# THERMOSALD

## HIGH FREQUENCY
## CHECK TWINLEAD
## FOR
## IMPULSES WELDING
## OF
## POLYTHENE AND PLASTIC FILM

**patent NO. BO93A 000274**
**(INTERNATIONAL PATENT PENDING)**

**3E S.r.l.**
**Via Turati n. 55 - 40134 BOLOGNA**

**Tel. 039-51-434738 Fax 039-51-437049**

**INDEX** **PAG.**

## 1 DESCRIPTION

### 1.1 GENERALS CHARACTERISTICS

THE WELDER OF IMPULSES OF FIRM 3E IS COMPOSED BY A THERMOREGULATOR FOR WIRE OR TWINLEAN RESISTANCE WHICH CONTROLS THE TEMPERATURE OF WELDING ON CLOSED
LOOP FOR COMPENCING CASUALS THERMICS DRIFTS.
A PREHATING SYSTEM PERMETS TO FETCH THE WELDER RAIL AT THE NECCESSARY TEMPERATURE FOR STARTING THE PRODUCTION IN A FEW SECONDS.

### 1.2 UTILIZE

IS PARTICULERLY SUITABLE FOR WELDING OF .POLYTHENE OR THE OTHERS PLASTIC MATERIALS
WHERE ARE NECESSARY PRECISION AND QUICKNESS.

### 1.3 PRINCIPLE OF WORKING

THE PREPARATION PERMET TO POST PREHATING TEMPERATURE ON THE TWINELAND AND A WELDING TEMPERATURE.
IT RECEIVES FROM THE MACHINE A COMMAND OF PREHATING AND IT GOING TO THE POSTED TEMPERATURE.
IT RECEIVES FROM THE MACHINE A COMMEND OF WELDING AND IT GOING TO AT THE TEMPERATURE OF WELDING POSTED FOR A TIME POSTED ON THE OUTSIDE POTENTIOMETER ( ON THE PLC VERSION , ON THE PLC).
THE CASUAL TIME OF COLLING IT IS POSED ON THE OUTSIDE POTENTIOMETER (ON THE PLC VERSION, ON PLC).

### 1.4 SECURITIES AND DIAGNOSTICS

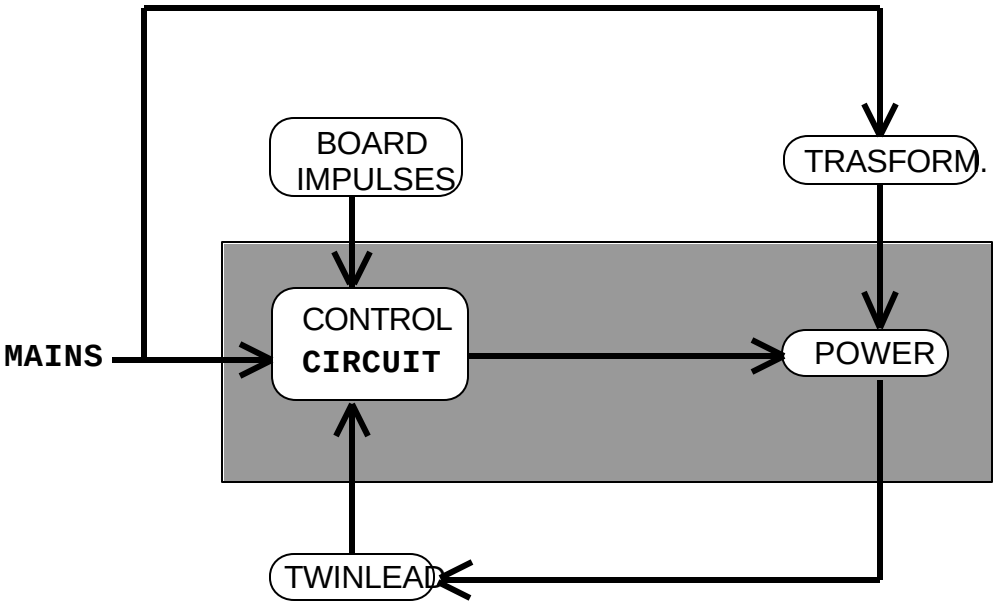
LED DL1 (GREEN): PRESENCE MAINS
LED DL2 (RED): SHART CIRCUIT AT THE EXTREMITIES OF THE TWINLEAND OR BETWEEN THE TWINLEAND AND THE GROUND ( A PROTECTION CIRCUIT CAMES ON 0,5 MICROSECONDS TO AVOIDING DAMAGES TO POWER'S SECTION).
LED DL3 (RED): PASSAGE OF INCANDESCENT CURRENT, DANGEROUS FOR INFLAMMABLE MATERIALS FOR MORE THAN ONE SECOND.
LED DL5 (RED): BLAK-OUT OF TWINLEAD OR OF REFERANCE MARK.
ON OUT-PUT A CUMULATIVE ALARM SIGNAL (SWITCH OFF OF THE CONTACT BETWEEN THE 4 E 5 PIN OF CN3) POINTS OUT THE MACHINE THAT WE ARE IN PRESENCE OF ONE OF THE RED LED INDICATED DAMAGE.

