

# REVO *CUSTOM 3PH* SOLID STATE RELAY 150-800 A

00011



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**Dichiarazione di Conformità CE**  
**CE Declaration of Conformity**

**The manufacturer**

**Dichiara che il prodotto:**  
**Declare that the product:**

**Revo LCS, 3ph 150 - 800A**

**FULFILLS THE REQUIREMENTS OF THE STANDARD:**


Electrical safety Standard EN60947-1 :2008  
EN60947-4-3:2001  
Generic Emission standard EN60947-4-3:2000  
Generic Immunity standard EN60947-4-3:2000

The manufacturer declares that The products above mentioned they am conforming to the directive **EMC 2004/108/CEE** e alla direttiva Bassa Tensione (low Voltage) **2006/95/CEE**

PRODUCT DESCRIPTION: Elettric power controll  
SCOPE OF APPLICATION: Thermal controll process

Issued on: 20/04/2010

Signed:





## 1 Important warning for safety



The Thyristor unit are integral part of industrial equipments.  
When it is supply, the Thyristor unit is subject to dangerous tensions. Don't remove the plastic cover.  
Don't use this unit in aerospace and nuclear application.

### **Electric Shock Hazard (Rischi di scosse elettriche, Risque de choqué électrique)**

When thyristor unit has been connected to main supply voltage and is switched off, before to touch it be secure that the unit is isolated and wait at least one minute to allow discharging internal capacitors.  
Thus be secure that:

- access to thyristor unit is only permitted to specialised personnel;
- the authorised personnel must read this manual before to have access to the unit;
- the access to the unit must be denied to unauthorised personnel.

### **Important warnings (Avvertenze importanti, attention)**

During the operations with units under tension, local regulations regarding electrical installation should be rigidly observed:

- Respect the internal safety rules.
- Don't bend components to maintain insulation distances.
- Protect the units from high temperature humidity and vibrations.
- Don't touch components to prevent electrostatic discharges on them.
- Verify that the size is in line with real needs.
- To measure voltage current etc. on unit, remove rings and other jewels from fingers and hands.
- Authorized personnel that work on thyristor unit under power supply voltage must be on insulated board

This listing does not represent a complete enumeration of all necessary safety cautions

### **Protection (Protezione, Protection)**

The unit have IP20 protection rating as defined by the specific international. Is necessary consider the place of installation.

### **Earth (Messa a terra, Terre)**

For safety, the Thyristor unit with isolated heat-sink must be connected to earth.

Earth impedance should be correspondent to local earth regulation. Periodically the earth efficiency should be inspected.

### **Electromagnetic compatibility (Compatibilità elettromagnetica, Compatibilité électromag.)**

Our thyristor units have an excellent immunity to electromagnetic interferences if all suggestions contained in this manual are respected. In respect to a good Engineering practice, all inductive loads like solenoids contactor coils should have a filter in parallel

### **Emissions (Emissioni, Emission)**

All solid-state power controllers emit a certain amount of radio-frequency energy because of the fast switching of the power devices. The Thyristor unit are in accord with the EMC norms, CE mark.  
In most installations, near by electronic systems will experience no difficulty with interference. If very sensitive electronic measuring equipment or low-frequency radio receivers are to be used near the unit, some special precautions may be required. These may include the installation of a line supply filter and the use of screened (shielded) output cable to the load.



## 2 Basic Connections and sizing

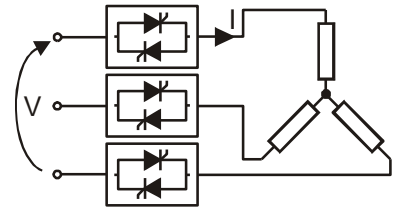
### Star wiring with resistive load

$$I = \frac{P}{1,73V}$$

V = Nominal voltage of the load

I = Nominal current of the load

P = Nominal power of the load



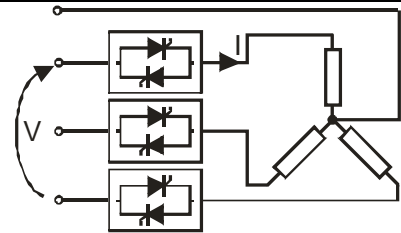
### Star wiring with resistive load + Neutral

$$I = \frac{P}{1,73V}$$

V = Nominal voltage of the load

I = Nominal current of the load

P = Nominal power of the load



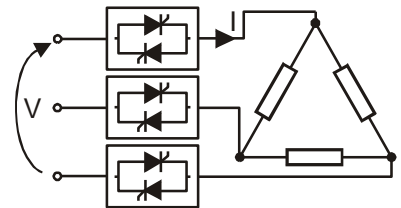
### Delta wiring with resistive load

$$I = \frac{P}{1,73V}$$

V = Nominal voltage of the load

I = Nominal current of the load

P = Nominal power of the load



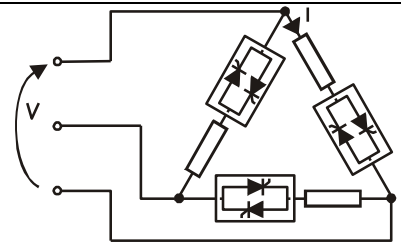
### Open Delta wiring with resistive load

$$I = \frac{P}{3V}$$

V = Nominal voltage of the load

I = Nominal current of the load

P = Nominal power of the load



## 3 Identification and Order Code

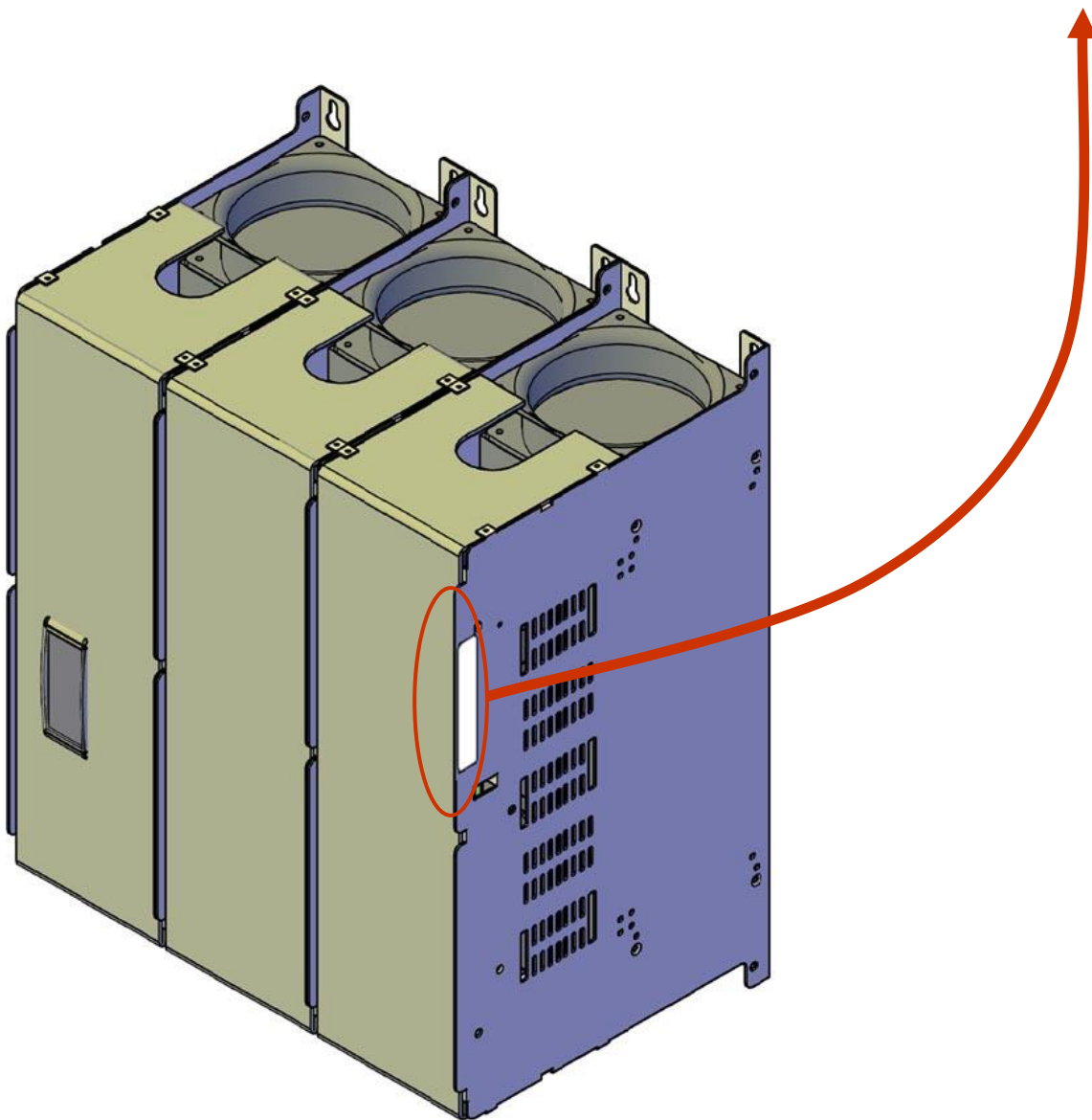
### 3.1 Identification of the unit



**Caution:** Before to install, make sure that the Thyristor unit have not damages. If the product has a fault, please contact the dealer from which you purchased the product.

The identification's label give all the information regarding the factory settings of the Thyristor unit, this label is on the unit, like represented in figure.

Verify that the product is the same thing as ordered .



### 3.2 Order Code

1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16					
C		3																																	
<b>CUSTOM - 3PH</b>																																			
<b>4, 5, 6 Current</b>																																			
Description code		Numeric code																																	
150A		0 1 5 0																																	
300A		0 3 0 0																																	
550A		0 5 5 0																																	
800A		0 8 0 0																																	
<b>7 Max Voltage</b>																																			
Description code		Numeric code																																	
480V		4																																	
600V		6																																	
690A		7																																	
<b>8 Control Mode</b>																																			
Description code		Numeric code																																	
90:130V (1)		1																																	
170:265V (1)		2																																	
300:530V (1)		5																																	
510:690V (1)		6																																	
600:760V (1)		7																																	
<b>9 Input</b>																																			
Description code		Numeric code																																	
SSR		S																																	
0:10V dc		V																																	
4:20mA		A																																	
<b>10 Firing</b>																																			
Description code		Numeric code																																	
Zero Crossing ZC		Z																																	
Burst Firing																																			
4 Cycles On at 50% Power Demand		4 (2)																																	
Burst Firing																																			
8 Cycles On at 50% Power Demand		8 (2)																																	
Burst Firing																																			
16 Cycles On at 50% Power Demand		6 (2)																																	
<b>11 Control Mode</b>																																			
Description code		Numeric code																																	
Open Loop		0																																	
<b>12 Fuse &amp; Option</b>																																			
Description code		Numeric code																																	
Fixed Fuses Standard		F																																	
Fixed Fuses + CT		Y																																	
Fixed Fuses + CT + HB		H																																	
<b>13 Fan Voltage</b>																																			
Description code		Numeric code																																	
No Fan 110V		1																																	
Fan 220V Standard		2																																	
<b>14 Approvals</b>																																			
Description code		Numeric code																																	
CE EMC		0																																	
<b>15 Manual</b>																																			
Description code		Numeric code																																	
None		0																																	
Italian Manual		1																																	
English Manual		2																																	
German Manual		3																																	
French Manual		4																																	
<b>16 Version</b>																																			
Description code		Numeric code																																	
Std with Fuse		1																																	

**LEGEND**

- IF = Internal Fixed Fuse
- CT = Current Transformer
- HB = Heater Break Alarm

**Note (1):** Load voltage must be included in Selected Auxiliary Voltage Range  
**Note (2):** Available with Analog input only

## 4 Technical Specifications

### 4.1 General features:


Cover and Socket material:	PolymericV2
Utilization Category	AC-51 AC-55b
IP Code	20
Method of Connecting	Load in Delta, Load in Star
Auxiliary voltage:	90:130V (8 VA Max) 170:265V (8 VA Max) 230:345V (8 VA Max) 300:530V (8 VA Max) 510:690V (8 VA Max)
Relay output for Heater Break Alarm (only with HB option):	0.5A a 125VAC
Max Voltage (max tolerance = Value+10%)	480V-600V-690V see order code.

