

Title: Program Manager

DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION **FACILITIES DEVELOPMENT DIVISION**

OFFICE USE ONLY APPLICATION FOR HCAI SPECIAL SEISMIC **CERTIFICATION PREAPPROVAL (OSP) APPLICATION #: OSP-0674 HCAI Special Seismic Certification Preapproval (OSP)** X New Type: Renewal **Manufacturer Information** Manufacturer: Vertiv Corporation Manufacturer's Technical Representative: Keith Goshia Mailing Address: 975 Pittsburgh Drive, Delaware, OH 43015 Telephone: (740) 833-8557 Email: keith.goshia@vetiv.com **Product Information** Product Name: UPS and Batteries Product Type: UPS Product Model Number: Varies, see tables General Description: UPS (lithium-ion battery cabinet) base mounted rigid standalone or base mounted rigid ganged. Mounting Description: Rigid, Floor Mounted None Tested Seismic Enhancements: **Applicant Information** Applicant Company Name: TRU Compliance, by Structural Integrity Associates, Inc. Contact Person: Katie Braman Mailing Address: 5215 Hellyer Ave, Suite 101, San Jose, CA 95138-1025 Telephone: (541) 526-1947 Email: kbraman@structint.com





STATE OF CALIFORNIA - HEALTH AND HUMAN SERVICES AGENCY

03/08/2022 OSP-0674



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

California Licensed Structural Engineer Respons	ible for the Engineering and Test Report(s)						
Company Name: STRUCTURAL INTEGRITY ASSOCIAT	ES, INC.						
Name: Andrew Coughlin California License Number: S6082							
Mailing Address: 5215 Hellyer Ave, Suite 101, San Jose,	 CA 95138-1025						
Telephone: (415) 635-8461 Email:	acoughlin@structint.com						
Certification Method							
GR-63-Core X ICC-ES AC156	☐ IEEE 344 ☐ IEEE 693 ☐ NEBS 3						
Other (Please Specify):							
EOR	CODECO						
Testing Laboratory	Mp.						
Company Name: ENVIRONMENTAL TESTING LABORA	TORIES, INC. (ETL)						
Contact Person: Jeremy Lange	Manufacture and the second sec						
Mailing Address: 11034 Indian Trail, Dallas TX 75229-351	3P-0674						
Telephone: (972) 247-9657 Email:	_info@etldallas.com						
DATE:	03/08/2022						





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Design Basis of Equipment or Components (Fp/Wp) = 1.224 @ 1.7g, z/h =1; 0.967@2.15g, z/h=0

SDS (Design spectral response acceleration at short period, g) = 1.7g @ z/h=1; 2.15g @ z/h=0

ap (Amplification factor) = 1.0

 R_p (Response modification factor) = 2.5

 Ω_0 (System overstrength factor) = 2.0

 I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1 and 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

HCAI Approval (For Office Use Only) - Approval Expires on 03/08/2028

Date: 3/8/2022 OSP-0674

Name: Mohammad Aliaari Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: Sps (g) = See Above z/h = See Above

Condition of Approval (if applicable):





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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX





2000359-CR-001-R0

Manufacturer:	Vertiv Corporation	TABLE 1
Model Line:	Li-lon Battery Cabinet	INDLET

Certified Product Construction Summary:

14 ga. Carbon Steel Cabinet

Certified Options Summary:

11-17 Lithium Battery Modules. Quantity is uniquely identified by model number.

All other subcomponents are identical between models.

Mounting Configuration:

Base mounted - Rigid (Standalone)

Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

Building Code: CBC 2019

Seismic Certification Limits:

 $S_{DS} = 1.70 g$ z/h=1.0 $S_{DS} = 2.15 g$ z/h=0.0

I_P= 1.5

Madallina	14.65	Dii	nensions	(in)4	Weight	Notes	UUT	
Model Line	Model	Depth	Width	Height ¹	(lb)	Notes	001	
	PHR2042-001A	3\/21\/\o	hai ² 6ma	d Alaa	rj 763	11 Battery Modules	2	
Likhiona Ian Dakkano	PHR2 <mark>652-0</mark> 01A	21	26	91	866	13 Battery Modules	Interp.	
Lithium-Ion Battery Cabinet	PHR28 <mark>52-00</mark> 1A	21	26/09	91	902	14 Battery Modules	Interp.	
Cabillet	PHR32 <mark>62-001</mark> A	21	26	91	974	16 Battery Modules	Interp.	
	PHR3462-001A	21	26	91	1010	17 Battery Modules	1	
				MAMA				
	The state of the s	1 MIN		1 HADDA	0			
		JA D						
		D	UILD.	140				
			•			!		

Note

¹The 91.0" height includes the height of the top hat junction box.