## 2 TECNICAL DATES

| | |
|---|---|
| CONTROL VOLTAGE | 220 VAC +/- 10% |
| AMBIENT TEMPERATURE | 0° C +50° C |
| ACCURACY | +/- 1% |
| DEFINIBLE PREHATING TEMPERATURE | 0-100% DELLA T.MAX |
| DEFINIBLE WELDING TEMPERATURE | 0-100% DELLA T.MAX |
| WELDING | DEFINIBLE |
| COOLING TIME | DEFINIBLE |
| PROTECTION LEVEL | IP00 |

## 3 DIAGRAMS

### 3.1 BLOCK DIAGRAM




THERMOSALD BLOK DIAGRAM

### 3.21 BASE CONNECTION DIAGRAM

**CN1 POWER**

| | | |
|---|---|---|
| PIN1 | ALTERNATING VOLTAGE | (4mmq) |
| PIN2 | ALTERNATING VOLTAGE | (4mmq) |
| PIN3 | TWINLEAD + | (4mmq) |
| PIN4 | TWINLEAD - | (4mmq) |
| PIN5 | GROUND | (4mmq) |

**CN2 CONTROL CURRENT VOLTAGE**

| | | |
|---|---|---|
| PIN 1 | 220 Vac (0,2A) | (0,5mmq) |
| PIN 2 | 220 Vac (0,2A) | (0,5mmq) |

**CN3 CONTROLS**

| | | |
|---|---|---|
| PIN1 | 15V | (0,5mmq) |
| PIN2 | PREHATING CONTROL (ON TO PLC 24V) | (0,5mmq) |
| PIN3 | WELDING CONTROL (ON TO PLC 24V) | (0,5mmq) |
| PIN4 | WELDING ALARM (N.C.CONCTAT.) 24V -1A/110V-0,5A | (0,5mmq) |
| PIN5 | WELDING ALARM (N.C. CONCTAT) 24V -1A/110V-0,5A | (0,5mmq) |
| PIN6 | PREHATING POTENTIOMETER TEMPERATURE (OV) | (0,5mmq) |
| PIN7 | PREHATING POTENTIOMETER TEMPERATURE(REF.) | (0,5mmq) |
| PIN8 | PREHATING POTENTIOMETER TEMPERATURE (+10V) | (0,5mmq) |
| PIN9 | WELDING POTENTIOMETER TEMPERATURE (OV) | (0,5mmq) |
| PIN10 | WELDING POTENTIOMETER TEMPERATURE (REF.) | (0,5mmq) |
| PIN11 | WELDING POTENTIOMETER TEMPERATURE (+10V) | (0,5mmq) |
| PIN12 | TWINLEAND MARK +10V/+40V | (0,5mmq) |
| PIN13 | TWINLEAND MARK +20V/+80V | (0,5mmq) |
| PIN14 | TWINLEAND MARK -10V/-40V | (0,5mmq) |
| PIN15 | TWINLEAND MARK -20V/-80V | (0,5mmq) |

**CN4 TIMES**

| | | |
|---|---|---|
| PIN1 | WELDING TIME POTENTIOMETER (+15v) | (0,5mmq) |
| PIN2 | WELDING TIME POTENTIOMETER | (0,5mmq) |
| PIN3 | COOLING TIME POTENTIOMETER (+15v) | (0,5mmq) |
| PIN4 | COOLING TIME POTENTIOMETER | (0,5mmq) |
| PIN5 | WELDING END (N.A. CONCTAT) 24V -1A/110V-0,5A | (0,5mmq) |
| PIN6 | WELDING END (N.A. CONCTAT) 24V -1A/110V-0,5A | (0,5mmq) |

### 3.22 PLC CONNECTION DIAGRAM

**CN1 POWER**

| | | |
|---|---|---|
| PIN1 | ALTERNATIVE VOLTAGE | (4mmq) |
| PIN2 | ALTERNATIVE VOLTAGE | (4mmq) |
| PIN3 | TWINLEAD+ | (4mmq) |
| PIN4 | TWINLEAD - | (4mmq) |
| PIN5 | GROUND | (4mmq) |

