

OPERATOR MANUAL Mk501 SEAM SEALING MACHINE

CE

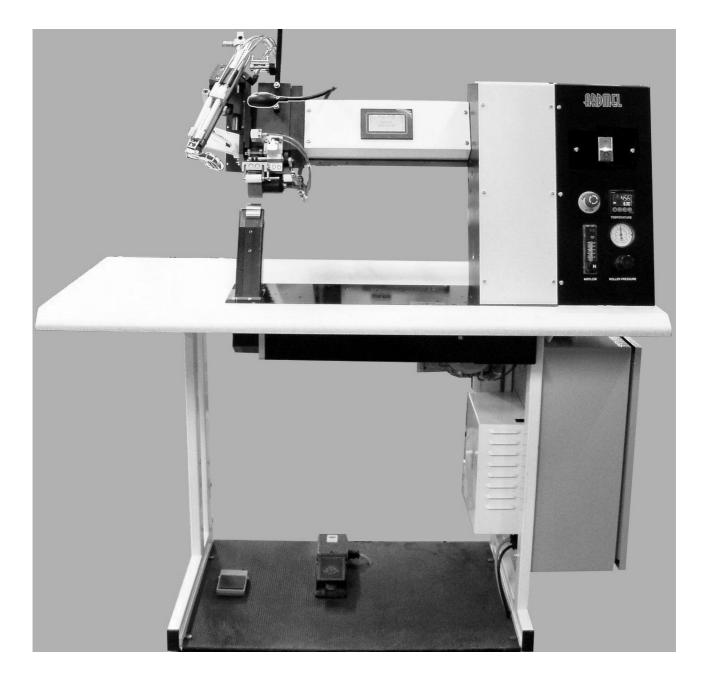
THIS DOCUMENT CONTAINS ESSENTIAL SAFETY INFORMATION AND OPERATING INSTRUCTIONS AND SHOULD BE READ AND UNDERSTOOD PRIOR TO OPERATING THE EQUIPMENT

KEEP THIS DOCUMENT WITH THE EQUIPMENT AT ALL TIMES

Manufacturer \sim

Local Agent ~

ARDMEL AUTOMATION LIMITED NAYSMYTH ROAD SOUTHFIELD INDUSTRIAL ESTATE GLENROTHES FIFE KY6 2SD GREAT BRITAIN



<u>CONTENTS</u>	PAGE
Front cover	1
Contents and Installation Requirements	3
Essential Safety Information	4
Statement and Equipment Specification	5
General Controls	7
HMI Operation Screen	8
Foot Well Switches	10
Temperature Controller Hot Air	11
Air Flow Meter Control	11
Scissors Unit	12
Circuit Breakers (Functions and locations)	13
HMI Unit Pages	- 14
DATA SET ~ Timer Values	15
FUNCTION SET ~ Operations	17
MENU ~ Language and Factory Reset	18
Basic Maintenance Section	
Changing the Heater	19
Changing the Drive Rollers	20
Setting the Nozzle position	21
Setting up for new tape / fabric	23
EC Declaration of Conformity	25

INSTALLATION REQUIREMENTS

Supply voltage Air Requirement ~ ~	230 ± 10% Volt AC Single Phase 15 Amp at 50 Hertz Pressure 90 - 100 p.s.i. / 7 Bar Volume 5 CFM / 8.5 cubic metres per hour (142 L / minute)		
Installation Conditions <u></u>	Oo not install the Mk501.02 in any of the following locations		
~ locations s	subject to temperatures not between 0 - 50 ° Celsius		
~ locations s	subject to condensation as the result of severe changes in temperature		
 locations subject to humidity not between 10% and 90% RH 			
 locations subject to corrosive or flammable gases 			
~ locations s	subject to dust (especially iron dust) or salts		
~ locations s	subject to shock or vibration		
~ locations s	locations subject to exposure to water, oil or chemicals		
~ locations a	above 2000 metres		

ESSENTIAL SAFETY INFORMATION

WEIGHT

The machine has a total weight of 185 Kg.

LIFTING

The majority of the weight is at the Control Cabinet end of the machine. Ardmel advises the use of three or more people to lift the machine a maximum height of 200 millimetres.

GUARDS

The machine must not be operated with any of the Guards or Covers removed.

EMERGENCY STOP

This is NOT a Power Off Switch . ENSURE ALL SWITCHES ARE OFF PRIOR TO RESETTING

CONTROL CABINET

Before opening the Control Cabinet , with the key supplied , ensure that the electric supply is switched off , wait at least 5 minutes and then observe normal safe practices.

HEATER GUARD

The Heater Guard will become warm during normal use

HEATER NOZZLE

There is a danger of severe burning if contact with the Nozzle is made, take extreme care and all reasonable precautions.

AIR SUPPLY

If the air supply fails remove hands from Danger Zone immediately, do not re-enter Danger Zone until the air supply is restored and machine is reset.

DO	Consider an area within 25mm of the Drive Rollers as a Danger Zone . Keep all loose and ill fitting clothing away from the machine
DO	Make sure the tape has been fed far enough so that it does not come into contact with the Heater Nozzle when the machine is operated.
DO NOT	Pull the tape by hand , always use the Inch Switch/Button to feed tape.
DO NOT	Operate the machine faster than your capabilities , always operate the machine within your own safe limits

STATEMENT AND EQUIPMENT SPECIFICATION

Read this document carefully to achieve the optimum performance from the Ardmel Mk501 Seam Sealing Machine .

The Ardmel Mk501 Seam Sealing Machine has been designed for safe operation providing reasonable precautions are taken and normal safe practices are implemented . The Ardmel Mk501 Seam Sealing Machine is intended for <u>industrial uses only</u>.

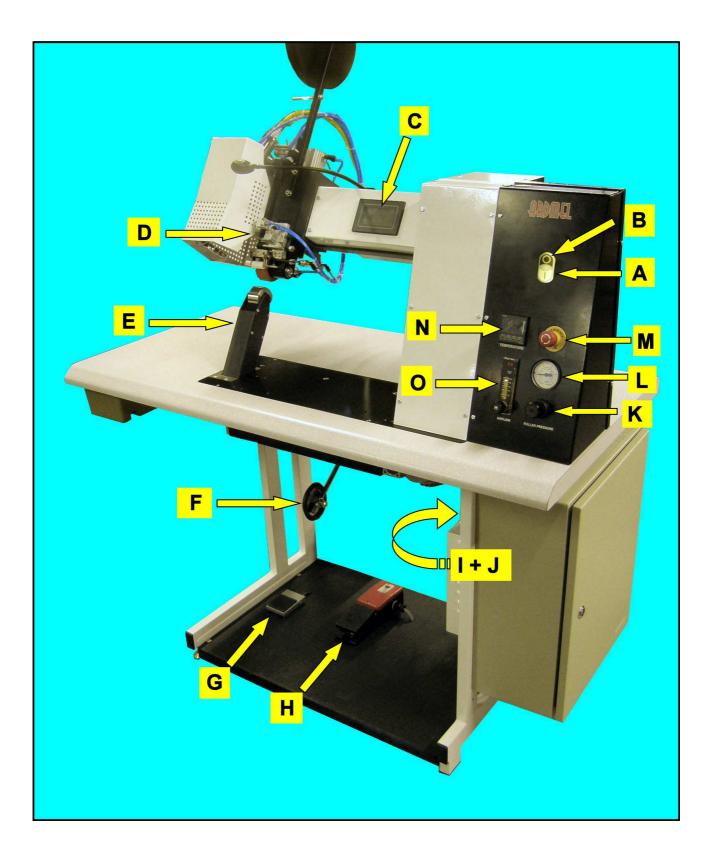
The descriptions and diagrams are intended for experienced personnel. It is important to note that altering the adjustments or configurations of the machines parameters will affect its functions and performance. It is therefore recommended to check that these changes do not expose personnel or the machine to any risk .

Any unauthorised changes will invalidate the EC Declaration of Conformity

Although every care has been taken in the preparation of this document, Ardmel Automation Limited cannot guarantee the contents and cannot be held responsible for any errors it may contain or for any damage which may result from its use or application. The hardware, software and services described in this document may be changed or modified at any time either, from a technical point of view or in the way they are operated. Their description can in no way be considered contractual.

Mk501 SEAM SEALING MACHINE SPECIFICATION

Table Dimensions Weight	600mm X 1200mm 185 Kg
	100 119
Maximum linear speed	10 metres per minute
Minimum linear speed	0.1 metres per minute
Maximum temperature	750 degrees Celsius
Maximum Air Flow	110 Square Cubic Feet per Hour (SCFH)
Minimum Air Flow	10 Square Cubic Feet per Hour
Main Drive Roller	Width 28.575mm (other sizes up to 54mm available)
Throat clearance	300mm
Upper Roller lift	14mm maximum
Post height	195mm
Bed Dimensions	205mm X 449mm
Main Drive ~ Motor	Y1 395208 Connected Delta
~ Gearbox	G4 878919
Main Drive ~ Control	Compact Frequency Inverter ~ Omron . Supply voltage $230 \pm 15\%$ V.
	Protection : IP20 Complying with Low Voltage Directive 73/23/EEC, amended by
	93/68/EEC, standards EN 61800-3, EN50081-1 and EN50082-1.
Heater ~	1.5 kW Heater element at 110 V ac
Heater Temperature Control	Digital readout PID Controller Conforming with the essential protection
	requirements of the EMC Directive 89/336/EEC, amended by 93/68/EEC, and
	European Low Voltage Directive 73/23/EEC, amended by 93/68/EEC, by the
	application of the safety standard EN 61010 . Supply voltage $100 - 240$ Vac $- 15\%$
	+ 10% at 48 to 62 Hz ac
Machine Controller	CP1L Programmable Controller
	Transistor Output . Supply voltage 24VDC . Conforming to Common Emission
	Standards (EN50081-2) of EMC Directives of the EU.
Low Voltage Supply	Supply 200-240 V ac Output 24 V dc at 2.1A . CE marked .

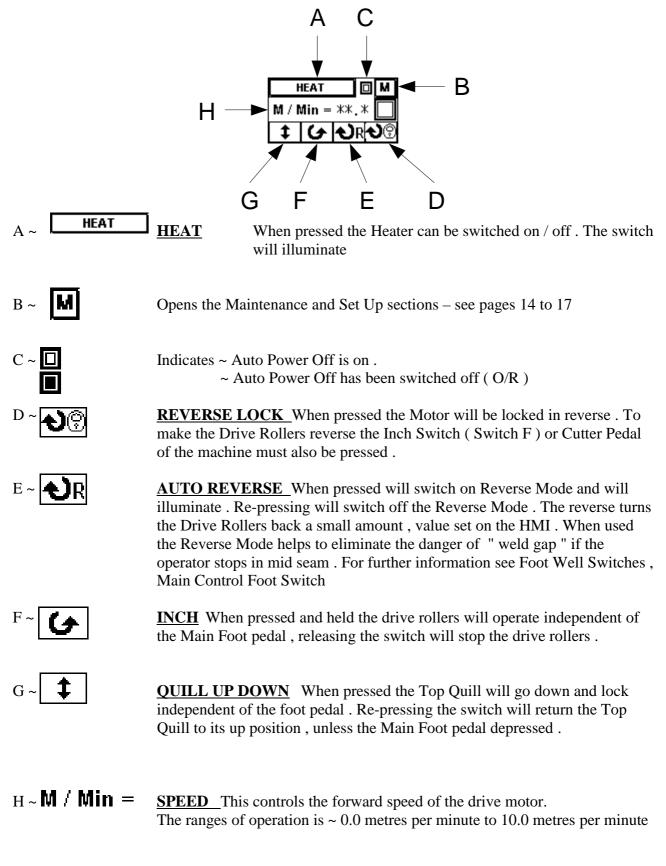


GENERAL CONTROLS

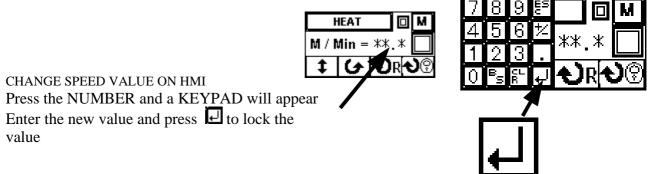
If no pedal or switch has been operated during the "Auto Power Off Delay" time (set on the HMI) the machine will switch off the Heater . See page 9 for details . When the Heater has cooled the machine will switch itself <u>and</u> the Heater air supply off

