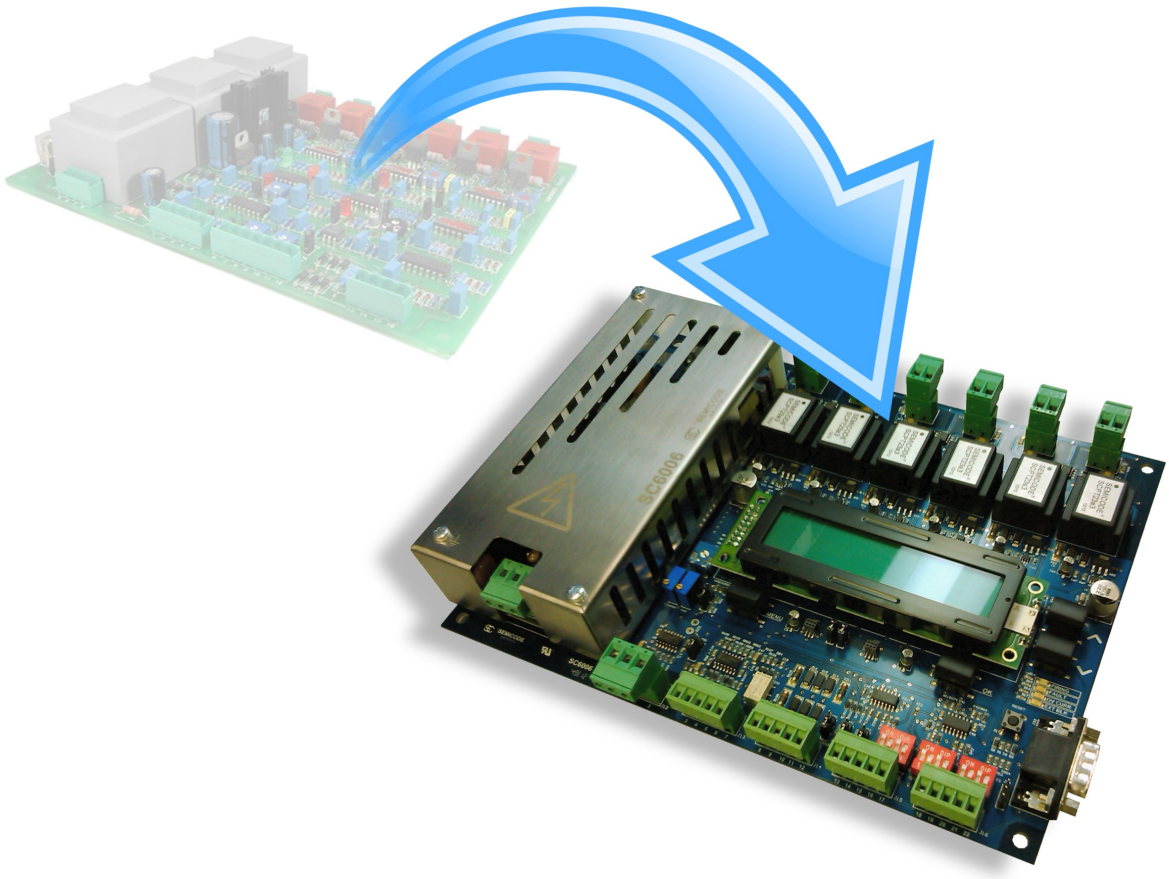
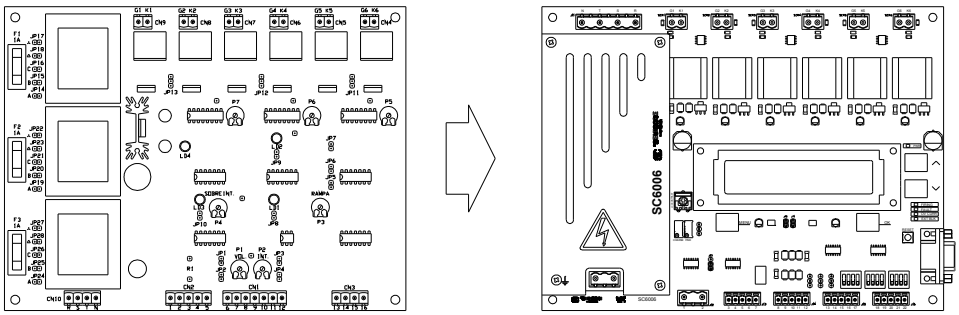
GUASCH COMPONENTES Y ELECTRONICA DE POTENCIA

**AN161101:**

# REPLACEMENT GUIDE SC6000 TO SC6006



# REPLACEMENT GUIDE SC6000 TO SC6006




## 1 DOCUMENT'S SCOPE

The following document is intended to be a quick installation guide for the SC6006 card in applications where the SC6000 card were currently used. The operations to follow to effectively replace one control card with another will be defined step by step.
The installer must follow and proceed with the execution of all the steps described in this document to correctly configure the new firing and control card.

