

OFFICE USE ONLY APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP) APPLICATION #: OSP - 0101 - 10 OSHPD Special Seismic Certification Preapproval (OSP) □ Renewal New Manufacturer Information Manufacturer: Vertiv Corporation Manufacturer's Technical Representative: Benjamin Lay Mailing Address: 975 Pittsburgh Drive, Delaware, OH 43015 Telephone: (740) 833 - 8518 Email: Benjamin.Lay@Vertiv.com **Product Information** Liebert GTX4 UPS, Liebert GTX4 External Battery Cabinet, Liebert APS UPS, APS Battery Cabinet, Product Name: MPH2-PDU, Liebert MicroPod Product Type: **UPS** Product Model Number: Varies, see attachment. (List all unique product identification numbers and/or part numbers) mothy J Piland General Description: Rack mounted and base mounted UPS, single phase power. Seismic enhancements made to the test units and modifications required to address the anomalies observed during the tests shall be incorporated into the production units. Rigid base mounted and rigid rack mounted. Rack mounted units may only be installed in Mounting Description: the same model rack, as tested, and cannot exceed the maximum wt. or C.G. as shown on the UUT Sheets. See rack reference sheet at end of OSP. **Applicant Information** Applicant Company Name: TRU Compliance, by Structural Integrity Associates, Inc. Contact Person: Andrew M. Coughlin, SE Mailing Address: 5215 Hellyer Ave., Suite 210, San Jose, CA 95138 844-878-0200 Email: acoughlin@structint.com Telephone: 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: 08/16/2019 Company Name: Director, TRU Compliance TRU Compliance, by Structural Integrity Associates, Inc.

OSH-FD-759 (REV 12/16/15)

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

STATE OF CALIFORNIA — HEALTH AND HUMAN SERVICES AGENCY

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California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)
Company Name: TRU Compliance, by Structural Integrity Associates, Inc.
Name: Andrew M. Coughlin California License Number: S6082
Mailing Address: _5215 Hellyer Ave., Suite 210, San Jose, CA 95138
Telephone: 844-878-0200 Email: acoughlin@structint.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 CODE
Certification Method
Testing in accordance with: Other (Please Specify): BY: Timothy J Piland
Testing Laboratory DATE: 12/18/2019
Company Name: QualTech by Curtiss-Wright Contact Name: Jerry Newberry
Mailing Address: 4600 East Tech Drive, Cincinnati, OH 45245
Telephone: 513-528-7900 Email: jnewberry@curtisswright.com
Company Name: Clark Dynamic Test Laboratory, Inc.
Contact Name: Devon Lohr
Mailing Address: 1801 Route 51, Jefferson Hills, PA 15025
Telephone: (412) 387-1026 Email: dlohr@clarktesting.com

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OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT FACILITIES DEVELOPMENT DIVISION

Seismic Parameters
Design in accordance with ASCE 7-10 Chapter 13: ⊠ Yes □ No
Design Basis of Equipment or Components $(F_p/W_p) = \underline{= 1.44 (S_Ds = 2.00, z/h = 1); 1.13 (S_Ds = 2.50, z/h = 0)}$
S _{DS} (Design spectral response acceleration at short period, g) = 2.00 (z/h = 1); 2.50 (z/h = 0)
a _p (In-structure equipment or component amplification factor) = 1
R _P (Equipment or component response modification factor) =2.5
Ω_0 (System overstrength factor) = 2
I _P (Importance factor) = 1.5
z/h (Height factor ratio) = 1 (Sps = 2.00); 0 (Sps = 2.50)
Equipment or Component Natural Frequencies (Hz) = See Product Matrices
Overall dimensions and weight (or range thereof) = See Product Matrices
Equipment or Components @ grade designed in accordance with ASCE 7-10 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) = OSP-0101-10
Ω₀ (System overstrength factor) =
Cd (Deflection amplification factor) = BY: Timothy J Piland
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): Rack drawings
OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2022
Signature: Date: December 18, 2019
Print Name: Timothy J. Piland Title: SSE
Special Seismic Certification Valid Up to: Sps (g) = See Above z/h = See Above
Condition of Approval (if applicable): Rack mounted units may only be installed in the same model rack, as
tested, and cannot exceed the maximum wt. or C.G. as shown on the UUT Sheets.
See rack reference sheet at end of OSP.

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OSHPD

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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1900374-CR-001 R1



Manufacturer: **Vertiv Corporation**

Model Line: Liebert GXT4 and APS Single Phase UPS **TABLE 1**

Certified Product Construction Summary:

Carbon Steel Housing

Certified Options Summary:

Mounting Configuration:

Base Mounted - Rigid in Two Post Rack (See UUT Summaries for directions on installation)

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

Building Code: CBC 2016, IBC 2015		Seismic Certification Limits:				2.0 g z/h=1.0 2.5 g z/h=0.0	/ _P = 1.5
Madalita		Dir	mensions ((in)	Weight		
Model Line	Model ^{1,2,3}	Depth	Width	Height	(lb)	Notes	UUT
	GXT4-500RT120	16.2	16.9	3.4	40	Input AC - 120 VAC	Extrap.
	GXT4-700RT120	16.2	16.9	3.4	40	Input AC - 120 VAC	Extrap.
	GXT4-1000RT120	16.2	16.9	3.4	40	Input AC - 120 VAC	Extrap.
	GXT4-1500RT120	19.7 T	16.9 Y	3.4	and ₅₅	Input AC - 120 VAC	Extrap.
	GXT4-2000RT120	19.5	16.9	3.5	59	Input AC - 120 VAC	1
LIST OF CALLIDO	GXT4-3000RT120	23.7 E	: 116.918	/ 23.41.9	71	Input AC - 120 VAC	Interp.
Liebert GXT4 UPS	GXT4-3000RT208	24	16.9	3.5	80	Input AC - 115-280 VAC	2
	GXT4-5000RT208	28	16.9	6.9	141	Input AC - 120/208 VAC	3
	GXT4-6000RT208	26.1	16.9	6.9	132	Input AC - 120/208 VAC	Interp.
	GXT4-6000RTL630	22.6	16.9	8.5	132	Input AC - 208 VAC	Interp.
	GXT4-8000RT208	26.5	16.9 D	I 10.3	213	Input AC - 120/208 VAC	Interp.
,	GXT4-10000RT208	26.5	17	10.5	236	Input AC - 120/208 VAC	4
	GXT4-48VBATT	19.5	16.9	3.5	71		5
	GXT4-72VBATT	23.5	16.9	3.5	97		6
Liebert GXT4 External	GXT4-144VBATT	26	16.9	3.4	106		7
Battery Cabinets -	GXT4-240VBATT	22.6	16.9	6.8	143		Interp.
	GXT4-288VBATT	26.1	16.9	6.9	184		8
Liebert APS AS5 Series UPS - 10 Bay	AS5	32	17.25	27.5	531		21B
Liebert Rack MPH2	MPHB6224	10	19	3.5	23		23
Rack PDU	MPHB2341	10.5	19	1.75	8		24
Notes:							-

Maximum center of gravity height of configured rack: 38" for AS5

See UTT Summary for center of gravity height limit per component.

