

PRELIMINARY TECHNICAL INFORMATION
HIGHLIGHTS

- Modular system
- Pulse train firing signal
- Wide range of application topologies
- Standard dimensions for 72 mm DIN rail platform
- SC2022HV version for higher voltages (up to 700 V)
- SC2022-60Hz version for 60 Hz mains



non-contractual photo

GENERAL DATA	SC2022	SC2022HV
Supply voltage	+15 / 0 / -15 V _{DC}	
Supply current ⁽¹⁾	+150 / -80 mA	
Converter voltage	50 to 480 V _{RMS}	100 to 700 V _{RMS}
Mains frequency ⁽²⁾	50 Hz: SC2022 60 Hz: SC2022-60Hz	50 Hz: SC2022HV 60 Hz: SC2022HV-60Hz
Load connections	single phase / multi phase	
Single phase application circuits	W1C, M2CA, M2CK, B2HZ, B2HK, B2HA, B2C	
Three phase application circuits	W3.2C, W3C, B6HA, B6HK, B6C	
Six phase application circuits	M6CA, M6CK, M3.2CA, M3.2CK	
Optional application circuits	W1H, M1C, W3H, M3CA, M3CK	

CONTROL OPTIONS

Supply voltage	External 4k7 Ω potentiometer ⁽³⁾ 0-10 V _{DC} analog signal
External blocking	External open contact

INTERNAL ADJUSTMENTS

Power-on ramp	Potentiometer on board 0.1 to 20"
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SIGNALING

External blocking	Red LED
Powered system	Green LED

FIRING

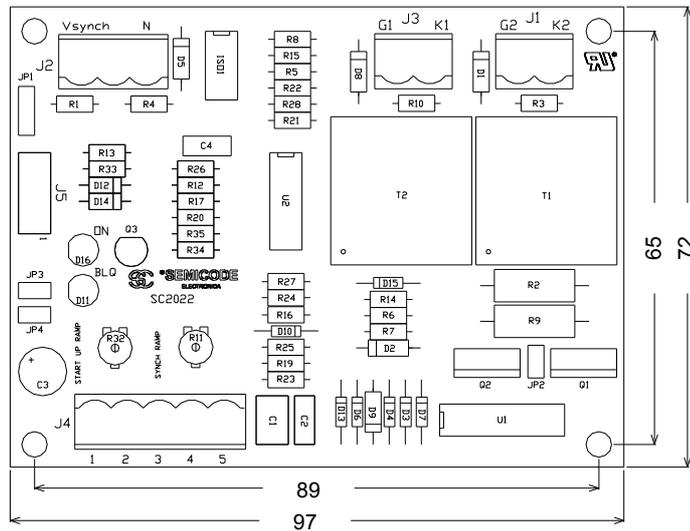
Gate pulse burst frequency	10 kHz
Sustaining gate pulse open circuit voltage	6 V
Trigger current	400 mA @ 2.5 V
Maximum firing voltage (pulse train)	4 V ⁽⁴⁾
Sustaining gate drive short circuit current	570 mA ⁽⁵⁾
Short-circuit gate drive current rise time	1.5 Aμs ⁽⁵⁾
Maximum voltage applied to pulse transformers	700 V _{RMS}


Notes:

- (1) At full conduction with 20 Ω load.
- (2) Standard 50 Hz/60 Hz ±5% frequency is shown due to typical application demand, other mains frequency adjusts can be available by order. Please contact us.
- (3) Please see typical application circuit using an external potentiometer on page 9.
- (4) Measured with 50 Ω load.
- (5) Assuming 1.0 Ω resistive output load.

DIMENSIONS

PCB	97x72x26 mm
Fixations	Drill holes Ø 4.2 mm
Weight	75 gr.



All dimensions in mm.

CONNECTIONS

Selecting options	Jumpers on board
Power supply, control and firing	type MSTBVA 2,5 (Phoenix contact)

ENVIRONMENTAL SPECS

Protection grade	IP-00
Maximum humidity	50% Rh @ 35°C / 70% Rh @ 20°C
Maximum working temperature	55°C
Pollution grade	III
Supply isolation	4000 V _{RMS} @ 1min

ACCESSORIES

The board is supplied with the following accessories:

- Isolators and fixing screws.
- Plugging connectors.
- Configuration jumpers.



