

User's guide

English

Plastic bending machine

HRT 220 - 300



 **SHANNON**

Plastic Bending Machine

HRT 220 -300



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Introduction

Congratulations on purchasing the **Shannon HRT 220 or 300** 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 **HRT 220 or 300**. We are always willing to advise on the use of the machine and its accessories.

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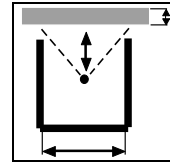
The **Shannon HRT** line heater is a rapidly convertible machine for the production of large series of items with multiple bends for the plastic sheet processing industry.

- 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 8 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 heating time all kinds of thermoplastic can be processed.



model	HRT 220	HRT 300	
Assembly			
control unit	2, (max 4)		
heating element	2, (max 4) fitted with single filament		
Electrical			
	voltage	power	fuse
control unit	220/240 V~	1000 VA	5 AT x2
max. power	4000 VA		
connection	CEE 7/4 16A 2P+A		
filament	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 (mm) (lxdxh)	2330 x 1000 x 185	3330 x 1000 x 200	
weight	100 Kg	175 Kg.	
life of filament	Approx. 500 hours		
Functional			
bending width	2000 mm	3000 mm.	
mutually extendible	20 – 610 mm		
sheet thickness	1 - 6 mm		
temperature range filament	20-550 °C		
filament height adjustment	1 – 6 mm		
Ambient			
temperature	18-30 °C		
humidity of the air	50–80 %		
Miscellaneous			
set of socket screw keys	1 x 2, 3, 5 mm		
spare fuse	4 x 6.3x32 5 AT		
spare filament	2 x Ø1,6 x 2350 mm	2 x Ø1,6 x 3150 mm	

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 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.

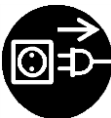
Never leave objects on the working surface.

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!



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

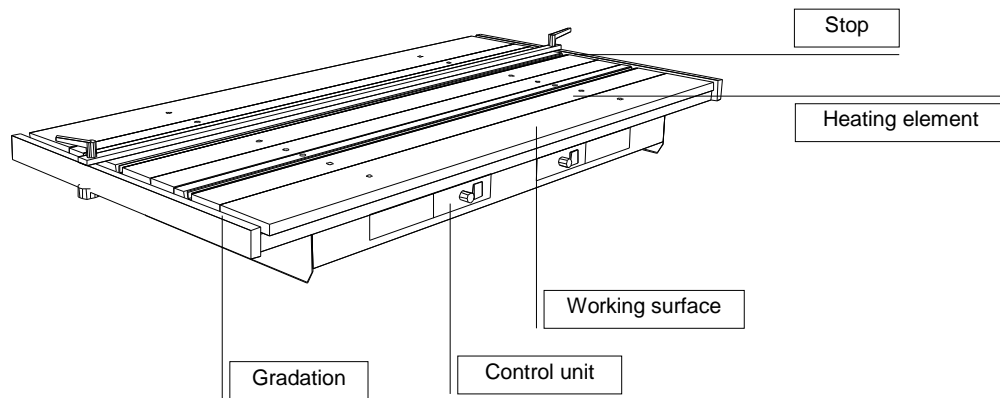


When servicing switch off the machine and remove the plug from the socket.

Only switch on those heating elements which are needed.

Never leave the machine unattended without switching it off.

