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# **Mobile Knife Fold Unit MS 45**

# **Operator's Manual**

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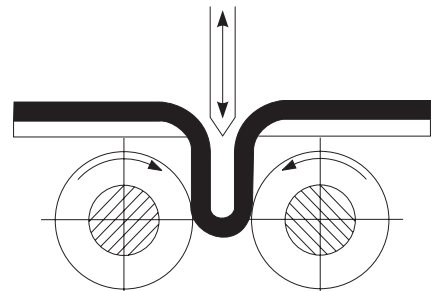
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# 1. GENERAL DESCRIPTION

The MS 45 is a mobile knife fold unit with its own drive, which is mainly used as an additional fold unit for the folders multipli-CAS 524 and CAS 524/4. It increases the versatility of the basic machine. Thanks to its mobility it can also be used in conjunction with other folders or in combination with cutters, bursters, collators, stapling units and other devices. The height is continuously adjustable.

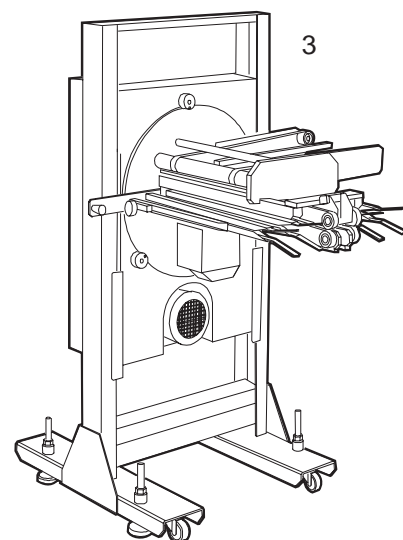
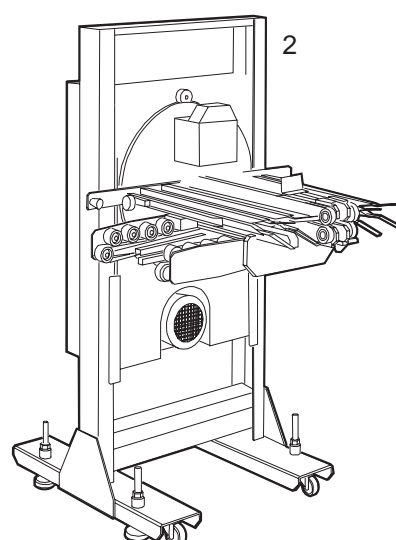
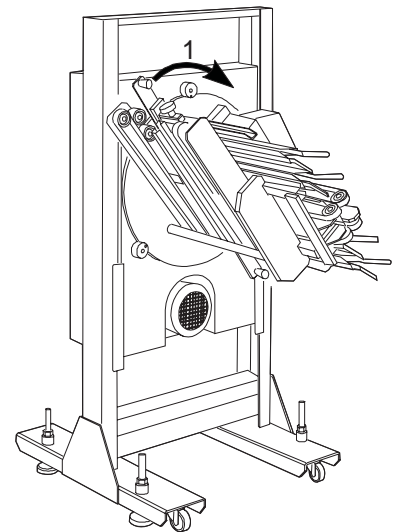
## Folding principle of the knife fold system:

The fold is executed by a folding knife (blade) and two rollers. A belt transports the sheet to a stop until it comes to rest under the folding knife. Triggered by a photodetector, the knife moves down and pushes the sheet between the pair of rollers below. This pair of rollers then forms the fold.



The MS 45 is designed in such a way that the knife unit can be turned by 180° (1).

Thus, the knife can fold a 16-page signature either from the top (2) or from the bottom (3).



## 2. SPECIFICATIONS

<b>Infeed width:</b>	<b>Maximum</b>	<b>Minimum</b>
	45 cm	12 cm
<b>Infeed length:</b>	33 cm	10 cm
<b>Infeed height:</b>	continuously adjustable from 75 to 88 cm	
<b>Speed:</b>	continuously adjustable up to 170 m/min	
<b>Paper weights:</b>	40 - 250 GSM	
<b>Electrical:</b>	two connections:	400 V, 3-phase (motor) 230 VAC, single phase (control)
<b>Power consumption:</b>	0,8 kW	
<b>Ambient conditions:</b>	Room temperature: 15 - 40°C Air humidity: 50 - 90%	
<b>Machine weight (net):</b>	140 kg	

### 3. PROPER HANDLING OF THE MACHINE

The mobile knife fold unit MS 45 is built exclusively for folding paper. It is unsuitable for handling other materials such as foils, plastics and textiles. The manufacturer/distributor is not responsible for damages resulting from such unsuitable handling. Responsibility lies alone with the user.

Reading the operator's manual and observing the conditions for inspection and maintenance are part of the proper handling of the machine.

Installation of the machine, i.e. assembling as well as electrical work should be carried out by skilled personnel authorized by the manufacturer or his representatives. Additional instructions are provided for this purpose.

