

User's Guide

English

Plastic bending machine HRP/D



 **SHANNON**

Plastic bending machine HRP/D



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Introduction

Congratulations on purchasing the **Shannon HRP/D** plastic bending-machine.

Read this Guide completely before installing and using the machine.

We want to keep in contact and to know how you find the **HRP/D**. We are always willing to advise on the use of the machine and its accessories.

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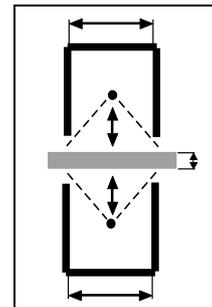
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The **Shannon HRP/D** plastic bending-machine is a rapidly convertible semi-automatic bending machine for the production of large series of items with multiple bends for the plastic sheet processing industry.

- o The machine has four adjustable heating elements as standard, the temperature of which can be adjusted by electronic controls.
- o The filaments of the heating elements on the working surface are adjustable in height. The other elements, which are mounted in the pneumatically operated top frame which clamps the workpiece in place, are adjustable in height as a single unit in respect of the working surface.
- o The workpiece can be heated from two sides, considerably reducing the production cycle time and making it possible with multiple-wire reflectors to bend sheet up to 20 mm thickness.
- o The top frame is switched on independently of the control units and is controlled by an adjustable timer.
- o The working surface is made of scratch-resistant solid core material with which the space between the zones to be heated can be filled to support the plastic sheet.
- o The machine has facilities for the mounting of additional heating elements at both top and bottom. The elements can be mounted by the user.
- o The machine is also equipped with an automatic transport-system existing of feedbelts and a speedcontroller.

When heated, thermoplastics become so flexible that they can be shaped. When a plastic sheet is heated to its softening point in a narrow zone, it can be bent to any angle desired. The bending radius is determined by the width of the heated zone. The zone is determined by the thickness of the material, the type of heating element and the distance between the plastic and the filament. Every plastic has its specific softening point. By co-ordinating the temperature, heated zone and heating time all kinds of thermoplastic can be processed.



model	HRP/D		
Assembly			
control	4 (max. 8)		
lower heating element	2 (max. 4), fitted with single filament		
upper heating element	2 (max. 4), fitted with single filament		
pressure bar	2 (max. 4)		
Feed belts	3 (max. 6)		
Speed controller	1		
options	see Annex G		
Electrical			
	voltage	power	fuse
timer unit	24 V=	15 VA	100mAT
switch unit	380/220 V~	20 VA	250 mAT
control unit	220/240 V~	1000 VA	5 AT
Driving motor	24 V	45 VA	
Speed-controller	220/240 V	144 VA	
max. power requirement	8.000 VA		
circuit breaker	3x16 A		
connection	CEE 4 32A 3P+0+A		
network connection	CEE 4 32A 3P+0+A		
Network circuitbreaker	Min 3x16 A		
filament	0-30 V, 0-19 A ~		
diagram	see Annex B, C and D		
Pneumatic			
air	Unlubricated clean dry air		
maximum	8 bar		
minimum	3.5 bar		
working pressure	6 bar		
coupling	Festo quick action coupling		
air consumption	21.6 NI per cycle at 6 Bar		
diagram	see Annex E		
Mechanical			
speed of top frame	≤ 5,9 rad/s (20cm/s at front)		
force on plastic	approx. 3.5 kg/cm ²		
gradation of stop	0-1000 mm		
dimensions	3390x1300x1092 mm (lxwxh) see Annex F		
weight	750 Kg		
life of filament	Approx. 600 hours		
Functional			
bending width	3000 mm		
mutually extendible	1000 mm (max.)		
sheet thickness	1- 20 mm (depending on heating element)		
setting range timer	0-9999 sec		
temperature range filament	20-600 °C		
filament height adjustment			
bottom	1 - 17,5 mm		
top	7 - 26 mm		
Ambient			
temperature	18-30 °C		
humidity of the air	50-80 % (no condensed)		
Miscellaneous			
set of socket screw keys	2, 3, 5, 6mm 1 x		
spare fuse	5x20mm 250 mAT 1 x		
spare fuse	6.3x32 5 AT 4 x		
spare filament	Ø1.6 x 3150 / 2150mm 2 x / 2x		

SAFETY INSTRUCTIONS:



To ensure safety when using the machine you should read this User's Guide carefully and follow the safety instructions closely.



Attention!

The machine contains a section where there is a risk of trapping.



Attention!

The machine contains parts which are hot. Touching them will cause burns.



Allow hot parts to cool sufficiently (at least 10 minutes) before touching them.



Never touch the filaments or the reflectors when the machine is in operation.

Always wear close-fitting clothing.

Be particularly careful of sleeves and always tie back long hair.



Never leave objects on the working surface.

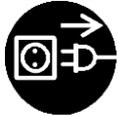
The machine may only be used for heating narrow zones in flat plastic sheet.

Any other use could lead to very hazardous situations or cause damage to the machine!

The plastic sheet to be bent should never be more than 20 mm thick.



Before commissioning and servicing always check the connection cable and plug for defects.



When servicing switch off the machine and remove the plug from the socket.

When the machine is temporarily out of use always remove the foot switch and keep it in a safe place.

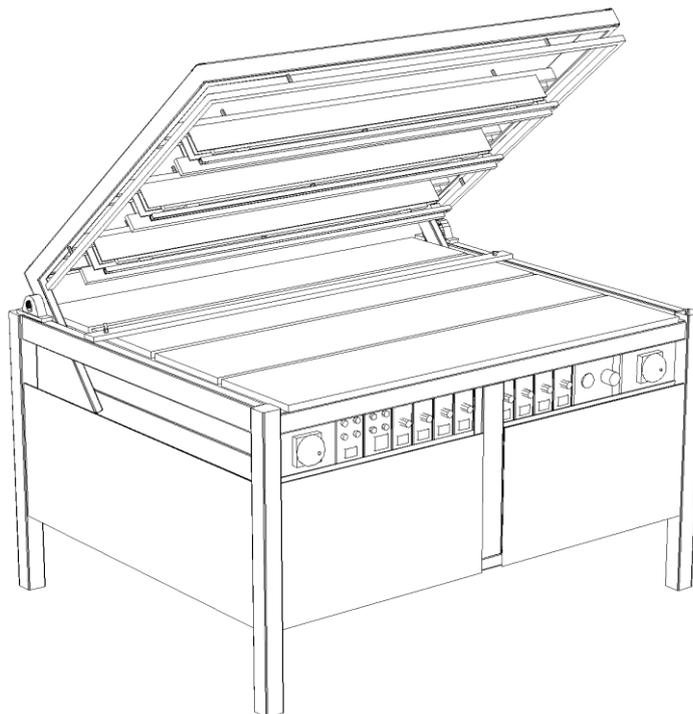
Before use always check that all the pressure bars and heating elements in the top frame are firmly attached.

Only switch on those heating elements which are needed.

Never operate the machine if anyone is standing close behind or beside it.

Never introduce objects or material into the machine from the rear.

Never leave the machine unattended without switching it off.



The machine is equipped with the following safety devices:

4.1 EMERGENCY TOP SWITCH

When the emergency top switch is touched the power on the top frame is interrupted and the machine opens. This avoids limbs becoming trapped. The red lamp (J) on the timer unit lights and the timer (K) is returned to zero (see also § 5.3.) The timer unit must be reset after a stop.

4.2 EMERGENCY STOP

There is an emergency stop button at the front of the machine on the left and right, which can be reached by the operator from the normal working position. The pedal switch has also an emergency stop function, when it is pushed in completely. By using the emergency steps the electrical power of the regulating units, will be disconnected and the top frame lifts up. (see also § 5.2)

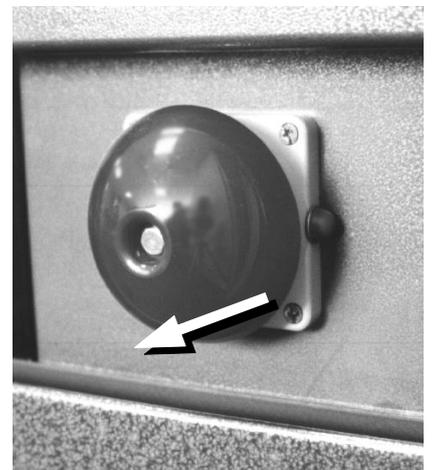


Only use the emergency stop buttons in the following situations:

- o Risk of trapped limbs.
- o Defects in the timer, so the machine fails to open after the pre-set time.
- o An outbreak of fire or situations involving a risk of fire.
- o Any situation which might present a risk to people or animals.
- o Any other situation, which might present a risk or cause, damage to the machine and/or objects.

When the emergency situation has been remedied, the emergency stop button must be reset and the various functions switched on again individually.

Pulling it out until a click is heard resets the emergency stop button. Pushing the blue button, which is mounted, on the pedal switch will reset the food pedal.



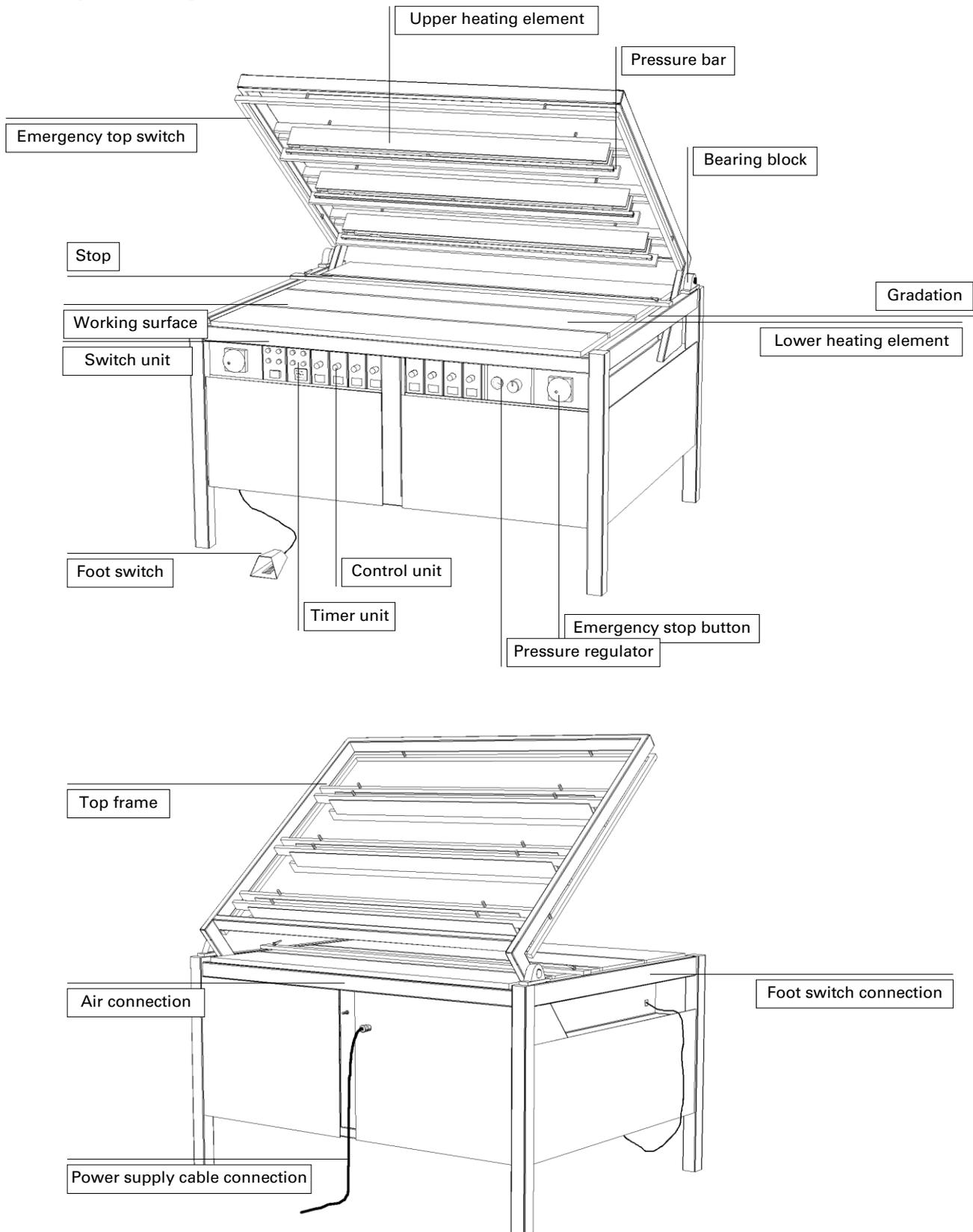
4.3 AIR PRESSURE MONITORING

The machine switches off if the air pressure fails.

