

Folding machine

Translation of the original operating manual



K8RS

Type of machine:	Folding machine		
Model:	K8RS		
Type of document:	Translation of the original operating manual		
Version:	V2.2	Author:	Wolfgang Matzner
Dated:	06/08/2016	Machine no.:	
Language:	English	File name:	BA_K8RS_M1-BF-Standard_Automatik_V2.2_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 alterations!

Copyright This documentation is subject to copyright law. The claimed copyright includes all forms and types of copyright-protected materials and information that are currently permitted. No part of the documentation may be copied, otherwise duplicated, edited or translated into other languages, regardless of the manner in which or with which tools this takes place.

Electronically-stored information provided by the manufacturer (CD-ROM, Internet) may be printed out by the user if the created print medium serves the purpose of use or service of the product described.

Name plate and CE marking

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.

For the identification of the machine and the most important machine data, see the name plate on the machine.



Figure 1: Name plate

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

- Commission number
- Type of machine

EC/EU Declaration of Conformity

according to EC Machine Directive 2006/42/EC, Annex II, No. 1 A.

The manufacturer

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

hereby declares that the machine described below

Designation Folding machine
Type K8RS
Commissioning no.

complies with the provisions of the following EC/EU directives

Machinery Directive 2006/42/EC
EMC Directive 2014/30/EU

Harmonized standards applied:

DIN EN ISO 12100:2010
DIN EN 1010-1:2004+A1:2010
EN 1010-4:2004+A1:2009
EN ISO 60204-1:2006
EN ISO 13849-1:2008

Authorized representative for compiling the technical file:

Name Wolfgang Matzner
Address Grabenstrasse 4-6
 71570 Oppenweiler
 GERMANY

Oppenweiler, 06/08/2016

Frank Eckert- Managing Director

Table of contents

1	About this manual	
1.1	Additional documents	10
1.1.1	Supplier documentation	10
1.2	Structure of the operating manual	10
1.3	Signs and symbols used	12
1.4	Description of safety messages	13
1.4.1	Signal words	13
1.4.2	Structure of safety messages	13
1.4.3	Safety sign	14
1.4.4	Marking of danger spots	18
1.5	User assessment of the operating manual	18
2	Basic safety instructions	
2.1	Intended use	19
2.2	Reasonable foreseeable misuse	20
2.3	Obligation and liability	21
2.4	Warranty	22
2.5	Residual risks	23
2.5.1	Transport, interim storage	23
2.5.2	Set-up, commissioning	23
2.5.3	Adjustment and operation	24
2.5.4	Maintenance	24
2.5.5	Decommissioning, storage	25
2.5.6	Disposal	25
2.6	Product-specific hazards	26
2.6.1	Entanglement hazard and crushing hazard	26
2.6.2	Cutting hazard	26
2.6.3	Noise	27
2.7	Life time	27
2.7.1	Life time of the machine	27
2.7.2	Service life of the control-technical safety components	27
2.8	General safety instructions	28
2.8.1	Transport, interim storage	28
2.8.2	Set-up, commissioning	28
2.8.3	Normal operation	28
2.8.4	Adjustment and operation	28

2.8.5	Maintenance and repair	29
2.8.6	Work on electrical equipment	29
2.9	Personnel, qualifications and duties	30
2.9.1	Qualification of the personnel	30
2.9.2	Duties of the operator	32
2.9.3	Duties of the operating personnel	33
2.9.4	Duties of the maintenance personnel	33
2.10	Personal protective equipment	34
2.10.1	Operation and adjustment	34
2.10.2	Operational maintenance (cleaning)	34
2.11	Work areas and workstations	35
2.11.1	Variants S-KTL, S-KTLT	35
2.11.2	Model S-KTZ	36
2.12	Markings on the machine	37
2.12.1	Position and meaning	37
2.13	Directions for emergencies	42
2.13.1	Emergency call numbers	42
2.13.2	Behavior in case of accidents	42
3	Product description	
3.1	Important notices about the product	43
3.1.1	Overall view	43
3.1.2	Standard equipment for K8RS	43
3.2	Technical data	44
3.2.1	Floor plan	44
3.2.2	Performance characteristics	45
3.2.3	Shipping and transport data	46
3.2.4	Electrical supply	47
3.2.5	Compressed air supply, control air	49
3.2.6	Emissions	49
3.2.7	Ambient conditions	50
4	Structure and function	
4.1	Introduction	51
4.1.1	What is folding?	51
4.1.2	Folding principles	51
4.2	Structure	53
4.2.1	Views of the palletized feeder	53
4.2.2	Views of the machine	57
4.3	Functional description	59
4.3.1	Pallet feeder	59
4.3.2	Combi folding machine	60

4.3.3	Register table	61
4.3.4	Parallel folding unit	61
4.3.5	Cross fold folding unit	62
4.3.6	Waste paper deflector	62
4.3.7	Threefold folding unit	63
4.3.8	Sheet monitoring of the machine	64
4.3.9	Delivery systems	65
4.4	Variants	65
4.4.1	FP800_130 RS	65
4.4.2	Model S-KTL	66
4.4.3	Model S-KTLT	67
4.4.4	Model S-KTZ	68
4.5	Machine control	69
4.5.1	M1 Advanced	69
4.5.2	RAPIDSET automation (option)	69
4.5.3	DATAMANAGER (optional)	69
4.5.4	MBO-RAS (optional)	69
4.6	Protective devices	70
4.6.1	Explanation of the term "guards"	70
4.6.2	Explanation of the term "protective devices"	71
4.6.3	Overview of protective devices on the palletized feeder	72
4.6.4	Overview of protective devices on the machine	73
4.6.5	Main switch	74
4.6.6	Noise damping safety hood	76
4.6.7	Safety switch	77
4.6.8	Operating the safety handwheel	80
4.6.9	Fixed guards	81
4.6.10	Faulty protective devices	81
4.6.11	Checking protective devices	81
4.6.12	Checklists for protective devices	81
5	Operating and display elements, operating modes	
5.1	Operating and display elements	95
5.1.1	Overview	95
5.1.2	Main switch	96
5.1.3	EMERGENCY STOP palm button on the FP130 feeder	97
5.1.4	Main control panel	97
5.1.5	<Machine functions> key field	98
5.1.6	Touchscreen handling	99
5.1.7	Touchscreen structure	100
5.1.8	Info box	101
5.1.9	Entering the password	102
5.1.10	Displaying machine status	104
5.1.11	Description of the function keys	105
5.1.12	Switching the help on/off	107

5.1.13	Selecting favorite pages	108
5.1.14	Switching on the large-scale display	109
5.1.15	Numeric input keyboard	110
5.1.16	<Diagnosis> page	111
5.1.17	Displaying alarms	119
5.1.18	Control panel in the cross fold and threefold	120
5.2	Compressed air nozzle with manometer	123
5.2.1	FP feeder	123
5.2.2	Combi area	123
5.3	Operating modes	124
5.3.1	Switching the operating mode of the folding knives	125
5.3.2	Set-up mode with open protective device	127
5.3.3	Creating production readiness	128
5.3.4	Machine control	129
5.3.5	Self-control	129
5.3.6	Adapter box	130
6	Transport, interim storage	
6.1	Introduction	131
6.1.1	Qualification of personnel	131
6.1.2	Safety messages	132
6.2	Packaging	133
6.2.1	Machine	133
6.2.2	Feeder	133
6.2.3	Buckle plates	133
6.2.4	Control cabinet	133
6.2.5	Pressure vacuum pump	133
6.2.6	Unpacking accessories/options	133
6.2.7	Performing an incoming inspection	133
6.2.8	Reporting a damage situation	134
6.3	Transporting the machine	134
6.4	Interim storage of the machine	135
6.4.1	Outdoors	135
6.4.2	In a storage room	135
7	Installation, commissioning	
7.1	Introduction	137
7.1.1	Qualification of personnel	137
7.1.2	Safety messages	138
7.2	Setting up the machine	139
7.3	Making the stationary mains connection	139
7.3.1	Safety messages	140

7.3.2	Heed network prerequisites	140
7.3.3	Observe the design of the stationary mains connection.	142
7.3.4	Making the stationary mains connection on the main control cabinet	143
7.3.5	Connecting the protective equipotential bonding conductor.	144
7.3.6	Checking the protective conductor connections.	144
7.4	Removing transport locks	145
7.4.1	On the threefold unit.	145
7.4.2	Threefold, variant KTZ	146
7.5	Connecting the compressed air supply	147
7.6	Commissioning	148
7.7	Conducting a final check of the protective devices	148
7.8	Conducting an inspection after commissioning	148
8	Operation and adjustment	
8.1	Introduction	149
8.1.1	Qualification of personnel.	149
8.1.2	Safety messages	149
8.2	Operating the machine	153
8.2.1	Switching the main switch on/off	153
8.2.2	EMERGENCY STOP palm button	154
8.2.3	Raising/lowering the pile plate	155
8.2.4	Switching the Feeder Loading System (FLS) on/off.	156
8.2.5	Switching the air supply on/off	158
8.2.6	Starting/stopping the machine	159
8.2.7	Starting/stopping the sheet infeed	160
8.3	Brief instructions for adjusting the machine	161
8.4	Adjusting the M1 control	162
8.4.1	Activate "Setup" machine.	162
8.4.2	Main page structure	163
8.4.3	Beginning a new job.	165
8.4.4	Beginning a new signature.	166
8.4.5	Beginning a new shift.	167
8.4.6	Making the counter settings	168
8.4.7	Selecting a folding imposition.	171
8.4.8	Start buckle plate positioning	179
8.4.9	Positioning of the fold rollers	180
8.4.10	"Setup" machine, manual activation.	181
8.4.11	Changing the infeed data	182
8.4.12	<FP130 settings> page	184
8.4.13	<PB1 settings> page	184
8.4.14	<KB settings> page	185
8.4.15	<DB settings> page	185

8.5	Setting the feeder	186
8.5.1	Pivoting the feeder head upwards	186
8.5.2	Set the right-hand pile stop	187
8.5.3	Loading the feeder with a pallet	189
8.5.4	Align the paper pile laterally	192
8.5.5	Position the feeder head	193
8.5.6	Set the left-hand pile stop	195
8.5.7	Inserting the smoothers	196
8.5.8	Adjusting the pressure vacuum pump	197
8.5.9	Adjusting the feeder head, VACULIFT RS	198
8.5.10	Setting the paper pile level	204
8.5.11	Setting the lateral ventilation	205
8.5.12	Setting the small sheet-size device	206
8.5.13	Adjusting the front ventilation	208
8.5.14	Adjusting the dual suction belt	210
8.6	Setting the standard register table	212
8.6.1	Warning messages	212
8.6.2	Adjusting the conveyor table	213
8.6.3	Switch ultrasonic double sheet detector on/off	214
8.6.4	Adjusting the manual double sheet detector	216
8.6.5	Adjusting for the sheet format	218
8.6.6	Adjusting the angle for the fold rollers	220
8.6.7	Adjusting the vacuum	221
8.7	Adjusting the parallel fold	222
8.7.1	Adjusting the roller pressure (standard)	223
8.7.2	Changing the fold roller setting (automatic)	226
8.7.3	Buckle plate positions	227
8.7.4	Inserting the buckle plates	228
8.7.5	Pull back/remove the buckle plates	230
8.7.6	Adjusting the buckle plates (standard)	232
8.7.7	Adjusting the buckle plates (automatic)	240
8.7.8	Adjusting the FTK combination buckle plate	244
8.7.9	Correcting skewed perforation	245
8.7.10	Installing/dismounting slitter shafts	246
8.7.11	Creasing, cutting and perforating devices	248
8.8	Adjusting the crossfold	255
8.8.1	Set-up of transport brushes	255
8.8.2	Adjusting the cross fold stop (standard)	256
8.8.3	Adjusting the cross fold stop (automatic)	258
8.8.4	Open/close crossfold stop	259
8.8.5	Opening/closing the pneumatic crossfold stop (option)	260
8.8.6	Adjusting the folding knife in the lengthwise position (standard)	261
8.8.7	Adjusting the folding knife in the lengthwise position (automatic)	262
8.8.8	Opening/closing the crossfold table	263
8.8.9	Adjusting the fold rollers and slitter shafts (standard)	264

8.8.10	Adjusting the fold rollers and slitter shafts (automatic)	265
8.8.11	Installing/removing slitter shafts	267
8.8.12	Adjusting the KLT buckle plate (standard)	269
8.8.13	Adjusting the KTL buckle plate (automatic)	270
8.9	Adjusting the threefold	271
8.9.1	Set-up of transport brushes	272
8.9.2	Adjusting the threefold stop (standard)	273
8.9.3	Adjusting the threefold stop (automatic)	274
8.9.4	Open/close threefold stop	275
8.9.5	Pull out the three fold carriage	276
8.9.6	Adjusting the fold rollers (standard)	277
8.9.7	Adjusting the fold rollers (automatic)	279
8.9.8	Installing/removing slitter shafts	281
8.9.9	Special procedure with threefold work	282
8.9.10	Adjusting the KTLT buckle plate (standard)	284
8.9.11	Adjusting the KTLT buckle plate (automatic)	285
8.10	Adjusting the folding knife	286
8.10.1	Adjusting the height	286
8.10.2	Adjusting the angle	287
8.10.3	Enter additional steadying distance	289
8.11	Adjusting outfeed transport	290
8.12	Turning the threefold folding unit (variant S-KTZ).	291
8.13	Removing the paper jam	292
8.14	Identification and handling of malfunctions	293
8.14.1	Palletized feeder	293
8.14.2	Register table	294
8.14.3	Parallel fold	295
8.14.4	Double fold in the first fold	296
8.14.5	Edges/dog ears at letter fold, gatefold	297

9 Maintenance

9.1	Introduction	299
9.1.1	Qualification of personnel	299
9.1.2	Safety messages	300
9.2	Customer service	302
9.2.1	Ordering spare and wear parts	302
9.3	Operational maintenance	303
9.3.1	Checking protective devices	303
9.3.2	Checking the pneumatic springs	312
9.3.3	Cleaning the machine	316
9.3.4	Cleaning/replacing air filter of the pressure vacuum pump	326
9.4	Maintenance	328
9.4.1	Checking the feeder	329

9.4.2	Checking the register table	332
9.4.3	Checking the parallel fold	335
9.4.4	Checking the fold rollers and slitter shafts	348
9.4.5	Checking the buckle plates	349
9.4.6	Checking the slitter shaft cassette	350
9.4.7	Checking the folding knives	351
9.4.8	Checking the crossfold table and threefold carriage	353
9.4.9	Maintaining the pressure vacuum pump	357
9.4.10	Lubricating the safety handwheel	358
9.4.11	Checking the fan in the control cabinet	359
9.5	Maintenance schedule	361
9.6	Repair	364
10	Shutdown, storage	
10.1	Introduction	365
10.1.1	Qualification of personnel	365
10.1.2	Safety messages	365
10.2	Decommissioning	365
10.2.1	Temporary shutdown	365
10.2.2	Final decommissioning	366
10.3	Storage	366
11	Disposal	
11.1	Introduction	367
11.1.1	Qualification of personnel	367
11.1.2	Safety messages	367
11.2	Disposal/recycling	367

1 About this manual



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

Safe use of the machine is only possible once everybody has understood the content of and follows all points of the operating manual. This applies especially to the chapter on safety.

This operating manual contains important notes on how to operate the machine safely, correctly, and economically.

Following these notices helps

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

Supplementation

- The operator must add instructions regarding national regulations for accident prevention to this operating manual.

Retention

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

If you sell the machine

- Give this operating manual to any subsequent owner or user of the machine.

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

1.1 Additional documents

In addition to this operating manual, there are these documents about the machine:

Designation	Type MBO part number	Use
Wiring diagram with pneumatic diagram		
Spare parts list		
Knife catalog		
Supplier documentation		

Table 1: Additional documents

1.1.1 Supplier documentation

Manufacturer	Designation	Type MBO part number	Use
Elmo-Rietschle	Pressure vacuum pump	C-KLR 140 4006527	Compressed air generation Vacuum generation

Table 2: Supplier documentation

1.2 Structure of the operating manual

The table lists the chapters of the operating manual. 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	<ul style="list-style-type: none"> • Operator • Operating personnel • Maintenance personnel • Service technicians
1	About this manual	Important notes about this operating manual	<ul style="list-style-type: none"> • Operator • Operating personnel • Maintenance personnel • Service technicians
2	Basic safety instructions	Details about: <ul style="list-style-type: none"> • Residual risks and hazards with intended use. • Foreseeable misuse. • Avoidance of the risks. 	<ul style="list-style-type: none"> • Operator • Operating personnel • Maintenance personnel • Service technicians
3	Product description	<ul style="list-style-type: none"> • Important notices about the product • Technical data 	<ul style="list-style-type: none"> • Operator • Operating personnel • Maintenance personnel
4	Structure and function	Description of: <ul style="list-style-type: none"> • Structure and function • Protective devices 	<ul style="list-style-type: none"> • Operating personnel • Maintenance personnel • Service technicians
5	Operating and display elements, operating modes	Description of the: <ul style="list-style-type: none"> • Operating and display elements • Operating modes 	<ul style="list-style-type: none"> • Operating personnel • Maintenance personnel • Service technicians
6	Transportation, interim storage	Details about: <ul style="list-style-type: none"> • Packaging • Transportation • Interim storage 	<ul style="list-style-type: none"> • Transport personnel • Maintenance personnel • Service technicians
7	Set-up and commissioning	Details for: <ul style="list-style-type: none"> • Set-up • Commissioning 	<ul style="list-style-type: none"> • Maintenance personnel • Service technicians
8	Adjustment and operation	Details for: <ul style="list-style-type: none"> • Operation • Adjustment 	<ul style="list-style-type: none"> • Operating personnel • Maintenance personnel • Service technicians
9	Maintenance	Details for the: <ul style="list-style-type: none"> • Operational maintenance • Maintenance • Repair 	<ul style="list-style-type: none"> • Operating personnel, • Maintenance personnel • Service technicians
10	Decommissioning, storage and putting the machine back into operation	Details for the: <ul style="list-style-type: none"> • Decommissioning • Storage • Recommissioning 	<ul style="list-style-type: none"> • Operator • Operating personnel • Maintenance personnel • Service technicians
11	Disposal	Details for the environmentally friendly disposal	<ul style="list-style-type: none"> • Operator • Maintenance personnel • Service technicians

Table 3: Structure of the operating manual

1.3 Signs and symbols used

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



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

Table 4: Symbols, terms, and abbreviations

1.4 Description of safety messages

Safety messages are marked by a safety sign 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	Meaning
DANGER	Signal word to indicate a hazardous situation with high risk level which, if not avoided, will result in death or serious injury.
WARNING	Signal word to indicate a possible hazardous situation with medium risk level which, if not avoided, could result in death or serious injury.
CAUTION	Signal word to indicate a possible hazardous situation with minor risk level which, if not avoided, could result in minor or moderate injury or property damage.

Table 5: Signal word meanings

1.4.2 Structure of safety messages

Each safety message is structured as follows:

- Safety sign
- 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 sign

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

Table 6: Safety sign

1.4.3.1 Prohibition sign


Depiction	Meaning
	<p>Entry of the area forbidden.</p> <p>This prohibition sign indicates that it is forbidden to enter the area.</p>

Table 7: Prohibition sign

1.4.3.2 Warning sign









Depiction	Meaning
	Warning about a general hazard. You will see this warning-triangle next to activities during which several causes can create hazards.
	Warning of hazardous voltage. You will see this warning-triangle next to activities during which there is a hazard of electrical shock, possibly with deadly consequences.
	Warning of crushing of body parts You will see this warning triangle next to activities during which there is a hazard of crushing, possibly with deadly consequences.
	Warning of rotating rollers. You will see this warning triangle next to activities during which there is a hazard of crushing, possibly with deadly consequences.
	Warning of crushing of hand. You will see this warning-triangle next to activities during which there is a hazard of crushing the hand.
	Warning of crushing by noise dumping hood. You will see this warning triangle next to activities during which there is a hazard of crushing by the noise dumping hood, possibly with deadly consequences.
	Warning against rotating knives. You will see this warning-triangle next to activities during which there is a hazard of cutting injuries, possibly with deadly consequences.
	Warning of lifting heavy machine parts. You will see this warning triangle next to activities during which there is a hazard of overloading due to lifting heavy loads.

Table 8: Warning sign








Depiction	Meaning
	<p>Warning of tipping machine parts. You will see this warning-triangle next to activities during which there is a hazard of crushing due to tipping loads.</p>
	<p>Warning of entanglement zones. You will see this warning triangle next to activities during which there is an entanglement hazard.</p>
	<p>Warning of sharp knives. You will see this warning-triangle next to activities during which there is a hazard of cutting injuries, possibly with deadly consequences.</p>
	<p>Warning of substances harmful to health. You will see this warning-triangle next to activities during which there is a hazard of substances harmful to health, possibly with deadly consequences.</p>
	<p>Warning of oxidizing substances. You will see this warning-triangle next to activities during which there is a hazard of oxidizing substances, possibly with deadly consequences.</p>
	<p>Warning of hot surfaces. You will see this warning-triangle next to activities during which there is a danger of burns, possibly with long-term consequences.</p>
	<p>Warning of stumbling points. You will see this warning-triangle next to activities during which there is a tripping hazard, possibly with deadly consequences.</p>

Table 8: Warning sign

1.4.3.3 Mandatory sign









Depiction	Meaning
	<p>Use hand protection. You will see this mandatory sign next to activities for which safety gloves should be worn.</p>
	<p>Use foot protection. You will see this mandatory sign next to activities for which safety shoes should be worn.</p>
	<p>Use ear protection. You will see this mandatory sign next to activities for which ear protection should be worn.</p>
	<p>Use eye protection. You will see this mandatory sign next to activities for which eye protection should be worn.</p>
	<p>Get help. You will see this mandatory sign next to activities for which you should ask for the help of other people.</p>
	<p>Follow the operating manual. You will see this mandatory sign next to activities for which you should follow the operating manual.</p>
	<p>Heed the maintenance chapter. You will see this mandatory sign next to activities for which you should heed the maintenance chapter.</p>
	<p>Activate before maintenance or repair. You will see this mandatory sign next to activities for which the machine must be de-energized.</p>

Table 9: Mandatory sign

1.4.4 Marking of danger spots

Permanent hazards and danger spots are marked with yellow and black stripes.


Depiction	Meaning
	<p>Heed danger spot or hindrance. This hazard marking is affixed to constant danger spots and hindrances.</p>

Table 10: Marking of danger spots

1.5 User assessment of the operating manual

Our operating manuals are updated regularly. Help us with your suggestions for improvement; they make the manuals user-friendly.

2 Basic safety instructions

The basic requirement for the safe handling and fault-free operation of this machine is knowledge of the basic 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 available to the operating and maintenance personnel.
- Also heed the applicable accident prevention and environmental protection rules and regulations for the place where the machine is used.

2.1 Intended use

- The machine is intended exclusively for the processing of broadsheets. 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 maintenance personnel, or a specialist from the manufacturer or supplier.
- The machine may only be operated by specially-trained and instructed personnel.
- The machine may only be operated with the required personal protective equipment.
- Troubleshooting, maintenance and service must be carried out by trained maintenance personnel only.
- Follow all instructions in this operating manual.
- Heed the local safety regulations and accident prevention regulations.
- Adhere to the inspection and maintenance intervals.
- Use only original wearing parts and spare parts.



Use the machine only as intended and when the protective device is working perfectly.
This is the only way to guarantee the machine's operating safety.

2.2 Reasonable foreseeable misuse

Reasonable foreseeable misuses are:

- Operation in an area subject to explosion.
- Operation with removed protective devices.
- Operation of the machine without the required personal protective equipment.
- Exceeding of the technical values specified for normal operation.
- Individual changes and rebuilding.
- Maintenance and cleaning intervals not adhered to.
- Maintenance and repair work that is not performed correctly.
- Wearing parts not replaced.
- Unintended use.

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

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

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

Use only original parts or parts approved by the manufacturer.

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

2.3 Obligation and liability

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

Nonetheless risks and damage can occur when using it:

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

If the machine is:

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

The machine is only to be used:

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

2.4 Warranty

Our "General sales and delivery conditions" apply here.

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

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

2.5 Residual risks

A risk analysis with risk assessment was conducted for this machine in accordance with DIN EN ISO 12100:2010.

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

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

- Warnings and protective devices on the machine.
- General safety instructions and special warnings in this operating manual.
- Operating manual of the machine/system manufacturer.
- Operator directives.

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

2.5.1 Transport, interim storage

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

2.5.2 Set-up, commissioning

- Hazardous voltage.
- Hazardous voltage at the stationary mains connection.
- Incorrect supply voltage
- Use of unsuitable fork lifts.
- Tipping machine parts during the installation process.
- Insufficient properties and condition of the underfloor.
- Transport locks on the threefold carriage.
- Transport locks on the threefold (KTZ).
- Improper alignment of the machine components.
- Excessive operating pressure (compressed air).
- Free, rotating fold rollers and slitter shafts due to pulling back/removing the buckle plates/sheet deflectors when the machine is running.
- Lifting heavy machine parts.
- Incorrect use of the outlets.
- Discharge currents greater than 10mA.
- Disconnected protective conductor connections.
- Trip hazards due to connecting cables lying around.
- Use of multiple adapter boxes in a machine combination.
- Incorrect direction of rotation of the feeder motor.

- Incorrect direction of rotation of the pressure vacuum pumps.
- Incorrect connection of the air hoses.
- Incorrect direction of rotation of the driving motor.
- Dismounted protective devices.

2.5.3 Adjustment and operation

- Dismantling, bridging or bypassing protective devices.
- Operation without protective devices.
- Overloading of the feeder.
- Rotating machine parts.
- Moving the pile plate.
- Self-acting lowering of the opened noise damping safety hood.
- Rotating machine parts.
- Free, rotating fold rollers and slitter shafts due to pulling back/removing the buckle plates/sheet deflectors when the machine is running.
- Setting of the roller pressure.
- Incorrect handling of the safety handwheels.
- High noise pressure level.
- Infeed point at the end of the register table.
- Unjamming of paper jams.
- Incorrectly fixed buckle plates.
- Cutting hazard due to slitter shafts.
- Trip hazards due to connecting cables lying around.

2.5.4 Maintenance

Operational maintenance:

- Free, rotating fold rollers and slitter shafts due to pulling back/removing the buckle plates/sheet deflectors when the machine is running.
- Rotating machine parts.
- Lifting heavy machine parts.
- Heavy contamination.
- Improper cleaning
- Unsuitable cleaning agents.
- Incorrect use of cleaning agents.
- Used cleaning cloths.
- Use of compressed air.
- Incorrect cleaning of the spiral fold rollers.
- High-grip fold rollers cleaned incorrectly.
- Penetration of foreign bodies into the pressure vacuum pump.
- Incorrect maintenance intervals during multi-shift operation.

Maintenance:

- Hazardous voltage.

- Dismantling, bridging or bypassing protective devices.
- Operation without protective devices.
- Free, rotating fold rollers and slitter shafts due to pulling back/removing the buckle plates/sheet deflectors when the machine is running.
- Rotating machine parts.
- Crushing.
- Winding up.
- Wrong/poor maintenance tool.
- Improper maintenance.
- Incorrect maintenance intervals during multi-shift operation.

Repair:

- Improper maintenance.

2.5.5 Decommissioning, storage

- Incorrect storage.

2.5.6 Disposal

- Improper disposal.

2.6 Product-specific hazards

2.6.1 Entanglement hazard and crushing hazard

Depending on the folding process, a folding machine has many rotating fold rollers and slitter shafts that run in opposite directions.

During all adjustment work on the fold rollers and slitter shafts, there is therefore an increased entanglement hazard and crushing hazard.

How to avoid injuries:

- ▷ Never reach into the fold rollers and slitter shafts while the machine is running.
- ▷ All adjustment and testing work may only be done on a machine that is switched off and secured against accidental switching on.
- ▷ Press the EMERGENCY STOP palm button.
- ▷ Always have the adjustment or testing/inspection work carried out by one individual person only.
- ▷ There are also entanglement and crushing hazards when turning the machine with the safety handwheel!
- ✓ Injuries will be avoided.

2.6.2 Cutting hazard

The tools on the slitter shafts are razor-sharp.

During all work on the tools of the slitter shafts, there is therefore an increased cutting hazard on hands and arms, such as when:

- Handling the tools.
- Installing and removing the slitter shafts.
- Fitting the slitter shafts.
- Handling slitter shafts installed on the machine.
- Removing paper jams in the area around the slitter shafts.

This is how to avoid cutting injuries:

- ▷ Never reach into the slitter shafts while the machine is running.
- ▷ All work on the slitter shafts may only be done on a machine that is switched off and secured against accidental switching on.
- ▷ Press the EMERGENCY STOP palm button.
- ▷ Always wear cut-proof safety gloves and safety shoes when working on the slitter shafts.
- ▷ Work on the machine must always be performed by one person only.
- ▷ There is also a risk of injuries when turning the machine with the safety handwheel.
- ▷ Always hold the slitter shaft on the shaft and not on the tool.
- ✓ Cutting injuries will be avoided.

2.6.3 Noise

There is a high sound pressure level on the buckle plates and on the folding knife with high production speeds and heavy papers.

This high sound pressure level can cause hearing damage.
See chapter "3.2.6 Emissions".

This is how to avoid hearing damage:

- ▷ Always wear ear protection when working on the machine.
- ▷ Always close the noise damping hoods whenever you work on the machine.
- ✓ Hearing damage will be avoided.

2.7 Life time

2.7.1 Life time of the machine

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

2.7.2 Service life of the control-technical safety components

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

2.8 General safety instructions

2.8.1 Transport, interim storage

- Only specially-trained and authorized personnel may transport the machine.
- Keep the transport paths and the loading and unloading areas free of personnel.
- Transport is only permitted to be carried out with approved lifting and transport equipment.

2.8.2 Set-up, commissioning

- Only specially-trained and authorized personnel may set up and commission the machine.

2.8.3 Normal operation

- Only instructed operating personnel may operate the machine.
- The machine may be operated only if all protective devices such as protective hoods and EMERGENCY STOP palm buttons, are present and fully functional.
- The machine may only be operated with the required personal protective equipment.
- 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 high machine parts must be reached: A suitable working stage or other platform must be used, which fulfills the safety-technical requirements such as height, stability, etc.

2.8.4 Adjustment and operation

- Only specially-trained and authorized personnel may set up the machine.
- The machine may only be set up with the required personal protective equipment.
- Inform operating personnel before beginning set-up.
- If the machine is switched off for set-up, it must be secured against unauthorized or inadvertent switching on again.
Use a padlock to secure the main switch against switching on. If necessary, attach a warning sign to the main switch.
- Machine parts may not be used as climbing aids. If higher machine parts must be reached, a suitable working stage or other platform must be used, which fulfills the safety-technical requirements such as 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 and parts so that they present no hazard.
Do not linger or work under suspended loads.
- After completion of the work, do not leave any tools or other loose objects lying on the machine.

2.8.5 Maintenance and repair

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

2.8.6 Work on electrical equipment

- Only an electrically qualified person is permitted to perform work on the electrical systems or equipment.
- In case of faults in the electrical power supply, the machine must be switched off immediately.
- Only use original fuses with the prescribed amperage.

2.9 Personnel, qualifications and duties

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

Authorized personnel is divided into several groups:

- Operator
- Operating personnel
- Maintenance personnel

The authorized personnel must:

- have reached the age of 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 on the machine,
- be trained and instructed in accordance with his or her responsibilities, tasks, and activities on the machine,
- have understood and can implement practically the operating manual with respect to responsibilities, tasks, and activities for the machine.

2.9.1 Qualification of the personnel

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

	Specially trained personnel	Instructed operating personnel	Instructed personnel with specialized training (mechanical/ electrical engineering)
Transportation	X	-	-
Interim storage	X	-	-
Set-up	-	-	X
Electrical connections	-	-	X
Stationary mains connection	-	-	X
Commissioning	-	-	X
Troubleshooting (mechanical/ electrical)	-	-	X
Installation, set-up	X	X	-
Operation	-	X	-
Operational maintenance (cleaning)	-	X	-
Maintenance	X	-	X
Repair	-	-	X
Decommissioning	-	-	X
Storage	X	-	-
Disposal	X	-	-

Table 11: Qualification of personnel
 Legend: X permitted, - not permitted

2.9.2 Duties of the operator

The owner/operator is responsible for

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

Heed the national laws and European directives about occupational safety and health of employees at work.

Germany The requirements of the German Labor Protection Act (ArbSchG) and the German Health and Safety at Work Regulations (BetrSichV) must be adhered to.

EC countries The requirements of the directives 89/391/EEC and 2009/104/EU must be adhered to.

2.9.3 Duties of the operating personnel

The operating personnel must:

- be trained and instructed,
- use the machine as intended,
- wear the necessary personal protective equipment,
- observe the basic regulations regarding workplace safety and accident prevention,
- read and heed the "2 Basic safety instructions" chapter and the safety messages in this operating manual,
- immediately take 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

- ensuring that the machine is protected against unauthorized use,
- ensuring that the machine is operated only when it is fully functional, safe and reliable,
- cleaning is performed according to the cleaning plan.

2.9.4 Duties of the maintenance personnel

The maintenance personnel must:

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

The maintenance personnel is responsible for

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

2.10 Personal protective equipment

2.10.1 Operation and adjustment

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



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



2.10.2 Operational maintenance (cleaning)

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



- Safety glasses
- Suitable safety gloves
- Safety shoes



2.11 Work areas and workstations

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

2.11.1 Variants S-KTL, S-KTLT

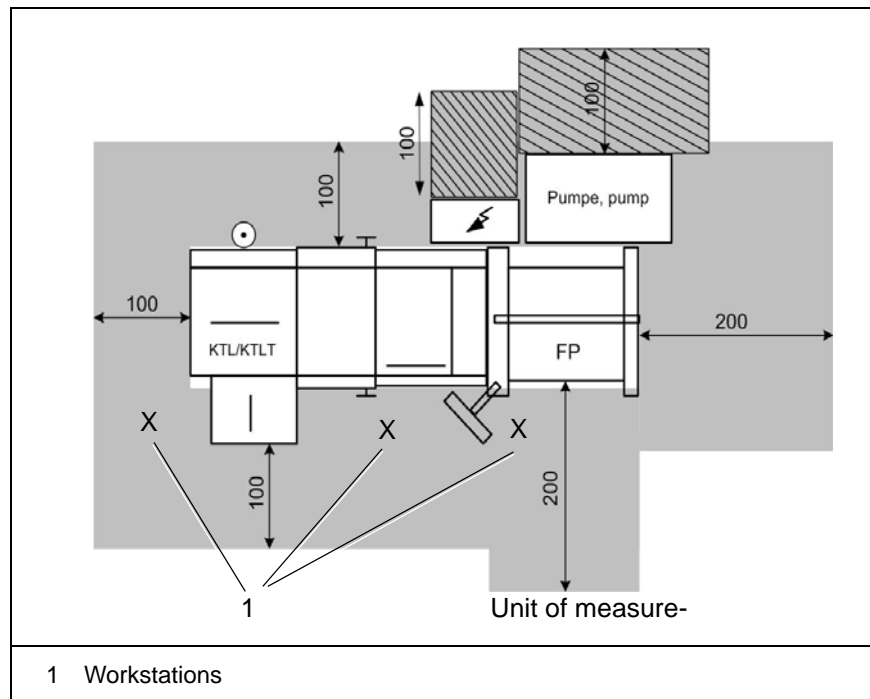


Figure 1: Work areas and workstations for S-KTLT

2.11.2 Model S-KTZ

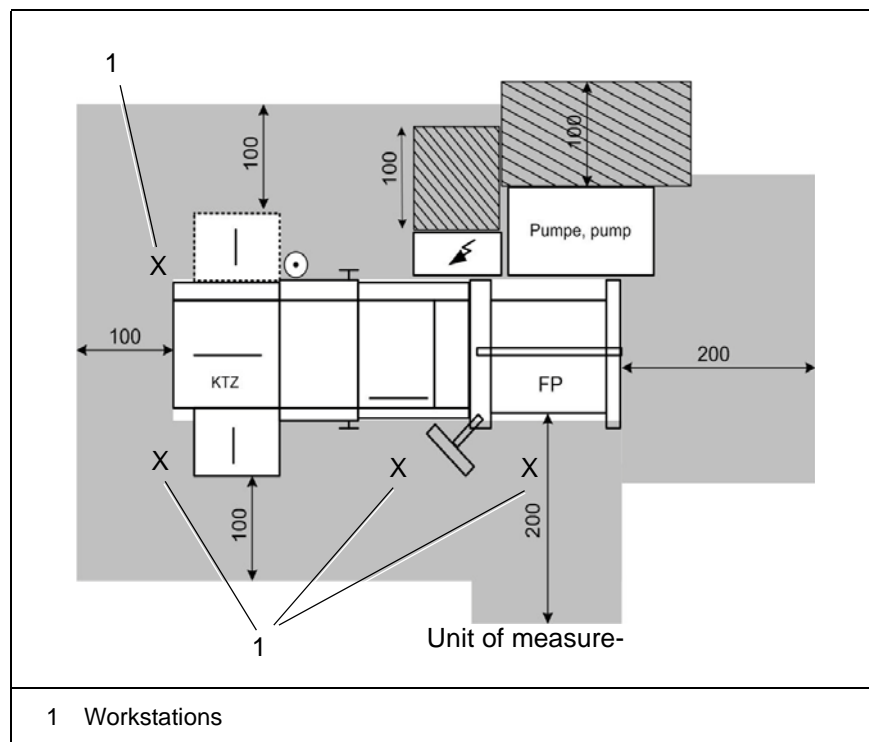


Figure 2: Work areas and workstations for S-KTZ


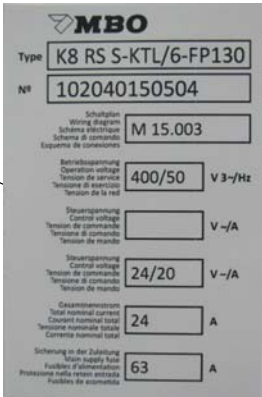
2.12 Markings on the machine

These markings must be on the machine and in an easily legible condition. If they are damaged or illegible, they must be replaced.

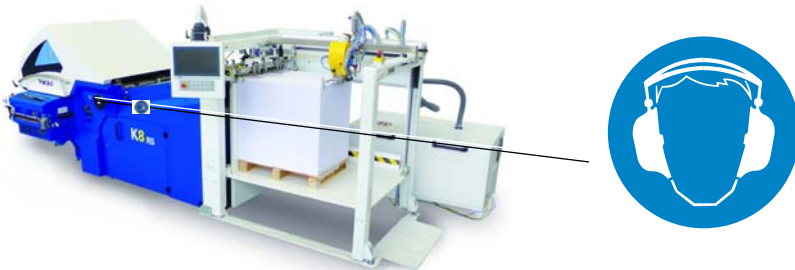
For the appropriate MBO part number, see chapter "2.12.1 Position and meaning".

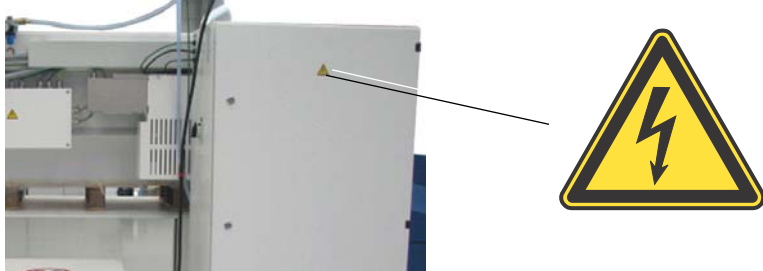
2.12.1 Position and meaning

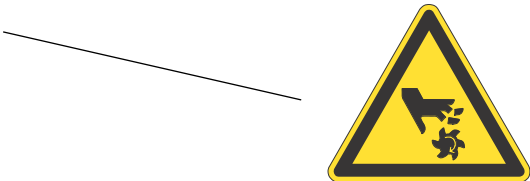
Pos. 1	MBO part number:4006536
	
Meaning: <Name plate>	

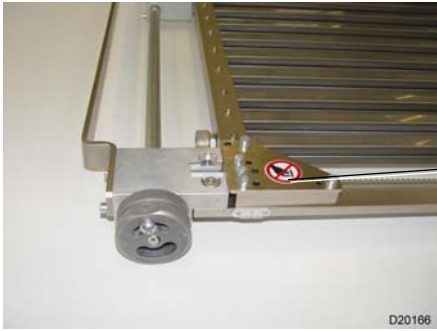

Pos. 2	MBO part number: 4006537
	
Meaning: <Electric name plate>	



<p>Pos. 3</p>	<p>MBO part number:4002643</p>
	
<p>Meaning: Mandatory sign <Read operating manual></p> <ul style="list-style-type: none"> • The operating manual must be heeded by all people who work on or at the machine. • Read and understand the operating manual before working with the machine. • Always keep the operating manual where the machine is being used. • The operating manual must always be freely available to the operating and maintenance personnel. 	

<p>Pos. 4</p>	<p>MBO part number:4002562</p>
	
<p>Meaning: <Use ear protection> mandatory sign High noise pressure level. Non-observance could result in hearing damage.</p> <ul style="list-style-type: none"> • Always wear ear protection when working on the machine. • Always close the noise damping hoods whenever you work at or on the machine. 	

Pos. 5	MBO part number: 0128301
	
<p>Meaning: <Hazardous voltage> warning sign Non-observance will result in serious injury or death.</p> <ul style="list-style-type: none"> • Only an electrically qualified person may perform work on the machine's electrical system. • Follow the local occupational safety regulations and electrotechnical regulations. • On the supply terminals and on the terminals of the main switch, there is hazardous voltage even when the main switch is switched off (see wiring diagram). • There is hazardous residual voltage on the connection terminals of the frequency inverter even when the main switch is switched off. (heed capacitor discharge time). 	

Pos. 6	MBO part number: 0128301
	
<p>Meaning: Cutting hazard due to slitter shafts. Non-observance could result in serious injury or death.</p> <ul style="list-style-type: none"> • Never reach into the slitter shafts while the machine is running. • All work on the slitter shafts may be carried out only when the machine is stopped and secured against switching on. • Press the EMERGENCY STOP palm button. • Always wear cut-proof safety gloves and safety shoes when working on the slitter shafts. • Work on the machine must always be performed by one person only. • There is also a risk of injuries when turning the machine with the safety handwheel. • Always hold the slitter shaft on the shaft and not on the tool. 	

<p>Pos. 7</p>	<p>MBO part No.: 0101730</p>
<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;">  </div> </div>	
<p>Meaning: <Do not touch> prohibition sign Crushing hazard during automated format change. Non-observance could result in injury.</p> <p>When starting the automated format change, observe the following precautions:</p> <ul style="list-style-type: none"> • Do not reach into the machine. • Make absolutely sure that there are no other people on the machine. 	

<p>Pos. 8</p>	<p>MBO part number: 0751412</p>
<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;">  </div> </div>	
<p>Meaning: CAUTION! Unsuitable cleaning agents. Non-observance could result in property damage.</p> <p>Use the roller cleaning agent "Varn-Wash VM 111" or "VWM" only.</p>	

Pos. 8	MBO part number:
	
<p>Meaning: <Do not enter> prohibition sign Non-observance could result in injury and/or property damage. Do not use any machine parts to climb on.</p>	

2.13 Directions for emergencies

The operator must add instructions regarding national regulations for accident prevention to this operating manual.

2.13.1 Emergency call numbers

European Union	Police	112
	Fire department	112
	Ambulance	112
Germany	Police	110 or 112
	Fire department	112
	Ambulance	112
USA	Police	911
	Fire department	911
	Ambulance	911
China	Police	110
	Fire department	119
	Ambulance	120

Table 12: Emergency call numbers

2.13.2 Behavior in case of accidents




<p>1 Immediate measures</p>		<ul style="list-style-type: none"> • Stay calm. • Secure the accident location. • Heed your own safety. • If necessary, rescue person from the danger zone. • Check consciousness and breathing/check for type of injury. • If necessary, take lifesaving measures right away.
<p>2 Emergency call</p>		<ul style="list-style-type: none"> • Where is the accident location? • What happened? • How many injured? • What injuries? • Who's calling? • Wait for queries!
<p>3 First aid</p>		<ul style="list-style-type: none"> • Provide help as necessary. • Check consciousness and breathing. • Protect against heat loss. • Provide support and assistance.

Table 13: Behavior in case of accidents

3 Product description

3.1 Important notices about the product

3.1.1 Overall view

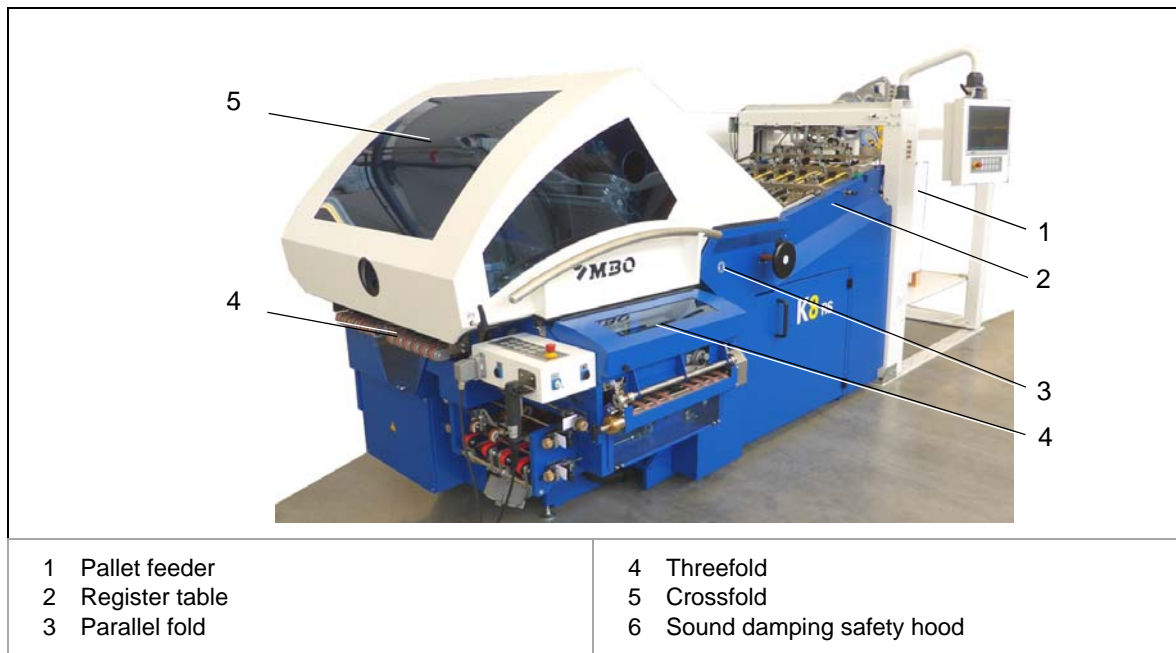


Figure 3: Overall view

3.1.2 Standard equipment for K8RS

- M1-Control machine control, TOUCHSCREEN
- FP800/130 palletized feeder with:
 - Feeder Loading Sytem FLS
 - Vaculift RS feeder head
 - Double Vacubelt
- Anti-static lattice-type register table
- VIVAS
- VIRO-TEC fold rollers
- 4 or 6 COMBIPLATE combination buckle plates
- MWK slitter shaft cassette
- VACUKNIFE
- Crossfold area can be swiveled up
- Threefold area can be pulled out
- Rapidset automation
- Powerful drive motor
- Torque-monitored toothed belt drive in parallel fold
- Sheet stop in the crossfold as waste sheet deflector including ultra sonic double sheet deflector.

3.2 Technical data

3.2.1 Floor plan

3.2.1.1 K8RS KTL, KTLT with palletized feeder

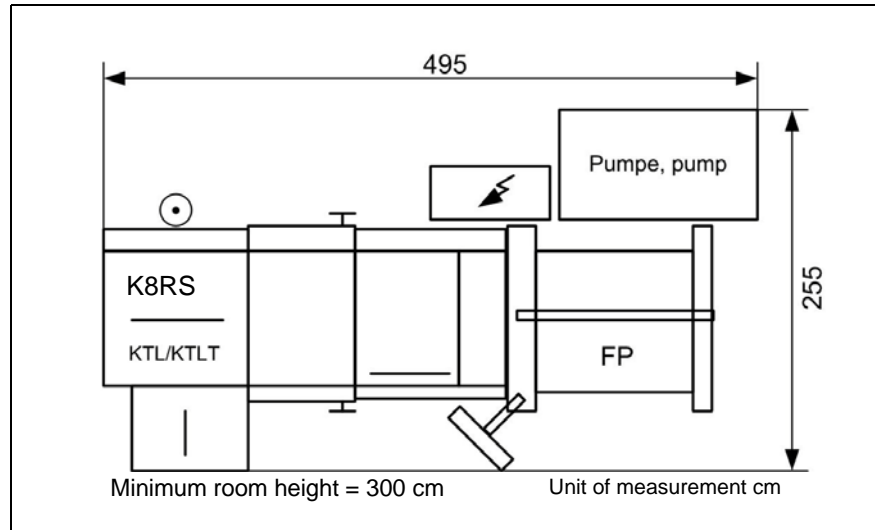


Figure 4: Floor plan for KTL /KTLT FP feeder

3.2.1.2 K8RS KTZ with palletized feeder

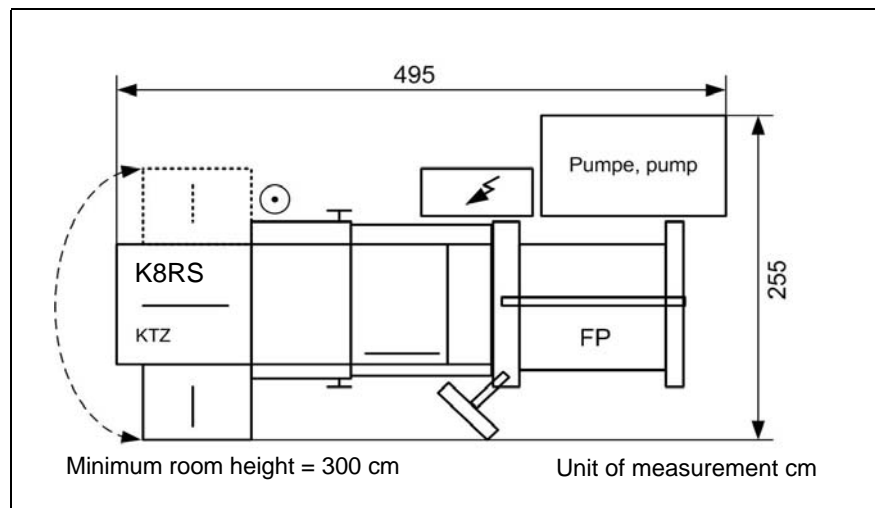


Figure 5: Floor plan for KTZ FP feeder

3.2.2 Performance characteristics

Speed		Minimum	Maximum ¹⁾
		30 m/min	275 m/min
Broadsheet	Format (length x width)	Minimum	Maximum
	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	15 cm x 10 cm	53 cm x 39 cm
	Grammage ²⁾	50 g/m ²	250 g/m ² 1st Fold 200 g/m ² 2nd Fold 175 g/m ² 3rd Fold 130 g/m ² 4th Fold
Pile height ³⁾		15 cm	130 cm
Load capacity		0 kg	1000 kg
Buckle plates	Fold length	Minimum	Maximum
	Standard buckle plate 1 +	6 cm	70 cm
	Standard buckle plate 3- 6	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
	Minimal cutting and perforation length	7.5 cm	
Fold rollers	Diameter		43.7 mm

Table 14: Performance characteristics

1) The maximum working speed depends on paper properties, format, fold type, temperature, and humidity, as well as various states at the operator that the manufacturer cannot influence.

2) All values refer to simple volume paper.

3) Including pallet height.

3.2.3 Shipping and transport data

Weights ¹⁾		Net	Gross
FP800/130	With transport pallet	870 kg	990 kg
	With shipping crate	870 kg	1255 kg
S-KTL	With transport pallet	1770 kg	1950 kg
	With shipping crate	1770 kg	2185 kg
S-KTLT	With transport pallet	1850 kg	2030 kg
	With shipping crate	1850 kg	2270 kg
S-KTZ	With transport pallet	1950 kg	2130 kg
	With shipping crate	1950 kg	2370 kg
4 buckle plates + KTL 6 buckle plates + KTL 1 x KTLT plate 1 x gatefold plate	With shipping crate	155 kg	205 kg
	With shipping crate	200 kg	255 kg
		14 kg	
		50 kg	
Control cabinet	With transport pallet	150 kg	190 kg
	With shipping crate	150 kg	275 kg
Pressure/vacuum pump	With transport pallet	310 kg	350 kg
	With shipping crate	310 kg	460 kg
Dimensions		L x W x H	
FP800/130	Without packaging	190 x 135 x 200 (cm)	
	Transport pallet	210 x 160 x 230 (cm)	
	Shipping crate	215 x 165 x 265(cm)	
S-KTL, S-KTLT, S-KTZ	Without packaging	320 x 180 x 180 ²⁾ (cm)	
	Transport pallet	330 x 200 x 230 (cm)	
	Shipping crate	335 x 205 x 245 (cm)	
4 buckle plates + KTL 6 buckle plates + KTL	Shipping crate	115 x 115 x 50 (cm)	
	Shipping crate	115 x 115 x 70 (cm)	
Control cabinet	Transport pallet	185 x 95 x 70 (cm)	
	Shipping crate	190 x 100 x 75 (cm)	
Pressure/vacuum pump	With transport pallet	170 x 120 x 115 (cm)	
	With shipping crate	175 x 125 x 120 (cm)	
Fork lift ³⁾	Carrying capacity / load (Q) ⁴⁾	Min. 4500 kg	
	Fork tine length	Min. 220 cm	
Floor conditions	Cargo ⁵⁾	> 20 kN/m ²	
	Levelness ⁶⁾	< 10 mm/m	

Table 15: Shipping and transportation data

1) All details are approximate values.

2) With closed noise damping and safety hood.

3) Minimum requirements of the fork lift

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

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

6) In the area of the machine, the total height difference may not exceed 20 mm.

3.2.4 Electrical supply



The machine is only designed for the following nominal voltage.

Electrical power supply ¹⁾	Wiring diagram no. See electrical name plate		
Nominal voltage 3 x 400 V + N + PE ²⁾	Required mains configuration ³⁾	TN - C - S - power mains TN - S - power	Clockwise rotating field required
	Voltage	400 V AC	+/-10%
	Frequency	50/60 Hz	+/-1 %
	Control voltage:	24 VDC/10 A	
Connecting line ⁴⁾	Cross-section (IEC)	5 x 16 mm ²	
	Max. line length	m	
	Min. network impedance	mOhm	
	Short-circuit current rating (SCCR)	5 kA	
Fuse	according to IEC	63 A characteristic C	
Protective equipotential bonding conductor ⁵⁾	Cross-section according to IEC	16 mm ²	
Connected loads	Total ⁶⁾	9.3 kW	
KTL/KTLT with palletized feeder	Feeder	0.75 kW	
	Pressure/vacuum pump	5.5 kW	
	Drive1	3 kW	
	Power supply	0.25 kW	
	Fan	0.05 kW	
	With airstream table ⁷⁾	1.5 kW	
Operational readiness (stand-by)	Power	kW	
	Current rate	A	

Table 16: Electrical supply 400V network

1) Stationary mains connection

- 2) *If the existing nominal voltage varies from the supply voltage specified above, an isolating transformer must be installed.
If the nominal voltage is 380 V or 415 V, the tolerance of the supply system must be checked.
If the tolerance is between 360 V – 440 V, an isolating transformer is not required.*
- 3) *N - line is loaded; a fault-current circuit breaker (FI) may not be used.*
- 4) *According to EN ISO 60204:2006 Table 10.*
- 5) *According to EN 60204:2006.*
- 6) *The total connected load depends on the feeder type, the equipment of folding unit I, as well as the number and equipment of the connected subsequent folding units and the delivery.*
- 7) *Add the connected values of the airstream table to the connection values of the corresponding machine.*

3.2.5 Compressed air supply, control air

Compressed air supply		
Connected loads	Necessary network pressure	6 bar 7 bar
	Average consumption ¹⁾	25 m ³ /h
	Purity class ²⁾	ISO 8573-1:2010 [3:4:2] ³⁾
	Coupler plug	KS4-1/4-A
Connecting line	Coupler socket	KD4....

Table 17: Compressed air supply, control air

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

2) Purity class according to ISO 8573-1:2010 [particles:water:oil].

3) Typical purity class for the publishing and print sector (control air) in compliance with VDMA standard sheet 15390-1:2014-12, table 5.

3.2.6 Emissions

3.2.6.1 Noise emissions

Noise emissions		
Specified two-digit noise emissions value according to DIN EN 4871	Idling	Load
A-scaled sound power level L_{WA} in dB re 1 pW Uncertainty K_{WA} in dB	- 2.5	105 2.5
A-scaled emission sound pressure level L_{PA} In dB re 20 μ Pa at the operating place, palletized pile feeder Uncertainty K_{PA} in dB	< 70 2.5	87.6 2.5
A-scaled emission sound pressure level L_{PA} In dB re 20 μ Pa at the operating place, register table Uncertainty K_{PA} in dB	< 70 2.5	87.4 2.5
A-scaled emission sound pressure level L_{PA} In dB re 20 μ Pa at the operating place, delivery Uncertainty K_{PA} in dB	< 70 2.5	85.9 2.5
The values were determined in accordance with the noise emission standard DIN EN ISO 13023 ¹⁾ using the basic standards DIN EN ISO 3746 and DIN EN ISO 11204		

Table 18: Noise emissions

1) Noise measurement EN 13023 J.2.2.2 - Class 2

3.2.7 Ambient conditions

Ambient temperature		17 ... 35 °C ¹⁾
Storage temperature		10 ... 35 °C
Relative humidity	Optimal Minimum Maximum	40 - 60 % 30 % 80 % (no condensation)
Set-up height ²⁾		Max. 800 above sea level

Table 19: Ambient conditions

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



Avoid direct sunlight and drafts.

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.

According to bookbinding terminology, the folding line is called a fold.

4.1.2 Folding principles

Buckle folding principle

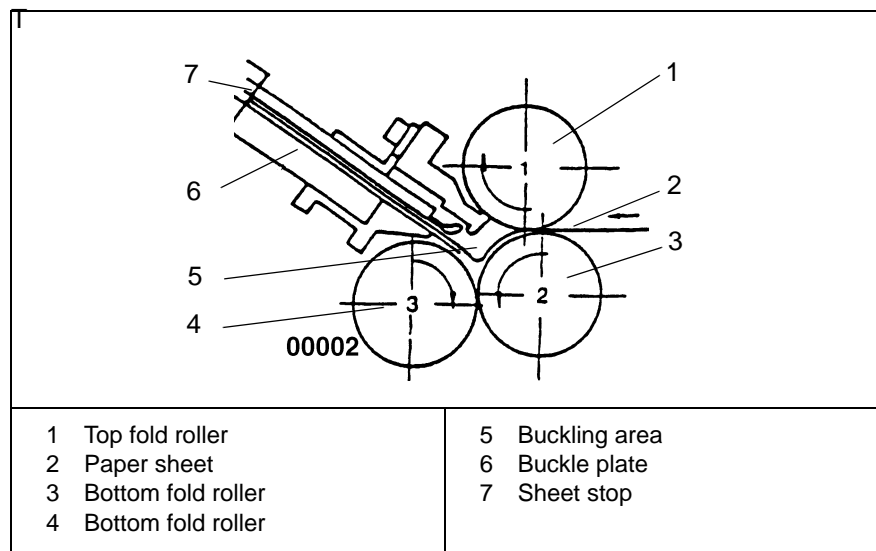


Figure 6: Buckle folding principle

To create a buckle fold, threefold rollers and a buckle plate are necessary.

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

Knife fold principle

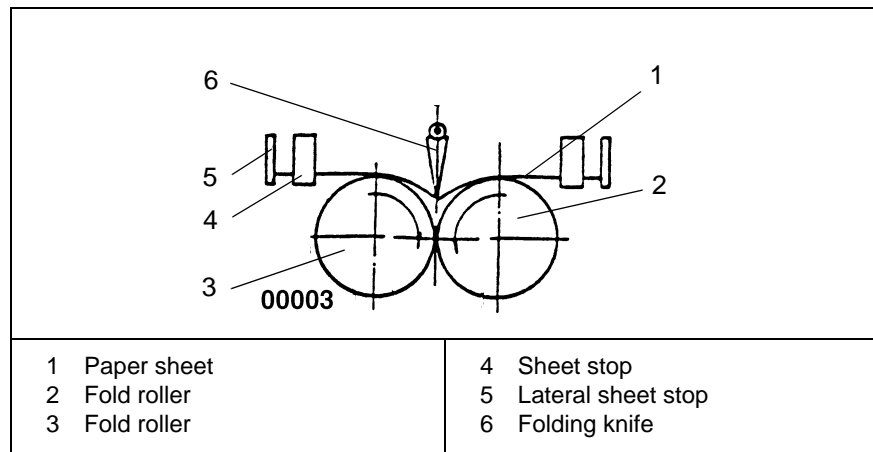


Figure 7: Knife fold principle

To create a knife fold, two fold rollers rotating in opposite directions and a folding knife that can be moved vertically 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 triggering the knife movement, the folding knife conveys (4) the sheet of paper (1) in the direction of the fold rollers (2) and (3).
- The sheet of paper (1) is grasped by the fold rollers (2) and (3) folded during its passage.

4.2 Structure

4.2.1 Views of the palletized feeder

The components are distributed across three sides of the palletized feeder.

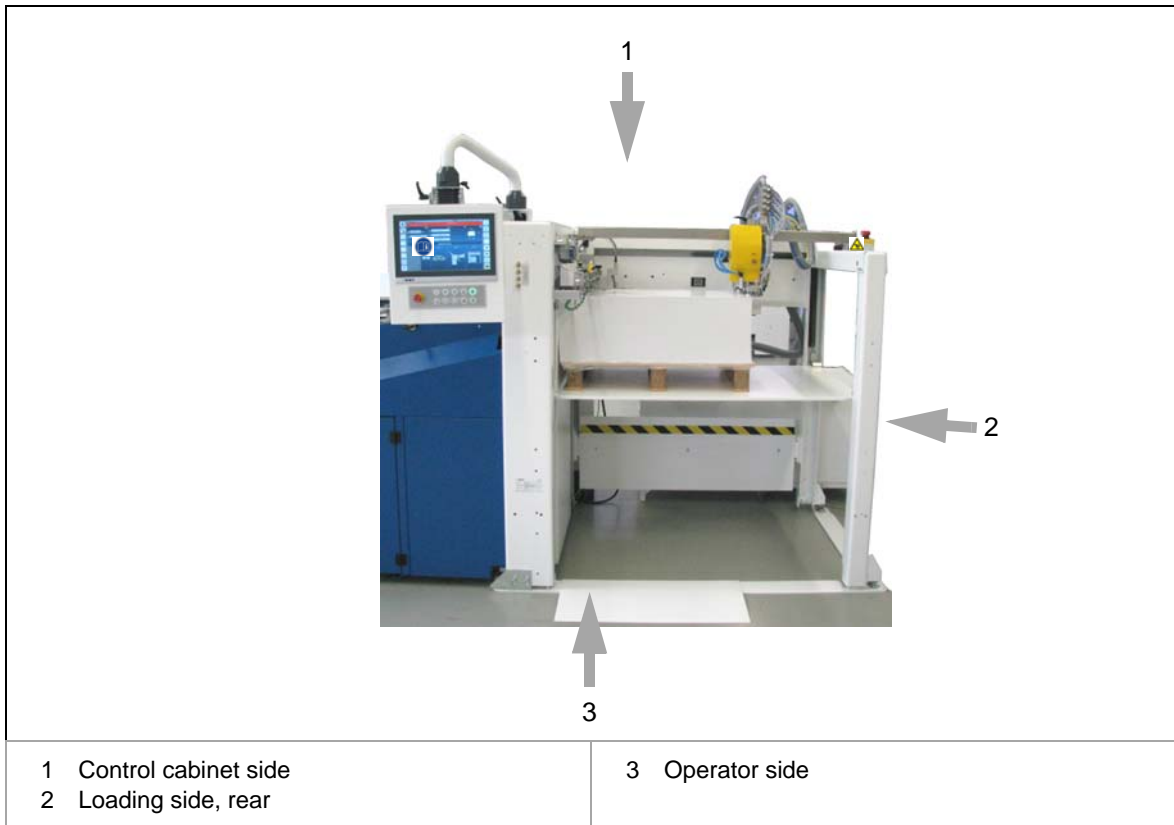


Figure 8: Views of the palletized feeder

4.2.1.1 Components of the operator side

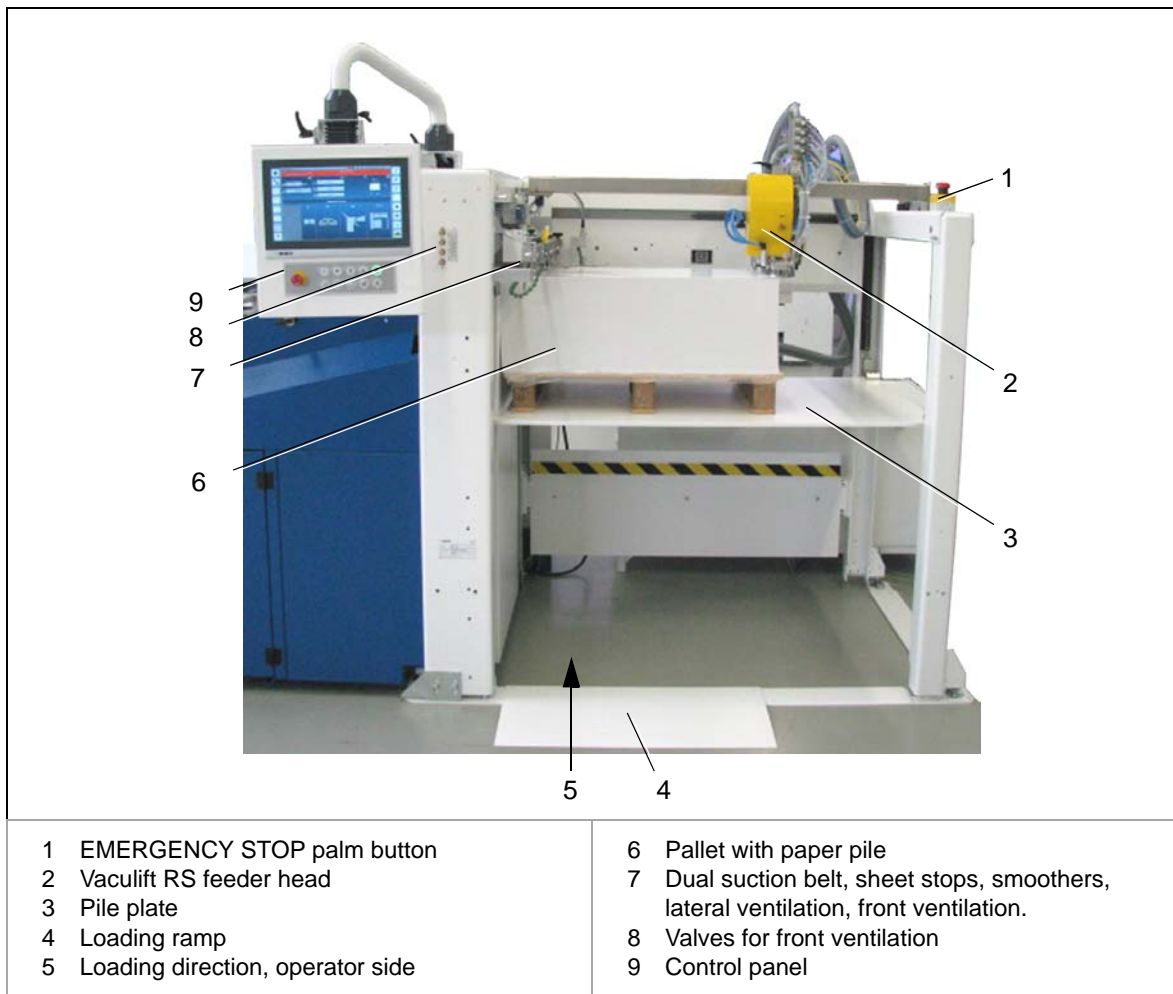


Figure 9: Components of the operator side

4.2.1.2 Components of the control cabinet side

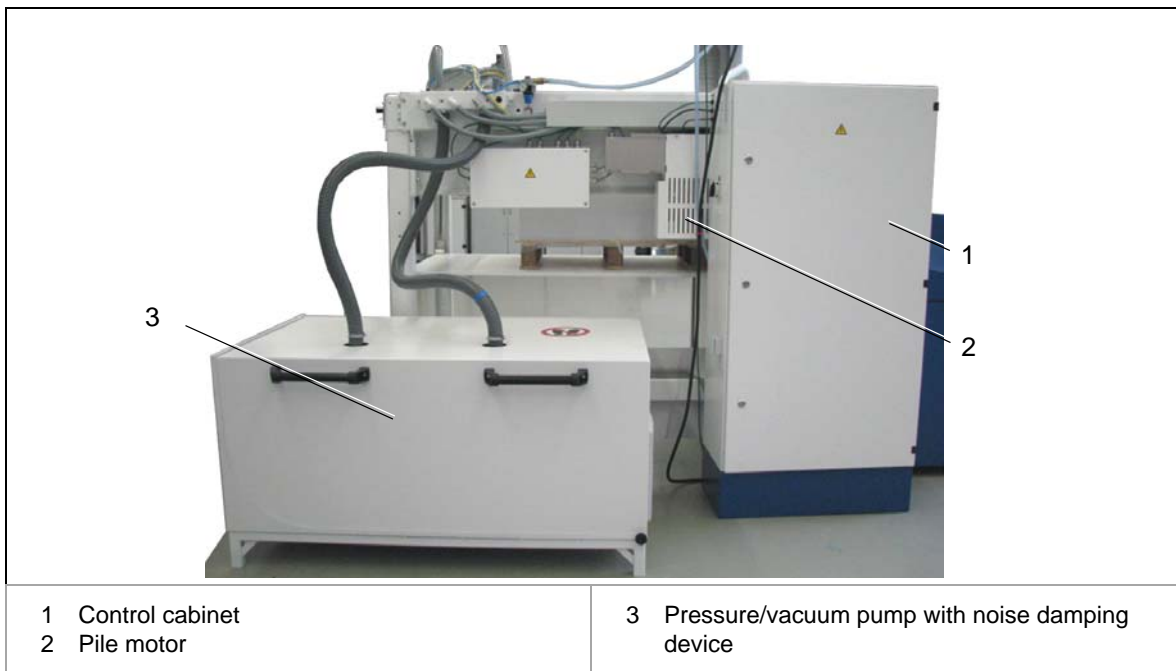


Figure 10: Components of the control cabinet side

4.2.1.3 Loading side components, rear

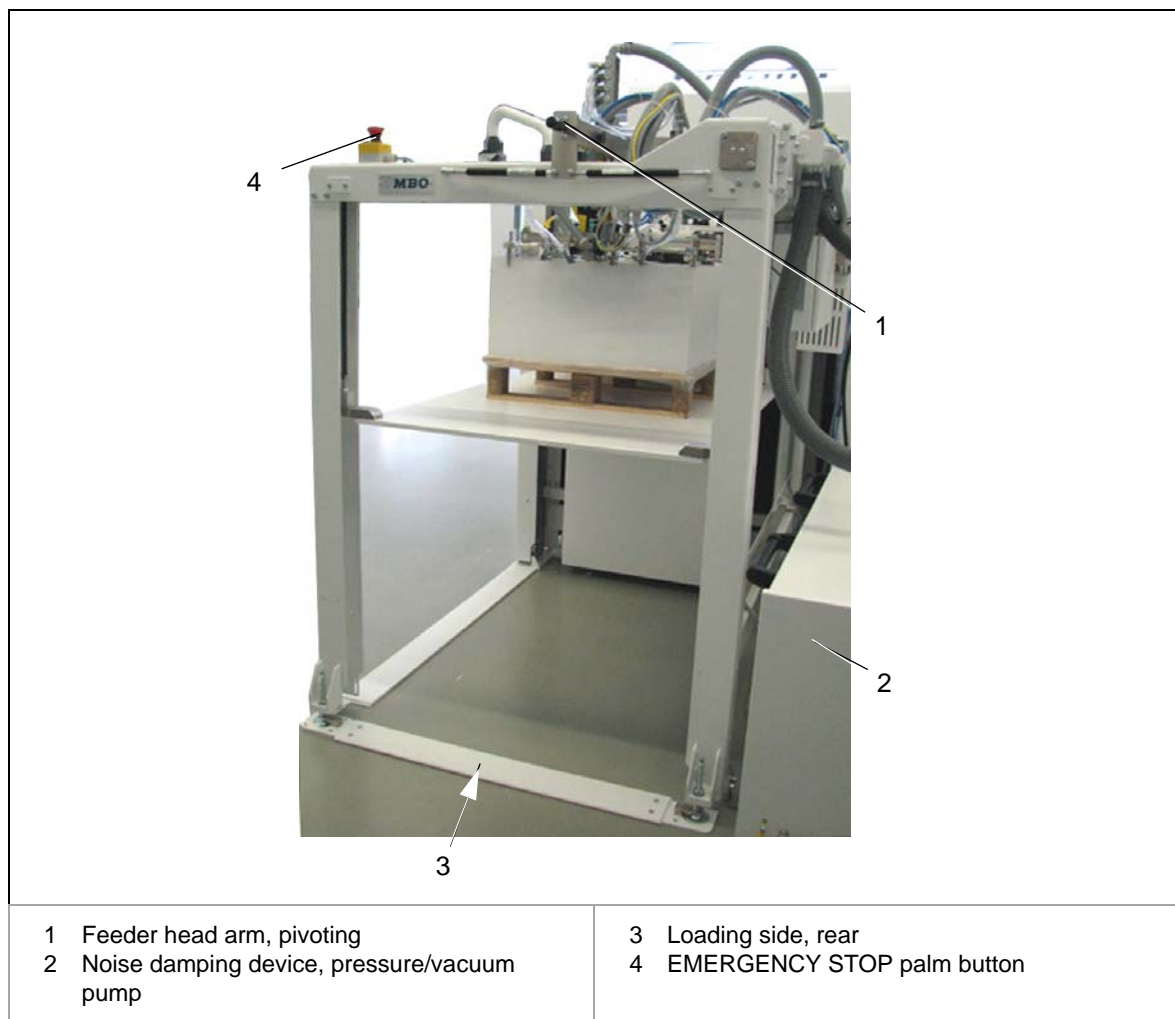


Figure 11: Loading side components, rear

4.2.2 Views of the machine

4.2.2.1 Operator side and exit side

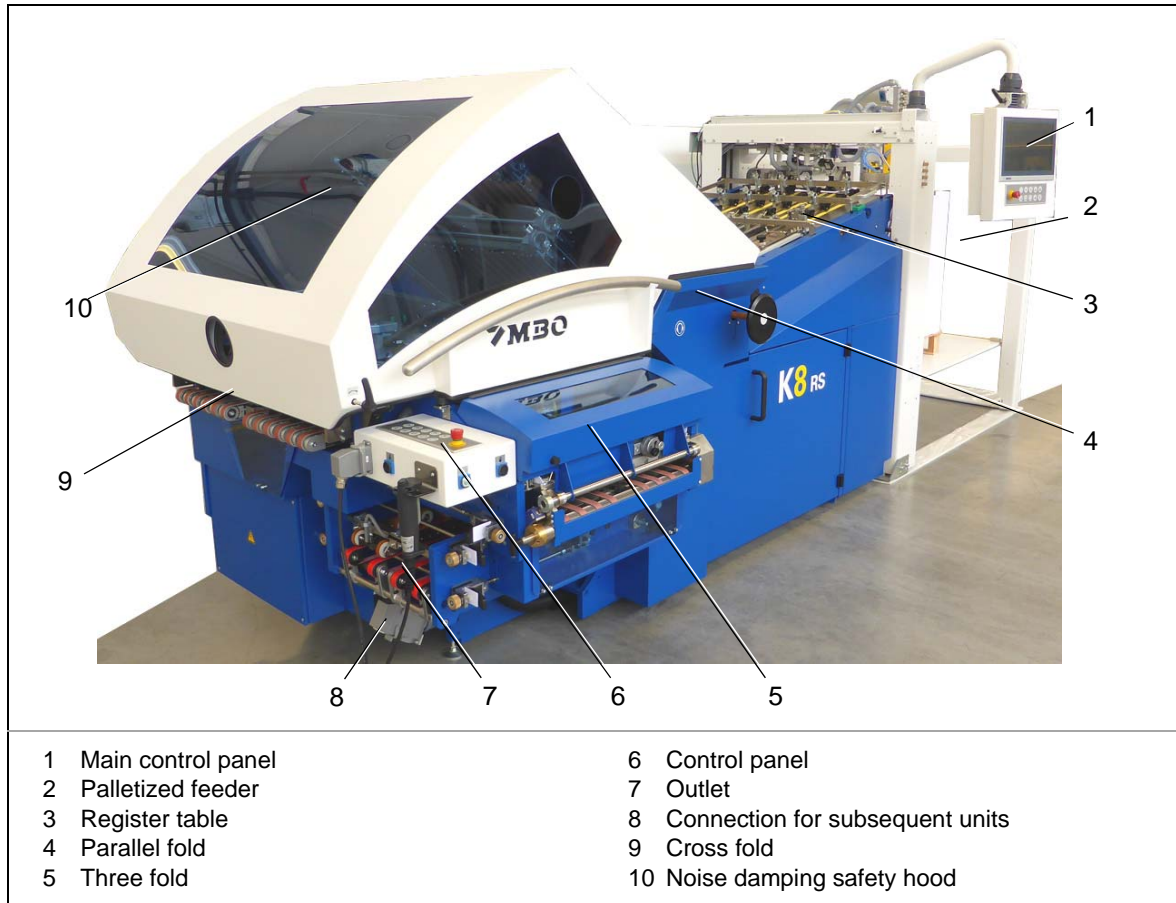


Figure 12: Operator side and exit side

4.2.2.2 Drive side

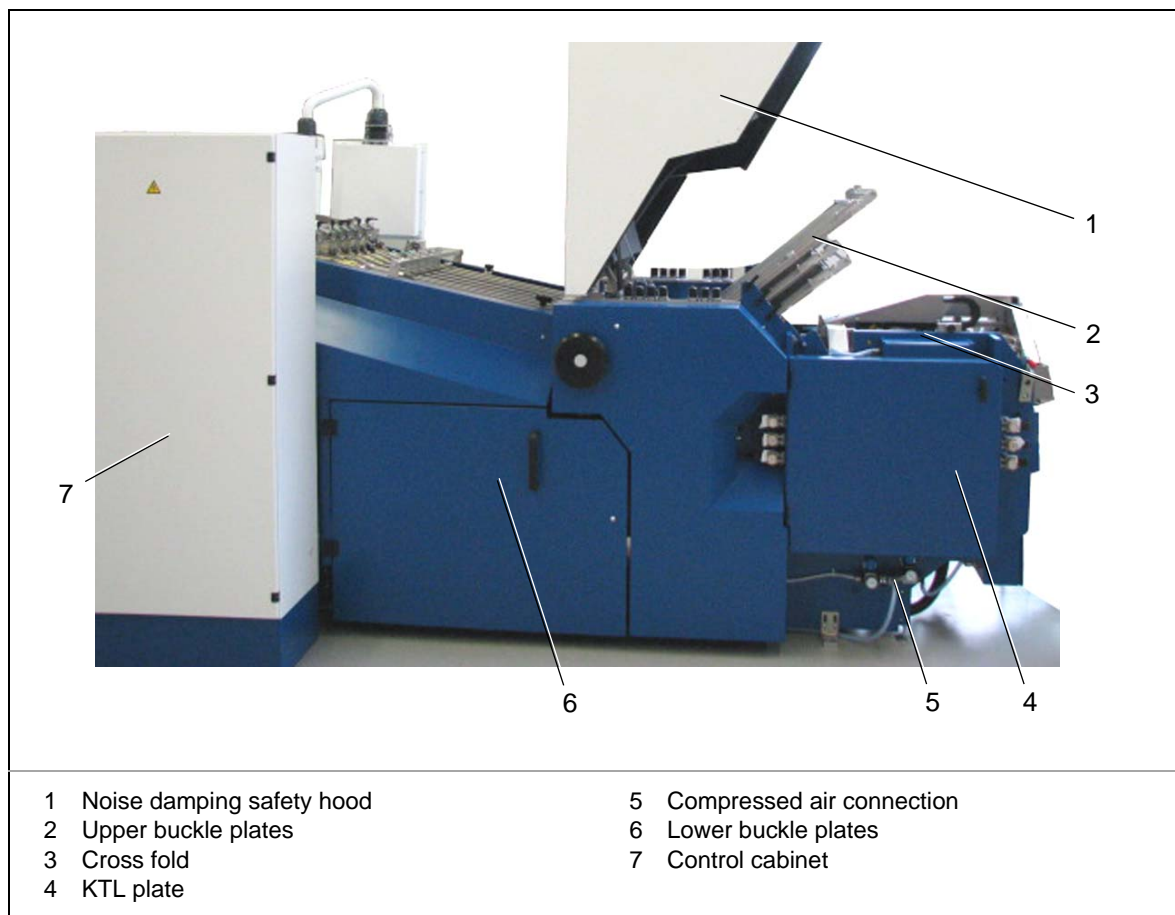


Figure 13: Drive side of the machine

4.3 Functional description

4.3.1 Pallet feeder

Palletized feeder	Used primarily for large runs and large broadsheets. The rapid pile changeover simplifies operation and shortens setup times.
Control panel	The palletized feeder is operated using the control panel of the folding machine. The feeder is operated with the following control: <ul style="list-style-type: none"> • M1 - Control There is also an emergency stop palm button on the rear loading side.
Pile plate	Used as a lifting table for the pallet with the paper pile.
Feeder head arm	Used for: <ul style="list-style-type: none"> • positioning the feeder head. • Pivot the feeder head upwards.
Feeder head	Separates the paper sheet from the paper pile. Is equipped with various setting options. Available in various different versions.
Vaculift RS	Advancement of the Vaculift III.
Lateral ventilation	Used for lateral ventilation of: <ul style="list-style-type: none"> • landscape formats • stuck sheets.
Right side stop	Laser pointer: Used to align the paper pile when changing pallets. Movable stop rod: Used as a mechanical stop in working position.
Lateral adjustment	Used for lateral alignment of the paper pile with the right-hand sheet stop when changing pallets.
Left side stop	Used to guide the paper sheet for transport into the register table.
Smoother	Used to hold down the paper sheet during transport.
Dual suction belt	Transports the individual broadsheets onto the register table.
Feeder Loading System (FLS)	Permits the manual inward stacking of broadsheets in an ergonomically designed work position.
Small format device	Required for broadsheets with a format length of less than 17 cm.
Front ventilation	Should only be used when utilizing a small sheet-size device. Used for ventilation and separation of the sheets from the paper pile.
Pressure/vacuum pump	Generates the required blast air/vacuum.

4.3.2 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 set-up and changeover times
- Processing of different paper grades.

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 variants with which a buckle plate is arranged parallel to each folding knife.

The sheet transport occurs via tapes 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:

- Cross folds with up to four folds for book and brochure production
- Various brochure folds.

4.3.3 Register table

Before infeed into the parallel fold folding unit, the sheet must be leveled out laterally.

This is handled by a skewed running, which levels out the sheet on a sidelay.

Various adjusting elements serve to adapt to the paper to be processed.