A ~ POWER ON	<u>PRESS AND HOLD</u> until the HMI (C) lights up then release
B ~ POWER OFF	Press and the machine will switch itself off <u>AFTER</u> allowing the Heater to cool down .
C ~ HMI SCREEN	See pages 8 and 9 for details of Operation Screens See pages 14 to 17 for details of Maintenance and Set Up screens
D ~ TOP QUILL	
E ~ BOTTOM QUILL	
F ~ DUAL SPEED	When pressed the drive speed of the Rollers is reduced to the speed set on the HMI . Only operates when Main Control Foot Switch is in Stage 2
G ~ CUTTER PEDAL	See FOOT WELL SWITCHES section
H ~ CONTROL PEDAL	See FOOT WELL SWITCHES section
I ~ MAIN AIR FILTER REGULATOR	Used to filter the compressed air and set operating pressure ($\max=8\text{bar}$)
J ~ ELECTRICAL ISOLOATOR	Used to isolate the electrical supply to the Control Cabinet
K ~ QUILL PRESSURE	SET Pull to unlock and push to lock .Turning knob will increase / decrease pressure on quill.
L ~ QUILL PRESSURE	INDICATOR - Indicates pressure on quill.
M ~ EMERGENCY STOP	When pressed the switch will lock and must be rotated to reset . The control functions of the machine are disabled when the switch is pressed .The Heater will retract to a safe position , the Drive Rollers will separate and the Motor will be disabled . THIS IS NOT A POWER OFF SWITCH .
N ~ TEMPERATURE	Controls temperature of air in the Heater . Press and hold the UP triangle button to increase the Temperature . Press and hold the DOWN triangle button to reduce the Temperature . The other buttons have no operator functions and should not be used . The Temperature Controller has no user serviceable parts
O ~ AIR FLOW	The amount of air flowing through the Heater is controlled by turning the control dial anti-clockwise to increase and clockwise to decrease the flow .

HMI OPERATION SCREEN



HMI OPERATION SCREEN



AUTO POWER OFF DISPLAY

If no pedal or switch has been operated during the "Auto Power Off Delay" time (set on the HMI) the machine will switch off the Heater . The HMI will display \sim

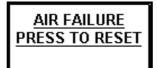


Press the display to switch the Heater back on **OR** press any pedal

When the Heater has cooled the machine will switch itself and the Heater air supply off

AIR FAILURE

If the Air Supply Pressure is below the machines safe operating limit the Red Air Failure screen will be on and will be flashing . The Heater will be switched off



Press the screen to reset the machine once the Air Supply Pressure has been restored .

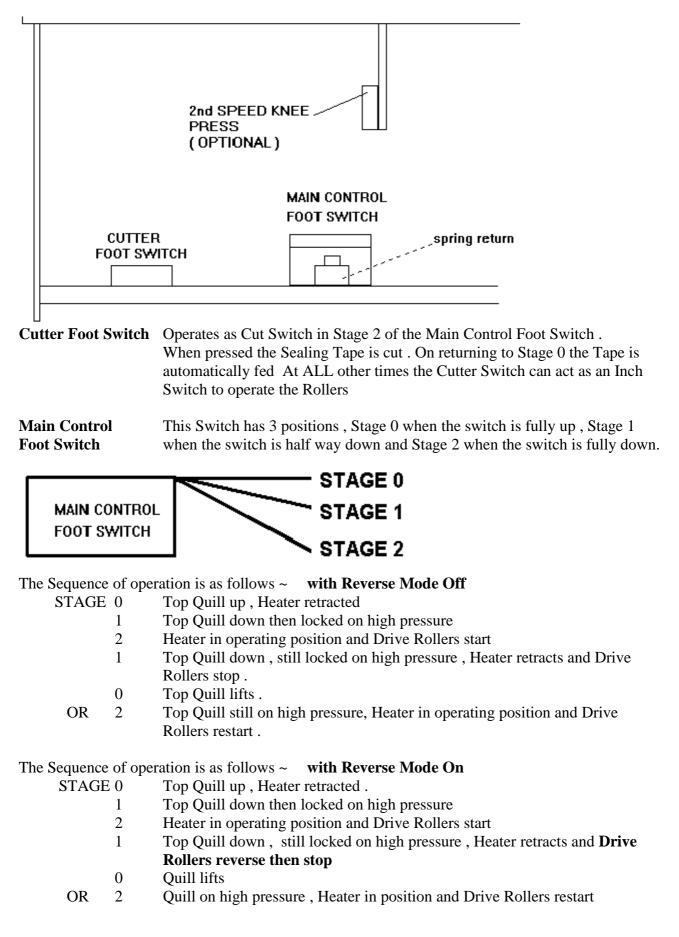
GAP ALARM

The Drive Roller has been lifted passed the safety mark . The Heater will retract , Drive Rollers separate and Drive Motor will stop

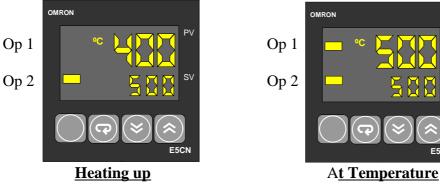


Press \mathbf{R} to reset back to Operation Screen

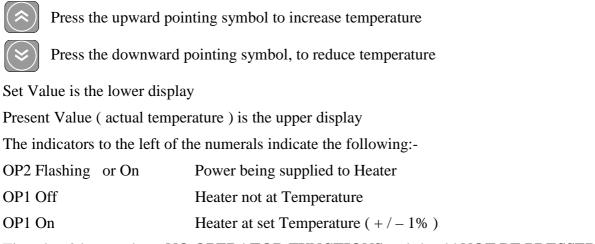
FOOT WELL SWITCHES



TEMPERATURE CONTROLLER



To alter the Heater Temperature .



