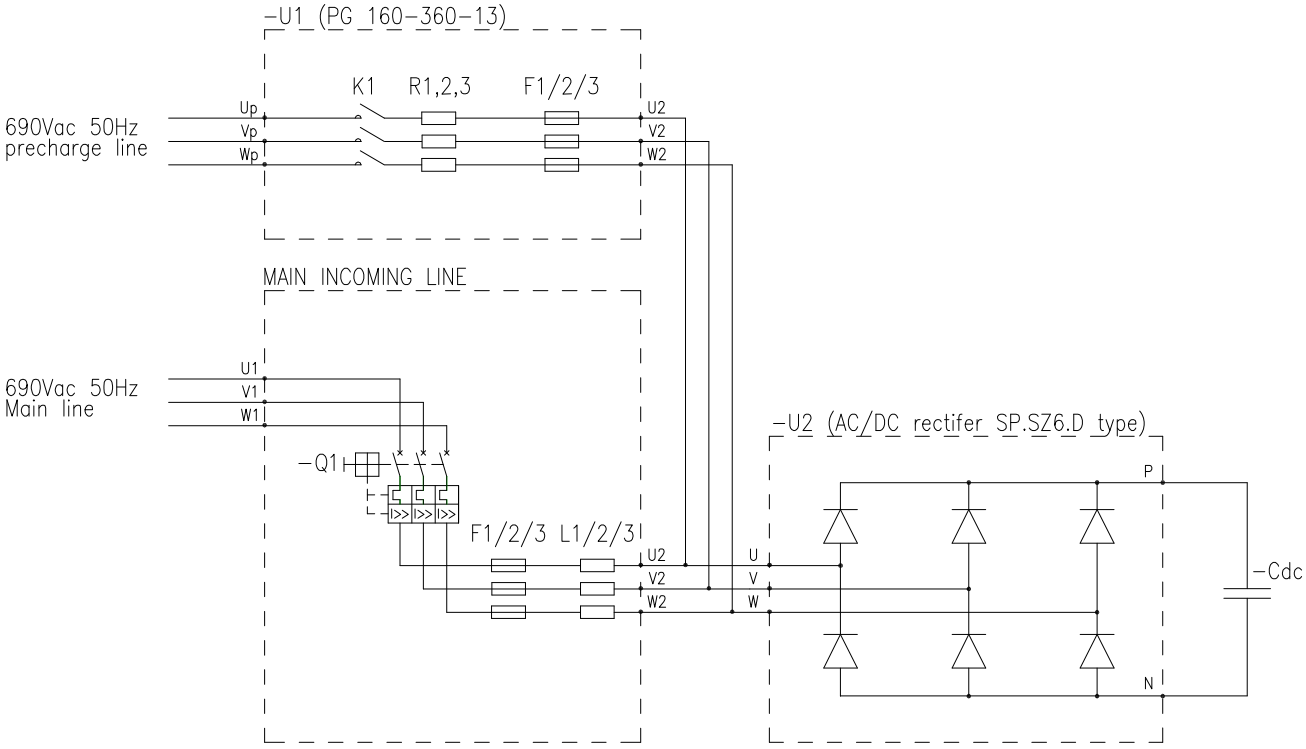
PRODUCT DESCRIPTION

The AC/DC three phase rectifier unit is a power device for convert the three phase ac input voltage in a continuous rectifier output voltage with a three phase bridge diode rectifier. Using the external precharge DC link unit is possible to charge the capacitor present in the DC link inside the inverter, with a precharge time depending on the total amount of capacitor present in the DC link.
A typical connection of the AC/DC three phase rectifier unit is showed below:



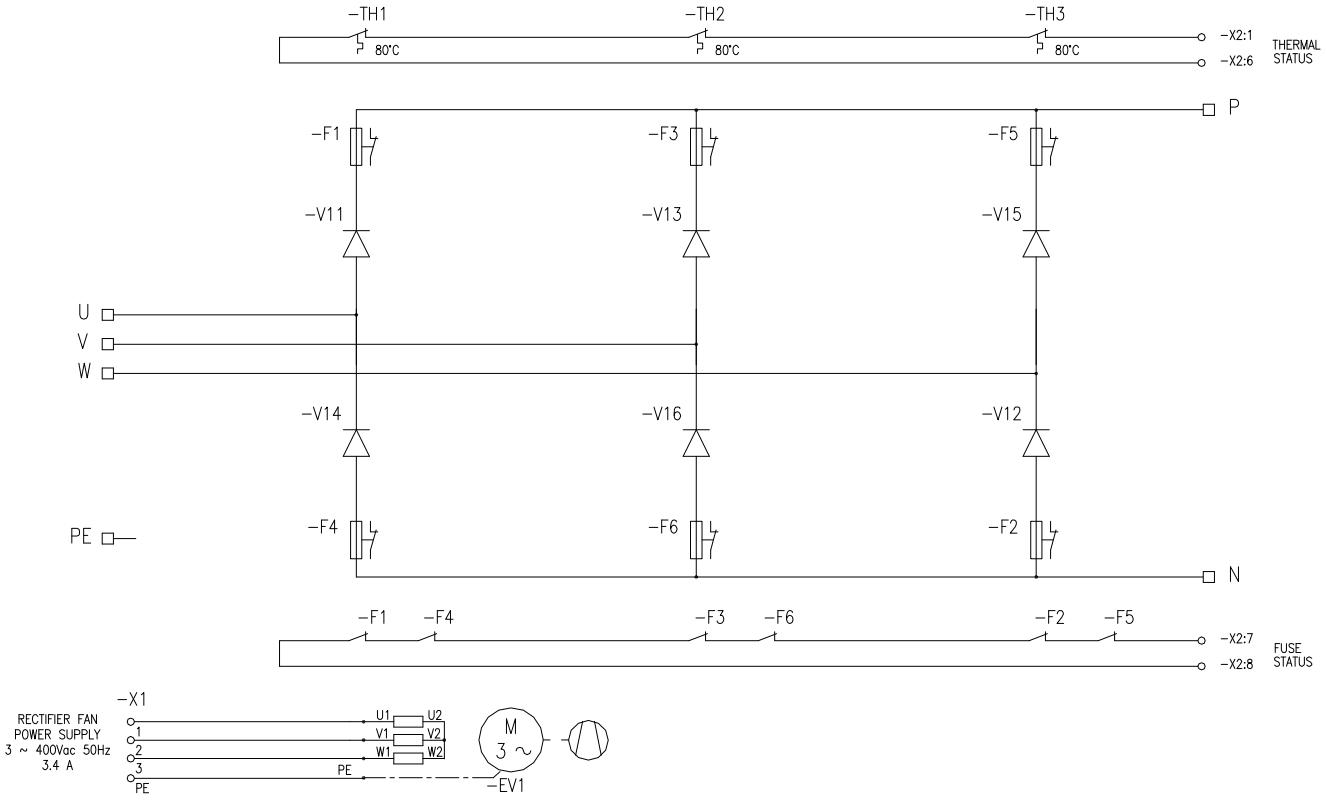
AC/DC bridge rectifier connection

The input ac bar U, V, W of the AC/DC converter are connected to the output of precharge unit (for example PG unit), as is possible to see in the previous figure, at the same bars are also connected the main incoming line voltage.
For precharge the DC link capacitor is necessary to close the precharge contactor and when the DC link voltage is greater than the 80% of final DC voltage, the main circuit breaker Q1 will be closed, in this way the precharge unit is bypassed and will be possible to open the precharge contactor.

In the figure below is possible to see the internal connection of the power module: the power diode are series connected with a fast aR fuse for protect them from the shortcircuit at the dc link side. Each power diode is mounted on a heatsink with a thermal contact, in this way all the thermal contact are series connected and a thermal contact status is available at a X2:1-6 terminal strip output.
Using the thermal contact is possible to protect the semiconductors from an over temperature condition, when this output contact will be open, is necessary to open the main circuit breaker and the precharge contactor too.

Each fast fuse is mounted with a contact status, all the fuse status are series connected and a fuse status is available at a X2:7-8 terminal strip output. When a fuse is broken the fuse output contact will be open and is necessary to open the main circuit breaker and the precharge contactor too.

The cooling of the power diodes is performed with an internal three phase 400Vac fan with a nominal current of 3.4 A, for protect the internal fan is necessary to use a three pole circuit breaker protection like, for example, the model 3RV2011-1EA10 of SIEMENS company (adjustment range 2.8..4 A) or model MS132-4 of ABB company (adjustment range 2.5..4 A).