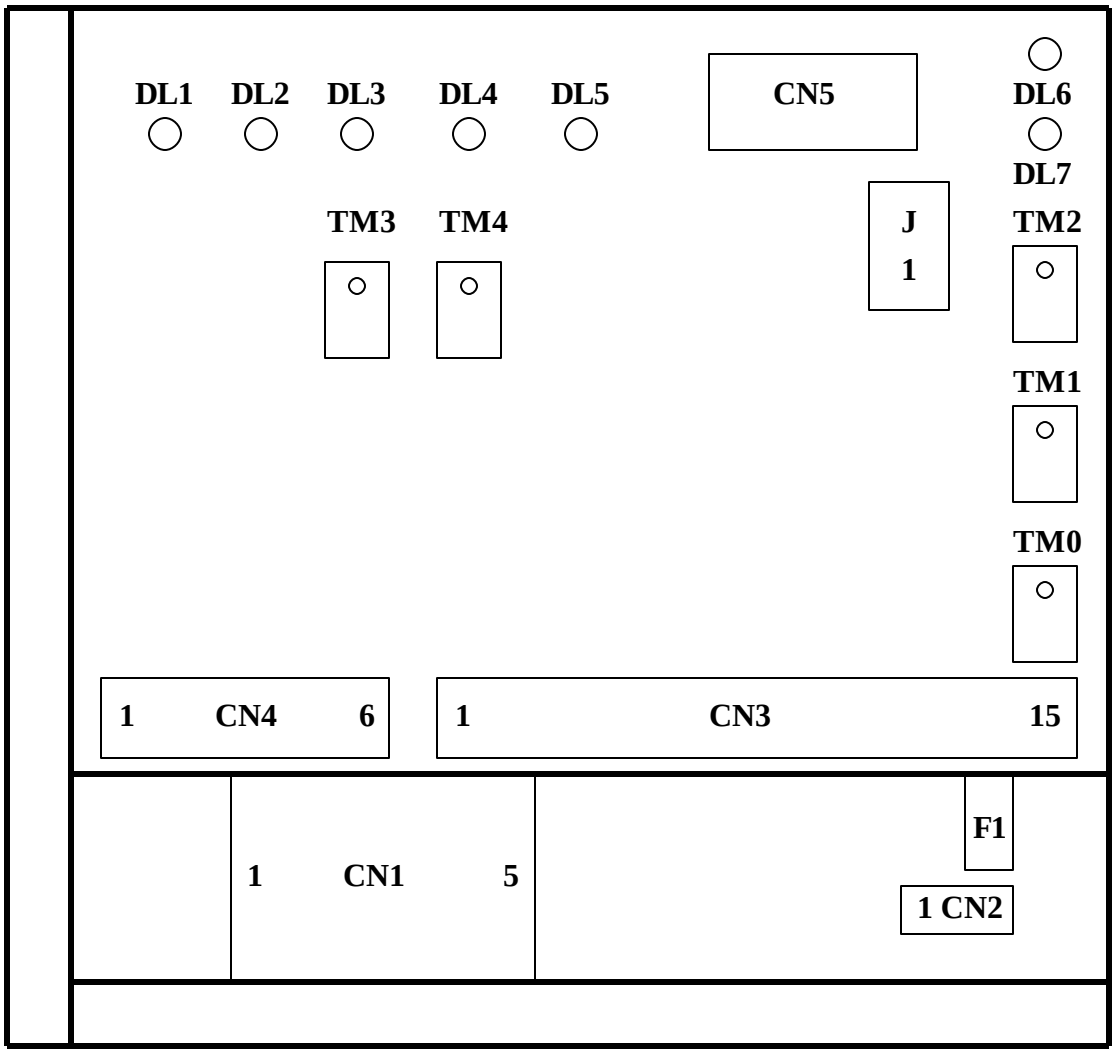
**CN2 CONTROL FEEDING CIRCUIT**

| | | |
|---|---|---|
| PIN 1 | 220 Vac (0,2A) | (0,5mmq) |
| PIN 2 | 220 Vac (0,2A) | (0,5mmq) |

