

THERMOSALD ISX-COPRO

A MODULAR SYSTEM
FOR
IMPULSE SEALING
version with coprocessor



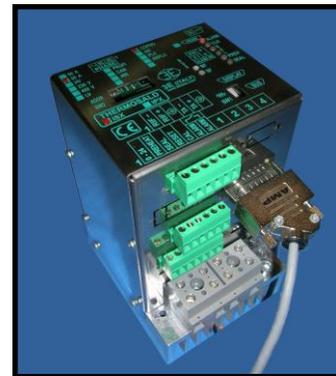
REDUNDANT MODEL

**BEFORE USING THIS DEVICE
PLEASE CAREFULLY READ THIS ENTIRE MANUAL
AND, IN PARTICULAR,**

THE SAFETY WARNINGS

THE INSTALLATION INSTRUCTIONS AND

THE MAINTENANCE INSTRUCTIONS



INSTALLATION AND USER MANUAL (V6)

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1 INTRODUCTION

This manual is *the only document relating to the product presented on the cover*. It very carefully and specifically deals with problems concerning the application on flat twin cable sealing bars, *refers to the basic user manual 3ES100_MDU*, contains safety warnings, a description of the device and some of its possible applications, instructions for installing, commissioning, servicing and scrapping, the codes and some examples for placing orders.

This manual is referred to in all the documents that accompany the product and must be referred to before using the product described herein.

In particular, read the safety warnings as well as the installation, commissioning, maintenance and scrapping instructions before using the product.

Known technical problems you may be faced with in a machine, the analysis of hazardous unpredictable failures as well as how to solve them, are highlighted in red.

REVISIONS OF THIS MANUAL:

Rev.: 0	Date: 17/01/2015	Software V6.1
Rev.: 1	Date: 18/11/2015	Software V6.1
Rev.: 2	Date: 18/03/2016	Software V6.1
Rev.: 3	Date: 27/01/2017	Software V6.2
Rev.: 4	Date: 06/09/2017	Software V6.5

2 SAFETY WARNINGS AND CERTIFICATIONS

2.1 SAFETY WARNINGS

ALL THE CONTROL CIRCUITS OF THIS THERMOREGULATOR ARE OF THE REDUNDANT TYPE. THE THERMOREGULATOR HAS A SINGLE CIRCUIT TO CONTROL THE POWER MODULE THAT SUPPLIES HEATING CURRENT. THE SYSTEM ENSURES SAFETY IN CASE OF POWER CIRCUIT FAILURE THROUGH THE OPENING OF THE ALARM RELAY THAT CUTS OFF THE POWER SUPPLY. THE EFFICIENCY OF THE ENTIRE ALARM CIRCUIT CAN BE CHECKED BY MEANS OF A MANUAL CONTROL PROVIDED ON THE PANEL.

BEFORE USING THE THERMOREGULATOR, READ THIS ENTIRE MANUAL CAREFULLY AND, IN PARTICULAR, THE SAFETY WARNINGS, THE WIRING INSTRUCTIONS AND THE INSTALLATION AND MAINTENANCE INSTRUCTIONS.

- The proper specific, technical training is required to install, commission, service or use the product. Consult this "USER MANUAL" and follow the instructions contained herein in compliance with the SAFETY REGULATIONS.

- Improper use of the apparatus may result in dangerous conditions for the operator, property, and people nearby.

- Do not use the equipment in an explosive atmosphere or with explosive material.

- Do not use the equipment with flammable material without first taking the necessary safety precautions.

- Install and use the thermoregulator only in industrial applications.

- Use only certified bands or wires with an APPROPRIATE POSITIVE TEMPERATURE COEFFICIENT ($\geq 800\text{PPM/K}$) as specified by the band manufacturer. If the band material is changed, set the new temperature coefficient in the relevant machine data.

-If the application requires that the band should not exceed the preset maximum temperature, set the MAXIMUM TEMPERATURE internal parameter.

- If the band must not exceed a preset maximum temperature for safety reasons, purchase the FIXED PARAMETERS OPTION, which indicates the required temperature coefficient and maximum temperature (see order-placing data in chapter 8).

-WIRING should be carried out by following the instructions in chapter 4.2.6 WIRING INSTRUCTIONS and, in particular, in compliance with all items highlighted in red.

-The INSTALLATION should be carried out by following the instructions in chapter 4.2.7 INSTALLATION INSTRUCTIONS and, in particular, in compliance with all items highlighted in red.

-The COMMISSIONING should be carried out by following the instructions in chapter 5.3 COMMISSIONING INSTRUCTIONS and, in particular, in compliance with all items highlighted in red.

