

User's Guide
English

Plastic bending machine

HRT 65 - 125



 **SHANNON**

Plastic bending machine HRT 65-125



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Introduction

Congratulations on purchasing Shannon's plastic bending machine **HRT 65-125**. Read this guide completely before installing and using the machine.

We want to keep in contact and to know how you find the **HRT 65-125**. We are always willing to advise on the use of the machine and its accessories.

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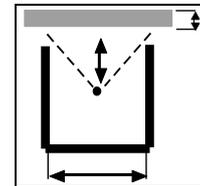
The **Shannon HRT** bending machine is a rapidly convertible machine for the production of large series of items with multiple bends for the plastic sheet processing industry.

- o The machine has two adjustable heating elements as standard. The temperature of which can be adjusted independently by electronic controls.
- o The filaments of the heating elements on the working surface are adjustable in height.
- o The workpiece can be heated from one side and it is possible to bend sheet up to 5 mm thick.
- 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.

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 coordinating the temperature, heated zone and the heating time all kinds of thermoplastic can be processed.



type		HRT 65	HRT 125
Assembly			
Control unit	Max.	2	4
Heating element	Max	2, fitted with single filament	4, fitted with single filament
Electrical			
Control unit	Voltage	220 – 240 V AC	
	Power	300 VA	500 VA
	Fuse	2,5 AT x2	5 AT x2
max. power:		600VA	2000 VA
connection		CEE 7/4 16A 2P+A	
Filament		0-17 V, 0-13 A ~	0-30 V, 0-13 A ~
Network connection		CEE 7/4 16A 2P+A	
Network circuit breaker		16 A	
Mechanical			
Gradation of stop		0-640 mm	
dimensions	[LxWxH]	835 x 680 x 160 mm	1470 x 850 x 160 mm
weight		40 Kg	60 kg**
Lifetime filament		±500 hours	
Functional			
Bending width		600 mm	1250 mm
Mutually extendible*		20-465 mm	20 - 610 mm
Sheet thickness*		1 - 5 mm	
Temperature filament	Max	20-550 °C	
Filament height adjustment		1 - 6 mm	
Ambient			
Temperature		18-30 °C	
Humidity of the air		50-80 % (no condensed)	
Miscellaneous			
set of socket screws keys		1 set [1½, 3, 5 mm]	
Spare fuse		4 x [6.3x32 2,5 AT] each controller	4 x [6.3x32 5 AT] each controller
Spare filament		1 x [∅0.9 x 750 mm] per element	1 x [∅0.9 x 1350 mm] per element

* Depends on the heating element

** Depends on the amount of controllers



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 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.

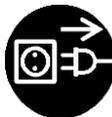
Be particularly careful of sleeves and always tie back long hair.

The machine may only be used for heating narrow zones in flat plastic sheets. Any other use could lead to very hazardous situations or cause damage to the machine!

The plastic sheets that have to be bent may never be thicker than 5 mm.



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

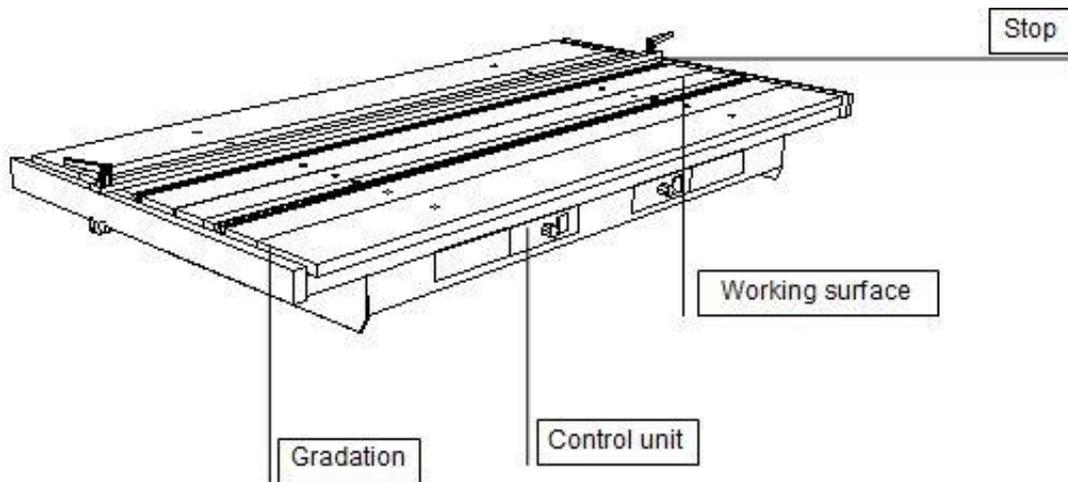


When servicing, switch off the machine and remove the plug from the socket.