Maximum center of gravity height of configured rack: 36" for GXT4, MPH, and MP2

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1900374-CR-001 R1



Manufacturer:	Vertiv Corporation	TABLE 1
Model Line:	Liebert GXT4 and APS Single Phase UPS	IADLE I

Certified Product Construction Summary:

Carbon Steel Housing

Certified Options Summary:

Mounting Configuration:

Base Mounted - Rigid in Two Post Rack (See UUT Summaries for directions on installation)

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

Building Code: CBC 20	016, IBC 2015	Seismic Certification	n Limits:	2.5 g z/h=0.0	/ _P = 1.5
Model Line	Model ^{1,2,3}	Dimensions (i		Notes	UUT

Model Line	Model ^{1,2,3}	Dimensions (in)			Weight	Notes	UUT
Model Lille	Model	Depth	Width	Height	(lb)	Notes	001
Libert Rack Mounted MicroPod	MP2-115A	3 0	SP 15)1(1-3 <u>1</u> 50	7	Z C I	28
	R					[2]	
		BY:T	imothy	J Pil	and	0	
		WWW.XXXXXX	MAAAAXXYYVAAAAAA				
	12	DATE	: 12/18	/2019		9 7	
	T T					0	
	H					/	
		PN		8	D ⁽³⁾		
		TA	William William		COX		
			$g_{I}IIII$	ING			

Notes

¹ See UTT Summary for center of gravity height limit per component.

² Maximum center of gravity height of configured rack: 36" for GXT4, MPH, and MP2

³ Maximum center of gravity height of configured rack: 38" for AS5

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX





Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

TABLE 2

Certified Product Construction Summary:

Carbon Steel Housing

Certified Options Summary:

Transformer free model

Mounting Configuration:

Base Mounted - Rigid (See UUT Summaries for directions on installation)

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

Building Code: CBC 2016, IBC 2015	Seismic Certification Limits: S _{DS} = 2.0 g z/h=1.0)
	$S_{DS} = 2.5 g z/h = 0.0$)

		3	mensions	(i.e.)		2.5 g 2/H=0.0		
Model Line	Model				Weight	Notes	UUT	
	(27)	Depth	Width	Height	(lb)			
Liebert APS AS5 Series UPS - 10 Bay	AS5	32	SP-01 17.25	1-10 27.5	531	Input AC - 200/208/220/ 230/240V; Single Phase Transformer free	21A	
Liebert APS AS6 Series UPS - 16 Bay	AS6	33.5 DATE	17.25 : 12/18	38.25 38.25	and 838	Input AC - 200/208/220/ 230/240V; Single Phase Transformer free	22	
Liebert APS External Battery Cabinet-16 Bay	EBC	28	17.25	38.13	755	V	20	
Liebert GXT4 UPS	GXT4-10000RT208-GE	27.5	14.38	21	268		29	
			$g_{I}IIII$	ING				

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

COMPLIAN

1900374-CR-001 R1

Manufacturer: **Vertiv Corporation** Table Description: Power Distribution Boxes **TABLE 3** Liebert GXT4 and APS Single Phase UPS Model Line: $S_{DS} = 2.0 g z/h = 1.0$ Building Code: CBC 2016, IBC 2015 $I_P = 1.5$ Seismic Certification Limits: $S_{DS} = 2.5 g z/h = 0.0$ Dimension (in) Weight **Model Line** Material Model **Notes** UUT (Manufacturer) √(lb) (Height Depth Width **Liebert Power** Distribution Boxes for 4, 21A, Carbon Steel Casing 8000 VA and 10000 VA 5.7 PD2-104 1.0 7.4 21B, 22 Models (Vertiv)

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1900374-CR-001 R1



Manufacturer:
Model Line:Vertiv CorporationTable Description:Internal BatteriesModel Line:Liebert GXT4 and APS Single Phase UPS

Building Code: CBC 2016, IBC 2015 Seismic Certification Limits: $S_{DS} = 2.0 \text{ g} \quad \text{z/h} = 1.0$ $S_{DS} = 2.0 \text{ g} \quad \text{z/h} = 0.0$

		$S_{DS} = 2.5 g z/h = 0.0$								
Model Line (Manufacturer)	Model	-	mension (Weight	Material	Notes	UUT		
(Manufacturer)	0)/7 / 5 / / 00 / 7 / 7	Depth	Width	Height	OF(lb) C	ODE	0/7, 500/700/10007700//			
	GXT4-5A48BATKIT	9.8	9.7	4.5	20.2	Carbon Steel Casing	GXT4-500/700/1000RT120; (lead acid)	Extrap		
Liebert Internal	GXT4-9A48BATKIT	12.9	8.2	3.5	28	Carbon Steel Casing	GXT4-1500/2000RT120; (lead acid)	5		
Batteries - GXT4	GXT4-9A72BATKIT	18	13.2	8	40.8	Carbon Steel Casing	GXT4-3000RT120/RT208; (lead acid)	6		
(Vertiv)	GXT4-144VBATKIT	19.3	8.1	2.8	75.8	Carbon Steel Casing	GXT4-5000/6000RT208; (lead acid)	7		
(VCI LIV)	GXT4-240VBATKIT	15.4	7.27	4.4	45.4	Carbon Steel Casing	GXT4-6000RTL630; (lead acid)	Interp		
	GXT4-288VBATKIT	19.7	8.1	5.3	71.1	Carbon Steel Casing	GXT4-8000/10000RT208; (lead acid)	8		
				BY:	l'imoth	y J Piland				
			W.	(XXXXVVVVV	MAAAAAA YYYVIAAA					
			7	/// DAT	E:12/1	8/2019				
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			17							
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Manufacture Model Line:	vertiv Corporation Liebert GXT4 and APS	Single Phase UPS				
UUT	Unit Description	Report Number	Testing Laboratory	S _{DS}	z/h	I _P
1	GXT4-2000RT120 2-Post Configuration	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.33 2.75	1.0 0.0	1.5
2	GXT4-3000RT208 2-Post Configuration	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.33 2.75	1.0 0.0	1.5
3	GXT4-5000RT208 2-Post Configuration	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.33 2.75	1.0 0.0	1.5
4	GXT4-10000RT208 2-Post Configuration	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.33 2.75	1.0 0.0	1.5
5	GXT4-48VBATT 2-Post Configuration	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.33 2.75	1.0 0.0	1.5
6	GXT4-72VBATT 2-Post Configuration	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.33 2.75	1.0 0.0	1.5
7	GXT4-144VBATT 2-Post Configuration	OSP-0101-10 Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.33 2.75	1.0 0.0	1.5
8	GXT4-288VBATT 2-Post Configuration	BY: Timothy J Pi Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.33 2.75	1.0 0.0	1.5
20	Liebert APS EBC Base mounted- rigid	DATE: 12/18/201 Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.11 3.15	1.0 0.0	1.5
21A	Liebert APS AS5 Series Base mounted-Rigid	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.43 2.64	1.0 0.0	1.5
21B	Liebert APS AS5 Series 2-Post Configuration	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.09 3.25	1.0 0.0	1.5
22	AS6A1RCJGNNX223 Base mounted-Rigid	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.11 3.15	1.0 0.0	1.5
23	MPHB6224 2-Post Configuration	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.33 2.75	1.0 0.0	1.5
24	MPHB2341 2-Post Configuration	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.33 2.75	1.0 0.0	1.5
28	MP2-115A 2-Post Configuration	Q18601.0, Rev.0	QualTech-NP Curtiss-Wright	2.33 2.75	1.0	1.5
29	GXT4-10000RT208-GE Base Mounted-Rigid	JID 19-00422, Rev.1	Clark Dynamic Test Laboratory, Inc.	2.0 2.5	1.0 0	1.5

Notes:

UUT 21 was tested twice, first in a 2-Post Rack configuration, and then base mounted-rigid.

