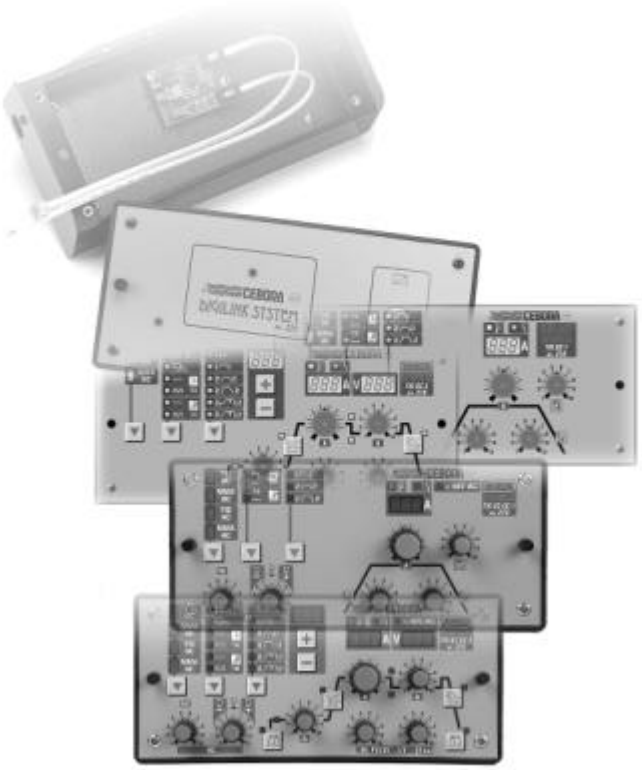
TIG SOUND DC – AC/DC

CONTROL PANELS
art. 213 – 216 – 218 – 220

REMOTE CONTROL MODULE
art. 222

SERVICE MANUAL



CONTENTS

1 - GENERAL INFORMATION

1.1 - Introduction.

This manual has been prepared for the purpose of training personnel assigned to carry out maintenance on Control panels art. 213, 216, 218, 220 and the remote control module art. 222. These articles must be used in TIG SOUND DC and TIG SOUND AC/DC welding systems combined with power sources art. 342 and 348.

1.2 - General service policy.

It is the responsibility of the customer and/or operator to use the equipment appropriately, in accordance with the instructions in the Instructions Manual, as well as to maintain the equipment and related accessories in good working condition, in compliance with the instructions provided in the Service Manual.

Any internal inspection or repairs must be carried out by qualified personnel who are responsible for any intervention on the equipment.

It is forbidden to attempt to repair damaged electronic boards or modules; replace them with original Cebora spare parts.

1.3 - Safety information.

The safety notes provided in this manual are an integral part of those given in the Instruction Manual for the control panels and the power sources to which they are connected. Therefore, before working on the machine, please read the paragraph on safety instructions in the aforementioned manuals.

Always unplug the power cord of the power source from the mains before accessing the internal parts.

Some internal parts, such as terminals and dissipaters, may be connected to mains or otherwise hazardous potentials. It is therefore forbidden to work with the safety guard removed from the power source unless strictly necessary. In this case, take special precautions such as wearing insulating gloves and footwear, and working in a perfectly dry environment with dry clothing.

1.4 - Electromagnetic compatibility.

Please read and observe the instructions provided in the paragraph “Electromagnetic compatibility” of the Instruction Manual for the power source to which the panel is connected.

2 - SYSTEM DESCRIPTION

2.1 - Introduction.

Control panels art. 213, 216, 218 and 220 are the control panels of the power sources for TIG SOUND DC 2640/T and TIG SOUND AC/DC 2540/T welding systems.

The remote control module art. 222 allows you to connect the aforementioned control panels at a distance from the power sources.

2.2 - Technical specifications.

To review the technical specifications, see the Instruction Manual and Sales Catalogue.

2.3 - Description of control panels art. 213, 216, 218, 220.

The control panels are available in two versions for each power source:

- for power source art. 342, art. 213, minimum version and art. 216, complete version;
- for power source art. 348, art. 218, minimum version and art. 220, complete version.

The control panel is connected to the power source via the power cord, from the flyback board, and the “RS485” standard communication cable, from the satellite board, and thus from the control.

Each control panel is made up of three boards mounted on top of one another; one is common to all versions, while the other two are configured the article that they represent.

The external panel board is the support for the entire control panel, and contains the indicator leds (all except those relating to the “Process”) and the function selection buttons.