-The MAINTENANCE should be carried out by following the instructions in chapter 6.2 MAINTENANCE INSTRUCTIONS and, in particular, in compliance with all items highlighted in red.

2.2 COMPLIANCE WITH STANDARDS – CE MARKING

The device complies with the fundamental requirements set forth in the following EU Directives that apply to the product, with reference to these harmonized standards:

89/336/EEC EMC Directive and subsequent amendments 92/31/EEC and 93/68/EEC

*IEC EN 61000-6-4 – Electromagnetic Compatibility (EMC) –
Emission for industrial environments*

*IEC EN 61000-6-3 – Electromagnetic Compatibility (EMC) –
Emission for residential environments
(with bands $\leq 3 \times 0.2$ in parallel and suitable filter)*

*IEC EN 61000-6-2 – Electromagnetic Compatibility (EMC) – Part 6-2: Generic Standards -
Immunity for industrial environments*

73/23/EEC/LOW VOLTAGE Directive and subsequent amendments 93/68/EEC

*IEC EN 60204-1 – Safety of machinery – Electrical equipment of machines
Part 1: General requirements*

3 DESCRIPTION

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

3.1 INTRODUCTION ON THE MARKET

THERMOSALD ISX-COPRO was designed to meet all the demands of a redundant product for the IMPULSE SEALING market.

3.2 DESCRIPTION OF THE PRODUCT

THERMOSALD ISX-COPRO is an extremely reliable product, manufactured with the following features:

- 2 independent band current reading circuits
- 2 independent band voltage reading circuits
- 2 independent control circuits, microprocessor + coprocessor
- 2 independent probes for accurate calibration
- 1 power supply controlled by 2 microprocessors
- 1 safety power circuit with alarm output on external circuit
- Unchangeable maximum temperature and temperature coefficient, with dedicated option

3.3 WORKING PRINCIPLE

THERMOSALD ISX-COPRO has 2 completely independent circuits to read band current and voltage on the band: processor circuit + coprocessor circuit. The processor and coprocessor process the received data to calculate the resistance of the band and, therefore, the temperature; at every network cycle, these calculations are updated and compared. In case of out-of-tolerance, processor and coprocessor trigger a thermoregulator alarm.

The cold temperature is assigned after calibration, either using the CALIBRATION TEMPERATURE manual parameter or the TEMPERATURE OF A PROBE installed next to the band. During calibration, probe temperatures are compared and in case a tolerance is out of range, processor and coprocessor trigger a thermoregulator alarm

The temperature is calculated via the reading of the cold band resistance and via the change in the resistance of the hot band. As such, it is important to know the band's characteristics, read the calibration temperature accurately and use a stable band.

3.4 APPLICATIONS

On all packaging machines with sealing requirements which demand great reliability in impulse temperature control.

3.5 ALPHANUMERIC IDENTIFICATION CODE (PLATE ON THERMOREGULATOR)

SERIAL NUMBER: this code uniquely identifies the thermoregulator, contains year and month of manufacture, and progressive number;
e.g. 15071234

PRODUCT CODE: this code uniquely identifies the thermoregulator model;
e.g. 3ES104S9G2V6CO stands for: THERMOSALD ISX 90A 4 Levels 90A COPRO

OPTION CODE: this code uniquely identifies a thermoregulator option;
e.g. 3ES100Z=CO_T180C900 stands for: FIXED PARAMETERS OPTION with MAX TEMPERATURE = 180° C TEMPERATURE COEFFICIENT = 900 PPM.

3.6 CONFIGURABILITY AND ADVANTAGES

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

4 INSTALLATION

4.1 WARNINGS AND REQUIREMENTS FOR INSTALLATION

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

-BEFORE STARTING an INSTALLATION, carefully read the SAFETY WARNINGS, THE WIRING NOTES AND THE INSTALLATION INSTRUCTIONS in this MANUAL .

- This apparatus must be installed in accordance with the requirements set forth in standard IEC - EN60204
- This apparatus must be installed carefully, by following the instructions provided in the THERMOSALD ISX-COPRO USER MANUAL and in the GENERAL USER MANUAL.
- This apparatus must be installed by skilled and properly trained personnel.

4.2 CHOOSING THE COMPONENTS AND TECHNICAL NOTES FOR INSTALLATION

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

4.2.1 SECONDARY THERMOREGULATOR

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

4.2.2 POWER TRANSFORMER AND SIZING

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

4.2.3 SIZING THE PROTECTION DEVICES

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

4.2.4 ELECTROMECHANICAL SYSTEM

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

4.2.5 MAINS FILTER

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

4.2.6 WIRING INSTRUCTIONS

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

For the electrical connections, refer to the wiring diagrams provided as examples in chapter 4.3.