### 4.2 Input features:

Logic input SSR:	5 ÷ 30Vdc 5mA Max (ON ≥ 4Vdc OFF < 1Vdc)
Analogic input	0 ÷ 10Vdc impedance 15 K ohm
Analogic input	4 ÷ 20mA impedance 100 ohm
POT	15 K ohm min.
Digital Input	4 ÷ 24Vdc 5mA Max (ON ≥ 4Vdc OFF < 1Vdc)

### 4.3 Output features (power device):

Current	Nominal Voltage range (Ue)	Repetitive peak reverse voltage (Uimp)		Latching current	Max peak one cycle	Leakage current	I <sup>2</sup> T value max	Frequency range	Power loss	Isolation Voltage (Ui)
		(480V)	(600V)							
(A)	(V)			(mAeff)	(10msec.) (A)	(mAeff)	tp=10msec c	(Hz)	I=Inom (W)	Vac
150A	24÷600	1600	1600	450	1900	15	18050	47÷70	486	3000
300A	24÷600	1600	1600	300	5000	15	125000	47÷70	958	3000
550A	24÷600	1200	1600	1000	15000	15	1150000	47÷70	1590	2500
800A	24÷600	1200	1600	1000	15000	15	1250000	47÷70	2529	2500

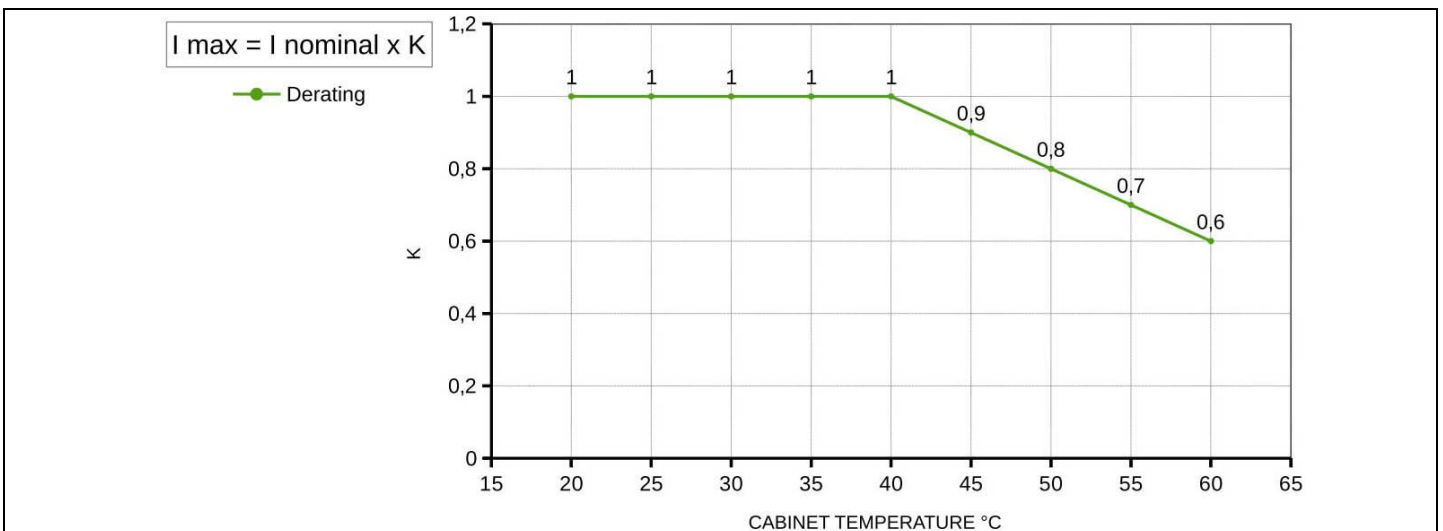
Size	 Number of fans
150A	One Fan - 17W (17W x 1 Fan)
300A	Two Fan - 34W (17W x 2 Fan)
550A	Three Fan - 51W (17W x 3 Fan)
800A	Six Fan - 102W (17W x 6 Fan)



### 4.4 Environmental installation conditions

Ambient temperature	0-40°C at nominal current. Over 40°C use the derating curve.
Storage temperature	-25°C a 70°C
Installation place	Don't install at direct sun light, where there are conductive dust, corrosive gas, vibration or water and also in salty environmental.
Altitude	Up to 1000 meter over sea level. For higher altitude reduce the nominal current of 2% for each 100m over 1000m
Humidity	From 5 to 95% without condense and ice
Pollution Level	Up to 2nd Level ref. IEC 60947-1 6.1.3.2

### 4.5 Derating Curve



## 5 Installation

Before to install, make sure that the Thyristor unit have not damages.

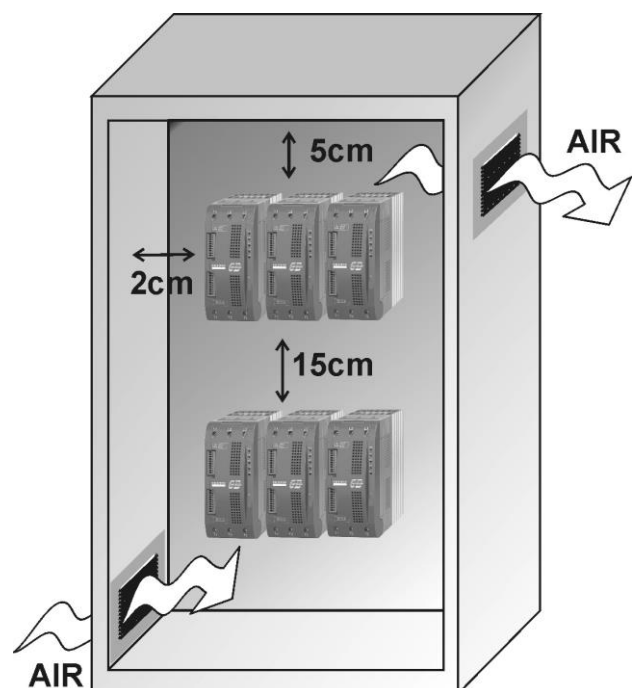
If the product has a fault, please contact the dealer from which you purchased the product. Verify that the product is the same thing as ordered.

The Thyristor unit must be always mounted in vertical position to improve air cooling on heat-sink.

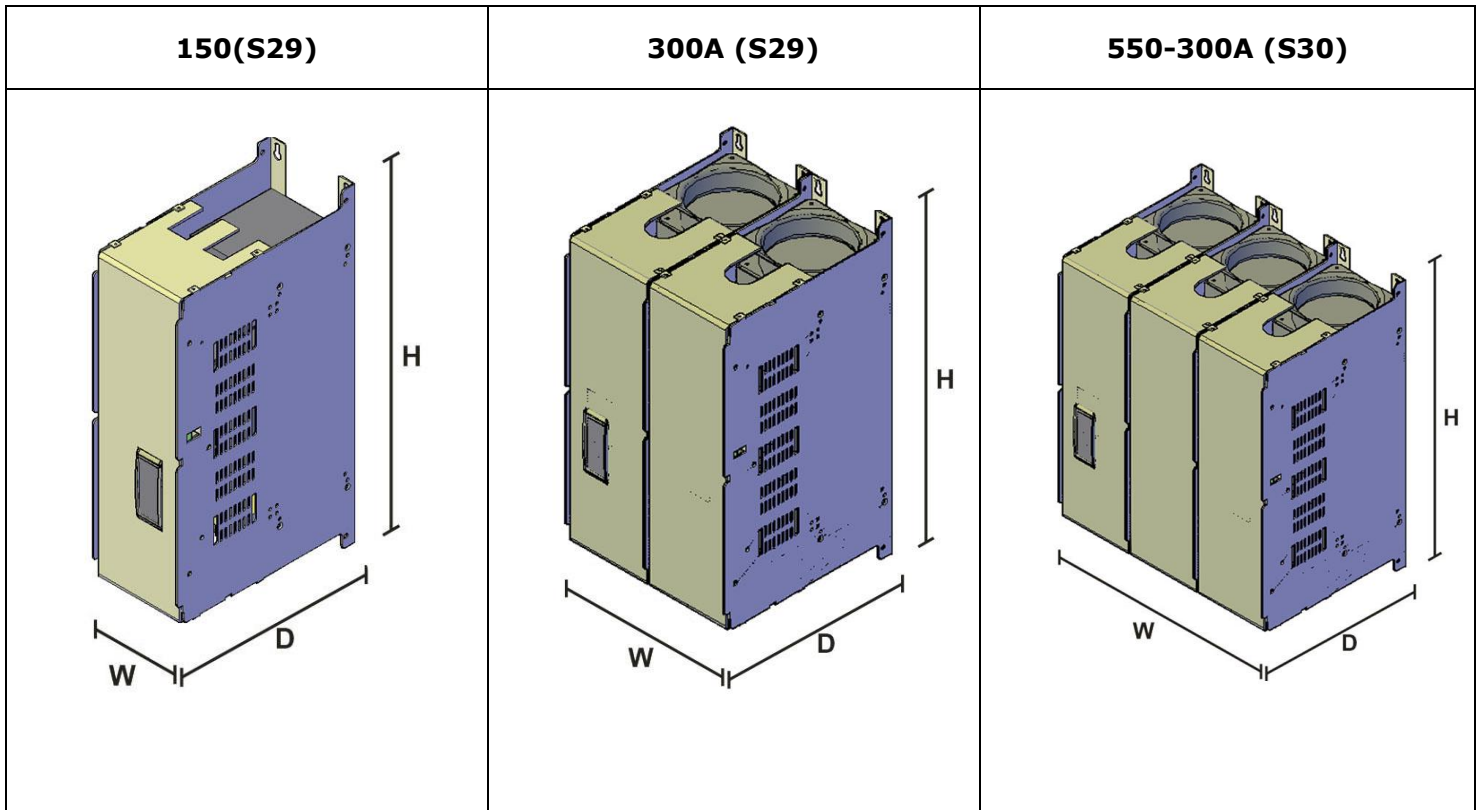
Maintain the minimum distances in vertical and in horizontal as represented.

When more unit has mounted inside the cabinet maintain the air circulation like represented in figure.

Sometimes is necessary installing a fan to have better air circulation.

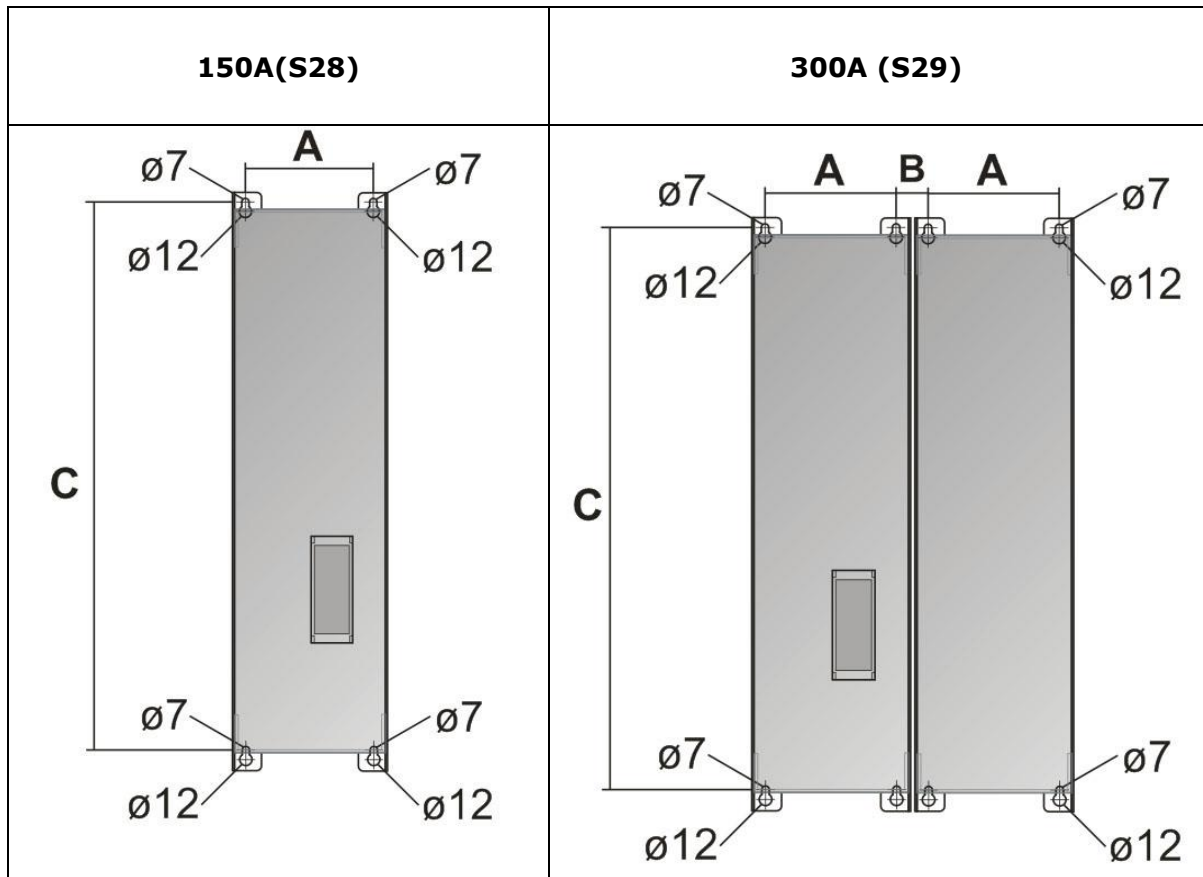


## 6 Dimensions and Weight

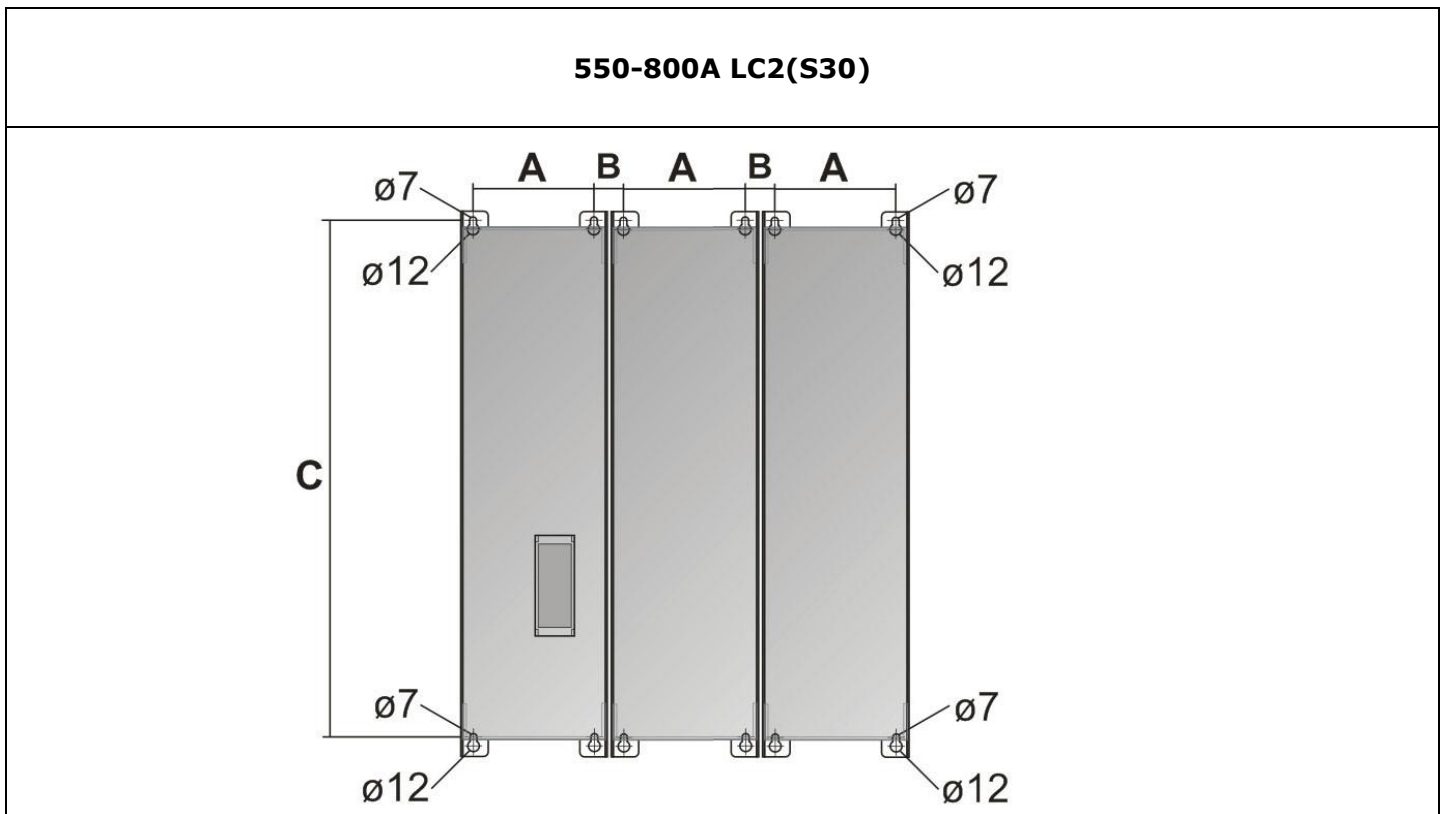


Size	W(mm)	H(mm)	D(mm)	Weight (kg)
150A	130	478	274	14
300A	260	478	274	27
550-800A	390	478	274	44

**6.1 Fixing holes**



A(mm)	B(mm)	C(mm)
106	24	448



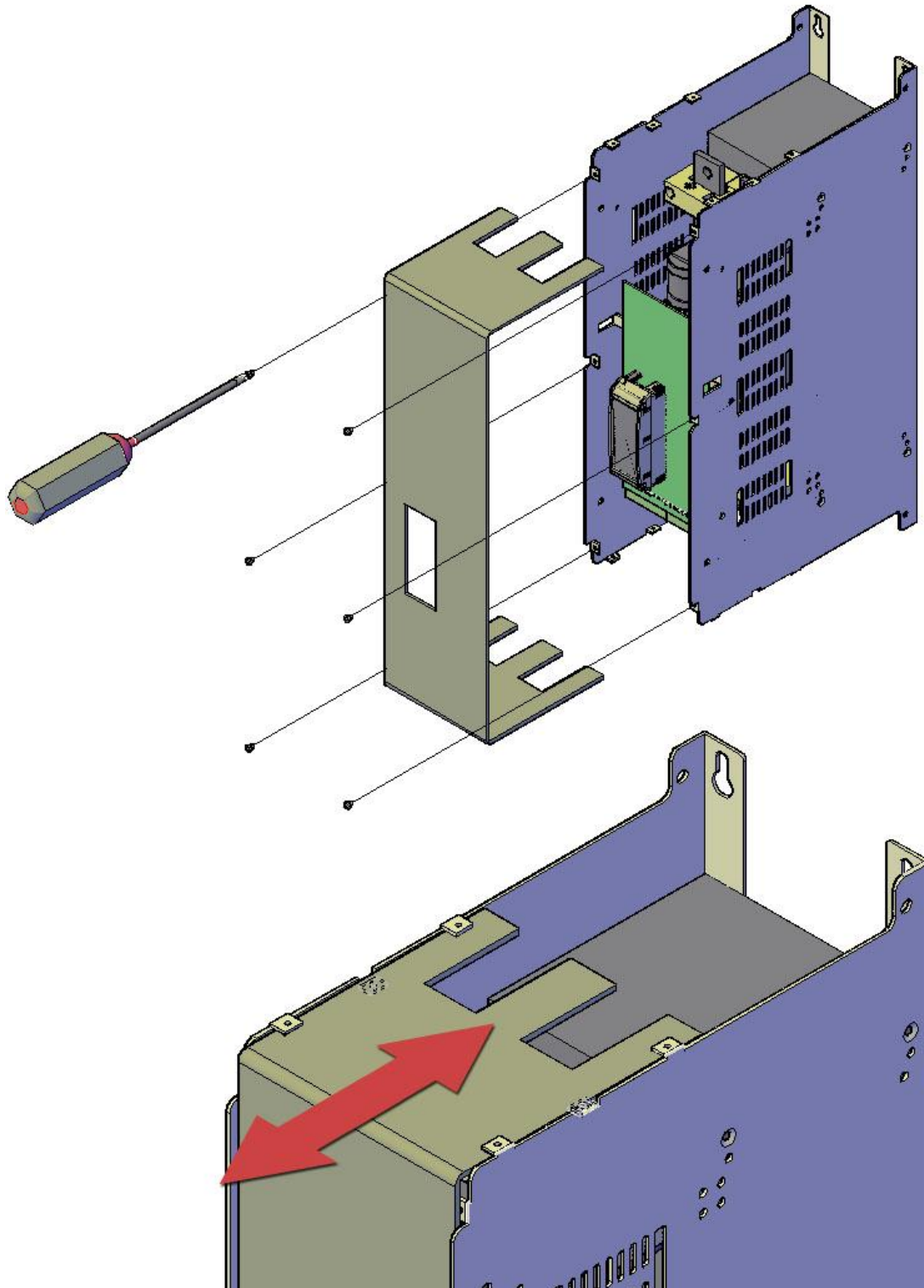
## 7 Wiring instructions

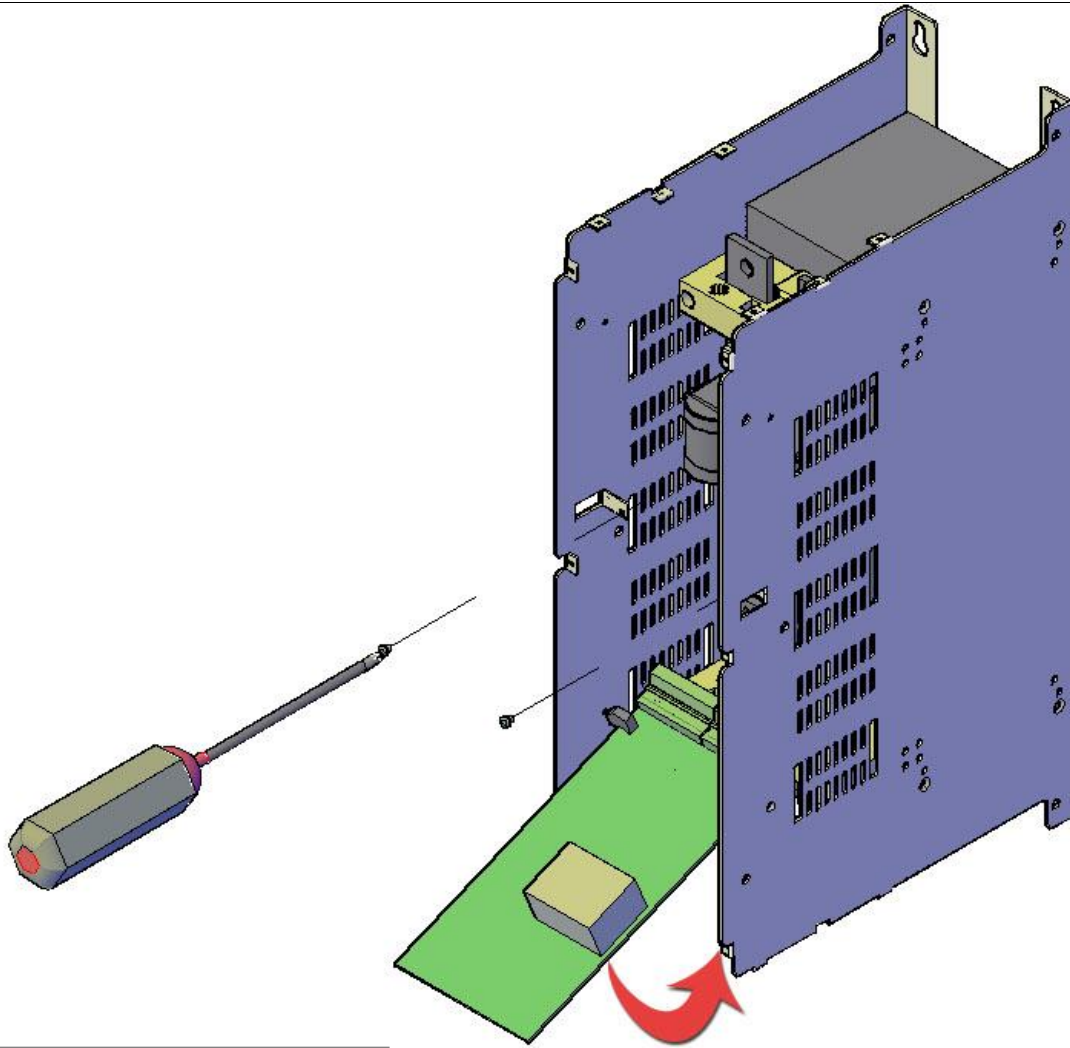
The Thyristor unit could be susceptible to interferences lost by near equipments or by the power supply, for this reason in accord to the fundamental practices rules is opportune take some precautions:

- The coil contactor, the relays and other inductive loads must be equipped with opportune RC filter.
- Use shielded bipolar cables for all the input and output signals.
- The signal cables must not be near and parallel to the power cables.
- Local regulations regarding electrical installation should be rigidly observed.

Use copper cables and wires rated for use at 75°C only.

### 7.1 Removing the cover





**To access to jumpers on the other side of the board unscrew the upper part and flip the board.**

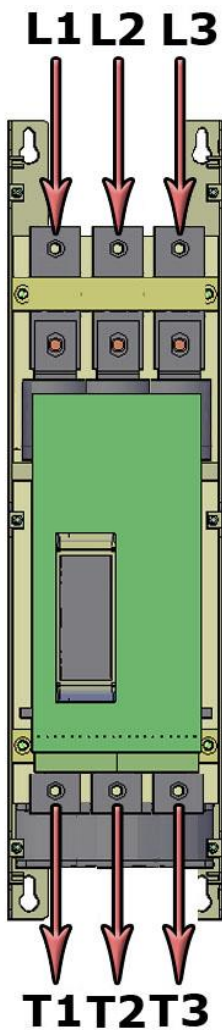
## 7.2 Power Terminals



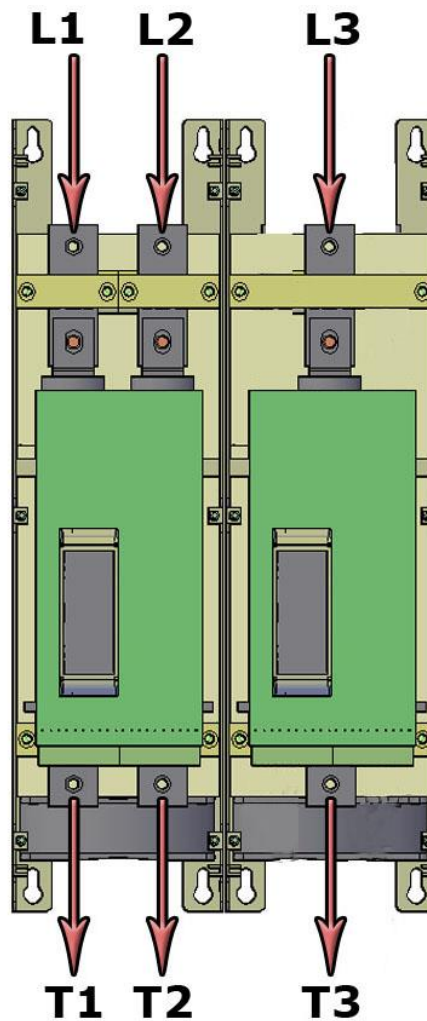
**Warning:** Before connecting or disconnecting the unit check that power and control cables are isolated from voltage sources.

Terminal	Description
L1	Line Input Phase 1
L2	Line Input Phase 2
L3	Line Input Phase 3
T1	Load Output Phase 1
T2	Load Output Phase 2
T3	Load Output Phase 3

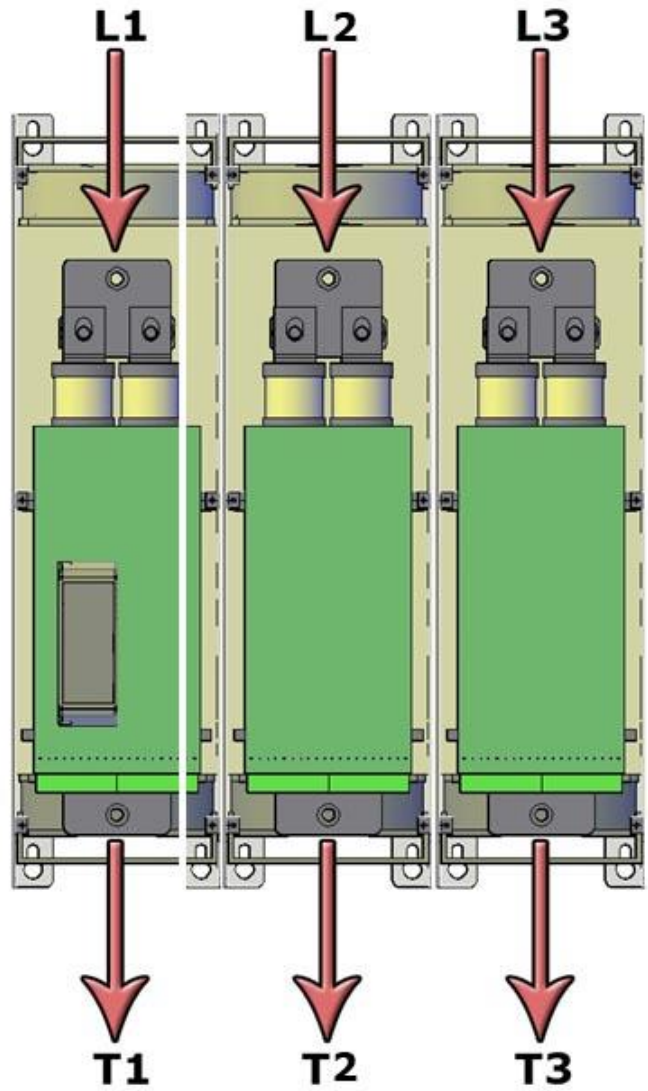
**150A**



**300A**



### 550-800A



### 7.3 Power Cable torque (suggested)

Current	Connector Type	Torque Lb-in (N-m)	Wire Range AWG / kcmil	Wire Terminal
150A	Bus Bar with M6 screw	70.8 (8.0)		8 4/0
300A	Bus Bar with M8 screw	141,6 (16.0)		2x1/0 350
550A	Bus Bar with M10 screw	505 (57.0)		Bus bar 60x5mm
800A	Bus Bar with M10 screw	505 (57.0)		Bus bar 60x6mm

### 7.4 Power cable dimensions (suggested)

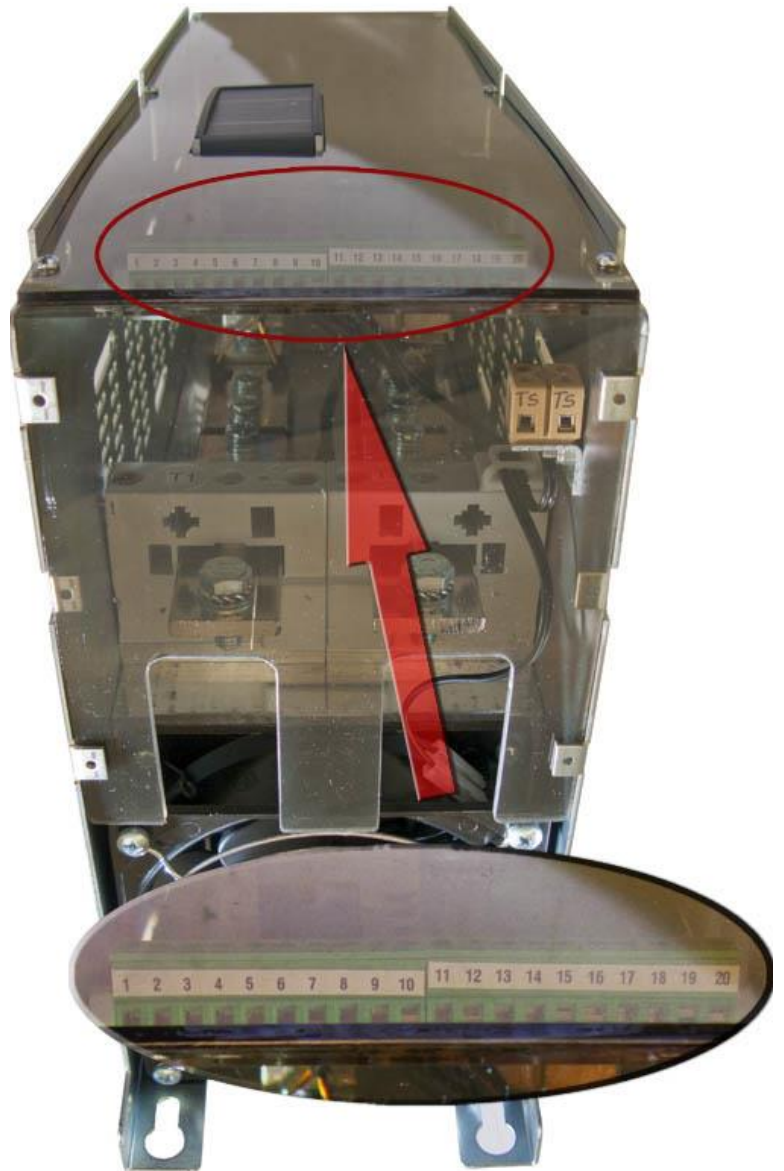
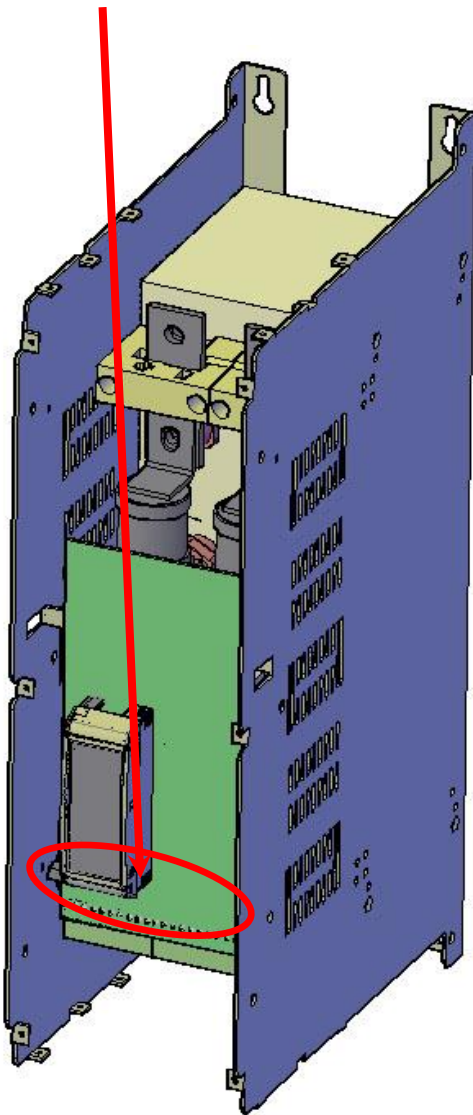
Current	Supply			Load		
	Cable		Screw M	Cable		Screw M
	mm <sup>2</sup>	AWG		mm <sup>2</sup>	AWG	
150A	50	1/0	M8	70	1/0	M6
300A	2 x 70	2 x 1/0	M8	2 x 70	2 x 1/0	M8
550A	Bus Bar		60 x 5 mm	Bus Bar		60 x 5 mm
800A	Bus Bar		60 x 6 mm	Bus Bar		60 x 6 mm

### 7.5 Cable dimensions (suggested) of Earth and of the Command Terminals

Current	Earth			Command Terminals		
	Cable		Screw M	Cable		
	mm <sup>2</sup>	AWG		mm <sup>2</sup>	AWG	
150A	16	6	M6	0,50	18	
300A	50	1	M8	0,50	18	
550A	70	1/0	M8	0,50	18	
800A	70	1/0	M8	0,50	18	



### 7.6 Control Terminals Positions



## 7.7 Command Terminals for SSR Input only



**Warning:** Before connecting or disconnecting the unit check that power and control cables are isolated from voltage sources.

### Standard Terminals

Terminal	Description
1	Not Connected
2	Not Connected
3	Not Connected
4	Not Connected
5	Enable
6	Not Connected
7	Not Connected
8	Not Connected
9	Not Connected
10	0V GND

Terminal	Description
11	- Input SSR
12	+ Input SSR
13	Not Connected
14	Not Connected
15	Fan supply voltage (230V standard - 115 option)
16	Fan supply voltage (230V standard - 115 option)
17	Not Connected
18	Aux - Voltage Supply for electronic boards (See order code for the Value)
19	Not Connected
20	Aux - Voltage Supply for electronic boards (See order code for the Value)

