



**MBO**

**Folding Technology**

# **Operating Manual**

**Typen R 66 and R 76**

**Continuous feeder**

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## Prologue

By purchasing an MBO folding machine you have acquired a valuable product. However, it is absolutely imperative that all Safety Regulations and Safety Instructions are complied with fully. This Operating Manual will help to instruct you on how to correctly operate the feeder, to comply with the Safety Regulations and also how to maintain the machine properly.

### 1.0 Machine specification

#### 1.1 Manufacturer

**MBO Binder & Co. - Maschinenbau Oppenweiler**

Grabenstrasse 4, 71570 Oppenweiler

P.O. Box 1169, D-71567 Oppenweiler

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Fax +49 7191 4634

<http://www.mbo-folder.com>

#### 1.2 Type:

Continuous feeder R 66 and R 76

## **1.3 Technical Data**

### **1.3.1 Sizes**

#### **R 76 /76**

Maximum sheet size: 76 x 108 cm (30 x 43")

Feeder: 15 x 18 cm (6 x 7")

### **1.3.2 Electrical data**

Feeder: 0,75 kW

Pump: 2,20 kW

### **1.3.3 Speed**

Combi Folder 10 - 180 m/min

Buckle Folder 10 – 205 m/min

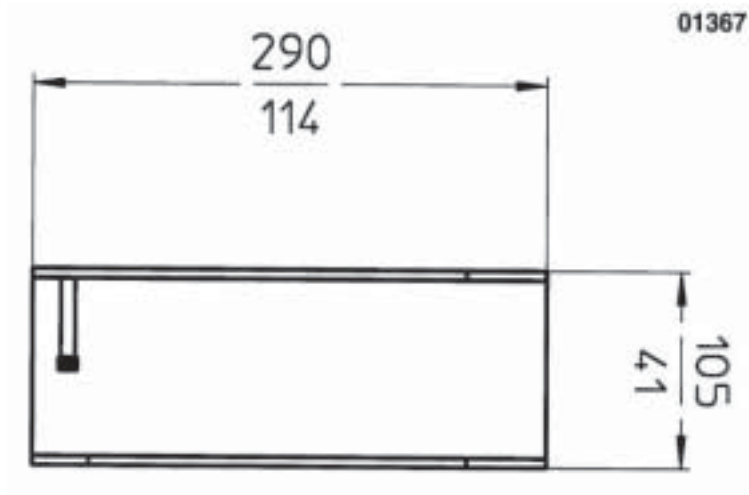
### **1.3.4 Weights in kg**

#### **Net/Gross**

Feeder: 1.050/1.350

1.3.5 Floor plan (measurements in cm):

R 66 and R 76



**1.4 Documentation**

Customer: \_\_\_\_\_

Machine no / Serial no: \_\_\_\_\_

Type of feeder: **Continuous feeder** \_\_\_\_\_

Type of air pump: \_\_\_\_\_

Electrical specifications: \_\_\_\_\_

Wiring diagram no: \_\_\_\_\_

Feeder: \_\_\_\_\_

Operational voltage (V: / Hz): \_\_\_\_\_

Control voltage (V: / A:): \_\_\_\_\_

Control voltage (V: / A:): \_\_\_\_\_

Total nominal current (A:): \_\_\_\_\_

Fuse at power supply (A:): \_\_\_\_\_

Certificate of Conformity: \_\_\_\_\_

GS - marking no: \_\_\_\_\_

**1.5 Supplementary documentation**

Operating Manual of air pump: \_\_\_\_\_

Operating Manual of other manufacturers: \_\_\_\_\_

Spare parts lists: \_\_\_\_\_

Feeder: \_\_\_\_\_

Air pump: \_\_\_\_\_

Other manufacturers: \_\_\_\_\_



## 1.6 User information / Functional description

### **SHEET FEEDER for OPEN SHEETS**

The feeder is designed to feed open sheets only. Feeding of any other material should not be attempted. The manufacturer or supplier will not be liable for any damage caused as a result.

Furthermore, the manufacturer will also not be liable for any malfunctions or damage of additional installations or alterations that were not delivered or installed by him.

The construction of your feeder may differ in some details from the photographs/diagrams shown. However, this does not have any influence on its safe operation. Since we are continuously working on further developments, we reserve the right to make alterations.

However, the efficiency depends on the type of paper, size, and type of fold, as well as on the different circumstances of the user which cannot be influenced by the manufacturer.

The following description should impart a general understanding of the feeder and its working method to the operator.

**Please be advised that due to technical reasons and for better understanding certain options are already described in the standard feeder description.**

The feeder basically consists of the basic frame, the upper and lower table including transport tapes, drum with tapes and chains, suction tape for sheet infeed, register table with suction tape for sheet alignment, and double sheet control.

## 2.0 BASIC SAFETY INSTRUCTIONS

### 2.1 Warnings and symbols

The following designations or symbols are used for very special instructions in this Operating Manual:



>**NOTICE**< Special instructions in respect of the economical use of the machine.



>**ATTENTION**< Special instructions or requirements and prohibitions to avoid injuries and damage.




>**DANGER**< Instructions or requirements and prohibitions to prevent personal injuries or extensive damage.

### 2.2 Safety at the working place - destined use of the feeder

- 2.2.1 MBO sheet feeders correspond to their prescribed Safety Technical Requirement at the time of their shipment. Therefore, any moveable and rotating parts are covered with protective hoods and are mechanically or electrically interlocked to such an extent so as to not unreasonably detract from the operation.
- 2.2.2 For safety reasons it is extremely important that all operating personnel receive sufficient technical safety instructions and are advised of all potential sources of danger. However, it must be remembered that even with proper use of the machine, accidents can occur which present a danger to life and limb of the operator or third parties. Respectively, it does not exclude the detraction of the machine and other material assets.
- 2.2.3 The feeder should only be operated when in good working order. Any malfunctions which may impair the safety must be removed immediately by trained personnel of the manufacturer/supplier.
- 2.2.4 The feeder is exclusively destined to feed sheets. The feeding of any other material should not be attempted as the manufacturer or supplier will not be liable for any damage caused thereof.
- 2.2.5 Carefully read the complete Operating Manual including the Safety and Service Requirements before you operate the feeder.
- 2.2.6 The Operating Manual should be kept with the feeder at all times.
- 2.2.7 Add to the Operating Manual if necessary, with internal Safety Instructions as well as with the legal regulations for the Prevention of Accidents.
- 2.2.8 Make sure that all frequently substituted operators are thoroughly informed about the aforementioned subjects and trained accordingly.


2.2.9 Never remove any protective or safety devices from the feeder, and do not make any changes which may impair the safety of the feeder.


2.2.10  **>DANGER<** Never use any tools which are not in perfect condition, and make sure that no tools are left on the feeder after completion of settings and maintenance work. Tools which fall into the feeder may cause serious injuries and damage.

2.2.11 Note that all Safety Instructions are kept in a legible and visible condition.

2.2.12 Any audible and visible change on the feeder in relation to the safety must be reported to the supervisor or manager of your company immediately.

2.2.13 The operating personnel should be aware that loose clothing, jewellery or (long?) hair can cause serious injuries if caught in the feeder.


2.2.14 It is absolutely prohibited to clean rollers, eliminate malfunctions, or to undertake adjustments while the feeder is on operation.  
 **>DANGER<** Therefore, always activate the EMERGENCY STOP button.

2.2.15 Make sure that no other person starts the feeder while you are working on it!  
 **>DANGER<** Therefore, always activate the EMERGENCY STOP button, or turn OFF the main switch, or UNPLUG.

2.2.16 Do not turn the feeder ON if it has stopped for any inexplicable reason. Make sure that the feeder is in good working condition and that no other person is working on the feeder.

2.2.17 Turn off the main switch and secure it, if necessary, with a lock if you are required to undertake extensive mechanical or electrical maintenance and repair work.

