

# **THIEME**

## **THIEME 1000 Flatbed Screen Printing Press**

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**Operator's Manual**

## General information

- \* This manual is an integral part of the machine. It should always be kept near the machine. Closely observe the information given in this manual to ensure operator safety as well as correct use and proper performance of the machine.
- \* This manual describes the machine model **THIEME 1000**.
- \* For detailed information on safety issues, please refer to chapter 2 "Safety Information".
- \* Proper performance of the system and operational safety as well as interference-free operation can be guaranteed only if system components verified and approved by THIEME are used.
- \* Only accessories that have been tested in conjunction with this machine and are approved by THIEME may be used with the machine. If accessories from other manufacturers are used, THIEME cannot be held liable for the safe operation and/or functioning of the machine.
- \* The warranty does not cover damages resulting from the use of non-THIEME accessories.
- \* THIEME is responsible for the effects on safety, reliability, and performance of the machine, only if:
  - assembly operations, extensions, readjustments, modifications, or repairs are carried out by THIEME or by persons authorized by THIEME,
  - the machine is used in accordance with the instructions given in the operator's manual.
- \* This manual conforms with the system specifications and applicable safety standards valid at the time of printing. All rights are reserved for products, circuits, techniques, software programs, and names appearing in this manual.
- \* No part of this manual may be reproduced without written permission from THIEME.

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Customer	.....
Order Number	.....
Machine Number	.....
Year of manufacture	.....

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### Revision History

Edition	Comments
11/00	Initial Release

## 1 Application and Functional Description

### 1.1 Intended Use

The flatbed screen printing press **THIEME 1000** is exclusively used for printing on rigid and flexible materials, varying in size and thickness (see table 1-1). Only working materials such as inks, varnishes and solvents with a flash point above 40 °C may be employed. Adequate ventilation of the room must be ensured. The machine is intended for commercial use only.

The system is not intended for uses other than those described above.

The intended use includes

- close observance of this operator's manual and
- observance of the inspection and maintenance instructions.

model	sheet size
THIEME 1010	55 x 75 cm
THIEME 1020	75 x 105 cm
THIEME 1030	100 x 140 cm
THIEME 1040	120 x 160 cm
THIEME 1050	140 x 180 cm

Table 1-1

### 1.2 Design and Functional Description

The **THIEME 1000** is a semi-automatic flatbed screen printing press where the substrate is

- manually fed and removed and
- automatically printed.

The substrate is held in place on the print table by a vacuum. As an option, the machine can be equipped with pneumatically activated stop pins which facilitate feeding of the substrate.

These are the steps of the printing process:

- the table travels into the machine,
- the frame comes down (if enabled),
- the substrate is printed by the squeegee traveling forward,
- the frame moves up (if enabled) and the table leaves the machine,
- the screen is flooded by the squeegee traveling back again.

In conjunction with the hydraulic feed damping system, the precise guidance of the table ensures a high level of register accuracy.

For register adjustment the screen frame can be adjusted by means of three high-precision spindles.

The printing press is controlled from the control panel.

The print cycle is initiated via the foot switch (single cycle or automatic mode).

Within the framework of the applicable guidelines, adequate measures have been taken to protect the machine operator from all moving parts of the machine. The machine can only be operated when the safety bar is closed. If the safety bar opens while the machine is operating, the machine will stop immediately.

The machine can also be stopped with the emergency stop switch.

The machine can be expanded with the following ancillary equipment and options:

- optical feed monitoring system
- cleaning unit
- table drive, frequency-controlled
- ionization unit
- anti-drip device

Figure 1-1 shows the major components of the **THIEME 1000**.

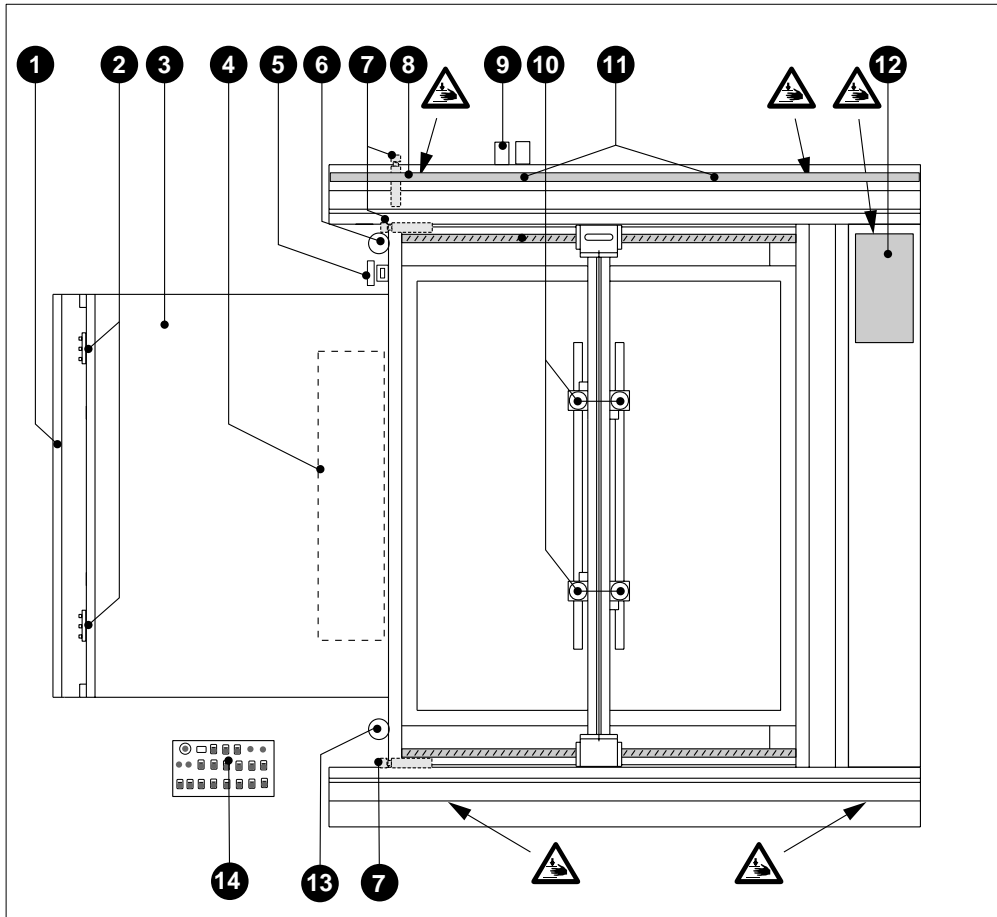



Figure 1-1. **THIEME 1000** flatbed screen printing press

- |   |  |
|---|--|
| <p><b>1</b> Safety bar</p> <p><b>2</b> Switches to enable and disable the stop pins (optional feeding controls)</p> <p><b>3</b> Table</p> <p><b>4</b> Switch cabinet with main switch</p> <p><b>5</b> Snap-off distance control</p> <p><b>6</b> Compressed air inlet (filter control unit for service pressure (top), squeegee pressure (bottom))</p> <p><b>7</b> Precision spindles for micro-adjustment of the screen</p> | <p><b>8</b> Print head</p> <p><b>9</b> Vacuum and blow air controls</p> <p><b>10</b> Squeegee cylinder</p> <p><b>11</b> Proximity switches for front and rear squeegee stop</p> <p><b>12</b> Screen lift adjustment</p> <p><b>13</b> Oiler for stop pins (option)</p> <p><b>14</b> Control panel</p> <p> Caution label warning against hand bruises</p> |
|---|--|

## 2 Safety Information

The terms "Danger", "Warning" and "Caution" are used throughout this manual to designate safety-related information. A "Note" provides useful information to assure that you get the most from your printing machine.

### Definitions

#### Danger

*indicates an imminent hazard. If not avoided, this hazard will result in death or serious injury.*

#### Warning

*indicates a hazard. If not avoided, this hazard could result in death or serious injury.*

#### Caution

*indicates a potential hazard. If not avoided, this hazard could result in minor personal injury or product/property damage.*

#### Note

*provides useful information to assure that you get the most from your machine.*

### Safety Information

#### Danger

*This screen printing machine must only be used as described under "Intended Use" in chapter 1 "Application and Functional Description". THIEME cannot be held liable for damages resulting from applications other than those stated in this manual.*

#### Danger

*This screen printing machine must only be used by persons*

- *who have received adequate training in the use of the machine,*
- *who are familiar with the relevant occupational safety and accident prevention regulations,*
- *who are familiar with the information given in this manual.*

*When the machine is put into service again after prolonged disuse, the operating staff must be re-trained in the use of the machine (at least once every year).*

#### Danger

*The customer is not authorized to modify the machine in any way. THIEME cannot be held liable for damages resulting from unauthorized modifications to the system.*

**Danger**

*The customer is obliged to observe the specified inspection and maintenance instructions (chapter 8 "Maintenance").*

**Danger**

*The user is responsible for choosing the appropriate substrates, inks, and solvents.*

**Note**

*The screen printing machine is designed in compliance with the applicable GMP requirements and conforms with the occupational safety and accident prevention regulations.*

**Danger**

*Before putting the machine into service, the operator is obliged to verify its functional safety and working order. Particularly the safety devices must be checked for proper functioning.*

**Danger**

*Only inks, solvents and additives that are commonly used in screen printing and have a flash point above 104 °F (40 °C) may be used.*

*When working with substances that are dangerous to the operator's health, care must be taken that the threshold limit values (TLV) are not exceeded. The pertinent measurements must be taken at maximum machine performance.*

*Adequate ventilation of the room must be ensured.*

*When using working materials such as inks, varnishes, solvents or additives, always observe the information given in the latest material safety data sheets. These data sheets are supplied with the substances or can be obtained from the vendors.*

*After use, the working materials must be disposed of in compliance with the local regulations or as outlined in the latest material safety data sheets.*

**Danger**

*Only authorized personnel is permitted to remove the guards prior to machine servicing. The guards may only be removed if*

- the machine is disconnected from the power line*
- the machine is protected from being turned on inadvertently.*

*Do not put the machine into service while guards are removed.*

*Removing guards does not automatically shut down the machine.*

**Danger**

*Before leaving the machine, always switch it off with the main switch.*

**Caution**

*If the machine is equipped with additional accessories, their respective operator manuals must be observed.*

### Caution

***Set up the machine in a location which affords sufficient ventilation. The ventilation openings must not be obstructed.  
The ambient conditions specified in the "Specifications" chapter must be ensured at all times.***