1900374-CR-001 R1



UUT 1

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: GXT4-2000RT120 Serial Number: 1712300555AFBB3

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

	UUT Properties									
Weight		Dimension (in)	Lowest Natural Frequency (Hz)							
(lb)	Depth	Width	\mathcal{R} Height \mathcal{E}	Front-Back	Side-Side	Vertical				
59	19-1/2	16-7/8	3-1/2	7.20	5.72	>33				
	UUT Highest Passed Seismic Run Information									
Buildi	Building Code Test Criteri			z/h I _P	A _{FLX-H} (g) A _{RIG-H} (g	$A_{FLX-V}(g)$ $A_{RIG-V}(g)$				

Building Code	Test Criteria —	S _{DS} (g)	z/h	IP	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	$A_{RIG-V}(g)$
CBC 2016, IBC 2015	A ICC ES ACIEGO O	2.33	1.0	1.5	2 72	2.80	1.84	0.74
	ICC-ES AC156SP-01	2.75	0.0	1.5	3.13	2.80	1.84	0.74

Test Mounting Details:



UUT 1 was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post rack was base mounted-rigid to the shake table with four (4) 5/8"-11 Grade 8 hex bolts, plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 1 was attached to the 2-Post rack with a 2U TELECOMRKIT. The kit contains two brackets, each bracket was secured to the rack with eight (8) #12 screws that are supplied with the kit. The UUT was secured to the bracket with eight (8) M4 screws that are supplied with the UPS.





Manufacturer: **Vertiv Corporation UUT 1** Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: GXT4-2000RT120 Serial Number: 1712300555AFBB3 Product Rack Configuration Summary: Rack Configuration 1A: <u>2 Past Rack</u> Height Weight (in.) (lbs.) on Rack on Rack RMU 84 UUT28 80.25 43 7 78.5 MicroPod 42 UUT24 41 8 76.75 75 **UUT 23** 40 23 **UUT 1** MPHB6224 73.25 39 Model Number: GXT4-2000 71.5 UUT 1 38 59 GXT4-2000 37 UUT Weight (lbs.): 59 69.75 68 UUT 5 36 Total UUT Weight (lbs.): 1012 71 GXT4-48VBATT 66.25 35 Rack Weight (lbs.): 30 UUT 2 34 64.5 Total Weight (lbs.): 1042 80 GXT4-3000 33 62.75 Overall Height (in.): 84 **UUT 6** 32/27 61 97 Center of Gravity for UUT (in.): 69.75 as limit 59.25 GXT4-72VBATT 310 Overall CG Height (in.) = 36 57.5 30 55.75 29 28 27 52.25 26 50.5 25 48.75 24 47 45.25 23 22 43.5 21 41.75 40 20 19 38.25 36.5 18 34.75 17 16 33 31.25 UUT 3 15 141 29.5 14 GTX4-5000 27.75 13 UUT 7 12 26 106 24.25 11 GXT4-144VBATT 22.5 10 20.75 UUT 4 19 GXT4-10000 236 17.25 15.5 13.75 12 **UUT8** 10.25 184 8.5 GTX4-288VBATT 6.75 5

1900374-CR-001 R1



UUT 2

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: GXT4-3000RT208 Serial Number: 1723400325AFBD3

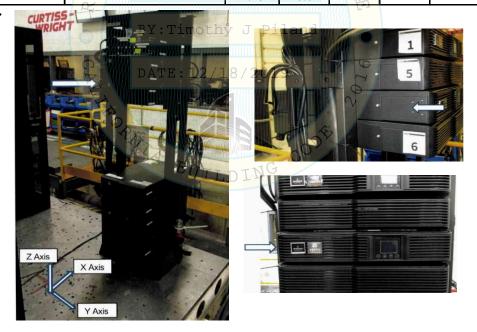
Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

			UUT Properties						
Weight		Dimension (in)	oor Properties		Lowes	st Natural	Frequen	ıcy (Hz)	
(lb)	Depth	Width	Front-Back S		Side	-Side	Vertical		
80	24	16-7/8 3-1/2 7.20		.20	5.	72	>	33	
		UUT Highest F	Passed Seismic Rui	n Inform	ation	-			
Buildi	ing Code	Test Criter	ia S _{DS} (g)	z/h	Ip	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (§
CDC 201	6 IBC 201E	ICC-ES AC1	2.33	1.0	1.5	3.73	2.00	1.84	0.74
CBC 201	6, IBC 2015	LT ICC-ES ACI	DOSP - U + U + - 1 C	0.0	10	3.13	2.80	1.64	0.74

Test Mounting Details:



UUT 2 was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post rack was base mounted-rigid to the shake table with four (4) 5/8"-11 Grade 8 hex bolts, plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 2 was attached to the 2-Post rack with a 2U TELECOMRKIT. The kit contains two brackets, each bracket was secured to the rack with eight (8) #12 screws that are supplied with the kit. The UUT was secured to the bracket with eight (8) M4 screws that are supplied with the UPS.

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Manufacturer: **Vertiv Corporation** UUT 2 Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: GXT4-3000RT208 Serial Number: 1723400325AFBD3 Product Rack Configuration Summary: Rack Configuration 1A: <u>2 Past Rack</u> Height Position (lbs.) (in.) on Rack on Rack RMU 84 UUT28 80.25 43 7 78.5 MicroPod 42 UUT24 41 **UUT 2** 76.75 8 **UUT 23** 75 40 Model Number: GXT4-3000 23 73.25 MPHB6224 39 UUT Weight (lbs.): 80 UUT 1 38 71.5 59 Total UUT Weight (lbs.): 1012 GXT4-2000 37 69.75 Rack Weight (lbs.): 30 UUT 5 36 68 71 Total Weight (lbs.): 1042 GXT4-48VBATT 35 66,25 Overall Height (in.): 84 64.5 **UUT 2** 34 08 Center of Gravity for UUT (in.): 62.75 as limit 62.75 GXT4-3000 33 Overall CG Height (in.) = 36 61 **UUT 6** 32 GXT4-72VBATT 59.25 31 57.5 30 55.75 29) 54 28 52.25 27/ 50.5 26 25 48.75 47 24 23 45.25 43.5 22 41.75 21 40 20 38.25 19 18 36.5 34.75 17 33 16 31.25 UUT 3 15 141 29.5 14 GTX4-5000 27.75 13 26 12 106 24.25 GXT4-144VBATT 22.5 10 20.75 **UUT 4** 19 GXT4-10000 236 17.25 15.5 13.75 12 **UUT8** 10.25 184 2 8.5 GTX4-288VBATT 6.75 5

1900374-CR-001 R1



UUT3

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: GXT4-5000RT208 Serial Number: 1716902401BW923

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

			UUT Pro	perties						
Weight		Dimension (in)				Lowes	t Natural	Frequen	cy (Hz)	
(lb)	Depth Width Height R				Front-Back Side-Sid		-Side	. Vertical		
141	28 16-7/8 6-7/8			COLT	.20	5.	72	>33		
		UUT Highest I	Passed Se	ismic Rui	Inform	ation				
Buildi	ing Code	Test Criter	ia D1	S _{DS} (g)	z/h	Ip	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CDC 2016 IDC 2015		A ICC ES ACI	ECOD O	2.33	1.0	1,5	3.73	2.80	1.84	0.74
CBC 2010	CBC 2016, IBC 2015	ICC-ES AC156SP-01		2.75	0.0	1.5	3.13	2.80	1.84	0.74

Test Mounting Details:







UUT 3 was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post rack was base mounted-rigid to the shake table with four (4) 5/8"-11 Grade 8 hex bolt, plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 3 was attached to the 2-Post rack with a 4U TELECOMRKIT. The kit contains two brackets, each bracket was secured to the rack with sixteen (16) #12 screws that are supplied with the kit. The UUT was secured to the bracket with eight (8) M4 screws that are supplied with the UPS.