2.2.18 Never open the main or subcontrol panel! Only authorised personnel should gain access to the electronic control cabinets as there are no user serviceable parts.

 **>DANGER<** If control cabinet is open! All main terminals could be alive even though the main switch has been turned off.

2.2.19 Any damaged cables or electrical connections must be reported to the competent authorities of your company.

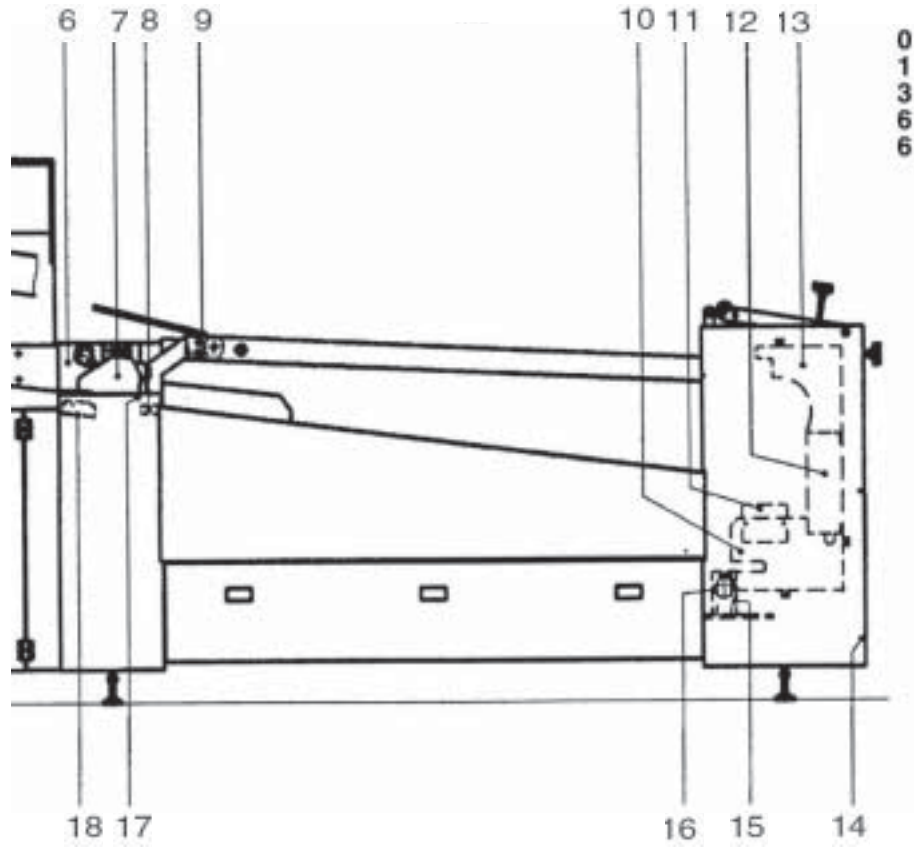
2.2.20 Machine connections must be installed in such a manner that no cables, tubes or hoses are left trailing.

2.3 Safety devices - machine

2.3.1 Machine / Check List

| Pos. | Identification                                   | Function control | Visual control | Result | Remarks                                |
|------|--|------------------|----------------|--------|--|
| 6    | Guard over drive shaft of suction wheel          |                  |                |        | at suction wheel and suction tape      |
| 7    | Guard over suction tape or suction wheel         |                  |                |        | at suction wheel and suction tape      |
| 8    | Guard over chain lead                            |                  |                |        |  |
| 9    | Guard at point of infeed of tape roller          |                  |                |        | upper table                            |
| 10   | Guard over drive chain                           |                  |                |        | at drive side                          |
| 11   | Cover external chain tensioner                   |                  |                |        | at drive side/external                 |
| 12   | Guard over drive chain                           |                  |                |        | at drive side/internal                 |
| 13   | Guard over drive chain                           |                  |                |        | at drive side/internal                 |
| 14   | Guard from drive to operator side                |                  |                |        |  |
| 15   | Guard over drive shaft of gear                   |                  |                |        | at drive side/internal                 |
| 16   | External cover drive shaft                       |                  |                |        | at drive side/external                 |
| 17   | Guard angle before suction wheel or suction tape |                  |                |        | Setting instruction see page 61 of OM. |
| 18   | Guard over pulley of register table              |                  |                |        |  |
|      | Date   | Name             |                |        | Signature                              |
|      |  |                  |                |        |  |

2.3.2 Chart for protection hoode of feeder

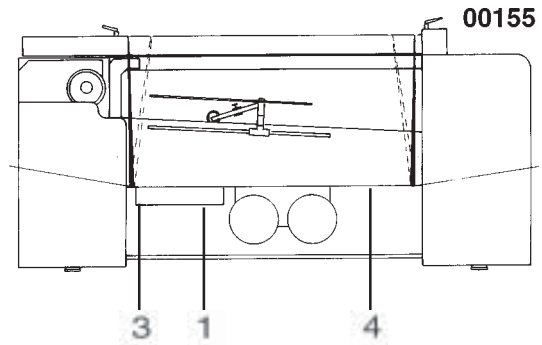


### 3.0 Transportation/Erection/Installation

This part of the Operating Manual is directed specifically at the competent service personnel and other authorised internal personnel responsible for transportation and installation.

#### 3.1 Transportation

Unscrew the feeder off the pallet, unscrew air distributor at **1** and **2** (secure) and move it with a fork lift at positions **3** and **4** to its final destination.



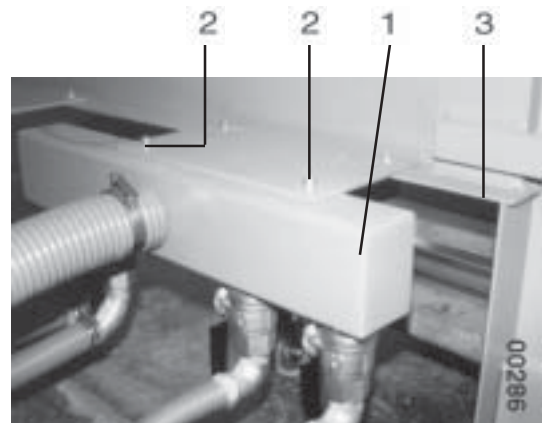
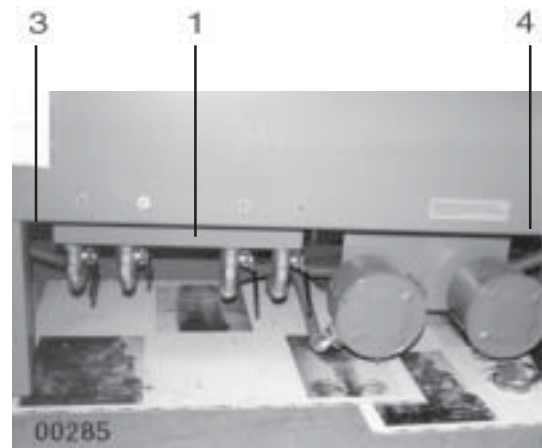
**>DANGER<** The feeder may fall/tip over or slip away!  
Secure the feeder accordingly!



**>ATTENTION<**  
The feeder may fall (tip) over two additional persons are required to secure the feeder!



**>DANGER<** Risk of personal injuries!



## 3.2 Erection/ / Installation

### 3.2.1 Feeder

Place the feeder onto the levelling screws and plastic feet **1** and move it to the folding unit.

