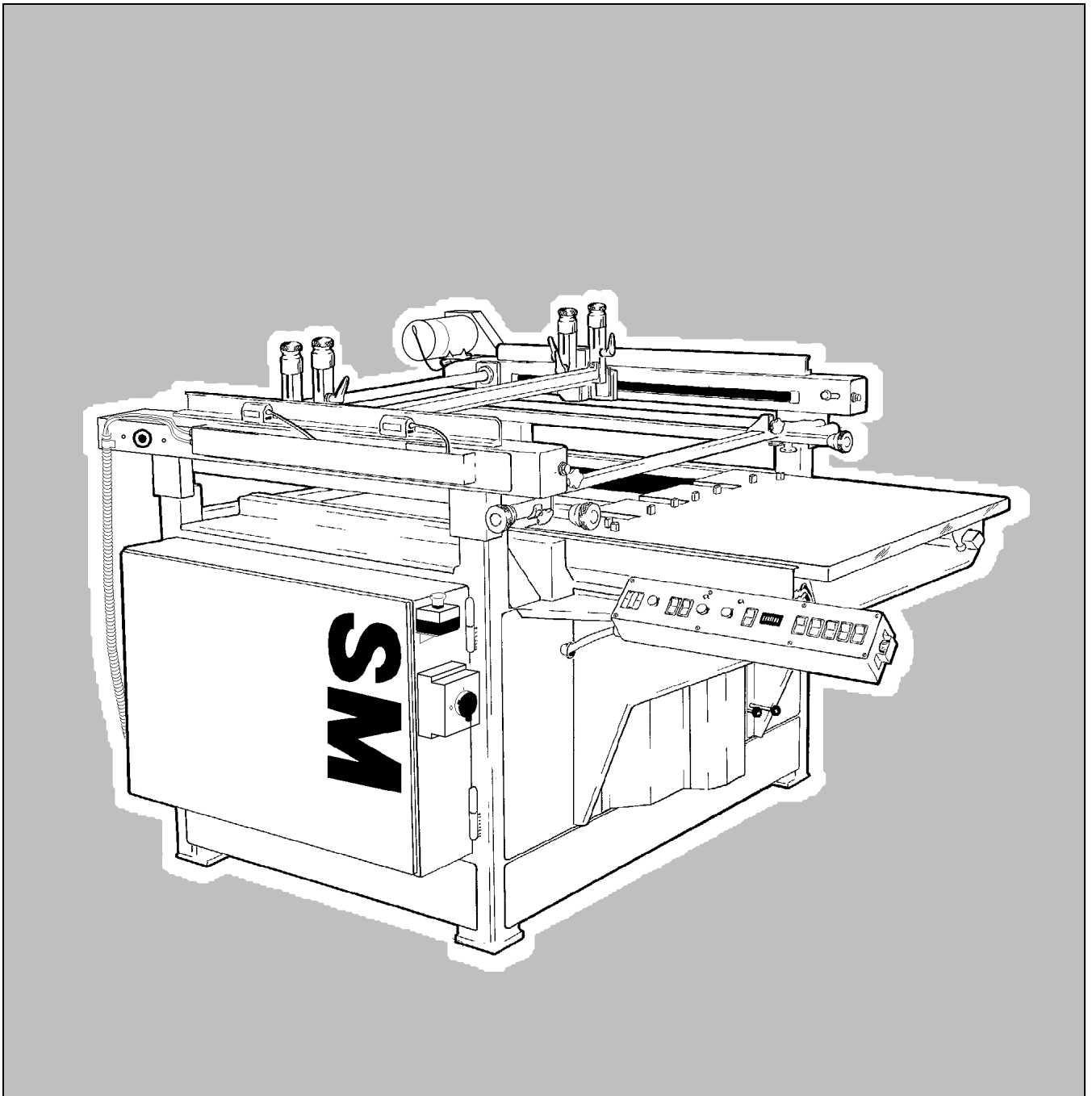


# Svecia Matic SM



**Operational and  
maintenance manual**  
B032E - 9601

# **SVECIA**



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**Svecia Matic  
SM  
Operational and  
maintenance manual  
B032E - 9601**

**SVECIA SCREEN PRINTING SYSTEMS AB  
S-145 81 Norsborg  
Sweden**

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## Safety precautions



1. Svecia recommends the use of protective gloves, safety goggles and respirator mask when working with inks or cleaning agents containing aggressive solvents or working with UV inks.

If exposed for long periods, solvent based inks and cleaning agents can cause respiratory injuries, skin irritations and damage to the central nerve system. UV inks can cause allergies.

2. Svecia's printing machines are equipped with connections intended for exhaust outlets, leading out from the printing room. We recommend that these are always connected. When this connection is made, a low pressure is created around the printing table, helping to remove the vapours from printing ink and solvents (SSM, SM and SPM only). When the external outlet is connected, however, the printing room should be well ventilated and have a stable temperature and humidity.



3. Important! Always use printing inks and solvents of class II (=flash-point exceeding 35 °C).

4. Always cut the power supply at the main power switch before carrying out service or mechanical settings on the printing machine.



5. Removal of machine covers and safety devices is to be done only during service and maintenance work. Covers and safety devices must always be put back in place before normal operation can start. Failure to do this can be the cause of great danger to human health.

6. Never connect and start a new machine before a Svecia authorized engineer arrives for installation. Only place the machine in its correct position and prepare the installation. An electrician and a ventilation technician must be present when the Svecia engineer arrives.

7. Always use lifting equipment rated for at least the weight of the machine that is going to be lifted (see the shipping documents).

8. Never lift printing machines in the print head columns, squeegee carriage or other parts related to the print head. Always use the sturdiest parts of the frame for lifting.



## 9. Danger

### Crush hazard

Never work under a hanging load.

10. When using fork lift for lifting, make sure the forks are in contact with the machine frame underneath, not resting on axles or other fragile parts in the bottom of the frame. Use fork lifters with forks long enough to reach from one side of the frame to the other. If such long forks are not at hand, use two fork lifters, one from each side. It is recommended to remove some side cover plates from the machine temporarily to get a better view of the frame bottom during the lift.

11. All operators should be familiar with the location and function of the printing machine's external main supply switch.

12. All operators and personnel in the vicinity of the printing machine must be aware of where the emergency stop switches are situated and how they function. Operating an emergency stop switch will cause the printing machine to stop immediately by switching it off.

13. All operators should be informed about regulations governing when a sheet can be picked up from the printing machine:

1. A sheet can be picked-up when the print table is stopped in its feeding position
2. A sheet can be picked-up when the print table is stopped in its printing position and the printing head is raised to its top position and the main power is switched OFF.
3. A sheet can be picked-up when it is on the delivery conveyor

14. All operators should be familiar with how to avoid accidents in the printing machine's hazardous areas.

The printing machine is designed in conformity with the health and safety requirements in directive 89/392/ EEC. Risk assessment EN 292. Access to electrically live parts inside the printing machine is only possible by removing cover panels using a tool such as a screwdriver. This action should only be carried out by authorized service personnel; operators are not permitted to remove any of the machine's cover panels.

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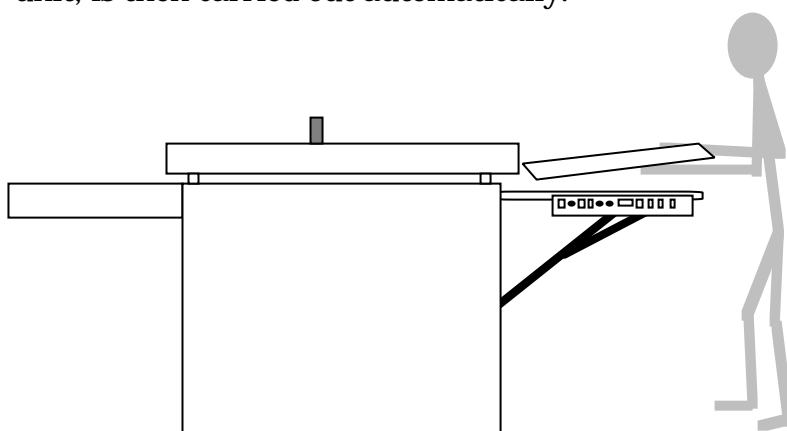
# 1. DESCRIPTION

## Introduction

The Svecia Matic, SM, is a 3/4 automatic screen printing flat bed machine.

### *Feeding*

The printing machine is fed by hand. Printing and subsequent unloading of the printed sheet onto the next machine in the production line, such as a dryer or UV-curing unit, is then carried out automatically.



### *Material transport*

When a new sheet is fed, the printing table moves into the printing position. After the printing, the sheet is kept under the print head by grippers and the printing table moves out to the feeding position. The next time the table moves in, the last sheet is transported by the take-off belt onto the following machine such as i.e. a dryer.

The automatic unloading can be switched off. In that case the machine works as a 1/2 automatic machine, and the sheets have to be removed from the returning printing table.

The SM works in accordance with the approved Svecia principle: the stencil screen is moved up by a few centimeters, keeping the same horizontal attitude, whilst the printing table moves into the printing position.

The speeds that the squeegee and flood coater traverse the printing table can be individually adjusted to any speed within the range 0 - 1.5 m/s.

The length of the squeegee stroke is set by two magnetically operated limit switches. These switches are moveable, allowing the length of the stroke to be varied to individual requirements.

The position of the printing frame can be finely adjusted laterally by three micrometer adjustment knobs.

The printing table is equipped with a registration lay stop system which can be set to accommodate differently sized sheets.

The machine is available in several different sizes each with or without optional equipment, such as a pneumatic squeegee pressure equalizer, screen tension compensator, horizontal frame adjustment knobs, etc.

Operational and maintenance instructions for optional equipment are contained in separate manuals.