### Note

***In normal operation, the noise level of the machine is 65 dB (A).***

### Danger

***The machine is not suitable for operation in areas where an explosion hazard may occur.***

### Warning

***There are no user-replaceable parts inside the machine. Do not open the machine or the switch cabinet (notify service).***

### Danger

***Chemicals required for the application or maintenance of the machine must under all circumstances be stored, prepared and kept at hand in the containers provided by the respective manufacturers. Failure to observe this instruction may result in severe consequences for the operating staff.***

### Danger

***Liquids must not be allowed to enter the machine. Machines into which liquids have penetrated must be checked by a service technician before being used again.***

### Danger

***Do not clean the machine while it is switched on.  
Always switch off the machine with the main switch during prolonged setup operations.***

### Note

***At the end of its service life, dispose of the machine and its accessories, observing the applicable local laws and regulations. Apart from the lubricants (oils, grease) the machine does not contain hazardous substances. For more information, please contact THIEME GmbH & Co. KG.***

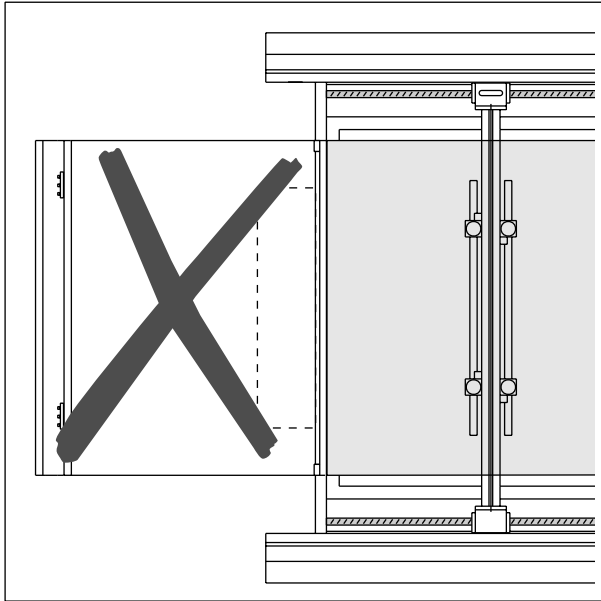


Figure 2-1. Keep clear of this area while the safety bar is closed

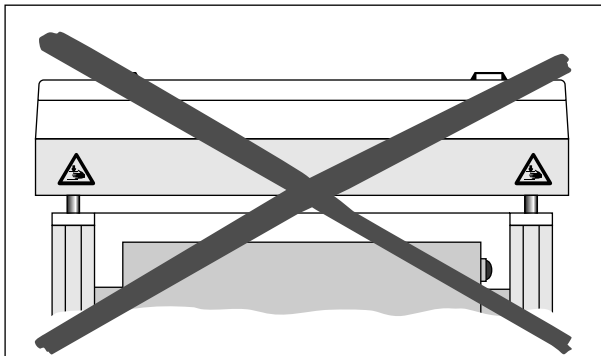


Figure 2-2. Print head


### Danger

**Dispose of the packaging material as per local waste control regulations. Keep the packaging material out of children's reach.**

### Danger

**Do not step into the area indicated in Figure 2-1 when the safety bar is closed.**

### Danger

**To avoid hand bruises, do not work on parts of the print head or within the print head while the machine is printing! These parts of the machine are labeled with the symbol  (Caution! Hand bruises) (Figures 1-1, 2-2).**

## 3 Machine Installation

### Transportation

The machine is shipped assembled. The packaging depends on the transportation route and shipping modality. Unless otherwise stipulated, the packaging complies with the requirements of the German Mechanical Engineering Association (Verein Deutscher Maschinenbauanstalten - VDMA).

The machine is usually mounted on a wooden frame for transport.

- Observe all safety and accident prevention regulations.
- Wear protective clothes.
- The size and capacity of all material handling equipment used (crane, lifting gears, fork lifts, haulage car, etc.) must be adequate for the task at hand (the weight of the machine is indicated in chapter 9 "Specifications").
- When using fork lifts, the length of the forks must be such that they support the entire underside of the machine.
- The machine must only be lifted at its bottom braces. It must be assured that the machine is protected from shifting or from tipping over during transport.
- If the machine is not immediately transported to its installation site
  - do not place it directly on the floor
  - protect it from temperature extremes, dust and moisture.

#### Warning

***Observe the symbols and notes on the machine packaging.***

#### Caution

***The customer is responsible for transporting the machine to its installation site within his facility (even if THIEME personnel is present).***

#### Caution

***The machine is a precision product. Therefore, it must be transported with great care.***

### Caution

**Only specially trained staff is permitted to install the machine.**

**Usually THIEME service staff is present at the customer's premises to put the machine into service.**

### Caution

**The installation site must meet the following requirements**

- **the floor must be level and vibration-free and it must support the machine weight**
- **the machine must not be installed in locations where an explosion hazard may occur**
- **the ambient conditions stated in the Specifications chapter must be ensured**  
(sources of heat (such as radiators) must not be installed in the immediate vicinity of the printing machine, since heat-sensitive components, such as conveyor belts, plastic covers or electrical components, may be damaged).

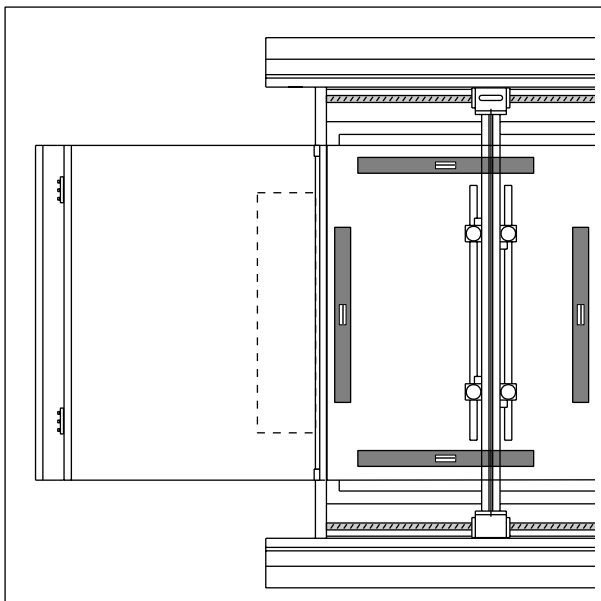


Figure 3-1. Spirit level positions

## Installation of the Machine

THIEME service staff will install the machine at the customer's facility, put it into service for the first time and hand it over to the customer. The information given in the following sections of chapter 3 "Machine Installation" should be observed when the machine is moved to another site and THIEME service staff is not present to install it and put it into service.

### Installation Site, Space Requirements

The space required to install the machine depends on the machine dimensions (Table 3-1) plus the working space.

Model	1010	1020	1030	1040	1050
width [mm]	1680	1980	2330	2580	2780
depth [mm]	2225	2625	3125	3575	3975

Table 3-1

### Alignment

The machine must be set up by means of the spirit level and the 4 leg levelers. To verify the machine position, place the spirit level on the print table in the locations shown in Figure 3-1. The print table must be in the print position (as shipped).

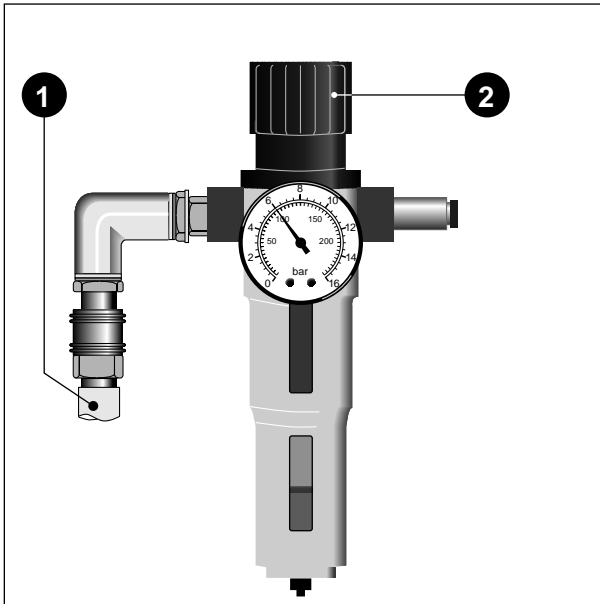


Figure 3-2. Filter control unit

## Compressed Air Inlet

The compressed-air connection (filter control unit) is located on the front side of the machine at left. The compressed air coupler is supplied with the machine. The compressed air must

- meet the quality requirements outlined below
  - provide a minimum operating pressure of 6 bar at a maximum network pressure of 10 bar.
- \* Connect the compressed air hose to the coupling of the filter control unit (1, Figure 3-2).
- \* Set an operating pressure of 6 bar (2, Figure 3-2).

### Warning

**Place the compressed air hose in such a way that it does not present a stumbling hazard.**

### Caution

**Ensure that the compressed air meets the quality standards outlined below! The system requires properly processed compressed air for correct operation. Unless otherwise stated, all pneumatic components use oil-free compressed air.**

**The compressed air must fulfill the following requirements of ISO 8573-1:**

- solid matter:** class 5, max. particle size 40  $\mu\text{m}$
- water content:** class 5, max. pressure dew point +7 °C
- oil content:** class 4, max. oil concentration 5  $\text{mg}/\text{m}^3$

**Compressed air contaminated with particles, oil, water or other substances can cause severe damage to the system. Damage resulting from contaminated compressed air is not covered by the warranty regulations!**

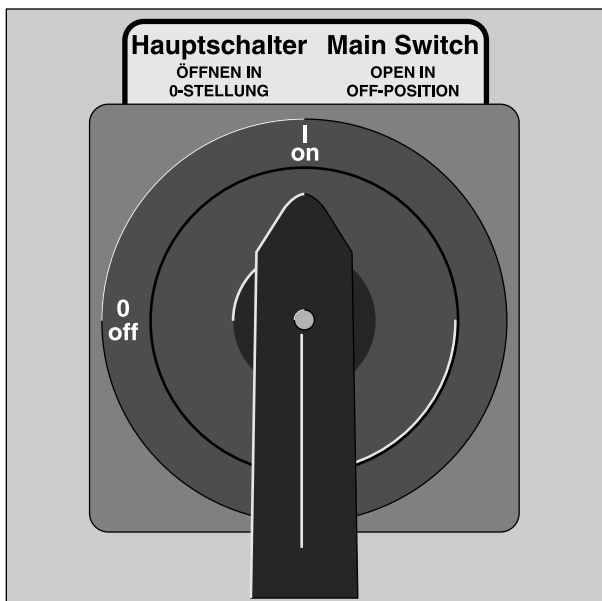


Figure 3-3. Main switch

### Danger

**Only qualified electricians are permitted to connect the machine to the power line.**

### Caution

**Before connecting the machine to the power line, check that the line voltage and frequency indicated on the nameplate are the same as the ratings of your local power line.**