Repairs and service should be carried out only by skilled personnel authorized by the manufacturer or his representatives.

The interval between inspections including safety-relevant functions depends on the machine usage.

For regular one-shift-operation, one inspection per year is recommended.

The machine needs a flat surface for installation. The levelling screws in the undercarriage of the machine can compensate for an uneven floor to a certain degree. The machine weight should be considered when choosing a location for the machine.

To ensure stability during operation the machine should be secured by means of the levelling screws.

The line voltage must correspond to the values on the name plate.

No harmful emissions are produced.

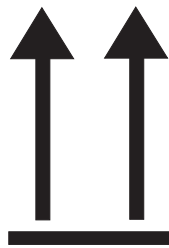
Read the operator's manual before working with the machine!

We recommend to carry out all operations and settings in the sequence mentioned in this manual.

## 4. SAFETY INSTRUCTIONS

### 4.1 Safety Instructions for Transport and Set-Up

The following instructions and warnings are applied to the packing to ensure appropriate and safe transport:



**Top! - Transport in upright position only!**



**Protect from humidity!**



**Fragile! - Handle with care!**

These instructions and warnings must also be observed for transport within the user's premises.

For transport to other premises resp. for return shipment the machines must be packed and provided with the same markings.

## 4.2 Fundamental Safety Instructions

### Warnings and Symbols

The following symbols and designations are used in the manual to identify instructions of particular importance.



General instructions and special information how to use the machine most efficiently.



Instructions designed to prevent injury or extensive equipment damage.

## Basic Operation

The machine has been built in accordance with state-of-the art standards and the recognized safety rules. Nevertheless, operators and third parties may get injured when working with the machine, or damage to the machine and to other material property may result.

The machine must only be used in technically perfect condition in accordance with its designated use and the instructions set out in the operator's manual.

Any malfunctions, especially those affecting the safety of the machine, should therefore be rectified immediately.

## Organizational Measures

The operator's manual must always be available near the machine.

In addition to reading the operator's manual, observe and instruct the user in all other generally applicable legal and other mandatory regulations relevant to accident prevention and environmental protection.

The operator's manual must be supplemented by instructions covering the duties involved in supervising and notifying special organizational features, such as job organization, working sequences or the personnel entrusted with work.

Personnel entrusted with work on the machine must have read the operator's manual and in particular the chapter on safety before beginning the work.

Reading this instructions after work has begun is too late.

This applies especially to persons working occasionally on the machine, e.g. during setting up or maintenance.

Check, at least from time to time, whether the personnel is carrying out the work in compliance with the operator's manual and paying attention to risks and safety factors.

For reasons of safety, long hair must be tied back or otherwise secured, garments must be close-fitting and no jewellery - such as rings - may be worn.

Injury may result from being caught on moving parts.

Observe all safety instructions and warnings attached to the machine.

See to it that safety instructions and warnings attached to the machine are always complete and perfectly legible.

## Organizational Measures

In the event of safety-relevant modifications or changes in the performance of the machine during operation, stop the machine immediately and report the malfunction to the competent person.

Never make any modifications, additions or conversions which might affect safety without the manufacturer's approval.

Adhere to prescribed intervals or those specified in the operator's manual for routine checks and inspections.

## Selection of Personnel, Basic Responsibilities

Employ only trained or instructed staff and set out clearly the individual responsibilities of the personnel for operation, set-up, maintenance and repair.

Work on the electrical system and equipment of the machine must be carried out only by a skilled electrician or by instructed persons under the supervision and guidance of a skilled electrician and in accordance with electrical engineering rules and regulations.

## Standard Operation

Avoid any operational mode that might be detrimental to safety.

Take the necessary precautions to ensure that the machine is used only in a safe and reliable state. Operate the machine only if all protective and safety-oriented devices, such as removable safety devices, emergency stops, sound proofing elements, are in place and fully functional.

In the event of malfunctions stop the machine immediately and prevent further use. Have any defects rectified immediately.

During start-up and shut-down procedures always watch display in accordance with the operator's manual. Before starting up or setting the machine in motion, make sure that nobody is in danger.

## Special Work, Maintenance, Repair

Observe the adjusting, maintenance and inspection activities and intervals set out in the operator's manual, including information on the replacement of parts and equipment.

If the machine is completely shut down for maintenance and repair work, it must be secured against inadvertent starting by attaching a warning sign to the main switch. Always tighten any screw connections that have been loosened during maintenance and repair.

## Special Dangers

The electric equipment of machines is to be inspected and checked at regular intervals.

Defects such as loose connections or scorched cables must be rectified immediately.