## Purpose of the Manual

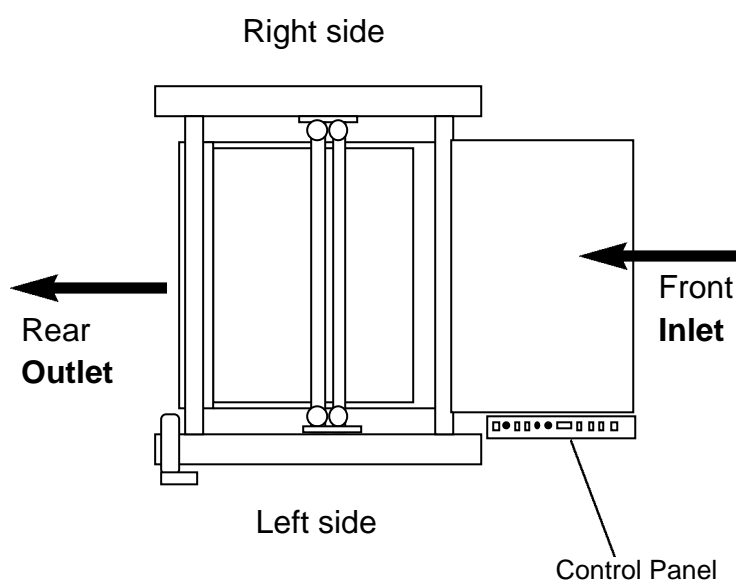
This manual consists of seven sections which describe how to install, set-up, start-up, operate, maintain and perform fault diagnosis on the machine. The manual is intended for both operator and maintenance personnel.

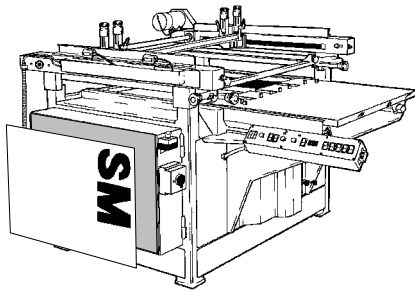
The manual gives the operator advice in normal operating situations. In some cases the operator must call for authorised service personnel which have access to more information about the machine.

***Note!*** *As the machine is deliverable in many different versions, this manual contains pictures and descriptions which are of a general nature. Your machine can differ from the information provided in this manual in some minor details.*

## Reference Directions

Whenever this manual refers to any of the sides of the machine, the conventions as indicated in the sketch below are used.





### Control Cabinet

Access to the control cabinet is obtained by removing the door on the side of the machine. However, the machine should be isolated by an external switch before performing any electrical maintenance.

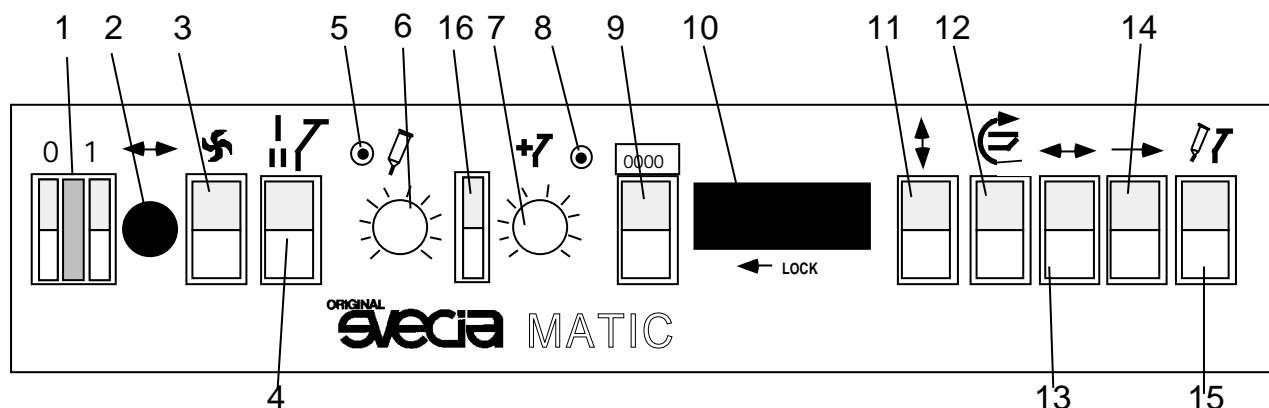


#### **WARNING!**

**High voltage!**

Only authorized personnel are permitted to access this section.

## Control Panel



### 1. On/off switch

Pressing "1" turns the machine ON; pressing "0" turns the machine OFF, stopping the printing cycle immediately. If the machine is switched ON when it is in the middle of a cycle, it will return to the starting position after switch 13 is set to its upper position and by pressing switch 14.

A lamp between the "0" and the "1" buttons illuminates to indicate that the machine is switched ON.

### 2. Machine speed knob (Option)

The speed of the table movement is adjustable by rotating this knob.

### 3. Vacuum On/Off

Up Vacuum fan ON  
Down Vacuum fan OFF.

### 4. Flood coater mode switch

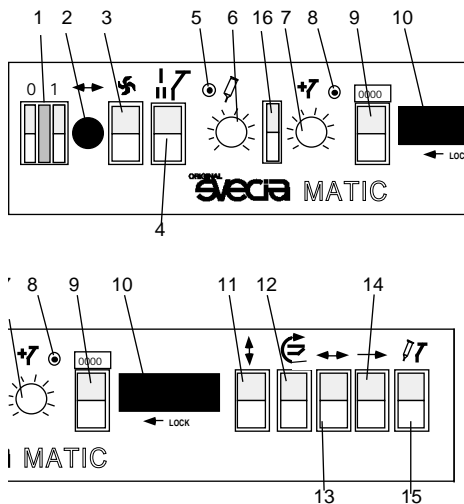
The position of the squeegee and flood coater while the gripper bar is in its feeding position can be selected using this switch.

Up (I) The machine floods after the squeegee stroke. While the printing table is at its feeding position, the squeegee and flood coater are positioned at the beginning of the squeegee stroke, i.e. at the rear turning point. The stencil is "flooded", meaning that it is coated with ink.

Down (II) The machine floods before the squeegee stroke. While the printing table is at its feeding position, the squeegee and flood coater are positioned at the end of the squeegee stroke, i.e. at the forward turning point. The stencil is "open", meaning that it is not coated with ink.

## Description

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### 5. Manual squeegee movement

When this button is pressed, the squeegee carriage is inched in the printing direction. The button is used when setting up the machine.

**Note!** The squeegee movement switch 15 must be in the down position, otherwise the squeegee carriage cannot be moved manually. The table movement switch 13 must be in the down position otherwise the table will start moving back to the feeding position when the squeegee carriage passes the limit switch.

---

### CAUTION - Risk of damage

When the squeegee carriage is moved manually, movement is not stopped when the limit switch is reached and activated.

---

### 6. Squeegee speed

This knob adjusts the speed of the squeegee.  
Range: 0 to 1.5 m/s.

**Note! 1** The inching speed of the squeegee when switch 5 is activated is fixed and cannot be adjusted by this knob.

**Note! 2** If the speed of the squeegee carriage is increased, also the stroke length is increased.

### 7. Flood coater speed

This knob adjusts the speed of the flood coater.

**Note! 1** The inching speed of the manual flood coater when switch 8 is activated is fixed and cannot be adjusted by this knob.

**Note! 2** If the speed of the squeegee carriage is increased, also the stroke length is increased.

### 8. Manual flood coater movement

When this button is pressed, the squeegee carriage is inched in the flood coater direction. The button is used when setting up the machine.

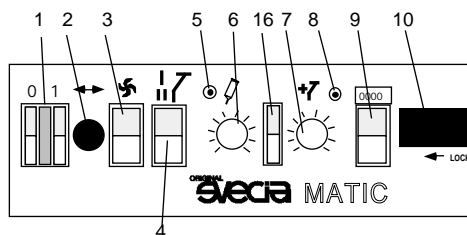
**Note!** The squeegee movement switch 15 must be in the down position, otherwise the squeegee carriage cannot be moved.

---

### CAUTION - Risk of damage

When the squeegee carriage is moved manually, movement is not stopped when the limit switch is reached and activated.

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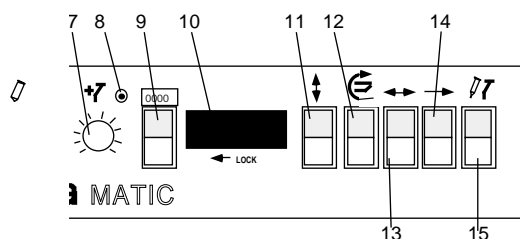
### 9. Resetable sheet counter On/Off switch

This switch controls whether the counter 10 is incremented after each sheet is printed.

Up Counter 10 ON.  
Down Counter 10 OFF.

### 10. Resetable sheet counter

This counter indicates the number of sheets that have been printed since the last time it was reset, omitting those that were printed whilst the counter was disabled by switch 10. The counter is reset by pressing the button on the lower edge of the unit.



### 11. Print head position switch

This switch is used to raise and lower the printing head.

Up Print head is raised to a maximum height of about 400 mm (16 ").

Middle Print head is held at the currently set height.

Down Print head is lowered and a warningsignal is heard.

Movement of the print head stops automatically when the highest or lowest position is reached.

**Note!** When lowering the print head, the switch must be



## WARNING!

### Risk of getting body caught!

Switch off the machine at the main power switch before working under or inside the print head.

*pressed until the motor is switched-off and a "click" is heard, as otherwise the printing head cannot reach the adjusted printing position.*

### 12. Gripper switch

This switch turns the take-off gripper action on and off.

Up: OFF (1/2 automatic mode = material take-off from the returning printing table).

Down: ON (3/4 automatic mode = material take-off in the rear of the machine).

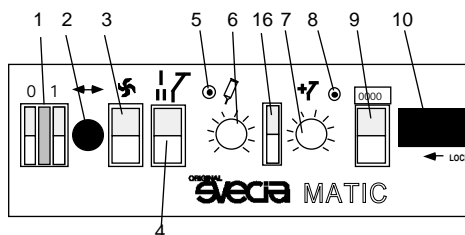
### 13. Table Movement On/Off switch

This switch toggles table movement on and off. If the table is moving when the switch is pressed, movement of the table is stopped in printing or feeding position.

