



**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

**APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: OSP – 0336

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: AMETEK Powervar

Manufacturer's Technical Representative: Peter Huss

Mailing Address: 1450 Lakeside Drive, Waukegan, IL, 60085

Telephone: 800-369-7179 Email: Peter.huss@ametek.com

Product Information

Product Name: 3200 Series UPS, Security Plus UPS, and Extended Run Battery Cabinet

Product Type: Power Protection Equipment

Product Model Number: See attached

(List all unique product identification numbers and/or part numbers)

General Description: Uninterruptable power supplies and battery cabinets containing batteries, capacitors, contactors, fuses, inductors, transistors, fans, switches, circuit breakers, bypass boards and gate drive board. Seismic enhancements made to the test units required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Units are rigid base mounted.

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John Giuliano

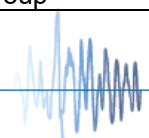
Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: john.giuliano@thevmcgroup.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant:  Date: 11/26/19
 Title: President Company Name: The VMC Group

"Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dynamic Needs"





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
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California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: The VMC Group
Name: Kenneth Tarlow California License Number: SE-2851
Mailing Address: 113 Main Street, Bloomingdale, NJ 07403
Telephone: (973) 838-1780 Email: ken.tarlow@thvmcgroup.com

Supports and Attachments Preapproval

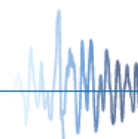
- Supports and attachments are preapproved under OPM- _____
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
- Supports and attachments are not preapproved

Certification Method

- Testing in accordance with: ICC-ES AC156
- Other (Please Specify): _____

Testing Laboratory

Company Name: DCL Labs
Contact Name: Josh Sailer, Laboratory Manager
Mailing Address: 1315 Greg Street, Suite 109, Sparks, NV 89431
Telephone: (775) 358-5085 Email: josh@shaketest.com





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Seismic Parameters

Design in accordance with ASCE 7-16 Chapter 13: Yes No

Design Basis of Equipment or Components (F_p/W_p) = 1.55 ($S_{DS}=2.15$); 1.80 ($S_{DS}=2.50$)

S_{DS} (Design spectral response acceleration at short period, g) = 2.15 (3200 UPS Units); 2.50 (All Other Units)

a_p (In-structure equipment or component amplification factor) = 1.0

R_p (Equipment or component response modification factor) = 2.5

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = See attachment

Overall dimensions and weight (or range thereof) = See attachment

Equipment or Components @ grade designed in accordance with ASCE 7-16 Chapter 15: Yes No

Design Basis of Equipment or Components (V/W) = _____

S_{DS} (Design spectral response acceleration at short period, g) = _____

S_{D1} (Design spectral response acceleration at 1 second period, g) = _____

R (Response modification coefficient) = _____

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = _____

I_p (Importance factor) = 1.5

Height to Center of Gravity above base = _____

Equipment or Component Natural Frequencies (Hz) = _____

Overall dimensions and weight (or range thereof) = _____

Tank(s) designed in accordance with ASME BPVC, 2015: Yes No

List of Attachments Supporting Special Seismic Certification

Test Report(s) Drawings Calculations Manufacturer's Catalog

Other(s) (Please Specify): _____

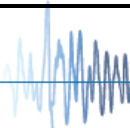
OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2025

Signature: *William Staehlin* Date: March 26, 2021

Print Name: William Staehlin Title: Senior Structural Engineer

Special Seismic Certification Valid Up to : S_{DS} (g) = See Above z/h = See Above

Condition of Approval (if applicable): _____



OSHPD Special Seismic Certification

Table A.1 - Certified Components

3200 Series UPS

Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: 3200 Series UPS

Mounting Configuration: Rigid Base Mount

Test Level: Sds=2.15g, z/h=1.0



Model Number	Description	Dimensions (inches)			Approximate Operating Weight (lb)	UUT
		Length	Width	Height		
3200 UPS 10kVA	10 kVA, 9 kW	33.7	18.0	48.0	750	UUT1
3200 UPS 20kVA	20 kVA, 18 kW	33.7	18.0	48.0	750 - 1,370	Interpolated
3200 UPS 30kVA	30 kVA, 27 kW	34.8	23.2	59.6		Interpolated
3200 UPS 40kVA	40 kVA, 40 kW	34.8	23.2	59.6	1,370	UUT2