## Product-Specific Safety Instructions



**Exercise caution in the vicinity of the folding knife, rotating shafts, rollers and moving belts! Hair, loose garments or jewellery may get caught! - SERIOUS INJURY MAY RESULT!**



**Exercise caution at the delivery end of the preceding fold unit! Do not get close to the rotating delivery shafts! - SERIOUS INJURY MAY RESULT!**



**Always pull the power plug or flip the safety switch on the CAS fold system before doing any setting jobs! This will ensure that no other person will be able to start the machine while you are working on it.**



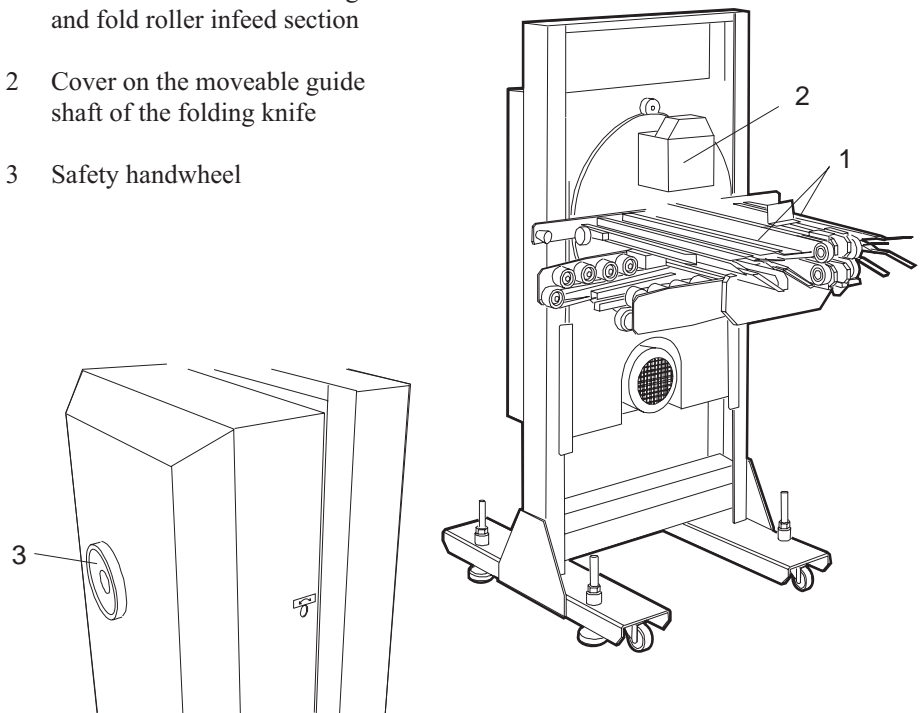
**Before disconnecting resp. connecting an electrical cable, always switch off the main switch or flip the safety switch at the fold system.**



## 5. SAFETY FEATURES

The knife fold unit MS 45 is equipped with various safety features. They ensure the safety of the persons working with the machine.

- 1 Protective bars at the folding knife and fold roller infeed section
- 2 Cover on the moveable guide shaft of the folding knife
- 3 Safety handwheel

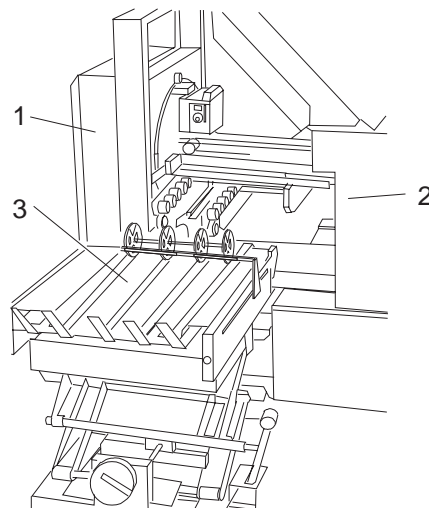


Possible remaining danger areas during set-up and operation are pointed out in the respective sections of this manual.

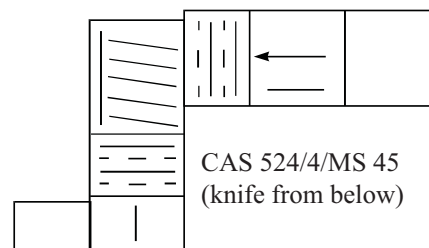
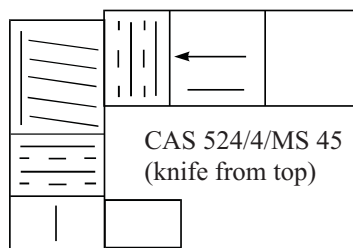
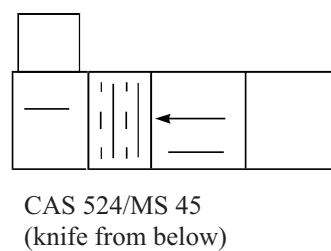
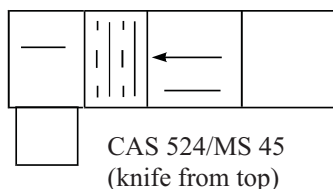
## 6. MACHINE COMBINATIONS

The knife fold unit MS 45 is mainly used in conjunction with machines of the CAS folder line.