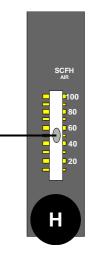
The other 2 buttons have NO OPERATOR FUNCTIONS and should NOT BE PRESSED

AIR FLOW METER CONTROL

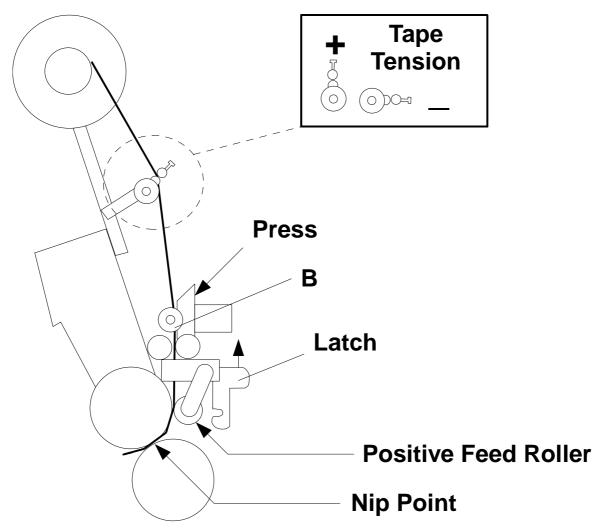
Turning the control knob anti-clockwise increases the air flowing through the heater and vice versa.

There is a by-pass which ensures that even if the Air Flow is turned to 0 there is still air flowing through the Heater.

The reading for Air Flow is taken at the **centre** of the floating bead.

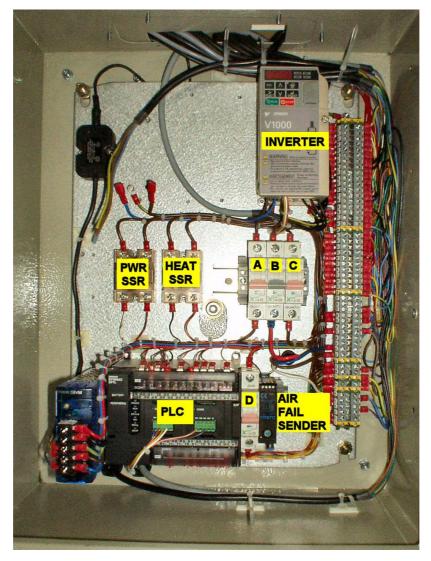


SCISSORS UNIT



- <u>Positive Feed Roller (White PTFE)</u> This roller is used to give a positive feed to the tape The latch fixes the roller 'in' or 'out' as required. The roller must be ' in ' when an unsupported tape is used or when the tape is being fed to a point in front of the nip point of the Drive Rollers.
- <u>Threading Up</u> Feed tape into scissors mouth (below Scissors Guide B) and press the Cutter Pedal or the Inch Rollers switch on the Arm of the machine until the tape is fed around the Drive Roller. If the tape does not go through then pull it back to Guide B and press the front of the Scissors Assembly as shown. This will open the feed rollers and allow the tape to drop through the assembly.
- 3. <u>Operation</u> The pedal to the left of the Main Control Pedal operates the scissors . The scissors only cut when on Stage 2 of the Main Control Pedal . As the machine is running, on Stage 2 , and the 'end ' of the item is about 4cms from the nip of the Drive Rollers press the scissors pedal and REMAIN ON STAGE 2 until the tail of the tape is used up . When the Main Control Pedal is returned to Stage 0 the tape will be automatically fed round ready for the next operation .

CIRCUIT BREAKERS



VIEW INSIDE CONTROL CABINET (DOOR OPEN) OBSERVE SAFE WORKING PRACTICES WHEN THE CONTROL CABINET DOOR IS OPEN - SWITCH OFF MAIN ISOLATOR AND WAIT 5 MINUTES BEFORE ENTERING CABINET

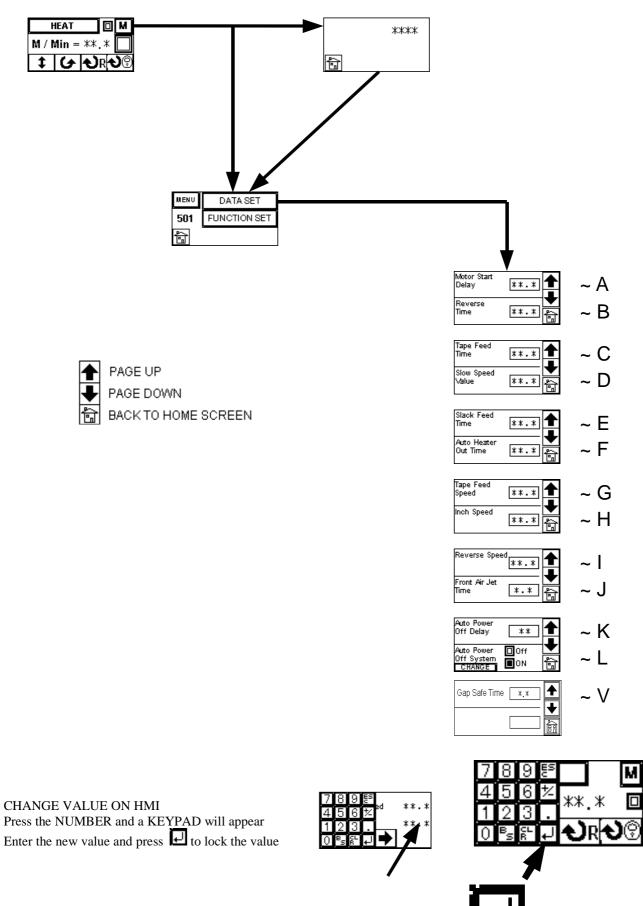
Access is gained by using the key supplied and unlocking the door in the side of the Cabinet .