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Manufacturer: **Vertiv Corporation** UUT3 Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: GXT4-5000RT208 Serial Number: 1716902401BW923 Product Rack Configuration Summary: Height Rack Configuration 1A: <u>2Past Rack</u> Weight (in.) (lbs.) on Rack on Rack RMU 84 80.25 UUT28 43 7 MicroPod 42 78.5 76.75 **UUT24** 41 75 **UUT 23** 40 23 73.25 MPHB6224 39 71.5 UUT 1 38 59 GXT4-2000 37 69.75 36 68 UUT 5 71 GXT4-48VBATT 66.25 35 **UUT 2** 34 64.5 08 62.75 GXT4-3000 33 **UUT 6** 32 61 GXT4-72VBATT 59.25 31 Timothy J Piland 57.5 30 55.75 29 28-52.25 27 DATE: 12/18/2019 26 50.5 48.75 25 47 24 45.25 23 22 43.5 41.75 21 40 20 UUT 3 19 38.25 Model Number: GXT4-5000 36.5 18 UUT Weight (lbs.): 141 34.75 17 33 16 Total UUT Weight (lbs.): 1012 UUT 3 31.25 15 Rack Weight (lbs.): 30 141 29.5 14 GTX4-5000 Total Weight (lbs.): 1042 13 27.75 Overall Height (in.): 84 UUT 7 26 12 106 24.25 GXT4-144VBATT 11 Center of Gravity for UUT (in.): 29.5 as limit 22.5 10 Overall CG Height (in.) = 36 20.75 **UUT 4** 19 GXT4-10000 236 17.25 15.5 13.75 12 **UUT8** 10.25 184 8.5 GTX4-288VBATT 6.75 5

1900374-CR-001 R1



UUT 4

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: GXT4-10000RT208 **Serial Number:** 1723502372BW953

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

			UUT Pro	perties						
Weight Dimension (in) Lowest Natural Frequency (Hz)										
(lb)	Depth	Depth Width Height				Front-Back Side-Side		-Side	Vertical	
236	26-1/2 17 10-1/2				7.20		5.72		>33	
		UUT Highest H	Passed Se	ismic Rui	n Inform	ation				
Buildi	ng Code	Test Criter	ia D1	S _{DS} (g)	z/h	Ip	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 201	6 IDC 2015	ICC-ES AC156SP-0		2.33	1.0	1.5	3.73	2.80	1.84	0.74
CBC 2010	CBC 2016, IBC 2015			2.75	0.0	1.5	3.13	2.80	1.84	0.74

Test Mounting Details:







UUT 4 was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post rack was base mounted-rigid to the shake table with four (4) 5/8"-11 Grade 8 hex bolts, plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 4 was attached to the 2-Post rack with a 4U TELECOMRKIT. The kit contains two brackets, each bracket was secured to the rack with sixteen (16) #12 screws that are supplied with the kit. The UUT was secured to the bracket with eight (8) M4 screws that are supplied with the UPS.

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Manufacturer: **Vertiv Corporation UUT 4** Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: GXT4-10000RT208 Serial Number: 1723502372BW953 Product Rack Configuration Summary: Rack Configuration 1A: <u>2 Past Rack</u> Weight Position Position (lbs.) (in.) on Rack on Rack RMU 84 UUT28 80.25 43 7 78.5 MicroPod UUT24 41 76.75 8 **UUT 23** 40 75 23 73.25 MPHB6224 39 71.5 **UUT 1** 38 59 69.75 GXT4-2000 37 UUT 5 36 68 71 66.25 GXT4-48VBATT 35 64.5 **UUT 2** 34 08 GXT4-3000 33 62.75 **UUT 6** 32 0 61 97 GXT4-72VBATT 59.25 31 30 57.5 29 55.75 28 54 52.25 27 26 50.5 48.75 25 24 47 23 45.25 43.5 22 21 41.75 20 40 19 38.25 36.5 18 34.75 17 UUT 4 16 33 31.25 UUT 3 15 Model Number: GXT4-10000 141 29.5 14 GTX4-5000 UUT Weight (lbs.): 236 27.75 13 Total UUT Weight (lbs.): 1012 UUT 7 26 12 106 24.25 11 GXT4-144VBATT Rack Weight (lbs.): 30 22.5 Total Weight (lbs.): 1042 20.75 **UUT 4** Overall Height (in.): 84 19 GXT4-10000 236 17.25 Center of Gravity for UUT (in.): 17.25 as limit 15.5 Overall CG Height (in.) = 36 13.75 12 **UUT8** 10.25 184 GTX4-288VBATT 6.75

1900374-CR-001 R1



UUT 5

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: GXT4-48VBATT Serial Number: 1716500039AGC73

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

GXT4-9A48BATKIT

	UUT Properties								
Weight		Dimension (in)		Lowest	t Natural Frequen	cy (Hz)			
(lb)	Depth	Width	R Height E	Front-Back Side-Side Ve					
71	19-1/2	16-7/8	3-1/2	7.20	5.72	>33			
				1/2					

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria 1	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016, IBC 2015	ICC-ES AC156SP-0	2.33	1.0	1.5	2 72	2.80	1.84	0.74
CBC 2016, IBC 2015	RI ICC-ES ACISOS P - 0	2.75	0.0	1.5	3.73	2.00	1.04	0.74

Test Mounting Details:







UUT 5 was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post rack was base mounted-rigid to the shake table with four (4) 5/8"-11 Grade 8 hex bolts, plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 5 was attached to the 2-Post rack with a 2U TELECOMRKIT. The kit contains two brackets, each bracket was secured to the rack with eight (8) #12 screws that are supplied with the kit. The UUT was secured to the bracket with eight (8) M4 screws that are supplied with the UPS.