4.3.4 Parallel folding unit

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

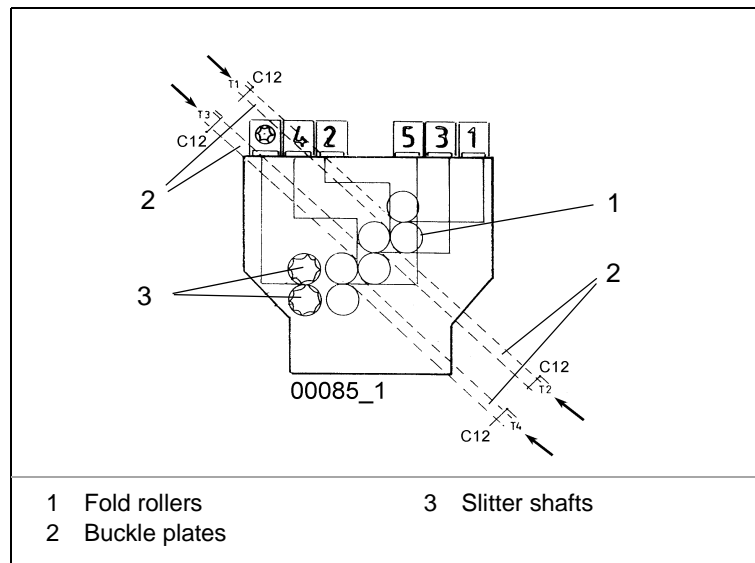


Figure 14: Overview of parallel fold folding unit

The parallel fold folding unit alternatively has:

- 4 or 6 buckle plates with swing deflectors,
- Spiral or high-grip fold rollers that can be adjusted with quick-adjust elements.
- Slitter shafts or slitter shaft cassette.

4.3.5 Cross fold folding unit

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

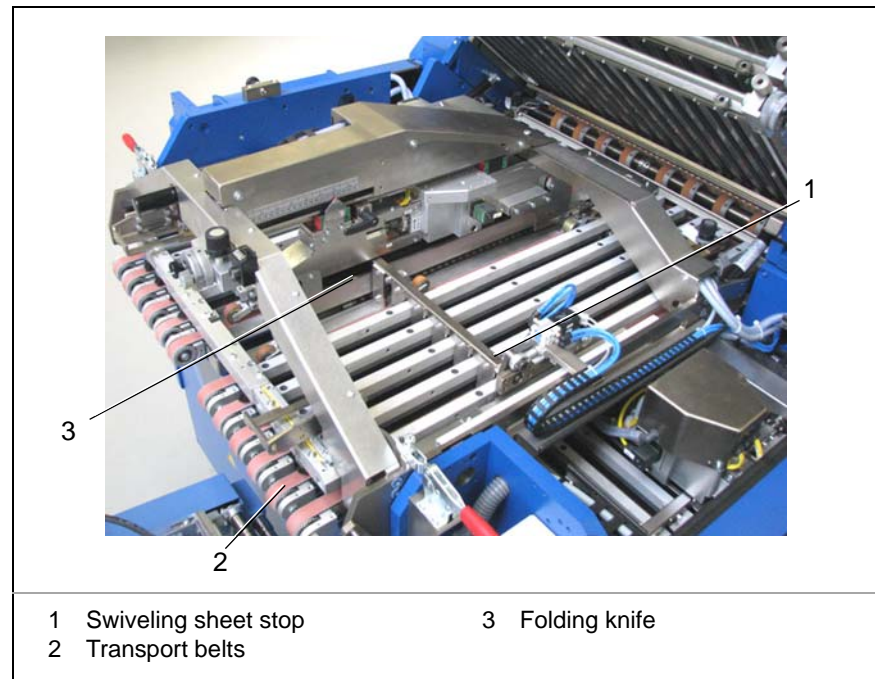


Figure 15: Cross fold folding unit

The cross fold folding unit consists of:

- Transport table
- Folding knife
- Swiveling sheet stop.
- Fold rollers
- Buckle plate for various fold types parallel to the crossfold folding knife (S-KTL, S-KTZ and SKTLT variants)
- Quick-change slitter shafts (standard)

4.3.6 Waste paper deflector

including ultrasonic double sheet detector.

The swiveling sheet stop in the crossfold has the following functions:

- Sheet stop for the crossfold
- Waste paper deflector for double sheets and mis-folded sheets.

4.3.7 Threefold folding unit

The threefold folding unit is the second knife fold folding unit of the machine.

There, the sheet of paper receives another fold offset by 90° (2nd cross fold).

The subsequent slitter shaft cuts, punches or perforates the sheet.

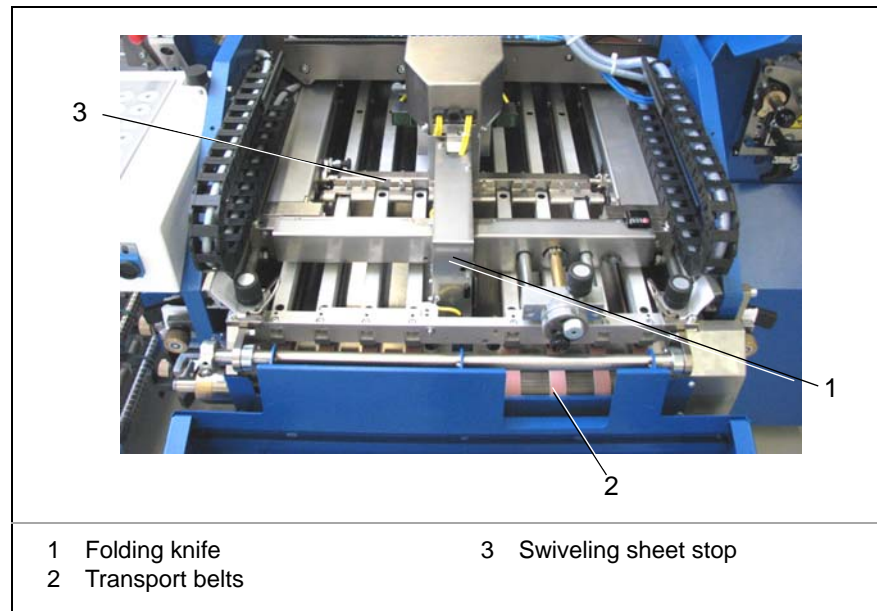


Figure 16: Threefold folding unit

The threefold folding unit consists of:

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

4.3.8 Sheet monitoring of the machine

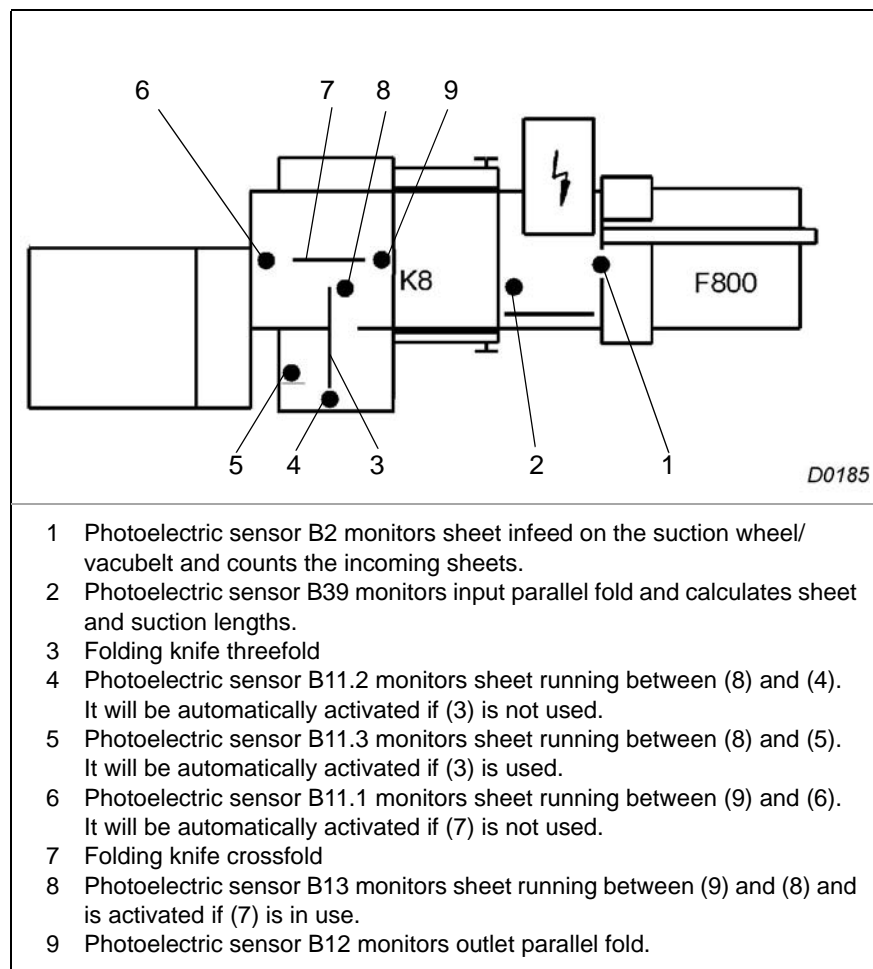


Figure 17: Main machine photoelectric sensor

- During "Calibrate" the sheets are measured by the machine automatically on pass through.
- The photo cells record the corresponding lengths and pass-through times.
- These values are used for sheet control and sheet monitoring.
- If a sheet, after passing completely through the machine, reaches the photo cell of the delivery, "Setup" is ended and the sheet monitoring is activated.
-



If a sheet does not pass through one of these photo cells at the calculated time:

- the machine stops.
- the appropriate error message is displayed.
See chapter "4.3.8 Sheet monitoring of the machine".

4.3.9 Delivery systems

For the various demands with respect to format, fold type, and performance, MBO offers different delivery systems.
For the corresponding descriptions, please see the operating manuals included with the delivery systems.

4.4 Variants

4.4.1 FP800_130 RS

The designation "FP 800 _130 RS" means:	
FP	Palletized feeder
800	Designation of type (working width)
130	Pile height 130 cm
RS	High-speed version

4.4.2 Model S-KTL

Definition of terms

The designation "K8RS S-KTL" means:	
K	Combi folding machine
8	Designation of type
RS	High-speed version
S	Super = full slitter shaft after the buckle plate in the crossfold
K	Cross fold
T	Buckle plate after the 1st folding knife (crossfold)
L	Threefold left of the sheet infeed direction

Schematic depiction

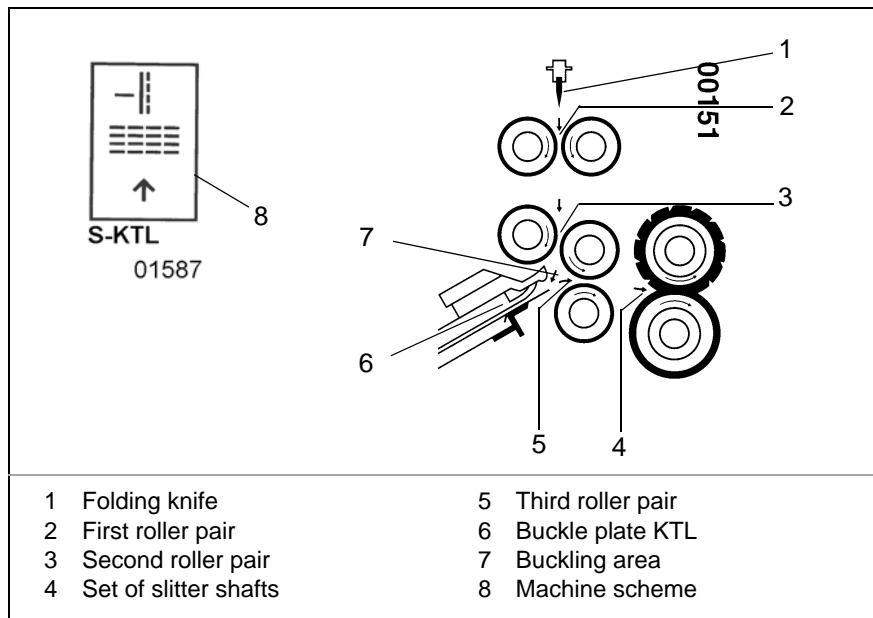


Figure 18: Model S-KTL

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 subsequent slitter shaft pair (4) cuts, punches or perforates the sheet of paper.

4.4.3 Model S-KTLT

Definition of terms

The designation "K8RS S-KTLT" means:	
K	Combi folding machine
8	Designation of type
RS	High-speed version
S	Super = full slitter shaft after the buckle plate in the crossfold and threefold
K	Cross fold
T	Buckle plate after the 1st Folding knife
L	Threefold left of the sheet infeed direction
T	Buckle plate after the 2nd Folding knife

Schematic depiction

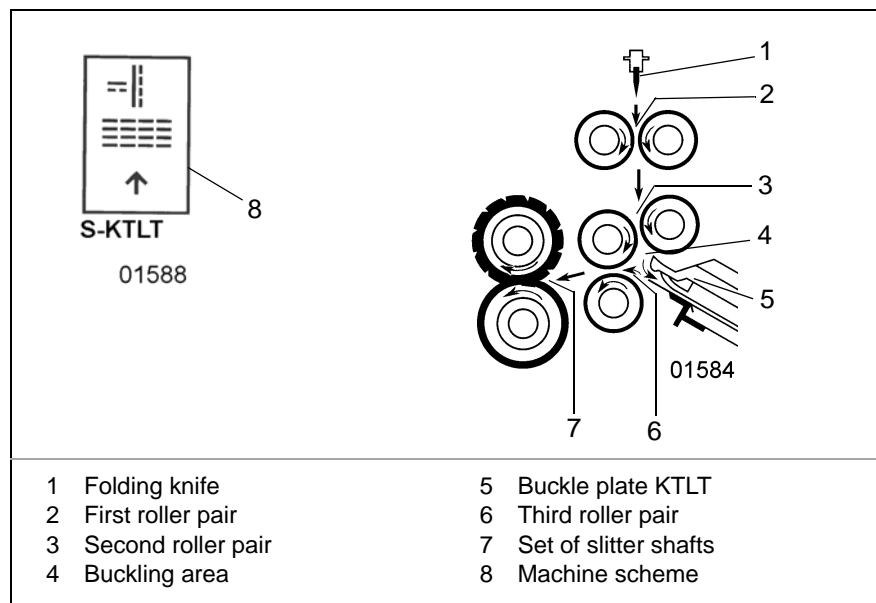


Figure 19: Model S-KTLT

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 subsequent slitter shaft pair (7) cuts, punches or perforates the sheet of paper.

4.4.4 Model S-KTZ

Definition of terms

The designation "K8RS S-KTZ" means:	
K	Combi folding machine
8	Designation of type
RS	High-speed version
S	Super = full slitter shaft after the buckle plate in the crossfold
K	Cross fold
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 depiction

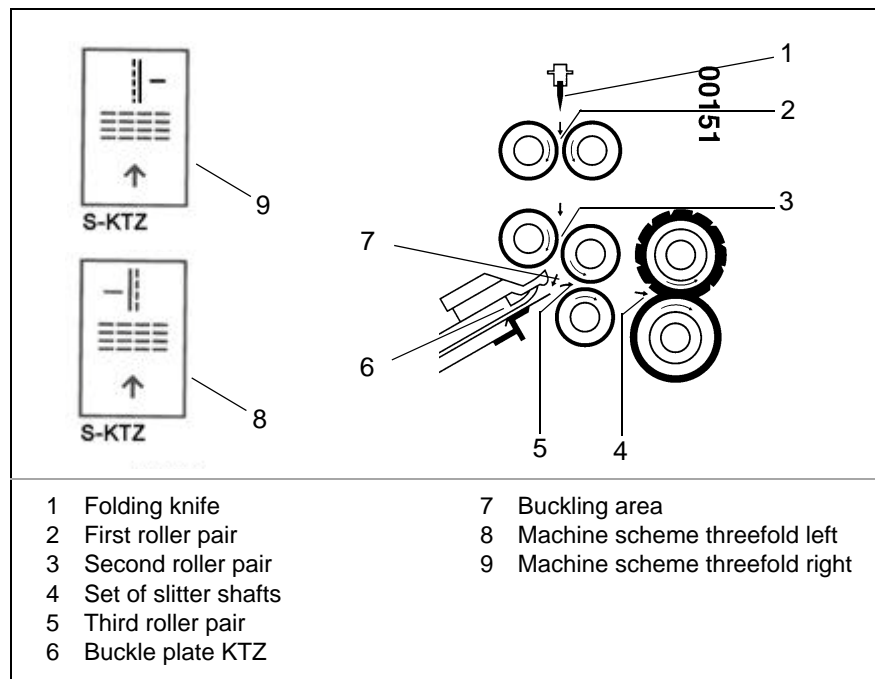


Figure 20: Model S-KTZ

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 subsequent slitter shaft pair (4) cuts, punches or perforates the sheet of paper.

4.5 Machine control

4.5.1 M1 Advanced

Control system M1 incl. swiveling touch screen

- Modern control technology supports intuitive user guidance on the touch screen.
- Comprehensive basic equipment such as integrated folding imposition catalog, sheet monitoring and automatically optimized speed control.
- Display of all counter settings.
- Plain text display of errors and error locations as well as operator and service diagnostics.
- All necessary setting data is calculated automatically after the basic values are entered.

4.5.2 RAPIDSET automation (option)

With the RAPIDSET electronic set-up system, a partial 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 fold
- Fold rollers/slitter shafts in parallel fold
- Horizontal adjustment of the crossfold folding arm to the format size
- Waste paper deflection in crossfold
- Buckle plates/sheet deflectors in cross fold and three fold
- Fold rollers/slitter shafts in cross fold and three fold

4.5.3 DATAMANAGER (optional)

The MBO DATAMANAGER is a management system for the integration of MBO machines into a digital workflow.

This software can also be coupled via CIP4/JDF to a prepress as well as via integrated interfaces to operating data and job data capture systems.

4.5.4 MBO-RAS (optional)

The MBO remote maintenance package RAS (Remote Access Service) provides remote access for the MBO service team to your folding machine.

This allows the MBO service team to operate the machine control, diagnostics using machine, job and job and folding imposition data as well as update the software from the Oppenweiler site.

A secure connection is established via the internet between MBO Service and the folding machine. A mirror image of the touch screen is shown on the MBO PC.

The MBO service technician is also able to operate the touch screen.

4.6 Protective devices

The protective devices are divided into the following main groups:

- Guards
- Protective devices

4.6.1 Explanation of the term "guards"

4.6.1.1 Fixed guards

Fixed guards:

- are used if access to the area secured by the protective device is seldom or never required.
- must only be loosened or removed using tools.
- do not have any electric locking (safety switch).

4.6.1.2 Moveable guard

Interlocking moveable guard:

- are used if access to the area secured by the protective device is frequently required.
- can be opened and closed without tools.
- have electric locking (safety switch).

When the protective device is opened, this causes the machine to stop.
The machine can be restarted only after the protective device is closed.

Interlocking, movable guards with guard locking:

- cannot be opened when the machine is operating.
The guard locking prevents access to the danger spot until the hazardous function has been eliminated.
- can be opened and closed without tools.
- have electric locking (safety switch) and a locking.

When the protective device is lifted, the electric locking causes the machine to stop.

Only when the hazardous function has been eliminated safely is the locking reset and then the protective device can be opened completely.
The machine can be restarted only after the protective device is closed.

4.6.1.3 Adjustable guards

Adjustable guards are used:

- where due to the use of different downstream devices, the protective device needs to be adjusted for the current situation.
- They can be set manually by the operator easily and without tools.
- They have electric locking (safety switch).

When the protective device is opened, this causes the machine to stop. The machine can be restarted only after the protective device is closed.

4.6.2 Explanation of the term "protective devices"

Protective devices differ from the guards in that they do not form a physical barrier between the endangered person and the danger spot.

Protective devices include:

- Two-hand switches
- Sensitive protective devices such as:
Contact mats, safety strips, switch rods and switch wires.
- Optoelectronic, protective devices such as:

Light barriers, laser scanners and camera-controlled safety systems.

4.6.3 Overview of protective devices on the palletized feeder

The following protective devices are present on the palletized feeder.



Operate the palletized feeder only if all protective devices are completely present and fully functional!



4.6.4 Overview of protective devices on the machine

The following protective devices are present on the machine.



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

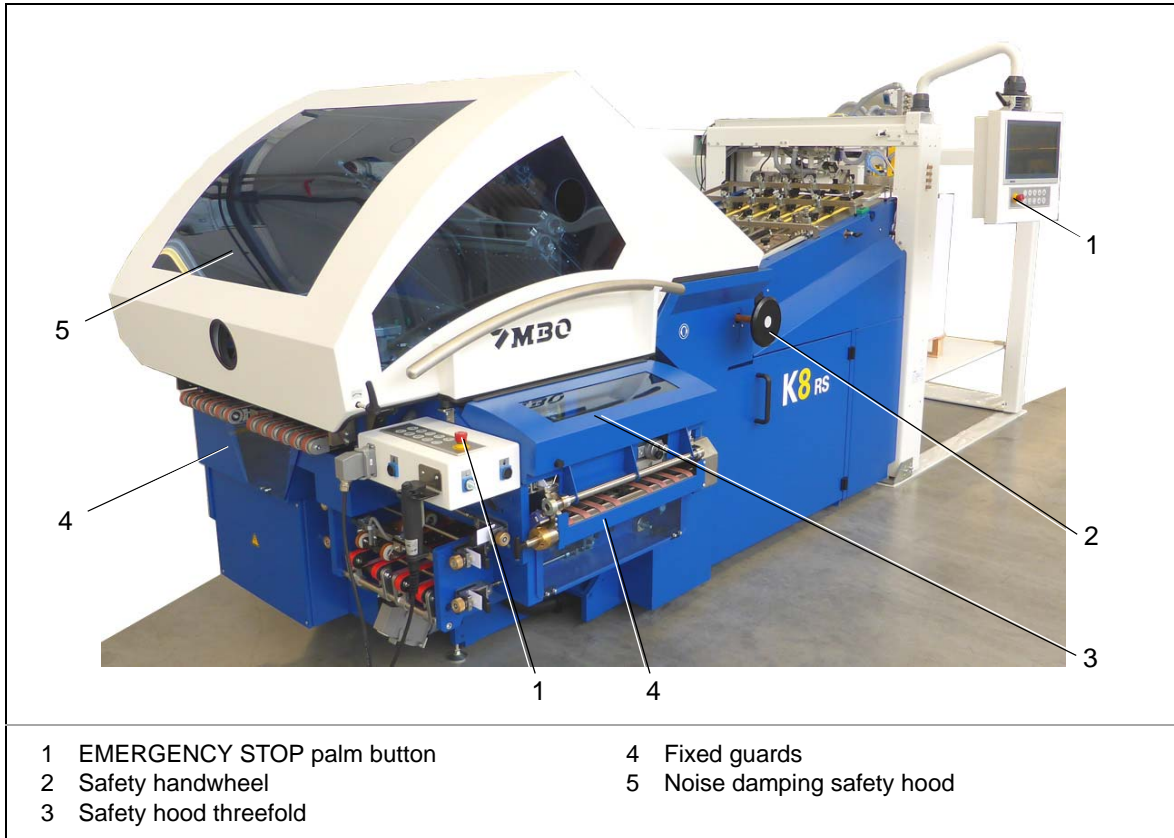


Figure 21: Overview

4.6.5 Main switch

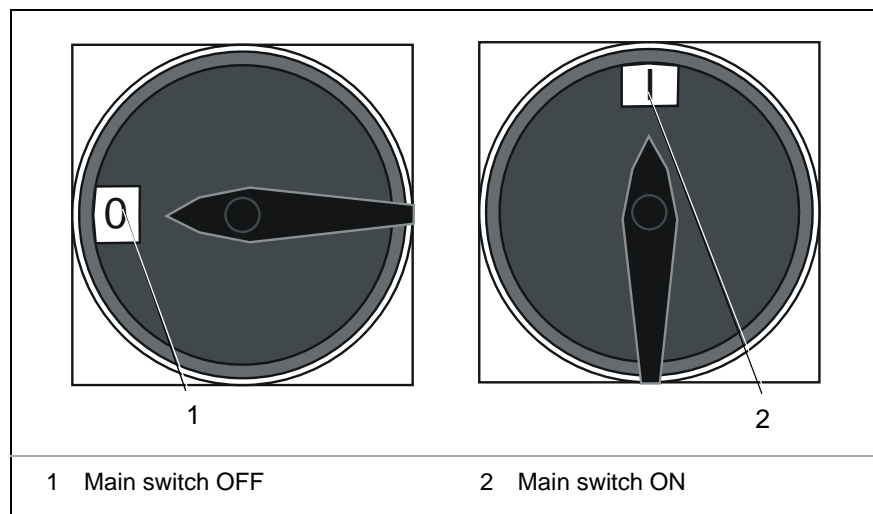


Figure 22: Main switch

The main switch has the following properties:

- it disconnects the machine from the electrical supply,
- it has only one OFF and one ON position, labeled as 0 and I,
- it is equipped with a device that enables it to be locked in the OFF position (e.g. by a padlock).



When switching off the main switch during production:

- the machine is stopped,
- the drives gradually run down,
- no emptying of the sheets takes place.

4.6.5.1 EMERGENCY STOP palm button

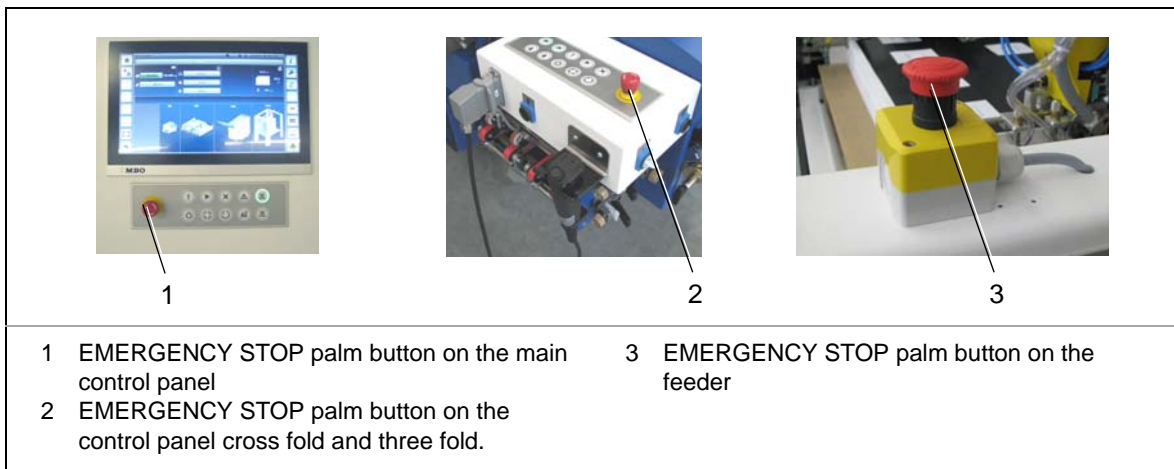


Figure 23: EMERGENCY STOP palm button



- 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.

How to press the EMERGENCY STOP palm button:

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



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

No emptying of the sheets takes place!

4.6.6 Noise damping safety hood



WARNING!

High noise pressure level.

Non-observance could result in hearing damage.

- Always wear ear protection when working on the machine.
- Always close the noise damping hoods whenever you work at or on the machine.

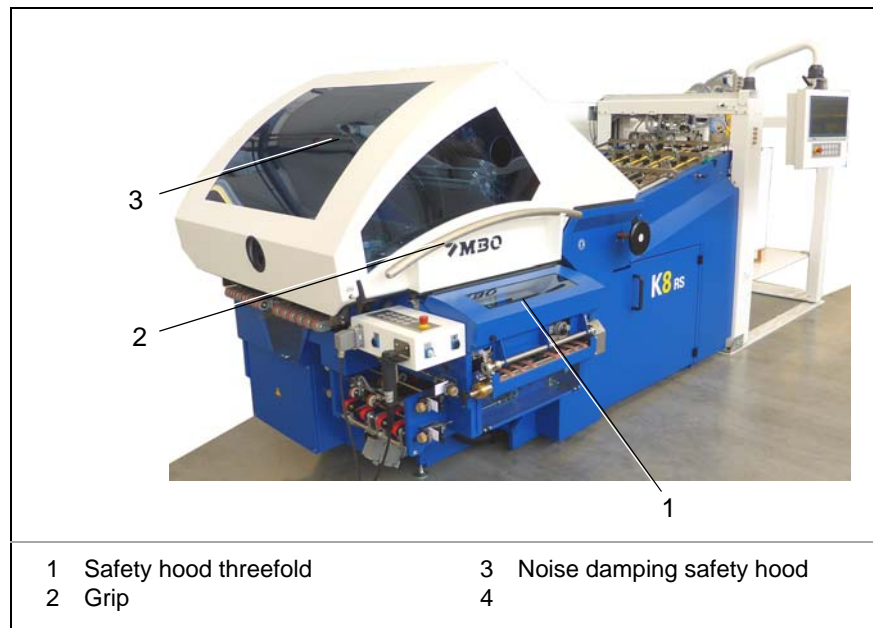


Figure 24: Noise damping and safety hood

The noise damping and safety hood (3) covers the entire parallel fold area and cross fold area.

The safety hood (1) covers the threefold area.

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

4.6.7 Safety switch



DANGER!

**Dismantling, bridging or bypassing protective devices:
Non-observance will result in serious injury or death.**

- No protective devices of the machine may be dismantled, bridged or bypassed.
- Report any audible/visible safety-relevant alteration to the machine to the person responsible for the plant in your company.

4.6.7.1 Noise damping safety hood

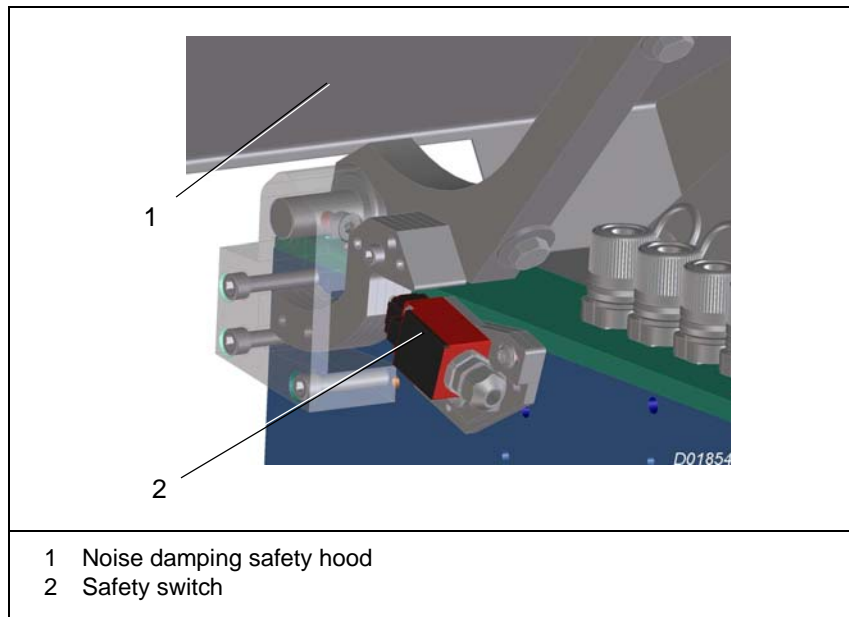


Figure 25: Safety switch for noise damping safety hood

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

4.6.7.2 Crossfold table



Figure 26: Safety switch for crossfold table

The safety switch (1) stops the drive of the machine when the crossfold table is lifted.

For the switch position, see chapter "4.6.12 Checklists for protective devices"

4.6.7.3 Threefold carriage

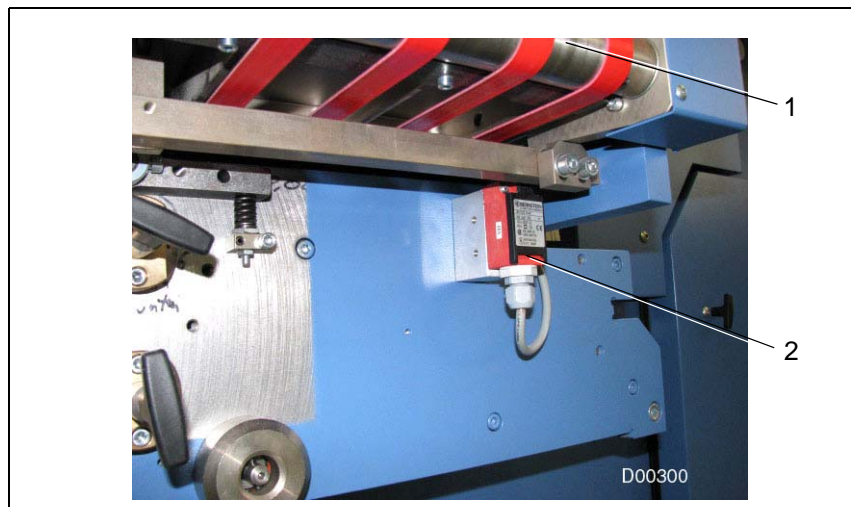


Figure 27: Safety switch for threefold carriage

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

For the switch position, see chapter "4.6.12 Checklists for protective devices"

4.6.7.4 Guard over three fold

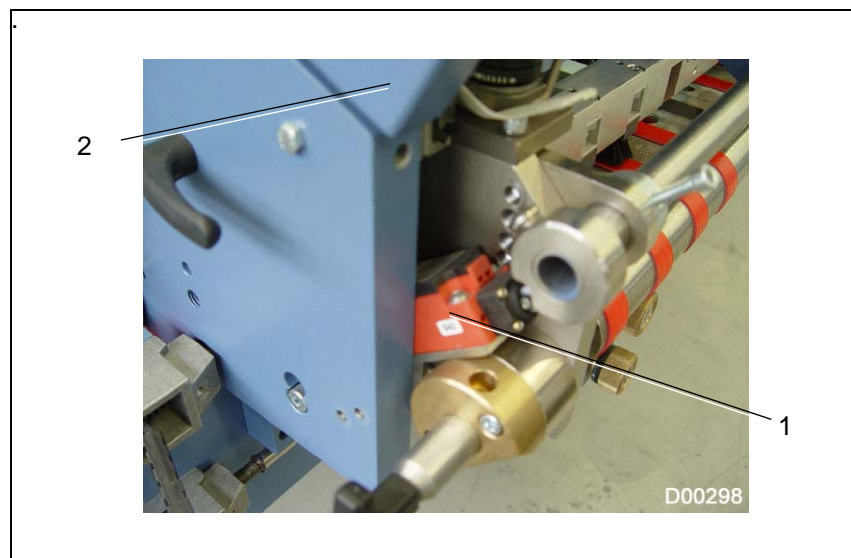


Figure 28: Safety switch for guard hood three fold

The safety switch (1) stops the drive of the machine as soon as the guard hood (2) over the threefold is opened.

4.6.8 Operating the safety handwheel



WARNING!

Incorrect handling of the safety handwheels.

Non-observance could result in serious injury or 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 hazard of being drawn in.
- Replace defective safety handwheels only with new safety handwheels with an overrunning clutch.

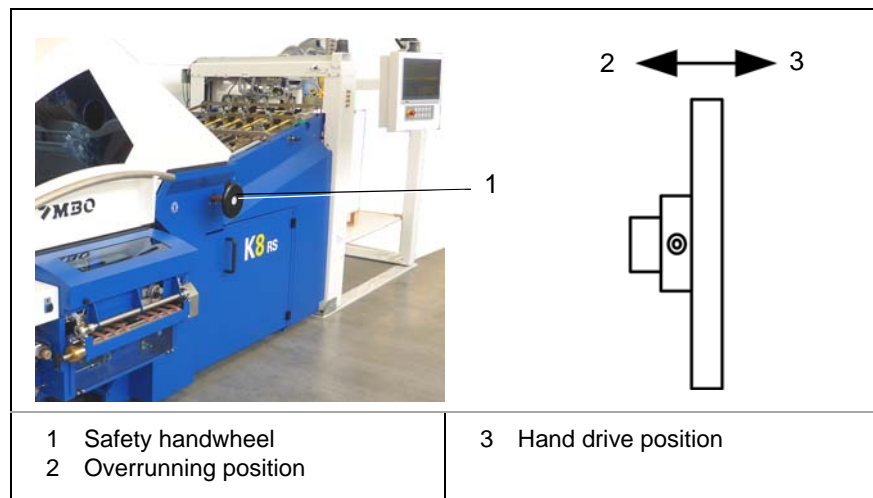


Figure 29: Operating the safety handwheel



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

- During setup tasks.
- when there is a paper jam.

How to operate the safety handwheel:

- ▷ Stop the machine.
- ▷ Press the EMERGENCY STOP palm button.
- ▷ Pull the safety handwheel (3) towards you.
The overrunning clutch is released.
- ▷ Turn the safety handwheel.

Direction of rotation:

Clockwise = Machine rotates forwards.

Counterclockwise = Machine rotates backwards.

4.6.9 Fixed guards

There are other fixed guards present on the machine.

The fixed guards can only be opened with tools.

These protect the operator against danger spots such as:

- rotating machine parts, e.g., drives, shafts
- Entanglement zones
- pinch points

The function and position of the corresponding guards are listed in the "Protective devices" check list.

4.6.10 Faulty protective devices

Faulty protective devices can lead to hazardous situations.

For this reason:

- ▷ Switch off the machine at the main switch immediately.
- ▷ Secure it against being switched on again.
- ▷ If necessary, disconnect the supply of compressed air and electrical current.
- ▷ Service faulty protective devices immediately.

4.6.11 Checking protective devices

All protective devices must be checked regularly.

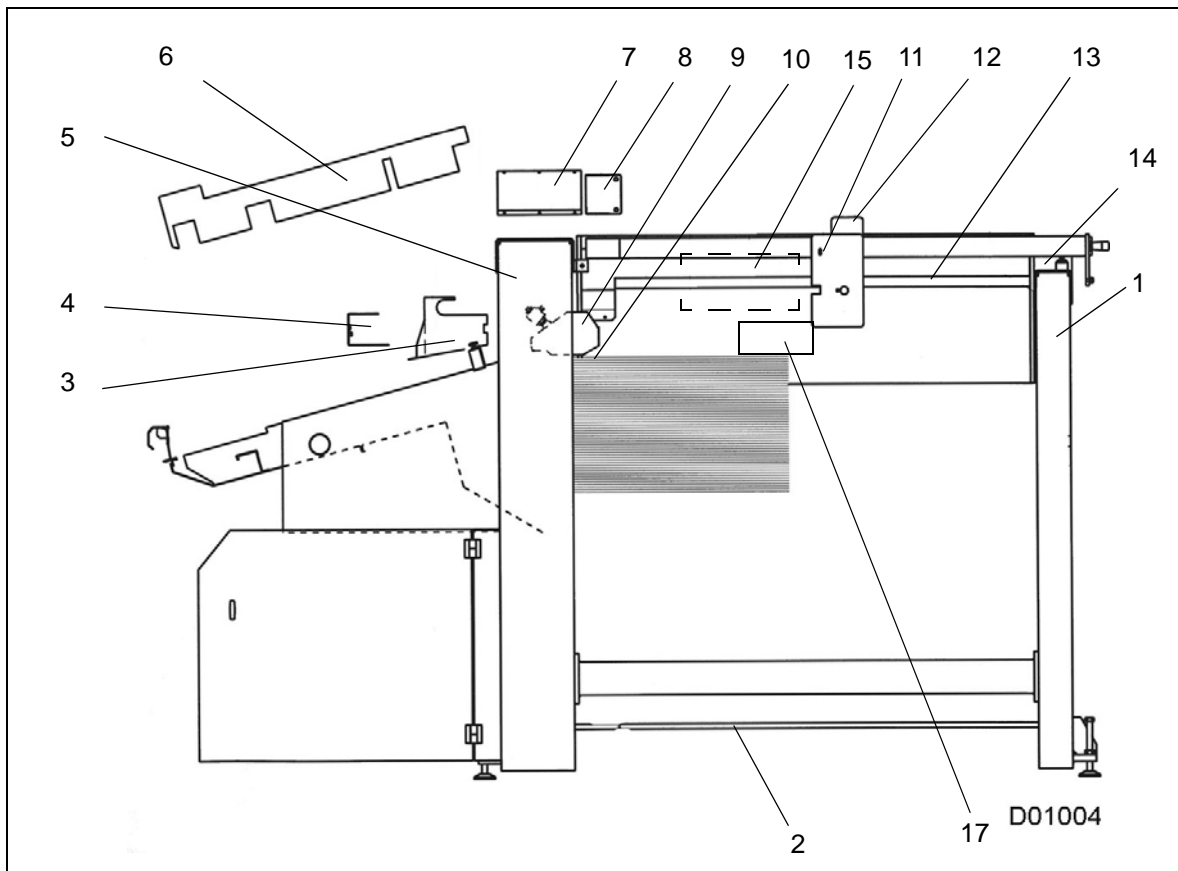
For the corresponding inspection intervals, see chapter "4.6.12.2 Variant S-KTL, S-KTLT"

For the corresponding procedure, see the Maintenance chapter.

4.6.12 Checklists for protective devices

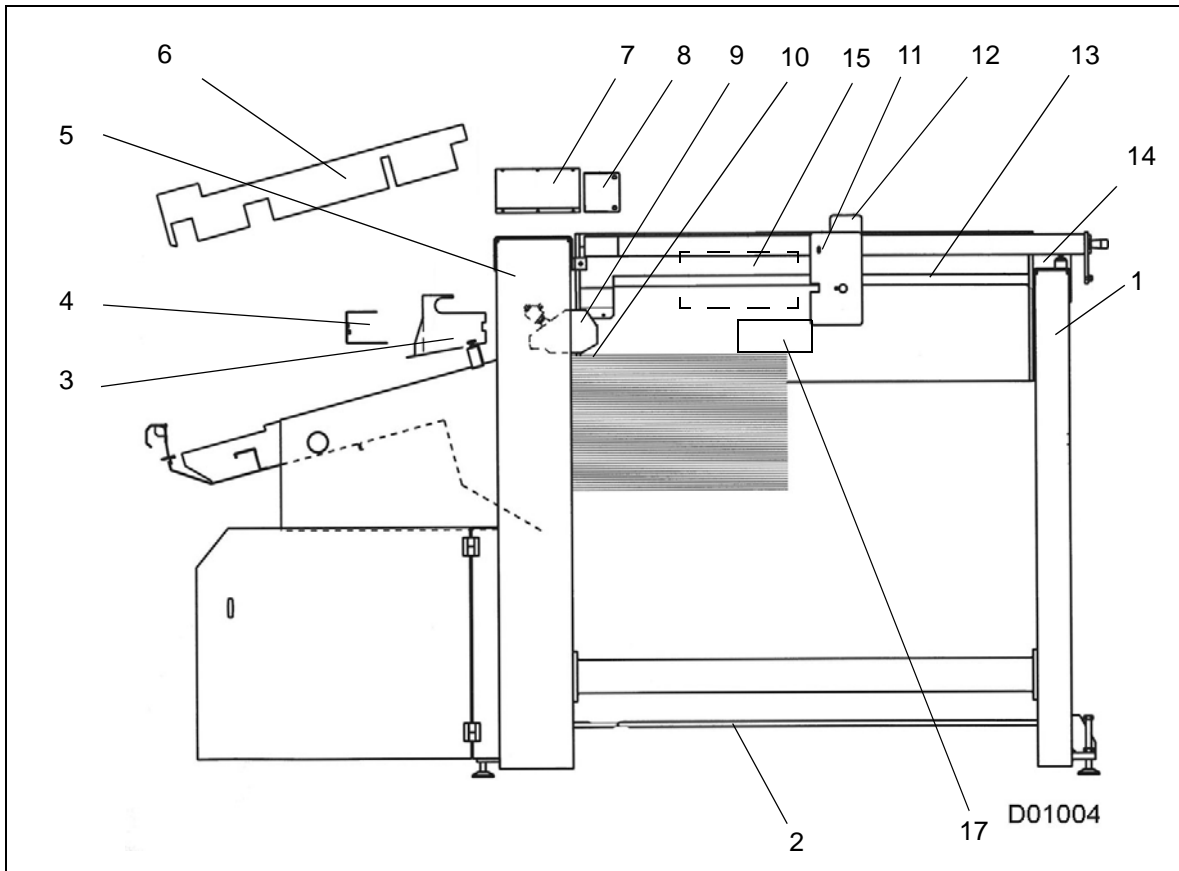
Use these checklists to check the protective devices of the machine regularly

4.6.12.1 FP800_130 RS



Pos.	Designation	Functioning control	Visual inspection	Result	Inspection interval
1	Guard above the chain guide				Weekly
2	Pile plate				Weekly
3	Guard over suction wheel/ suction belt pulley				Weekly
4	Guard over drive shaft suction wheel/suction belt				Weekly
5	Guard above the chain guide				Weekly
6	Guard over suction wheel/ suction belt drive				Weekly
7	Guard over control gear, drive side				Weekly
8	Guard over drive chain. Drive side				Weekly
9	Guard over suction wheel/ suction belt				Weekly
10	Guard in front of the suction belt/suction wheel.				Weekly

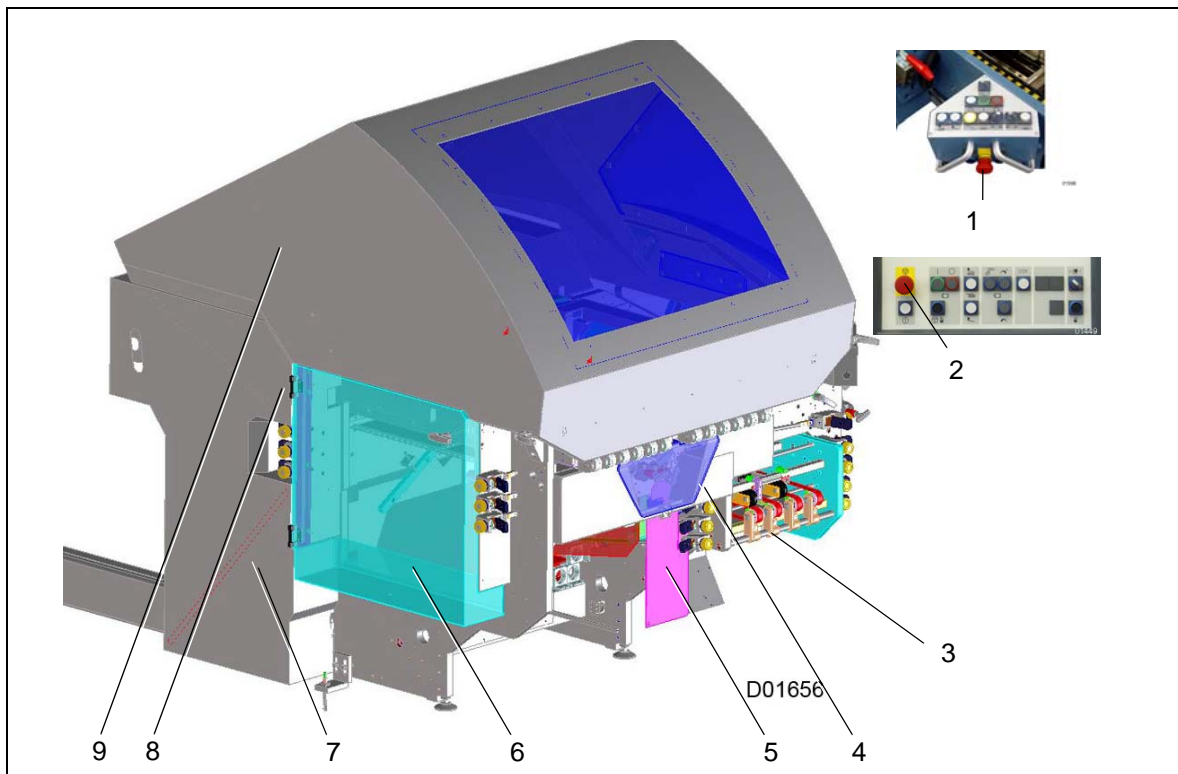
Table 20: Checklist for protective devices



Pos.	Designation	Functioning control	Visual inspection	Result	Inspection interval
11	Guard above feeder head				Weekly
12	Guard above motor for feeder head				Weekly
13	Guard above feeder drive shaft, drive side				Weekly
14	EMERGENCY STOP palm button				Daily
15	Safety switch in the gears. All fastening and stop screws must be safety screws.				Weekly
16	all safety screws secured using screw lock (e.g. Loctite 222). No illustration				Weekly
17	Plate - max. load				Weekly
Date:		Name:		Signature:	

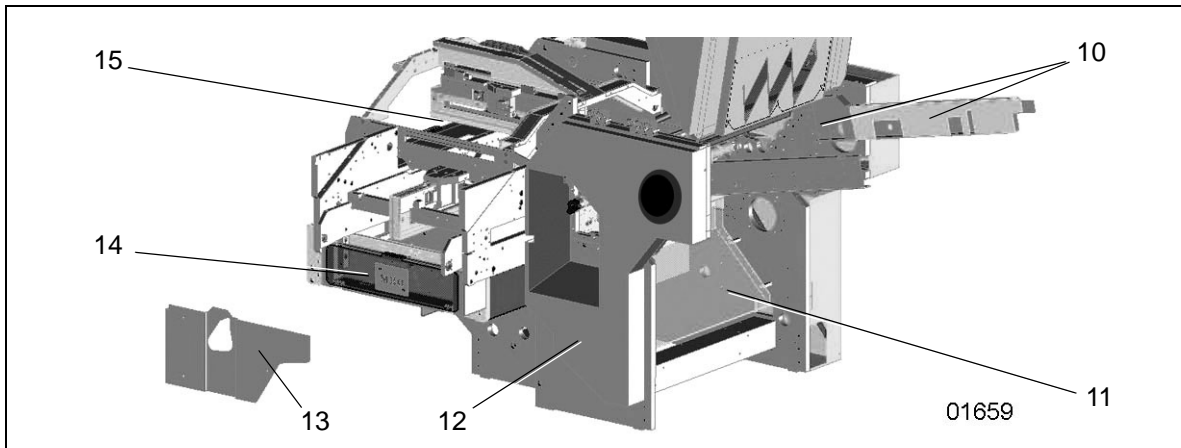
Table 20: Checklist for protective devices

4.6.12.2 Variant S-KTL, S-KTLT



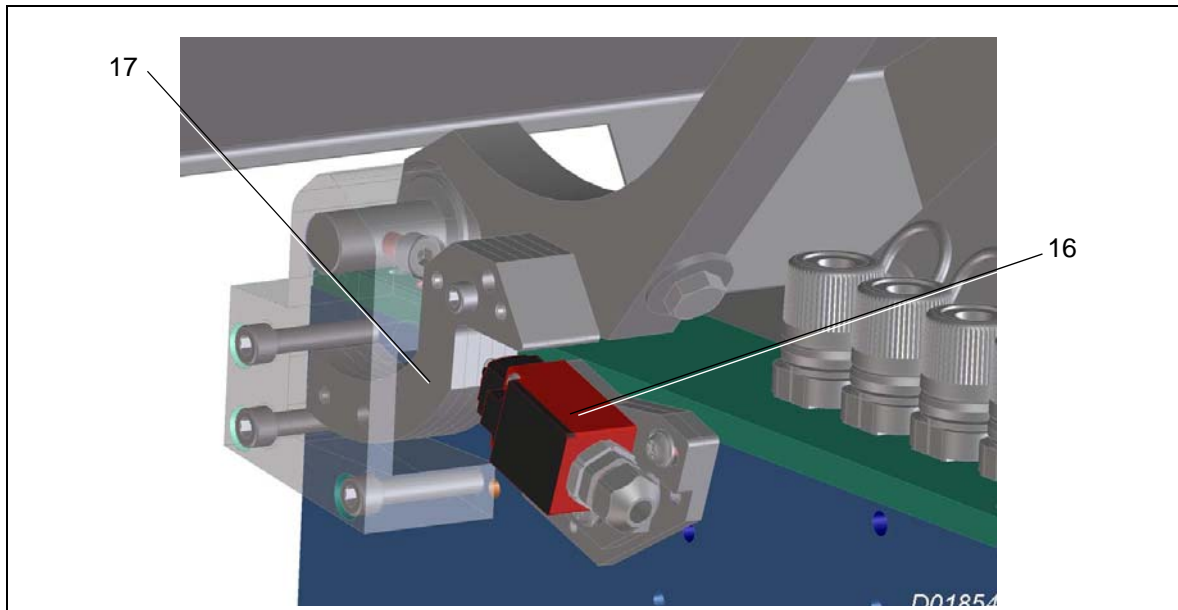
Pos.	Designation	Functioning control	Visual inspection	Result	Inspection interval
1	EMERGENCY STOP palm button on the control panel cross fold and three fold.				Daily
2	EMERGENCY STOP palm button on the Main control panel				Daily
3	Guard under three fold				Weekly
4	Guard in front of fold rollers and slit shaft bearing				Weekly
5	Guard, three fold, drive				Weekly
6	Guard, KTL plate				Weekly
7	Guard, parallel fold (drive side)				Weekly
8	Safety switch, cross fold table				Daily
9	Noise damping safety over parallel fold and cross fold				Weekly
Date:		Name:		Signature:	

Table 21: Checklist protective devices variants S-KTL, S-KTLT.



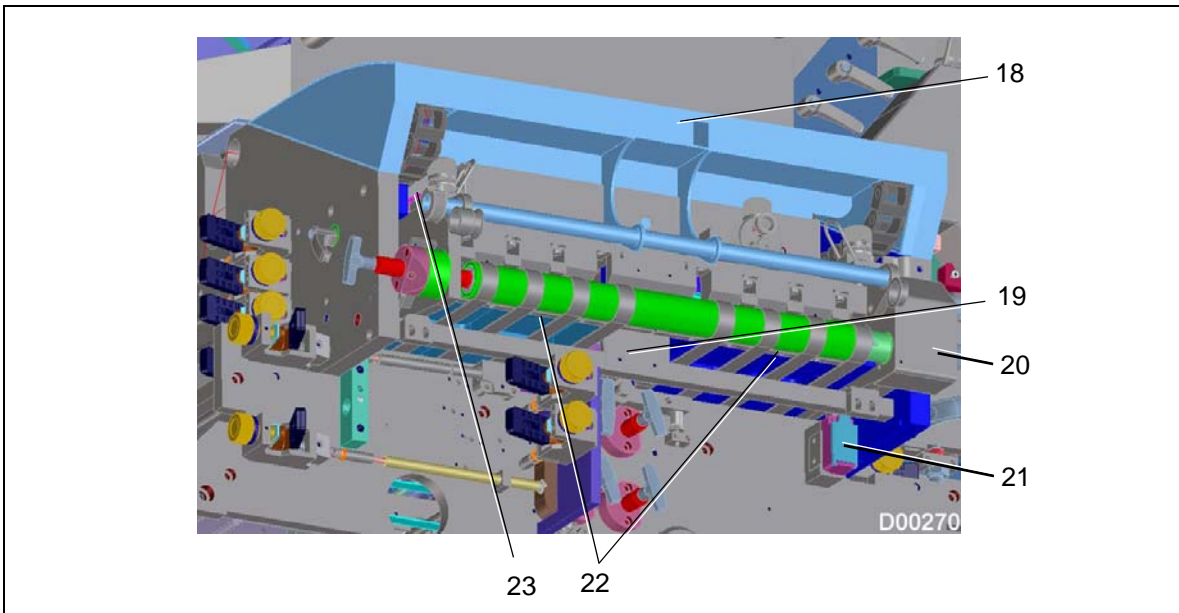
Pos.	Designation	Functioning control	Visual inspection	Result	Inspection interval
10	Guard, drive register table (2-part)				Weekly
11	Guard, drive combi area				Weekly
12	Guard, parallel fold (operator side)				Weekly
13	KTLT guard, fold rollers, and slitter shafts, three fold				Weekly
14	KTL guard, fold rollers, and slitter shafts, three fold				Weekly
15	Guard, cross fold knife				Weekly
Date:		Name:		Signature:	

Table 22: Checklist protective devices designs S-KTL, S-KTLT.



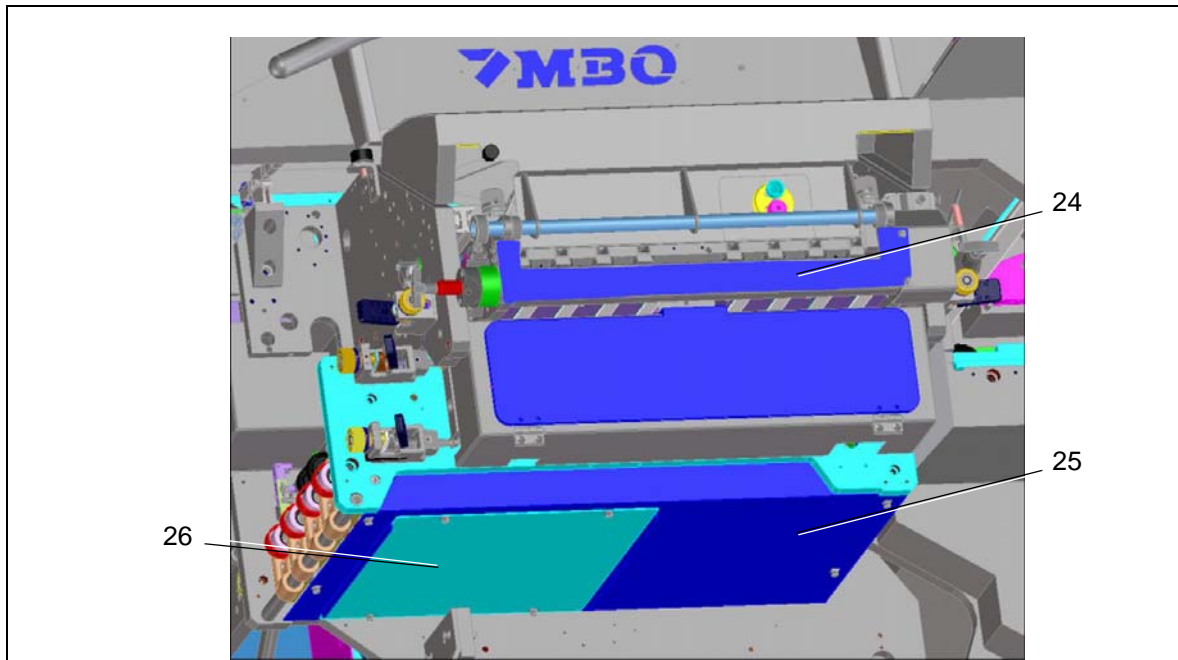
Pos.	Designation	Functioning control	Visual inspection	Result	Inspection interval
16	Safety switch, noise damping safety hood				Daily
17	Cam disk of the noise damping safety hood. Form-closed.				
	All safety screws are secured with screw locking (e.g. Loctite 222). Not marked in the figure				
Date: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

Table 23: Checklist protective devices variants S-KTL, S-KTLT.



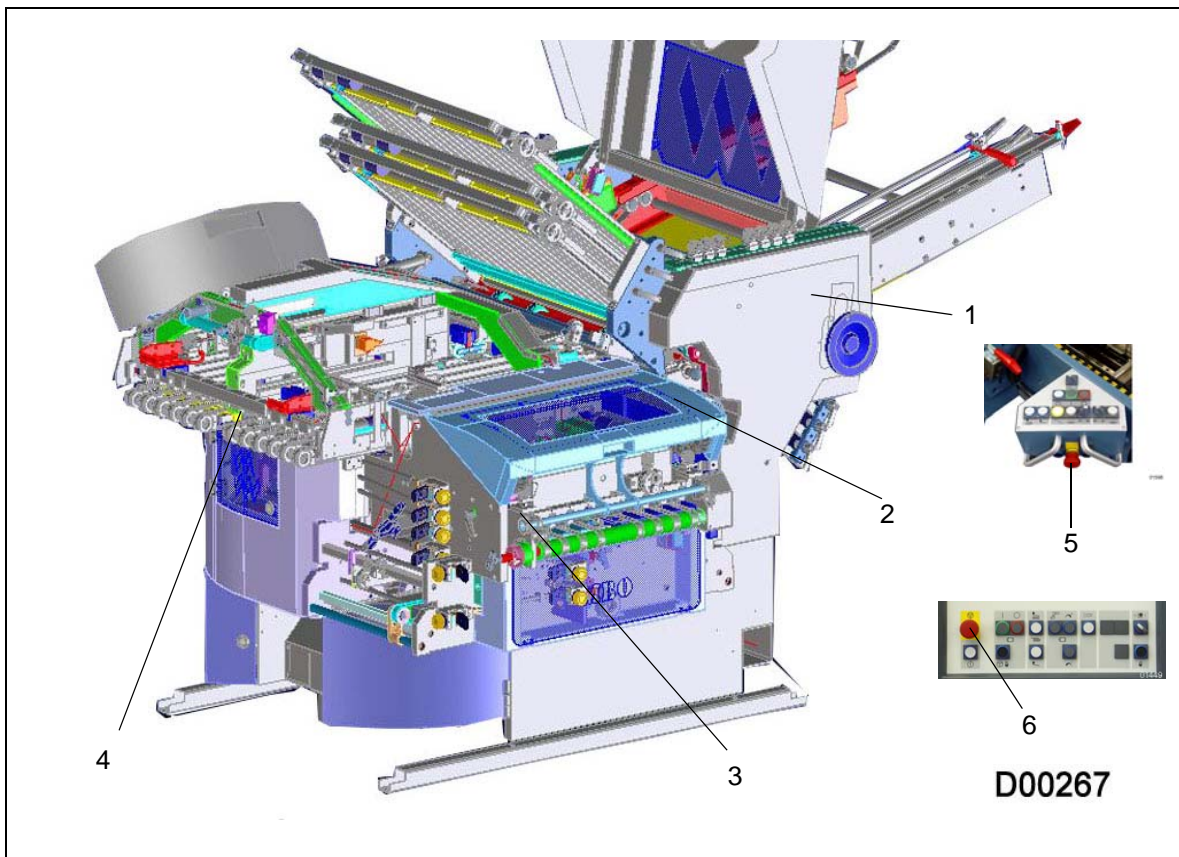
Pos.	Designation	Functioning control	Visual inspection	Result	Inspection interval
18	Safety hood three fold				Daily
19	Guard, three fold knife				Weekly
20	Guard, tape roller drive				Weekly
21	Safety switch, threefold carriage				Daily
22	Guard, threefold, tape roller				Weekly
23	Safety switch, safety hood, threefold				Daily
Date:		Name:		Signature:	

Table 24: Checklist protective devices variants S-KTL, S-KTLT.



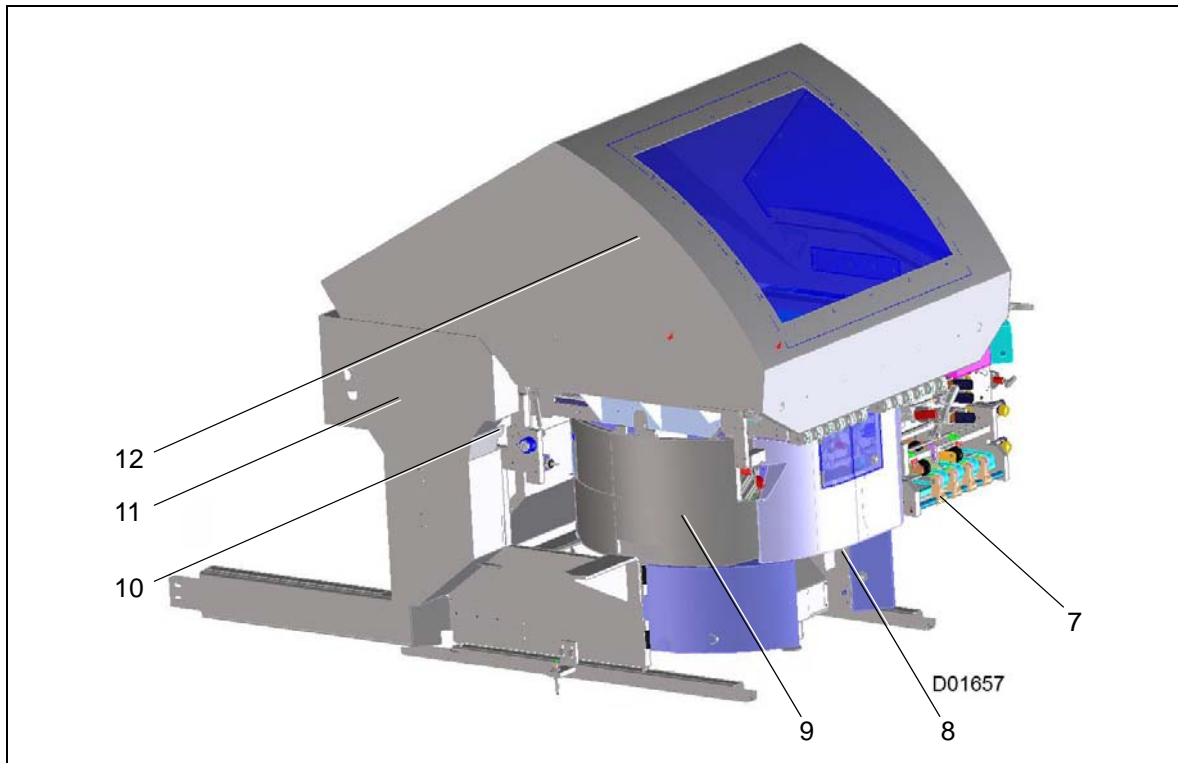
Pos.	Designation	Functioning control	Visual inspection	Result	Inspection interval
24	Guard over tape roller, threefold				Weekly
25	Guard under threefold				Weekly
26	Guard, removable				Weekly
Date:		Name:		Signature:	

4.6.12.3 Variant S-KTZ



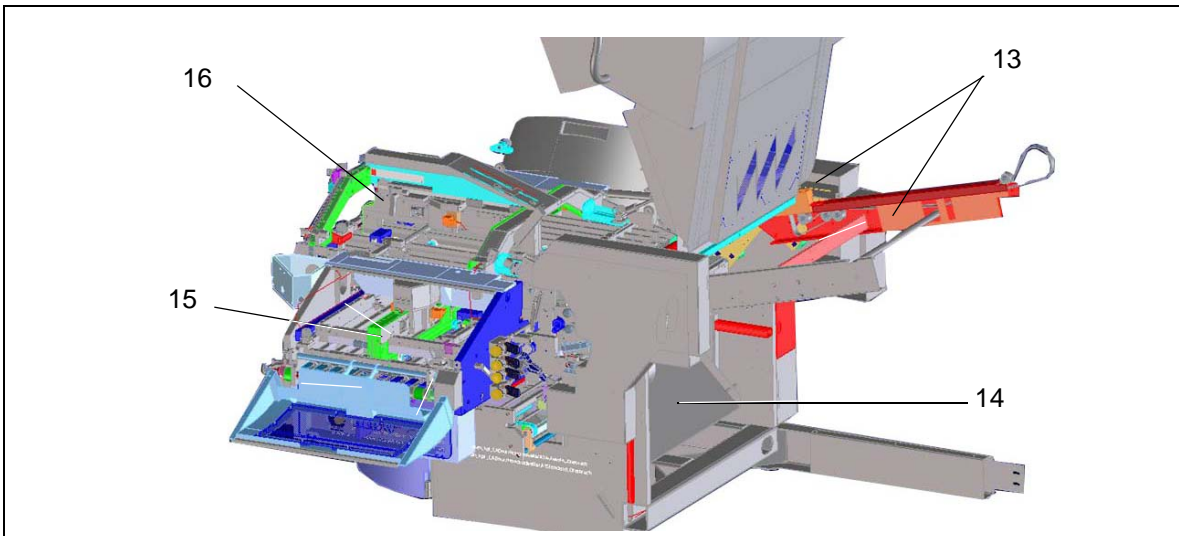
Pos.	Figure 30: Designation	Functioning control	Visual inspection	Result	Inspection interval
1	Guard, parallel fold (operator side)				Weekly
2	Safety hood threefold				Daily
3	Safety switch, threefold safety hood				Daily
4	Guard, cross fold knife				Weekly
5	EMERGENCY STOP palm button on the control panel cross fold and threefold.				Daily
6	EMERGENCY STOP palm button, main control panel				Daily
	All safety screws are secured with screw locking (e.g. Loctite 222). Not marked in the figure				
Date:		Name:		Signature:	

Table 25: Checklist of protective devices for variant S-KTZ.



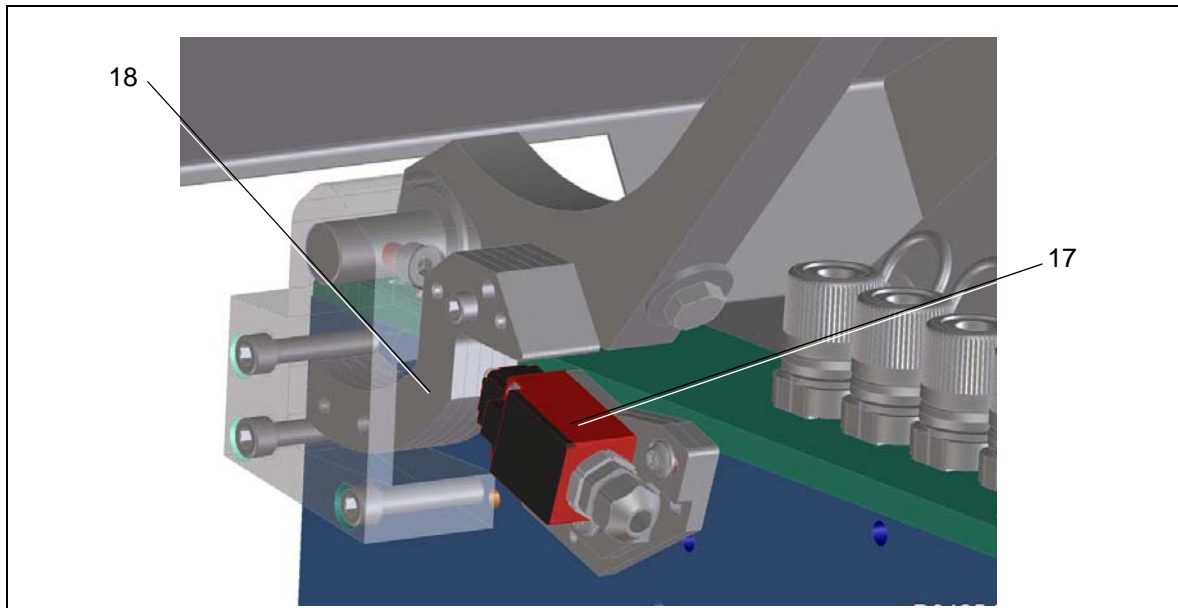
Pos.	Designation	Functioning control	Visual inspection	Result	Inspection interval
7	Guard under threefold				Weekly
8	Guard, threefold drive				Weekly
9	Guard, KTL plate				Weekly
10	Guard, parallel fold (drive side)				Weekly
11	Safety switch, cross fold table				Daily
12	Noise damping safety hood				Daily
Date:		Name:		Signature:	

Table 26: Checklist of protective devices for variant S-KTZ.



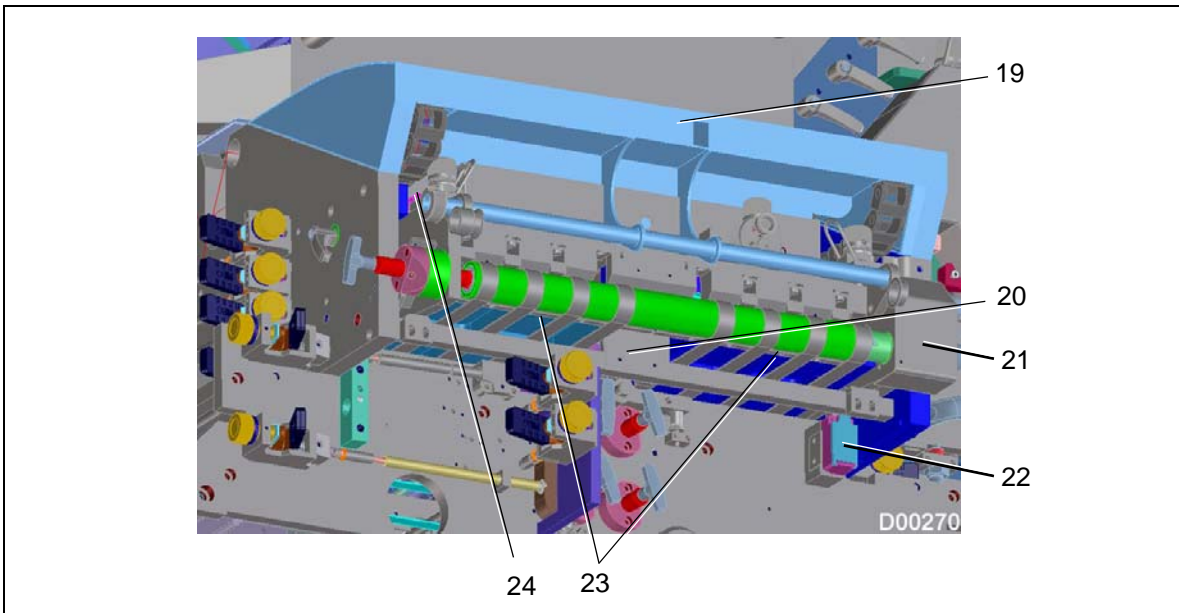
Pos.	Designation	Functioning control	Visual inspection	Result	Inspection interval
13	Guard, register table drive				Weekly
14	Guard, drive combi area				Weekly
15	Guard, threefold knife				Weekly
16	Guard, cross fold knife				Weekly
Date:		Name:		Signature:	

Table 27: Checklist of protective devices for variant S-KTZ.



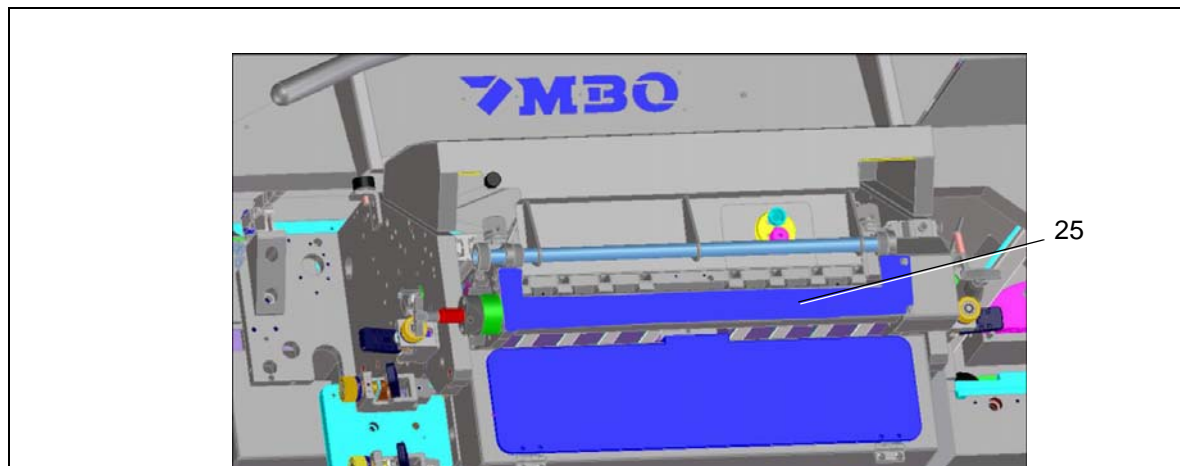
Pos.	Designation	Functioning control	Visual inspection	Result	Inspection interval
17	Safety switch, noise damping safety hood				Daily
18	Cam disk of the noise damping safety hood. Form-closed. Tighten grub screw with point forcefully; (greater than 9 Nm)				
Date:		Name:		Signature:	

Table 28: Checklist of protective devices for variant S-KTZ.



Pos.	Designation	Function- ing control	Visual inspec- tion	Result	Inspection interval
19	Safety hood threefold				Daily
20	Guard, threefold knife				Weekly
21	Guard, tape roller drive				Weekly
22	Safety switch, threefold carriage				Daily
23	Guard, threefold, tape roller				Weekly
24	Safety switch, safety hood, threefold				Daily
Date:		Name:		Signature:	

Table 29: Checklist protective devices variants S-KTL, S-KTLT.



Pos.	Designation	Functioning control	Visual inspection	Result	Inspection interval
25	Guard over tape roller, threefold				Weekly
Date:		Name:		Signature:	

5 Operating and display elements, operating modes

5.1 Operating and display elements

5.1.1 Overview

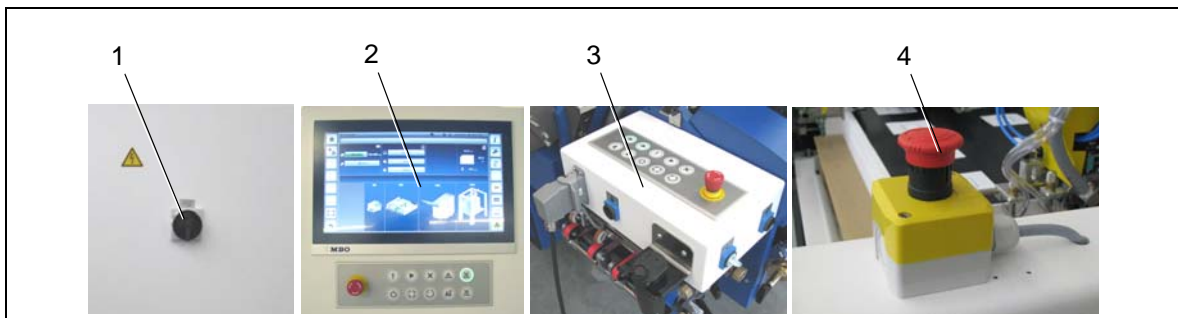


Figure 31: Overview, operating and display elements

- 1 **Main switch.**
See chapter "5.1.2 Main switch".
- 2 **Main control panel.**
See chapter "5.1.4 Main control panel".
- 3 **Control panel in the crossfold and threefold.**
See chapter "5.1.18 Control panel in the cross fold and threefold"
- 4 **EMERGENCY STOP palm button (FP130)**
See chapter "5.1.3 EMERGENCY STOP palm button on the FP130 feeder"

5.1.2 Main switch

The main switch is located on the side frame of the control cabinet.

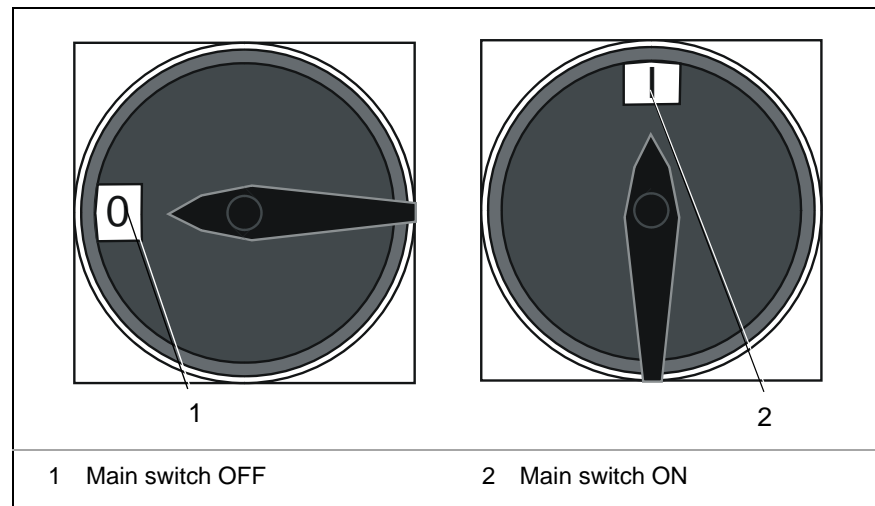


Figure 32: Main switch

The main switch has the following properties:

- it disconnects the machine from the electrical supply,
- it disconnects the subsequent folding units and delivery connected to folding unit 1 from the electrical supply.
- It has only one OFF and one ON position, labeled as 0 and I.
- It is equipped with a device that enables it to be locked in the OFF position (e.g. by a padlock).

5.1.3 EMERGENCY STOP palm button on the FP130 feeder

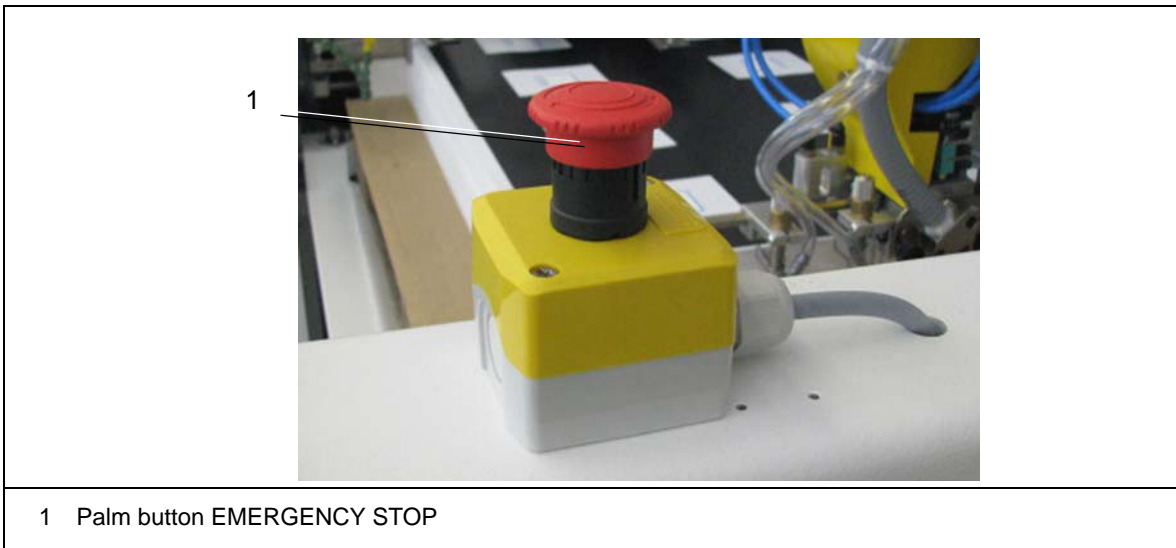


Figure 33: EMERGENCY STOP palm button on the FP130 feeder

5.1.4 Main control panel



Figure 34: Main control panel

- 1 TOUCHSCREEN
See chapter "5.1.6 Touchscreen handling"
- 2 <Machine functions> key field
See chapter "5.1.5 <Machine functions> key field"

5.1.5 <Machine functions> key field

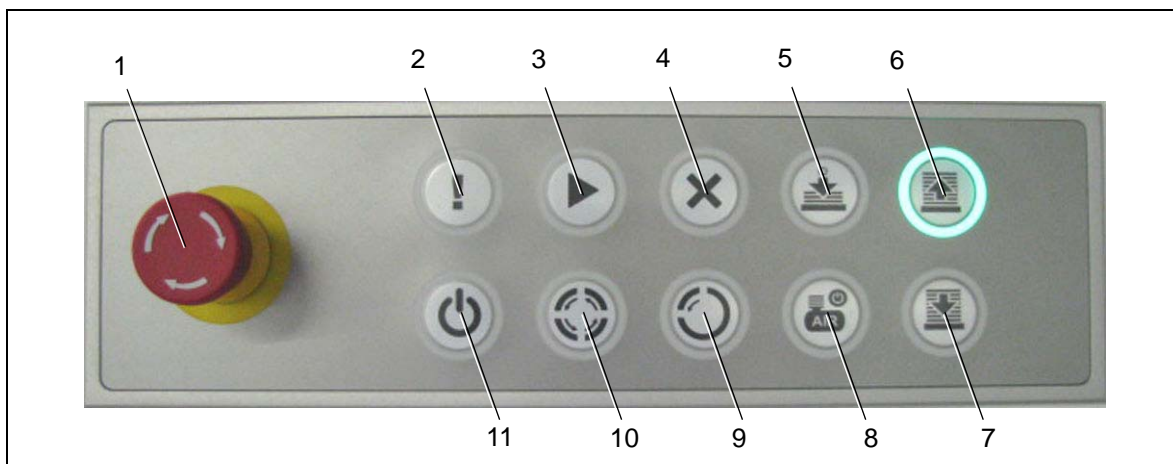


Figure 35: <Machine functions> key field, palletized feeder

- 1 **<EMERGENCY STOP> palm button.**
- 2 **<Confirm error> illuminated button.**
 Status display of the illuminated ring:
 Off = no error/warning present.
 Yellow = an error/warning present.
- 3 **<Machine start> illuminated button.**
 Status display of the illuminated ring:
 Off = The machine is stationary.
 Flashing green = start preparation.
 Green = The machine is running.
- 4 **<Immediate machine stop> illuminated button.**
 Status display of the illuminated ring:
 Off = The machine is stationary.
 Flashing green = The machine is running.
- 5 **<Feeder loading system (FLS)> illuminated button.**
 Status display of the illuminated ring:
 Off = the FLS is switched off.
 Flashing green = pile table moves downwards.
 Green = FLS position reached.
 Green = FLS is switched on.
- 6 **<Pile table up> illuminated button.**
 Status display of the illuminated ring:
 Off = pile table up is switched off.
 Flashing green = pile table moves upwards.
 Green = pile table has reached the "Position feeder head" stop position.
 Green = pile table moves to "Production" stop position.
 Green = pile table has reached the "Production" stop position.
- 7 **<Pile table down> illuminated button.**
 Status display of the illuminated ring:
 Off = pile table down is switched off.
 Flashing green = pile table moves downwards.
 Green = pile table has reached the "15 cm" stop position.
 Green = pile table moves downward to "Floor" stop position. (Inching)
 Green = pile table has reached the "Floor" stop position.
- 8 **<Switch air supply on / off> illuminated button.**
 Status display of the illuminated ring:
 Off = The air supply is switched off.
 Green = The air supply is switched on.