**CN3 CONTROL FEEEDING CIRCUIT**

| | | |
|---|---|---|
| PIN1 | OV DIGITAL (O V PLC) | (0,5mmq) |
| PIN2 | PREHATING CONTROL (ON TO PLC 24V) | (0,5mmq) |
| PIN3 | WELDING CONTROL (ON TO PLC 24V) | (0,5mmq) |
| PIN4 | WELDING ALARM(N.C. CONCTAT.) 24V -1A/110V-0,5 | (0,5mmq) |
| PIN5 | WELDING ALARM (N.C. CONCTAT.) 24V -1A/110V-0,5 | (0,5mmq) |
| PIN6 | PREHATING TEMPERATURE POTENTIOMETER (OV) | (0,5mmq) |
| PIN7 | PREHATING TEMPERATURE POTENTIOMETER(REF.) | (0,5mmq) |
| PIN8 | PREHATING TEMPERATURE POTENTIOMETER (+10V) | (0,5mmq) |
| PIN9 | WELDING TEMPERATURE POTENTIOMETER (OV) | (0,5mmq) |
| PIN10 | WELDING TEMPERATURE POTENTIOMETER(REF) | (0,5mmq) |
| PIN11 | WELDING TEMPERATURE POTENTIOMETER (+10V) | (0,5mmq) |
| PIN12 | TWINLEAND REFERENCE +10V/+40V | (0,5mmq) |
| PIN13 | TWINLEAND REFERENCE +20V/+80V | (0,5mmq) |
| PIN14 | TWINLEAND REFERENCE -10V/-40V | (0,5mmq) |
| PIN15 | TWINLEAND REFERENCE -20V/-80V | (0,5mmq) |