Only switch on those heating elements which are needed.

Never leave the machine unattended without switching it off.

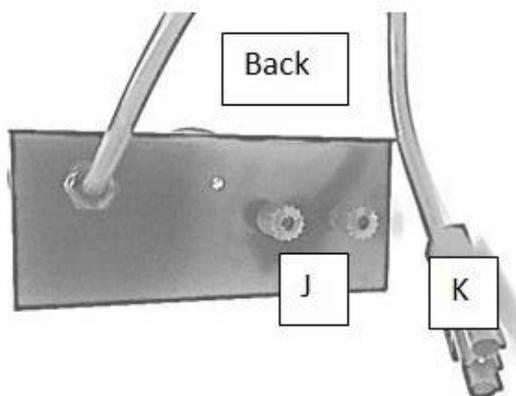
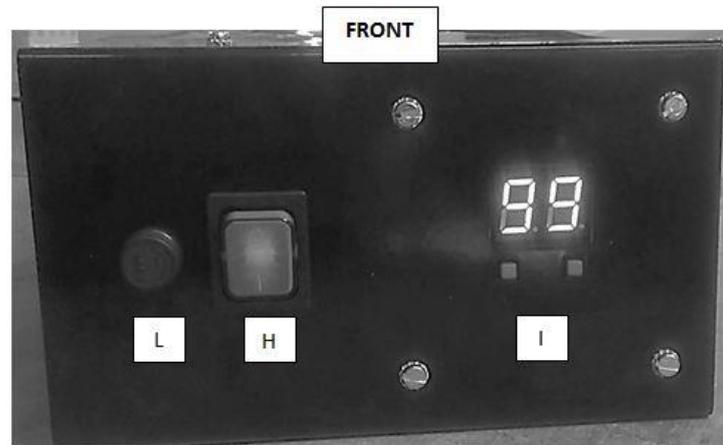
4.1 VIEW



4.2 CONTROL UNITS

The control units contain an electronic control with which the temperature of a filament is set.

- H Switch on/off
- I Temperature setting
- J Connection to filaments
- K Connection to 220 V AC
- L Fuseholder

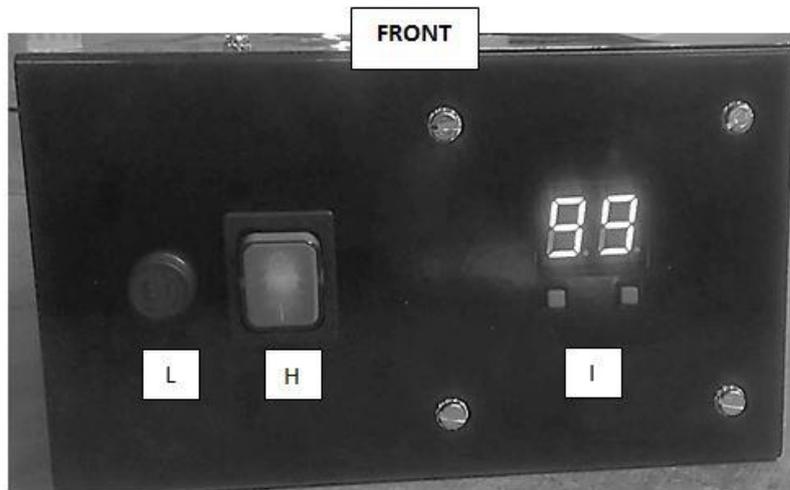


5.1 ASSEMBLY

1. Place the machine on a level floor with sufficient space around and above the machine.
2. Ensure that there is adequate ventilation and lighting at the workplace.
3. Avoid draughts, in order to prevent uneven heating.