SCCAB21



SCCAB22

Optionally can be request the following accessories:

- Interconnection flat cable for three-phase assemblies (SCCAB22 reference).
- Interconnection flat cable for 2 boards assemblies (SCCAB21 reference).
- External power supply (SCPS2515 standard type).



SCPS2515

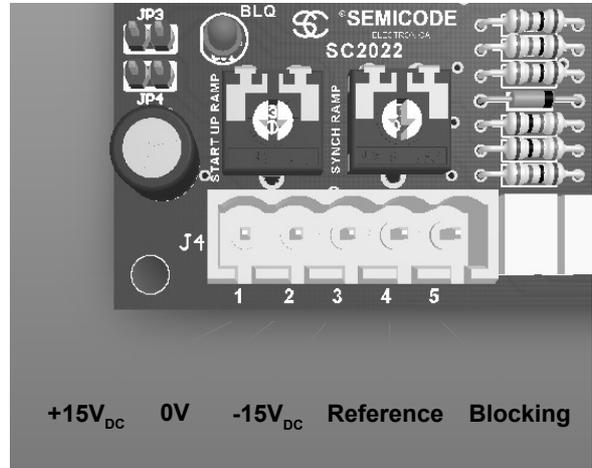
CONTROL & SUPPLY CONNECTORS:

J4 CONNECTOR:

1- Pins **+15V**, **0V**, **-15V** are the board's connection for input power supply. An external power supply capable to provide ± 150 mA is required.

2- **Reference** Pin is an external reference 0 – 10V, referred to **0V** Pin.

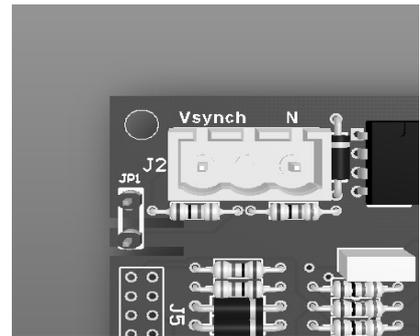
3- Connecting the **Blocking** pin to **0V**, the board suppress the thyristors' firing pulses, and the converter output voltage becomes 0 V. In case that, the function start up ramp has been selected, when the board is unblocked, then starts a progressive start up with a fixed duration.



J2 CONNECTOR:

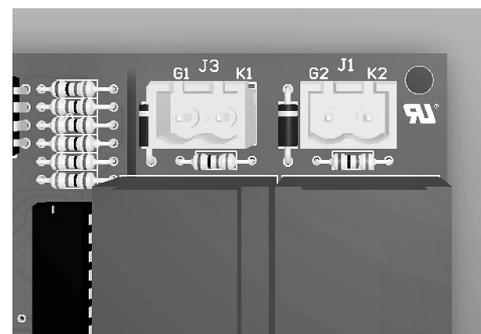
J2 connector, is the synchronism voltage reference. Consider different connection types following the schemes below.

The synchronism voltage reference is obtained normally by the corresponding thyristors cathodes. The connection schemes for each configuration are specified in the following pages.



J1 AND J3 CONNECTORS:

J1 and **J3** connectors are the thyristors gate outputs. It has been used the nomenclature **G1** as gate 1, **K1** as cathode 1, **G2** as gate 2, and **K2** as cathode 2.



J5 CONNECTOR:

This connector is used for interconnect different boards in the case of a multiphase application. A flat cable, which must be previously requested by the customer, brings the power supply, blocking and control signals, as well as, the progressive start up.

JUMPER SELECTABLE OPTIONS:

JP1 JUMPER:

JP1 jumper must be active when the synchronism voltage is below $230 V_{RMS}$, and disabled when then voltage synchronism is above $230 V_{RMS}$.

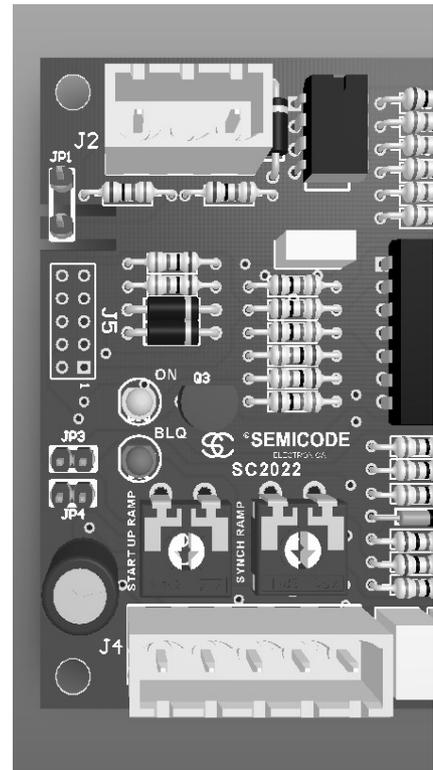
JP3 JUMPER:

JP3 jumper is used to activate the progressive start up. In the case of a multiphase assembly, **JP3** will be activated only at the master board.

JP4 JUMPER:

JP4 jumper, will be connected only in the master board for a multiphase assembly or to the control board for a single phase assembly with a single SC2022 board.

For multi-phase assemblies one board must be set as master (**JP4** connected) connected with the rest, left as slave boards (**JP4** unconnected). To master board must be connected to **J4** the power supply and external control signals. User must leave unconnected slave **J4** connectors.



RAMP ADJUST POTENTIOMETER:

Potentiometer **Start up ramp**, allows to set the progressive start up time.

SYNC RAMP POTENTIOMETER:

Potentiometer **Synch ramp** is preset and it mustn't be modified.

LIGHTNING INDICATIONS:

ON LED, indicates that the board power supply is on.

BLQ LED, indicates the blocking condition.

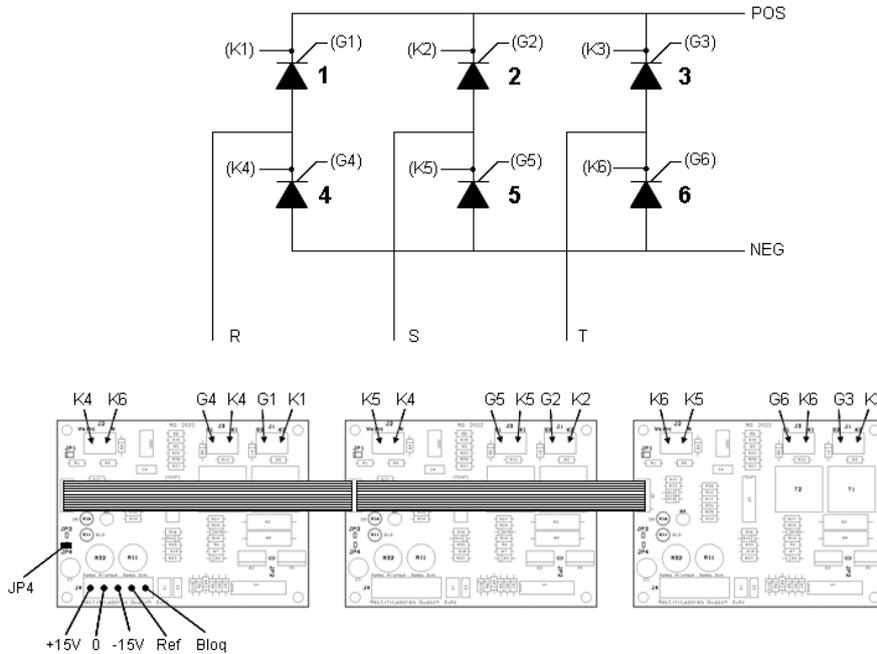
MOUNTING CONSIDERATIONS

- 1- Avoid using long cables for the firing system, so that, use twisted or shielded cables. This advice is also for the control potentiometer cables.
- 2- Protect the control board in front of strong magnetic fields, for example, large power transformers. It's recommended to locate the board over a surface connected to ground.
- 3- After mounting the system, it's advisable to make some working measures with small loads and reduced voltages. In this way, any possible error in the connections will be detected on time and won't be produced any serious consequences for the application.
- 4- In critical applications, with variable loads, parasitic in the network, regulation with minimum currents and voltages, etc... can produce non desirable regulation oscillations. For these cases, **contact our technical department to study an optimal solution.**
- 5- For specific and exclusive applications, which are not described in this brief, it is possible to make adaptations of the board and connect auxiliary control modules. So please, contact our technical department.