### Warning

**Place the power cord in such a way that it does not present a stumbling hazard.**

### Warning

**Call in a qualified electrician to disconnect the machine from the power line when it becomes necessary to work on the electric system.**

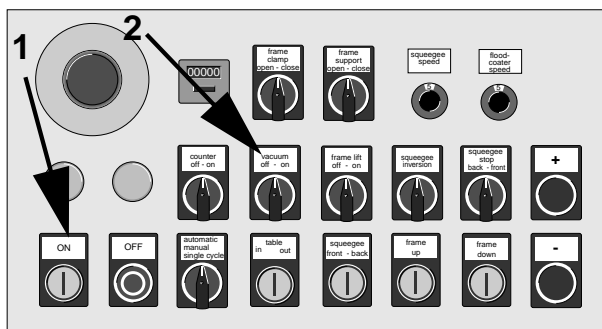


Figure 3-4. Control panel

## Power Input

A standard coupler plug is provided for connecting the machine to the power line. After connecting the machine to the power line, the polarity (sense of rotation) must be verified by a trained technician, to prevent damage caused by motors with the wrong sense of rotation.

- \* Switch on the compressed air supply (6 bar).
- \* Switch OFF the main switch (Figure 3-3), if it is ON.
- \* Remove the side panel from that side of the machine where the controls for vacuum and blow air are located (the two knobs for vacuum and blow air are secured with a hexagon socket screw).

The vacuum motor is now visible.

- \* Set all switches on the control panel to "0" or "Off".
- \* Close the safety bar in front of the table exit.
- \* Turn ON the main switch (Figure 3-3).
- \* Push the **ON** button (1, Figure 3-4). The indicator of the button lights up.
- \* Turn the vacuum motor briefly on and off again (2, Figure 3-4).
- \* Verify the correct sense of rotation by means of the direction indicator (arrow) on the vacuum motor.
- \* Turn off the main switch and reinstall the side panel.

### Warning

**When working between the print head and the machine stand, the main switch must be turned off as an additional safety precaution to prevent that the print head is inadvertently lowered.**

### Caution

**Before transporting the machine, all transportation guards must be reinstalled.**

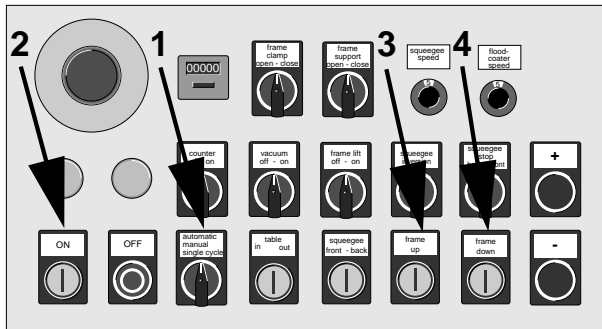


Figure 3-5. Control panel

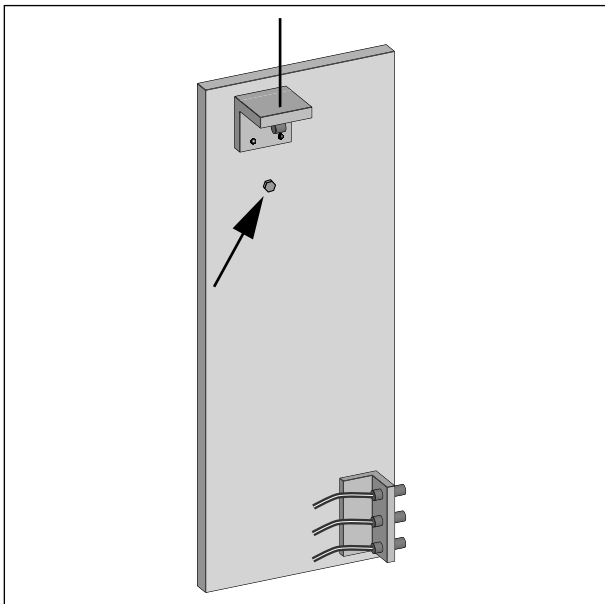


Figure 3-6. Screw securing the carriage for the snap-off distance switches during machine transport

### Performance Check, Removing the Transportation Guards

Before setting up the machine for the first time, the performance check outlined below should be completed. It is of particular importance that the print head is properly lifted and lowered. The supports should not jerk or jam. Also, the transportation guard screw must be removed from the support carriage of the snap-off distance switches.

- \* Turn on the compressed air supply.
- \* Close the safety bar in front of the table exit.
- \* Set all switches on the control panel to "0" or "Off".
- \* Turn on the main switch.
- \* Set the operating mode control to "manual" (1, Figure 3-5).
- \* Push the **ON** button 2. The indicator in the button lights up.
- \* Push **frame up** 3. The print head moves up to the cleaning position. Hold the key down until the print head has reached the top position
- \* Remove the 4 shims from the lifting supports between the machine stand and the print head that were required for machine transport.
- \* Remove the transportation guard screw from the support carriage of the snap-off distance switch (Figure 3-6). The carriage is located behind the left, front column (remove cover from carriage).
- \* Verify the alignment of the print table again.
- \* To lower the print head, hold **ON** depressed and simultaneously push **frame down** (4, Figure 3-5), until the print head has reached the bottom position.

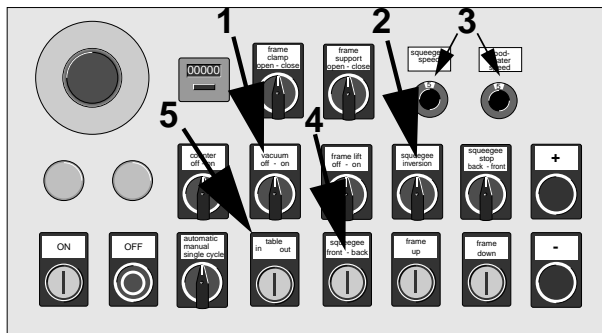


Figure 3-7. Control panel

- \* Turn ON the vacuum (1, Figure 3-7).
- \* Using **squeegee inversion** (2), move the squeegee cylinders to the upper position.
- \* Define the squeegee stroke with the two proximity switches **11** (Figure 1-1). Do not let the squeegee travel the full length.
- \* Set the controls for squeegee and flood coater speed to the minimum value (3, Figure 3-7).
- \* Using **squeegee front - back** check that the squeegee carriage moves unimpeded (the carriage continues moving as long as the button is pressed and stops at the proximity switch). Press the key again to reverse the direction. Move the squeegee carriage to the rear stop position.
- \* Check the movements of the print table with **table in - out** (5, Figure 3-7). Leave the table outside the machine.
- \* Press the foot switch to enable and disable the vacuum.

### Functional Test Before Each Use

**Each time** before putting the machine into service, complete the performance check outlined below and the verify the protective measures. These are

- the emergency stop switch,
- the safety bar.

Activating the emergency stop switch will disable machine control (indicator in **ON** button is not illuminated).

As soon as the safety bar opens, the print table can not be moved any more.

## 4 Control Panel

Besides the buttons, switches and controls for machine operation, the control panel also accommodates the emergency stop switch and the sheet counter.

The text below explains the operating controls from the top left to the bottom right.

**Note**

*In this chapter we will explain the functions of the operating controls only briefly. For details on machine control, please refer to chapter 5 "Machine Setup".*

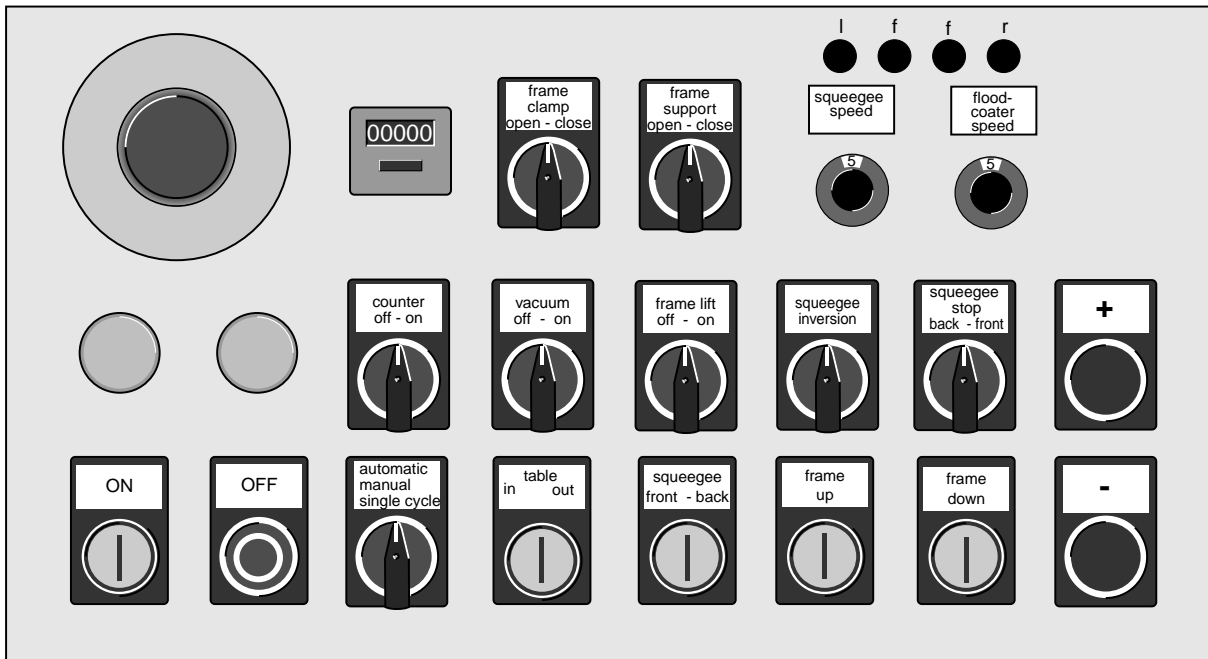


Figure 4-1. Control panel

### **emergency STOP**

Once activated, this pushbutton must be released before the machine can be turned on again.

