# Operating & Maintenance Instructions Triform 180

# 1. Introduction

Your new Triform 180 uses the hot wire principle for:

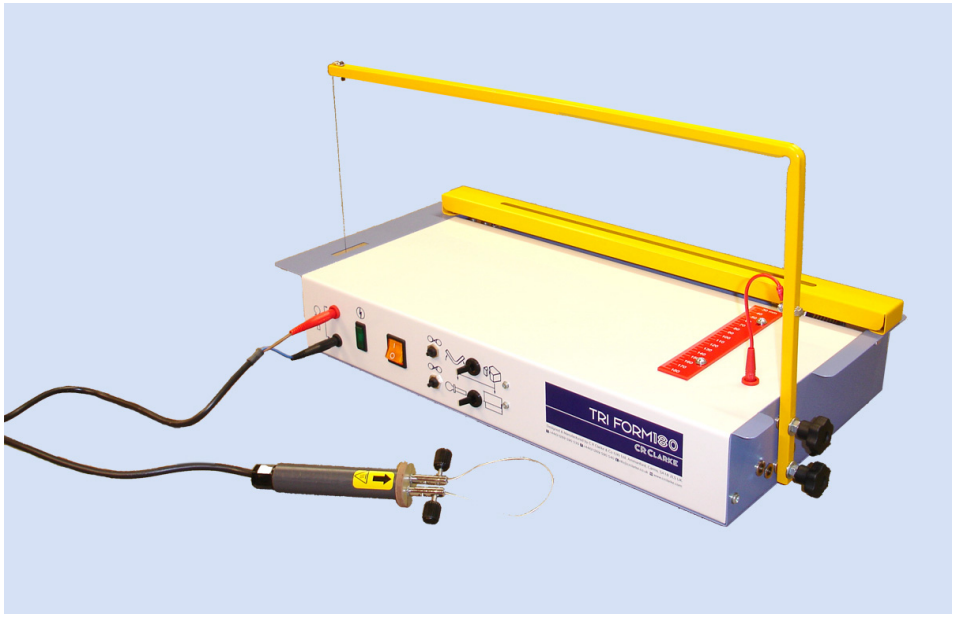
Local Line bending of thermoplastic material of 0.5 - 6.0mm in thickness Hot Wire Sculpting using a tensioned hot wire or alternatively a hand-held sculptor tool

The unit is compact and easily portable, and incorporates the following features:

***General***
Separate heating wires for line bending and sculpting, optimising performance in both modes
Toroidal transformer providing low voltage power to the heating wires

***Local Line Bending***
Guarded hot wire for safety Calibrated work table for easy setting of bend position In line bending mode, heating wire is constantly energised

***Hot Wire Sculpting***
Tilting wire bow, enabling the operator to cut at 90° , 67.5° , 60° and 45°
Pneumatic foot switch to energise the hot wire or sculptor tool only while cutting.
This provides safer operation and reduces fume emissions during cutting to a minimum.



# 2. Health & Safety Information

***Local Line Bending***
The line bending facility of the Triform 180 is designed for the heating of thermoplastic materials of between 0.5mm (0.020") and 6.0mm (0.250"). The machine should not be used for the heating of any other materials.

***Hot Wire Sculpting***
The hot wire sculpting facility, on both the wire bow and the sculptor tool, is designed for the cutting of expanded polystyrene of both the low density (normally white) and also the higher density (often blue) varieties. Note that only expanded polystyrene is to be cut with the Triform 180.

Styrene fumes can be produced as the material degrades when overheated. While cutting material, the cooling effect of the material being cut keeps the wire at a low enough temperature such that fumes are not given off. When there is no material being cut, the wire should be switched off to avoid overheating and subsequent fume emission. This is simply achieved on the Triform 180 with a footswitch, so that the wire is energised only when the footswitch is pressed.

The Triform 180 must always be used in well-ventilated conditions. No special extraction facilities are required. No more than five machines should be used in one room at any one time. At certain times, for example when cutting a piece of thin material after a piece of thick material, a small amount of fume is unavoidable. Effective ventilation should sweep these away immediately.