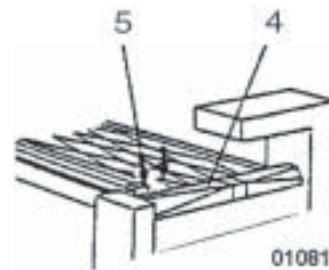
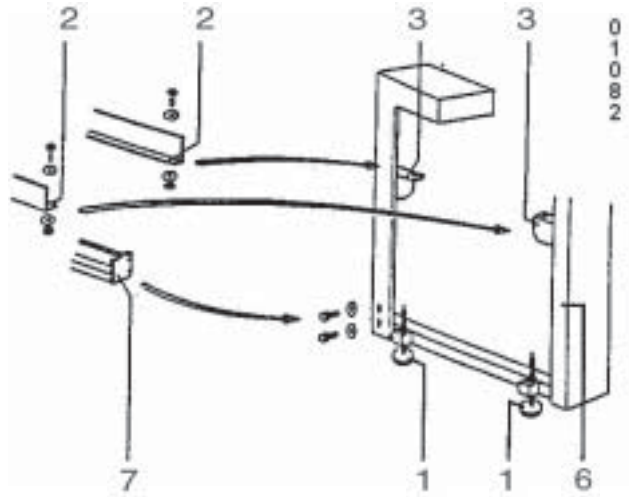
Alignment holes of register table **2** and feeder **3** must correspond with each other.

Exact position has been marked by the factory.

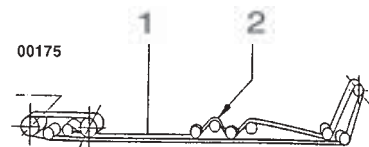
A distance of 1-2 mm must be between the conveyor plate **4** and the register bar **5**.

Set the exact height through the setting screws, adjust it with the spirit level **6** and screw them up without stress.

Thereafter, screw the feeder and folding unit with the connecting piece **7** up without stress.



Place the flat belt **1** for the drive of suction wheel onto the drive rollers and tension it with the tensioning roller **2**.

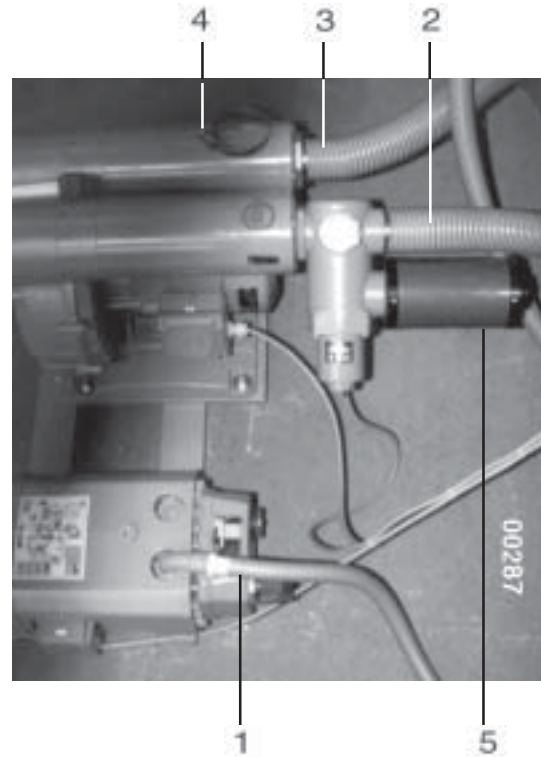


3.2.2 Pressure / Vacuum pump

Put the vacuum- 1, air pressure- 2 and suction air tubes 3 with hose tubes 4 onto the matching connection pieces. Allix noise reducer 5.



**>ATTENTION<** Check before the rotating field. If this is not correct, it may cause essential damages to the pump or to the feeder - head.





### 3.3 Electrical connection



>DANGER< This work should only to be carried out by authorised or skilled personnel!

#### 3.3.1 Installation of main control panel

Fasten the holder/support **1** by means of 5 screws **2** and attach **4** the main control panel **3** onto it.

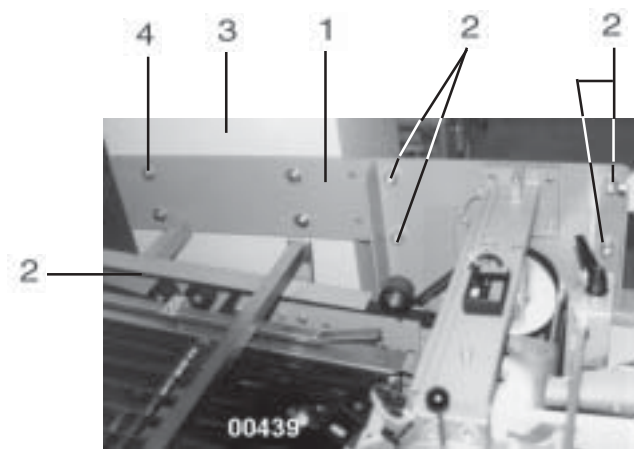
Insert the plugs of the machine and the feeder into the corresponding sockets at the control panel.

Matching plugs and sockets bear the same markings.

Connect the motor cables directly with the motor protective switches in the main control panel.

Connect the pressure/vacuum pump- the cables are numbered.

**Make sure you closely observe the wiring diagram!**



3.3.2 Main current connection

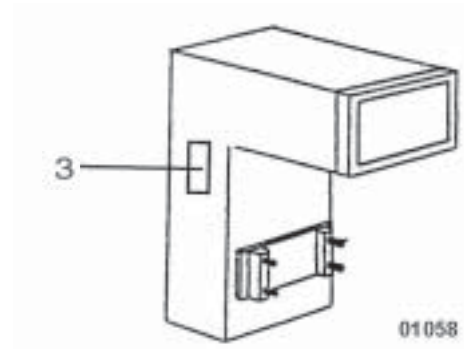


>**DANGER - MAY BE HAZARDOUS TO YOUR LIFE**<  
These works are only to be carried out by authorized or skilled personnel!



>**ATTENTION**< Check whether the supply voltage and frequency correspond to the data indicated on the machine label 3.

Enter the connecting cable from the base of the control panel, connect the wires to the main terminals provided and secure it with protective plates.  
**Please note wiring diagram!**



>**ATTENTION**< Check clockwise rotating field!



>**ATTENTION**< Check the rotating field of the motors! If necessary, alter the terminal strip in the main control panel. **Turn the machine immediately OFF**, if the rotating field of the pile table does not correspond with the switch position at main control panel. In this case the final switch control is not properly functioning. This may cause essential damages to the feeder!

## 4.0 Service and maintenance

This part is directed towards service personnel or other internally authorised personnel.



>**DANGER**< Unless the feeder is isolated no service or maintenance work should be carried out. Always activate the EMERGENCY STOP button or turn OFF the main switch and secure it with a safety lock.



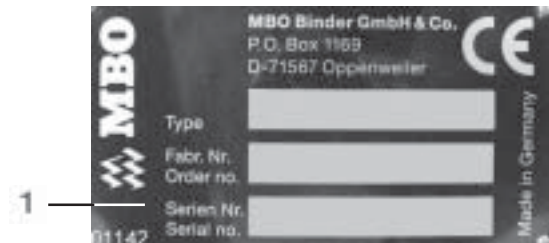
>**DANGER**< This, as well as the following described work, should be carried out by one person only! Danger of squeezing!!

### Procurement of spare parts:



>**ATTENTION**< Only use the spare parts which are supplied or recommended by the manufacturer.

For enquiries and spare parts orders it is necessary to provide the machine and serial number, which may be obtained from the label 1.