AC/DC bridge rectifier internal connection

TECHNICAL FEATURES

The following technical features are valid for AC/DC three phase diode bridge rectifier

MODEL	I_{N_DC} A	I_{H_DC} A	Max Ac voltage	V_{RRM} Diode	Fuse Type	Fuse Amp Volt	Dimension (WxDxH) mm
SP.SZ6.D.3000.A.V25	3000	2300	830	2500	2 x 170M6348	2x1000 1000	322 x 650 x 1650
SP.SZ6.D.3500.A.V25	3500	2600	830	2500	2 x 170M8612	2x1250 1000	322 x 650 x 1650
SP.SZ6.D.4000.A.V25	4000	3100	830	2500	2 x 170M8613	2x1400 1000	322 x 650 x 1650
SP.SZ6.D.4500.A.V25	5000	3900	830	2500	4 x 170M6346	4 x800 1000	322 x 650 x 1650

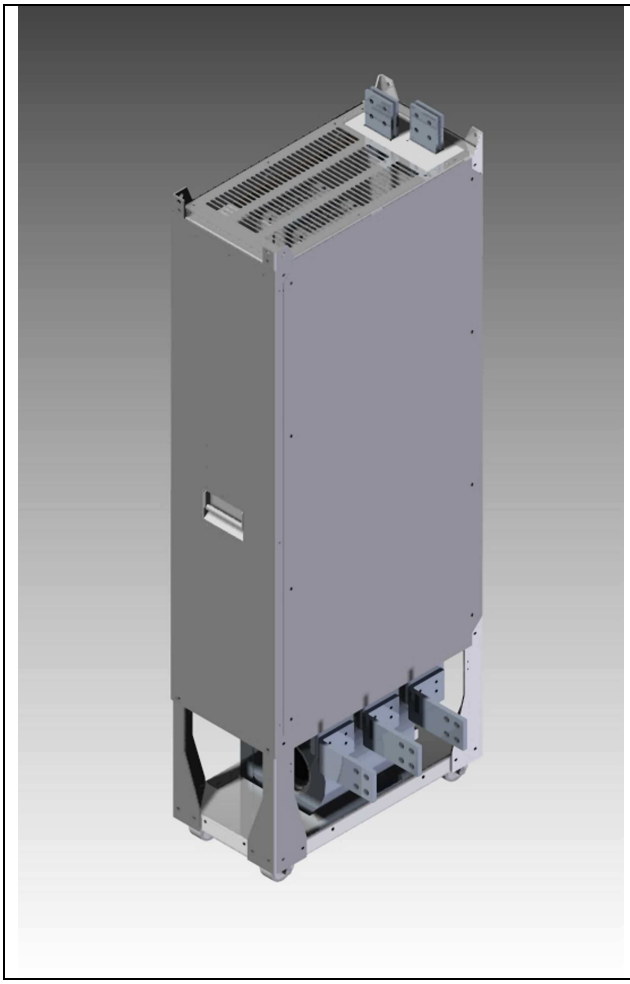
The maximum AC input voltage is equal to 830 Vac (720Vac + 15%),

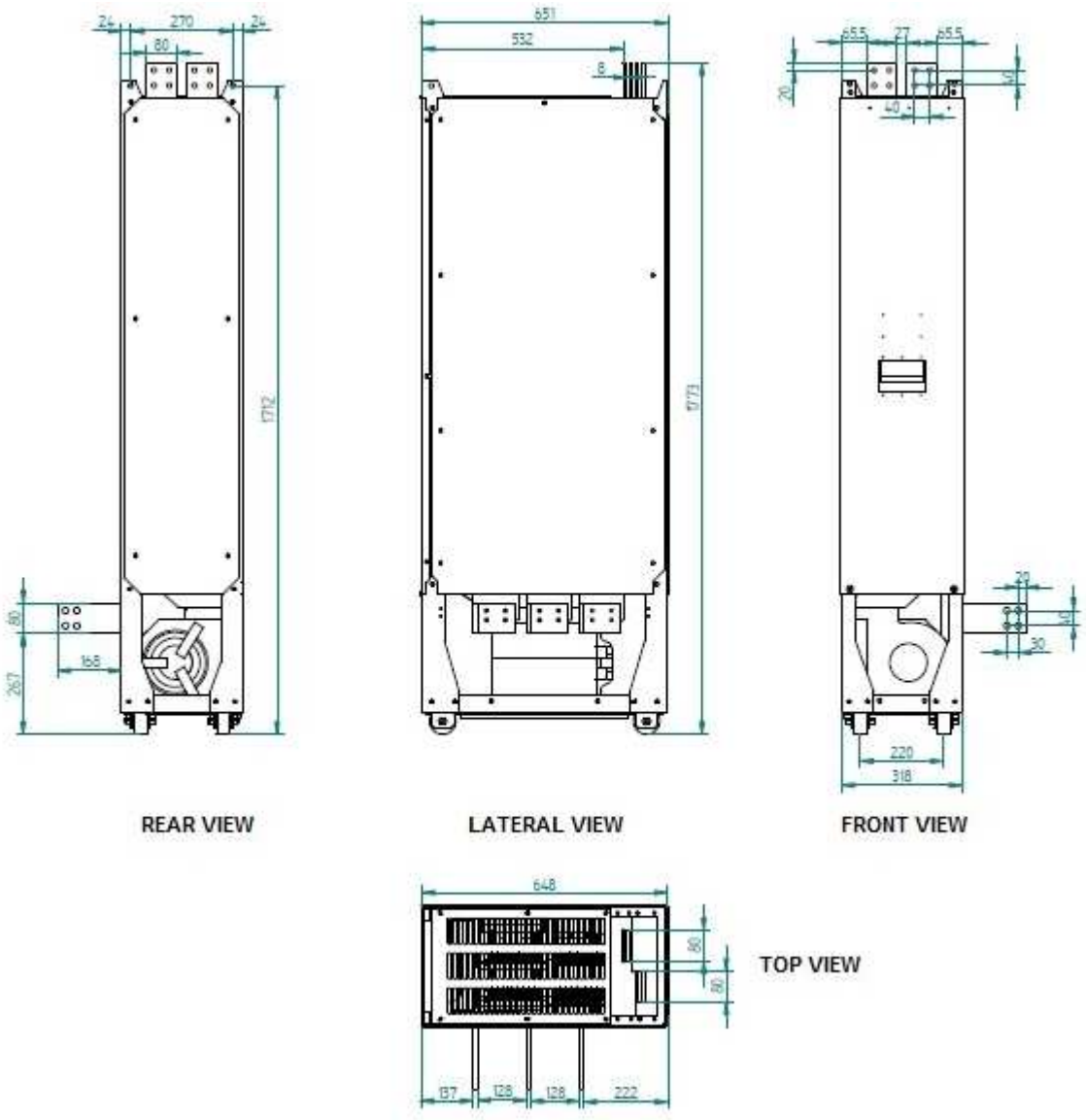
The dimensions of each AC/DC three phase bridge diode rectifier unit model are listed below:
Width: 322 mm, height: 1650mm, depth: 650 mm. The weight is about 180 Kg, the degree of protection is IP00.

The value of current indicated in the previous table are valid for continuous duty, without overloads, at ambient temperature of 40℃, at a maximum installation level of 1000 m above the sea level, at a maximum humidity level of 40%, with an air flow without conductive dust. For temperature level greater than 40 ℃ is necessary to reduce the nominal and maximum current of 15 % each 10 ℃. For installation level greater than 1000 m a.s.l. is necessary to reduce the nominal and maximum current of 1.5% every 100m.

The AC/DC converter unit are supplied with:
- thermal switch and fuse micro-switch available at the terminal strip X2,
- Air fan and its terminal strip X1,
- RC snubber across each semiconductor for protection again overvoltage spikes.

Is possible to see the external layout in the figure below, the cooling fan is located in the bottom part of the device, then is possible to see the 6 power diode assembled in the heatsink. In the top part of the device is possible to see the DC output bar, in the bottom part, at the right side is possible to see the 3 ac input bars.





AC/DC power module external dimension

As is possible to see in the previous figure, the AC/DC three phase bridge rectifier unit has to be installed in vertical position, the main ac input bars are positioned in the bottom part, right side, of the device, and the dc output bars are positioned in the top part of the device.