The display board contains the display to show the sizes measured, the “Process” indicator leds, and the potentiometers to adjust the functions.

The micro board contains the microprocessor that manages the entire control panel and “RS485” communication with the satellite board of the power source. This board is programmed with the version of the program corresponding to the article on which it is mounted.

The control panels are normally mounted in the housing provided on the side of the power sources.

2.4 - Description of remote control module art. 222.

This is an optional unit that allows you to connect the control panel at a distance of up to five meters from the power source.

The devices are connected via the extension cord art. 1190, which uses a fiber optic for data communication, and an electrical cable for the control panel power supply.

Two boards are present to convert the signals from electrical to light and vice-versa:

- optic interface on power source side code 5.600.763, which is placed on the power source in the control panel slot.
- optic interface on panel side code 5.600.768, which is placed remotely in the control panel housing.

These two boards use the same power supply source as the control panel.

3 - MAINTENANCE

WARNINGS

ANY INTERNAL INSPECTIONS OR REPAIRS MUST BE CARRIED OUT BY QUALIFIED PERSONNEL.

UNPLUG THE UNIT FROM THE POWER MAINS AND WAIT FOR THE INTERNAL CAPACITORS TO DISCHARGE (2 MINUTES) BEFORE PERFORMING MAINTENANCE.

3.1 - Periodic inspection, cleaning.

Clean the front of the control panel with a soft cloth dampened with water and ethyl alcohol, taking care not to press too hard on the surface to avoid scratching. Do not use paint solvents, benzene or abrasive cleansers.

Periodically check the condition of the cables and connectors.

3.2 - Sequence of operations (fig. 3.2.2).

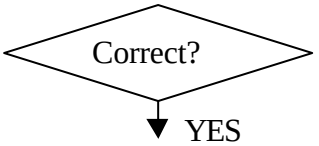
The following sequence represents correct functioning of the machine. It may be used as a guiding procedure for troubleshooting.

For convenience, the description refers to the complete version of the panels (art. 216 and 220). The most important differences referring the minimum versions are mentioned in parentheses, while the differences due to missing functions are obvious and thus not mentioned.

NOTE

- ❑ Operations preceded by this symbol refer to operator actions.
- ♦ Operations preceded by this symbol refer to machine responses that must occur following an operator action.

- ❑ Connect the Control panel to the power source.
- ❑ Power the power source.
  - ♦ System powered; on the control panel, the Process, Mode and Program indicators are lit, per the settings before the unit was last switched off.
  - ♦ For one second, display (Y) and (Z) indicate the control panel version installed, for example Y = Art; Z = 216 or 220 (in panels art. 213 and 218, the article number replaces the “art” label on the same display (Y)).
  - ♦ Subsequently, display (Y) indicates the current value programmed and adjustable by rotating the knob (AC).
  - ♦ Display (Z) indicates the output voltage (0 V in TIG, 57 V in MMA) and display (V) indicates “- - -” in TIG or “0 – 99” in MMA.



NO (see 3.3.1-3.3.2).

▼ YES

- ❑ Press the button (A) several times; the “Process” selection is repeated in sequence.
- ❑ Press the button (B) several times; the “Mode” selection is repeated in sequence.
- ❑ Press the button (C) several times; the “Program” selection is repeated in sequence (“Program” selection cannot be selected in MMA).
- ❑ Simultaneously press the buttons (AH) and (AI) to enter the “preset” condition (function not available in panels art. 213 and 218).

- Press the torch trigger several times to check, in sequence, the available “preset” parameters.
  - Display (Z) reads “PrE”, thus preset.
  - Each time the start button is pressed, the AG, AP, AH, AQ, AR, AI and AL leds light one after another.
  - Display (Y) reads “- - -”, or the value corresponding to the function indicated by the leds AP, AQ and AR.
  - Display (V) indicates the value corresponding to the function indicated by the leds AG, AP, AH, AR, AI and AL.