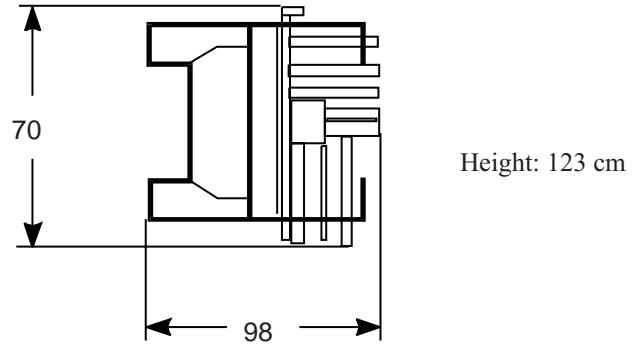
The MS 45 (1) is always placed between the last fold unit (2) and the delivery section (3).



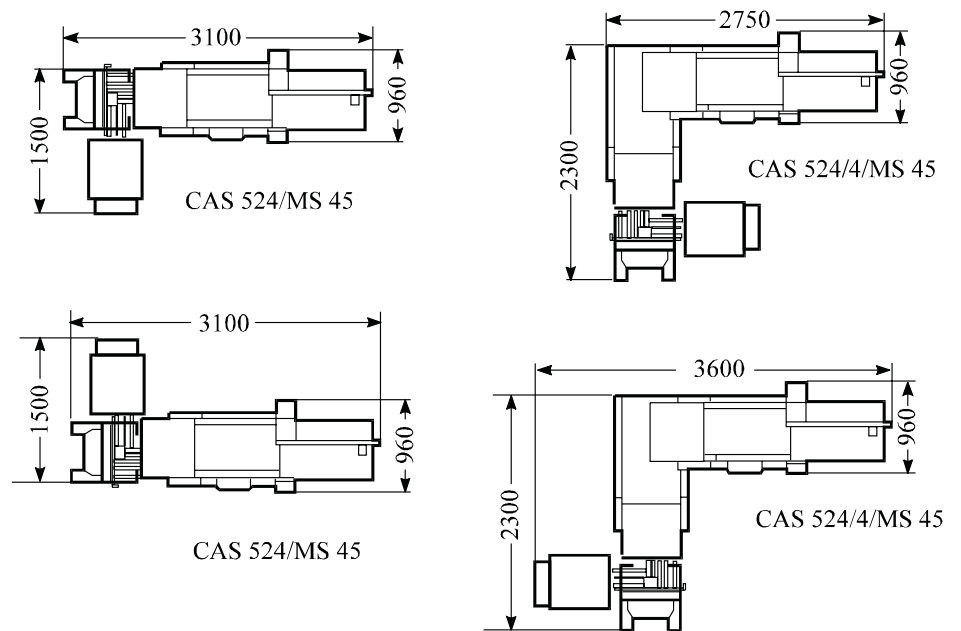
The following machine combinations are possible:



## 7. SPACE REQUIRED



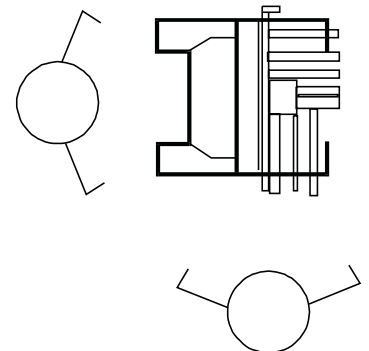
For combinations with fold units from the CAS folder line, the MS 45 can be placed in the following positions:



## 8. OPERATING POSITIONS

The operating positions at the knife fold unit MS 45 are almost exclusively used for set-up and retrofit jobs.


For cleaning and service as well as for repair, the MS 45 is accessible from every side.





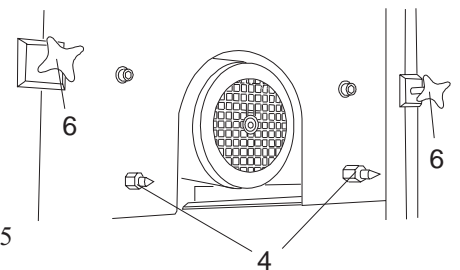
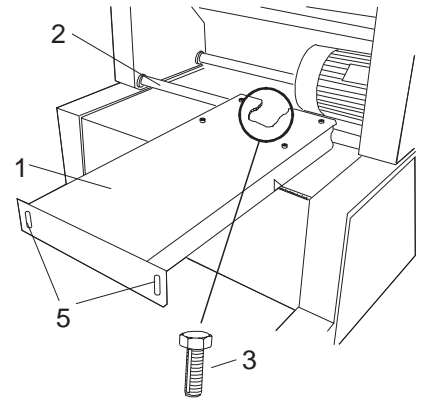
# 9. SET-UP INSTRUCTIONS

## Combination with CAS-Fold Units

 Exercise caution at the delivery end of the preceding fold unit! Do not get close to the rotating delivery shafts! - **SERIOUS INJURY MAY RESULT!**

For exact positioning of the MS 45, attach a spacer plate (1) to the buckle fold unit in the following manner:

- Place the plate on the spacer rod (2) of the fold unit.
- Tighten the screw (3) only slightly so that the plate can still be moved to the left and to the right.
- Push the MS 45 up to the fold unit.
- The two guide pins at the housing of the MS 45 (4) must engage the guide slots (5) of the plate.