## 4.1 Exchange and / or tensioning of belts / tapes

### 4.1.1 Register belt at register table

Exchange of register belt:

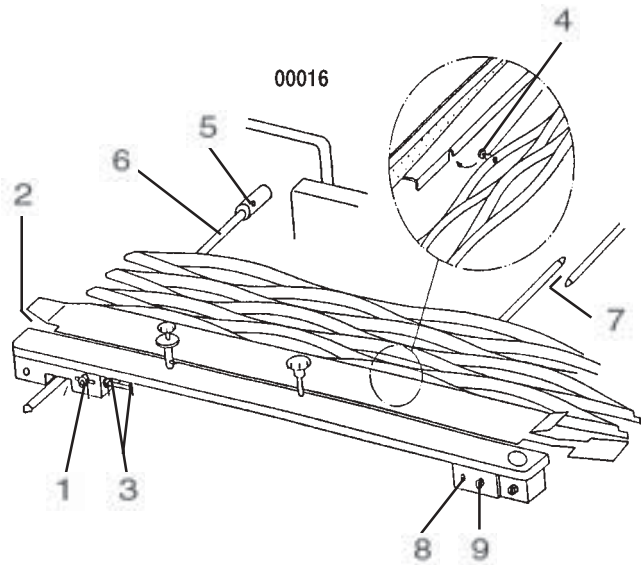
Loosen the screw **1** and release tension of register belt **2** through screws **3**.  
Unhinge the latticetype alignment table at **4**.

Loosen the screw **5** and remove rod **6**.  
Take the register belt off the rollers and thread out at **7**.

Insert the new register belt in the opposite sequence.

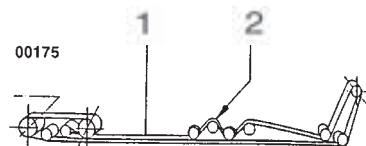
Adjust for centre running of the tape with screw **8**.

Prior thereto, loosen the screw **9** and retension after completion of work.  
Screws **8** and **9** are located at the internal side !



### 4.1.2 Drive belt for suction wheel/Vacubelt

Place the flat belt **1** and tension it from the bottom with the tensioning roller **2**.



**4.1.3 Feeder - tensioning of chain for main drive**

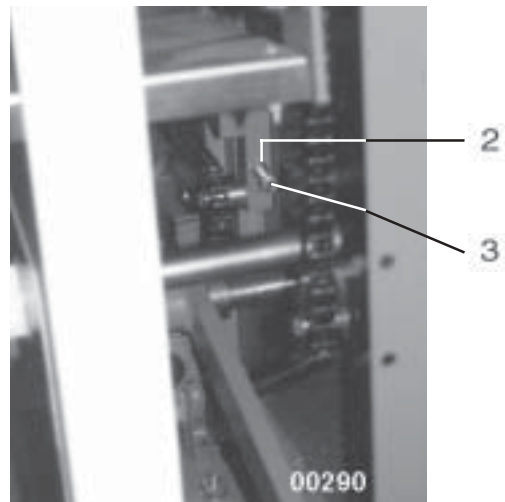
Remove guard **1**,  
loosen the counter nut **2**  
and screw-in the screw **3**.



>**ATTENTION**< Do not overtighten.

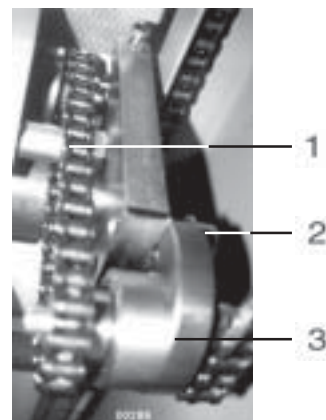


Refasten counter nut **2**  
and replace the guard **1**!



**4.1.4 Feeder - Tensioning of drive chain for tapes**

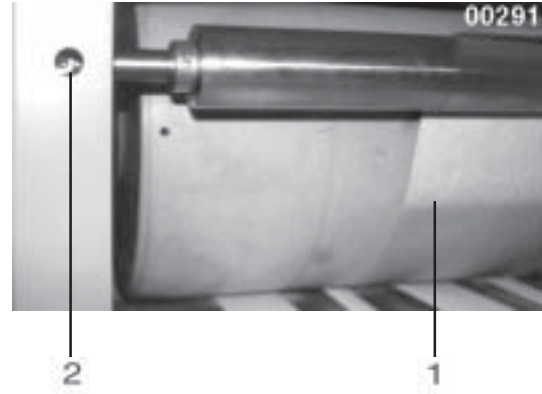
Tension the chain **1**  
under the lower table:  
Loosen the two screws **2**,  
push the sprocket **3** down and  
refasten the two screws **2**.



**4.1.5 Feeder – Upper transport tape**

The transport tape **1** must be tightened properly to ensure a trouble-free sheet transportation.

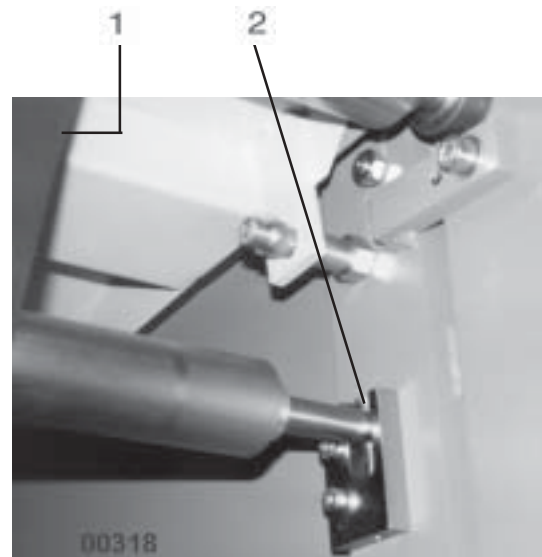
Screw in both screws **2** equally at both sides!



**4.1.6 Feeder – Lower transport tape**

The transport tape **1** must be tightened properly to ensure a trouble-free sheet transportation.

Screw in both screws **2** equally at both sides!



## 4.2 Lubrication / Cleaning



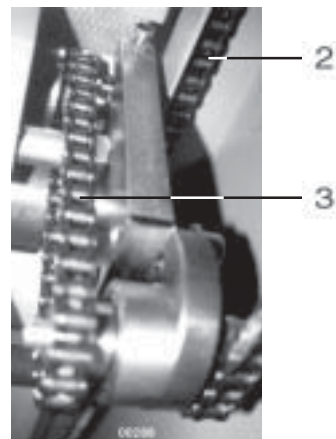
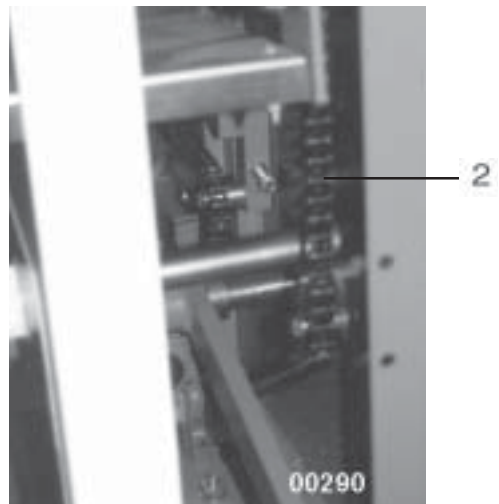
>NOTICE< Generally, the machine should be cleaned after each job, particularly moveable parts which have been changed due to change of sheet size, because heavy dust may cause reduction of function.

### 4.2.1 Feeder

Remove protective hood 1

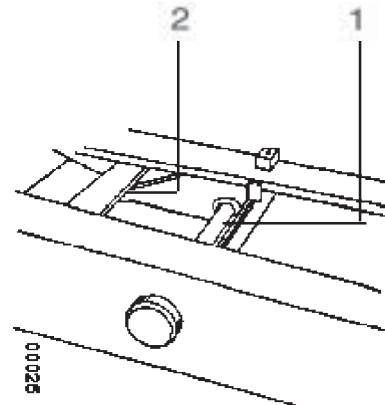


and put a slight touch of oil onto chains 2 and 3.



4.2.2 Register table

Clean the guide shaft for sheet size adjustment **1** as well as drive shaft **2** off from dust and provide them with a slight touch of oil.