5.2 CONNECTING MAIN VOLTAGE

1. Check that all switched of the control units are in the 0-position (Switch **H**).
2. Put the plug into the socket



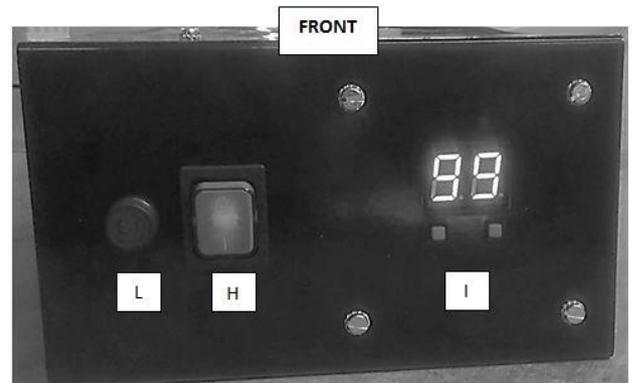
6.1 PREPARATION

1. Clear the working surface.
2. Check that all the heating elements are connected to the control units.
3. Check that no scraps of material remain in the reflectors.

6.2 SWITCHING ON HEATING ELEMENTS

Each heating element can be switched on and controlled individually.

Switch on the control unit with switch **H**.



6.3 SETTING TEMPERATURE

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

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.

6.4 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 connection 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

Adjustment

7.1 SAFETY PRECAUTIONS

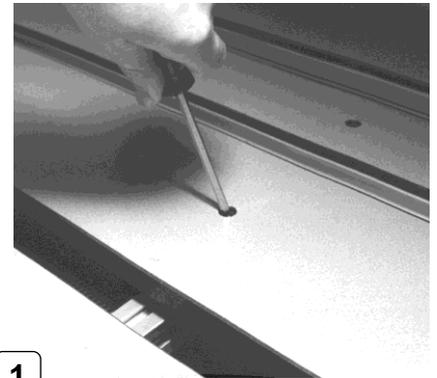
Always take the following safety precautions before adjusting the heating elements:

1. Switch off the heating elements one by one (Switch L).
2. Clear the working surface.
3. Allow the heating elements to cool for at least **10** minutes.



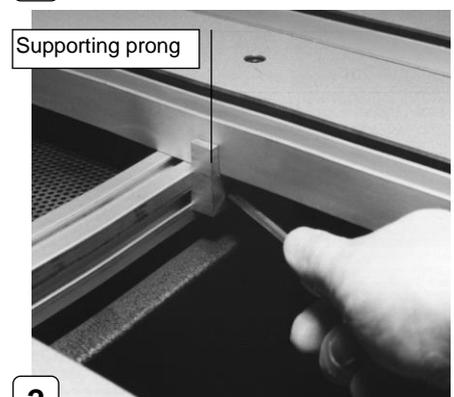
7.2 HEATING ELEMENT

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**).



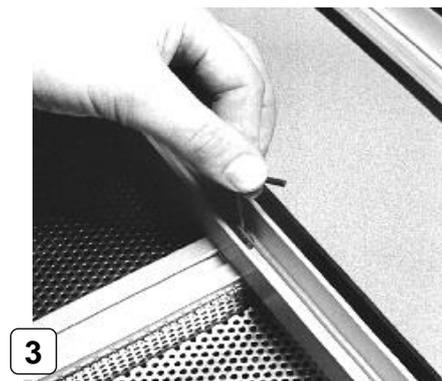
1

2. Loosen the socket head screws in the supporting prongs on the left and right of the heating element one half turn.

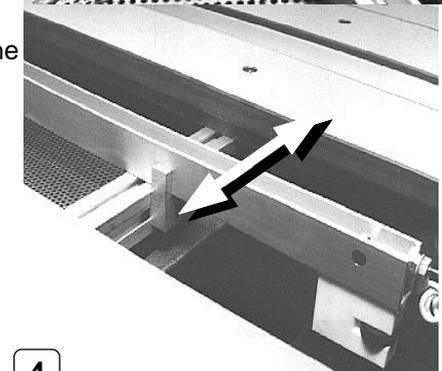


2

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.



5. Hold the heating element parallel to the front of the machine and the supporting prongs. This prevents the notched nuts in the X-profiles from binding.