## 7.8 Command Terminals for Analog Input or SSR input with HB

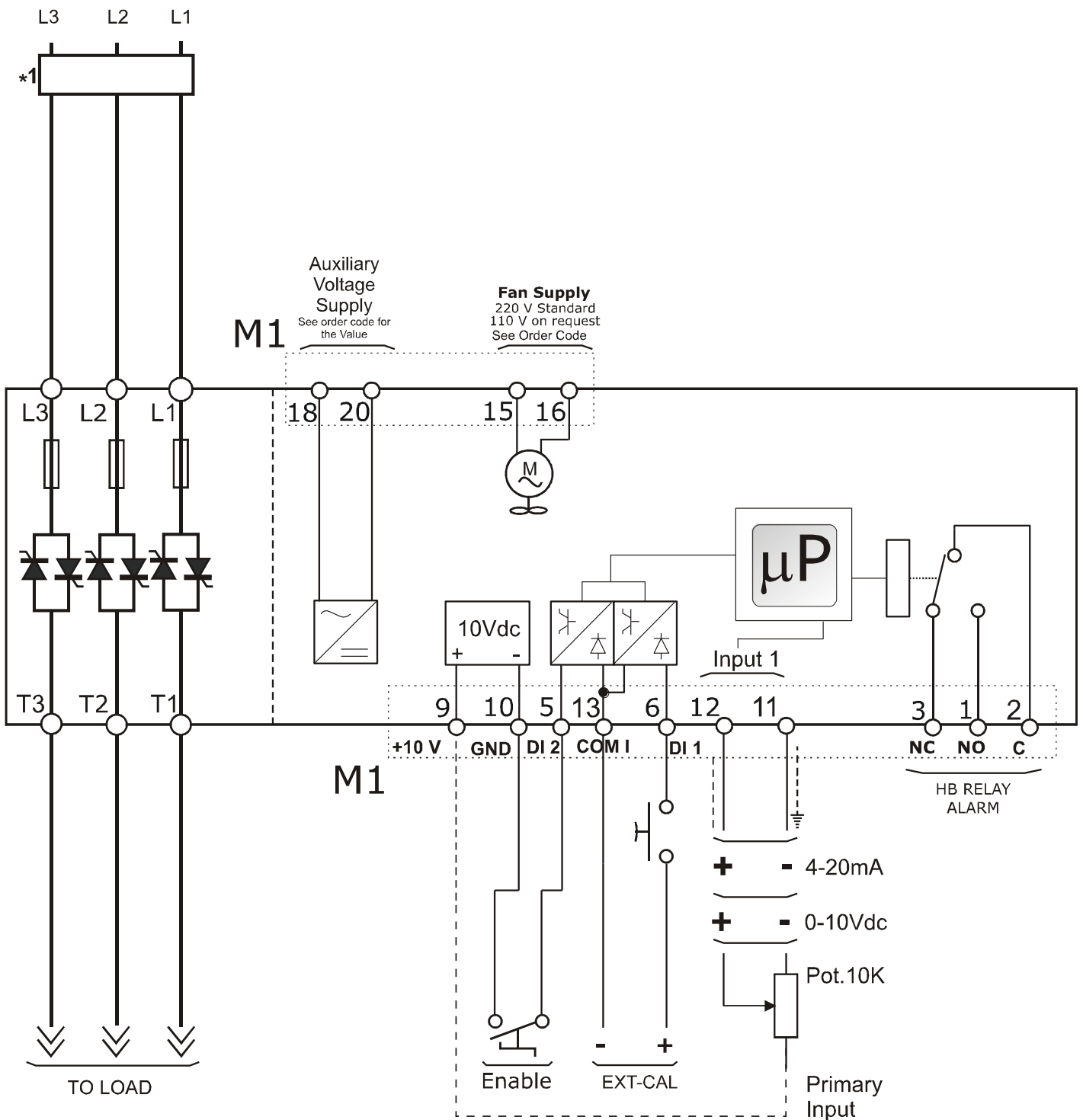
Terminal	Description
1	NO - Normally Open contact alarm relay output (HB)
2	C - Common contact alarm relay output
3	NC - Normally Close contact alarm relay output (HB)
4	Not Connected
5	Enable
6	+ Cal Ext. 12/24Vdc
7	Not Connected
8	Not Connected
9	Output +10Vdc stabilized 1 mA MAX
10	0V GND

Terminal	Description
11	- Control Input (SSR/0-10Vdc/4-20mA)
12	+ Control Input (SSR/0-10Vdc/4-20mA)
13	- Cal Ext. 12/24Vdc
14	Not Connected
15	Fan supply voltage (230V standard - 115 option)
16	Fan supply voltage (230V standard - 115 option)
17	Not Connected
18	Aux - Voltage Supply for electronic boards (See order code for the Value)
19	Not Connected
20	Aux - Voltage Supply for electronic boards (See order code for the Value)

### 7.9 Schematic



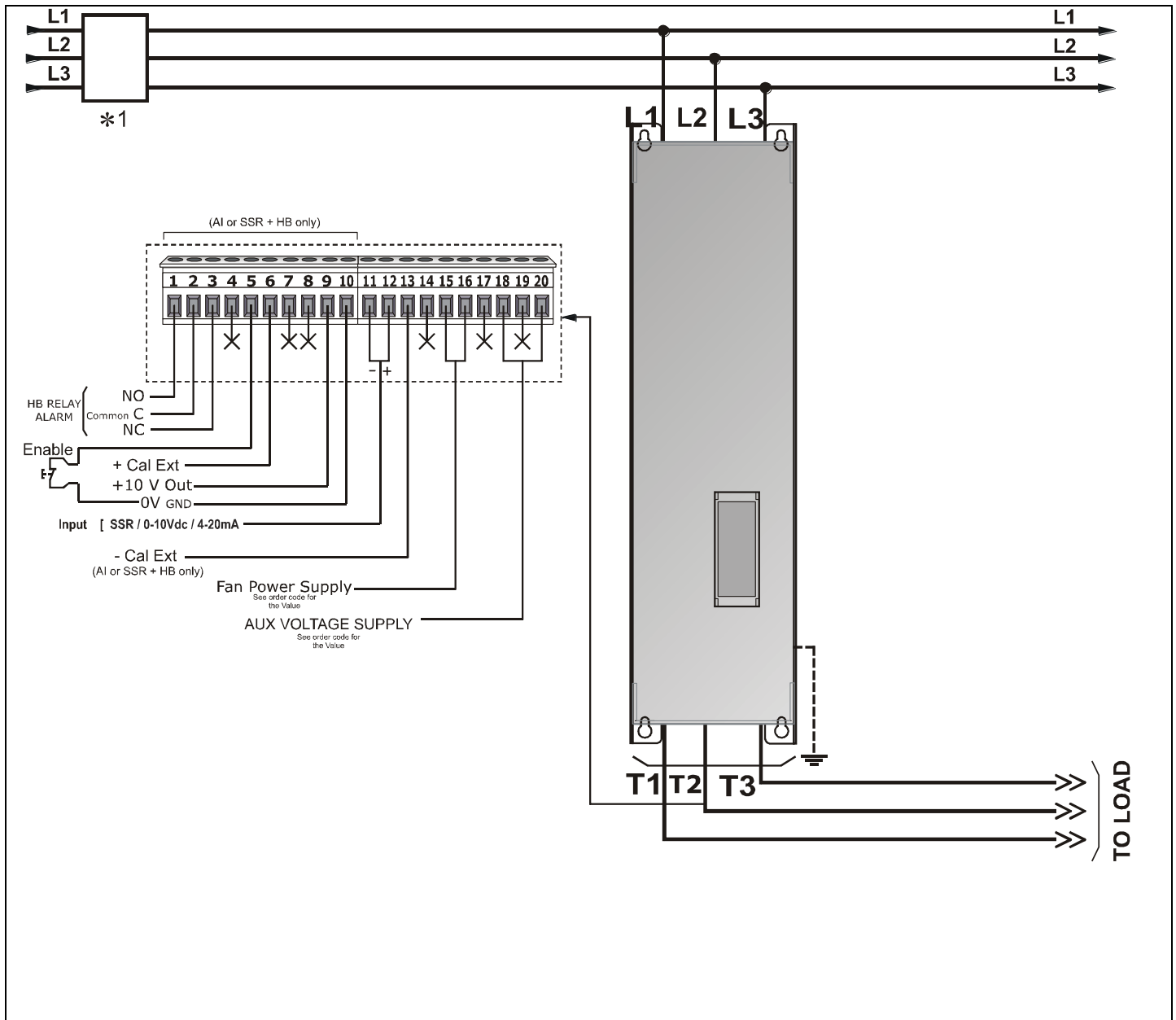
**Caution:** this procedure must be performed only by qualified persons.



**NOTE:**

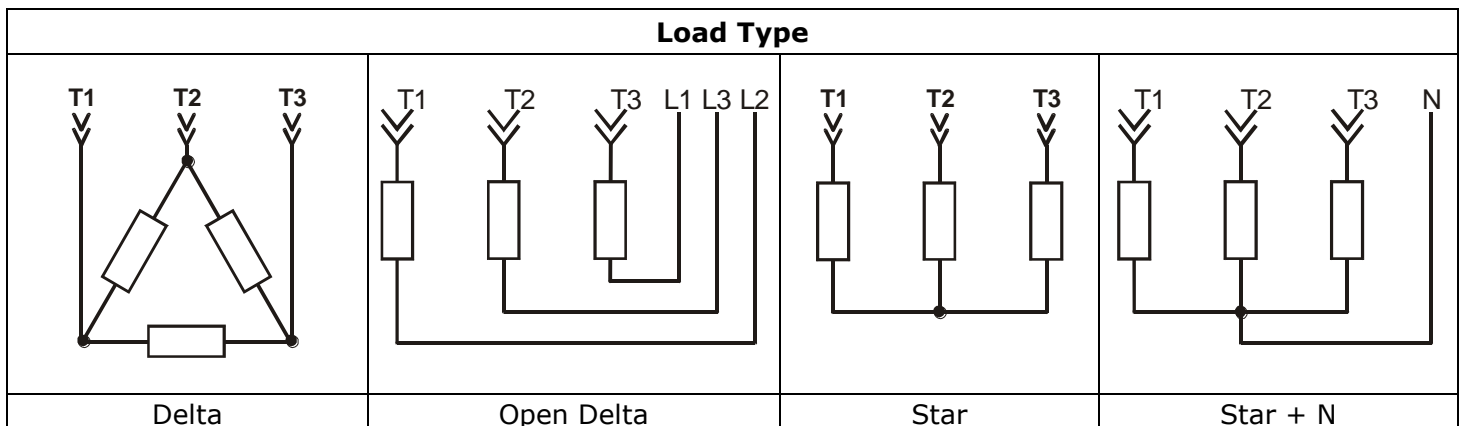
- \*□ The user installation must be protecting by electromagnetic circuit breaker or by fuse isolator. The semiconductor I2t should be 20% less than power controller I2t. Semiconductor fuses are classified for UL as suplemetar protection for semiconductor. They are note approved for branch circuit protection.

### 7.10 Connection Diagram for 3 phases (control on 3 phases) 150A

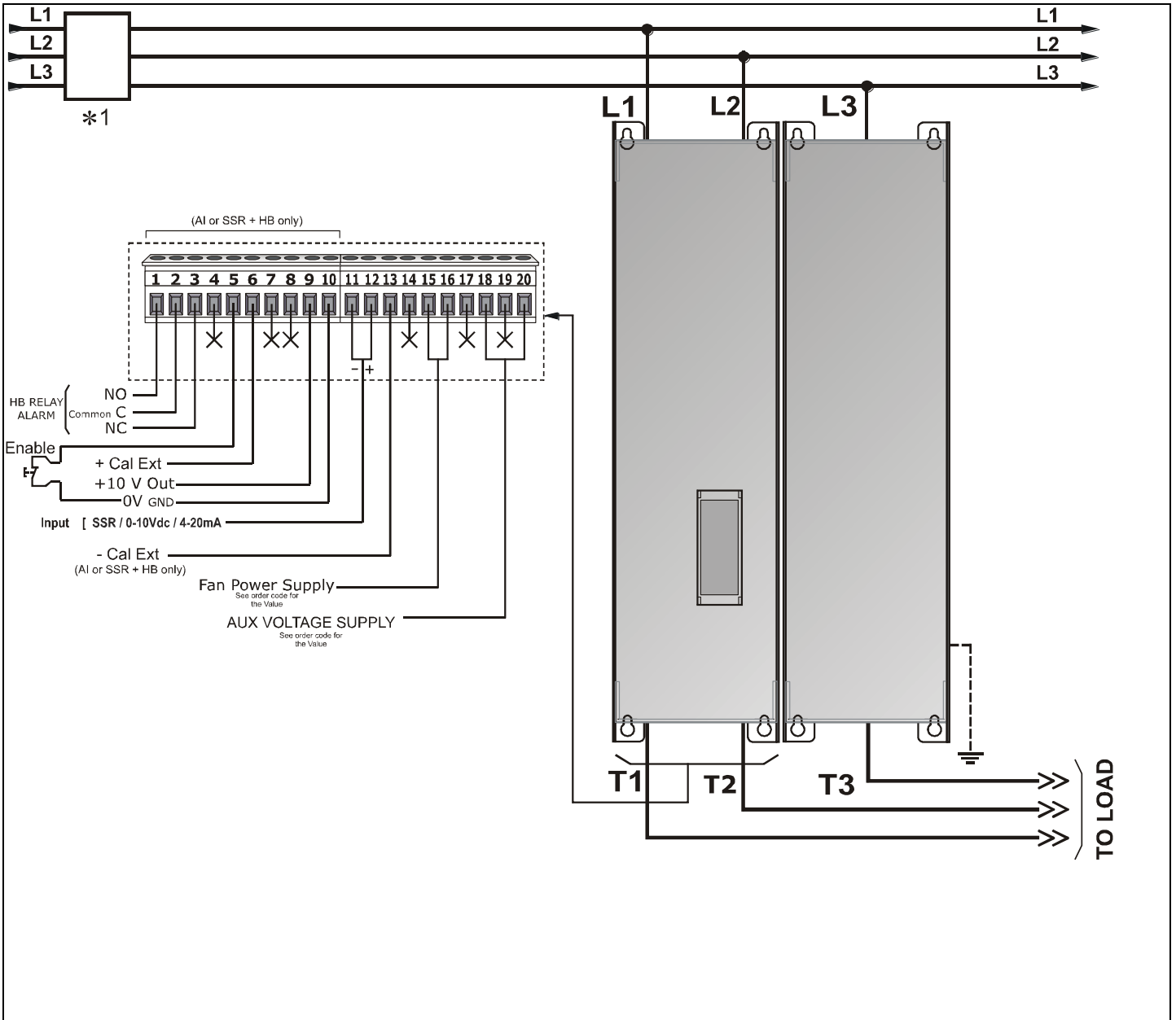


X = not connected

\*1 The user installation must be protecting by electromagnetic circuit breaker or by fuse isolator. The semiconductor I2t should be 20% less than power controller I2t. Semiconductor fuses are classified for UL as supplementar protection for semiconductor.