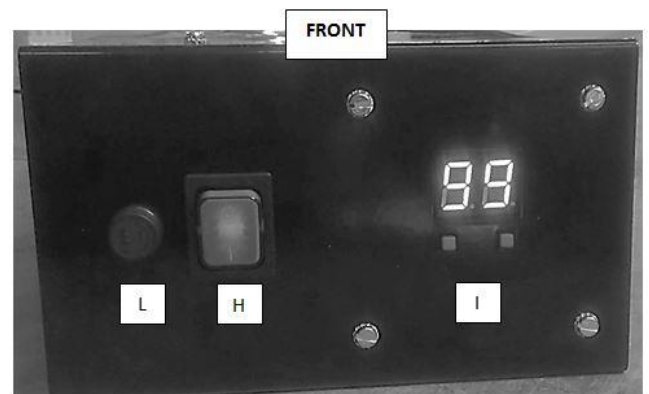
4.1 VIEW



4.2 CONTROL UNITS

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

- H Switch on/off.
- I Temperature setting.
- L Fuse holders



5.1 ASSEMBLY

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

5.2 CONNECTING MAINS VOLTAGE

1. Check that all control units are in position **O** (switch **H**).
2. Plug in the machine.

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

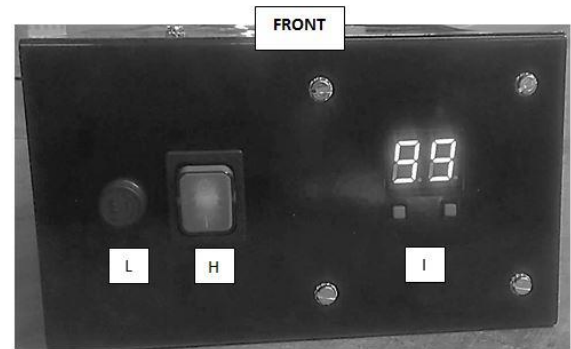
Each heating element can be switched on and controlled individually.

1. Switch on 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 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

7.1 SAFETY PRECAUTIONS

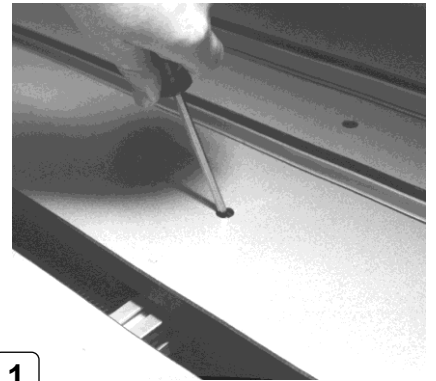
Always take the following safety precautions before adjusting the heating elements:



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

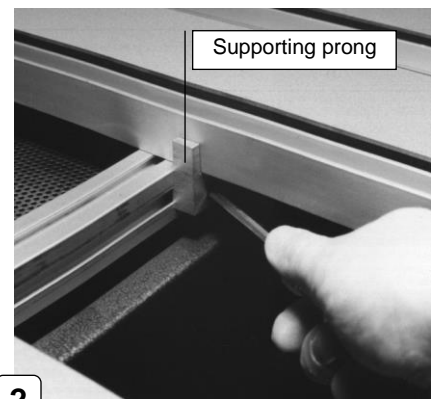
7.2 HEATING ELEMENT

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.

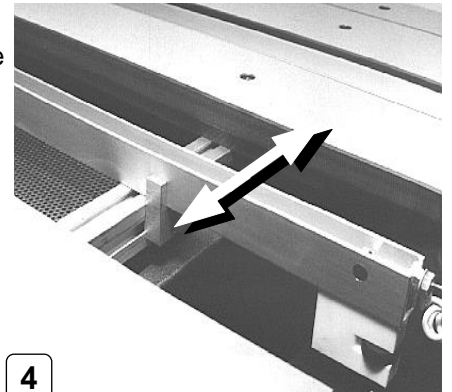


2

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. 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.



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.

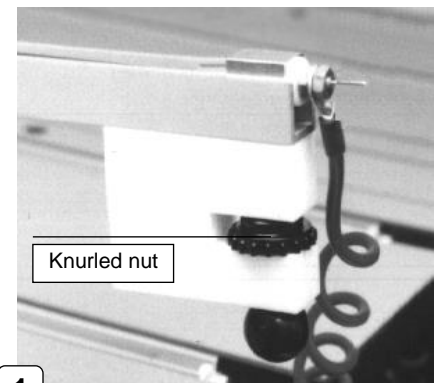
7. Fill up the space between the heating elements as far as possible with solid core strips and hand tighten them. First slide the notched nuts into the aluminium X-profile roughly level with the holes and then lay the solid core strip on top.

8. Switch on the machine again as in Section 6.

7.3 FILAMENT HEIGHT

1. Adjust the height of the filament using the knurled nut.

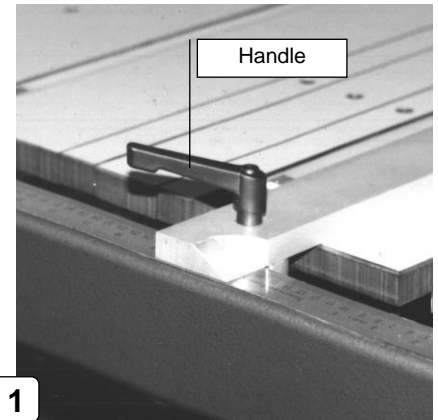
These can be reached from the sides. Make sure that the filament height is the same on both sides.