***Further Information***
Should you wish to know more about the Health and Safety of expanded polystyrene cutters, please contact the following organisations:

School Science Service
Brunel University
Uxbridge
UB8 3PH
UK
Publishers of "Risk Assessment for Technology in Secondary Schools"

British Standards Institute
389 Chiswick High Road
London
W4 4AL
Publishers of BS4163:2000 "Health & Safety for Design & Technology in Schools and similar establishments - Code of Practice"

# 3. Unpacking & Assembly

Your Triform 180 will require a minimal amount of assembly prior to it's first use. Proceed as follows:

***Unpack the Machine***
Carefully unpack the machine and check for any signs of transit damage. These should be reported to the manufacturer or their distributor within three days of receipt.

***Fit the Wire Bow (Refer also to Diagram 2 below)***
Remove the two handwheels (1) which are screwed into the machine casing for transit.

Pass one handwheel through the upper hole in the wire bow and screw back into the upper threaded insert in the machine casing.

Pass the second handwheel through the lower hole in the wire bow and screw into one of the lower threaded inserts in the machine casing.

Connect the cable plug (2) into the socket (3) in the table.

Gently push the wire bow downwards and hook the heating wire over the pin on the top face (4). Ensure that the wire locates in the groove on the end of the wire bow.

*Note : By fitting the lower handwheel into the appropriate threaded insert the heating wire can be set at 90 ° , 67.5 ° , 60 ° and 45 ° .*

To adjust the angle of the wire bow proceed as follows:

slacken the upper handwheel by 1 turn
remove the lower handwheel
adjust to the required setting
refit the lower handwheel
retighten the upper handwheel.

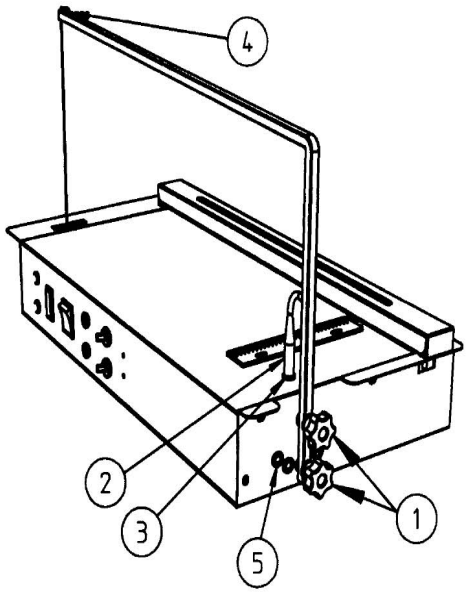



**Diagram 2**

# 3. Unpacking & Assembly (cont...)

***Fit the Sculptor Tool (Refer also to Diagram 3 below)***

Connect the two plugs on the end of the sculptor tool power lead (1) to the corresponding sockets on the control panel (2). Ensure that they are connected in line with their colour coding, i.e. red to red and black to black.

When not in use, the sculptor tool should be secured with the clips (3) on the side of the machine.

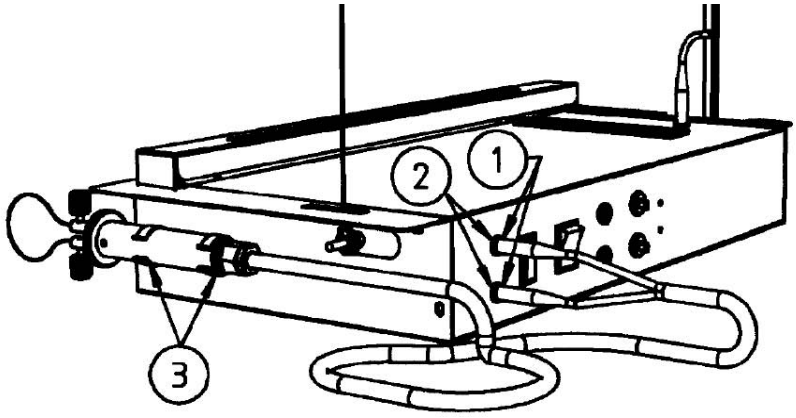



**Diagram 3**

***Fit the Footswitch and Mains Lead (Refer also to Diagram 4 below)***

Unpack the footswitch, and uncoil the connecting pipe.