VERY IMPORTANT WIRING INSTRUCTIONS FOR SAFETY AND TEMPERATURE ACCURACY:

EMERGENCY BUTTON: The emergency button that stops the end machine will stop all machine operations connected to it, including the sealing operations, and will cut off power at once.

EMERGENCY CIRCUIT: the thermoregulator's ALARM output must cut off the thermoregulator's power directly, without going through the PLC, and warn the PLC about the triggered alarm (see example in wiring diagram in chapter 4.3).

POWER CABLES: these cables must be of the proper size and twisted (both the 2 input cables from the transformer to the thermoregulator, and the 2 output cables from the thermoregulator to the machine). Concerning bands that are not too short, you can use a supporting machine terminal block near the band, where you can connect the bands, the reference cable and the power cables from the thermoregulator. It is advisable to place the machine terminal block inside 1 standalone box for each thermoregulator so as not to bundle the wires of multiple thermoregulators, which would generate instability.

REFERENCE CABLES: use 1 shielded reference cable for each thermoregulator (connect thermoregulator input to machine terminal block near the bands, if provided).

WIRING OF OPPOSED BANDS: opposed bands cannot be connected in series but must be connected only in parallel, so that all opposed points will be at the same potential. In the case of parallel bands, make sure that it is not possible to mistakenly connect the bands in an anti-parallel manner even when bands will be changed over time.

MOUNTING THE BANDS ON THE BAR: isolate the bands from the machine's mechanical structure. The ends of the bands must be copper-plated; this plating must cover at least 1 cm of the bar to avoid any overtemperatures in the zones up in the air between the bar and the terminal. Bands should bear in the same manner on all the bar's points to avoid any overtemperatures in the zones where bands do not bear on the bar.

TERMINALS: tighten all the terminals to their limit, especially the power terminals.

- *Mechanically secure the thermoregulator to the plate through the fixing holes*
- *Connect the protective ground conductor to the fixing bolt, provided and identified by the PE yellow-green indication on the dissipator. The core section of the ground conductor should be*

>= the power conductors . It is advisable to connect the ground conductor directly to the galvanized support plate as close as possible to the ground bolt.

4.2.7 INSTALLATION INSTRUCTIONS

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

Below are summarized any dangerous unpredictable faults that may occur, and how to solve them:

POWER SCR BREAKAGE: in order to avoid overheating, the thermoregulator opens the alarm contact instantly; this contact must cut off the emergency chain. We observed an increase in temperature of a few degrees during lab tests. Records on over 10,000 applications do not record any such event. It is advisable to carry out a machine simulation.

BAND BREAKAGE: the thermoregulator stops regulating and opens the emergency contact instantly. During lab tests we observed that a small spark may occur due to the waveform that has already triggered; **to prevent breakage, it is advisable to use bands having a good-sized section, e.g.: 0.3 mm, and to change bands during scheduled maintenance to prevent wear.**

BAND AND GROUND SHORT CIRCUIT: il termoregolatore blocca la regolazione e apre istantaneamente il contatto di emergenza. During lab tests we observed that a small spark may occur due to the waveform that was already triggered; **to prevent short circuits, it is advisable to place and/or handle the bands so that there can be no accidental contact between the bands and the machine's metal structure (see chapter 4.2.6 wiring notes).**

SHORT CIRCUIT BETWEEN BANDS: This event cannot occur if wiring is made correctly (see chapter 4.2.6 wiring notes).

BANDS NOT COPPER-PLATED AND NOT BEARING ON BARS: the thermoregulator regulates the band's average temperature with the same heating current: temperature increases in the air. **This event cannot occur if the bands are copper-plated in the terminals' area and if they bear equally on the entire bar. Give the sealing command when grippers are closed or, even better, a few moments before the grippers close, so that temperature will be distributed evenly on the entire bar, from one copper-plating to the next.**

BAND AGING: Temperature is measured by reading the band's electrical characteristics; there is a change in the electrical characteristics of bands currently on the market, when used at temperatures higher than 180°, and the band's real temperature therefore changes by a few degrees. In particular, you can observe that the displayed balancing temperature decreases by a few degrees over time. **You should not exceed 180° working degrees to guarantee a fairly stable temperature. It is advisable to choose stable, properly copper-plated bands, and to check temperature behaviour in the machine to see if the temperature error is acceptable. Replace the bands according to scheduled maintenance and machine requirements.**

Below are summarized the inspections to be carried out and relating conditions:

TEMPERATURE COEFFICIENT of installed bands: the band's TEMPERATURE COEFFICIENT, declared in PPM or parts per million, must be equal to machine TEMPERATURE COEFFICIENT data.