6. Hand tighten the socket head screws, **starting** in the supporting prongs and **then** in the centre.

4

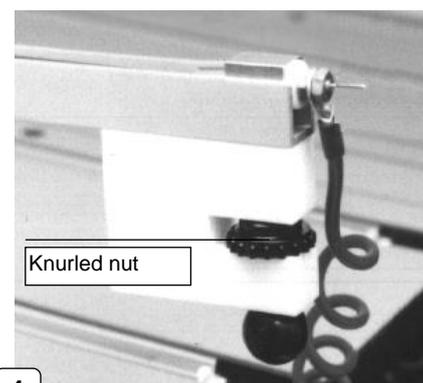
7. Position the other profiles in the same way if necessary.

8. 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-profiles, roughly level with the holes and then lay the solid core strip on top.

9. Switch on the machine again as in section 6.

7.3 FILAMENT HEIGHT

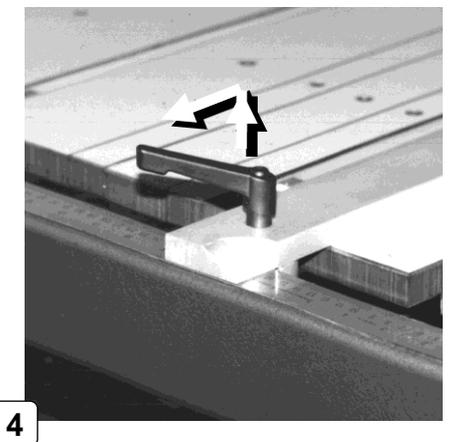
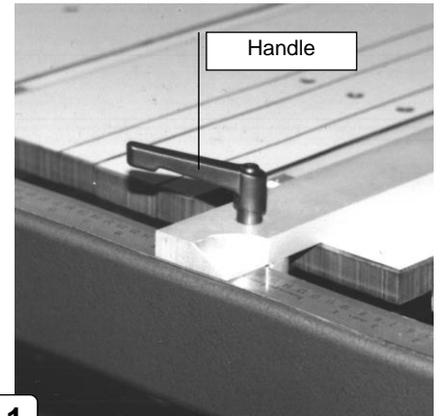
1. Adjust the height of the filament using the knurled nut. These can be reached from the sides. Make sure that the filament height is the same on both sides.



2. Start up the machine again as in Section 11.

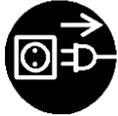
7.4 STOP

1. Loosen both the handles on the stop one half turn.
2. Slide the stop into the desired position.
3. Hold the guide parallel to the front of the machine. This stops the clamping blocks from binding.
4. Tighten the handles.
5. Pull the handle upwards against the spring pressure, and turn it outwards.

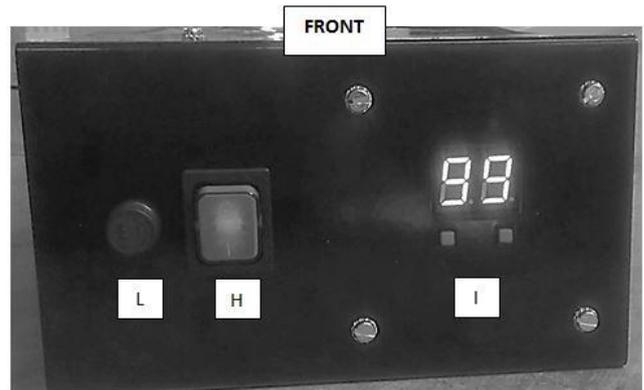


This machine needs little maintenance. Remove loose dirt once in a while.

8.1 SAFETY PRECAUTIONS



1. Switch of all regulating units (Switch **H**).
2. Clear the working surface.
3. Remove the plug from the socket.



8.2 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.

9.1 SAFETY PRECAUTIONS

Before tensioning and changing filament always take the following safety precautions.