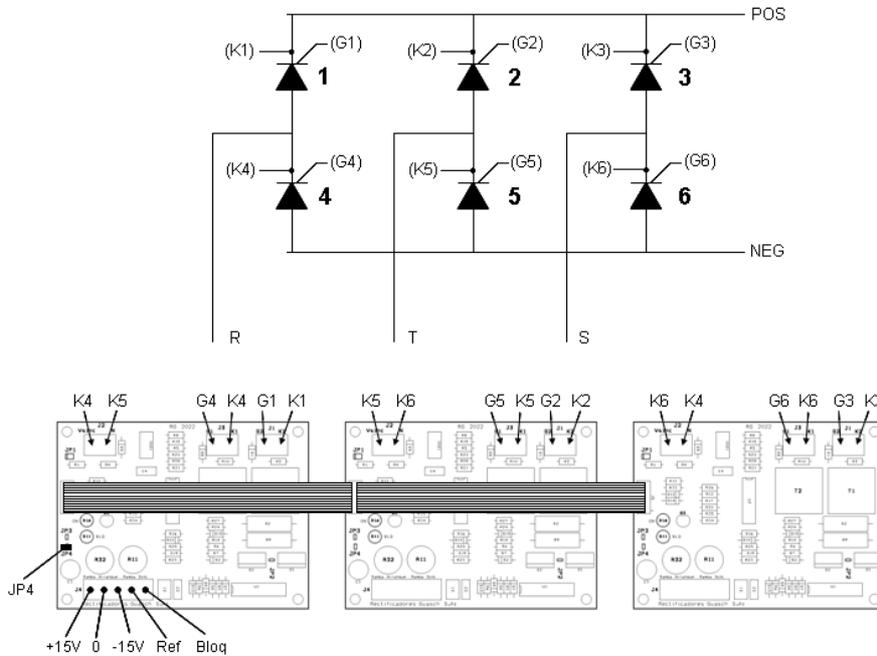
CONNECTION SCHEMES

Following you can find the most typical topology scheme connections. Regarding other configurations please contact us.

B6C (THREE PHASE CONTROLLED BRIDGE).

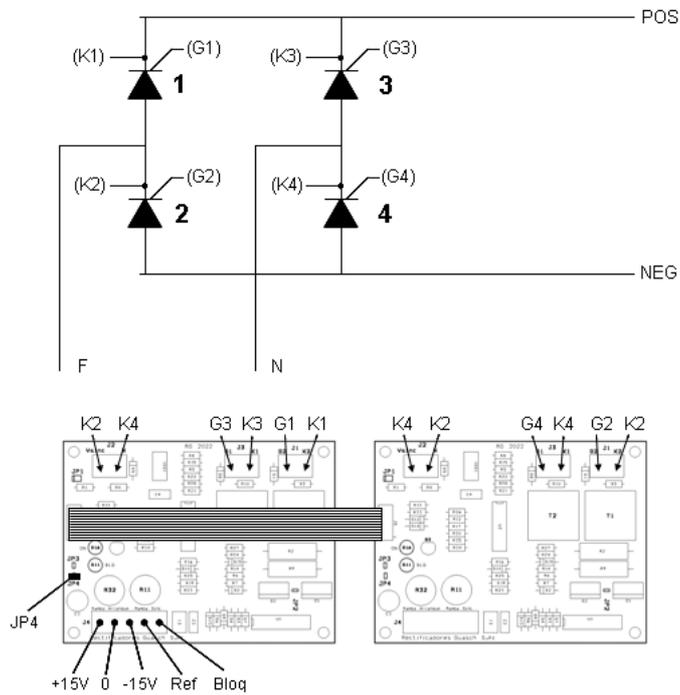


B6C INVERTED PHASE ROTATION CASE.

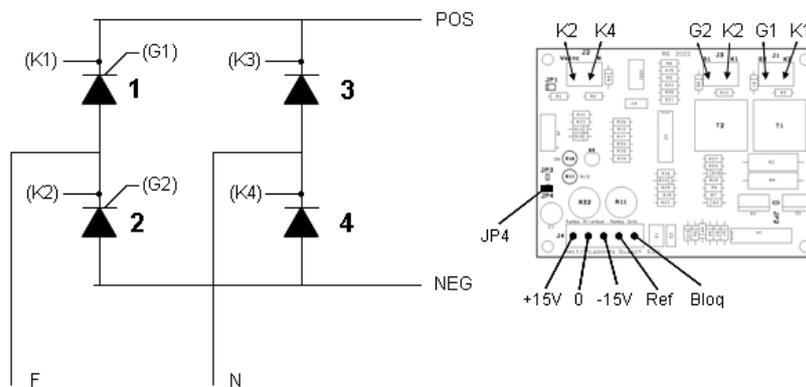


Note: For half controlled full bridges (as B6HK, B6HA...) all depicted connections remain the same but changing SCR for diodes.

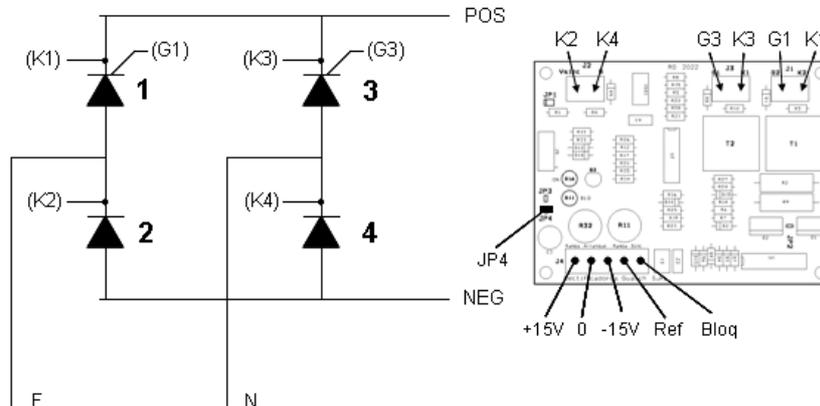
B2C (SINGLE PHASE CONTROLLED BRIDGE).



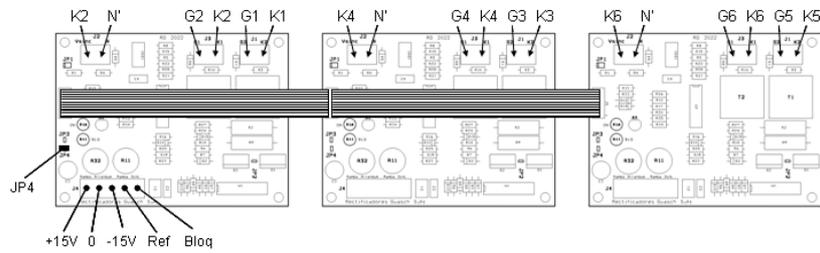
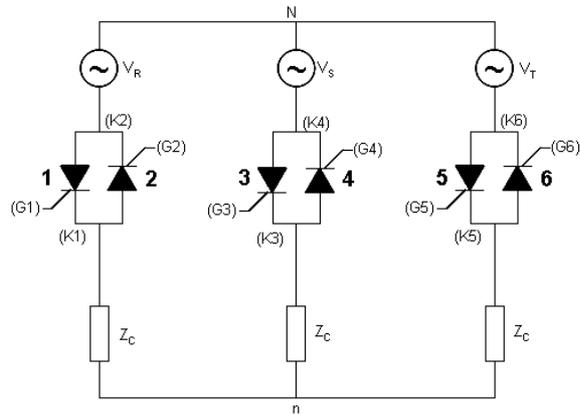
B2HZ (SINGLE PHASE SEMICONTROLLED BRIDGE).



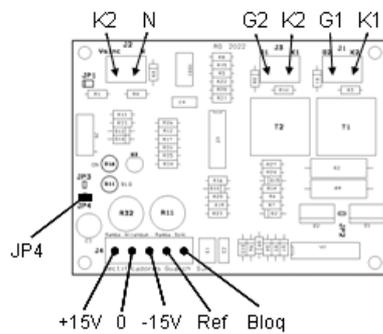
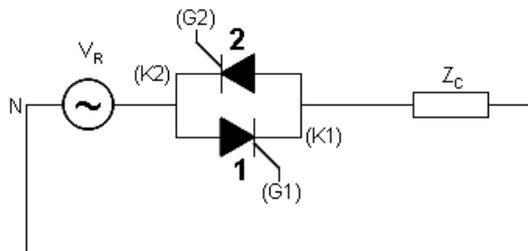
B2HK (SINGLE PHASE SEMICONTROLLED BRIDGE)