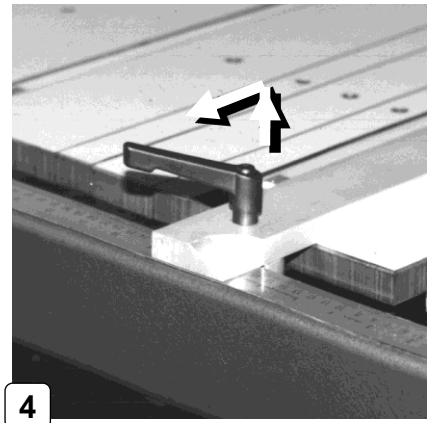
2. Start up the machine again as in Section 6.

7.4 STOP

1. Loosen both the handles on the stop one half turn.

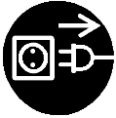


2. Slide the stop into the desired position.
Hold the guide parallel to the front of the machine. This stops the clamping blocks from binding.
3. Tighten the handles.
4. Pull the handle upwards against the spring pressure and turn it outwards.



This machine needs little maintenance. Remove loose dirt out of the machine 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

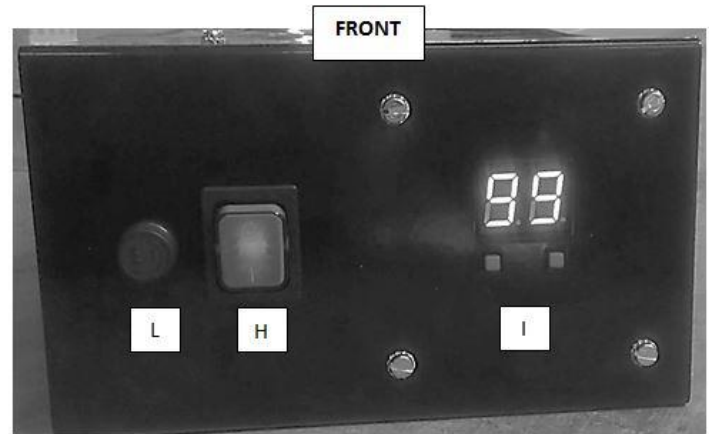
The heating elements work more effectively when they are clean. Remove dirt and deposits from the heating elements regularly. Blow away loose dirt and brush them clean.

9.1 SAFETY PRECAUTIONS

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

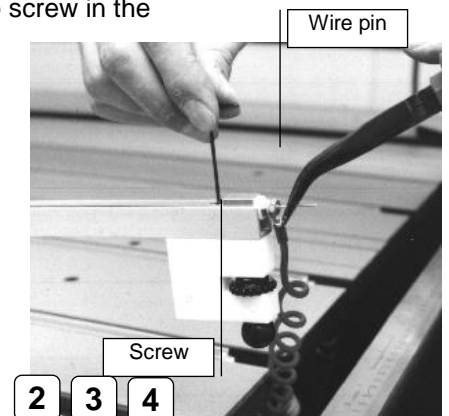


1. Clear the working surface.
2. Switch off the control units one at a time (switch H).
3. Allow the heating elements to cool for at least **10** minutes.



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 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.



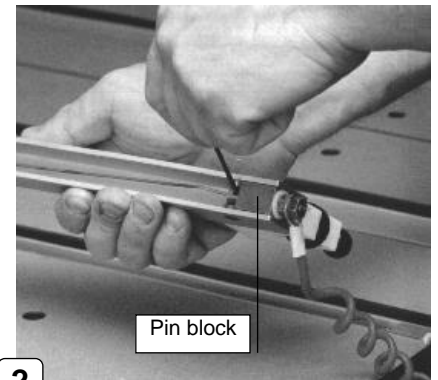
5. Cut off the end of the filament. Always leave **8-10** mm projecting in order to be able to tension the filament again. Bend the projecting piece down.



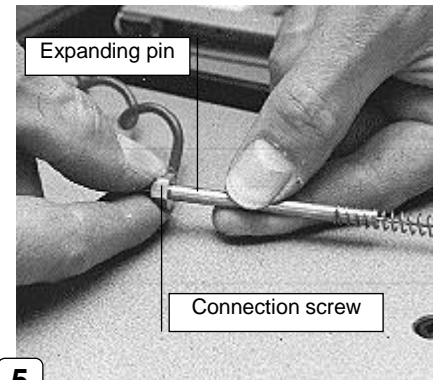
Attention! The end of the filament is sharp.

9.3 CHANGING

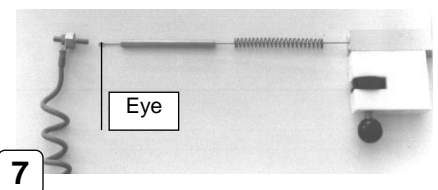
1. Turn the filament to the lowest position.
2. Unscrew socket head screw in the wire pin on the right. (Use socket screw key **no.2**).