The lamp in the main switch **A** remains alight.

When the pressure is restored the top frame lifts up again. The machine must then be started up again.

5.1 OVERVIEW



5.2 SWITCH UNIT

This contains the main switch (A) of the machine and the push button switches to start the heating and the top frame.

A Main switch.

heating

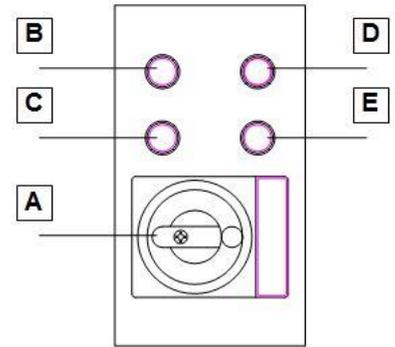
B Switch on control units (Also reset button for emergency stop).

C Switch off control units.

top frame

D Switch on top frame.

E Switch off top frame.



5.3 AIR/TIMER UNIT

The timer unit is the combined unit for operation of the top frame (G and H), operating the buzzer (I and J) and setting the cycle time (K). When the foot or push-button (H) switch is operated, the machine closes. The counter begins to run when the machine is fully closed, afterwards the switch can be released. At the end of the pre-set time, the top frame opens and the buzzer (J) makes a whistling sound for a few seconds. This sound can be turned off by switch (I). The counter is then returned to 0.

F Selector switch foot/hand operation.

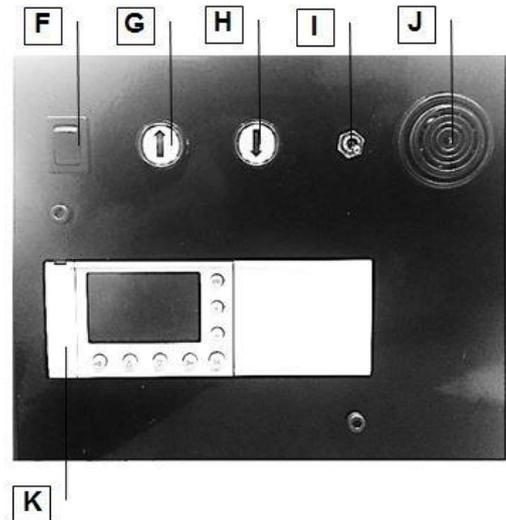
G Top frame up.

H Top frame down.

I Buzzer on/off

J Buzzer

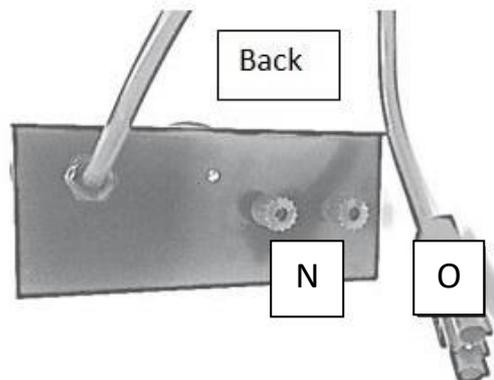
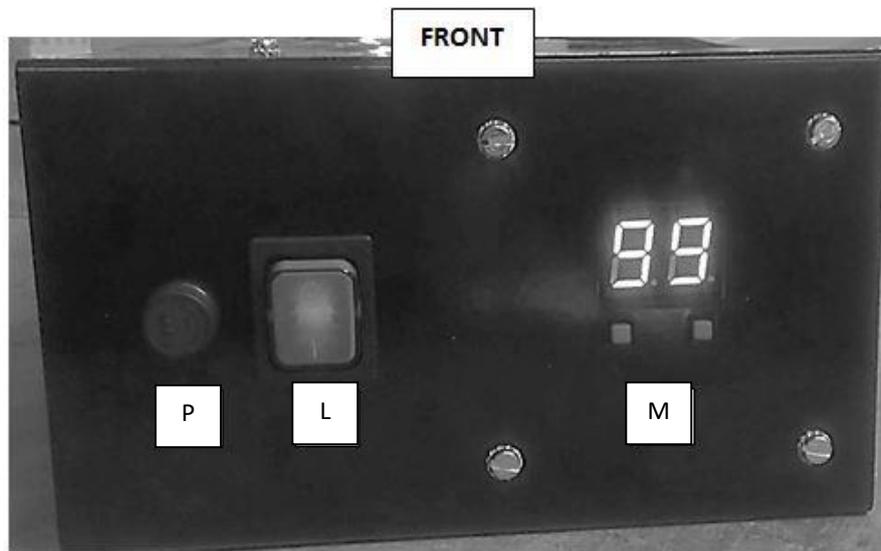
K Electronic timer.



5.4 CONTROL UNITS

The control unit contains an electronic control with which the temperature of a filament is set.

- L Switch on/off (green lamp).
- M Temperature adjustment
- N Connection to filaments
- O Connection to 220V ACL
- P Fuse

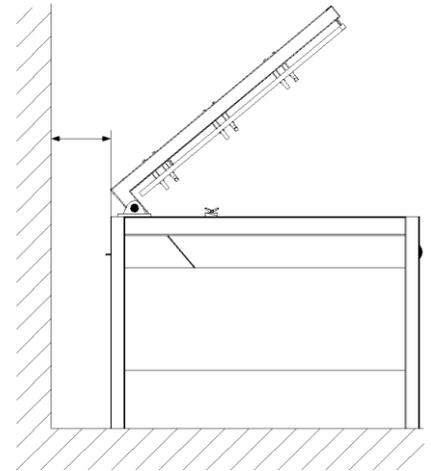


6.1 ASSEMBLY

1. Remove packaging and blocking of top frame.
2. Place the machine on a level floor with sufficient space around and above the machine.
3. Level the working surface of the machine, using shims under the feet if necessary.
4. Ensure there is adequate ventilation and lighting at the workplace.
5. Avoid draughts, in order to prevent uneven heating.



When moving the machine with a forklift truck ensure that the machine is supported right in the centre. Also use sufficiently long prongs on the forklift truck.



6.2 CONNECTING COMPRESSED AIR

1. Check that all heating elements and pressure bars in the top frame are firmly attached.
2. Check the air pressure in your system (max. 8 bar).
3. Close the reducing valve on the air unit (**turn to the left**). Unlock if necessary (**pull out**).
4. Using a quick-action coupling connect the rear of the machine to your compressed air system or compressor.
5. Slowly open the reducing valve (**turn to the right**) and set the air pressure in the system at **6 bar**.



6.3 CONNECTING POWER CABLE

1. Check that the rating of the electrical system is adequate (see technical data).
2. Check that the main switch **A** is in the **O**-position.
3. Plug in the machine.

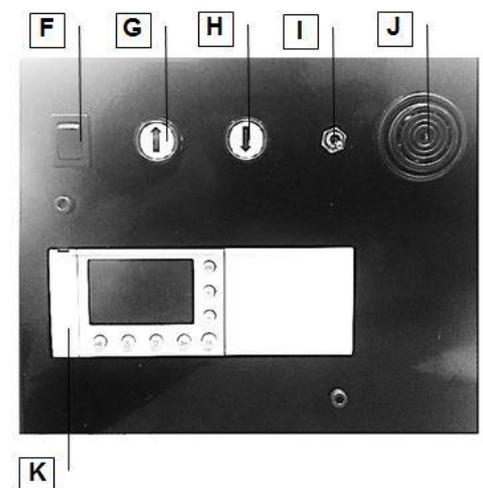
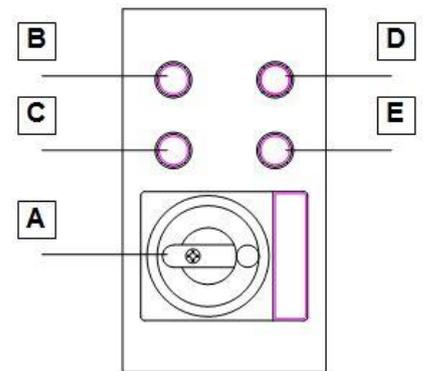
6.4 CONNECTING FOOT SWITCH

1. Insert the plug of the foot switch into the connection on the side of the machine. The plug will click into place. N.B. To remove the foot switch the small stop above the plug must be pressed.



7.1 PREPARATION

1. Check that the air pressure is set at **6 Bar** (see 7.8, page 16).
2. Clear the working surface.
3. Check that all the heating elements are connected to the control units.
4. Check that no scraps of material remain in the reflectors.
5. Check that all the upper heating elements and pressure bars are firmly attached to the top frame.
6. Turn the potentiometers in the control units to "0".
7. Switch off all the control units (position "O").
8. Turn on the main switch **A** (position **I**).
The red lamp in switch **C** will light.
The yellow lamp in switch **E** will light.
If switch **F** is set to Hand Operation, the yellow lamp in switch **H** will light.



7.2 SWITCHING ON CONTROL UNITS

The power supply to the control units must be switched on separately.

1. Press switch **B**.
The red lamp in switch **C** will go out.
The green lamp in switch **B** will light.

The control units are now ready for use!

7.3 SWITCHING ON TOP FRAME

The top frame is switched on separately. The safety system with the ribbon switch must then be released.

1. Press switch **D**.
The yellow lamp in switch **E** will go out.
The green lamp in switch **D** will light.

7.4 SWITCHING ON HEATING ELEMENTS

Each heating element can be switched on and controlled individually.

Switch on the desired control unit with switch (L). See 5.4.

7.5 SETTING THE TEMPERATURE

The temperature of the filament can be set using the temperature regulator.