### 3.31 CALIBRATING AND ADJUSTMENT BASE DIAGRAM

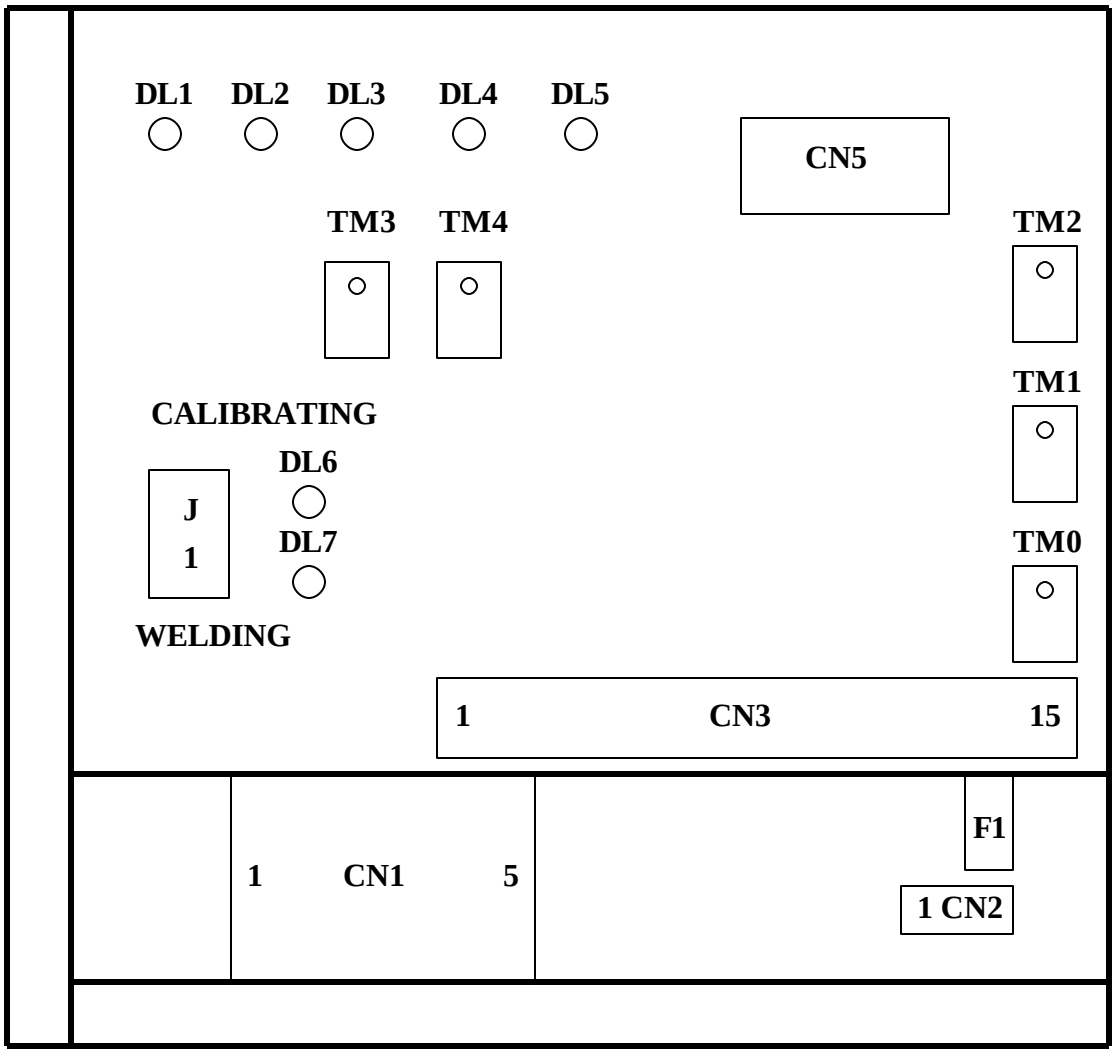



**TM0 -** OFFSET ADJUSTMENT (DON NOT TOUCH)
**TM1 -** STARTING CALIBRATING

**TM2 -** TEMPERATURE ADJUSTMENT
**TM3 -** CURRENT LIMITATION MAX.
**TM4 -** TENSION LIMITATION MAX.
**DL1 -** MAINS GREEN LED
**DL2 -** SHORT CIRCUIT OF THE RED LED ON THE TWINLEAD
**DL3 -** RED LED TENSION ALARM MAX.
**DL4 -** RED LED CRACKING CABLE MAX.
**DL5 -** GREEN LED CALIBRATING
**DL6 -** GREEN LED CALIBRATING
**DL7 -** RED LED CALIBRATING
**F1 -** FUSIBLE MAINS
**J1 -** (WELDING/CALIBRATING)(SALDATURA/TARATURA) SWITCH