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Manufacturer: **Vertiv Corporation** UUT 5 Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: GXT4-48VBATT **Serial Number:** 1716500039AGC73 Product Rack Configuration Summary: Rack Configuration 1A: <u>2 Post Rack</u> Height Position (lbs.) (in.) on Rack on Rack RMU 84 UUT28 80.25 43 7 MicroPod 78.5 42 **UUT24** 41 76.75 8 75 **UUT 23** 40 23 MPHB6224 39 73.25 UUT 5D F **UUT 1** 38 71.5 Model Number: GXT4-48VBATT 59 GXT4-2000 37 69.75 UUT Weight (lbs.): 71 68 UUT 5 36 Total UUT Weight (lbs.): 1012 71 GXT4-48VBATT 35 66.25 Rack Weight (lbs.): 30 UUT 2 64.5 34 08 Total Weight (lbs.): 1042 62.75 GXT4-3000 33 Overall Height (in.): 84 **UUT 6** 32 61 Center of Gravity for UUT (in.): 66.25 as limit GXT4-72VBATT 31 59.25 30 57.5 Overall CG Height (in.) = 36 55.75 29 28 54 52.25 27 50.5 26 25 48.75 24 47 45.25 23 22 43.5 21 41.75 40 20 38.25 19 18 36.5 34.75 17 33 31,25 UUT 3 15 141 29.5 14 GTX4-5000 13 27.75 UUT 7 12 26 106 24.25 GXT4-144VBATT 11 22.5 10 20.75 **UUT 4** 19 GXT4-10000 236 17.25 15.5 13.75 12 **UUT8** 10.25 184 8.5 GTX4-288VBATT 6.75 5

1900374-CR-001 R1



UUT 6

Manufacturer: **Vertiv Corporation**

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: GXT4-72VBATT **Serial Number:** 1715200425ADC83

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

GXT4-9A72BATKIT

	UUT Properties									
Weight	Dimension (in) Lowest Natural Frequency (Hz)									
(lb)	Depth	Width	R Height E	Front-Back	Side-Side	Vertical				
97	23-1/2	16-7/8	3-1/2	7.20	5.72	>33				
	UUT Highest Passed Seismic Run Information									

Building Code	Test Criteria 1	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016, IBC 2015	ICC-ES AC156SP-0	2.33	1.0	1.5	2 72	2.80	1.84	0.74
CBC 2016, IBC 2015	RI ICC-ES ACISOS P - 0	2.75	0.0	1.5	3.73	2.00	1.04	0.74

Test Mounting Details:







UUT 6 was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post rack was base mounted-rigid to the shake table with four (4) 5/8"-11 Grade 8 hex bolts with plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 6 was attached to the 2-Post rack with a 2U TELECOMRKIT. The kit contains two brackets, each bracket was secured to the rack with eight (8) #12 screws that are supplied with the kit. The UUT was secured to the bracket with eight (8) M4 screws that are supplied with the UPS.





Manufacturer: **Vertiv Corporation UUT 6** Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: GXT4-72VBATT **Serial Number:** 1715200425ADC83 Product Rack Configuration Summary: Rack Configuration 1A: <u>2Past Rack</u> Height Weight (in.) (lbs.) on Rack on Rack RMU 24 UUT28 80.25 7 MicroPod 78.5 42 **UUT24** 41 76.75 8 **UUT 23** 40 75 23 MPHB6224 39 73.25 71.5 **UUT 1** 38 59 GXT4-2000 37 69.75 68 UUT 5 36 71 UUT 6 GXT4-48VBATT 66.25 Model Number: GXT4-72VBATT 64.5 UUT 2 34 80 UUT Weight (lbs.): 97 62.75 GXT4-3000 33 Total UUT Weight (lbs.): 1012 **UUT 6** 32 61 59.25 GXT4-72VBATT Rack Weight (lbs.): 30 57.5 30 Total Weight (lbs.): 1042 55.75 29 Overall Height (in.): 84 54 28 27 52.25 Center of Gravity for UUT (in.): 59.25 as limit DATE: 50.5 26 Overall CG Height (in.) = 36 25 48.75 47 24 23 45.25 22 43.5 21 41.75 20 40 38.25 19 36.5 18 34.75 16 33 31.25 UUT 3 15 141 29.5 14 GTX4-5000 27.75 13 26 UUT 7 12 106 24.25 GXT4-144VBATT 22.5 20.75 **UUT 4** 19 236 GXT4-10000 17.25 15.5 13.75 12 **UUT8** 10.25 184 8.5 GTX4-288VBATT 6.75 5

1900374-CR-001 R1



UUT 7

Manufacturer: **Vertiv Corporation**

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: GXT4-144VBATT **Serial Number:** 1705000062BY983

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

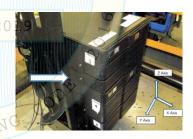
GXT4-144VBATKIT

	UUT Properties									
Weight		Dimension (in)		Lowest	t Natural Frequer	ncy (Hz)				
(lb)	Depth	Width	R Height E	Front-Back	Side-Side	Vertical				
106	26	16-7/8	3-3/8	7.20	5.72	>33				
	UUT Highest Passed Seismic Run Information									

Building Code	Test Criteria 1	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016, IBC 2015	ICC-ES AC156SP-0	2.33	1.0	1.5	2 72	2.80	1.84	0.74
CBC 2016, IBC 2015	RI ICC-ES ACISOS P - 0	2.75	0.0	1.5	3.73	2.00	1.04	0.74

Test Mounting Details:







UUT 7 was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post rack was base mounted-rigid to the shake table with four (4) 5/8"-11 Grade 8 hex bolts, plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 7 was attached to the 2-Post rack with a 2U TELECOMRKIT. The kit contains two brackets, each bracket was secured to the rack with eight (8) #12 screws that are supplied with the kit. The UUT was secured to the bracket with eight (8) M4 screws that are supplied with the UPS.

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Manufacturer: **Vertiv Corporation UUT 7** Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: GXT4-144VBATT **Serial Number:** 1705000062BY983 Product Rack Configuration Summary: Weight Height Rack Configuration 1A: <u>2 Past Rack</u> (in.) Position Position on Rack on Rack 84 RMU 80.25 UUT28 7 78.5 MicroPod 42 **UUT24** 41 76.75 8 **UUT 23** 40 75 23 MPHB6224 39 73.25 71.5 **UUT 1** 59 GXT4-2000 37 69.75 88 UUT 5 36 71 66.25 GXT4-48VBATT 35 **UUT 2** 34 64.5 08 62.75 GXT4-3000 33 32 A **UUT 6** 61 97 GXT4-72VBATT 59.25 57.5 30 55.75 29 28 54 52.25 27 26 50.5 48.75 25 24 47 23 45.25 43.5 22 21 41.75 40 20 38.25 19 36.5 18 **UUT 7** 34.75 16 33 Model Number: GXT4-144VBATT 31.25 UUT 3 15 141 UUT Weight (lbs.): 106 14 29.5 GTX4-5000 Total UUT Weight (lbs.): 1012 27.75 UUT 7 26 Rack Weight (lbs.): 30 106 24.25 GXT4-144VBATT Total Weight (lbs.): 1042 22.5 Overall Height (in.): 84 **UUT 4** 20.75 19 Center of Gravity for UUT(in.): 24.24 as limit GXT4-10000 236 17.25 Overall CG Height (in.) = 36 15.5 13.75 12 UUT 8 10.25 184 8.5 GTX4-288VBATT 6.75 5

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UUT8

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: GXT4-288VBATT Serial Number: 17185000066BY993

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

GXT4-288VBATKIT

	UUT Properties									
Weight		Dimension (in)		Lowes	t Natural Frequer	ncy (Hz)				
(lb)	Depth	Width	R Height E	Front-Back Side-Side Ve						
184	26-1/8	16-7/8	6-7/8	7.20	5.72	>33				

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria 1	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016, IBC 2015	ICC-ES AC156SP-0	2.33	1.0	1.5	2 72	2.8	1.84	0.74
CBC 2016, IBC 2015	RI ICC-ES ACISOS P - 0	2.75	0.0	1.5	3.73	2.0	1.04	0.74

Test Mounting Details:







UUT 8 was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post rack was base mounted-rigid to the shake table with four (4) 5/8"-11 Grade 8 hex bolts, plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 8 was attached to the 2-Post rack with a 4U TELECOMRKIT. The kit contains two brackets, each bracket was secured to the rack with sixteen (16) #12 screws that are supplied with the kit. The UUT was secured to the bracket with eight (8) M4 screws that are supplied with the UPS.