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).



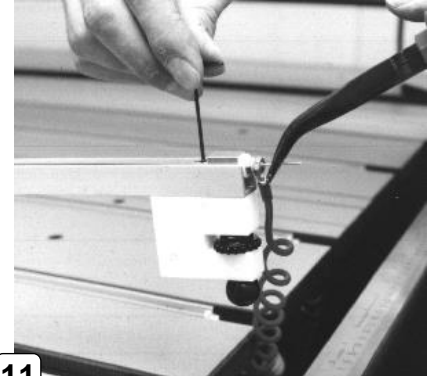
6. Remove filament from the expanding pin and the wire pin.
7. Slide a new filament into the expanding pin and make sure that the eye is pulled well into the pin.



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



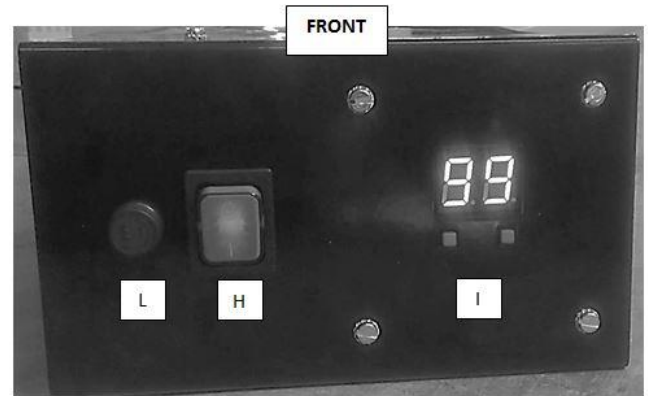
9. Slide the spring over the filament and slide the filament through to the expanding pin.
10. Slide the filament with expanding pin through the white insulation sleeve of the pin block and pull it through as far as possible.
11. Then insert the end of the filament in the wire pin. Pull it taut and tension 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 **H**). Then turn the temperature control (**I**) to the highest position (position **99**).

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 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.

10.1 SAFETY PRECAUTIONS

Before replacing a fuse always take the following safety precautions:

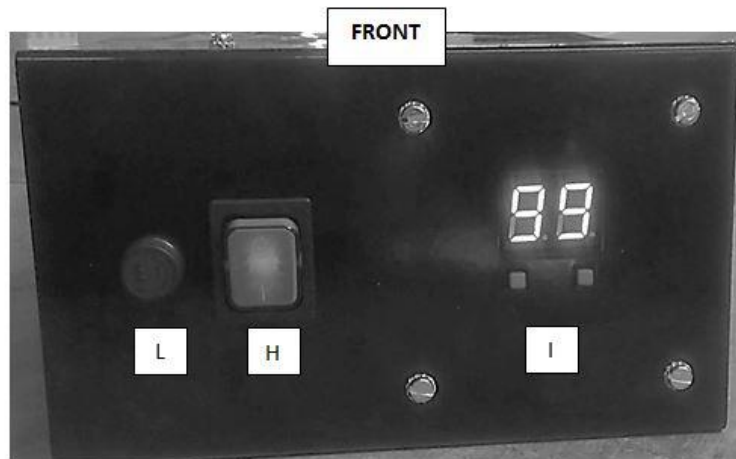
1. Clear the working surface.
2. Switch the control units off one by one (switch **H**).
3. Remove plug from socket.
4. Allow the heating elements to cool for at least **10** minutes.



10.2 CONTROL UNIT FUSE

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

N.B. Fuse **6,3x32mm; 5 AT** 1 piece1 a control unit.



OPTIONS

Additional heating elements can easily be fitted to the machine.
All extensions and accessories are easy for the customer to mount and connect.
Non-standard sizes and quantities on request.

Regulating units

Maximum number of controls per machine: **4**
Each regulating unit controls one filament.

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 number of heating elements: **4**

Number of filaments per heating element	Profile width*(internal)
1 filament	20 40
2 filaments	50

*measuring 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	HRT 220	HRT 300
Filament	Ø1,6 x 2350 mm	Ø1,6 x 3150 mm
Fuse	5 AT	
Wire tensioning set	1,6 mm	

ACCESSORIES

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

Working width of reducing set

Working width of reducing set for heating one or more zones per bending line.

Foil bending profile

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

Profile lengths:	500, 650, 1000 en 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.

EQUIPMENT

DIAMOND POLISHING MACHINES

Serie **EF-200** 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.