TEMPERATURE PROBES: In order to have an accurate balancing temperature, you can mount the TEMPERATURE PROBES on the sealing bar or near the band in order to measure the band's temperature during calibration (see order-placing data in chapter 8).

CALIBRATION WHILE MACHINE IS COLD: calibration must be carried out when machine temperature is cold and stable to allow the band to be very close to the room temperature set in machine CALIBRATION TEMPERATURE data or, if the TEMPERATURE PROBE is present, it should be very close to the probe's temperature.

MAXIMUM WORKING TEMPERATURE: If the band must not exceed the preset maximum temperature for working purposes, set the MAXIMUM TEMPERATURE internal parameter. Whereas if the band must not exceed a preset maximum temperature for safety reasons, you can purchase the preset TEMPERATURE COEFFICIENT and MAX REQUIRED TEMPERATURE options (see order-placing data in chapter 8).

TEMPERATURE ACCURACY: the thermoregulator features the degree resolution but the real temperature at all the band's points depends on some factors already described elsewhere, which we have summarized here: correct temperature coefficient, correct balancing temperature, calibration while machine is cold, use of temperature probes, band with good copper-plating at the ends, good contacts, exactly parallel bands, bands bearing evenly on the entire bar, working temperature not higher than 180° C, band replacement before it ages.

ALARM OUTPUT CONTACT TEST AND EMERGENCY CHAIN CHECK: the thermoregulator features an alarm output contact, CN6/6-7, which opens at any of its alarm conditions and that must consequently open the emergency chain: in order to check its working efficiency, press the mode button as is done at power-on, or access the emergency control menu: the alarm output relay must open, and consequently the power circuit must open and remain off. Should any chain component be faulty, the thermoregulator triggers alarm 79.

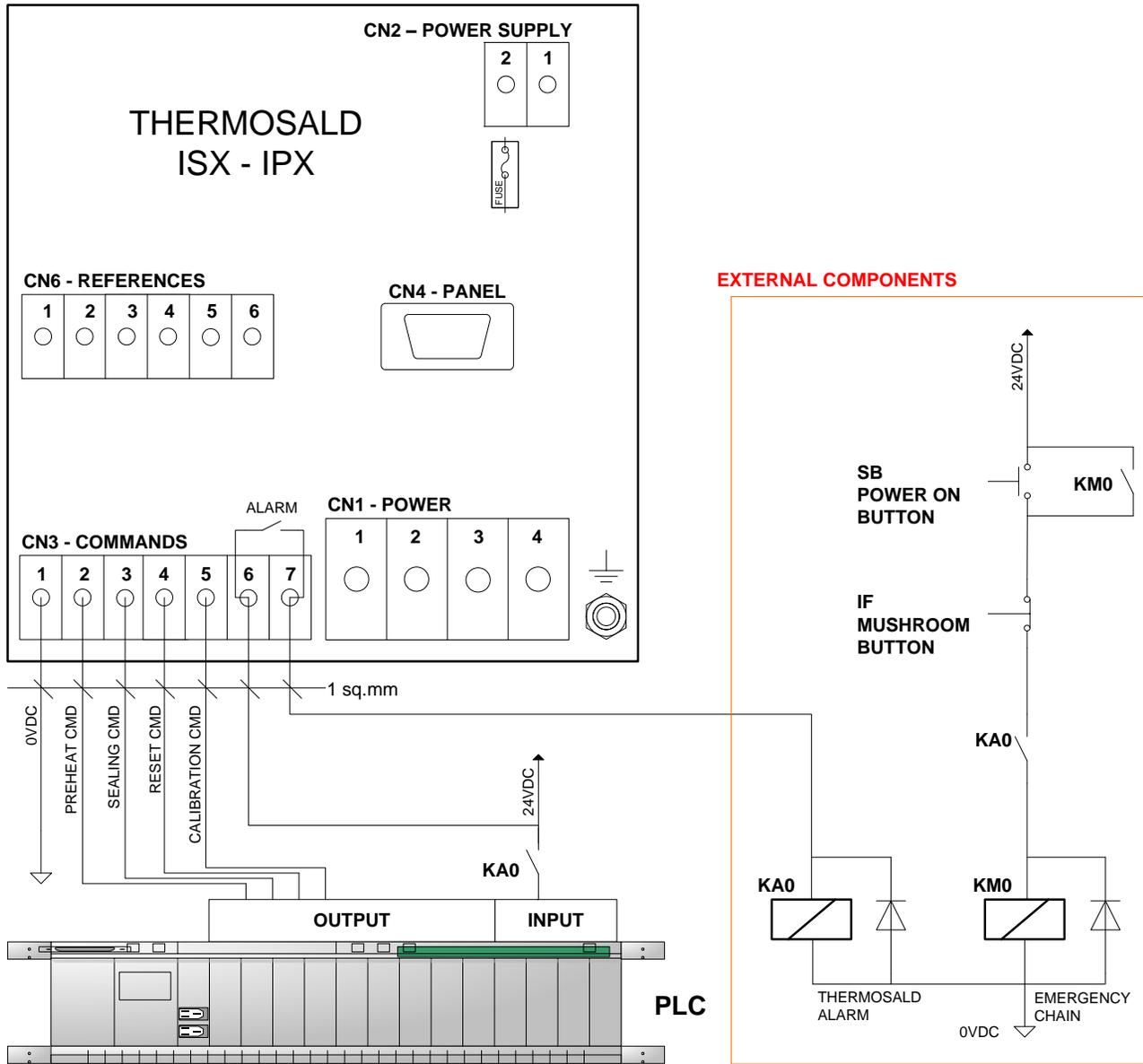
WORKING CONDITION CHECK: it is advisable to install an ammeter on the current circuit, which can be seen by the operator to check the machine's proper operation.

- Do not enable the thermoregulator's power circuit when the machine's mechanical guards are open.

- *Do not power-on the thermoregulator without its safety cover.*
- *Install all the bands to ensure perfect contact; use copper-plated bands locked on firm terminals and/or eyelets, or terminals+eyelets. The copper plating should cover the band by a few millimeters outside the bag up to the far ends inside the terminal.*

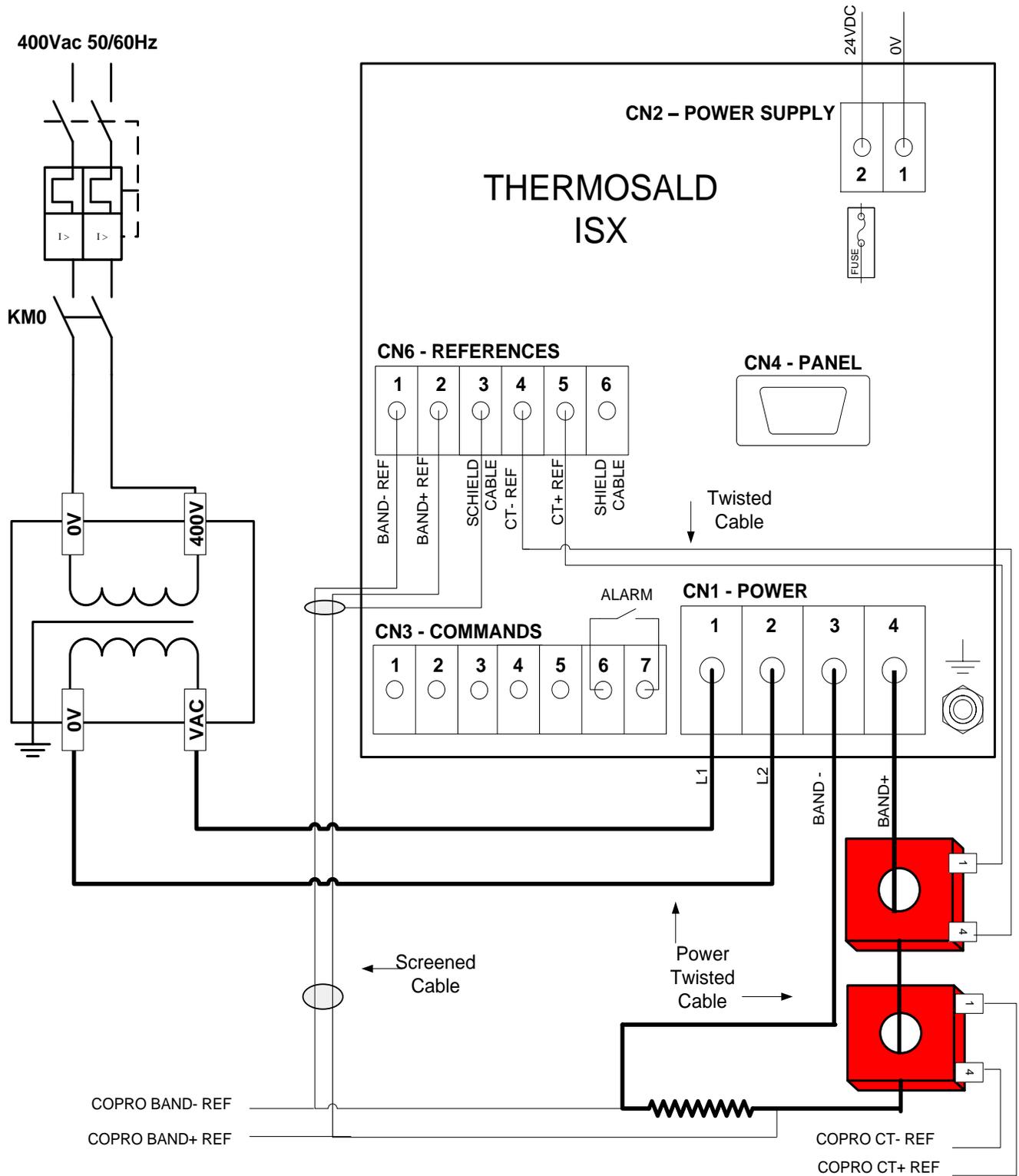
4.3 WIRING DIAGRAMS

4.3.1 DIGITAL SIGNAL CONNECTIONS



CONSTRUCTION NOTES:

4.3.2 POWER CONNECTIONS - CONTROL ON THE SECONDARY (THERMOSALD ISX MODEL)



- 4.3.3 N.U.
- 4.3.4 N.U.
- 4.3.5 STANDARD WITH OPERATOR PANEL
- 4.3.6 STANDARD WITH PROFIBUS
- 4.3.7 STANDARD WITH CANBUS
- 4.3.8 STANDARD WITH ANALOG OPTION
- 4.3.9 TEMPERATURE PROBE



TEMPERATURE PROBE CONNECTOR (9 PINS, MALE)

PIN1	0V INTERNAL - green wire	(1 mA max)
PIN2	+5 Vdc - brown wire	(1 mA max)
PIN3		
PIN4		
PIN5		
PIN6		
PIN7	CLOCK -yellow wire	(1 mA max)
PIN8		
PIN9	DATE - white wire	(1 mA max)

4.4 LIST OF EXCHANGE SIGNALS

This list shows and describes the list of the connections and relating PINS of

CN1 – POWER TERMINAL BLOCK (MODEL WITH CONTROL ON THE SECONDARY)

PIN1	ALTERNATING POWER SUPPLY