Circuit Breaker ~

- A Controls the supply (always 230v ac) to the Motor Controller (Inverter)
- **B** Controls the 110v ac supply (from transformer if 230v ac Supply Voltage) to the Heater Element
- C Controls the Supply Voltage (230v ac / 110v ac) **TO** the ~ Temperature Controller , DC Power Supply (input Mains Power) 24 volt
- **D** Controls the 24 volt d.c. supply to the Pneumatic Valves, PLC

The Circuit Breaker is ON when the switch is to the UP

HMI PANEL



A - MOTOR START DELAY

This delay controls the time at which the Motor starts when the Heater Nozzle swings into position. The " ranges " of operation are \sim

- i / Motor starts Drive Rollers turning ; then Heater swings " in " .
- ii / Motor starts rollers turning at the same time as the Heater reaches its fully " in " position
- iii / Heater " in " ; then Motor starts rollers turning .

0.0 =minimum delay , 10.0 =maximum delay

B - REVERSE TIME

The Timer controls the amount of time the Motor runs in reverse when going from Stage 2 to Stage 1 and the " R " Button on the Arm is engaged , i.e. how far back the rollers turn . 0.0 = minimum reverse , 10.0 = maximum reverse

C - TAPE FEED TIME

The Timer controls the amount of time the Motor runs during the Feed Cycle after the Cutter has been used and going off Stage 1 to Stage 0, i.e. how much tape is fed round the Drive Rollers. 0.0 = minimum feed, 10.0 = maximum feed

D – SLOW SPEED VALUE - DUAL SPEED

Speed of Drive Rollers when the Dual Speed Knee Press Switch is used . Only operates when Main Control Foot Switch is in Stage 2 0 = 0.0 metres per minute , 10.0 = 10 metres per minute

<u>E – SLACK FEED TIME</u>

The Timer controls the length of time the Slack Feed runs until the Lift Cylinder is dis-engaged

F - AUTO HEATER OUT TIME

The Timer controls the time before the heater moves out of 'in' position when in Auto Heater Out 0.0 = minimum delay, 10.0 = maximum delay.

<u>G – TAPE FEED SPEED</u>

Controls the speed the tape is fed after the cut operation

<u>H – INCH SPEED</u>

Controls the speed of the rollers when the Inch Button is pressed or the Cutter Pedal is pressed if the PEDAL INCH OPTION has been selected

<u>I – REVERSE SPEED</u>

Controls the speed when the rollers are reversing

<u>J – FRONT AIR JET TIME</u>

The Timer controls the length of time the Front Air Jet is on (used when Heated Roller fitted)

K – AUTO POWER OFF DELAY

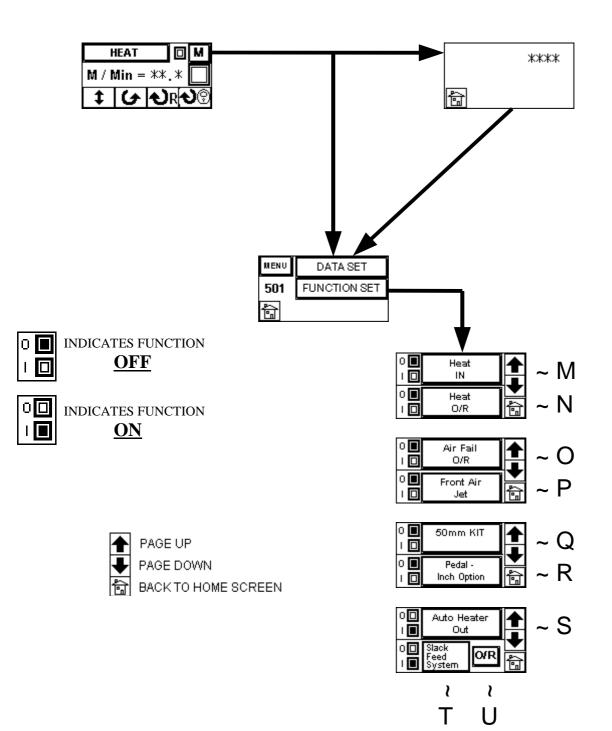
The time the machine will wait before switching the Heater off then ,after the Heater has cooled , switching the complete machine off – air and electrical power If any pedals or switches are pressed the timer is reset to zero

<u>L – AUTO POWER OFF O/RIDE</u>

Turns the Auto Power Off system OFF .

V - GAP SAFE TIME

HMI PANEL



<u>M – HEAT IN</u> <u>THE SWITCH IS ONLY USED FOR SETTING UP ~ ENSURE NO OTHER PERSON IS</u> <u>WITHIN THE VICINITY OF THE HEATER OR DRIVE ROLLERS WHEN USED</u>

Sends the Heater in the operating position and starts the Drive Rollers turning . The switch is latched on when pressed and requires a further press to disengage .

<u>N – HEAT O/R</u> THE SWITCH IS ONLY USED FOR SETTING UP

Overrides the temperature controller allowing the user to operate the machine when not at temperature

O - AIR O/R

Overides the Air Failure System - ONLY USED DURING MAINTENANCE

<u>P – FRONT AIR JET</u>

Enables Front Air Jet system . Used to blow tape under the Drive Rollers . Duration is set in J Front Air Jet Time

<u>Q – 50mm KIT</u>

Press when a 50mm Kit is fitted . The scissor system is disabled

<u>R – PEDAL INCH OPTION</u>

When enabled this allows the use of the Cut Pedal as a tape feed switch. Depressing the Cut Pedal feeds the tape in the same way as the Inch Switch on the HMI Panel except in Stage 2 operation

S- AUTO HEATER OUT SYSTEM

The Alternative Heater Out Program is used when there is a problem of tape folding under after the Scissors have been used and the end of the tape passes the nozzle .

Instead of the Heater retracting when releasing Stage 2 the Heater is automatically retracted after a Set Time after the Scissors have been used .

The sequence of events when using the Alternative Heater Out Programme is ~

- 1 In Stage 2 and taping
- 2 Hit Scissors Pedal to cut tape , stay on Stage 2
- 3 After Set Time the Heater retracts but the operator is still on Stage 2 and the **rollers are still turning !**
 - Lift off Stage 2 as normal.

As the Heater has retracted while the rollers are still turning it is unlikely that the tape will fold under itself .

<u>T – SLACK FEED SYSTEM</u>

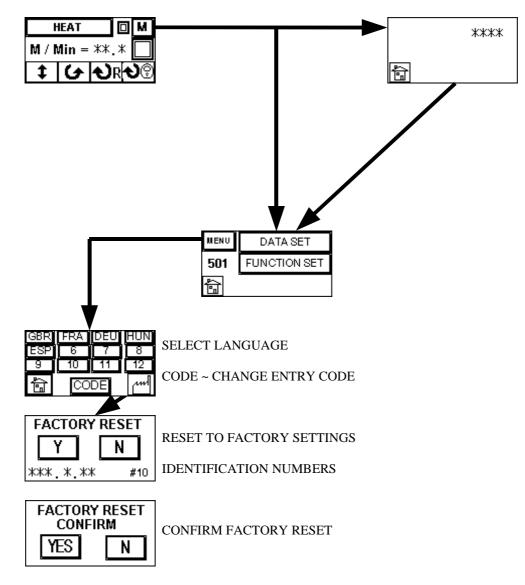
4

The Lift (feed) Cylinder remains closed for a set time giving a Slack Feed to the tape . The time is set in Slack Feed Time - $\rm E$

U - O/R

Overides the Slack Feed System . The Lift (feed) cylinder opens as soon as the Drive Rollers are closed

HMI PANEL



HEATER ELEMENT - REPLACE

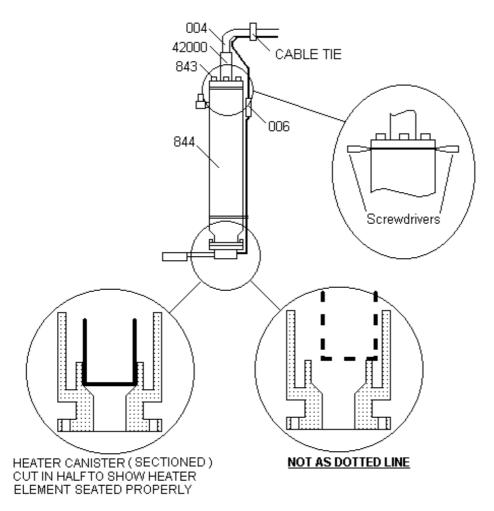
Switch Heater OFF and allow to cool

<u>Removal</u>

- a) Remove Tape from Scissors Assembly
- b) Unplug Heater Element plug, rotate the collar to unscrew.
- c) Press the Heater In Switch that is located inside the Control Cabinet , ensure no person is within the vicinity of the Heater Nozzle when the Heater In Switch is pressed .
- d) With the Heater in the vertical position remove the 4 screws 843
- e) Cut Cable Ties securing the Thermocouple 006 cable to the Heater Element 004 wire and Air Pipe
- Remove the Heater Element by drawing it straight up and out of the Canister 844.
 Inserting 2 screwdrivers, as shown, and twisting them will help to ease the Heater Element out.

Replacement

- a) Slide the new Heater Element 42000 down inside the Canister 844 and rotate it until it touches the bottom ~ as shown in the diagram
- b) Replace the 4 screws 843
- c) Switch Heater In switch OFF
- d) Replace Cable Ties, tie Heater Element cable to the Thermocouple cable only
- e) Plug Heater Element plug back in .
- f) Switch Heat on



TOP ROLLER - REMOVAL / REPLACE

REMOVAL - FIGURE 1 ~ SWITCH HEAT OFF AND ALLOW TO COOL

- a) Remove screw 533 along with washer 507
- b) Remove Roller 504, take care not to lose Key 519

<u>REPLACE</u> - FIGURE 1

- a) Ensure Key 519 is on the shaft
- b) Slide the new Roller 504 onto the shaft
- c) Replace screw 533 along with washer 507

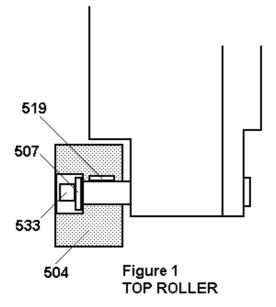
BOTTOM ROLLER - REMOVAL / REPLACE

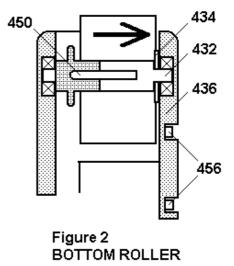
REMOVAL - FIGURE 2

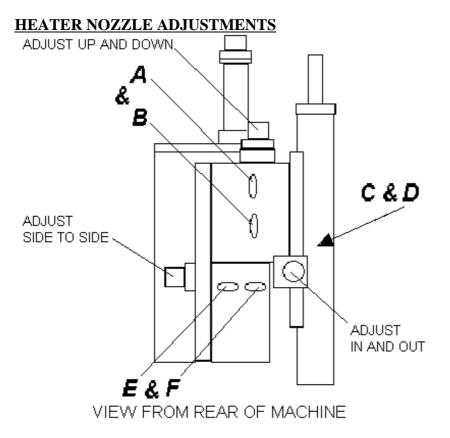
- a) Remove the 4 screws 456
- b) Remove Side Plate 436
- c) Place allen key on the end of Shaft 432 and slide Roller off the shaft, take care not to lose the key 450 or the Spacer 434

<u>REPLACE</u> - FIGURE 2

- a) Ensure Key 450 is on the Shaft
- b) Slide the Roller onto the Shaft
- c) Replace the Spacer 434
- d) Replace the Side Plate 436 and the 4 screws 456



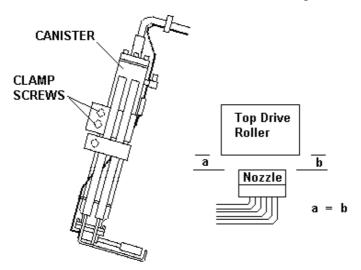


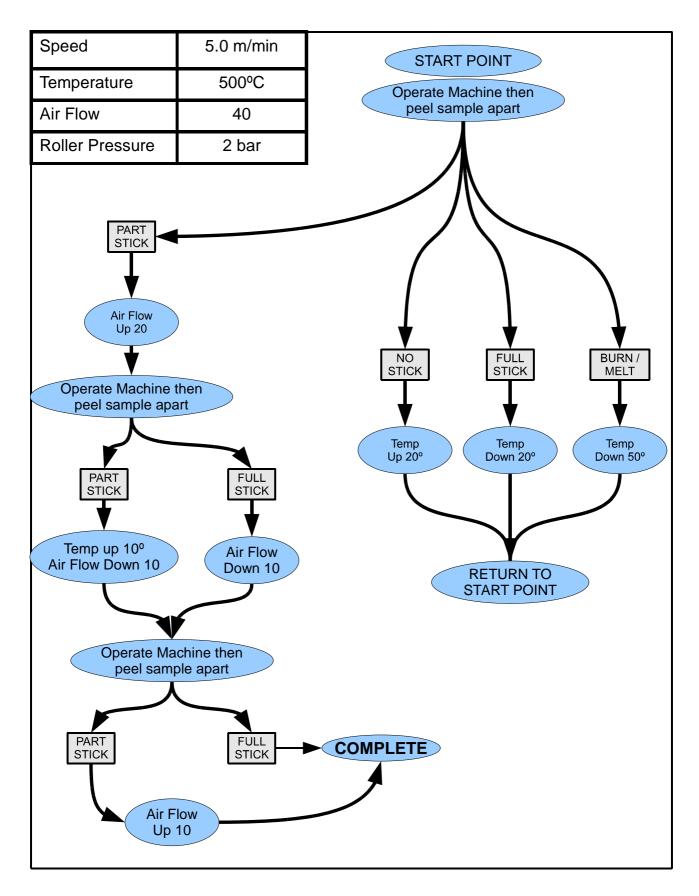


Heater Nozzle Position

- 1. Up and Down ~ Unlock A and B and turn knurled knob to adjust Relock A and B
- 2. In Out ~ Unlock C and D and turn knurled knob to adjust Relock C and D
- 3. Side to Side ~ Unlock E and F and turn knurled knob to adjust Relock E and F

Extra VERTICAL adjustment can be obtained by loosening the CLAMP SCREWS and sliding the CANISTER up or down. Make sure the Nozzle is even to the Top Drive Roller after any adjustments have been made and that the CLAMP SCREWS are tight.





SETTING UP FOR NEW TAPE / FABRIC

Use the chart opposite to set up Temperature and Air Flow Boxes are " **is this what has happened ?** " and Ovals are " **change settings to --** " . Start by setting at a Temperature of 500, Air Flow at 50 and Speed at 5

Apply the tape to the fabric .

Try to remove the tape from the fabric .

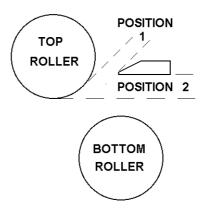
The result will be one of the boxes on the second row . Follow the arrows and carry out the instructions in the Ovals .

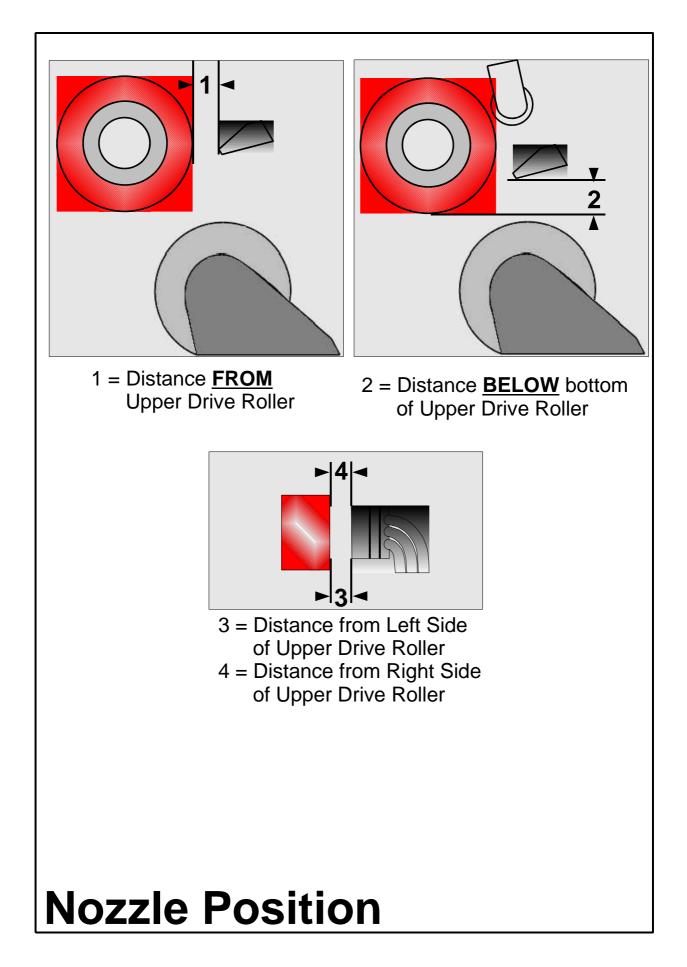
After making the change re apply the tape at the new settings .