At the rear of the machine, locate the footswitch connection (1), and remove the pipe locking nut (2).

Feed the pipe locking nut over the footswitch connecting pipe.

Push the footswitch connecting pipe onto the stub protruding from the footswitch connection.

Screw the pipe locking nut back onto the footswitch connection.

Connect the mains lead into the socket on the rear of the machine (3).

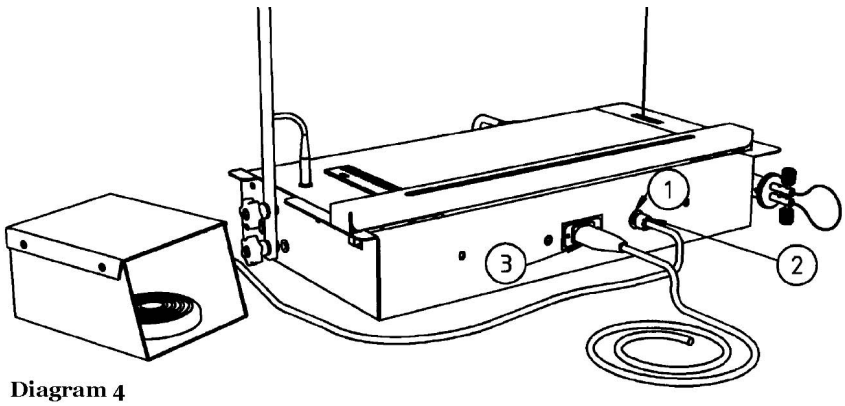



**Diagram 4**

# 4. Electrical Supply & Connection

The electrical specification of your new machine is as follows:-

| | |
|---|---|
| Voltage | 220/240AC 50-60Hz |
| Current (max) | 0.32A |
| Watts (max) | 75W |

Electrical supply to the machine must be in accordance with the details shown on the rating label. As the colours of the wires in this mains lead may not correspond with the coloured markings identified in your plug appliance, should the plug need to be changed proceed as follows:-

The wire which is coloured green and yellow must be connected to the terminal which is marked with the letter E or by the earth symbol or coloured green and yellow or green.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured blue or black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured brown or red.

***Should there be any queries regarding the electrical requirements of the Triform 180 please refer back to the manufacturer or their nominated distributor.***

# 5. Machine Operation

### *General (Refer also to Diagram 5 below)*

Plug the machine into a suitable mains supply. The green neon indicator (1) will illuminate. Switch the machine on at the mains switch (2) (I = On, O = Off). The switch will illuminate in amber. Check that both circuit breakers (3) are set (pushed in). Due to the inductive nature of the transformer winding, the circuit breakers may sometimes trip (pop out) while switching the machine on. With the machine still switched on, simply press the white button back in to reset.

### *Line Bending (Refer also to Diagram 5 below)*

Set the function selector switch (5) to the line bending position. The line bending wire will be constantly energised while the machine is switched on.

Slide the material under the guard (6), and position as required using either the red calibrated fence (7) or visually by looking down onto the material through the slot in the guard.

Note that the bend quality will be better if you load the material so that the face of the material which will form the outside of the bend is nearest the heating wire (i.e. the bottom face).

Heat the material until it is flexible.

Slide the material out of the machine and fold to the required angle. Either set in a cooling
jig or hold by hand.

Allow to cool.

