CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certification No.

VMA-51398-01C (Revision 00)

Expiration Date: 05/31/2020

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 2015, 2012, 2009, 2006; EC8 2004

The following model designations, options, and accessories are included in this certification. Reference report number **VMA-51398-01** as issued by The VMC Group for a complete list of certified models, included accessories/options, and certified installation methods.

FG Wilson Diesel Generator Sets
P730 – P2500, 730 kVA – 2500 kVA

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. The equipment is qualified by successful seismic shake table testing at the nationally recognized *ENEA Physical Technologies and New Materials Laboratories of the Casaccia Research Center in Rome, Italy* under the witness of the ISO Accredited Product Certification Agency, The VMC Group.

Certified Seismic Design Levels[9]			
Certified **IBC**	**Importance $I_P \le 1.5$** Soil Classes A-E Risk Categories I-IV Design Categories A-F	**$S_{DS} \le 0.682$ g**	**$S_{DS} \le 0.559$ g**
		z/h = 0.0	**z/h ≤ 1.0**
		Horizontal Design[6] $\frac{F_p}{W_p} = 0.4 S_{DS} I_p \frac{a_p}{R_p}\left(1 + 2\frac{z}{h}\right) \le$ **1.477 g**	
Certified **EC8**[5]	**Importance $\gamma_a \le 1.5$** Soil Classes A-E, Type I-II	**$a_g \le 0.169$ g**	**$a_g \le 0.086$ g**
		z/h ≤ 0.0	**z/h ≤ 1.0**
Test Datum **IEC68**	ISO 17025 Laboratory Pre/Post-Shake Functionality Tri-axial, 5% Damping SRS	**$A_{FLEX-H} \le 1.530$ g**	**$A_{FLEX-V} \le 0.765$ g**
		$A_{RIG-H} \le 0.510$ g	**$A_{RIG-V} \le 0.255$ g**
		$ZPA_H \le 0.510$ g	**$ZPA_V \le 0.255$ g**

Certified Seismic Installation Methods	
Rigid mounting from unit base to rigid structure	External isolation mounting from unit base to rigid structure

THE VMC GROUP
The Power of Together™

FG WILSON

CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certified Product Table:

Model	Rating [kVA] (Standby)	Dimensions			Maximum Weight kg (lb)	Certified Seismic Levels		
		Length mm (in)	Width mm (in)	Height mm (in)		IEC68	IBC	
							S_{DS} (g) z/h=0.0	S_{DS} (g) z/h=1.0
P730P1 / P800E1	730-800	4,280 (168.5)	1,912 (75.3)	2,371 (93.3)	6,045 (13,327)	AG5	1.16	0.94
P800P1 / P900E1	800-900	4,280 (168.5)	1,912 (75.3)	2,371 (93.3)	6,245 (13,327)			
P910P1 / P1000E1	910-1000	4,967 (195.6)	2,162 (85.1)	2,227 (87.7)	6,820 (15,036)			
P1000P1 / P1100E1	1000-1100	4,976 (195.9)	2,046 (80.6)	2,158 (85.0)	7,408 (16,332)			
P1125P1 / P1250E1	1125-1250	4,789 (188.5)	2,257 (88.9)	2,069 (81.5)	7,753 (17,092)			
P1250P3 / P1375E3	1250-1375	4,888 (192.4)	1,895 (74.6)	2,433 (96.5)	9,447 (20,827)			
P1350P1 / P1500E1	1350-1500	4,888 (192.4)	1,895 (74.6)	2,450 (96.5)	9,447 (20,827)			
P1500P3 / P1650E3	1500-1650	5,095 (200.6)	1,900 (74.8)	2,435 (95.9)	10,385 (22,895)			
P1700P1 / P1875E1	1700-1875	5,259 (207.0)	2,192 (86.3)	2,453 (96.6)	11,207 (24,707)			
P2000-1 / P2250-1E	2000-2250	5,799 (228.3)	2,298 (90.5)	3,068 (120.8)	15,451 (34,064)	AG3 / AG2*	0.682 / 0.447*	0.559 / 0.363*
P2500-1 / P2500-1E	2500	6,038 (237.7)	2,180 (85.8)	2,900 (114.2)	13,380 (29,498)			