### 3.32 CALIBRATING AND ADJUSTAMENT PLC DIAGRAM

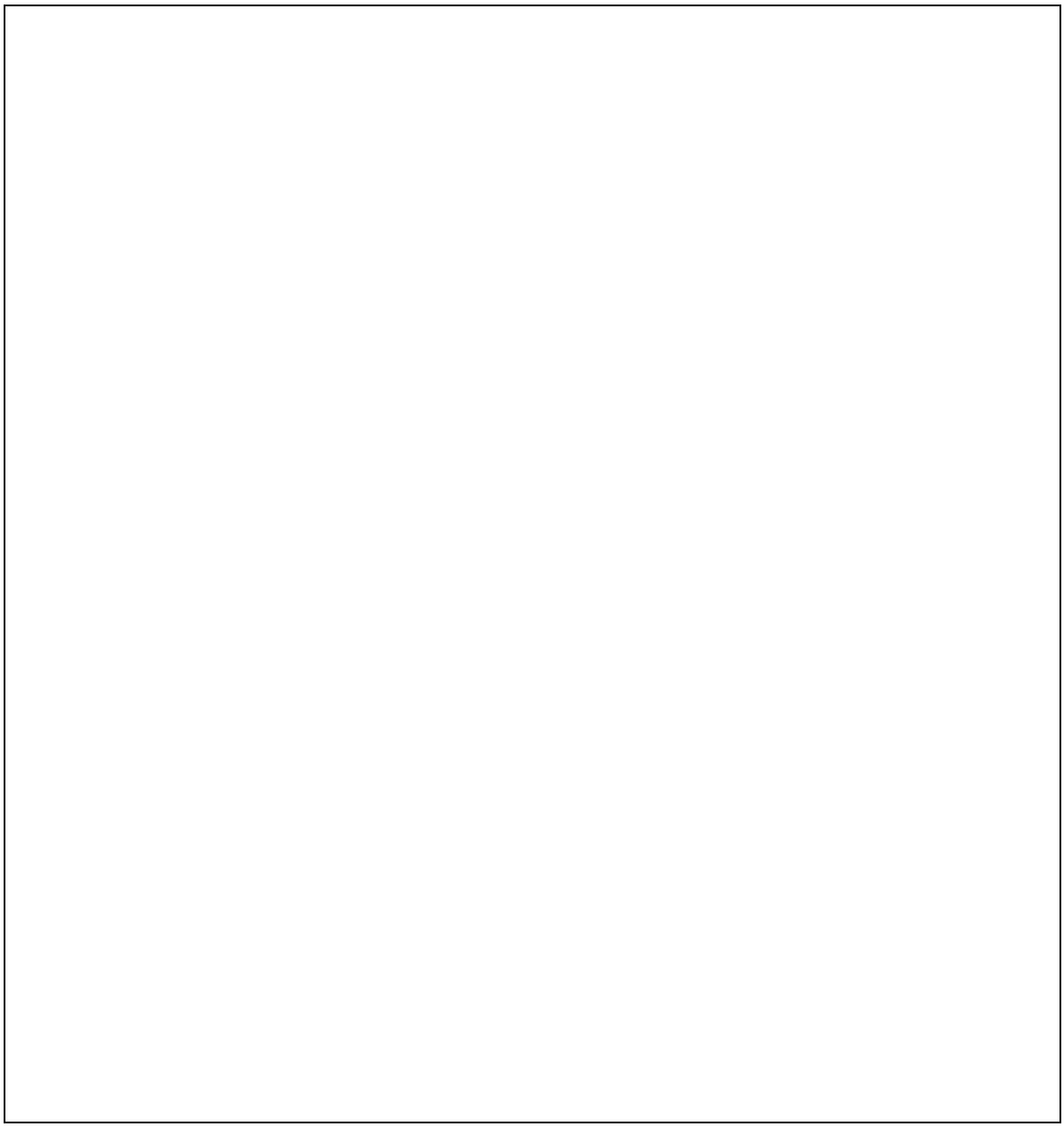



**TM0 -** OFFSETT ADJUSTMENTS ( DO NOT TOUCH)
**TM1 -** STARTING CALIBRATING
**TM2 -** CURRENT LIMITATION

**TM3 -** TENSION LIMITATION MAX.
**TM4 -** TENSION LIMITATION MAX.
**DL1 -** MAINS GREEN LED
**DL2 -** SHORT CIRCUIT OF THE RED LED ON THE TWINLEAD
**DL3 -** CURRENT MAX ALARM OF RED LED .
**DL4 -** CURRENT MAX ALARM OF RED LED.
**DL5 -** TENSION ALARM OF RED LED
**DL6 -** CALIBRATING GREEN LED
**DL7 -** CALIBRATING RED LED
**F1 -** FUSIBLE MAINS
**J1 -** (WELDING/CALIBRATING) (SALDATURA/TARATURA)SWITCH



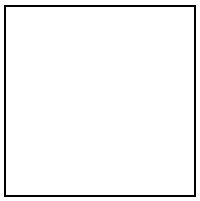
### 3.41 BASE LINKING DIAGRAM



**NOTE 1**
**TWINLEAD REFERENCE CONNECTION (CN3)**
AT TERMINAL BLOCK CN3/12,14 IF TRASFORMER<=30VAC
AT TERMINAL BLOCK CN3/12,15 IF TRASFORMER >30VAC
**N.B. TO PAY ATTENTION TO POLARITY**



**3.42 PLC LINKING DIAGRAM**



**NOTE 1 LINKING TWINLEAD REFERENCE (CN3)**
AT TERMINAL BLOCK CN3/12,14 IF TRASFORMER <=30VAC
AT TERMINAL BLOCK CN3/12,15 IF TRASFORMER >30VAC
**N.B. TO PAY ATTENTON TO POLARITY**



## 4 ELETTRICAL TRASFORMER DIMENSION

**SECONDARY CALCULATION TRASFORMER (V) :**

READ RESISTANCE VALANCE ON THE EXTREMITIES OF THE TWINLEAD
TAKE INTO CONSIDERATION THE NOMINAL CURRENT OF THE CARD (I =20A/40A)
CALCULATE THE TRASFORMER SECONDARY TENSION V<= RxI.

**CONNECTION TWINLEAD REFERENCE:**

AT THE TERMINAL BLOCK CN3/12, 14 IF THE TRASFORMER <= 30Vac.
AT THE TERMINAL BLOCK CN3/13, 15 IF THE TRASFORMER > 30Vac

## 5 CALIBRATING

**NOTE:** THE CARD IS PREPARED BY A **STATIC GAIN GS=20. I DO NOT SUGGEST YOU TO CHANGE THE VALUE.**
**NOTE:** YOU WISH TO CHANGE THIS VALUE TURN THE TEMPERATURE TRIMMER TM2 TOTALLY ON CLOCKWISE DIRECTION AND SEE THE FOLLOWING WELDING TABLE.

GS = 10 TURN ON ANTICLOCKWISE DIRECTION FROM 0 TURNS.
GS = 20 TURN ON ANTICLOCKWISE DIRECTION FROM 3,5 TURNS.
GS = 30 TURN ON ANTICLOCKWISE DIRECTION FROM 7 TURNS.
GS = 40 TURN ON ANTICLOCKWISE DIRECTION FROM 10 TURNS.

EVERY TIME YOU MODIFY THE POSITION TRIMMER TM2, YOU MUST EFFECT AGAIN THE WELDING.
**NOTE :** THE WRITING "**ATTENTION TO AMPEREMETER**" THAT YOU CAN FOUND INTO THE FOLLOWING INDICATIONS , SAY THAT THE OPERATOR MUST ALWAYS CONTROL THAT THE CURRENT DO NOT ADJUGMENT TOO MUCH FOR AVOIDING A WRONG OPERATION.(IN THIS CASE PRESS THE EMERGENCY HEAD).