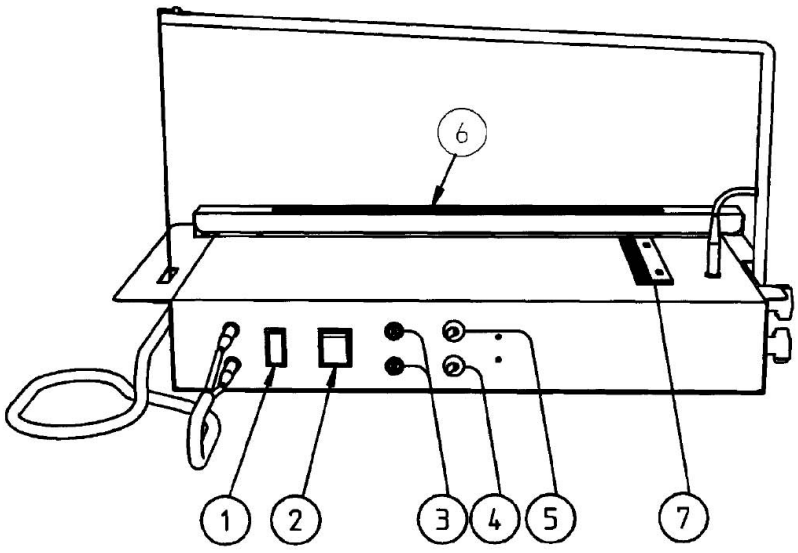
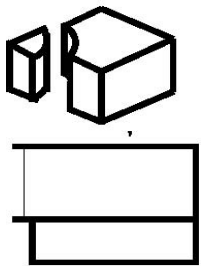



**Diagram 5**

# 5. Machine Operation (cont...)

***Polystyrene Cutting - Wire Bow (Refer also to Diagram 6 below)***



Set the function selector switch (1) to the cutting position.

Set the lower selector switch (2) to the Wire Bow position

The wire bow will be energised only while the footswitch is pressed.

Set the wire now to the required angle (refer to Section 3 above)

Position the material to be cut next to the heating wire.

Press the footswitch (3) to energise the heating wire.

Push the material so that the wire melts its way through the material. Note that, unlike a sawing process, there is no cutting pressure required.

When the wire is around 5mm from the end of the cut, release the footswitch and complete the cutting. This technique will eliminate any fume emission from the machine

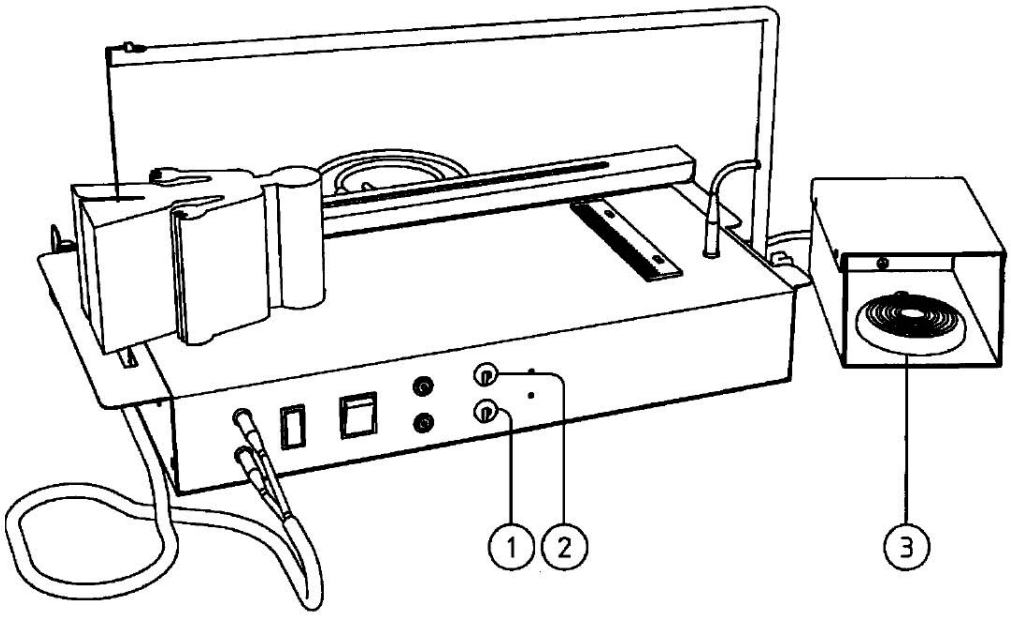
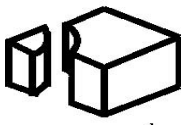



**Diagram 6**

# 5. Machine Operation (cont...)

***Polystyrene Cutting -Sculptor Tool (Refer also to Diagram 7 below)***

Set the function selector switch (1) to the cutting position.