Correct? NO (see 3.3.3),

▼ YES

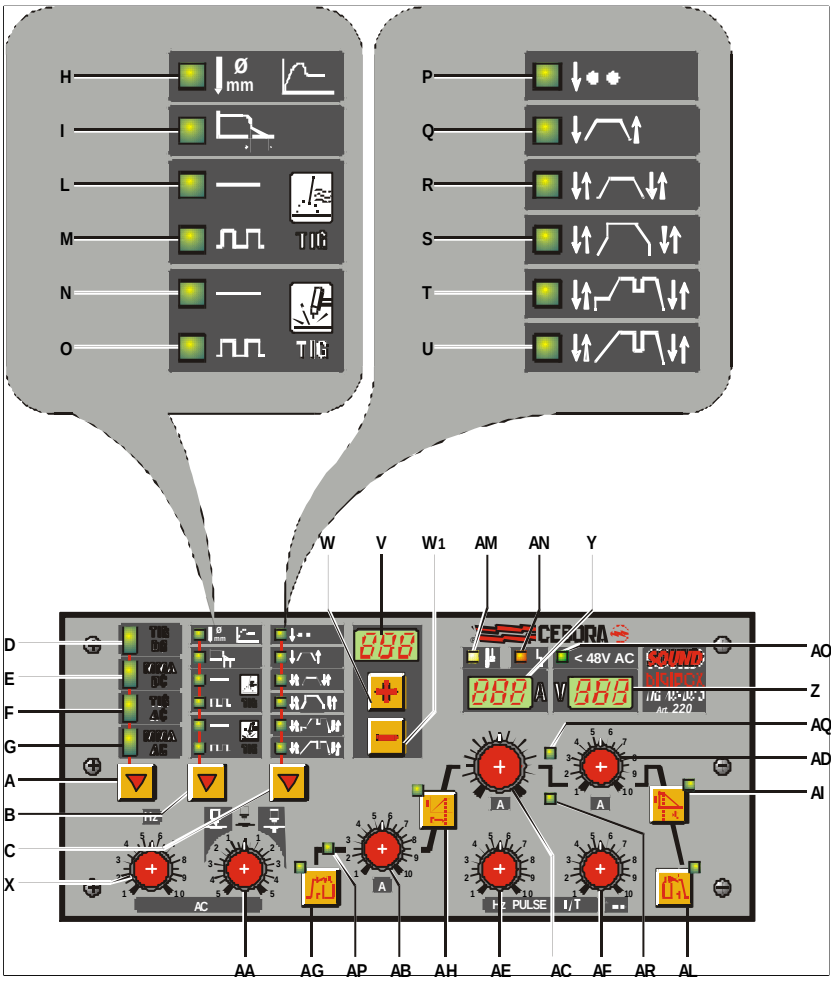
- Simultaneously press the buttons (AH) and (AI) to exit the “preset” condition.

REGULAR OPERATION.

3.2.1 - Remote control module (art. 222).

To check the operation of the remote control module art. 222, carry out the sequence described above, with the control panel connected remotely. The same results should also be obtained in this case.

3.2.2 - Commands and signals (art. 220).



3.3 - Troubleshooting.

Given the particular type of equipment represented by the control panels, troubleshooting must also be carried out considering the part relating to the power source to which the panel is connected (see power source Service Manual).

In any case, this Service Manual provides some useful tips to check the panel functions, assuming that the power source connected to it is in proper working order.

WARNING

UNPLUG THE UNIT FROM THE POWER MAINS AND WAIT FOR THE INTERNAL CAPACITORS TO DISCHARGE (2 MINUTES) BEFORE REMOVING THE SAFETY COVERS AND ACCESSING INTERNAL PARTS.

NOTE

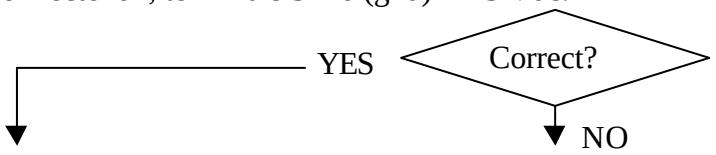
Boldface text is used for descriptions of problems that may occur with the equipment (symptoms).

- ❑ Operations preceded by this symbol refer to situations the operator must determine (causes).
- ♦ Operations preceded by this symbol refer to actions the operator must perform in order to solve the problems (solutions).

3.3.1 - Power source powered (leds on flyback board lit), control panel off, fan stopped.

CONTROL PANEL POWER SUPPLY TEST.

- ❑ Temporarily disconnect J1 from the micro board on the control panel. Control panel, connector J1, terminals 5 – 6 (gnd) = +5 Vdc.