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Manufacturer: **Vertiv Corporation UUT8** Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: GXT4-288VBATT **Serial Number:** 17185000066BY993 Product Rack Configuration Summary: Height Rack Configuration 1A: 2Past Rack (in.) (lbs.) on Rack 84 RMU UUT28 80.25 43 78.5 MicroPod 42 UUT24 41 76.75 8 **UUT 23** 40 75 23 73.25 MPHB6224 39 **UUT 1** 38 71.5 59 69.75 GXT4-2000 37 68 UUT 5 36 71 GXT4-48VBATT 35 66.25 UUT 2 64.5 34 08 GXT4-3000 33 62,75 **UUT 6** 32 61 59.25 GXT4-72VBATT 31 57.5 30 29 55.75 28 54 27 52.25 26 50.5 25 48.75 47 24 23 45.25 43.5 22 21 41.75 20 40 19 38.25 18 36.5 34.75 17 16 33 31.25 UUT 3 15 141 14 29.5 GTX4-5000 13 27.75 **UUT 8** UUT 7 26 12 106 Model Number: GXT4-288VBATT 24.25 11 GXT4-144VBATT UUT Weight (lbs.): 184 22.5 20.75 UUT 4 Total UUT Weight (lbs.): 1012 19 236 GXT4-10000 Rack Weight (lbs.): 30 17.25 15.5 Total Weight (lbs.): 1042 13.75 Overall Height (in.): 84 12 **UUT 8** Center of Gravity for Configuration (in.): 8.5 as limit 10.25 3 184 8.5 GTX4-288VBATT Overall CG Height (in.) = 36 6.75 5

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UUT 20

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: EBC-16 Bay Serial Number: 1613000009AW113

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

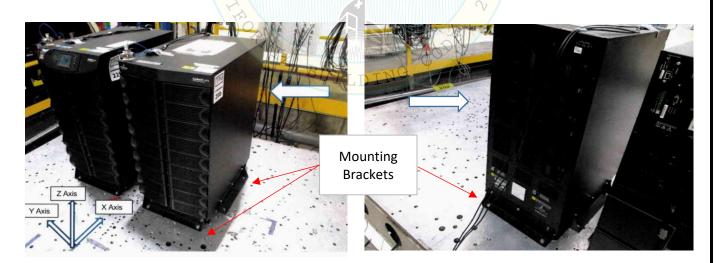
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 <i>'UI</i>	PI	on	en	105

Weight		Dimension (in)	OCHDD	Lowest Natural Frequency (Hz)				
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical		
BC 2016, IBC 201	28	17-1/4	38-1/8	26.17	7.56	23.14		

UUT Highest Passed Seismic Run Information

Building Code	H	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 2016	0	BY: Timoth	2.11 ^{P1}	land 1.0	1.5	2 20	2 52	2 11	0.85	
		ICC-ES AC156	3.15	0.0	1.5	3.38	2.53	2.11	0.65	

Test Mounting Details:



UUT 20 was base mounted-rigid to the shake table using four (4) mounting brackets (P/N 63122695), one on each side of the unit. Mounting brackets are supplied by the manufacturer and affixed to the shake table with two (2) 3/8"-16 Grade 5 hex bolts, lock washer and flat washer. A total of eight (8) 3/8"-16 bolts were used to mount unit to shake table.
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 21A

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: AS5-10 Bay Serial Number: 1725000161AU043

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

Liebert Power Distribution Boxes (PD2-104), Transformer free option

Contents were included in testing per operating conditions.

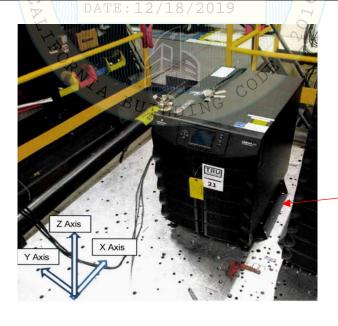
UUT Properties

	Controperties												
Weight		Dimension (in)	OCHDD	Lowest Natural Frequency (Hz)									
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical							
BC 2016, IBC 201	32	17-1/4	27-1/2	23.91	12.59	>33							

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 2016, IBC 2015	BY: Timoth	2.43	land 1.0	1.5	3.89	2.92	1.77	0.71	
		ICC-ES AC136	2.64	0.0	1.5				0.71	

Test Mounting Details:



Mounting Bracket

UUT 21A was base mounted-rigid to the shake table using two (2) mounting brackets (P/N 63122695), one on each side of the unit. Mounting brackets are supplied by the manufacturer and affixed to the shake table with two (2) 3/8"-16 Grade 5 hex bolts, lock washer and flat washer. A total of eight (8) 3/8" -16 bolts were used to mount unit to shake table.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

1900374-CR-001 R1



UUT 21B

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: AS5-10 Bay Serial Number: 1725000161AU043

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

Liebert Power Distribution Boxes (PD2-104), transformer free option

UUT Properties

			o o i i i operaco					
Weight		Dimension (in)	Lowest Natural Frequency (Hz)					
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical		
BC 2016, IBC 201	32	17-1/4	27-1/2	6.96	5.14	>33		

UUT Highest Passed Seismic Run Information

Building Code	H	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)
CPC 2016 IPC 2015		BY: Timoth	2.09	1.0	1.5	3.34	2 51	2 10	0.88
CBC 2016, IBC 2015	ICC-ES AC130		3.25	0.0	1.5	3.34	2.51	2.18	0.88

Test Mounting Details:





Four (4) M4 Screws

UUT 21B was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post racked was mounted to the shake table with four (4) 5/8"-11 Grade 8 hex bolts with plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 21 B was mounted to rack using Rack Solutions Shelf Kit (P/N 2USHL-100) and one and a half (1.5) 2-Post Conversion Brackets (P/N: 2POST-7UKIT) and two Chatsworth rear strap (P/N 12086-719). The unit was affixed to the shelf kit and brackets using eight (8) M4 bolts at each of the units ears.

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Manufacturer: **Vertiv Corporation UUT 21B** Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: AS5-10 Bay Serial Number: 1725000161AU043 Product Rack Configuration Summary: Height Rack Configuration 2: 2 Post Rack (in.) (Ibs.) Position Position on Rack on Rack 84 RMU 80.25 **UUT28** 43 7 78.5 MicroPod 42 76.75 UUT24 41 75 **UUT 23** 40 23 MPHB6224 39 73.25 71.5 **UUT 1** 38 59 69.75 GXT4-2000 37 36 **UUT 5** 68 71 GXT4-48VBATT 35: 66.25 64.5 UUT 2 34 62.75 GXT4-3000 33 UUT 6 32 61 GXT4-72VBATT 59 25 31 57.5 30 55.75 29 28 54 52.25 27 50.5 26 48.75 25 47 24 45 25 23 43.5 22 41.75 21 20 40 38.25 19 **UUT 21B** 36.5 18 17 34.75 Model Number: AS5-10Bay 16 33 UUT Weight (lbs.): 531 31.25 15 Total UUT Weight (lbs.): 876 29.5 14 13 27.75 Rack Weight (lbs.): 30 12 26 Total Weight (lbs.): 906 24.25 11 22.5 10 Overall Height (in.): 84 **UUT 21B** 531 20.75 AS5-10Bay Center of Gravity for UUT (in.): 20.75 as limit 8 19 17.25 Overall CG Height (in.) = 38.6 15.5 5 13.75 12 3 10.25 2 8.5 6.75 5

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UUT 22

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: AS6-16 Bay Serial Number: 1703800256AU053

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

Liebert Power Distribution Boxes (PD2-104), transformer free option

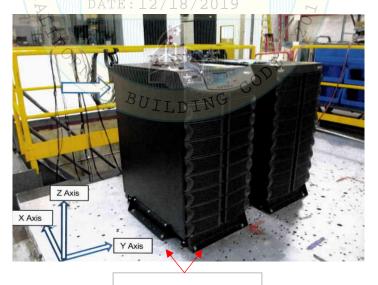
UUT Properties

Weight		Dimension (in)	OCHDD	Lowest Natural Frequency (Hz)				
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical		
BC 2016, IBC 201	33-1/2	17-1/4	38-1/4	9.92	14.72	30.85		

UUT Highest Passed Seismic Run Information

	Building Code	H	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 2016, IBC 2015		BY: Timoth	2.11 ^{P1}	land 1.0	1.5	2 20	2 52	2 11	0.85
		ICC-ES AC156		3.15	0.0	1.5	3.38	2.53	2.11	0.85

Test Mounting Details:



Mounting Brackets

UUT 22 was base mounted-rigid to the shake table using four (4) mounting brackets (P/N 63122695), one on each side of the unit. Mounting brackets are supplied by the manufacturer and affixed to the shake table with two (2) 3/8"-16 Grade 5 hex bolts, lock washer and flat washer. A total of eight (8) 3/8" -16 bolts were used to mount unit to shake table.

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UUT 23

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: MPHB6224 Serial Number: V16J2600147

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

			UUT Pro	perties							
Weight		Dimension (in)	Dimension (in)			Lowest Natural Frequency (Hz)					
(lb)	Depth	Width	th Height Front-Back Side-Side						Vertical		
23	10	19 3-1/2				.20	5.	72	>	33	
		UUT Highest H	Passed Se	ismic Rui	Inform	ation					
Buildi	ng Code	Test Criter	ia D1	S _{DS} (g)	z/h	IP	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
CPC 201/	6 IBC 2015	ICC-ES AC156SD = 01		2.33	1.0	1.5	3 73	2.8	1 84	0.74	

Test Mounting Details:

BY:Timothy J Pilap

Four (4) M4 Screws

DATE: 12/18/2019





UUT 23 was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post rack was base mounted-rigid to the shake table with four (4) 5/8"-11 Grade 8 hex bolts with plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 23 was attached to the 2-Post rack using four (4) M4 screws at it ears.

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Manufacturer: **Vertiv Corporation UUT 23** Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: MPHB6224 Serial Number: V16J2600147 Product Rack Configuration Summary: Rack Configuration 1A: <u>2Past Rack</u> (in.) Position on Rack on Rack **UUT 23** RMU 84 Model Number: MPHB6224 UUT28 43 80.25 7 UUT Weight (lbs.): 23 MicroPod 78.5 42 **UUT24** 76.75 41 8 Total UUT Weight (lbs.): 1012 75 **UUT 23** 40 Rack Weight (lbs.): 30 23 MPHB6224 39 73.25 Total Weight (lbs.): 1042 71.5 **UUT 1** 38 59 Overall Height (in.): 84 69.75 GXT4-2000 37 Center of Gravity for UUT(in.): 73.25" limit **UUT 5** 36 68 71 Overall CG Height (in.) = 36 GXT4-48VBATT 35 66.25 UUT 2 34 64.5 08 OSP-0101-10 GXT4-3000 33/27 62.75 **UUT 6** 32 61 97 GXT4-72VBATT 59.25 31 57.5 30 29 55.75 28 54 52.25 27 50.5 26 25 48.75 47 24 45.25 23 22 43.5 41.75 21 20 40 38.25 19 18 36.5 34.75 17 33 16 15 31.25 UUT 3 141 14 29.5 GTX4-5000 27.75 13 UUT 7 12 26 106 24.25 GXT4-144VBATT 10 22.5 20,75 UUT 4 19 236 GXT4-10000 17.25 15.5 13.75 12 **UUT8** 10.25 184 2 8.5 GTX4-288VBATT 6.75 5

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UUT 24

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: MPHB2341 Serial Number: V16E2600129

Product Construction Summary:

Carbon Steel Casing

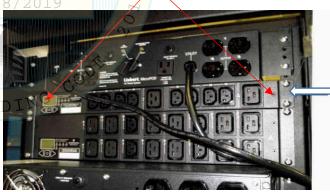
Options/Subcomponent Summary:

UUT Properties										
Weight	Dimension (in)				Lowest Natural Frequency (Hz)					
(lb)	(lb) Depth Width Height					t-Back	Side	-Side	Vertical	
8	10-1/2 19			3/4	7.20		5.72		>33	
		UUT Highest H	Passed Se	eismic Rui	n Inform	ation				
Buildi	ing Code	Test Criter	ia 201	S _{DS} (g)	z/h	Ip	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 201	6 IBC 201E	ICC-ES AC156SP-03		2.33	1.0	1.5	2.72	2.8	1 04	0.74
CBC 201	CBC 2016, IBC 2015			2.75	0.0	1.5	3.73	2.8	1.84	0.74

Test Mounting Details:

BY: Timothy J Piland Four (4) M4 Screws





UUT 24 was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post rack was base mounted-rigid to the shake table with four (4) 5/8"-11 Grade 8 hex bolts with plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 24 was attached to the 2-Post rack using four (4) M4 screws at the ears.