Note *: The values here correspond to P2000-1, P2250-1E, P2500-1, and P2500-1E using the CRDA 1474 and CRDA 1506 radiators

This certification includes the open generator set. The generator set and included options shall be a catalogue design and factory supplied. The generator set and applicable options shall 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 mufflers, isolation/restraint devices, remote control panels, remote radiators, pumps and other electrical/mechanical components.

IBC CERTIFIED
THE VMC GROUP

VMA-51398-01C (Revision 0)
Issue Date: May 5, 2017
Revision Date: May 12, 2017
Expiration Date: May 31, 2020

THE VMC GROUP
The Power of Together™

FG WILSON

CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Cross-Code Compliance:

EC8 Approved Equivalent a_g							
Earthquake Type	**Install Height**	**f_1/f_a**					
		0.01	**0.10**	**0.50**	**1.0**	**2.0**	**100.0**
Type 2 Only	**z/h = 0.0**	0.337	0.320	0.195	0.148	0.337	0.337
Type 1 Only		0.169	0.169	0.169	0.169	0.169	0.169
Type 1 and Type 2		0.169	0.169	**0.169**	0.148	0.169	0.169
Type 2 Only	**z/h = 1.0**	0.146	0.132	0.086	0.067	0.148	0.337
Type 1 Only		0.169	0.169	0.111	0.087	0.169	0.169
Type 1 and Type 2		0.146	0.132	**0.086**	0.067	0.148	0.169

*The type of earthquake to use per country/region is listed in the national annex

*The f_1/f_a is fundamental frequency of the building divided by that of the component

*The column for f_1/f_a=1 can be used as the most conservative approved ground motion

VMA-51398-01C (Revision 0)
Issue Date: May 5, 2017
Revision Date: May 12, 2017
Expiration Date: May 31, 2020

IBC CERTIFIED
THE VMC GROUP

THE VMC GROUP
The Power of Together™

FG WILSON

CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

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 IEC 60068-3-3 1991. 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 2015 – referencing ASCE7-10 and ICC AC-156
   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
   EC8 2004 – full reference Eurocode EN-1998 2004
   IEC 60068-3-3 1991 and IEC 60068-2-57 1999

3. Refer to the manufacturer supplied installation drawings for anchor requirements and mounting considerations for seismic applications. 2. Required anchor locations, size, style, and load capacities (tension and shear) are may be specified on the installation drawings or specified by a 3rd party. 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. The Eurocode 8 maximum ground motion for equipment installed at grade or roof listed assumes that the fundamental frequency of the component is exactly twice that of the building (approximately 5 times more stiff compared to the building). If the frequency of the building or equipment is not known for a particular project, the cross-code table for EC8 may be used after the certified product table for the value of $f_1/f_a=1$ as it represents the worst case amplification (and thus approves the lowest most conservative maximum ground motion).

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 NEMA, IP, UL, or CSA standards after a seismic event.

7. This certificate applies to units manufactured at:

   FG Wilson, Old Glenarm Road, Larne, County Antrim BT40 1EJ. Northern Ireland, United Kingdom

8. This project follows The VMC Group’s ISO-17065 Scheme for Product Certification of Nonstructural Components.

9. The qualified seismic design level stated is the lowest for all series this certificate covers, for more detailed ranges of qualified seismic design levels, see the certified product tables.

John P. Giuliano, PE
President, The VMC Group

VMA-51398-01C (Revision 0)
Issue Date: May 5, 2017
Revision Date: May 5, 2017
Expiration Date: May 31, 2020

IBC CERTIFIED
THE VMC GROUP