1)POSITION THE COMMUTATOR J1 ON CALIBRATING.
2)TURN THE OUTSIDE WELDING AND PREHATING POTENTIOMETERS AT 0 ,OTHERWISE IN ANTICLOCKWISE DIRECTION .
3) INSERT THE PREHATING ORDER (ATTENTION TO AMPEREMETER).
4) TURN THE WELDING TRIMMER TM1 TILL WHEN THE RED WELDING LED TURN OFF AND THE GREEN LED LIGHT.

5) POSITION THE J1 COMMUTATOR ON WELDING (ATTENTION TO AMPEREMETER) (IT IS POSSIBLE TO VERIFY THE CORRECT FUNCTIONING TURNING OF A FEW GRADES THE OUTSIDE PREHATING POTENTIOMETER TO ANTICLOCKWISE DIRECTION FOR CHECKING THAT THE CURRENT AUGMENT AND TO CARRY IT BACK IMMEDIATELY AT 0 TO ANTICLOCKWISE DIRECTION ).
6) INSERT THE WELDING ORDER (IN CASE MAKE SOME PLASTIC BAG) AND FOUND THE RIGHT CURRENT TURNING TO CLOCKWISE DIRECTION THE OUTSIDE WELDING POTENTIOMETER (ATTENTION TO AMPEREMETER).
(IF YOU WISH TO AUGMENT AGAIN THE CURRENT YOU MUST SLOWLY TURN THE WELDING TRIMMER TM1 TO ANTICLOCKWISE DIRECTION ATTENTION BECAUSE THE REGULATION IS VERY SENSIBLE).



**CALIBRATING OPTIMIZATION**
(TO EXECUTE IT AFTER THE INITIAL CALIBRATING AND IN THE NEXT TUNING UP).

FOR A GOOD FUNCTIONING OF MACHINE THE AMPEREMETER MUST INDEX ON AUGMENT OF CURRENT EVERY TIME THAT YOU GIVE A WELDING ORDER OTHERWISE EVERY TIME THE WELDING BARS ARE CLOSING.
IF YOU WISH THAT THE CIRCUIT BECOME MORE SENSIBLE, YOU MUST REDUCE WITH MORE ATTENTION THE OUTSIDE WELDING POTENTIOMETER AND YOU MUST SLOWLY TURN THE WELDING TRIMMER TM1 TO ANTICLOCKWISE DIRECTION TILL WHEN YOU FOUND THE BEST CONDITIONS FOR WORKING.
(THE MACHINE IS READY FOR WORKING).

**PROTECTION**

1) TURN ON CLOCKWISE DIRECTION TM3 POTENTIOMETER TILL WHEN THE DL3 CURRENT ALARM LED BEGUINS TO LIGHT.
2) TURN ON CLOCKWISE DIRECTION TM4 POTENTIOMETER TILL WHEN THE DL4 TENTION ALARM LED BEGUINS TO LIGHT.
3) CHECK THAT THE ALARMS DO NOT CAME IN DURING THE FIRST WELDING.

**RESET ALARMS**

WHEN THE PREHATING AND WELDING COMANDS THERE ARE NOT TO TURN J1 SWITCH ON CALIBRATING FOR 1 SECOND.

**NOTA BENE:** CHECK THAT THE HEAT SINK TEMPERATURE IS NOT OVER 60° C DURING THE FACTION RATE.

## 6 ORDERS DATES

THERMOSALD 5020 BASE THERMOWELDING 50VAC/20A
3ESD0050

THERMOSALD 7020 BASE THERMOWELDING 70VAC/20A
3ESD0051

THERMOSALD 5040 BASE THERMOWELDING 50VAC/40A
3ESD0052

THERMOSALD 5050 BASE THERMOWELDING 50VAC/50A
3ESD0030

THERMOSALD 1020 PLC THERMOWELDING 10VAC/20A (WIRE CONTROL)
3ESD0038

THERMOSALD 5020 PLC THERMOWELDING 50VAC/20A
3ESD0030

THERMOSALD 7020 PLC THERMOWELDING 70VAC/20A
3ESD0031

THERMOSALD 5040 PLC THERMOWELDING 50VAC/40A
3ESD0032

THERMOSALD 5050 PLC THERMOWELDING50VAC/20A
3ESD0033

ALIMENTATION TRANSFORMER 600VA (10-0-20)

3ESD0018

ALIMENTATION TRASFORMER 1400VA (0-30-40-50-60)

3ESD0029

ALIMENTATION TRASFORMER 2000VA

3ESD0037

ACCESSORIES KIT (POTENTIOMETER AND GRIPS)