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Manufacturer: **Vertiv Corporation UUT 24** Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: MPHB2341 Serial Number: V16E2600129 Product Rack Configuration Summary: Height Rack Configuration 1A: <u>2 Past Rack</u> Weight **UUT 24** (in.) (lbs.) Model Number: MPHB2341 on Rack on Rack UUT Weight (lbs.): 8 84 RMU 80.25 UUT28 Total UUT Weight (lbs.): 1012 7 MicroPod 42 78.5 Rack Weight (lbs.): 30 76.75 **UUT24** 41 8 Total Weight (lbs.): 1042 75 **UUT 23** 40 Overall Height (in.): 84 23 MPHB6224 39 73.25 Center of Gravity for UUT (in.): 75.88" limit **UUT 1** 38 71.5 59 Overall CG Height (in.) = 36 69.75 GXT4-2000 37 **UUT 5** 36 68 71 GXT4-48VBATT 35 66.25 **UUT 2** 34 64.5 08 62.75 GXT4-3000 33 🖂 **UUT 6** 32 61 97 B GXT4-72VBATT 59.25 57.5 30 55.75 29 28 27 52,25 50.5 26 48.75 25 24 47 45.25 23 43.5 22 21 41.75 40 20 38.25 19 18 36.5 17 34.75 33 16 31.25 UUT 3 15 141 29.5 14 GTX4-5000 13 27.75 **UUT 7** 26 12 106 24.25 11 22.5 20.75 **UUT 4** 19 236 GXT4-10000 17.25 15.5 13.75 12 **UUT 8** 10.25 184 8.5 GTX4-288VBATT 6.75 5

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UUT 28

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: MP2-115A Serial Number: 1716100024AG333

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

			UUT Pro	perties						
Weight	Dimension (in)				Lowest Natural Frequency (Hz)					
(lb)	Depth	th Width Height Front-Back Side-Side						-Side	Vertical	
7	3 15 3-1/2				7.20 5.72 >33					33
		UUT Highest H	Passed Se	ismic Rui	n Inform	ation				
Buildi	ing Code	Test Criter	ia 101	S _{DS} (g)	z/h	Ip	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CPC 201	6 IBC 2015	ICC-ES AC156SP=01+		2.33	1.0	1.5	3 73	2.80	1 84	0.74
יוטר אם א	רווו/ וחו ח	I (C-F S AC I S S D = I I F					3/3	1 / 80	1 74	11/4

Test Mounting Details:

BY: Timothy J Piland

Four (4) M4 Screws

DATE: 12/18/2019





UUT 28 was mounted to a 2-Post B-Line (Eaton) Seismic Relay Rack (P/N SB85219084) 19" (W) x 84" (H). The 2-Post rack was base mounted-rigid to the shake table with four (4) 5/8"-11 Grade 8 hex bolts with plate washer (provided with 2-Post rack) and 5/8" lock washers. UUT 28 was attached to the 2-Post rack using four (4) M4 screws at the ears.

1900374-CR-001 R1



Manufacturer: **Vertiv Corporation UUT 28** Model Line: Liebert GXT4 and APS Single Phase UPS Model Number: MP2-115A **Serial Number:** 1716100024AG333 Product Rack Configuration Summary: Height Rack Configuration 1A: 2Past Rack Position **UUT 28** on Rack on Rack RMU Model Number: MP2-115A 84 UUT28 80.25 43 UUT Weight (lbs.): 7 7 78.5 MicroPod 42 Total UUT Weight (lbs.): 1012 UUT24 41 76.75 8 Rack Weight (lbs.): 30 75 **UUT 23** 40 23 Total Weight (lbs.): 1042 MPHB6224 39 73,25 Overall Height (in.): 84 71.5 **UUT 1** 38 59 Center of Gravity for UUT (in.): 78.5 limit GXT4-2000 69.75 37 Overall CG Height (in.) = 36 UUT 5 36 68 71 GXT4-48VBATT 35 66.25 UUT 2 34 64.5 08 GXT4-3000 62.75 33 **UUT 6** 32 61 59.25 GXT4-72VBATT 31 57.5 30 55.75 29 28 54 27 52.25 50.5 26 48.75 25 47 24 45.25 23 22 43.5 21 41.75 40 20 38.25 19 18 36.5 34.75 17 16 33 31.25 UUT 3 15 141 29.5 GTX4-5000 14 27.75 13 UUT 7 12 26 106 24.25 GXT4-144VBATT 11 22.5 10 20.75 **UUT 4** 19 GXT4-10000 236 17.25 15.5 13.75 12 **UUT 8** 10.25 184 2 8.5 GTX4-288VBATT 6.75

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UUT 29

Manufacturer: Vertiv Corporation

Model Line: Liebert GXT4 and APS Single Phase UPS

Model Number: GXT4-10000RT208-GE Serial Number: N/A

Product Construction Summary:

Carbon Steel Casing

Options/Subcomponent Summary:

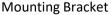
	UUT Properties												
Weight		Dimension (in)		Lowest Natural Frequency (Hz)									
(lb)	Depth	Width	R Height E	Front-Back	Side-Side	Vertical							
268	27.5	14.375	21	29.67	25.52	>33							
		UUT Highest I	Passed Seismic Rui	n Information									

Building Code Test Criteria S_{DS} (g) z/h $A_{FLX-H}(g) A_{RIG-H}(g) A_{FLX-V}(g) A_{RIG-V}(g)$ 2.0 1.0 1.5 CBC 2016, IBC 2015 ICC-ES AC156SP-0 3.20 2.40 1.67 0.67 2.5 0.0 1.5

Test Mounting Details:

BY: Timothy J Piland







Mounting Brackets

UUT 29 was base mounted-rigid to the shake table using two (2) mounting brackets (P/N 63240chm), one on each side of the unit. Mounting brackets are supplied by the manufacturer and affixed to the shake table with five (5) 1/2"-13 hex head grade 8 bolts with flat washers and lock washers. A total of ten (10) 1/2"-13 bolts were used to mount unit to shake table. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

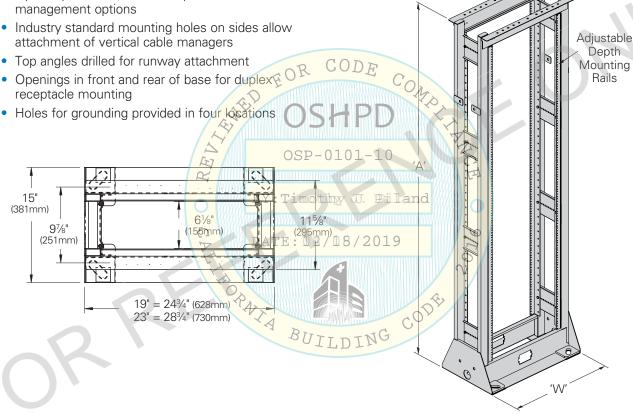
Network Equipment Racks & Accessories

Two-Post Relay Rack

Two-Post Seismic Relay Rack 19" & 23" Panel Mounting, Welded Steel

- Independently tested to NEBS GR-63-CORE Seismic Zone 4 standard; and for 900 lbs. (408kg) of equipment
- Independent testing conducted in accordance with ICBO AC156 standard for use up to 900 lbs. (408kg)
- Conformance to EIA/ECA-310-E
- Mounting rail spacing is adjustable from 3" (76mm) to 8" (203mm)
- 43 RMU (rack mounting units)
- Open top, bottom, and sides permit unlimited cable management options
- attachment of vertical cable managers

- Tubular steel frame provides a high degree of strength to weight ratio
- See page ii for link to OPM approvals
- Concrete installation requires (4) AWA-62-350 (sold separately)
- Finish ____: Flat black powder coat (FB) Telco gray powder coat (TG)



	Part Number		A′ ight (mm)	′W Spac In.	-	Mounting Spaces	Shipping Weight Lbs. (kg)
< T	19" (482mm) Rack Width						
\rightarrow	SB85219084	84"	(2133)	243/4"	(628)	43	(113) ((51.3)
	SB85219096	96"	(2438)	243/4"	(628)	49	124 (56.2)
	23" (584mm) Rack Width	_					
_	SB85223084	84"	(2133)	283/4"	(730)	43	117 (53.1)
-	SB85223096	96"	(2133)	283/4"	(730)	49	127 (57.6)

Specify part number and finish when ordering.