).

Procedure:

▷ Completely open the crossfold table.
▷ The pneumatic springs must be replaced if the crossfold table independently lowers itself from the completely opened position.
✓ The pneumatic springs have been checked.

Only have the pneumatic springs replaced by MBO Service or by an authorized customer service agent.

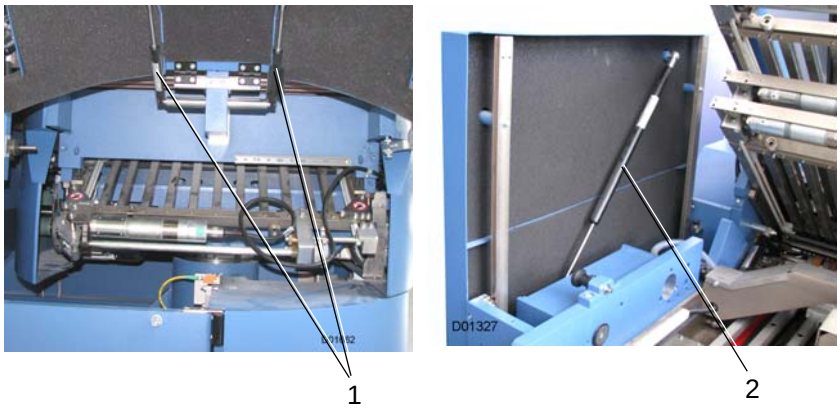
9.4.8.3 Guard over the KTL buckle plate

WARNING!

Independent lowering of the open guard.

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

Check the pneumatic springs after each production / daily to ensure they are functioning properly.



1 Pneumatic spring S-KTZ	2 Pneumatic springs S-KTL

Illustration 197: Pneumatic spring on the KTL buckle plate guard

Check the condition of the pneumatic springs after every production (daily).

Procedure:

▷ Completely open the guard.

▷ The pneumatic springs must be replaced if the guard independently lowers itself from the completely opened position.

✓ The pneumatic springs have been checked.

Only have the pneumatic springs replaced by MBO Service or by an authorized customer service agent.

9.5 Maintenance, lubrication and cleaning schedule

CAUTION!

False maintenance, lubrication and cleaning intervals in multi-shift operation.

Non-observance could result in damage to property.

All specified maintenance, lubrication and cleaning intervals are intended for a one-shift operation.
Convert the indicated intervals for multishift operation accordingly.

	Chapter No.:	Working process	Interval	Date	Signature
Operational maintenance	7.7	“Performing a verification inspection after the initial commissioning”	After 20 operating hours		
	9.3.1	“Checking safety and protective devices”	Daily		
	9.3.1.1	“Checking the EMERGENCY STOP palm button”	Daily		
	9.3.1.2	“Check noise damping and safety hood”	Daily		
	9.3.1.4	“Check crossfold table”	Daily		
	9.3.1.5	“Check threefold carriage”	Daily		
	9.3.1.6	“Checking the slitter shaft cassette.”	Daily		
	9.3.1.7	“Check inching mode and two-hand operation function”	Daily		
	9.3.1.8	“Check protective coverings”	Daily		
	9.3.2	“Cleaning of the machine”	Weekly		
	9.3.2.2	“Cleaning of the machine”	Weekly		
	9.3.2.3	“Clean the guide shafts on the register table”	Weekly		
	9.3.2.4	“Cleaning swivelling lever and side frames”	Monthly		
	9.3.2.5	“Cleaning foldrollers”	Weekly		
	9.3.2.6	“Cleaning the buckle plates”	Weekly		