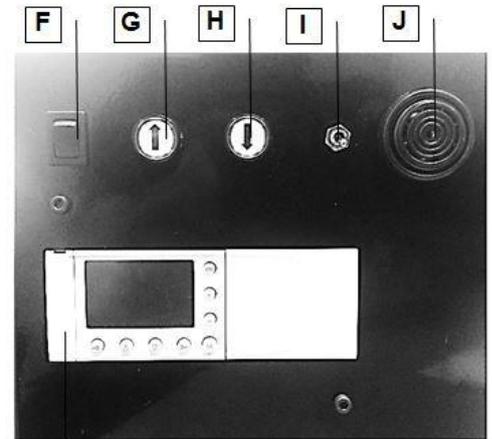
1. When turning on the on/off switch, the display will show the value that was last saved (keeping the machine on a certain value for >20 seconds will make it remember this value).
2. Press the right button (arrow up) to increase the value, up to 99 (keeping this pressed in will make the value cycle much faster)
3. Press the left button (arrow down) to decrease the value, down to 00 (keeping this pressed in will make the value cycle much faster)
4. Press both buttons at the same time to go directly to 00. Doing this also resets the machine.

7.6 TROUBLE SHOOTING

Error message	Meaning	Solution
E1	The wire is loose (not connected)	Turn off the machine, check the filament, and reset the machine (see §9.1 for changing filament) Note: Between the values 00 and 04, this fault cannot be detected
E2	The wire is loose (spark detection)	Check the connection of the filament Check the filament, and reset the machine This fault can also be reset by the arrow down button (see §9.1 for changing filament)
E9	Broken circuit board	Contact the supplier for a new circuit board
Empty display	No power	Alert a maintenance engineer Check the fuse (see §10.1) Check the power supply cable Contact the supplier if necessary

7.7 SETTING CYCLE TIME

The time during which the machine is closed to heat the plastic sheet on two sides is set using the electronic timer **K**.



7.8 HAND OR FOOT OPERATION

Select hand or foot operation using switch **F**.

- Position 1: Hand operation.
The frame closes when switch **H** is pressed.
- Position 2: Foot operation.
The frame closes when the foot pedal is pressed.

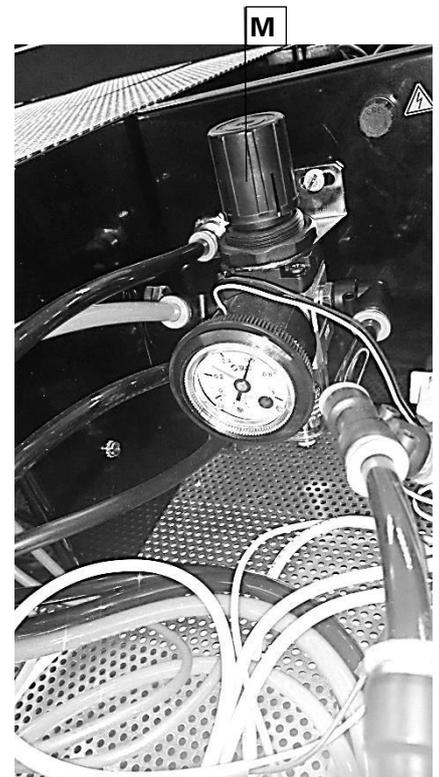
Press switch **G** (arrow up) to open the machine before the end of the set time. The timer (**K**) is returned to **0**.



7.9 SET AIR PRESSURE

Control the pressure in the system with reducing valve **M**, which can be found on the water separator (see 10.4, page 30). The air pressure is set by the factory at **6 bar**.

- N.B. To right: ⇨ valve open
- To left: ⇨ valve closed
- press knob in: ⇨ lock
- pull knob out: ⇨ unlock



Always lock the reducing valve when the air is being disconnected from the machine.

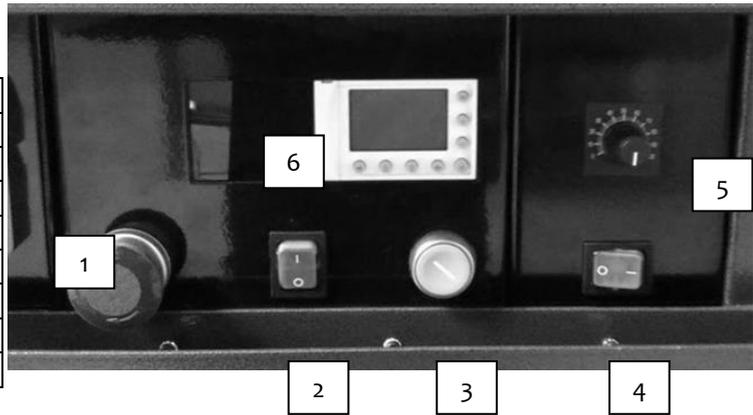
7.10 RESET RIBBON SWITCH

When the ribbon switch is touched the machine opens immediately. It is then impossible to close the machine with the foot switch or pressure switch **H**. The red lamp **E** will light. Press switch **D** to start the machine again. The green lamp in switch **D** will light.

7.11 SWITCHING ON TRANSPORTSYSTEM

Display buttons[6]

Button	function
Esc	Cancel
+	Increase value
-	Decrease value
OK	Confirm
▶	Move right
▼	Move down
▲	Move up
◀	Move left



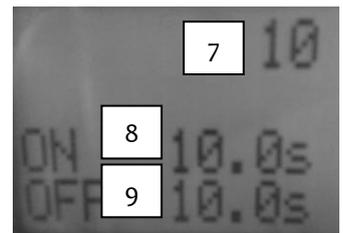
Transport system:

Before using the transport system, first turn the speed regulator[5] all the way to the left. To activate the transport system, switch the green button[4] so that it lights up. Then, turn the speed regulator[5] to regulate the speed. On the right you'll find a table which gives an indication on how fast the track goes from 1 end of the machine to the other, on each rotation of the knob.
 Note: these times are an indication, and are not absolute.

Full knob rotation	Time (in seconds)
1	70
2	35
3	24
4	19
5	16
6	14
7	12.5
8	12
9	11.5
10	11

Feeding system:

1. Press the left green button[2] so that it lights up. The control system of the feeding system is now activated.
2. There are three numbers now on the display ranked from top to bottom as:
 - a. [7] The number of cycles that the machine will operate.
 - b. [8] The time in seconds that the pusher is reloading a new piece of plastic.
 - c. [9] The time in seconds that the feeding system is pushing a new piece of plastic.
3. For first time usage, set all the values on 10:
 - a. Swap between values by using the ▼/▲ buttons.
 - b. Increase or decrease the value by using +/-.
 - c. Cancel the value by using the "ESC" button.
 - d. Confirm the value by using the "OK" button.



4. Press the round red button[1] to stop the machine
5. Press the green round button[3] to active the pneumatics. The feeding system will begin working now.
6. If the pusher has to wait between two cycles of pushing plates on the belt, it can best be done by pausing the pusher beneath the stack of plates. The system has to be tuned in such a way that if the pusher comes from underneath the stack of plates, it has to begin pushing immediately.
7. The feeding system can be fine-tuned un the following ways:
 - a. If the system stops to fast, increase the cycle number by increasing the top value in the display.
 - b. If the reloading time is too long, decrease the second value on the display.
 - c. If the pushing time is too long, decrease the third value on the display.

8.1 SAFETY MEASURES

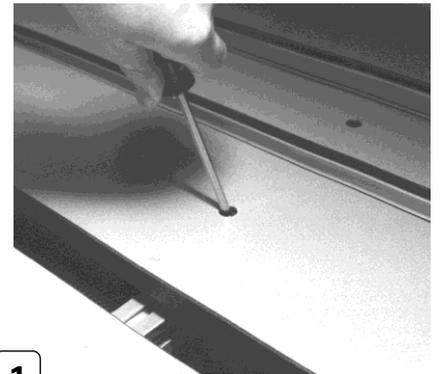
Always take the following safety measures before adjusting the heating elements:

1. Switch off the foot switch by setting switch **F** to hand operation (page 11).
2. Ensure that the upper heating elements and pressure bars is firmly attached.
3. Switch off the heating elements one at a time (Switch **L**).
4. Switch off the control units and top frame (Switches **C** and **E**, page 11).
5. Clear the working surface.
6. Allow the heating elements to cool for at least **10** minutes.



8.2 LOWER HEATING ELEMENT

1. Remove the strips of solid core material next to the heating element to be adjusted by loosening the two socket head screws. (Use socket screw key **no. 5**).
2. Loosen the socket head screws in the supporting prongs on the left and right of the heating element one half turn.

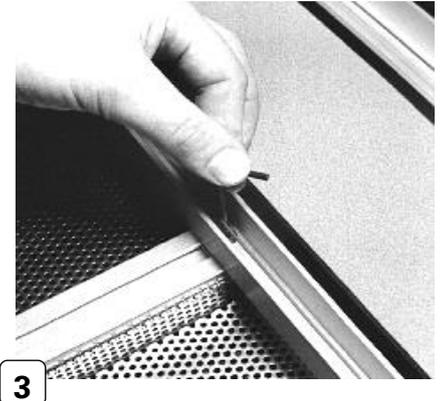


1

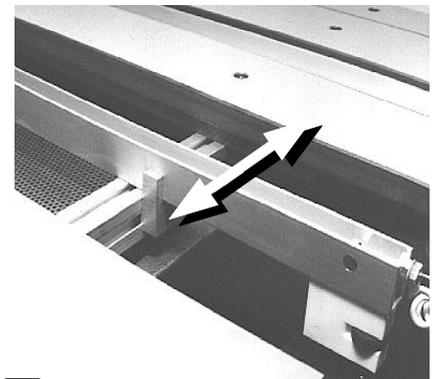


2

3. Loosen the socket head screw in the centre of the heating element one half turn.
(Use socket screw key **no. 3**)



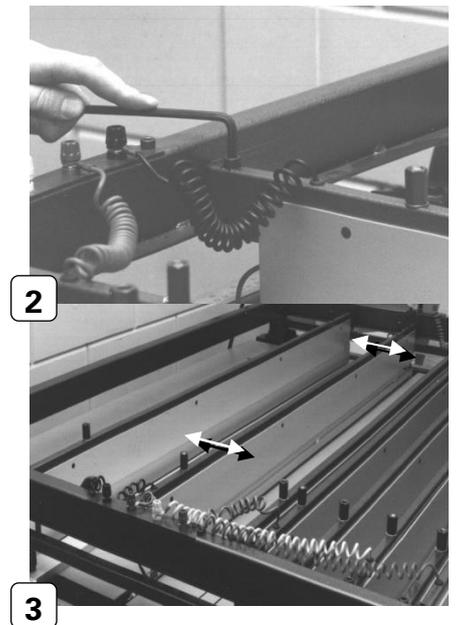
4. Take the heating element with both hands close to the supporting prongs on the left and right and slide it into the desired position.
Hold the heating element parallel to the front of the machine and the supporting prongs. This prevents the notched nuts in the aluminium **X**-profiles from binding.



5. Hand tighten the socket head screws, **starting** in the supporting prongs and **then** in the centre.
6. Position the other profiles in the same way if necessary.
7. Fill up the space between the heating elements as far as possible with solid core strips and hand tighten them. First slide the notched nuts into the aluminium **X**-profile roughly level with the holes and then lay the solid core strip on top.
8. Switch on the machine again as in Section 7.