Set the lower selector switch (2) to the Sculptor position

The sculptor tool will be energised only while the footswitch is pressed.

Remove the sculptor tool from its clips.

While the sculpting wire is cold, adjust it to the required shape.

Position the sculptor tool near to the material to be cut.

Press the footswitch (3) to energise the heating wire. Due to the thickness of the heating wire the sculptor tool will take 5-10 seconds to reach cutting temperature.

Move the sculptor tool so that the wire melts its way through the material. Note that, unlike a sawing process, there is no cutting pressure required.

When the wire is around 10mm from the end of the cut, release the footswitch and complete the cutting. This technique will eliminate any fume emission from the machine

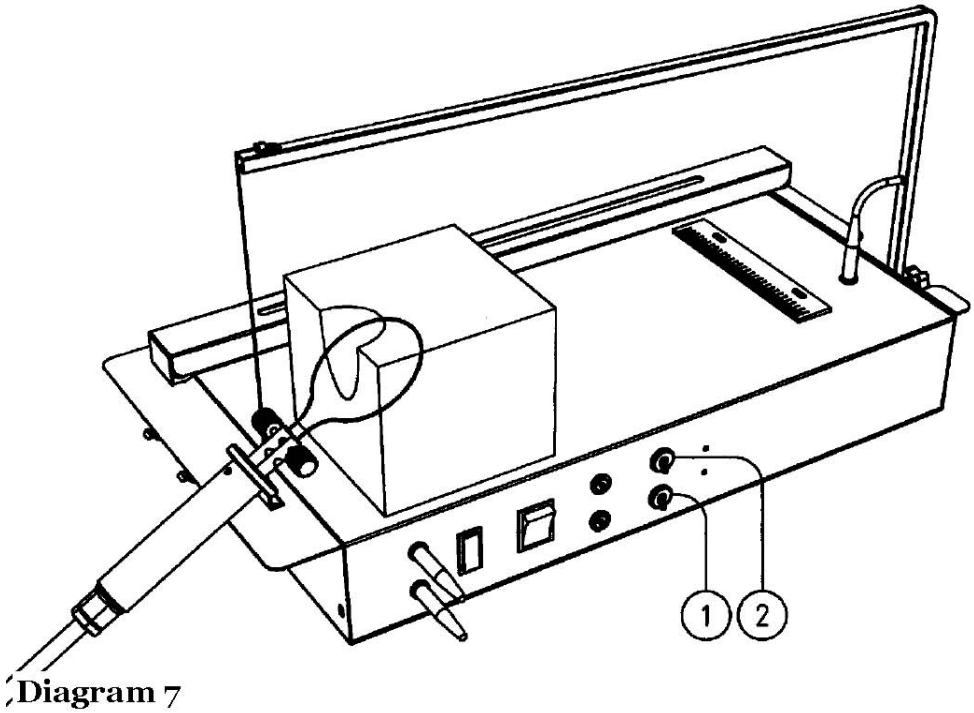



Diagram 7

# 6. Maintenance

***Changing a Heating Wire -Line Bending (Refer also to Diagram 8)***

Disconnect the machine from the electrical supply.

Remove the four guard securing screws (1), and lift the guard off.

Push in the tensioning bar (2), and remove the heating wire from its locating pins (3) and (4).

Fit the new wire over locating pin (4).

Push in tensioning bar (2), and fit the wire over locating pin (3).

***Note: during manufacture, washers may be fitted onto the wire locating pins to adjust the wire height. If fitted, these should be left in position below the heating wire terminals.***