When the switch is set to its ON position (upwards), the table movement can be started with switch 14.

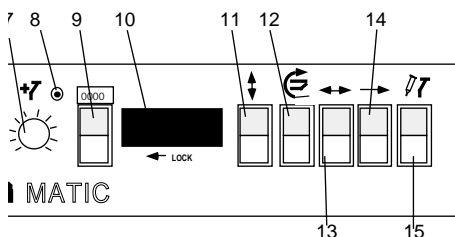
If switched OFF (downwards) while the squeegee is printing, the table remains in printing position and the squeegee carriage remains at the forward turning point.

## Description



*Preferred table position for switching movement OFF:*

- If the table movement is switched OFF while the table is moving into feeding position, and flood coater switch 15 is set to its up position, the printing table stops in the feeding position and the squeegee carriage remains at the rear turning point. If flood coater switch 15 is in its down position, the squeegee carriage remains in the forward turning point.



### 14. Cycle start button.

Turns the machine into autocytle after switches 13 and 15 have been turned on.

### 15. Squeegee carriage movement switch

This switch allows the printing table to reciprocate with or without squeegee movement.

Up- The table motion is performed with squeegee carriage movement.

Down- The table motion is performed without squeegee carriage movement.

Only operate this switch when the squeegee carriages is located at either of its turning points.

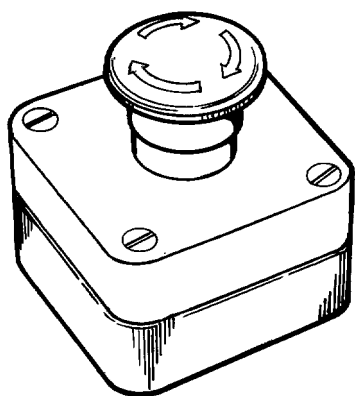
This switch must be set to its down position if the squeegee carriage needs to be moved manually via switch 5.

### 16. Manual squeegee turn-over switch

Up- The squeegee carriage is set to printing position

Down- The squeegee carriage is set to flood coating position  
The switch has to be set in middle position when adjustments are finished.

Works only when squeegee movement switch is in OFF position.



## Emergency Stop

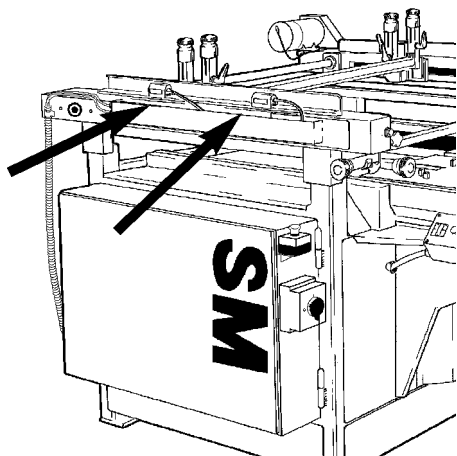
The machine is equipped with two emergency stop buttons, one at each side of the machine.

Also a safetychain is fitted between the tabel rails. If removed, it has the same function as an emergency stop button.

To restart the machine after an emergency stop button have been pressed:

- Make sure that all emergency stop buttons are released.
- If the table has stopped between its end positions:  
Turn OFF buttons 13 and 15. Press button 14 until the table has reached one of its end positions.
- Restart by turning buttons 13 and 15 ON and pushing 14.

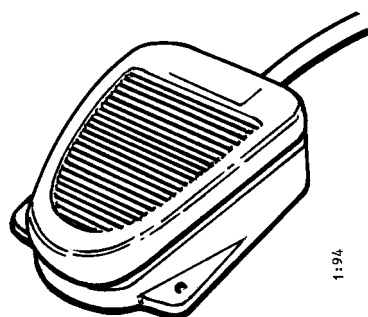




## Limit switches

The machine is equipped with two limit switches which are magnetically operated. These are fitted on the frame of the machine top part and determine the movement limits of the squeegee carriage.

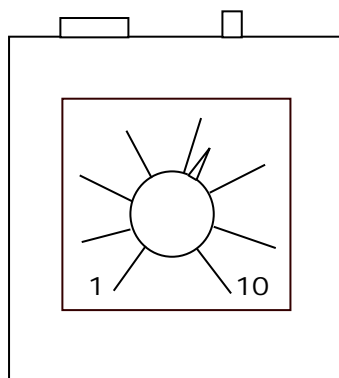
For further instructions, see section "Set-up", "Adjusting the stroke length"



1:9/4

## Foot Switch

The machine is equipped with a foot switch for holding the printing table in outer position (feeding position) and stopping the machine temporarily. The timer function must be set to zero delay when the foot switch is used.



## Timer function

The timer delays the table a certain amount of time in feeding position before it moves in again. The delay is adjustable between 1 and 10 sec.

The timer can be used instead of the foot switch.

The control knob for the timer is located on the side of the control panel box.

## Description

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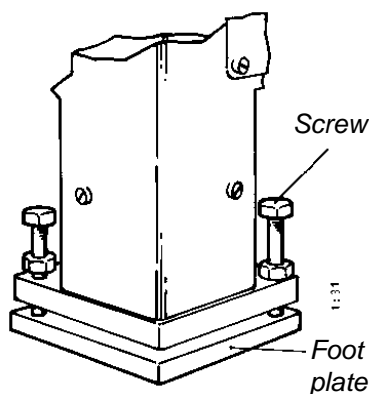
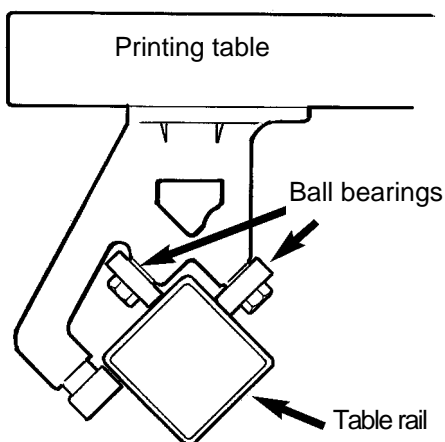
## 2. INSTALLATION

### Delivery and erection of the machine

The machine is normally delivered in a fully assembled state, in a box or in a container. The machine can be hoisted and moved into position using a fork lift. If this method is used, wooden beams somewhat longer than the machine should be put across the forks.

When the machine is being installed, the supplied foot plates should be put under each foot of the machine so that the screws sit in the holes in the plates on all legs.

The machine has been treated with an anti-rust agent. If this anti-rust agent has a light red color, it should be wiped off with a dry rag or some cotton waste. If the antirust agent is brown, it must be removed using white spirit or similar alcohol-based cleaning fluid.



### Levelling of the machine

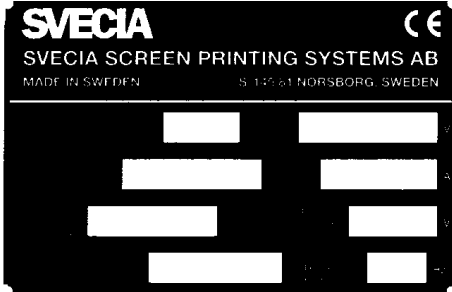
1. Put a spirit-level on the printing table (table in printing position).
2. Tap carefully in all four corners of the table to find out if any of the bearings does not rest on the table rails.
3. Adjust the screws at the feet of the machine until the printing table is level and all bearings are resting completely steadily on the rails. When adjusting the screws, use only one at each foot until the machine is level. Then drive the other one until it touches the foot plate. Lock the screws with the lock nuts.

**Note! 1.** It is very important that all screws are in contact with the foot plate when the installation is finished.

The machine should now be lubricated according to the lubrication instructions in chapter "Maintenance".


## Electrical Connections

### Main Power Connection



Electrical power supplied to the machine must pass through an external fuse and an isolator switch. The rating of the fuse must be sufficient (see the machine's type plate located on the right-hand side of the machine). An external isolator switch is required if one is not already mounted on the side of the control cabinet.

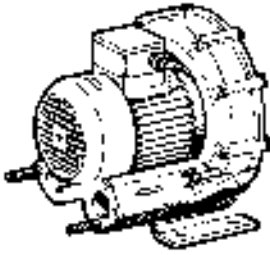
1. Locate the control panel at the left-hand side and to the front of the machine and ensure that the main on/off switch 1 is switched-OFF (the 0 side of the button should be depressed).
2. Check that the voltage and frequency stated on the machine type plate (pop riveted to the right-hand side of the control cabinet) corresponds to the main supply being connected.



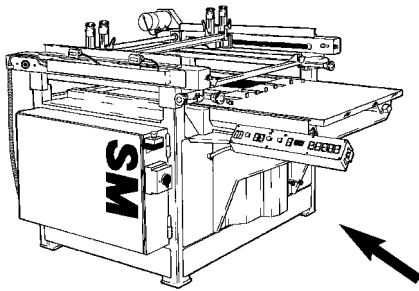
**WARNING!**  
**High voltage!**

Only authorized personnel are permitted to access this section.

3. Remove the cover of the external main switch which is located on the right side of the control cabinet.
4. Connect the mains supply leads to the terminal clamps L1 (R), L2 (S), L3 (T) and PE ( , protective earth).
5. To ensure that the three phase mains supply is connected in the correct sequence, you will need to check that the machine's ventilation fan rotates in the correct direction. Proceed through the following steps:
  - 5.1 Disconnect the overload cut-out switch for the control circuit by pressing its red button.
  - 5.2 Engage the isolator switch to supply power to the machine.
  - 5.3 Push manually the main contactor and the contactor for the vacuum fan.



- 5.4 Locate the ventilation fan at the rear of the machine and check that the fan rotates in a clock-wise direction. The fan should be blowing air. If air is being sucked, electrically isolate the machine and exchange any two of the three supply leads connected to the terminal clamps. Repeat the check-up.
- 5.5 Switch on the control circuit overload cut-out switch again by pressing the green button.
6. Refit the cover of the main switch box.



