

THERMOSALD

UPSCR10030-M-V3
UPSCR10045-M-V3
UPSCR10060-M-V3
UPSCR10090-M-V3
(08/2000)

TEMPERATURE CONTROLLER
for
IMPULSE HEAT-SEALING
(automatic calibrating system)

MAINTENANCE & OPERATIONS MANUAL

HARDWARE MOD. M
SOFTWARE V. 3

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0 WARNINGS

0.1 SAFETY PRECAUTIONS

- Never use the equipment in explosive atmospheres or with explosive materials.
- Never use the equipment with flammable material without first taking the required safety precautions.
- Never turn on the temperature controller power circuit when the safety guards are open.
- Do not use the temperature controller for tasks other than those it is designed for i.e to control the temperature of bands or wires for industrial-grade sealing. Contact our engineering department for information regarding specific applications.
- Do not deliver electrical power to the temperature controller if the protective cover has been removed for special servicing on the electronic system.
- Operate the equipment by following the instructions contained herein.
- Employ qualified and well-trained personnel, familiar with the technology used to install the equipment and put it into service.
- Use bands or wires having an adequate positive temperature coefficient ($> 1 \times 10E-3$)
- When the machine is running under normal conditions, make sure the heat sink of the controller does not exceed 60°C . If this happens, increase heat sink ventilation or contact our engineering department.

0.2 COMPLIANCE WITH ELECRO-MAGNETIC STANDARDS - CE KITE MARKS

Directives which apply :

- Low voltage electrical codes : 73/23 CEE - 93/68 CEE (in force since 01/01/97)
 - Elecro-magnetic compatibility : 89/336 CEE - 92/31 CEE - 93/68 CEE (in force since 01/01/96)
 - Machine directive : 89/392 CEE - 91/368 CEE - 93/68 CEE (in force since 01/01/95)
- NOTE - this directive does not automatically apply to the electronic equipment; our controllers are designed to conform with the directive if installed correctly as described in this user's manual.

Electro-magnetic compliance tests :

Test conditions :

- Mains supply filter Mod. Siemens B84112-B-B60 (115 / 250 V - 6A - 50/60 Hz)
- Temperature controller connecting cable and standard panel 3ESD0035E (5 m)
- Input power cables (3 m long)
- Band output cables (10 m long)

Safety tests :

- The criteria indicated in the EN50082-2 directive have been followed: general standards regarding safety in industry.
- IEC 1000-4-2 (IEC 801-2/1991): STATIC ELECTRICITY DISCHARGE (ESD)
- IEC 1000-4-3 (CEI 801-3): RADIATED ELECTRO-MAGNETIC FIELD
- IEC 1000-4-4 (CEI 801-4): FAST TRANSIENT OSCILLATIONS (FAST TRANSIENT / BURST)
- ENV50141: MAINS PICKUP INTERFERENCE

Emissions tests :

- The criteria specified in the EN50081 -2 directive have been followed: general rules regarding emissions in industry
- EN55011 (CEI 110-6): LIMITS AND METHODS OF MEASURING RADIO INTERFERENCE PRODUCED BY INDUSTRIAL, SCIENTIFIC AND MEDICAL EQUIPMENT (ISM)

Compliance certificate :

- The temperature controller passed the compliance tests and is considered a class B device.
- The manufacturer states that the temperature controller fully complies with current council directives as regards electro-magnetic compatibility, 89/336 CEE standards and following amendments
- The manufacturer states that the temperature controller fully complies with current low voltage electrical codes 73/23 CEE and subsequent amendments.

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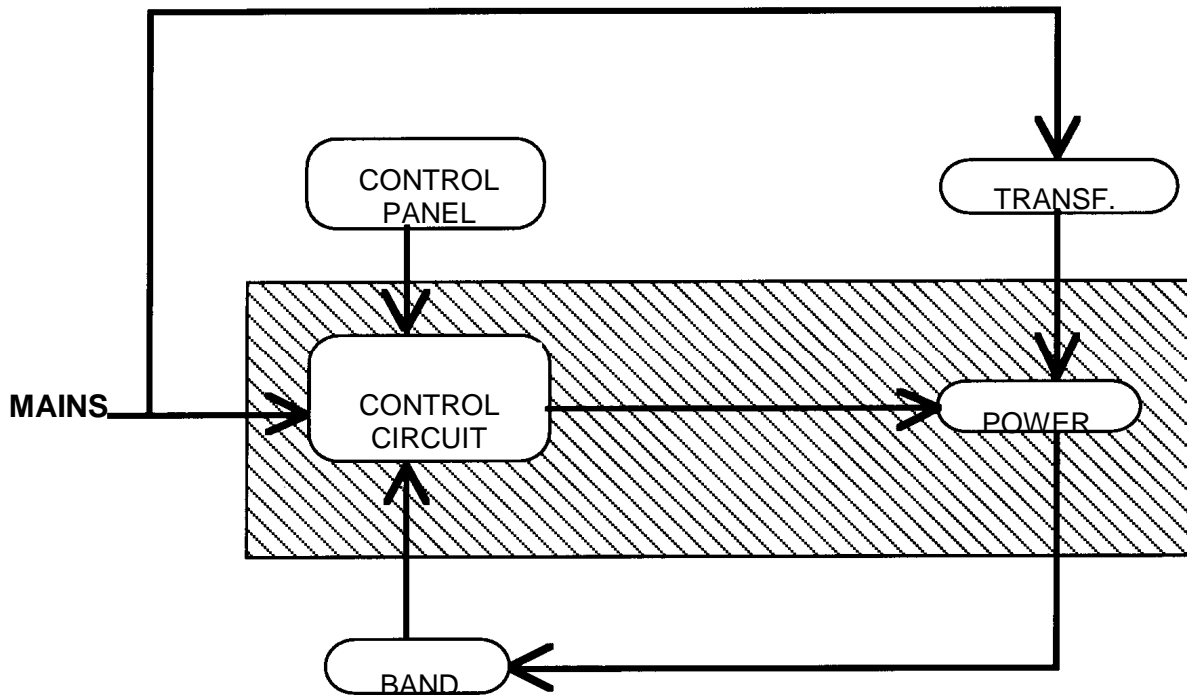
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1 DESCRIPTION