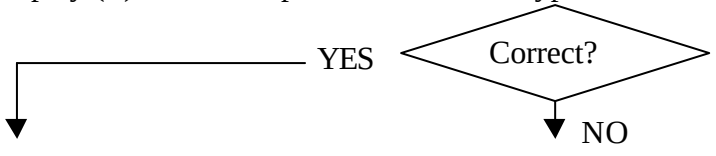


  - ♦ Check the wiring between J3 micro board on the control panel and J3 flyback board on the power source.
  - ♦ With the power source off, temporarily disconnect the connector J3 on flyback board and check the resistance between terminals 1 - 2 of J3 on the micro board. If short-circuited, replace the control panel.
  - ♦ Replace the flyback board on the power source.
- ♦ Replace control panel.

3.3.2 - Display (Y) on control panel displays “art”, fan stopped, power source does not work.

CONTROL PANEL COMMUNICATION TEST.

- ❑ Display (Z) on control panel indicates the type of article of the panel.



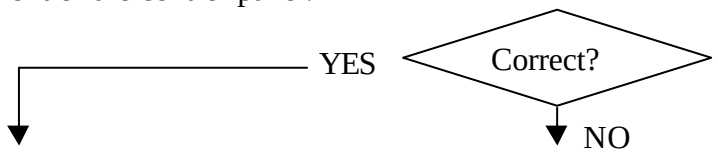
- ♦ Check the wiring between connector J1 micro board on control panel and J3 satellite board on power source.
- ♦ Make sure the satellite board is correctly mounted on the power source control board.
- ♦ Replace satellite board on power source.
- ♦ Replace control board on power source.
- ♦ Replace control panel.

♦ Power source malfunction.

3.3.3 - Control panel lit, power source running, some functions are not possible.

MICRO BOARD PROGRAMMING TEST ON CONTROL PANEL.

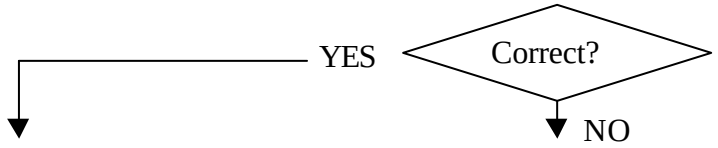
❑ The type of article shown on display (Z) corresponds to the type of article indicated on the front of the control panel.



- ♦ Replace control panel; the micro board contains an incorrect program or is defective.

CONTROL PANEL / POWER SOURCE COMPATIBILITY TEST

❑ The type of article shown on display (Z) is compatible with the power source to which the control panel is connected.



- ♦ Replace control panel (see par. 2.3).

♦ Check the wiring between connector J1 control panel micro board and J3 satellite board on the power source.

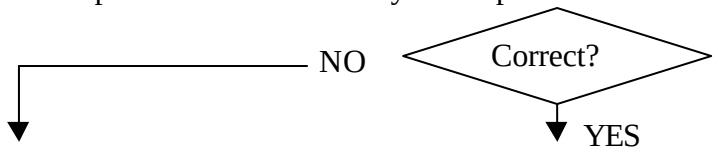
♦ Replace control board.

♦ Replace satellite board.

3.3.4 - The control panel does not work in remote position.

LOCAL OPERATING TEST.

❑ Control panel connected directly to the power source works properly.