8.3 UPPER HEATING ELEMENT AND PRESSURE BAR

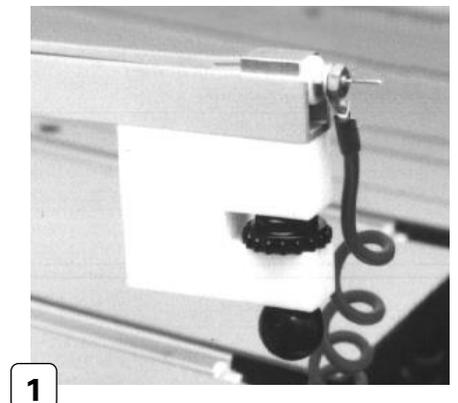
1. Disconnect the compressed air.
The top frame will then slowly lower while air escapes.
The power is automatically switched off.
2. Loosen the socket head screws on the support bar clamps one turn. (Use socket screw **no. 6**).
3. Take hold of the heating element at the sides, left and right, and slide it into the desired position. Move the support bar parallel to the front of the top frame, so that you position the top filament above the bottom one.
4. Tighten the support bar clamps again.
5. Switch on the machine again as in Section 7.



The upper heating elements and pressure bars may fall out of the top frame if they are loose or not properly attached.

8.4 LOWER FILAMENT HEIGHT

1. Adjust the height of the filament using the knurled nut. These can be reached from the sides. Make sure that the filament height is the same on both sides.
2. Start up the machine again as in Section 7.

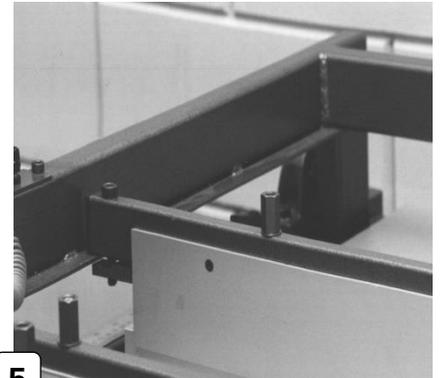


8.5 UPPER FILAMENT HEIGHT



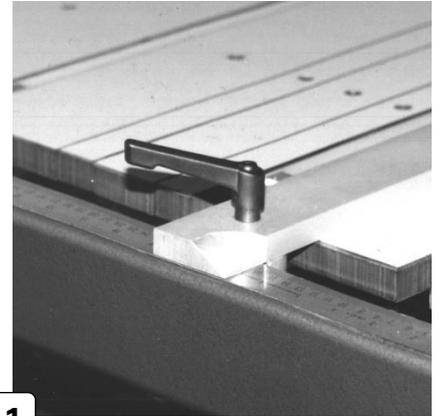
Make sure that the lower and upper heating elements and the pressure bars are in the correct position.

1. Switch on the top frame (switch **D**, page 11).
2. Set the timer (**K**, page 12) to 9999 sec.
With this time setting the machine will remain closed for long enough to adjust the filament height.
3. Place a test piece of the plastic to be processed on the working surface.
4. Lower the top frame (switch **H**, page 11).
5. Adjust the height of the filament using the adjusting nuts on the upper heating elements.
You can set the filament to a minimum of 6 mm above the plastic.
Adjust the height so that the element is clear of the plastic.
6. Open the top frame (Switch **G**, page 12).
7. Reset the timer (**K**, page 12).
8. Start the machine again as in Section 7.



8.6 STOP

1. Loosen both the handles on the stop one half turn.
2. Slide the stop into the desired position. Hold the guide parallel to the front of the machine. This stops the clamping blocks from binding.
3. Tighten the handles.



Always ensure that the stop is placed in such a way that heating elements or pressure bars cannot hit the stop as they are lowered.

Alterations

9.1 SAFETY MEASURES

Before changing a heating element take the following safety measures:



1. Switch the top frame to hand operation using switch F (see page 12).
2. Allow the heating elements to cool for at least **10** minutes.
3. Clear the working surface.
4. Remove the foot switch from the connector. (See section 6).
5. Switch off the heating elements one at a time (switch L, page 12).
6. Switch off the control units and the top frame (switches C and E, page 11).
7. Check that the heating elements and pressure bars are firmly attached to the top frame.

9.2 LOWER HEATING ELEMENT

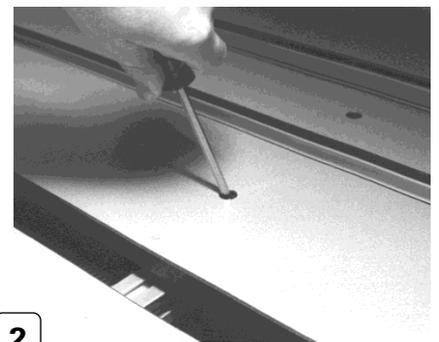
9.2.1 Removal

1. Undo the connection wires in the heating element, at the terminals.

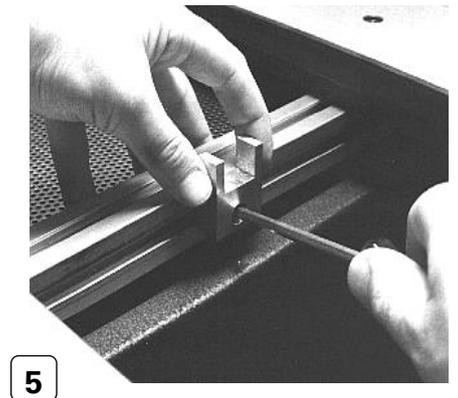
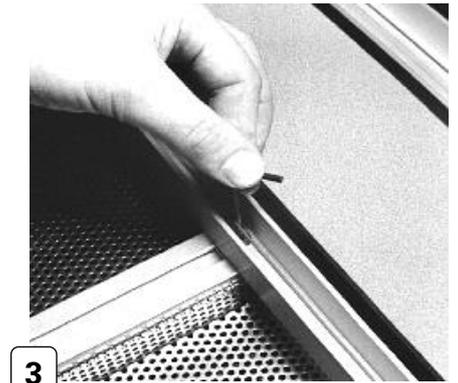


Never use pliers. This could damage the terminals.

2. Remove the strips of solid core material next to the heating element. (Use socket screw key **no. 5**).



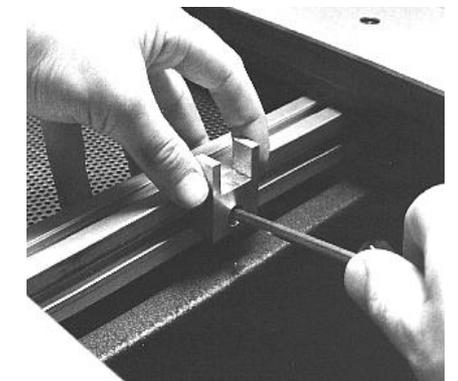
3. Fully loosen the socket head screw in the centre of the heating element.
(Use socket screw key **no. 3**).
4. Lift the heating element out of the machine.
5. Remove the supporting prongs on the left and right by undoing the socket head screws.
(Use socket screw key **no. 5**).



9.2.2 Installation/replacement

When replacing a heating element with a different type, **first** change the supporting prongs.

1. Place the two supporting prongs on the outermost **X**-profiles and screw them into the notched nuts using socket head screws (M6x12 cylinder head). (Use socket screw key **no. 5**). Do not tighten them fully yet. Line them up with each other.



- Place the heating element in position and fix it with a socket head screw (M6x12 countersunk) in the centre. (Use socket screw key **no. 3**). Do not tighten fully at this point.



Make sure that the long pin on the heating element is on the left side of the machine.



2

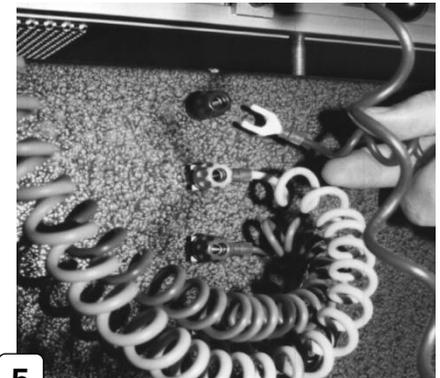
- Position the heating element. (See section 8).
- Hand tighten the socket head screws, **starting** at the side and **then** in the centre.
- Connect the wires to the terminals on either side of the machine. Insert the forked tongue under the rotary knob and tighten the knob firmly by hand.



Always use terminals of the same colour on both sides of the machine.



Never use pliers. This could damage the terminals.



5

- Fill the space between the heating elements as far as possible with solid core strips and hand tighten them. First slide the notched nuts into the aluminium **X**-profile approximately level with the holes and then place the solid core strip on top.
- Switch on the machine as described in Section 7.

9.3 UPPER HEATING ELEMENT AND PRESSURE BAR

9.3.1 Removal

1. Disconnect the compressed air.
The top frame will now lower slowly, as the air escapes.
2. Position the heating element or pressure bar so that there is approximately 20 cm clearance.
(For positioning see Section 8).



2

3. Remove the wires from the terminals (only at the heating elements).



3



Never use pliers. This could damage the terminals.

4. Loosen the socket-head screws on the support bar clamps on either side a few turns. (Use socket screw key no. 6).



4

5. Slide the heating element or pressure bar diagonally (5a) and lift it out of the top frame (5b).



5a

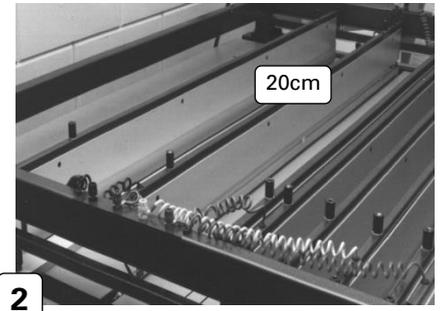
Always have two people to do this.



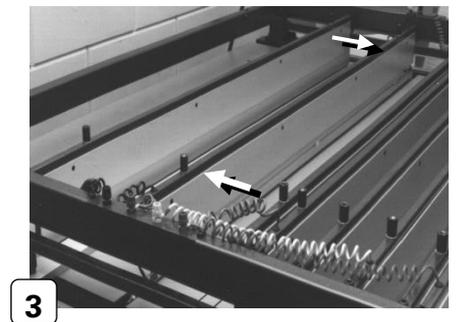
5b

9.3.2 Installation

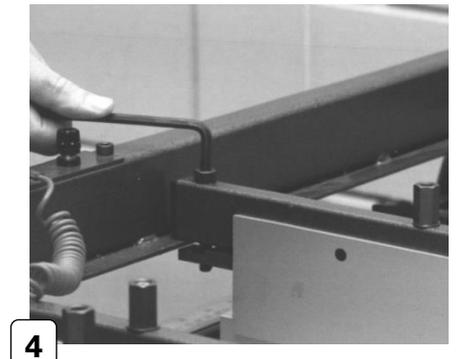
1. Disconnect the compressed air.
The top frame will now lower slowly as the air escapes.
2. Clear a space of approximately 20 cm in the top frame by moving other heating elements and/or pressure bars. (For positioning see Section 8).