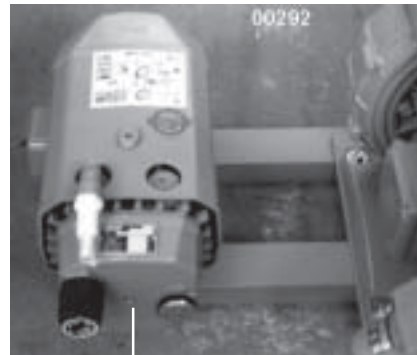
4.2.3 Pressure/Vacuum Pump

Please check separate Operating Manual of manufacturer.

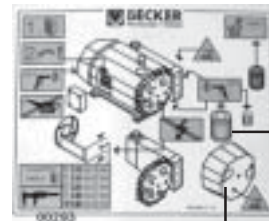


>NOTICE< To ensure full efficiency, however, the cartridge at suction side should be checked and cleaned occasionally. The filtre cartridge must be cleaned every 50 hours of operation and be exchanged every 6 months. Dirty or damaged cartridges must be replaced immediately. Do not remove the filtre cartridge in any case, otherwise penetration of foreign substances will damage the pump. Make sure that pump is turned OFF during maintenance works.

Remove cap 1, as well as filtre cartridges 2.  
Clean the cartridge by blowing through from the internal to the external side. Exchange cartridge every six months.



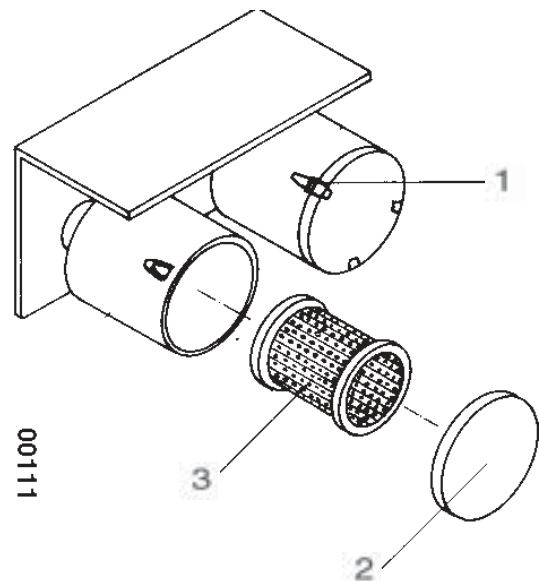
1



1

2

Open the clips 1 and remove caps 2 as well as the filtre cartridges 3 and clean them by blowing through from the internal to the external side. Exchange the cartridge every six months.



00111

3

2

4.3.4 Maintenance Report

This page may be attached to the Maintenance and Check Lists with the machine, whereby all items described under para. 4.2 should be considered!

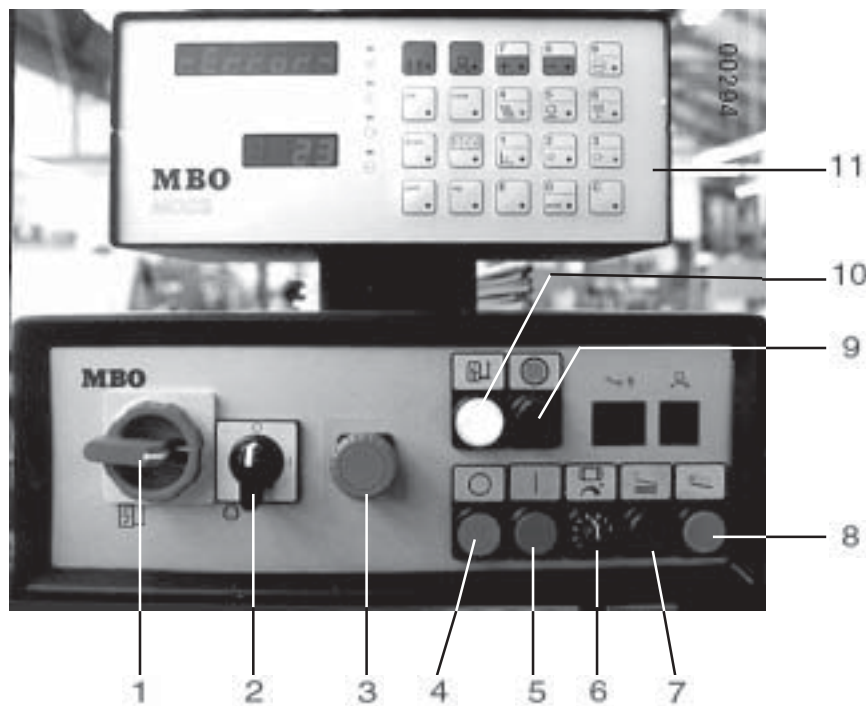
| Working cycle            | Interval                   | Date | Signature |
|--------------------------|----------------------------|------|-----------|
|                          |                            |      |           |
|                          |                            |      |           |
| Feeder (4.2.1)           | monthly                    |      |           |
| Register table (4.2.2)   | monthly                    |      |           |
|                          |                            |      |           |
|                          |                            |      |           |
| Feeder (4.2.1)           | monthly                    |      |           |
| Register table (4.2.2)   | monthly                    |      |           |
|                          |                            |      |           |
|                          |                            |      |           |
| Feeder (4.2.1)           | monthly                    |      |           |
| Register table (4.2.2)   | monthly                    |      |           |
|                          |                            |      |           |
|                          |                            |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
| Filtre cartridge (4.2.3) | after 50 hrs. of operation |      |           |
|                          |                            |      |           |

## 5.0 Operation of the machine

### 5.1 Main control panel - Standard control "MC"

If your machine is equipped with the optional Micro-Processor-Control „MPC“ you will find its description in the attached Operating Manual „MPC“.

- 1 MAIN SWITCH
- 2 ON/OFF switch for AIR PUMP
- 3 Red mushroom button with locking for EMERGENCY STOP
- 4 Button to STOP the machine
- 5 Button to START the machine
- 6 Potentiometre (optional)
- 7 Button for SHEET INFEED during production and START/STOP of feeder
- 8 Button for SINGLE SHEET INFEED
- 9 INDICATOR LIGHT for the main drive
- 10 INDICATOR LIGHT for the main switch
- 11 Batch counter MCC3 with integrated sheet infeed control "MC".  
See separate Operating Manual "MC Control" for detailed description.



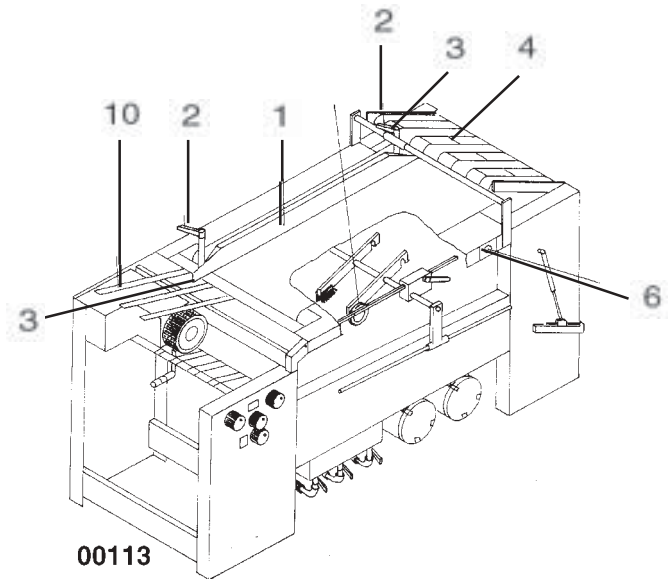
## 5.2 Continuous Feeder

### 5.2.1 Upper pile table

Set the lateral sheet stop **1** with knurled grips **2** to  $\frac{1}{2}$  of sheet width; use mm-scale **3**.