3ESD0028

AMPEREMETER 30A

3ESD0035

AMPEREMETER 60A

3ESD0036

THERMOSALD 5020 MOD
THERMOWELDING COMPLETE MODULE 50VAC/20A

3ESD0040

THERMOSALD 7020 MOD
THERMOWELDING COMPLETE MODULE 70VAC/20A

3ESD0041

THERMOSALD 5040 MOD
THERMOWELDING COMPLETE MODULE 50VAC/40A

3ESD0042

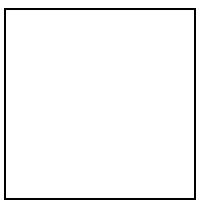
THERMOSALD 5050 MOD
THERMOWELDING COMPLETE MODULE 50VAC/50A

3ESD0043

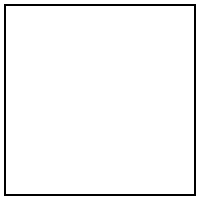


## 7 DIMENSION

### 7.1 DIMENSION THERMOSALD 20A - 40A - 50A



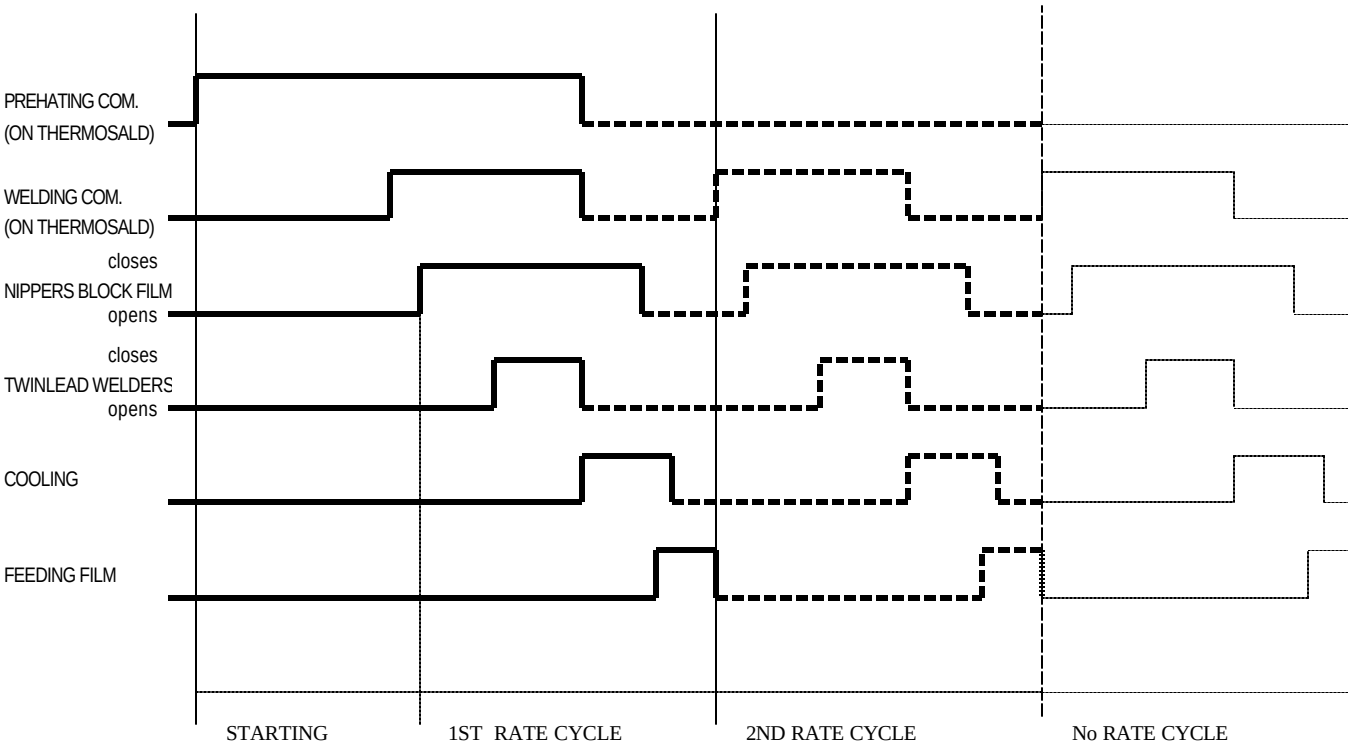
## 7.2 TRASFORMER DIMENSION



THERMOSALD-EDITION '94/6

**Appendix A**

# WELDING CYCLE



**THERMOSALD-EDITION '94/6**