## Compressed Air Connection

The machine is equipped with equipment that is controlled with compressed air and requires a supply of compressed air with a minimum pressure of 600 kPa (6 bar, 6 Kp/cm<sup>2</sup> or 87 lb/in<sup>2</sup>).

Connect this compressed air supply to the bayonet socket located on the front of the machine.

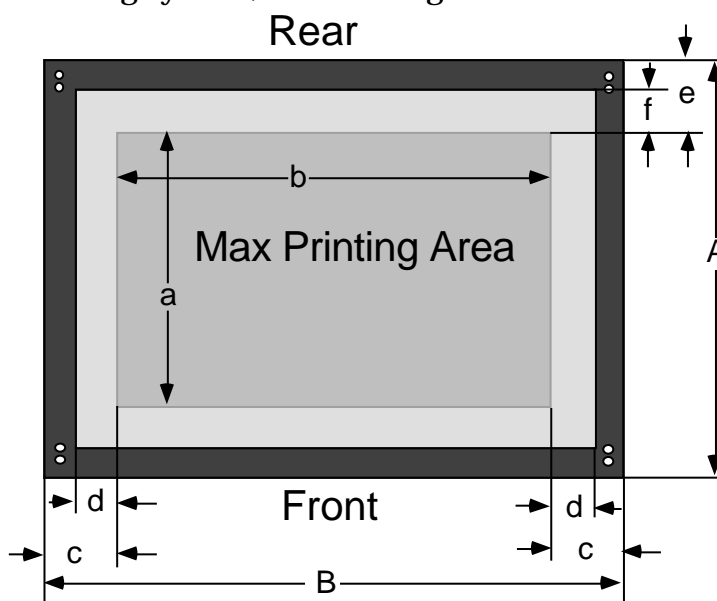
Connection female is supplied with the machine.



### 3. SET -UP

#### Printing Frame

The machine can hold printing frames with a 40 x 40 mm profile, except for the 1200x1600 printing size and larger, which requires a frame of 40x60 mm profile. The frame must have one or two M8 threaded bushings in each of the four corners. If the machine is equipped with pneumatic frame locking system, the bushings are not needed.



#### Dimensions

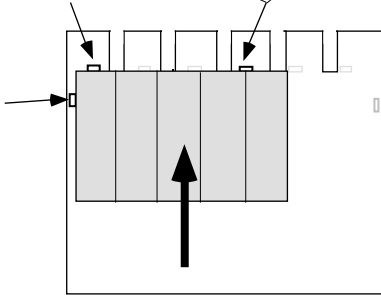
Machine size	Frame Size		Max. Printing size		c	d	e	f
	A	B	a*	b				
550x750	1000	1090	550	750	170	130	225	185
650x900	1100	1190	650	900	145	105	225	185
765x1070	1200	1390	765	1070	160	120	217	178
880x1250	1350	1590	880	1250	235	195	170	130
1050x1450	1550	1850	1050	1450	175	135	225	185
1200x1600	1700	2100	1200	1600	250	190	250	190
1400x1800	1900	2300	1400	1800	250	190	250	190

All dimensions are in mm.

\* -10 mm gripping margin

**Note! 1.** The dimensions apply to standard machines. Fitted options like screen stretch compensator, quick-locking clamps etc. might cause deviations.

Try to choose an inner front lay stop so that it is 1/4 or 1/5 sheet length from the edge .



## Setting up the Machine for Printing

### Lay stops

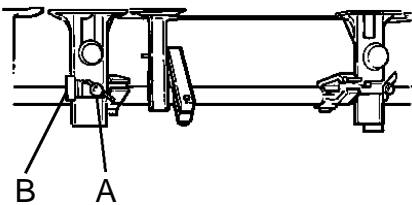
Normally, the sheet must be placed to the left or to the right side to use the side lay stops.

Besides the side lay stop, only two front lay stops should be used. Choose the two lay stops to be used according to the sheet size.

The lay stops are kept up by a spring on each lay stop.

### Putting a lay stop out of function

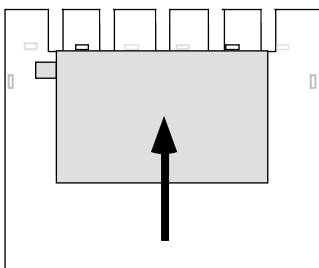
Loosen the wing nut (A) and pull the guide pin (B) sideways out of the slot. Lock it in the new location with the wing nut.



Press the lay stop down to its lower position.

### Putting a lay stop in function

Loosen the wing nut and pull the guide pin into the slot and retighten the wing nut.

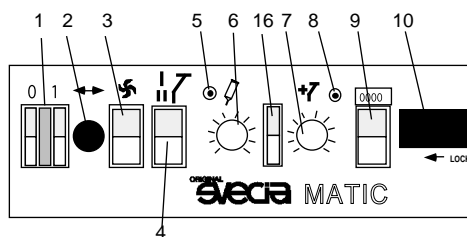


### Center line oriented printing

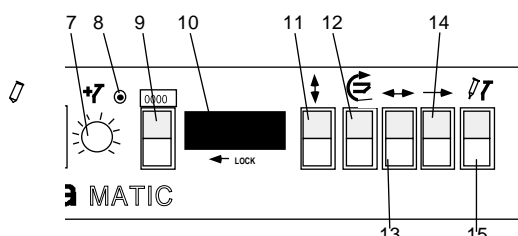
If you prefer to print in the center of the table; then use a small piece of plastic or cardboard (thinner than 2 mm) as a side lay stop.

Tape the plastic piece on the feeding table, close to the gripping edge, so that it is lowered together with the feeding table below the level of the sheet when this latter is transported into the printing position.





## Covering of the vacuum holes

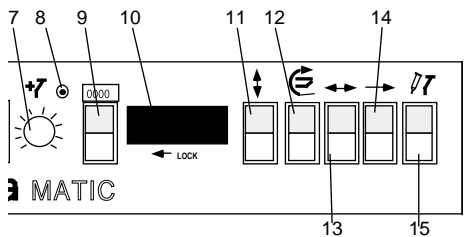
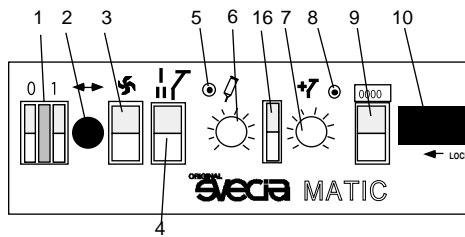


1. Place the squeegee carriage in printing position by pressing the flood coater button 8. Run the carriage to a point approximately where the squeegee stroke will start.
2. Set one of the magnetic proximity switches for stroke length limit above the squeegee carriage. See "Adjusting the stroke length", later in this chapter.
3. Put a sheet manually in register on the printing table.
4. Switch ON the vacuum switch 3.
5. Switch On the table movement switch 13.
6. Press the cycle start button 14 upwards once. Now the table moves into printing position and stops. Switch OFF switch 13.
7. Cover all vacuum holes around the sheet with tape and paper (not thicker than the printing material).
8. Set the other magnetic proximity switch for stroke length limit according to the size of the material.

## Fitting the printing frame

1. Put the register sheet on the table.
2. Switch ON the vacuum switch 3.
3. Switch ON switches 13 and 15 (Upwards).
4. Press the foot switch and keep it pressed. Press switch 14 upwards. (The squeegee carriage moves to the rear turning point.) Switch OFF the squeegee movement switch 15 (Down).
5. Release the foot switch. (The table transports the sheet into the printing position and stops.)
6. Switch OFF the gripper switch 12 (Downwards).
7. Pull out the frame holder bars to their maximum outer position.

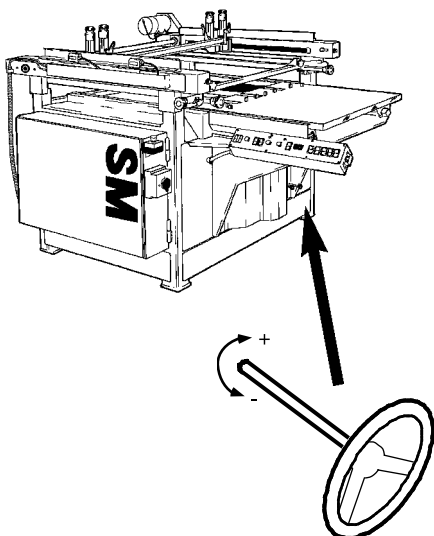
## Set-up

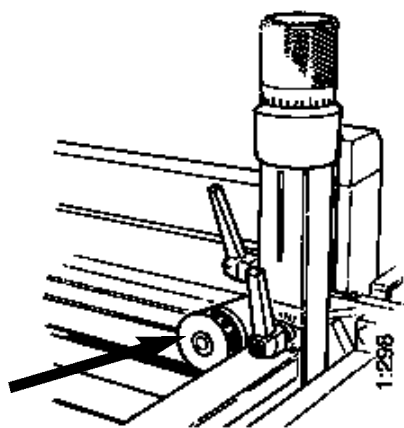


8. Elevate the print head to its top position by pressing switch 11 upwards.
9. Put the printing frame on the printing table as accurate to the register sheet as possible. Maximum frame size must be placed from the front end of the machine.
10. Lower the print head by pressing switch 11 downwards. Keep the switch pressed until a "click" is heard.  
**Note!** Be very careful not to hit the frame with the frame holder bars when lowering the print head.
11. Reset the three frame position adjustment micrometer screws to middle position.  
**Note!** The four micrometer locking screws and the black locking screw in the left rear end of the frame holding assembly must be released when adjusting the frame position. Do not forget to tighten them again after adjustment.
12. Push in the two frame holder bars beside the printing frame. The distance from the frame holders to the printing frame must be approximately 5 mm.
13. Tighten the two front locking screws of the frame holding assembly.
14. Fasten the printing frame in the frame holders with the T-screws and also fasten the frame holders.
15. Fine-adjust the position of the printing frame according to the register sheet. Do not forget to fasten the black locking screws after adjustment.