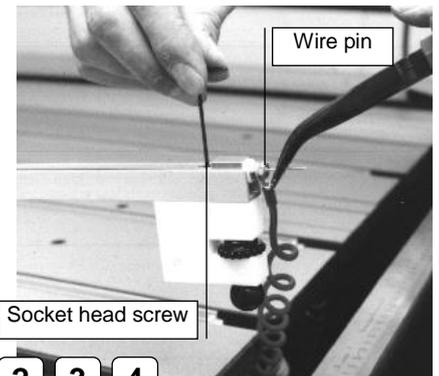
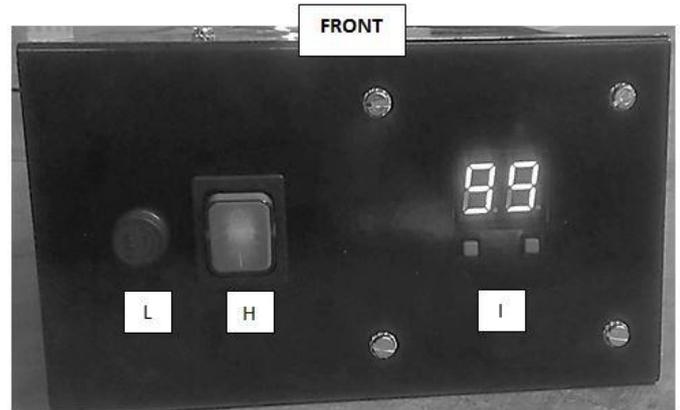
1. Clear the working surface.
2. Switch off the control units one at a time (Switch **H**).
3. Allow the heating elements to cool for at least **10** minutes.



9.2

TENSIONING

1. Turn the filament to the lowest position
2. Hold the end of the wire on the right with pliers, and undo the screw in the wire pin.
(Use socket screw key **No. 1½**).
3. Pull the wire taut with pliers and tension the spring.
4. Tighten the socket head screw firmly again.



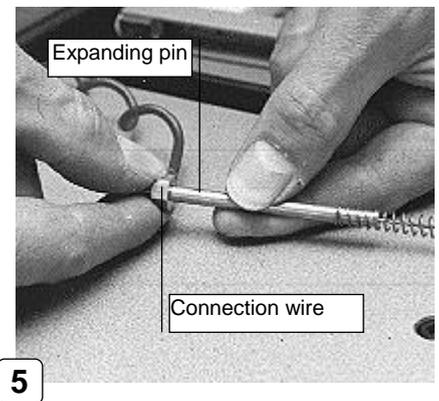
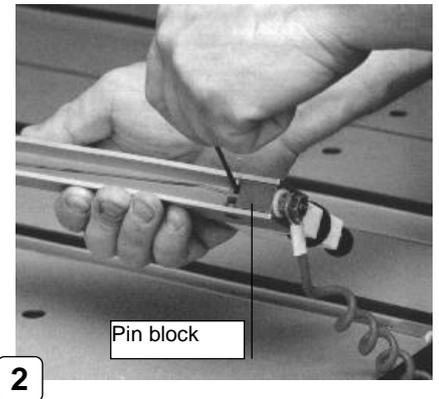
5. Cut off the end of the filament. Always leave **8-10** mm projecting in order to be able to tension the filament again.



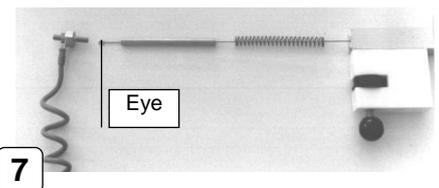
Attention! The end of the filament is sharp.

9.3 CHANGING THE FILAMENT

1. Turn the filament to the lowest position.
2. Unscrew the socket head screw in the wire pon on the right. (Use socket screw key **No. 1½**).
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).



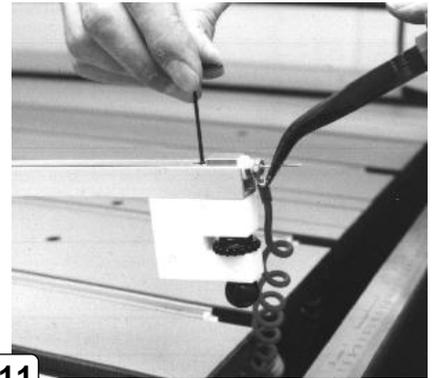
6. Remove the filament from the expanding pin and the wire pin.
7. Slide a new filament into the expanding pin, and make sure that the eye is pulled well into the pin.
8. Screw the expanding pin onto the connection wire (incl. connection wire), and attach firmly.



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 socket head screw (use socket screw key **No. 1½**).