3. Place the heating element or the pressure bar diagonally in the top frame and then slide it straight.



4. Position the heating element or the pressure bar and tighten the support bar clamps. (Use socket screw key no. 6).



5. Connect the wires to the terminals on either side of the machine. Insert the fork terminal under the rotary knob and tighten it firmly by hand. (Only for heating elements).

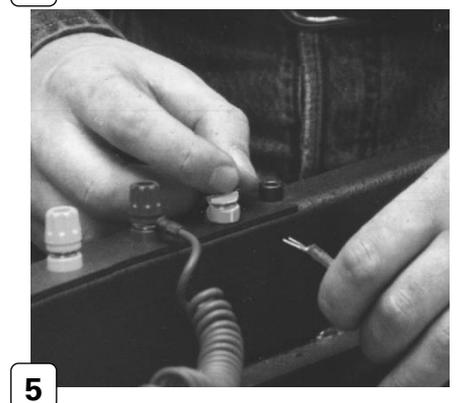
Always use the same colour terminals on both sides of the machine.



Never use pliers. This could damage the terminals.



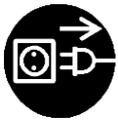
6. Switch on the machine again as described in Section 7.



The machine requires very little maintenance. Occasionally remove loose dirt from the machine and brush it clean.

10.1 SAFETY MEASURES

1. Switch off the main switch (switch **A**).
2. Clear the working surface.
3. Disconnect the compressed air..
4. Remove the plug from the socket.

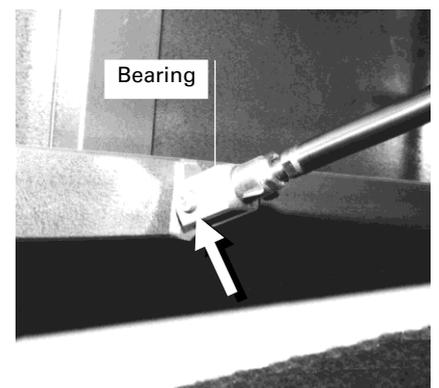


10.2 LUBRICATION POINTS

The following points should be lubricated with a drop of oil or grease once a year:

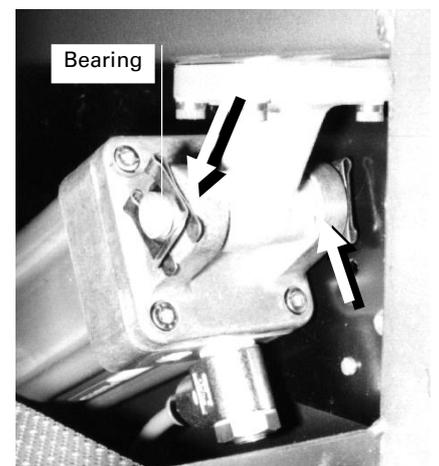
10.2.1 Cylinder bearing: bottom.

To reach the lubrication point remove a frame plate on the rear or side of the machine.



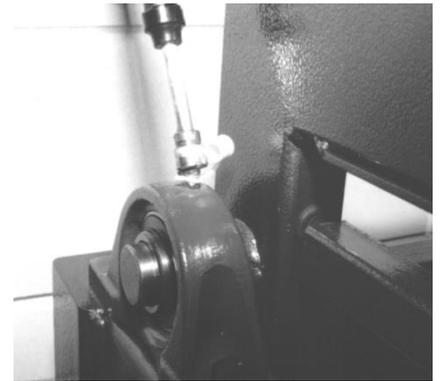
10.2.2 Cylinder bearing: top.

To reach the lubrication point remove the control units next to the central support.
(See Section 12.)



10.2.3 Bearing blocks

Grease the bearing using a grease gun. The grease nipple is on the bearing block.



10.3 PROFILES

The heating elements work more effectively when they are clean. Remove dirt and deposits from the heating elements regularly. Blow away loose dirt and brush them clean.

10.4 WATER SEPARATOR

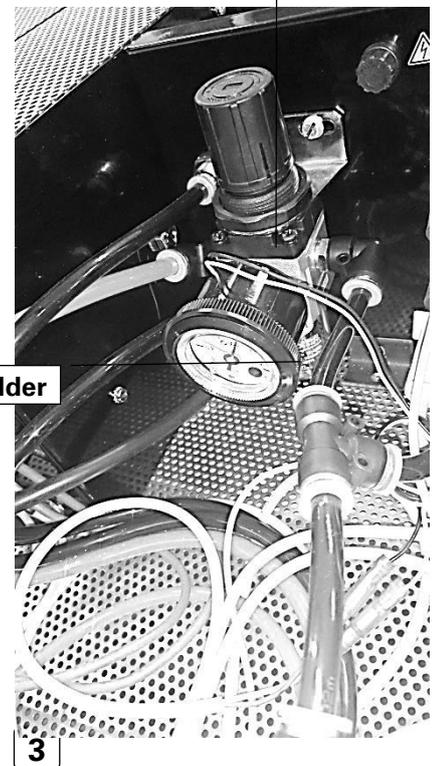
Check if there is water in the water separator and remove it if necessary.

10.4.1 Checking

1. Remove a number of solid core strips from the front of the machine. (Use socket screw key **no. 5**).
2. Slide heating elements backwards if necessary. (See Section **8**).
3. The water separator is now visible at the back of the air/timer unit. If there is water in the glass holder, it should be drained off (see §**10.4.2**).

Water Separator

Glass holder



10.4.2 Emptying

1. Disconnect the compressed air.
The top frame will lower slowly.
2. Remove the left-hand frame plate on the front of the machine.
3. Remove the 2 screws in the front of the Timer unit, and 1 in the back of the timer unit.
4. Lift the back of the Timer unit a bit, so that you can put a container underneath the Glass Holder (if necessary, remove some connectors to make room as explained in section 12.3. These are not interchangeable, and so they cannot be put in the wrong socket. Before performing this action, **make sure the main power switch is off!**)
5. Slowly open the nipple. All the water will then run out of the glass holder, in the container underneath.
6. Close the drain nipple by hand.
7. Reposition the Timer unit, and all the connectors that may have been removed earlier. Screw the Timer unit back into place.
8. Screw the left-hand frame plate on the front of the machine back in position.
9. Switch the machine on again as described in Section 7.



Trouble shooting

If the machine is not working properly, first check the following points:

Fault	Possible cause	Refer
Machine does not respond.	Not plugged in.	§6.3
	Main switch (A) not turned on.	§7.1
	Circuit breaker off.	§14.3
Switch unit not working. Lamp C and E are on	An emergency button is pressed in.	§4.2
	No air is connected to the system.	§6.2
	The reducing valve (knob M) is closed.	§7.9
Machine does not open.	No air is connected to the system.	§6.2
	The reducing valve (knob M) is closed.	§7.9
Top frame does not close when foot pedal is	Foot/hand operation switch (F) is turned to hand operation.	§7.8
	Top frame is not switched on (switch D). Red lamp (E) is on.	§7.3
Control units do not turn on.	Control units are not connected (switch B). Red lamp (C) is on.	§7.2
The switch (L) of the control unit is on, but the lamp is not alight.	Connection between control unit and distributing block is broken.	§12.2.1 pt.4b
	Fault in control unit fuse.	§14.2
	Control unit defective.	Contact supplier.
Filament does not heat up.	Control unit is not switched on (switch L). Green lamp is not on.	§7.4
	Control unit is switched on. Green lamp (L) is on. Error message E1 displayed	§7.6
	Control units are not connected (switch B). Red lamp (C) is on.	§7.2
	Connecting wires are not properly attached to the terminals. Error message E2 displayed.	§7.6
	Value on display is 0	§7.5
	Fault in control unit fuse.	§14.2
	Control unit defective.	Contact supplier.

If the cause of the failure cannot be found, always alert a maintenance engineer and/or contact the supplier.

12.1 SAFETY MEASURES

Before installing or removing units always observe the following safety measures:

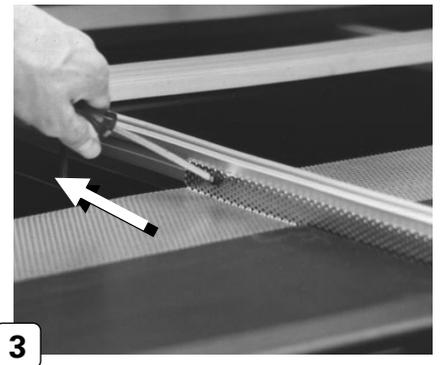
1. Switch off the foot switch by setting switch **F** to hand operation.
2. Clear the working surface.
3. Switch off the control units one at a time (switch **L**).
4. Turn off the main switch (switch **A**).
5. Remove the plug from the socket.
6. Check that the heating elements and pressure bars in the top frame are firmly attached.
7. Allow the heating elements to cool for at least **10** minutes.



12.2 CONTROL UNIT

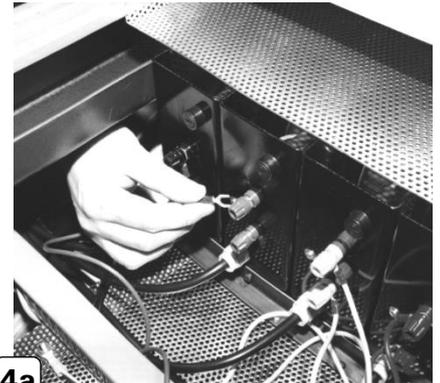
12.2.1 Removal

1. Remove the front solid core strips by undoing the socket head screws. (Use socket screw key **no. 6**).
2. Slide the heating elements backwards (see Section 8).
3. Loosen the socket head screws on the cover plate above the control unit one turn and slide the plate backwards. (Use socket screw key **no. 5**).

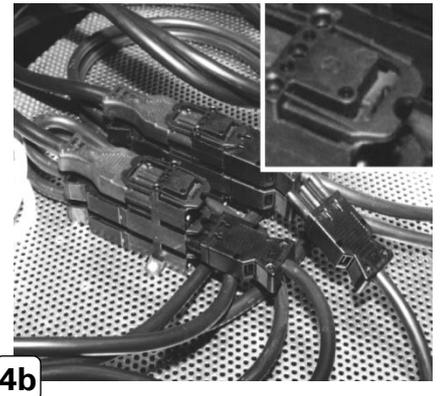


4. Loosening the wiring:

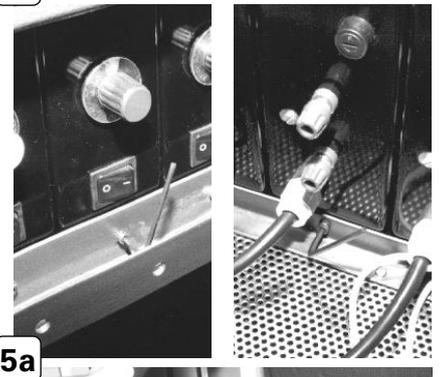
- a Disconnect wires from the terminals on the rear of the control unit.