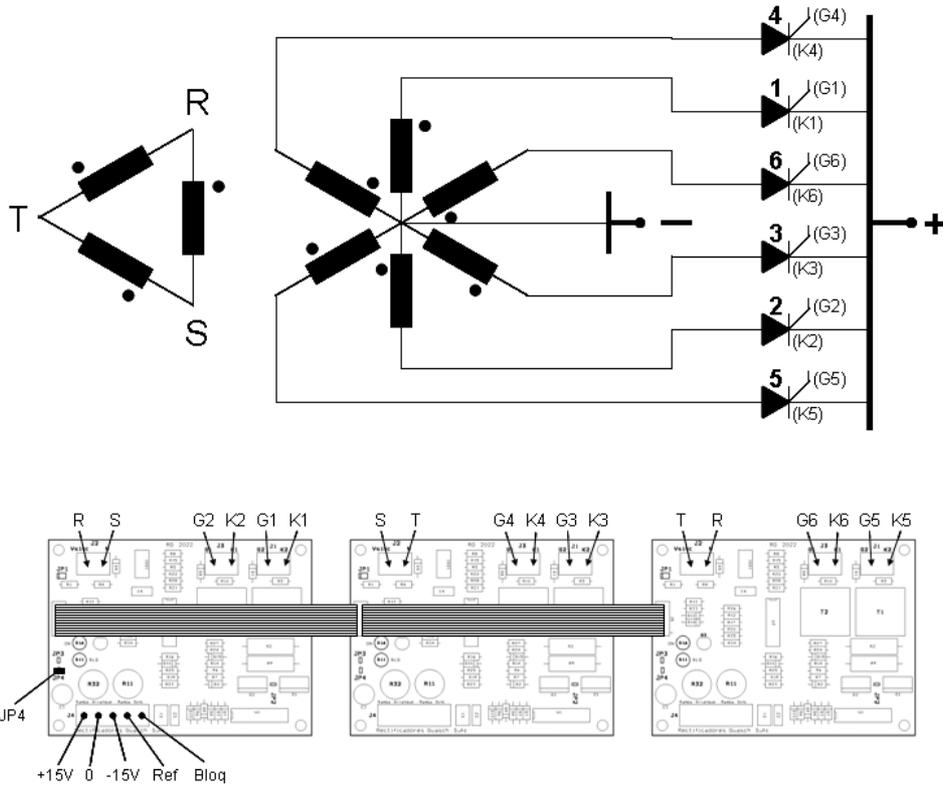
W3C (THREE PHASE WYE AC/AC CONVERTER).



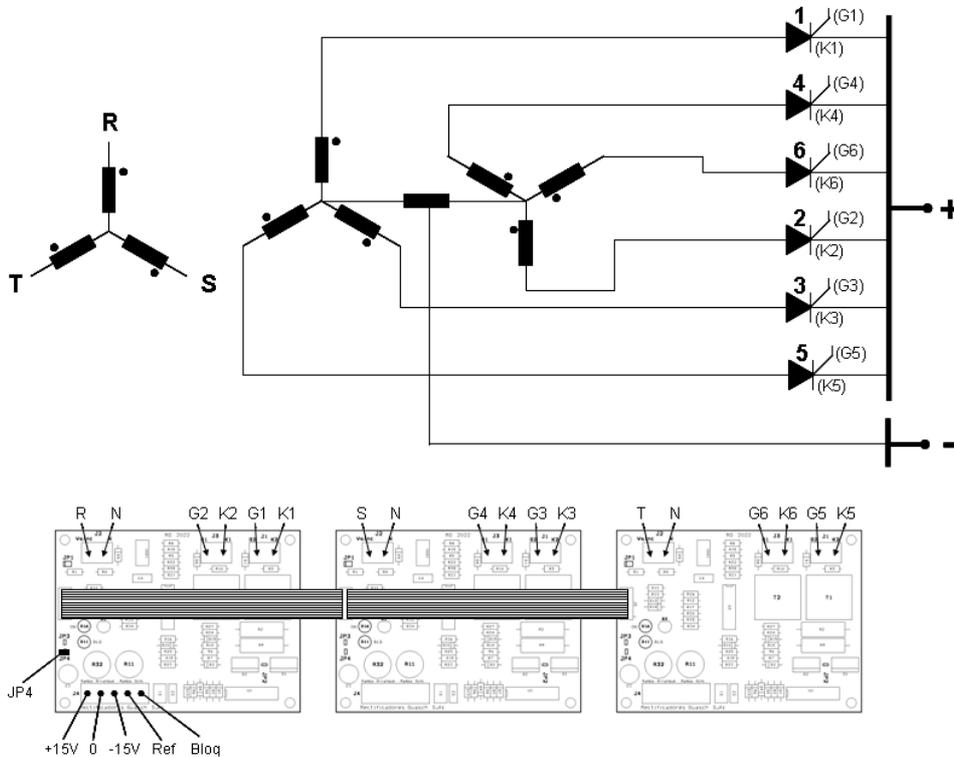
W1C (SINGLE PHASE AC/AC CONVERTER).