- 9 **<Sheet infeed, single sheet> illuminated button.**
Status display of the illuminated ring:
Off = The sheet infeed is switched off.
Green = A single sheet is called up.
- 10 **<Sheet infeed, production> illuminated button.**
Status display of the illuminated ring:
Off = The sheet infeed is switched off.
Green = The sheet infeed is switched on.
- 11 **<Soft machine stop> illuminated button.**
Status display of the illuminated ring:
Off = The machine is stationary.
Flashing green = The machine is running empty.

5.1.6 Touchscreen handling



- Only use your finger or a stylus pen (part number 0131900) to operate the touchscreen.
 - Ball-point pens or other metallic objects may damage the surface of the touchscreen.
-

5.1.7 Touchscreen structure

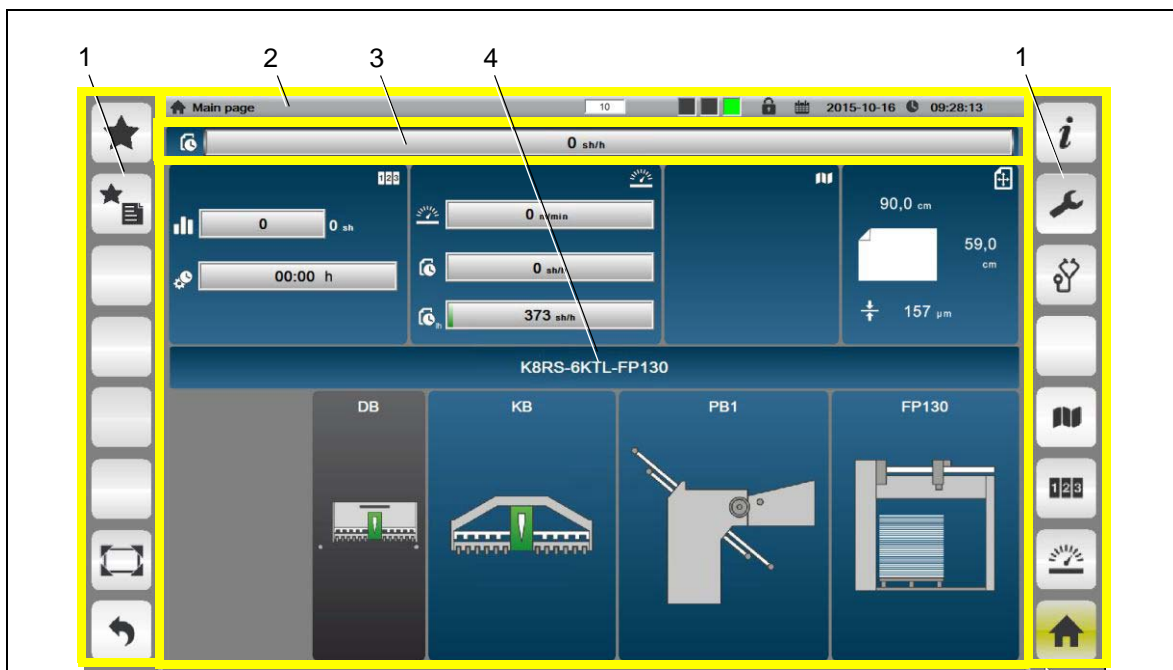


Figure 36: Touchscreen structure

The touchscreen is divided into the following functional groups:

- 1 **Function keys.**
See chapter "5.1.11 Description of the function keys"
- 2 **<Page name, machine status, password level, date and time> info box.**
See chapter "5.1.8 Info box".
- 3 **Current production speed, alarms, notices> display field.**
See chapter "5.1.17 Displaying alarms".
- 4 **<Current page content> display.**
See chapter "8.4.2 Main page structure".

5.1.8 Info box

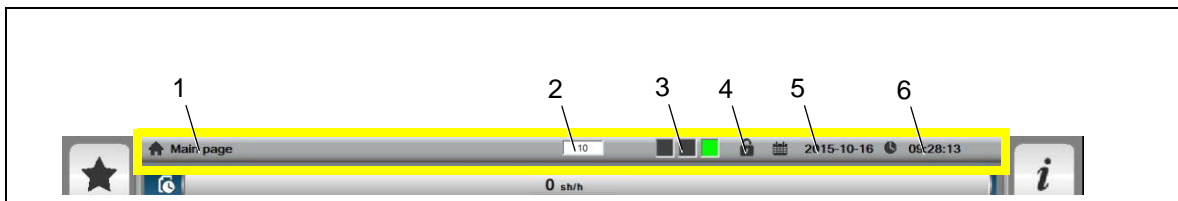


Figure 37: Info box

- 1 **<Title of the current page> display.**
Pressing this displays the current page number.
Pressing this again hides the current page number.
- 2 **<Page number> display.**
Displays the page number of the current page.
Switched on/off by pressing.
- 3 **<Machine status> display.**
Displays the current status of the machine.
See chapter "5.1.10 Displaying machine status"
- 4 **<Password> button.**
Displays the current password level.
See Chapter "5.1.9 Entering the password".
- 5 **<Current date> display.**
- 6 **<Current time> display.**

5.1.9 Entering the password

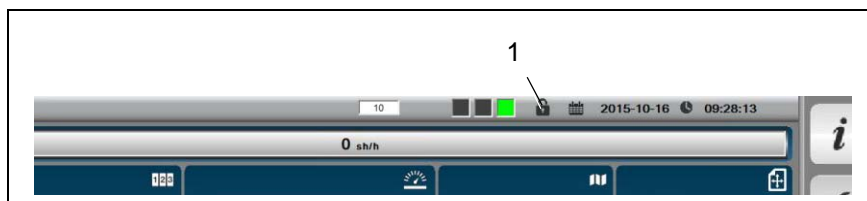


Figure 38: Password

1 <Password> button.

With the <Password> button, various password levels can be selected. If the <Padlock> symbol is closed, no password level is selected. If the <Padlock> symbol is open, the current password level is displayed as a number in the symbol.

5.1.9.1 Password levels

Password level	Password	Area and authorization	Symbol
0	-	Area: <ul style="list-style-type: none"> • Diagnostics (view all/change something). Authorization for: Operator	
1	XXXX	Area: <ul style="list-style-type: none"> • Diagnostics (view all/change something). • Service (view all/change something). Authorization for: Machine setter with supervision	

Table 30: Password level

5.1.9.2 Change password level

Special diagnostic and configuration pages can be unlocked by entering particular passwords.

Proceed as follows to change the password level.

Prerequisites These prerequisites must be fulfilled:

- You are authorized to change the password level.

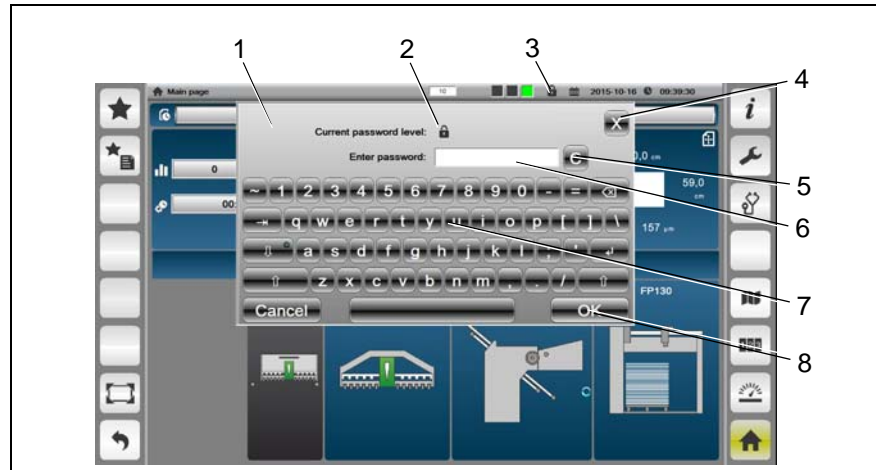


Figure 39: Password

Entering the password

How to enter a password.

- ▷ Press the <Password> (3) button.
The password input window (1) is opened.
- ▷ The <Current password level> display (2) shows the current password level as a number.
- ▷ Enter the password for the required password level via the alphanumeric keyboard (6)
- ▷ Press the <Enter> button (8).
The <Password> button (3) displays an open lock with the corresponding password level.
- ✓ The password level is changed.

Canceling password input

How to cancel password input:

- ▷ Press the <Close window> (4) button.
The password input window is closed.
- ✓ The password input is canceled.

Resetting the password level

How to reset the password level:

- ▷ Press the <Password> button (1).
The password input window is opened.
- ▷ Press the <C> button (7).
- ▷ Press the <Enter> button (8).
The <Password> button (3) displays a closed lock.
- ✓ The password level is reset.

5.1.10 Displaying machine status

The operating status of the machine is shown on the <Machine status> display.

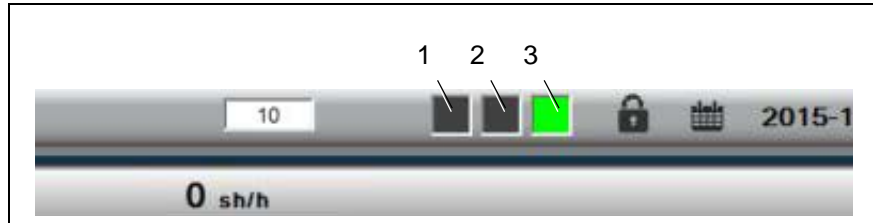


Figure 40: Displaying machine status

The individual operating states are given in the table below.

Display (1)	Display (2)	Display (3)	Meaning
Red	Black	Black	An alarm message is present.
Black	Yellow	Black	Rapidset or ARA drive not positioned.
Black	Yellow with gear wheels	Black	Rapidset or ARA drive is positioned.
Black	Black	Green	Machine is ready for production.

Table 31: Operating states

5.1.11 Description of the function keys



For improved orientation, the function key currently active is highlighted in yellow.

See "Figure 41: Function keys" position 8.



Figure 41: Function keys

- 1 **<Help> button.**
Pressing the button switches the Help on.
See chapter "5.1.12 Switching the help on/off".
- 2 **<Service> button (password-protected).**
Pressing the button displays the <Password> page.
See chapter "5.1.9 Entering the password"
- 3 **<Diagnosis> button.**
Pressing the button displays the <Diagnosis> page.
See chapter "5.1.16 <Diagnosis> page"
- 4 **Not assigned.**
- 5 **<Folding imposition> button.**
Pressing the button displays the <Folding imposition> page.
See chapter "8.4.7 Selecting a folding imposition".
- 6 **<Counter> button.**
Pressing the button displays the <Counter> page.
See chapter "8.4.6 Making the counter settings".
- 7 **<Settings> button.**
Pressing the button displays the <Settings> page.
See chapter "8.4.11 Changing the infeed data".
- 8 **<Home> button.**
Pressing the button displays the <Main page> page.
See chapter "8.4.2 Main page structure".
- 9 **<Page back> button.**
Pages back to the previous pages selected.
- 10 **<Large-scale display> button.**
Pressing the button displays the <Large-scale display> page.
See chapter "5.1.14 Switching on the large-scale display".

- 11 **Not assigned.**
- 12 **Not assigned.**
- 13 **Not assigned.**
- 14 **Not assigned.**
- 15 **<Display favorite pages> button.**
Pressing the button displays the <Favorite> page.
See chapter "5.1.13 Selecting favorite pages".
- 16 **<Select favorite pages> button.**
Pressing this button saves this page as a <Favorite>.
See chapter "5.1.13 Selecting favorite pages"

5.1.12 Switching the help on/off

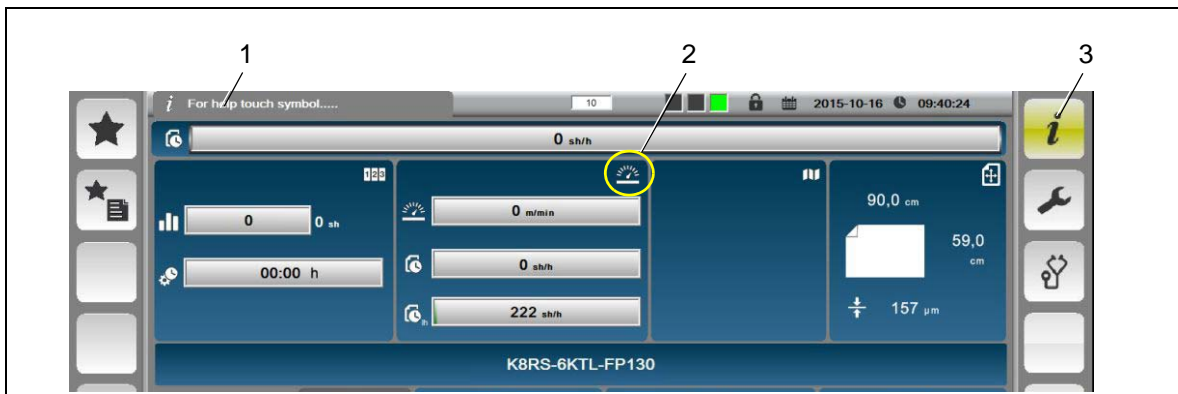


Figure 42: Switching the help on/off

After switching on the help function, it is possible to display the corresponding help text for a symbol by touching a symbol you do not recognize on the currently-displayed page.

Switching the help on

How to switch help on:

- ▷ Press the <Help> function key (3).

The function key is lit yellow.

A pop-up window (1) opens in the current page with the notice: <Touch symbol to get help>.

- ✓ The help is switched on.

Displaying help text

How to display help text:

- ▷ Press the unknown symbol (2) on the current page.

The corresponding help text will be displayed in a pop-up window, e.g. <Speed>.

- ✓ The help text is displayed.

Switching the help off

How to switch help off:

- ▷ Press the <Help> function key (3) again.

The pop-up window (1) is closed.

- ✓ The help is switched off.



No other functions can be run when the help is switched on (<Help> function key is lit in yellow).

5.1.13 Selecting favorite pages

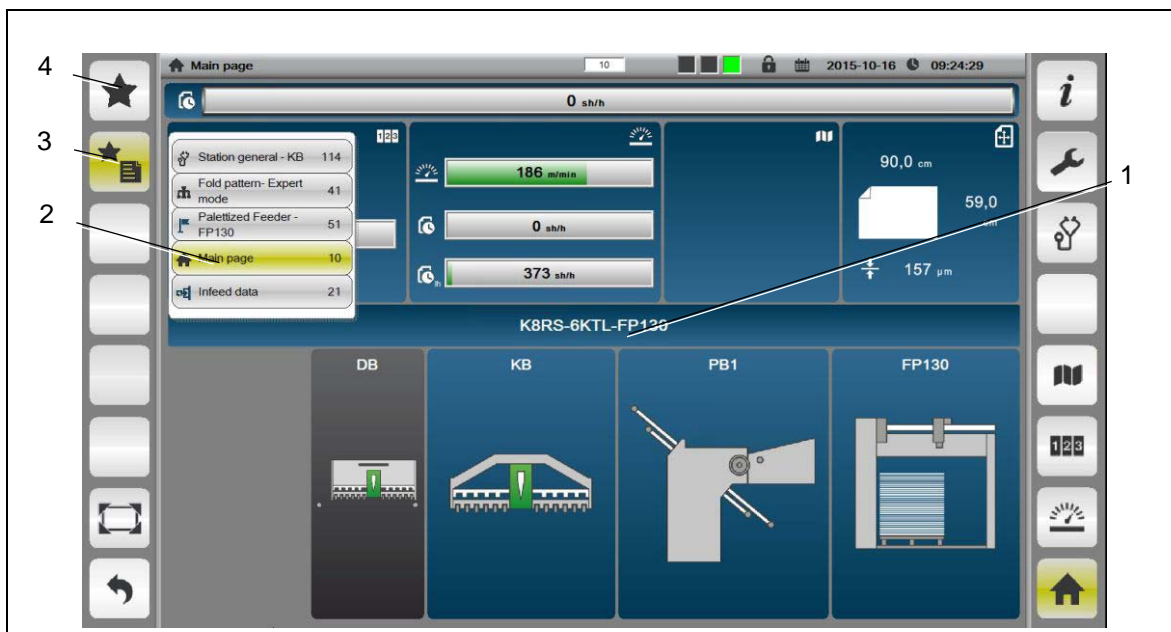


Figure 43: Selecting favorite pages

The favorite changeover is used for the rapid changeover between up to five different favorite menus.

How to select the favorite pages:

- ▷ Navigate to the first page that you want to set as a favorite page.
- ▷ When the content of the required page (1) is displayed, press the <Select favorite pages> button (4)
- ▷ Navigate to the second page that you want to set as a favorite page.
- ▷ When the content of the required page (1) is displayed, press the <Select favorite pages> button (4),
- ▷ Pressing the <Favorite page changeover> button (3) displays a selection list (2) with a maximum of five favorite pages.
- ▷ Press the required favorite page (2) in the selection list.
- ✓ The required favorite page is displayed.



The favorites list must be rebuilt again after switching the main switch off/on.

5.1.14 Switching on the large-scale display

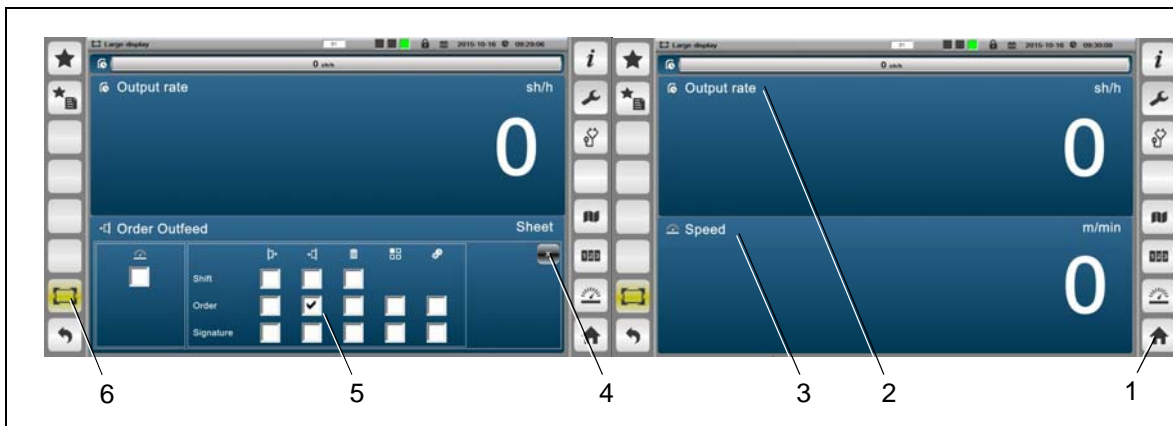


Figure 44: Switching on the large-scale display

On the <Large-scale display> page, the top display field (2) always displays the production speed.

A selected function is displayed in the lower display field (3).

Switching on the large-scale display

How to switch on the large-scale display:

- ▷ On the <Main page> page, press the <Large-scale display> function key (6).

✓ The large-scale display is switched on.

Switching off the large-scale display

How to switch off the large-scale display:

- ▷ Press the <Home> function key (1).

The main page is displayed

✓ The large-scale display is switched off.

Selecting a function

How to select the function:

- ▷ Press the display field (3).

A selection window (5) is displayed.

- ▷ Press the required function.

A checkmark is set.

✓ The function is selected.

Close the selection window

How to close the selection window (5):

- ▷ Press the <Close> button (4).

✓ The selection window (5) is closed.

5.1.15 Numeric input keyboard

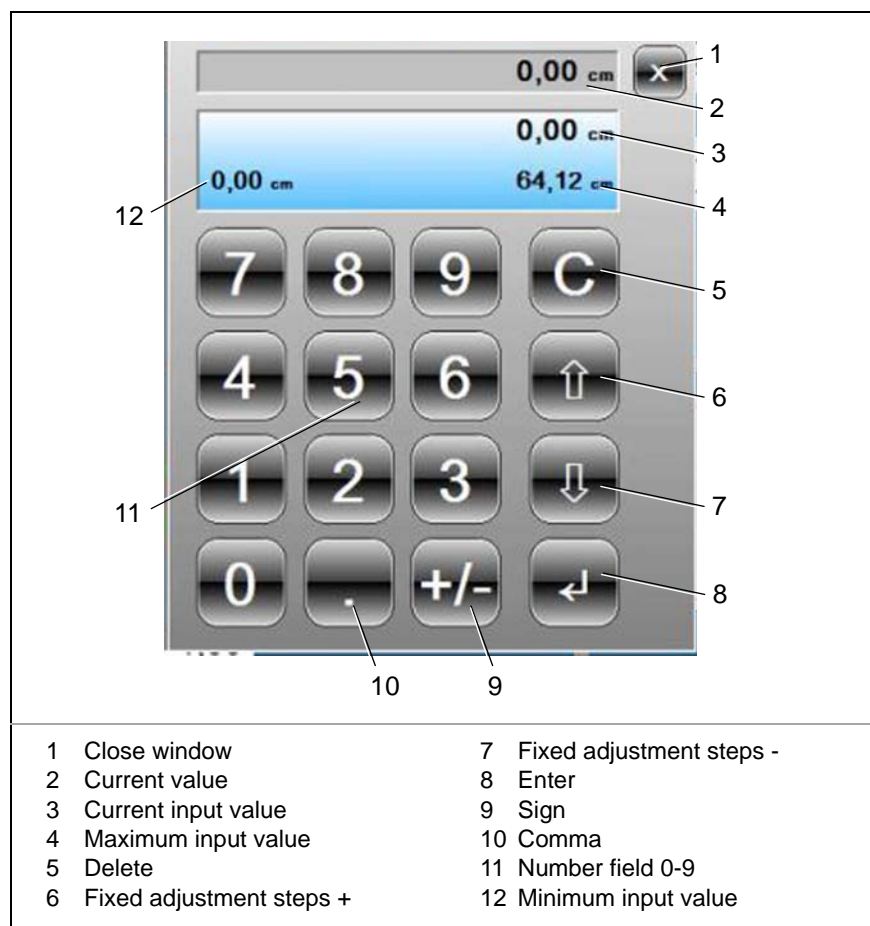


Figure 45: Numeric input keyboard

Enter negative number

How to enter a negative number:

- ▷ Press the <Delete> button (5).
- ▷ Enter the required number.
- ▷ Press the <Algebraic sign> button (9).
A minus sign is shown in front of the number entered.
- ▷ Press the <Enter> button (8).
- ✓ A negative number is entered.



Depending on the unit to be changed, the structure of the numeric input keyboard can vary somewhat.

5.1.16 <Diagnosis> page

The <Diagnosis> page has the following functions:

- Selection of the screen language, units of measurement and date formats
- Branching to the various diagnostic pages.

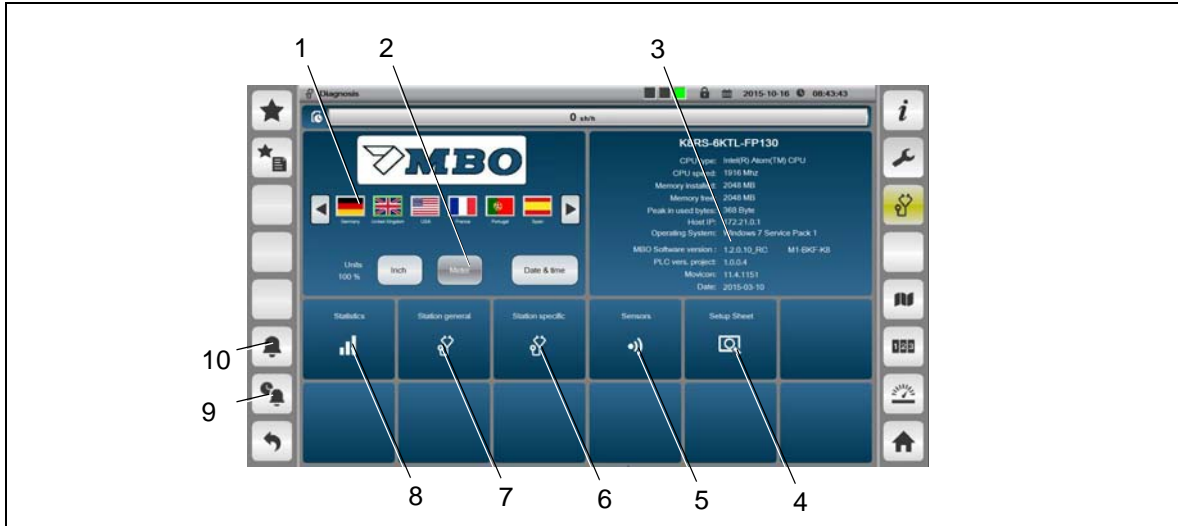


Figure 46: <Diagnosis> page

- <Select language> selection field.**
Pressing a flag displays the screen texts in the relevant language.
- <Units of measurement> buttons.**
Press the buttons Inch, Metre, Date & Time to display the corresponding national units of measurement (metric/Imperial) or date and time formats.
- <Software diagnosis> display field.**
The display field shows all relevant data on the installed software.
- <Setup sheet> keypad.**
Pressing the keypad opens the page.
See chapter "5.1.16.1 <Setup sheet> page"
- <Sensors> keypad.**
Pressing the keypad opens the page.
See chapter "5.1.16.2 <Sensors> page".
- <Station specific> keypad.**
Pressing the keypad opens the page.
See chapter "5.1.16.5 <Station specific> page".
- <General station> keypad.**
Pressing the keypad opens the page.
See chapter "5.1.16.6 <General station> page".
- <Statistics> keypad.**
Pressing the keypad opens the <Statistics> page.
See chapter "5.1.16.7 <Statistics> page".
- <Alarms history> function key.**
Pressing the key displays the page.
See chapter "5.1.17 Displaying alarms".
- <Alarms> function key.**
Pressing the key displays the page.
See chapter "5.1.17 Displaying alarms".

5.1.16.1 <Setup sheet> page

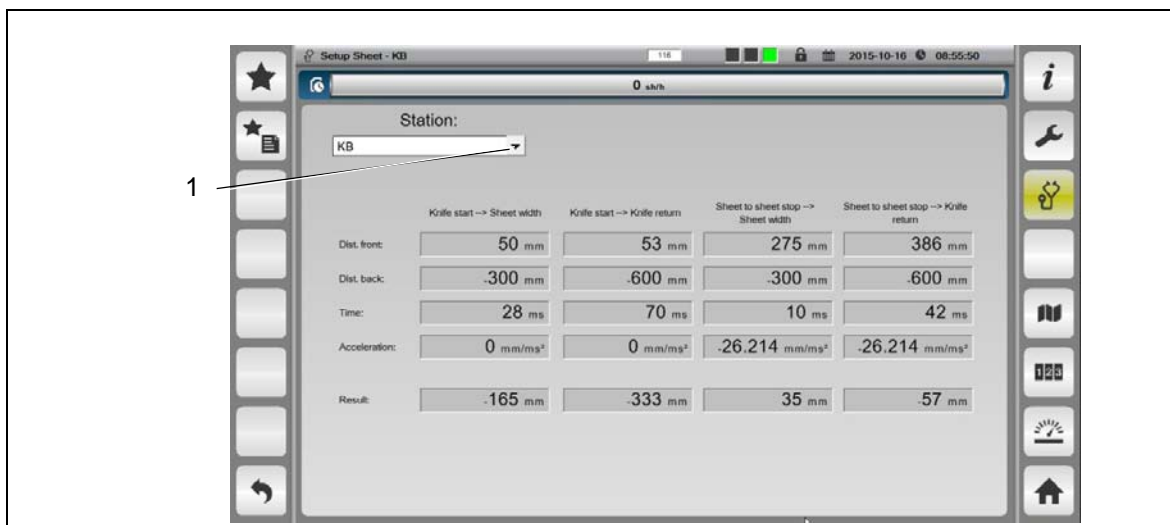


Figure 47: <Setup sheet> page

This page displays the specific data for the selected station.

How to select the required station:

- ▷ Press the selection button (1).
A selection list is displayed.
- ▷ Tap on the required station.
- ✓ The data for the selected station is displayed.

5.1.16.2 <Sensors> page

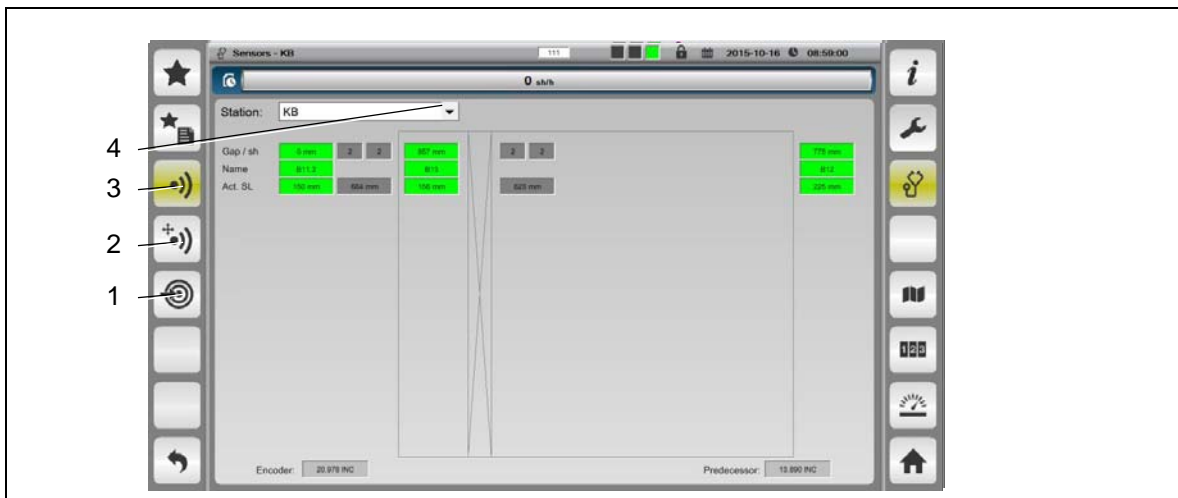


Figure 48: <Sensors> page

- 1 **<Sheet monitoring> function key.**
Pressing the button displays the <Sheet monitoring> page.
See chapter "5.1.17 Displaying alarms"
- 2 **<Sensors and sheet length> function key.**
Pressing the key displays the <Sensors and sheet length> page.
See chapter "5.1.17 Displaying alarms"
- 3 **<Sensors> function key.**
Pressing the button displays the <Sensors> page.
- 4 **<Station> selection button.**
Pressing the button displays a selection list of all stations.

This page displays the specific sensor data for the selected station.

How to select the required station:

- ▷ Press the selection list (4).
A selection list is displayed.
- ▷ Tap on the required station.
- ✓ The sensor data for the selected station is displayed.

5.1.16.3 <Sheet monitoring> page

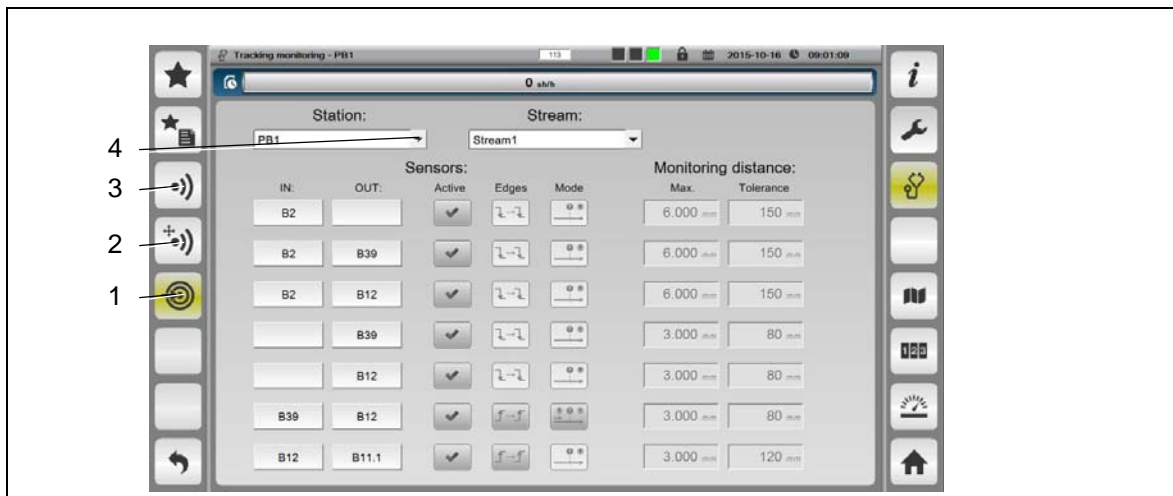


Figure 49: <Sheet monitoring> page

- 1 **<Sheet monitoring> function key.**
Pressing the button displays the <Sheet monitoring> page.
- 2 **<Sensors and sheet length> function key.**
Pressing the key displays the <Sensors and sheet length> page.
See chapter "5.1.16.4 <Sensors and sheet length> page"
- 3 **<Sensors> function key.**
Pressing the button displays the <Sensors> page.
See chapter "5.1.16.2 <Sensors> page"
- 4 **<Station> selection button.**
Pressing the button displays a selection list of all stations.

This page displays the sheet monitoring data for the selected station.

How to select the required station:

- ▷ Press the selection list (4).
- ▷ A selection list is displayed.
- ▷ Tap on the required station.
- ✓ The sheet monitoring data for the selected station is displayed.

5.1.16.4 <Sensors and sheet length> page

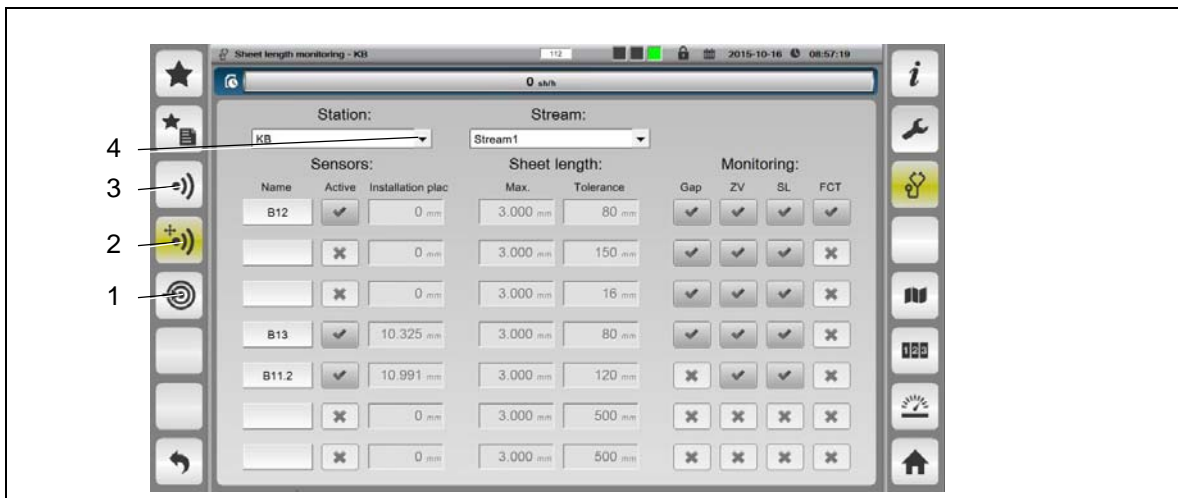


Figure 50: <Sensors and sheet length> page

- 1 **<Sheet monitoring> function key.**
Pressing the button displays the <Sheet monitoring> page.
See chapter "5.1.16.4 <Sensors and sheet length> page"
- 2 **<Sensors and sheet length> function key.**
Pressing the key displays the <Sensors and sheet length> page.
- 3 **<Sensors> function key.**
Pressing the button displays the <Sensors> page.
See chapter "5.1.16.2 <Sensors> page"
- 4 **<Station> selection button.**
Pressing the button displays a selection list of all stations.

This page displays the data for the sensors and sheet lengths for the selected station.

How to select the required station:

- ▷ Press the selection list (4).
A selection list is displayed.
- ▷ Tap on the required station.
- ✓ The data for the selected station is displayed.

5.1.16.5 <Station specific> page

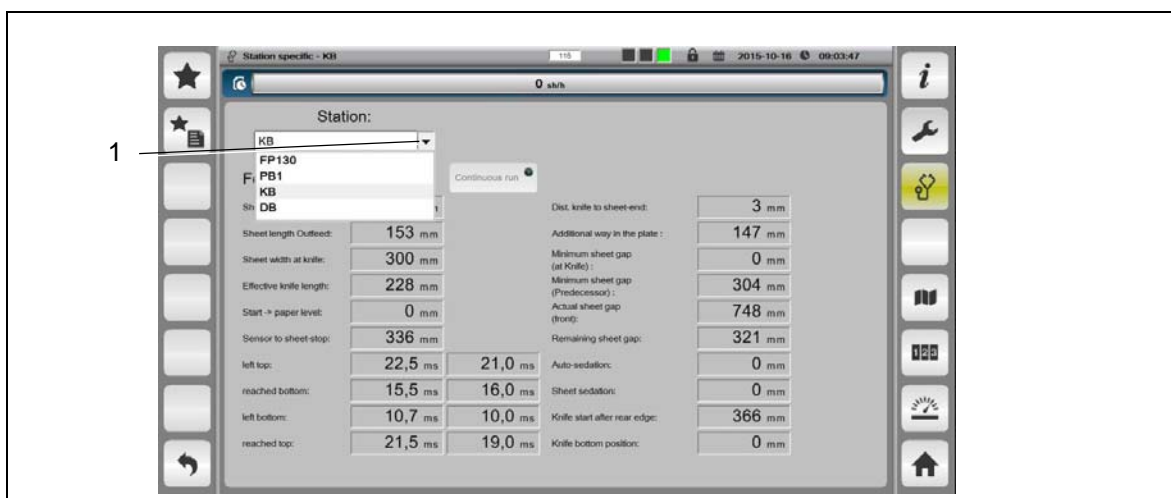


Figure 51: <Station specific> page

This page displays the specific data for the selected station.

How to select the required station:

- ▷ Press the selection button (1).
A selection list is displayed.
- ▷ Tap on the required station.
- ✓ The data for the selected station is displayed.

5.1.16.6 <General station> page

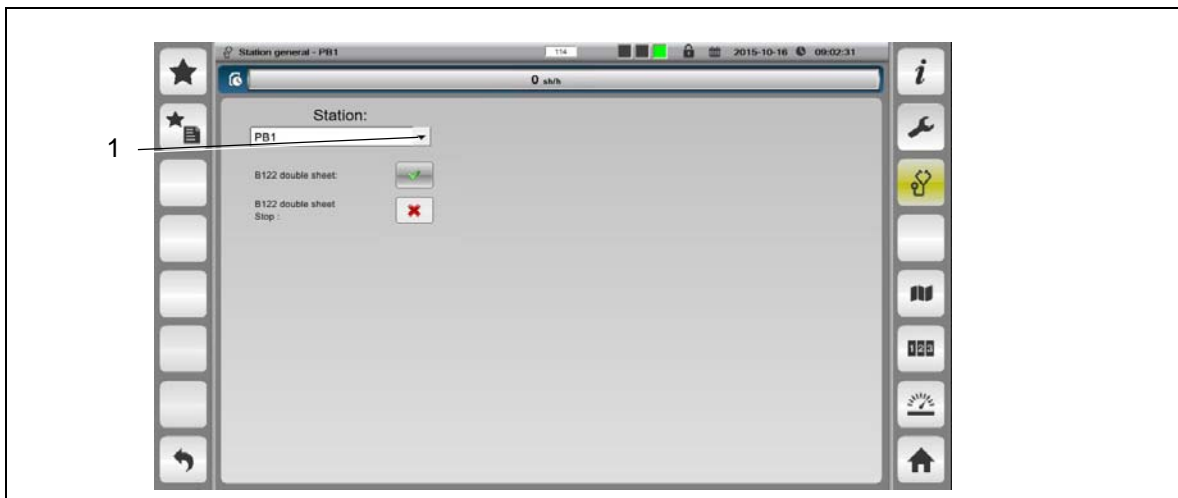


Figure 52: <General station> page

This page displays the general data for the selected station.

How to select the required station:

- ▷ Press the selection button (1).
A selection list is displayed.
- ▷ Tap on the required station.
- ✓ The data for the selected station is displayed.

5.1.16.7 <Statistics> page

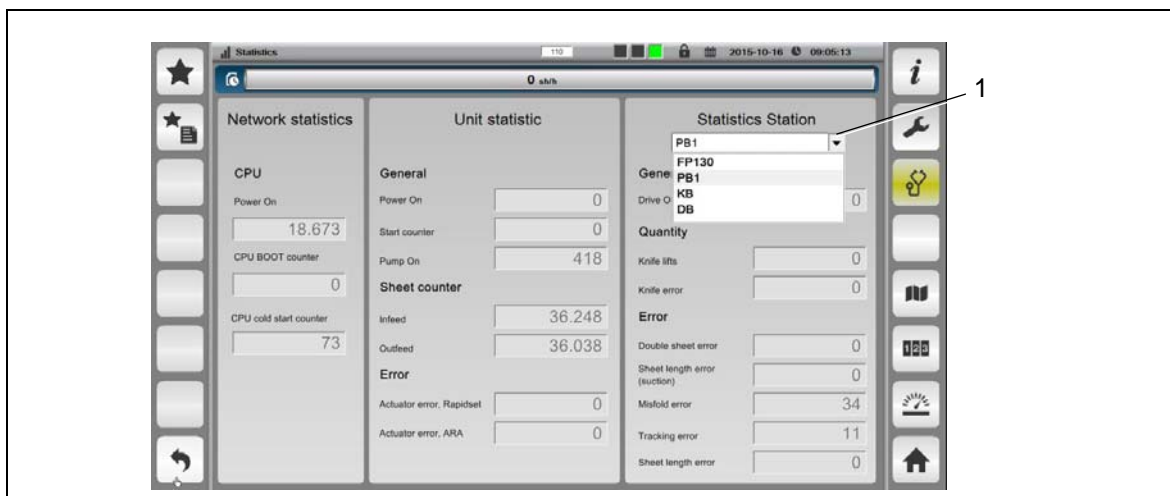


Figure 53: <Statistics> page

This page displays the statistics data for the selected station.

How to select the required station:

- ▷ Press the selection button (1).
A selection list is displayed.
- ▷ Tap on the required station.
- ✓ The statistics data for the selected station is displayed.

5.1.17 Displaying alarms

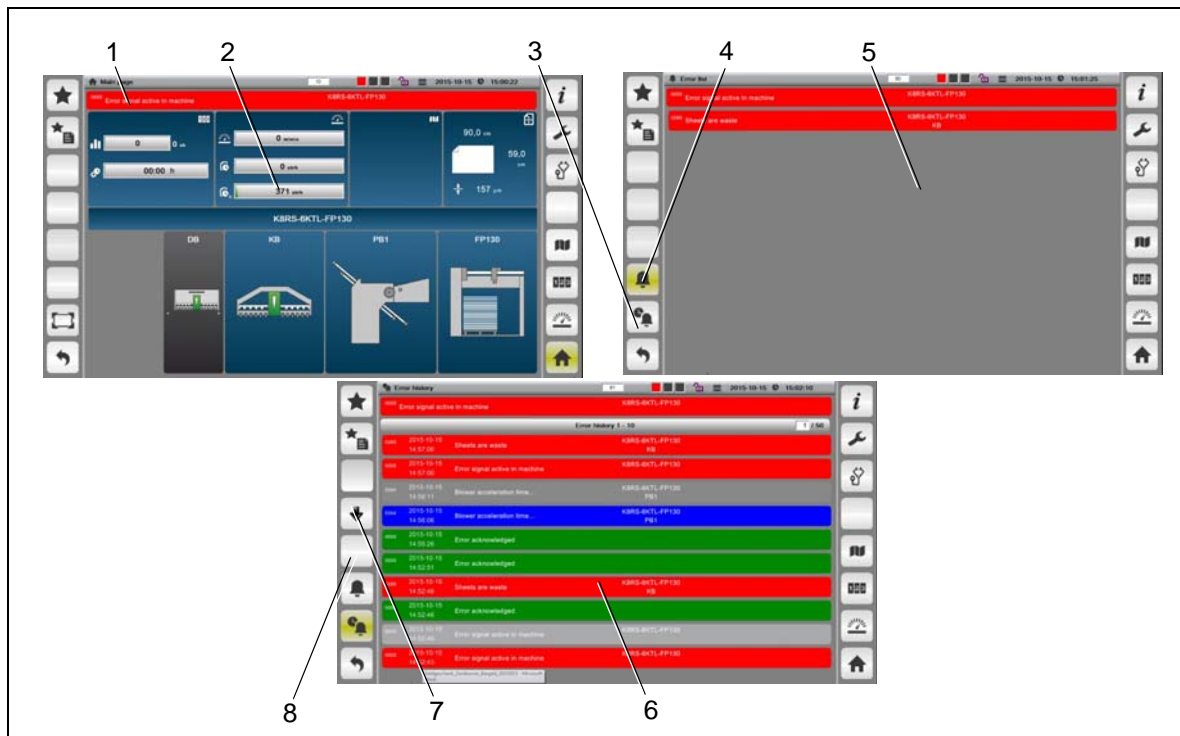


Figure 54: <Alarms> and <History> pages

- Display current alarms** The current alarms are displayed in the <Current production speed, alarms, notices> (1) display field.
- Display alarm list** The <Alarm list> page lists all current error messages.
 How to display the <Alarm list> (5) page.
 ▷ Tap the display field (1).
 ✓ The <Alarm list> page (5) is displayed.
- Display alarm history** The <Alarm history> page lists all error messages.
 How to display the <Alarm history> (6) page.
 ▷ Tap on the <Alarm history> function key (3).
 ✓ The <Alarm history> page (6) is displayed.
- Scroll through the alarm history** How to scroll through the <Alarm history> (6) page.
 ▷ Press the function key <Scroll down> (7).
 ▷ Press the <Scroll up> function key (8).

5.1.18 Control panel in the cross fold and threefold



Figure 55: Control panel in the cross fold and threefold

- 1 **<Machine function> key field.**
See chapter "5.1.18.1 <Machine function> key field in the cross fold and threefold"
- 2 **<Two-hand switching> button.**
(press the buttons simultaneously (2 and 6))
- 3 **<Set-up mode with open protective device> illuminated selecting switch.**
Position 0 = Set-up mode OFF.
Position 1 = Set-up mode ON.
- 4 **<Inching> enabling grip switch.**
- 5 **Plug connection for enabling grip switch.**
- 6 **<Two-hand switching> button.**
(press the buttons simultaneously (2 and 6))

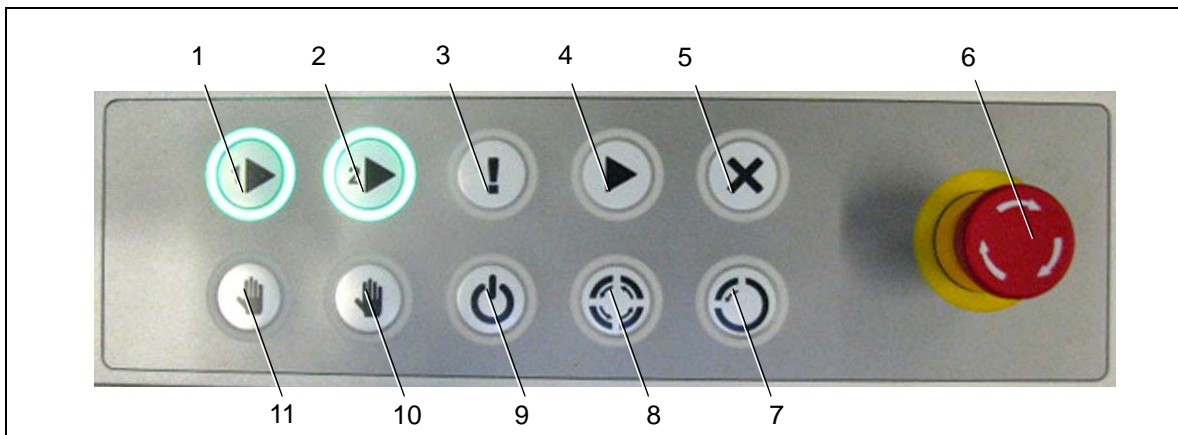
5.1.18.1 <Machine function> key field in the cross fold and threefold


Figure 56: <Machine functions> combi area key field

- 1 **<Folding knife 1 on/off> illuminated button.**
 Status display of the illuminated ring:
 Off = The folding knife is switched off.
 Green = Automatic mode.
 Yellow = Manual mode.
- 2 **<Folding knife 2 on/off> illuminated button.**
 Status display of the illuminated ring:
 Off = The folding knife is switched off.
 Green = Automatic mode.
 Yellow = Manual mode.
- 3 **<Confirm error> illuminated button.**
 Status display of the illuminated ring:
 Off = no error/warning present.
 Yellow = an error/warning present.
- 4 **<Machine start> illuminated button.**
 Status display of the illuminated ring:
 Off = The machine is stationary.
 Green = The machine is running.
- 5 **<Immediate machine stop> illuminated button.**
 Status display of the illuminated ring:
 Off = The machine is stationary.
 Green = The machine is running.
- 6 **<EMERGENCY STOP> palm button.**
- 7 **<Sheet infeed, single sheet> illuminated button.**
 Status display of the illuminated ring:
 Off = The sheet infeed is switched off
 Green = A single sheet is called up.
- 8 **<Sheet infeed, production> illuminated button.**
 Status display of the illuminated ring:
 Off = The sheet infeed is switched off.
 Green = The sheet infeed is switched on.
- 9 **<Soft machine stop> illuminated button.**
 Status display of the illuminated ring:
 Off = The machine is stationary.
 Flashing green = The machine is running empty.
- 10 **<Knife stroke, folding knife 2> illuminated button.**
 Status display of the illuminated ring:
 Off = Folding stroke is switched off.
 Flashing yellow = A folding stroke can be triggered.
- 11

11 **<Knife stroke, folding knife 1> illuminated button.**

Status display of the illuminated ring:

Off = Folding stroke is switched off.

Flashing yellow = A folding stroke can be triggered.

5.2 Compressed air nozzle with manometer

5.2.1 FP feeder

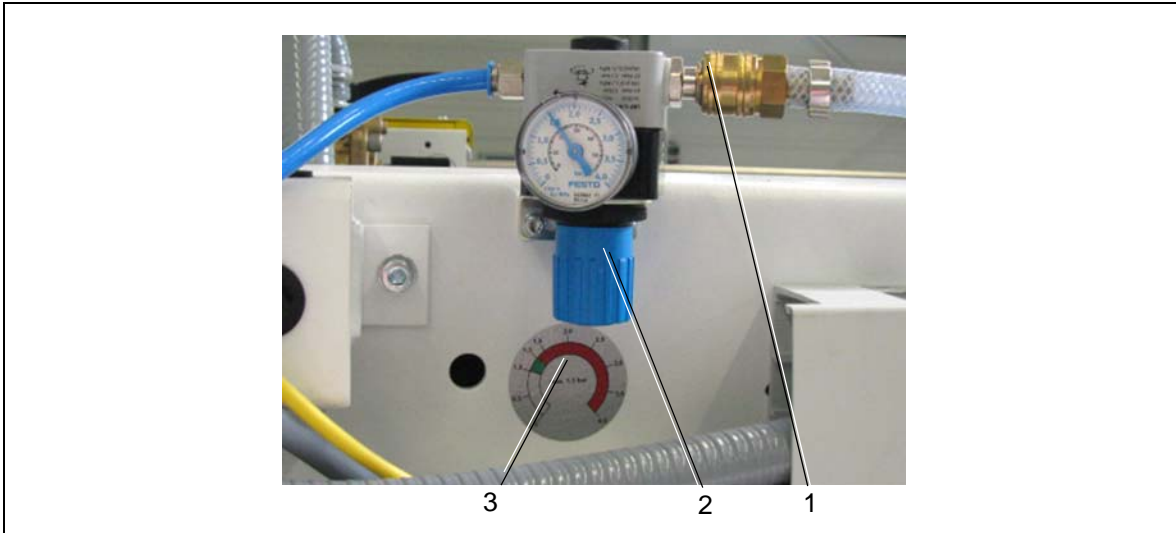


Figure 57: FP feeder compressed air supply

- 1 Compressed air connection
- 2 Pressure regulator, feeder head
- 3 Sign of maximum operating pressure for feeder head

5.2.2 Combi area

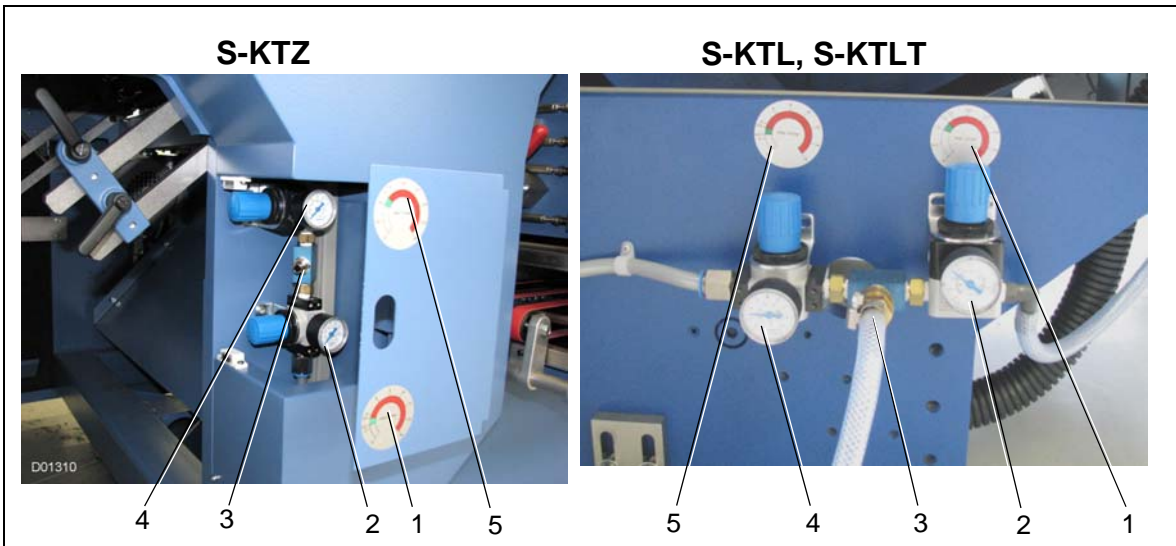


Figure 58: Compressed air supply combi area

- 1 Sign maximum operating pressure for waste paper deflector
- 2 Pressure regulator, waste paper deflector
- 3 Compressed air connection
- 4 Pressure regulator, folding knives
- 5 Sign maximum operating pressure for folding knives

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!

Rotating machine parts with opened protective devices in set-up mode.

Non-observance could result in serious injury or death.

In set-up mode, there is an increased hazard of injuries since danger spots 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 outlets.

Non-observance could result in serious injury or death.

- The machine sockets of the MBO machines may be used exclusively for the connection of MBO folding units, MBO units or MBO deliveries.
- The 230 VAC sockets of the MBO machines may be used exclusively for connecting auxiliary devices intended for this purpose, such as gluing devices.
- All sockets (400 VAC and 230 VAC 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 points due to cables lying around.

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

Lay the machine connections (cables, hoses, pipes) so that there are no tripping points.

5.3.1 Switching the operating mode of the folding knives

5.3.1.1 Folding knife 1

Proceed as follows to switch on the operating mode of folding knife 1.

- Prerequisites** These prerequisites must be fulfilled:
- The sheet stop on folding knife 1 is closed.

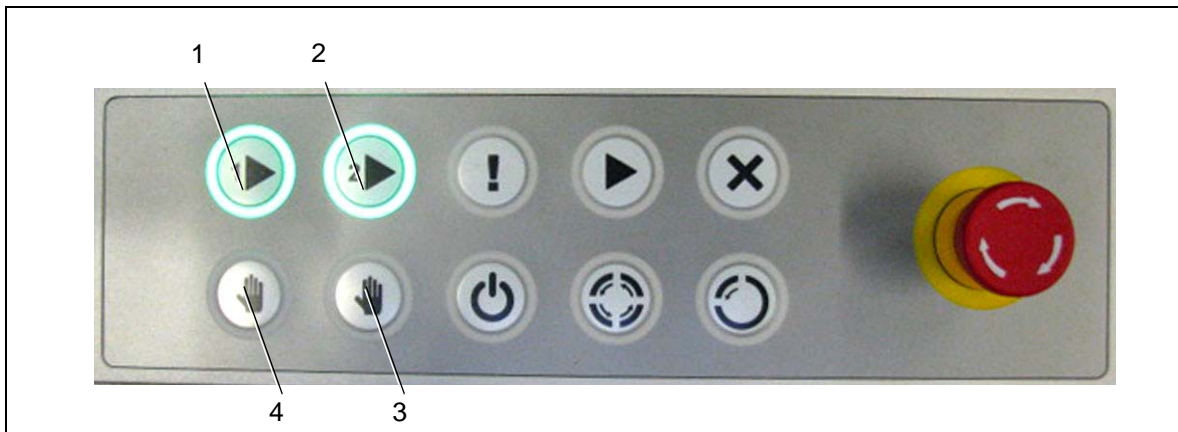


Figure 59: Set-up mode of folding knives

- Switching on automatic mode** How to switch on automatic mode:
- ▷ Press the <Folding knife 1 on/off> button (1).
The illuminated ring (1) is lit in green.
 - ✓ Automatic mode is switched on.

- Switching on manual mode** How to switch on manual mode:
- ▷ Press the <Single stroke, folding knife 1> button (4).
The illuminated ring (4) is flashing yellow.
The illuminated ring (1) is lit in yellow.
 - ✓ Manual mode is switched on.

- Trigger knife stroke** How to trigger a knife stroke:
- ▷ Press the <Single stroke, folding knife 1> button (4) again.
 - ✓ A knife stroke is triggered.

- Switching off the folding knife** How to switch off the folding knife:
- ▷ Press the <Folding knife 1 on/off> button (1).
The illuminated ring (1) is off.
 - ✓ The folding knife is switched off.

5.3.1.2 Folding knife 2

Proceed as follows to switch on the operating mode of folding knife 2.

- Prerequisites** These prerequisites must be fulfilled:
- Automatic mode is switched on for folding knife 1.
 - The sheet stop of folding knife 2 is closed (manual).

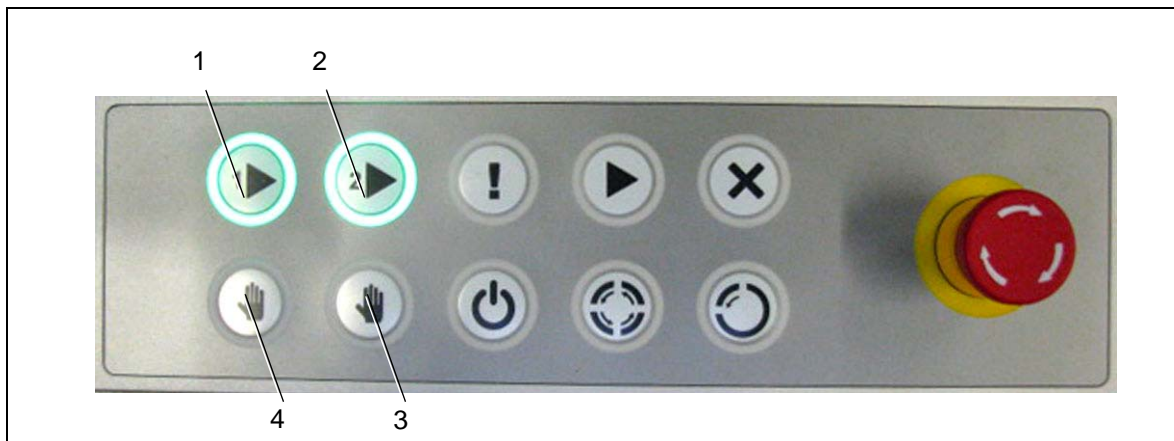


Figure 60: Set-up mode of folding knives

- Switching on automatic mode** How to switch on automatic mode:
- ▷ Press the <Folding knife 2 on/off> button (2).
The illuminated ring (2) is lit in green.
 - ✓ Automatic mode is switched on.

- Switching on manual mode** How to switch on manual mode:
- ▷ Press the <Single stroke, folding knife 2> button (3).
The illuminated ring (3) is flashing yellow.
The illuminated ring (2) is lit in yellow.
 - ✓ Manual mode is switched on.

- Trigger knife stroke** How to trigger a knife stroke:
- ▷ Press the <Single stroke, folding knife 2> button (3) again.
 - ✓ A knife stroke is triggered.

- Switching off the folding knife** How to switch off the folding knife:
- ▷ Press the <Folding knife 2 on/off> button (2).
The illuminated ring (2) is not lit up.
 - ✓ The folding knife is switched off.

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, via two-hand switching.
- Inching at 5 m/min, using enabling grip switch.



WARNING!

Rotating machine parts with opened protective devices in set-up mode.

Non-observance could result in serious injury or death.

In set-up mode, there is an increased hazard of injuries since danger spots 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.

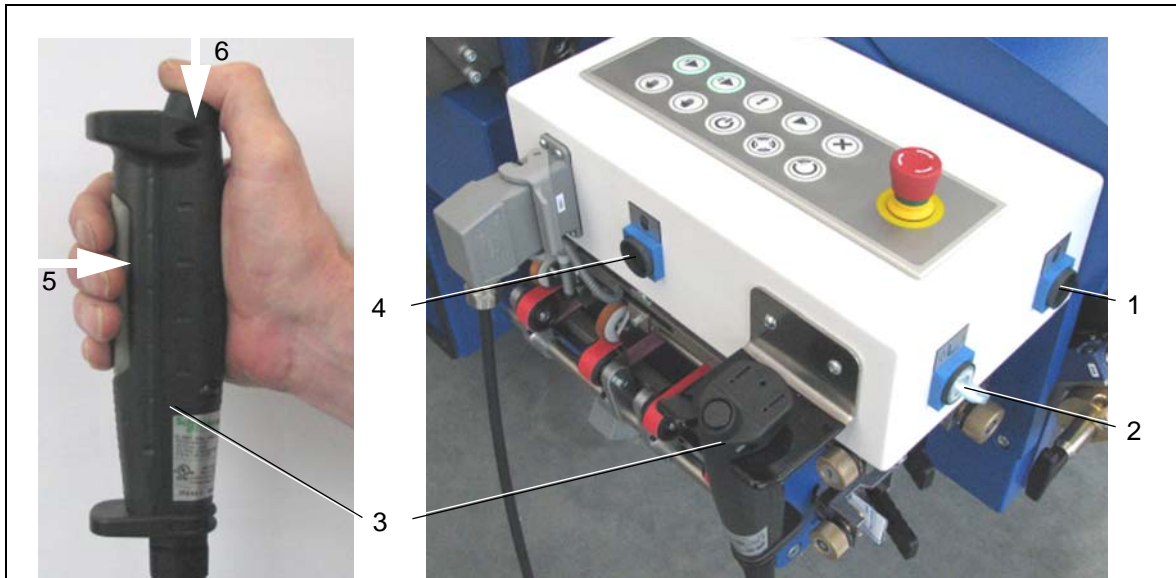


Figure 61: Set-up mode with open protective device

- | | |
|--------------------------------|---|
| Switching on setup mode | How to switch on setup mode: <ul style="list-style-type: none"> ▷ Turn the illuminated selector switch (2) to the right (position 1). ✓ Setup mode is switched on. |
| Production speed | How to proceed at production speed: <ul style="list-style-type: none"> ▷ Press buttons (1) and (4) simultaneously. ✓ After a delay time, the machine runs at production speed. |
| Inching at 5 m/min: | How to move in inching mode: <ul style="list-style-type: none"> ▷ Remove the enabling grip switch (3) from the support. ▷ Keep the enabling grip switch (3) held down as shown in the illustration. ▷ Press the enabling grip switch until first lock-in position is reached. ▷ Press the button (6) with your thumb. ✓ After a delay time, the machine runs at 5 m/min. |

- Switching off set-up mode** How to switch set-up mode off:
- ▷ Turn the illuminated selector switch (2) to the left (position 0).
 - ✓ Set-up mode is switched off.

5.3.3 Creating production readiness

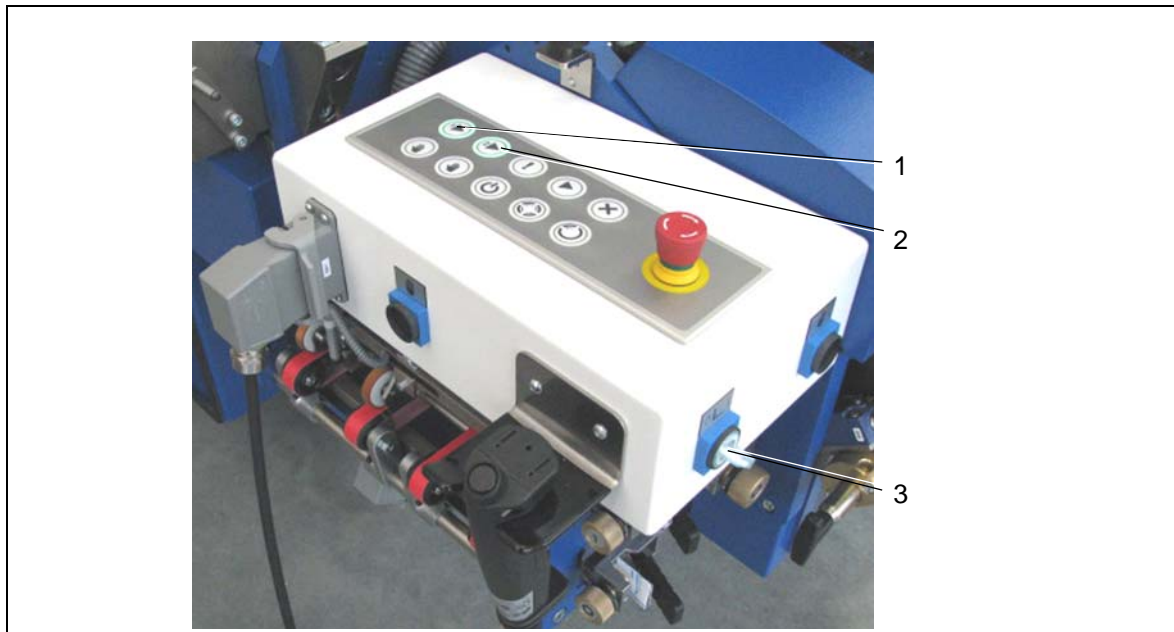


Figure 62: Creating production readiness

- How to get ready for production:
- 1) Turn the illuminated selector switch (3) to the left (position 0).
 - ▷ Press the <Folding knife 1 on/off> button (1).
 - The illuminated ring (1) is lit in green.
 - 2) Press the <Folding knife 2 on/off> button (2).
 - The illuminated ring (2) is lit in green.
 - ✓ The system is ready for production.

5.3.4 Machine control

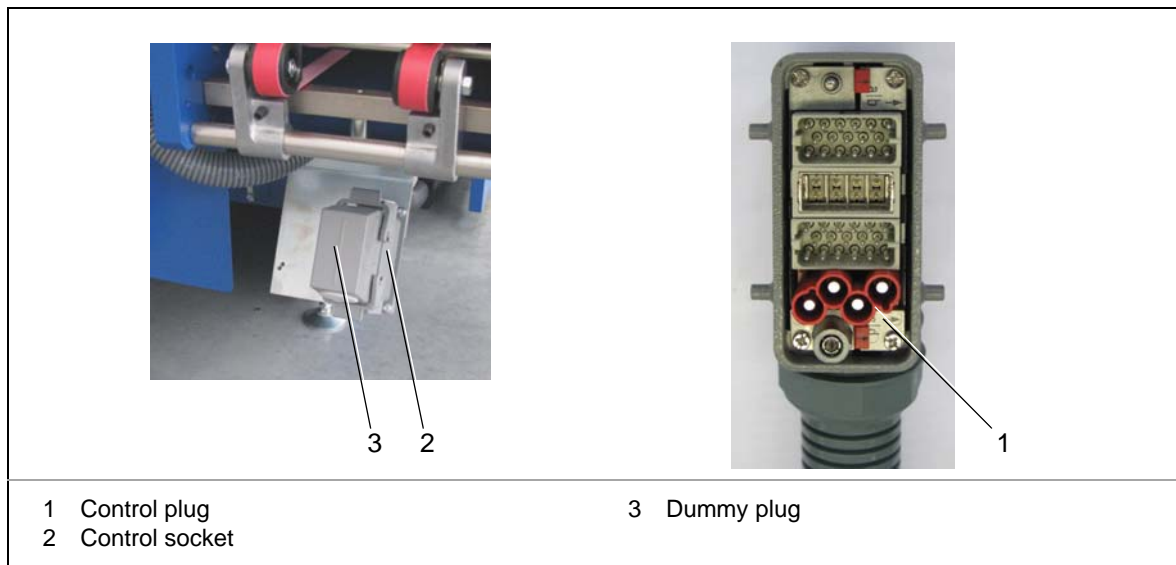


Figure 63: Electrical connection

Connecting subsequent folding units or deliveries

How to connect the subsequent units:

- ▷ Plug the control plug (1) of the subsequent folding unit or delivery into the control socket (2).
- ✓ The subsequent units are connected.

Working without subsequent folding unit or delivery

How to work without subsequent units:

- ▷ Plug the dummy plug (3) into the control socket (2).

5.3.5 Self-control

MBO units with M1 control are not prepared for the self-control operating mode.

In other words, the MBO units can only be operated in combination with folding unit I with M1 control.

5.3.6 Adapter box



WARNING!

Use of multiple adapter boxes in a machine combination.

Non-observance could result in serious injury or death.

For technical safety reasons, use a maximum of **one adapter box in a machine combination.**

It is possible to interconnect subsequent MBO units with different control systems to a machine combination. The relevant adapter boxes are required to do this.

Details of which adapter boxes can be used is available from MBO Service or from authorized customer services.



A risk assessment of the machine combination must be carried out by the operator and their results are summarized in an operating manual.

Heed the national laws and European directives about occupational safety and health of employees at work.

Germany

The requirements of the German Labor Protection Act (ArbSchG) and the German Health and Safety at Work Regulations (BetrSichV) must be adhered to.

EC countries

The requirements of the directives 89/391/EEC and 2009/104/EU must be adhered to.

6 Transport, interim storage

6.1 Introduction

For transport and interim storage of the machine, also observe:

- The qualification of transport personnel.
See chapter "6.1.1 Qualification of personnel".
- The safety messages.
See chapter "6.1.2 Safety messages".

6.1.1 Qualification of personnel

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

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

Table 32: Qualification of personnel; Transport, interim storage
Legend: X permitted, - not permitted

6.1.2 Safety messages

**WARNING!**

Crushing hazard during transport of the machine and machine parts.

Non-observance could result in serious injury or death.

- Transport may only be carried out by trained specialized personnel.
 - Only use approved lifting and transport equipment for transport (crane, fork lift, pallet truck, lifts, etc.)
 - Keep the transport paths and the loading and unloading areas free of personnel.
-

**WARNING!**

Use of unsuitable fork lifts.

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

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

**WARNING!**

Insufficient properties and condition of the underfloor.

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

- Check the properties and condition and load rating of the subsurface in the set-up location.
 - For necessary minimum requirements, please see the "Technical data" chapter.
-

**CAUTION!**

Incorrect storage.

Non-observance could result in property damage.

Observe the specified storage conditions.

6.2 Packaging

6.2.1 Machine

The machine is delivered as follows:

- On a transport pallet (Europe)
- In a shipping crate (overseas).

In addition, it is covered with plastic foil that is fastened to the transport pallet.

6.2.2 Feeder

The feeder is delivered as follows:

- On a transport pallet (Europe)
- In a shipping crate (overseas).

In addition, it is covered with plastic foil that is fastened to the transport pallet.

6.2.3 Buckle plates

The buckle plates are packaged in a separate shipping crate.

6.2.4 Control cabinet

If the control cabinet has been dismantled for transport, it is delivered on a separate transport pallet/transport case.

6.2.5 Pressure vacuum pump

The pressure vacuum pump is delivered with the noise damping hood on a separate transport pallet/transport crate.

6.2.6 Unpacking accessories/options

Standard accessories, tools, options, and documentation are packaged with the machine or accommodated in separate cartons or containers.

Procedure:

- ▷ Be sure to unpack these carefully.

6.2.7 Performing an incoming inspection

How to conduct an incoming inspection:

- ▷ When you receive the shipment, check the packaging right away for transport damage.
- ▷ Check the machine, feeder and accessories for transport damage.
- ▷ Check that the shipment is complete based on the delivery note.

- ✓ The incoming inspection has been carried out.

6.2.8 Reporting a damage situation

How to report a damage situation:

- ▷ Notify the transport company immediately of any damage.
- ▷ Contact your transport insurance carrier immediately.
- ▷ Safeguard the machine, feeder and accessories from further damage.
- ✓ A damage situation has been reported.

6.3 Transporting the machine

How to proceed to transport the machine:

Prerequisites These prerequisites must be fulfilled:

- Machine must be screwed to the shipping pallet.
- Use a suitable fork lift.

For requirements, see chapter "3.2.3 Shipping and transport data".

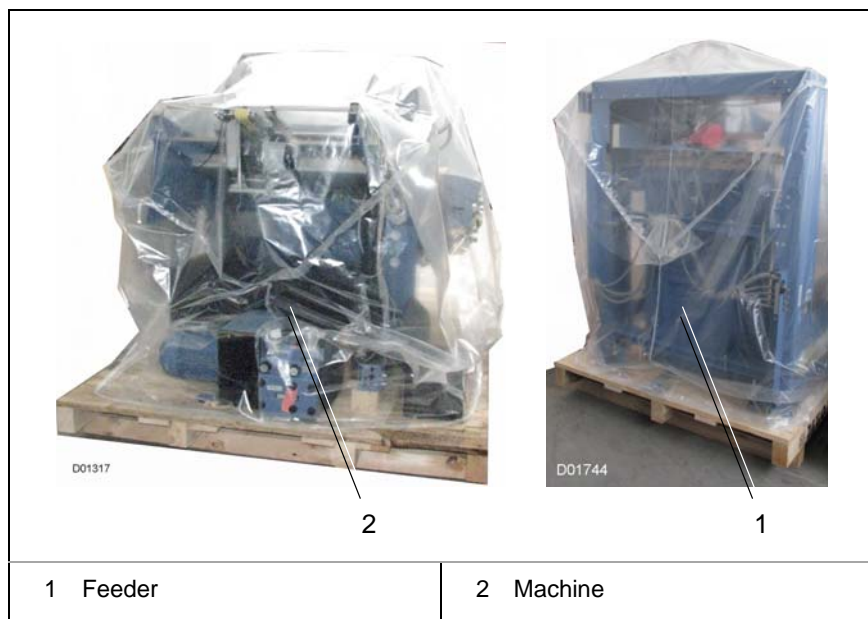


Figure 64: Transportation

Transporting the machine

How to transport the machine:

- ▷ Observe the safety messages.
- ▷ Only lift the transport pallet as high as absolutely necessary for the transport.
- ▷ Transport the transport pallet as close as possible to the intended location.
- ▷ Set the transport pallet down carefully.
- ▷ Machine is transported.

6.4 Interim storage of the machine

6.4.1 Outdoors

How to proceed to store the machine temporarily outdoors.

- Prerequisites** These prerequisites must be fulfilled:
- Machine must be screwed to the shipping pallet.
 - The packaging must be intact.
 - Storage time outdoors = maximum two weeks.

- Interim storage of the machine** How to store the machine outdoors:
- ▷ Observe the specified storage conditions.
 - ▷ Protect machine with a roof or suitable cover tarps against humidity.
 - ▷ As soon as condensate forms, store the machine in a storage room (danger of corrosion).
 - ▷ Loosen cover film from the transport pallet and lift it so that the air can circulate.
 - ✓ Machine is stored temporarily.

6.4.2 In a storage room

For storage conditions, see chapter "3.2.7 Ambient conditions"

7 Installation, commissioning

7.1 Introduction

To install/commission the machine, also observe:

- Qualification of personnel.
See chapter "7.1.1 Qualification of personnel".
- The safety messages.
See chapter "7.1.2 Safety messages".
- The protective devices.
See chapter "4.6.11 Checking protective devices".

7.1.1 Qualification of personnel

This table lists the necessary qualification of the personnel related to "Set up and commissioning" of the machine.

	Specially trained personnel	Instructed operating personnel	Instructed personnel with specialized training (mechanical/ electrical engineering)
Set-up	-	-	X
Electrical connections	-	-	X
Stationary mains connection	-	-	X
Commissioning	-	-	X

Table 33: Qualification of personnel; Set-up, commissioning
Legend: X permitted, - not permitted

7.1.2 Safety messages

**WARNING!****Hazardous voltage.****Non-observance could result in serious injury or death.**

- Only a electrically qualified person may perform work on the machine's electrical system.
 - Follow the local occupational safety regulations and electrotechnical regulations.
 - On the terminals of the main switch, there is hazardous voltage even when the main switch is switched off (see wiring diagram).
 - There is hazardous residual voltage on the connection terminals of the frequency inverter even when the main switch is switched off (heed capacitor discharge time).
-

**WARNING!****Crushing hazard during transport of the machine and machine parts.****Non-observance could result in serious injury or death.**

- Transport may only be carried out by trained specialized staff.
 - Only use approved lifting and transport equipment for transport (crane, fork lift, pallet truck, lifts, etc.)
 - Keep the transport paths and the loading and unloading areas free of personnel.
-

**WARNING!****Use of unsuitable fork lifts.****Non-observance could result in serious personal injury or property damage.**

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

**WARNING!****Insufficient properties and condition of the underfloor.****Non-observance could result in serious personal injury or property damage.**

Check the properties and condition and load rating of the subsurface in the set-up location.

For necessary minimum requirements, please see the "Technical data" chapter.

**WARNING!****Trip hazards due to cables and hoses lying around.****Non-observance could result in serious injury or death.**

Lay the machine connections (cables, hoses, pipes) so that there are no tripping points.

7.2 Setting up the machine

- The machine must be unpacked, assembled and installed at the installation site by specialized personnel.
 - Separate installation and commissioning instructions are required for this.
-



Only have the machine installed by MBO Service or by a customer service technician authorized by MBO.

7.3 Making the stationary mains connection

The electrical supply of the machine must be performed by a stationary mains connection.



The stationary mains connection may:

- in Germany this may only be done by an installation company that is registered in the installers' directory of the local power supply company
- in Europe, this must generally be done by a electrically qualified person.

This electrically qualified person must be familiar with the corresponding standards, especially EN IEC 60364, as well as the technical connection requirements of the local power supply company.

- in the USA, this must generally be carried out by a licensed electrician.

This licensed electrician must be familiar with the corresponding standards, especially NFPA 70, as well as the technical connection requirements of the local power supply company.

7.3.1 Safety messages



DANGER!

Hazardous voltage at the stationary mains connection.

Non-observance will result in serious injury or death.

- The stationary mains connection of the machine may only be made by an electrically qualified person.
- Follow the local occupational safety regulations and electrotechnical regulations.
- 400 V power supply. In case of a missing neutral conductor, electrical components, e.g. frequency inverters, can be destroyed.
- Due to the leakage currents of the controlled drives (frequency inverters), an equipotential bonding conductor must be connected.

7.3.2 Heed network prerequisites



CAUTION!

Incorrect supply voltage.

Non-observance could result in property damage.

- Verify that the specifications for mains voltage and frequency on the name plate match the supply network data.
- Connect the machine only if the mains voltage and frequency match.
- If the existing rated voltage deviates from the details on the name plate, wiring diagram, and "technical data" in the operating manual, an isolating transformer must be used.
You can get the necessary information from the manufacturer.



With regard to the stationary mains connection, make sure that:

- This may only be done in Germany by an installation company that is registered in the installers' directory of the local power supply company.
- In Europe, this must generally be done by an electrically qualified person.
This electrically qualified person must be familiar with the corresponding standards, especially EN IEC 60364, as well as the technical connection requirements of the local power supply company.
- In the USA, this must generally only be carried out by a licensed electrician.
This licensed electrician must be familiar with the corresponding standards, especially NFPA 70, as well as the technical connection requirements of the local power supply company.
- This may **not** be connected by an MBO technician or a customer service technician.
- For the electrical installation, EN 60204-1, Clause 6.3.3. "Protection through automatic switching off of the supply" is adhered to.
- The loop impedance and the suitability of the assigned overcurrent protection device are checked according to EN 60204-1, Clause 18.2.2.

- A TN-S power system or TN-C-S power system is mandatory as the power supply system.
- The voltage, frequency, network cross-section, and mains protection must match the details on the name plate, wiring diagram, and "Specifications" of the operating manual.
- Due to the leakage currents of the EMC filter, the mains connection must be 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 should have as small a grounding resistance as possible (optimal would be a value $< 2 \text{ Ohm}$), since with relatively high grounding resistance levels ($> 50 \text{ Ohm}$) the EMC filters hardly have any more filter effect.
- The N conductor is loaded (for 400 VAC power supply).
- A right rotating field is absolutely necessary.
- The machine sockets of the MBO machines may be used exclusively for the connection of MBO folding units, units, or deliveries.
- The 230 VAC sockets of the MBO machines may be used exclusively for connecting auxiliary devices intended for this purpose, such as gluing devices.
- All sockets (400 VAC and 230 VAC sockets) of the MBO machines must be monitored at all times according to the corresponding federal and local codes, guidelines and other regulations.

7.3.3 Observe the design of the stationary mains connection

Electrical power supply	Connecting line		
Nominal voltage 3 x 400 V + N + PE	Cable	Cross-section	PE conductor
Design according to DIN EN 60204-1, Clause 4.3.1	Five-pin copper cable (L1, L2, L3, N, PE): Single-conductor or multi-conductor with connector sleeves, make connection touch-proof, clockwise rotating field.	Design according to VDE 0100 Part 430 (IEC 60364-4-47)	Design according to VDE 0100 Part 540 (IEC 60364-5-54)
	Protective equipotential bonding¹⁾ (Second, additional PE conductor)		
		Cross-section	
		Design according to VDE 0100 Part 540 (IEC 60364-5-54) and EN 60204-1, Clause 8.2.8 Cross-section = 10 mm ² (Cu).	

Table 34: Design of the stationary mains connection

1) Prerequisite, see chapter "7.3.5 Connecting the protective equipotential bonding conductor".