OSHPD Special Seismic Certification
Table A.2 - Certified Subcomponents
3200 Series UPS



Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: 3200 Series UPS

Mounting Configuration: Rigid Base Mount

Test Level: Sds=2.15g, z/h=1.0

BATTERIES				
Model Number	Manufacturer	Description	Material	Unit
HR 1234 FRW	CSB	Battery, 12V 34W	ABS, Lead Acid	UUT1
HR 1251 FRW	CSB	Battery, 12V 51W	ABS, Lead-Acid	Interpolated
GP 12260 FR	CSB	Battery, 12V 26Ah	ABS, Lead-Acid	UUT2

CAPACITORS				
Model Number	Manufacturer	Description	Material	Unit
ECG2EPK103MD130B	Jianghai	250VDC 10000uF Electrolytic Capacitor	Aluminum	UUT1
C65R	Sheng Ye	275VAC 100uF Electrolytic Capacitor	Aluminum	UUT1
52000YBM4030100E	Yuhchang	300VAC 200uF Electrolytic Capacitor	Aluminum	UUT2

CONTACTORS				
Model Number	Manufacturer	Description	Material	Unit
CU-40	Taian	230VAC 40A Contactor	Plastic	UUT1
CU-65	Taian	230VAC 65A Contactor	Plastic	Interpolated
CU-100	Taian	230VAC 100kW Contactor	Plastic	UUT2

FUSES				
Model Number	Manufacturer	Description	Material	Unit
JKS 70	Bussmann	600VAC 70A Fuse	Ceramic, Copper, Fiberglass	UUT1
FWH 70	Bussmann	500VDC 70A Fuse	Ceramic, Copper, Fiberglass	UUT1
FWH 100	Bussmann	500VDC 100A Fuse	Ceramic, Copper, Fiberglass	UUT1
JKS 80	Bussmann	600VAC 80A Fuse	Ceramic, Copper, Fiberglass	Interpolated
JKS 100	Bussmann	600VAC 100A Fuse	Ceramic, Copper, Fiberglass	Interpolated
JKS 125	Bussmann	600VAC 125A Fuse	Ceramic, Copper, Fiberglass	Interpolated
JKS 150	Bussmann	600VAC 150A Fuse	Ceramic, Copper, Fiberglass	UUT2
JKS 200	Bussmann	600VAC 200A Fuse	Ceramic, Copper, Fiberglass	UUT2
FWH 150	Bussmann	500VDC 150A Fuse	Ceramic, Copper, Fiberglass	UUT2
FWH 200	Bussmann	500VDC 200A Fuse	Ceramic, Copper, Fiberglass	Interpolated
FWH 250	Bussmann	500VDC 250A Fuse	Ceramic, Copper, Fiberglass	UUT2

INDUCTORS				
Model Number	Manufacturer	Description	Material	Unit
41-110121-00G	Click	254uH 155 deg C Inductor	Iron, Copper	UUT1
41-10070-01G	Click	254uH 180 deg C Inductor	Iron, Copper	Interpolated
41-110000-01G	Click	240uH 155 deg C Inductor	Iron, Copper	Interpolated
41-110109-01G	Click	240uH 180 deg C Inductor	Iron, Copper	UUT2
41-11071-01G	Click	180uH 180 deg C Inductor	Iron, Copper	UUT2

OSHPD Special Seismic Certification
Table A.3 - Certified Subcomponents Cont
3200 Series UPS



Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: 3200 Series UPS

Mounting Configuration: Rigid Base Mount

Test Level: Sds=2.15g, z/h=1.0

INSULATED-GATE BIPOLAR TRANSISTOR (IGBT)				
Model Number	Manufacturer	Description	Material	Unit
SKM 100 GB12T4	Semikron	1200V 100A IGBT	Ceramic, Aluminum	UUT1
SKM 150 GB12T4	Semikron	1200V 150A IGBT	Ceramic, Aluminum	Interpolated
SKM 200 GB12T4	Semikron	1200V 200A IGBT	Ceramic, Aluminum	Interpolated
SKM 400 GB12E4	Semikron	1200V 400A IGBT	Ceramic, Aluminum	UUT2
FANS				
Model Number	Manufacturer	Description	Material	Unit
A1123-HBT(7).GN	Sunon	115VAC 124CFM Fan	Aluminum, Plastic	UUT1
A1175-HBT TC.GN	Sunon	115VAC 239CFM Fan	Aluminum, Plastic	UUT2
MA1062-HVL.GN	Sunon	115VAC 18CFM Fan	Plastic	UUT1
A1123-HBT TC.GN	Sunon	115VAC 117CFM Fan	Aluminum, Plastic	UUT1, UUT2
OA109AP-11-1 TB.XC	Orion	115VAC 131CFM Fan	Aluminum, Plastic	UUT2
SWITCHES				
Model Number	Manufacturer	Description	Material	Unit
OT40F3	ABB	600VAC 40A Switch	Plastic	UUT1
OT80F3	ABB	600VAC 80A Switch	Plastic	Interpolated
OT125F3	ABB	600VAC 125A Switch	Plastic	Interpolated
OT160E3	ABB	600VAC 160A Switch	Plastic	UUT2
CIRCUIT BREAKERS				
Model Number	Manufacturer	Description	Material	Unit
T1N040TL-4	ABB	600VAC 40A Circuit Breaker	Plastic	UUT1
T1N080TL-4	ABB	600VAC 80A Circuit Breaker	Plastic	Interpolated
T1N100TL-4	ABB	600VAC 100A Circuit Breaker	Plastic	Interpolated
T3N150TW-4	ABB	600VAC 150A Circuit Breaker	Plastic	UUT2
BYPASS BOARDS				
Model Number	Manufacturer	Description	Material	Unit
71-300885-00G	Voltronics	10kVA LV Bypass Board	Printed Circuit Board	UUT1
71-300579-02G	Voltronics	20-40kVA LV Bypass Board	Printed Circuit Board	UUT2
GATE DRIVE BOARD				
Model Number	Manufacturer	Description	Material	Unit
71-300161-03G	Voltronics	10-40kVA LV Gate Drive Board	Printed Circuit Board	UUT1

OSHPD Special Seismic Certification

Table B.1 - Certified Components

Security Plus UPS

Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: Security Plus UPS

Mounting Configuration: Rigid Base Mount

Test Level: Sds=2.50g, z/h=1.0



Model Number	Description	Dimensions (inches)			Approximate Operating Weight (lb)	UUT
		Length	Width	Height		
ABCDEF 2000-11	2 kVA	31.9	11.8	28.9	210	UUT3
ABCDEF 3000-11	3 kVA	31.9	11.8	28.9	210 - 750	Interpolated
ABCDEF 2000-22	2 kVA	31.9	11.8	28.9		Interpolated
ABCDEF 3000-22	3 kVA	31.9	11.8	28.9		Interpolated
ABCDEF 4000-22	4 kVA	31.9	11.8	28.9		Interpolated
ABCDEF 5200-22	5.2 kVA	31.9	11.8	28.9		Interpolated
ABCDEF 6000-22	6 kVA	31.9	11.8	28.9		Interpolated
ABCDEF 8000-22	8 kVA	38.6	13.8	33.5		Interpolated
ABCDEF 10.0-22	10 kVA	38.6	13.8	33.5		Interpolated
ABCDEF 12.0-22	12 kVA	44.4	15.8	42.5		Interpolated
ABCDEF 15.0-22	15 kVA	44.4	15.8	42.5		750

OSHPD Special Seismic Certification
Table B.2 - Certified Subcomponents
Security Plus UPS



Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: Security Plus UPS

Mounting Configuration: Rigid Base Mount

Test Level: Sds=2.50g, z/h=1.0

BATTERIES				
Model Number	Manufacturer	Description	Material	Unit
HR1234WF2FR	CSB	12 V Battery	Lead-Acid	UUT3
HR1251WF2FR	CSB	12 V Battery	Lead-Acid	UUT4
CAPACITORS				
Model Number	Manufacturer	Description	Material	Unit
ECG2EPK332H	Nantong Jianghai	250 VDC 3300 uF	Aluminum	UUT3
ECG2WPK332H	Nantong Jianghai	450 VDC 3300 uF	Aluminum	Interpolated
ECG2WPK472H	Nantong Jianghai	450 VDC 4700 uF	Aluminum	Interpolated
ECG2WPK562H	Nantong Jianghai	450 VDC 5600 uF	Aluminum	UUT4
B32926	EPCOS	X2, 305 VAC, 10uF	Aluminum	UUT3
FUSES				
Model Number	Manufacturer	Description	Material	Unit
6S	Sun Electric	250 VAC, 20-25 A	Ceramic, Copper, Fiberglass	UUT3
660GH-40	Hinode Electric	660VDC 40A	Ceramic, Copper, Fiberglass	UUT3
660GH-80	Hinode Electric	660VAC 80A	Ceramic, Copper, Fiberglass	Interpolated
660GH-100	Hinode Electric	660VAC 100A	Ceramic, Copper, Fiberglass	UUT4
FANS				
Model Number	Manufacturer	Description	Material	Unit
AD0912UB-A70GL	ADDA	12VDC, .23A	Aluminum, Plastic	UUT3
AD0924UX-A71GL	ADDA	24 VDC, 0.22A, 57 CFM	Aluminum, Plastic	UUT4
4715KL-05W-B40	EMINEBEA	24 VDC, 0.46A, 118 CFM	Plastic	UUT4
D12BH-24D	Yate Loon Electronic	24 VDC	Plastic	UUT3
CIRCUIT BREAKERS				
Model Number	Manufacturer	Description	Material	Unit
FAZ-C63/1	Moeller	277 V 63 A	Plastic	UUT3
FAZ-C63/2	Moeller	277VAC 63A	Plastic	UUT3
T1N	ABB	480VAC 80A	Plastic	UUT4
T3N	ABB	480VAC 125A	Plastic	UUT4

OSHPD Special Seismic Certification
Table B.3 - Certified Subcomponents Cont
Security Plus UPS



Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: Security Plus UPS

Mounting Configuration: Rigid Base Mount

Test Level: Sds=2.50g, z/h=1.0

PRINTED CIRCUIT BOARDS				
Model Number	Manufacturer	Description	Material	Unit
PR020A	Kehua Tech	2-3 LV	Printed Circuit Board	UUT3
PR030A	Kehua Tech	2-3 LV	Printed Circuit Board	Interpolated
PR020 Main	Kehua Tech	2-6 HV Main Board	Printed Circuit Board	Interpolated
PR030 Main	Kehua Tech	2-6 HV Main Board	Printed Circuit Board	Interpolated
TP103R-GF01 Main	Kehua Tech	8-15 HV Main Board	Printed Circuit Board	UUT4
PR020 Slave	Kehua Tech	2-6 HV Main Board	Printed Circuit Board	Interpolated
PR030 Slave	Kehua Tech	2-6 HV Main Board	Printed Circuit Board	Interpolated
TP103R-GF01 Slave	Kehua Tech	8-15 HV Main Board	Printed Circuit Board	UUT4
PR020A Control	Kehua Tech	2-3 LV Control Board	Printed Circuit Board	UUT3
PR030A Control	Kehua Tech	2-3 LV Control Board	Printed Circuit Board	Interpolated
PR020 Control	Kehua Tech	2-6 HV Control Board	Printed Circuit Board	Interpolated
PR030 Control	Kehua Tech	2-6 HV Control Board	Printed Circuit Board	Interpolated
PR040 Control	Kehua Tech	2-6 HV Control Board	Printed Circuit Board	Interpolated
PR060 Control	Kehua Tech	2-6 HV Control Board	Printed Circuit Board	Interpolated
TP103R-M03	Kehua Tech	8-15 HV Control Board	Printed Circuit Board	UUT4
PR030A Charger	Kehua Tech	2-3 LV Charger Board	Printed Circuit Board	UUT3
PR030 Charger	Kehua Tech	2-6 HV Charger Board	Printed Circuit Board	Interpolated
TP802R-C02	Kehua Tech	8-15 HV Charger Board	Printed Circuit Board	Interpolated
TP802R-C03	Kehua Tech	8-15 HV Charger Board	Printed Circuit Board	UUT4
PR030A SCR	Kehua Tech	2-3 LV SCR Board	Printed Circuit Board	UUT3
PR030 SCR	Kehua Tech	2-6 HV SCR Board	Printed Circuit Board	Interpolated
PR060 SCR	Kehua Tech	2-6 HV SCR Board	Printed Circuit Board	Interpolated
TP103R-CON1001	Kehua Tech	8-15 HV SCR Board	Printed Circuit Board	UUT4
TRANSFORMERS				
Model Number	Manufacturer	Description	Material	Unit
TV-2K-120	Kehua Tech	Main Output Transformer	Iron, Copper	UUT3
TV-3K-120	Kehua Tech	Main Output Transformer	Iron, Copper	Interpolated
TV-2K-240	Kehua Tech	Main Output Transformer	Iron, Copper	Interpolated
TV-3K-240	Kehua Tech	Main Output Transformer	Iron, Copper	Interpolated
TV-4K-240	Kehua Tech	Main Output Transformer	Iron, Copper	Interpolated
TV-6K-240H	Kehua Tech	Main Output Transformer	Iron, Copper	Interpolated
TV-8K-240	Kehua Tech	Main Output Transformer	Iron, Copper	Interpolated
TV-10K-240	Kehua Tech	Main Output Transformer	Iron, Copper	Interpolated
TV-12K-240	Kehua Tech	Main Output Transformer	Iron, Copper	Interpolated
TV-15K-240	Kehua Tech	Main Output Transformer	Iron, Copper	UUT4

OSHPD Special Seismic Certification

Table C.1 - Certified Components

Extended Run Battery Cabinet

Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: Extended Run Battery Cabinet

Mounting Configuration: Rigid Base Mount

Test Level: Sds=2.50g, z/h=1.0



Model Number	Description	Dimensions (inches)			Approximate Operating Weight (lb)	UUT
		Length	Width	Height		
D9648-11	2 kVA	31.7	11.8	29.0	410	UUT5
D9632-11	2 kVA	31.7	11.8	29.0	410 - 760	Interpolated
D9632-22	2 kVA	31.7	11.8	29.0		Interpolated
D9648-22	2 kVA	31.7	11.8	29.0		Interpolated
D28848-22	15 kVA	38.6	13.7	33.5	760	UUT6

OSHPD Special Seismic Certification
Table C.2 - Certified Subcomponents
Extended Run Battery Cabinet



Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: Extended Run Battery Cabinet

Mounting Configuration: Rigid Base Mount

Test Level: Sds=2.50g, z/h=1.0

BATTERIES				
Model Number	Manufacturer	Description	Material	Unit
HR1234WF2FR	CSB	12 V Battery	Lead-Acid	UUT5
HR1251WF2FR	CSB	12 V Battery	Lead-Acid	UUT6
FUSES				
Model Number	Manufacturer	Description	Material	Unit
6S	Sun Electric	250 VAC, 10-25 A	Ceramic	UUT5, UUT6
660GH-40	Hinode Electric	660VDC 40A	Ceramic	UUT5
660GH-80	Hinode Electric	660VAC 80A	Ceramic	Interpolated
660GH-100	Hinode Electric	660VAC 100A	Ceramic	UUT6
FANS				
Model Number	Manufacturer	Description	Material	Unit
AD0912UB-A70GL	ADDA	12VDC, .23A	Aluminum, Plastic	UUT6
RDH6025S	Xinruilian Electronic	12 VDC, 0.14A	Plastic	UUT5
CIRCUIT BREAKERS				
Model Number	Manufacturer	Description	Material	Unit
FAZ-C63/1	Moeller	277 V 63 A	Plastic	UUT5, UUT6
PRINTED CIRCUIT BOARDS				
Model Number	Manufacturer	Description	Material	Unit
PR030A Charger	Kehua Tech	2-3 LV Charger Board	Printed Circuit Board	UUT5
PR030 Charger	Kehua Tech	2-6 HV Charger Board	Printed Circuit Board	Interpolated
TP802R-C02	Kehua Tech	8-15 HV Charger Board	Printed Circuit Board	Interpolated
TP802R-C03	Kehua Tech	8-15 HV Charger Board	Printed Circuit Board	UUT6

Special Seismic Certification

Table D - Tested Units

Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Mounting Configuration: Rigid Base Mount



Model Number	Description	Dimensions (inches)			Approximate Operating Weight (lb)	Sds (g), z/h=1	UUT
		Length	Width	Height			
3200 (Sds=2.15g)							
3200 UPS 10kVA	10 kVA, 9 kW	33.7	18.0	48.0	750	2.15	UUT1
3200 UPS 40kVA	40 kVA, 40 kW	34.8	23.2	59.6	1,370	2.15	UUT2
Security Plus UPS (Sds=2.50g)							
ABCDEF 2000-11	2 kVA	31.9	11.8	28.9	210	2.50	UUT3
ABCDEF 15.0-22	15 kVA	44.4	15.8	42.5	750	2.50	UUT4
Extended Run Battery Cabinets (Sds=2.50g)							
D9648-11	2 kVA	31.7	11.8	29.0	410	2.50	UUT5
D28848-22	15 kVA	38.6	13.7	33.5	760	2.50	UUT6

UUT 1

UNIT UNDER TEST (UUT) Summary Sheet



Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: 3200 Series UPS

Model Number: 3200 UPS 10kVA

Product Construction Summary:

Carbon Steel, electrogalvanized, cold-rolled, coil

Options / Component Summary:

12V battery, capacitors, contactors, fuses, inductors, insulated-gate bipolar transistors, fans, switches, circuit breaker, bypass board and gate drive board

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Cabinet Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Length	Width	Height	Front-Back	Side-Side	Vertical
750	33.7	18.0	48.0	12.5	8.8	25.0

Seismic Test Parameters

Building Code	Test Criteria	Sds [g]	z/h	Ip	Aflx-H [g]	Arig-H [g]	Aflx-V [g]	Arig-V [g]
CBC 2016	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



The unit was attached to the shake table interface plate using four manufacturer-provided brackets. The front and rear brackets were attached with 1/2-inch diameter Grade 8 bolts and were spaced approximately 8" widthwise and 34" lengthwise: (2) bolts connecting the bracket to the unit and (2) bolts connecting the bracket to the shake table interface plate. The side brackets were attached with 1/2-inch diameter Grade 8 bolts spaced at approximately 8" lengthwise and 20" widthwise: (3) bolts connecting the bracket to the unit and (3) bolts connecting the bracket to the shake table interface plate.

UUT 2

UNIT UNDER TEST (UUT) Summary Sheet



Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: 3200 Series UPS

Model Number: 3200 UPS 40kVA

Product Construction Summary:

Carbon Steel, electrogalvanized, cold-rolled, coil

Options / Component Summary:

12V battery, capacitors, contactors, fuses, inductors, insulated-gate bipolar transistors, fans, switches, circuit breaker, bypass board and gate drive board

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural

UUT Properties

Operating Weight (lb)	Cabinet Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Length	Width	Height	Front-Back	Side-Side	Vertical
1,370	34.8	23.2	59.6	7.3	7.3	22.3

Seismic Test Parameters

Building Code	Test Criteria	Sds [g]	z/h	Ip	Aflx-H [g]	Arig-H [g]	Aflx-V [g]	Arig-V [g]
CBC 2016	ICC-ES AC156	2.15	1.0	1.5	3.44	2.58	1.43	0.57

Unit Mounting Description:



The unit was attached to the shake table interface plate using four manufacturer-provided brackets. The front and rear brackets were attached with 1/2-inch diameter Grade 8 bolts and were spaced approximately 8" widthwise and 35" lengthwise: (2) bolts connecting the bracket to the unit and (2) bolts connecting the bracket to the shake table interface plate. The side brackets were attached with 1/2-inch diameter Grade 8 bolts and are spaced approximately 8" apart lengthwise and 26" apart widthwise: (3) bolts connecting the bracket to the unit and (3) bolts connecting the bracket to the shake table interface plate.

UUT 3

UNIT UNDER TEST (UUT) Summary Sheet



Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: Security Plus UPS

Model Number: ABCDEF 2000-11

Product Construction Summary:

Carbon Steel, electrogalvanized, cold-rolled, coil

Options / Component Summary:

12V battery, capacitors, fuses, fan, circuit breakers, circuit boards and transformer

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Cabinet Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Length	Width	Height	Front-Back	Side-Side	Vertical
210	31.9	11.8	28.9	23.5	16.8	>33.3

Seismic Test Parameters

Building Code	Test Criteria	Sds [g]	z/h	Ip	Aflx-H [g]	Arig-H [g]	Aflx-V [g]	Arig-V [g]
CBC 2016	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



The unit was attached to the shake table interface plate using two manufacturer-provided brackets. Each bracket was attached to the unit with (3) 5/16-inch diameter Grade 2 bolts. Each bracket was attached to the shake table interface plate with (2) 3/8-inch diameter Grade 8 bolts spaced approximately 14" lengthwise and 14" widthwise.

UUT 4



UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: Security Plus UPS

Model Number: ABCDEF 15.0-22

Product Construction Summary:

Carbon Steel, electrogalvanized, cold-rolled, coil

Options / Component Summary:

12V battery, capacitors, fuses, fan, circuit breakers, circuit boards and transformer

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Cabinet Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Length	Width	Height	Front-Back	Side-Side	Vertical
750	44.4	15.8	42.5	16.5	7.8	24.3

Seismic Test Parameters

Building Code	Test Criteria	Sds [g]	z/h	Ip	Aflx-H [g]	Arig-H [g]	Aflx-V [g]	Arig-V [g]
CBC 2016	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



The unit was attached to the shake table interface plate using two manufacturer-provided brackets. Each bracket was attached to the unit with (3) 5/16-inch diameter Grade 2 bolts. Each bracket was attached to the shake table interface plate with (3) 3/8-inch diameter Grade 8 bolts spaced approximately 11" lengthwise and 18" widthwise.

UUT 5

UNIT UNDER TEST (UUT) Summary Sheet



Manufacturer: AMETEK Powervar
Product Type: Power Protection Equipment
Product Line: Extended Run Battery Cabinet
Model Number: D9648-11
Product Construction Summary:
 Carbon Steel, electrogalvanized, cold-rolled, coil
Options / Component Summary:
 12V battery, fuses, fan, circuit breakers, and circuit board
Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Cabinet Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Length	Width	Height	Front-Back	Side-Side	Vertical
410	31.7	11.8	29.0	18.5	8.0	30.5

Seismic Test Parameters

Building Code	Test Criteria	Sds [g]	z/h	Ip	Aflx-H [g]	Arig-H [g]	Aflx-V [g]	Arig-V [g]
CBC 2016	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



The unit was attached to the shake table interface plate using two manufacturer-provided brackets. Each bracket was attached to the unit with (3) 5/16-inch diameter Grade 2 bolts. Each bracket was attached to the shake table interface plate with (3) 3/8-inch diameter Grade 8 bolts spaced at approximately 8" apart lengthwise and 14" apart widthwise.

UUT 6

UNIT UNDER TEST (UUT) Summary Sheet



Manufacturer: AMETEK Powervar

Product Type: Power Protection Equipment

Product Line: Extended Run Battery Cabinet

Model Number: D28848-22

Product Construction Summary:

Carbon Steel, electrogalvanized, cold-rolled, coil

Options / Component Summary:

12V battery, fuses, fan, circuit breakers, and circuit board

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Cabinet Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Length	Width	Height	Front-Back	Side-Side	Vertical
760	38.6	13.7	33.5	22.3	8.5	22.8

Seismic Test Parameters

Building Code	Test Criteria	Sds [g]	z/h	Ip	Aflx-H [g]	Arig-H [g]	Aflx-V [g]	Arig-V [g]
CBC 2016	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



The unit was attached to the shake table interface plate using two manufacturer-provided brackets. Each bracket was attached to the unit with (3) 5/16-inch diameter Grade 2 bolts. Each bracket was attached to the shake table interface plate with (2) 3/8-inch diameter Grade 8 bolts spaced at approximately 20" lengthwise and 16" widthwise.