1.1 GENERAL DESCRIPTION

- **APPLICATION:** Impulse heat sealers are used to seal polyethylene film, single-component plastic material or plastic material in general rapidly and with great accuracy. These materials should reach their melting temperature and cool down immediately in order to avoid deformation.
- **OPERATING PRINCIPLES:** To impulse-seal the plastic material, use a sealing bar with bands or wires supplied by a piece of electronic equipment designed specifically for this application and capable of delivering the power required to maintain the band at the desired temperature during the sealing operations. No additional probes are required, the equipment simply reads the feedback signals from the bands and controls the heating current with a closed-loop circuit. The temperature controller first receives a pre-heat signal from the outside so that the sealing bars can reach the required temperature before starting work . A further signal is emitted to allow the correct temperature to be attained when the sealing bars are brought together.
- **MAIN FEATURES:** The temperature controller allows the user to check the band characteristics and the state of the machine and to locate faults by referring to the display console. The system is provided with an "**automatic calibration**" function so that the band can be set up simply by pressing a key.
- **DIAGNOSTICS:** The temperature controller comes with an efficient diagnostics system capable of identifying faults which have occurred during the production process, indicating the cause and suggesting the remedies required to restore normal operating conditions.

1.2 BLOCK DIAGRAM

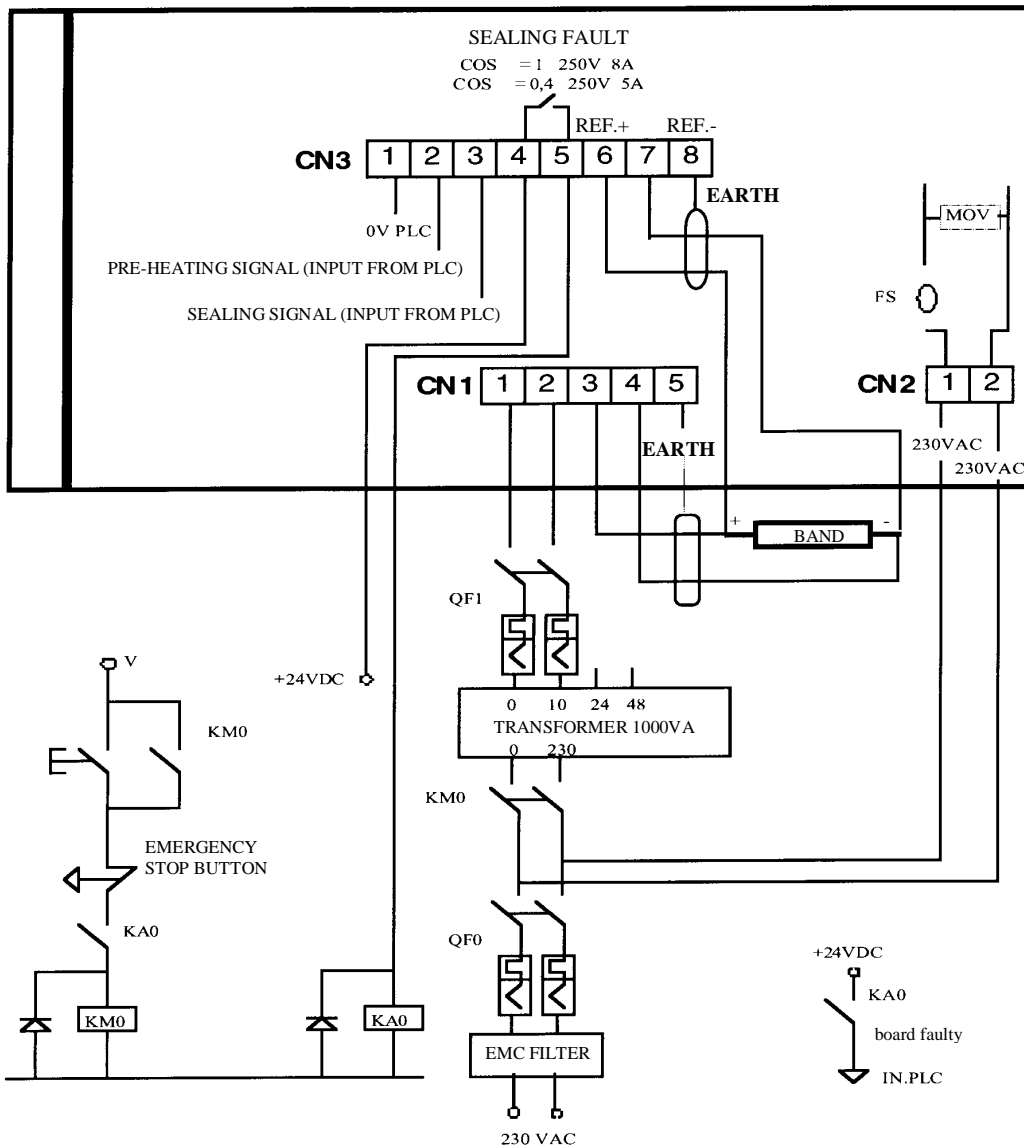


2 WIRING DIAGRAM

2.1 LIST OF CHANGE-OVER SIGNALS

CN1	POWER (Power circuit supply synchronised with control circuit supply)	
PIN1	ALTERNATING CURRENT SUPPLY	(4 - 6 sq.mm)
PIN2	ALTERNATING CURRENT SUPPLY	(4 - 6 sq.mm)
PIN3	BAND +	(4 - 6 sq.mm)
PIN4	BAND -	(4 - 6 sq.mm)
PIN5	EARTH	(4 - 6 sq.mm)
CN2	CONTROL CIRCUIT SUPPLY (Control circuit supply synchronised with power circuit supply)	
PIN 1	230 Vac (0.1A absorption, max)	(1sq.mm)
PIN 2	230 Vac (0.1A absorption, max)	(1sq.mm)
CN3	CONTROLS	
PIN1	COMMON 0 V PLC	(0.5 sq.mm)
PIN2	PRE-HEAT SIGNAL FROM PLC, 24V DC (12 mA absorption, max)	(0.5 sq.mm)
PIN3	SEALING SIGNAL FROM PLC, 24V DC (12 mA absorption, max)	(0,5 sq.mm)
PIN4	SEALING FAULT (CONTACT N.C.) $\cos\Phi = 1$ 250V 8A	(0,5 sq.mm)
PIN5	SEALING FAULT (CONTACT N.C.) $\cos\Phi = 0.4$ 250V 5A	(0,5 sq.mm)
PIN6	BAND REFERENCE +	(0,5 sq.mm)
PIN7	BAND REFERENCE -	(0,5 sq.mm)
PIN8	SIGNAL LEAD SCREEN (do not connect from the machine side)	(1 sq.mm)
CN4	DISPLAY CONSOLE	
PIN1	Supply, +5V	Screened (0,25 sq.mm)
PIN2	Supply, 0 V	Screened (0,25 sq.mm)
PIN3	Data	Screened (0,25 sq.mm)
PIN4	Clock	Screened (0,25 sq.mm)
PIN5	Key	Screened (0,25 sq.mm)
PIN6	Key	Screened (0,25 sq.mm)
PIN7	Key	Screened (0,25 sq.mm)
PIN8	Key	Screened (0,25 sq.mm)

2.2 WIRING DIAGRAM



- NOTE

The power circuit supply (CN1/1 and CN1/2) MUST BE synchronised with the control circuit supply (CN2/1 and CN2/2).

CN1/5 should be connected to the EARTH ELECTRODE of the machine by using a yellow-green wire whose size should be \geq that of the power leads.

2.3 BOARD-PANEL CONNECTING CABLE DIAGRAM

Board side Canon 9-pin male connector		Panel side Canon 9-pin female connector
1 + 5V	GREEN	1 + 5V
2 0V	RED	2 0V
3 Data	WHITE	3 Data
4 Clock	YELLOW	4 Clock
5 Key	ORANGE	5 Key
6 Key	BROWN	6 Key
7 Key	BLACK	7 Key
8 Key	BLUE	8 Key

- Use a 8 x 0.22 multi-core **screened** cable. The screen must be wired to both connectors. It is advisable to run this cable away from transformers or unshielded power leads.

2.4 POWER TRANSFORMER DIMENSIONS

PRIMARY WINDING: 0/230/400 Vac

(With a 400 Vac primary winding, use a 230 Vac autotransformer
or a 400/230 external transformer to supply the synchronised logic system)

CORE: EARTHED

SECONDARY WINDING: DETERMINED BY USING THE FOLLOWING FORMULA :

$$\text{TRANSFORMER RATED V} = \text{R} \times \text{RATED I}$$

(RATED I = 30 AMP. FOR TEMPERATURE CONTROLLER UPSCR10030, UPSCR10045

RATED I = 60 AMP. FOR TEMPERATURE CONTROLLER UPSCR10060, UPSCR10090

BAND RESISTANCE R = DETERMINED BY TAKING DIRECT READINGS AT THE ENDS OF THE BAND (OR CALCULATED BY REFERRING TO THE CHART IN THE BLOCK BELOW, CHAPTER 2.6)

SUPERIMPOSED WINDINGS

ELECTRICAL SPECIFICATIONS:

THE VOLTAGE IN THE SECONDARY WINDING CAN BE STEPPED UP 1.6 TIMES (MAX.) IN ORDER TO INCREASE THE SEALING SPEED.

2.5 PROTECTIVE DEVICE DIMENSIONS

REFER TO CHAP. 3.4 - WIRING DIAGRAM

CN2 - 230 V SUPPLY : INTERNAL PROTECTION DEVICE PROVIDED

QF0 - D-TYPE, TWO-POLE CIRCUIT BREAKER OR DELAYED-ACTION FUSE
(6A 1000 VA TRANSFORMER / 8A 1400 VA TRANSFORMER)

QF1 - C-TYPE, TWO-POLE CIRCUIT BREAKER OR FUSE
(40A WITH BOARD 10030 SCR uP : RATED I = 30A)
(63A WITH BOARD 10060 SCR uP :RATED I = 60A)

The recommended specifications are for indication purposes only. Take into consideration the electrical system being used when examining these specifications.

2.6 BAND RESISTANCE CHART

Band length BEVELLED	Band thickness BEVELLED	Specific resistance R0 Ω / m
3	0.1	2.81
3	0.15	1.95
3	0.2	1.50
3	0.25	1.27
4	0.1	2.37
4	0.15	1.40
4	0.2	1.12
4	0.25	0.96
5	0.2	0.8
6	0.1	1.6
6	0.2	0.72
8	0.1	1.2
8	0.2	0.51

Determining the resistance of the band on the machine (R)

- 1 - Single band : $R = R0 \times \text{band length [m]}$
- 2 - 2 series-connected bands : $R = R0 \times \text{band length [m]} \times 2$
- 3 - 2 parallel-connected bands : $R = R0 \times \text{band length [m]} / 2$

NOTE : With copper-coated bands, "band length" refers to the portion which is not copper-coated

3 COMMISSIONING

3.1 FIRST TIME START-UP

- **SET DIP SWITCHES SW+/SW- ACCORDING TO THE RATED VOLTAGE V OF THE TRANSFORMER (TRANSFORMER'S RATED VOLTAGE = R x RATED I / SEE ALSO CHAP 2.4), AS INDICATED IN THE CHART BELOW:**

(this procedure is required to adapt the temperature controller to the rated voltage of the transformer)

DIP SWITCH SW+ / SW- CHART

Dip 1	Dip 2	Dip3	Dip4	TRANSFORMER'S RATED VOLTAGE	
ON	ON	ON	ON	05 - 07	(GREEN WHEN ON - RED WHEN OFF)
OFF	ON	ON	ON	08 - 15	
ON	OFF	ON	ON	16 - 25	
OFF	OFF	ON	ON	26 - 35	
ON	ON	OFF	ON	36 - 42	
OFF	ON	OFF	ON	43 - 50	
ON	OFF	OFF	ON	51 - 57	binary system
OFF	OFF	OFF	ON	58 - 65	
ON	ON	ON	OFF	66 - 75	
OFF	ON	ON	OFF	76 - 82	
ON	OFF	ON	OFF	83 - 92	
OFF	OFF	ON	OFF	93 - 97	
ON	ON	OFF	OFF	97 - 100	
OFF	ON	OFF	OFF	-	
ON	OFF	OFF	OFF	-	
OFF	OFF	OFF	OFF	-	
					(RED WHEN ON - GREEN WHEN OFF)

EXAMPLE:
 (Band = 1 Ω - RATED I = 30 A - TRANSFORMER RATED VOLTAGE = 30 V
 Voltage provided = 40 V - DIP SWITCH SW+ and SW- = ON ON OFF OFF for voltages between 26 and 35 V)

- **BALANCING WHEN COLD AS INDICATED BELOW:**
 (this procedure is required to find out the controller setpoint)

Turn the **BALANCING** trimmer so that the **GREEN** and **RED** LEDs light up at the same time.
 (turn clockwise to light up the GREEN Led , anticlockwise to light up the RED Led) .

The GREEN and RED Leds are updated once a second, therefore when the calibration procedure is performed, turn the BALANCING trimmer and wait 1 second for the updating to take place.

- **CALIBRATING WHEN HOT**

(this operation allows the user to check the machine during the first start-up procedure. Set dip switches SW1, set the IREAD dip switches, set the heating factor. This allows the user to check the state of the machine whenever maintenance problems arise)

In "hot calibration" mode, deliver a SET CURRENT so that the band reaches a temperature of 100°C (212°F)

- Press the **RESET/MODE** and **UP** keys for 6 seconds (**1.1.1.1.** appears on the display)
- Press the **RESET/MODE** key.
- **0.XXX SET CURRENT** (the set current expressed in A appears on the display) : set the current by pressing the **UP** and **DOWN** keys and wait for the machine to heat up until the band reaches a temperature of 100°C/212°F (check with a thermometer)
- Press the **RESET/MODE** key.
- **1.XXX HEATING FACTOR V-I** (a reference value which should be between 0.8 and 1.6 will appear on the display). To check this value, the machine should be at 100°C/212° F. To change this value, change the setting for dip switches **SW1**

	Dip 1	Dip 2	Dip 3	Dip 4	(binary system)
Minimum value	ON	ON	ON	ON	
Most recurrent value	OFF	ON	ON	ON	
Higher value	ON	OFF	ON	ON	(for this setting or higher settings,
Higher value	OFF	OFF	ON	ON	contact our engineering dept.)
"					
Maximum value	OFF	OFF	OFF	OFF	(do not use)

- Press the **RESET/MODE** key.
- **2.XXX CALIBRATION I READ** (a reference value which should be between 3.0 and 3.8 will appear on the display). To check this value, the machine should be at 100°C/212° F. To change this value, change the setting for dip switches **SW1**

	Dip 1	Dip 2	Dip 3	Dip 4	(binary system)
Minimum value	ON	ON	ON	ON	
Higher value	OFF	ON	ON	ON	
Higher value	ON	OFF	ON	ON	
Higher value	OFF	OFF	ON	ON	
Higher value	ON	ON	OFF	ON	
"					
Maximum value	OFF	OFF	OFF	OFF	

- Press the **RESET/MODE** key.
- **3.AAA HEATING FACTOR ACQUISITION** (**3.A.A.A.** should flash on the display): under this condition, the temperature controller automatically acquires heating factor **5.XXX**
- Press the **RESET/MODE** key.
- **4.XXX PEAK CURRENT** (the peak current expressed in A appears on the display)
- Press the **RESET/MODE** key.
- **5.XXX HEATING FACTOR V-I** (the V-I heating factor appears on the display. To change the factor, use the **UP** and **DOWN** keys to increase or decrease the machine temperature)
- To quit, press the **RESET/MODE** key for 3 seconds.

□ AUTOMATIC CALIBRATION

(This operation is required whenever a temperature of 100°C/212°F needs to be reached automatically)

- Press key **RESET/MODE** for 6 seconds. Keep it pressed until the operation has been completed: 100°C/212°F should flash on the display.
- **WARNING!!! IN THE EVENT OF OVERHEATING CAUSED BY MACHINE PROBLEMS, IMMEDIATELY RELEASE THE KEY**

□ **ENERGY CONTROL (THIS FUNCTION NEEDS TO BE ENABLED TO INCREASE REDUNDANCY, SELF-CONTROL AND SYSTEM SAFETY BY INPUTTING MACHINE DATA F=1)**

(this procedure is performed to allow the machine to automatically receive the energy transferred to the band during operation. This function has been provided in order to increase system safety as, in many cases, it comes into action with complex algorithms to identify faults and eliminate overheating which, under certain conditions, may lead to dangerous situations).

- Give the signal to pre-heat for 10 seconds
- Start with the machine producing bags
- NOTE: each time the pre-heating or sealing temperatures are changed, an automatic acquisition procedure needs to be repeated.

□ **WRITE DOWN THE MACHINE DATA**

- Fill in the chart in annex D

3.2 GENERAL COMMISSIONING

- **SET DIP SWITCHES SW+ / SW- / SW1 IREAD** (as indicated in the chart drawn up the first time the machine was started up)
- **BALANCE WHEN COLD** (Turn the balancing trimmer so that both the green and red Leds light up)
- **SET HEATING FACTOR V-I** (as indicated in the chart drawn up the first time the machine was started up; set hot calibration, parameter 5)
- **PRESS THE RESET KEY FOR 6 SECONDS (AUTOMATIC CALIBRATION)**

3.3 AUTOMATIC CALIBRATION ON THE MACHINE

- **PRESS THE RESET KEY FOR 6 SECONDS (AUTOMATIC CALIBRATION)**

3.4 ENERGY CONTROL ENABLING (PROCEDURE REQUIRED ON ALL THE MACHINES HANDLING SLIGHTLY FLAMMABLE MATERIAL) (Enter machine data F=1)

- **SEND THE PRE-HEAT SIGNAL (AUTOMATIC ENERGY ACQUISITION DURING PRE-HEATING)**
- **START SEALING OPERATIONS IN AUTOMATIC MODE (AUTOMATIC ENERGY ACQUISITION DURING SEALING)**

3.5 SETTING THE PRE-HEATING AND SEALING TEMPERATURES

- **SETTING THE PRE-HEATING TEMPERATURE** - Press the **RESET / MODE** and **T / I** keys for 3 seconds. The **PREHEATING** Led on the panel starts flashing and the display console indicates the set pre-heating temperature. The temperature can be changed by using the **UP** and **DOWN** keys. If no operations are performed for 3 seconds, the board will automatically display the actual temperature.
- **SETTING THE SEALING TEMPERATURE** - With the **PREHEATING** Led on the panel flashing, press the **RESET/MODE** key. The **WELDING** Led on the panel will start flashing and the display shows the set sealing temperature. To change the temperature use the **UP** and **DOWN** keys. If no operations are performed for 3 seconds, the board will automatically display the actual temperature.