### **Sheet Counter**

The sheet counter can be enabled and disabled with **counter off - on** . It indicates the number of prints. To reset the counter, the button must be pressed.

### **frame clamp open - close**

Opens and closes the screen clamping cylinders.

### **frame support open - close**

Opens and closes the frame clamping mechanism.

### **squeegee speed / flood-coater speed**

For adjustment of the speed (**Caution: At high speeds, the squeegee carriage may travel a short distance beyond the proximity switches! Therefore, be sure to increase the speed only gradually.**)

**Feed Control Indicators (Option)**

The indicators light up as soon as the feed controls detect the substrate.

**counter off - on**

Turns the sheet counter on and off (push the button to reset the counter).

**vacuum off/on**

Enables and disables the vacuum motor.

**frame lift on/off**

With this control you can choose whether or not the frame will be lifted and lowered during a print cycle.

**squeegee inversion**

To lift and lower the squeegee.

**squeegee stop back - front**

After printing, the squeegee carriage will stop in the rear or front position. When you choose "front", the squeegee assembly will stop in the "print end" position after each print cycle and the screen will be flooded at the beginning of the next cycle.



These buttons are used to adjust

- the pre-vacuum time
- the delay until the table moves out
- the delay until the table moves in
- multiple prints
- the table speed (option).



Enables/disables machine control.

The function can be enabled only if

- the machine is supplied with 6 bar of compressed air,
- the emergency stop switch is not activated.

**automatic - manual - single cycle**

Selects the operating mode.

"automatic":

After activation of the foot switch, the machine continues to print until stopped with the foot switch or until the "manual" mode is selected.

"manual":

Select to control the machine functions with the pushbuttons and switches on the control panel (the vacuum is still enabled and disabled with the footswitch).

"single cycle":

After activation of the foot switch, the machine completes one print cycle.

**table in - out**

Moves the table in and out.

**squeegee front - back**

The squeegee carriage will move to the end position while this key is held depressed.

Press the key again to reverse the direction.

**frame up , frame down**

These controls are used to move the print head up and down for screen cleaning (also refer to the "Performance Check" in chapter 3). The print head can only be lowered if **ON** is pressed at the same time.

## 5 Machine Setup

### Warning

**Do not enter the table area without opening the safety bar first.**

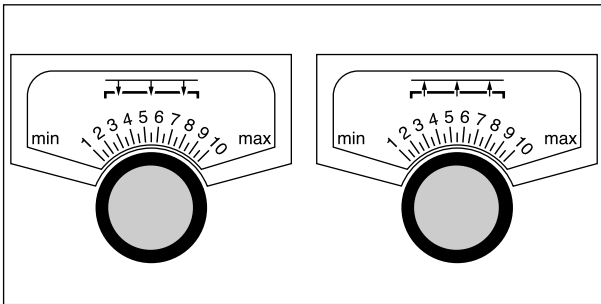


Figure 5-1. Controls for vacuum (left) and blow air (right)

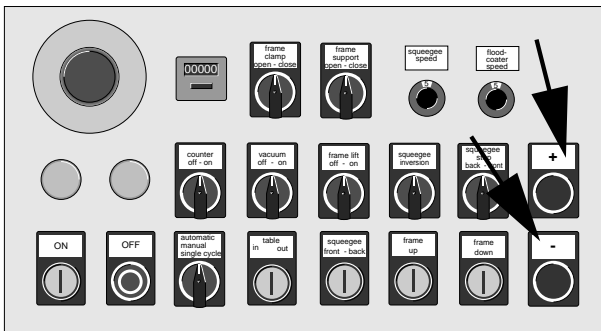


Figure 5-2. Control panel

### Basic Settings

#### Vacuum, Blow Air

The substrate is held in place on the print table by means of suction (vacuum). After the printing process, air is blown under the substrate for easy removal.

With the two controls 9 (Figure 1-1, Figure 5-1) on the left side of the machine, you can adjust the vacuum and blow air.

- \* Set both controls to the center position (basic setting).

#### Pre-vacuum time

Pre-vacuum time is the time in which the vacuum is turned on before the table moves into the machine.

- \* Set the operating mode switch to "single-cycle".
- \* Activate the foot switch and push  or  at the same time (Figure 5-2) to change the pre-vacuum time in steps of 1/10 s. Pushing both buttons at the same time will reset the time to zero.

#### Delay until print table moves out

(period of time the print table remains in the machine after completion of the print cycle)

- \* Set the operating mode switch to "single-cycle".
- \* Initiate a single cycle with the foot switch.
- \* Stop machine with the foot switch while the squeegee carriage is moving.
- \* Adjust the time in steps of 1/10 s with the buttons  ,  .

**Delay until print table moves in (feed time)**

- \* Set the operating mode switch to "automatic".
- \* Activate the foot switch to start the machine.
- \* Activate the foot switch while the table is moving out.

The table stops outside the machine.

- \* Adjust the time in steps of 1/10 s with the buttons  ,  .

**Multiple Prints**

- \* Set the operating mode switch to "manual".
- \* Activate the foot switch and adjust the number of squeegee carriage rides per print cycle with  ,  (when you push both buttons simultaneously, the machine is reset to single prints).

**Table Speed (Option)**

- \* Set the operating mode switch to "single-cycle".
- \* Holding  depressed, adjust the speed with  or  . The speed can be adjusted in 5 steps. Simultaneously pressing  and  selects the minimum speed.

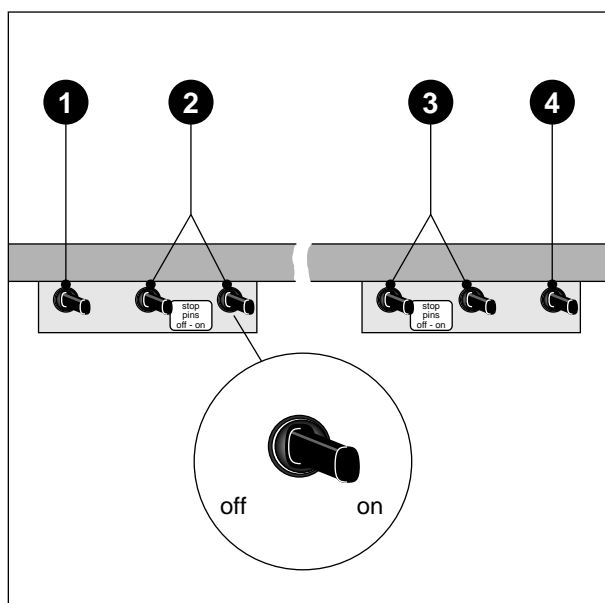


Figure 5-3. Switches to enable and disable the stop pins

- 1 Pin on the left side
- 2 Pins at the front left
- 3 Pins at the front right
- 4 Pin on the right side

## Feeding the Substrate

On the print table, the substrate is aligned with the aid of adhesive marks and held in place by suction (vacuum).

As an option, the machine can be equipped with pneumatically activated stop pins. Toggle switches (below the front edge of the table, Figure 5-3) are used to switch the pins on and off.

- \* Close the safety bar in front of the table exit.
- \* Turn on the main switch.
- \* Press **ON** (the indicator lights up).
- \* Using **table in - out**, move the table out of the machine.
- \* Press the foot switch to enable the vacuum.
- \* Place the substrate on the print table.
- \* Mask the free area of the print table with a suitable material. This prevents the screen from adhering to the table and improves the performance of the vacuum pump. The material used should be air-tight (e.g. plastic foil) and have the same thickness as the substrate.
- \* Using **table in - out**, move the table into the machine.

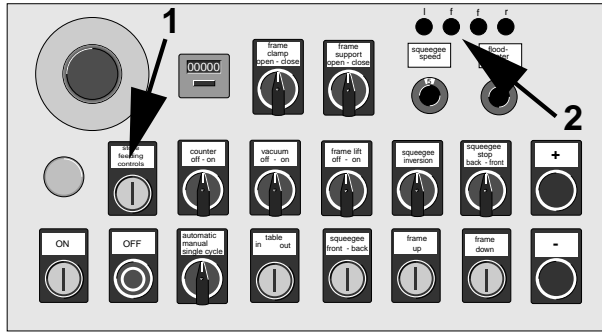


Figure 5-4. "Store feeding controls" button 1, indicators 2

### Optical Feed Controls (Option)

Machines with pneumatically activated stop pins can also be equipped with optical feed controls. One feed control is located next to each stop pin. As soon as the substrate is correctly aligned, the corresponding indicators on the control panel light up (2, Figure 5-4).

When the feed monitors detect the substrate in the automatic operating mode, the vacuum is automatically enabled and the table moves in.

### Enabling the Feed Controls

Only those feed controls must be enabled that correspond to the stop pins used.

- \* Cover the feed control of the stop pin on one side, using a piece of paper, for instance.
- \* As soon as the corresponding indicator 2 (Figure 5-4) lights up, push the "store" button 1.
- \* Repeat this procedure for the feed controls that correspond to the two stop pins at the front.