### Adjusting the off-contact

The off-contact should be as small as possible, depending on the actual screen tension. Make sure that the frame does not get in contact with the printing table. The off-contact is adjusted with the hand wheel on the front of the machine.

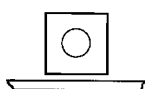
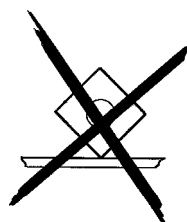




### Adjusting the peel-off

The peel-off movement should be as small as possible, but the bigger the ink surface, the more peel-off is needed.

The peel-off is adjusted with the two black hand wheels on the rear side of the squeegee carriage on each left and right side. The wheel has to be pulled out before adjustment. If the wheel's rotation is rough, just press the printing frame holding system slightly downwards. This will make the wheel turn more easily.



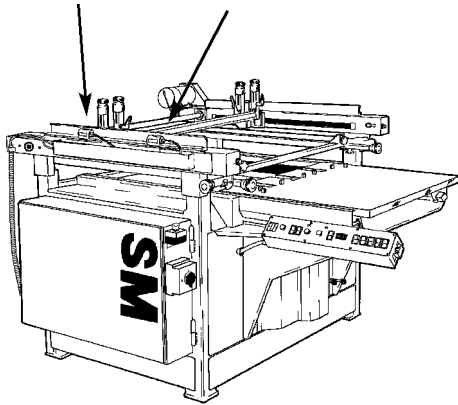
**Note!** Avoid getting the square support stud to stand on an edge.

When the peel-off is set to 0, there is still a difference of about 5 mm in height of the printing frame's front and rear ends (maximum frame size). The wheel can be set to values from 0 to 6. Every value higher than 0 means additional peel-off to the 5 built-in millimeters.

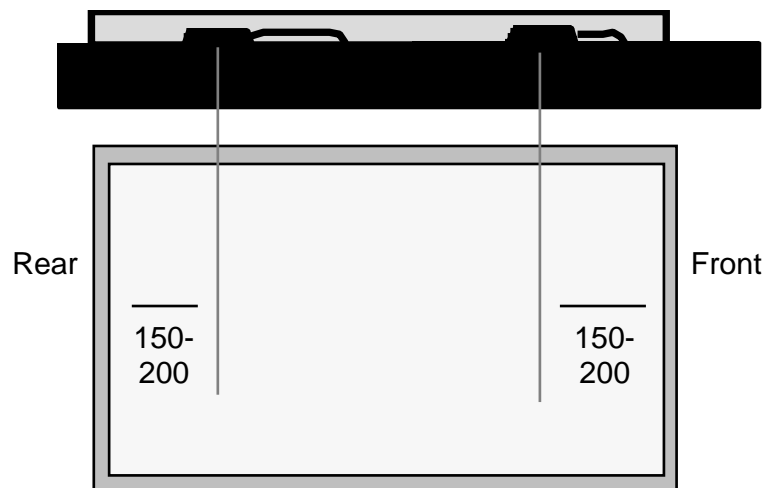
Normal operation setting off the peel-off is 2-3.

### Adjusting the stroke length

The length of the squeegee stroke is determined by the positions of two limit switches. These switches are activated when a magnet, fitted on the squeegee carriage, moves into close proximity with the switch. By moving these limit switches, the length of the squeegee stroke can be set as required.



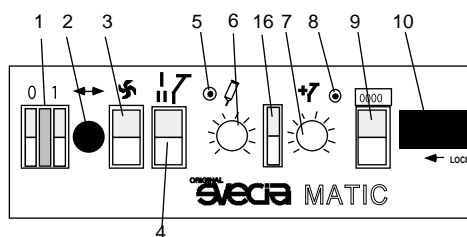
Before fitting the squeegee and flood coater, position the limit switches such that movement of the squeegee will be stopped before it reaches the rear edge of the printing frame, and that movement of the flood coater will be stopped before it reaches the front edge of the printing frame. Initially the switches should be positioned at least 150 - 200 mm from the front and rear edges of the printing frame (maximum frame size).



Before the squeegee stroke can be checked, move the squeegee carriage between the limit switches by carrying out the following three steps:

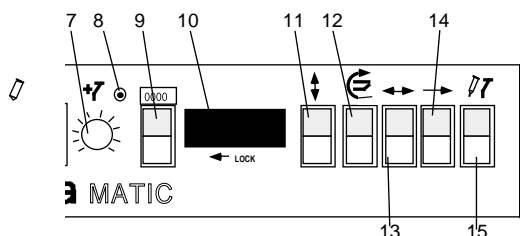
1. Switch OFF the table switch 13.
2. Set the machine to operate with squeegee movement by setting switch 15 to its upper position.
3. By pressing the switches 5 (Squeegee movement) or 8 (Flood coater movement) the squeegee carriage can be inched to a position between the limit switches.

The limit switches and the squeegee carriage can be moved when the machine is switched on (main switch 1 is set to its on position) and squeegee movement is disabled (switch 15 is set to its down position). But when the squeegee carriage passes the forward limit switch the frame lifting, frame lowering and table movement are turned on when the table switch 13 is switched on.



If the machine is switched off, the limit switches can be moved provided the squeegee carriage is positioned between the limit switches before the squeegee movement switch 15 is switched on (up).

Check the squeegee stroke by carrying out the following steps:



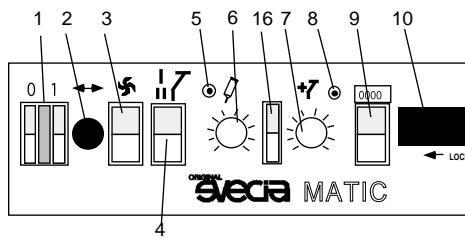
1. Switch On the table switch 13.
2. Switch ON the squeegee switch 15.
3. Press switch 14 upwards once.
4. The machine starts running.

### Adjusting the Squeegee and Flood Coater Speed

The speed that the squeegee travels across the printing area can be adjusted using knob 6, and the speed of the flood coater can be adjusted by knob 7. The range of speeds that can be set for both is 0 - 1.5 m/s.

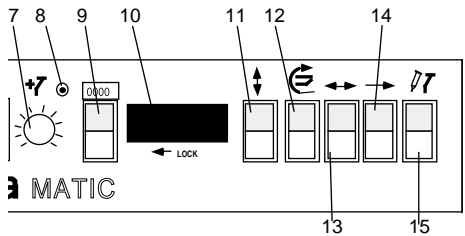
***Note!*** *If the speed of the squeegee carriage is increased, also the stroke length is increased.*

## Fitting the Squeegee

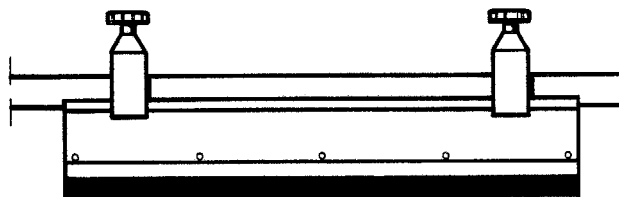


The squeegee should always be fitted before the flood coater. Attach the squeegee using the two holders on the squeegee bar.

Adjust the position of the squeegee by proceeding through the following steps:

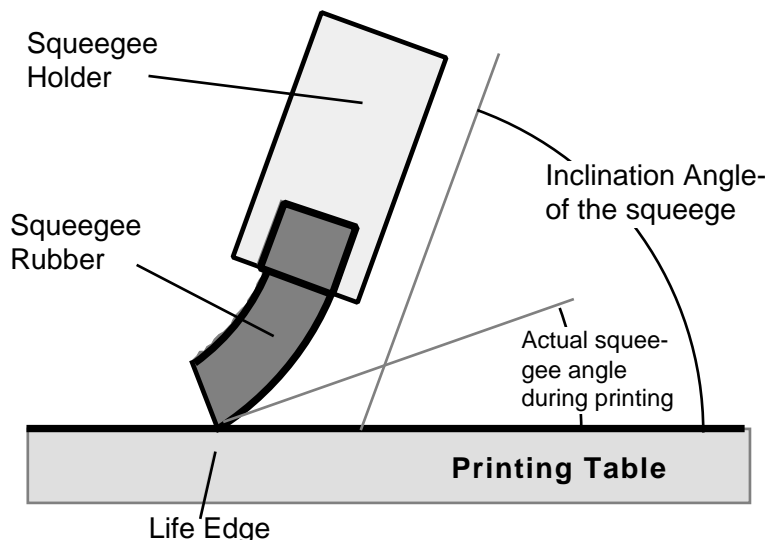


1. Place a sheet onto the printing table .
2. Turn on the vacuum by setting switch 3 to its up position.
3. Set the squeegee movement switch 18 to its down position.
4. Start the machine with gripper movement switch 16. The gripper bar should move into its printing position and stop there. Movement of the squeegee carriage has been disabled by switch 15.
5. Disable table movement by setting switch 13 to its down position.
6. Press change-over button 16 downwards.
7. Adjust the height of the squeegee bar, such that it presses lightly against the sheet to be printed, by rotating the two adjustment knobs at either end of the squeegee carriage.



*In case of fitted option "Pneumatic squeegee pressure equalizer". refer to separate manual B300.*

## Adjusting the Squeegee Angle



The inclination angle that the squeegee makes with the printing table should be set as required by loosening the locking screws at either ends of the squeegee bar.

If you change the squeegee angle during a production run, the squeegee pressure must be checked and readjusted. Inclination, squeegee pressure and shore hardness of the squeegee rubber determine the squeegee setting angle at the point of the life edge. The size of the squeegee setting angle determines the thickness of the coating applied to the sheet. The smaller the angle, the thicker the coating, and vice versa. These factors have a great effect on the printing quality and therefore some time should be taken to ensure that they are set to their optimum settings. Incorrect adjustment can result in heavy wear on the squeegee and the mesh.