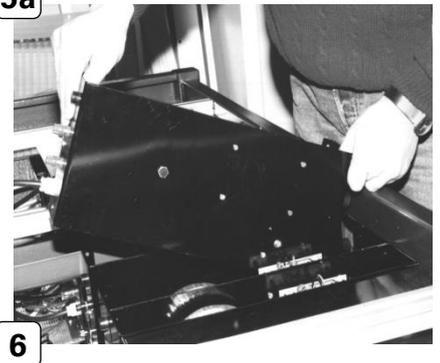
- b Take the flat plug out of the distribution block. **Attention!** These plugs are secured. Bend the safety clip up slightly in order to remove it. If necessary first remove the plugs above it.



- 5. Unscrew the two socket head screws. The screw at the front is easiest to reach by unscrewing the frame plate on the front.



- 6. Remove the unit from the machine.



12.2.2 Installation

Installation is done in the reverse order.

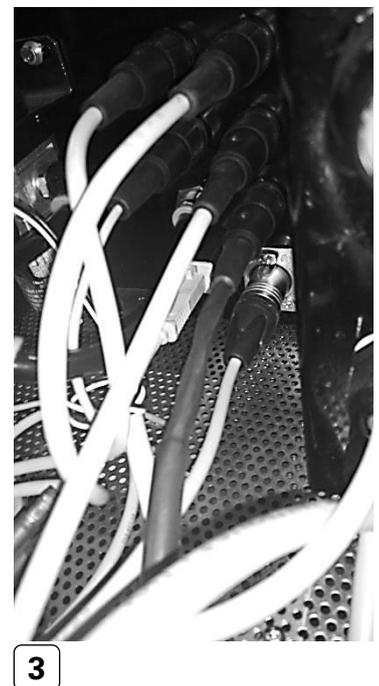
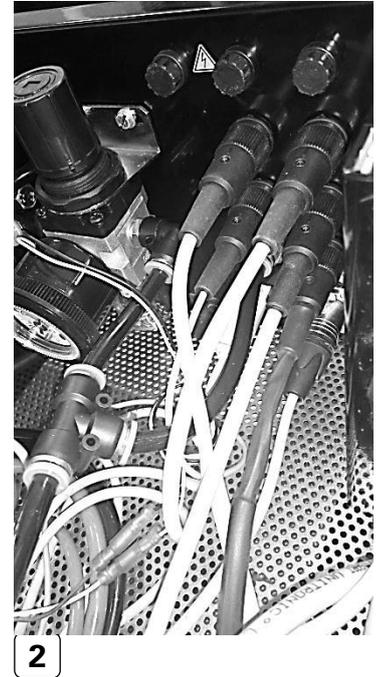
12.3 TIMER/SWITCH UNIT

Installation and removal of these units is the same as for the control units, except for undoing the wiring

Undoing the wiring

The plugs are not interchangeable, as each one is unique to its panel socket. A wrong connection can never be made

1. Disconnect the compressed air, and make sure the main power switch is off.
2. The round black plugs have a bayonet fitting. Remove them by turning the ring one turn to the left and pulling out the plug. The small line on the ring is then lined up with the screw.
3. The bottom plug on the timer unit can be removed by pressing in the small stop.
4. To remove the white plug, press down the white stop on the top of the plug with a screwdriver.
5. Remove the flat plug simply by pulling it out.
6. Disconnect the cables connected to the Water Separator, and remove the Air tubes from the unit.

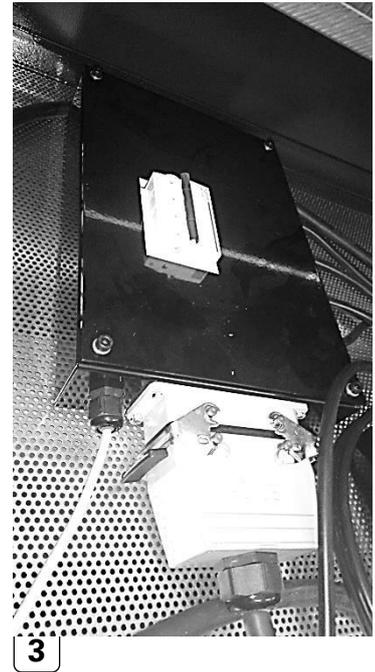


12.4 MAIN SWITCH BOX

12.4.1 Removal

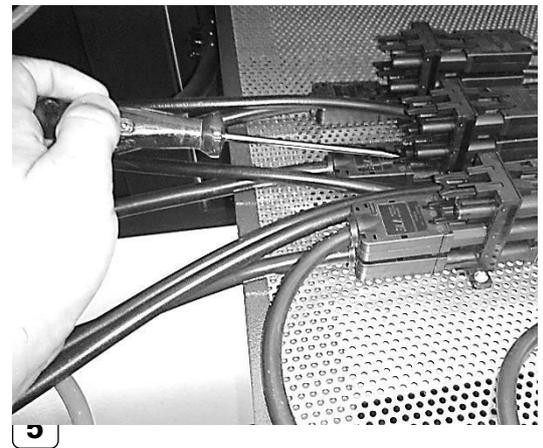
1. Remove the solid core strips by unscrewing the socket head screws. (Use socket screw key **no. 6**).
2. Slide the heating elements forward (see Section 8).

- 3. Disconnect the 380V power supply cable. Click the safety clips backwards and pull out the connector.



- 4. Undo the connections with the timer and Main switch box (see §12.3, part 3 & 5).
- 5. Undo the flat black plugs from their dividing blocks. Use a screwdriver to lift up the clip, and remove the flat plug.

- 6. Remove the flat lid from the unit.
- 7. Unscrew the two self-tapping screws in the 2 corners of the unit, including the ground terminal.



- 8. Remove the box from the machine.

12.4.2 Installation

Installation is done in the reverse order.

13.1 SAFETY MEASURES

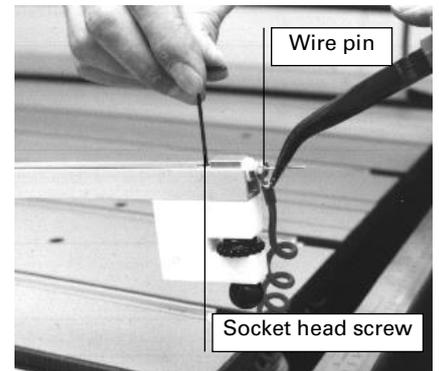
Before tensioning and changing the filament always take the following safety measures:

1. Switch off the foot switch by turning switch **F** to hand operation.
2. Clear the working surface.
3. Switch off the control units one at a time (switch **L**).
4. Turn off the main switch (switch **A**).
5. Check that the heating elements and pressure bars in the top frame are firmly attached.
6. Allow the heating elements to cool for at least **10** minutes.



13.2 TENSIONING

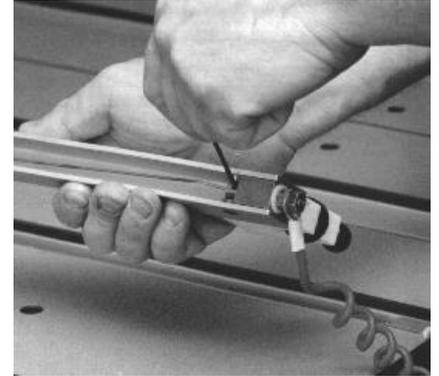
1. Turn the filament to the lowest position. (Only bottom heating).
2. Hold the end of the wire on the right with pliers and undo screw in the wire pin.
(Use socket screw key **no. 2**)
3. Pull the wire taut with pliers and tension the spring.
4. Tighten the socket head screw firmly again.
5. Cut off the end of the filament. Always leave 8-10 mm projecting in order to be able to tension the filament again.
Bend the projecting piece down.



Attention! The end of the filament is sharp.

13.3 CHANGING

1. Turn the filament to the lowest position. (Only for bottom heating).
2. Unscrew socket head screw in the wire pin on the right. (Use socket screw key **no.2**).



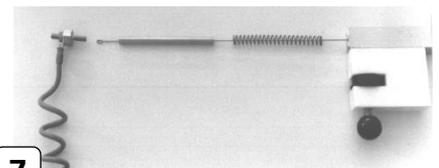
3. On the left side slide the expanding pin with the spring out of the pin block.
4. Slide the spring off the expanding pin.
5. Unscrew the expanding pin from the connection screw (incl. connection wire).



6. Remove filament from the expanding pin and the wire pin.
7. Slide a new wire into the expanding pin and make sure that the eye is pulled well into the pin.

5

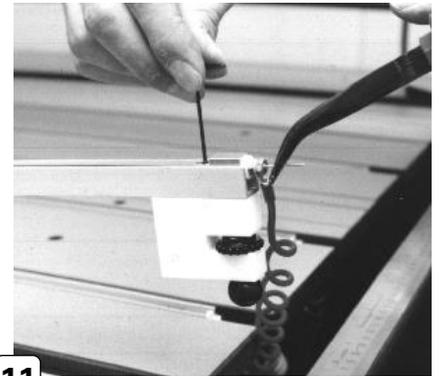
7



8. Screw the expanding pin on the connection screw (incl. connection wire) and attach firmly. **Take care not to damage the expanding pin. Tightening firmly by hand is sufficient.**



9. Slide the spring over the filament and slide the filament through to the expanding pin.
10. Slide the filament with expanding pin through the white insulation sleeve of the pin block and pull it through as far as possible.
11. Then insert the end of the filament in the wire pin. Pull it taut and tension the spring with pliers.



11

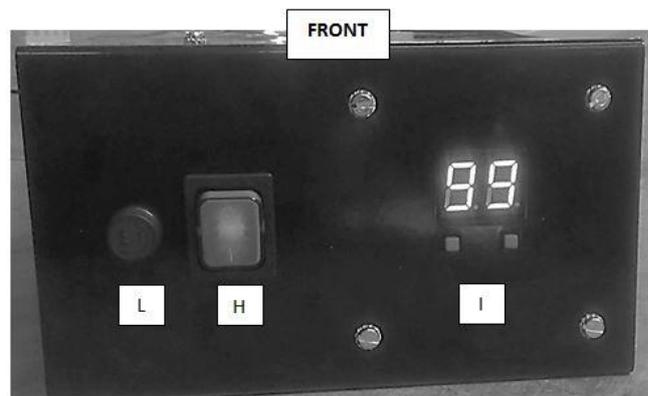
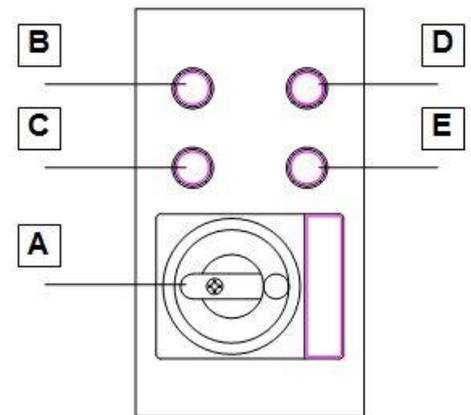
12. Tighten the socket head screw. (Use socket screw key **no. 2**).
13. Switch on the machine and the control unit corresponding to the replaced filament (switch **A, L**). Then turn the temperature regulator (knob **T**) to the highest position (position **100**).

The filament will then glow red.



Never touch the filaments and the reflectors when the machine is in operation.

14. Take hold of the end of the filament with pliers and loosen the socket head screw one half turn. (Use socket screw key **no. 2**).
15. Pull the filament taut and tighten the socket head screw. Check that the filament is straight. If not, repeat this operation.