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



 $S_{DS} = 2.15 g z/h = 0.0$



I p= 1.5

2000359-CR-001-R0

Manufacturer:	Vertiv Corporation	TABLE 2
Model Line:	Li Ion Rattony Cabinet	IADLEZ

Certified Product Construction Summary:

14 ga. Carbon Steel Cabinet

Certified Options Summary:

22-34 Lithium Battery Modules. Quantity is uniquely identified by model number.

All other subcomponents are identical between models.

Mounting Configuration:

Base mounted - Rigid (Ganged)

Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

Building Code: CBC 2019 Seismic Certification Limits: S_{DS}= 1.70 g z/h=1.0

Model Line	104	Dii	mensions	(in)4	Weight ²	Notes	
Model Lille	Model⁴	Depth	Width	Height ³	(lb)	Notes	UUT
	PHR20 <mark>42-0</mark> 01A	BY21 _{1/10}	hai ⁵² ma	d Aliaa	rj 1724	22 Battery Modules	Interp.
Lithium lan Datton.	PHR2 <mark>652-0</mark> 01A	21	52	91	1773	26 Battery Modules	Interp.
Lithium-Ion Battery Cabinet	PHR28 <mark>52-00</mark> 1A		52	91	1845	28 Battery Modules	Interp.
Cabinet	PHR32 <mark>62-001</mark> A	21	52	91	1917	32 Battery Modules	Interp.
	PHR3462 <mark>-001A</mark>	21	52	91	1989	34 Battery Modules ¹	3
				MAMA	960		
	4	MILL OF			0		
		AD		160			
		D	OILD:	140			

Notes:

 $^{^{1}}$ UUT1 and UUT2 were ganged to together and populated with 17 battery modules each to create UUT3.

²The ganged unit weighs less than identical standalone units due to the interior panels being removed to join the two battery cabinets.

³The 91.0" height includes the height of the top hat junction box.

⁴The model numbers do not change for the ganged configuration.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX





2000359-CR-001-R0

Manufacturer:Vertiv CorporationTable Description:Various SubcomponentsTABLE 3Model Line:Li-Ion Battery Cabinet

Building Code: CBC 2019 Seismic Certification Limits: $S_{DS} = 1.70 g \quad z/h = 1.0$ $S_{DS} = 2.15 g \quad z/h = 0.0$

.9	Seismic Certificati	$S_{DS} = 2.15 g z/h = 0.0$	$I_P = 1.5$	
Manufacturer	Model	Description	Notes	UUT
Sameung	EM2031AE00XA	Type A, 36.0 lbs, Plastic Case		1,2,3
Sallisung	EM2031AE00YA	Type B, 36.0 lbs, Plastic Case		1,2,3
Samsung	V049-0011XA	Carbon Steel, Plastic		1,2,3
	V044-0006XA	3-Phase Type A, Carbon Steel, Plastic		1,2,3
Cameung	SJ94-00238B	3-Phase Type B, Carbon Steel, Plastic		1,2,3
Sallisung	V044-0004XA	1-Phase Type A, Carbon Steel, Plastic		1,2,3
	V044-0005AA	1-Phase Type B, Carbon Steel, Plastic		1,2,3
Compung	V808-00066A	White, Carbon Steel, 298 lbs		Interp
Sallisung	V8 <mark>08-00068A</mark>	Black, Carbon Steel, 298 lbs		1,2,3
Samsung	571563P1	Carbon Steel, 30.5 lbs, 10.0" High		1,3
	PNIAL	UILDING COOK		
	Manufacturer Samsung Samsung Samsung Samsung	Manufacturer Model Samsung EM2031AE00XA EM2031AE00YA EM2031AE00YA Samsung V049-0011XA V044-0006XA SJ94-00238B V044-0004XA V044-0005AA V808-00066A V808-00068A	ManufacturerModelDescriptionSamsungEM2031AE00XA EM2031AE00YAType A, 36.0 lbs, Plastic Case Type B, 36.0 lbs, Plastic CaseSamsungV049-0011XA V044-0006XACarbon Steel, Plastic 3-Phase Type A, Carbon Steel, Plastic V044-0004XASamsungV044-0006XA 1-Phase Type B, Carbon Steel, Plastic V044-0004XAV044-0004XA V044-0005AA1-Phase Type B, Carbon Steel, Plastic V044-0005AAV808-00066A V808-00068AWhite, Carbon Steel, 298 lbsBlack, Carbon Steel, 298 lbs	ManufacturerModelDescriptionNotesSamsungEM2031AE00XAType A, 36.0 lbs, Plastic CaseEM2031AE00YAType B, 36.0 lbs, Plastic CaseSamsungV049-0011XACarbon Steel, PlasticSamsungV044-0006XA3-Phase Type A, Carbon Steel, PlasticSJ94-00238B3-Phase Type B, Carbon Steel, PlasticV044-0004XA1-Phase Type A, Carbon Steel, PlasticV044-0005AA1-Phase Type B, Carbon Steel, PlasticV808-00066AWhite, Carbon Steel, 298 lbsV808-00068ABlack, Carbon Steel, 298 lbs