How to set the tapes **4**: the distance of the external tapes to the edge of pile **5** should be approximately 2 cm; mediate the tapes resting between them.  
Note: use all tapes for wide sheets, less tapes for small sheets!

For pile transportation ON/OFF: Use button **6** at feeder table or push button at main control panel **7**.

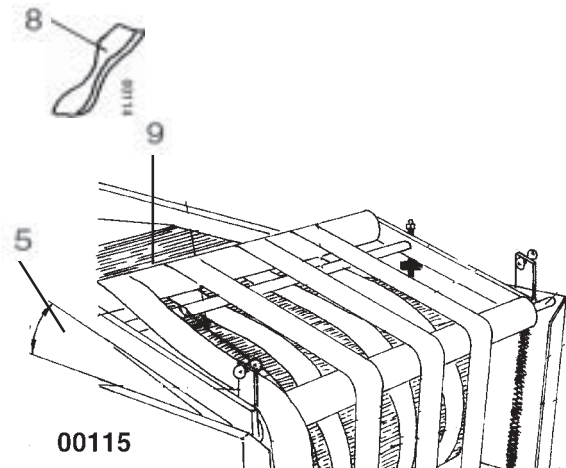


00113



**>NOTICE<** Run the feeder for a while in order to align the tapes.

Place a bulk of sheets onto the feeder table and shingle **9** them with a spatula **8**. Bear in mind that maximum loading height is approx. 8 cm. Use extension bars **10** when you process long sheet sizes.



00115

5.2.2 Drum

Use teflon tapes **2** at the transition to the lower table **1**.

Set the infeed angle **3** between the upper table and tapes through knurled nut **4** (equally at both sides)!



**>NOTICE<** The paper edges may bend if the angle is too flat.

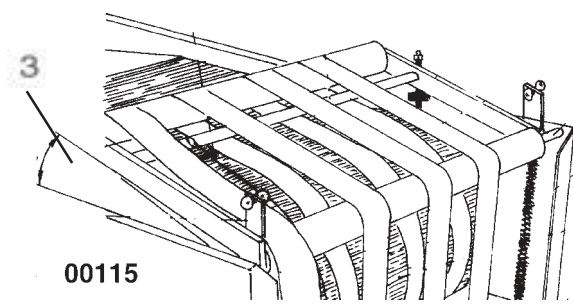
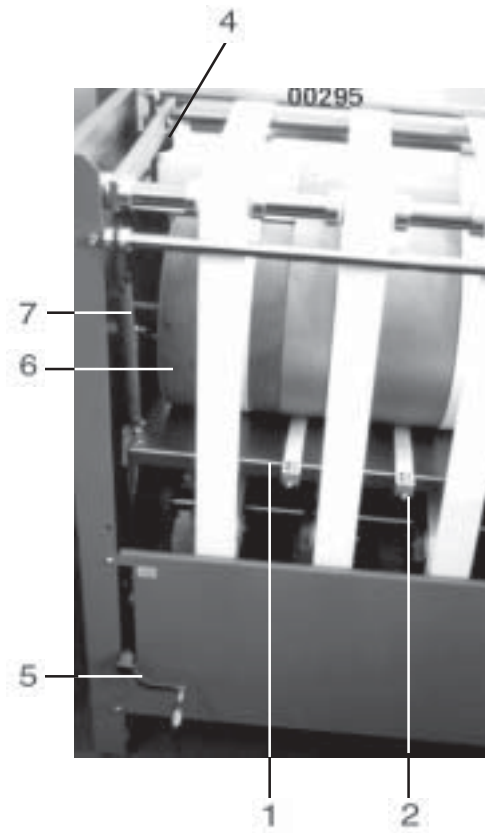
How to change the pressure of tapes through crank **5**:  
Clockwise turn = tapes become loose,  
counter-clockwise turn = tapes become stretched.

Guide the sheet with medium pressure around drum **6**.  
Reduce the pressure when you process very smooth sheets and the shingle at lower table **1** is increasing.  
This will avoid backdraft of pile.

Pretension of springs **7** for the lower table **1**. Use one or two springs depending on the sheet size and height of pile. Please note that springs have different sizes.



**>NOTICE<** Set the pretension rather more light than too strong, because the sheets may get sagged.

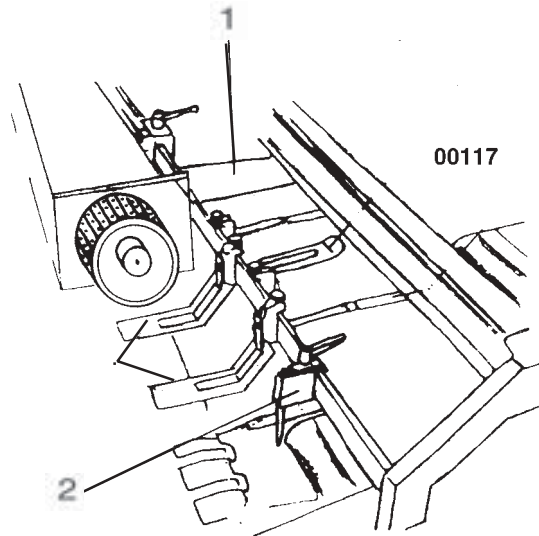


5.2.3 Lower table

Use the guide plate 1 and pin 2 for exact positioning of the paper.



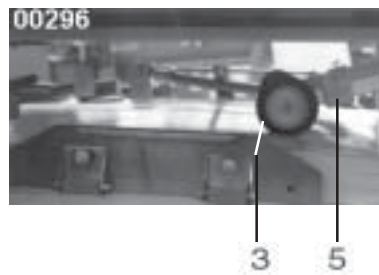
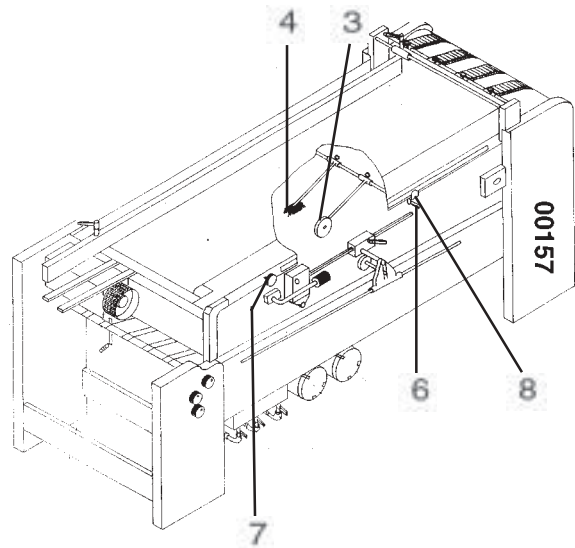
>NOTICE< Jam will occur if sheets are pinched!



For safe sheet separation set the rollers 3 and brush 4 to the end of approx. 2-5 top sheets. Weights 5.

Positioning: Loosen the grip 6 and turn knurled grip 7.

Set the required length measurement at mm-scale 8 of the sheet to be processed.