A maintenance engineer should **always** be alerted when a fuse blows. Do not replace the fuse until the short circuit has been corrected.

14.1 SAFETY MEASURES

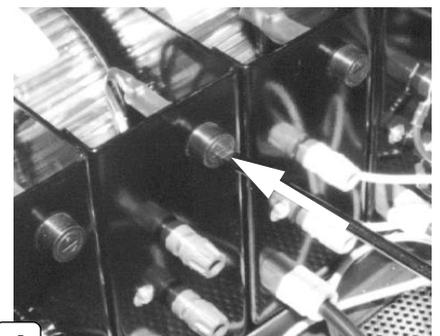
Before replacing a fuse always take the following safety measures:

1. Clear the working surface.
2. Switch the control units off one by one (switch **N**).
3. Switch off the main switch (switch **A**).
4. Remove plug from socket.
5. Allow the heating elements to cool for at least **10** minutes.



14.2 CONTROL UNIT FUSE

1. Remove a number of solid core strips at the front of the machine. (Use socket screw key **no. 5**)
2. Slide the heating elements backwards. (see Section **8**).
3. Slide the cover plate above the defective control unit backwards. (Use socket screw key **no. 5**)
The fuse is now visible at the back of the control unit.
4. Open the fuse holder by turning the button loose. The fuse will come out.



4

5. Replace the fuse and mount it in the reverse order.

N.B. Fuse **6,3x32mm; 5 AT**



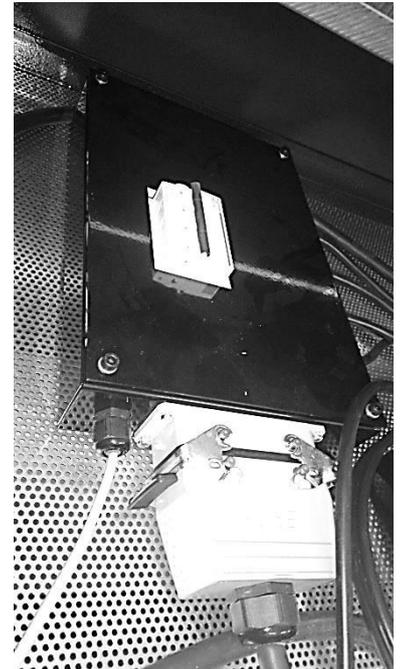
5

14.3 RESTORING CIRCUIT BREAKER

1. Remove a number of solid core strips in the centre of the machine.

The circuit breaker which is at the front of the main switch box is now visible. When the switch is down ("off"), the circuit breaker is switched off.

2. Switch on the circuit breaker by pushing the switch up.



2

14.4 TIMER UNIT FUSE

1. Remove a number of solid core strips in the centre of the machine.

The 3 fuse holders, which are on the backside of the Timer unit are then visible.

2. Open the fuse holder by turning the button loose. The fuse will come out.
3. Replace the fuse and mount it in reverse order.
N.B. Fuse **5x20mm; 2,5AT**

MACHINE SUMMARY

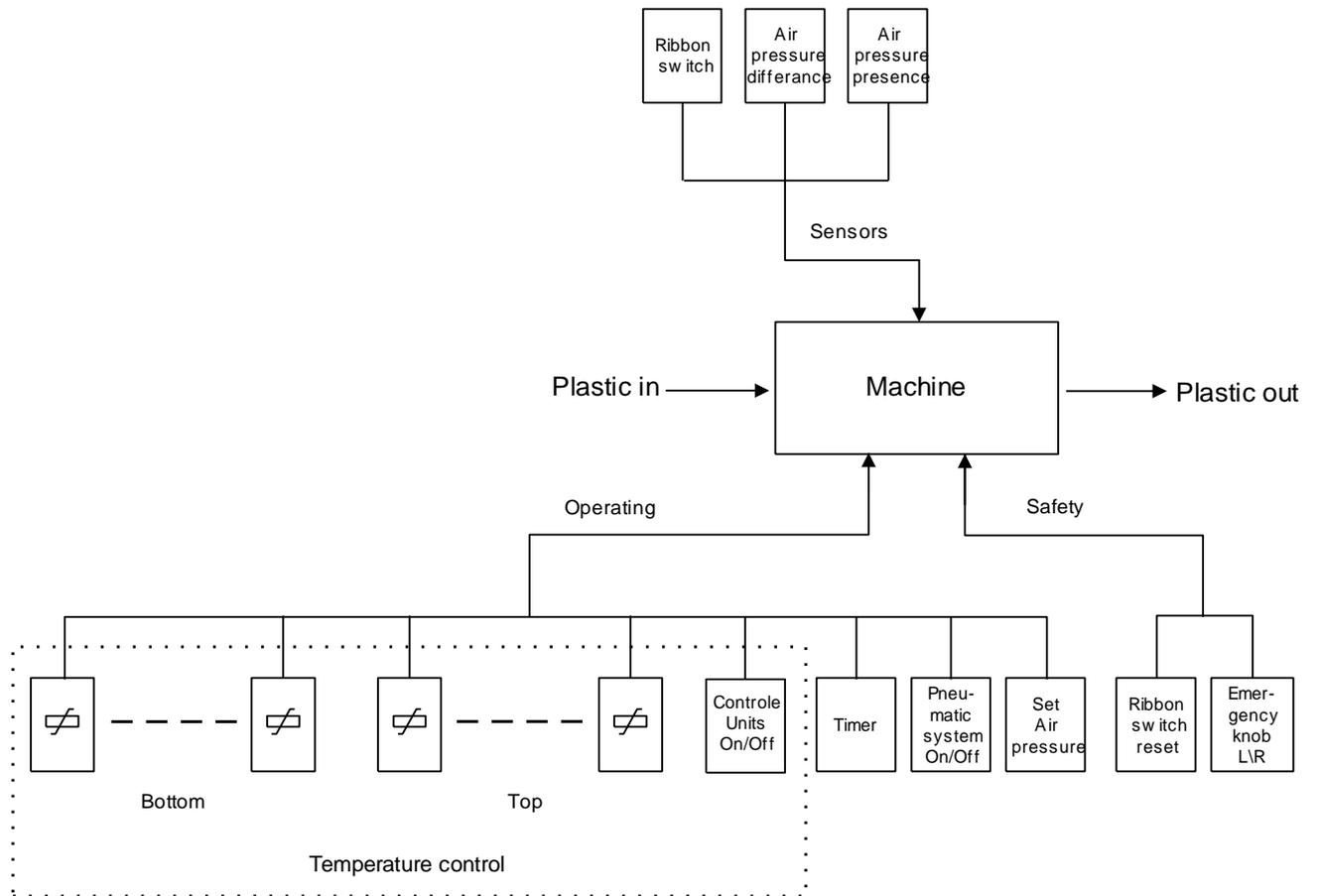
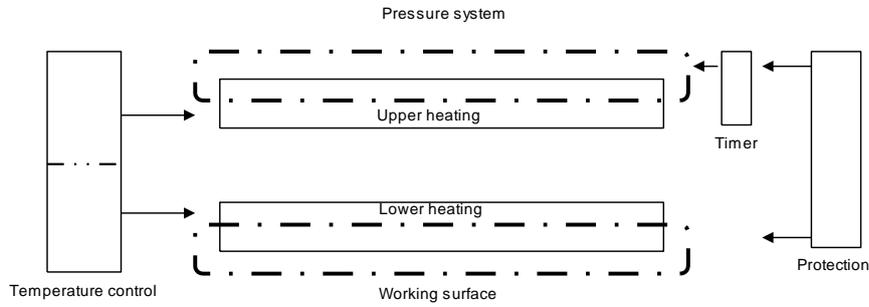