In case of doubt all the technical information regarding both control and firing cards is available in the following links:

**SC6000:**

- SC6006 Datasheet
- SC6006 Quick connection guide

**SC6006:**

- SC6006 Datasheet
- SC6006 Manual

## 2 PREVIOUS CONSIDERATIONS

The dimensions and anchoring points of the SC6006 card are identical to those of the SC6000, so mechanically changing one card for the other can be done directly and without any previous modification of the cabinet or location of old control card.

As for the wiring of signals and card's power supply; when setting up the new SC6006 with multiple new functions and configurations, it will be necessary to rewire the signal and power connectors to adapt them to the new SC6006 as well as to configure the jumpers on the board.

In the following sections of the document it will described step by step the changes to be performed on the control board and internal configurations to replace one card for the other.

All the necessary plug-in connectors, anchoring screws and external potentiometers are included in the box of the SC6006. For its installation only be necessary in some cases (apart from cutting tools and screwdriver) a multimeter to calibrate the resistance of feedback of the input voltage of the SC6006.

### *2.1 Safety requirements for the card installer/operator*

The operator / installer of the card must take into consideration and follow the following points:

- That all safety devices (switches, housings, protections, danger symbols, etc.) are present and in perfect condition and used correctly.
- That the security regulations that apply are contemplated.
- That the personnel have access to the operating instructions and safety regulations at all times.
- That the operating conditions and restrictions resulting from the technical information are contemplated.
- In case of overvoltage, noise, temperature increase, abnormal vibration or similar, the device should be put out of operation immediately and the maintenance personnel should be informed.

*For more information on technical characteristics, operation and safety of the device, consult the SC6006 card user manual.*



Reserves the right to change limits, test conditions and dimensions given in this data sheet at any time without previous notice.

# 3 PROCEDURE

## 3.1 REWIRING OF THYRISTOR GATE CONNECTORS

SC6006 gate connectors must be connected with the same order and the same connector that were on SC6000.

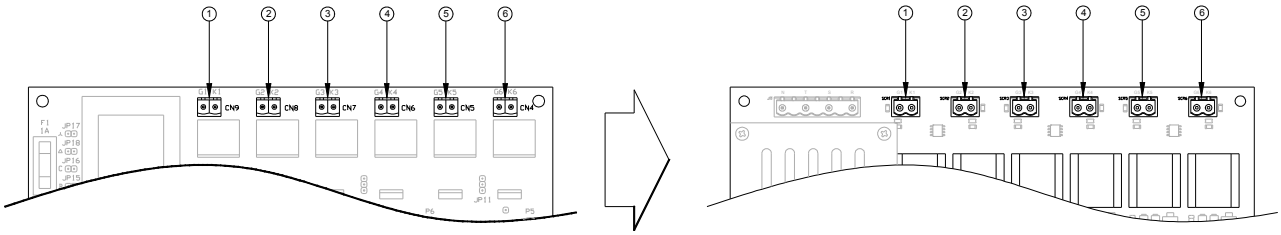


*Figure 1: Gate connection reconnection detail.*

*Take special care not to interchange the order of any of the connectors, which would mean the loss of the correct gate assignment according to synchronism.*

## 3.2 REWIRING OF SYNCHRONISM AND POWERSUPPLY CONNECTORS

The SC6006 card, unlike the old SC6000, separates the synchronization acquisition signals from the power supply signals. The following diagram shows how the card should be rewired.

This operation is valid for 230 $V_{AC}$ and 400 $V_{AC}$ networks and no other adjustment is necessary on the card. For operation in networks with different voltage or in the case of operating in a 60 Hz network consult the manual of SC6006.

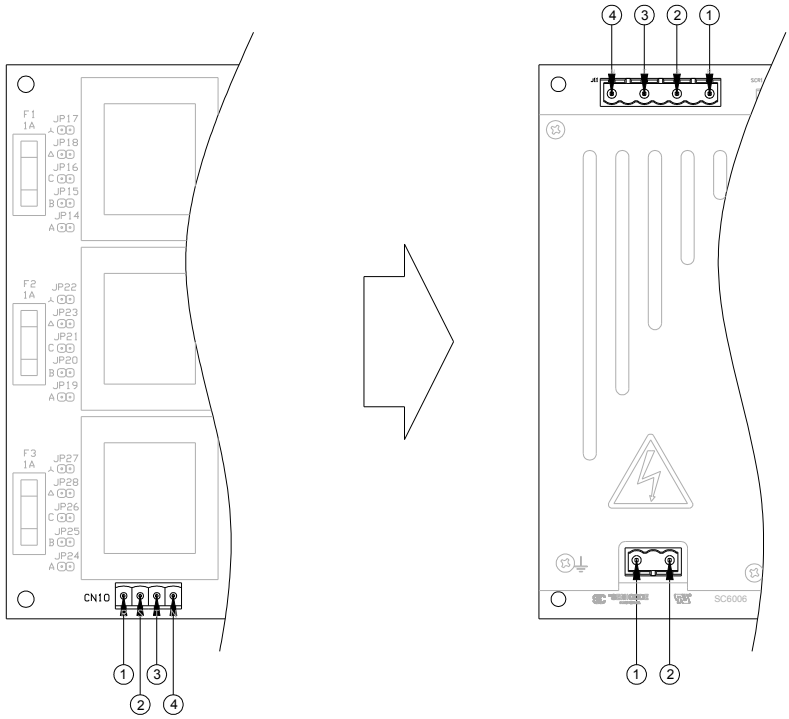


*Figure 2: CN10 connector rewiring detail.*

*Take special care to follow the numbering shown in Figure 2, do not interchange the order of any of the phases in connector J11 of SC6006 which would mean the loss of the correct of synchronism acquisition and correspondence with the gates of the card.*

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## 3.3 REWIRING OF VOLTAGE REFERENCE, CURRENT AND EXT. CONTROL

All voltage and current references as well as the external control signal in the SC6000 are 0-10V and are provided to the card either using external potentiometers or through a PLC or others.

SC6006 has available other voltage and current input ranges. In order to configure all the inputs at level 0-10V, the DIP-Switches of the SC6006 must be configured as shown in the Figure 3. All tabs on down position.

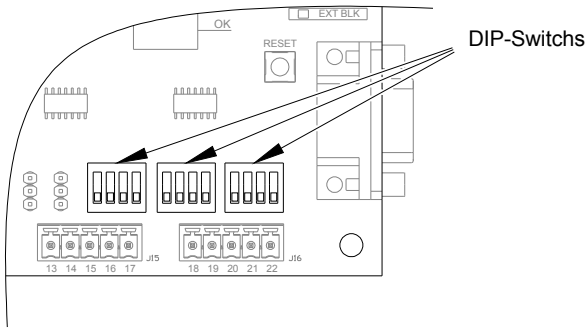



*Figure 3: DIP-Switchs configuration detail on SC6006.*

The wiring of SC6000's CN1 connector of the should be wired as follows in SC6006 (J15 and J16):

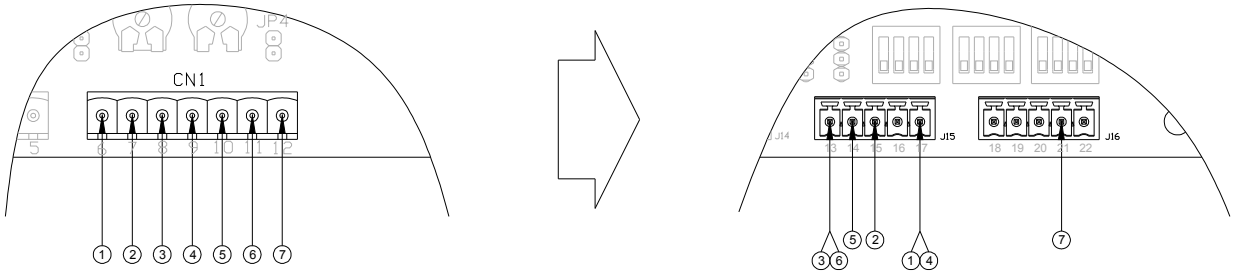



*Figure 4: Rewiring of CN1 detail.*

*Please note that, in the case where the terminals marked in the previous section were connected to the old SC6000 card. Figure 4 as 1,3,4, y 6 should be rewired, all of them, on J15 connector of the new SC6006 following indications depicted on Figure 4.*

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## 3.4 FEEDBACK AND EXTERNAL BLOCK REWIRING

Next, it is shown how to rewire the feedback connector of the old SC6000 (CN2) to the new SC6006 (J12, J13 and J14).