PIN2	ALTERNATING POWER SUPPLY
PIN3	- BAND
PIN4	+ BAND

NOTE 1: We recommend you twist the power cables

CN2 – CONTROL CIRCUIT POWER SUPPLY TERMINAL BLOCK

PIN 1	0 Vdc	(Max. absorption: 0.5 A)
PIN 2	24 Vdc	(max. absorption: 0.5 A)

NOTE 1: 0-24VDC is insulated from the internal power supply and ground

CN3 – COMMANDS TERMINAL BLOCK

PIN1	COMMON 0 V PLC (24 Vdc)	(0.1A Max. absorption)
PIN2	PREHEATING COMMAND FROM 24 Vdc PLC (0)	(20 mA max)
PIN3	SEALING COMMAND FROM 24 Vdc PLC (0)	(20 mA max)
PIN4	RESET COMMAND FROM 24 Vdc PLC (0) DC	(20 mA max)
PIN5	CALIBRATION COMMAND FROM 24 Vdc PLC (0) DC	(20 mA max)
PIN6	SEALING ALARM (N.C. CONTACT)	(4 A max)
PIN7	SEALING ALARM (N.C. CONTACT)	(4 A max)

CN4 - CONNECTOR FOR DISPLAY PANEL (15 PINS, FEMALE)

PIN1	+5 Vdc	Shielded (0.25 mm ²)
PIN2	0 V	Shielded (0.25 mm ²)
PIN3	SPI-SDO	Shielded (0.25 mm ²)
PIN4	SPI-SCK	Shielded (0.25 mm ²)
PIN5	SPI-SDI	Shielded (0.25 mm ²)
PIN6		
PIN7		
PIN8		
PIN9	SPI-SS	Shielded (0.25 mm ²)
PIN10	RESERVED	Shielded (0.25 mm ²)
PIN11	RESERVED	Shielded (0.25 mm ²)
PIN12	RESERVED	Shielded (0.25 mm ²)
PIN13	RESERVED	Shielded (0.25 mm ²)
PIN14		
PIN15		

NOTE 1: The thermoregulator-panel connection cable must be shielded with pin-to-pin connection. Max. 15 m.