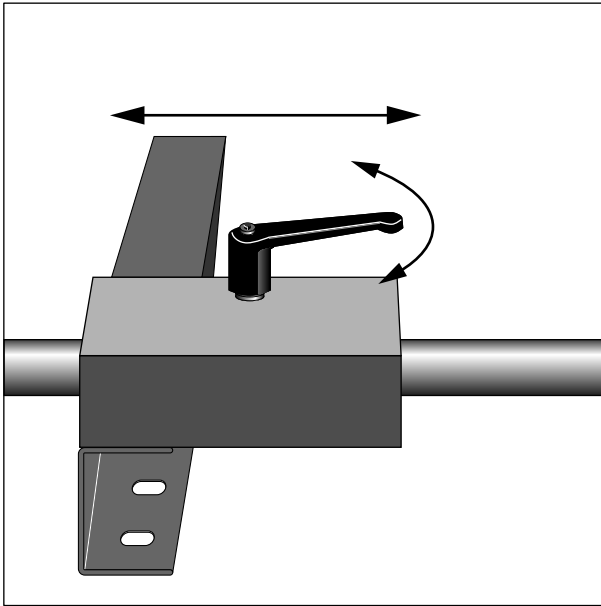


Figure 5-5. Clamping lever for screen support bars

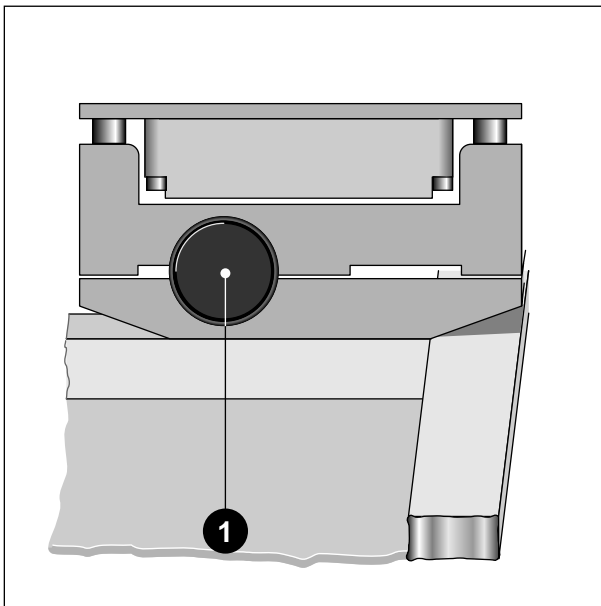


Figure 5-6. Screen clamping cylinder

## Installing the Screen

- \* Press **frame clamp open - close** to open the screen clamping mechanism.
- \* Press **frame support open - close** to open the frame clamping mechanism.
- \* Set the 3 precision spindles for the screen micro-adjustment (7, Figure 1-1) to 0.
- \* Press **frame support open - close** to clamp the screen frame.
- \* Open the clamps of the two screen support bars (2 clamps each at the front and at the back, Figure 5-5).
- \* Fold up the screen stops at the front.
- \* Mount the screen stops (3-point registration) on the appropriate side of the machine.
- \* Adjust the screen support bars to the screen width.
- \* Insert the screen.
- \* Fold down the screen stops at the front.
- \* Align the screen to the substrate by adjusting the screen support bars. Check that the screen is correctly aligned with the 3 stops.
- \* Close the 4 clamps of the screen support bars.
- \* Loosen the set screws of the 4 screen clamp cylinders (1, Figure 5-6) and position each cylinder as close as possible to the end of the screen frame (Figure 5-6).
- \* Press **frame clamp open - close** to activate the screen clamping mechanism.

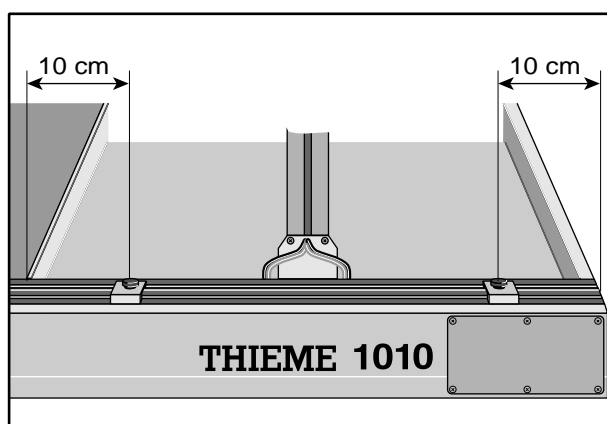


Figure 5-7. Adjusting the squeegee stroke

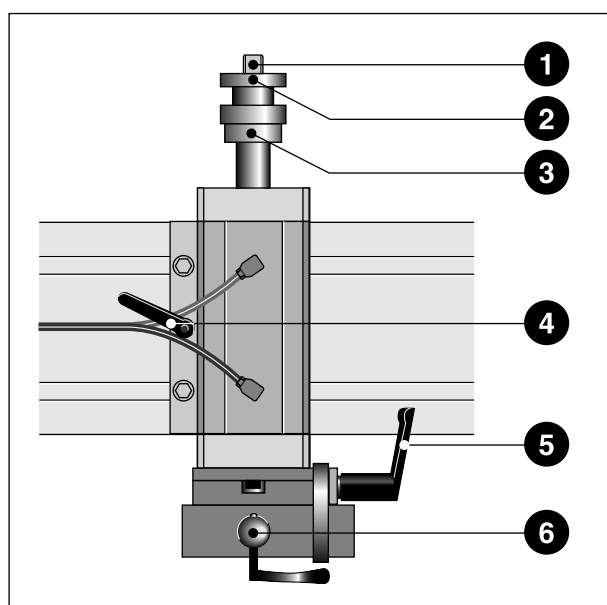


Figure 5-8. Flood bar cylinder

- 1 Scale for adjustment of the squeegee downstop
- 2 Counter nut
- 3 Screw to set the squeegee downstop
- 4 Clamping lever to adjust the squeegee cylinder position
- 5 Clamping lever to adjust the squeegee angle
- 6 Clamping lever to secure the squeegee

### Installing the Squeegee

- \* Using the two proximity switches, make a preliminary adjustment for the squeegee stroke. Ensure a distance of 10 cm to the end of the screen frame on either side (Figure 5-7).
- \* Select a slow speed with **squeegee speed** and **flood-coater speed**, because at high speeds the squeegee carriage may travel a short distance beyond the proximity switches!
- \* Press **squeegee front - back** to move the squeegee carriage to the front position.
- \* Press **squeegee inversion** to move the cylinders up.
- \* Choose the correct squeegee size.

The squeegee should extend beyond the image area by approx. 20 mm on each side. The maximum length of the squeegee depends on the size of the screen frame. The screen length should allow approx. 100 mm distance to the end of the squeegee.

- \* Open the clamping levers (4, Figure 5-8) and move the squeegee cylinders to the positions shown in Figure 5-9.
- \* Tighten the compressed air hoses again so that they sit close to the squeegee carriage.
- \* Verify that the same squeegee angle is set at both hinged plates (if the angle is not the same, correct the setting with clamping lever 5).

### Caution

**The max. operating force of the squeegee cylinders is only 360 N (Newton).**

**Before raising or lowering the squeegee cylinders, ensure that no one is working on them (risk of bruises!).**

**When the control system fails, the cylinders may inadvertently move up or down. For this reason, turn off the machine with the main switch whenever its setup takes a prolonged period of time.**

**If the cylinders were moved manually with the machine turned off (e.g. main switch turned off), they will return to the original position when the machine is turned on again.**

- \* Insert the flood bar (front) and the squeegee (rear) in the clamping retainers and tighten the clamping levers (6).

The squeegee should be symmetrically supported by the clamping retainers and should not protrude more than 25% of its max. length on either side.

### Adjusting the Squeegee Angle

- \* Open the clamping levers (5, Figure 5-10) at both cylinders and set both hinged plates to the same angle (initial value: 70 °). Then tighten the clamping levers.

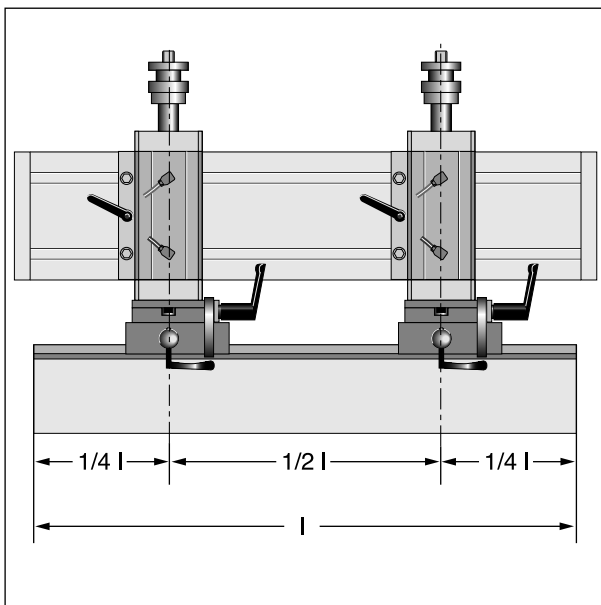


Figure 5-9. Installing the squeegee

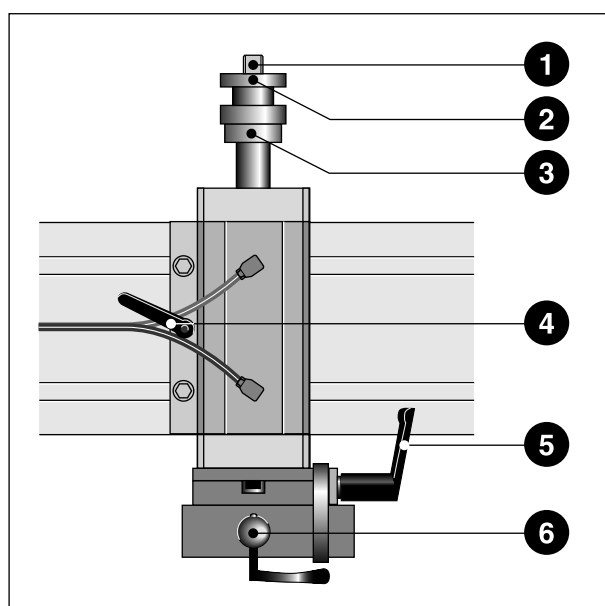


Figure 5-10. Flood bar cylinder

- 1 Scale for adjustment of the squeegee downstop
- 2 Counter nut
- 3 Screw to set the squeegee downstop
- 4 Clamping lever to adjust the squeegee cylinder position
- 5 Clamping lever to adjust the squeegee angle
- 6 Clamping lever to secure the squeegee

## Setting the Flood Bar Travel

### Caution

*If you are printing without frame lift, select a flood-bar downstop where the flood bar is just in contact with the screen. Otherwise the moving table would damage the screen.*

To prevent damage to the screen when the flood bar is lowered, you should choose an initial flood bar travel setting where the counter nut (2, Figure 5-10) is set at 15 mm on the scale 1.

- \* Loosen the counter nut 2 at the flood-coater cylinders and set the flood-coater downstop to 15 mm, using the knurled nut 3.
- \* Press **squeegee inversion** to lower the flood-coater.

The flood-coater should be just in contact with the screen mesh.

- \* If the flood-coater does not reach the screen, press **squeegee inversion** to lift the flood-coater and repeat the adjustment.
- \* If the squeegee reaches the screen on both sides, increase the flood-coater downstop (initial adjustment) 2 mm on the right and left, but only if you are printing **with** frame lift.
- \* Set this adjustment by means of the counter nut.

## Adjusting the Print Squeegee Pressure

The squeegee pressure (1 to 4 bar) is adjusted with the pressure control at the front left below the compressed-air inlet (6, Figure 1-1).

### Danger

**Adjust the squeegee stroke to allow for a minimum distance of 1 inch / 25 mm between the squeegee and the screen frame at both end positions (to prevent bruises).**

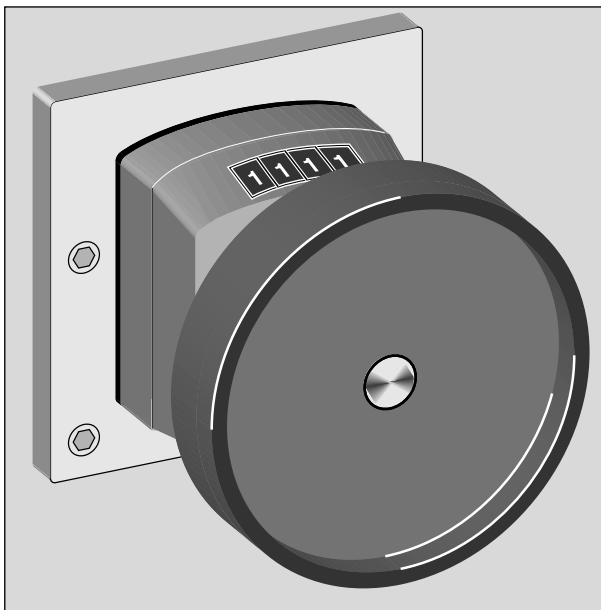


Figure 5-11. Snap-off distance control

### Squeegee Speed and Stroke

- \* Set the desired speed for the squeegee and flood bar (**squeegee speed**, **flood-coater speed**).
- \* Now adjust the exact squeegee stroke with the two proximity switches (**11**, Figure 1-1) (move squeegee to the end position with **squeegee front - back**).

### Snap-Off Distance

The snap-off distance is the distance between the underside of the screen mesh and the top of the print table. The minimum distance is 4 mm.

The distance must be adapted to the thickness of the substrate.

The control shown in Figure 5-11 is used to adjust the snap-off distance.

When you have adjusted the snap-off distance, the print head must be moved up and down once (section "Performance Check" in chapter 3).

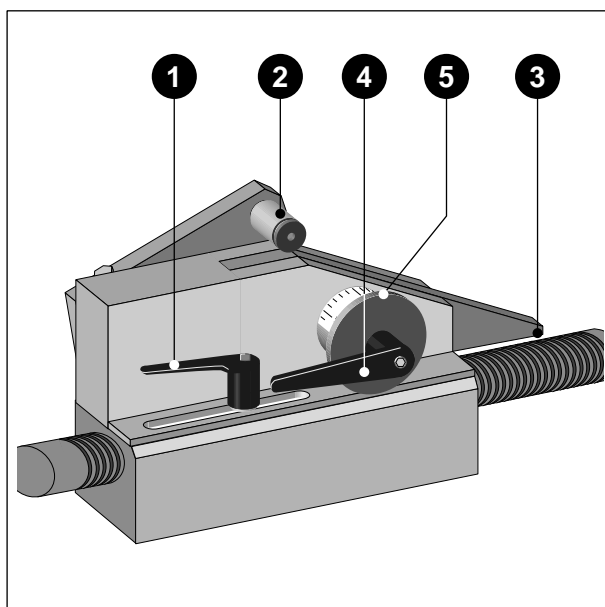


Figure 5-12. Screen lift adjustment

- 1 Clamping lever to adjust the wedge (screen lift starting point)
- 2 Roller
- 3 Lever for screen lift travel
- 4 Clamping lever
- 5 Knob to adjust lever (3) (screen lift travel)

### Adjusting the Screen Lift

Since the distance between the screen mesh and the substrate is kept very small, the screen lift device is needed to lift the screen behind the squeegee, preventing that the screen sticks to the substrate. This risk is particularly high when using high-viscosity inks.

To avoid distortions of the screen, two parameters can be continuously adjusted at the screen lift device:

1. the point where the device is to start lifting the screen and
2. the distance by which the screen will be lifted.

The squeegee drive controls the screen lift. The unit for adjustment of the screen lift is located in the rear brace of the print head assembly, under a plexiglass lid (12, Figure 1-1).

- \* Using **squeegee front - back**, move the squeegee carriage to the point where the screen lift function is expected to start (usually the rear stop position).
- \* Open the clamping lever 1 (Figure 5-12) and move the wedge to the position where the beginning of the slanting surface is exactly below the roller 2 (as shown in Figure 5-12).
- \* Tighten the clamping lever 1.

The slant of the wedge determines the screen lift travel. Lever 3 can be used to adjust different slants. The lower the lever, the shorter the screen travel (when the lever is horizontal, the screen travel is "0").

- \* Loosen the clamping lever 4 and select a different slant with lever 3 by turning knob 5.
- \* Tighten the clamping lever 4.

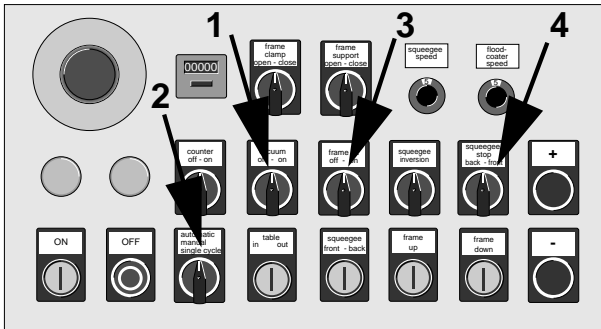


Figure 5-13. Control panel

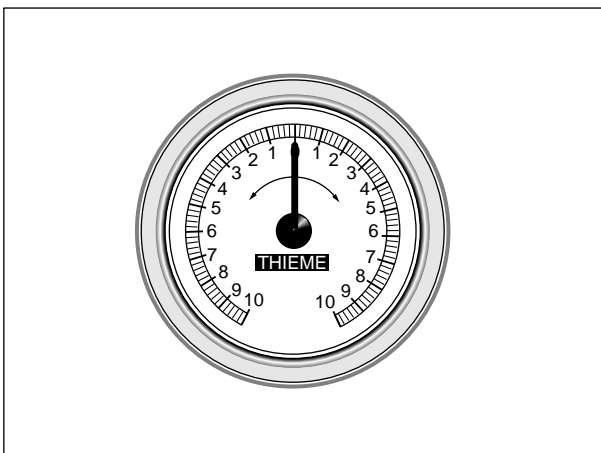


Figure 5-14. Screen alignment control

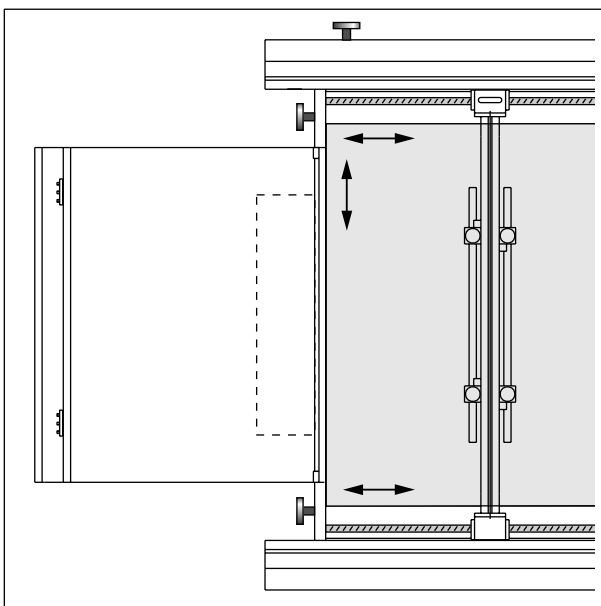


Figure 5-15. Screen alignment control

## Trial Print Runs, Screen Alignment

### Trial print runs

- \* Using **squeegee front - back** , move the squeegee carriage to the front stop and memorize the position of the squeegee (the ink should be filled in below the squeegee).
- \* Move the squeegee carriage to the back and fill in ink.
- \* Move the squeegee carriage to the front stop position.
- \* Close the safety bar.
- \* Move the table out.
- \* Turn ON the vacuum with **vacuum off/on** (1, Figure 5-13).
- \* Set the operating mode switch to "single-cycle" 2.
- \* Choose whether you are printing with or without frame lift 3.
- \* Select the squeegee stop at the back or front 4.
- \* Initiate the print cycle by activating the foot switch.
- \* Check the print quality and adjust
  - the times
  - the speeds
  - the squeegee pressure, etc. if necessary.

### Screen Alignment

By adjustment of the screen frame, the screen can be precisely aligned. There are three controls at the print head for this purpose: two at the front and one on the left (Fig. 5-14, 5-15).

- \* Press **frame support open - close** to open the frame clamping mechanism.
- \* Adjust the screen position with the three precision spindles.
- \* Close the frame clamping mechanism.
- \* Repeat the above steps until the screen is perfectly aligned.

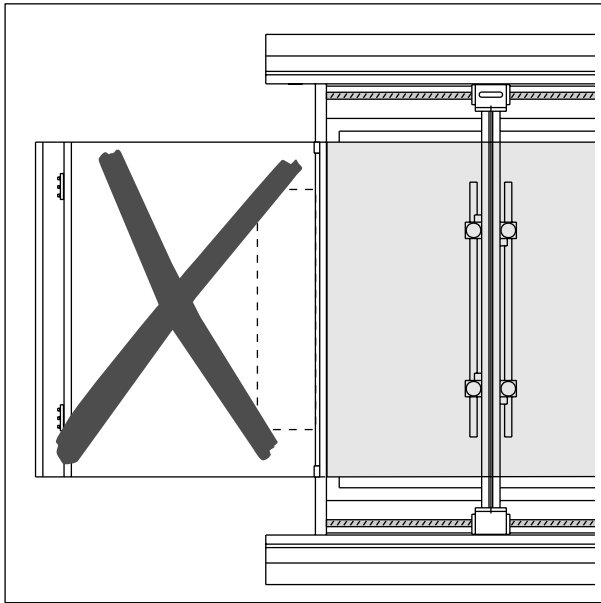


Figure 6-1. Keep clear of this area while the safety bar is closed

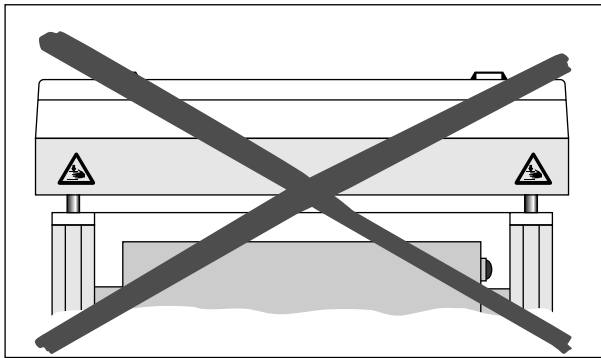


Figure 6-2. Print head

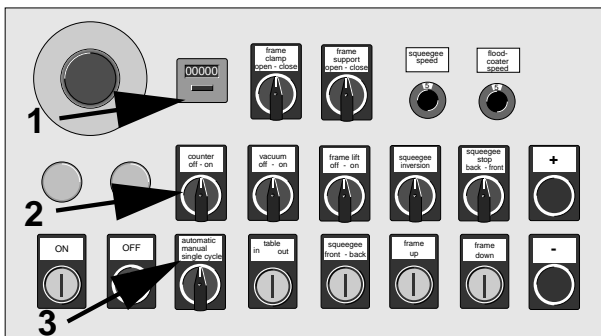


Figure 6-3. Control panel

**Caution**


**The hood always protects the foot switch from inadvertent activation. As an added safety precaution, position the foot switch such that it cannot be activated inadvertently.**

## 6 Printing

Having set up the machine as outlined in chapter 5 "Machine Setup", you can start printing.

### Danger

**Do not step into the area indicated in Figure 6-1 when the safety bar is closed.**

**To avoid hand bruises, do not work on parts of the print head or within the print head while the machine is printing! These parts of the machine are labeled with the symbol  (Caution! Hand bruises) (Figures 1-1, 6-2).**

- \* Set the sheet counter to 0 (1, Figure 6-3).
- \* Press **counter off - on** 2 to enable the sheet counter.
- \* Set the operating mode switch to "automatic".
- \* Initiate the automatic print cycle by activating the foot switch.
- \* Check the quality of the first prints and readjust the squeegee and flood-coater (angle, pressure, speed), if required.
- \* Check all set screws at the squeegee assembly, the screen lift device and the screen attachment and tighten them, if necessary.
- \* If a sheet is not correctly positioned, you can fetch it back by activating the foot switch while the table moves in.

## Stopping the Automatic Mode

- \* To stop the automatic mode, hold the foot switch down while the table moves out.
- \* When the table has moved out, set the operating mode switch to "manual".

## Putting the Machine into Operation after Emergency Stop or Opening the Safety Bar (during print cycle)

- \* Pull on the emergency switch until it locks into position (or close the safety bar).
- \* Press **ON** .
- \* Using **table in - out** , move the table out of the machine.
- \* Press **squeegee front - back** to move the squeegee carriage to the front position.

## 7 Working on the Screen

The entire print head can be moved up to enable working on the underside of the screen.

Although, for reasons of safety, the print head can only be lowered by simultaneously pressing two keys, the machine must be switched off with the main switch as an additional safety precaution. We recommend to move the table into the machine with **table in - out** before cleaning.

- \* Use **frame up** to move the print head up.
- \* Before working on the screen, switch off the machine with the main switch.
- \* Having completed your work, turn the machine on again and lower the print head by simultaneously pressing **ON** and **frame down** .  
Hold the keys down until the print head comes to a stop.

## 8 Maintenance

To ensure a long service life,

- the machine must always be kept clean
- the machine must be regularly lubricated as specified in the lubrication plan
- the machine must be serviced at the recommended intervals.

### Cleaning the Machine Surface

The following components should not come in contact with the ink. If they do, they must be immediately cleaned:

- table guide and rollers
- print table and stop pins.

Rests of ink or ink splashes on metal surfaces can be removed with a solvent.

Varnished surfaces are not resistant to solvents. Remove rests of ink immediately.

Use the cleaning agents with care to prevent damage to the varnished surfaces.

Do not clean plexiglass surfaces with solvents like acetone, cyclohexanone, tetrahydrofuran or methylene chloride.

Depending on the degree of soiling, we recommend the use of soft soap solutions, methylated spirit or naphtha.

### Cleaning the Print Table

#### Caution

***When cleaning the print table, take care that no solvent enters the vacuum holes.***

***Turn on the blow air to the maximum before cleaning the table.***

- \* Set the blow air control to the maximum settings and turn the blow air on.
- \* Use a cloth moistened (not soaked) with a solvent to wipe the table clean.
- \* Soiled vacuum holes can be cleaned carefully with a needle or with a 1.5-mm drill.

#### Tip

***If solvent has penetrated into the table all the same, turn the vacuum setting to the maximum for some minutes with the foot switch, so that as much of the solvent as possible is aspirated.***

### Legibility of Symbols and Machine Labeling

#### Warning

***Once a year, check that no symbols or labels have been removed from the machine and that they are clearly legible.***

### Danger

**The machines require regular preventive maintenance to ensure their operational safety and performance. Please observe the recommended maintenance intervals.**

### Maintenance

The machine must be serviced after 1500 hours of operation by our service staff.

Please contact our US service office at +1 630 513 1666 or THIEME in Germany at +49 76 41 58 35 22 to set a date for a service check.

### Oiler for Stop Pins

An oiler is provided for automatic lubrication of the stop pins. The oiler is located at the front of the machine. One filling should be sufficient for about 1 year. Unscrew the viewing glass, to refill the oiler (when the machine is not under pressure).

### Lubrication Plan

assembly	component	1)	2)	3)	4)	clean- ing	month- ly	every 3 months	when needed	comment
frame	4 lifting rods					x	x			
	4 lifting rods			x			x			thin film
main shaft	chains	x						x		
manual snap-off distance	mech. spindles		x					x		
print table	surface					x			x	clean vacuum holes
	stop pins				x		x			
squeegee assembly drive	table guide			x				x		
	chain	x						x		
	chain tension carriage						x			check check play
screen support	clamping lever thread		x					x		
screen lift	spindle, wedge, nut		x				x			
squeegee assembly	piston rod, cylinder					x			x	
hoods	hood bearing			x					x	
table drive	chain	x					x			
pneumatic system	connections						x			check for leaks
squeegee assembly	guide					x	x			
	guide		x				x			
screen lift	guide					x	x			
	guide		x				x			

1) chain spray 152-479, 2) grease 152-506, 3) silicone lubricant 152-503, 4) dry film lubricant 152-483

Also observe the separate maintenance instructions for the vacuum motor, stepper motor, mitre gear, indexing coupling, drive motor, and feeder.

### Recommended Oils

AGIP	ANTAR	ARAL	ASEOLI	BP	CASTROL	ESSO	MOBIL	SHELL	VALVOLINE
OLS5	Misola BH	BS36	Slide 16- 22	Energol HP20-C	Magna BD	Febis K-53	Vactra No. 2	Tonna F33	EP comp. HTX No. 2

**9 Specifications****General Specifications**

<b>Model</b>	<b>Unit</b>	<b>1010</b>	<b>1020</b>	<b>1030</b>	<b>1040</b>	<b>1050</b>
print format	mm	550x750	750x1050	1000x1400	1200x1600	1400x1800
print format max.	mm	570x770	770x1070	1020x1410	1220x1660	1420x1860
sheet format max.	mm	580x780	780x1080	1030x1420	1230x1670	1430x1870
frame format	mm	1000x1100	1200x1400	1450x1750	1700x2000	1900x2200
print table	mm	800x1000	1000x1300	1250x1650	1450x1900	1650x2100
vacuum field size	mm	570x765	765x1065	1020x1410	1215x1665	1410x1860
substrate height max. (3/4 automatic)	mm	50	50	50	50	50
screen micro- adjustment	mm	± 8	± 8	± 8	± 8	± 8
squeegee speed	m/s	1,2	1,2	1,2	1,2	1,2
weight	kg	1200	1300	1450	1550	1650
print speed	sheets/ h	1350	1300	1050	900	800
input voltage	V	400 / 230	400 / 230	400 / 230	400 / 230	400 / 230
power consumption	kW	3.35	3.35	3.35	3.35	3.35
rated current	A	12 / 20	12 / 20	12 / 20	12 / 20	12 / 20

## Dimensions

\* **THIEME 1010**

width: 1680 mm

length: 2225mm

\* **THIEME 1020**

width: 1980 mm

length: 2625 mm

\* **THIEME 1030**

width: 2330mm

length: 3125 mm

\* **THIEME 1040**

width: 2580 mm

length: 3575 mm

\* **THIEME 1050**

width: 2780 mm

length: 3975 mm

## Environmental conditions

\* Transport/Storage:

temperature -20 to +50 °C

rel. humidity 30 to 75%, no condensation

atmospheric pressure 500 to 1060 hPa

\* Operation:

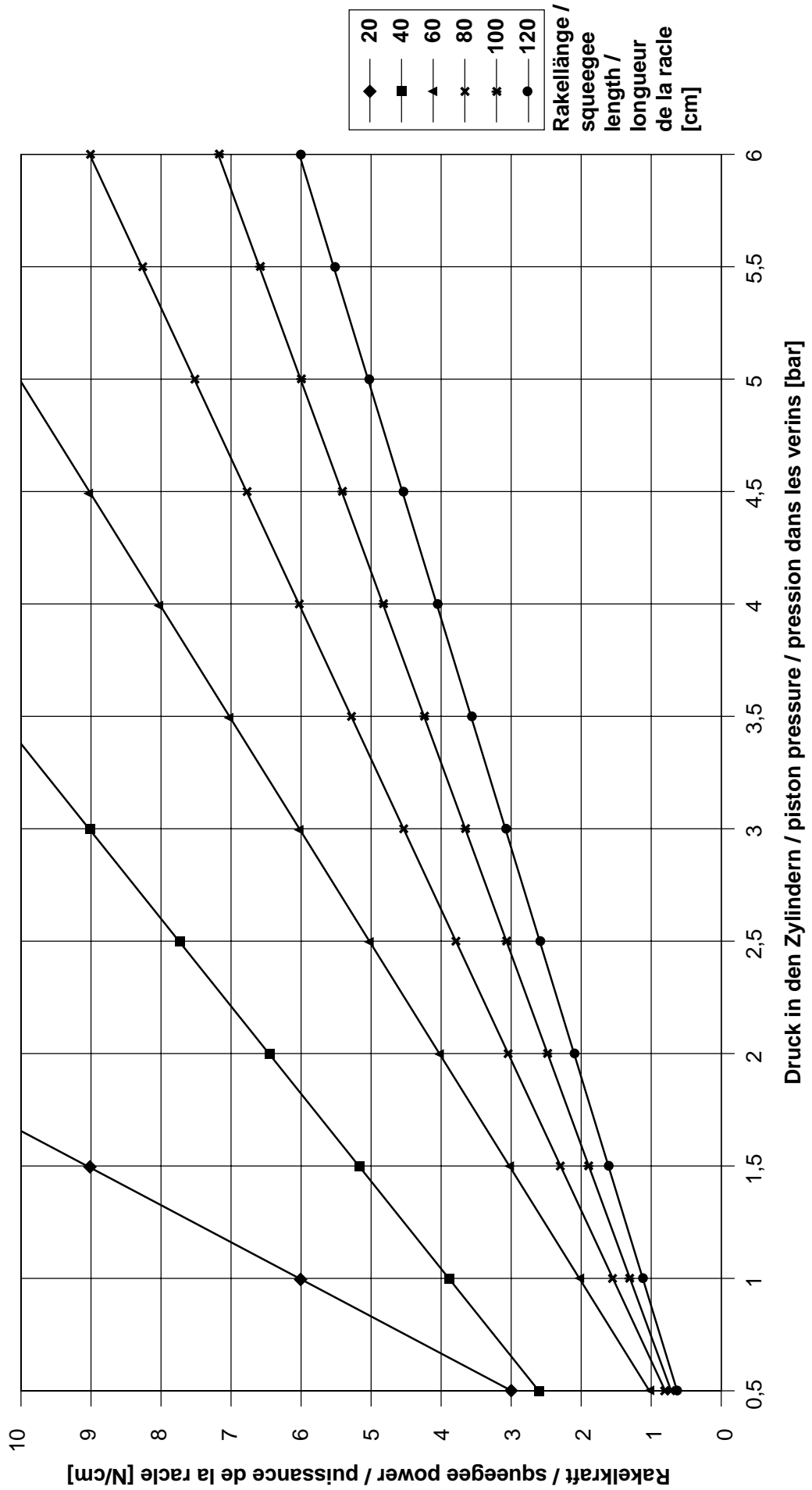
temperature +10 to +40 °C

rel. humidity 30 to 75%, no condensation;

atmospheric pressure 700 to 1060 hPa

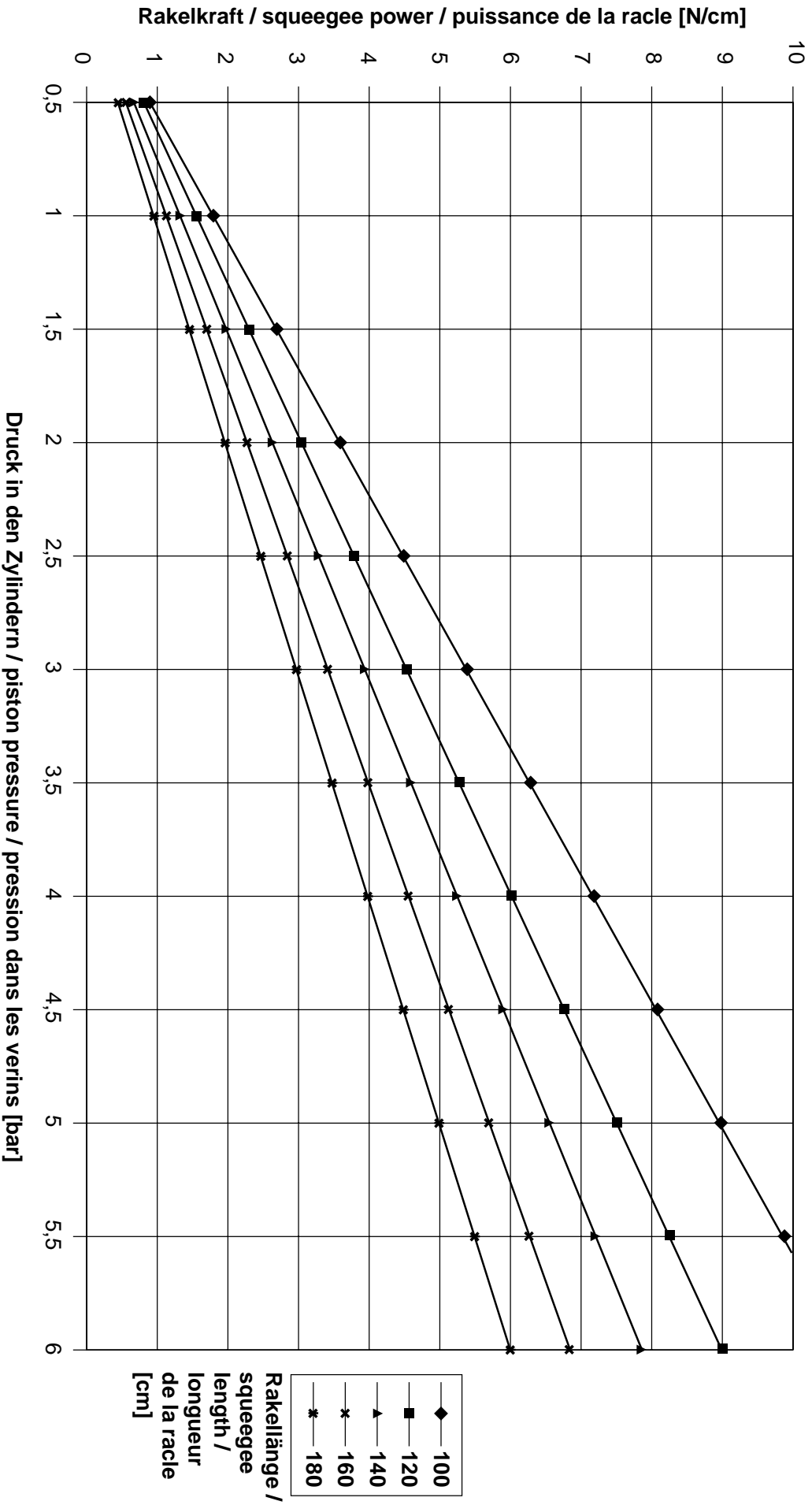
Adequate ventilation in dependence of the nature and quantity of working materials used.

**THIEME** 2 Rakelzylinder / 2 squeegee pistons / 2 verins de raclage

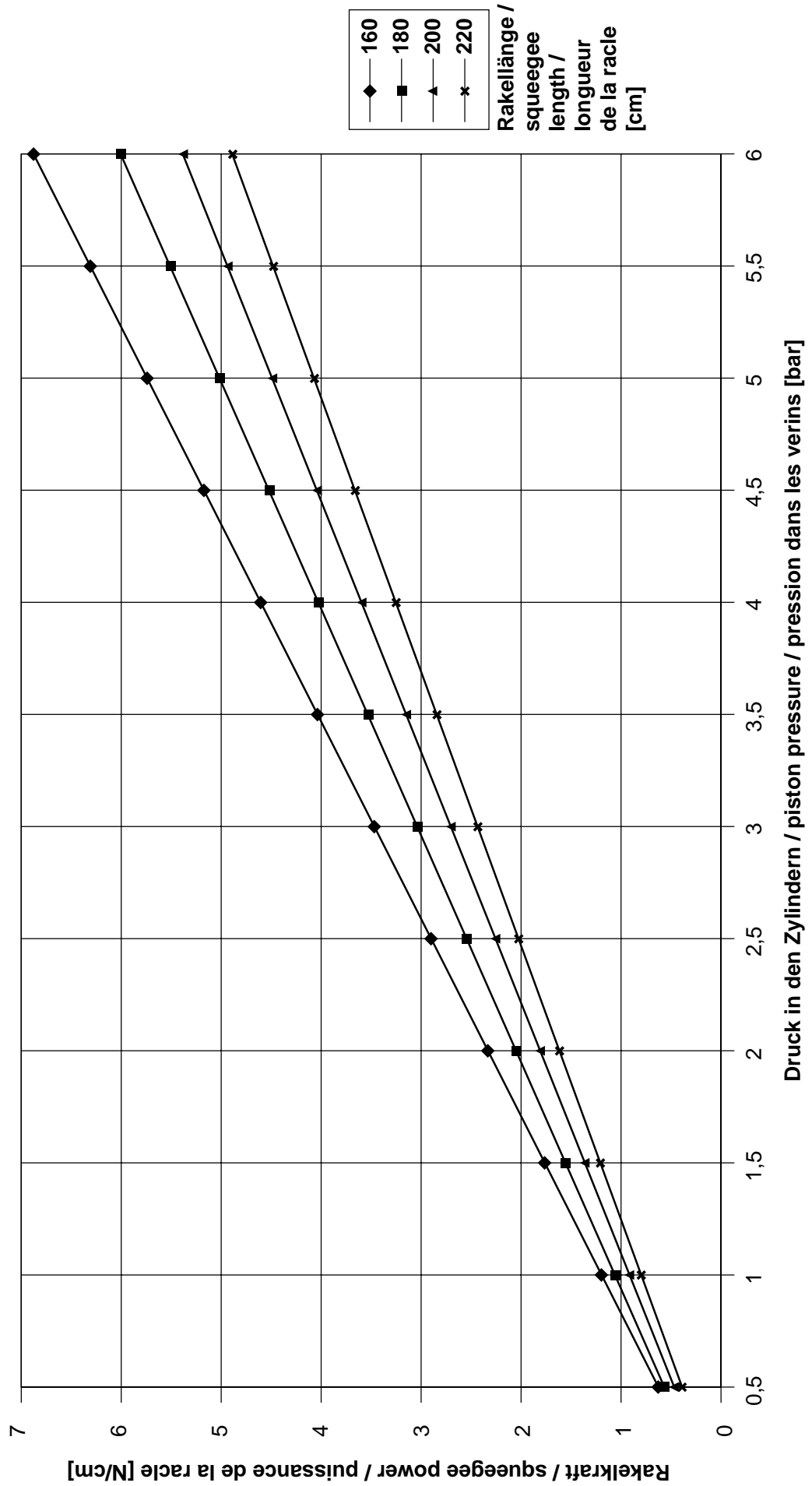


## THIEME

### 3 Rakelzylinder / 3 squeegee pistons / 3 verins de raclage



**THIEME** 4 Raketzylinder / 4 squeegee pistons / 4 verins de raclage



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