5.2.4 Transport control

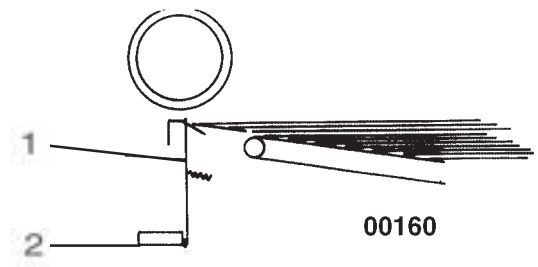
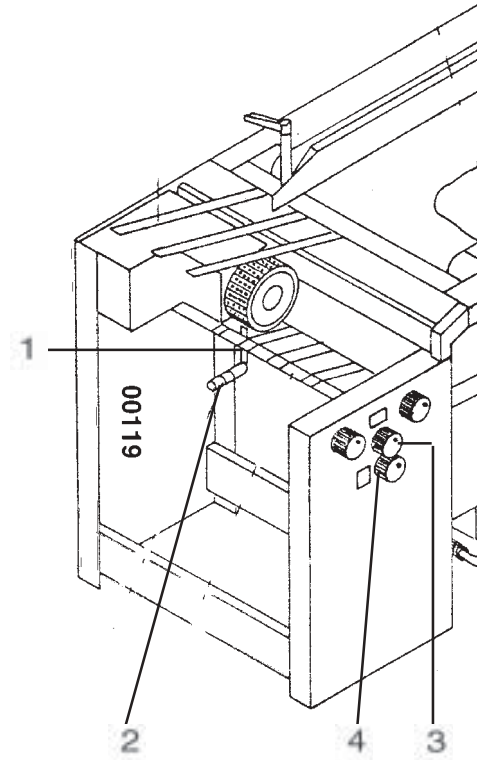
The transportation of feeder is controlled through feeler tongue 1 and sensor 2. The feeler tongue 1 is resting at sensor 2 if no sheets are processed; for turn ON of feeder see para. 5.2.1. Maximum speed of feeder is 2,0 mtrs./mte.

The oncoming sheets push the feeler tongue 1 off from the sensor 2. This enables infinite speed reduction. STOP at approx. 8 mm gap.

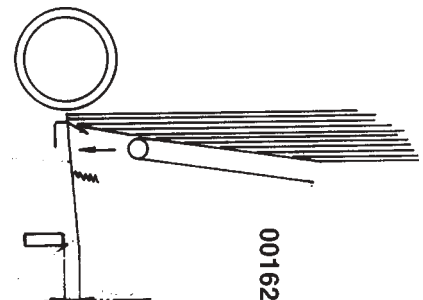
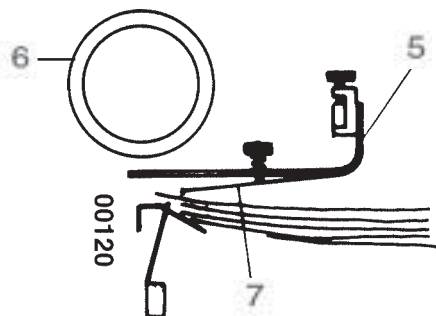
Setting of feeler tongue 1:  
Horizontally through button 3:  
Feeler tongue 1 to front = more sheets are aerated  
Feeler tongue 1 to rear = less sheets are aerated

Vertically through button 4:  
Feeler tongue 1 downwards = if sheets tend to roll down  
Feeler tongue 1 upwards = if sheets tend to roll up

If sheets tend to roll up:  
Use smoother 5 aside the suction wheel 6. Hold down sheets which move up and avoid "double sheets" through the adjustable plate spring 7.



Continuation

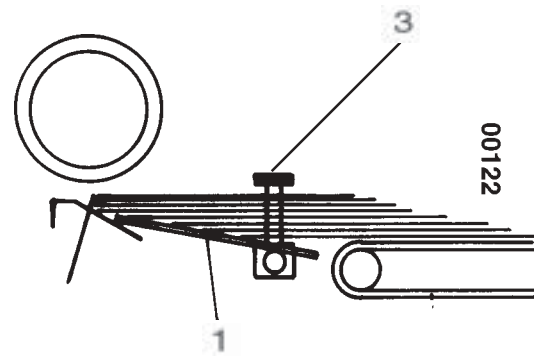
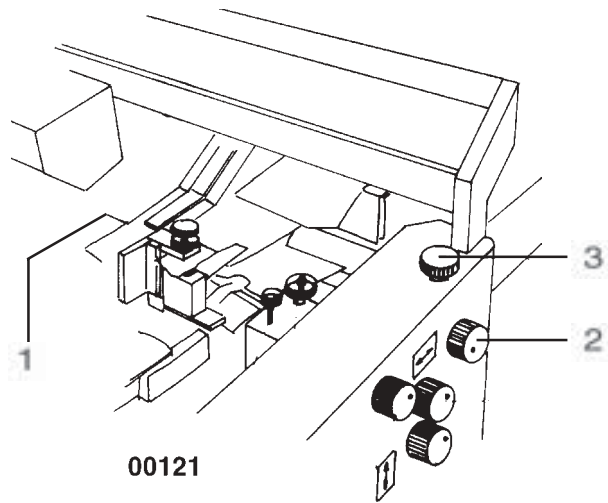


Continuation

Set the infeed plate **1** with knurled grip **2** higher/lower and fix it through the knurled screw **3**.

For sheets which tend to roll down:  
move the infeed plate **1** up.

For sheets which tend to roll up:  
move the infeed plate **1** down.



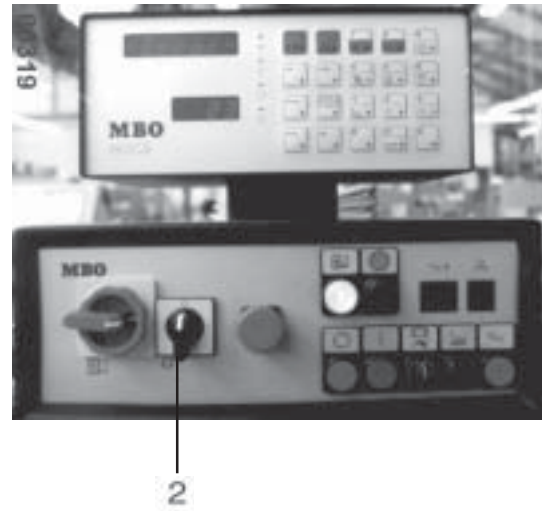


**5.2.5 Aeration/air support**

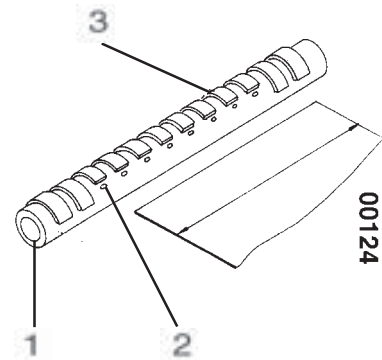
Air blast support through turbo-type air pump.

Vacuum air support through separate vacuum pump.

Both pumps can be turned ON/OFF through switch 2.

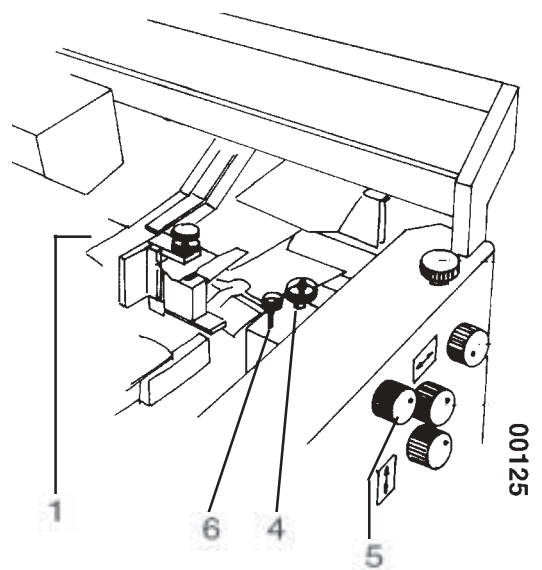


Air tube 1 with nozzles 2 may be opened or closed through the clips 3. The quantity of opened clips depend on the sheet width. Please bear in mind that the clips under the suction wheel should always be opened.