## Fitting the Flood Coater

Move the squeegee carriage to the rear turning point by carrying out the following steps:

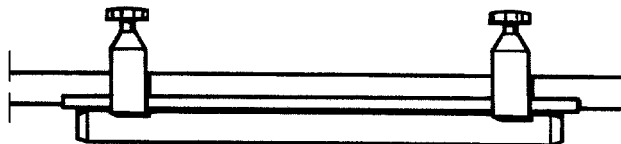
1. Switch on main switch 1. The green lamp should illuminate.
2. Set the squeegee switch 15 to its down position.
3. Switch the table movement switch 13 ON.
4. Press cycle start button 14. The machine starts.
5. Press the foot switch as soon as the squeegee carriage

starts moving towards the rear turning point. The squeegee carriage will then stop at the rear turning point.

6. The printing table will now stay in its feeding position as long as the foot switch is pressed. When table movement switch 13 and squeegee switch 15 are turned down, the foot switch can be released.
7. Move the squeegee carriage using switch 8 until it nearly reaches the limit switch. When stopping, the change over mechanism turns to flood coater position. Press the change-over button 16 upwards.
8. Fasten the flood coater using the two holders on the flood coater bar.
9. Adjust the height of the flood coater bar such that it slightly presses down the screen (approximately 1 - 1 1/2 mm, depending on the ink viscosity), by rotating the two adjustment knobs at either end of the squeegee carriage.

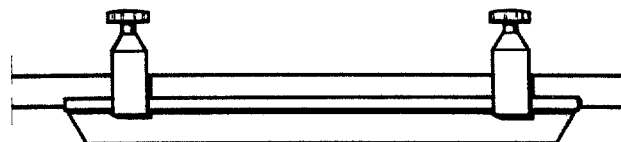
The standard equipment includes both a normal flood coater and a special one.

The *normal* flood coater has a scraper on its left and right



hand edges.

The *special* flood coater is ground sharp on the life edge



from the underside and stands in a larger angle to the screen. This special flood coater is used for half tone printing when using Tricomatic-/thexotropic inks or to get a thin ink layer.

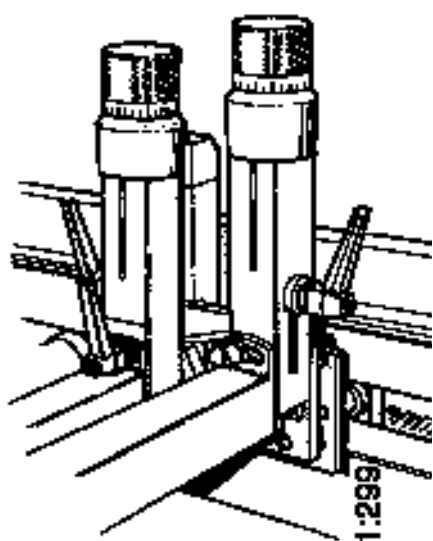
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**CAUTION - Risk of damaging the screen**

*The sharp edge of the special flood coater must not have any notches in it and should therefore be treated with special care. If the flood coater is accidentally damaged such that a notch is created, it must be removed by filing and resharping the edge. Under no circumstances should a squeegee grinding machine be used as this could damage the screen.*

*When using the special flood coater, that part of the screen which the flood coater traverses must not be obstructed by paper or tape.*



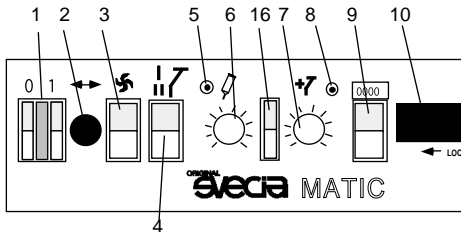
The height of the flood coater above the screen can be set by rotating the two adjustment knobs at either end of the squeegee carriage. Adjust the flood coater's position until it just touches the screen.

When installing the normal flood coater, care must be taken to ensure that the two scrapers are parallel with the screen. The angle that the flood coater makes with the screen can be adjusted by loosening two locking screws, one at each end of the squeegee carriage, and turning the flood coater bar into the required position. Then tighten the two locking screws.



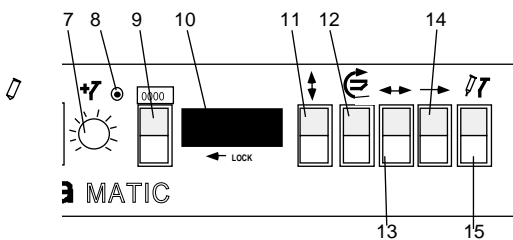
## OPERATION

### Counter



The counter 11 is switched on and off by the switch 10 and can be reset by the black button on the counter.

### "Open" or "Flooded" Stencil



The position of the squeegee and the flood coater during the feeding operation can be chosen with the flood coater mode switch 9. For example, when working under the screen, it is advisable not to have the screen flooded.

#### *Flood coater mode switch in position I:*

The machine floods after the squeegee stroke. While the printing table is at its feeding position, the squeegee and flood coater are positioned at the beginning of the squeegee stroke, i.e. at the rear turning point. The stencil is "flooded", meaning that it is coated with ink.

#### *Flood coater mode switch in position II:*

The machine floods before the squeegee stroke. While the printing table is at its feeding position, the squeegee and flood coater are positioned at the end of the squeegee stroke, i.e. at the forward turning point. The stencil is "open", meaning that it is not coated with ink.

### Adjustable Squeegee- and Flood Coater Speed

The squeegee speed can be adjusted with knob 6.

The flood coater speed can be adjusted with knob 7.

When changing the speed of the squeegee carriage, please note:

- The different braking distances of the varying speeds make it necessary to adjust the sliding proximity switches accordingly. The higher the speed, the longer the braking distance and in order to compensate for this, the limit switches are moved as required.

### Vacuum

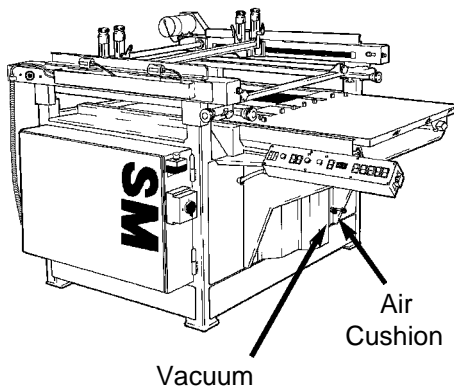
In order to keep the sheet in the right position on the printing table, there is a vacuum fan, sucking the sheet firmly onto the table surface. The intensity of the vacuum can be adjusted with the right lever on the front of the machine.

Lever pulled out = maximum vacuum  
Lever pushed in = minimum vacuum

### Air Cushion

When the sheet is transported from the printing table, the vacuum is changed into an air cushion to facilitate the movement. If static electricity makes the sheet hard to move, the problem might be solved by changing the air cushion intensity. The intensity of the air cushion can be adjusted with the left lever on the front of the machine.

Lever pulled out = maximum air cushion  
Lever pushed in = minimum air cushion



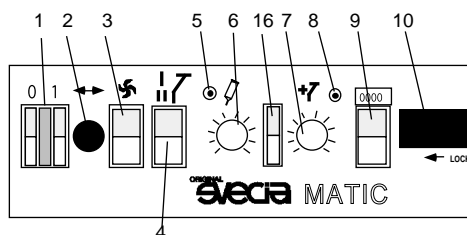
### Squeegee Pressure

It should not be necessary to use a high squeegee pressure to ensure suitable printing results. If it does, it is most probable that the printer is not set up correctly or some parts are worn.

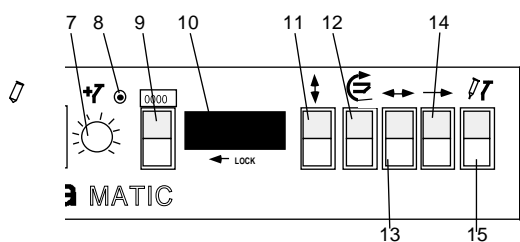
Inspect the life edge of the squeegee and check the squeegee angle. Check the distance between the screen and the printed sheet. Also check the consistency of the ink and the condition of the stencil.

To reduce unnecessary wear on the mesh and on the squeegee rubber, never use more squeegee pressure than needed.

## Inspection of Printing Quality

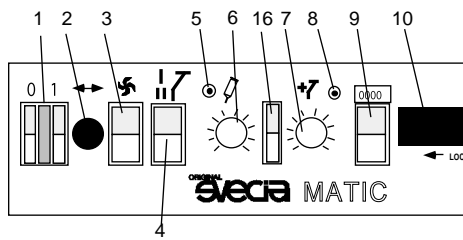


If a sheet needs to be inspected after being printed and before being passed on to dryer, carry out the following steps:



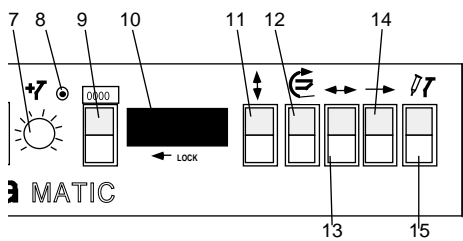
1. Press and hold down the foot switch while the squeegee is moving across the screen. The squeegee carriage will stop at the forward turning point.
2. Disable squeegee movement by setting switch 18 to its down position.
3. Disable the action of the take-off grippers by setting switch 12 to OFF position (UP).
4. Release the foot switch. The table will then move into its feeding position and should be held there by pressing and holding down the foot switch again or by pressing the table movement switch 13.
5. The sheet can now be removed from the printing table for inspection.
6. After inspecting the sheet replace it onto the printing table.
7. Restore the action of the GRIPPERS by setting switch 12 to its DOWN position.
8. Release the foot switch or press the table movement switch 13. The printing table will then return to its printing position, eject the sheet onto the delivery conveyor and then return to the feeding position. The sheet is not printed again.
9. Place a new sheet onto the printing table.
10. Restore squeegee movement by setting switch 15 to its up position.
11. Resume normal printing.

## Normal Operation Settings for MANUAL Machine Mode



The control panel settings of switches and knobs should be as follows for the printer to operate normally in its MANUAL printing mode:

Switch	Position	Significance
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1	On	Printing machine on
2	Any	Print table speed (optional)
3	Up	Vacuum on
4	Up	Flood coater mode
6	Any	Squeegee speed
7	Any	Flood coater speed
9	Up	Counter on
11	Down	Print head must be completely lowered before start.
12	Up	Take-off grippers working
13	On	Table movement on
15	Up	Squeegee movement on
16	Middle	Neutral position

All other controls (except the emergency stop switches) have no significance.

## 5. MAINTENANCE

A check list of all normal maintenance actions is to be found below. Detailed instructions are given in the following pages.

### Summary

The maintenance intervals stated in the table below are applicable only when the printer is being used for normal eight-hour working days. When printing dust-producing materials, or when the printer is being used in shifts, cleaning and lubrication should take place at correspondingly shorter intervals.

Interval	Action	Item	Remarks
<b>Daily</b>	Check water separators for function	<i>Air treatment apparatus</i>	
	Lubrication	<i>Lift columns, 4 pcs</i>	Oil type A
<b>Weekly</b>	Lubrication	<i>Running surface of the peel-off bar, left and right side</i>	Oil type B
		<i>Side and inner running surfaces of the guide rails for the squeegee carriage, left and right side</i>	Oil type B
		<i>Peel-off steering guide bar, left and right side</i>	Oil type B

## Maintenance

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<b>Interval</b>	<b>Action</b>	<b>Item</b>	<b>Remarks</b>
<b>Weekly</b>	Lubrication	<i>Chains for frame lifting columns</i>	Oil type A
		<i>Guide wheels for lifting chains, 4 pcs</i>	Oil type A
		<i>Cam lift chain for adjustment of the gap between screen and sheet being printed (off-contact)</i>	Oil type A
		<i>Vacuum valve</i>	Oil type A
		<i>Cam lobes on the main driving shaft</i>	Oil type B
<b>Monthly</b>	Lubrication	<i>Fixing and locking T-screws, left and right side</i>	Oil type A

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## Maintenance Condition

All periodic maintenance *must be done* with the main switch switched OFF. This *must be accomplished* by isolating the machine at the main supply switch and then locking the switch in this position with a padlock.

It is *not permitted* to take any maintenance action in the following situations:

- during an emergency stop
- when the machine is switched OFF only by setting switch 1 to its "0" position.



## Lubrication

### General

It is very important to follow the lubrication program according to the intervals specified.

Insufficient lubrication causes unnecessary wear on the printing machine and can result in expensive repairs together with a corresponding loss of production time.

### Lubrication Intervals

The maintenance intervals stated are applicable only when the printing machine is being used for normal eight-hour working days. When printing dust-producing materials, or when the machine is being used in shifts, cleaning and lubrication should take place at correspondingly shorter intervals.

#### Drive belts

Drive belts located in the print head are not to be lubricated. These are maintenance free and should always be dry.

### **Oil Types**

We recommend three main types of oils; type A, B, and D.

*Oil type A* is to be used for chains, levers and angular levers, and threads on locking and fixing screws.

*Oil type B* is to be used for lubricating cam surfaces.

*Oil type D* is to be used for oil-mist lubricating devices (optional equipment).

### **Recommended brands**

*Oil type A:*

- Castrol Magna ED SAE 20
- Esso Coray 55
- Shell Carnea 35
- Gulf Paragon 51
- Mobil Vactra oil heavy

*Oil type B:*

- Esso Cyclesso 300
- Castrol Cresta Extra SHS

*Oil type D:*

- FESTO special oil
- Avia Avilub RSL 10
- BP Energol HLP 10
- Esso Spinesso 10
- Shell Tellus Oil C 10
- Mobil DTE 21
- Blaser Blasol 154

## Lubrication Instructions

**Note!** All bearings in the printer are of the sealed type and do not require any lubrication under normal conditions.

- 1 Lift columns, 4 pcs**  
Daily, oil type A.

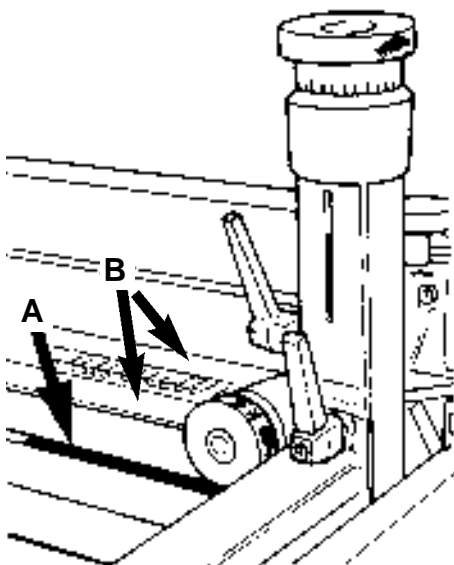
Raise the printing head by setting switch 11 to its up position. Clean all four lift columns and oil them sufficiently.

### WARNING!



#### Risk of injury

Switch off the printing machine at the main power switch before working underneath the print head to avoid the risk of getting body caught.

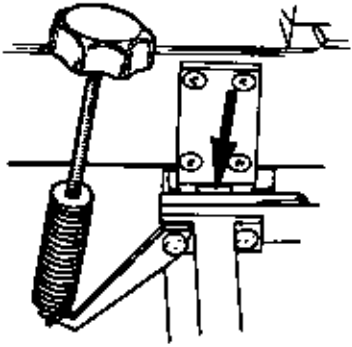


- 2 Running surface (A) of the peel-off bar, left and right side**  
Weekly, oil type B.

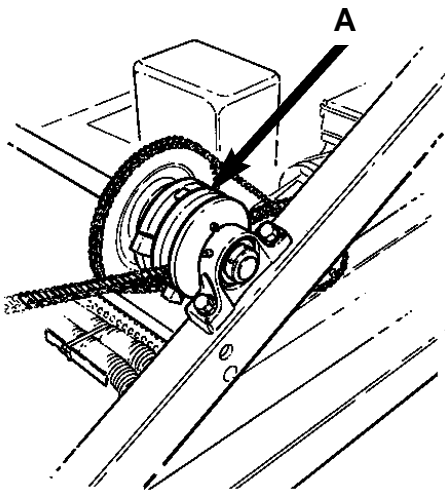
Clean the running surface and apply a thin film of oil.

- 3 Side and inner running surfaces (B) of the guide rails for the squeegee carriage, left and right side**  
Weekly, oil type B.

Clean the running surface and apply a thin film of oil.



- 5 Peel-off steering guide bar, left and right side**  
Weekly, oil type B.



- 6 Chains for lifting the frame, chains in the machinery and the four chains for lift columns**  
Weekly, oil type A.

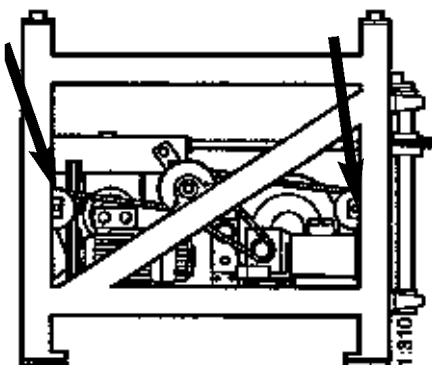
Lubricate the entire length of the chains.

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**CAUTION - Risk of malfunction**

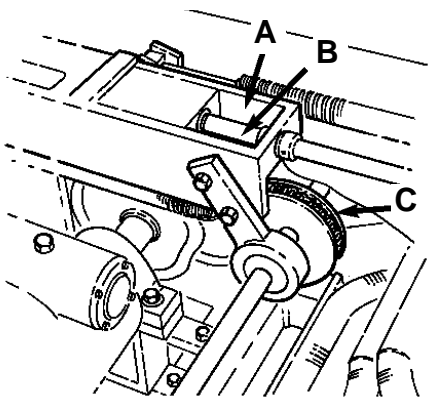
Do not oil or lubricate the automatic safety mechanism (A) for a lifted frame. This mechanism engages if the lifting chain breaks and must be kept un-oiled even if it becomes corroded. If the mechanism is oiled, it is possible that it may engage during a normal printing operation.

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- 7 Guide wheels for lifting chains, 4 pcs**  
Weekly, oil type A.

Lubricate the wheel shaft.

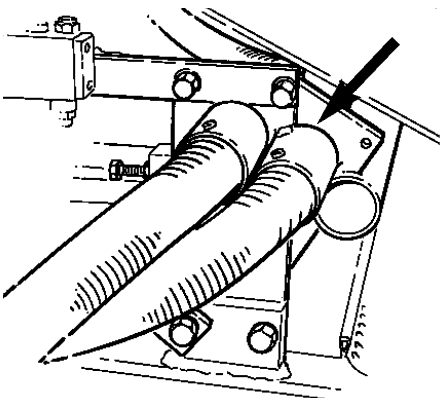


**8 Chain for adjustment of the gap between screen and sheet being printed (Off-contact)**

Weekly, oil type A.

Lubricate:

1. Sliding surfaces on the inside of the "fork" (A)
2. The fine thread on the off-contact shaft (B)
3. Off-contact chain (C)



**9 Vacuum valve**

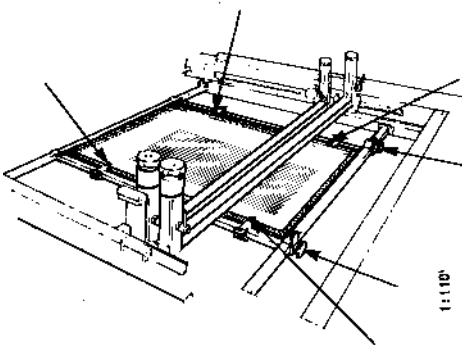
Weekly, oil type A.

Pull the two halves of the valve apart a little and lubricate the sliding surfaces. In addition, clean the sliding surfaces before lubrication once a month.



**10 Cam lobes on the main driving shaft**

Weekly, oil type B.



**11 Fixing and locking T-screws, left and right side**

Monthly, oil type A.

Unscrew the four T-screws that hold the printing frame to the four sliding frame holders. Also unscrew the two knurled screws that lock the holding bars to the upper part of the printer. Lubricate the threads of the six screws in order to reduce wear on the threads.

### Care of Machinery

Care of machinery is a very important task that must never be overlooked.

- Keep all parts of the printing machine in a clean condition, to prevent the attraction of dust onto the material being printed and contamination of the printing ink.
- The printing table with its vacuum perforations should never come in contact with ink.

Existing ink stains should be removed immediately. Blocked vacuum perforations can be cleaned with care using a 1.5 mm drill. The depth of these perforations is approximately 1 mm.

### Care of Water Separator

The water separator must be checked *daily* and any excess water removed.

### **Manual Removal of Water from the Water Separator**

Water is normally removed from the water separator automatically. However, it should be checked to ensure that it is functioning correctly and to remove any excess water manually. To remove excess water, press the brass button on the bottom of the separator's tank.





## 6. FAULT CONDITIONS

### General

A fault condition is a situation which stops the operation of the printer or is indicated by a lamp.

A fault can be either

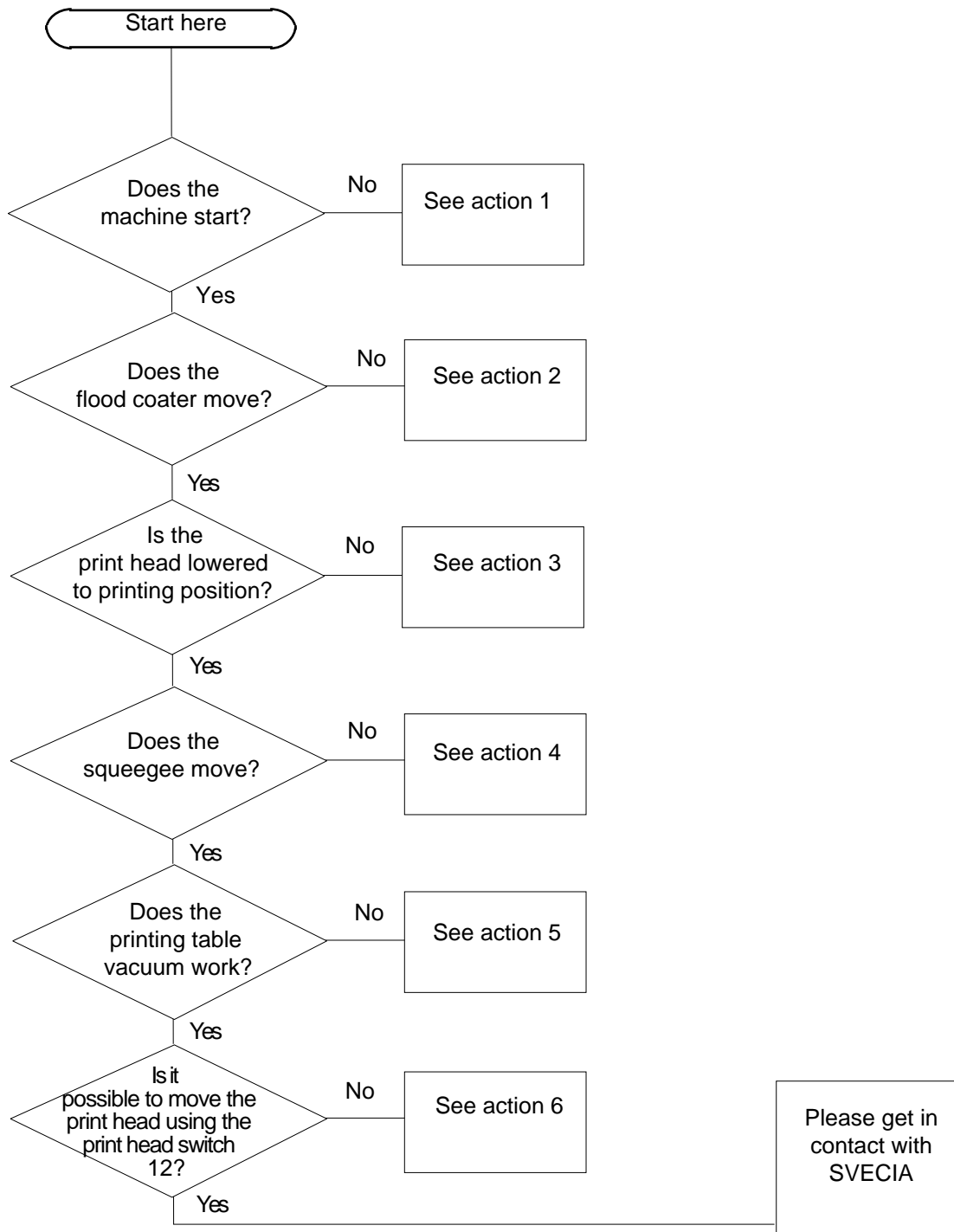
- a functional fault, such as a sheet jamming or the automatic operation of a safety switch, or
- a mechanical or electrical fault, where one of the components in the printer fails.

The operator may attempt to correct only functional faults.

An operator *must not* attempt to correct a mechanical or electrical fault. These faults must be corrected by authorized service personnel.

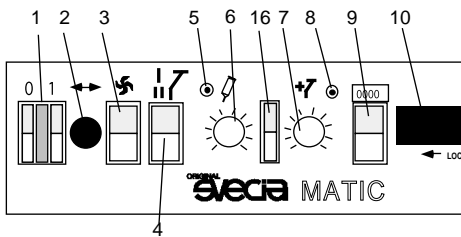
### Fault Action List

## Fault tracing diagram



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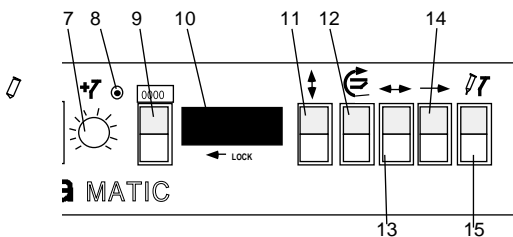
## **Action 1:** *The machine does not start.*



**Alt. 1:** Check that the external main supply switch is set to its  $\text{ON}$  position.

**Alt. 2:** Check that the buttons on the emergency stop switches are not stuck in a depressed position.

**Alt. 3:** Check that the On/Off switch 1 is in the ON position.



**Alt. 4:** Check the operation controls:

- Knob 2 might be set at 0. It has to be increased for the machine to work.
- Knob 6 or 7 might be set at 0. If so, set it to a larger value.
- Either switch 13 or switch 15 could be set to their OFF position. Switch them ON.

**Note!** When restarting the machine, use switch 14, as described in "Control Panel", chapter "Description".

**Alt. 5:** *Only authorized personnel*

Check that power is being applied on all three phases of the input main supply. An external fuse might be tripped.

**Alt. 6:** *Only authorized personnel*

If a motor becomes too hot, an overload cut-out switch is tripped which turns the machine OFF. Find out the reason for this, using the wiring diagram and restart the machine the following way:

1. Remove the door to the control cabinet and reset the overload cut-out switch.
2. Replace the door to the control cabinet and restart the machine.

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## **Action 2** *The flood coater is not moving.*

**Alt. 1:** Check that the squeegee- and flood coater switch 15 is in ON position (upwards).

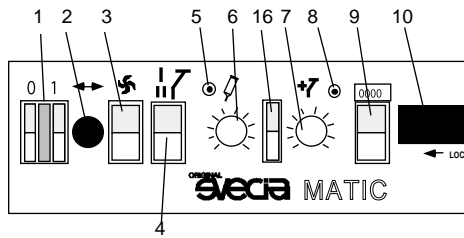
**Alt. 2:** Check that the squeegee- and flood coater speed potentiometers 6 and 7 are not set to zero.

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## **Action 3:** *The print head is not lowered to printing position.*

## Fault conditions

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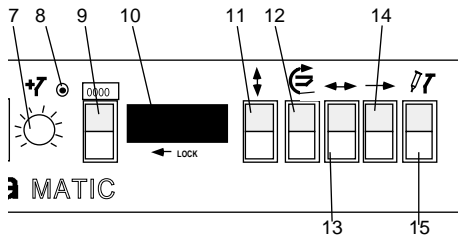


**Alt. 1:** Check that the print head is not manually elevated above flooding position.

**Alt. 2:** Check that the squeegee- and flood coater switch 15 is in ON position (upwards)

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**Action 4:** *The squeegee is not moving.*



**Alt. 1:** Check that the squeegee- and flood coater switch 15 is in ON position (upwards).

**Alt. 2:** Check that the squeegee- and flood coater speed potentiometers 6 and 7 are not set to zero.

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**Action 5:** *The printing table vacuum does not work.*

**Alt. 1:** Check that the fan switch 3 is in ON position (upwards).

**Alt. 2:** Check that the air valve is working properly.

**Alt. 3:** ***Only authorized personnel***

If a fan motor is overloaded, the overload cut-out switch is tripped. Find out the reason for this using the wiring diagram and restart the machine.

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**Action 6:** *It is not possible to move the print head using the print head switch 11.*

**Alt. 1:** ***Only authorized personnel***

Check the overload cut-out switch for the print head elevating motor.

**Alt. 2:** ***Only authorized personnel***

Check the limit switches for the elevating movement.

## Electrical Faults

Several electrical circuits in the machine are protected by

overload cut-out switches. One of these may be tripped if a component develops a fault. To correct such a fault, the person authorized to perform service on the machine should locate the component that caused the overload switch to cut out.

To locate such a fault, it may be helpful to refer to the circuit diagram located in a pocket on the back of the control cabinet door. This diagram is essential when diagnosing electrical faults in detail.



## **7. SPARE PARTS**

### **Ordering Details**

When ordering spare parts please mention:

- machine type
- machine size
  - printing table size
- serial number
- year of manufacture
- any accessories or fitted options

together with the spare part description or article number.