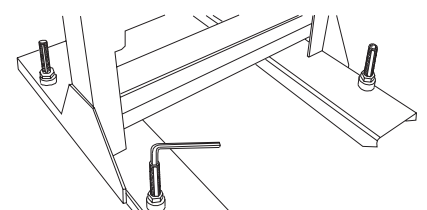
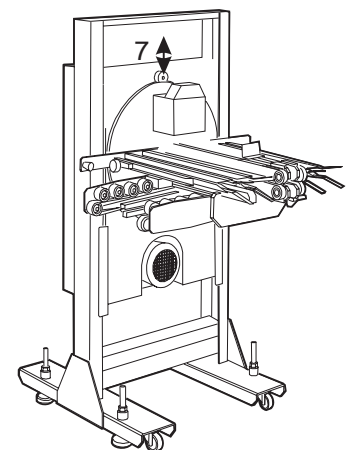
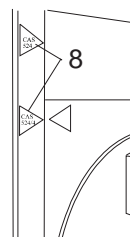


## Height Adjustment

The infeed height of the knife fold unit MS 45 is continuously adjustable from 75 to 88 cm and can therefore be adapted to different operating conditions.

- Loosen the knobs (6).
- Push the fold unit up- or downwards (7).
- Retighten the knobs (6).

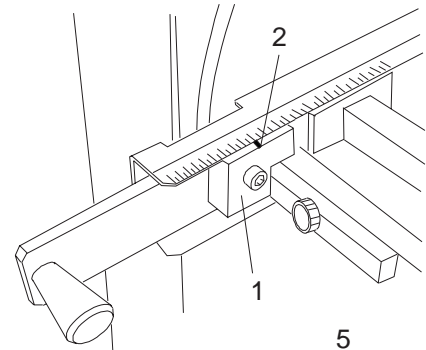
After finishing the height adjustment, mark the correct position with self-adhesive arrows provided for this purpose (8). This facilitates further adjustments.



Before working with the knife fold unit, secure the MS 45 by lowering the 4 levelling screws.

### Side Stops

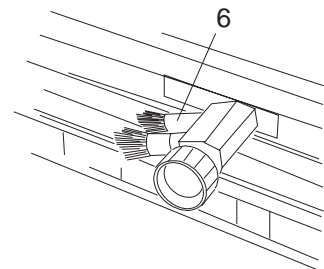
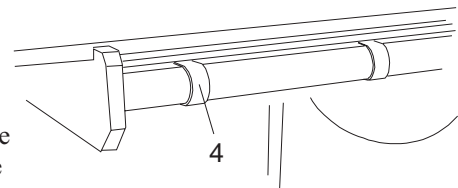
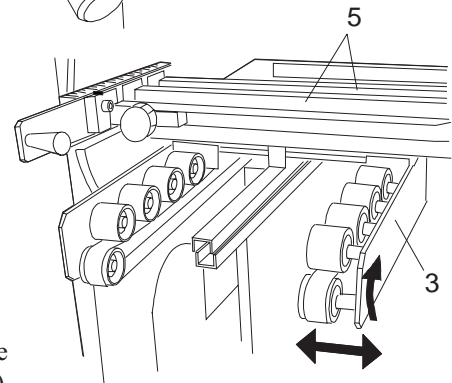
- Loosen the left and right side stop (1) by means of a 6-mm Allen key.
- By using the scale, set the marking (2) to half of the sheet width.
- Retighten the Allen screws.



### Sheet Guide Devices

Proceed as follows to set the roller-belt-arrangement in the delivery section (3) for paper size:

- Lift the left (seen in direction of paper travel) roller-belt-assembly and shift it in such a way that the open edge of the folded sheet is guided properly.
- Slide the belt on the rear shaft (4) by the same distance (otherwise it will run off).
- Set the paper guide rails (5) to the desired paper size.
- Push the retainer brushes (6) against the trailing edge of the sheet (this stops the sheets from bouncing back).