12. Tighten the socket head screw (use screw key **No. 1½**).

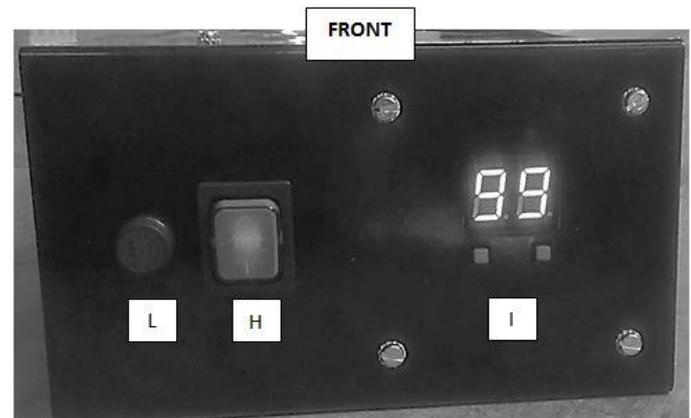
11

13. Switch on the machine and the control unit, corresponding to the replaced filament (switch **H**), then turn the temperature control (**I**) to the highest position (position **99**).

14. The filament will then glow red.



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



15. Hold the end of the filament with pliers, and loosen the socket head screw one turn (use socket screw key **No. 1½**).

16. 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.

10.1 SAFETY PRECAUTIONS

Before replacing a fuse, always take the following safety precautions.

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

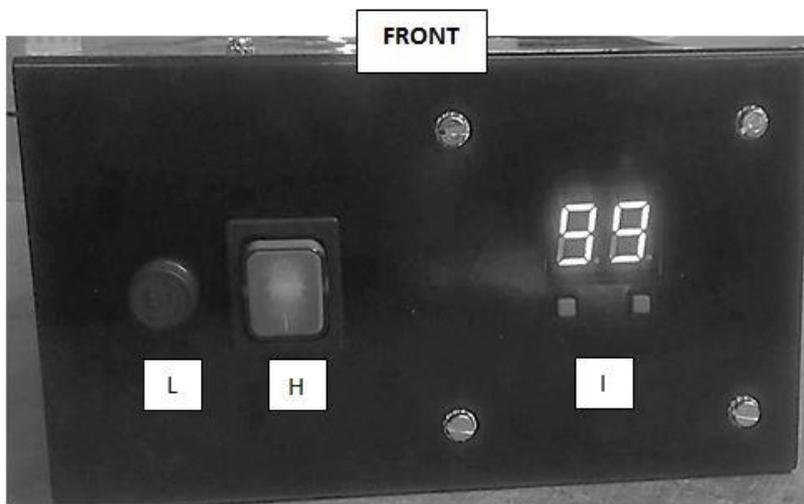


10.2 FUSES CONTROL UNIT

1. Open the fuse holder (**L**). Push it in slightly, and turn one-quarter to the left. The fuse will come out.
2. Verify and replace the fuse if necessary, in the reversed order.

N.B. Fuse **6,3x32mm**; **2,5 AT** 1 pieces per control unit for HRT 65.

N.B. Fuse **6,3x32mm**; **5 AT** 1 pieces per control unit for HRT 125.



OPTIONS

Additional heating elements can easily be fitted to the machine, both at the top and 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 **two** controllers for an HRT 65
Maximum **four** controllers for an HRT 125

Heating elements

Heating elements are available in a variety of widths and with 1 or 2 filaments.
Heating elements with 2 filaments are suitable for heating wide zones, and for obtaining a large radius.

Maximum **two** heating elements for the HRT 65.
Maximum **four** heating elements for the HRT 125.

Number of filaments per heating element	Profile width
1 filament	15 mm
	30 mm
2 filaments	30 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.

Spare parts

Part	HRT 65	HRT 125
Filament	∅ 0,9 x 750mm	∅ 0,9 x 1350mm
Fuse	2,5 AT	5 AT
Wise tensioning set	0.9 mm	

ACCESORIES

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

Working length reducing set

Working length reducing set for heating one or more zones per bending time.

Foil bending profile

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

Profile length:	500, 650, 1.000 and 1.250 mm.
Ridge widths:	1 to 10 mm.
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.

EQUIPMENT

Flame polishing equipment

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

Diamantpoliermaschinen

To provide a glossy finish to edges of acrylic sheets up to 20 mm thickness.

With ground tracks and adjustable feed speed control.

Also available with specially developed frame for stable feed of long sheets.

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 reflector with heating wire that is adjustable in height.
2 upperreflectors, pneumatic pressuresystem and stop, all adjustable.
Easily extendable up to 4 regulating units with 2 under- and 2 upperreflectors.
Working lengths; **2.00** 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 tot 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.

Special versions on request.

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.