7.3.4 Making the stationary mains connection on the main control cabinet



Figure 65: Stationary mains connection

How to connect the stationary mains connection:

- 1) Feed the mains connection through the cable grommet into the main control cabinet.
 - 2) Connect the power cable to the main switch (1) according to the wiring diagram.
- ✓ The stationary mains connection is complete.

7.3.5 Connecting the protective equipotential bonding conductor



CAUTION

Discharge currents greater than 10 mA.

Non-observance could result in property damage.

- Connect the protective equipotential bonding conductor to the PE terminals.
- Cross-section 10 mm² (Cu).



Figure 66: Protective - equipotential bonding conductor connection

The RFI filters of the frequency converters used generate a system-conditioned grounding leakage current.

Since this can be greater than 10 mA, according to EN 60204-1 Clause 8.2.8 a protective equipotential bonding conductor is necessary.

This should have a cross-section of 10 mm².

How to connect the protective equipotential bonding conductor:

- 1) Insert the protective equipotential bonding conductor into the main control cabinet through the cable grommet.
 - 2) Connect the protective equipotential bonding conductor to the PE connection terminal strip (1).
- ✓ The protective equipotential bonding conductor is connected.

7.3.6 Checking the protective conductor connections



WARNING!

Disconnected protective conductor connections.

Non-observance could result in serious injury or death.

Reconnect all protective conductor connections that were disconnected for transport.

Check that all protective conductor connections that were disconnected for transport are reconnected correctly.

Procedure:

- ▷ Check this by visual inspection.

7.4 Removing transport locks

7.4.1 On the threefold unit

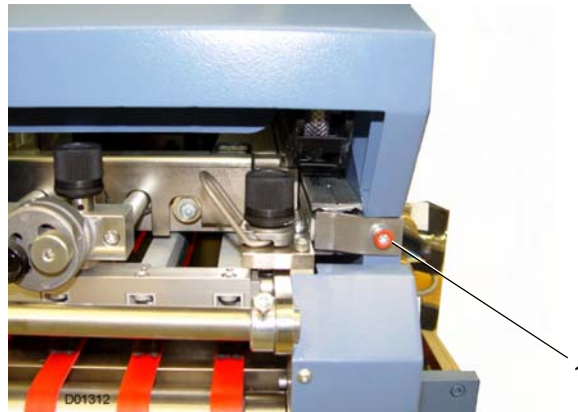


CAUTION!

Transport lock on the threefold unit.

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

- Always secure the threefold unit with the transport lock (1) before transport.
- Remove the transport lock (1) from the machine following setup.



1 Transport lock

Figure 67: Transport lock threefold carriage

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

How to remove the transport lock:

- 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 is removed.



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

7.4.2 Threefold, variant KTZ

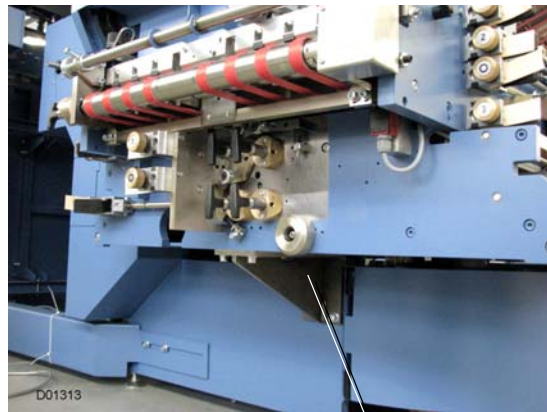


CAUTION!

Transport lock on the threefold (KTZ).

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

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



1 Transport lock

Figure 68: Transport lock combi part

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

How to remove the transport lock:

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



- Keep the transport lock for later use.
- Before every subsequent transport, secure the pivotable threefold using the transport lock (1).

7.5 Connecting the compressed air supply

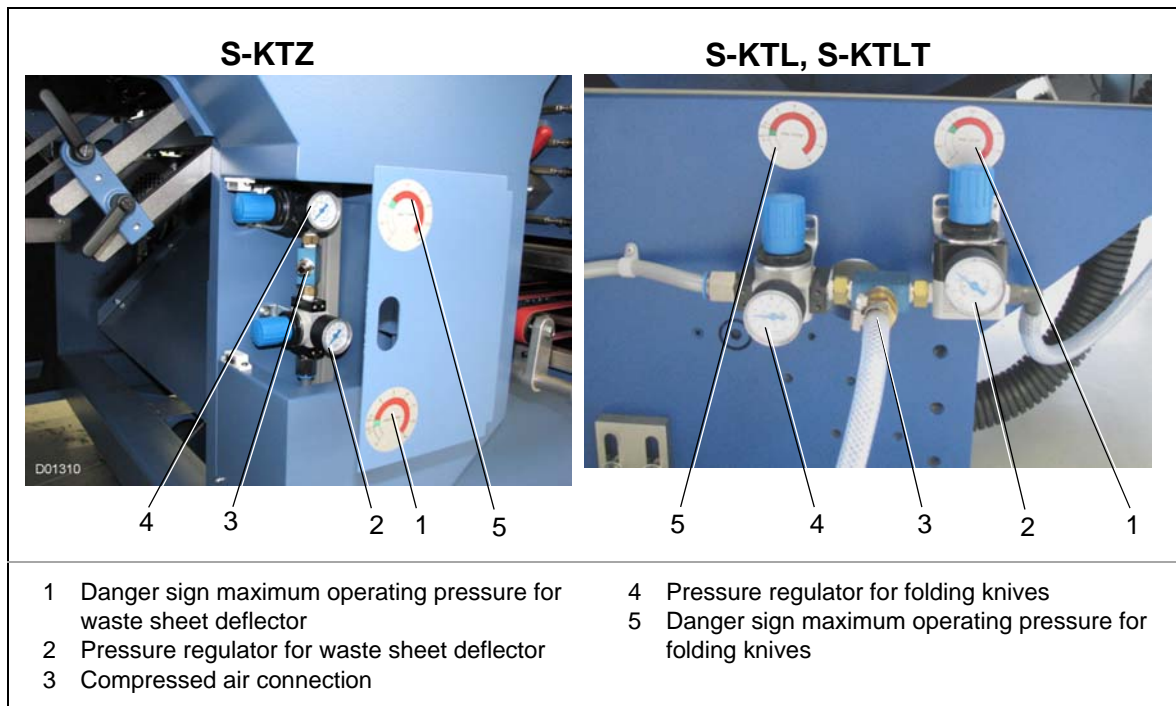


Figure 69: Connecting the compressed air supply

How to connect the compressed air supply:

- ▷ 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 "3.2.5 Compressed air supply, control air"
- ▷ On the pressure regulator (2), set the operating pressure for the waste sheet deflector to 3.5 bar.
- ▷ On the pressure regulator (4), set the operating pressure for the folding knives to 1.3 bar.
- ✓ The compressed air supply is connected.



CAUTION!

Excessive operating pressure.

Non-observance could result in serious property damage to the folding knives and on the waste sheet deflector.

It is essential to observe the specified operating pressures.



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

7.6 Commissioning

- After the mains connection, the machine must be commissioned.
- Separate installation and commissioning instructions are required for this.



Only have the machine commissioned by MBO Service or by a customer service technician authorized by MBO.

7.7 Conducting a final check of the protective devices

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

How to conduct a final check:

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

For this purpose, use the checklist for the protective devices.

See chapter "4.6.12 Checklists for protective devices".

7.8 Conducting an inspection after commissioning



20 operating hours after the commissioning, it is necessary to perform an inspection of all belts and tapes.

Proceed as follows to conduct the inspection after commissioning.

Prerequisites

These prerequisites must be fulfilled:

- The machine is ready for operation.

Carrying out an inspection

How to carry out an inspection:

- ▷ Check all tapes and belts to make sure they run centered and have the necessary tension.
- ▷ If required, readjust these.
See Maintenance chapter.
- ✓ The inspection has been carried out.

8 Operation and adjustment

8.1 Introduction

To adjust and operate the machine, heed also:

- Qualification of the operating personnel.
See chapter "8.1.1 Qualification of personnel".
- The safety messages.
See chapter "8.1.2 Safety messages".
- The intended use.
See chapter "2.1 Intended use".

8.1.1 Qualification of personnel

This table lists the necessary qualification of the personnel related to "Operation and setting work" of the machine.

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

Table 35: Qualification of personnel, operation and setting work
Legend: X permitted, - not permitted

8.1.2 Safety messages



WARNING!

**Dismantling, bridging or bypassing protective devices.
Non-observance could result in serious injury or death.**

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



WARNING!

**Self-acting lowering of the opened noise damping safety hood.
Non-observance could result in serious injury or death.**

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



WARNING!

**Automatic lowering of the open crossfold table.
Non-observance could result in serious injury or death.**

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



WARNING!

**Rotating machine parts.
Non-observance could result in serious injury or death.**

- Make sure you always tie back your hair and keep it protected.
- Remove your jewelry during operation and maintenance of the machine.
- Make sure of wearing only close fitting clothes while you operate or maintain the machine.



WARNING!

**Rotating machine parts.
Non-observance could result in serious injury or death.**

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

- That there are no other people on the machine.
- That the machine is in perfect condition.



WARNING!

Rotating machine parts with opened protective devices in set-up mode.

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

Non-observance could result in serious injury or death.

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

**WARNING!**

Pull back/remove the buckle plates/sheet deflectors when the machine is running.

The exposed, rotating fold rollers and slitter shafts make up hazardous entanglement zones.

Non-observance could result in serious injury or death.

- Never reach into the fold rollers and slitter shafts while the machine is running.
- All adjustment or testing/inspection work may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.
- Always have the adjustment or testing/inspection work carried out by one individual person only.
- There are also entanglement and crushing hazards when turning the machine with the safety handwheel!

**WARNING!**

Cutting hazard due to slitter shafts.

Non-observance could result in serious injury or death.



- Never reach into the slitter shafts while the machine is running.
- All work on the slitter shafts may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.
- Always wear cut-proof safety gloves and safety shoes when working on the slitter shafts.
- Work on the machine must always be performed by one person only.
- There is also a risk of injuries when turning the machine with the safety handwheel.
- Always hold the slitter shaft on the shaft and not on the tool.

**WARNING!**

Incorrect handling of the safety handwheels.

Non-observance could result in serious 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 hazard of being drawn in).

**WARNING!**

High noise pressure level.

Non-observance could result in hearing damage.



- Always wear ear protection when working on the machine.
- Always close the noise damping safety hoods whenever you work at or on the machine.



WARNING!

Unjamming of paper jams.

Paper jams can block the drive and it can start up again unexpectedly when the jam is cleared.

Non-observance could result in serious injury or death.

- Unjamming work may only be done on a machine that is switched off and secured against switching on again.
- When removing the paper jam, turn the machine using the safety handwheel only.
- Only start the machine again after completely removing the paper jam, since otherwise there can be property damage to drive belts, transport belts, fold rollers, etc.



CAUTION!

Danger when lifting heavy machine parts (buckle plates, slitter shafts, etc.)

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



To lift heavy machine parts such as buckle plates, slitter shafts, etc., request the help of another person or people.



CAUTION!

The deflection roller at the end of the register table is a hazardous entanglement zone.

Non-observance could result in personal injury.

Never reach into the register table while the machine is running.



CAUTION!

Incorrectly fixed buckle plates.

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

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

8.2 Operating the machine

8.2.1 Switching the main switch on/off

Proceed as follows to switch on/off the main switch.

Prerequisites These prerequisites must be fulfilled:

- The machine is connected to the mains supply.

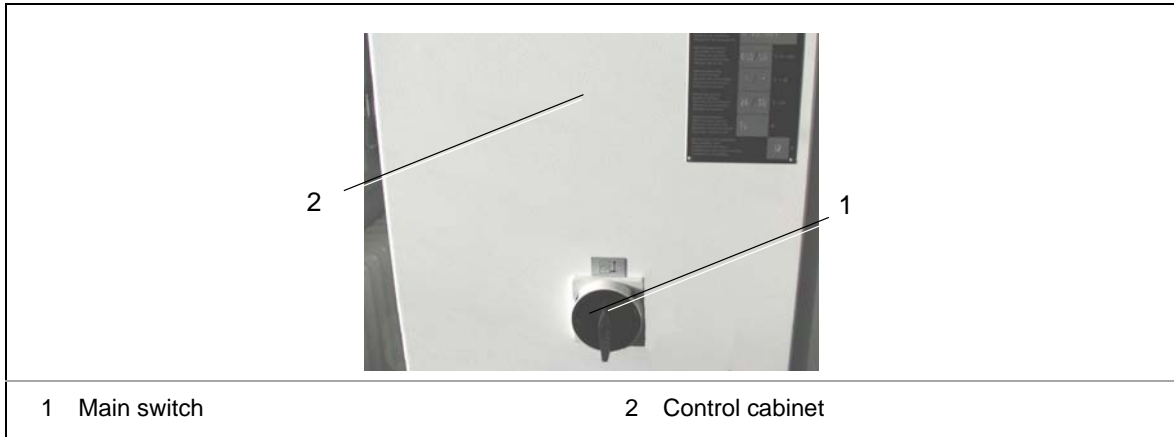


Figure 70: Switch the main switch on/off

- Switching on** How to switch the main switch on:
- ▷ Turn the main switch (1) to switch position 1.
The control system boots up.
 - ✓ The machine is switched on.
- Switching off** How to switch the main switch off:
- ▷ Turn the main switch (1) to switch position 0.
The display turns off.
 - ✓ The machine is turned off now.



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

8.2.2 EMERGENCY STOP palm button

Proceed as follows to activate the EMERGENCY STOP palm button.

Prerequisites These prerequisites must be fulfilled:

- There is a hazard to people.
- There is danger to the machine.

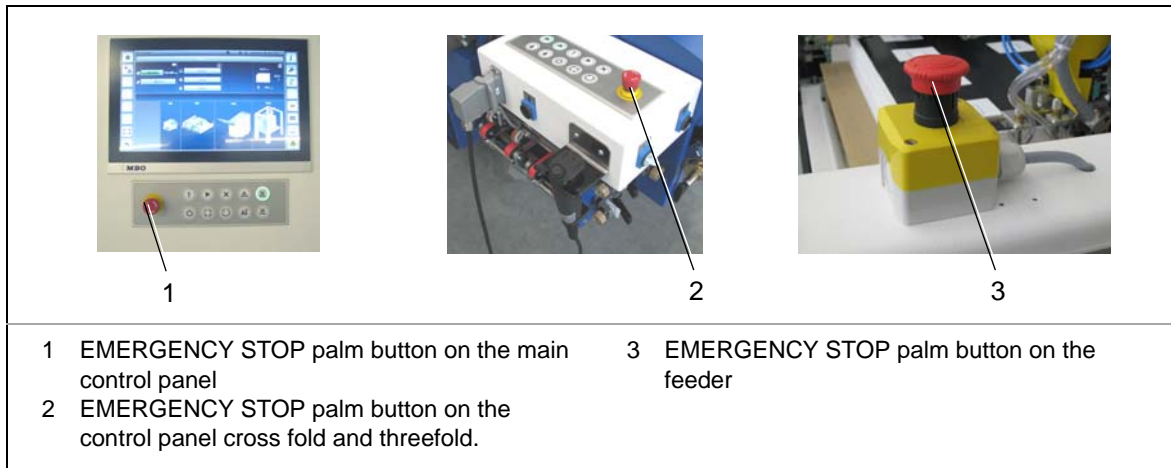


Figure 71: EMERGENCY STOP palm button



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.

Press the EMERGENCY STOP palm button

How to press the EMERGENCY STOP palm button:

- 1) Press the EMERGENCY STOP palm button (1).
 - 2) Eliminate the problem.
 - 3) Disengage the EMERGENCY STOP palm button (1) by turning it to 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!

8.2.3 Raising/lowering the pile plate



WARNING!

Moving the pile plate.

Non-observance could result in serious injury or death.

When moving the pile plate, ensure that:

- No persons are in the area of the feeder.
- There are no objects on or underneath pile plate.

Proceed as follows to lower/raise the pile plate.

Prerequisites These prerequisites must be fulfilled:

- The main switch is switched on.



Figure 72: Raising/lowering the pile plate

Lowering the pile plate

How to lower the pile plate:

- ▷ Press the button (2).
The illuminated ring (2) is flashing green.
The pile plate moves downwards and stops approx. 15 cm from the ground.
The illuminated ring is lit in green.
- ✓ The pile plate is lowered.

Lowering the pile plate to the ground:

- How to lower the pile plate to the ground:
(Pile plate is stationary at the 15 cm position).
- ▷ Press the button (2) until the pile plate reaches the floor.
The illuminated ring (2) is flashing green.
The pile plate is lowered to the ground.
The illuminated ring is lit in green.
 - ✓ The pile plate is lowered to the ground.

Raising the pile plate

How to raise the pile plate:

- ▷ Press the button (1).

The illuminated ring (2) is flashing green.

The pile plate moves upwards and stops approx. 5 cm underneath the suction belt.

The illuminated ring is lit in green.

The pile plate is raised.



- The pile movement can be stopped by pressing the corresponding illuminated button again.
 - The pile plate is stopped when it reaches the limit positions via limit switches.
-

8.2.4 Switching the Feeder Loading System (FLS) on/off

If the Feeder Loading System (FLS) is switched on, the feeder is stopped in an ergonomically appropriate feed position for lowering.

When a paper pile is placed onto the pallet, the pile plate moves downwards, following a delay time of a few seconds, by the thickness of the paper pile.

When the light barrier is cleared, the pile plate remains stationary once again.

More paper can then be placed into position.

Proceed as follows to switch the Feeder Loading System (FLS) on/off.

Prerequisites These prerequisites must be fulfilled:

- The feeder is loaded manually.
 - There must be a pallet on the pile plate.
-



CAUTION!

Crushing hazard.

The light barrier opening represents a danger spot.

Non-observance could result in personal injury.

Never reach into the light barrier opening.

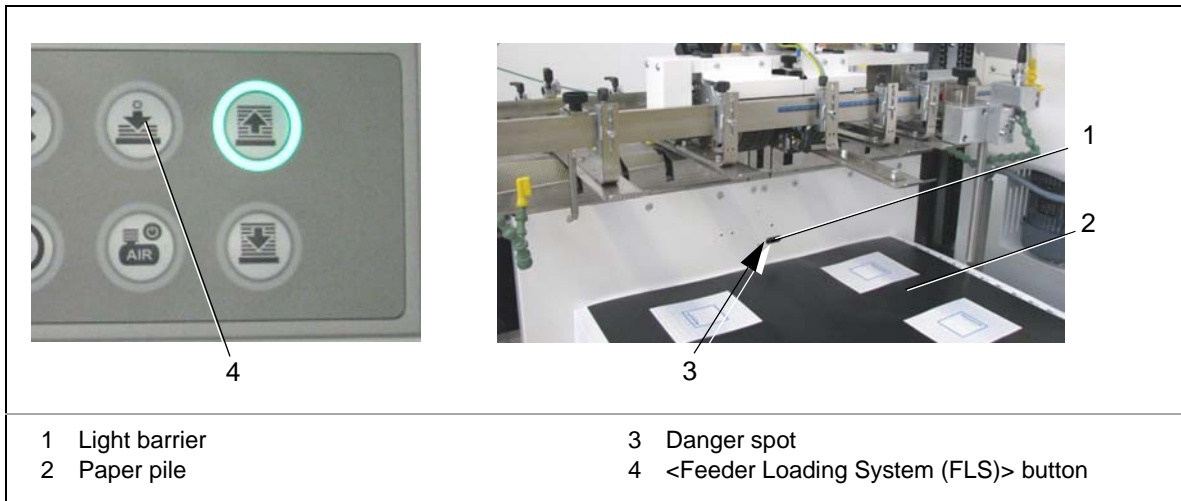


Figure 73: Switching the Feeder Loading System on/off

Switching on FLS

How to switch on the FLS:

- ▷ Press the <Feeder Loading System on/off> button (4).
The illuminated ring is lit in green.
- ✓ The FLS is switched on.

Switching off the FLS

How to switch off the FLS:

- ▷ Press the <Feeder Loading System on/off> button (4) again.
The illuminated ring is not lit.
- ✓ The FLS is switched off.



Ventilate the paper pile before feeding in as this will ensure improved separation of the sheets away from the paper pile.

8.2.5 Switching the air supply on/off

The blast and suction air supply is provided by a pressure vacuum pump. Proceed as follows to switch the air supply on/off.

Prerequisites These prerequisites must be fulfilled:

- The main switch is switched on.

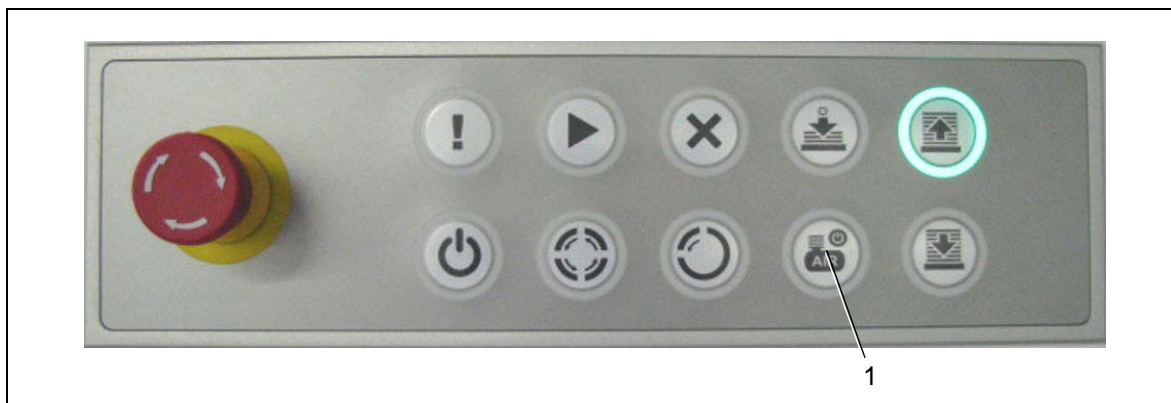


Figure 74: Switching the air supply on/off

Switch on air supply How to switch the air supply on:

- ▷ Press the button (1).
- The illuminated ring is lit in green.
- ✓ The air supply is switched on.

Switching off the air supply How to switch the air supply off:

- ▷ Press the button (1) again.
- The illuminated ring is not lit.
- ✓ The air supply is switched off.



- How to set the full blast air volume to adjust the feeder:
- Stop the machine.
- How to switch the air supply on:
- Request a single sheet.

8.2.6 Starting/stopping the machine

Prerequisites These prerequisites must be fulfilled:

- The main switch is switched on.

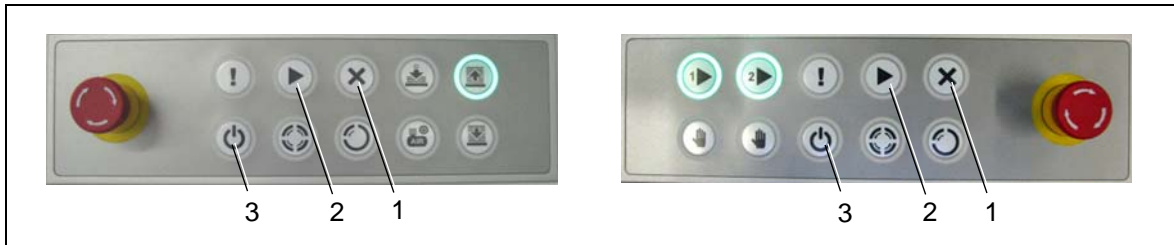


Figure 75: Starting/stopping the machine

Starting the machine How to start the machine:

- ▷ Press the <Machine start> button (2).
The illuminated ring (2) is lit in green.
- ✓ The machine starts.

Stopping the machine with <Immediate stop> How to stop the machine using an <Immediate stop>:

- ▷ Press the <Immediate machine stop> button (1).
The illuminated ring (2) is not lit.
- ✓ The machine stops immediately.

Stopping the machine with <Soft stop> How to stop the machine using a <Soft stop>:

- ▷ Press the <Machine soft stop> button (3).
The illuminated ring (2) is not lit.
- ✓ The machine is run empty and then stopped.



With a soft stop during production:

- The sheet infeed is stopped.
- The machine is run empty.
- The machine is stopped.

8.2.7 Starting/stopping the sheet infeed

- Prerequisites** These prerequisites must be fulfilled:
- The main switch is switched on.
 - The machine is started.

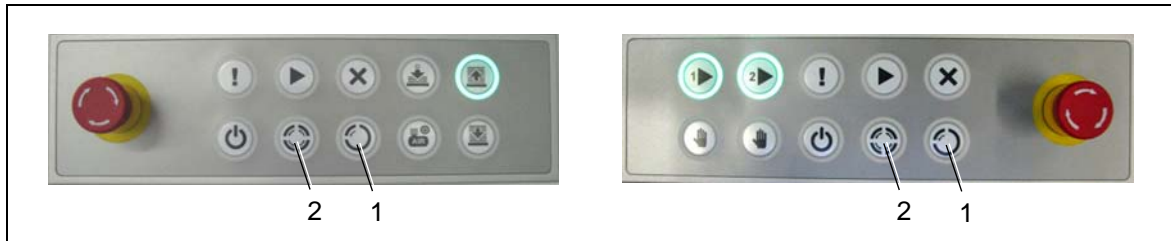


Figure 76: Starting/stopping the sheet infeed

- To call up single sheets** How to request a single sheet:
- ▷ Press the <Sheet feed, single sheet> button (1).
The illuminated ring (1) is lit in green.
 - ✓ A single sheet is fed.

- Starting production** How to start production:
- ▷ Press the <Sheet feed, production> button (2).
The illuminated ring (2) is lit in green.
 - ✓ Sheets are fed continuously.

- Stopping production** How to stop production:
- ▷ Press the <Sheet feed, production> button (2) again.
The illuminated ring (2) is not lit.
 - ✓ The sheet infeed is stopped.



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

8.3 Brief instructions for adjusting the machine

The machine is adjusted in these work steps.

- Operate the machine.
See chapter "8.2 Operating the machine"
- Set folding imposition.
See chapter "8.4.7.2 Quick Mode".
- Delete counter data.
See chapter "8.4.3 Beginning a new job".
- Adjust counter.
See chapter "8.4.3 Beginning a new job".
- Adjust the feeder.
See chapter "8.6.5 Adjusting for the sheet format"
- Adjust the register table.
See chapter "8.6.5 Adjusting for the sheet format".
- Change the sheet infeed data if necessary.
See chapter "8.4.11 Changing the infeed data".
- Adjusting the fold rollers/slitter shafts.
See chapter "8.7.1 Adjusting the roller pressure (standard)".
- Adjusting the buckle plates.
See chapter "8.7.3 Buckle plate positions".
- Placing the knives on the slitter shafts.
See chapter "8.7.10 Installing/dismounting slitter shafts".
- Paying attention to error messages.
See chapter "8.5 Setting the feeder".
- Remove the paper jam.
See chapter "8.13 Removing the paper jam".

8.4 Adjusting the M1 control

8.4.1 Activate "Setup" machine



The prerequisite for the adjustment of the folding machine is that the machine control is put into the state "Setup" machine.

- All sheet infeed data is deleted here.
- Note required data in advance.

For "Setup" machine, the following data are calculated automatically:

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

This new calculated data can be changed manually afterwards, see chapter "8.4.11 Changing the infeed data".

Activate "Setup" manually

Activate "Setup" machine manually, see chapter "8.4.10 "Setup" machine, manual activation".

Activate "Setup" automatically

"Setup" machine is activated automatically when:

- A new job is started, see chapter "8.4.3 Beginning a new job".
- A new folding imposition is selected, see chapter "8.4.7 Selecting a folding imposition".
- A job is activated in the job management (see separate DATAMANAGER operating manual).



"Setup" machine is finished automatically after the first sheet passes through all photoelectric sensors of the fully adjusted machinery.

8.4.2 Main page structure

The main page has the following functions:

- Current display of the machine's most important data.
- Branching to the most important pages for the operator.

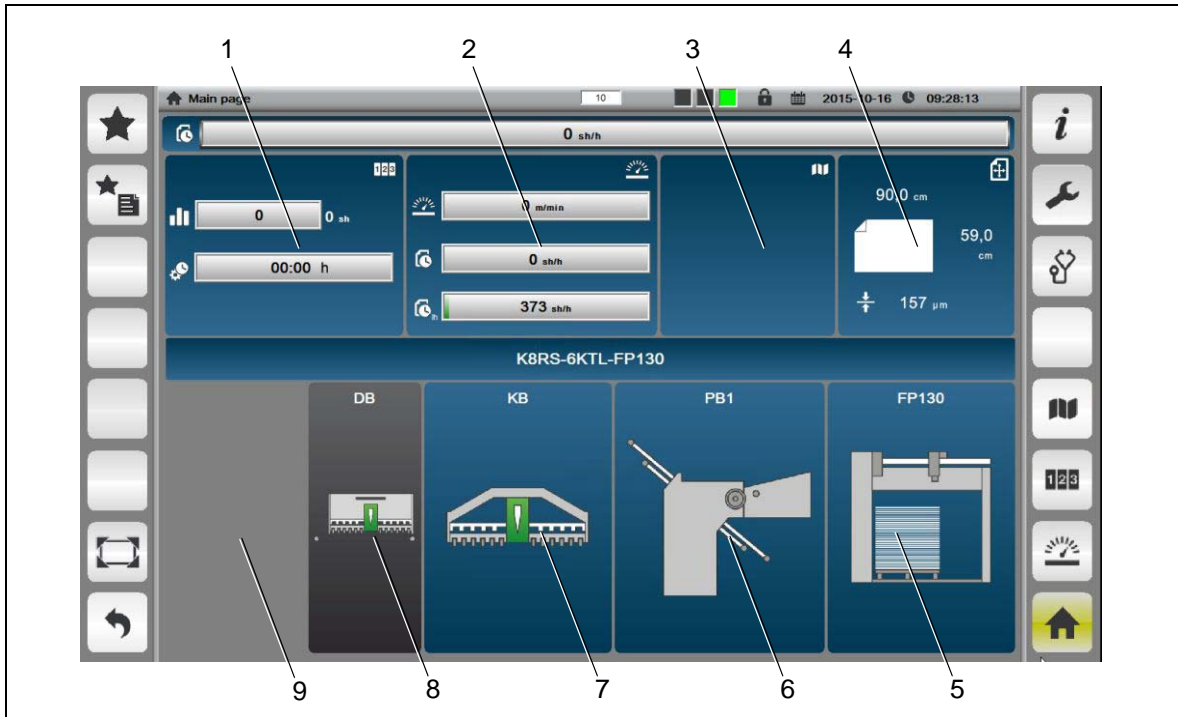


Figure 77: Main page structure

- 1 **<Counter> display field.**
Displays the current counter data.
Tapping the display field activates the <Counter> page.
See chapter "8.4.6 Making the counter settings".
- 2 **<Speed> display field.**
Displays the current speed data.
Tapping the display field activates the <Infeed data> page.
See chapter "8.4.11 Changing the infeed data".
- 3 **<Folding imposition> display field.**
Tapping the display field activates the <Folding imposition> page.
See chapter "8.4.7 Selecting a folding imposition".
- 4 **<Infeed data> display field.**
Displays the current infeed data.
Tapping the display field activates the <Infeed data> page.
See chapter "8.4.11 Changing the infeed data".
- 5 **<FP130> feeder display field.**
Tapping the display field activates the <FP130 settings> page.
See chapter "8.4.12 <FP130 settings> page".
- 6 **<PB1> parallel fold display field.**
Tapping the display field activates the <PB1 settings> page.
See chapter "8.4.13 <PB1 settings> page".
- 7 **<KB> crossfold display field.**
Tapping the display field activates the <KB settings> page.
See chapter "8.4.14 <KB settings> page".
- 8 **<DB> threefold display field.**

Tapping the display field activates the <DB settings> page.
See chapter "8.4.15 <DB settings> page".

9 Not assigned

8.4.3 Beginning a new job



A job change means that:

- The job- and signature counters are deleted.
- The shift counter is retained.
- The machine adjustment data is retained.
- "Setup" machine is activated automatically.



Figure 78: Beginning a new job

Beginning a new job

How to proceed to begin a new job:

- 1) Press the <Counter> function key (1).
The <Counter> page (2) is displayed.
 - 2) Press the <Delete job> function key (4).
The <Reset job counter> selection window is displayed.
 - 3) Press the <Apply> button.
- ✓ The counter readings of the job (3) and the signature are deleted.

8.4.4 Beginning a new signature



Figure 79: Beginning a new signature

The counter readings of the current signature are displayed in the fields (3).

Deleting counter readings

Proceed as follows to delete the counter readings of the signature:

- 1) Press the <Counter> function key (1).
The <Counter> page (2) is displayed.
- 2) Press the <Delete signature> function key (4).
The <Reset signature counter> selection window is displayed.
- 3) Press the <Apply> button.
✓ The counter readings of the signature (3) are deleted.



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

8.4.5 Beginning a new shift

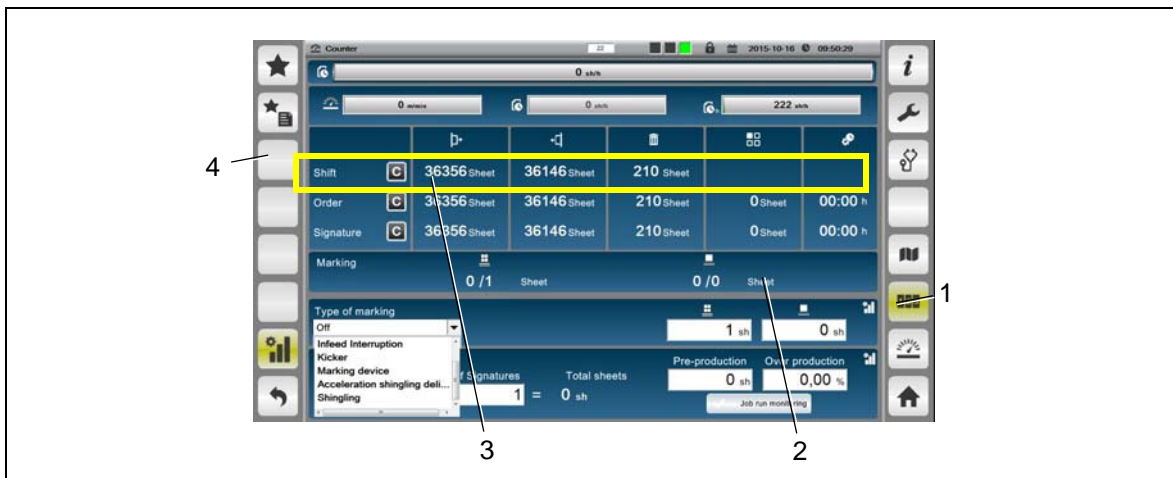


Figure 80: Beginning a new shift

The counter readings from the current shift are displayed in the fields (3).

Deleting counters

Proceed as follows to delete the counter readings of the shift:

- 1) Press the <Counter> function key (1).
The <Counter> page (2) is displayed.
 - 2) Press the <Delete shift> function key (4).
The <Reset shift counter?> selection window is displayed.
 - 3) Press the <Apply> button.
- ✓ The counter readings of the shift (3) are deleted.



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

8.4.6 Making the counter settings

8.4.6.1 Making the marking settings

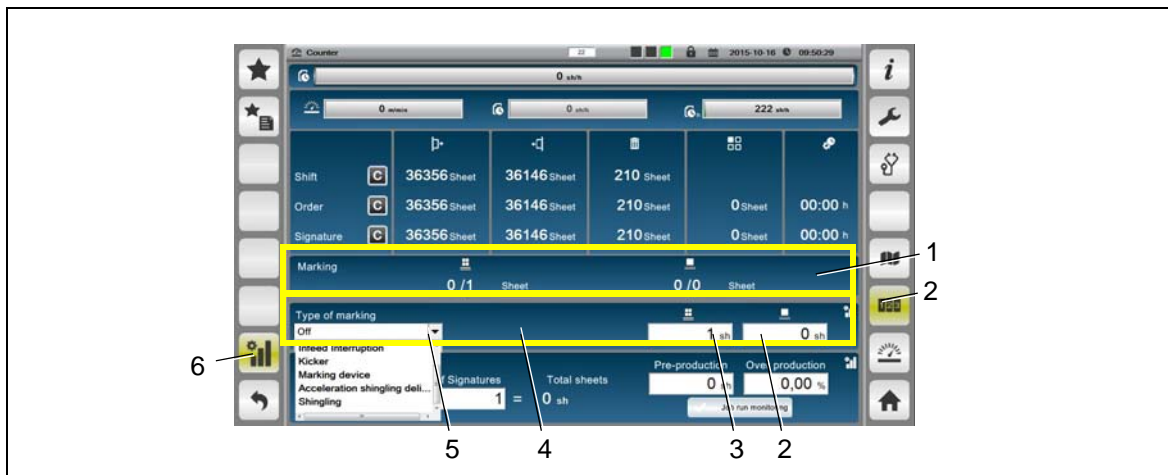


Figure 81: Making the marking settings

- Open <Counter> page** How to open the <Counter> page:
- ▷ Press the <Counter> function key (2).
 - ✓ The <Counter> page is opened.
- Open <Marking settings> page** How to open the <Marking settings> page.
- ▷ Press the <Marking settings> function key (6).
 - ✓ The <Marking settings> page is opened.
- Display current marking readings** The current marking readings are displayed in the (1) display field.
- <Marking type>** How to select the <Marking type>:
- ▷ Press the <Marking type> selection button (5).
 - A selection list with the possible marking types opens.
 - ▷ Select the desired marking type.
 - The selection list is closed.
 - ✓ The selection button (5) displays the selected marking type.
- <Marking distance>** How to enter the <Marking distance> (with suction wheel interruption only):
- ▷ Press the input field (4).
 - A numeric input keyboard appears.
 - ▷ Enter the value for the required marking distance.
 - ✓ The <Marking distance> is displayed in the input field (4).
- <Sheets per batch>** How to enter the <Sheets per batch> number:
- ▷ Press the input field (3).
 - A numeric input keyboard appears.
 - ▷ Enter the desired number here.
 - ✓ The <Sheets per batch> number is displayed in the input field (3).

- <Batches per box>** How to enter the <Batches per box> number:
- ▷ Press the input field (2).
 - A numeric input keyboard appears.
 - ▷ Enter the desired number here.
 - ✓ The <Batches per box> number is displayed in the input field (2).

8.4.6.2 Making the print run settings

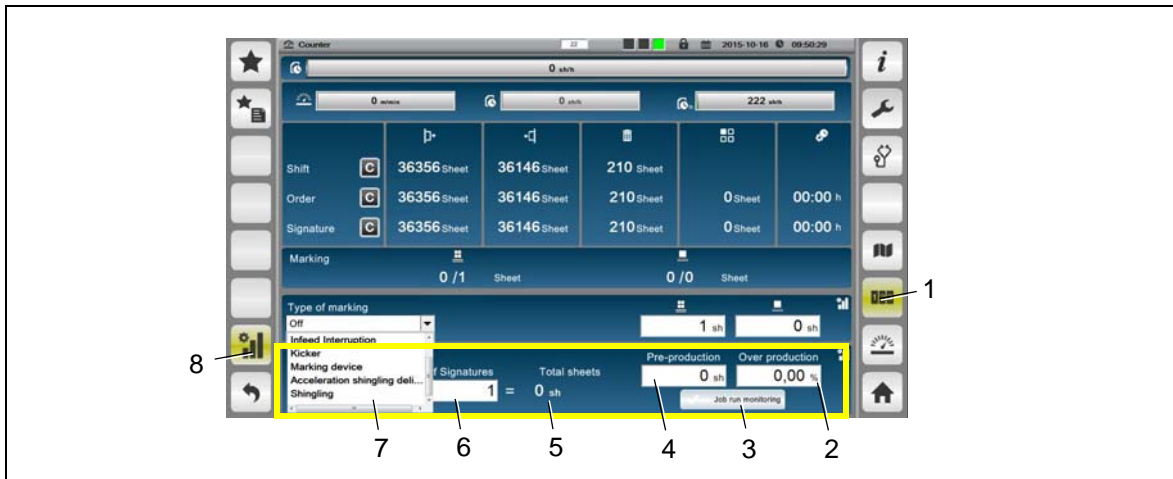


Figure 82: Making the print run settings

- Open <Counter> page** How to open the <Counter> page:
- ▷ Press the <Counter> function key (1).
 - ✓ The <Counter> page is opened.
- Open <Marking settings> page** How to open the <Marking settings> page.
- ▷ Press the <Marking settings> function key (8).
 - ✓ The <Marking settings> page is opened.
- <Length of print run>** How to enter the <Length of print run>:
- ▷ Press the input field (7).
 - A numeric input keyboard appears.
 - ▷ Enter the required length of print run.
 - ✓ The length of print run is displayed in the input field (7).
- <Number of signatures>** How to enter the <Number of signatures>:
- ▷ Press the input field (6).
 - A numeric input keyboard appears.
 - ▷ Enter the number of signatures.
 - ✓ The <Number of signatures> is displayed in the input field (6).
- <Pre-print run>** How to enter the <Pre-print run>:
- ▷ Press the input field (4).
 - A numeric input keyboard appears.
 - ▷ Enter the number of <Pre-print run>.
 - ✓ The <Pre-print run> is displayed in the input field (4).

- <Over quantity>** How to enter the <Over quantity>:
- ▷ Press the input field (2).
A numeric input keyboard appears.
 - ▷ Enter the number of <Over quantity>.
 - ✓ The <Over quantity> is displayed in the input field (2).

- Switch on <Print run monitoring>** How to switch on the <Print run monitoring>:
- ▷ Press the <Print run monitoring> button (3).
A blue OK mark appears in the button.
 - ✓ The <Print run monitoring> is switched on.

8.4.7 Selecting a folding imposition

There are three ways to select a new folding imposition as given below:

- Folding imposition selection via <Quick Mode> page
See chapter "8.4.7.2 Quick Mode"
- Folding imposition selection via <Expert Mode> page
See chapter "8.4.7.3 Expert mode"
- Folding imposition selection via <Folding imposition memory> page
See chapter "8.4.7.4 Folding imposition memory"

In addition, the sheet to be folded must be measured.

The following measurements should be taken:

- Sheet length
- Sheet width
- Paper thickness
See chapter "8.4.7.1 Measuring the paper thickness"

8.4.7.1 Measuring the paper thickness



Figure 83: Measuring paper thickness

The paper thickness is measured using the attached micrometer.

How to measure the paper thickness:

- ▷ Clamp 10 sheets of the paper to be processed using the knurled screw (1).
- ▷ Divide the value displayed by ten.
The result is the individual paper thickness (in this case 113).
- ✓ The paper thickness is measured.

8.4.7.2 Quick Mode

The <Quick Mode folding imposition> page can be used to select set folding impositions based on the corresponding machine configuration.

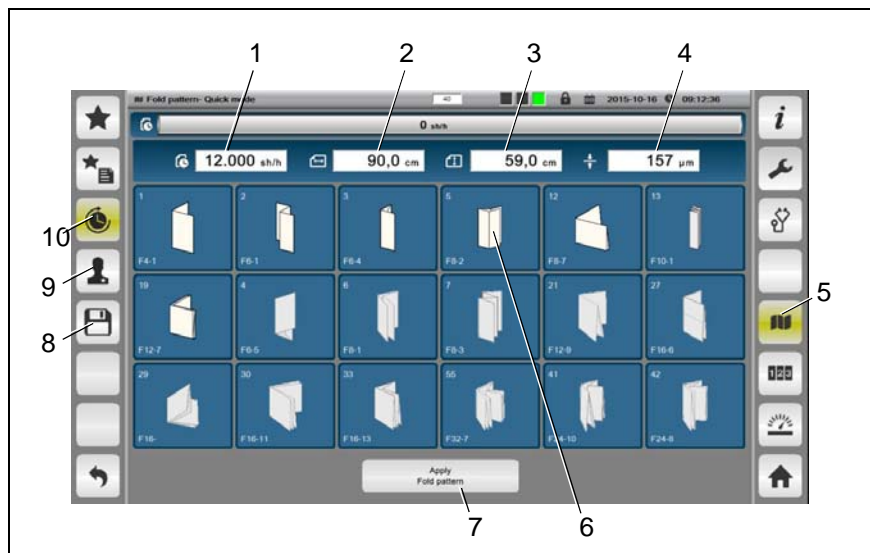


Figure 84: <Quick Mode> page

- 1 <Production speed> input field
- 2 <Sheet length> input field
- 3 <Sheet width> input field
- 4 <Paper thickness> input field
- 5 <Folding imposition> function key
- 6 <Folding imposition> selection fields
- 7 <Folding imposition transfer> button
- 8 <Folding imposition memory> function key
- 9 <Expert mode folding imposition> function key
- 10 <Quick mode folding imposition> function key

Open page How to open the <Quick mode folding imposition> page.

- ▷ Press the <Folding imposition> function key (5).
- ✓ The <Quick mode folding imposition> page is opened.

Entering the sheet data How to enter the sheet data:

- ▷ Enter the required sheet production speed in the input field (1).
- ▷ Enter the measured sheet length in the input field (2).
- ▷ Enter the measured sheet width in the input field (3).
- ▷ Enter the measured paper thickness in the input field (4).
- ✓ The sheet data is entered.

Select new folding imposition How to select a new folding imposition.

- 1) Tap on the required folding imposition (6).
- 2) Press the <Folding imposition transfer> button (7).

The <PB1 buckle fold> page is displayed.

See chapter "8.4.13 <PB1 settings> page"

- ✓ A new folding imposition is selected.

8.4.7.3 Expert mode

The <Expert mode folding imposition> page can be used to compile individual folding impositions based on the corresponding machine configuration.

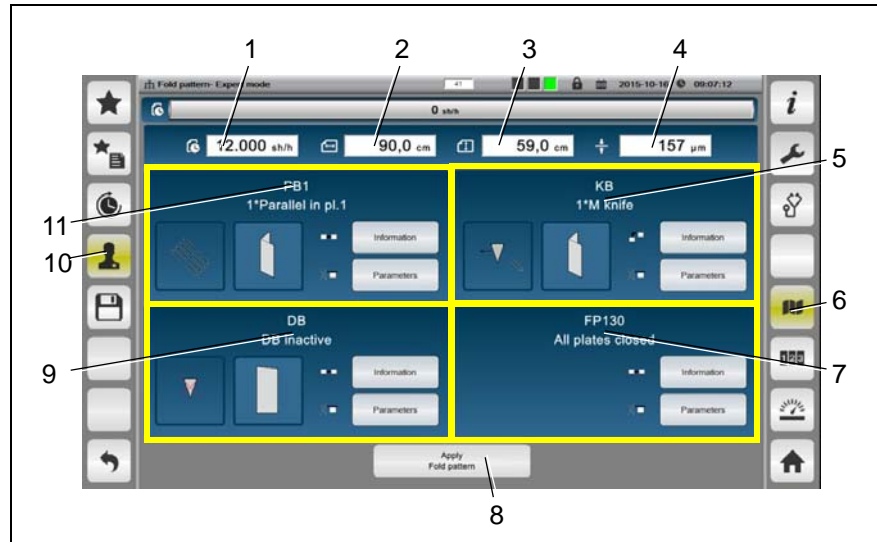


Figure 85: <Expert mode folding imposition> page

- 1 <Production speed> input field
- 2 <Sheet length> input field
- 3 <Sheet width> input field
- 4 <Paper thickness> input field
- 5 <KB crossfold folding imposition> selection field
- 6 <Folding imposition> function key
- 7 <Feeder> selection field
- 8 <Accept>button
- 9 <DB threefold folding imposition> selection field
- 10 <Folding imposition memory> function key
- 11 <PB parallel fold folding imposition> selection field

- Open page** How to open the <Expert mode folding imposition> page.
- ▷ Press the <Folding imposition> function key (6).
The <Quick mode folding imposition> page is opened.
 - ▷ Press the <Expert Mode> function key (10).
 - ✓ The <Expert mode folding imposition> page is opened.

- Entering the sheet data** How to enter the sheet data:
- ▷ Enter the required sheet production speed in the input field (1).
 - ▷ Enter the measured sheet length in the input field (2).
 - ▷ Enter the measured sheet width in the input field (3).
 - ▷ Enter the measured paper thickness in the input field (4).
 - ✓ The sheet data is entered.

Select new folding imposition

The <Expert mode folding imposition> page can be used to select relevant folding impositions for the parallel fold, crossfold and threefold.

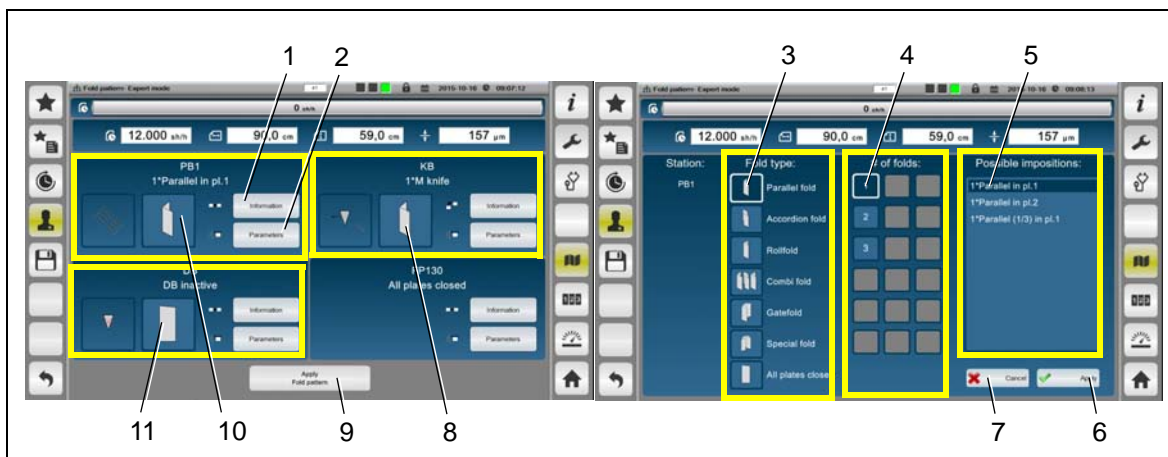


Figure 86: Expert mode

Open <PB1 folding imposition> page

How to open the <PB1 folding imposition> page:
 ▷ Press the <Folding imposition> button (10) in the selection field.
 ✓ The <PB1 folding imposition> page is opened.

Open <KB folding imposition> page

How to open the <KB folding imposition> page:
 ▷ Press the <Folding imposition> button (8) in the <KB> selection field.
 ✓ The <KB folding imposition> page is opened.

Open <DB folding imposition> page

How to open the <DB folding imposition> page:
 ▷ Press the <Folding imposition> button (11) in the <DB> selection field.
 ✓ The <DB folding imposition> page is opened.

Selecting a folding imposition

How to select a folding imposition:
 ▷ Select a folding type (3).
 ▷ Select the number of folds (4).
 ▷ Select a folding imposition (5).
 ▷ Press the <Cancel> button (7) to cancel the process.
 ▷ Press the <Apply> button (6) to apply the selection.

The <PB1 buckle fold> page is displayed.
 See chapter "8.4.13 <PB1 settings> page"

✓ A folding imposition is selected.

Information (1)

The <Information> page displays the settings of the buckle plates, the fold rollers and the sidelays of the selected station.
 See two pages on.

Parameter (2)

Additional settings can be made on the <Parameter> page. See next page.

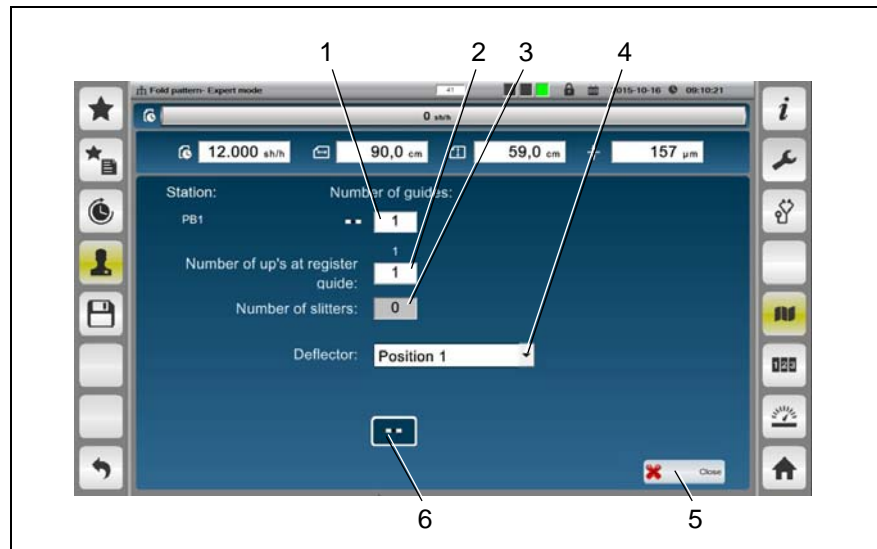
<Parameter> page


Figure 87: <PB1 parallel fold parameters> page

On the <Parameter> page, you can make the following settings:

**Display/
specification of the
sheet running (6)**

With some folding impositions and suitable units, the sheet running/direction can be changed.

- 90° at right angles (default)
- In line with folding unit I

**Number of sidelays
(1)**

Enter the <Number of sidelays> for the current unit.

Multiple job factor (2)

Enter the <Multiple job factor per sidelay>.

Number of knives (3)

The number of knives required is displayed.

**Alternating
deflector (4)**

Select the basic position of the alternating deflector.

Close (5)

Close the page with this button.



Entering the <Number of sidelays> and <Multiple job factor per sidelay> affects the speed, the sheet monitoring and the counter data.

<Information> page

The <Information> page displays the settings of the buckle plates, the fold rollers and the sidelay of the selected station.

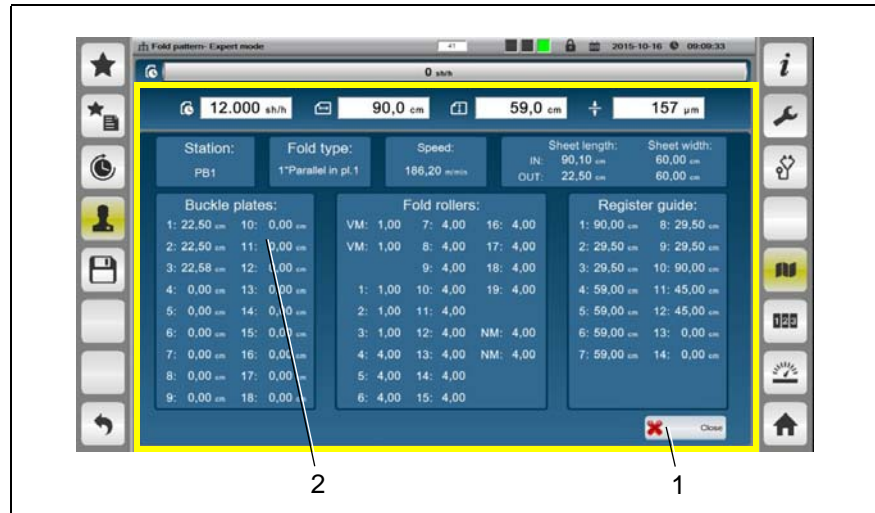


Figure 88: <Information> page



Use these values as adjustment tool for a machine without automation.

8.4.7.4 Folding imposition memory

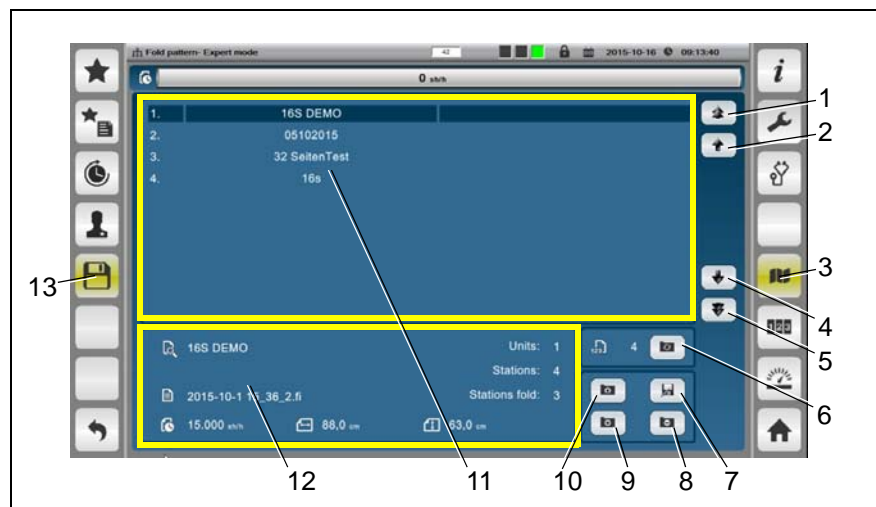


Figure 89: <Folding imposition memory> page

Open page How to open the <Folding imposition memory> page.

- ▷ Press the <Folding imposition> function key (3).
The <Quick mode folding imposition> page is opened.
- ▷ Press the <Folding imposition memory> function key (13).
- ✓ The <Folding imposition memory> page (11) is opened.

On the <Folding imposition memory> page, you can carry out the following settings:

- Load (10)** The folding imposition selected in the selection window (11) is loaded as the current folding imposition.
- Save (9)** The current folding imposition is saved in the folding imposition memory.
- Overwrite (7)** The folding imposition selected in the selection window (11) is overwritten with the current folding imposition data.
- Delete (8)** The folding imposition selected in the selection window (11) is deleted from the folding imposition memory.
- Update list (6)** The folding impositions displayed in the selection window (11) are updated. The number to the left of the button (6) displays the number of saved folding impositions.

Saving a folding imposition

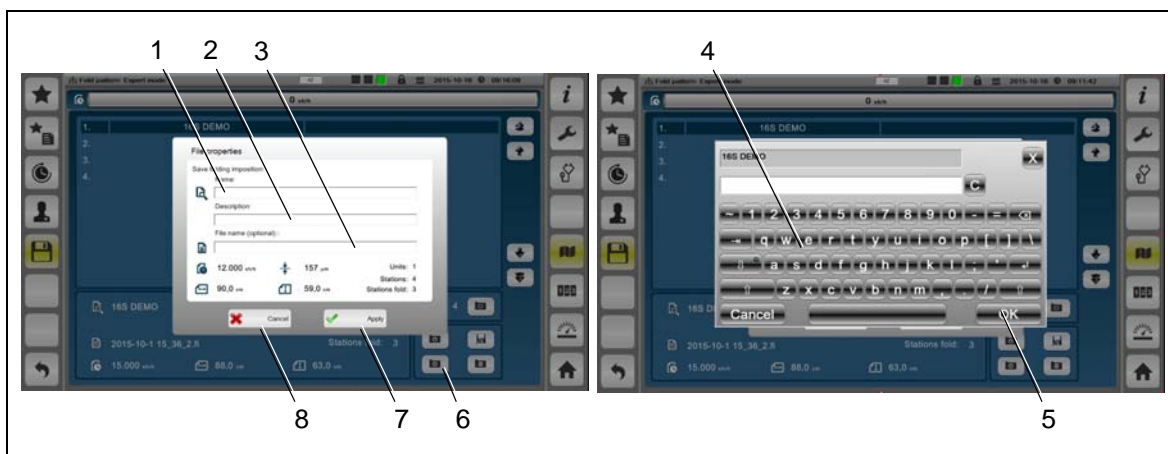


Figure 90: Saving a folding imposition

In the menu <Save folding imposition>, the texts for the name (1) of the folding imposition, the description (2) and the file name (3) can be selected as desired.



- <Name> (1).
If no name is entered, the file name is entered automatically.
- <Description> (2).
The input is optional.
- <File name> (3).
If no file name is entered, the current date and time are entered automatically.
Entering a filename is recommended for better orientation when storing the folding imposition.

How to save a folding imposition:

- ▷ Press the desired input field to make an entry.
An alphanumeric keyboard is displayed.
- ▷ Enter the required text.
Confirm the input with the <OK> button (5).
- ▷ Follow the same procedure to enter the texts for the additional fields.
- ▷ Press the <Apply> button (7) to finish the process of saving the folding imposition.
- ▷ Press the <Cancel> button (5) to cancel the <Save folding imposition> process.
- ✓ A folding imposition is saved.



Proceed as follows to overwrite the folding imposition.

8.4.8 Start buckle plate positioning

After selecting a new folding imposition or changing a calculated setting value, for safety reasons the positioning of the buckle plates must be started manually.



CAUTION!

Crushing hazard during automated format change.

Non-observance could result in minor or moderate injury.

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 on the machine.

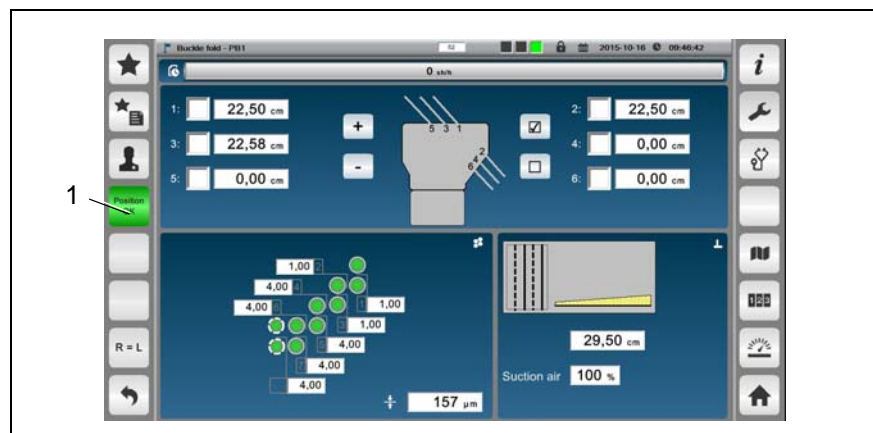


Figure 91: Start positioning

Start positioning

How to start positioning:

- ▷ Press the blue flashing button (1).
- ✓ The buckle plate stops are positioned.



Meaning of the different colors of the button (1):

- The button flashes blue and is marked <Start>. The positioning can be started.
- The button is red and says <Stop>. The positioning can be canceled.
- The button is green and says <Position OK>. The positioning is complete.

8.4.9 Positioning of the fold rollers

After selecting a new folding imposition or changing a calculated setting value, the positioning of the fold rollers is carried out automatically when the machine is started.

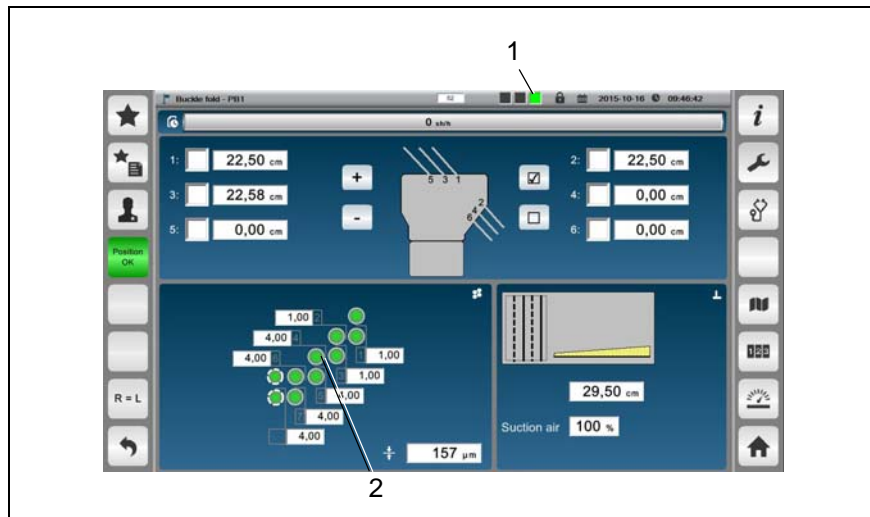


Figure 92: Positioning of the fold rollers

How to start positioning:

- ▷ Start the machine by pressing the <Start> button.
The positioning is carried out.
The color of the fold rollers changes from yellow to blue.
The positioning is complete when all fold rollers (2) are green.
- ✓ The fold rollers are positioned.



All fold rollers that:

- are not in the target position, are yellow.
- are currently being positioned, are blue.
- are at the target position, are green.



The positioning of the fold rollers can take several minutes.
Only start production if the display for the machine status (1) is green.

8.4.10 "Setup" machine, manual activation

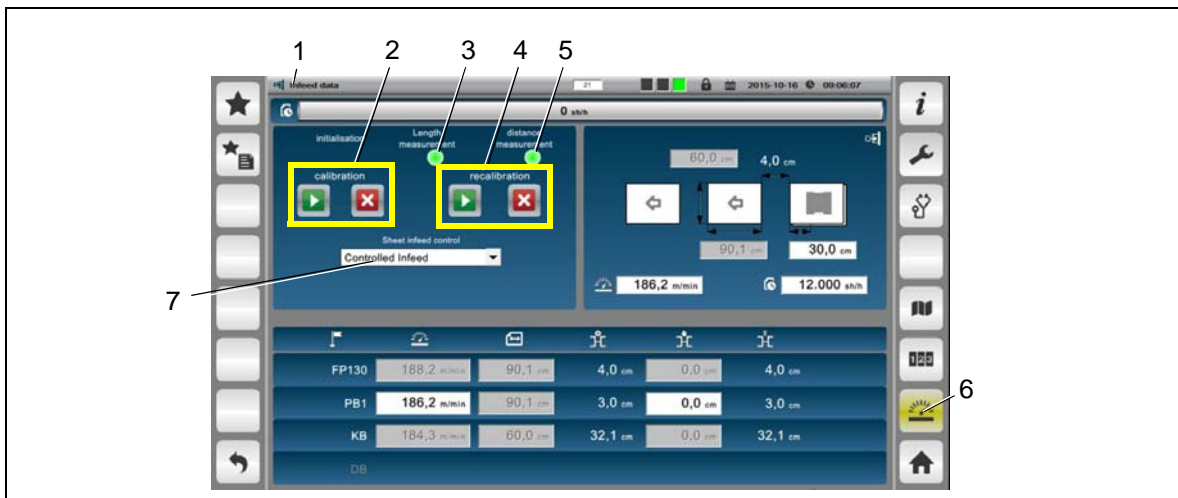


Figure 93: <Setup> machine



- After selecting <New job> or <New folding imposition>, <Setup> is active automatically.
- <Setup> and <Re-start setup> can also be activated manually.

Open page How to open the <Infeed data> page.
 ▷ Press the <Settings> function key (6).
 ✓ The <Infeed data> page is opened.

Switch on <Setup> (2) With <Setup> (2), the following parameters are re-calculated and optimized:

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

These new calculated parameters can be changed manually.
 (See chapter "8.4.11 Changing the infeed data").

Switch on <Re-start setup> (4)

- <Re-start setup> (4) is executed automatically with a speed change of 20 % or over.
- With <Re-start setup> (4) only the values for the sheet monitoring are recalculated.

Manually-changed parameters are retained.

8.4.11 Changing the infeed data

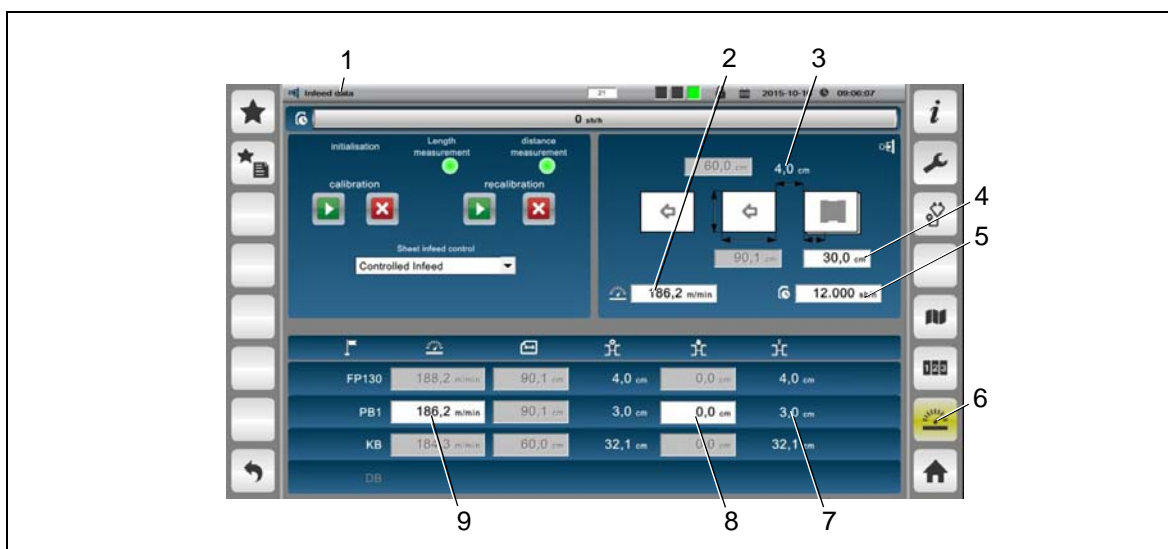


Figure 94: Changing the infeed data

- Open page** How to open the <Setup> page.
- ▷ Press the <Settings> function key (6).
 - ✓ The <Infeed data> page is opened.

How to change the infeed data.

- 1) Change the suction length in the input field (4).
 - 2) Change the sheet gap in the input field (8).
 - 3) Change the sheet production speed in the input field (5).
 - 4) Change the parallel fold speed in the input field (2).
- ✓ The input data is changed.

- Sheet gap (8)**
- 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 production speed is reduced.

Actual sheet gap (7) Display of the current sheet gap.
It results from the basis sheet gap, e.g.: 3 cm and the sheet gap.

- Sheet production speed (5)**
- Displays the specified or calculated sheet production speed per hour.
 - Can be increased and decreased.
This causes a change to the speed of the machine combination.

- Suction length (4)**
- Automatically calculated with <Setup> (approx. 1/3 of the sheet length).
 - Can be increased and decreased.

- Speed (2 + 9)**
- Displays the current speed of the machine.
 - Can only be increased.

The sheet gap is increased.
The sheet production speed is not changed.



- An increase in speed has no effect on the output. It only increases the sheet gap.
 - Please note that after a calibration speeds can be increased but not reduced.
-

8.4.12 <FP130 settings> page

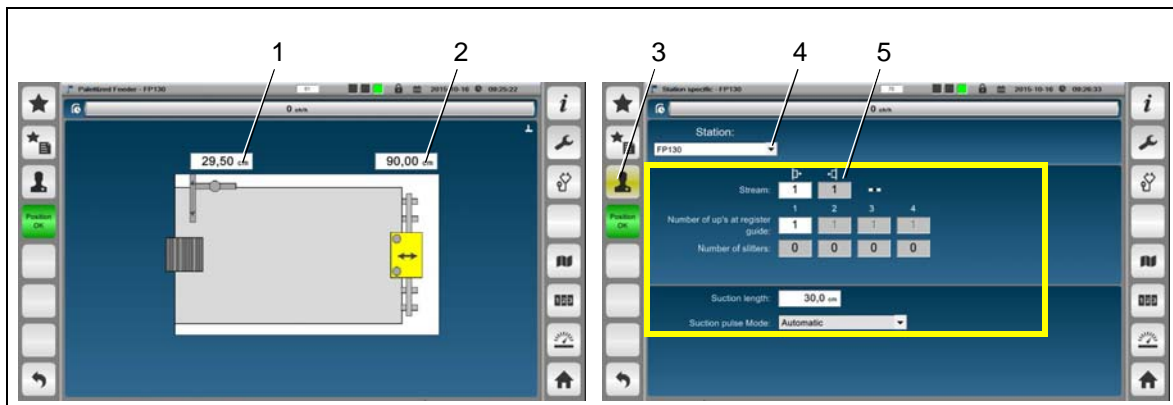


Figure 95: <FP130 settings> page

- 1 <Right-hand pile stop position> input field
- 2 <Feeder head position> input field
- 3 <Additional settings page> function key
- 4 <Station> selection button
- 5 <Additional settings> input fields

8.4.13 <PB1 settings> page

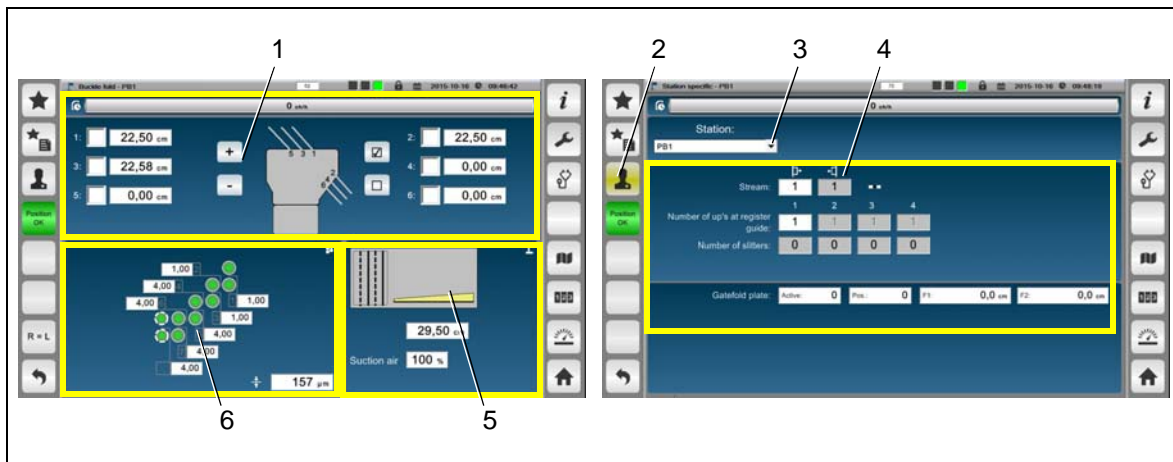


Figure 96: <PB1 settings> page

- 1 <Buckle plates> input field
- 2 <Additional settings page> function key
- 3 <Station> selection button
- 4 <Additional settings> input fields
- 5 <Register table> input field
- 6 <Fold rollers> input field

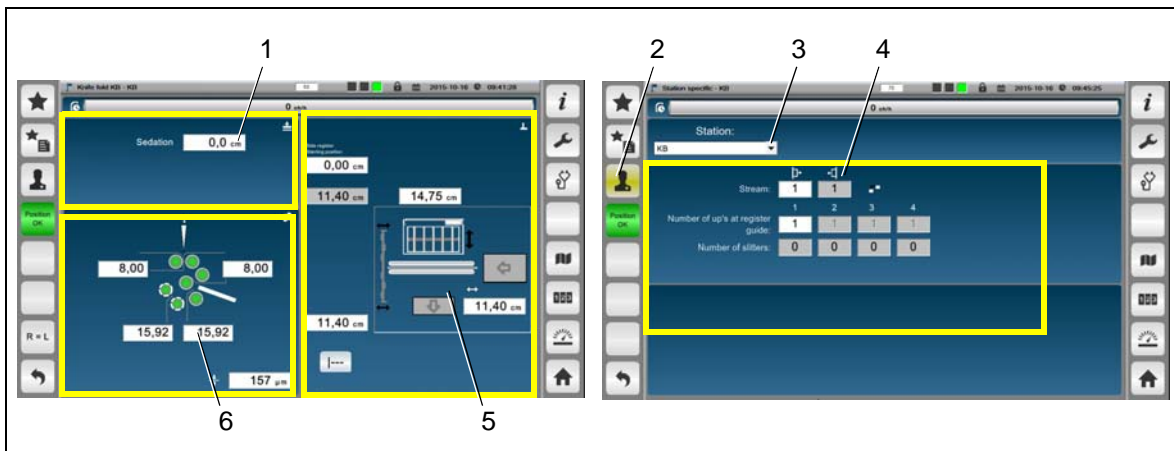
8.4.14 <KB settings> page


Figure 97: <KB settings> page

- 1 <Steadying distance> input field
- 2 <Additional settings page> function key
- 3 <Station> selection button
- 4 <Additional settings> input fields
- 5 <Cross fold knife and KTL plate> input field
- 6 <Fold rollers> input field

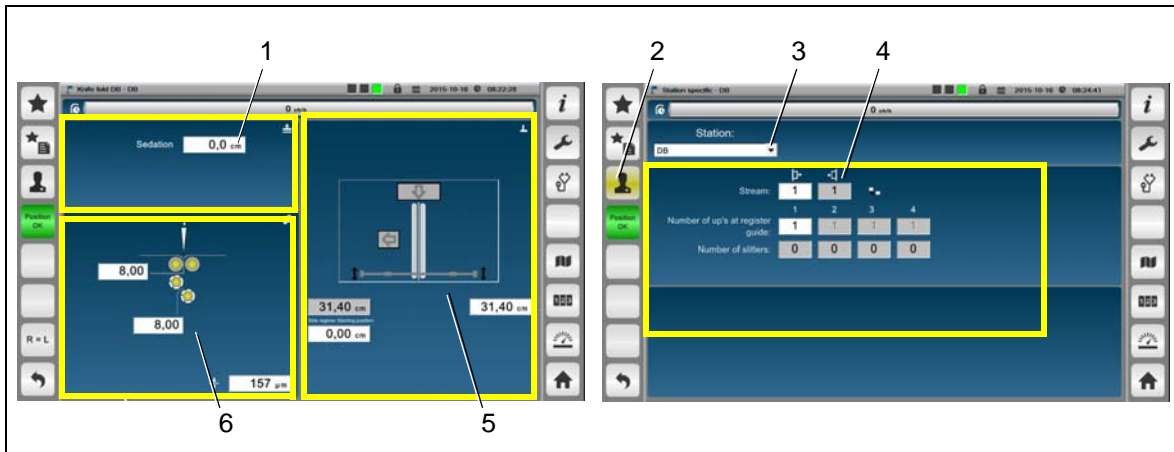
8.4.15 <DB settings> page


Figure 98: <DB settings> page

- 1 <Steadying distance> input field
- 2 <Additional settings page> function key
- 3 <Station> selection button
- 4 <Additional settings> input fields
- 5 <Threefold knife> input field
- 6 <Fold rollers> input field

8.5 Setting the feeder

8.5.1 Pivoting the feeder head upwards



CAUTION!

Crushing hazard when pivoting the feeder head.

Non-observance could result in minor or moderate injury.

- Before pivoting the feeder head, ensure that it is securely clamped onto the feeder head arm with the clamping lever.
- Always pivot the feeder head up to the top limit position.
- Always use both hands for pivoting.

Proceed as follows to pivot the feeder head upwards.

Prerequisites These prerequisites must be fulfilled:

- The feeder is loaded with a new pallet at the maximum loading height.
- Feeder head is securely clamped onto the feeder arm.

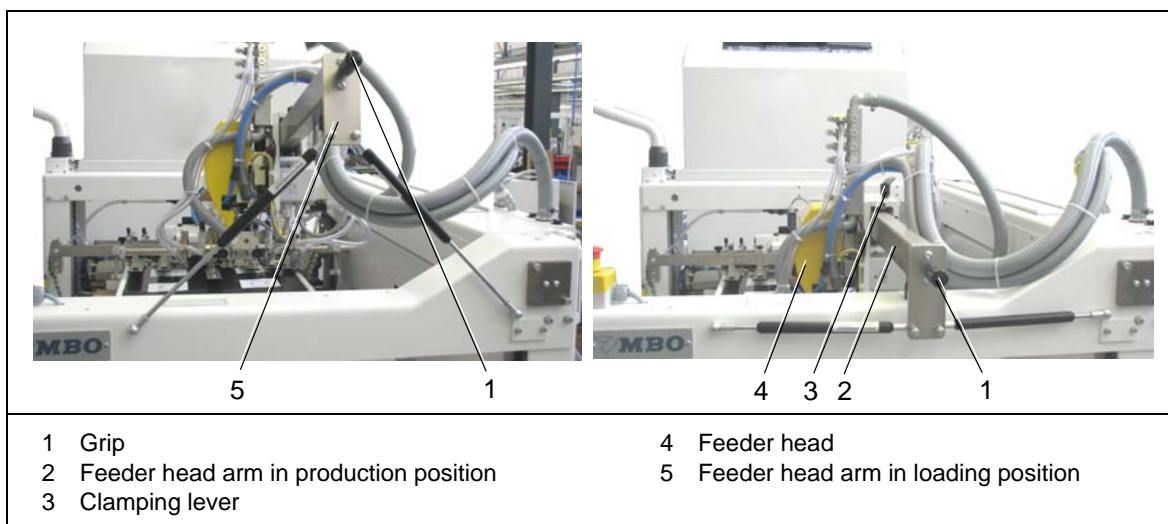


Figure 99: Pivot the feeder head

Pivoting the feeder head upwards

How to pivot the feeder head upwards:

- ▷ Check that the feeder head (4) is securely clamped to the feeder head arm (2) with the clamping lever (3).
- ▷ Use the handle (1) to pivot the feeder head (4) up to the top limit position.
The feeder head moves to its top position.
- ✓ The feeder head is moved upwards.

Lowering the feeder head

After inserting the pallet into the feeder, the feeder head must be lowered again.

How to lower the feeder head:

- ▷ Use the handle (1) to pull the feeder head (6) down to the bottom limit position.

- ✓ The feeder head is lowered.

8.5.2 Set the right-hand pile stop

8.5.2.1 Manual

The laser pointer is used for approximate positioning of the paper pile when changing pallets.

The stopper rod is used to position the paper pile for production.

Proceed as follows to set the right-hand pile stop.

Prerequisites These prerequisites must be fulfilled:

- The feeder is loaded with a new sheet format.
- There is no pallet on the pile plate.
- The pile plate is lowered onto the ground.

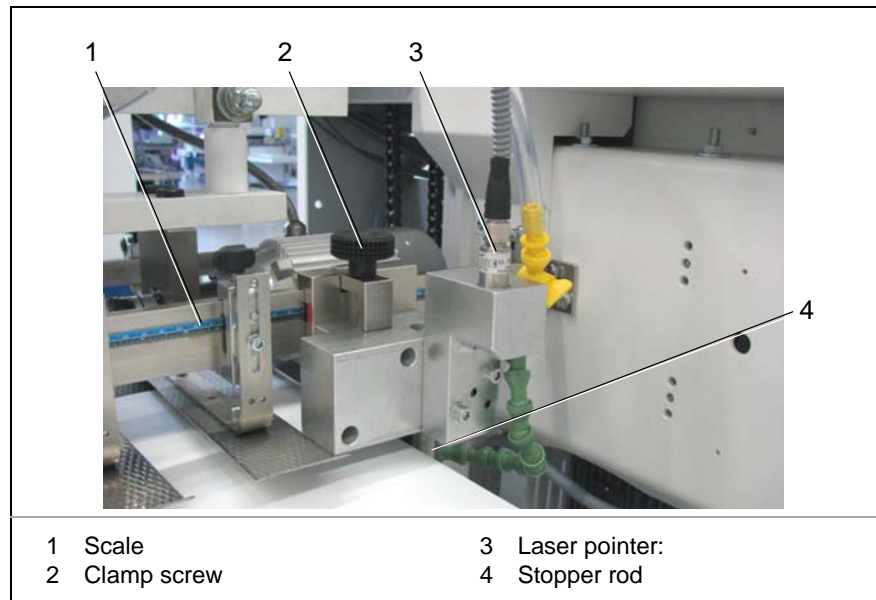


Figure 100: Right-hand pile stop

Proceed as follows to set the right-hand pile stop:

- ▷ Unfasten the clamp screw (2).
- ▷ Set the pile stop (3) to half the sheet width using the scale (1).
- ▷ Re-tighten the clamp screw (2).
- ✓ The right-hand pile stop is set.

8.5.2.2 Motorized



The motorized setting of the right-hand pile stop is carried out when calculating a new folding imposition. See operating manual for the folding machine.

The laser pointer is used for approximate positioning of the paper pile when changing pallets.

The stopper rod is used to position the paper pile for production.

The right-hand pile stop is set automatically.

Prerequisites These prerequisites must be fulfilled:

- A new folding imposition is calculated.
- The setting value is changed manually.

Motorized positioning After a new folding imposition is calculated:

- the right-hand pile stop is moved to the calculated position via motor.
- the Vaculift RS feeder head is moved to the calculated position.

Displaying the calculated adjustment values

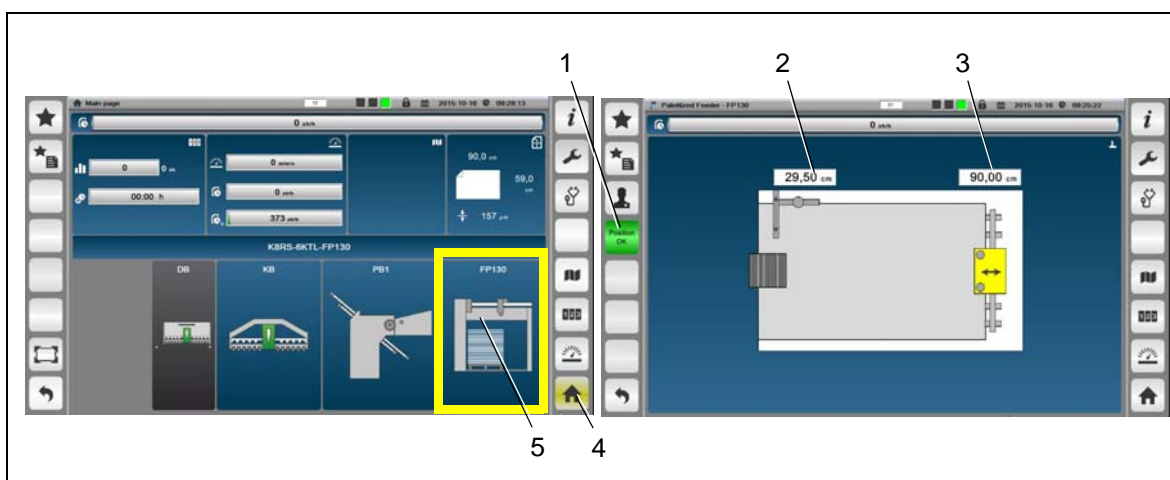


Figure 101: <FP130> page

When a new folding imposition has been calculated, the adjustment values for the feeder are displayed on the <FP-130> page.

Open page How to open the <FP130> page.

- ▷ Press the <Home> function key (4).
The <Main page> is opened.
- ▷ Press the <FP130> (5) selection field on the <Main page>.
- ✓ The <FP130> page is opened

Correcting the adjustment value

How to correct the calculated adjustment value:

- ▷ Press the input field (2).
A numeric input keyboard is opened.
- ▷ Enter the new value.
- ▷ Press the <Start> function key button (1).
- ✓ The adjustment value is corrected.



The input changes only become effective when the <Start> (1) button is pressed.

8.5.3 Loading the feeder with a pallet

**WARNING!****Overloading of the feeder.**

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

Please observe the maximum loading weight when loading the feeder. Details on the maximum loading weight can be found in

- the "Technical data" chapter.
- on the relevant marking on the feeder.

Proceed as follows to load the feeder with a pallet.

Prerequisites

These prerequisites must be fulfilled:

- Maximum loading weight = 1000 kg
- The pile plate is lowered onto the ground.
- The feeder head is moved upwards.
- The right-hand pile stop is set to half the sheet width.
- The loading ramp is located at the required loading and unloading point.
- With the pallet full, the front edge of the paper pile must be flush with the front edge of the pallet.

Possible loading and unloading positions

The feeder can be loaded from the following positions:

- Loading side, rear
- Operator side

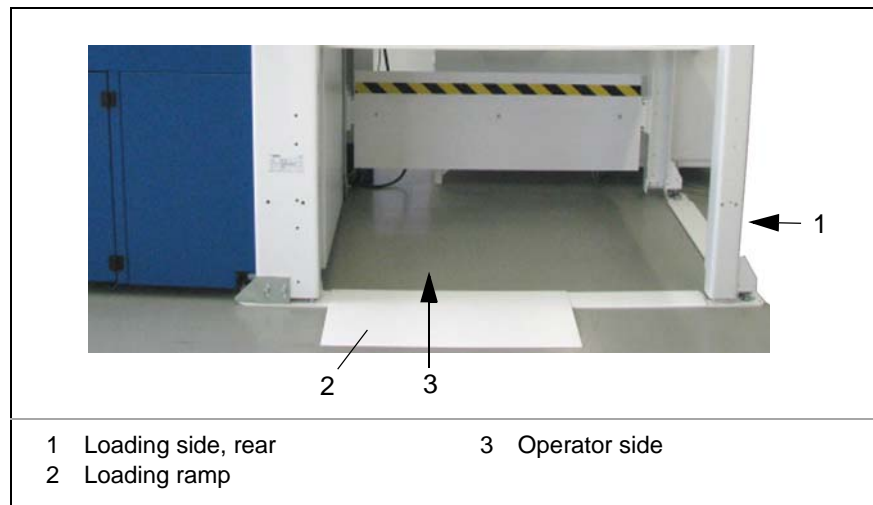


Figure 102: Loading and unloading position



Always position the loading ramp (2) on the required loading and unloading position.

Removing an empty pallet

How to remove the empty pallet:

- ▷ Remove the empty pallet using a pallet truck.
- ✓ The empty pallet is removed.

Inserting a full pallet



Ensure that the pallet truck forks do not project beyond the end of the pallet.

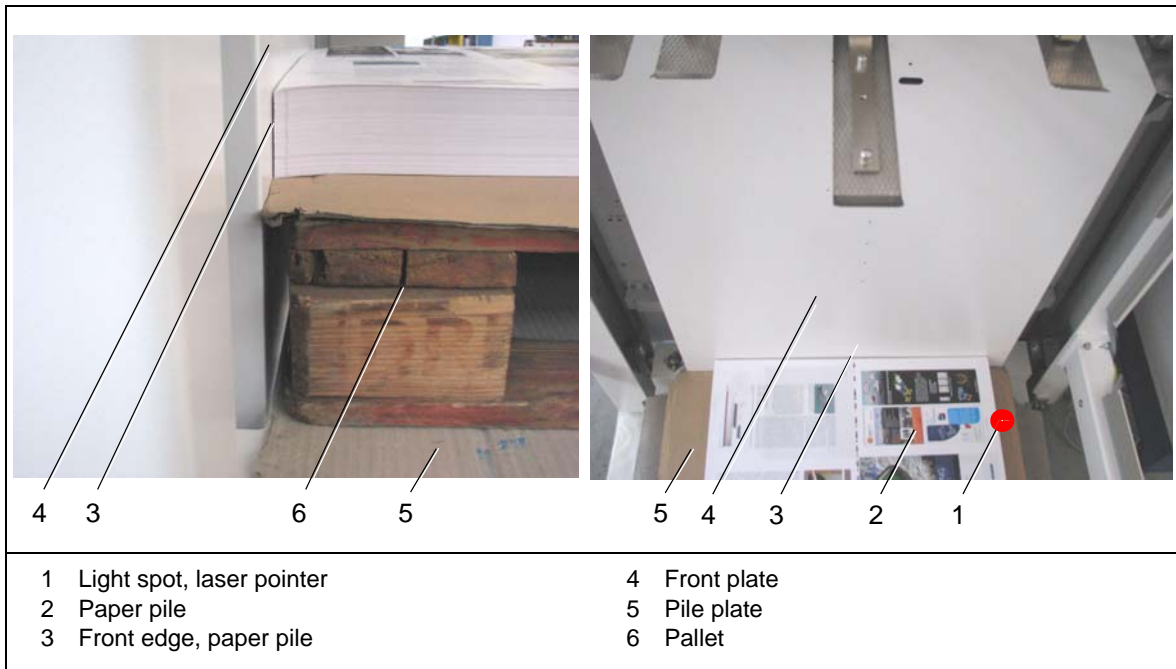


Figure 103: Positioning pallets in the feeder

How to insert the full pallet into the feeder:

- ▷ Move the full pallet into the feeder using a pallet truck so that:
 - The light spot of the laser pointer (1) is located on the right-hand edge of the paper pile (2).
 - The front edge of the paper pile (3) is in gentle contact with the front plate (4).
- ✓ The full pallet is inserted.

8.5.4 Align the paper pile laterally

An adjustment device permits the sideways movement of the entire pile plate in the range of +/- 20 mm.

This permits:

- a lateral fine adjustment of the paper pile position.
- the processing of a sloping paper pile within the adjustment area.

Proceed as follows to align the paper pile laterally.

Prerequisites These prerequisites must be fulfilled:

- The paper pile is raised far enough that the right-hand pile stop is located underneath the right-hand edge of the pile.

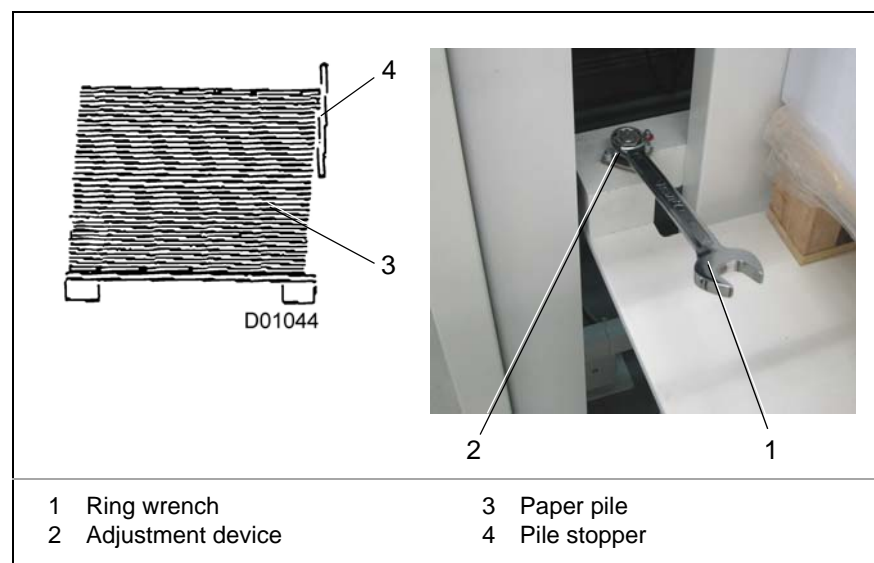


Figure 104: Align the pallet laterally

How to align the pallet laterally:

- ▷ Use a SW 24 ring wrench (1) to adjust the adjustment device (2) so that the right-hand edge of the paper pile (3) is in gentle contact with the pile stop (4).
Adjustment range: +/- 20 mm.
- ▷ After adjustment, always remove the ring wrench from the adjustment device.
- ✓ The paper pile is aligned laterally.



When processing a sloping paper pile, the paper pile always needs to be re-adjusted laterally multiple times.

Basic setting

When lowering the pile plate to the ground, the lateral adjustment is automatically moved back to the central position.

8.5.5 Position the feeder head

8.5.5.1 Manual

The feeder head must be positioned on the rear edge of the paper pile when changing the format.

Proceed as follows to position the feeder head.

Prerequisites These prerequisites must be fulfilled:

- The feeder is loaded with a new sheet format.
- The paper pile is leveled out.
- The paper pile is underneath the suction belt.

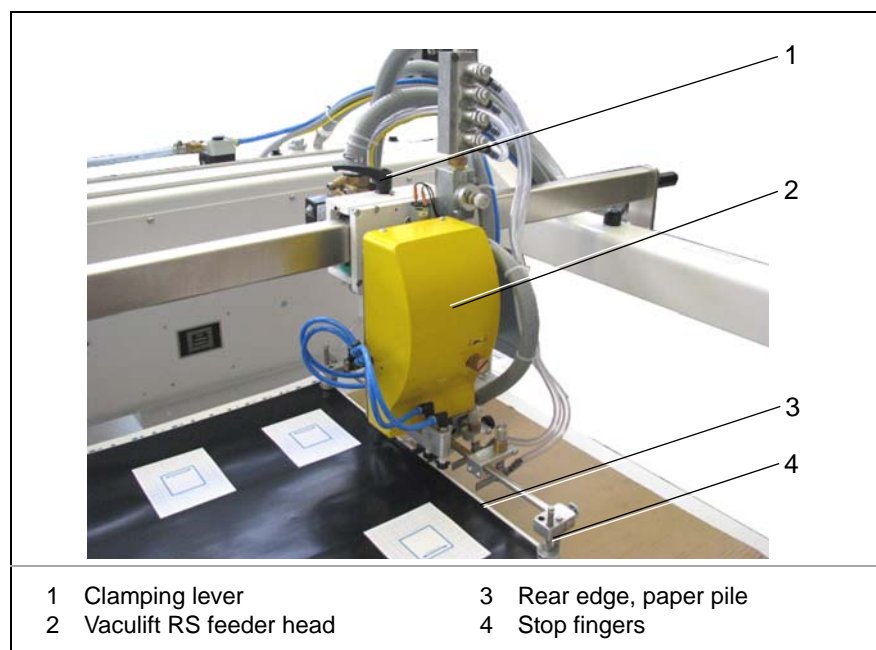


Figure 105: Positioning the feeder head

How to position the feeder head:

- ▷ Loosen the clamping lever (1).
- ▷ Position the feeder head (2) so that the rear stop finger (4) touches the rear edge of the paper pile (3).
- ▷ Re-tighten the clamping lever (1).
- ✓ The feeder head is positioned.

8.5.5.2 Motorized



The motorized positioning of the feeder head is carried out when calculating a new folding imposition. See operating manual for the folding machine.

The feeder head is positioned via motor.

- Prerequisites** These prerequisites must be fulfilled:
- A new folding imposition is calculated.
 - The setting value is changed manually.

Motorized positioning After calculating a new folding imposition, the feeder head is moved to the correct position via motor.

Displaying the calculated adjustment values

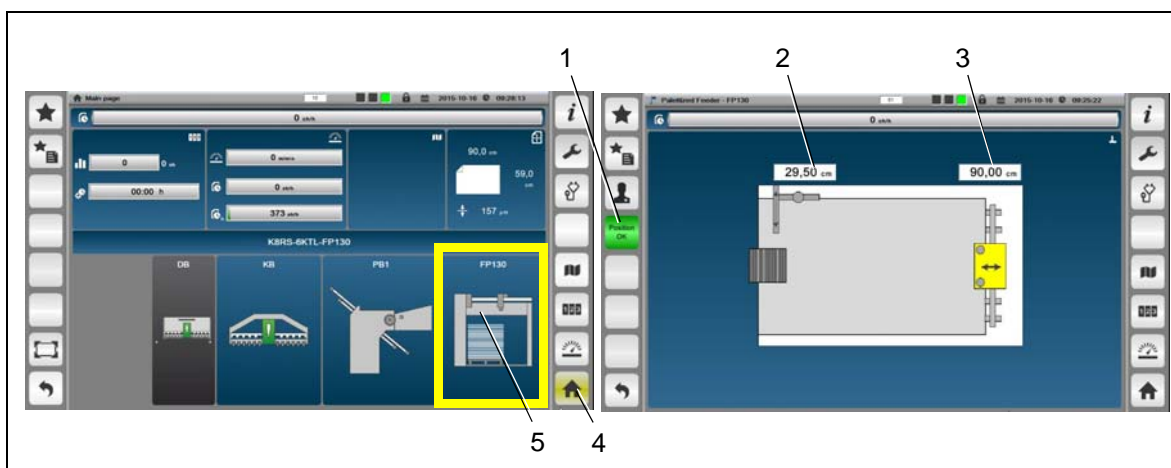


Figure 106: <FP130> page

After calculating a new folding imposition, the adjustment values for the feeder are displayed on the <FP-130> page.

- Open page** How to open the <FP130> page.
- ▷ Press the <Home> function key (4).
The <Main page> is opened.
 - ▷ Press the <FP130> (5) selection field on the <Main page>.
 - ✓ The <FP130> page is opened

- Correcting the adjustment value** How to correct the calculated adjustment value:
- ▷ Press the input field (3).
A numeric input keyboard is opened.
 - ▷ Enter the new value.
 - ▷ Press the <Start> function key button (1).
 - ✓ The adjustment value is corrected.



The input changes only become effective when the <Start> (1) button is pressed.

8.5.6 Set the left-hand pile stop

Proceed as follows to set the left-hand pile stop.

- Prerequisites** These prerequisites must be fulfilled:
- The feeder is loaded with a new sheet format.
 - The paper pile is leveled out.
 - The paper pile is below the suction belt.

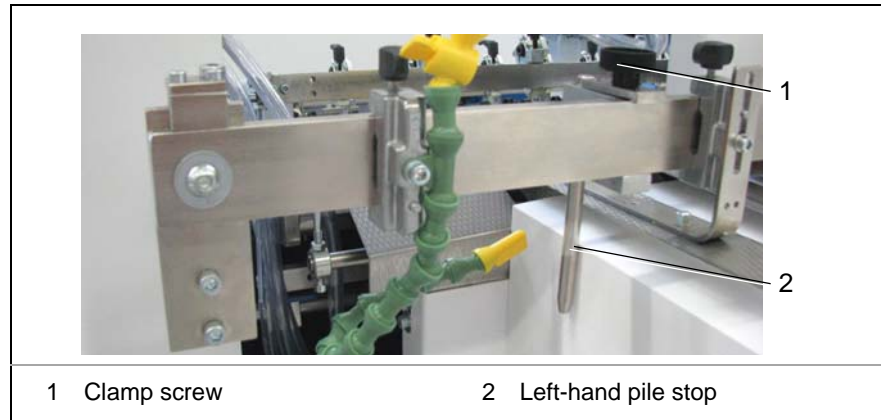


Figure 107: Set the left-hand pile stop

Proceed as follows to set the left-hand pile stop:

- ▷ Loosen the clamp screw (1).
- ▷ Position the left-hand pile stop (2) so that it is gently in contact with the left-hand edge of the paper pile.
- ▷ Re-tighten the clamp screw (1).
- ✓ The left-hand pile stop is positioned.

8.5.7 Inserting the smoothers

Proceed as follows to insert the smoothers.

Prerequisites These prerequisites must be fulfilled:

- The feeder is loaded with a new sheet format.
- The paper pile is leveled out.
- The pile stops are set.

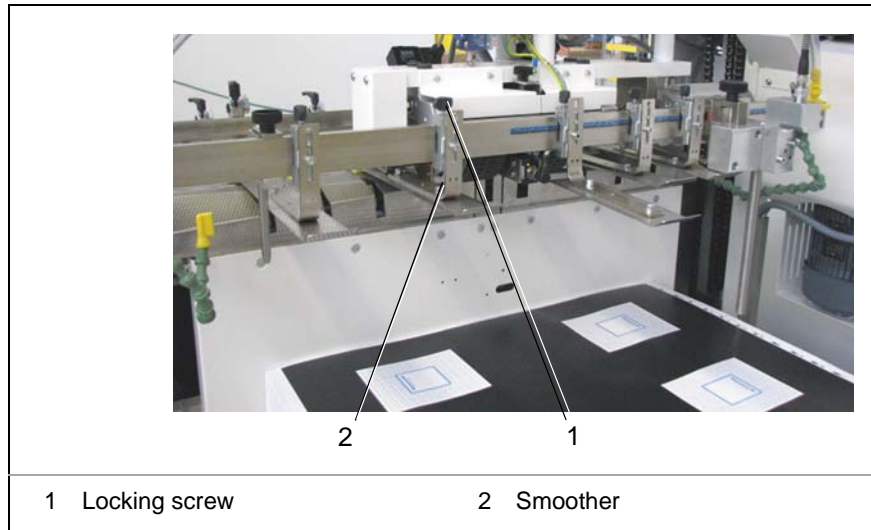


Figure 108: Insert the smoothers

Determine the number and position of the smoothers according to the paper format, as shown in the diagram.

Proceed as follows to adjust the smoothers:

- ▷ Loosen the locking screw (1).
- ▷ Position the smoothers (2).
- ▷ Re-tighten the locking screw (1).
- ✓ The smoothers are adjusted.

8.5.8 Adjusting the pressure vacuum pump

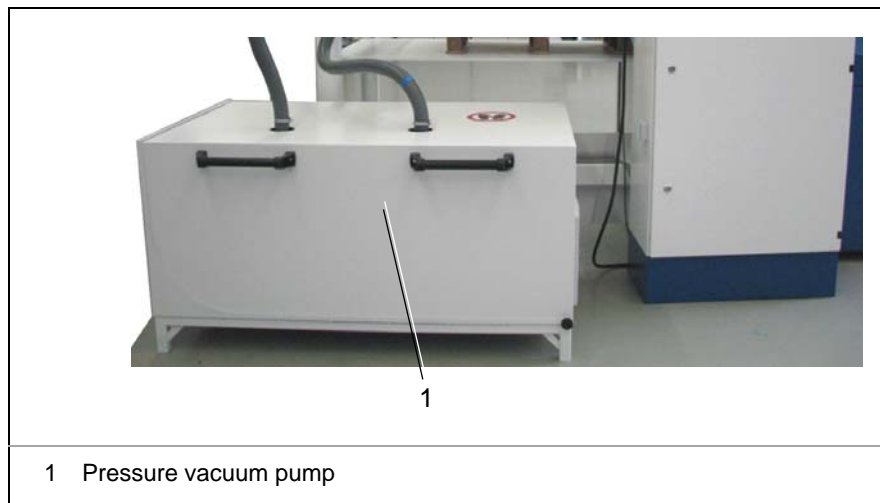


Figure 109: Pressure vacuum pump



The settings for pressure and vacuum are specified by the manufacturer.

8.5.9 Adjusting the feeder head, VACULIFT RS

The "VACULIFT RS" feeder head separates the paper sheets from the paper pile.

Proceed as follows to set the feeder head.

Prerequisites These prerequisites must be fulfilled:

- The paper pile is leveled out.
- The feeder head is positioned.

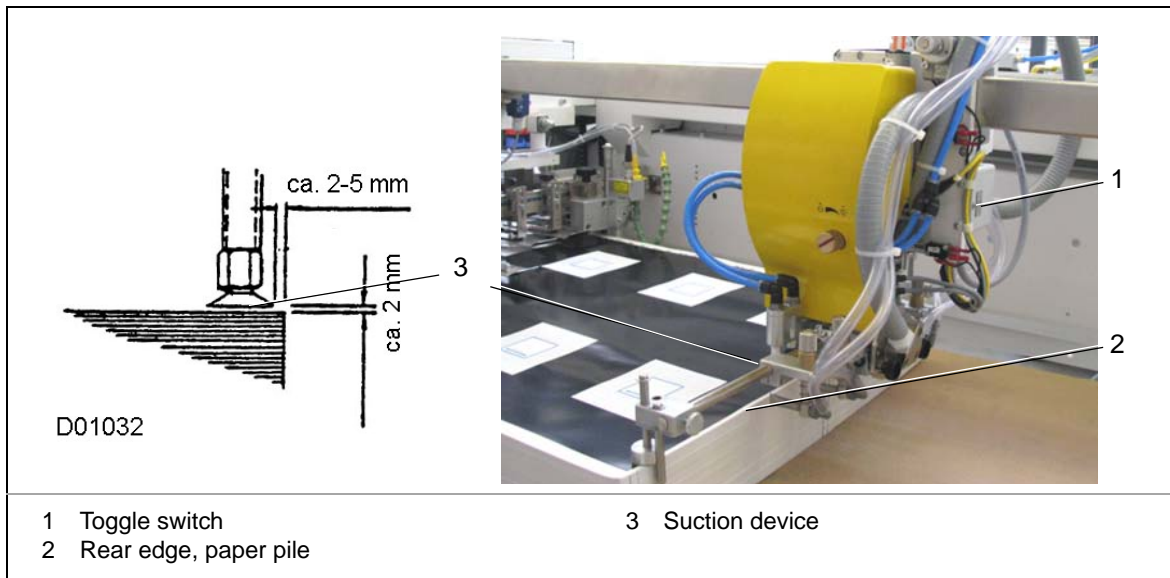


Figure 110: VACULIFT RS feeder head

Switching on the feeder head

How to switch on the feeder head:
 ▷ Move the tumbler switch (1) to position 1.
 ✓ The feeder head is switched on.

Switching off the feeder head

How to off the feeder head:
 ▷ Move the toggle switch (1) to position 0.
 ✓ The feeder head is switched off.

Setting the suction device position

Basic adjustment with the suction devices (3) pointing downwards:

- approx. 1-2 mm above the surface of the paper
- approx. 2-5 mm in front of the rear edge of the paper pile (2).

How to set the suction devices (3) for the paper quality being processed:

The scale (4) is used as an adjustment tool.

With paper bending downwards:

▷ Turn the knurled screw (5) anti-clockwise.
 ✓ The suction devices (2) are set higher.

With paper rolled upwards:

▷ Turn the knurled screw (5) clockwise.
 ✓ The suction devices (2) are set lower.

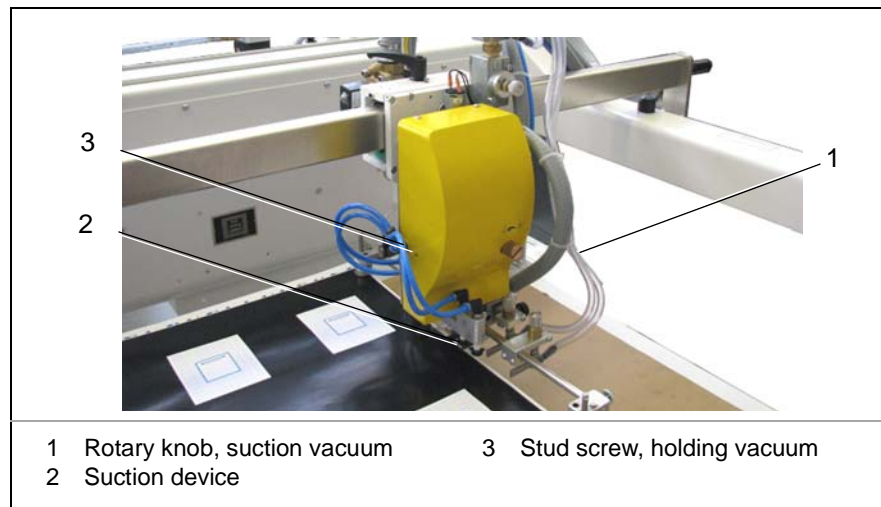


Figure 111: Adjusting the vacuum

Setting the suction vacuum

Proceed as follows to set the suction vacuum of the suction devices (2):

Reducing the suction vacuum:

- ▷ Turn the rotary knob (1) clockwise.

Increasing the suction vacuum:

- ▷ Turn the rotary knob (1) anti-clockwise.
- ✓ The suction vacuum is set.

Setting the holding vacuum

The reduction in the holding force in the top position of the suction device simplifies sheet removal via the suction belt.

Proceed as follows to set the holding vacuum of the suction devices (2):

Reducing the holding vacuum:

- ▷ Turn the stud screw (3) anti-clockwise.

Increasing the holding vacuum:

- ▷ Turn the stud screw (3) clockwise.
- ✓ The holding vacuum is set.



Changing the holding vacuum does not affect the suction vacuum setting.

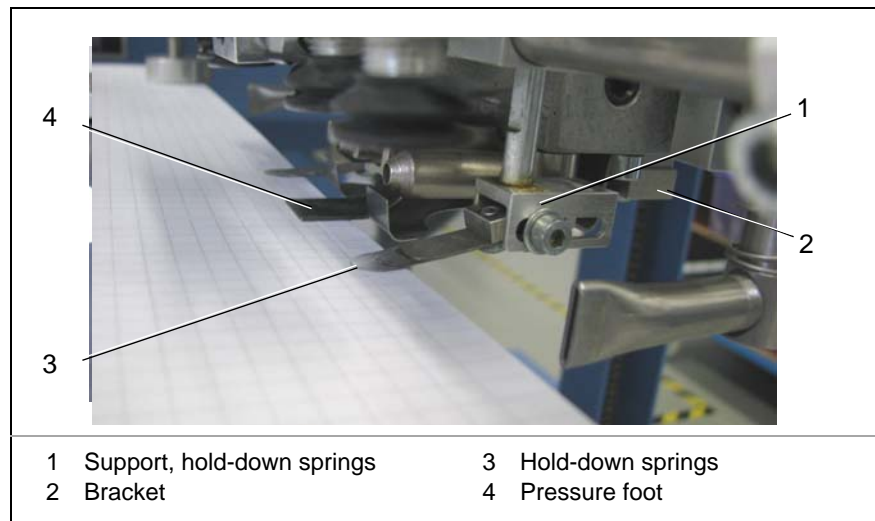


Figure 112: Setting the hold-down springs

The hold-down springs fix the top sheets on the paper pile.

Positioning the hold-down springs

How to position the hold-down springs:

- ▷ Set both hold-down springs (3) as close as possible to the pressure foot (4).
- ✓ The hold-down springs are positioned.

Setting the hold-down springs

Proceed as follows to set the hold-down springs:

- ▷ Set the holder (1) so that the lower edges are higher than the brackets (2).
- ▷ Set the hold-down springs so that they
 - project into the paper pile by approx. 5-7 mm.
 - are pointing diagonally downwards.
 - are positioned gently against the paper pile.
- ✓ The hold-down springs are set.

Positioning the stop retainers

The stop retainers prevent the sheets drifting away during the suction process.

These must be positioned according to the sheet format.

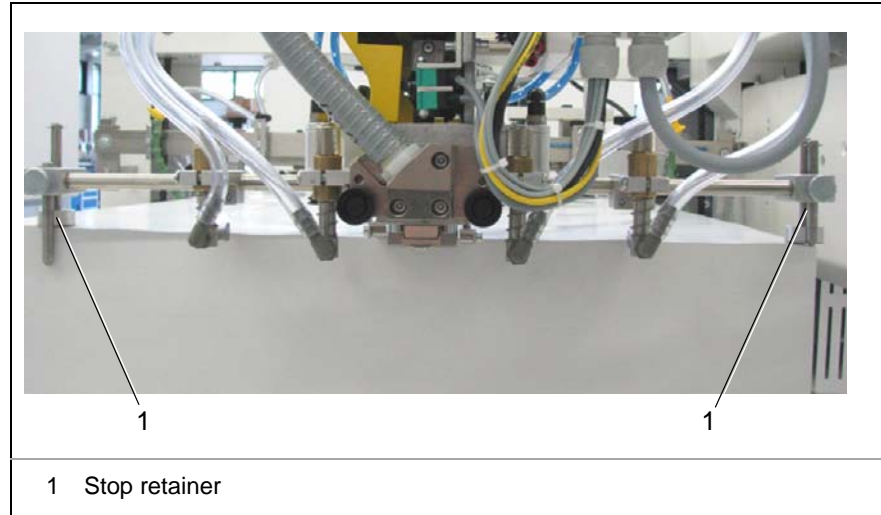


Figure 113: Set the stop retainers

How to position the stop retainers according to the sheet format:

For small sheet formats:

- ▷ Position stop retainers (1) on the corners of the sheet.
- ▷ Arrange the stop pins in accordance with the diagram.

For large sheet formats:

- ▷ Position stop retainers (1) as far as possible towards the outside.
- ▷ Arrange the stop pins in accordance with the diagram.
- ✓ The stop retainers are positioned.

Adjusting the blast air Proceed as follows to adjust the blast air.

Prerequisites These prerequisites must be fulfilled:

- Machine is stationary.
- The air supply is switched on.
- ✓ A single sheet is requested.

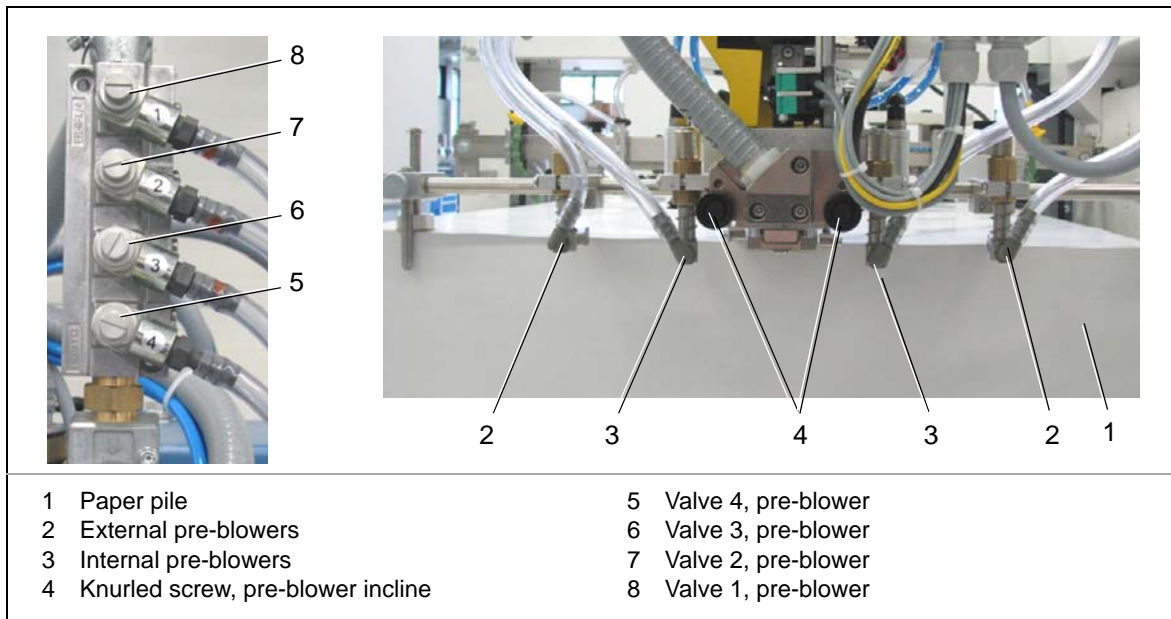


Figure 114: Setting the pre-blowers

Setting the pre-blowers The pre-blowers should fan out the top sheets like a mushroom so that the feeder head suckers can safely grip the top sheets on the paper pile.

The following settings can be made on the internal pre-blowers:

- ▷ Height
- ▷ Pivot horizontally.
- ▷ Pivot vertically, with the knurled screws (4).
- ▷ Air volume, with the valves (6 + 7)
- ✓ The internal pre-blowers are set.

The following settings can be made on the external pre-blowers:

- ▷ Position
- ▷ Height
- ▷ Pivot horizontally.
- ▷ Air volume, with the valves (5 + 8)
- ✓ The external pre-blowers are set.



Use the external pre-blowers to fan out the sheets first.

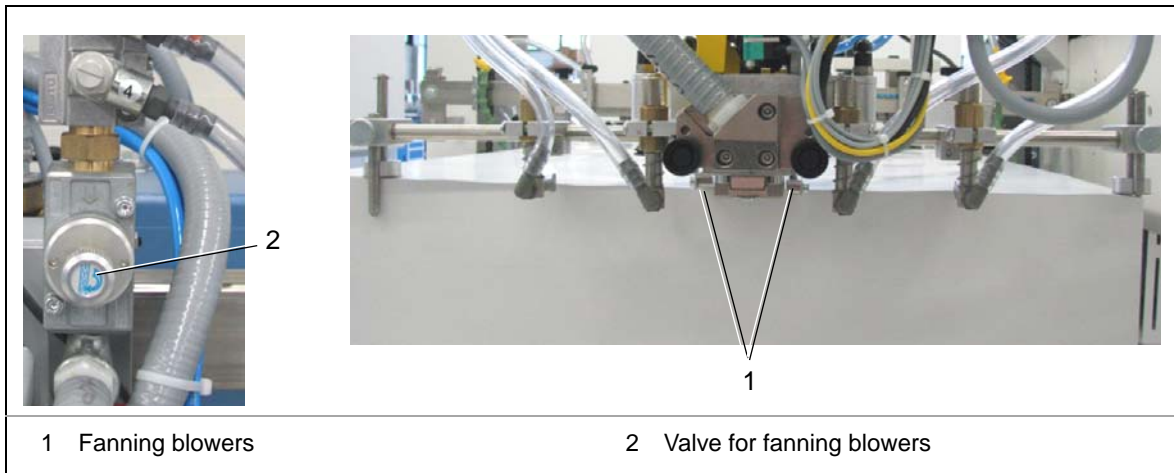


Figure 115: Setting the fanning blowers

Setting the fanning blowers

The fanning blowers should blow the separated sheet from underneath so that it flaps slightly across its entire length and can be safely gripped from the suction belt.

Proceed as follows to set the fanning blowers:

Setting the blowing direction:

The blowing direction cannot be changed.

Setting the air volume:

▷ Adjust the air quantity with the valve (2).

✓ The fanning blowers are set.

8.5.10 Setting the paper pile level

Proceed as follows to set the paper pile level.

Prerequisites These prerequisites must be fulfilled:

- Machine is stationary.
- The air supply is switched on.
- A single sheet is requested.

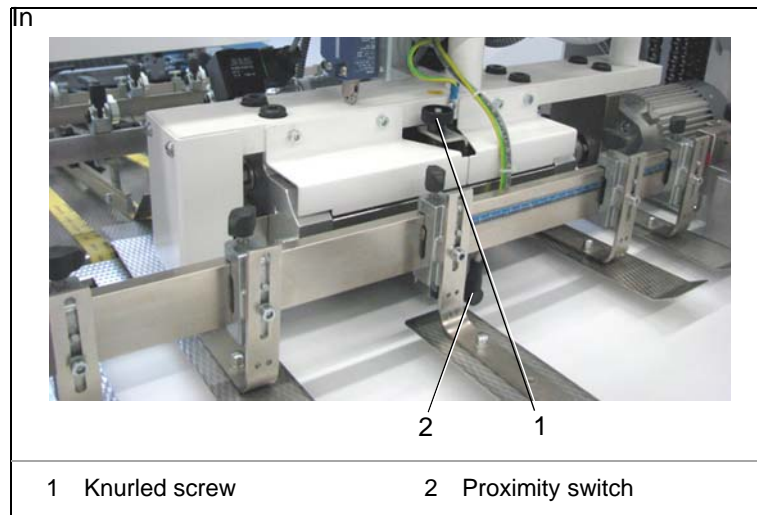


Figure 116: Setting the paper pile level

The paper pile level is controlled via a capacitive proximity switch. The "Suction wheel/suction belt" distance to the "Surface of the paper pile" is approx. 7 - 8 mm (basic setting). To maintain reliable removal of the suction wheel/suction belt, the distance must be adjusted according to the surface of the paper pile.

Adjust the distance How to adjust the distance:

Increase the distance:

- ▷ Turn the knurled screw (1) clockwise.

Reduce the distance:

- ▷ Turn the knurled screw (1) counterclockwise.
- ✓ The distance is adjusted.



Changes following "Increase distance" only become effective once the paper pile has been lowered.

8.5.11 Setting the lateral ventilation

Proceed as follows to set the lateral ventilation.

Prerequisites These prerequisites must be fulfilled:

- The paper pile is leveled out.
- The side stops are positioned.
- The smoothers are adjusted.

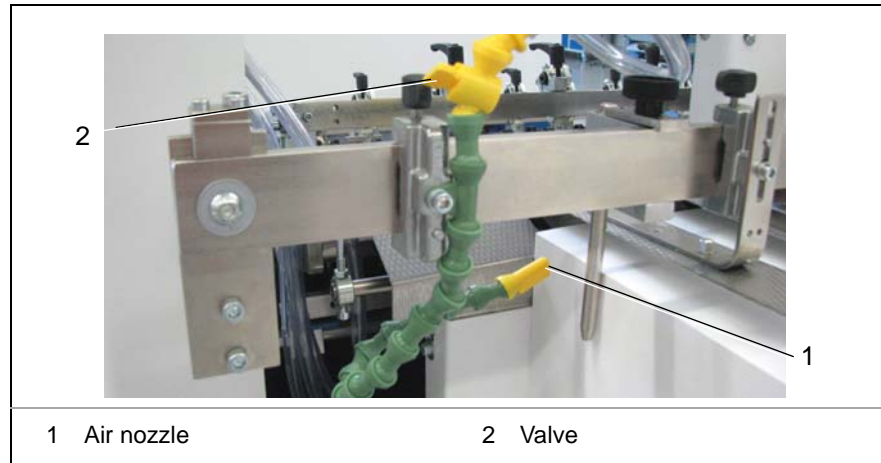


Figure 117: Setting the lateral ventilation

How to set the lateral ventilation:

- ▷ Position the air nozzle (1) so that approx. 10 to 15 paper sheets are ventilated.
- ▷ Set the required air volume using the valve (2).
- ▷ Carry out the adjustment on both sides.
- ✓ The lateral ventilation is set.

8.5.12 Setting the small sheet-size device

Proceed as follows to set the small sheet-size device.

Prerequisites These prerequisites must be fulfilled:

- Format length is less than 17 cm.
- The feeder head is pivoted upwards or removed.

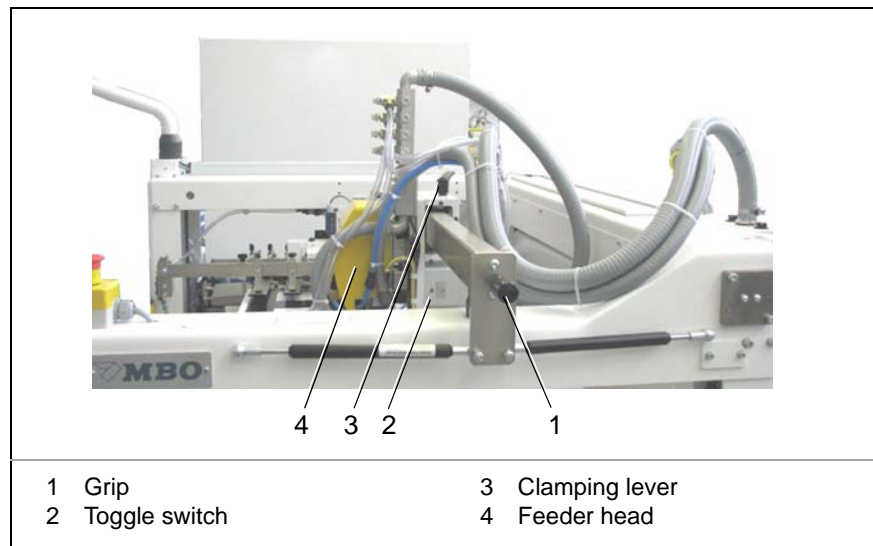


Figure 118: Resetting the feeder head

Resetting the feeder head

How to reset the feeder head:

- ▷ Switch off the feeder head with the toggle switch (2).
- ▷ Open the clamping lever (3).
- ▷ Slide the feeder head (4) backwards.
- ▷ Secure the feeder head (4) using the clamping lever (3).
- ✓ The feeder head is reset.



Ensure that the clamping lever (3) is secure once more after moving the feeder head.

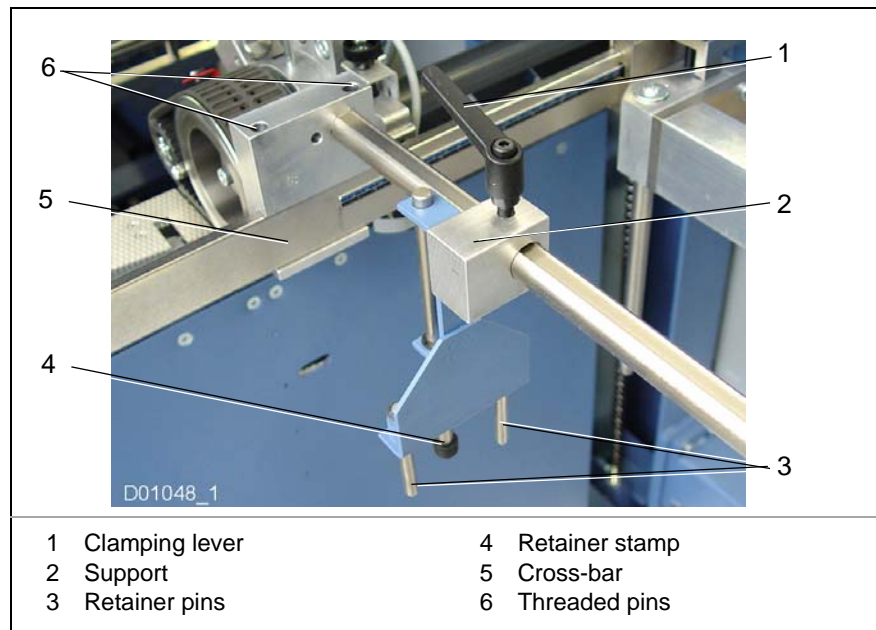


Figure 119: Small format device

Setting the small sheet-size device

How to set the small sheet-size device:

- ▷ Secure the small sheet-size device onto the cross-bar (5) using the two threaded pins (6).
- ▷ Loosen the clamping lever (1).
- ▷ Set the retainer (2) to the format being used so that the retainer pins (3) are gently positioned against the rear edge of the pile.
- ▷ Position the retainer stamp (4) onto the end of the pile.
- ▷ Re-tighten the clamping lever (1).
- ✓ The small sheet-size device is set.

Adjusting the ventilation

How to adjust the ventilation:

- ▷ Only use front ventilation and lateral ventilation when using the small sheet-size device.
See chapter "8.5.13 Adjusting the front ventilation".
See chapter "8.5.11 Setting the lateral ventilation"

8.5.13 Adjusting the front ventilation



Only use front ventilation when using the small sheet-size device. The front ventilation affects the response of the capacitive proximity switch.

With front ventilation, the sheets are ventilated from the front so that they are separated off from the paper pile. The movable air nozzles are located below the suction wheel/suction belt. The air volume from the air nozzles is set for each group of nozzles. Please see the allocation plan for more details. Only ventilate the top 10 to 15 sheets.

How to proceed to adjust the front ventilation.

- Prerequisites** These prerequisites must be fulfilled:
- The small sheet-size device is used.

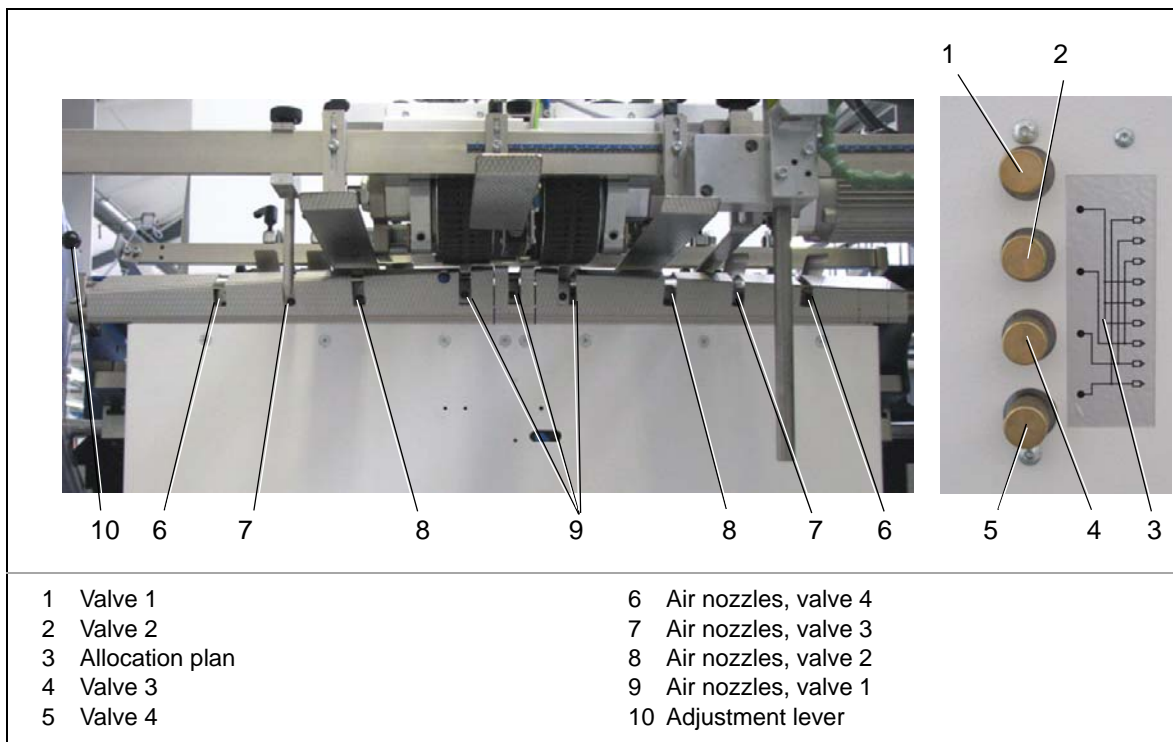


Figure 120: Adjusting the front ventilation

- Setting air nozzles together** How to adjust the air nozzles together:
- ▷ Position the adjustment lever (10) up or down until the required blow pattern is achieved.
 - ✓ The air nozzles are set together.

Setting the air nozzles individually

How to adjust the air nozzles individually:

- ▷ Unfasten the pin screw on the inside.
- ▷ Position the air nozzle in the required position.
- ▷ Re-tighten the internal pin screw.
- ✓ The air nozzles are set individually.

Setting the air volume

How to set the required air volume:

- ▷ Follow the allocation plan (3).

Increasing the air volume:

- ▷ Turn the valves 1 to 4 counter-clockwise.

Reducing the air volume:

- ▷ Turn valves 1 to 4 clockwise.
- ✓ The air volume is set.

8.5.14 Adjusting the dual suction belt

The dual suction belt separates the sheets from the feeder and transports them to the register table.

Proceed as follows to set the dual suction belt.

- Prerequisites** These prerequisites must be fulfilled:
- The feeder is completely adjusted.



CAUTION!

Danger due to entanglement zone.

Non-observance could result in personal injury.

- Never reach underneath the dual suction belt when the machine is running.

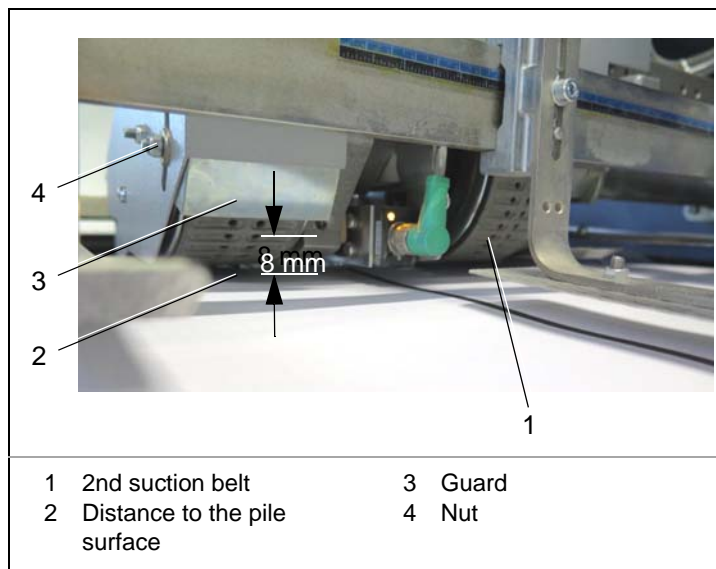


Figure 121: Adjusting the dual suction belt

Adjusting the guard

How to set the guard:

- ▷ Unfasten the nut (4).
- ▷ Set the distance (2) between the pile surface and the guard (3) to be as small as possible, maximum 8 mm.
- ▷ Re-tighten the nut (4).
- ▷ Set the guard on the second suction belt evenly.
- ✓ The guard is set.



The distance between the pile surface and the guard must be set as small as possible, maximum 8 mm!

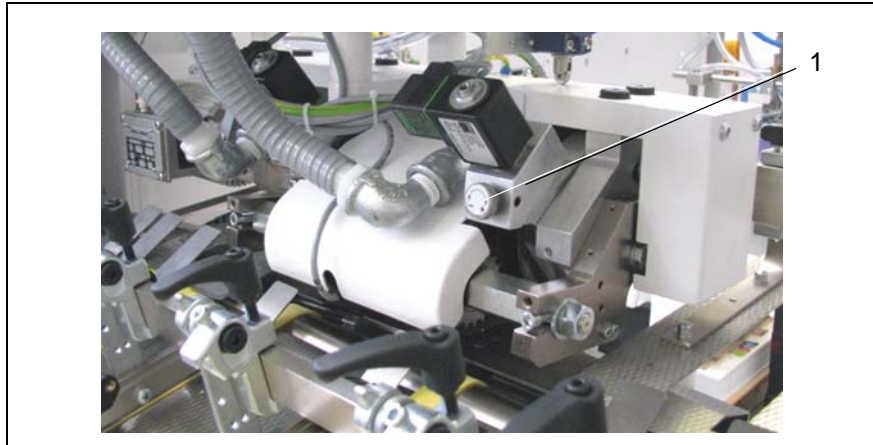


Figure 122: Adjusting the suction force

Adjusting the suction force

The suction force has to be adjusted depending on the properties of the paper to be processed.

How to reduce the suction force for:

- sensitive paper stock (lightweight printing stock) that tends to develop markings.
 - porous papers (double sheet).
- ▷ Turn the knurled screw (1) counterclockwise.

How to increase the suction force for:

- heavy papers.
- ▷ Turn the knurled screw (1) clockwise.



Set the suction force on both suction belts evenly.
The sheets may be drawn in unevenly if the setting is not even.

8.6 Setting the standard register table

The register table aligns incoming paper sheets left-aligned through the angular position of the transport belt.

8.6.1 Warning messages



CAUTION!

The deflection roller at the end of the register table is a hazardous entanglement zone.

Non-observance could result in injury.

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

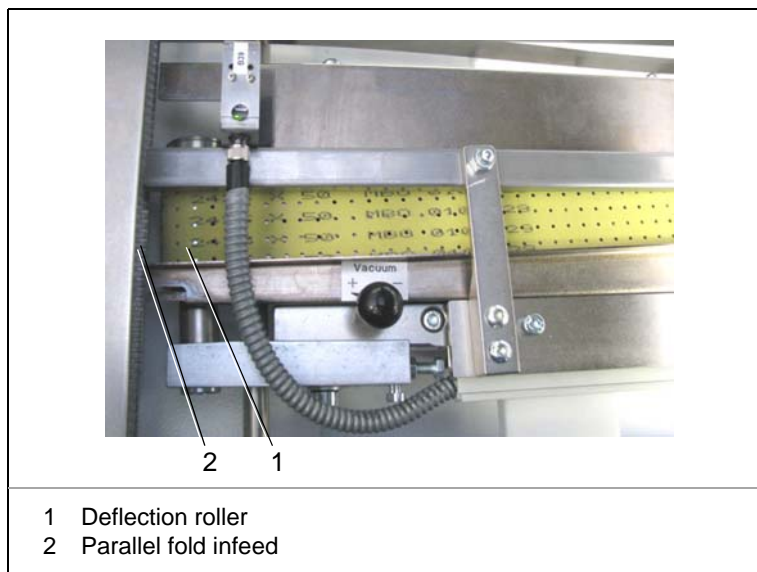


Figure 123: Deflection roller danger spot

8.6.2 Adjusting the conveyor table

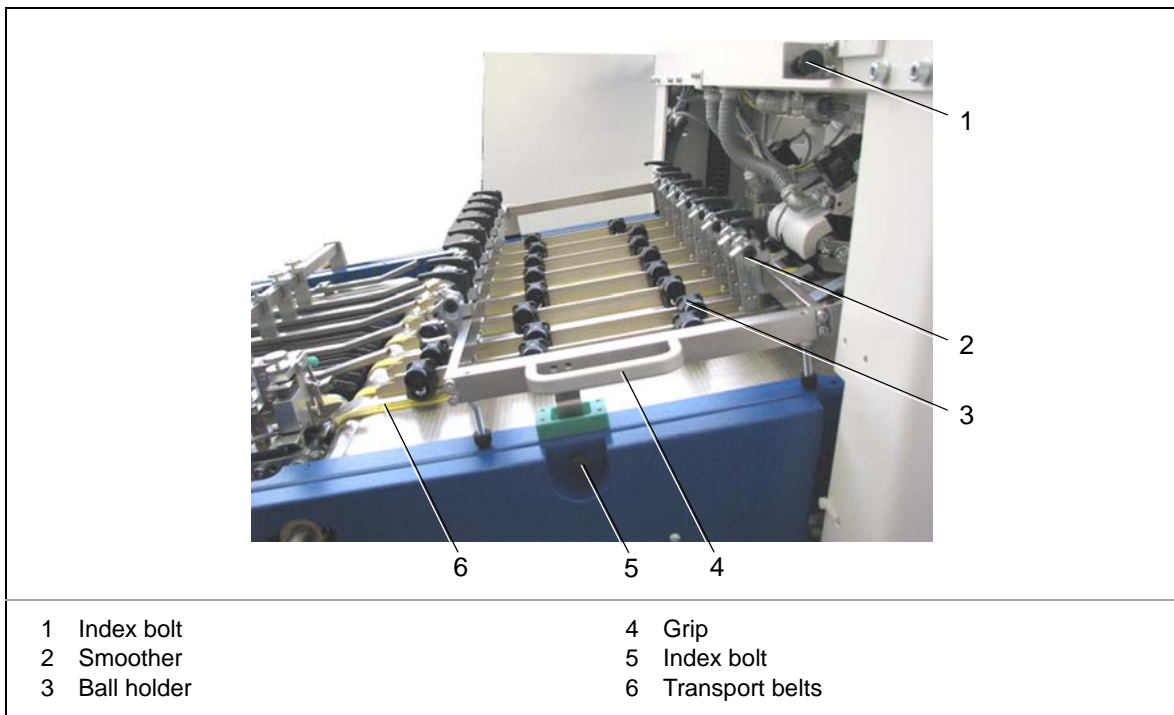


Figure 124: Adjusting the conveyor table

Adjusting the conveyor table

How to adjust the transport belts:

- ▷ Position the transport belts (6) according to the sheet format.
- ▷ Position the smoothers (2) over the transport belts (6).
- ▷ Position the ball holders (3) according to the sheet format.
- ✓ The conveyor table is set.

8.6.3 Switch ultrasonic double sheet detector on/off

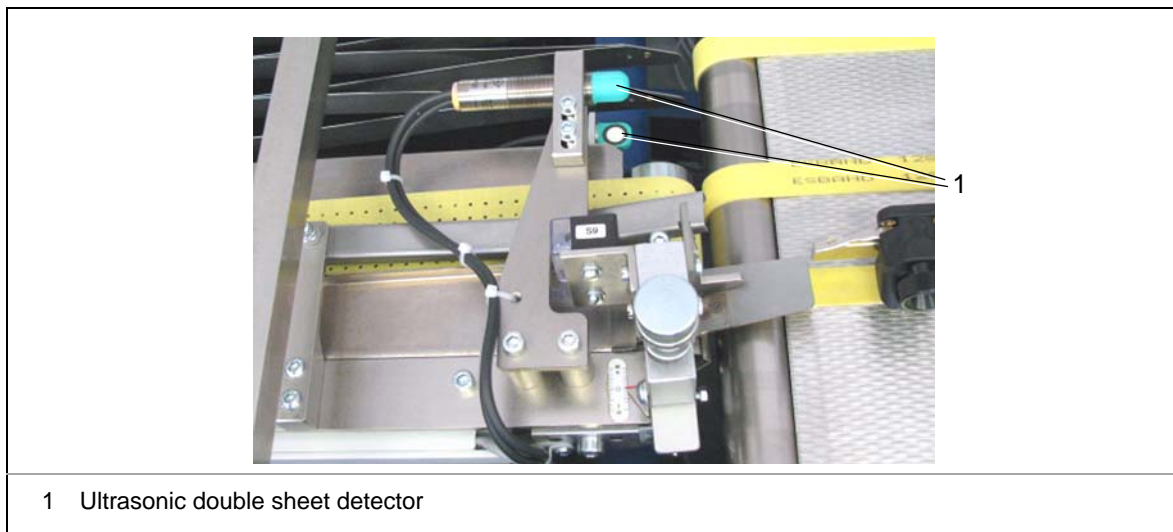


Figure 125: Ultrasonic double sheet detector (option)

The machine is equipped with an ultrasonic double sheet detector (B122). This detects an air gap between two sheets.

It is used for conventional paper grades and detects:

- No sheet
- Single sheet
- Double sheet

Double sheets are detected by the control and ejected in the crossfold via the waste paper deflector.

If no sheet is coming out, an error message will appear.



With different paper grades, error messages may arise through an air gap within the material.

This is possible for:

- Zig zag folds with more than 3 folds.
- Pre-folded products
- Coated products
- Laminated products
- Foil-clad products

Measure:

- ▷ Switch off the ultrasonic double sheet detector.
See chapter "8.6.3 Switch ultrasonic double sheet detector on/off"
- ▷ Activate the <Manual double sheet detector>.
See chapter "8.6.4 Adjusting the manual double sheet detector"

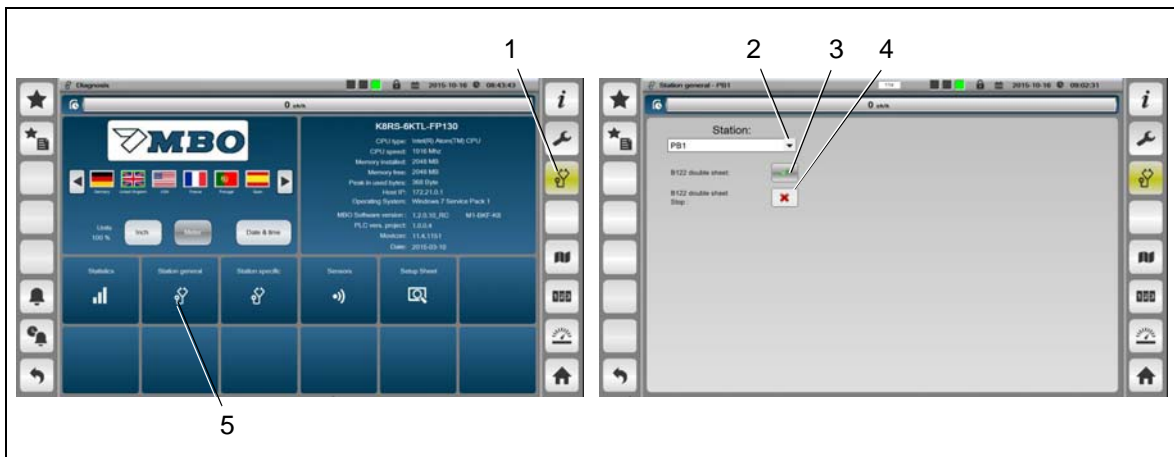


Figure 126: Switch ultrasonic double sheet detector B122 on/off

Switch on ultrasonic double sheet detector

How to switch on the ultrasonic double sheet detector:

- 1) Press the <Diagnosis> function key (1).
The <Diagnosis> page is displayed.
 - 2) Press the input field <General station> (5).
The <General station> page is displayed.
 - 3) Press the selection button (2).
A selection list is displayed.
 - 4) Select station PB1.
 - 5) Press the <B122 double sheet> button (3).
The <B122 double sheet> button displays a green OK mark.
- ✓ The ultrasonic double sheet detector is switched on.

Switch off ultrasonic double sheet detector

How to switch off the ultrasonic double sheet detector:

- 1) Press the <Diagnosis> function key (1).
The <Diagnosis> page is displayed.
 - 2) Press the input field <General station> (5).
The <General station> page is displayed.
 - 3) Press the selection button (2).
A selection list is displayed.
 - 4) Select station PB1.
 - 5) Press the <B122 double sheet> button (3).
The <B122 double sheet> button displays a red warning mark.
- ✓ The ultrasonic double sheet detector is switched off.

8.6.4 Adjusting the manual double sheet detector

The manual double sheet detector detects sheets of paper that stick to one another.

If a double sheet occurs, it is held by the switching segment. At the same time, an electrical signal is generated by the microswitch that stops the sheet infeed 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.

Mechanical double sheet detector

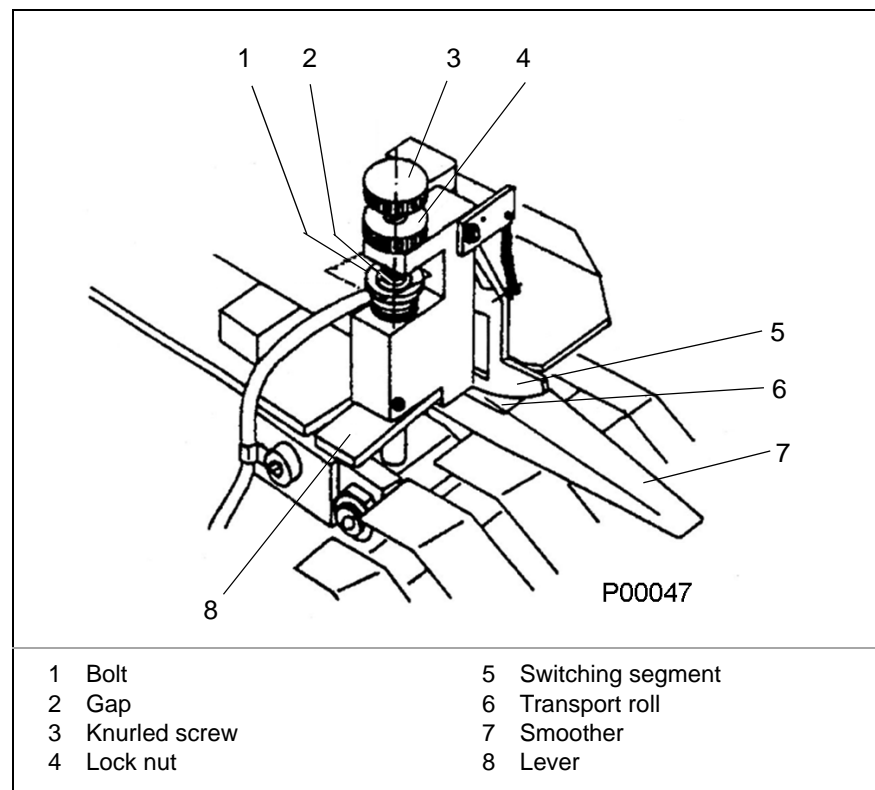


Figure 127: Manual double sheet detector

- Setting** How to set the double-sheet detector:
- 1) Press the lever (8) downwards.
 - 2) Insert a strip (simple paper thickness) of the paper to be processed in the gap (2) between bolts (1) and knurled screw (3).
 - 3) Release the lever (8) again.
- ✓ The double sheet detector is set.

- Checking the function** How to check the function:
- 1) Start the machine.
 - 2) Push a strip of simple paper thickness under the smoother (7) until it is between the switching segment (5) and the transport roll (6).
- The double sheet detector may not switch.

- 3) Push a strip of double paper thickness under the smoother (7) until it is between the switching segment (5) and the transport roll (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 is checked.

Readjustment How to readjust the double sheet detector:

- 1) Loosen the lock nut (4).
- 2) Adjust the gap (2) between the switching 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 re-adjusted.



To account for paper differences:

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

8.6.5 Adjusting for the sheet format

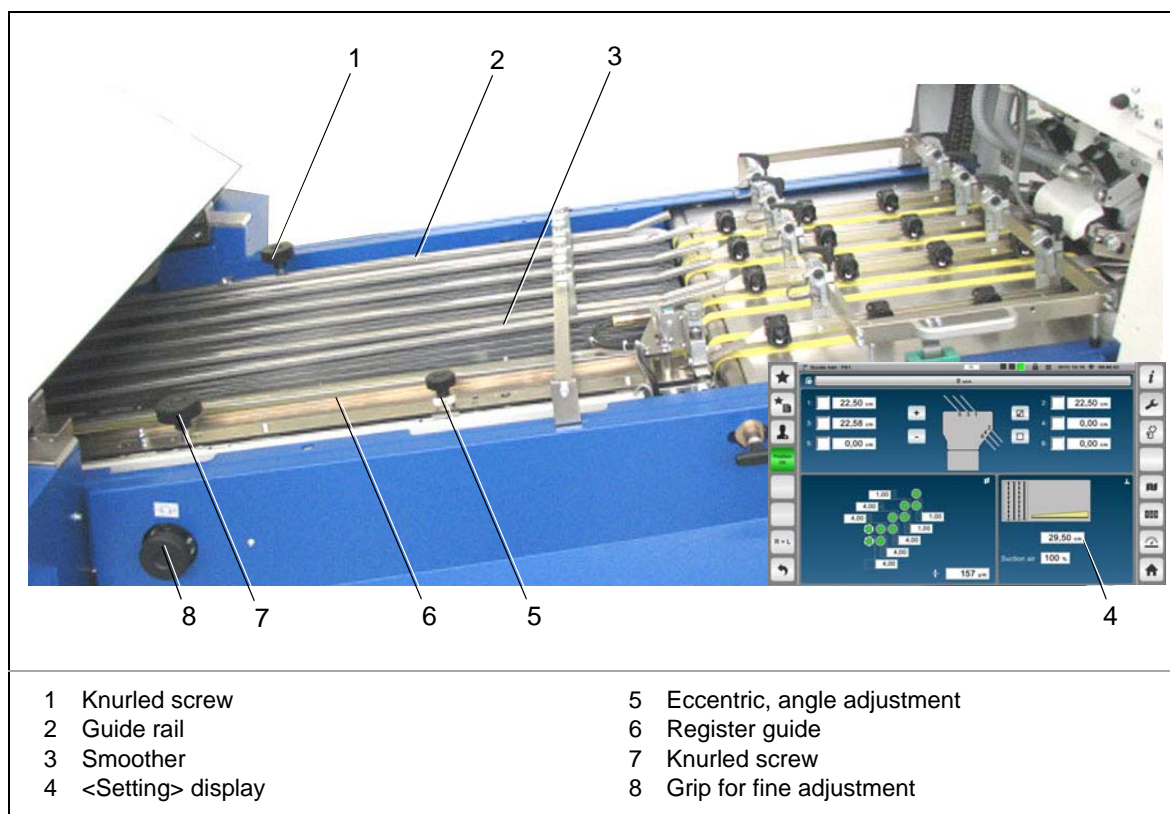


Figure 128: Adjusting the register table to the sheet format

Adjusting the register guide

How to set the register guide:

- 1) Loosen the knurled screw (6).
 - 2) Adjust the sidelay (5) with the help of the scale to half of the sheet width (4).
 - 3) Tighten the knurled screw (6).
- ✓ The register guide is adjusted.

Setting the fine adjustment

How to adjust the fine adjustment:

- 1) The knurled screw (6) remains closed
- 2) Make a precise adjustment by turning the grip (7).

Clockwise direction of rotation (+).

The register guide and guide rail are shifted parallel to the operator side.

Counterclockwise direction of rotation (-).

The register guide and guide rail are shifted parallel to the drive side.

- ✓ Precise adjustment is adjusted.

Adjusting the guide rail

How to adjust the guide rail:

- 1) Loosen the knurled screw (1).
 - 2) Adjust the guide rail (2) so that the sheet edge runs in the middle of the guide rail.
 - 3) Tighten the knurled screw (1).
- ✓ The guide rail is set.

**Distributing
smoother bars**

How to position the smoother bars:

- 1) Select the number of smoothers (3) according to the sheet format.
 - 2) Open the knurled screws on the smoothers (3).
 - 3) Distribute the smoothers evenly (3).
 - 4) Hook the smoothers (3) into the sheet guide plate of the parallel fold using the plate springs.
 - 5) Tighten the knurled screws on the smoothers (3).
- ✓ The smoothers are distributed.

8.6.6 Adjusting the angle for the fold rollers

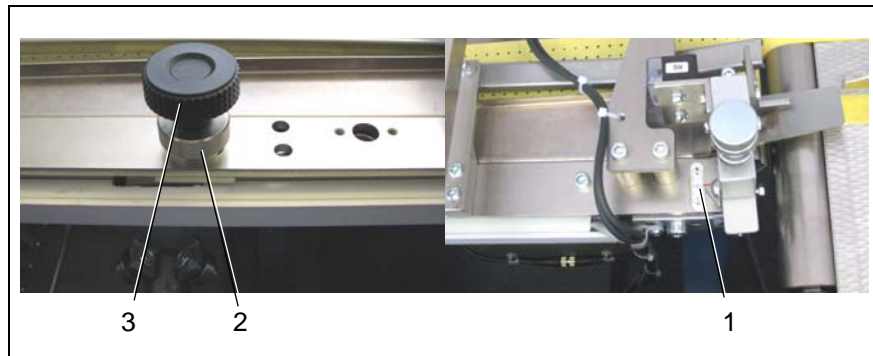


Figure 129: Adjusting the angle for the fold rollers

Basic setting of the angle

How to make the basic setting:

- 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 adjusted.

Adjustment for tilt of the fold

How to adjust the angle:

- ▷ 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.
- ✓ The angle is adjusted.

8.6.7 Adjusting the vacuum

The register table has a separate vacuum pump.
It runs automatically after the <Start Machine> button has been pressed.



Figure 130: Adjusting the vacuum

- Adjusting the vacuum** How to set the vacuum:
- ▷ Adjust the vacuum with the input field (1) so that the sheet lies parallel to the register rail.
 - You can check this through the inspection window (3) at the end of the register guide.
 - ✓ The vacuum is adjusted.
- Reducing the vacuum** The vacuum in the transfer area to the fold rollers can be reduced for large and long formats.
- How to reduce the vacuum:
- ▷ Reduce vacuum by pushing the lever (3) in the direction <-> (feeder).
 - ✓ The vacuum is reduced.



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

8.7 Adjusting the parallel fold

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!

Pull back/remove the buckle plates/sheet deflectors when the machine is running.

The exposed, rotating fold rollers and slitter shafts make up hazardous entanglement zones.

Non-observance could result in serious injury or death.

- Never reach into the fold rollers and slitter shafts while the machine is running.
- All adjustment or testing/inspection work may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.
- Always have the adjustment or testing/inspection work carried out by one individual person only.
- There are also entanglement and crushing hazards when turning the machine with the safety handwheel!



CAUTION!

Stop screws adjusted.

Non-observance could result in serious property damage to the buckle plates and folding units.

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



CAUTION!

Incorrectly fixed buckle plates.

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

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

8.7.1 Adjusting the roller pressure (standard)

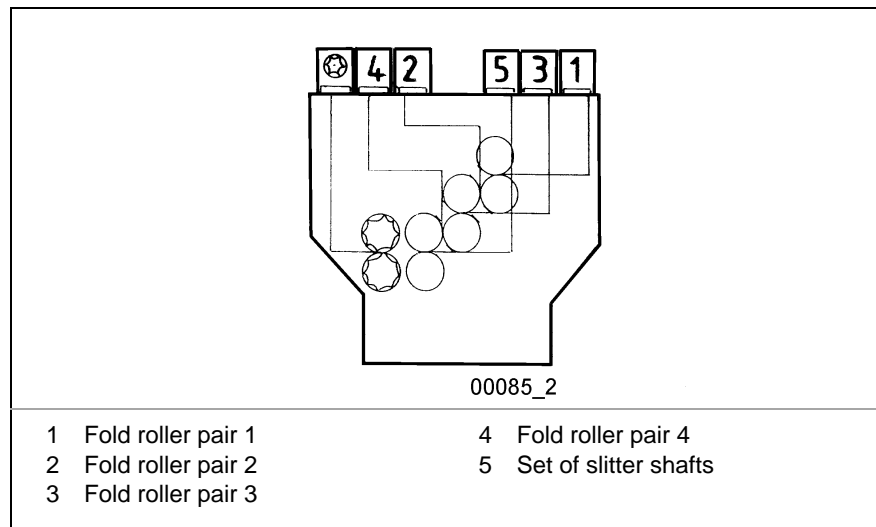


Figure 131: Parallelfold roller diagram

The roller diagram is on the side wall of the parallel fold and serves as an adjustment aid.

It shows the fold rollers and slitter shafts with the associated setting elements.

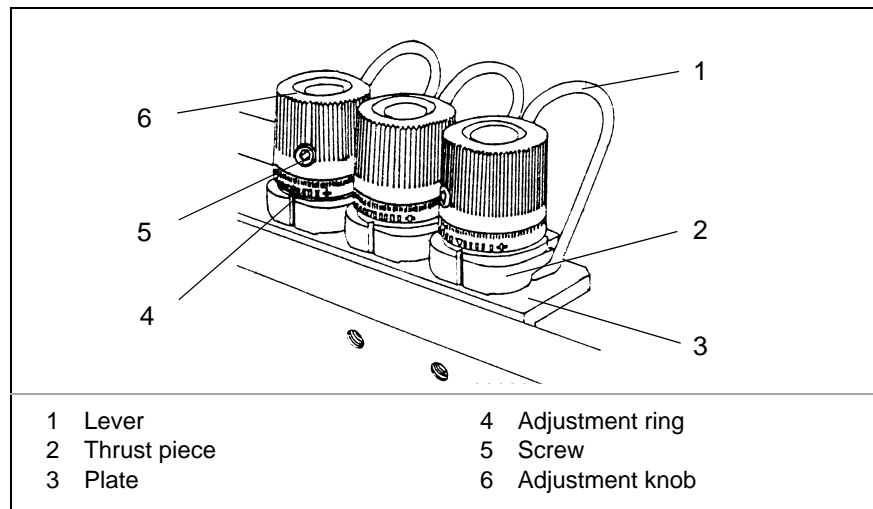


Figure 132: Setting of fold rollers and slitter shafts

To achieve an exact fold, the roller pressure on the fold rollers and the slitter shafts must be set correctly.

**Basic setting
roller pressure**

How to make the basic setting:

- 1) Stop machine and secure against switching on.
- 2) Press the EMERGENCY STOP palm button.
- 3) Pull back/remove the buckle plates.

See safety messages under heading "8.7 Adjusting the parallel fold".

- 4) Use the <Parallel fold> roller diagram to orient yourself.
- 5) Begin with the 1st roller pair.
- 6) Press the lever (1) downwards.
- 7) Place a strip of the paper to be processed between the thrust piece (2) and plate (3).

Place under both sides equally.

- 8) Place a longer strip of paper (format approx. 5 x 20 cm) on the roller gap to be set.
- 9) Hold the strip of paper fast with your hand.
- 10) Use the safety handwheel to turn the machine forwards.
- 11) Check the roller pressure across the entire roller width.
- 12) Set the required roller pressure across the entire roller width by turning the adjustment knobs (6) on both sides of the parallel fold equally.

Turning clockwise (+) = roller pressure is reduced.

Turning counter-clockwise (-) = roller pressure is increased.

- 13) Adjust the other roller pairs and the slitter shaft in the same way.
- 14) Replace buckle plates.

See chapter "8.7.4 Inserting the buckle plates"

✓ The basic setting is adjusted.



Always complete settings with a turn of the adjustment knob (6) clockwise (+). (roller pressure is getting looser). This way, an even roller pressure is guaranteed with 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.

How to mark the basic setting:

- ▷ Turn the set collar (4) until its arrow matches the marking on the thrust piece (2).
- ✓ The basic setting 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.

How to set the rollers:

- ▷ 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 rollers are adjusted.



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

- Folding imposition calculation.
See chapter "8.4.7.2 Quick Mode".
- Heed setting instructions for the parallel folding.
See chapter "8.14 Identification and handling of malfunctions".

Securing adjustment knobs against twisting

How to lock the adjustment knobs:

- ▷ Tighten the screws (5) on the adjustment knobs (6).
- ✓ The adjustment knobs (6) are secured.



Do not tighten the screws (5) too much; otherwise you may damage the adjustment knobs (6).

8.7.2 Changing the fold roller setting (automatic)



The fold rollers are adjusted automatically during the selection of a new folding imposition.
See Chapter "8.4.7 Selecting a folding imposition"

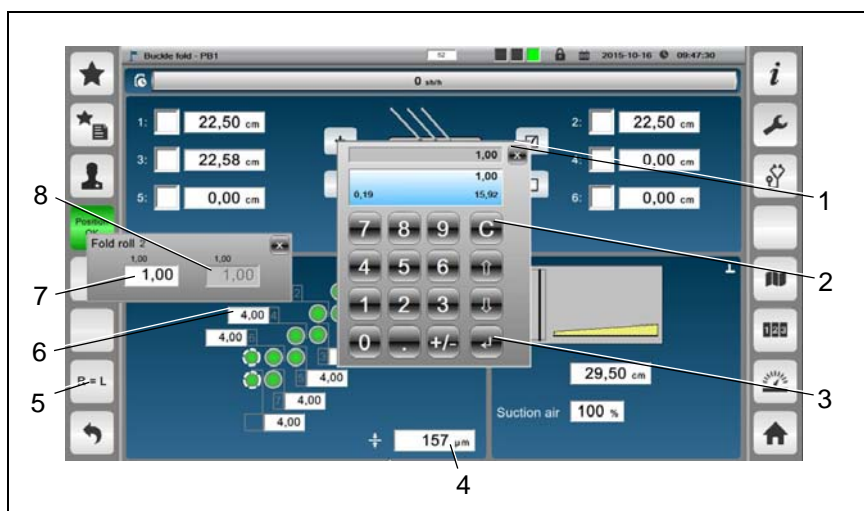


Figure 133: Changing the fold roller adjustment, change slitser shafts



All fold rollers that:

- are not in the target position, are yellow.
- are currently being positioned, are blue.
- are at the target position, are green.

Changing the roller setting

How to change the roller setting:

Change both sides evenly:

- ▷ Press the button (5) until the **R=L** symbol appears on the button.
- ▷ Press the input field (6).
A selection window is opened.
- ▷ Press the input field (7).
A numeric input keyboard is opened.
- ▷ Enter the new value for both sides.
- ▷ Press the <Enter> button (3) to complete the input.
- ✓ Both sides are changed equally.

Change both sides unevenly:

- ▷ Press the button (5) until the **R≠L** symbol appears on the button.
- ▷ Press the input field (6).
A selection window is opened.
- ▷ Press the input field (7).
A numeric input keyboard is opened.
- ▷ Enter the new value for the left-hand side.

- ▷ Press the <Enter> button (3) to complete the input.
- ▷ Press the input field (8).
- A numeric input keyboard is opened.
- ▷ Enter the new value for the right-hand side.
- ▷ Press the <Enter> button (3) to complete the input.
- ✓ Both sides are changed unevenly.



The input changes only become effective when the machine is restarted.

8.7.3 Buckle plate positions

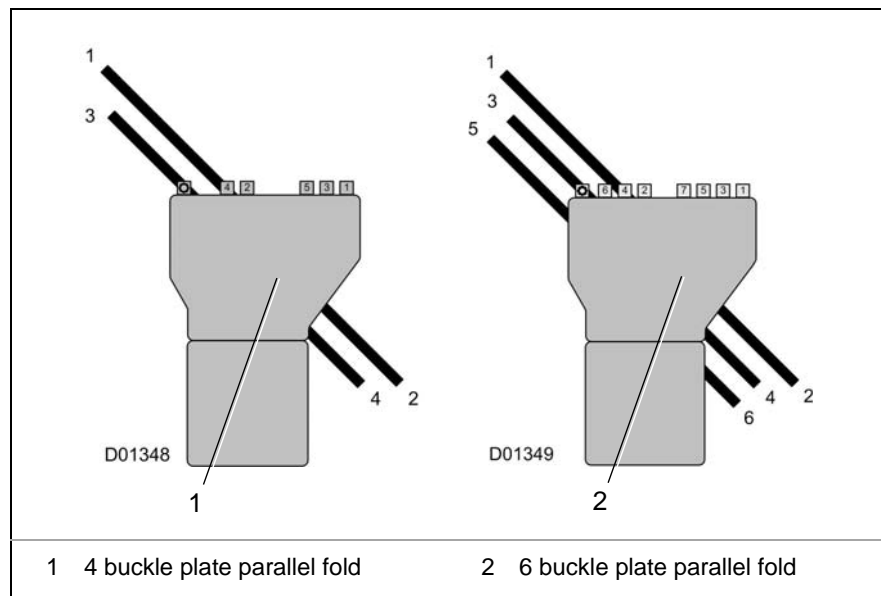


Figure 134: Buckle plate positions

The upper buckle plates have an uneven numbering.
The lower buckle plates have an even numbering.

8.7.4 Inserting the buckle plates



WARNING!

Inserting the buckle plates when the machine is running.
The exposed, rotating fold rollers and slitter shafts make up hazardous entanglement zones.

Non-observance could result in serious injury or death.

- All adjustment or testing/inspection work may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.
- Always have the adjustment or testing/inspection work carried out by one individual person only.
- There are also entanglement and crushing hazards when turning the machine with the safety handwheel!