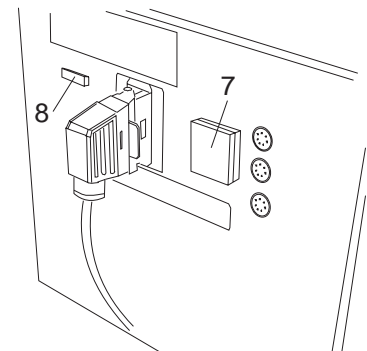


### Electrical Connection

Two different electrical connections are needed:  
 - 400 V, 3-phase for the drive  
 - 230 VAC for the control

Both connections are established by plugs and sockets.

If the MS 45 is used with a CAS fold unit, the 230 V cord is plugged into the socket (7) at the rear of the fold unit.

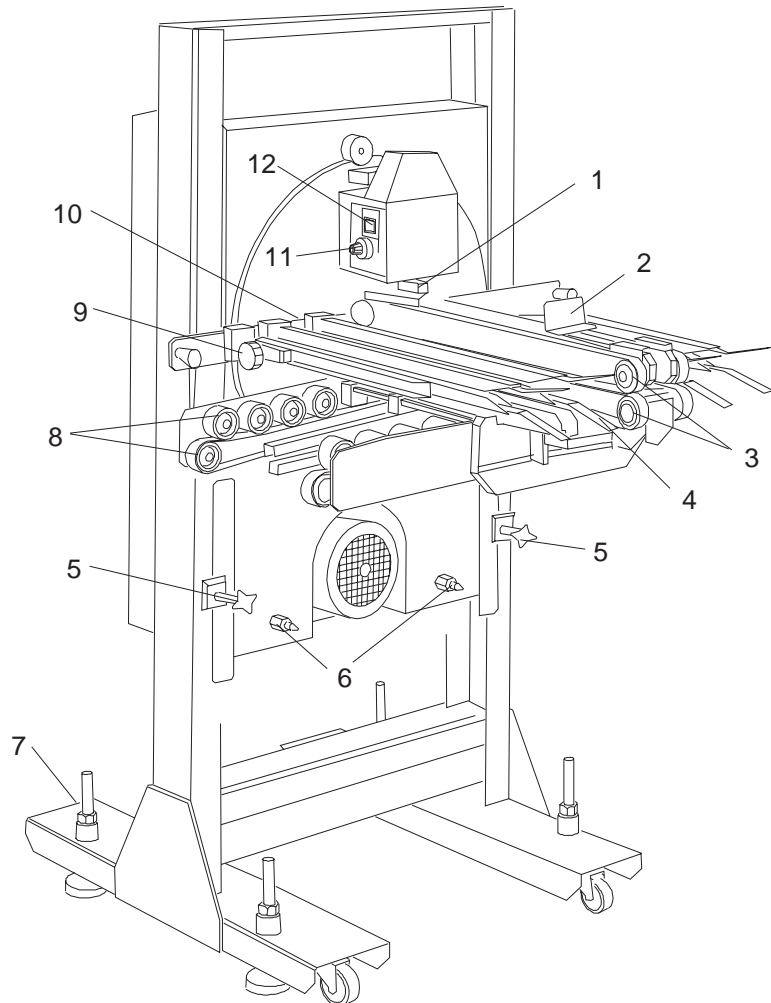


**⚠ Before disconnecting resp. connecting an electrical cable, always switch off the main switch or flip the safety switch (8) at the fold system.**

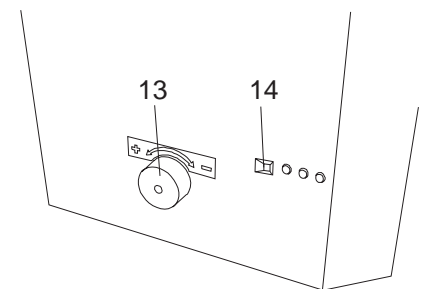
As the MS 45 is not equipped with its own main switch, it is started and stopped together with the CAS folder through the 230 VAC control line.

# 10. OPERATING INSTRUCTIONS

## Description



- 1 Folding knife
- 2 Photodetector
- 3 Transport belts
- 4 Sheet guide device
- 5 Knob for height adjustment
- 6 Guide pins
- 7 Feet
- 8 Roller-belt-assembly
- 9 Side stop
- 10 Front paper stop
- 11 Setting knob for register time delay
- 12 Switch (continuous operation / individual operation)



## Format Setting

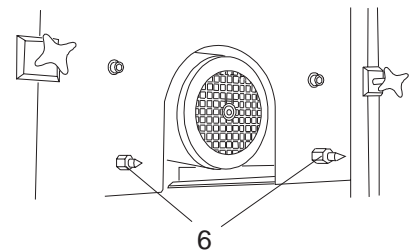
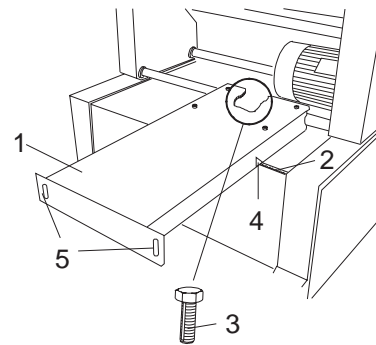


Always switch off the main switch or flip the safety switch of the CAS fold system before doing any setting jobs! This will ensure that no other person will be able to start the machine while you are working on it!