Table 38: Maintenance, lubrication and cleaning schedule

	Chapter No.:	Working process	Interval	Date	Signature
	9.3.2.7	“Clean the spindles and guide shafts of the RAPIDSET drives.”	Weekly		
	9.3.2.8	“Cleaning the optical sensors”	Daily		
	9.3.2.9	“Cleaning the sensors in the folding knife”	Weekly		
	9.3.2.10	“Cleaning the slitter shaft cassette”	Weekly		
	9.3.2.11	“Cleaning threefold carriage guide shafts”	Weekly		
	9.3.2.12	“Cleaning the crossfold folding knife guide shafts”	Weekly		
	9.3.3	“Cleaning/renewing the pressure vacuum pump air filters”	Weekly		
Maintenance	9.4.1	“Checking the register table”	Monthly		
	9.4.1.1	“Checking the suction belt drive belt”	Monthly		
	9.4.1.2	“Check the alignment belt”	Monthly		
	9.4.2	“Checking the parallel fold”	Monthly		
	9.4.2.2	“Checking the drive belt, S-KTL and S-KTLT models”	Monthly		
	9.4.2.5	“Checking the drive belt of the foldrollers”	Monthly		
	9.4.2.6	“Checking the drive belt for foldrollers in the crossfold and threefold unit”	Monthly		
	9.4.3	“Checking the foldrollers and slitter shafts”	Monthly		
	9.4.4	“Checking the buckle plates”	Monthly		
	9.4.5	“Checking the slitter shaft cassette.”	Monthly		
	9.4.6	“Checking the folding knives”	Monthly		

Table 38: Maintenance, lubrication and cleaning schedule

	Chapter No.:	Working process	Interval	Date	Signature
	9.4.6.1	“Checking the soft running”	Weekly		
	9.4.6.2	“Checking the tension of toothed belts”	Weekly		
	9.4.6.3	“Checking the blades of the folding knives”	Daily		
	9.4.7	“Checking the crossfold table and threefold carriage”	Monthly		
	9.4.7.1	“Check crossfold table”	Monthly		
	9.4.7.2	“Check threefold carriage”	Monthly		
	9.4.7.3	“Checking the brushes in the crossfold and threefold unit”	Monthly		
	9.4.7.4	“Checking the high-speed rollers”	Monthly		
	9.4.7.5	“Checking the transport belts”	Monthly		
	9.4.8	“Checking the pneumatic springs”	Daily		
	9.4.8.1	“Noise damping and safety hood”	Daily		
	9.4.8.2	“Crossfold table”	Daily		
	9.4.8.3	“Guard over the KTL buckle plate”	Daily		

Table 38: Maintenance, lubrication and cleaning schedule

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

9.6 Repair

WARNING!

Improper repair.

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

- Repair work may only be performed by trained and authorized personnel.
- Observe the local occupational safety regulations.
- After carrying out repairs, perform a functional test.

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

10 Shutdown, storage

10.1 Introduction

10.1.1 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

Table 39: Qualification of personnel; Shutdown, storage
Key: X permitted, - not permitted

10.1.2 Safety instructions

Caution!
Incorrect storage.
Non-observance could result in property damage.
Observe the corresponding storage conditions.

10.2 Decommissioning

10.2.1 Temporary decommissioning

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 decommissioning, the machine must be commissioned again.
See Chapter "7 Installation, initial operation"

10.2.2 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, intermediate storage".

10.3 Storage

CAUTION!
Incorrect storage.
Non-observance could result in property damage.
Observe the corresponding storage conditions.

▷ Check the premises in respect of temperature and humidity. See Chapter "3.2.6 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 "3.2.3 Transport data, fork lifts, and floor requirements".
▷ Cover the machine with foil.

11 Disposal

11.1 Introduction

11.1.1 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 personnel with specialized training (mechanical/electrical engineering)
Disposal	X	-	-

Table 40: Qualification of personnel; Disposal
Legend: X permitted, - not permitted

11.1.2 Safety instructions

Caution!

Incorrect disposal.

Non-observance could result in environmental damage.

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

11.2 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.

Procedure:

- Decommission the machine prior to disposal.
  See Chapter "10.2 Decommissioning".
- For transport, observe the instructions in Chapter "6 Transport, intermediate storage"
- 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!

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