



---

# *SEISMIC Qualification Certificate*

---

**Delivered on:** Friday, 17 April 2015

**References:**

- **VIRLAB** test procedure number **150314E1**, issue 0, dated 14/03/2015: “*STANDARD TEST PROCEDURE FOR THE SEISMIC QUALIFICATION OF A SWITCHGEAR FABRICATED BY BTICINO ACCORDING TO INTERNATIONAL STANDARDS IEC 60068-3-3 AND IEC 60068-2-57*”.
- International standard **IEC60068-2-57/2013**: “*Environmental testing - Part 2-57: Test Ff: Vibration - Time-history method*”.
- International standard **IEC 60068-3-3/1993**: “*Environmental testing – Part 3: Guidance. Seismic tests methods for equipments*”.
- International standard **IEC 60068-2-6/2008**: “*Environmental testing – Part 2: Tests – Fc: Vibration (sinusoidal)*”.
- International standard **IEC 60068-2-47/2005**: “*Environmental testing - Part 2-47: Tests. Mounting of specimens for vibration, impact and similar dynamic tests*”.

**Laboratory Name:** **VIRLAB, S.A.** (accredited by ENAC, Spanish National Accreditation Entity).  
ENAC certificate number 54/LE131.

**Laboratory Address:** Polígono Industrial de Asteasu, Zona B - 44  
Apartado 247  
20159 ASTEAU (SPAIN)

**Equipment tested:** A “**XL<sup>3</sup> 6300 Assembly**”, manufactured by **BTICINO**, according to drawing number “Arrangement 109-110”, revision 01, dated 18/03/2015, whose main dimensions and weight are,

- Maximum dimensions, 3098 mm (length) x 985.6 mm (depth) x 2232 mm (height).
- Approximate weight, 2000 kg.

Photographs included here below shows the **Switchgear** on the test platform EDB250x250 (2500x2500 mm), before starting the tests in front-to back direction.





**VIRLAB, S.A.** certifies that the referred *Switchgear* has been seismically tested in March, between the 23<sup>th</sup> and the 24<sup>th</sup> 2015, according to test procedure number **150314E1**, Issue 0, of VIRLAB, elaborated in agreement with **IEC 60068-2-57/2000**, **IEC 60068-3-3/1993**, **IEC 60068-2-6/2008** and **IEC 60068-2-47/2005**.

The seismic tests have been carried with the level according to **IEC 60068-2-57: 2000 (ZPA=0.3 g)**, **AG3**, which considers a Zero Period Acceleration of 0.3 g in horizontal direction, reaching maximum spectral accelerations of 0.9 g for 5% damping. 0.15 g in vertical direction (50% of the horizontal component) is to be considered.

The horizontal ZPA level is equivalent to the corresponding to the **AG3** “Ground Acceleration Reference” defined in point 8.2.7 of International standard **IEC 60068-3-3: 1993**, 0.3 g:

$$\text{➤ } a_f = a_g \times K \times D = 0.5 \times 1 \times 1 = \underline{0.3 \text{ g}}, \text{ being}$$

$a_f$  (floor acceleration);

$a_g$  (ground acceleration) = 0.3 g (Table 3 of EN 60068-3-3: 1993);

$K$  (amplification factor) = 1 (Table 4 of EN 60068-3-3: 1993);

$D$  (direction factor) = 1 (Table 5 of EN 60068-3-3: 1993).

The vertical ZPA level is equivalent the corresponding to the **AG3** “Ground Acceleration Reference” defined in point 8.2.7 of International standard **IEC 60068-3-3: 1993**, 0.15 g:

$$\text{➤ } a_f = a_g \times K \times D = 0.3 \times 1 \times 0.5 = \underline{0.15 \text{ g}}, \text{ being}$$

$a_f$  (floor acceleration);

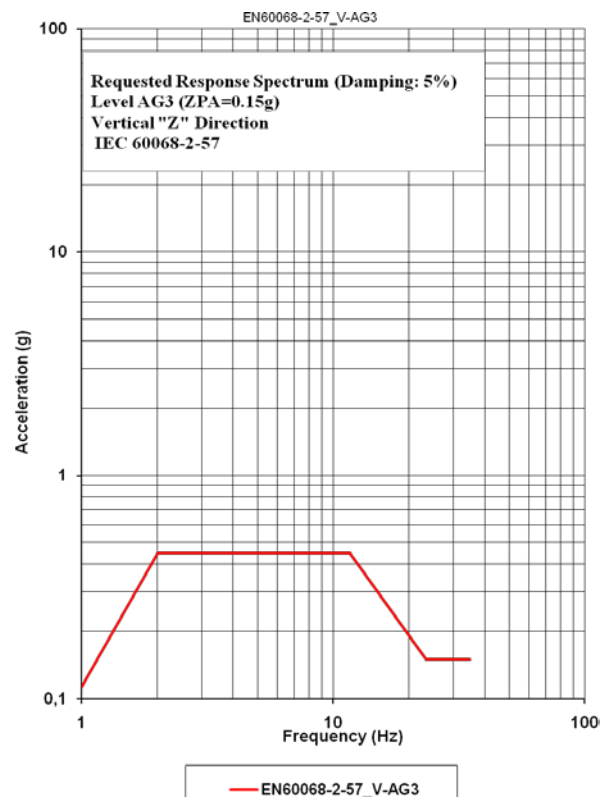
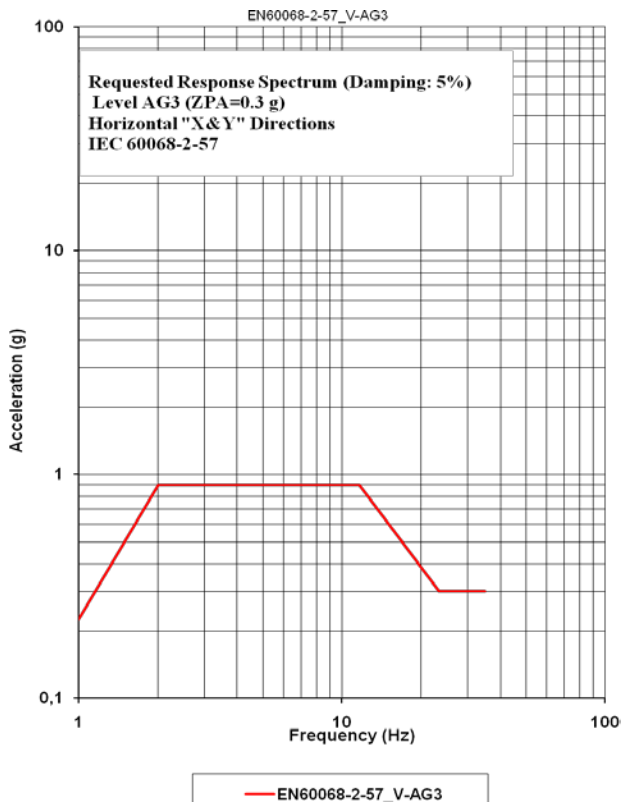
$a_g$  (ground acceleration) = 0.3 g (Table 3 of EN 60068-3-3: 1993);

$K$  (amplification factor) = 1 (Table 4 of EN 60068-3-3: 1993);

$D$  (direction factor) = 0.5 (Table 5 of EN 60068-3-3: 1993).

The applied level is defined by the Required Response Spectra included here below, drawn for the 5% damping:





This **Switchgear** has been submitted to one (1) AG3 level test (previously, one AG2 (ZPA=0.2 g) has been applied), carried out in the two main horizontal directions, *front-to-back* and *side-to-side* with regard to the **Unit**, simultaneously with the *vertical* direction.

The continuity of the main contacts of the switches of the **Switchgear** has been monitored during the tests.

The **Switchgear** has successfully passed the Seismic Qualification Tests to which it has been subjected, without any anomaly or structural deterioration having been detected.

On the other hand, resonance search tests have been performed before and after the seismic test, in the three mains directions of the **Switchgear**.

In test report number **152172** of **VIRLAB, S.A.**, will be included all the information obtained, with tables, photographs and so on.

VIRLAB representative

**Mr. DENIS AGOTE**  
Engineer of Laboratory

