Three Phase UPS, Galaxy VL, 200-500 kW Energized

The Schneider Electric equipment referenced in this certificate has been qualified to the requirements of the listed regional building codes and/or seismic design standards shown in EDS table (equipment demand spectra). This certification is based on tri-axial shake-table test results conducted in accordance with globally recognized equipment test protocols. Assessment of earthquake demands and equipment seismic capacity follows the guidelines contained in ISO 3010 and ISO 13033 respectively. Earthquake demand at location of equipment installation must be less than equipment capacity shown in ECS table to validate seismic conformance.[1]

Product Category: UPS and Inverter System
Product Model: Galaxy VL 200-500 kW Energized
Product Type: Three Phase UPS
Product Mounting: Rigid Floor Mount

EDS Summary Table of Assumed Maximum Demands for Regional Building Codes and Seismic Standards[2]

Country / Region[1]	Code ID	Exceedance Probability	Hazard Level Ground	EDS Horz A_{FLX-H} Ground	EDS Horz A_{RIG-H} Ground	Hazard Level Roof	EDS Horz A_{FLX-H} Roof	EDS Horz A_{RIG-H} Roof
Argentina	INPRES-CIRSOC103	10% in 50 yrs	Zone 4	1.05	0.35	Zone 4	1.89	1.05
Australia	AS 1170.4-2007	10% in 50 yrs	Z = 0.22	0.81	0.29	Z = 0.22	1.46	0.86
Canada*	2015 NBCC	2% in 50 yrs	$S_a = 1.98$	1.98	0.80	$S_a = 1.45$	2.31	1.74
Chile	NCh 433.Of1996	10% in 50 yrs	Zone 3	1.61	0.52	Zone 2	2.17	1.17
China	GB 50011-2010 (2016)	2% in 50 yrs	$\alpha_{Max} = 1.4$	1.40	0.63	$\alpha_{Max} = 0.9$	1.62	1.22
Europe	Eurocode 8 EN1998-1	10% in 50 yrs	$a_{gR} = 0.4$	1.80	0.72	$a_{gR} = 0.27$	2.19	1.46
India	IS 1893 (Part 1) : 2016	10% in 50 yrs	Z = 0.36	0.90	0.36	Z = 0.36	1.62	1.08
Japan	Building Standard Law	10% in 50 yrs	Zone A	1.22	0.49	Zone A	2.20	1.47
New Zealand	NZS 1170.5:2004+A1	10% in 50 yrs	Z = 0.54	1.62	0.72	Z = 0.37	2.00	1.48
Peru	N.T.E. - E.030	10% in 50 yrs	Zone 4	1.24	0.50	Zone 4	2.23	1.49
Russia	SNIP II-7-81 (SP 14.13330.2014)	10% in 50 yrs	MSK 9	1.02	0.41	MSK 9	1.84	1.22
Taiwan	CPA 2011 Seismic Design Code	10% in 50 yrs	$S_S^D = 0.8$	1.20	0.48	$S_S^D = 0.8$	2.16	1.44
U.S.A.*	IBC 2018 / ASCE 7-16	10% in 50 yrs	$S_{DS} = 1.98$	1.98	0.79	$S_{DS} = 1.45$	2.31	1.73

*EDS defined at frequency points $f_1 = 0.1$ Hz, $f_2 = 1.3$ Hz, $f_3 = 8.3$ Hz, $f_4 = 33.3$ Hz with $BA_{FLX} |_{MAX} = 1.6$ in accordance with AC156 test protocol

ECS Summary Table (Equipment Capacity Spectra) of Tested Product Capacity[3]

Equipment Product Line		ECS Horz A_{FLX-H} Ground	ECS Horz A_{RIG-H} Ground		ECS Horz A_{FLX-H} Roof	ECS Horz A_{RIG-H} Roof
Three Phase UPS, Galaxy VL, 200-500 kW Energized	ECS	1.88	0.73	ECS	2.33	1.51
	ECS*	1.98	0.80	ECS*	2.31	1.74

*ECS defined at frequency points $f_1 = 0.1$ Hz, $f_2 = 1.3$ Hz, $f_3 = 8.3$ Hz, $f_4 = 33.3$ Hz with $BA_{FLX} |_{MAX} = 1.6$ in accordance with AC156 test protocol

Equipment Importance Factor[4]: $I_e > 1.0$ for designated seismic systems in essential building applications.
Installation Restrictions[5]: Equipment ECS must exceed EDS at install location to validate certification.