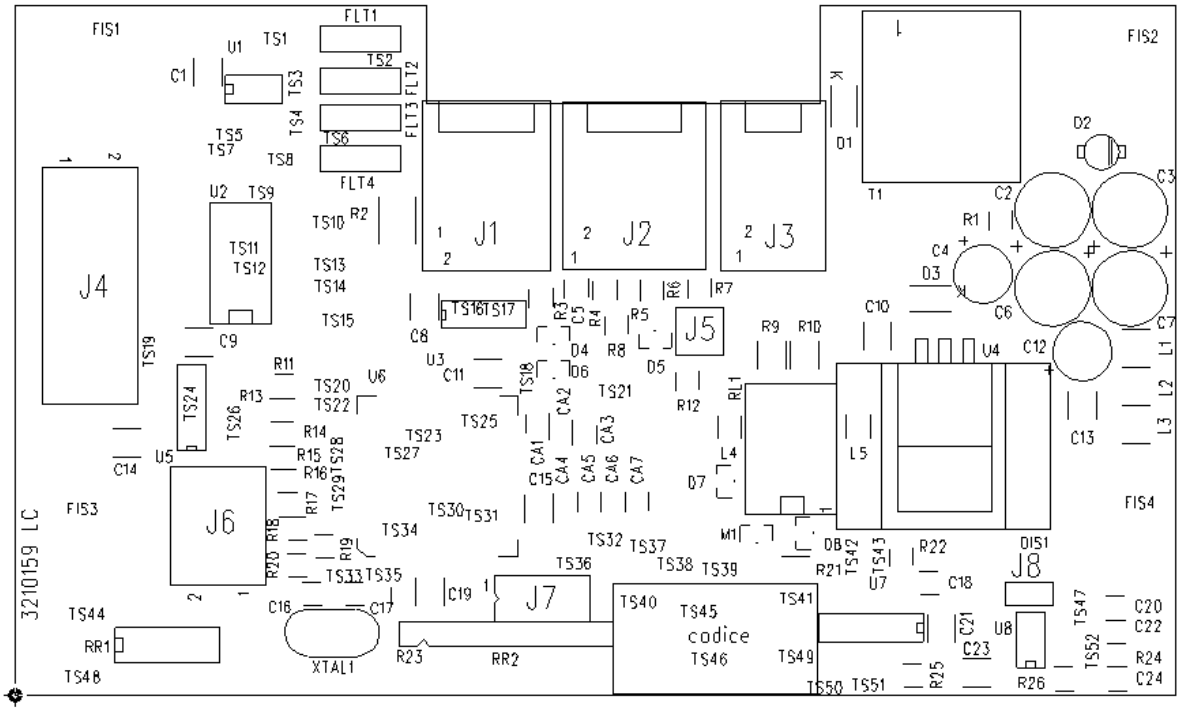
- ♦ Check both the electrical and fiber optic wiring between power source, optic interface boards and control panel.
- ♦ Replace fiber optic extension (art. 1190).
- ♦ Replace optic interface boards.

♦ Malfunction of the control panel or power source.

4 - ELECTRICAL DIAGRAMS

4.1 - Micro board code 5.602.005/A.

4.1.1 - Topographical drawing.

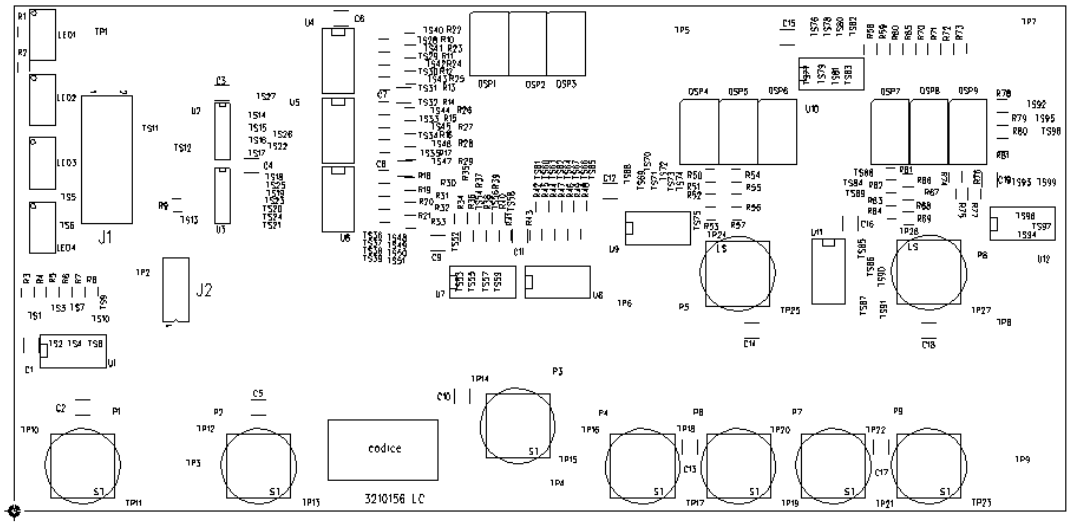


4.1.2 - Connector tables.

Connector	Terminals	Function
J1	1-2-3-4	RS485 communication line signals.
J1	5 – 6	5 Vdc power supply for RS485 communication line.
J2	-	connector for microprocessor programming.
J3	1-3 – 2-4	control panel power supply input.
J4	-	digital signal bus to/from display boards and external panel.
J5	-	board pre-selection.
J6	-	analogue signal bus to/from display board.
J7	-	board pre-selection.
J8	-	board pre-selection.

4.2 - Display board code 5.600.748/A (art. 220).

4.2.1 - Topographical drawing.