Always set the preceding buckle fold unit first before doing the settings on the MS 45.

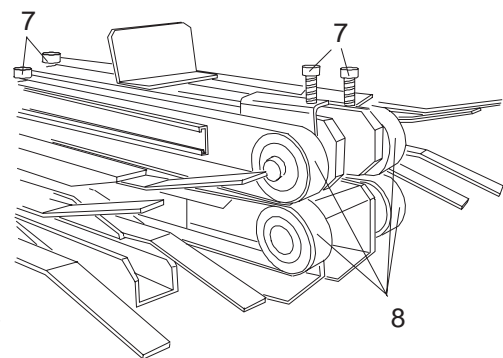
### Positioning of the MS 45:

- Push back the MS 45 somewhat.
- Loosen the screw (3) at the spacer plate.
- Read the figure on the scale at the sheet infeed section of the last buckle fold unit (for example 30 cm).
- Divide the scale value by 2 (in our example 15 cm)
- Displace the spacer plate (1) in such a way that the marking (4) on the scale (2) shows this figure (e.g. 15 cm).
- Tighten the screw (3).
- Push the MS 45 back up to the buckle fold unit until the guide pins (6) engage the guide slots (5).



## Adjusting the Transport Belts

The sheets are transported under the folding knife by means of belts which are placed on top of each other (8). The sheets must be guided securely, but should not be squeezed. For this reason the gap between the transport belt can be adjusted. If the gap is too small, the sheets are not aligned properly at the stop, resulting in inaccurate folds. The transport belts are driven by rollers. The gap between these rollers is adjustable by means of 5-mm Allen screws (7):



Thick signatures: Increase the roller gap by turning the screws clockwise.  
Thin signatures: Reduce the gap by turning the screws counter-clockwise.

## Setting the Time Delay

Depending on paper quality and type of fold, the time delay allows varying the register- and setting time of the paper at the stop.

The adjustment of the knob at the knife (1) makes it possible to change the time that it takes for the sheet to reach the stop and settle after passing the photodetector.

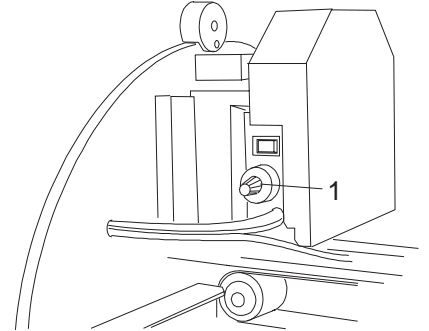
This will vary with the type of paper and fold.

Small formats:

longer register time = higher numbers

Large formats:

shorter register time = small numbers



## Height Adjustment of the Knife

The knife is set properly when the paper is pushed down deep enough by the knife so that it is gripped safely by the rollers.

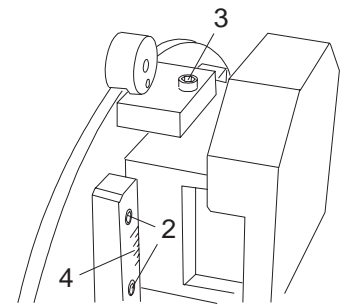
It is sometimes necessary to set the knife deeper, especially for glossy papers.

- A scale (4) indicates the position of the knife. 0 = basic position.
- Loosen four 6-mm Allen screws (2).
- The knife can be moved up or down by means of an 8-mm Allen key (3).

Turning the Allen screw clockwise:  
= knife higher

Turning the Allen screw counter-clockwise:  
= knife lower

- Retighten the four Allen screws (2).

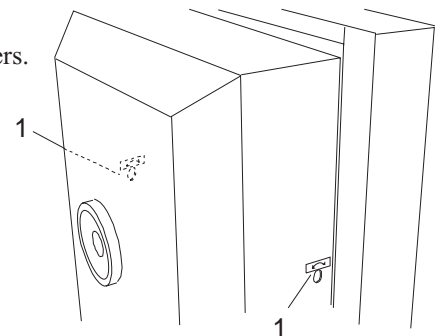


## Adjusting the Fold Roller Gap

If creasing occurs or if sheets are not transported between the fold rollers, the gap between the fold rollers must be modified.

Adjustment is done via two setting screws:

- Hold a fold sample between the fold rollers.
- Turn the handwheel and adjust both setting screws (1) with a 6-mm socket wrench until slight resistance is felt when pulling back the fold sample. The adjustment must be identical for both setting screws (same number of turns).

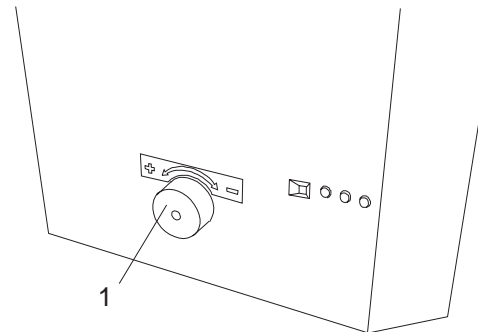


## Setting the Transport Speed


The correct transport speed can only be set with the machine running. It must be adapted to the speed of the preceding fold unit.

The transport speed of the belts and the fold rollers can be continuously adjusted by means of a knob (1).

If the sheets skew on the belts, increase the speed.



# 11. OPERATION AND SAMPLE FOLDS

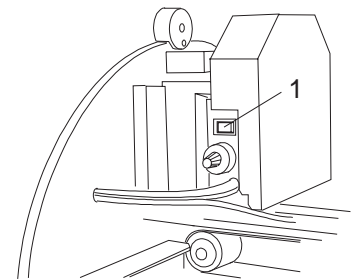
 Exercise caution in the vicinity of the folding knife, rotating shafts, rollers and moving belts! Hair, loose garments or jewellery may get caught! - **SERIOUS INJURY MAY RESULT!**

 Exercise caution at the delivery end of the preceding fold units! Do not get close to the rotating delivery shafts! - **SERIOUS INJURY MAY RESULT!**

## Sample Folds

When set-up is completed, make a few sample folds to make sure that the folds are satisfactory. Proceed as follows:

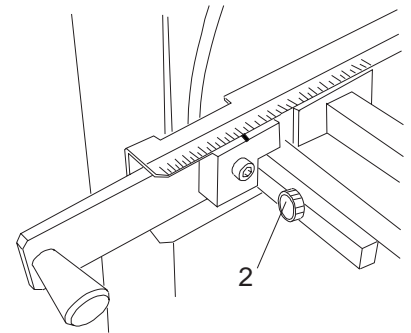
- Push the toggle switch at the knife (1) to position "0".
- Start the motor and the pump of the CAS 524 after it has been set-up (see operator's manual multipli-CAS 524). The motor of the MS 45 is started automatically because of the electrical connection between the units.



- Push the paper transport key  on the operator panel of the CAS 524.

Now a sheet is fed, folded in the CAS fold unit and transported under the knife of the MS 45.

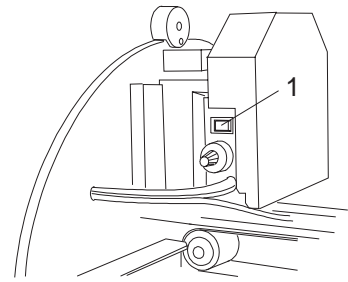
- Check the position of the side stops.
- The lateral paper stops can be adjusted by turning the set screws (2). This makes it possible to relocate the fold line by approx. 5 mm to the left or the right.




- Push the toggle switch (1) to position "1". This triggers the knife.
- Push the toggle switch to position "0".
- Check the fold and, if necessary, feed further sample sheets and make the fine adjustment.

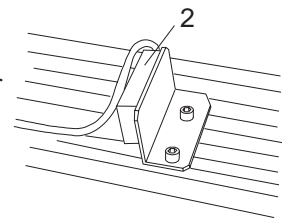
## Continuous Operation

- Push the toggle switch (1) to position "1". This activates the photodetector (2) and the MS 45 is ready for continuous operation. Each arriving sheet creates an impulse via the photodetector and triggers the knife.



- Start the motor and the pump of the set-up CAS folder (see operator's manual CAS 524). The electrical connection between the two units also starts the motor of the MS 45.

- Push the paper transport key  on the CAS operator panel.



- When connected to a CAS fold unit, the MS 45 cannot be switched on/off separately. This is only possible for the complete machine configuration, including the MS 45.

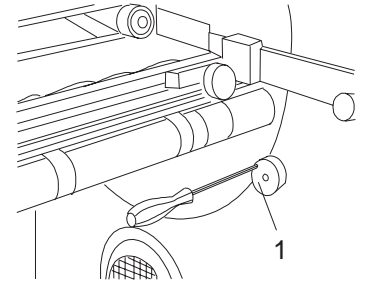
## 12. TURNING THE KNIFE FOLD UNIT



Always switch off the main switch or flip the safety switch of the CAS fold system before doing any setting jobs! This will ensure that no other person will be able to start the machine while you are working on it!

If a type of fold requires a fold from below, the knife has to be turned by 180°.

- Loosen three Allen screws by means of a 3-mm Allen key (1).
- Turn the knife unit all the way clockwise by 180° (2).
- Retighten the Allen screws.



For folding jobs in this position, all adjustments must be done *before* turning the knife unit by 180°.

