Operating & Maintenance Instructions 600 Hot Wire Strip Heater

Table of Contents

1.	Introduction	. 2
2.	Specifications	. 3
3.	Electrical Supply & Connection	.4
4.	Bend Angle Stop Assembly	. 5
5.	Machine Operation	. 6
	Example for producing a photo frame in 3mm acrylic	.7
6.	Heating Characteristics	. 8
7.	Maintenance & Wire Height Setting	. 9
8.	Circuit Protection	10
9.	Connection Diagram	11

1. Introduction

The Model 600 is a sheet bending heater working on the hot wire principle which provides extremely close control over bend characteristics and is particularly suited to the 1-3mm (0.040 - 0.125") thickness range, although up to 6mm (1/4") thickness can be comfortably accommodated. The unit is of rugged construction, compact and easily portable and incorporates a number of features such as work clamping and bend angle setting stop, unique for a machine in its price range. The electrical supply to the hot wire is supplied from a safety screened low voltage transformer providing two power settings, maximum operating voltage 15V•AC. The machine is available in 110-115V and 220-230V versions - please check the rating label on your machine to ensure compatibility with your electrical supply. All the high voltage components are contained within the main enclosure and are fully earth bonded where necessary. The transformer primary is protected by a motor rated (anti-surge) fuse fitted above the mains inlet, with a resettable circuit breaker on the control panel protecting the secondary winding.



2. Specifications

The 600 is available in two electrical specifications:-

220-230V 50-60Hz 110-115V 50-60Hz

Appropriate plug and lead sets are supplied to suit your electrical supply.

The voltage and frequency requirements for your machine are stated on the rating label affixed to the left hand side of the control enclosure.

Power consumption (all machines):	0.14kW
Weight (all machines):	14kg / 31lb

This machine complies with the European EMC Directive and Low Voltage Directive, as detailed in the Declaration of Conformity in this Manual, and carries a CE Mark.



3. Electrical Supply & Connection

The 600 is fitted with an IEC mains input socket, and is supplied with a mains lead appropriate for the supply voltage / market area. Moulded on plugs are supplied where appropriate. The wires in the mains lead are coloured in accordance with the following code:-

UK / European Mac	American Ma	American Machines		
Green & Yellow	Earth	Green	Earth	
Blue	Neutral	White	Neutral	
Brown	Live	Black	Live	

As the wires in this mains lead may not correspond with the coloured markings identified in your plug appliance, proceed as follows:-

UK / European Spec Machines - 220-230V & 110-115V

The wire which is coloured green & 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.

American Spec - 110-115V

The wire which is coloured green must be connected to the larger pin which is coloured green.

The wire which is coloured white must be connected to the silver coloured pin.

The wire which is coloured black must be connected to the brass coloured pin.

American Spec - 220-230V

The wire which is coloured green must be connected to the larger pin which is coloured green.

The wires which are coloured white and black must be connected to the two smaller pins. Polarity of these wires is unimportant.

4. Bend Angle Stop Assembly

To avoid damage these stops are supplied loose for assembly by the customer upon receipt of the machine. The stops comprise of the following items:-

2 off stop rods - threaded2 off plastic handwheels2 off M6 spring washers2 off M6 nuts

To fit, raise the outer red handle on the right hand side thus lowering the bending angle stop located at the rear of the machine. Feed the stops through the holes provided in the top table, from the rear of the machine, and screw into the threaded inserts located in the front edge of the aluminium work table. Continue threading through the threaded inserts until approximately 25mm of thread is visible. Spin an M6 nut onto each rod followed by a spring washer and a handwheel, approximately 6-8 turns of thread engagement is recommended for the handwheel and lock in position using a 10mm AF spanner. The backstop can now be operated where upon it will contact the round nose of the stop rods and adjustment of the handwheels will illustrate the mode of operation.

5. Machine Operation

Plug the machine into a suitable mains supply, and the green "Mains Available" neon will illuminate. Switch on the machine at the mains switch (I = On, O = Off). Within a few seconds of switching on the hot wire will begin heating and working temperature will be achieved in approximately 20 seconds.

