THE VMC GROUP
The Power of Together™

SIEMENS

CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certification No.

VMA-48153-01C (REVISION 0)

Expiration Date: 04/30/2016

Certification Parameters:

The nonstructural products (mechanical and/or electrical components) listed on this certificate are CERTIFIED[1] FOR SEISMIC APPLICATIONS in accordance with the following building code[2] releases.

IBC 2000, IBC 2003, IBC 2006, IBC 2009, IBC 2012

The following model designations, options, and accessories are included in this certification. Reference report number **VMA-48153-01** as issued by The VMC Group for a complete list of certified models, included accessories/options, and certified installation methods.

Siemens Gen-II Robicon W-Series and Sinamics G120E Variable Frequency Drives

The above referenced equipment is **APPROVED** for seismic application when properly installed,[3] used as intended, and contains a Seismic Certification Label referencing this Certificate of Compliance[4]. As limited by the tabulated values, below grade, grade, and roof-level installations, installations in essential facilities, for life safety applications, and/or of equipment containing hazardous contents are permitted and included in this certification with an Equipment Importance Factor assigned as I_P=1.5.

Certified Seismic Design Levels	
S_{DS} <= 2.11 g	S_{DS} <= 1.32 g
z/h <= 0.0 (Equipment at Grade)	z/h <= 1.0 (Equipment on Roof)
Soil Classes A, B, C, D, Seismic Risk Category I, II, III, IV, and Seismic Design Categories A, B, C, D, E, and F are all covered under this certification, limited by the S_{DS} value stated above.	

Certified Seismic Installation Methods	
Directly to non-structural wall	Directly to rigid wall
External isolation to rigid wall	External isolation to non-structural wall
Rigid mounting from unit base to rigid structure	

Shake Test of Active and Energized Components, Non-Active Components, and Equipment Structure:

Qualified by successful seismic shake table testing at the nationally recognized University of California Berkeley Pacific Earthquake Engineering Research Center under the witness of the Certified Seismic Qualification Agency, The VMC Group. Testing was conducted in accordance with ICC-ES AC-156 to envelope the required response spectrum (RRS) of maximum horizontal flexible acceleration (A_{FLEX}) of 2.11 g and a rigid acceleration (A_{RIG}) of 1.58 g. This test level corresponds to an S_{DS} = 2.11 g with a z/h of 0.0. Functionality was verified before and after the shake test.

Basis of Design for Supports and Attachments to the Building:

For calculations and analysis of the equipment attachment to the building structure, the equivalent static force method was employed using the Seismic Design Acceleration, F_P/W_P,[5] for Load Resistance Factored Design (LRFD) methods. This includes but is not limited to the unit anchoring requirements and external isolation calculations.

Seismic Design Acceleration Equation, $F_P/W_P = 0.4 \times (S_{DS}=1.32\ g) \times (I_P=1.5) \times (a_P/R_P=2.5/2.0) \times (1 + 2(z/h=1.0) = 2.97\ g$

a_P/R_P is representative of the worst-case shake tested condition, as determined from Table 13.6-1 in ASCE/SEI7-05/10.

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Certified Product Table:

Drive Type	Catalog or Model No. (See Notes 1, 2 & 3)	Frame Type	HP	Enclosure NEMA Rating	Input Voltage (V) (See Note 4)	Output Rating (A)	Nominal Cabinet Dimensions (inches) (WxDxH)	Max. Cabinet Weight (lbs)
ROBICON W120/SINAMICS G120E	6SL3710-1BJ12-2AR 6SL3710-1BJ12-2AU	A3	1	1 or 12	460 to 480	2.2	20 x 16 x 48	230
	6SL3710-1BJ13-1AR 6SL3710-1BJ13-1AU	A4	1.5	1 or 12	460 to 480	3.1	20 x 16 x 48	230
	6SL3710-1BJ14-1AR 6SL3710-1BJ-14-1AU	A5	2	1 or 12	460 to 480	4.1	20 x 16 x 48	230
	6SL3710-1BJ16-0AR 6SL3710-1BJ16-0AU	B1	3	1 or 12	460 to 480	5.9	20 x 16 x 48	230
	6SL3710-1BJ17-7AR 6SL3710-1BJ17-7AU	B2	4	1 or 12	460 to 480	7.7	20 x 16 x 48	230
	6SL3710-1BJ21-0AR 6SL3710-1BJ21-0AU	B3	5	1 or 12	460 to 480	10.2	20 x 16 x 48	230
	6SL3710-1BJ21-8AR 6SL3710-1BJ21-8AU	C1	10	1 or 12	460 to 480	16	20 x 16 x 48	230
	6SL3710-1BJ22-5AR 6SL3710-1BJ22-5AU	C2	15	1 or 12	460 to 480	22	20 x 16 x 48	230
	6SL3710-1BJ23-2AR 6SL3710-1BJ23-2AU	C3	20	1 or 12	460 to 480	27	20 x 16 x 48	230
	6SL3710-1BJ23-8AR 6SL3710-xBJ23-8AU	D1	25	1 or 12	460 to 480	34	26 x 20 x 60	330
	6SL3710-1BJ24-5AR 6SL3710-XBJ24-5AU	D2	30	1 or 12	460 to 480	41	26 x 20 x 60	330
	6SL3710-1BJ26-0AR 6SL3710-xBJ26-0AU	D3	40	1 or 12	460 to 480	54	26 x 20 x 60	330
	6SL3710-1BJ27-5AR 6SL3710-xBJ27-5AU	E1	50	1 or 12	460 to 480	68	26 x 20 x 60	330
	6SL3710-1BJ29-0AR 6SL3710-xBJ29-0AU	E2	60	1 or 12	460 to 480	80	26 x 20 x 60	330
	6SL3710-1BJ31-1AR 6SL3710-xBJ31-1AU	F1	75	1 or 12	460 to 480	100	30 x 24 x 94	720
	6SL3710-1BJ31-5AR 6SL3710-xBJ31-5AU	F2	100	1 or 12	460 to 480	130	30 x 24 x 94	720
	6SL3710-1BJ31-8AR 6SL3710-xBJ31-8AU	F3	125	1 or 12	460 to 480	160	30 x 24 x 94	720
	6SL3710-1BJ32-0AR 6SL3710-xBJ32-0AU	F+1	150	1 or 12	460 to 480	186	30 x 24 x 94	720
	6SL3710-1BJ32-5AR 6SL3710-xBJ32-5AU	F+2	200	1 or 12	460 to 480	240	30 x 24 x 94	720

Notes:

1. Where “x” in the catalog number may be replaced by “1” for power module PM240 or “5” for power module PM250.
2. The suffix “.” In the catalog number may be replaced by any number based on the firmware version
3. Where “y” in the catalog number may be replaced by “R” or “U”
4. Optional 380 to 480 V input
5. More than one optional cabinet may be attached to main drive cabinet and installed as specified in this document.
6. Matrix continued on the following page

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Drive Type	Catalog or Model No. (See Notes 1, 2 & 3)	Frame Type	HP	Enclosure NEMA Rating	Input Voltage (V) (See Note 4)	Output Rating (A)	Nominal Cabinet Dimensions (inches) (WxDxH)	Max. Cabinet Weight (lbs)
ROBICON W120CP / SINAMICS G120E	6SL3710-3BJ27-5Ay	E1	50	1 or 12	460 to 480	68	30 x 24 x 94	930
	6SL3710-3BJ29-0Ay	E2	60	1 or 12	460 to 480	80	30 x 24 x 94	930
	6SL3710-3BJ31-1Ay	F1	75	1 or 12	460 to 480	100	30 x 24 x 94	1120
	6SL3710-3BJ31-5Ay	F2	100	1 or 12	460 to 480	130	30 x 24 x 94	1160
	6SL3710-3BJ31-8Ay	F3	125	1 or 12	460 to 480	160	30 x 24 x 94	1260
	6SL3710-3BJ32-0Ay	F+1	150	1 or 12	460 to 480	186	30 x 24 x 94	1460
	6SL3710-3BJ32-5Ay	F+2	200	1 or 12	460 to 480	240	30 x 24 x 94	1660
Robicon W150CP	6SL3710-3GJ33-1AS	G1	250	1 or 12	460 to 480	310	54 x 28 x 100	2420
	6SL3710-3GJ33-8AS	G2	300	1 or 12	460 to 480	380	54 x 28 x 100	2520
	6SL3710-3GJ35-0AS	G3	400	1 or 12	460 to 480	490	54 x 28 x 100	2880
	6SL3710-3GJ36-1AS	H1	500	1 or 12	460 to 480	605	68 x 32 x 100	3270
	6SL3710-3GL37-5AS	H2	600	1 or 12	460 to 480	745	68 x 32 x 100	3960
	6SL3710-3GJ38-4AS	H3	700	1 or 12	460 to 480	840	100 x 32 x 104	6170
	6SL3710-3GJ41-0AS	J1	800	1 or 12	460 to 480	985	100 x 32 x 104	6600

Notes:

1. Where “x” in the catalog number may be replaced by “1” for power module PM240 or “5” for power module PM250.
2. The suffix “.” In the catalog number may be replaced by any number based on the firmware version
3. Where “y” in the catalog number may be replaced by “R” or “U”
4. Optional 380 to 480 V input
5. More than one optional cabinet may be attached to main drive cabinet and installed as specified in this document.

This certification **includes** the product and factory supplied accessories and options. The product and included accessories and options shall be a catalogue design and factory supplied. The product must be installed and attached to the building structure per the manufacturer supplied seismic installation instructions. This certification **excludes** all non-factory supplied accessories, including but not limited to enclosures, isolation/restraint devices, remote control panels, mounting brackets and other electrical/mechanical components.

IBC CERTIFIED THE VMC GROUP

Issue Date: April 30, 2013
Expiration Date: Apri 30, 2016

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Notes and Comments:

1. All equipment listed herein successfully passed the seismic acceptance criteria for shake testing non-structural components and systems as set forth in the ICC AC-156. The Test Response Spectrum (TRS) enveloped the Required Response Spectrum (RRS) for all units tested. The units cited in this certification were representative sample(s) of a contingent of models and all remained captive and structurally sound after the seismic shake simulation. The units also remained functionally operational after the simulation testing as functional testing was completed by the equipment manufacturer before and after the seismic simulations. Although a seismic qualified unit inherently contains some wind resisting capacity, that capacity is undetermined and is excluded from this certification. Snow/Ice loads have been neglected and thus limit the unit to be installed both indoors (covered by an independent protective structure) and out of doors (exposed to accumulating snow/ice) for ground snow loads no greater than 30 psf for all applications.

2. The following building codes are addressed under this certification:

   IBC 2012 - referencing ASCE7-10 and ICC AC-156
   IBC 2009 – referencing ASCE7-05 and ICC AC-156
   IBC 2006 – referencing ASCE7-05 and ICC AC-156
   IBC 2003 – referencing ASCE7-02 and ICC AC-156
   IBC 2000 – referencing ASCE7-98 and ICC AC-156

3. Refer to the manufacturer supplied installation drawings for anchor requirements and mounting considerations for seismic applications. Required anchor locations, size, style, and load capacities (tension and shear) are specified on the installation drawings. Mounting requirement details such as anchor brand, type, embedment depth, edge spacing, anchor-to-anchor spacing, concrete strength, special inspection, wall design, and attachment to non-building structures must be outlined and approved by the Engineer of Record for the project or building. Structural walls, structural floors, and housekeeping pads must also be seismically designed and approved by the project or building Structural Engineer of Record to withstand the seismic anchor loads as defined on the installation drawings. The installing contractor is responsible for observing the installation detailed in the seismic installation drawings and the proper installation of all anchors and mounting hardware.

4. For this certificate and certification to remain valid, this certificate must correspond to the “Seismic Certification Label” found affixed to the unit by the factory. The label ensures the manufacturer built the unit in conformance to the IBC seismic design criteria set forth by the Certified Seismic Qualification Agency, The VMC Group, and meets the seismic design levels claimed by this certificate.

5. When the site soil properties or final equipment installation location are not known, the soil site coefficient, F_A, defaults to the Soil Site Class D coefficient. Soil Classes A, B, C, D, Seismic Risk Category I, II, III, IV, and Seismic Design Categories A, B, C, D, E, and F are all covered under this certification, limited by the S_{DS} values on page 1, respective to the applicable building code, Importance factor, and z/h ratio.

6. Mechanical, Electrical, and Plumbing connections to the equipment must be flexibly attached as to not transfer load through the connection. The structural integrity of any conduit, cable trays, piping, ductwork and/or flexible connections is the responsibility of others. This certification does not guarantee the equipment will remain compliant to UL or NEMA standards after a seismic event.

John P. Giuliano, PE
President, The VMC Group

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