The result should be below the Oval instruction that has just been carried out .

Repeat until bond is as required and record the results below .

Fabric	Tape	Temp	Air Flow	Speed	Quill	Pos 1	Pos 2







EC Declaration of Conformity Certificat de Conformité Aux Normes Européennes

Full address :- ARDMEL AUTOMATION LIMITED. NASMYTH ROAD, SOUTHFIELD INDUSTRIAL ESTATE, GLENROTHES, FIFE, KY6 2SD UNITED KINGDOM.

Ardmel Automation declares that the machinery described / Ardmel Automation Certifie que la machine décrite ci-dessous :

Make / Marque :- Ardmel Seam Sealing Machine

Model / Modèle :- MK501.02

Confirms to the following Directives / Est Conforme aux Directives Européennes suivantes :--Machinery Directive 2006/42/EC EMC Directive 2004/108/EC EMC Directive 2004/108/EC

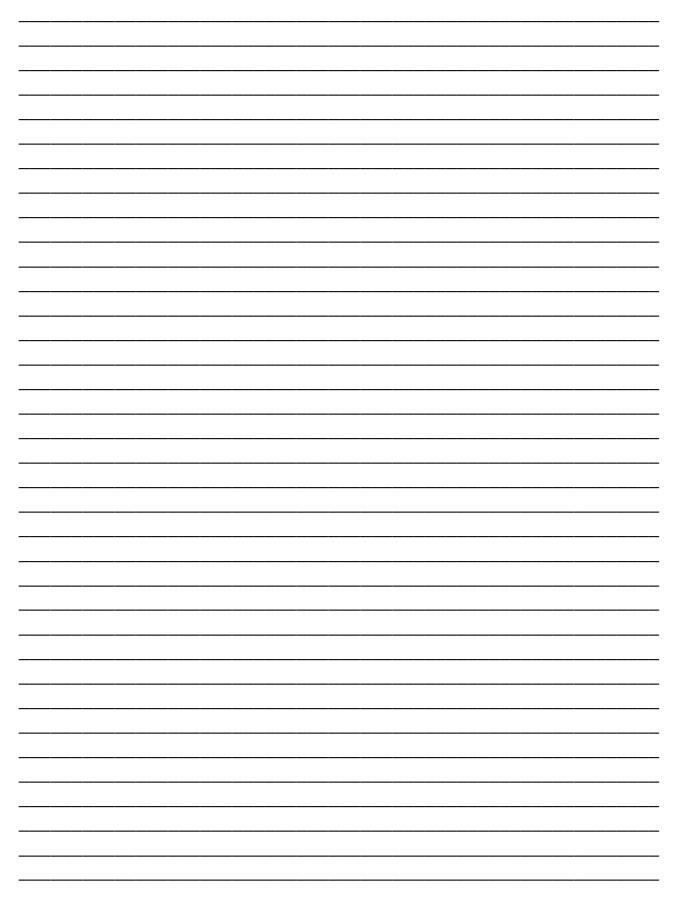
Sound Emissions / Emissions sonores :--

Less than 70 dB (A) measured on identical machinery. Inférieures à 70 dB (A) testées sur machines identiques

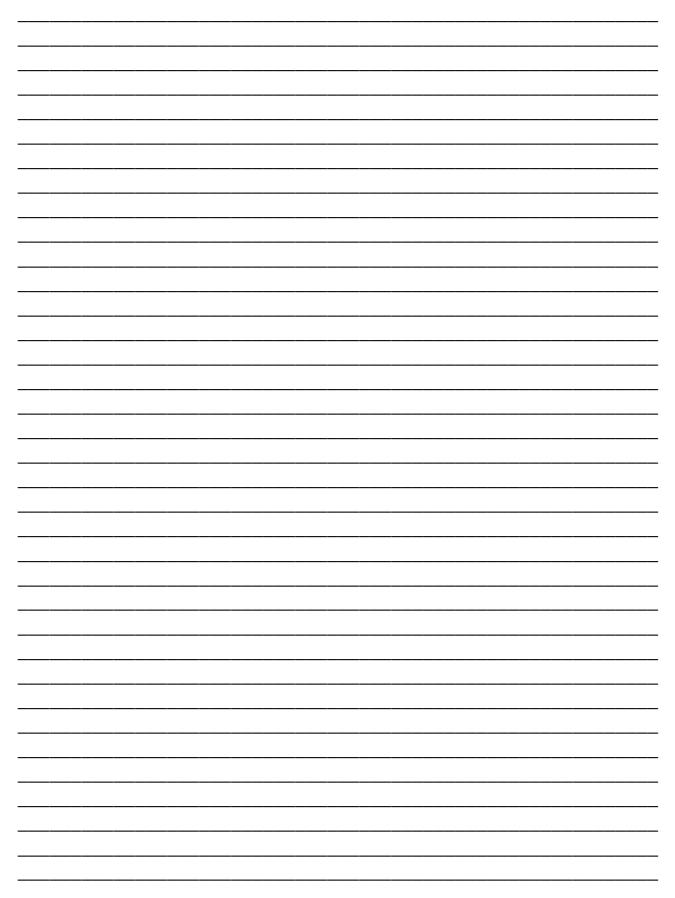
Director Signed at Ardmel Automation Ltd on / Signé à Ardmel Automation Ltd le : 01/07/2009



NOTES



NOTES



BACK COVER