DIAGRAM CONTROL UNIT

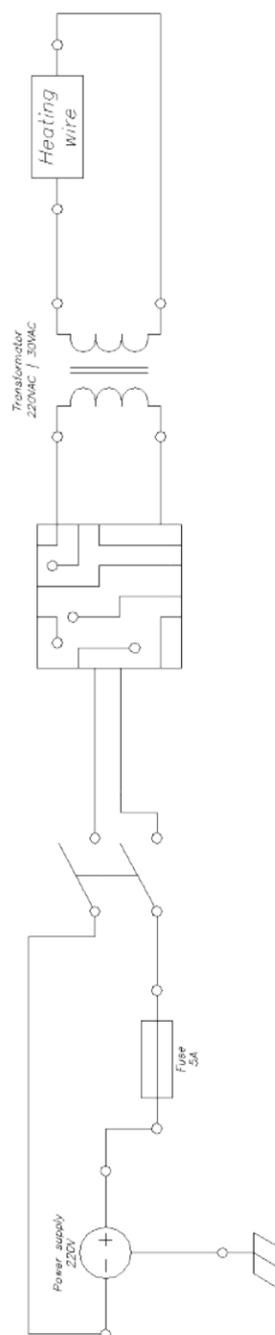
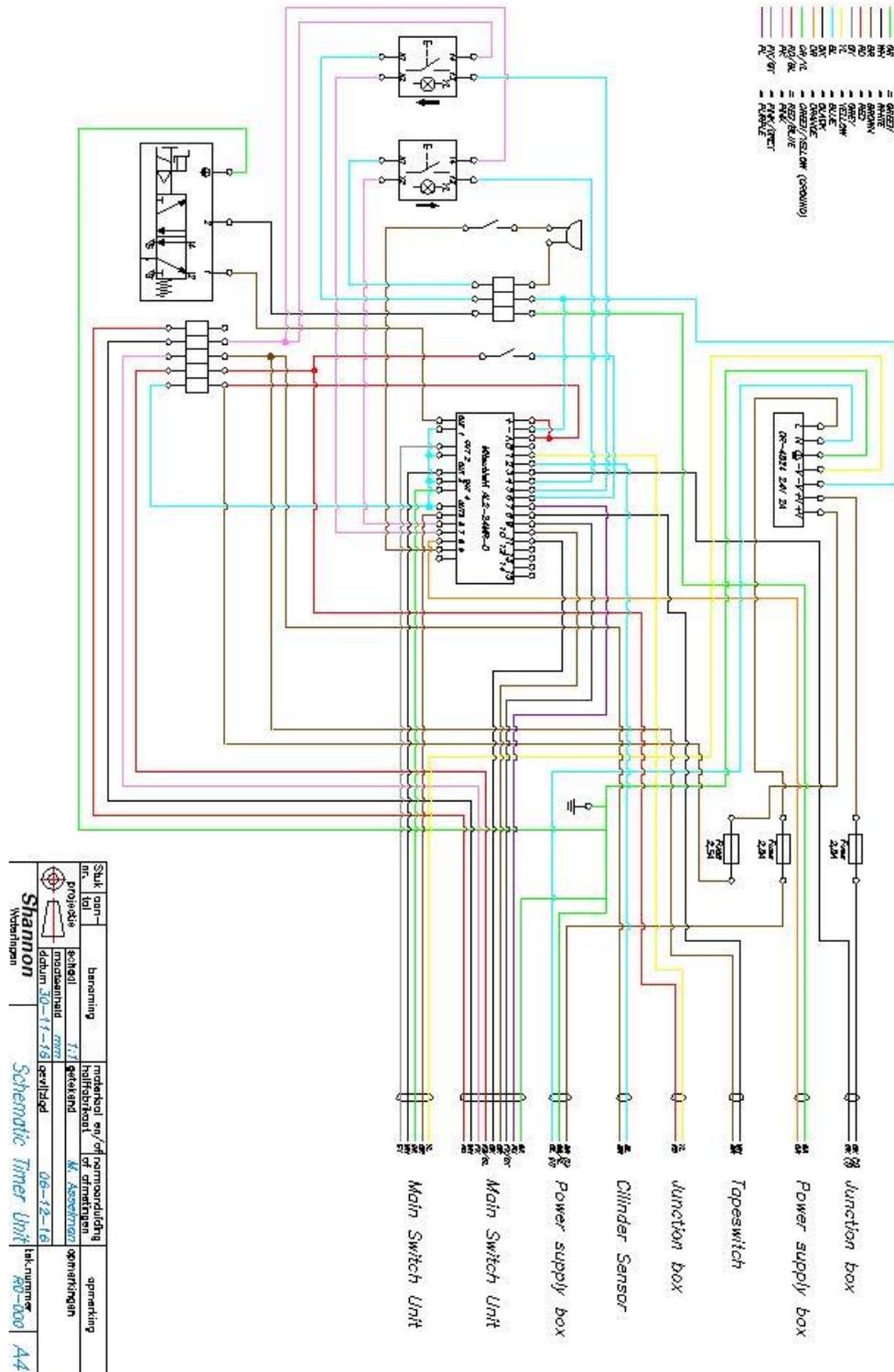
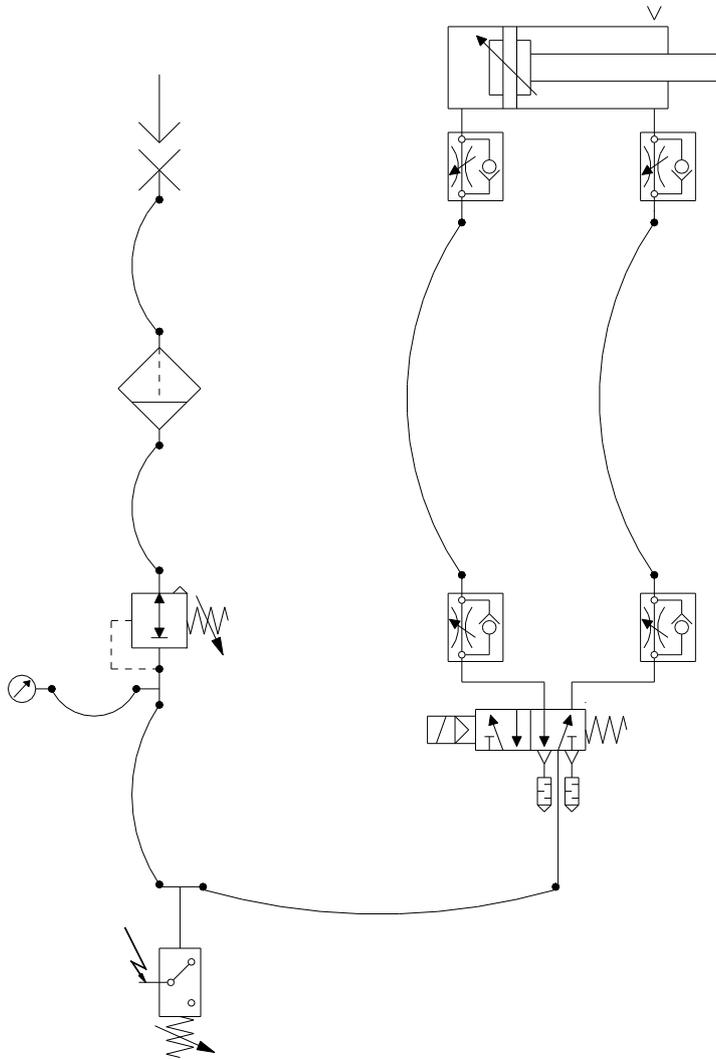


DIAGRAM TIMER UNIT

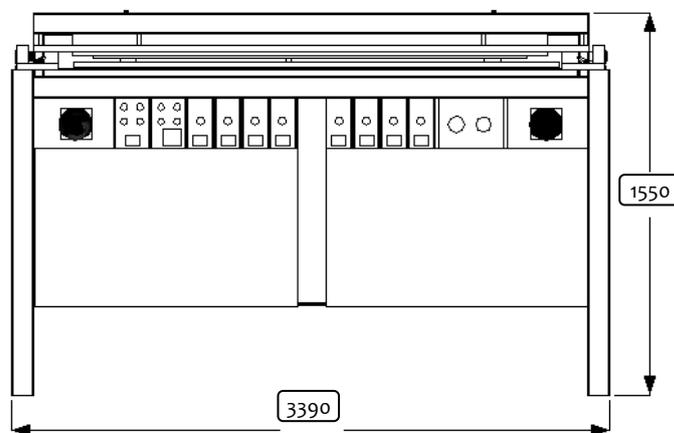
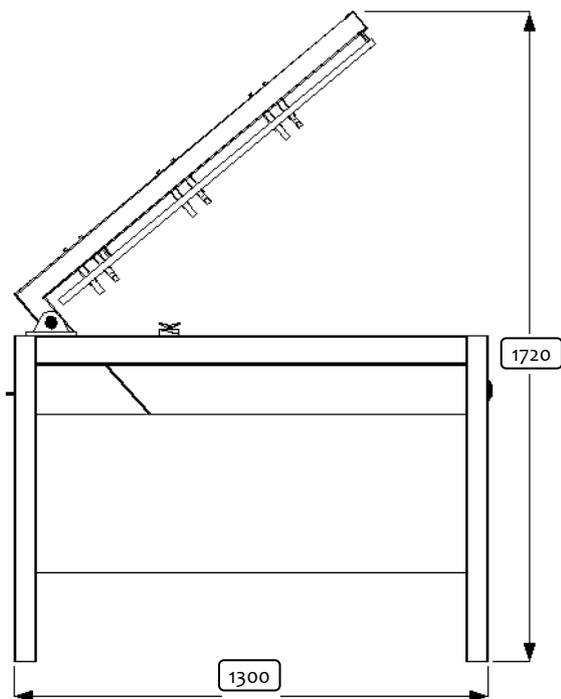


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	06-12-16		
	Schematic Timer Unit		
	ro-0001		A4

DIAGRAM PNEUMATIC SYSTEM



DIMENSIONS



OPTIONS

Additional heating elements can easily be fitted to the machine, both at the top and at the bottom.

All extensions and accessories are easy for the customer to mount and connect.

Non-standard sizes and quantities on request.

Control units

Maximum number of controls per machine: **8**

Each control unit controls one filament.

Heating elements

Heating elements are available in a variety of widths and with 1, 2 or 3 filaments.

Heating elements with 2 or 3 filaments are suitable for heating wide zones and for obtaining a large radius.

Water-cooled profiles to shield zones which are not to be heated are available on request.

Maximum number of heating elements bottom: 4

Maximum number of heating elements top: 4

Number of filaments per heating element	Reflector width*
1 filament	20 40
2 filaments	50
3 filaments	78

*dimensions in mm

All heating elements are provided with fastening material and connecting cables.

Service Contract

Shannon offers you an opportunity to take out a service contract. Let us tell you about it.

Spares

Part	Size/value
Filament under	3150 mm x Ø 1.6
Filament upper	2150 mm. x Ø 1.6
Fuse	5 AT
Timer unit fuse	2,5 mAT
Wire tensioning set	1.6 mm

ACCESSORIES

Shannon can supply various accessories and production equipment for the processing of plastic sheet.

Working length adjusting set

Working length adjusting set for heating one or more zones per bending line.

Thin sheet bending profile

A contact profile with anti-stick coating suitable for bending thin sheets from 0.3 - 2 mm.

Profile lengths:	500, 650, 1000 and 1250 mm
Ridge widths:	1 to 10mm
Number of ridge widths:	single and double
Special versions:	on request

Mould

In which to allow the bent product to cool. Adjustable to any desired angle.

Available lengths:	650, 1.250, 2.200 and 3.000 mm
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EQUIPMENT

Flame polishing equipment

To provide a glossy finish to edges, holes and slots in clear acrylic sheet.

Diamond polishing machines

To provide a glossy finish to edges of acrylic sheet, etc, to a thickness of 20 mm or 100mm.

Bending machines

Type HR	Standard ; 1 regulating unit and 1 underreflector with heating wire that is adjustable in height Working lengths; 500, 1.250, 2.200 and 3.000 mm.
Type HRT	Standard ; 2 regulating units and 2 underreflectors with heating wire that is adjustable in height. Reflectors and stop adjustable with scale calibration. Easily extendable up to 4 regulating units with 4 underreflectors. Working lengths; 650, 1.250, 2.200 and 3.000 mm.
Type HRK	Standard ; 4 regulating units and 4 adjustable under reflectors with heating wire that's adjustable in height. 2 upperreflectors, pneumatic pressuresystem and stop, all adjustable. Easily extendable up to 4 regulating units with 4 under- and 4 upperreflectors. Working lengths; 650 and 1.250 mm.
Type HRP/S	Standard ; 4 regulating units and 2 adjustable under reflectors with heating wire that is adjustable in height. 2 upperreflectors, pneumatic pressuresystem and stop, all adjustable. Easily extendable up to 4 regulating units with 4 under- and 2 upperreflectors. Working lengths; 2.200 and 3.000 mm.
Type HRP	Standard ; 4 regulating units and 2 adjustable under reflectors with heating wire that is adjustable in height. 2 upperreflectors, pneumatic pressuresystem and stop, all adjustable. Easily extendable up to 8 regulating units with 4 under- and 4 upperreflectors. Working lengths; 2.200 and 3.000 mm.
Type HRT/D	Standard ; automatic feed- and transport system for equal heating of big productions. 2 regulating units and 2 adjustable underreflectors with heating wire that is adjustable in height. 2 adjustable parallel stops. Can also be used as a normal HRT machine. Easily extendable up to 4 regulating units and 4 underreflectors. Working length; 3.000 mm.
Type HRP/D	Standard ; automatic feed- and transport system for equal heating of big productions. 4 regulating units and 2 adjustable underreflectors with heating wire that is adjustable in height. 2 upperreflectors, pneumatic pressure system, rollers and parallel stops, all adjustable. Can also be used as a normal HRP machine Easily extendable up to 8 regulating units with 4 under- and 4 upperreflectors. Working length; 3.000 under and 2.000 mm. upper.
Type FBM	Standard ; automatic bending- and transportsystem for big productions of thin foils (0,4 to 1 mm.) 2 regulating units with 2 upperreflectors with an adjustable distance between from 45 mm. up to 420 mm. Also provided with a vacuum feed system Working lengths; 650 mm.

SERVICE AND WARRANTY

Shannon gives one year's warranty on all parts with the exception of the filaments and/or heating elements. This warranty is inclusive of parts, call-out charge and labour.

The maximum replacement time for the control units is one working day. The user will then have to install and remove the unit himself.