CN6 – REFERENCES TERMINAL BLOCK

PIN1	REF- BAND REFERENCE	(1 mA max)
PIN2	REF+ BAND REFERENCE	(1 mA max)
PIN3	REF0 REFERENCES CABLE SHIELD (do not connect on the machine side)	
PIN4	CT- REFERENCE	(500 mA max) twisted cable
PIN5	CT+ REFERENCE	(500 mA max) twisted cable
PIN6	N.C. REF0 REFERENCES CABLE SHIELD (do not connect on the machine side)	

CN9 – TEMPERATURE PROBE CONNECTOR (9 PINS, FEMALE)

PIN1	0V INTERNAL	(1 mA max)
PIN2	+5 Vdc	(1 mA max)
PIN3		
PIN4		
PIN5		
PIN6		
PIN7	OUT CLOCK	(1 mA max)
PIN8		
PIN9	DATE	(1 mA max)

5 COMMISSIONING

5.1 COMMISSIONING WARNINGS

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

-BEFORE STARTING COMMISSIONING, carefully read the SAFETY, INSTALLATION and COMMISSIONING WARNINGS in this MANUAL .

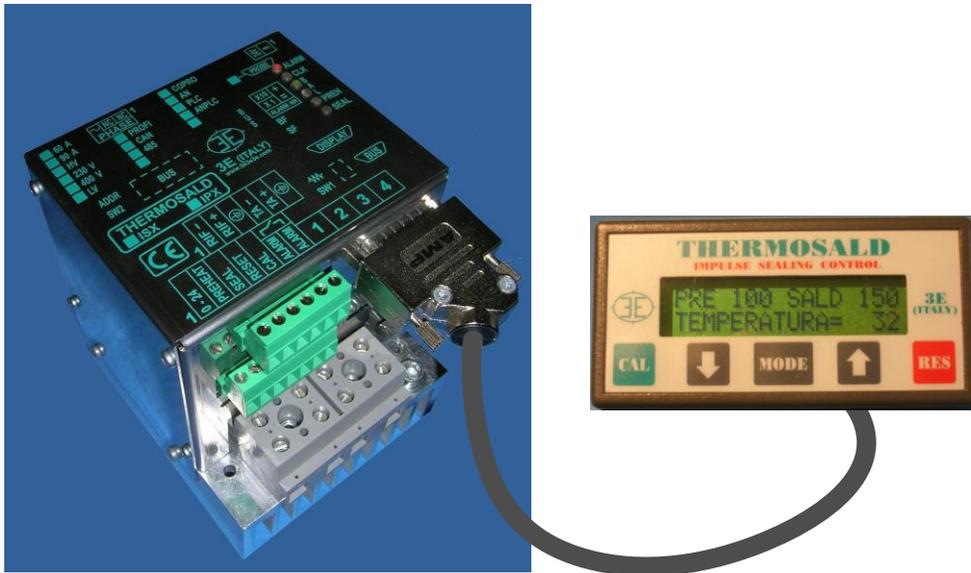
-The system must have been sized as specified in the installation warnings and built in a workmanlike fashion.

-The thermoregulator is provided in the MASTER RESET condition. After every MASTER RESET, the parameters return to the default status: if they were changed for operation purposes, the working parameters must be restored; during MASTER RESET, the 4 LEDs at the top on the right will blink on the equipment.

-For any further information, do not hesitate to contact 3E.

5.2 N.U.

5.3 COMMISSIONING INSTRUCTIONS



For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

Step 1 - calibrate only after reading the commissioning warnings. Make sure that the terminals of the POWER TRANSFORMER, THERMOREGULATOR, AND SEALING BAR are correctly tightened.

Step 2 - the machine must be at ambient temperature

Step 3 - the preheating and sealing commands must be deactivated

Step 4 – power-on the thermoregulator

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Step 5 - in the event an alarm is triggered, the red ALARM LED ON on the thermoregulator, follow the suggestions shown on the panel or provided by the supervisor and solve the alarm (the number of the alarm and its description is displayed on the panel in the selected language among the 6 ones available)

Step 6 – perform the first calibration: press the green CAL button on the multilanguage panel for 3 seconds (the 2 balancing LEDs on the equipment blink during calibration).

Step 7 – at the end of the calibration, the machine is ready to work: set the preheating and sealing temperatures in the TEMPERATURE submenu

Step 8 – to return to the home page, press the RES button and follow the instructions

NOTE 1: for the following calibrations, wait for the machine to reach the ambient temperature and press buttons CAL+MODE+CAL in sequence on the multilanguage panel.