CAUTION!

Incorrectly fixed buckle plates.

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

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

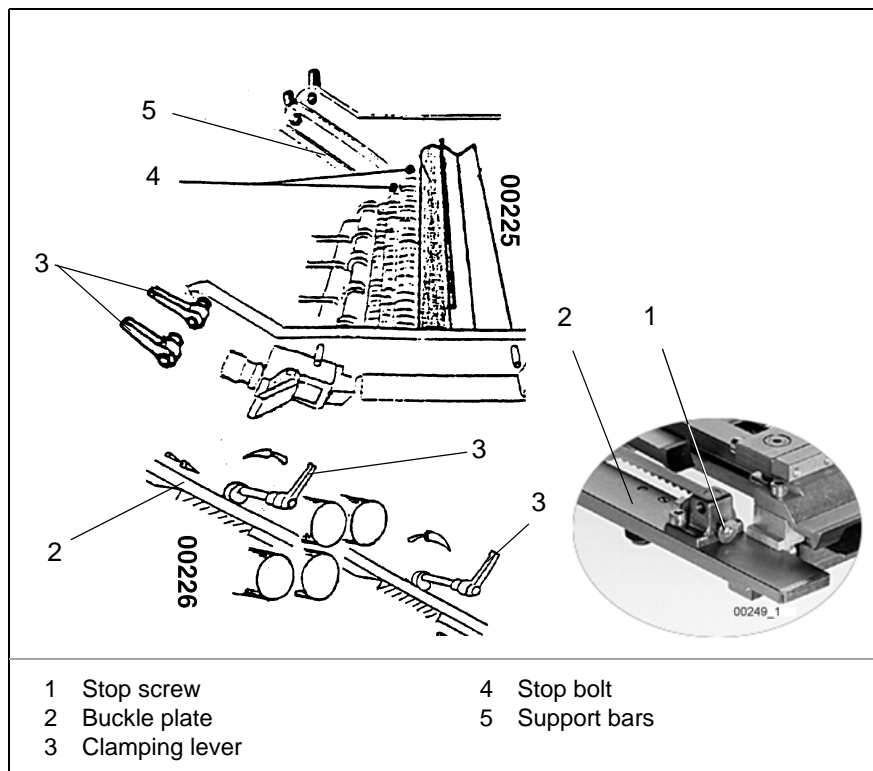


Figure 135: Buckle plates

How to insert a buckle plate:

- 1) Stop machine and secure against switching on.
Press the EMERGENCY STOP palm button.
 - 2) Pull the clamping lever (3) outwards.
 - 3) Push buckle plate (2) in until the stop screw (1) lies on the stop pin(4).
 - 4) Clamp the buckle plate (2) with the clamping lever (3).
- ✓ The buckle plate is inserted.



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

8.7.5 Pull back/remove the buckle plates



WARNING!

Pull back/remove the buckle plates/sheet deflectors when the machine is running.

The exposed, rotating fold rollers and slitter shafts make up hazardous entanglement zones.

Non-observance could result in serious injury or death.

- Never reach into the fold rollers and slitter shafts while the machine is running.
 - All adjustment or testing/inspection work may be carried out only when the machine is stopped and secured against switching on.
 - Press the EMERGENCY STOP palm button.
 - Always have the adjustment or testing/inspection work carried out by one individual person only.
 - There are also entanglement and crushing hazards when turning the machine with the safety handwheel!
-



CAUTION!

Incorrectly fixed buckle plates.

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

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

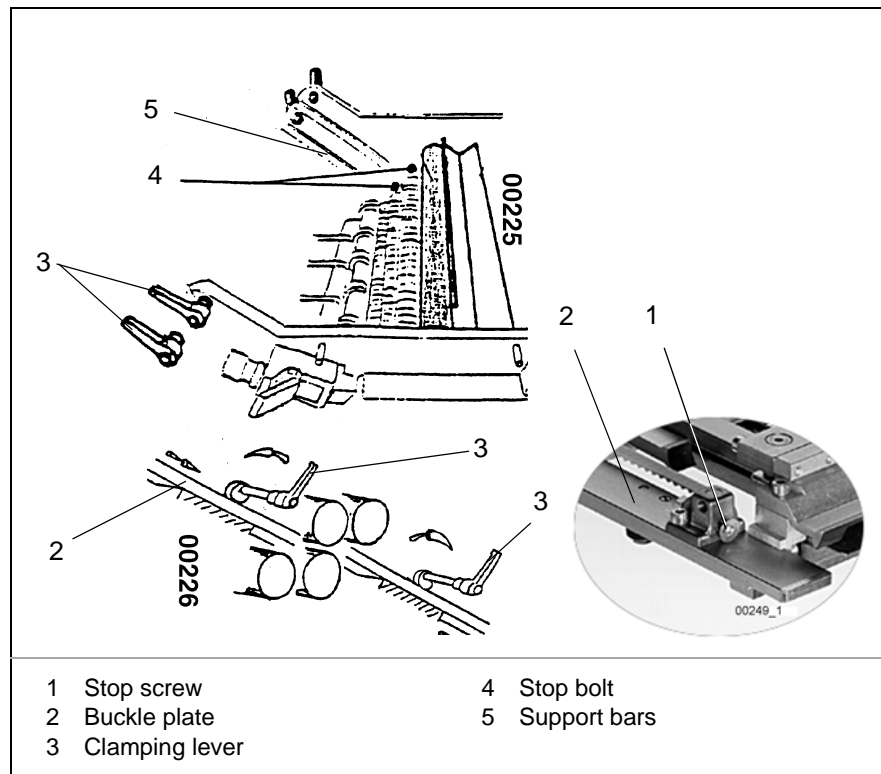


Figure 136: Pulling out/removing buckle plates

Pulling back the buckle plate

How to pull back a buckle plate:

- 1) Stop machine and secure against switching on.
Press the EMERGENCY STOP palm button.
 - 2) Loosen the clamping lever (3).
 - 3) Pull back buckle plate (2) up to the stop.
 - 4) Clamp the buckle plate (2) with the clamping lever (3).
- ✓ The buckle plate is pulled back.



Use the clamping lever eccentric to press the buckle plates (2) in the direction of the fold rollers.

Removing the buckle plate

How to remove a buckle plate:

- 1) Stop machine and secure against switching on.
Press the EMERGENCY STOP palm button.
 - 2) Loosen the clamping lever (3).
 - 3) Pull the clamping lever (3) outwards.
 - 4) Pull out the buckle plate (2).
 - 5) Place the buckle plate (2) correctly.
- ✓ The buckle plate is removed.

8.7.6 Adjusting the buckle plates (standard)



WARNING!

Pull back/remove the buckle plates/sheet deflectors when the machine is running.

The exposed, rotating fold rollers and slitter shafts make up hazardous entanglement zones.

Non-observance could result in serious injury or death.

- Never reach into the fold rollers and slitter shafts while the machine is running.
 - All adjustment or testing/inspection work may be carried out only when the machine is stopped and secured against switching on.
 - Press the EMERGENCY STOP palm button.
 - Always have the adjustment or testing/inspection work carried out by one individual person only.
 - There are also entanglement and crushing hazards when turning the machine with the safety handwheel!
-



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).

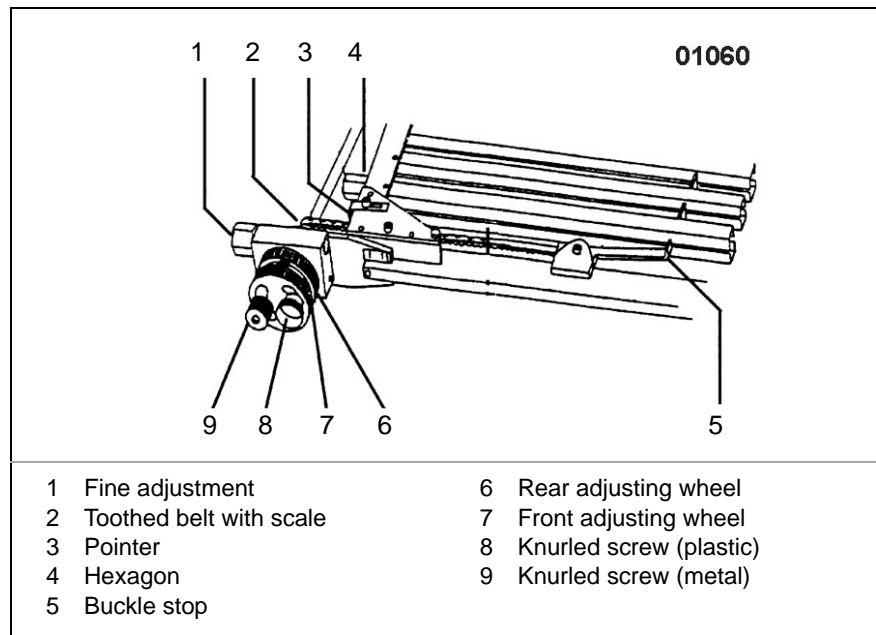
8.7.6.1 Adjusting the folding length (standard):


Figure 137: Adjusting the folding length

Adjusting the folding length

How to set the folding length:

- ▷ Loosen the knurled screw (metal) (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 knurled screw (metal) (9).
- ✓ The folding length is adjusted.

Setting the fine adjustment

How to adjust the fine adjustment:

- ▷ 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 adjustment is adjusted.

8.7.6.2 Adjusting the angle of the buckle stop (standard)

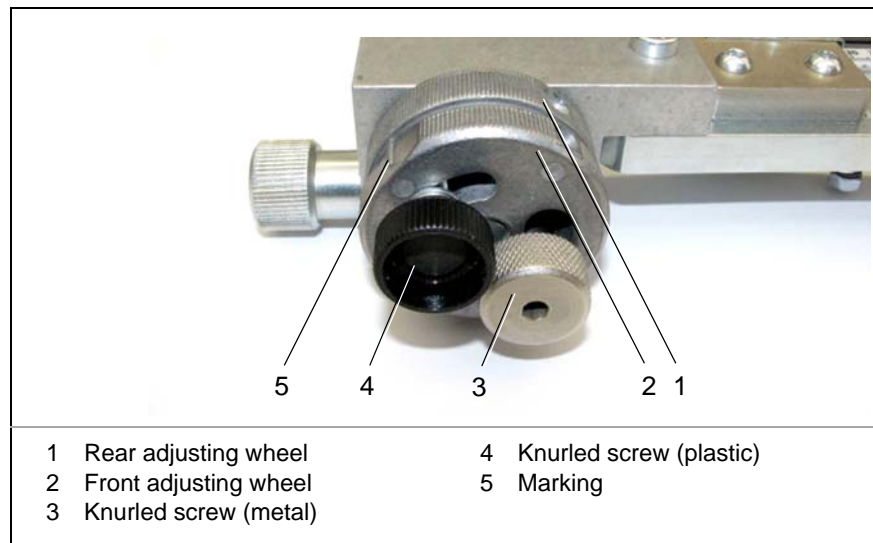


Figure 138: Adjusting the angle of the sheet stop.

Adjusting the angle

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

How to adjust the angle:

- ▷ Loosen the knurled screw (plastic) (4).
- ▷ By turning the front adjusting wheel (2), only the plate 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 big an adjustment was made.
- ▷ Tighten the knurled screw (plastic) (4).
- ✓ Angle is adjusted.

Adjusting the basic setting

How to make the basic setting:

- ▷ Loosen the knurled screw (plastic) (4).
- ▷ Turn the front adjusting wheel (2) so that the markings (5) on both adjusting wheels are above one another.
- ▷ Tighten the knurled screw (plastic) (4).
- ✓ The basic setting is adjusted.



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

8.7.6.3 Activating sheet deflector function (standard)

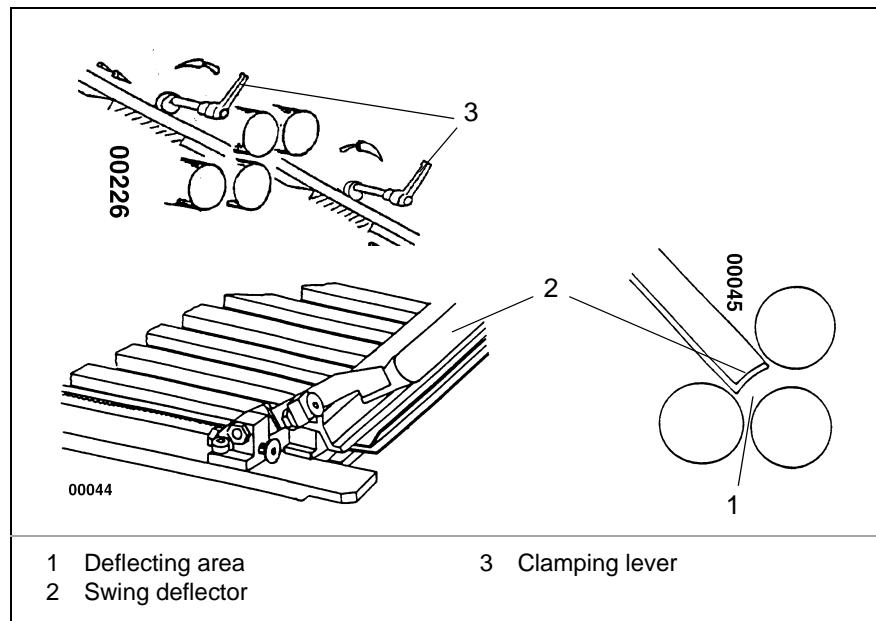


Figure 139: Activating the sheet deflector function.

The standard buckle plates are equipped with swing deflectors (2).
For buckle plates that are not needed, the sheet deflectors (2) must be reversed.

How to activate the sheet deflector function:

- 1) Stop machine and secure against switching on.
Press the EMERGENCY STOP palm button.
See safety instruction under heading "8.7.6 Adjusting the buckle plates (standard)".
 - 2) Loosen the clamping lever (3).
 - 3) Pull back unneeded buckle plates.
 - 4) Reverse the installed sheet deflector (2).
 - 5) Push the buckle plate forwards.
 - 6) Tighten the clamping lever (3).
- ✓ The sheet deflector function is activated.

8.7.6.4 Adjusting the lower plate lip

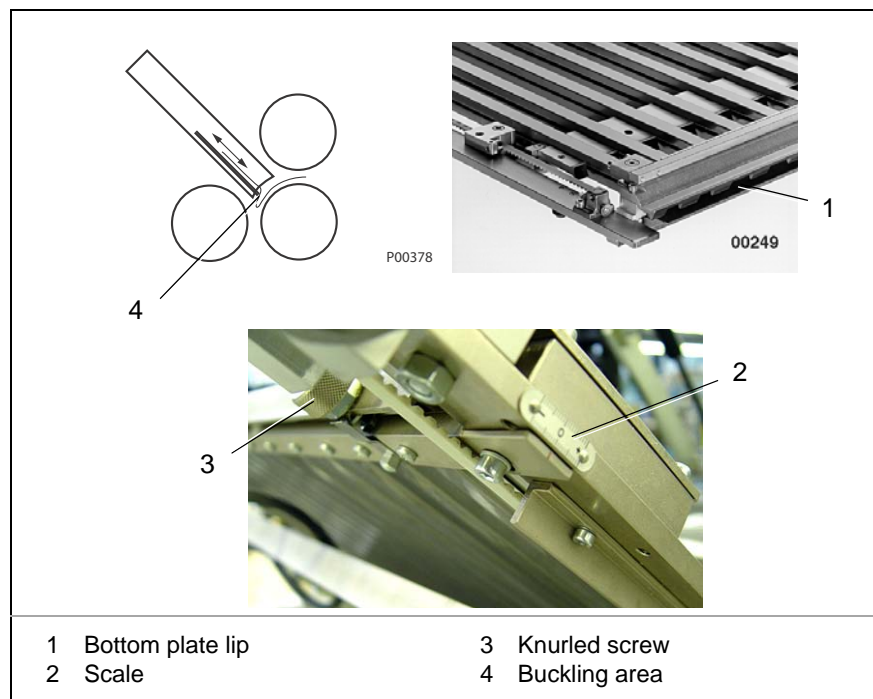


Figure 140: Adjusting the lower plate lip

Depending on the paper thickness, fold type, and properties of the front edge of the sheet, it may be necessary to enlarge or reduce the size of the buckling area (4).

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

How to set the lower plate lip:

- 1) The adjustment must be undertaken in small steps on both sides equally.
 - 2) You can use the scales (2) on the right and left to check the adjustment.
 - 3) Turn the knurled screw (3).
 - Turn to the right = buckling area (4) becomes larger.
 - Turn to the left = buckling area (4) becomes smaller.
- ✓ The lower plate lip is adjusted.



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 the lower plate lip (1) towards the fold rollers.

Adjusting the basic setting

How to make the basic setting:

- ▷ The adjustment must be undertaken in small steps on both sides equally.
 - ▷ Turn both knurled screws (3) until both scales (2) are on zero.
- ✓ The basic setting is adjusted.

Pre-tensioning the bottom plate lip

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

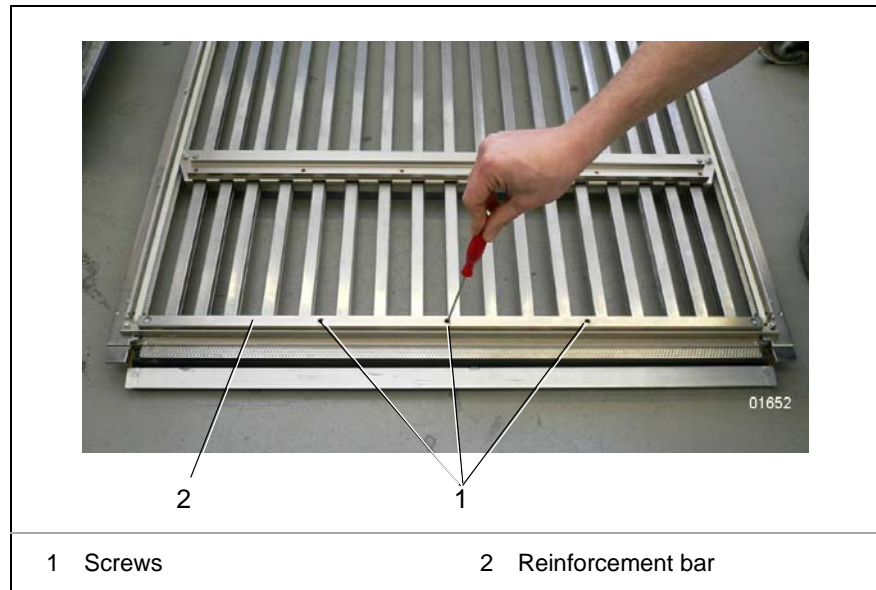


Figure 141: Pre-tensioning the bottom plate lip

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

How to adjust the set the pretension:

- 1) Stop machine and secure against switching on.
Press the EMERGENCY STOP palm button.
See safety instruction under heading "8.7.6 Adjusting the buckle plates (standard)".
 - 2) Pull back/remove the buckle plate.
See safety instruction under heading "8.7.6 Adjusting the buckle plates (standard)".
 - 3) The setting must be made with the outer screws on both sides equally.
 - 4) Turn the knurled screw (1).
 - 5) Turn to the right = pretension is increased.
 - 6) Turn to the left = pretension is decreased.
- ✓ The pretension is adjusted.

Adjusting the basic setting

How to make the basic setting:

- ▷ Turn the screws (1) to the left until they are flush with the surface of the reinforcement bar (2).
Visual inspection: The reinforcement bar (2) must be straight.



It may also be necessary to enlarge the inner width.

8.7.6.5 Setting of the inner width

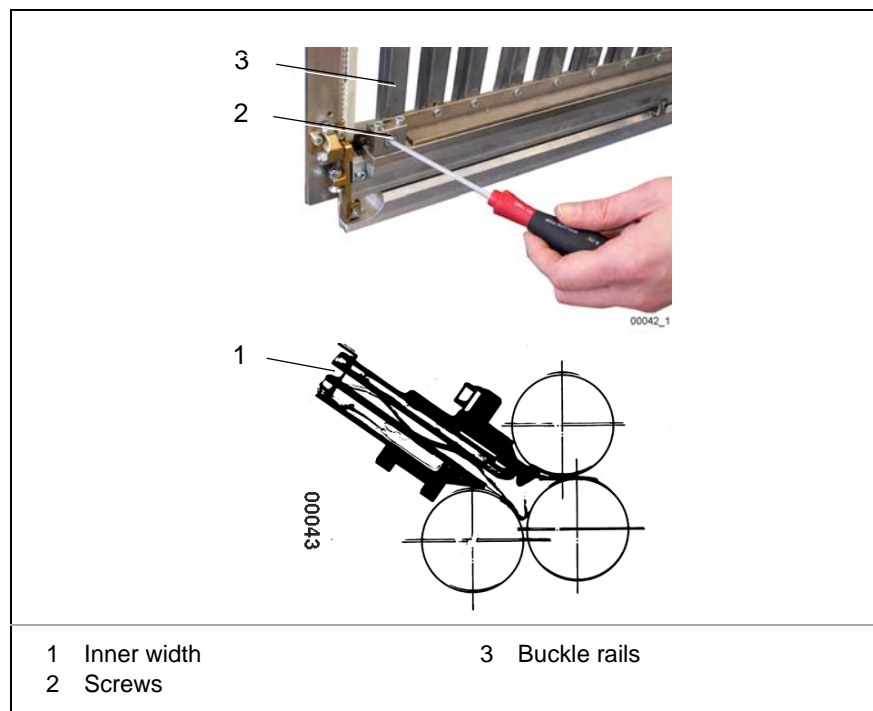


Figure 142: Setting of the inner width

Depending on paper properties, paper thickness, fold type, and working speed, the "inner width" (1) must be set.

The "inner width" (1) is the distance between the upper and lower bars (3).

How to set the "inner width":

- 1) Stop machine and secure against switching on.
Press the EMERGENCY STOP palm button.
 - 2) Pull back/remove the buckle plate.
See safety instruction under heading "8.7.6 Adjusting the buckle plates (standard)".
 - 3) The adjustment must be made on 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 adjusted.

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.

8.7.6.6 Increasing the deflecting area/buckling area

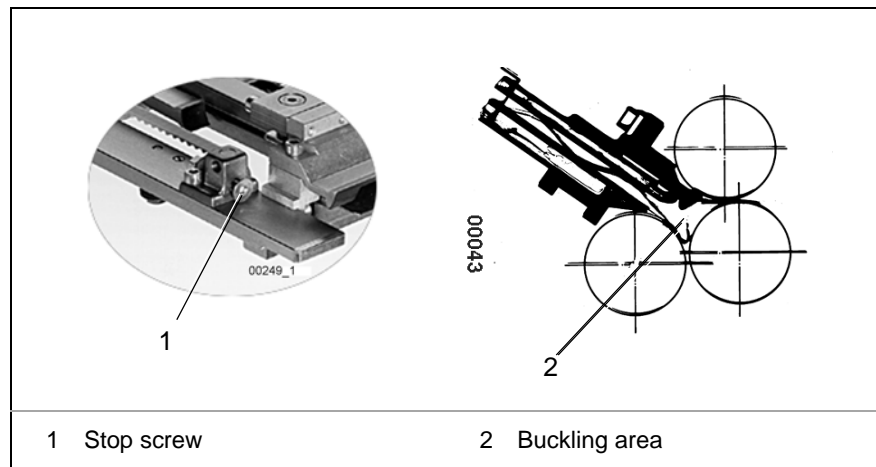


Figure 143: Increase the deflecting area/buckling area.

Depending on the product thickness, it is possible that the buckling area/deflecting area must 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).

Increasing the deflecting area/buckling area

How to increase the buckling area/deflecting area:

- 1) Stop machine and secure against switching on.
Press the EMERGENCY STOP palm button.
See safety instruction under heading "8.7.6 Adjusting the buckle plates (standard)".
 - 2) Pull back the buckle plate/sheet deflector a little or clamp strips of carton or several paper thicknesses between the stop pins and stop screw (1).
 - 3) Adjust both sides equally.
- ✓ The deflecting area/buckling area is increased.

8.7.7 Adjusting the buckle plates (automatic)



WARNING!

Pull back/remove the buckle plates/sheet deflectors when the machine is running.

The exposed, rotating fold rollers and slitter shafts make up hazardous entanglement zones.

Non-observance could result in serious injury or death.

- Never reach into the fold rollers and slitter shafts while the machine is running.
- All adjustment or testing/inspection work may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.
- Always have the adjustment or testing/inspection work carried out by one individual person only.
- There are also entanglement and crushing hazards when turning the machine with the safety handwheel!



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).

8.7.7.1 Correcting the folding length (automatic)



The folding lengths of the buckle plates are calculated automatically when selecting a new folding imposition. See Chapter "8.4.7 Selecting a folding imposition"



CAUTION!

Crushing hazard during automated format change.

Non-observance could result in personal injury.

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 on the machine.

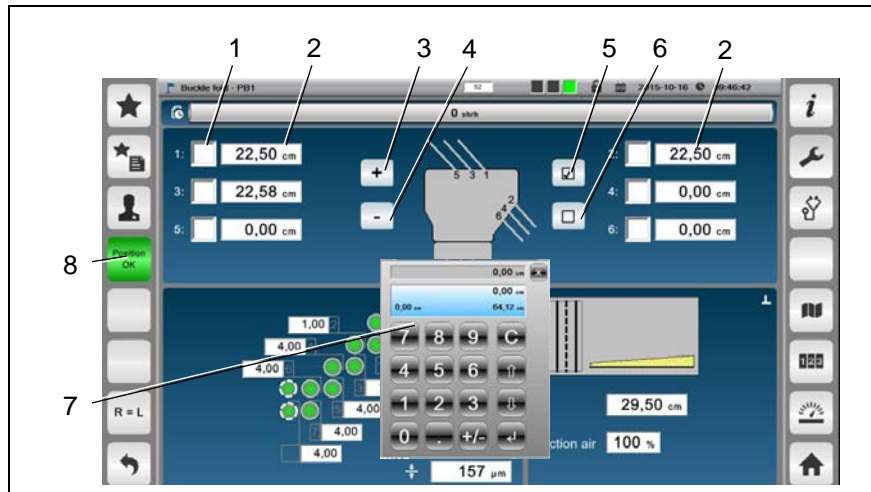
Changing calculated folding lengths manually


Figure 144: 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 corrected manually.

Selecting buckle plates

How to select the buckle plates:

- ▷ Mark the individual buckle plates by pressing the fields (1).
- ▷ Mark all buckle plates by pressing the button (5).
- ▷ Delete all marks by pressing the button (6).
- ✓ The buckle plates are selected.

Increasing the set value

How to increase the settings of the marked buckle plates:

- ▷ Press the button (3).
- With each press, the value is increased by 0.1 mm.
- ✓ The settings are increased.

Reducing the set value

How to reduce the settings of the marked buckle plates:

- ▷ Press the button (4).
- With each press, the value is reduced by 0.1 mm.
- ✓ The settings are reduced.

Large changes

How to make large changes:

- ▷ Press the input field (2).
- A numeric input keyboard (7) is opened.
- Enter the desired value.
- ✓ Large changes are made.

Repositioning sheet stops

How to re-position the sheet stops:

- ▷ Press the <Start> button (8).
- ✓ The sheet stops are positioned to the values entered.

8.7.7.2 Adjusting the angle of the sheet stop (automatic)

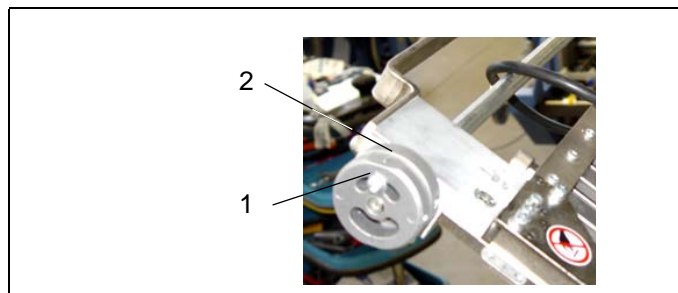


Figure 145: Modification of the sheet stop angle

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

Adjusting the angle

How to adjust the angle:

- ▷ 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).
- ✓ Angle is adjusted.

Adjusting the basic setting

How to adjust the basic setting:

- ▷ Loosen the screw (1).
- ▷ Turn the rear adjusting wheel (2) so that the markings on the two adjusting wheels are above one another.
- ▷ Tighten the screw (1).
- ✓ The basic setting is adjusted.



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

8.7.7.3 Activating sheet deflector function (automatic)

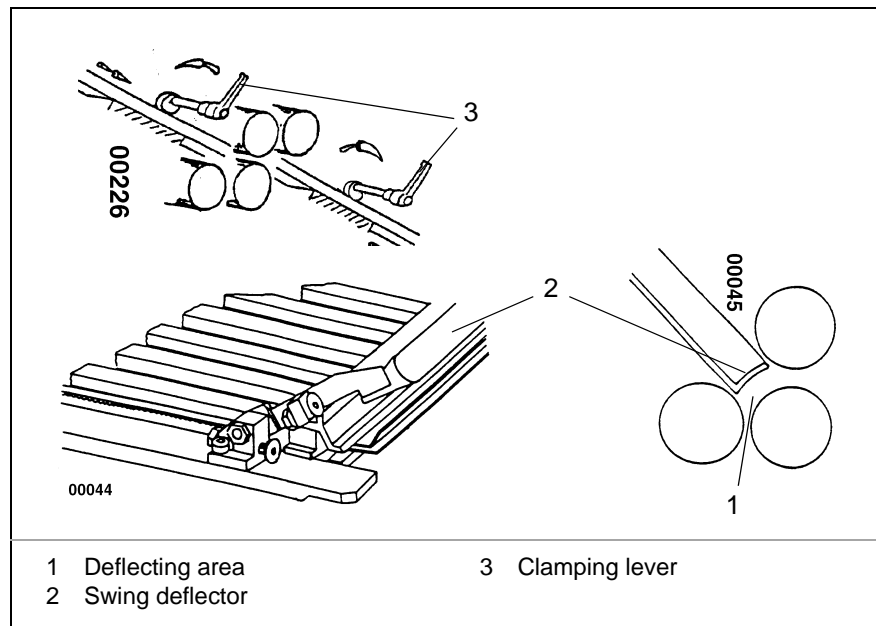


Figure 146: Activating sheet deflector function

The first buckle plate is equipped with a swing deflector (2).
 If the first buckle plate is not needed, the sheet deflector (2) has to be reversed.

How to activate the sheet deflector function:

- 1) Stop machine and secure against switching on.
 Press the EMERGENCY STOP palm button.
 See safety instruction under heading "8.7.7 Adjusting the buckle plates (automatic)".
 - 2) Loosen the clamping lever (3).
 - 3) Pull back the first buckle plate.
 - 4) Reverse the installed sheet deflector (2).
 - 5) Push the buckle plate forwards.
 - 6) Tighten the clamping lever (3).
- ✓ The sheet deflector function is activated.

8.7.7.4 Additional settings of the buckle plates (automatic)

Additional settings of the buckle plates (automatic) are identical to the settings of the buckle plates (standard).
 See chapter "8.7.6 Adjusting the buckle plates (standard)".

8.7.8 Adjusting the FTK combination buckle plate

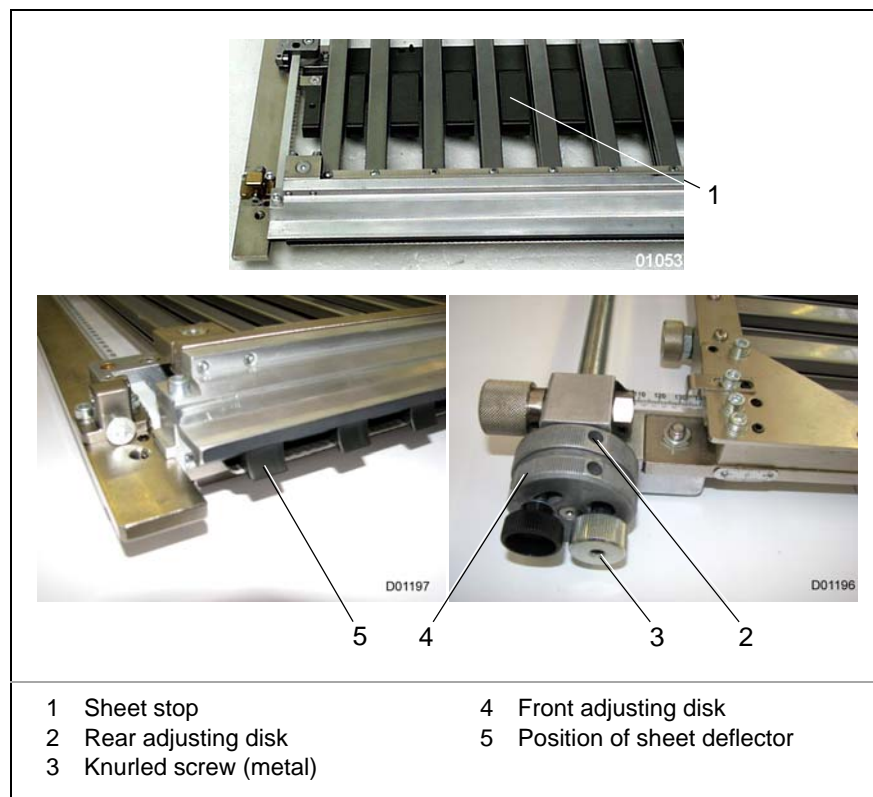


Figure 147: Combination buckle plate

With this type of buckle plate, the swing deflector is omitted. The sheet stop (1) can be adjusted as far in the direction of the fold rollers that it assumes the sheet 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 "8.7.6 Adjusting the buckle plates (standard)"

Sheet deflector function

Move the sheet stop (1) up to the sheet deflector position (5).

How to activate the sheet deflector function:

- ▷ Loosen the knurled screw (metal) (3).
- ▷ Turn the rear adjusting disk (2) until the sheet stop (1) is in the sheet deflector position (5).
 - Upper buckle plates 1, 3, 5. = turn right
 - Lower buckle plates 2, 4, 6. = turn left
- ▷ Tighten the knurled screw (metal) (3).
- ✓ The sheet deflector function is activated.

8.7.9 Correcting skewed perforation



WARNING!

Pull back/remove the buckle plates/sheet deflectors when the machine is running.

The exposed, rotating fold rollers and slitter shafts make up hazardous entanglement zones.

Non-observance could result in serious injury or death.

- Never reach into the fold rollers and slitter shafts while the machine is running.
- All adjustment or testing/inspection work may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.
- Always have the adjustment or testing/inspection work carried out by one individual person only.
- There are also entanglement and crushing hazards when turning the machine with the safety handwheel!

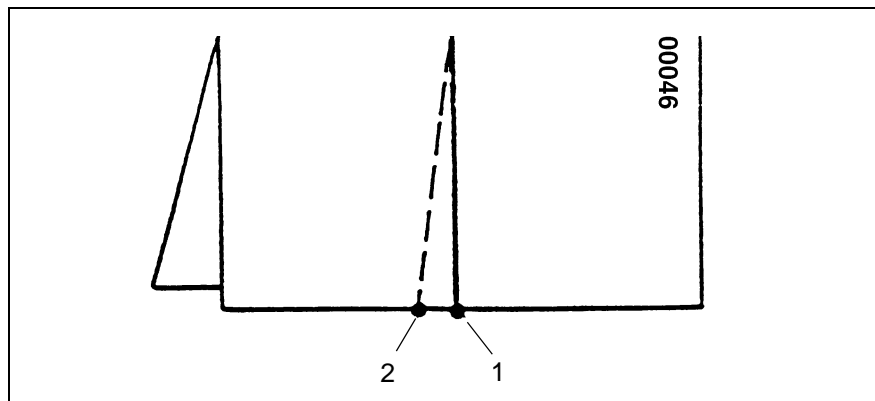


Figure 148: Correcting skewed perforation

Skewed perforations, creasing or cuts (2) can be corrected by pulling out a sheet deflector on one side.

How to correct a skewed perforation:

- 1) Stop machine and secure against switching on.
Press the EMERGENCY STOP palm button.
 - 2) Pull the last sheet deflector out a little on one side.
Check the result with a new sheet and correct if necessary.
- ✓ The skewed perforation is corrected.



- The adjustment of the stop screws may not be changed (factory setting).
- In case of deviations greater than 5 mm (0.0197 in.), distribute the setting across two sheet deflectors.

8.7.10 Installing/dismounting slitter shafts



WARNING!

Cutting hazard due to slitter shafts.

Non-observance could result in serious injury or death.

- Never reach into the slitter shafts while the machine is running.
- All work on the slitter shafts may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.
- Always wear cut-proof safety gloves and safety shoes when working on the slitter shafts.
- ▷ Always have work on the machine carried out by one individual person only.
- There is also a risk of injuries when turning the machine with the safety handwheel.
- Always hold the slitter shaft on the shaft and not on the tool.

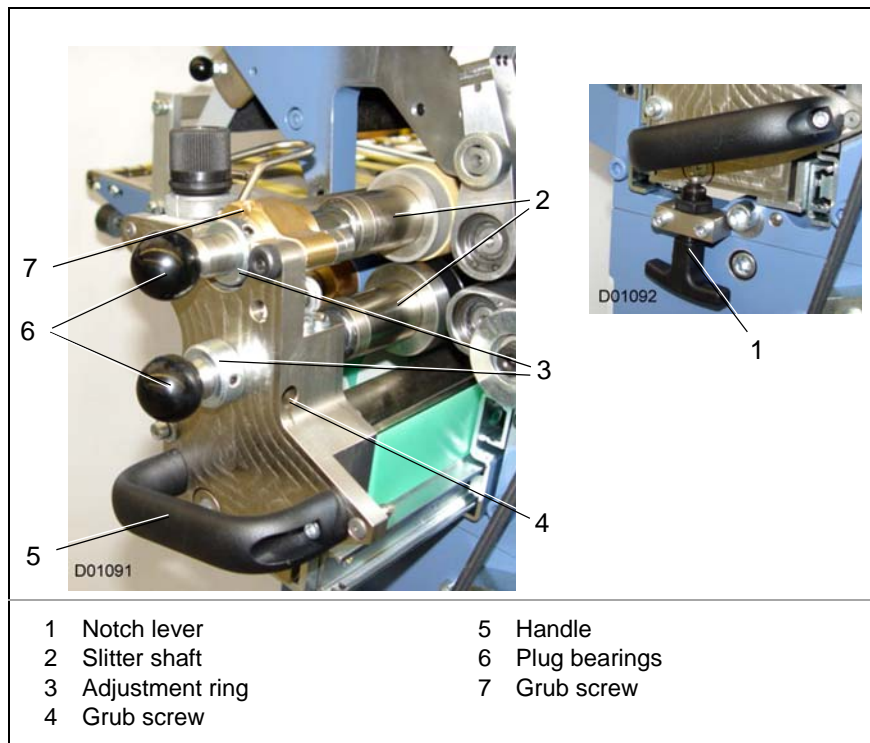


Figure 149: Slitter shaft cassette

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 re-mounting.

Removing a slitter shaft

How to remove the slitter shafts:

- ▷ 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 key SW4.

- ▷ Pull out the plug bearings (6).
- ▷ Remove the slitter shafts (2).
- ✓ The slitter shafts are removed.

Installing a slitter shaft

How to install the slitter shafts:

- ▷ Insert 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 key SW4.
- ▷ Push the slitter shaft cassette in with the handle (1) until it snaps in.
The notch lever (1) must be fully engaged.
- ✓ The slitter shafts are installed.



The slitter shaft cassette is secured electrically.

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

8.7.10.1 Stripper cutting device

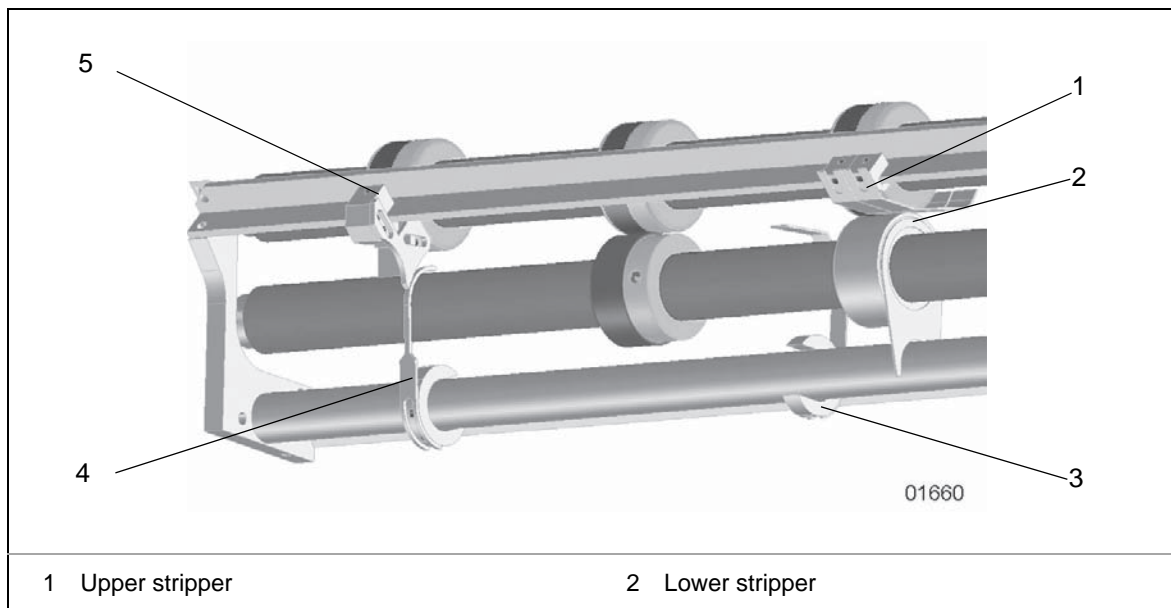


Figure 150: Stripper cutting device

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

8.7.11 Creasing, cutting and perforating devices



WARNING!

Cutting hazard due to slitter shafts.

Non-observance could result in serious injury or death.

- Never reach into the slitter shafts while the machine is running.
- All work on the slitter shafts may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.
- Always wear cut-proof safety gloves and safety shoes when working on the slitter shafts.
- ▷ Always have work on the machine carried out by one individual person only.
- There is also a risk of injuries when turning the machine with the safety handwheel.
- Always hold the slitter shaft on the shaft and not on the tool.

8.7.11.1 Perforating device

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

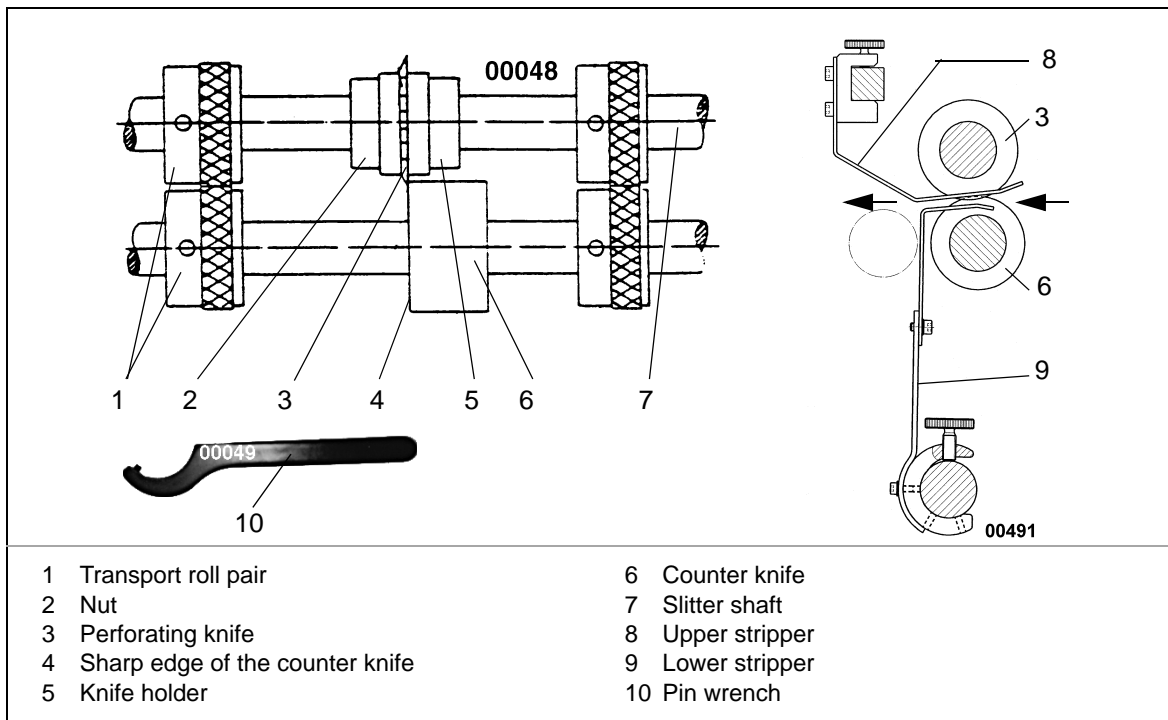


Figure 151: Application of perforating knife

How to insert the perforating knife:

- ▷ Loosen the nuts (2) with the hook wrench (10).
 - ▷ Insert the perforating disk (3) into the knife holder (5).
- The slotted knives need not be taken off the slitter shaft.

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.

When the knife holder opens when the machine is running, this can cause material damage.

- ▷ 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 disk 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.

Tooth forms

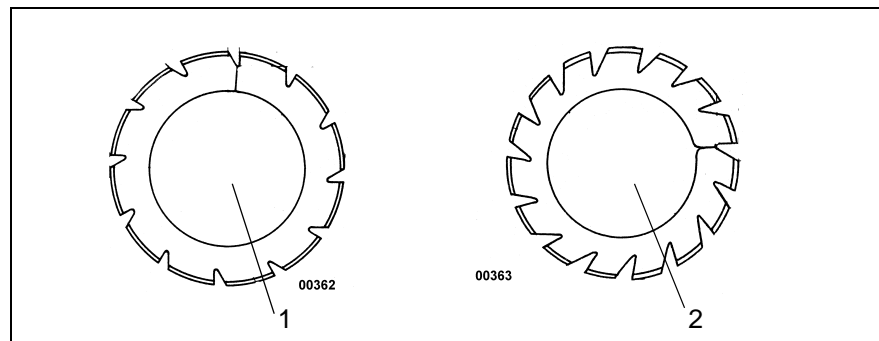


Figure 152: Tooth forms

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

8.7.11.2 V-shaped special perforating knife (option)

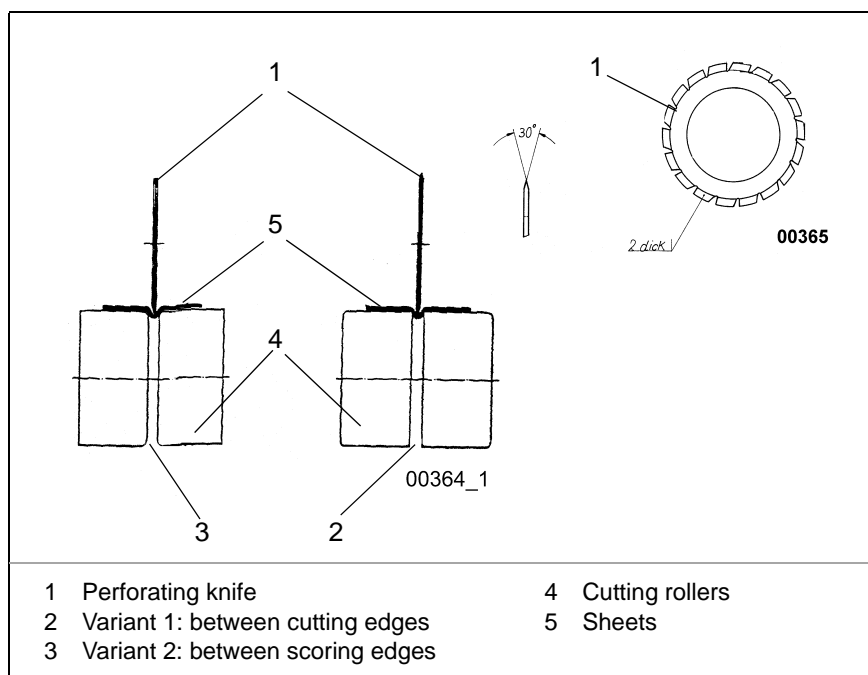


Figure 153: V-shaped special perforating knives

The V-shaped special perforating knife is used on the slitter shafts in folding unit I.

The perforating knife (1) is 1.6 mm (0.063 in.) thick, non-slotted and ground in a wedge shape on both sides. The 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 installation variant Between the cutting edges (2).

Second installation variant Between the scoring edges (3).



- Match the gap and installation method to the product to be processed.
- Cutting and scoring edges may never touch the perforating knives.
- However, the perforation cut of this knife will not be as sharp as a normal perforation.

8.7.11.3 Scoring device

Pre-scoring will be applied at crossfolds with buckle plates if no perforating is required. Such scoring ensures that the fold is established exactly in its predetermined folding point. Special scoring devices may also be applied on request.

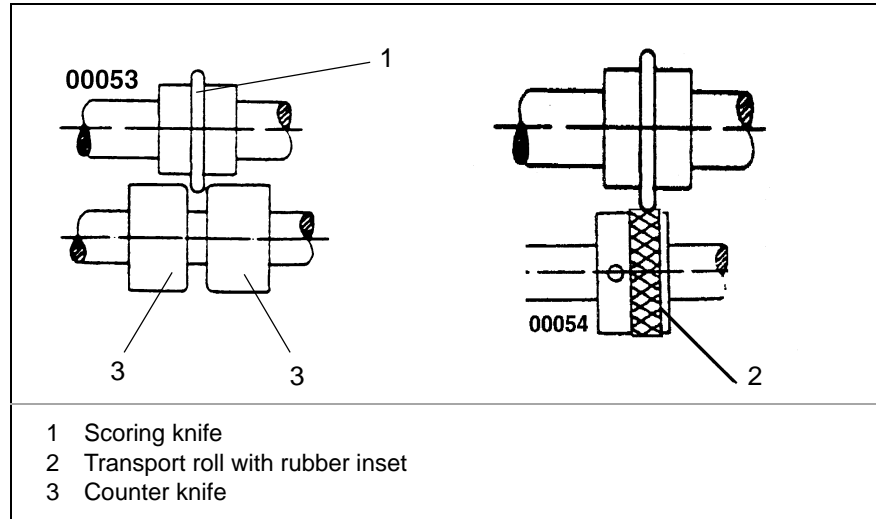


Figure 154: Setting up the scoring device.

Setting up

How to set up the scoring device:

- ▷ Set up the scoring knives (1) on the slitter shaft such that they are positioned between two transport rolls (3) or between the rounded sides of two counter-knives (3).
- ✓ The scoring device is set up.

Scoring brittle paper

How to score brittle paper:

- ▷ With brittle paper surfaces, score the paper on the rubber insert of a transport roll (2).
- ▷ Use a scoring knife with a smaller diameter.
- ✓ The brittle paper is scored.

8.7.11.4 Setting up the Super-Score device

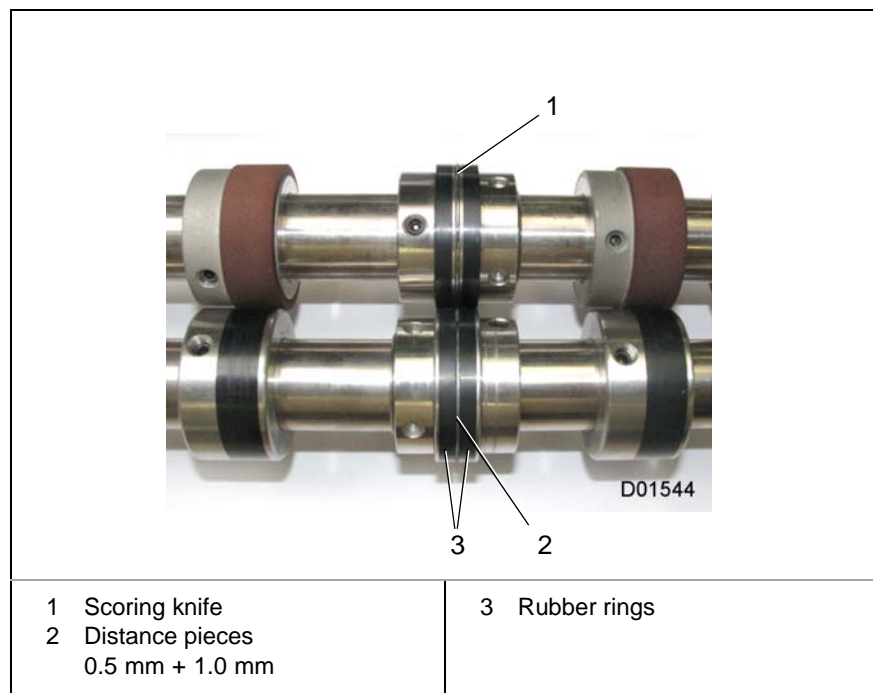


Figure 155: Super-Score device

How to set up the Super-Score device:

▷ Set up the Super-Score device as shown in the illustration.



- Use fewer distance pieces (2) if the rubber rings (3) are worn.
- Use more distance pieces (2) if the paper is cut during scoring.

8.7.11.5 Slitting device

Folded sheets can be cut with the cutting device.

Separator cut for multiple-up production

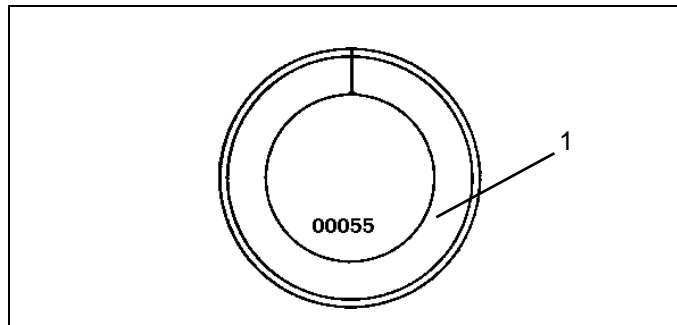


Figure 156: Cutting knives

How to set up a separator cut:

- ▷ Use one or several slitting disk(s) (1).
- ▷ Install slitting disk (1) according to the principle of the perforating disk.

Edge trim

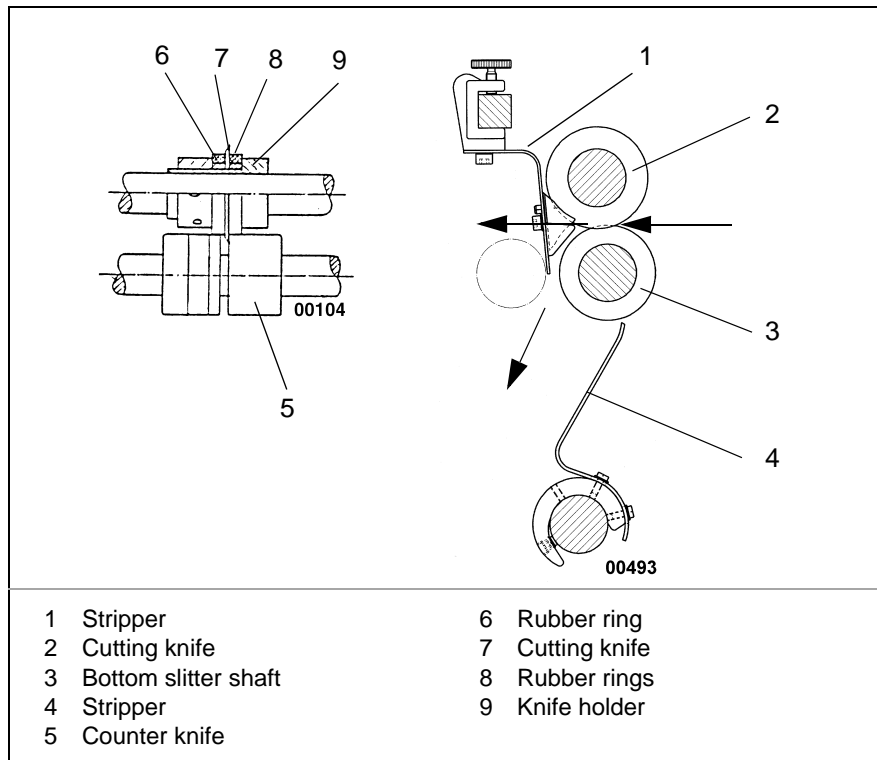


Figure 157: Strippers for edge trimming

How to set up an edge-trim:

- ▷ Insert the knife holder (9) with the rubber rings (6) and (8) as well as the slitting disks (7) into the upper slitter shaft.
- ▷ Make sure that there is a distance washer (0.5 mm) between the rubber ring (8) and slitting disk (7).
- ▷ Adjust the counter knife (5) on the bottom slitter shaft. Please follow the illustration for the proper position.
- ▷ Use strippers (1)

- ▷ Discharge the paper bits between the stripper (1) and rubber rings (6).
- ▷ Use strippers (4)

A skewed cut or poor discharged paper trim

Proceed as follows:

- ▷ Fit the knife holder (9) onto the lower slitter shaft, the slitting disk (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).
-

8.8 Adjusting the crossfold

8.8.1 Set-up of transport brushes

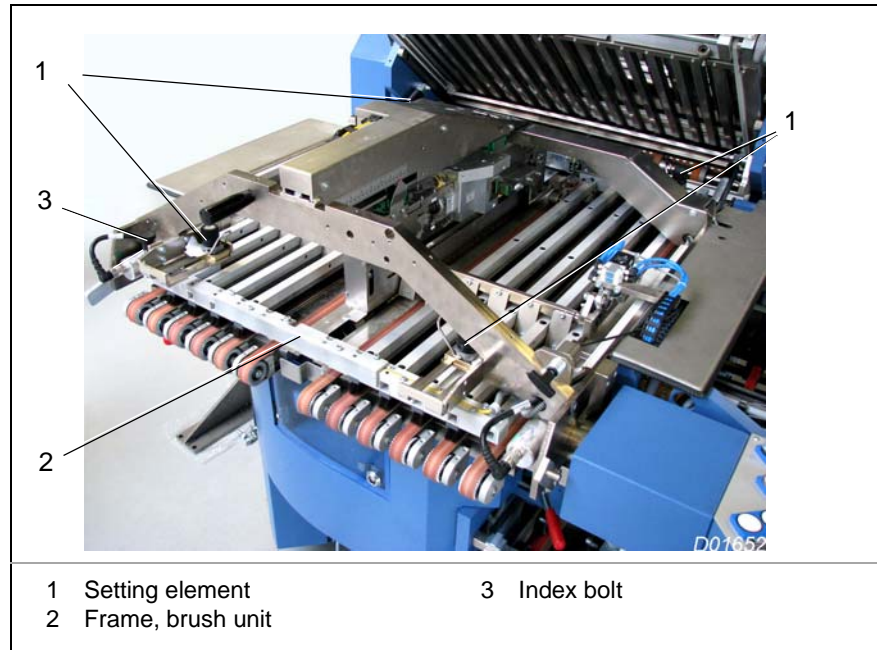


Figure 158: Set-up of transport brushes

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 at the stop. The lower the brushes are on the sheet, the more power of feed is carried out.

Set-up of transport brushes

How to adjust the transport brushes:

- ▷ Place the number of paper thicknesses of the sheet to be transported underneath all four adjusting elements (1).



In case of tensions or shafts on the stop:

- Reduce the pressure by placing several paper strips under the adjusting elements (1).
- The sheet should lie flat on the stop (depending on the fold type and paper).

Withdrawing the brush unit

- ▷ Removing the index bolt (3).
- ▷ Pull the entire brush unit on the frame (2) forwards.



This makes it easier to remove misfolded sheets.

8.8.2 Adjusting the cross fold stop (standard)

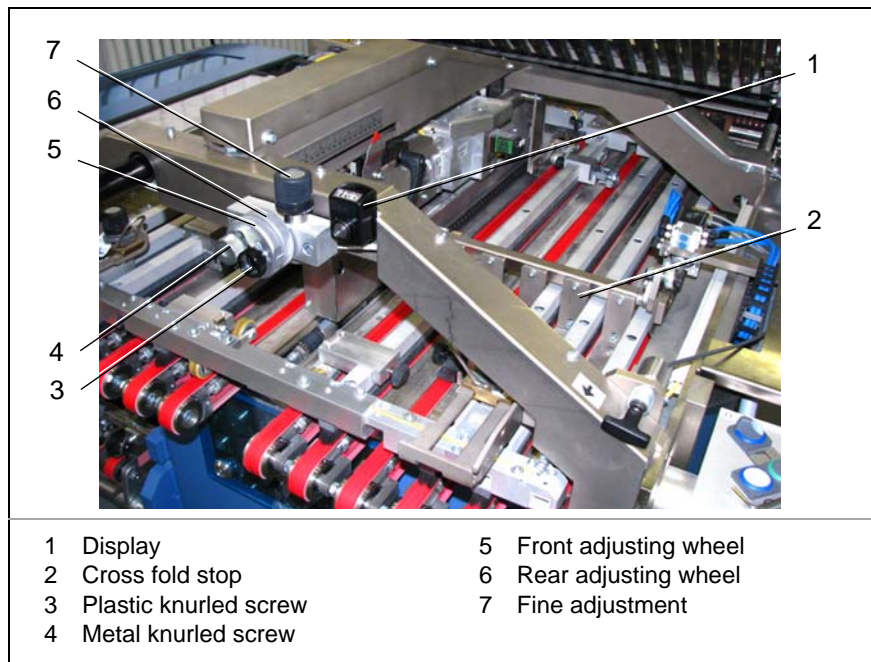


Figure 159: Adjusting the cross fold stop

Adjusting the cross fold stop

How to set the cross fold stop:

- ▷ 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).
- ▷ Carrying out precise adjustment (7).
- ✓ The crossfold stop is set.



If a folding imposition was calculated by the 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.

How to set the angle:

- ▷ 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 is adjusted.

Adjusting the basic setting

How to make the basic setting:

- ▷ 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).
- ✓ The basic setting is adjusted.



Also use the crossfold stop to change the length position of the folding knife.

Thus the transport rollers remain in the right position.

See chapter "8.8.7 Adjusting the folding knife in the lengthwise position (automatic)".

8.8.3 Adjusting the cross fold stop (automatic)



The cross fold stop is adjusted automatically during the selection of a new folding imposition. See Chapter "8.4.7 Selecting a folding imposition"

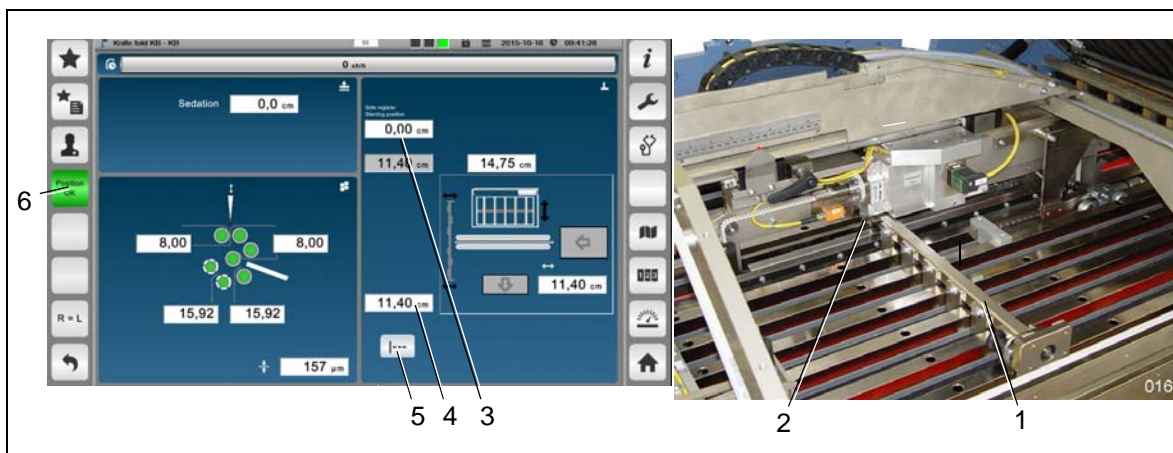


Figure 160: Cross fold stop

Correcting the adjustment value

How to correct the adjustment value:

- ▷ Press the input field (4).
A numeric input keyboard appears.
- ▷ Enter a new value for the position of the crossfold stop (1).
- ✓ The adjustment value is corrected.

Angle adjustment

How to set an angle adjustment:

- ▷ Press the input field (3).
A numeric input keyboard appears.
- ▷ Enter a value for the angle adjustment of the crossfold stop (1).
- ✓ Only the right side of the stop is adjusted in the running direction.



When calculating a new folding imposition, the angle adjustment is automatically set to 0.0 mm.

Repositioning the stop

How to re-position the stop:

- ▷ Always press the <Start> function key (6) after the value is changed.
- ✓ The crossfold stop is repositioned.

8.8.4 Open/close crossfold stop

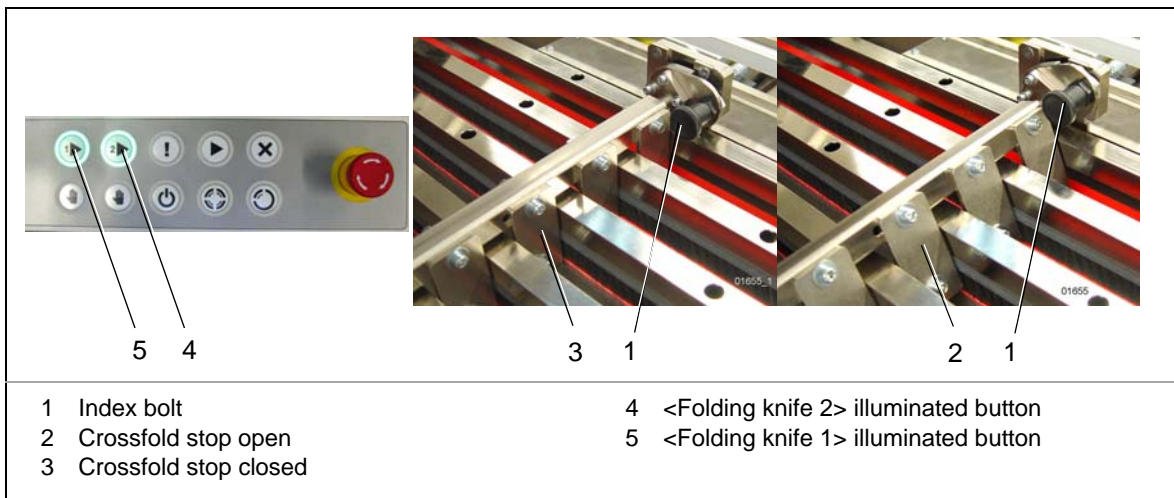


Figure 161: Opening/closing the crossfold stop.

Open the crossfold stop

How to open the crossfold stop:

- ▷ Remove the index bolt (1).
- ▷ Pull the crossfold stop on the index bolt (1) upwards.
- ▷ Re-fit the index bolt (1).
- ✓ The crossfold stop is open.



- When opening the crossfold stop (2), the crossfold and threefold knife is deactivated automatically.
- Illuminated buttons (4 and 5) are not lit.

Closing the crossfold stop

How to close the crossfold stop:

- ▷ Remove the index bolt (1).
- ▷ Push the crossfold stop on the index bolt (1) downwards.
- ▷ Re-fit the index bolt (1).
- ✓ The crossfold stop is closed.



- When closing the crossfold stop (2), the crossfold and threefold knife is activated automatically.
- Illuminated buttons (4 and 5) are lit green.

8.8.5 Opening/closing the pneumatic crossfold stop (option)

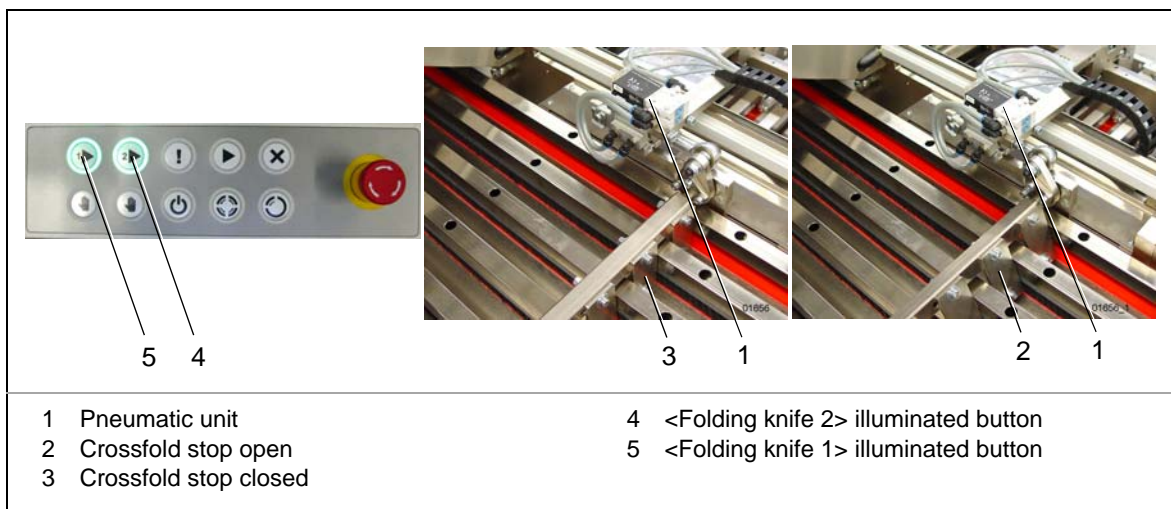


Figure 162: Opening/closing the crossfold stop.

Open the crossfold stop

How to open the crossfold stop:

- ▷ Press the <Folding knife 1> (5) illuminated button.
The crossfold knife is switched off.
The illuminated ring is not lit.
- ✓ The crossfold stop (2) is opened automatically.

Closing the crossfold stop

How to close the crossfold stop:

- ▷ Press the <Folding knife 1> (5) illuminated button again.
The crossfold knife is switched on.
The illuminated ring is lit in green.
- ✓ The crossfold stop (2) is closed automatically.

8.8.6 Adjusting the folding knife in the lengthwise position (standard)

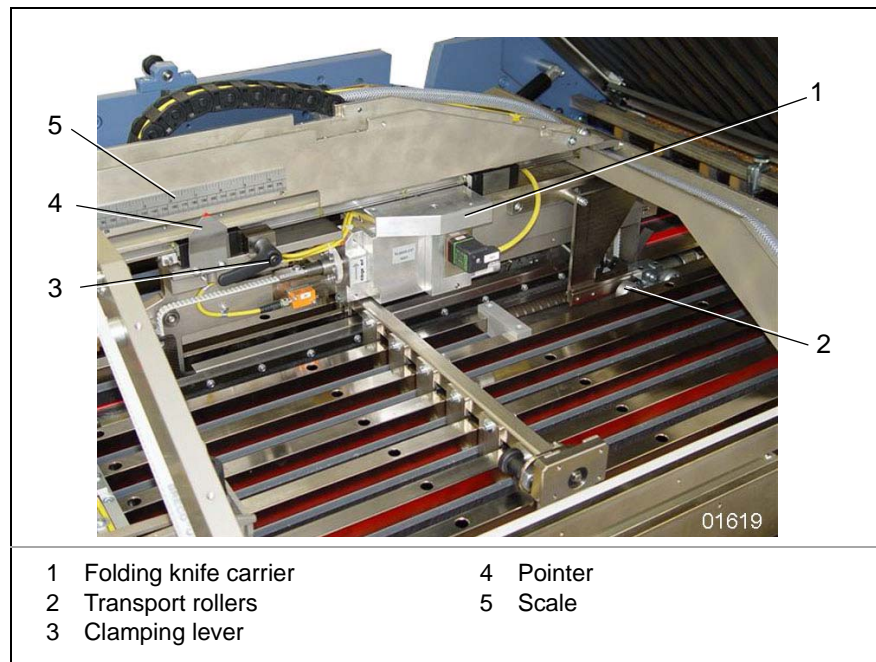


Figure 163: Adjusting the folding knife in the lengthwise position

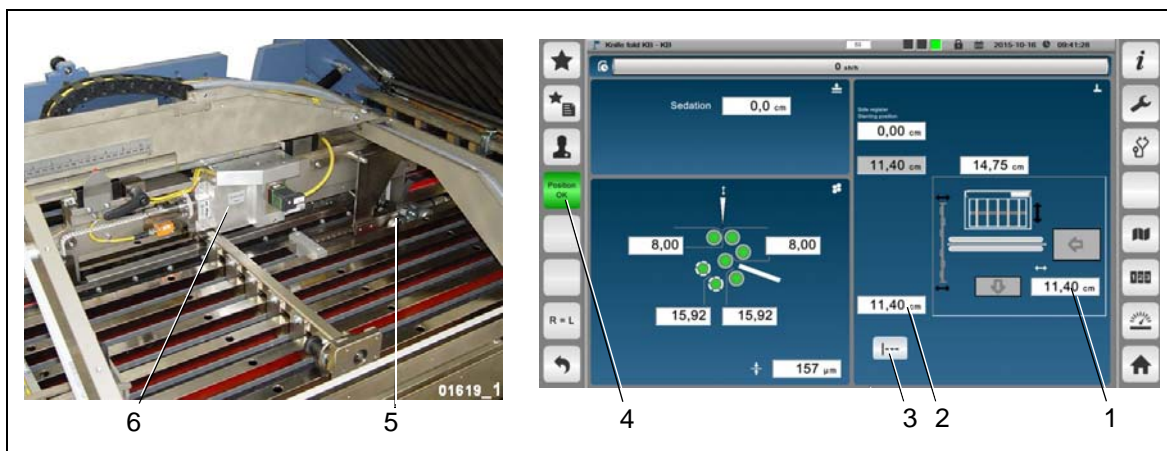
How to adjust the lengthwise position:

- ▷ 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.
- ▷ Make a precise adjustment so that the transport rollers (2) touch the back edge of the sheet slightly.
- ▷ Tighten the clamping lever (3).
- ✓ The lengthwise position is adjusted.



- The transport rollers fixed to the folding knife (2) are automatically adjusted with the folding knife carrier (1).
- The transport rollers are aligned at the factory in a fixed position and they should not be moved.

8.8.7 Adjusting the folding knife in the lengthwise position (automatic)



In the folding imposition calculation, the crossfold knife is automatically set in its lengthwise position.

The transport rolls (5) aligned fixed to the crossfold knife are automatically adjusted with the crossfold knife (6).

The transport rolls are set up in a fixed position and should only be moved separately for very small formats.

Correct the position of the transport rolls

Proceed as follows to correct the position of the transport rolls (5):

- ▷ Press the button (1).
- A numeric input keyboard appears.
- ▷ Enter the required value for the correction.
- ▷ Press the <Start> button (4)
- ✓ The position of the transport rolls is corrected.



- To avoid the sheet sticking, the transport rolls (5) must be positioned approx. 1 mm behind the rear edge of sheet!
- With negative numbers: First enter the number, then a minus sign.

Correct the center position of the crossfold knife

Proceed as follows to correct the center position of the crossfold knife:

- ▷ Press the button (3).
- A numeric input keyboard appears.
- ▷ Enter the required value for the correction.
- ▷ Press the <Start> button (4).
- ✓ The center position of the crossfold knife is corrected.



- Only ever change the center position of the crossfold knife by pressing the button (3). This ensures a parallel correction of the sheet stop and transport rolls.
- With negative numbers: First enter the number, then a minus sign.

8.8.8 Opening/closing the crossfold table



WARNING!

Automatic lowering of the open crossfold table.

Non-observance could result in serious injury or death.

- Check the pneumatic springs after each production run / daily to ensure they are functioning properly.
- Ensure that the safety bolts in the top position are securely engaged.



CAUTION!

Crushing hazard when closing the crossfold table.

Non-observance could result in injury.

- 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 handles (3).

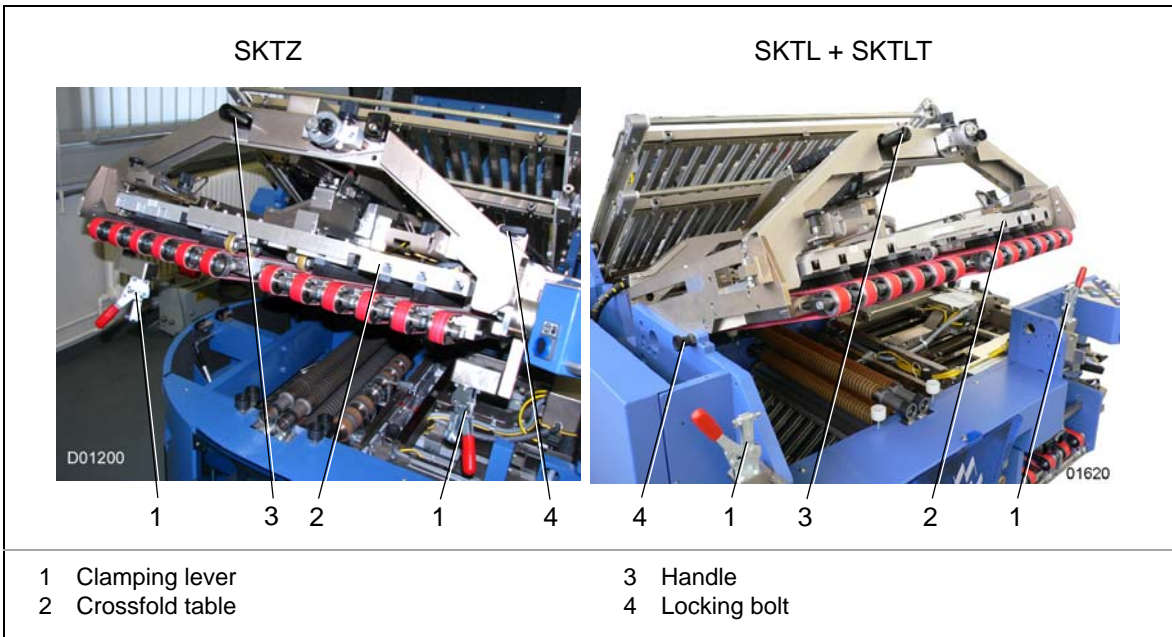


Figure 164: Opening/closing the crossfold table

The crossfold table can be opened for adjustment and cleaning work.

Opening the crossfold table

How to open 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 fold rollers and the slitter shafts.

Closing the crossfold table

How to close the crossfold table:

- ▷ Secure the crossfold table by pressing up the handles (3).
- ▷ Pull the safety bolt (4).
- ▷ Close the crossfold table (2) using the handle (3).
- ▷ Close the clamping lever (1).

- ✓ This fixes the crossfold table (2) in its working position.
- ✓ The crossfold table is closed.

8.8.9 Adjusting the fold rollers and slitter shafts (standard)

Set the fold rollers and slitter shafts in the crossfold to the number of sheets to be run through.

Setting elements for fold rollers

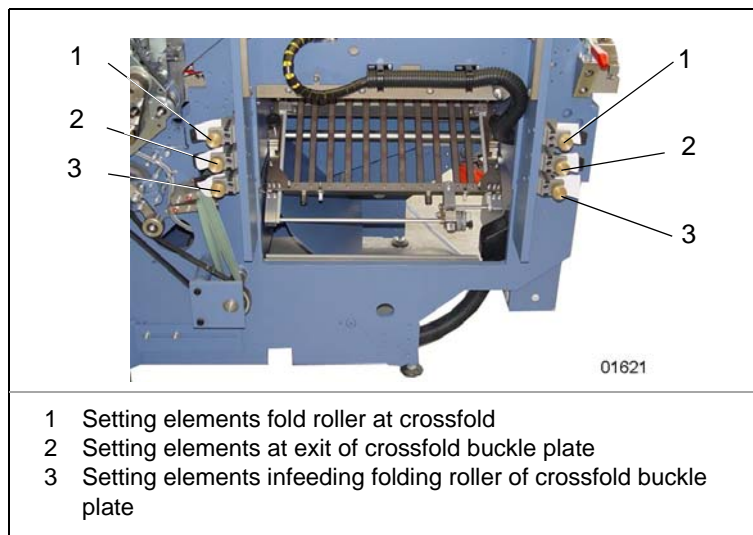


Figure 165: Setting elements fold rollers

Setting elements for slitter shafts

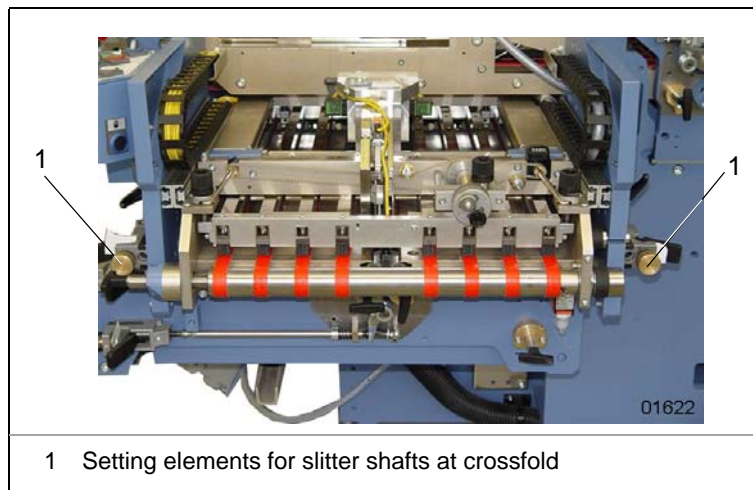


Figure 166: Setting elements slitter shafts

For additional details for the set-up of setting elements, see chapter "8.7.1 Adjusting the roller pressure (standard)"

8.8.10 Adjusting the fold rollers and slitter shafts (automatic)



The cross fold rollers and slitter shafts are adjusted automatically when selecting a new folding imposition.
See Chapter "8.4.7 Selecting a folding imposition"

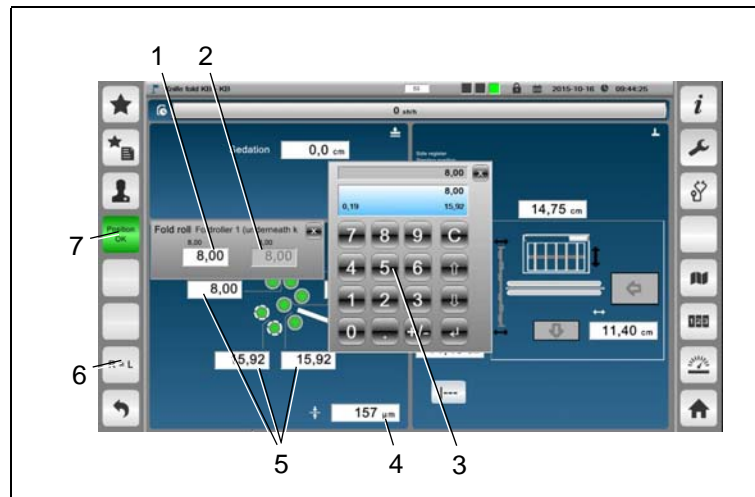


Figure 167: Adjusting the cross fold rollers and slitter shafts

Correcting the roller position

How to correct the roller setting:

Change both sides evenly:

- ▷ Press the button (6) until the **R=L** symbol appears on the button.
- ▷ Press the required input field (5).
A selection window is opened.
- ▷ Press the input field (1).
A numeric input keyboard (3) is opened.
- ▷ Enter the new value for both sides.
- ▷ Press the <Enter> button to complete the input.
- ✓ Both sides are changed equally.

Change both sides unevenly:

- ▷ Press the button (6) until the **R≠L** symbol appears on the button.
- ▷ Press the required input field (5).
A selection window is opened.
- ▷ Press the input field (1).
A numeric input keyboard (3) is opened.
- ▷ Enter the new value for the left-hand side.
- ▷ Press the <Enter> button to complete the input.
- ▷ Press the input field (2).
A numeric input keyboard is opened.
- ▷ Enter the new value for the right-hand side.
- ▷ Press the <Enter> button to complete the input.
- ✓ Both sides are changed unevenly.