SWITCH OFF WHEN NOT IN USE AND WHEN SETTING OR ADJUSTING KEEP FINGERS CLEAR OF HOT WIRE

To produce a bend, set the work stop using the calibrations provided or a rule measuring from the heating wire for absolute accuracy. Lift the clamping beam and latch into the loading position by pulling up and back. Load workpiece and release clamp beam.

Select the desired energy setting and wire height. Generally, low energy and close wire proximity produces a very local bend for thin materials. Higher energy will radiate heat over a wider band. Thicker materials will be over-heated on the face nearest the heating wire before penetration is complete and the heat line will be too concentrated, increasing the work/wire air gap simultaneously reduces the face temperature and increase the width of the heat band, a desirable feature for thicker materials (i.e. 4-6mm). Initial setting recommendations are provided on the control panel and are based on Cast Acrylic. PVC will be similar. Polystyrene will respond faster because of its lower forming temperature.

Example for producing a photo frame in 3mm acrylic:



1. Marking out bend line on material.



3. Heating and bending material.



2. Position material on Strip Heater.



4. Setting correct bend angle.



5. After 2 bends, a photo frame is Produced



6. Samples of line bending.

6. Heating Characteristics

When heating from one side a section of the penetration pattern is shown in Fig. 1. If the face nearest the heating wire ultimately forms the outside of the bend, the majority of the forming will be stretching and a tight inside radius will be achieved. Upon completion of a satisfactory heating cycle, bend by hand and flip up the rear bend angle stop using the handle located on the right of the work table. Minor adjustment to final bend angle can be achieved using the two screw adjusters, with the machine switched onto the low setting, and once correct bend angle has been established, switch off the machine to allow the workpiece to cool. On some pieces, the bend angle stop can be left resting under the workpiece during heating, upon reaching a flexible state the material will be automatically folded. Always ensure that the component can be removed from under the clamp beam after cooling using the rear bend angle setting stop. If this is not possible bend and cool remote from the machine, or take the clamp beam off by removing the screws securing it to the uprights at each end.



Figure 1.

7. Maintenance & Wire Height Setting

Little routine maintenance is required, mechanical moving parts are not likely to require any predictable attention. Wire height is critical if established settings are to be repeated successfully and during assembly the wire is positioned 3mm (1/8") below the worktable face with the adjustment levers fully down (i.e. minimum work / wire air gap). To check this setting, place any suitable straight edge (a piece of acrylic sheet is ideal) under the clamp beam and carefully check the measurement using an engineers rule. Check at a point as close as practicable to the extreme ends of the stretched wire. To adjust, slacken the two plastic thumb screws mounted on the height adjustment levers. Adjust wire height by applying pressure in the appropriate direction to the outer (wire supporting) stainless steel spring leaf. DO NOT SLACKEN THE TWO MOUNTING SCREWS AND NUTS RETAINING THE STAINLESS SPRING LEAVES, IF SUFFICIENT PRESSURE IS APPLIED FINE ADJUSTMENT WILL BE FOUND POSSIBLE (See Fig. 2). The 3mm (1/8") setting recommendation is considered ideal for normal use. If it is found that workpieces are being consistently overheated, it may be increased to 4mm (5/32"). When satisfied with the setting, tightening of the plastic thumbscrews will ensure that the set height will be retained during normal handling and use.



Thin Materials

The heating wire is 20SWG (0.9mm / 0.036" diameter) 80/20 Nickel Chrome resistance wire and a spare wire is attached to the underside of a new machine. For bending very thin sheet (less than 0.5mm/0.020") a narrow line of heat will reduce the tendency to "corrugate". This can be achieved by using 25SWG (0.5mm/0.020" diameter) 80/20 Nickel chrome wire as both width of heat band and power will be reduced.

8. Circuit Protection

Transformer protection is achieved by a primary fuse situated above the mains input plug and a secondary resettable circuit breaker on the control panel. In the event of excessive demand or a fault either the fuse will blow or the circuit breaker trip, preventing any damage to the transformer. Replace the primary fuse only with 1.25 in. glass cartridge fuses. Fuse ratings are as follows:-

> 110-120V 2A-T 220-230V 1A-T

The secondary circuit breaker pops out when tripped, and is reset by pushing back in.

In the event of electrical problems please refer to the manufacturers or a qualified electrician.



9. Connection Diagram