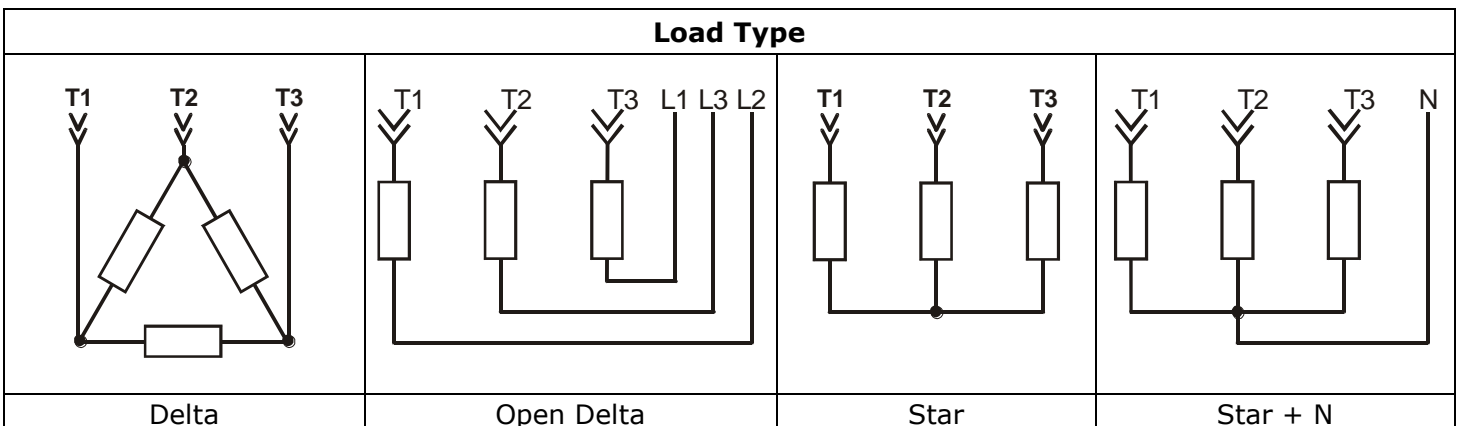


### 7.11 Connection Diagram for 3 phases (control on 3 phases) 300A

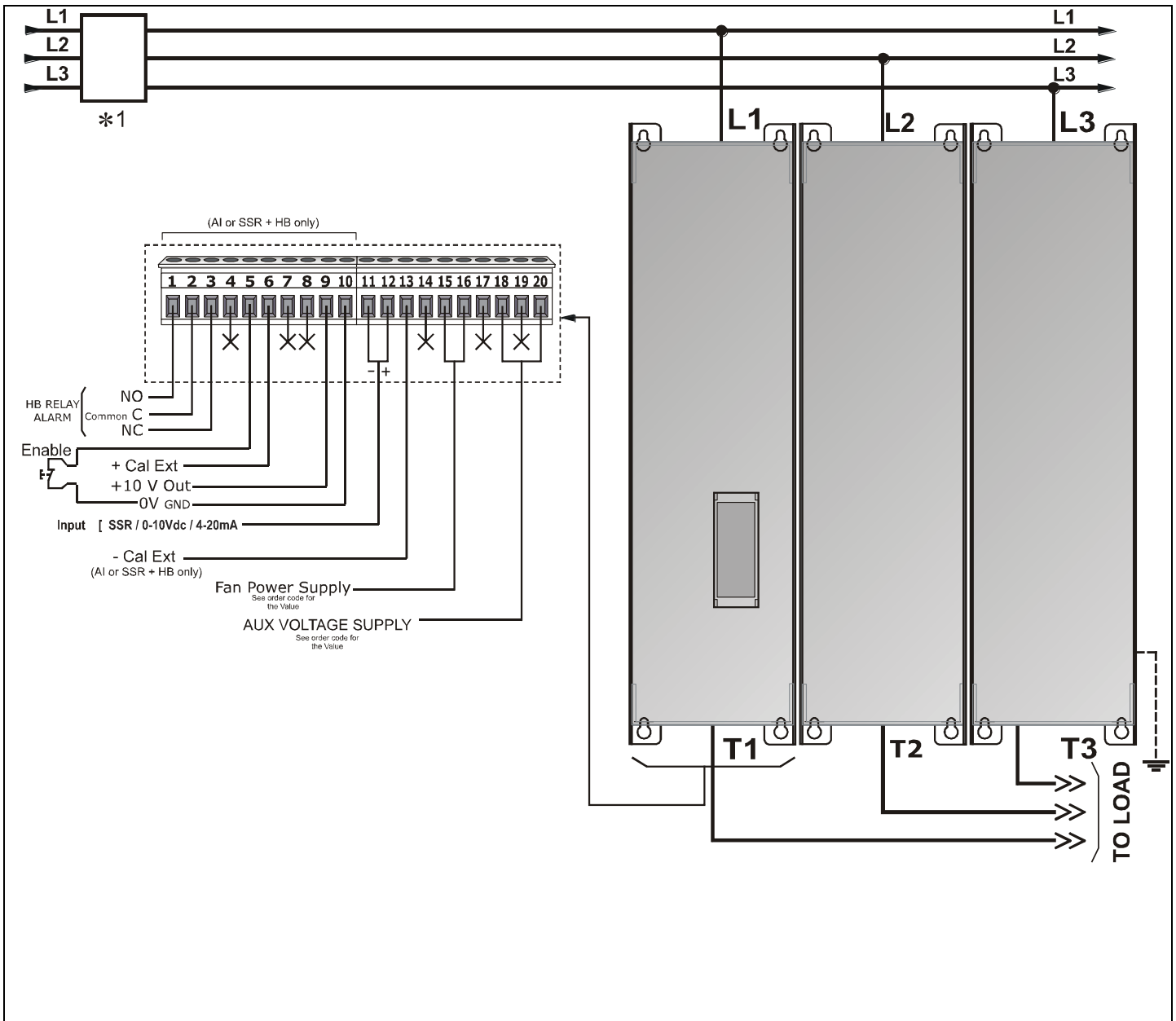


**X** = not connected

\*1 The user installation must be protecting by electromagnetic circuit breaker or by fuse isolator. The semiconductor I2t should be 20% less than power controller I2t. Semiconductor fuses are classified for UL as supplementar protection for semiconductor.

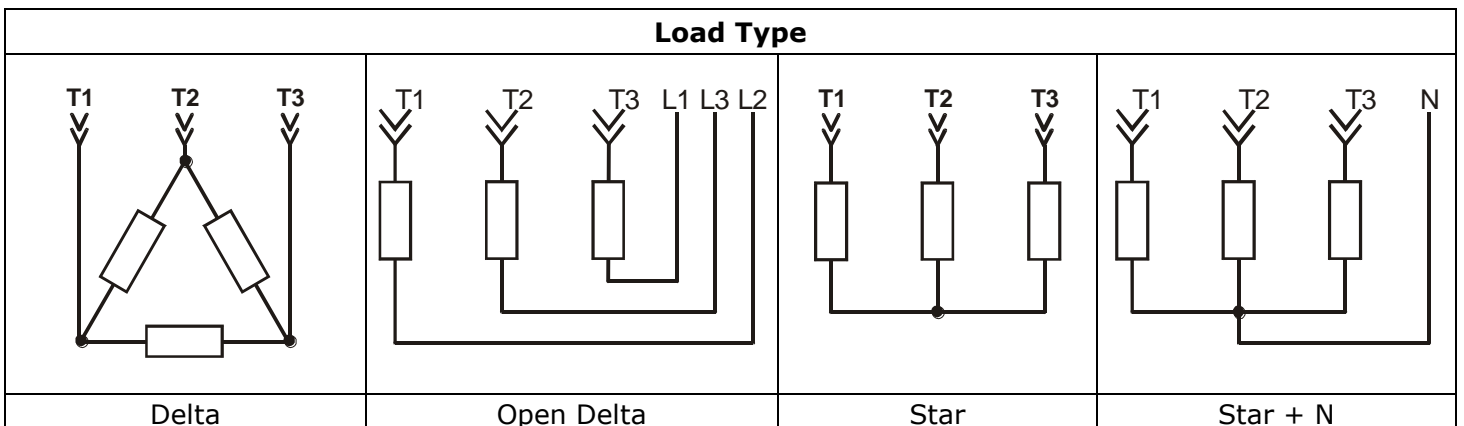


### 7.12 Connection Diagram for 3 phases (control on 3 phases) 550-800A



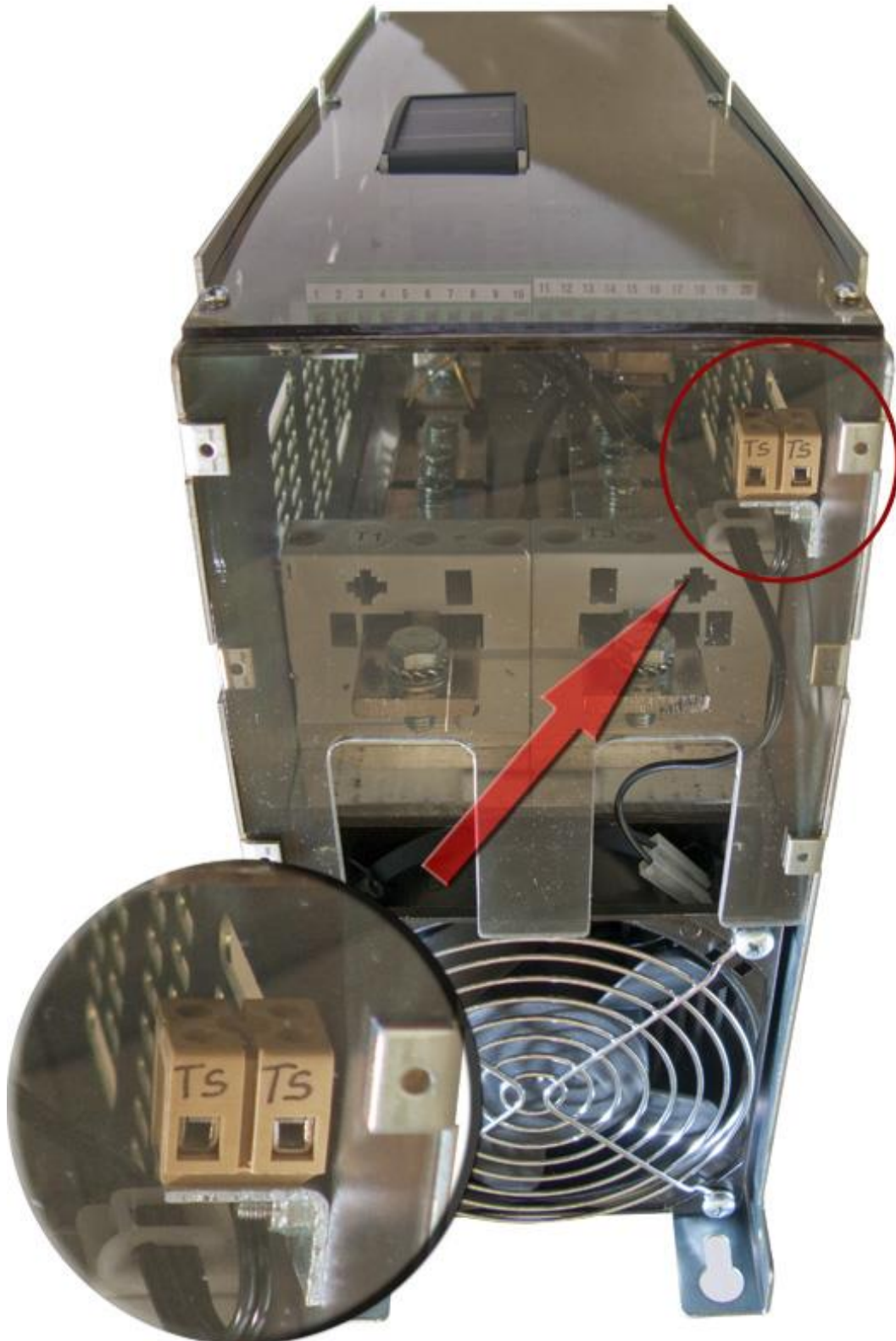
**X** = not connected

\*1 The user installation must be protecting by electromagnetic circuit breaker or by fuse isolator. The semiconductor I2t should be 20% less than power controller I2t. Semiconductor fuses are classified for UL as supplementar protection for semiconductor.



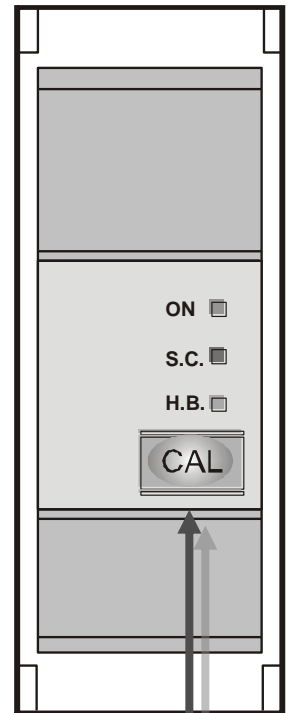
## 7.13 Thermal Switch

Terminal	Description
TS	Thermal Switch 1
TS	Thermal Switch 2



## 8 Led status and Alarms

LED	STATUS	DESCRIPTION
H.B. S.C.	LED OFF	Load OK
	LED ON (Yellow)	Load Fault (only with HB option)
	LED ON (Red)	SCR short circuit (only with HB option)
ON	LED OFF	Load is NOT powered
	LED ON (Green)	Load is powered



## 9 Heater Break alarm and SCR short circuit (HB Option only)



**Caution:** to work properly the load must be powered at least about 160msec.

The Heater Break circuit read the load current with an Internal current transformer (C.T.). Minimum current is 10% of the current transformer size.

If load current is below this value the Heater Break Alarm doesn't work properly.

### Heater break Calibration procedure

An automatic function sets the Heater Break Alarm.

The auto setting function can be activated using the "CAL" button on front unit, or supply with 12-24Vdc the digital input "Cal Ext." (See Connection Diagram).

The Heater Break calibration procedure is performed in this way:

- The Unit gives the maximum voltage output
- all LEDs are on, this means that calibration procedure is active
- The current value is stored in memory
- After about 15 second the unit comes back to the initial situation

If load current decreases for partial or total load failure (sensitivity 20%) the yellow LED HB become ON and alarm relay change status.

If the unit is still in conduction with no input signal (LED green OFF) it means that there is a short circuit on thyristors and red LED (SC) become ON.

If the load has been changed the Heater Break calibration procedure must be done again



## 10 Supply the Electronic Board

The REVO S thyristor unit, to work, requires a voltage supply for the electronic boards. The Max consumption is 10VA.

The voltage supply for the electronic boards is configured in line with customer requirements that are defined in the Order Code. The Order Code is written on the identification label.

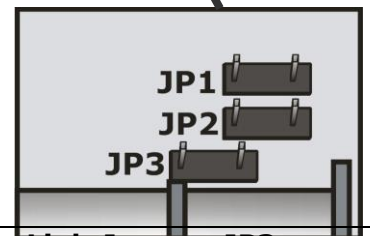
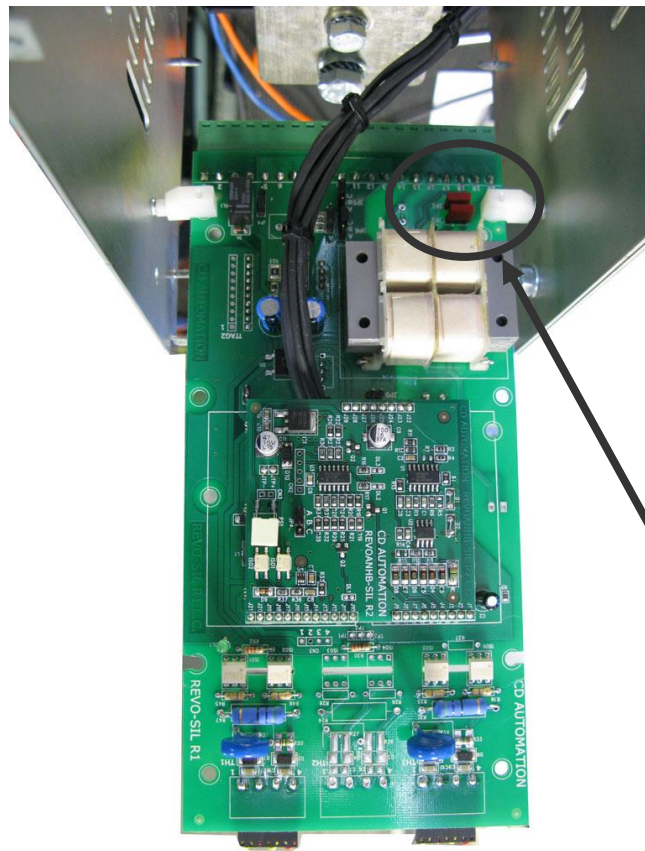


**Warning:** Before connecting or disconnecting the unit check that power and control cables are isolated from voltage sources.

S12 Terminal	Description
18	Voltage Supply for Electronic Boards
19	Not Used
20	Voltage Supply for Electronic Boards

To change auxiliary supply voltage sold the correct link-jumper on board  
The type of mounted transformer depends of the chosen Voltage in the order code.

**To access to jumpers on the other side of the board unscrew the upper part and flip the board**



Transformer Type	Link-Jumper JP1+JP2	Link-Jumper JP3
TR-605 120V	90:130V	170:265V
TR-605 230V	170:265V	300:530V
TR-605 300V	230:345V	510:690V

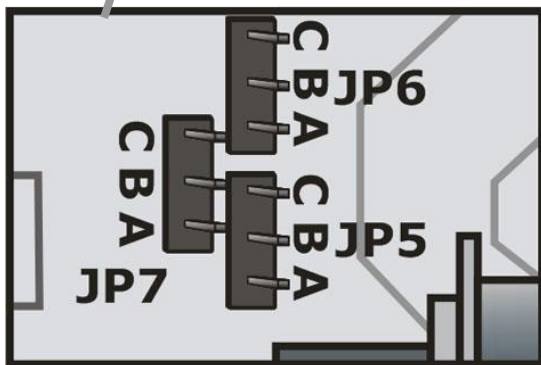
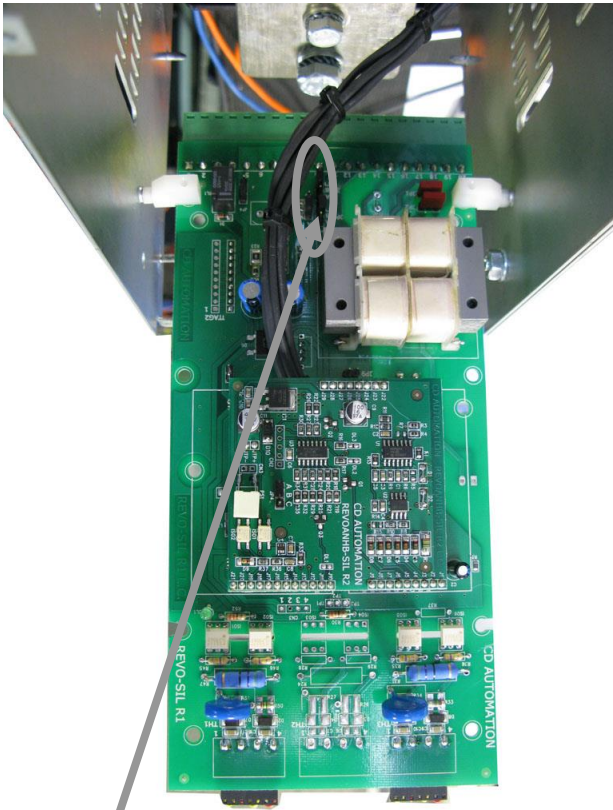
If the Auxiliary Voltage (written on the identification label) is different from Supply Voltage (to the load), use an external transformer with primary equal to load voltage and secondary equal to the Auxiliary Voltage

# 11 Input setting

The input type is already configured in line with customer requirements that are defined in the Order Code. However, verify that the jumper are set as below represented:



**Warning:** Before operate, be sure that power and control cables are isolated from voltage sources



To access to jumpers on the other side of the board unscrew the upper part and flip the board

	0 ÷ 10	4 ÷ 20	SSR						
<table border="1"> <tr><td>A</td><td>■</td></tr> <tr><td>B</td><td>■</td></tr> <tr><td>C</td><td>■</td></tr> </table> JP5	A	■	B	■	C	■	B-C	B-C	A-B
A	■								
B	■								
C	■								
<table border="1"> <tr><td>A</td><td>■</td></tr> <tr><td>B</td><td>■</td></tr> <tr><td>C</td><td>■</td></tr> </table> JP6	A	■	B	■	C	■	B-C	B-C	A-B
A	■								
B	■								
C	■								
<table border="1"> <tr><td>A</td><td>■</td></tr> <tr><td>B</td><td>■</td></tr> <tr><td>C</td><td>■</td></tr> </table> JP7	A	■	B	■	C	■	B-C	A-B	-
A	■								
B	■								
C	■								

Type	Input features	
0÷10V (default)	Impedance	15KΩ
POT	Impedance	10KΩ min
4÷20mA	Impedance	100Ω

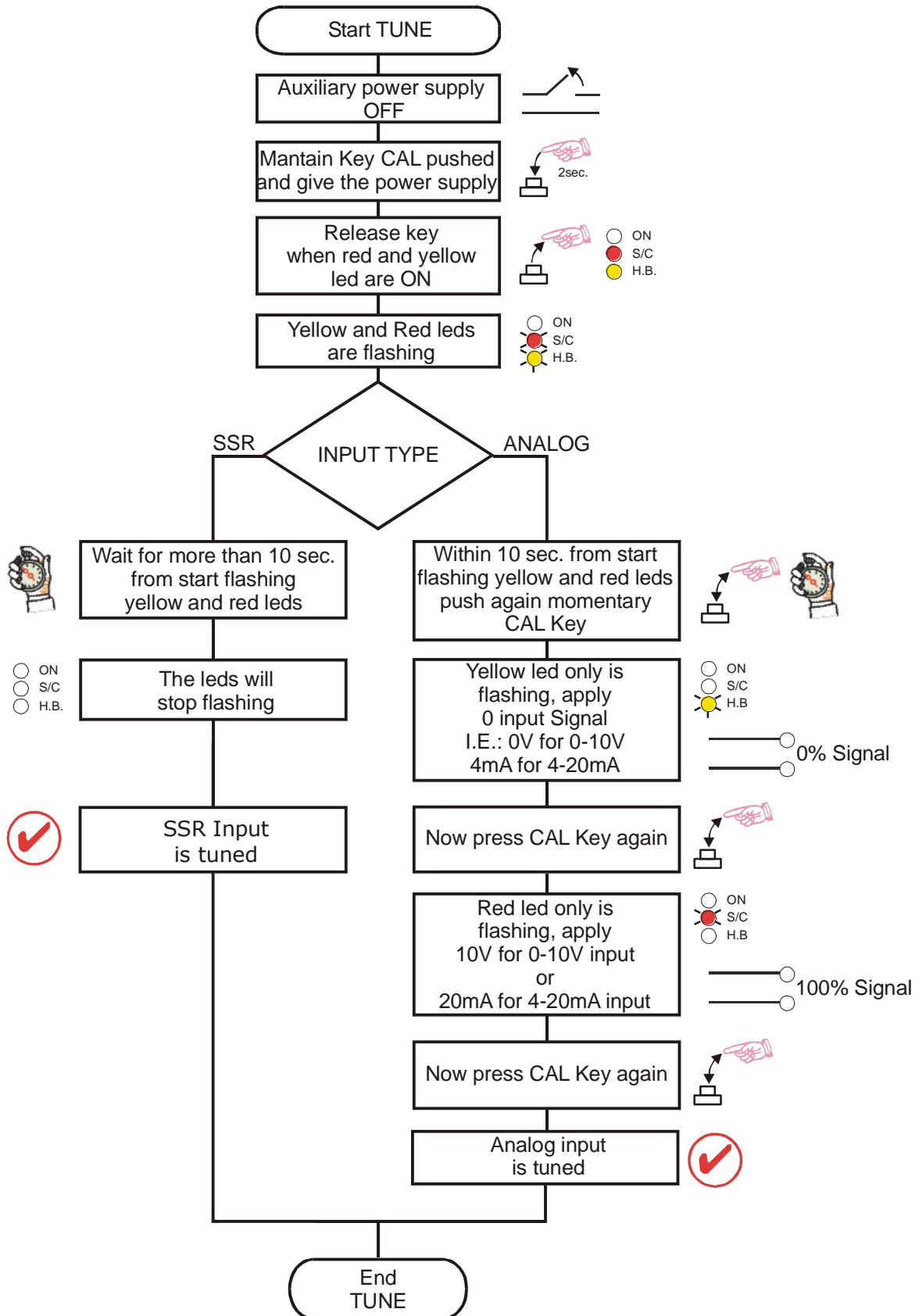
**0-10 Vdc/4-20 mA Jumper settings are only for Analog Input option.**

### 11.1 Input calibration procedure



**Warning:** this procedure can be done just by specialized personnel

**This procedure is needed only if you change the input type**



## 12 Firing type

Choose a correct firing type allows to optimize the thyristor unit for the installed load. The firing type has already configured in line with customer requirements, Zero Crossing for SSR input and Burst firing for Analog Input.

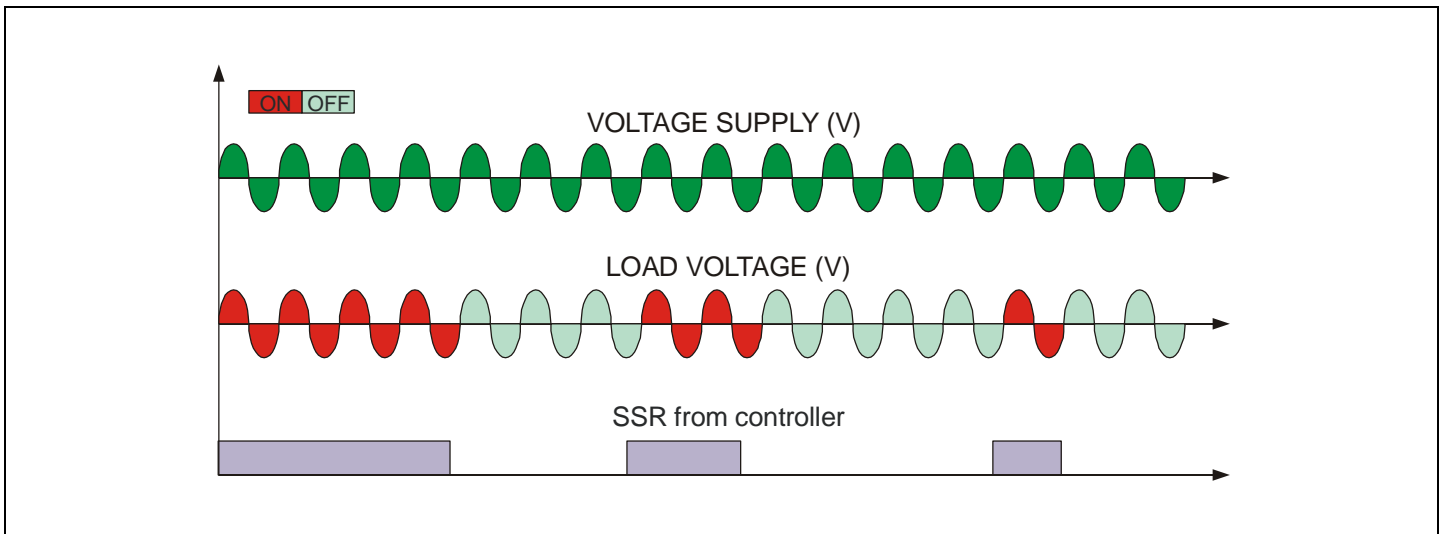


**Caution:** this procedure must be performed only by qualified persons.

### 12.1 Zero Crossing (ZC) with SSR input

ZC firing mode is used with Logic Output from temperature controllers and the Thyristor operates like a contactor.

The Cycle time is performed by temperature controller. ZC minimizes interferences because the Thyristor unit switches ON-OFF at zero voltage.

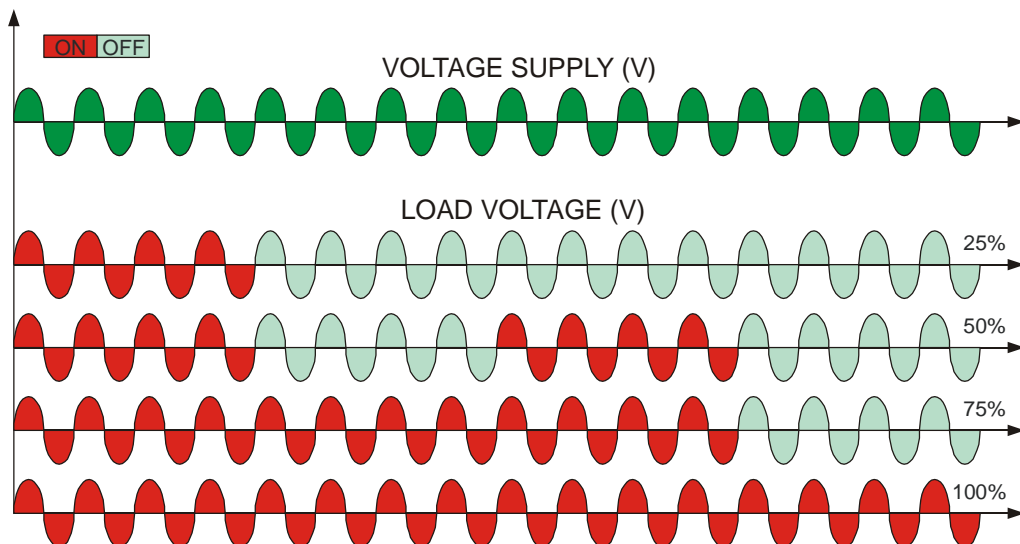


### 12.2 Burst Firing (BF) with Analog Input

The Burst Firing is similar to the Single Cycle, but consecutive cycles ON are selectable between 2 and 255, with input signal equal at 50%.

Burst Firing is a method zero crossing that it reduces the electromagnetic interferences because the thyristor switches at zero voltage crossing.

The example show the Burst Firing with Burst cycles: 4



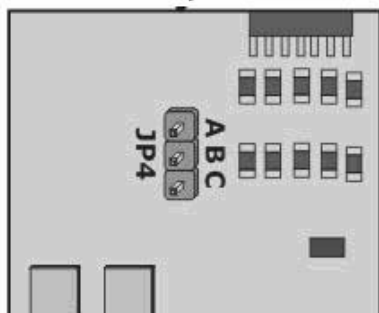
### 12.3 Burst Firing settings

The Burst Firing cycles is already configured in line with customer requirements that are defined in the Order Code. However, if you wish to change the Burst Firing cycles (es. from 4 to 8) set the jumpers as below represented:



**Warning:** Before operate, be sure that power and control cables are isolated from voltage sources

To access to jumpers on the other side of the board unscrew the upper part and flip the board

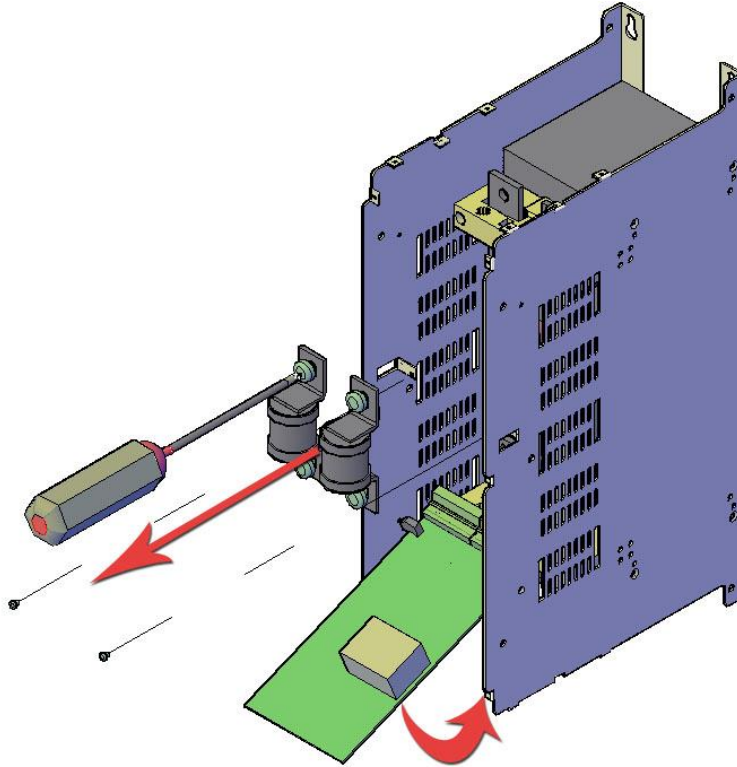


<b>JP4</b>	
	BF4 Open
	BF8 A-B
	BF16 B-C

## 13 Internal Fuse

The thyristor unit have internal fuse extrarapid at low  $I^2t$  for the thyristor protection of against the short-circuits.

The Fuses must have  $I^2t$  20% less than thyristor's  $I^2t$ . The warranty of thyristor is null if no proper fuses are used.



Remove cover, if necessary remove connector from board and upper screw and rotate board, remove screw and fuse.

Size	200 kARMS Symmetrical A.I.C.				Qty
	Fuse CODE	Current (A RMS)	$I^2T$ ( $A^2sec$ )	Vac	
150A	20 282 20.250	250	35200	660	3
300A	2x20 559 02.250	2x250	140800	660	3
550A	2xFU450FMM	2x450	378000	660	3
800A	2xFU550FMM	2x550	860000	660	3



**Caution:** High speed fuses are used only for the thyristor protection and can not be used to protect the installation.



**Caution:** The warranty of thyristor is null if no proper fuses are used. See tab.



**Warning:** When it is supply, the Thyristor unit is subject to dangerous voltage, don't open the Fuse-holder module and don't touch the electric equipments.

## 14 Maintenance

In order to have a corrected cooling, the user must clean the heat-sink and the protective grill of the fans. The frequency of this servicing depends on environmental pollution.

Also check periodically if the screw for the power cables and safety earth are tightened correctly (See Connection Diagram)

### 14.1 Trouble Shooting

Small problems sometimes can be solved locally with the help of the below tab of trouble shooting. If you don't succeed, contact us or your nearest distributor.

Symptom	Indication on front unit	Possible reasons of the symptom	Actions
Load current doesn't flow	Green LED (ON) light OFF	<ul style="list-style-type: none"> <li>No Auxiliary Voltage</li> <li>No input signal</li> <li>Reversed polarities of input signal</li> </ul>	<ul style="list-style-type: none"> <li>Give auxiliary voltage supply (See Connection Diagram)</li> <li>Provide to give input signal</li> <li>Reverse the input signal polarity</li> </ul>
	Green LED (ON) light ON	<ul style="list-style-type: none"> <li>Fuse failure</li> <li>Load connection interruption</li> <li>Load failure: The yellow led (HB) is light on (with HB option)</li> <li>Thyristor fault: The red led (SC) is light on (with HB option)</li> </ul>	<ul style="list-style-type: none"> <li>Change the fuse</li> <li>Check the wiring</li> <li>Check the load</li> <li>Change the thyristor module</li> </ul>
Load current flow also without input signal	Red LED (SC) light on	<ul style="list-style-type: none"> <li>Wrong wiring</li> <li>SCR short circuit</li> </ul>	<ul style="list-style-type: none"> <li>Check the wiring</li> <li>Change the thyristor module</li> </ul>
Current flows at nominal value but Yellow LED (HB/SC) is light on	Yellow LED (HB) light on or Red LED (SC) light on	<ul style="list-style-type: none"> <li>HB circuit not tuned</li> <li>Current transformers not properly wired</li> </ul>	<ul style="list-style-type: none"> <li>Make HB calibration procedure</li> <li>Check current transformers wiring</li> </ul>
Thyristor unit doesn't work properly		<ul style="list-style-type: none"> <li>Auxiliary voltage supply out of limits</li> <li>Wrong input signal selection.</li> <li>Wrong input signal calibration (out of range)</li> </ul>	<ul style="list-style-type: none"> <li>Verify the auxiliary voltage supply</li> <li>Control input signal setting.</li> <li>Check input setting</li> </ul>

### 14.2 Warranty condition

Producer gives a 12 months warranty to its products.  
 The warranty is limited to repairing and parts substitution in our factory and does exclude products not properly used and fuses.  
 Warranty does not include products with serial numbers deleted. The faulty product should be shipped to Producer at customer's cost and our Service will evaluate if product is under warranty terms.  
 Substituted parts remain of Producer property.