The input changes only become effective when the machine is restarted.

8.8.11 Installing/removing slitter shafts



WARNING!

Cutting hazard due to slitter shafts.

Non-observance could result in serious injury or death.

- Never reach into the slitter shafts while the machine is running.
- All work on the slitter shafts may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.
- Always wear cut-proof safety gloves and safety shoes when working on the slitter shafts.
- ▷ Always have work on the machine carried out by one individual person only.
- There is also a risk of injuries when turning the machine with the safety handwheel.
- Always hold the slitter shaft on the shaft and not on the tool.

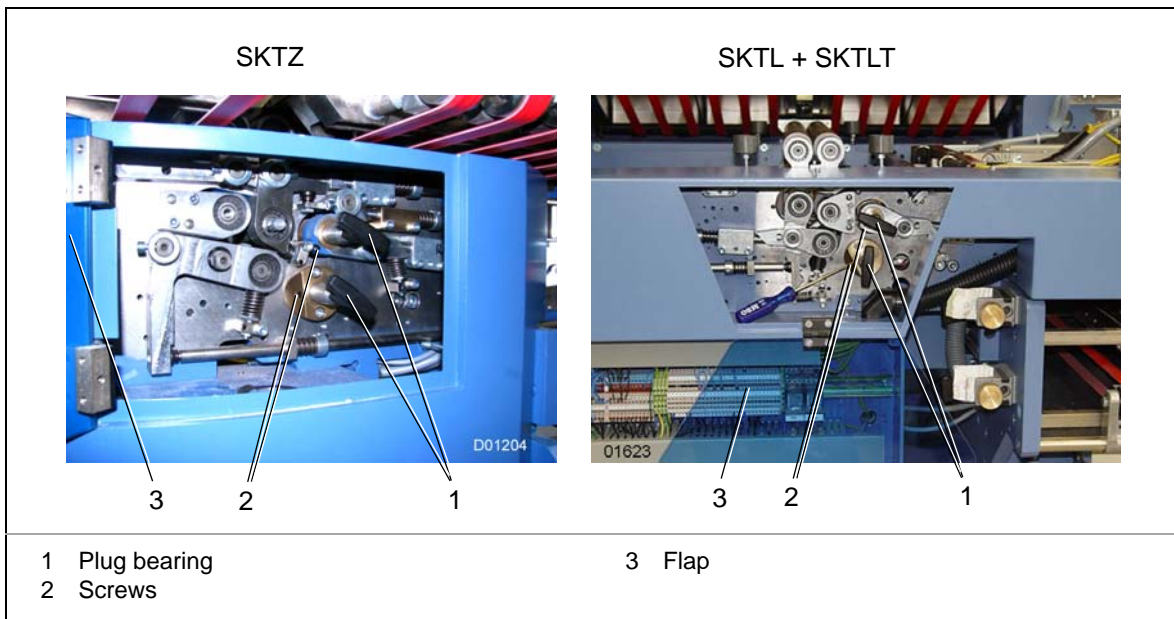


Figure 168: Installing/removing slitter shafts

Dismount slitter shaft

How to remove the slitter shafts:

- ▷ Opening the crossfold table.
See chapter "8.8.8"
- ▷ Open the flap (3).
- ▷ Remove the strippers that get in the way of removal.
- ▷ Loosen the screws (2) with the MBO ball Allen key size SW4.
- ▷ Secure the slitter shafts.
If necessary, seek the help of a second person.
- ▷ Remove the plug bearings (1).
- ▷ Remove the slitter shafts.
- ✓ The slitter shafts are removed.

Mounting of slitter shafts

How to install the slitter shafts:

- ▷ Install the slitter shafts.
- ▷ Slide the plug bearings (1) into the bore of the slitter shaft stub.
- ▷ Tighten the screws (2) with the MBO ball Allen key size SW4.
While doing this, press the plug bearings (1) against the slitter shafts.
Axial play is thus avoided.
- ▷ Fit the required stripper.
- ▷ Close the flap (3).
- ▷ Close the crossfold table.
See chapter "8.8.8"
- ✓ The slitter shafts are installed.



With the S-KTZ model, the slitter shafts can only be removed in the threefold position left.

8.8.12 Adjusting the KLT buckle plate (standard)



WARNING!

Pull back/remove the buckle plates/sheet deflectors when the machine is running.

The exposed, rotating fold rollers and slitter shafts make up hazardous entanglement zones.

Non-observance could result in serious injury or death.

- Never reach into the fold rollers and slitter shafts while the machine is running.
- All adjustment or testing/inspection work may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.
- Always have the adjustment or testing/inspection work carried out by one individual person only.
- There are also entanglement and crushing hazards when turning the machine with the safety handwheel!

8.8.12.1 Standard buckle plate with swing deflector

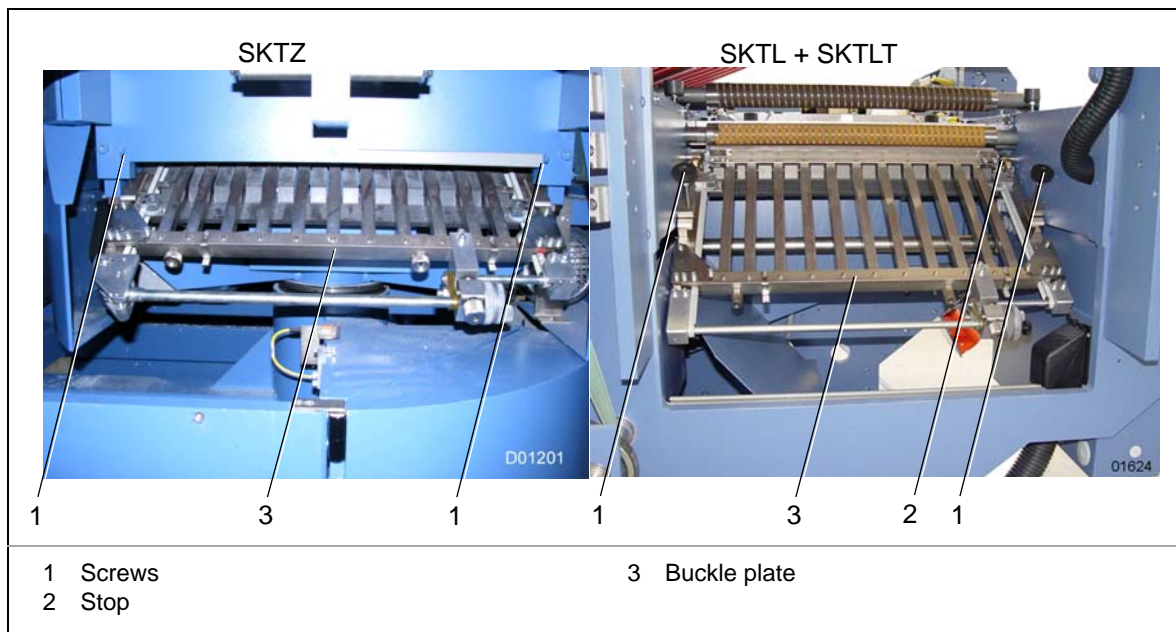


Figure 169: Change function "buckle plate" to "swinging-sheet deflector"

Activating the sheet deflector

Change from function "buckle plate" to "sheet deflector" or vice-versa.

How to activate the sheet deflector:

- ▷ Loosen both screws (1).
- ▷ Pull out the buckle plate (3) a little.
- ▷ Fold down the attached swinging-sheet deflector.
- ▷ Push the buckle plate (3) in up to the stop (2).
- ▷ Tighten the screws (1).

Adjusting the buckle plate See chapter "8.7.6 Adjusting the buckle plates (standard)"

8.8.12.2 Combination buckle plate FTK

For settings, see Chapter "8.7.8 Adjusting the FTK combination buckle plate".

8.8.13 Adjusting the KTL buckle plate (automatic)



The folding length of the crossfold buckle plate are adjusted automatically during the selection of a new folding imposition
See Chapter "8.4.7 Selecting a folding imposition"



Figure 170: Buckle plate to sheet deflector

Correcting calculated folding lengths

How to correct the folding length:

- ▷ Press the <KTL plate> (1) input field.
A numeric input keyboard appears.
- ▷ Enter a new value for the folding length.
- ▷ Press the <Start> button (2).
- ✓ The sheet stop is repositioned.

8.8.13.1 Adjusting the angle of the sheet stop

See chapter "8.7.7.2 Adjusting the angle of the sheet stop (automatic)"

8.9 Adjusting the threefold



CAUTION!

Crushing hazard on the threefold tape roller.

Non-observance could result in injury.

- Never reach towards the tape roller while the machine is running.

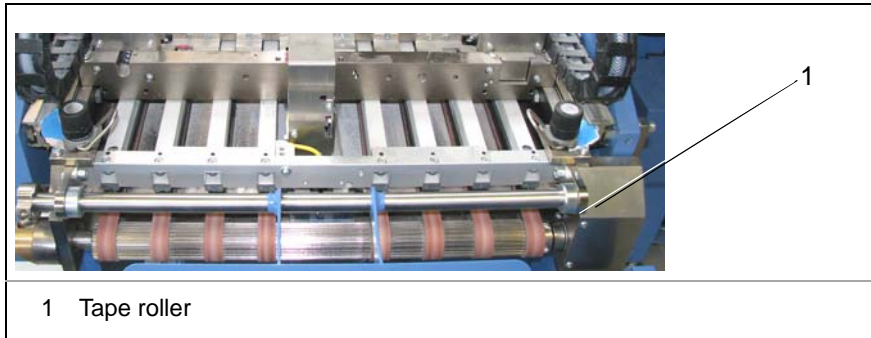


Figure 171: Checking tape roller on the threefold outlet

8.9.1 Set-up of transport brushes

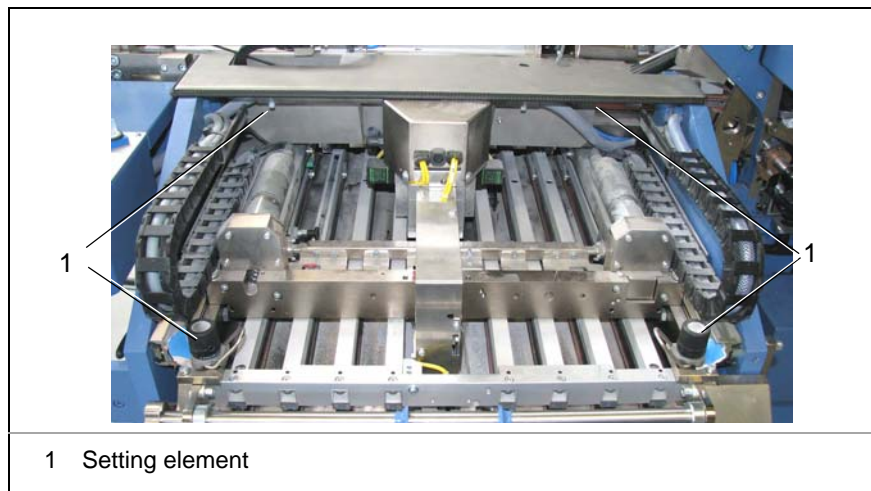


Figure 172: Set-up of transport brushes

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 at the stop. The lower the brushes are on the sheet, the more power of feed is carried out.

Set-up of transport brushes

How to adjust the transport brushes:

- ▷ Place the number of paper thicknesses of the sheet to be transported underneath all four adjusting elements (1).



In case of tensions or shafts on the stop:

- Reduce the pressure by placing several paper strips under the adjusting elements (1).
- The sheet should lie flat on the stop (depending on the fold type and paper).

8.9.2 Adjusting the threefold stop (standard)

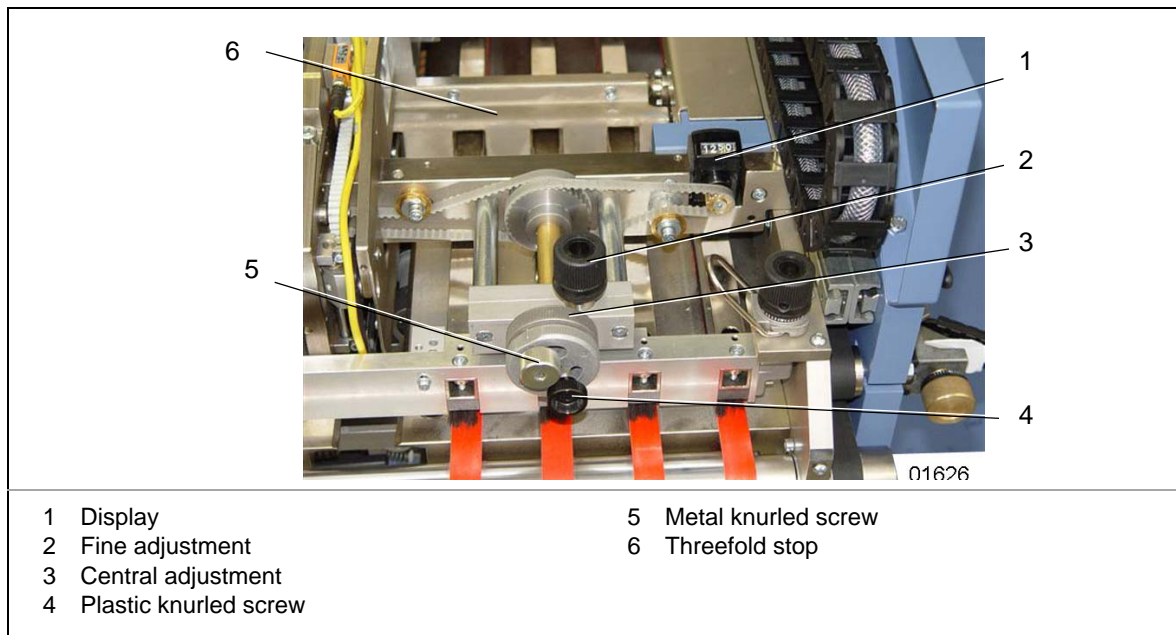


Figure 173: Adjusting the threefold stop

Adjusting the threefold stop

How to set the threefold stop:

- ▷ Loosen the knurled screw (metal) (5).
- ▷ Adjust the threefold stop (6) 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).
- ✓ The threefold stop is set.



If a folding imposition was calculated by the control system, the adjustment values can be read off the "Current settings threefold" menu.

Adjusting the angle

How to set 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).
- ✓ Angle is adjusted.

8.9.3 Adjusting the threefold stop (automatic)

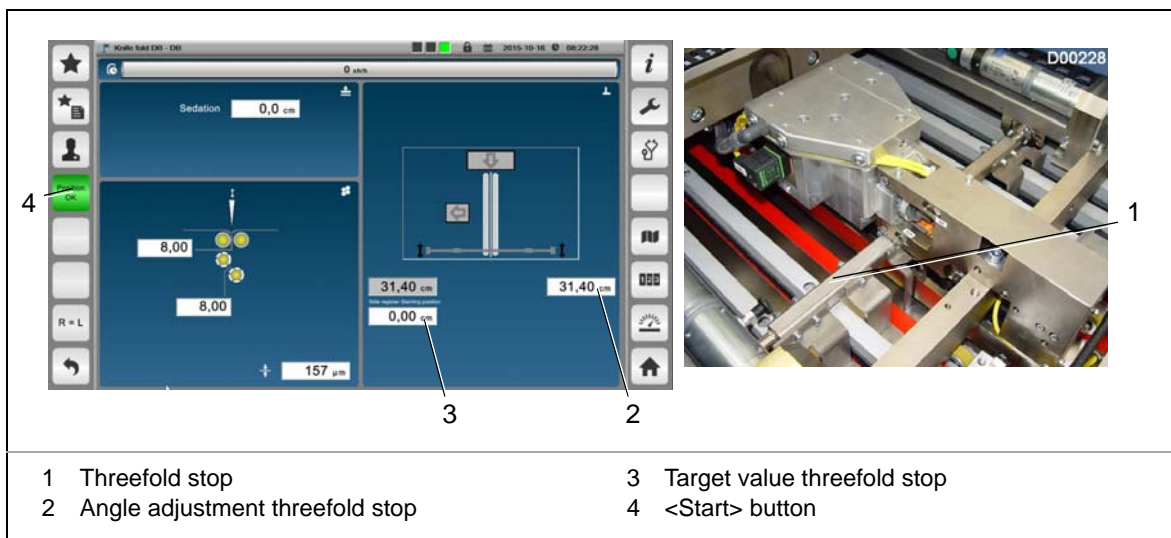


Figure 174: Threefold stop

Correcting the adjustment value

How to correct the adjustment value:

- ▷ Press the input field (2).
A numeric input keyboard appears.
- ▷ Enter a new value for the position of the threefold stop (1).
- ✓ The adjustment value is corrected.

Angle adjustment

How to carry out an angle adjustment:

- ▷ Press the input field (3)
A numeric input keyboard appears.
- ▷ Enter a value for the angle adjustment of the threefold stop (1).
- ✓ Only the right side of the stop is adjusted in the running direction.



When calculating a new folding imposition, the angle adjustment is automatically set to 0.0 mm.

Repositioning the stop

How to re-position the stop:

- ▷ Always press the <Start> button (4) after the value is changed.
- ✓ The threefold stop is repositioned.

8.9.4 Open/close threefold stop

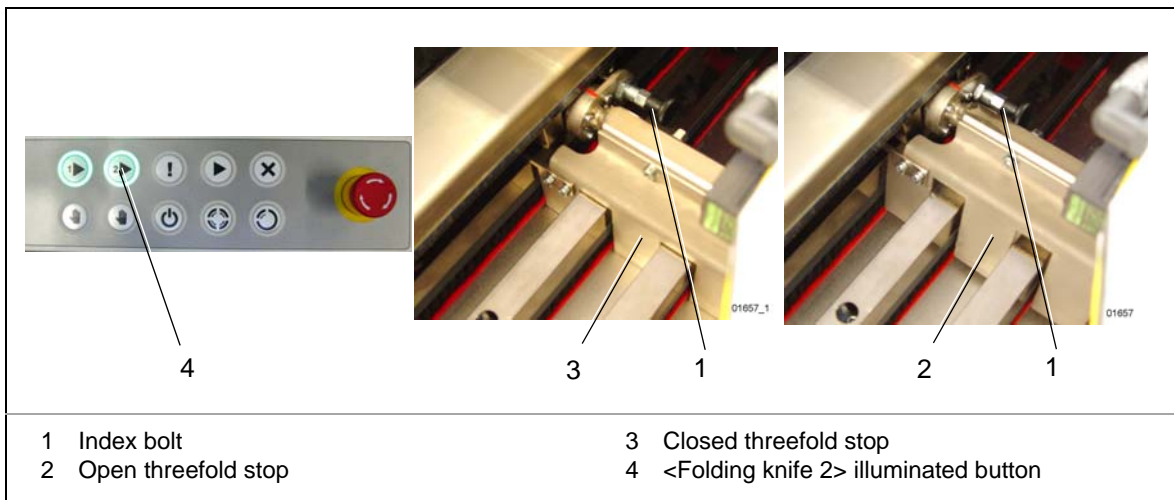


Figure 175: Opening/closing the threefold stop.

Opening the threefold stop

How to open the threefold stop:

- ▷ Remove the index bolt (1).
- ▷ Pull the threefold stop on the index bolt (1) upwards.
- ▷ Engage the index bolt (1).
- ✓ The threefold stop is open.



- When opening the threefold stop (2), the crossfold and threefold knife is deactivated automatically.
- The illuminated button (4) is not lit.

Closing the threefold stop

How to close the threefold stop:

- ▷ Remove the index bolt (1).
- ▷ Push the threefold stop on the index bolt (1) downwards.
- ▷ Engage the index bolt (1).
- ✓ The threefold stop is closed.



- When closing the threefold stop (3), the crossfold and threefold knife is activated automatically.
- The illuminated button (4) is lit green.

8.9.5 Pull out the three fold carriage.

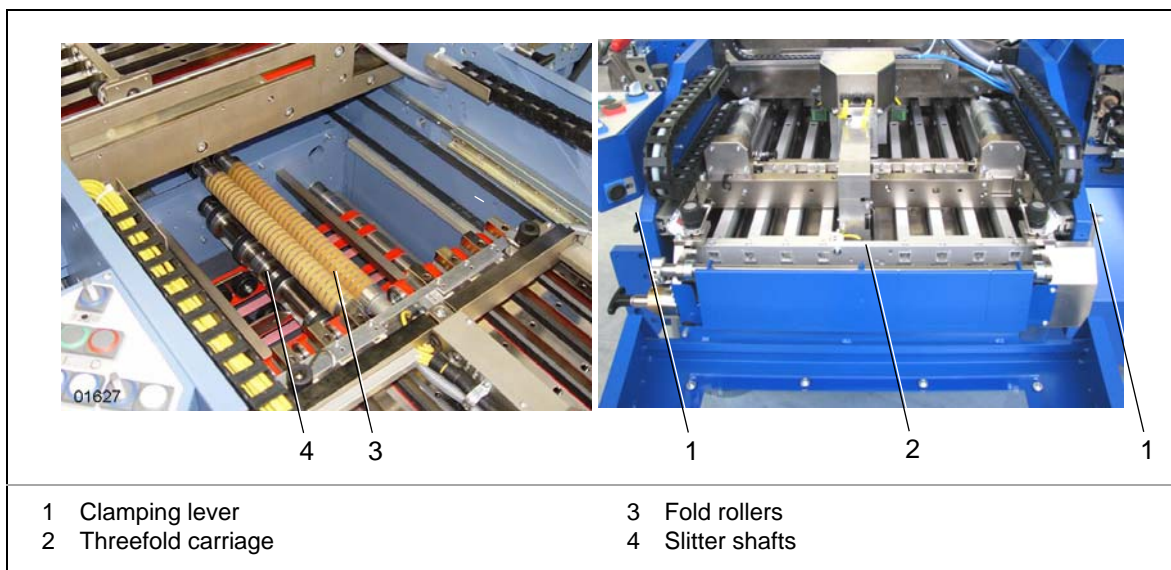


Figure 176: Pull out the three fold carriage.

The threefold carriage (2) can be pulled out for adjustment and cleaning work.

Pull out the three fold carriage

Pull out the threefold carriage.

- ▷ 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 fold rollers (3) and the slitter shafts (4).



CAUTION!

Tilting 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

Push in the threefold carriage:

- ▷ The clamping levers (1) must remain pulled out.
- ▷ Push the threefold carriage (2) in.
- ▷ Push in the clamping lever (1).
- ▷ Clamp the clamping levers (1) counter-clockwise.
- ▷ The threefold carriage is pushed in.

8.9.6 Adjusting the fold rollers (standard)

8.9.6.1 Model S-KTL

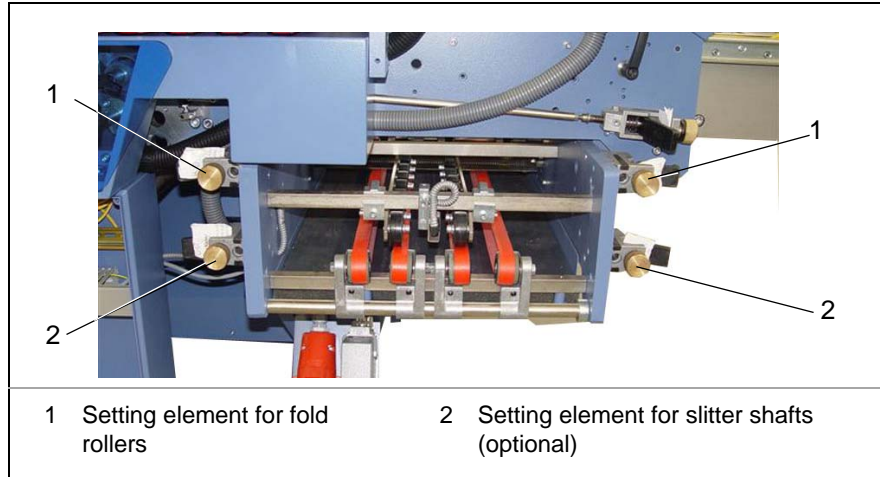


Figure 177: Threefold rollers (S-KTLT)

Adjust the fold rollers and slitter shafts to the number of sheets to run through using the setting elements (1) and (2).

For additional details on adjusting setting elements:
See chapter ."8.7.1 Adjusting the roller pressure (standard)".

8.9.6.2 Model S-KTLT

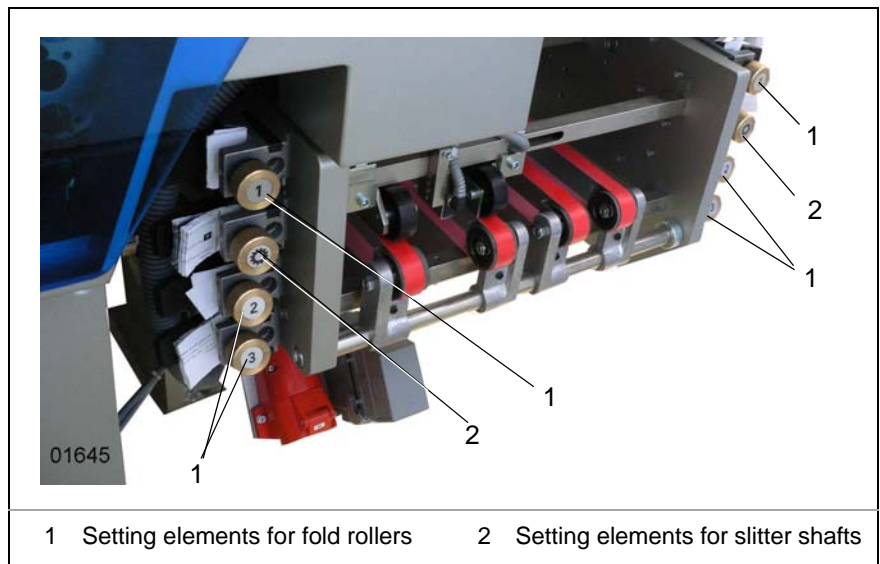


Figure 178: Threefold rollers (S-KTLT)

Adjust the fold rollers and slitter shafts to the number of sheets to run through using the setting elements (1) and (2).

For additional details on adjusting setting elements:
See chapter ."8.7.1 Adjusting the roller pressure (standard)".

8.9.6.3 Model S-KTZ

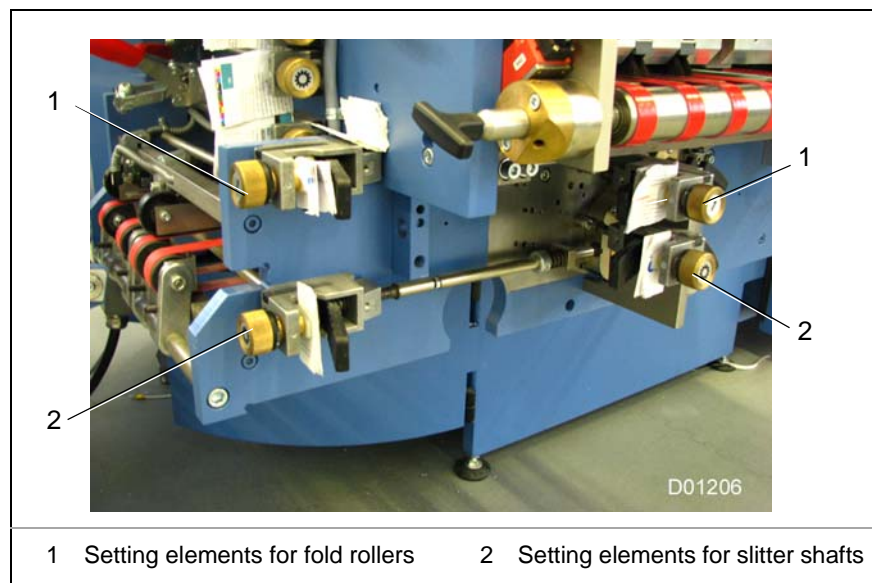


Figure 179: Fold rollers threefold (S-KTZ)

Adjust the fold rollers and slitter shafts to the number of sheets to run through using the setting elements (1) and (2).

For additional details on adjusting setting elements:
See chapter ."8.7.1 Adjusting the roller pressure (standard)".

8.9.7 Adjusting the fold rollers (automatic)



The three fold rollers and slitter shafts are adjusted automatically when selecting a new folding imposition.
See Chapter "8.4.7 Selecting a folding imposition"

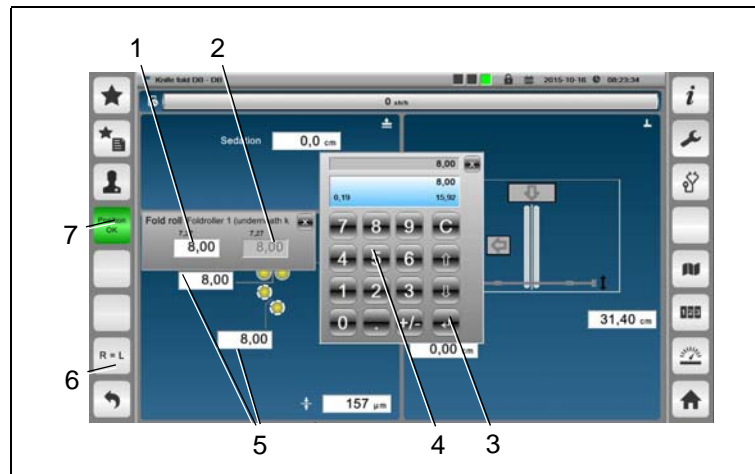


Figure 180: Adjusting the three fold rollers and slitter shafts

The setting menus for the three fold rollers and slitter shafts vary depending on the variants S-KTL, S-KTLT and S-KTZ.
The illustration shows variant S-KTL.

Correcting the roller setting

How to correct the roller setting:

Change both sides evenly:

- ▷ Press the button (6) until the **R=L** symbol appears on the button.
- ▷ Press the required input field (5).
A selection window is opened.
- ▷ Press the input field (1).
A numeric input keyboard (4) is opened.
- ▷ Enter the new value for both sides.
- ▷ Press the <Enter> button (3) to complete the input.
- ✓ Both sides are changed equally.

Change both sides unevenly:

- ▷ Press the button (6) until the **R≠L** symbol appears on the button.
- ▷ Press the required input field (5).
A selection window is opened.
- ▷ Press the input field (1).
A numeric input keyboard (3) is opened.
- ▷ Enter the new value for the left-hand side.
- ▷ Press the <Enter> button (3) to complete the input.
- ▷ Press the input field (2).
A numeric input keyboard is opened.

- ▷ Enter the new value for the right-hand side.
- ▷ Press the <Enter> button (3) to complete the input.
- ✓ Both sides are changed unevenly.



The input changes only become effective when the machine is restarted.

8.9.8 Installing/removing slitter shafts



WARNING!

Cutting hazard due to slitter shafts.

Non-observance could result in serious injury or death.

- Never reach into the slitter shafts while the machine is running.
- All work on the slitter shafts may be carried out only when the machine is stopped and secured against switching on.
- Press the EMERGENCY STOP palm button.
- Always wear cut-proof safety gloves and safety shoes when working on the slitter shafts.
- ▷ Work on the machine must always be performed by one person only.
- There is also a risk of injuries when turning the machine with the safety handwheel.
- Always hold the slitter shaft on the shaft and not on the tool.

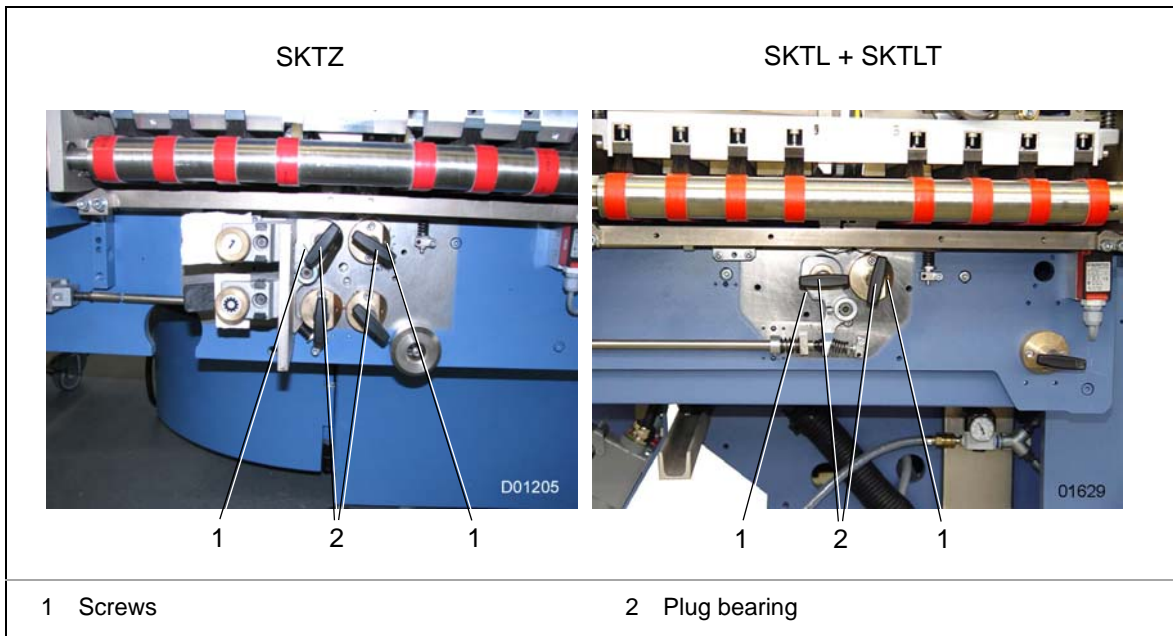


Figure 181: Removing slitter shafts.

Dismount slitter shaft

How to remove the slitter shafts:

- ▷ Pull out the threefold carriage.
See chapter "8.9.5 Pull out the three fold carriage."
- ▷ Remove the stripper that prevents removal.
- ▷ Loosen the screws (1) with the MBO ball Allen key SW4.
- ▷ Hold the slitter shafts fast.
If necessary, seek the help of a second person.
- ▷ Pull out the plug bearings (2).
- ▷ Remove the slitter shafts.
- ✓ The slitter shafts are removed.

Mounting of slitter shafts

How to install 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) with the MBO ball Allen key SW4.

While doing this, press the plug bearings (2) against the slitter shafts.
Axial 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.

8.9.9 Special procedure with threefold work

When carrying out work on folded sheets that generates chips due to the threefold slitter shafts, it must be possible to remove the chips from the slitter shaft area. The access to this area is prevented by the guard fitted there, however.

There is the option to remove the guard for the duration of this work. This means that the hazard areas are freely accessible.

After completing the work that generates chips, the guard must be re-fitted.



CAUTION!

Crushing hazard and cutting hazard after removing a part of the threefold guard.

Non-observance could result in injury.

- Never reach into the area cleared due to the removed guard while the machine is running!
-

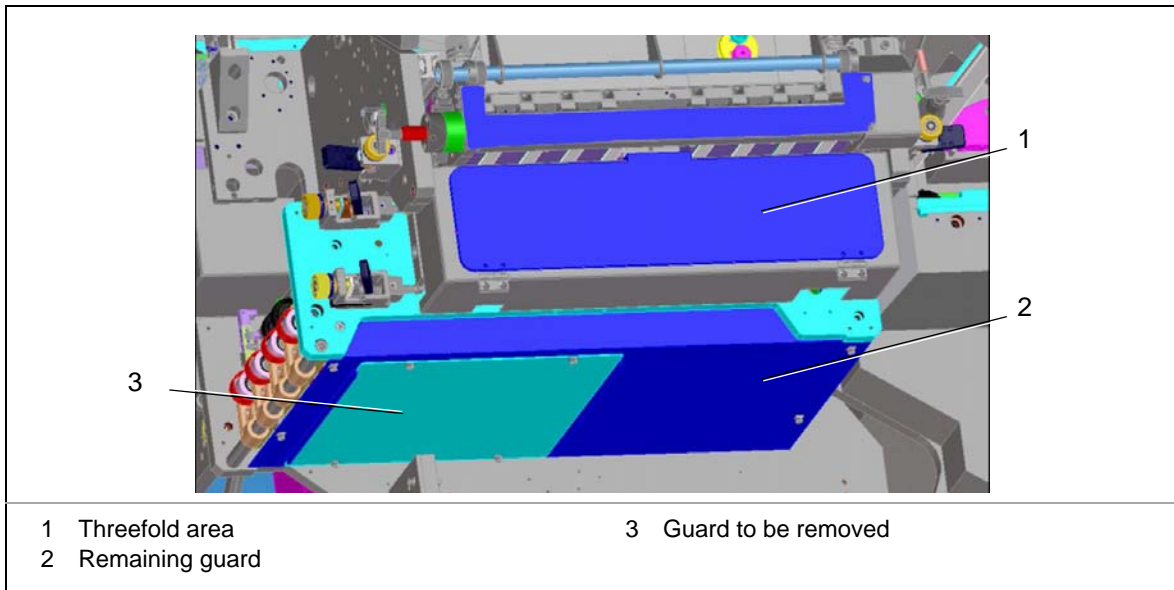


Figure 182: Guard on threefold slitter shafts

Removing the guard

How to remove the guard:

- ▷ Remove the four screws on the guard to be removed (3).
- ▷ Remove the guard (3).
- ▷ Keep the four screws and the guard stored safely, for subsequent installation.
- ✓ The guard (3) has been removed.

Fitting the guard

How to fit the guard:

- ▷ Re-fit the guard (3).
- ▷ Fasten the guard (3) using the four screws.
- ✓ The guard (3) has been fitted.

8.9.11 Adjusting the KTLT buckle plate (automatic)



The folding length of the KTLT buckle plate is adjusted automatically during the selection of a new folding imposition. See Chapter "8.4.7 Selecting a folding imposition".

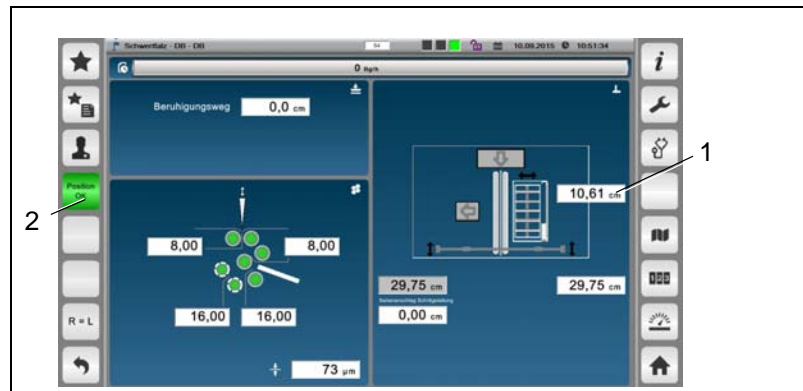


Figure 184: Adjusting the KTLT buckle plate

Correcting calculated folding lengths

Proceed as follows to correct the calculated folding lengths:

- ▷ Press the <KTLT plate> (1) field.
A numeric input keyboard appears.
- ▷ Enter a new value for the folding length (1).
- ▷ Press the <Start> button (2).
The buckle stop is repositioned.
- ✓ The folding lengths have been corrected.

8.9.11.1 Adjusting the angle of the sheet stop

See chapter "8.7.7.2 Adjusting the angle of the sheet stop (automatic)".

8.10 Adjusting the folding knife

8.10.1 Adjusting the height



CAUTION!

Folding knife is set too low.

The folding knife can be pulled into the fold rollers.

Non-observance could result in property damage.

- When adjusting, make sure that the folding knife is not set too low.
- For an extreme incline adjustment, it may be necessary to set the folding knife a bit higher.

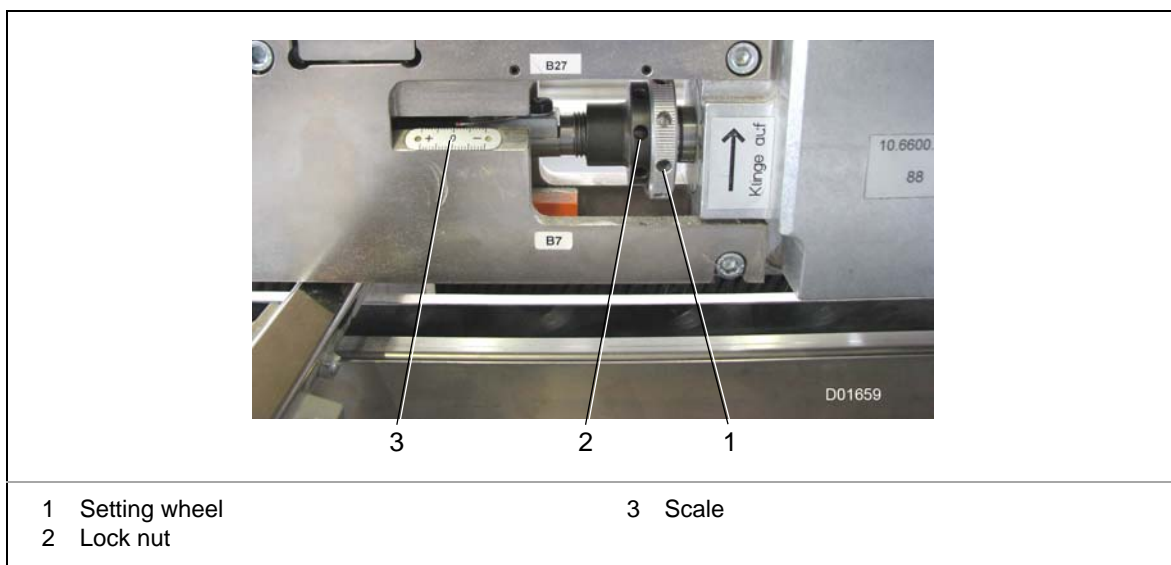


Figure 185: Height adjustment folding knife

Basic setting Red marking must be on zero (3).

Height adjustment ▷ Loosen the lock nuts (2) with the MBO ball Allen key SW4.

Setting the folding knife higher ▷ Turn the setting wheel (1) counter-clockwise.
▷ Loosen the lock nuts (2) with the MBO ball Allen key SW4.

Setting the folding knife lower ▷ Turn the setting wheel (1) clockwise.
▷ Loosen the lock nuts (2) with the MBO ball Allen key SW4.

**The sheet not taken over by the fold rollers.**

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 folding knives.
- ▷ Then set the folding knife another quarter-turn lower so that the folding sheet is taken over securely by the fold rollers.

8.10.2 Adjusting the angle

The incline adjustment influences the irregular pulling-in of the sheets into the fold rollers as well as the following perforation, creasing or cutting.

**CAUTION!**

Folding knife is set too low.

The folding knife can be pulled into the fold rollers.

Non-observance could result in property damage.

- When adjusting, make sure that the folding knife is not set too low.
- For an extreme incline adjustment, it may be necessary to set the folding knife a bit higher.

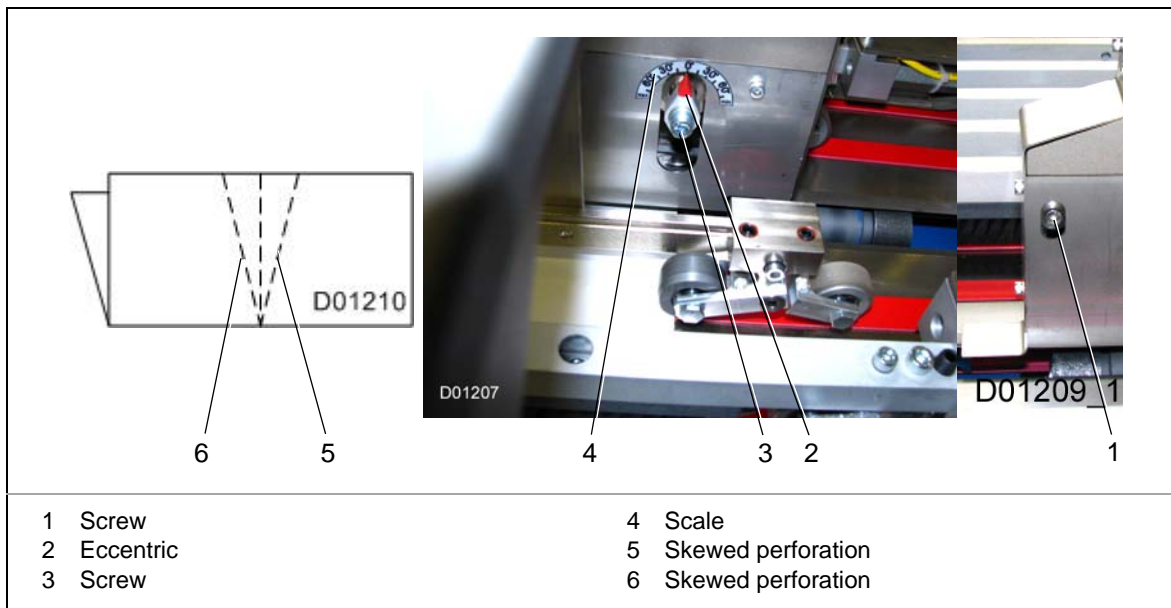


Figure 186: Adjust the folding knife.

Basic setting ▷ The red point of the eccentric (2) must be on zero.

Adjusting the angle How to adjust the angle:

- ▷ Open the screw (1) with the MBO ball Allen key SW4.
(Relax the toothed belt).
- ▷ Open the screw (3) with the MBO Allen key 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 tip of the folding knife downward by turning the eccentric (2) to the left.

Skewed perforation (6) The sheet runs after on the stop side (6):
▷ Adjust the tip of the folding knife upward by turning the eccentric (2) to the right.
▷ Fix the eccentric position (2).
▷ Tighten the screw (3) with the MBO Allen key SW5
▷ Tighten the screw (1) with the MBO ball Allen key 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 plate on one side.

8.10.3 Enter additional steadying distance

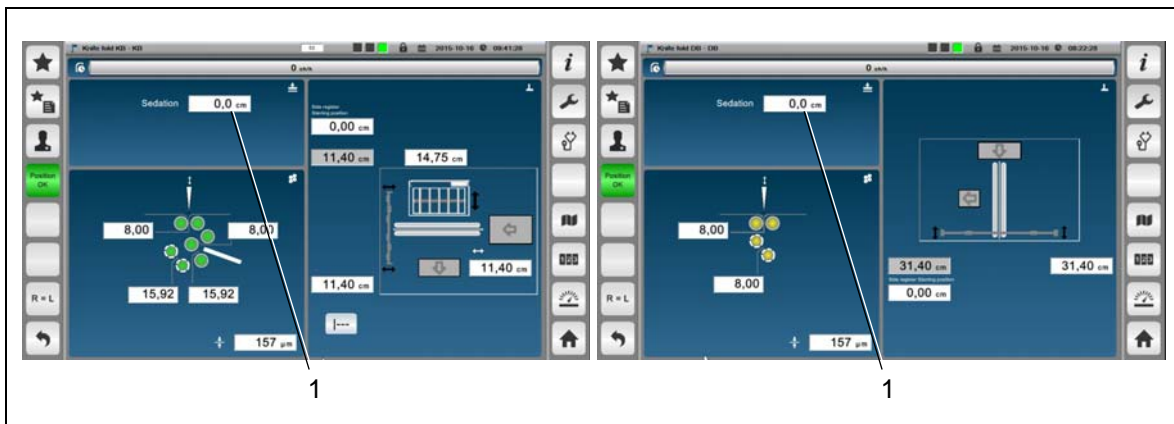


Figure 187: Enter additional steadying distance

For <Setup> of the machine, a steadying distance for the sheets under the folding knives is specified automatically. However, this automatic steadying distance is not displayed.

How to enter a steadying distance:

- ▷ Press the input field (1).
A numeric input keyboard appears.
- ▷ Enter a value for the additional steadying distance.
- ✓ An additional steadying distance has been entered.



- The input of an additional steadying distance can change the sheet gap.
- If the machine has been calibrated, the steadying distance can only be increased.

8.11 Adjusting outfeed transport

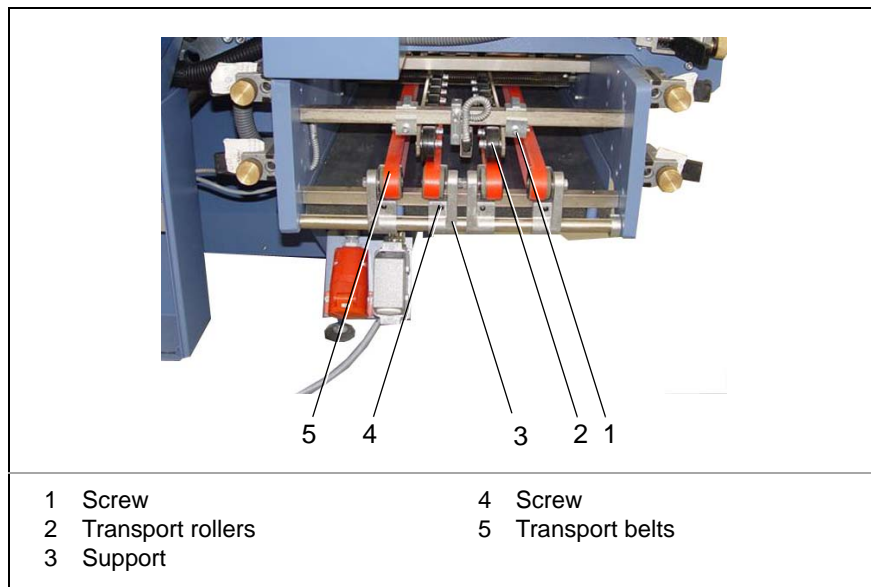


Figure 188: Adjusting outfeed transport

Adjusting transport belts

How to adjust the transport belts:

- ▷ Loosen the screws (4) with the MBO ball Allen key SW4.
- ▷ Position the supports (3) with transport belts (5) according to the paper format.
- ▷ Tighten the screws (4) with the MBO ball Allen key SW4.
- ✓ The transport belts are adjusted.

Adjusting transport rolls

How to adjust the transport rolls:

- ▷ Loosen the screws (1).
- ▷ Position the transport rolls (2) over the transport belts (5) according to the paper format.
- ▷ Tighten the screws (1).
- ✓ The transport rolls are adjusted.

8.12 Turning the threefold folding unit (variant S-KTZ).

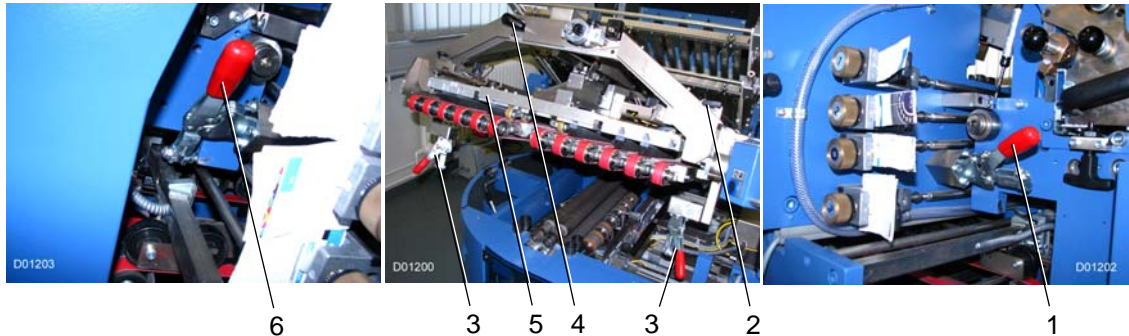


WARNING!

Automatic lowering of the open crossfold table.

Non-observance could result in serious injury or death.

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



- | | |
|------------------------------------|------------------------------------|
| 1 Clamping lever <Threefold left> | 4 Handle |
| 2 Locking bolt | 5 Crossfold table |
| 3 Clamping lever <Crossfold table> | 6 Clamping lever <Threefold right> |

For particular folding types, it is necessary to turn the threefold folding unit.

- Position <Threefold left>
- Position <Threefold right>

Opening fixing ▷ Open the clamping lever (1).
(The clamping lever must be opened completely).

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 threefold folding unit ▷ Turn the threefold folding unit slowly under the crossfold table (5) until the stop <Threefold right>.

Fixing the threefold 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 swinging-sheet deflector for the outfeed transport is switched automatically when the folding unit is turned.

8.13 Removing the paper jam



WARNING!

Unjamming of paper jams.

Paper jams can block the drive and it can start up again unexpectedly when the jam is cleared.

Non-observance could result in serious injuries or death.

- Unjamming work may only be done on a machine that is switched off and secured against switching on again.
- When removing the paper jam, turn the machine using the safety handwheel only.
- Only start the machine again after completely removing the paper jam, since otherwise there can be property damage to drive belts, transport belts, fold rollers, etc.

How to remove a paper jam:

- ▷ Press the EMERGENCY STOP palm button.
- ▷ Try to determine the cause of the paper jam and eliminate it (to prevent other subsequent faults).
- ▷ Remove, if necessary, all disturbing smoothers, strippers, etc.
- ▷ Carefully remove the jammed paper.
- ▷ Check that no torn-off pieces of paper remain in the machine (to prevent other subsequent faults).
- ▷ Adjust the removed smoothers, strippers, etc. again.
- ▷ 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.
- ✓ Paper jam is removed.



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

8.14 Identification and handling of malfunctions

8.14.1 Palletized feeder

Error	Cause	Remedy
Double sheet on the flat pile/ palletized feeder	Pile is too high.	Set the capacitive sensors lower down on the side of the suction belt using the knurled screw.
	Front air is switched on (makes the sheet float).	Switch off the front air.
	Suction devices are set too low (sucking through).	Set the suction devices higher (approx. 2 mm above the pile).
	Vacuum on the VIVAS too strong.	Reduce vacuum (red screw, underneath of valve to the left).
	Fan blowers set too weak (air pillow breaks down).	Increase the blowing force.
	Vaculift is incorrectly positioned (too far back).	Vaculift set correctly (pressure foot must be approx. 8-9 mm on the sheet).
	Brushes incorrectly positioned.	Set the brushes approx. 2-3 mm above the pile and 5-6 mm in the pile.
	Sheets are sticking.	Ventilate the pile (to roll, etc.).
	Sheet is being ventilated too strongly from behind and ripped away from the sucker, floating forwards.	Set the leading blowers weaker.
Poor, faltering pick-up	Too little air on the leading blowers with large, heavy sheets.	Increase the ventilation (upgrade any lateral ventilation if necessary).
	Smoother too low, sheet is becoming trapped.	Set smoother higher.
	Pile is too low.	Set the capacitive sensors higher with the knurled screw (pile approx. 3-4 mm below the suction belt).
	Corners hanging down, sheet askew.	Level out the pile using wedges, or ventilate the corners strongly via lateral front ventilation.
	Vacuum too weak on the VIVAS.	Set stronger (red screw, below the valve to the right).
	Vaculift is positioned too far in the pile, pressure foot is pressing the raised sheets back down.	Set correctly (pressure foot must be approx. 8-9 mm on the sheet).
	Brushes are too high or not far enough in the pile, sheets may float away.	Brushes should be approx. 2-3 mm above the pile and 5-6 mm in the pile.

Table 36: Error/cause/remedy on the flat pile feeder/palletized feeder

Error	Cause	Remedy
	Vaculift runs up and down continuously during machine operation.	Height control defective? Check the basic settings.

Table 36: Error/cause/remedy on the flat pile feeder/palletized feeder

8.14.2 Register table

Error	Cause	Remedy
First fold is skew.	Sheet forms a wave on the left or drifts with its rear edge from register guide, register guide is not angled.	Set register guide to right angle.
	Sheet is pulled too strong into the register guide, forms a wave, too much vacuum.	Reduce vacuum generally, knurled screw to the left.
	Sheet is pulled too strong into the register guide, 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 register guide at the transfer and tips over to the right, generally too less vacuum.	Increase vacuum, turn knurled screw to the right.

Table 37: Error/cause/remedy on the register table

8.14.3 Parallel fold

Failure	Cause	Remedy
First fold is crooked.	Sheet forms a wave at the feeder side, sheet is pulled to the register guide too strong.	Set register guide to right angle. Reduce vacuum at the infeed.
	Sheet is tipping off with its front edge from register guide, vacuum is too weak at infeed.	Increase vacuum, turn control lever to + (plus).
	Sheet is drifting with its rear edge from register guide.	Set register guide to right angle.
	Fold rollers do not have a parallel tension.	Adjust fold rollers evenly. Heavy products: strong pull Thin products: weak pull
	Sheet stop is not angled	Set sheet stop at correct angle; attention: check zero setting of the setting wheel by turning the stop all the way down and adjusting if necessary.
	The lower plate lip is crooked or too deep. The sheet is thus stopped.	Straighten out. Sensible: start from the zero-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.
Perforation/score/cut is too crooked or fluctuates	Too much vacuum or too many heavy balls/conical rollers on the register guide.	Use less vacuum or lighter balls; Adjust conical rollers looser.
	Infeed register guide is not angled.	Set infeed register guide to the right angle.
	Too less vacuum or balls/conical rollers too light, sheet runs away from register guide.	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 38: Error/cause/remedy at parallel fold

8.14.4 Double fold in the first fold

Failure	Cause	Remedy
Double fold in the first fold	After the cross fold: Round, cockling fold	Pretension buckle plate in the previous machine. Pretension rail on the underside (lower lip).
	After the letter fold	<ul style="list-style-type: none"> • Open fold rollers at exit • Use hold-down springs in buckle plate 3.
		<ul style="list-style-type: none"> • Lower lip deeper in the folding space, thus there is an excessive fold that functions as a deflector. (Works only with a distance of approx. 3-8 mm ahead the fold). • Use hold-down springs in buckle plate 3.
		<ul style="list-style-type: none"> • Fold downward, e.g. in buckle plate 2+4. Open fold rollers at exit, set more underneath. • Use hold-down springs in buckle plate 3.
	At open gatefold	<ul style="list-style-type: none"> • Open fold rollers at exit, set more underneath. • Use hold-down springs in buckle plate 3.
		Fold downward, e.g. in buckle plate 2+ 4. Open fold rollers at exit, set more underneath.
	With a closed gatefold (option)	Do not use gatefold yet. Let the sheet fall to the floor. If double fold appears, set folding rollers 4 or 6 looser. Use hold-down springs in buckle plate 3 or 5.
		Use now gatefold plate. If double fold appears again, open fold rollers at exit up to 12 paper thicknesses.

Table 39: Error/cause/remedy at first fold

8.14.5 Edges/dog ears at letter fold, gatefold

Failure	Cause	Remedy
Edges/dog ears at letter fold, gatefold.	Letter fold: Corners of the incoming sheet hang down.	<ul style="list-style-type: none"> • Pre-bend sheet to the top, • Use hold-down springs in buckle plate 3. • Turn sheet and fold downwards, e.g. in buckle plates 2 + 4. • Open fold rollers at exit, up to 6 paper thicknesses. • Use hold-down springs in buckle plate 3.
	Inner width in buckle plate 3 is too big.	<ul style="list-style-type: none"> • Reduce the inner width, • Use hold-down springs in buckle plate 3.
		<ul style="list-style-type: none"> • Pre-bend sheet to the top, • Use hold-down springs in buckle plate 3. • Turn sheet and fold downwards, e.g. in buckle plates 2 + 4. • Open fold rollers at exit, up to 6 paper thicknesses. • Use hold-down springs in buckle plate 3.

Table 40: Error/cause/remedy for letter and gatefold

9 Maintenance

9.1 Introduction

For the maintenance of the machine, also observe:

- The qualification of maintenance personnel.
See chapter "9.1.1 Qualification of personnel".
- The safety messages.
See chapter "9.1.2 Safety messages".
- The protective devices.
See chapter "4.6.11 Checking protective devices".

9.1.1 Qualification of personnel

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

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

Table 41: Qualification of personnel
Legend: X permitted, - not permitted

9.1.2 Safety messages

**WARNING!****Hazardous voltage.****Non-observance will result in serious injury or death.**

- Only an electrically qualified person may perform work on the machine's electrical system.
 - Observe all local work safety regulations and electrical engineering rules.
 - On the supply terminals and on the clamps of the main switch, there is hazardous voltage even when the main switch is switched off. (See wiring diagram)
 - There is hazardous residual voltage on the connection terminals of the frequency inverter even when the main switch is switched off. (heed capacitor discharge time).
-

**WARNING!****Dismantling, bridging or bypassing protective devices.****Non-observance will result in serious injury or death.**

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

**WARNING!****Improper maintenance.****Non-observance could result in serious injury or death.**

- Maintenance work may only be performed by trained and authorized personnel.
 - Observe all local work safety regulations and electrical engineering rules.
 - Heed the maintenance plan.
-

**WARNING!****Crushing during maintenance work.****Non-observance could result in serious injury or death.**

Maintenance work must be carried out by one person only.

**WARNING!****Operation without protective devices.****Non-observance could result in serious injury or death.**

The protective devices protect against danger spots.

- Never operate the machine without protective devices.
- Note that after maintenance or repair work, all protective devices must be reinstalled.

**WARNING!****Rotating machine parts during maintenance work.****Non-observance could result in serious injury or death.**

- Maintenance 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 property damage.**

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

**WARNING!****Entanglement hazard when removing the safety handwheel.****Non-observance could result in serious injury or death.**

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

9.2 Customer service



WARNING!

Non-approved safety components.

Non-observance could result in serious injury or death.

- 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.

For the identification of the machine and the most important machine data, see the name plate on the machine.

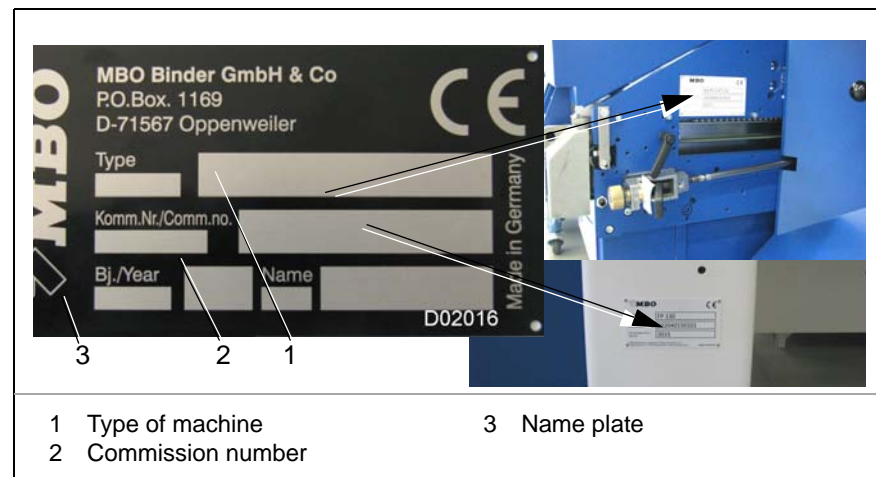


Figure 189: Name plate

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

- Commission number
- Type of machine



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

9.3 Operational maintenance



WARNING!

**Rotating machine parts during operational maintenance.
Non-observance could result in serious injury or death.**

Operational maintenance work 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 property damage.

- 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 protective devices



WARNING!

Incorrectly set safety switch.

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 re-adjusted by MBO Service or authorized customer service.
 - Never dismantle, bridge or bypass safety switches.
-



- All devices for shutting down the machine in an emergency and all protecting doors must be checked individually and separately from each other.
 - If any protective 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

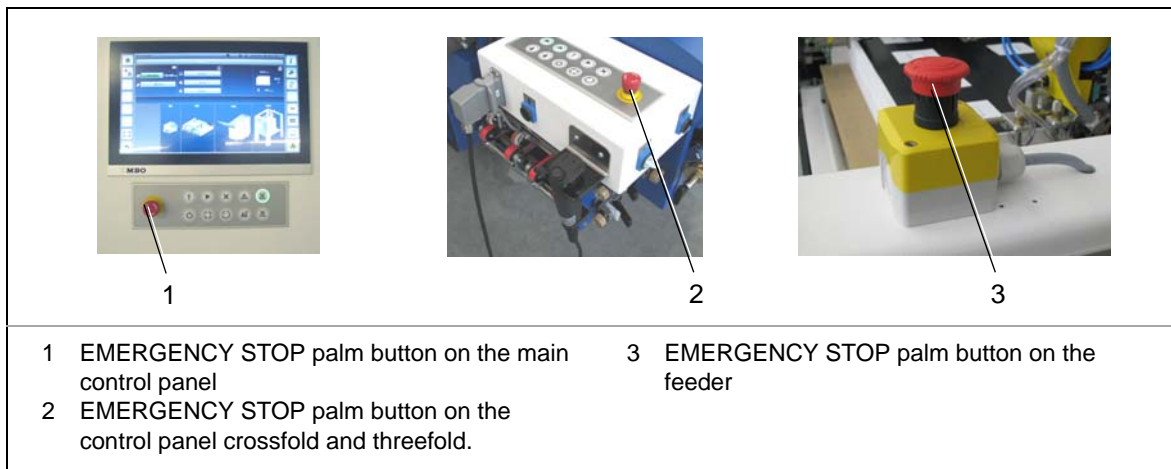


Figure 190: EMERGENCY STOP palm button



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.

How to check the EMERGENCY STOP palm button:

- 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 must not start up.
 - 4) After the test is complete, disengage the EMERGENCY STOP palm button.
- ✓ EMERGENCY STOP palm button is checked.



If the function does not match the description, have it checked by MBO Service or an authorized customer service agent.

9.3.1.2 Checking the safety handwheel



WARNING!

Entanglement hazard due to faulty safety handwheel.

Non-observance could result in serious injury or death.

Replace defective safety handwheels only with new safety handwheels with an overrunning clutch.



- Perform a daily check that the overrunning clutch on the safety handwheel is functioning correctly.
- If the safety handwheel is running stiffly and/or if the overrunning clutch is not engaging or disengaging cleanly, it should be replaced with a new safety handwheel.

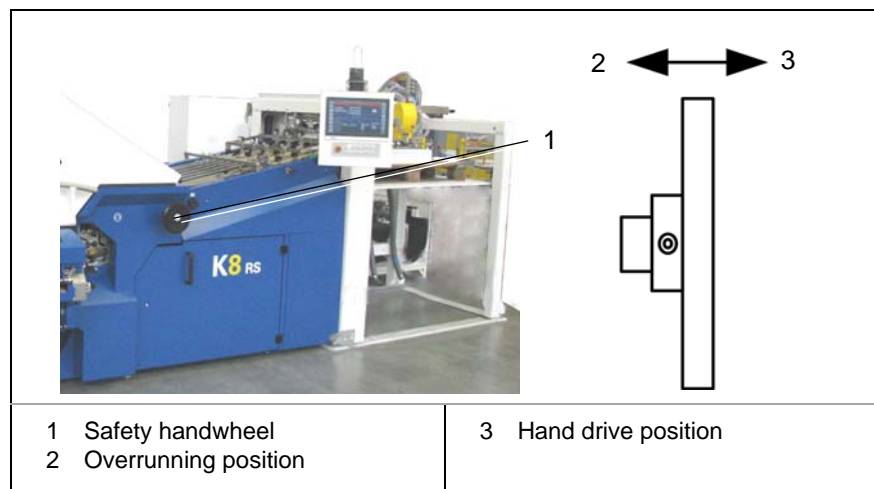


Figure 191: Checking the safety handwheel

The safety handwheel has the following positions:

- Overrunning clutch position (2)
The safety handwheel is disengaged from the machine drive.
The machine is **not** driven by turning the safety handwheel.
- Hand drive position (3)
The safety handwheel is coupled to the machine drive.
The machine is driven by turning the safety handwheel.

How to perform the daily check for the correct functioning of the overrunning clutch on a stationary machine:

Checking the smooth running

- ▷ Turn the safety handwheel.
The safety handwheel must turn easily on the shaft.
It is not permitted for the machine to turn as well.
- ✓ The smooth running has been checked.

Checking the hand drive

- ▷ Pull the safety handwheel (3) towards you, turning the safety handwheel at the same time.

The overrunning clutch is disengaged and the machine is turning at the same time.

✓ The hand drive is checked.

Checking the overrunning clutch

▷ Release the safety handwheel again.

The safety handwheel must engage securely into the overrunning clutch position (2).

▷ Turn the safety handwheel.

The safety handwheel must turn easily on the shaft.

It is not permitted for the machine to turn as well.

✓ The overrunning clutch is checked.

9.3.1.3 Checking the noise damping safety hood

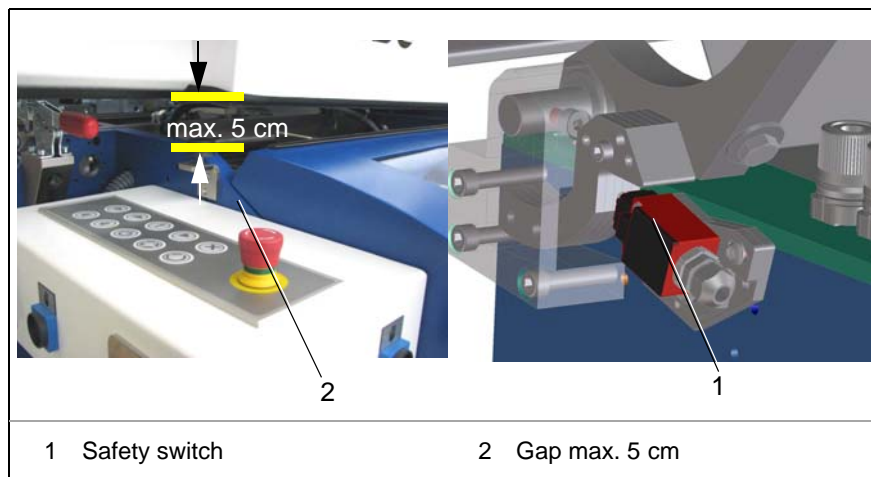


Figure 192: Checking the noise damping safety hood

Check the correct functioning of the safety switch.

How to check the noise damping safety hood:

▷ Close the noise damping safety hood slowly.

✓ The safety switch must, after reaching a gap of maximum 5 cm, switch on safely.



- If the safety switch does not switch on and off safely, the safety switch must be re-adjusted.
- For safety reasons, the safety switch must be adjusted by MBO Service or an authorized customer service agent.

See also Chapter"4.6.12 Checklists for protective devices"

9.3.1.4 Checking the safety hood over the threefold

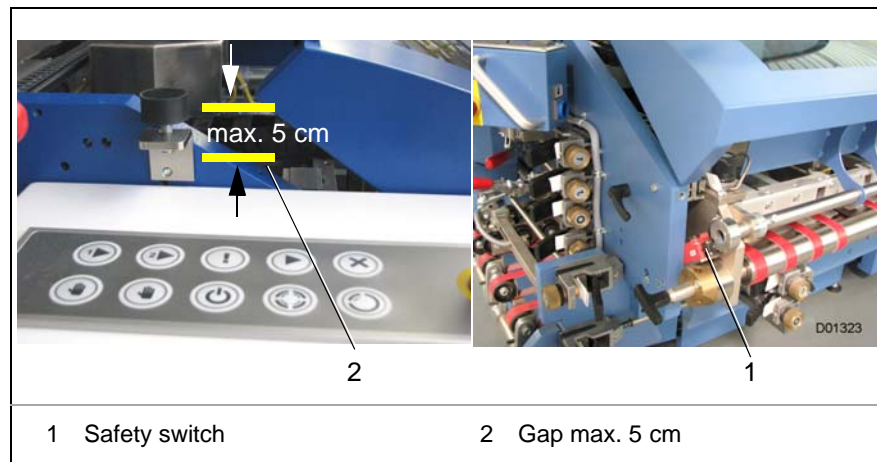


Figure 193: Gap safety hood, model SKTZ

Check the correct functioning of the safety switch (1).

How to check the safety hood:

- ▷ Close the safety hood slowly.
- ✓ The safety switch (1) must, after reaching a gap of maximum 5 cm, switch on safely.



- If the safety switch does not switch on and off safely, the safety switch must be re-adjusted.
- For safety reasons, the safety switch must be adjusted by MBO Service or an authorized customer service agent.

See also chapter "4.6.12 Checklists for protective devices".

9.3.1.5 Checking the crossfold table.

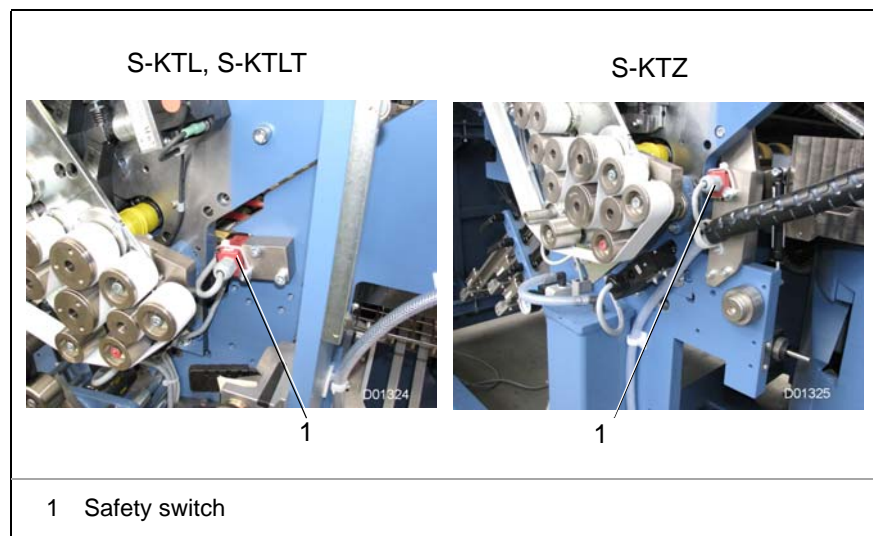


Figure 194: Safety switch, crossfold

Check the correct functioning of the safety switch (1).

How to check the crossfold table:

- ▷ 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 safety switch does not switch on and off safely, the safety switch must be re-adjusted.
- For safety reasons, the safety switch must be adjusted by MBO Service or an authorized customer service agent.

See also chapter "4.6.12 Checklists for protective devices".

9.3.1.6 Checking the threefold carriage

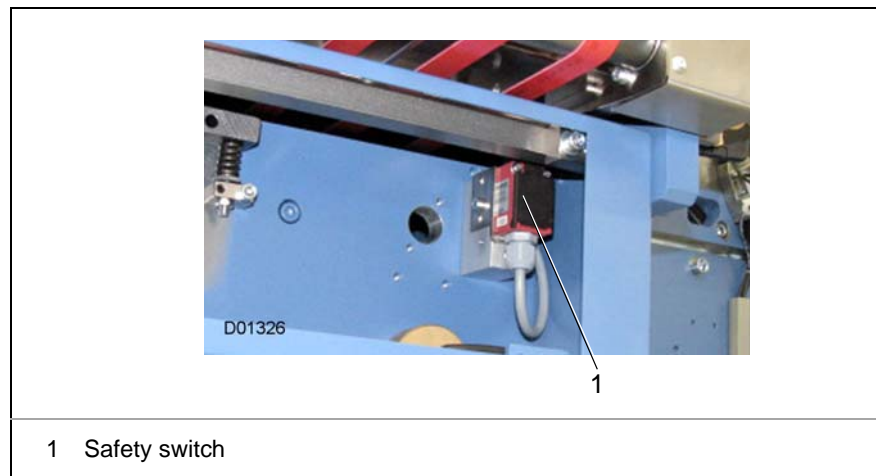


Figure 195: Safety switch, threefold

Check the correct functioning of the safety switch (1).

How to check the threefold carriage:

- ▷ 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 safety switch does not switch on and off safely, the safety switch must be re-adjusted.
- For safety reasons, the safety switch must be adjusted by MBO Service or an authorized customer service agent.

See also chapter "4.6.12 Checklists for protective devices".

9.3.1.7 Checking the slitter shaft cassette

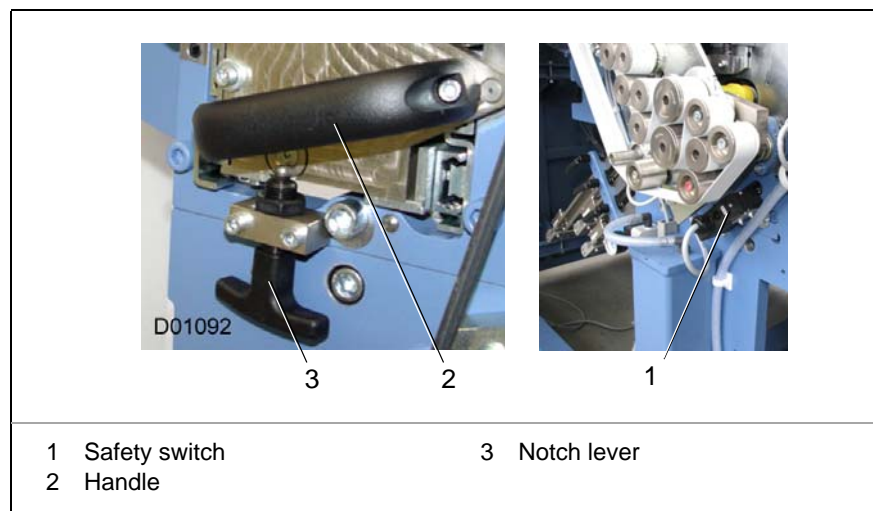


Figure 196: Safety switch slitter shaft cassette

The safety switch of the slitter shaft cassette is equipped with a locking device. That is, the slitter shaft cassette cannot be pulled out when the machine is running.

For safety-technical reasons, the correct function of the safety switch (1) must be checked daily.

How to check the slitter shaft cassette:

Checking the locking function

- ▷ Start the machine.
- ▷ Unlock the notch lever (3).
- ▷ Try to pull the slitter shaft cassette out on the handle (2).
- ✓ The slitter shaft cassette cannot be pulled out when the machine is running.

Checking the shutdown function

- ▷ Stop the machine.
- ▷ Unlock the notch lever (3).
- ▷ Pull the slitter shaft cassette out using the handle (2).
- ✓ The machine may not be run when the slitter shaft cassette is pulled out.

Checking the switch-on function

- ▷ Push the slitter shaft cassette in slowly.
- ▷ The slitter shaft cassette must snap in securely.
- ▷ The notch lever (3) must snap in securely.
- ✓ The machine may only be started up again when the slitter shaft cassette is snapped in.



- If the safe function of the safety switch is no longer guaranteed, it must be readjusted or replaced.
- For safety reasons, this must be adjusted by MBO Service or an authorized customer service agent.

9.3.1.8 Checking the inching mode and two-hand operation functions

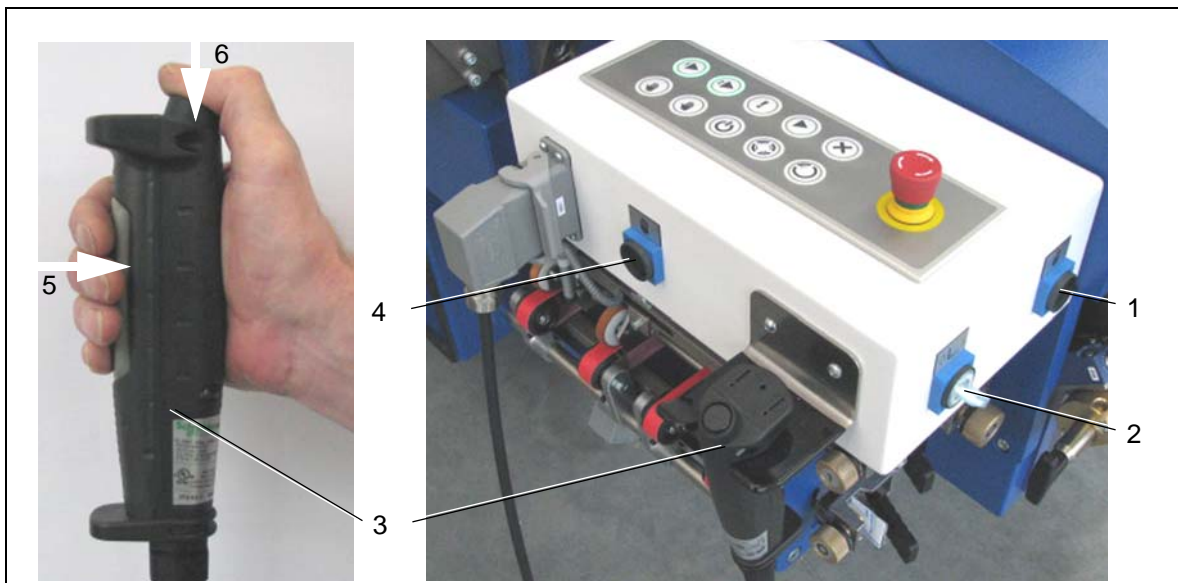


Figure 197: Checking the inching mode and two-hand operation

Checking inching mode

How to check the inching mode:

- ▷ Turn the illuminated selector switch (2) to the right (position 1).
- ▷ Open the noise damping safety hood.
- ▷ Remove the enabling grip switch (3) from the support.
- ▷ Keep the enabling grip switch (3) held down as shown in the illustration.
- ▷ Press the enabling grip switch until the first grip position (5) is reached.
- ▷ Press the button (6) with your thumb.
- ✓ After a delay time, the machine runs at 5 m/min.

Checking two-hand switching

How to check the two-hand switching:

- ▷ Turn the illuminated selector switch (2) to the right (position 1).
- ▷ Open the noise damping safety hood.
- ▷ Press buttons (1) and (4) simultaneously.
- ✓ After a delay time, the machine runs at production speed.



If the function does not match the description, have it checked by MBO Service or an authorized customer service agent.

9.3.2 Checking the pneumatic springs

9.3.2.1 Feeder head arm on the feeder



WARNING!

**Automatic lowering of the supporting arm pivoted upwards.
Non-observance could result in serious injury or death.**

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

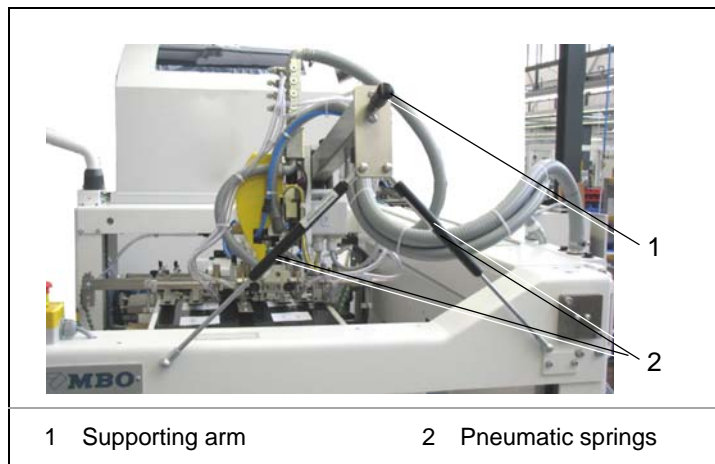


Figure 198: Testing the pneumatic springs

Check the pneumatic springs after each production run / daily to ensure that they are in good condition.

How to check the pneumatic springs:

- ▷ Check that the feeder head is securely clamped onto the supporting arm.
- ▷ Swivel the supporting arm (1) fully upwards.
- ▷ The pneumatic springs (2) must be replaced if the supporting arm (1) is lowered automatically from the pivoted upwards position.
- ✓ The pneumatic springs are checked.



Only have the pneumatic springs replaced by MBO Service or by an authorized customer service agent.

9.3.2.2 Noise damping safety hood

**WARNING!**

**Self-acting lowering of the opened noise damping safety hood.
Non-observance could result in serious injury or death.**

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



Figure 199: Pneumatic springs on the noise damping safety hood

Check the pneumatic springs after each production run / daily to ensure that they are in good condition.

How to check the pneumatic springs:

- ▷ Open the noise damping safety hood fully.
- ▷ The pneumatic springs must be replaced when the noise damping safety hood lowers by itself from the completely open position.
- ✓ The pneumatic springs are checked.



Only have the pneumatic springs replaced by MBO Service or by an authorized customer service agent.

9.3.2.3 Crossfold table

**WARNING!**

Automatic lowering of the open crossfold table.

Non-observance could result in serious injury or death.

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

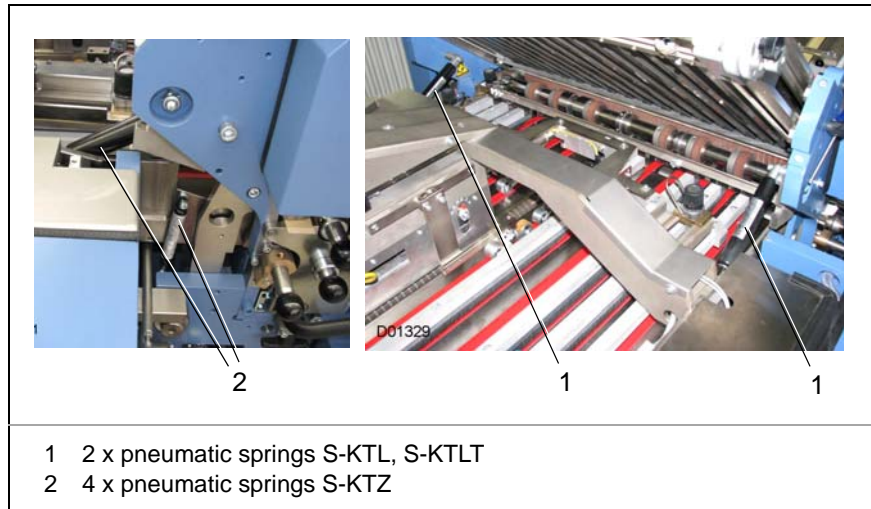


Figure 200: Pneumatic springs on the crossfold table

Check the pneumatic springs after each production run / daily to ensure that they are in good condition.

How to check the pneumatic springs:

- ▷ Open the crossfold table completely.
- ▷ The pneumatic springs must be replaced when the crossfold table lowers by itself from the completely open position.
- ✓ The pneumatic springs are checked.



Only have the pneumatic springs replaced by MBO Service or by an authorized customer service agent.

9.3.2.4 Guard over KTL plate



WARNING!

Automatic lowering of the open guard.

Non-observance could result in serious injury or death.

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

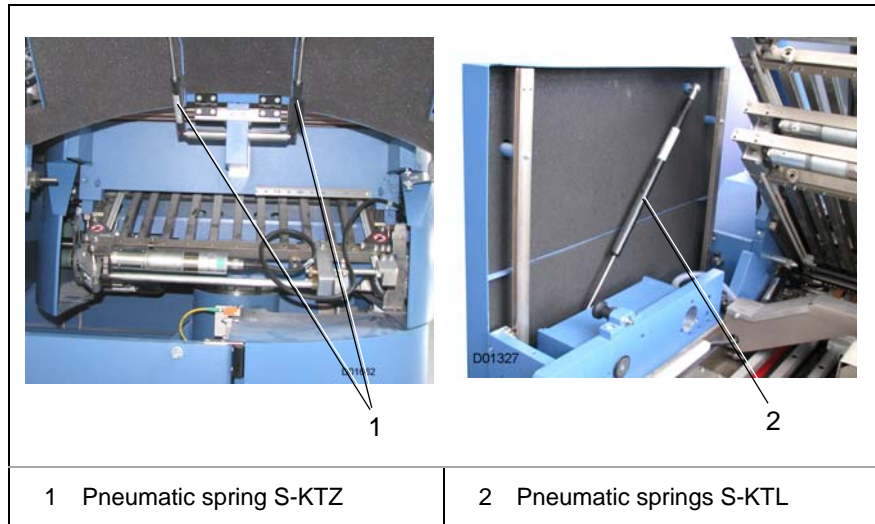


Figure 201: Pneumatic springs on KTL plate guard

Check the pneumatic springs after each production run / daily to ensure that they are in good condition.

How to check the pneumatic springs:

- ▷ Open the guard completely.
- ▷ The pneumatic springs must be replaced when the guard lowers by itself from the completely open position.
- ✓ The pneumatic springs are checked.



Only have the pneumatic springs replaced by MBO Service or by an authorized customer service agent.

9.3.3 Cleaning the machine

**WARNING!****Rotating machine parts during operational maintenance.****Non-observance could result in serious injury or death.**

- Work on the machine must be carried out by specially trained and authorized technicians only.
 - Switch the machine to de-energized and secure against reconnection by third persons.
 - Observe all local work safety regulations and electrical engineering rules.
-

**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 washing and cleansing agents. If unsuitable detergents or cleaning agents are used, they can attack lacquered surfaces or cause the fold roller coating to swell.
 - Never clean the machine using compressed air (bearing damage).
-

**CAUTION!****Danger when lifting heavy machine parts (buckle plates, slitter shafts, etc.)****Non-observance could result in personal injuries or damage to property.**

To lift heavy machine parts such as buckle plates, slitter shafts, etc., request the help of another person or people.

**CAUTION!****Incorrect use of cleaning agents.****Non-observance could result in personal injury.**

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

**CAUTION!****Used cleaning cloths.****Non-observance could result in personal injuries or damage to property.**

- Observe fire hazards resulting from the inflammability of the cleansing agent.
- Dispose of the cleaning rags in an environmentally-friendly fashion.
- Inform yourself by asking the cleaning agent manufacturer about residual risks and about environmentally friendly disposal.

9.3.3.1 Recommended cleaning agents**Flat surfaces and cavities**

Suction clean or sweep out

For deposits that adhere to finished surfaces

Solvent-free cleansing agent

Cleaning rollers

MBO Binder GmbH & Co. KG recommends "Varn" cleansing agent with the designation: "VM 111 or VWM Wash".

The "Varn" company delivers to the printing industry worldwide.

It is therefore not impossible for different product names to be used in certain countries.

Therefore, please use the respective order no. from the technical data sheets of the "Varn" company.



Be sure to follow the manufacturer's safety instructions.

9.3.3.2 Cleaning 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.

How to clean the machine:

- ▷ Suck up the dirt.
- ▷ Use a brush for hard-to-reach areas.
- ▷ Wipe down the surfaces using a dry cloth.
- ▷ Do not use any aggressive chemical washing and cleansing 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. (bearing damage)
-

9.3.3.3 Cleaning Vaculift RS feeder head

The guides in the feeder head get dirty during production due to paper dust and printing powder.

They should therefore be cleaned after each job (daily).

How to clean the guides:

- ▷ Clean the guides using a cloth.
- ▷ Lubricate the guides using silicone spray.
- ✓ The guides are cleaned.

9.3.3.4 Clean guides on the register table.



Figure 202: Cleaning the register table

Clean the drive shaft (1) and guide rods (2) weekly to remove paper dust and ink powder.



- Never clean the machine using compressed air (bearing damage).
- Use only brushes and a vacuum cleaner for this.
- The drive shafts and guides may not be greased.

9.3.3.5 Cleaning the swiveling lever and side frames

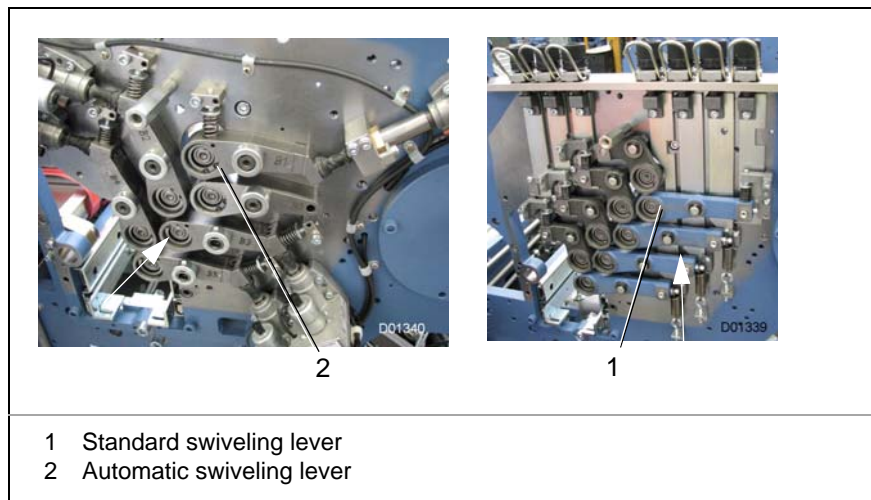


Figure 203: Cleaning the swiveling lever and side frames.

Clean the swiveling lever and the gap to the side frame monthly to remove paper dust and ink powder.



- Never clean the machine using compressed air. (bearing damage)
- Use only brushes and a vacuum cleaner for this.

9.3.3.6 Cleaning fold rollers


CAUTION!

Unsuitable cleaning agents.

Non-observance could result in property damage.

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


CAUTION!

Incorrect cleaning of the spiral fold rollers.

Non-observance could result in property damage.

Be absolutely certain to observe the special cleaning instructions for the spiral fold rollers.


CAUTION!

High-grip fold rollers cleaned incorrectly.

Non-observance could result in property damage.

Note especially the special cleaning instructions for high-grip fold rollers.



- Deposits of printing powder and/or printing ink on the fold rollers can lead to a reduction in quality of folding products.
- Clean the fold rollers weekly and as needed.

Spiral fold rollers

How to clean the spiral fold rollers:



- 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 fold rollers, use the roller cleaning agent "Varn-Wash VM 111" or "VWM" only.
 - 3) Use only linen cloths as cleaning cloths.
 - 4) Moisten the linen cloth using the roller cleaning agent.
 - Never immerse the fold rollers in the roller cleaning agent.
 - Penetrating roller cleaning agent can destroy the bearings.
 - 5) Use the linen cloth to remove the deposits on the fold rollers.
 - Apply only a little pressure when rubbing.
 - 6) Dry the fold rollers with a dry 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 fold rollers are cleaned.

High-grip/Virotec fold rollers



High-grip fold rollers have an open-pored surface. If small particles or partially dissolved printing ink or printing powder are absorbed by this surface, they harden and the high-grip fold rollers become unusable.



How to clean the fold rollers:

- 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 rollers, use the roller cleaning agent "Varn-Wash VM 111" or "VWM" only.
 - 3) Use only linen material for cleaning cloths
 - 4) Moisten the linen cloth using the roller cleaning agent.

Never immerse the high-grip fold rollers in the roller cleaning agent. Penetrating roller cleaning agent can destroy the bearings.
 - 5) Use the linen cloth to remove the deposits on the high-grip fold rollers.

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 cleaning agent from the roller coating.
 - 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) Dry the high-grip fold rollers with a dry 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>.
- ✓ High-grip fold rollers are cleaned.

9.3.3.7 Cleaning the buckle plates



CAUTION!

Lifting heavy machine parts.

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

To lift heavy machine parts such as buckle plates, slitter shafts, etc., request the help of another person or people.



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.

How to clean the buckle plates:

- ▷ Remove the buckle plates.
- ▷ Vacuum these using a vacuum cleaner.
- ▷ Reinstall the buckle plates.
- ✓ Buckle plates are cleaned.

9.3.3.8 Cleaning the spindles and guides of the rapid-set drives.

Paper dust and printing powder influence the function of the spindles and guides significantly.

Clean the spindles and guides weekly.



- Use only brushes and a vacuum cleaner for this.
- The drive shafts and guides may not be greased.

9.3.3.9 Cleaning the optical sensors

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

They should therefore be cleaned after each job (daily).

How to clean the optical sensors:

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

9.3.3.10 Cleaning the sensors in the folding knives

The sensors in the folding knives get dirty during production due to paper dust and printing powder. This can impair their function.

They should therefore be cleaned after each job (daily).

How to clean the sensors:

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

9.3.3.11 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.

How to clean the slitter shaft cassette:

- 1) Clean the slitter shaft cassette with a brush.
 - 2) Vacuum out the paper dust with an industrial vacuum cleaner.
 - 3) Points to which special attention should be paid are:
 - Telescopic rails: all running guides
 - Roller adjustment elements
 - Index bolt
 - Barrel bolts and sockets
 - 4) Clean the telescopic rails with a degreaser.
 - 5) Rub the telescopic rails dry with a linen cloth.
 - 6) Grease the running surfaces of the telescopic rails slightly with a resin-free grease.
- ✓ Slitter shaft cassette is cleaned.



Never use silicone spray or WD40.
Otherwise, the residue combines with the accumulating paper dust to make a gluey mess.

9.3.3.12 Cleaning the guides on the threefold carriage

Paper dust and printing powder influence the function of the guides significantly.

Clean and grease the guides monthly.

How to clean the guides:

- 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) Grease the running surfaces of the telescopic rails slightly with a resin-free grease.
- ✓ The guides are cleaned.



Never use silicone spray or WD40.

Otherwise, the residue combines with the accumulating paper dust to make a gluey mess.

9.3.3.13 Cleaning the guides of the crossfold folding knife

Paper dust and printing powder influence the function of the guides significantly.

Clean the guides monthly.

How to clean the guides:

- 1) Vacuum out the paper dust with an industrial vacuum cleaner.
 - 2) Rub the guides dry with a linen cloth.
- ✓ The guides are cleaned.

9.3.4 Cleaning/replacing air filter of the pressure vacuum pump

Refer also to the separate operating manual of the pressure vacuum pump.

To guarantee full output capacity the filter cartridges must be cleaned after every 50 hours of operation.



CAUTION!

Ingress of foreign objects.

Non-observance could result in property damage.

- Switch off the pressure vacuum pump for maintenance work.
- Do not start up the pressure vacuum pump without a filter cartridge.
- Replace stopped-up or damaged filter cartridges.

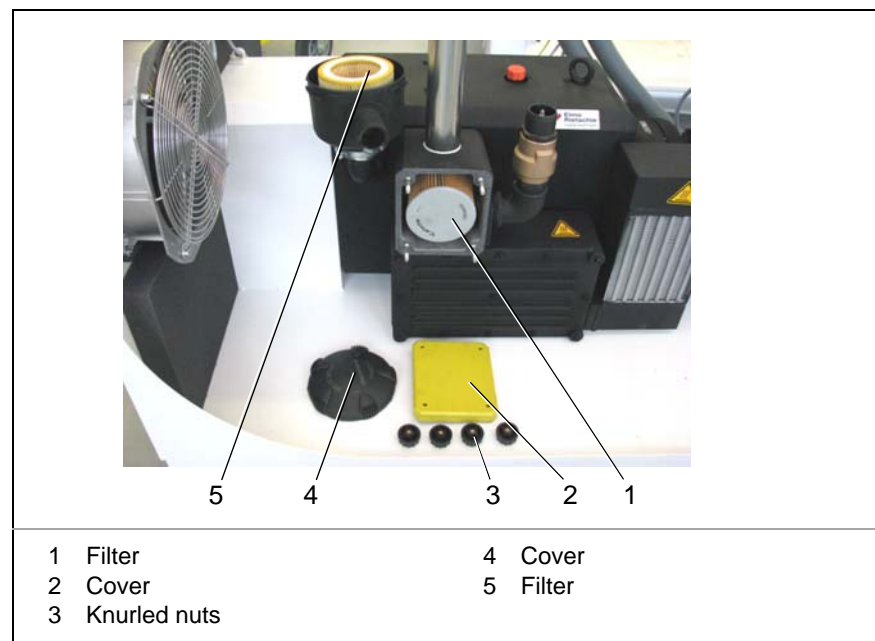


Figure 204: Pressure vacuum pump filter

Cleaning the filter

How to clean the filter:

- ▷ Unfasten and remove the knurled nuts (3).
 - ▷ Remove the cover (2).
 - ▷ Unfasten and remove the cover (4) by turning counter-clockwise.
 - ▷ Remove the filter cartridges (1 + 5).
 - ▷ Remove the coarsest dust with a brush.
 - ▷ Remove the remaining dust by blowing it out with compressed air from the inside to the outside.
 - ▷ Re-insert the filter cartridges (1 + 5).
 - ▷ Fit the cover (4) and lock it by turning clockwise.
 - ▷ Replace the cover (2).
 - ▷ Re-tighten the knurled screws (3).
 - ▷ Confirm the maintenance on the display.
- See chapter "9.4 Maintenance"
- ✓ The filters are clean.



Replace the filter cartridges (1 + 5) every six months or as necessary.

9.4 Maintenance

**WARNING!****Rotating machine parts during maintenance and repair.****Non-observance could result in serious injury or death.**

- Work on the machine may only be performed by a qualified specialist.
 - Switch the machine to de-energized and secure against reconnection by third persons.
 - Observe all local work safety regulations and electrical engineering rules.
-

**WARNING!****Improper maintenance.****Non-observance could result in serious injury or death.**

- Maintenance work must be carried out by a qualified specialist only.
 - Heed the local occupational safety regulations.
 - Maintenance work should be carried out by one person only.
 - Heed the maintenance plan.
 - The manufacturer shall not be liable for any damage caused by improper maintenance, lubrication and cleaning.
-

**WARNING!****Rotating machine parts.****Non-observance could result in serious injury or death.**

- Make sure that third parties are not endangered during any maintenance work.
- Make sure that all persons are in a safe area prior to re-connection of the machine.

9.4.1 Checking the feeder

9.4.1.1 Checking the drive chain



DANGER!

Removing the geared motor.

The geared motor keeps the pile plate in position.

If the geared motor is removed, the pile plate will drop downwards.

Non-observance will result in serious injury or death.

- The geared motor must not be removed until a secure support has been placed underneath the pile support plate and the chain has been relieved of tension/secured.
- To do so, use a suitable fork lift.

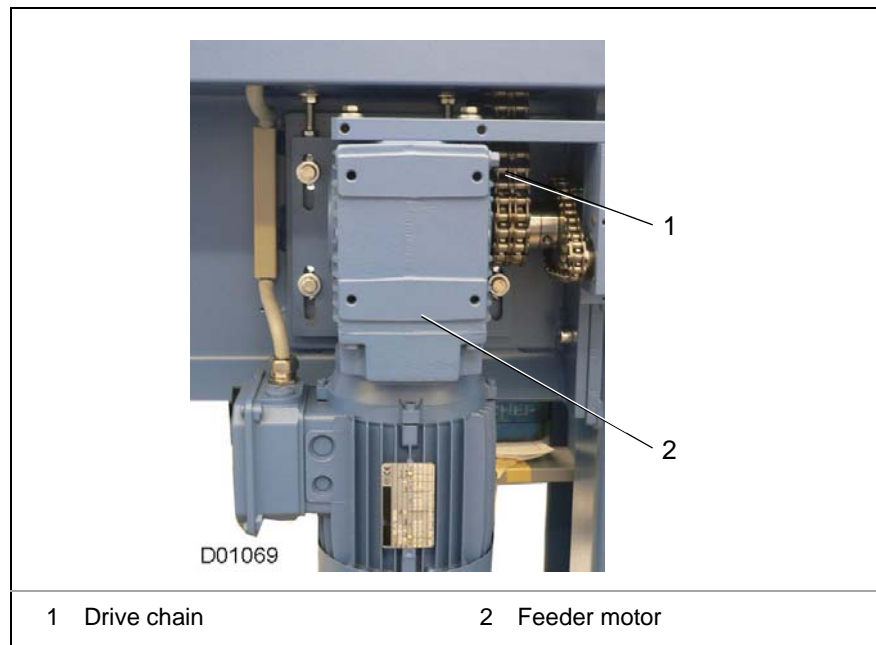


Figure 205: Checking the drive chain

Check the drive chain (1) every six months for its tension.

- ▷ If the drive chain needs to be tightened, please inform MBO Service or an authorized customer service representative.



For safety reasons, work is only permitted to be carried out on the feeder motor by MBO Service or an authorized customer service agent.

9.4.1.2 Greasing the chains

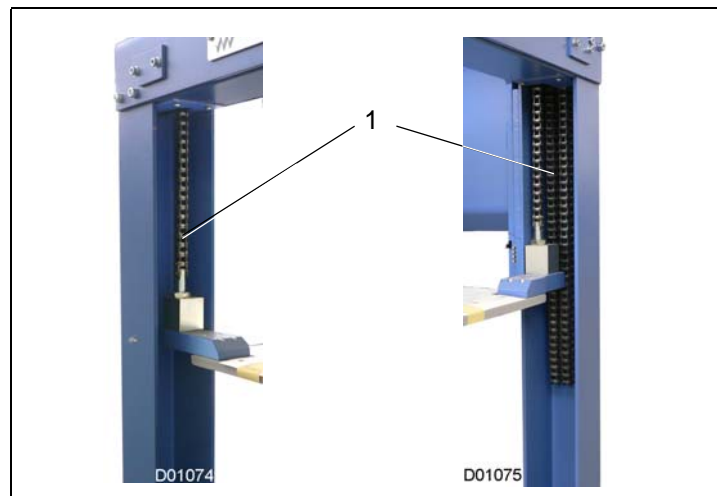


Figure 206: Lubricating the chains

Lightly oil the chains (1) every 500 operating hours.

How to lubricate the chains:

- ▷ Move the feeder to the top position.
- ▷ Secure the feeder against unauthorized re-start.
- ▷ Clean the chains (1).
- ▷ Rub the chains (1) with an oil-saturated cloth.

9.4.1.3 Lubricating the axle on the pile plate

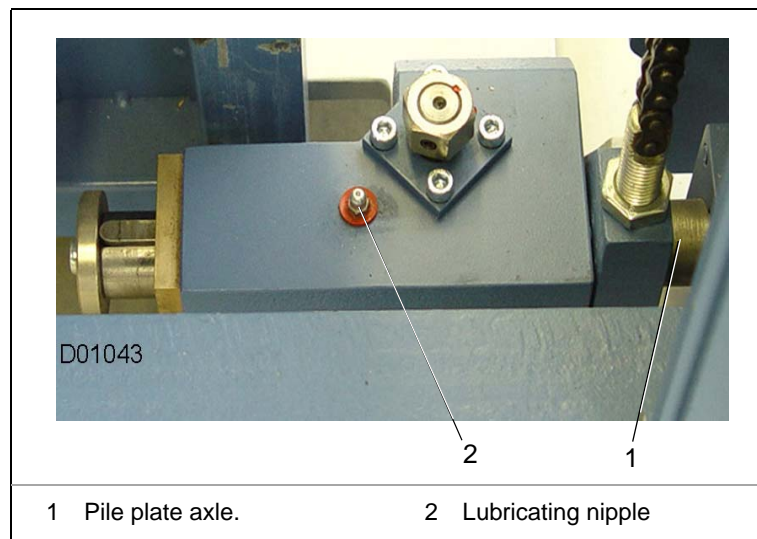


Figure 207: Lubricate the pile plate axle

Lubricate the pile plate axle (1) every 500 operating hours.

How to lubricate the axle:

- ▷ For this purpose, lubricate the lubrication nipples (2) on the left and on the right.

9.4.1.4 Checking the suction belts



- Check the suction belts monthly for their running properties, tension, condition, and soiling.
- If it is no longer possible to adjust centered running or achieve the necessary tension or if the general condition of the tapes is poor, these must be replaced.

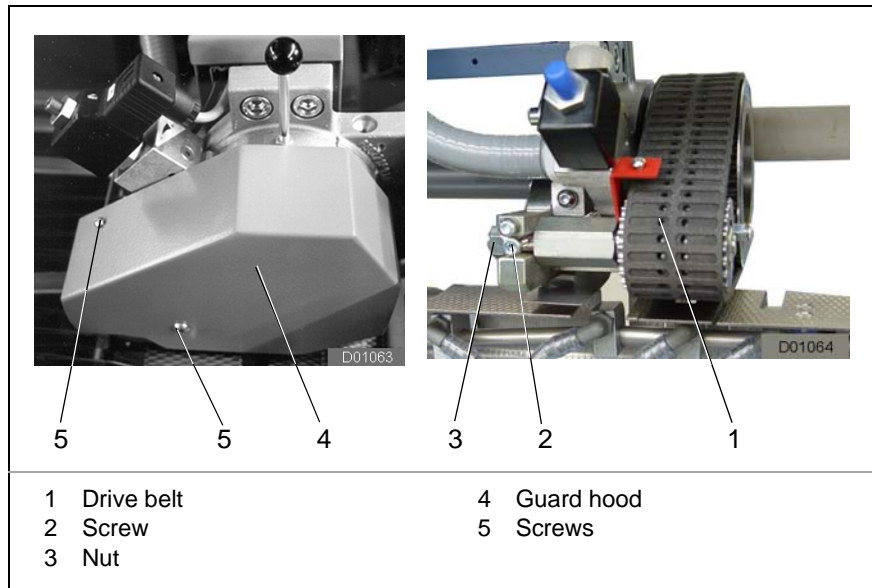


Figure 208: Check the suction belt

Adjusting the belt:

How to adjust the belt:

- ▷ Loosen the screws (5) and remove the guard (4).
- ▷ Loosen the nuts (3).
- ▷ Tension the belt (1) by turning in the screw (2).
Do not tension the belt (1) too much.
- ▷ Fasten nut (3).
- ▷ Fix the guard with the screws (5).
- ✓ The belt is adjusted

Replacing the belt:

How to replace the belt:

- ▷ Loosen the screws (5) and remove the guard (4).
- ▷ Loosen the nuts (3).
- ▷ Relieve the tension of the belt (1) by turning out the screw (2).
- ▷ Take out the old belt and replace it with a new one.
- ▷ Tension the belt (1) through turning in the screw (2).
Do not tension the belt (1) too much.
- ▷ Fasten nut (3).
- ▷ Fix the guard (4) with the screws (5).
- ✓ The belt is replaced.

9.4.2 Checking the register table

9.4.2.1 Checking the drive belt



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

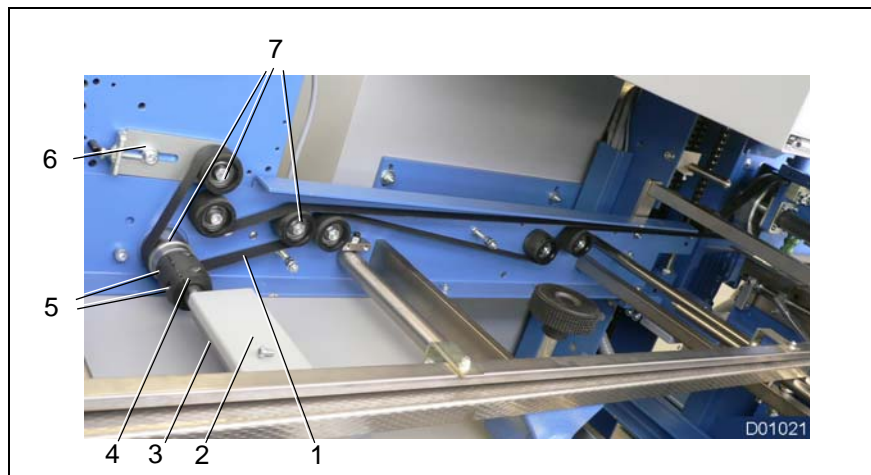


Figure 209: Checking the drive belt

How to check the drive belt:

- Removing the guard** ▷ Remove the guards from the drive belt and the handwheel (3)
- Centering the belt** ▷ Centering is carried out automatically via the crowned tape rollers (6).
- Tensioning the belt** ▷ Tension the drive belt (1) with the tension lever (7).
- Replacing the belt**
- 1) Loosen the drive belt (1) with the tension lever (7).
 - 2) Loosen both screws (5) on 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) Position the coupling (4).
 - 7) Fix the coupling (4) with the screws (5).
 - 8) Tension the drive belt (1) with the tension lever (7).
 - 9) Check the centric running of the belt.
- ✓ Drive belt is replaced.
- Attaching the guard** ▷ Mount the guards on the drive belt and the handwheel (3)

9.4.2.2 Checking the alignment belt



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



With the C feeder:

A suction roller or clocked suction roller is used.

With FP and F feeder:

A standard tape roller is used.

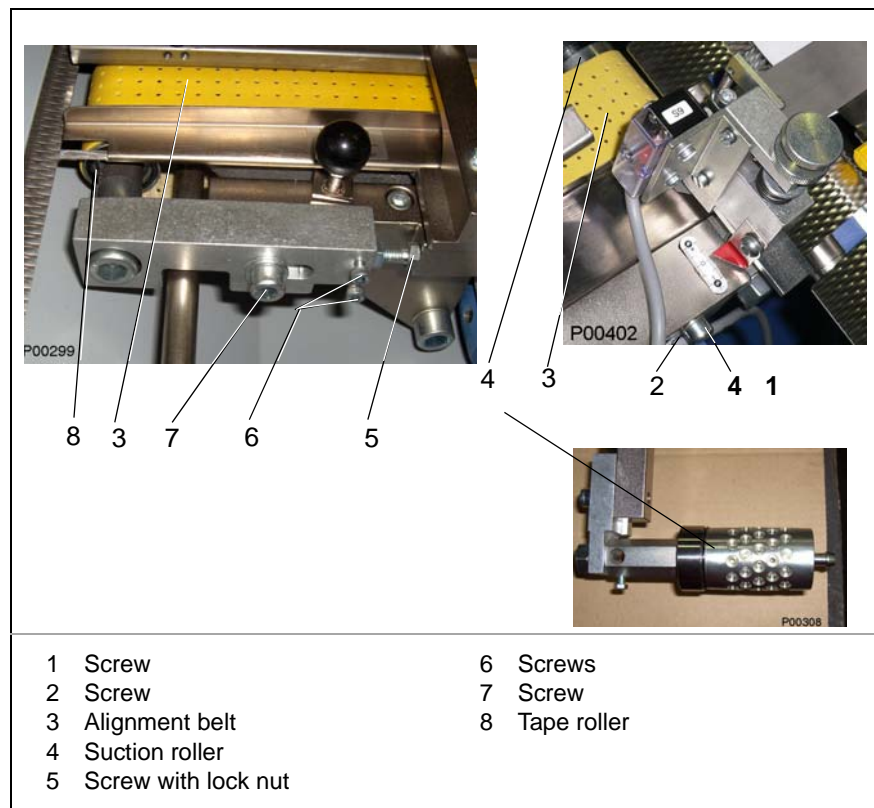


Figure 210: Adjusting the alignment belt.

How to check the alignment belt:

Adjusting the alignment belt on the tape roller (8):

- ▷ Unfasten 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 tape roller (8).
The row of holes on the alignment belt (3) must match the row of holes on the register guide.
- ▷ Tighten the screw (7).
- ▷ Check the position of the alignment belt again and re-adjust it if necessary.

Adjusting the alignment belt on the suction roller (4)

- ✓ Alignment belt is adjusted.
- ▷ Unfasten the screw (7).
- ▷ Adjust the position of the alignment belt with the screw (2) so that the row of holes on the alignment belt (3) matches the row of holes on the suction roller (4).
- ▷ Tighten the screw (1).
- ▷ Check the position of the alignment belt again and re-adjust it if necessary.
- ✓ Alignment belt is 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 row of holes on the alignment belt (3) with respect to the holes on the suction roller (4).
- ✓ Vacuum is checked.

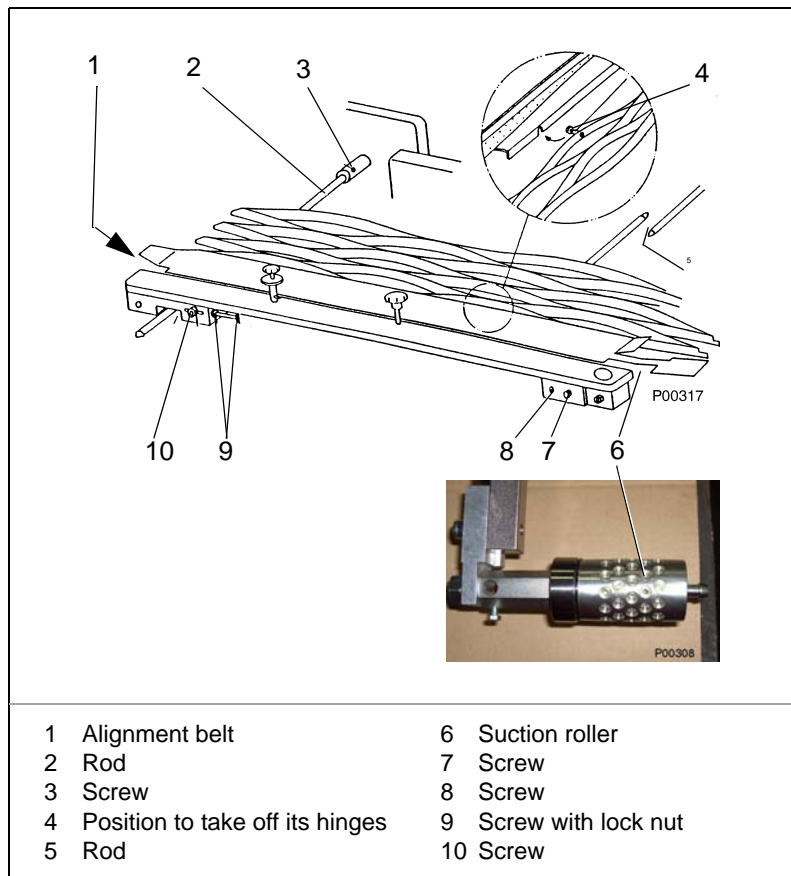


Figure 211: Replacing the alignment belt.

How to remove the alignment belt:

Removing the alignment belt

- ▷ Unfasten the screw (10)
- ▷ Relax the tension on the alignment belt (1) by loosening the screw (9).
- ▷ Unhook the lattice from the hooking points (4).
- ▷ Unfasten the screw (3).

- ▷ Remove the rod (2).
 - ▷ Remove the alignment belt (1).
 - ✓ Alignment belt is removed.
- Mounting 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 roller (6) so that the rows of holes lie over the holes on the suction roller.
 - ▷ Tension the alignment belt (1) by tightening the screw (9).
 - ▷ Adjust the centric running of the alignment belt (1).
 - ✓ Alignment belt is installed.

9.4.3 Checking the parallel fold

9.4.3.1 Removing/attaching the guard over the drive



WARNING!

Operation without protective devices.

Non-observance could result in serious injury or death.

The protective devices protect against danger spots.

- Never operate the machine without protective devices.
- Note that after maintenance or repair work, all protective devices must be reinstalled.



WARNING!

Removing the safety handwheel.

The rotating shaft represents a risk of entanglement

Non-observance could result in serious injury or death.

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

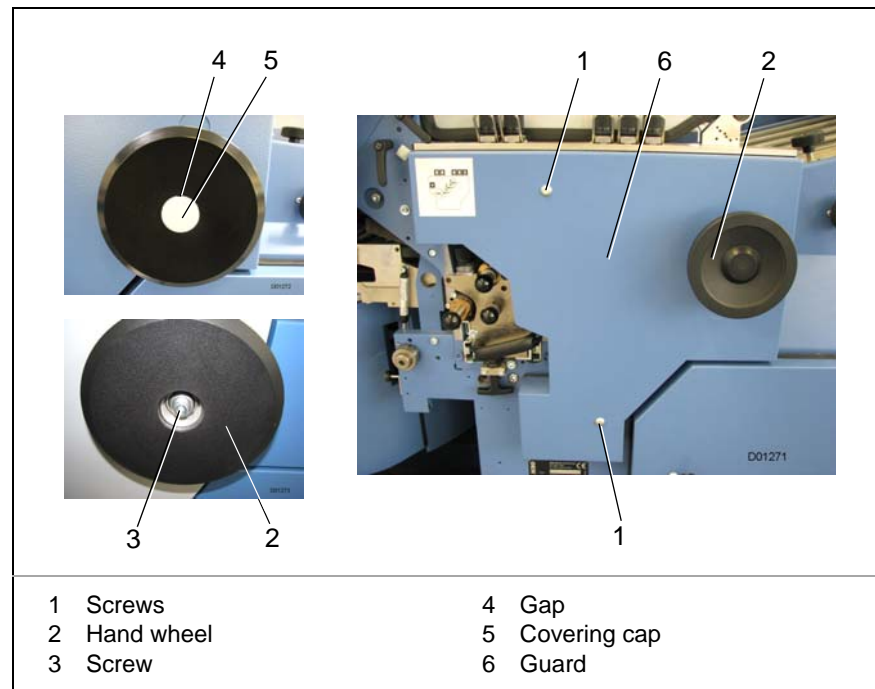


Figure 212: Removing the guards

Removing the guard

How to remove the guard:

- 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 hexagon wrench 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 fastening screws depend on the variant.

- 7) Remove the guard (6).
- ✓ The guard is removed.

Attaching the guard

How to attach the guard:

- 1) Insert the guard (5).
- 2) Fasten the guard (5) with the screws (1).

The positions of the fastening screws depend on the variant.

- 3) Insert the key.
- 4) Position 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 hexagon wrench SW6.
- 6) Replace the end cover (5) on the handwheel (2).

- ✓ The guard is fitted.

9.4.3.2 Checking the drive belts, variants S-KTL and S-KTLT.



- 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.

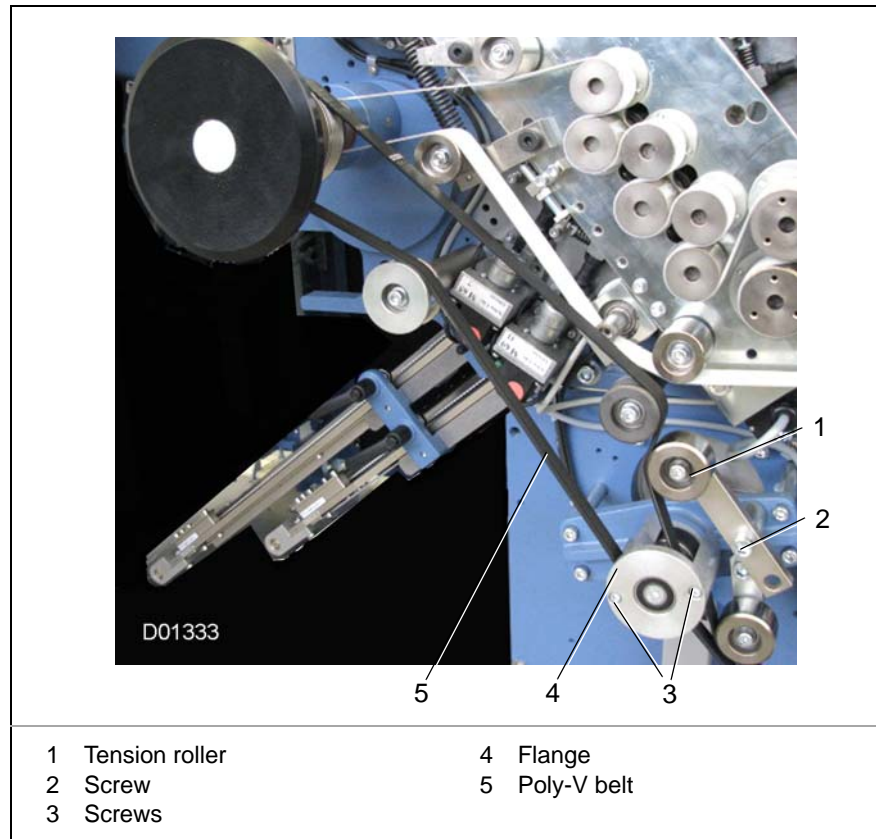


Figure 213: Replacing the drive belt

How to check the drive V belt:

Tensioning the belt ▷ Tension the Poly-V belt (5) with the tensioning roller (1) and tighten the screw (2).

- Replacing the belt**
- 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) Fit 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).
- ✓ The belt is replaced.

9.4.3.3 Checking the drive belt, variant 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.

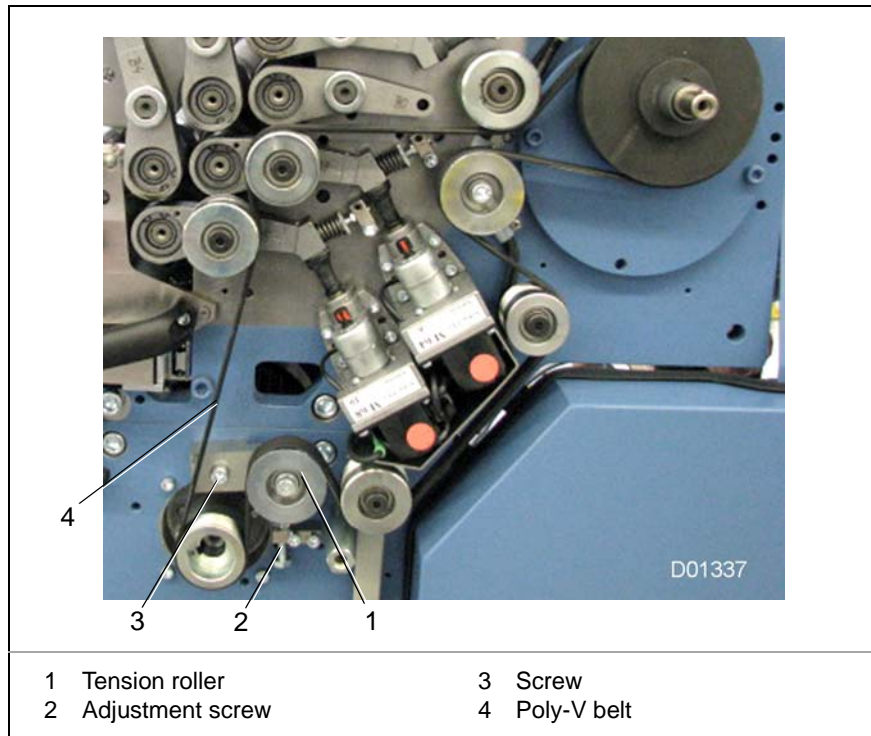


Figure 214: Replacing the drive belt.

How to check the drive V belt:

Tensioning the belt

- ▷ Loosen the screw (3) on the tensioning roller (1).
- ▷ Loosen the lock nut on the adjusting screw (2).
- ▷ Tension the Poly-V belt (4) by tightening the adjustment screw (2).
- ▷ Loosen the lock nut on the adjusting screw (2).
- ▷ Tighten the screw (3) on the tensioning roller (1).
- ✓ The belt is tensioned.

Replacing the belt

- ▷ Loosen the screw (3) on the tensioning roller (1).
- ▷ Loosen the lock nut on the adjusting screw (2).
- ▷ Turn and remove the adjusting screw (2) until the Poly-V belt (4) is loose.
- ▷ Remove the old Poly-V belt (4).
- ▷ Fit the new Poly-V belt (4).
- ▷ Tension the Poly-V belt (4) by tightening the adjustment screw (2).
- ▷ Loosen the lock nut on the adjusting screw (2).
- ▷ Tighten the screw (3) on the tensioning roller (1).
- ✓ The belt is replaced.

9.4.3.4 Checking the drive belts in the K area, variants S-KTL and S-KTLT.



- 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.

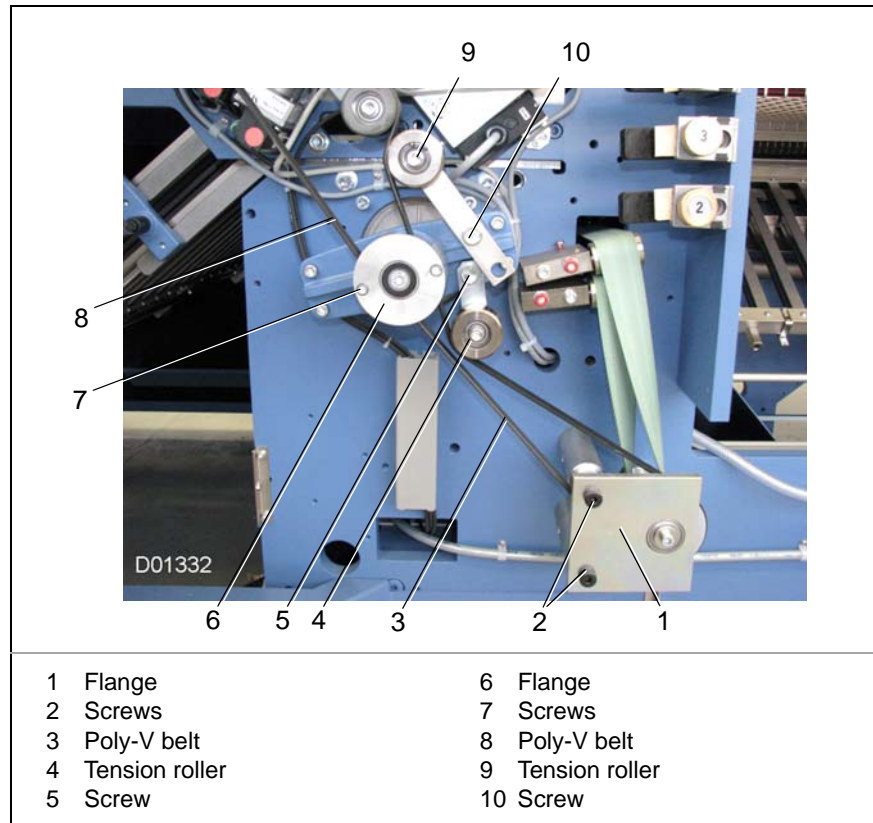


Figure 215: Replacing the drive belts in the K area.

How to check the drive V belt:

- 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 re-tighten the screw (5).
 - ✓ The belt is tensioned.
- Replacing the belt**
- ▷ Loosen the screw (10) on the tension roller (9).
The Poly-V belt (8) is loosened.
 - ▷ 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).
 - ▷ Fit 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).
- ✓ The belt is replaced.

9.4.3.5 Checking the drive belt of the fold rollers



- Check the drive belt monthly for its running properties, tension, condition, and soiling.
 - 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 folding rollers, the following steps are required:

- Remove the guard and handwheel.
See chapter "9.4.3.1 Removing/attaching the guard over the drive"
- Loosen the tension of belt of the main drive.
See chapter "9.4.3.2 Checking the drive belts, variants S-KTL and S-KTLT."
- Replace the drive belt for fold rollers.
- Tension the belt of the main drive.
See chapter "9.4.3.2 Checking the drive belts, variants S-KTL and S-KTLT."
- Attach the guard and handwheel.
See chapter "9.4.3.1 Removing/attaching the guard over the drive"

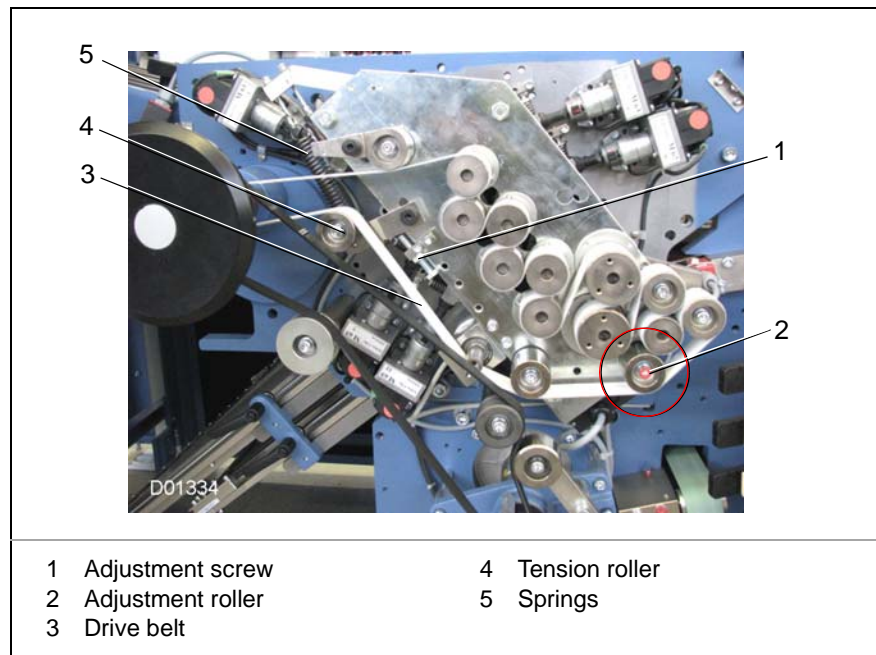


Figure 216: Replacing the drive belts in the K area.

How to check the drive belt:

Tensioning the drive belt

- 1) Loosen the lock nut at the adjusting screw (1).
 - 2) Unscrew the adjustment screw (1) a little.
 - 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 tension monthly.
To do this, turn the machine by hand.
Here, the fold rollers may not be stopped by hand.
- The center rollers on the drive belt have red markings on them.

Replacing the drive belt

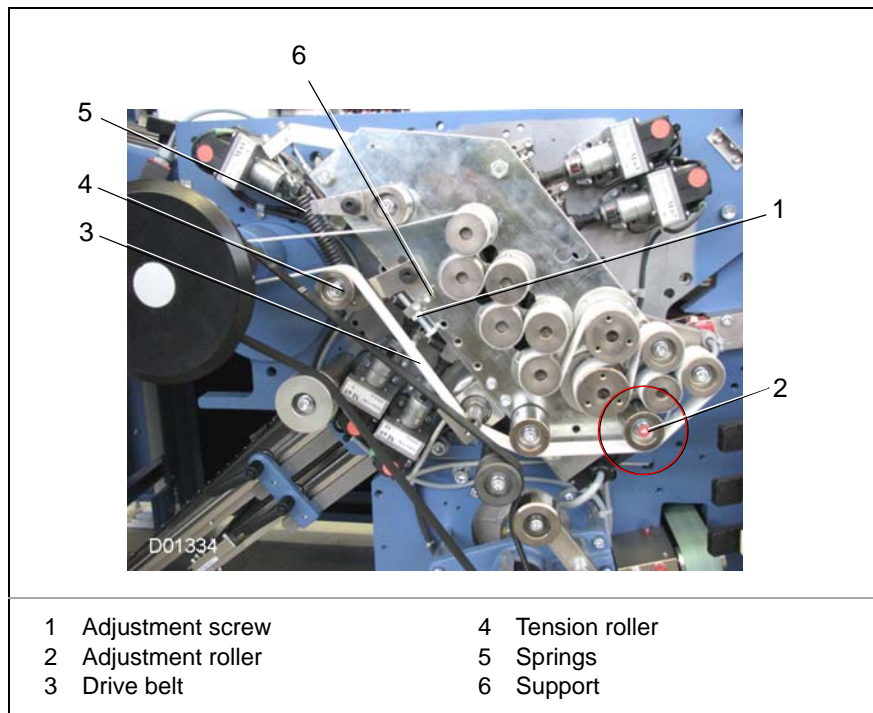


Figure 217: Replacing the drive belt.



CAUTION!

High spring tension.

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

The belt tension device is under great 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 property damage.

Never pull the drive belt over edges during installation!

How to check the drive belt:

- 1) Loosen the lock nut at the adjusting screw (1).
 - 2) Unscrew the adjustment screw (1) a little.
 - 3) Remove the support (6) with the adjustment screw (1).
 - 4) Relax the tension on the drive belt by pressing the tensioning roller downwards (4).
 - 5) Use a cropped ring wrench 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 centrally on all tape rollers.
 - 9) Remove 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

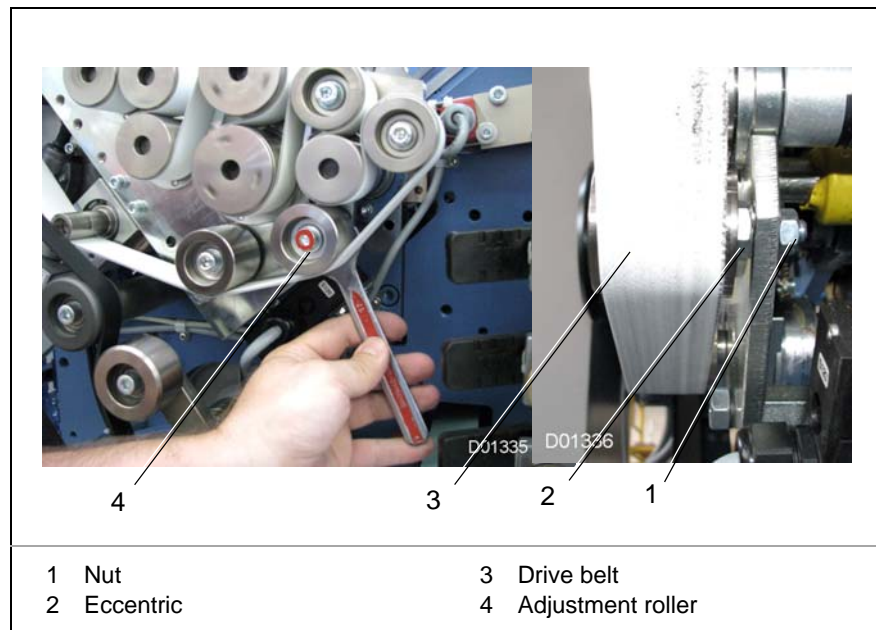


Figure 218: Adjusting the drive belt of the fold rollers.

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.
 - ▷ Tighten the nut (1) again.
- ✓ The belt running is centred.

9.4.3.6 Checking drive belt for fold rollers in crossfold and threefold.



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

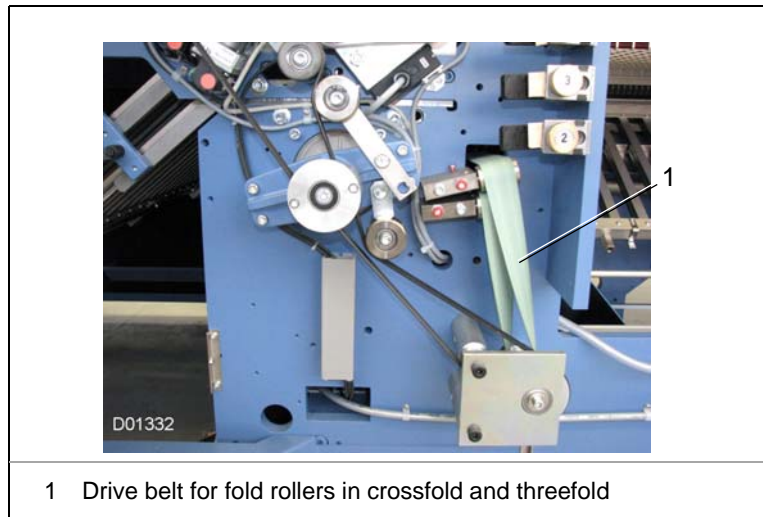


Figure 219: Checking drive belt for fold rollers in crossfold and threefold



Only have the drive belt replaced by MBO Service or by an authorized customer service technician.

9.4.3.7 Checking the drive belt crossfold, model S-KTZ.



- Check the drive belt monthly for its running properties, tension, condition, and soiling.
 - 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 injuries or damage to property.

The belt tension device is under great 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 property damage.

Never pull the drive belt over edges during installation!

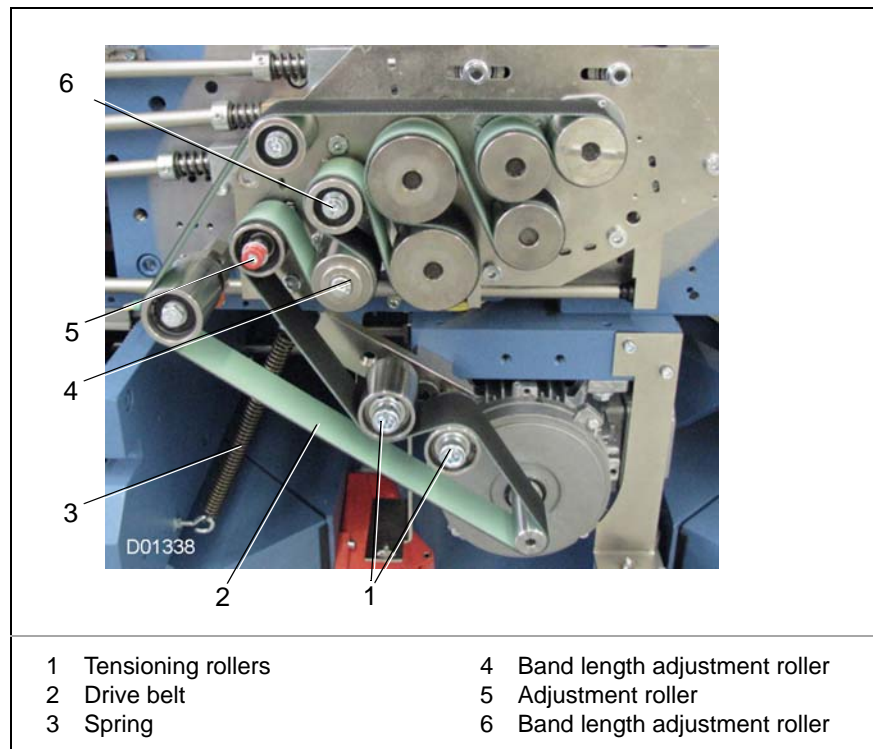


Figure 220: Replacing the drive belt crossfold.

How to check the drive belt:

- 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) with the tensioning 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.

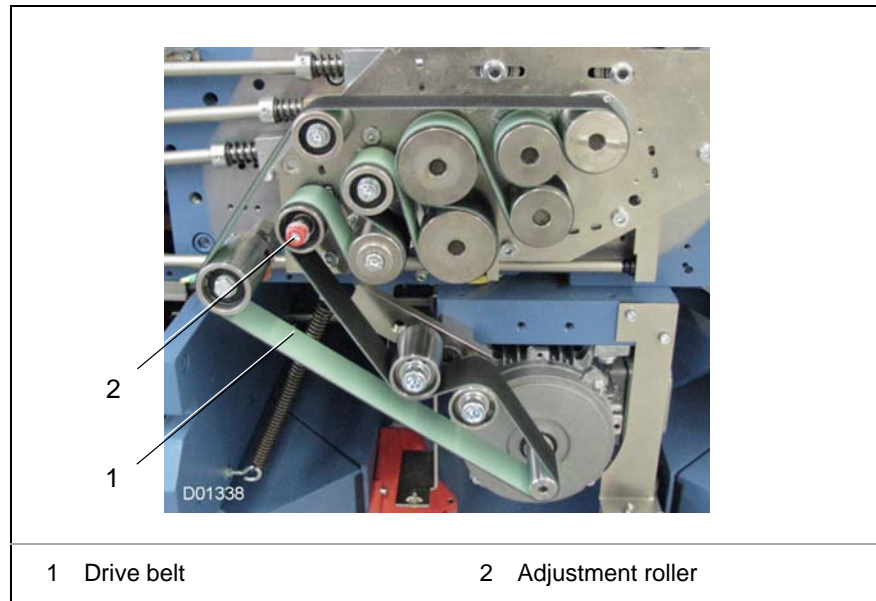
Adjusting the centric running


Figure 221: Adjusting the drive belt of the fold rollers.

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 eccentric 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.

9.4.3.8 Checking the threefold drive belt, variant S-KTZ.



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

9.4.4 Checking the fold rollers and slitter shafts

Check the fold rollers and slitter shafts in the:

- Parallel fold
 - Crossfold
 - Threefold
-



Only have the fold rollers replaced by MBO Service or by an authorized customer service technician.

9.4.4.1 Contamination and damage

Check the fold rollers and slitter shafts weekly for contamination and damage:

- Clean fold rollers and slitter shafts if necessary.
See chapter "9.3.3.6 Cleaning fold rollers"
- If the fold rollers or slitter shafts are damaged, they must be replaced.

9.4.4.2 Tension and wear-off

Check the fold rollers and slitter shafts semi-annually for tension and wear-off:

See chapter "8.7.1 Adjusting the roller pressure (standard)"

- If no more even tension can be adjusted, the fold rollers and slitter shafts must be replaced.

9.4.5 Checking the buckle plates

Check the buckle plates monthly for wear-off and damage.

Special attention should be paid to:

- Sheet stop
- Bottom plate lip
- Top plate lip
- Visual check of the screws



Only have any damage repaired by MBO Service or by an authorized customer service agent.

9.4.6 Checking the slitter shaft cassette

Check the slitter shaft cassette monthly for function and damage.

Special attention should be paid to:

- Smooth running of the telescopic rails.
- Bearing assembly of the slitter shafts
- Smooth running of the roller adjustment elements
- Smooth running of the index bolt.
- Barrel bolts and sockets

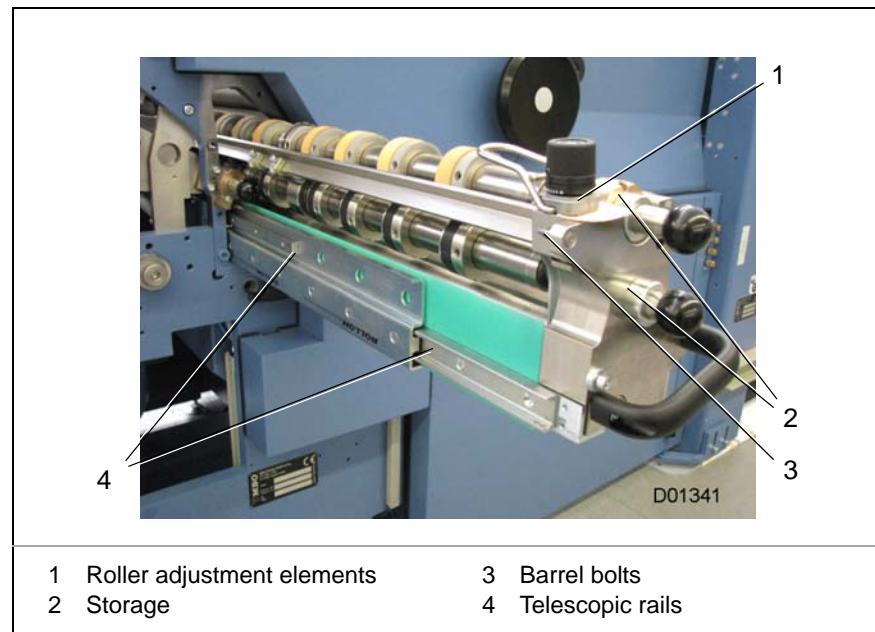


Figure 222: Checking the slitter shaft cassette.



If the function is compromised, clean the slitter shaft cassette. See chapter "9.3.3.11 Cleaning the slitter shaft cassette"



Only have any damage repaired by MBO Service or by an authorized customer service agent.

9.4.7 Checking the folding knives

9.4.7.1 Checking the smooth running

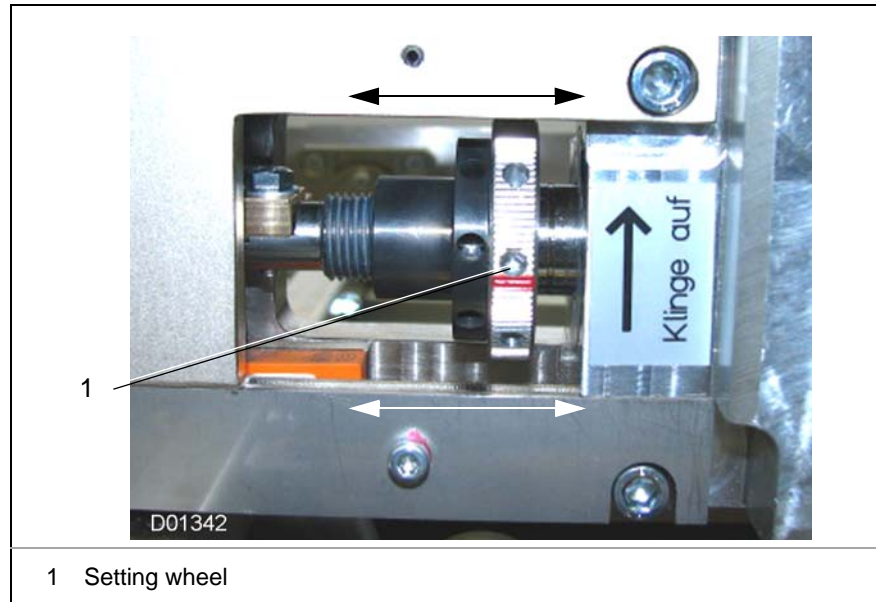


Figure 223: Checking the smooth running

Check the folding knives weekly to make sure they run smoothly.

How to check the ease of movement:

- ▷ 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 smooth running restored by MBO Service or by an authorized customer service agent.

9.4.7.2 Checking the tension of the 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.

9.4.7.3 Check the blades of the folding knife

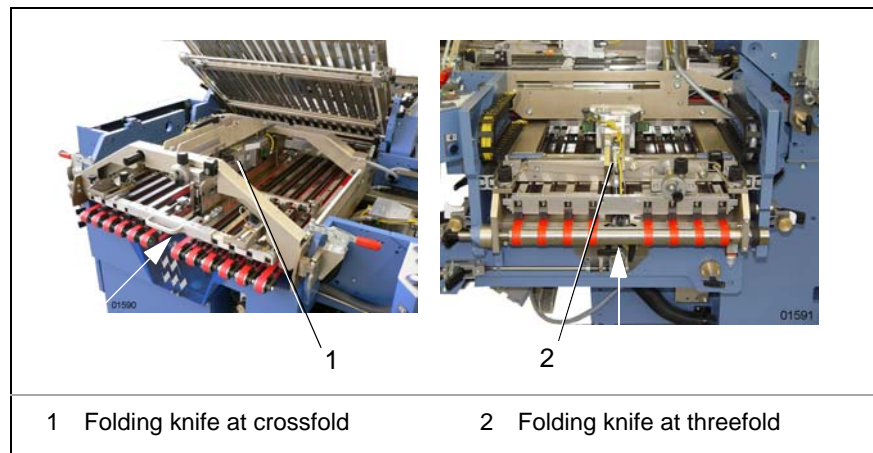


Figure 224: Checking the folding knives.

Check the blades of the folding knives daily for damage such as deformation, notches, etc.

How to check the blades:

- ▷ Open the crossfold stop.
- ▷ Swivel the crossfold table upwards.
- ▷ Pull 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.

9.4.8 Checking the crossfold table and threefold carriage

9.4.8.1 Checking the crossfold table.

Check the crossfold table monthly for function and smooth running.

Special attention should be paid to:

- Swivel mechanism
- Locking device

9.4.8.2 Checking the threefold carriage

Check the threefold table monthly for function and smooth running.

Special attention should be paid to:

- Smooth running of the telescopic rails
- Locking device



If the function is compromised, clean the telescopic rails. See chapter "9.3.3.12 Cleaning the guides on the threefold carriage".

9.4.8.3 Checking brushes in the crossfold and threefold.

Check the brushes monthly for wear-off.
If necessary, re-adjust the brushes or replace them.

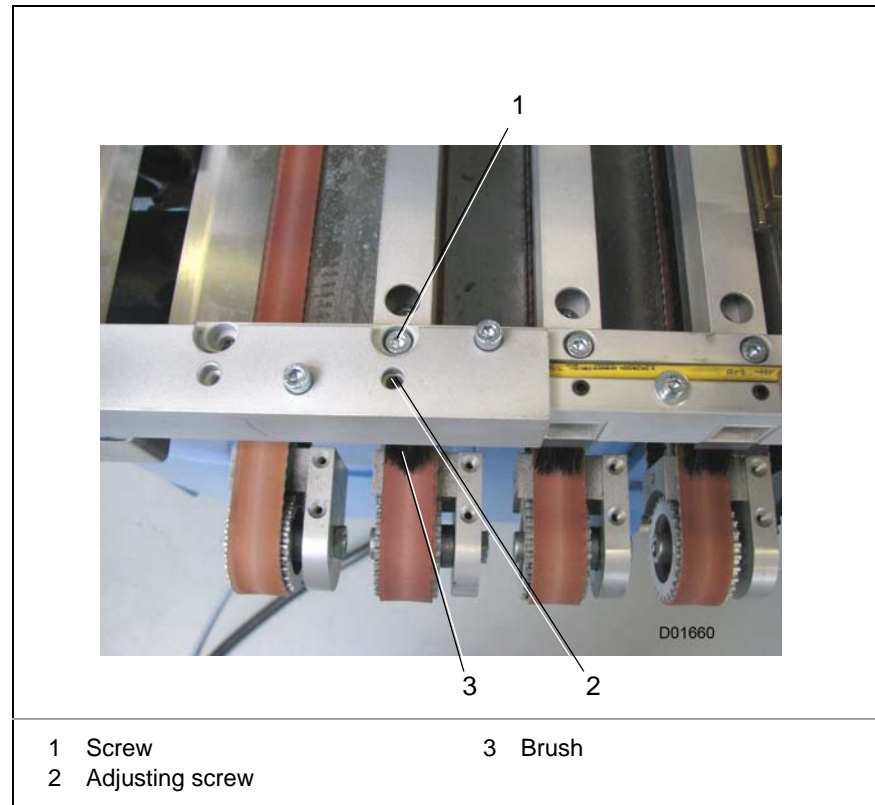


Figure 225: Adjusting the brushes

Adjusting the brushes

How to adjust the brushes:

- ▷ Loosen the screw (1).
- ▷ Tighten the adjusting screw (2) with a size 4 Allen key.
- ▷ Use a piece of paper to check that there is even pull across the entire length of the brushes.
- ▷ Re-tighten the screw (1).
- ▷ Adjust the setting of all brushes (3).
- ✓ The brushes are adjusted.



- Please see to an uniform height adjustment of all brushes to the register table.
- Use a piece of paper to check that there is even pull across the entire surface.

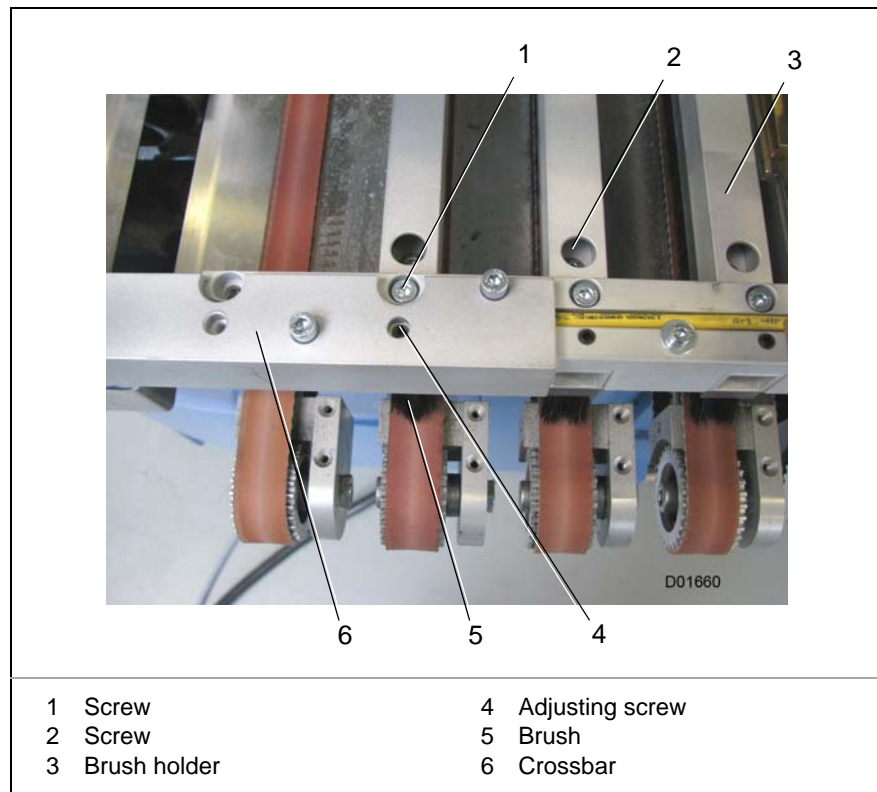
Replacing the brushes


Figure 226: Replacing the brushes

How to replace the brushes:

- 1) Remove the screws (1).
 - 2) Pull out the brush holders (3).
 - 3) Loosen the screws (3) at every brush holder (2) and remove the brush (5).
 - 4) Insert the new brushes (5) and fasten these onto the brush holder (3) using the screws (2).
 - 5) Position the brush holder (3) on the cross bar (6).
 - 6) Fasten the brush holder (3) with the screws (1).
 - 7) Adjust the brushes (5) with the screws (4) evenly, see above <Adjust brushes>.
- ✓ The brushes are replaced.



With new brushes, the distance <Top edge of the brush holder to the belt surface> approx. 51 mm.

9.4.8.4 Checking high-speed rollers

Check the high-speed rollers in the crossfold and threefold monthly.
Special attention should be paid to:

- Function
- Smooth running
- Damage
- Wear-off



If necessary, clean and spray high-speed rollers with silicon spray.

9.4.8.5 Checking the transport belts

Check the transport belts, belt running, guide rollers, belt tightener, and bearing monthly.

Special attention should be paid to:

- Function
- Smooth running
- Damage
- Wear-off



If necessary, clean transport belts with "Varn-Wash VM 111 or VWM" and re-apply silicon carefully with silicon spray.



Only have the transport tapes replaced by MBO Service or by an authorized customer service technician.

9.4.9 Maintaining the pressure vacuum pump

The maintenance intervals and the corresponding procedure is described in the <C-KLR80/140> operating manual from the firm Elmo Rietschle.

See chapter 7. Maintenance and repair

9.4.10 Lubricating the safety handwheel



- Clean and lubricate the safety handwheel monthly to maintain the safe function of the free running.
- The manufacturer recommends using the lubricant "Fin Lube TF" from the company INTERFLON.



1 Oiler

Figure 227: Lubricating the safety handwheel

How to lubricate the safety handwheel:

- ▷ Clean the safety handwheel with a brush.
- ▷ Lubricate the safety handwheel monthly on the oiler (1).
- ✓ The safety handwheel is lubricated.

9.4.11 Checking the fan in the control cabinet

9.4.11.1 Safety messages



WARNING!

Risk of fire!

Non-observance could result in serious injury or death.

- Do not use any flammable liquids for cleaning.



- Maintenance and cleaning work on the fans must be carried out by a qualified electrician.
- Read and understand the operating manual for the fan from the firm Rittal.

9.4.11.2 Manufacturer

Manufacturer	Designation	Type MBO part number	Use
Rittal	Filter fan	SK3238.100 4005706	Ventilation, control cabinet
Rittal	Air outlet filter	SK3238.200 4005708	Ventilation, control cabinet

9.4.11.3 Checking the fan



- During production, paper dust and printing powder soil the air filters.
- The cooling system of the control cabinet is compromised by soiled air filters.
- The fans must therefore be checked monthly.
- If the filter mat cannot be cleaned any more, it must be replaced.

Proceed as follows to check the fan.

Prerequisites

These prerequisites must be fulfilled:

- Main switch is switched off and secured.
The electrotechnical regulations are heeded.
- The fan wheel must be stationary.

Opening the filter housing

How to open the filter housing:

- ▷ Pull the function symbol in the louvre grille upwards with a finger.
The louvre grille will open up.
- ✓ The filter housing is open.

Cleaning the fan

How to clean the filter:

- 1) Remove the filter mat.
- 2) Clean the filter mat using a vacuum cleaner.

If the filter mat cannot be cleaned any more, it must be replaced.

- 3) Clean the fan blades with a paint brush and vacuum cleaner.
 - 4) If the fans start to make noise, blow them out with compressed air in the control cabinet, from inside to outside.
 - 5) Place the cleaned filter mat or a new filter mat in the filter housing.
- ✓ The fans are cleaned.



- Compressed side of the filter mat pointing towards the fan wheel.
-

Closing the fan case

How to close the fan case:

- ▷ Fold the louver grille back onto the filter housing until it clicks into place.

The filter housing is closed.

9.5 Maintenance schedule



Incorrect maintenance intervals during multi-shift operation.

Non-observance could result in property damage.

- All specified maintenance intervals are designed for single-shift operation.
- For multi-shift operation, calculate the specified intervals accordingly.

	Chapter No.:	Step	Interval	Date	Signature
Operational maintenance	7.8	"Conducting an inspection after commissioning"	After 20 operating hours		
	9.3.1	"Checking protective devices"	Daily		
	9.3.1.1	"Checking the EMERGENCY STOP palm button"	Daily		
	9.3.1.2	"Checking the safety handwheel"	Daily		
	9.3.1.3	"Checking the noise damping safety hood"	Daily		
	9.3.1.4	"Checking the safety hood over the threefold"	Daily		
	9.3.1.5	"Checking the crossfold table."	Daily		
	9.3.1.6	"Checking the threefold carriage"	Daily		
	9.3.1.7	"Checking the slitter shaft cassette"	Daily		
	9.3.1.8	"Checking the inching mode and two-hand operation functions"	Daily		
	9.3.2	"Checking the pneumatic springs"	Daily		
	9.3.2.1	"Feeder head arm on the feeder"	Daily		
	9.3.2.2	"Noise damping safety hood"	Daily		
	9.3.2.3	"Crossfold table"	Daily		
	9.3.2.4	"Guard over KTL plate"	Daily		
	9.3.3	"Cleaning the machine"	Weekly		

Table 42: Maintenance schedule

	Chapter No.:	Step	Interval	Date	Signature
	9.3.3.2	"Cleaning the machine"	Weekly		
	9.3.3.3	"Cleaning Vaculift RS feeder head"	Monthly		
	9.3.3.4	"Clean guides on the register table."	Monthly		
	9.3.3.5	"Cleaning the swiveling lever and side frames"	Monthly		
	9.3.3.6	"Cleaning fold rollers"	Weekly		
	9.3.3.7	"Cleaning the buckle plates"	Weekly		
	9.3.3.8	"Cleaning the spindles and guides of the rapid-set drives."	Weekly		
	9.3.3.9	"Cleaning the optical sensors"	Daily		
	9.3.3.10	"Cleaning the sensors in the folding knives"	Weekly		
	9.3.3.11	"Cleaning the slitter shaft cassette"	Weekly		
	9.3.3.12	"Cleaning the guides on the threefold carriage"	Weekly		
	9.3.3.13	"Cleaning the guides of the crossfold folding knife"	Weekly		
	9.3.4	"Cleaning/replacing air filter of the pressure vacuum pump"	Weekly		
Maintenance	9.4.1	"Checking the feeder"	Monthly		
	9.4.1.1	"Checking the drive chain"	Monthly		
	9.4.1.2	"Greasing the chains"	Monthly		
	9.4.1.3	"Lubricating the axle on the pile plate"	Monthly		
	9.4.1.4	"Checking the suction belts"	Monthly		
	9.4.2	"Checking the register table"	Monthly		
	9.4.2.1	"Checking the drive belt"	Monthly		

Table 42: Maintenance schedule

	Chapter No.:	Step	Interval	Date	Signature
	9.4.2.2	"Checking the alignment belt"	Monthly		
	9.4.3	"Checking the parallel fold"	Monthly		
	9.4.3.2	"Checking the drive belts, variants S-KTL and S-KTLT."	Monthly		
	9.4.3.3	"Checking the drive belt, variant S-KTZ"	Monthly		
	9.4.3.4	"Checking the drive belts in the K area, variants S-KTL and S-KTLT."	Monthly		
	9.4.3.5	"Checking the drive belt of the fold rollers"	Monthly		
	9.4.3.6	"Checking drive belt for fold rollers in crossfold and threefold."	Monthly		
	9.4.3.7	"Checking the drive belt crossfold, model S-KTZ."	Monthly		
	9.4.3.8	"Checking the threefold drive belt, variant S-KTZ."	Monthly		
	9.4.4	"Checking the fold rollers and slitter shafts"	Monthly		
	9.4.5	"Checking the buckle plates"	Monthly		
	9.4.6	"Checking the slitter shaft cassette"	Monthly		
	9.4.7	"Checking the folding knives"	Monthly		
	9.4.7.1	"Checking the smooth running"	Weekly		
	9.4.7.2	"Checking the tension of the toothed belts"	Weekly		
	9.4.7.3	"Check the blades of the folding knife"	Daily		
	9.4.8	"Checking the crossfold table and threefold carriage"	Monthly		
	9.4.8.1	"Checking the crossfold table."	Monthly		

Table 42: Maintenance schedule

Repair

	Chapter No.:	Step	Interval	Date	Signature
	9.4.8.2	"Checking the threefold carriage"	Monthly		
	9.4.8.3	"Checking brushes in the crossfold and threefold."	Monthly		
	9.4.8.4	"Checking high-speed rollers"	Monthly		
	9.4.8.5	"Checking the transport belts"	Monthly		
	9.4.9	"Maintaining the pressure vacuum pump"	Daily		
	9.4.10	"Lubricating the safety handwheel"	Monthly		
	9.4.11	"Checking the fan in the control cabinet"	Monthly		

Table 42: Maintenance schedule



MBO recommends attaching a copy of this maintenance schedule to the machine.

9.6 Repair



WARNING!

Improper maintenance.

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

- Repair work may only be performed by trained and authorized specialized personnel.
- Heed the local occupational safety regulations.
- Carry out a function test after the repair.



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

10 Shutdown, storage

10.1 Introduction

10.1.1 Qualification of personnel

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

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

Table 43: Qualification of personnel; Decommissioning, storage
Legend: X permitted, - not permitted

10.1.2 Safety messages



CAUTION!

Incorrect storage.

Non-observance could result in property damage.

Observe the corresponding storage conditions.

10.2 Decommissioning

10.2.1 Temporary shutdown

How to shut the machine down temporarily.

- Prerequisites** These prerequisites must be fulfilled:
- Main switch is switched off.
 - Compressed air supply is cut off.

Shutting down the machine

How to shut down the machine:

- ▷ Remove products, tools from the machine.
- ▷ Clean and maintain machine.
See chapter "9 Maintenance".
- ✓ The machine is temporarily shut down.



After a temporary shutdown, the machine must be commissioned again. See chapter "7 Installation, commissioning".

10.2.2 Final decommissioning

How to shut the machine down permanently.

Prerequisites

These prerequisites must be fulfilled:

- Main switch is switched off.
- Electrical supply is disconnected.
- Compressed air supply is cut off.

Shutting down the machine permanently

How to shut down the machine permanently:

- ▷ 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, interim storage".
- ✓ The machine is permanently shut down.

10.3 Storage

How to proceed to store the machine.

Prerequisites

These prerequisites must be fulfilled:

- Machine is shut down.

Storing the machine

How to store the machine:

- ▷ Check the premises with respect to the temperature and humidity.
See chapter "3.2.7 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 Shipping and transport data".
- ▷ Cover the machine with foil.
- ✓ The machine is stored.

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

11.1.2 Safety messages



CAUTION!

Improper disposal.

Non-observance could result in environmental damage.

Comply with the corresponding national 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.

EC countries

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

Non-EU countries:

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

How to proceed to dispose of/recycle the machine.

Prerequisites

These prerequisites must be fulfilled:

- Decommission the machine prior to disposal.
See chapter "10 Shutdown, storage".
- Observe transport instructions.
See chapter "6 Transport, interim storage".

Disposing of/ recycling the machine

How to dispose of/recycle the machine:

- Separate machine parts and electrical components by type and dispose of them properly.
- ✓ The machine is disposed of.



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!

MBO Group worldwide

MBO Germany



MBO Maschinenbau Oppenweiler Binder GmbH & Co. KG
PO Box 1169
71567 Oppenweiler
GERMANY
Tel.: +49 7191 46 0
Fax: +49 7191 46 34
www.mbo-folder.com
info@mbo-folder.com

MBO Portugal



MBO Binder Máquinas Gráficas, S.A.
Rua Joaquim Alves da Silva, 240, 420 e 570
4455-473 Perafita
PORTUGAL
Tel.: +351 22 99822 00
Fax: +351 22 99822 01
www.mbo-folder.com
info@mbo-folder.com

MBO America



MBO America
4 E Stow Road, Suite # 12
Marlton, NJ 08053
USA
Tel.: +1 609 267 2900
Fax: +1 609 267 1477
www.mboamerica.com
info@mboamerica.com

MBO France



MBO France SAS
Z. A. Burospace N° 3
Route de Gisy B.P. 33
91571 Bievres Cedex
FRANCE
Tel.: +33 1 6935 5090
Fax: +33 1 6935 5099
www.mbo-folder.com
info@mbofrance.fr

MBO China



MBO Binder Graphic Systems (Beijing) Co. Ltd.
Haishunde Building, 201 room, No.A1,
Donghuanbei Road, BDA
Beijing 100176
P.R. CHINA
Tel.: +86 10 6786 4021
Fax: +86 10 6787 3502
www.mbo-folder.com.cn

Herzog & Heymann



Herzog & Heymann GmbH + Co. KG
Postfach 110355
33663 Bielefeld
GERMANY
Tel.: +49 5205 7509 0
Fax: +49 5205 7509 20
www.herzog-heyman.com
info@herzog-heyman.com