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Manufacture Model Line:	Vertiv Corporation Li-Ion Battery Cabine	t				
UUT	Unit Description	Report Number	Testing Laboratory	S _{DS}	z/h	I _P
1	Li-Ion Battery Cabinet 17 Modules w/ Junction Box (Standalone)	2000359-TR-001-R0	ETL	1.70 2.15	1.0 0.0	1.5
2	Li-Ion Battery Cabinet 11 Modules (Standalone)	2000359-TR-001-R0	ETL	1.70 2.15	1.0 0.0	1.5
3	Li-Ion Battery Cabinet 34 Modules (Ganged)	2000359-TR-001-R0	ETL	1.70 2.15	1.0 0.0	1.5
	2	HCAi	10/4			
	REL	OSP-0674	36			
		BY: Mohammad Alia	aari			
	12	DATE: 03/08/202	2 5			
			OF.			
		BUILDING	C			
Notes:		I	1	1	<u> </u>	

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UUT 1

Manufacturer:Vertiv CorporationModel Line:Li-Ion Battery Cabinet

PHR3462-001A Serial Number: N/A

Product Construction Summary:

14 ga. Carbon Steel Cabinet

Model Number:

Options/Subcomponent Summary:

Battery Modules: (9) EM2031AE00XA, (8) EM2031AE00YA, SMU: V049-0011XA, SMPS Assembly: V044-0006XA, SJ94-00238B, V044-0004XA, V044-0005AA, Rack Frame: V808-00068A, Junction Box: 571563P1

UUT Properties

Weight		Dimension (in)		Lowest	Natural Frequen	cy (Hz)
(lb)	(lb) Depth Width		Height ¹	Front-Back	Side-Side	Vertical
1010	21.0	26.0	OSP91.6674	6.2	5.7	16.0

¹Total height includes the height of the junction box on top of the cabinet.

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2019	ICC-ES AC156 03/0	1.70 2.15	2 1.0 0.0	1.5	2.77	2.08	1.43	0.57

Test Mounting Details:





Base Mounted - Rigid: Four (4) 5/8" Grade 5 bolts with four (4) plate washers.

Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

Contents were included in testing per operating conditions.

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UUT 2

Manufacturer:Vertiv CorporationModel Line:Li-Ion Battery Cabinet

PHR2042-001A Serial Number: N/A

Product Construction Summary:

14 ga. Carbon Steel Cabinet

Model Number:

Options/Subcomponent Summary:

Battery Modules: (6) EM2031AE00XA, (5) EM2031AE00YA, **SMU:** V049-0011XA, **SMPS Assembly:** V044-0006XA, SJ94-00238B, V044-

0004XA, V044-0005AA, Rack Frame: V808-00068A

			UUT Pi	operties		7				
Weight Dimension (in) Lowest Natural Frequency									cy (Hz)	
(lb)	Depth	Width	OSFI	ight 74	Front	-Back	Side	-Side	Ver	tical
763	21.0	21.0 26.0 81.0				.0	7	.0	16	5.0
		UUT Highe	est Passed S	eismic Run	Informa	tion				
Buildi	ng Code	Test Cri	teria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2019		ICC-ES AC156 03/0		1.70	1.0	1.5	2.77	2.08	1.43	0.57
СВС	. 2019		16450 02V	2.15	0.0	1.5	2.11	2.00	1.43	0.51

Test Mounting Details:





Base Mounted - Rigid: Four (4) 5/8" Grade 5 bolts with four (4) plate washers.

Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

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UUT3

Manufacturer:Vertiv CorporationModel Line:Li-Ion Battery Cabinet

PHR3462-001A (2) Serial Number: N/A

Product Construction Summary:

14 ga. Carbon Steel Cabinet

Model Number:

Options/Subcomponent Summary:

Battery Modules: (18) EM2031AE00XA, (16) EM2031AE00YA, **SMU:** V049-0011XA, **SMPS Assembly:** V044-0006XA, SJ94-00238B, V044-0004XA, V044-0005AA, **Rack Frame:** V808-00068A, **Junction Box**: 571563P1

UUT Properties

Weight Dimension (in)			Lowest	Natural Frequen	cy (Hz)	
(lb)	Depth Width		Height ¹	Front-Back	Side-Side	Vertical
1989	21.0	52.0	OSP91.674	2.6	6.0	8.4

¹The total height includes the height of the junction box on top of the cabinet.

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2019	ICC-ESAC156 03/0	1.70 2.15	2 1.0 0.0	1.5	2.77	2.08	1.43	0.57

Test Mounting Details:



Base Mounted - Rigid: Eight (8) 5/8" Grade 5 bolts with eight (8) 5/8" plate washers. The two (2) PHR3462-001A units are ganged together using twelve (12) M10 Grade 8.8 bolts, washers and nuts through the holes on the sides of the units.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.