NOTE 2: calibration is also possible from the outside: press the CALIBRATION COMMAND button on terminal block CN3/5 for 3 seconds.

NOTE 3: if problems cannot be solved, perform a MASTER RESET according to one of the following procedures:

procedure 1 - Keep ARROW DOWN + ARROW UP on the multilanguage panel pressed for 6 seconds.

procedure 2 – Keep the external RESET + CALIBRATION buttons pressed at the same time for 6 seconds

The 4 LEDs on the equipment remain ON for 3 seconds during the MASTER RESET. The thermoregulator has loaded all parameters, as when factory-set.

5.4 N.U.

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

5.5 INSTRUCTIONS FOR USING THE MULTILANGUAGE PANEL

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

6 MAINTENANCE

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

6.1 MAINTENANCE WARNINGS

-BEFORE STARTING a MAINTENANCE INTERVENTION, please carefully read the SAFETY and MAINTENANCE WARNINGS provided in this MANUAL.

6.2 MAINTENANCE INSTRUCTIONS

For the general notes, please refer to the basic user and maintenance manual 3ES100_MDU.

REPLACING THE BAND WITH THE MACHINE COLD (i.e. bars at ambient temperature)

To be scheduled according to the working environment and band wear, in any case with periodical interventions at intervals not longer than 30 days each.

- 1 - Power off, remove the preheating and sealing commands, let the grippers cool down so that band and bar are at the same temperature.
- 2 – Mount the new bands, well-aligned; always check that terminals are clean to ensure a good contact; tighten the terminals.
- 3 – Power on.
- 4 - Calibrate.
- 5 – Try a sealing cycle with an empty bag and, if the check ammeter is provided on the panel, check that heating current behaves correctly.
- 6 – THE MACHINE is ready.

REPLACING THE BAND WITH THE MACHINE HOT (i.e. bars at operating temperature - quick intervention)

It must not be carried out - let the bars cool down.

THERMOREGULATOR AND POWER TRANSFORMER MAINTENANCE

To be scheduled according to the working environment, in any case with periodical interventions at intervals not longer than 90 days each.

- 1 – Make sure that all the terminals of both the power transformer and any terminal blocks are connected and well tightened.
- 2 – Make sure that all thermoregulator terminals are well tightened and, in particular, the CN1 power terminals of the thermoregulator, the inner and outer screws.
- 3 – Periodically check the correct operation of the output safety alarm contact: press the MODE BUTTON as requested at start-up in order to check the alarm circuit, or access the EMERGENCY CHECK MENU; the emergency output relay must open and the power circuit must remain disconnected. If any component of the chain is faulty, the thermoregulator triggers alarm 79.

SEALING BARS MAINTENANCE

To be scheduled according to the working environment, in any case with periodical interventions at intervals not longer than 90 days each.

1 – Make sure that the feedback reference terminals and the power terminals are well tightened.

2 – Make sure the band's terminals are highly conductive and do not show any oxidation or bad contacts: otherwise carry out maintenance.

3 – Check the band's supports made of insulating material and Teflon.

7 TECHNICAL DATA

7.1 TECHNICAL DATA FOR THE MODULATION-ON-THE-SECONDARY MODEL

CONTROL POWER SUPPLY (CN2)	24VDC +/- 20% (0.2 A max. absorption)
POWER SUPPLY	SECONDARY POWER TRANSFORMER
STANDARD MODEL	10V-70V (BANDS 20CM-200CM)
LOW VOLTAGE MODEL	5V-10V (SHORT BANDS <20CM)
HIGH VOLTAGE MODEL	70V-140V (LONG BANDS >140CM)
BAND SHORT CIRCUIT CURRENT	180A (mod.60) 400A (mod.90)
I2T STANDARD – I2T MAX CURRENT	150-180A (mod.60) 260-300A (mod.90)
MAINS FREQUENCY	50 – 60 Hz automatic switchover
DIGITAL COMMANDS	24 VDC (max. absorption: 20 ma)
SEALING ALARM CONTACT	250 V 1 A (2A MAX)
REPETITIVENESS WITH RESPECT TO CALIBRATION TEMP.	\cong +/- 1° C
PREHEATING TEMPERATURE	Can be set via the display panel 0 - 300° C
SEALING TEMPERATURE	Can be set via the display panel 0 - 300° C
SEALING AND COOLING TIME	External via PLC
WORKING ENVIRONMENT TEMPERATURE	-20° C + 40° C
WORKING ENVIRONMENT HUMIDITY	<50%
THERMOREGULATOR PROTECTION RATING	IP20
PANEL PROTECTION RATING	IP44 (IP65 with option)
POWER UNIT WEIGHT	