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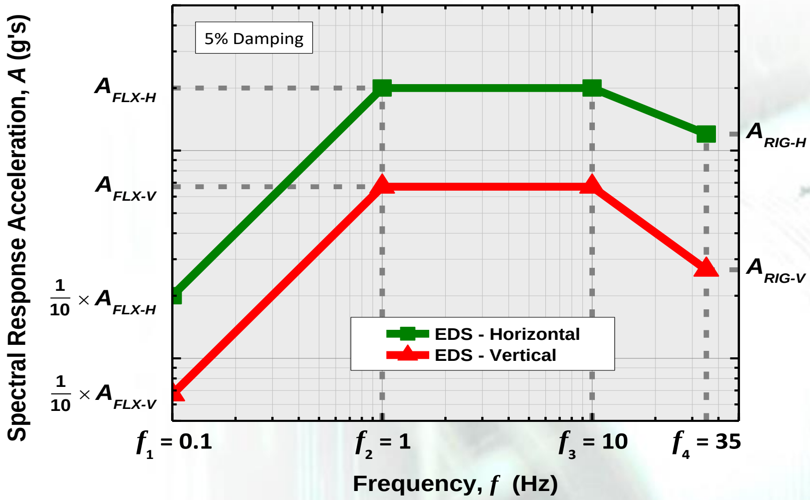
Regional Codes and Standards EDS Shape Profiles



$$A_{FLX-H} = BDS_{PEAK\ G}\left(BA_{FLX}\right)$$

$$BA_{FLX} = \left(1+2\frac{z}{h}\right) \rightarrow \begin{array}{l} BA_{FLX}\big|_{MAX} = 1.8 \text{ or} \\ BA_{FLX}\big|_{MAX} = 1.6 \end{array}$$

$$A_{RIG-H} = PGA_{MAX}\left(BA_{RIG}\right)$$

$$BA_{RIG} = \left(1+2\frac{z}{h}\right)$$

$$A_{FLX-V} = \frac{2}{3}\left(BDS_{PEAK\ G}\right)$$

$$A_{RIG-V} = \frac{2}{3}\left(PGA_{MAX}\right)$$

Horizontal EDS Shape Rules

A_{FLX-H} = Peak response acceleration ($BDS_{PEAK\ G}$), taken from a given country/region building design spectrum for all code prescribed soil type classifications using assumed maximum hazard level, multiplied by a building amplification factor (BA_{FLX}) to account for amplified response of equipment installations located above grade elevation. The BA_{FLX} factor is a function of the z/h height ratio where z is the height in structure at equipment location and h is average roof height of structure relative to grade elevation. The z/h height ratio ranges from zero at ground to one at roof elevation. The BA_{FLX} factor is limited to a maximum value of either 1.6x or 1.8x depending on the code. The BA_{FLX} limit factor accounts for building structure inelastic response reductions during strong ground shaking events over the amplified portion of the EDS from f_2 to f_3 frequency points. Building design spectrum parameters not related to ground motion intensity are set to unity.

A_{RIG-H} = Maximum response acceleration at zero period (T = 0), taken from a given country/region building design spectrum for all code prescribed soil type classifications using assumed maximum hazard level. This acceleration is the peak ground acceleration (PGA_{MAX}). The PGA_{MAX} is multiplied by a building amplification factor (BA_{RIG}) to account for amplified response of equipment installations located above grade elevation. The BA_{RIG} factor is a function of the z/h height ratio and corresponds with an amplified PGA_{MAX} during strong ground shaking events at the ZPA (zero period acceleration) portion of the EDS at f_4 frequency point. Building design spectrum parameters not related to ground motion intensity are set to unity.

Vertical EDS Shape Rules

A_{FLX-V} = A two-thirds ratio of the peak response acceleration ($BDS_{PEAK\ G}$), taken from a given country/region building design spectrum for all code prescribed soil type classifications using assumed maximum hazard level. The two-thirds ratio of $BDS_{PEAK\ G}$ is constant for all equipment locations and is not a function of the z/h height ratio and corresponds with the amplified portion of EDS from f_2 to f_3 frequency points. Building design spectrum parameters not related to ground motion intensity are set to unity.