Depending on the application and the way of controlling the equipment, some of the signals may not be wired in your current application. Write down the pre-existing configuration using the Table 1 and rewire according connection diagram of Figure 5 following poles numeration.
Leave the unused contacts (if any) in the old configuration unconnected on the new card.

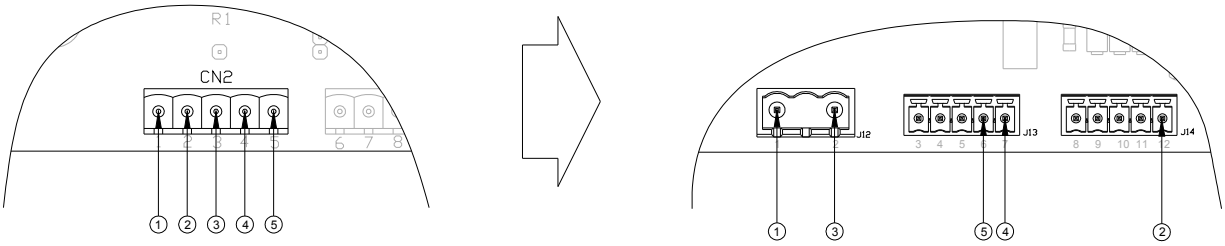



*Figure 5: CN2 rewiring detail.*

| CABLING ON SC6000 CN2 | OPERATION MODE SC6006 |
|---|---|
| 1,2 y 3 | IV |
| 1 y 3 | V |
| 2 y 3 | I |
| None | OL |

*Table 1: Operation modes.*

*Obtained operation mode of Table 1 will be used on chapters 3.6 y 3.8.3 to determine and set up SC6006 feedback scheme.*

## 3.5 CURRENT TRANSFORMERS REWIRING

In the case of using feedback through current transformers, the CN3 connector on board SC6000 must be rewired to connector J14 of SC6006 as shown on Figure 6.

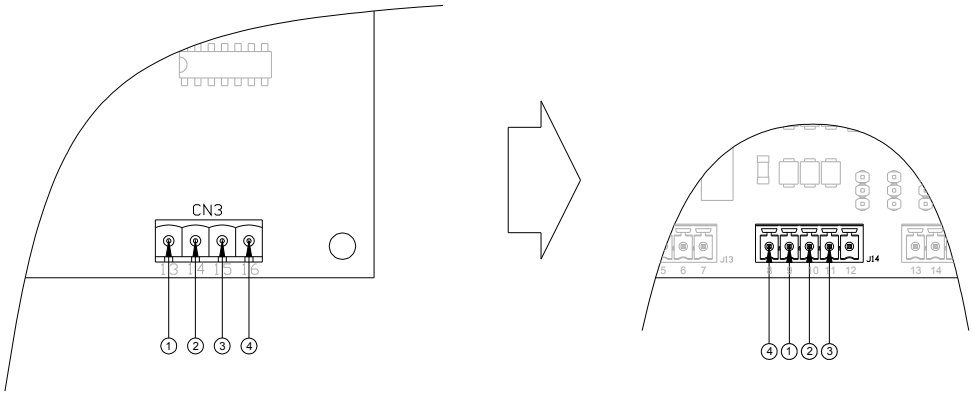



*Figure 6: CN3 rewiring detail.*

Reserves the right to change limits, test conditions and dimensions given in this data sheet at any time without previous notice.

## 3.6 VOLTAGE FEEDBACK CALIBRATION

In the case that the configuration obtained with Table 1 is type V or IV R1 resistance for voltage feedback loop muyst be calibrated by using the 2 blue multi-turn potentiometers on SC6006.

To do so, it will be necessary to use a multimeter to check the resistive value in kOhms of the resistance R1 welded on the SC6000 card and, using the multi-turn potentiometers of the SC6006 to configure the feedback resistance.

1. **Get the resistive value drom R1 on SC6000.**
   By inspection of the welded R1 resistor (see Figure 7) or by measuring with multimeter between resistor terminals on points A and B depicted on Figure 7.
   **<u>Warning:</u> Resistive measure must be performed with the card disconnected from power grid.**

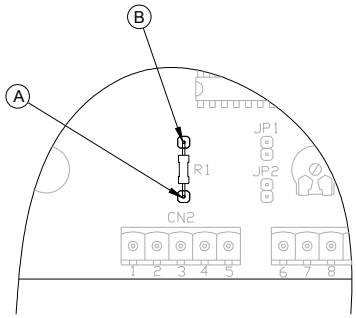



*Figure 7: R1 resistor test points detail.*

2. **Calculate the ner resistive value to calibrate on SC6006.**
   With the value R1 obtained from the original card (SC6000) obtain the equivalent resistance to be configured in SC6006 by using the following equation:

$$R1_{(SC6006)} = 1.5 \times R1_{(SC6000)}$$

3. **Adjust the calculated R1 value on SC6006.**
   Using card's potentiometers (marked as “AJUSTE” on Figure 8) and measuring the resistance between points A and B of the SC6006 card (see Figure 8) adjust the previously calculated resistive value in point 2.

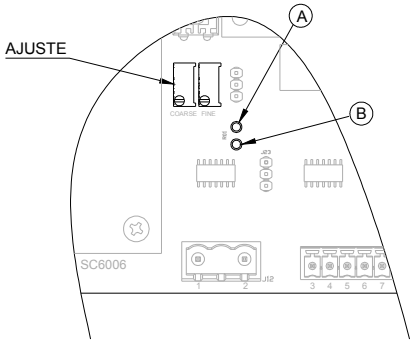



*Figure 8: R1 SC6006 test points.*

Reserves the right to change limits, test conditions and dimensions given in this data sheet at any time without previous notice.

## 3.7 JUMPERS CONFIGURATION

The jumpers settings to be followed are given in the following table according to the SC6000 card's origin configuration.

You must check in the old SC6000 its configuration of jumpers and configure the new SC6006 according to the scheme of the same row in the following tables:

**SC6000**

| JP1 | JP2 | JP3 | JP4 | JP5 | JP6 | JP7 |
|---|---|---|---|---|---|---|
| OFF | ON | ON | OFF | OFF | ON | ON |
| ON | OFF | ON | OFF | OFF | ON | ON |
| ON | OFF | OFF | ON | OFF | ON | ON |
| OFF | OFF | OFF | OFF | ON | OFF | OFF |
| ON | OFF | ON | OFF | OFF | ON | ON |

*Table 2: SC6000 jumpers.*

**SC6006**

| JP20 | JP21 | JP22 | JP23 |
|---|---|---|---|
| UP | UP | UP | UP |
| UP | UP | UP | DOWN |
| UP | DOWN | ARRIBA | DOWN |
| DOWN | DOWN | DOWN | DOWN |
| UP | DOWN | DOWN | DOWN |

*Table 3: SC6006 jumpers.*

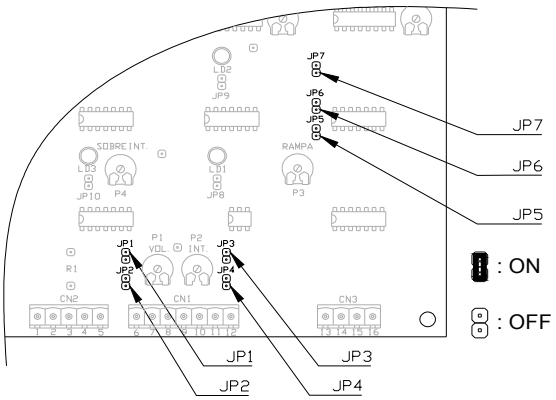



*Figura 9: SC6000 jumpers detail.*

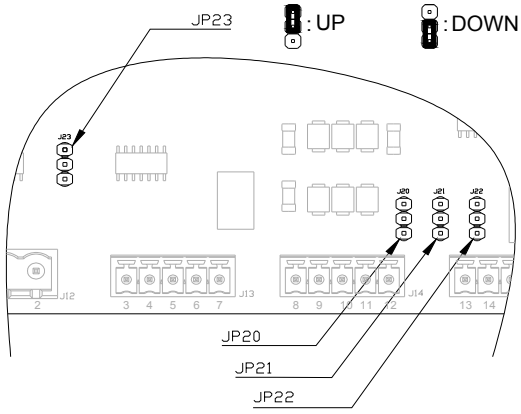



*Figura 10: SC6006 jumpers detail.*

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## *3.8 LCD OPTIONS SET UP ON SC6006*

Following the previous steps and once the rewiring of the connectors, jumpers and and DIP-switches configurations on the board is done, the card must be powered on and several parameters are configured through the card's LCD screen.

### 3.8.1 Start screen of the control card

On Figure 11 the start screen that appears when the SC6006 card is powered is displayed.