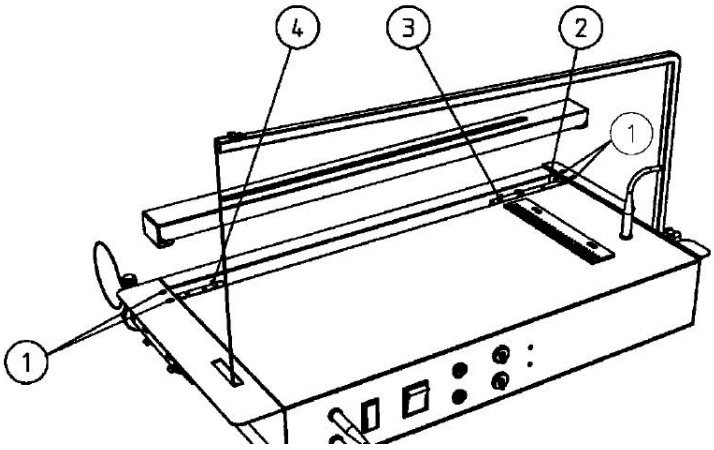



**Diagram 8**

***Replacement Wire Part No 180/99***

***Changing a Heating Wire -Wire Bow (Refer also to Diagram 9)***

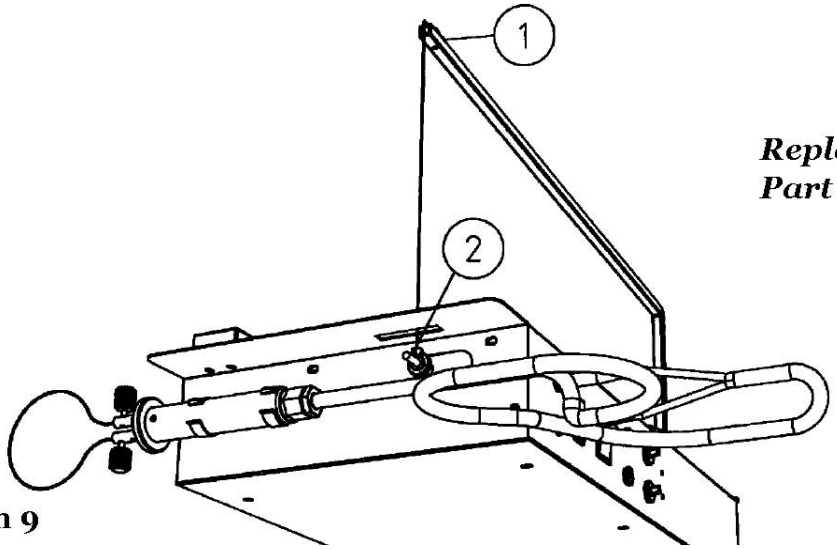
Disconnect the machine from the electrical supply.

Push down the Wire Bow (1), and remove the heating wire from its locating pin.

Using an 8mm spanner, remove the outer nylock nut (2), and remove the heating wire from the lower terminal.

Fit the new heating wire to the lower terminal, and refit the nylock nut (2). Note that this nut is only to position the wire, the wire should be free to pivot as the bow is moved to different angles.

Push down the Wire Bow (1) and fit the new wire onto its locating pin. Ensure that the wire locates in the groove on the end of the wire bow.




***Replacement Wire***
***Part No 180/98***

**Diagram 9**

# 6. Maintenance (cont...)

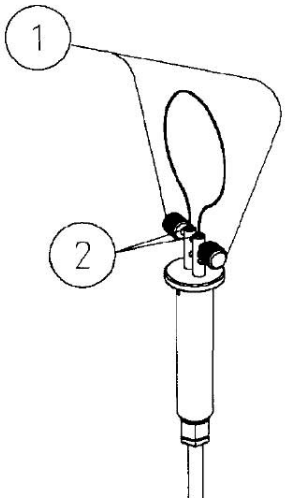
***Changing a Heating Wire -Sculptor Tool (Refer also to Diagram 10)***

Disconnect the machine from the electrical supply.

Slacken the thumbscrews (1), and remove the old heating wire.

Form the new heating wire into a loop, and fit into the holes in the ends of the terminal posts (2).

Retighten thumbscrews (1), taking care not to overtighten and damage the heating wire.




***Replace with 20SWG (0.9mm diameter) 80/20 Nickel-chrome wire (available as a 10 metre roll-Part No 900/32). Cut to 255mm long.***

**Diagram 10**

Should there be any other problems or queries regarding your Triform 180 please refer back to the manufacturer or their nominated distributor.

# 7. Electrical Connection Diagram