M6CK (SIX PHASE AC/DC CONVERTER).

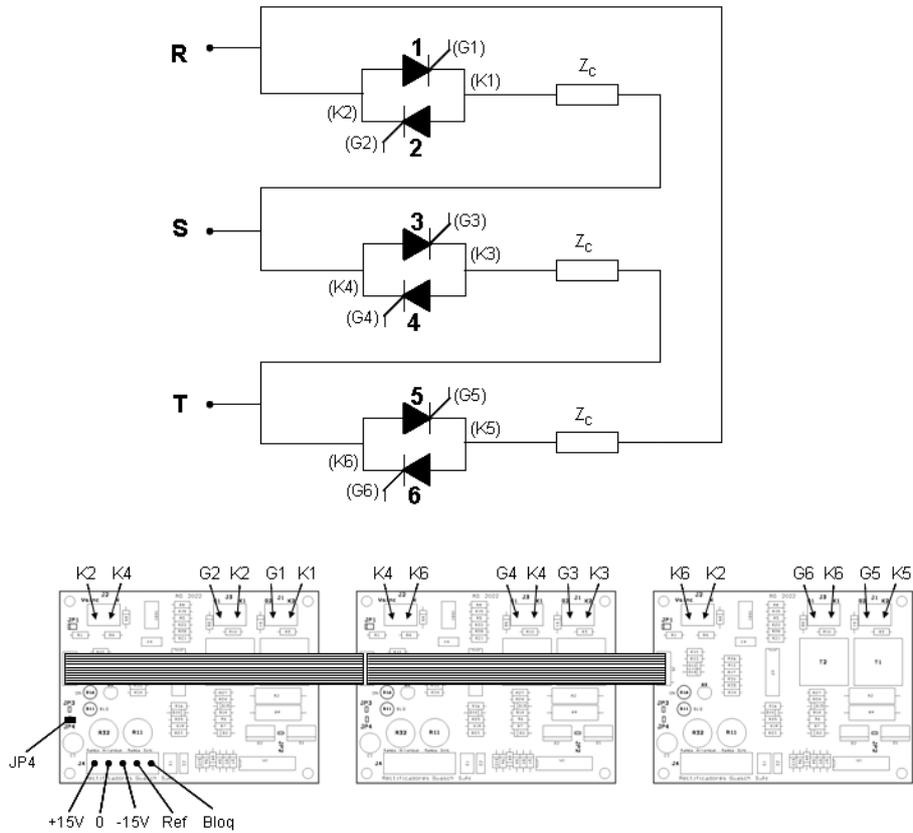


M3.2CK (SIX PHASE STAR AC/DC CONVERTER).



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

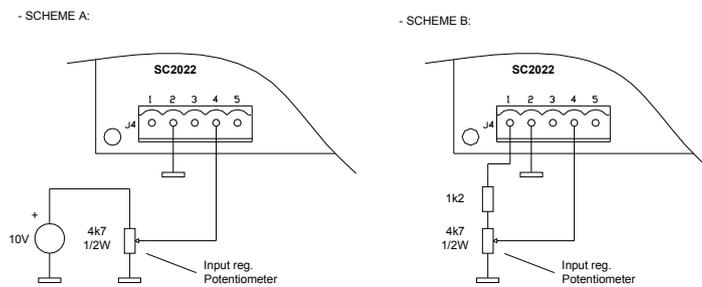
W3C (THREE PHASE DELTA AC/AC CONVERTER).



USING AN EXTERNAL POTENTIOMETER TO DRIVE THE BOARD

User must provide an input signal of 0-10 V to regulate the SC2022 output. In those cases where an active signal of 0-10 V is not available and the control is made by means of a potentiometer the recommended value of this potentiometer is 4k7 and user must provide 10 V external following the scheme A.

If a 10 V supply is not available it is also possible to use the positive board's supply to provide the 0-10 V input signal by means of an external potentiometer adding a 1.2 kΩ resistor in series with the potentiometer as shown on scheme B.



Input impedance R_{IN} of Reference input (J4:4) of 10.2 kΩ approx.

Cost Effective Products

SEMICODE ELECTRONICA

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