3.6 CURRENT/TEMPERATURE DISPLAY

- When the **T / I** key is pressed, the current circulating in the band or the temperature of the band will be indicated on the display console.

3.7 COLD SYSTEM COMPENSATION OPTION (enabled from machine data C.XXX)

0XXX SETTING THE INITIAL SEALING TEMPERATURE WITH SYSTEM COLD - While the WELDING Led on the panel is still flashing, press the **RESET / MODE** key. The display will show the set initial sealing temperature with the machine cold. To change the temperature press the **UP** and **DOWN** keys.

If no operations are performed for 3 seconds, the board will automatically display the actual temperature. This option is used to automatically bring the jaws and the sealing system to the correct operating temperature when the machine is still cold.

This temperature is used when the board receives the sealing signal and the system temperature is lower than that set for parameter SYSTEM OPERATING TEMPERATURE.

_XXX SYSTEM OPERATING TEMPERATURE. While the display is showing the **INITIAL SEALING TEMPERATURE WITH SYSTEM COLD**, press the **RESET / MODE** key; the display shows the set operating temperature of the system. To change the temperature, press the **UP** and **DOWN** keys.

If no operations are performed for 3 seconds, the board will automatically display the actual temperature.

3.8 GENERAL RESET PROCEDURE (CONTACT THE SUPPLIER)

- This procedure is used at the beginning and at the end of machine testing by qualified personnel in order to reset the system memory. The procedure can be repeated in particular cases following malfunctioning which causes the machine to stop.
- Contact the supplier to obtain the authorisation to perform this procedure
- Turn off the equipment.
- Keep the **DOWN** and **RESET** keys pressed until the equipment is turned back on again. Four blocks will appear on the display.
- Check the dip switches
- Check balancing
- Enter the heating factor (Parameter 5 appears, Set data with the system hot)
- Check machine data
- Perform the standard procedure in order to put the machine into operation.

4 - MACHINE DATA

The machine data can be used to adapt the temperature controller for a specific application.
Press the **RESET/MODE** and **DOWN** keys for 6 seconds (**0.0.0.0.** will appear on the display).

- 0.0.0.0. **INITIAL MACHINE DATA**
- Press the **RESET/MODE** key.

- 1.XXX **HEATING INCREASE** (The temperature increase following a pre-heat or sealing signal is shown on the display in degrees/10 ms). To change the value use the **UP** and **DOWN** keys.
Decrease the value of this parameter to increase the time required to bring the band up to the correct temperature and, as a result, increase the amount of time the band lasts.
- Press the **RESET/MODE** key.

- 2.XXX **KV GAIN** (the value of the proportional closed-loop gain appears on the display): to change this value, use the **UP** and **DOWN** keys.
Increase the value of this parameter to increase the closed-loop response speed and make the system quicker to come into action.
An excessive KV increase may cause input currents to become unsteady and therefore lead to temperature fluctuation.
- Press the **RESET/MODE** key.

- 3.XXX **KINT GAIN** (the integral closed-loop gain value appears on the display): to change the value, press the **UP** and **DOWN** keys.
To increase system stability, increase this parameter.
An excessive KINT increase may lead to an overtemperature after a pre-heat signal (this parameter is not active during the sealing operations).
- Press the **RESET/MODE** key.

- 4.XXX **KINT OPERATING LIMIT** (This limit appears on the display): to change the value, press the **UP** and **DOWN** keys.
This parameter should not be changed.
- Press the **RESET/MODE** key.

- 5.XXX **SELECT °C / °F DISPLAY** (the value selected is shown on the display as 00C / 00F): to change the value, press the **UP** and **DOWN** keys.
- Press the **RESET/MODE** key.

- 6.XXX **SELECT MAINS FREQUENCY 50 / 60 Hz** (the value is shown on the display as 050 / 060): to change the value, press the **UP** and **DOWN** keys.
- Press the **RESET/MODE** key.
- 7.XXX **MAXIMUM SEALING TIME** (the maximum sealing time expressed in seconds appears on the display).
To change the value, press the **UP** and **DOWN** keys.
This function is used to control the maximum sealing time. If the actual sealing time is longer than this value, the controller sends fault signal F085.
For applications where the sealing signal is kept high, this parameter should be set to 000. In this case parameter 3 (KINT gain) is enabled even during sealing.
- Press the **RESET/MODE** key.

- **8.XXX PARTIAL SHORT-CIRCUIT FACTOR** (A multiplier for the instantaneous standard current is shown on the display). Press the **UP** and **DOWN** keys to change this value.
This function is used to set an instantaneous current threshold, above which a partial short-circuit occurs and the temperature controller sends fault signal F097.
The standard instantaneous current is input during the calibration procedure with the system hot (see par. 5.2)
- Press the **RESET/MODE** key.
- **9.XXX FAULT DISPLAY ENABLE** (numeric codes appear to enable/disable certain fault messages). Press the **UP** and **DOWN** keys to change this value.
0 = disable all fault messages
255 = enable all fault messages
To enable certain fault messages only, the code is determined as follows:

ENABLE FAULT 82	1 +
ENABLE FAULT 84	2 +
ENABLE FAULT 86	4 +
ENABLE FAULT 87	8 +
ENABLE FAULT 89	16 +
ENABLE FAULT 97	<u>32</u>
CODE DETERMINED	= <u>63</u>
- **A.XXX RATED CURRENT** (the rated current of the temperature controller appears on the display as 030 / 060): Press the **UP** and **DOWN** keys to change this value.
The rated current depends on the temperature controller hardware.
Note : To increase the level of protection, this parameter is fixed and cannot be changed with the new boards.
- Press the **RESET/MODE** key.
- **B.XXX KD GAIN** (the value corresponding to the derivative gain appears on the display). Press the **UP** and **DOWN** keys to change this value.
- Press the **RESET/MODE** key.
- **C.XXX ENABLE COMPENSATION WITH SYSTEM COLD** (000/ 001 appears on the display). Press the **UP** and **DOWN** keys to change this value.
This is used to enable the initial pre-heat function , 001=enable; for further information about this function, refer to paragraph 5.6.
- **D.XXX SERIAL PRINTER ENABLING** (000/ 001 appears on the display). Press the **UP** and **DOWN** keys to change this value.
This function allows data to be exchanged with the 3E GRAPHIC PRINTER.
- **E.XXX SEALER NO. FOR PRINTER** (the number assigned to the heat-sealer appears on the display).
Press the **UP** and **DOWN** keys to change this value.
This function allows the 3E-GRAPHIC PRINTER to recognise the number of the sealer.
- Press the **RESET/MODE** key for 3 seconds to exit.

- **F.XXX ENERGY control enabling**
- Press the **RESET/MODE** key.

- H.XXX ENERGY Current tolerance during pre-heating
- i.XXX ENERGY Phase tolerance during pre-heating
- L.XXX ENERGY Current tolerance during sealing
- O.XXX ENERGY Phase tolerance during sealing
- P.XXX ENERGY minimum temperature threshold above which an automatic energy setting procedure cannot be started during pre-heating

5 - LIST OF FAULT MESSAGES

FAULT	CAUSES	REMEDIES
FDiP	A general reset procedure has been performed. Set or check the dip switches	Press the reset key
FBAL	A general reset procedure has been performed. Set or check the balance with the system cold	Press the reset key
FCAL	Equipment not calibrated	Perform automatic calibration
Fo5o	Enter the heating factor	Press PsUP+PsReset for 6 seconds and set parameter 5 (heating factor)
F33	No supply Power	Turn power on
	No current to the band	Check whether the band is broken
F38	The machine is paused while it cools down during a calibration procedure	Check whether the power leads are pinched
F39	The machine is paused while it cools down when energy is input during pre-heating	
F41	Pre-heating energy, Current	Check band installed
		Input energy again
F42	Pre-heating energy, Phase	Check band installed
		Input energy again
F43	Pre-heating energy, Current energy has not been input	Check heat-sealing electronic equipment
		Input pre-heating energy
F44	Pre-heating energy, Phase energy has not been input	Input pre-heating energy
F51	Sealing energy, Current	Check band installed
		Input energy again
F52	Sealing energy, Phase	Check band installed
		Input energy again
		Check heat-sealing electronic equipment
F55	Continuous sealing energy, current	
F56	Continuous sealing energy, phase	
F69	Earth current	Make sure band is earthed
F76	Iread too high	Check band installed
F77	50/60 Hz frequency change detected	Press reset key
F78	Equipment not calibrated	Perform automatic calibration

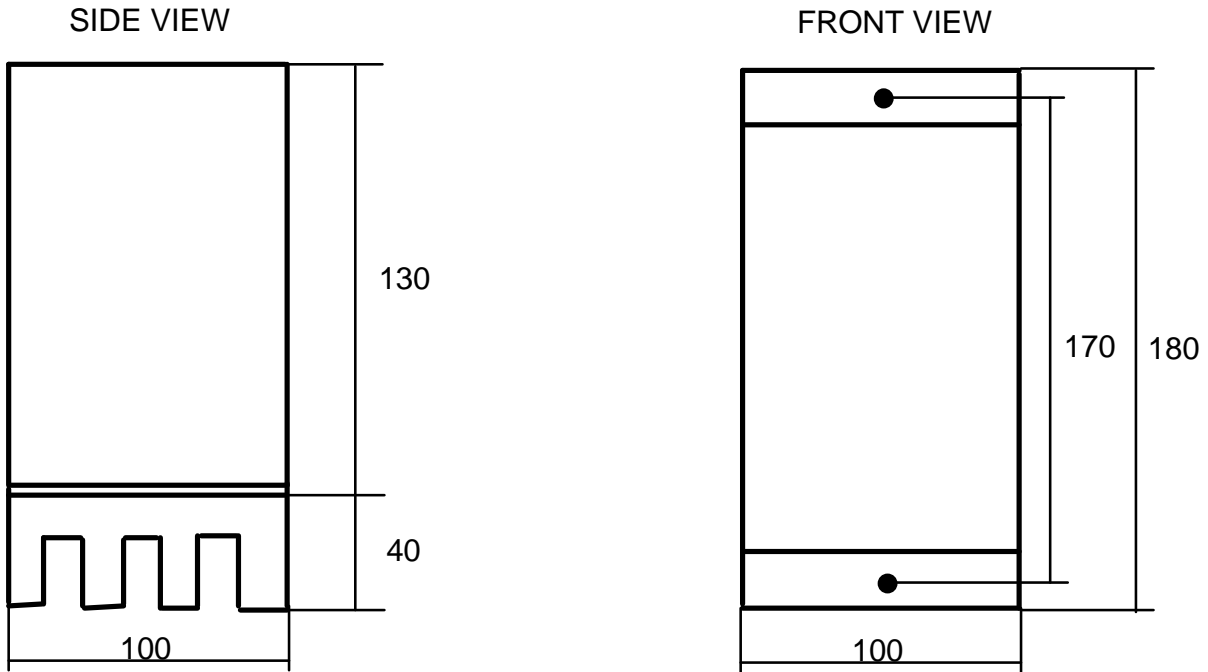
6 LIST OF WARNING AND FAULT MESSAGES (CAUSES - REMEDIES)

Display	CAUSES	REMEDIES
F081	check-sum fault Shut-down while data being updated Hardware problem	Press RESET / MODE Contact the manufacturer.
F082	Fault - control circuit supply (CN2) and power circuit supply (CN1) not synchronised	Make changes to the electrical system as shown in the wiring diagram.
F083	Fault - signal leads wrong way round (CN3/6 - CN3/7)	Reverse the signal leads
F084	Fault - power transformer voltage too high	Check transformer rating (Chap 4.1) Check dip switches SW+ SW-
F085	Fault - sealing time higher than machine set data 7.XXX .	Enter new maximum time and check the electronic timer
F086	Fault - mains voltage decreased by more than 10 % .	Check mains voltage. The fault message is displayed until the RESET key is pressed. The card still works but a few cold sealing operations may be performed due to the voltage drop.
F087	Fault - mains voltage decreased by more than 10 % during sealing	Check mains voltage. The fault message is displayed until the RESET key is pressed. The card still works but a few cold sealing operations may be performed due to the voltage drop.
F089	Fault - band broken if the bands are parallel-connected	Check bands
F090	Fault - short circuit between the bands or between the bands and earth connection	Check the machine for shorts
F091	Fault I ² T	Check for abnormal absorption
F092	Fault - power part malfunctioning	Hardware problem , contact the manufacturer
F093	Fault - band broken if the bands are series-connected	Replace the band and/or sealing wire Check that power is supplied when the sealing signal is given
F094	Fault- signal lead is pinched (CN3/6 - CN3/7)	Check signal lead connections
F095	Fault - mains supply does not match machine requirements	Hardware problem , contact the manufacturer
F096	Fault V-I Wrong setup Check BALANCING trimmer	Check SW1
F097	Fault - partial short-circuit between the bands or between the bands and earth connections	Check sealing jaws
F098	No current delivered during calibration	Check power supply
F099	Eeprom fault	Contact supplier

NOTE - Press the **RESET / MODE** key to clear the fault message.

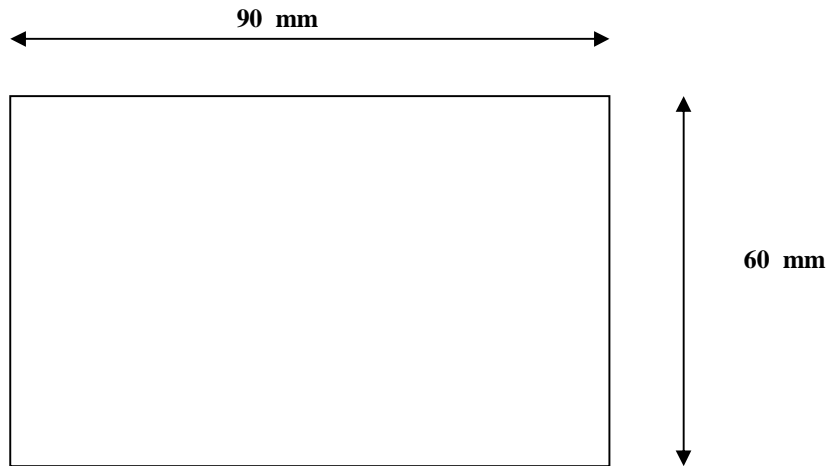
6 DIMENSIONS

6.1 DIMENSIONS OF THE TEMPERATURE CONTROLLER

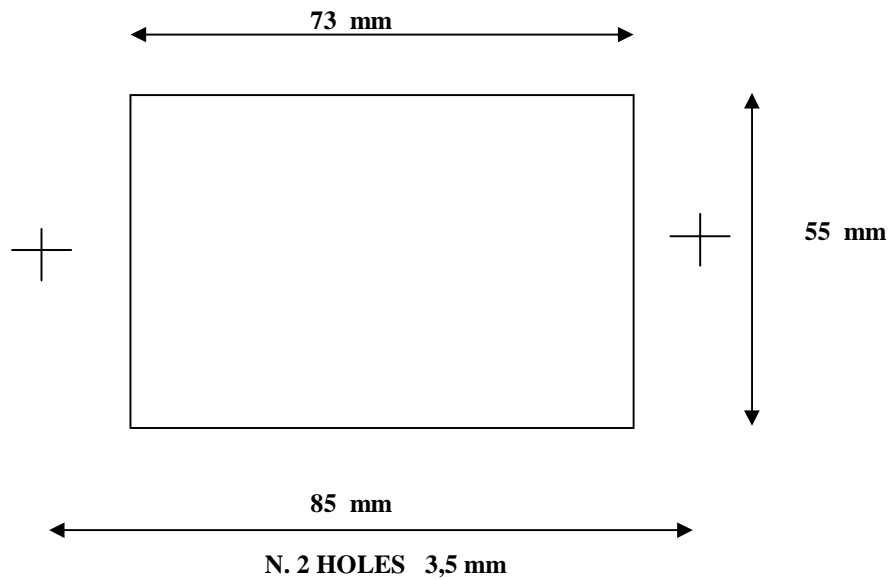


6.2 DIMENSIONS OF THE PANEL

FRONT VIEW



HOLE PLAIN



7 SPECIFICATIONS

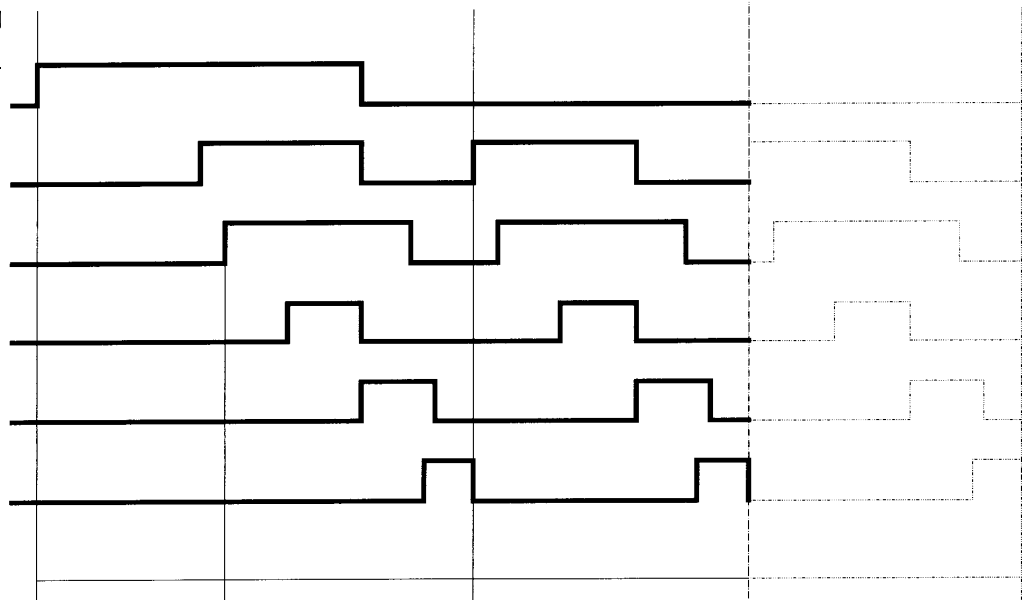
CONTROL CIRCUIT SUPPLY (CN2)	230Vac +/- 10% (0.1 A absorption)
POWER CIRCUIT SUPPLY	10 - 100V (max 60 A absorption at 100 V)
DIGITAL CONTROLS	24 VDC (12 mA max. absorption)
SEALING FAULT CONTACT	250 V 8A cosΦ = 1 250V 5A cosΦ = 0.4
POWER TRANSFORMER RATING	depends on the application (e.g. 1000 Va)
DISPLAY CONSOLE SUPPLY	See wiring diagram
MAINS FREQUENCY	50 - 60 Hz (can be set by changing parameter)
AMBIENT TEMPERATURE	0° C +50° C
PRE-HEATING SIGNAL (IN THERMOSALD)	≅ +/- 1 °C
PRE-HEATING TEMPERATURE	can be set from display console, 0 - 250 °C
SEALING SIGNAL (IN THERMOSALD)	can be set from display console, 0 - 250 °C
SEALING TIME	determined by PLC (or precision timer)
COOLING TIME	determined by PLC (or precision timer)
LEVEL OF BOARD PROTECTION	IP00
LEVEL OF DISPLAY CONSOLE PROTECTION	IP65
POWER ASSEMBLY WEIGHT	2.5 Kg
PANEL WEIGHT	0.3 Kg
PANEL-POWER ASSEMBLY EXTENSION WEIGHT	0.2 Kg
COOLING	

FILM FEED

8 DETAILS FOR ORDER FORM

MODEL	DESCRIPTION	OPERATING CYCLES		CODE
		START-UP	1 ST OPERATING CYCLE	
	Thermosald - Pulsed temperature controller 100V 30A			UPSCR10030_M_V3
	Thermosald - Pulsed temperature controller 100V 45A			UPSCR10045_M_V3
	Thermosald - Pulsed temperature controller 100V 60A			UPSCR10060_M_V3
	Thermosald - Pulsed temperature controller 100V 90A			UPSCR10090_M_V3
	Digital Panel data input			3ESD0039
	Cable connecting panel with termoregulator			3ESD0035
OPTIONAL EQUIPMENT				
	- Power transformer 1400 VA – impulsive (for model 30A/45A)			TRASF1400/70/30
	0 / 230 / 400 / SCH / GND = 0 / 30 / 40 / 50 / 60 / 70			
	- Power transformer 1400 VA – impulsive (for model 60A/90A)			TRASF1400/50/60
	0 / 230 / 400 / SCH / GND = 0 / 30 / 40 / 50			
	- Sealing bands and wires of all types : by the metre, copper-coated, teflon-coated.			
	- GRAPHIC PRIN			

ANNEX A



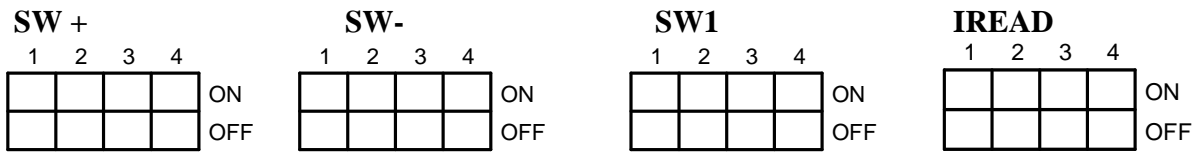
ANNEX B - INSTALLING THE TEMPERATURE CONTROLLER

- **POWER CONNECTIONS:** use adequately-sized cables to connect the transformer's secondary winding to terminals CN1/L1-L2, from terminals CN1/+ - to the sealing band and from terminal CN1/EARTH to the earth electrode (for cables shorter than 5m: 30 Amp. temperature controller - 2 x 4 sq.mm (minimum cross-section)
60 Amp. temperature controller – 2 x 6 sq.mm (minimum cross-section)
for cables longer than 5m: contact our Engineering Department.
It is advisable to twist the power cables together or use a twisted screened two-core cable in order to limit the electro-magnetic emissions. Contact our Engineering Department for further information.
The power cables should not be placed next to sensitive pieces of equipment (PC, PLC, Analog interfaces)
- **SIGNAL LEAD:** only use a two-core twisted screened cable with the screen connected on the equipment side only to CN3/8 (we recommend using a TWINAX 7362211 cable). This cable should run directly from the temperature controller to a terminal block next to the band installed on the machine. The wiring of the signal lead should be completed from this terminal block with 2 cables connected directly to the ends of the band. Avoid interrupting the circuit at any other points unless absolutely necessary. If a further interruption is necessary, electrical continuity of the screen should be maintained without making earth connections at the intermediate points.
The signal lead should not be placed near parts and cables of other pieces of equipment which produce considerable electro-magnetic interference (Drives, Motors, Transformers).
- **PHASE-LINE CONNECTIONS:** the power transformer supply and the 220Vac control circuit supply should be phased:
 - 1 – supply/neutral wire connection (220Vac): use the same phaseline
 - 2 – supply wire-to-supply wire connection (380Vac): for the control circuit, use a 380/220 V transformer shunted to the same phaselines as the power transformer or, as an alternative, use a 220 Vac tap on the power transformer's primary winding (in this case, however, the temperature controller will shut off if a fault arises).
- **VENTILATION:** The equipment should be installed inside the electrical cabinet in such a way that adequate natural or artificial ventilation is provided in the heat sink. It is a good idea to position the temperature controller at the bottom of the electrical cabinet at least 3 cm away from the conduits above and below it.

ANNEX C - TROUBLE-SHOOTING

- **PROBLEM:** Fault message Fxxx shown on the display - **CHECK** list of faults, chap. 5.
- **PROBLEM:** The band heats up during balancing- **CHECK** the control and power circuit supplies have the same phase line
- **PROBLEM:** The display shows that the temperatures are fluctuating - **CHECK** the contacts of the band, check the machine data and, if the settings are not correct, the parameters must be set to zero and then calibrated again.
- **PROBLEM:** The temperature of one or both sealers is fluctuating from time to time - **CHECK** the wiring by referring to the directions given in the manual and summarised in annex B.

DIP SWITCH CHART



CALIBRATION DATA WITH SYSTEM HOT

Calibration current	(0XXX)	: 0 _____
Heating factor V-I (0.8 - 1.6)	(1XXX)	: 1 _____
Calibration IREAD (>3.0 < 3.8)	(2XXX)	: 2 _____
Self-calibration state	(3AAA)	: 3 AAA
Peak current	(4XXX)	: 4 _____
Heating factor V-I	(5XXX)	: 5 _____

SYMBOLS USED

Band resistance	= _____	Ω
Power transformer's secondary winding rating	= _____	V
Pre-heating temperature	= _____	°
Sealing temperature	= _____	°
Initial sealing temperature when system cold	= _____	°
System operating temperature	= _____	°