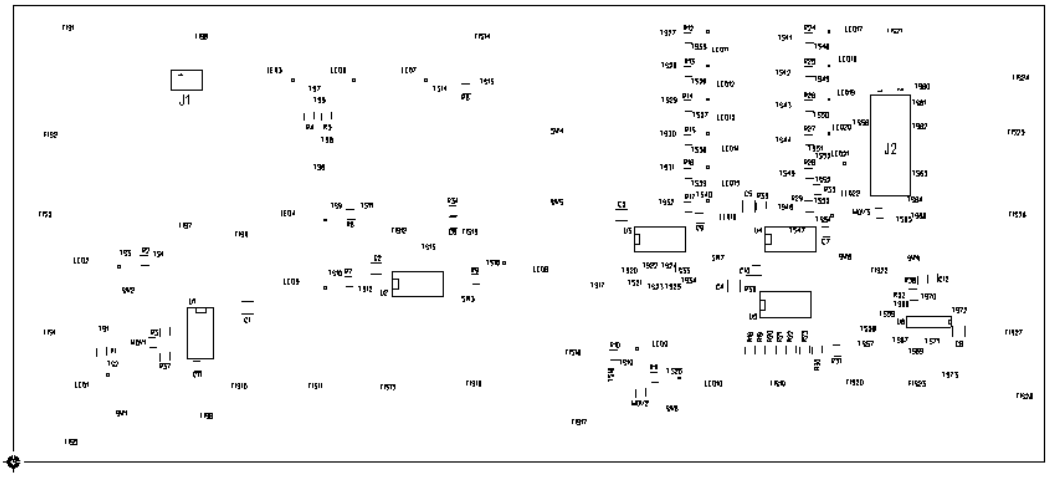


4.2.2 - Connector table.

Connector	Terminals	Function
J1	-	digital signal bus to/from micro boards and external panel.
J2	-	digital signal bus to/from micro boards.

4.3 - External panel board code 5.600.853/B.

4.3.1 - Topographical drawing.

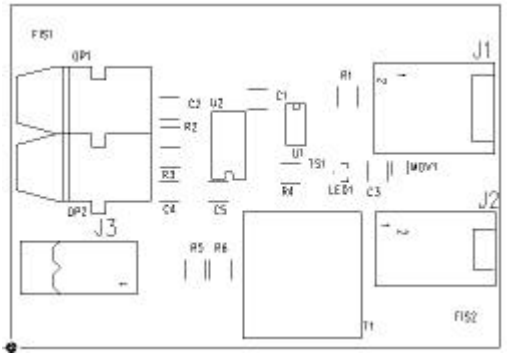


4.3.2 - Connector table.

Connector	Terminals	Function
J1	-	shielding connection for front membrane.
J2	-	digital signal bus to/from micro and display boards.

4.4 - Optic interface board power source side code 5.600.763 (art. 222).

4.4.1 - Topographical drawing.

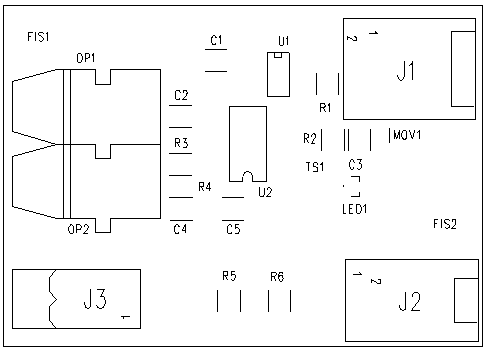


4.4.2 - Connector table.

Connector	Terminals	Function
J1	1-2-3-4	RS485 communication line signals (from satellite board).
J1	5 - 6	5 Vdc power supply input for RS485 communication line.
J2	1-3 – 2-4	power supply input for optic interface control panel side.
J3	1 – 2	power supply output for optic interface control panel side.
OP1	-	fiber optic receiver (Rx).
OP2	-	fiber optic transmitter (Tx).

4.5 - Optic interface board control panel side code 5.600.768 (art. 222).

4.5.1 - Topographical drawing.



4.5.2 - Connector table.

Connector	Terminals	Function
J1	1-2-3-4	RS485 communication line signals (for control panel micro board).
J1	5 – 6	5 Vdc power supply output for RS485 communication line.
J2	1-3 – 2-4	power supply output for control panel.
J3	1 – 2	power supply input for optic interface control panel side.
OP1	-	fiber optic receiver (Rx).
OP2	-	fiber optic transmitter (Tx).