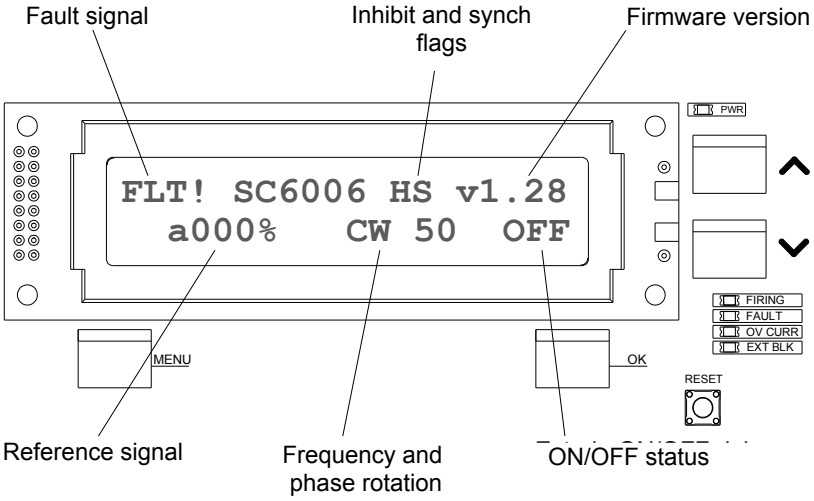



*Figure 11: Start screen SC6006 detail.*

### 3.8.2 W3C or B6C operation

To determine the pre-existing tripping configuration and proceed to configure the new SC6006 according to the installed converter topology, you should check the jumpers JP17-JP18, JP22-JP23, JP27-JP28 of the SC6000 card if they were in the "Y" position or the "D" position.

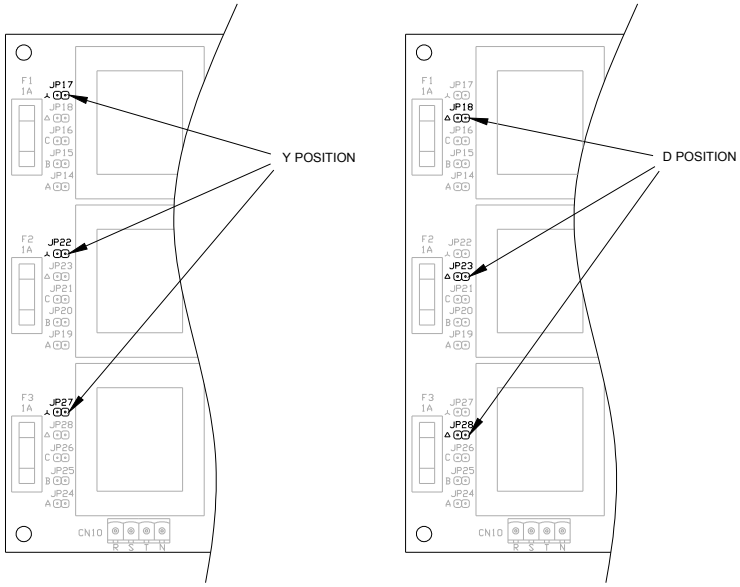



*Figure 12: Power supply jumpers on SC6000 detail.*

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To configure the SC6006 card, in the main menu press once on the "MENU" button and set the "Topology" section to "W3C" if the position of jumpers on the old SC6000 was "D" or "B6C" if the position of the jumpers on the SC6000 was "Y" by clicking on the OK button to change the settings.

START → MENU → OK ,

">Topology : W3C"

MENU x2 → START

Start screen

### 3.8.3 Control loop type

In the main menu of the card SC6006 press once in MENU, go down through the options until you select "Control" and configure the type of control loop of the card according to the result obtained in the Table 1.

START → MENU → ∨ X4 → OK X3 ,

"Control: IV"

MENU x2 → START

Start screen

Once the configurations are done they must be saved in the memory of the card:

### 3.8.4 Save the configuration

Each time a configuration change is made through the LCD screen of the controller, the user must save the changes in the EEPROM memory, or when the device is restarted, the configuration of the control card will be the last one recorded correctly.

Therefore, once the operation and the type of control have been configured, the changes must be be saved.

From the initial screen of the control card.

START → MENU → ∨ X11 → OK X2 → MENU X2

">Save all?"

"Save all changes"

Once the configurations are saved, the card should be ready to operate replacing the former SC6000.

Reserves the right to change limits, test conditions and dimensions given in this data sheet at any time without previous notice.