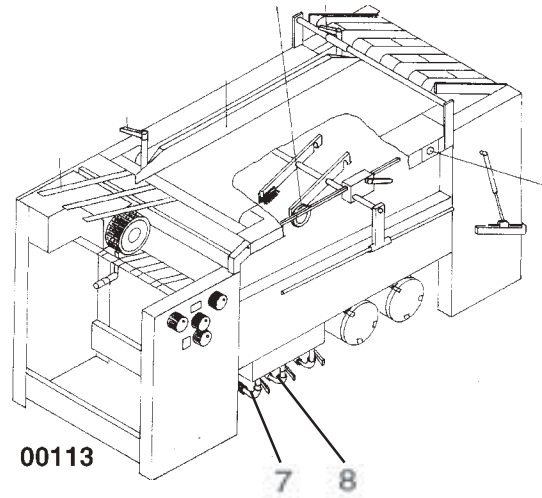
The air tube 1 is height adjustable through knurled nut 4, it may be swivelled through knurled grip 5 and fixed through knurled screw 6.

**Continuation**



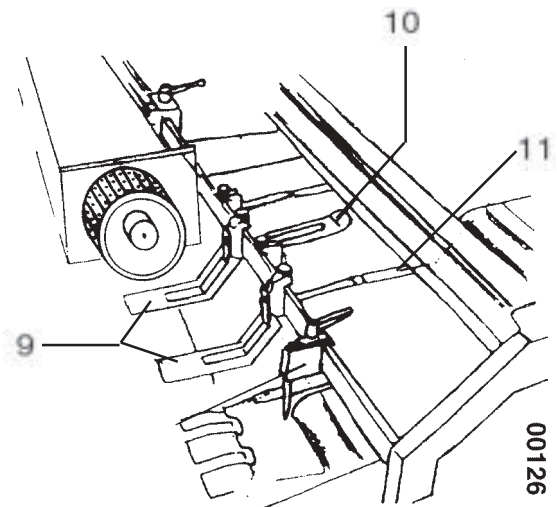
**Continuation**

Regulate the quantity of air blast through valves **7** and **8**.  
Approximately 10 - 15 sheets on top of pile should be created.



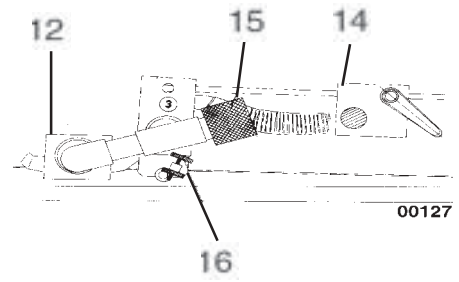
Use smoothers **9** and **10** as well as spring steel tape **11** for safe sheet conveyance to the alignment table.

**Continuation**

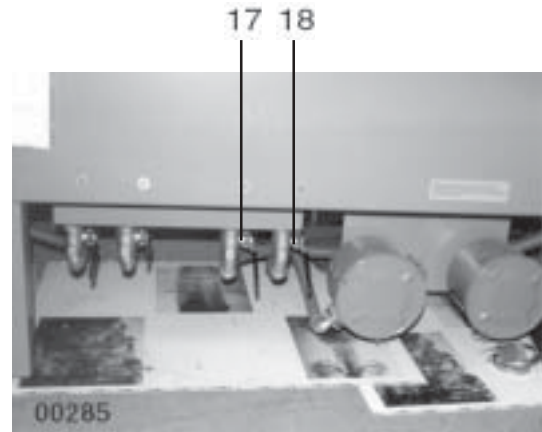


**Continuation**

The positioning of side blower **12** into length- and crosswise direction occurs through holder **14**. Set the balance through the weight **15** to such an extent that the side blower **12** is slightly touching the sheet; fix it through the nut **16**.



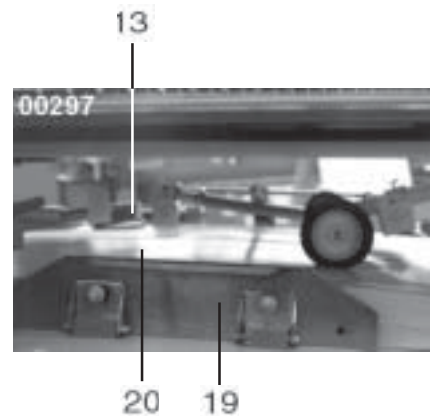
Regulate the quantity of air blast through valve **17** and **18**.



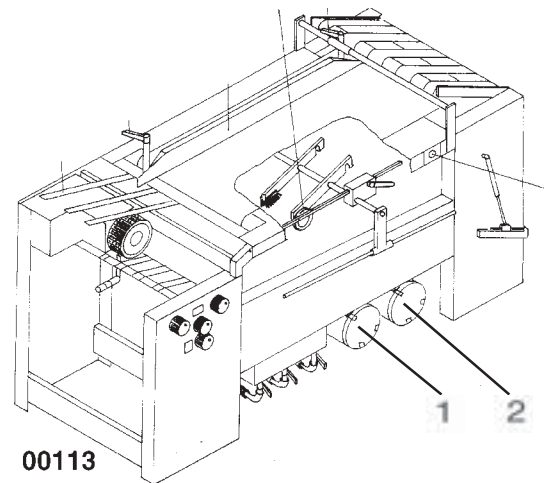
**>NOTICE<**

Use plate for back-up **19** at operator side when you process large sheet sizes. Regulate the air blast through valve **18** in case of a air back-up within the pile **20** opposite to the blower **13**.

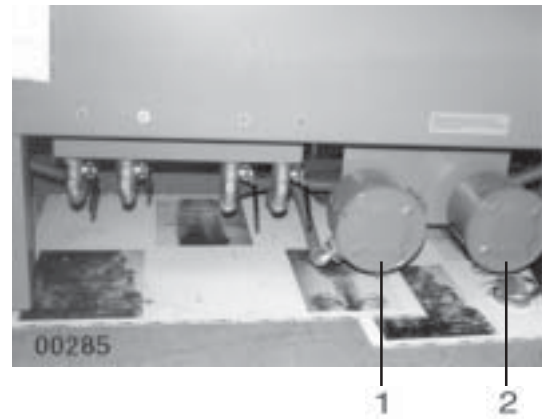
**Continuation**



Continuation



Air filtre 1 for suction air.  
Air filtre 2 for air blast.

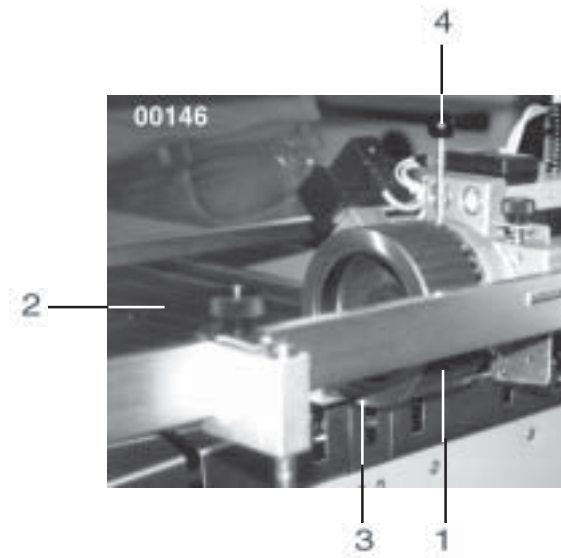


5.2.6 Suction wheel

The suction wheel **1** is carrying the sheets onto the register table **2**. Point of suction **3** should be on the lowest position of the suction wheel; set lever **4** into vertical position.

If sheets tend to roll down:  
point of suction should be at the front (push lever **4** to the right)

If sheets tend to roll up:  
point of suction should be at the rear (push lever **4** to the left).



### **5.3 Other options**

If this machine includes other options not described, separate Operating Manuals are attached.

### **5.4 Peripheral units**

Operating Manuals pertaining to mobile peripheral units are attached separately, if these units are part of the order at the time of shipment.

### **5.5 Final remarks**

**We wish you much pleasure and success with this machine. Should you, however, still have problems with it, please do not hesitate to contact our technicians or supervisors who will be able to further assist you. Any recommendations to improve this Operating Manual are greatly appreciated.**



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