A_{RIG-V} = A two-thirds ratio of the maximum response acceleration at zero period (T = 0), taken from a given country/region building design spectrum for all soil type classifications using assumed maximum hazard level. The two-thirds ratio of PGA_{MAX} is constant for all equipment locations and is not a function of the z/h height ratio and corresponds with the ZPA (zero period acceleration) portion of the EDS at f_4 frequency point. Building design spectrum parameters not related to ground motion intensity are set to unity.

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Regional Codes and Standards Compliance Notes

1. Equipment location is defined as the final geographic location of equipment installation. Earthquake demands are prescribed based on install location using code specified hazard maps and site geotechnical classification. The EDS table (equipment demand spectra) presents assumed maximum hazard demands for the given regional code or standard and may not be absolute code maximums. Assumed maximum demands represent a practical limit for building construction. It is the responsibility of the building design professional or engineer of record (EOR) to ensure the earthquake demand at equipment install location, as prescribed by code hazard maps and site classification, is less than the equipment tested seismic capacity as shown in ECS table.
2. The referenced regional building codes and standards specify seismic demand requirements in terms of ground-level site hazard response spectra used for seismic design. Site hazard spectra are generally defined in terms of three constructs: (1) location dependent ground spectral acceleration shape profile which varies with geographic location and is determined by response spectrum shape factors or formulas, which are adjusted for geotechnical site soil classification, (2) site class correction parameters that are dependent on the soil/rock classification at building construction site with the maximum values assumed herein, and (3) factors related to earthquake return rate to convert maximum considered to design level earthquake assuming the identified probability of exceedance. Factors not related to seismic ground motion intensity are set to unity. Equipment demand spectra (EDS) are defined as the peak responses from the site hazard spectra multiplied by a building amplification factor, (1 + 2 z/h), to account for dynamic amplification effects for equipment installations above grade elevation (see pg. 2). The identified EDS peak response magnitudes at ground and roof height elevations are assumed maximum demands for the listed region. Assumed maximum demands represent a practical limit for building construction. The equipment install location for this certification may be at a location that exceeds the assumed maximum hazard levels.
3. Equipment capacity is established with tri-axial seismic shake-table test results in accordance with the International Code Council (ICC) Acceptance Criteria for Seismic Certification by Shake-Table Testing of Nonstructural Components (AC156, dated September 2019). The equipment demand spectra (EDS) shape profiles are defined as broadband spectra with energy content from f_1 to f_4 Hz, adjusted for building amplification effects, and is the test input for nonstructural equipment qualification. To meet the EDS, the corresponding shake-table drive signals are nonstationary, multi-frequency random excitations. Equipment capacity spectra (ECS) are derived from shake-table test data results for horizontal and vertical input motions. It is the responsibility of the EOR to validate the tested equipment capacity exceeds the seismic demand at equipment install location.
4. An equipment importance factor, I_e, that is greater than one (I_e > 1.0) is assumed and indicates that equipment functionality is required after a seismic event and after seismic simulation testing. This importance factor is applicable for designated seismic systems (i.e., essential equipment applications) within critical facilities where post-earthquake equipment functionality is a priority.
5. Seismic certification of nonstructural components and equipment by Schneider Electric is just one link in the total chain of responsibility required to maximize the probability that the equipment will be intact and functional after a seismic event. During a seismic event the equipment must be able to transfer the inertial loads that are created and reacted through the equipment's force resisting system and anchorage to the load-bearing path of the building structural system. Anchorage of equipment (i.e., nonstructural supports and attachments) to the primary building structure is required to validate this seismic certification. The structural engineer or design engineer of record (EOR) is responsible for detailing the equipment anchorage requirements for the given installation. The installer and manufacturers of the anchorage system are responsible for assuring the mounting requirements are met. Schneider Electric is not responsible for the specification and performance of anchorage systems.

Issue Date: 2/19/2021

SKU No.'s: Standalone: GVL200K500DS, GVL300K500DS, GVL400K500DS, GVL500KDS
GVLMBCA200K500G bayed with GVL200K500DS or GVL300K500DS or GVL400K500DS or GVL500KDS
GVLMBCA200K500H bayed with GVL200K500DS or GVL300K500DS or GVL400K500DS or GVL500KDS
GVBEC bayed with GVL200K500DS or GVL300K500DS or GVL400K500DS or GVL500KDS

This is a generalized, multi-code certificate and not specific to a regional code's seismic demand requirement. If code and site-specific certificates are required, contact your local Schneider Electric representative with code details and equipment location to request code/site-specific certificates.

Authorization Signature

Name:

Position:

Signature: