



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

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

OFFICE USE ONLY

APPLICATION #: OSP-0709

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Vertiv Corporation

Manufacturer's Technical Representative: Julian Freeman

Mailing Address: 975 Pittsburgh Drive, Delaware, OH 43015

Telephone: (740) 833-8910

Email: julian.freeman@vertiv.com

Product Information

Product Name: UPS and Batteries

Product Type: UPS

Product Model Number: EXL-S1

General Description: 400 kVA and 600 kVA UPS with backfeed disconnect and sharing inductor

Mounting Description: Rigid, Floor Mounted

Tested Seismic Enhancements: None

DATE: 08/06/2021

Applicant Information

Applicant Company Name: Structural Integrity Associates, Inc.

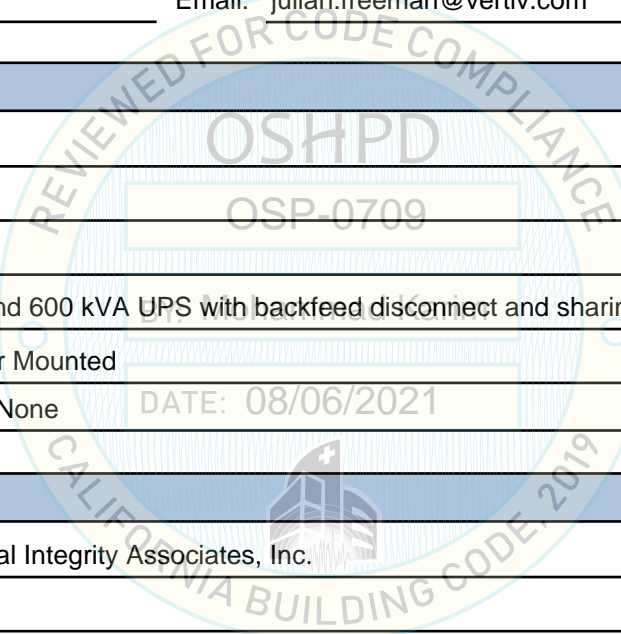
Contact Person: Galen Reid

Mailing Address: 233 SW Wilson Ave Suite 101, Bend, OR 97702

Telephone: (541) 604-7225

Email: greid@structint.com

Title: Manager, TRU Compliance





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California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: STRUCTURAL INTEGRITY ASSOCIATES, 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 ICC-ES AC156 IEEE 344 IEEE 693 NEBS 3
- Other (Please Specify): _____

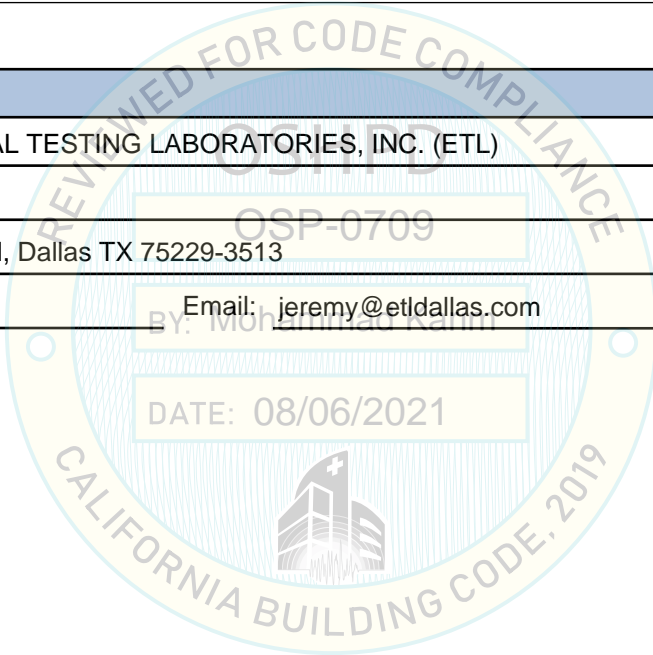
Testing Laboratory

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)

Contact Person: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513

Telephone: (972) 247-9657 Email: jeremy@etldallas.com





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.11 (SDS = 1.54); 0.72 (SDS = 1.61)

SDS (Design spectral response acceleration at short period, g) = 1.54 (z/h = 1); 1.61(z/h = 0)

a_p (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

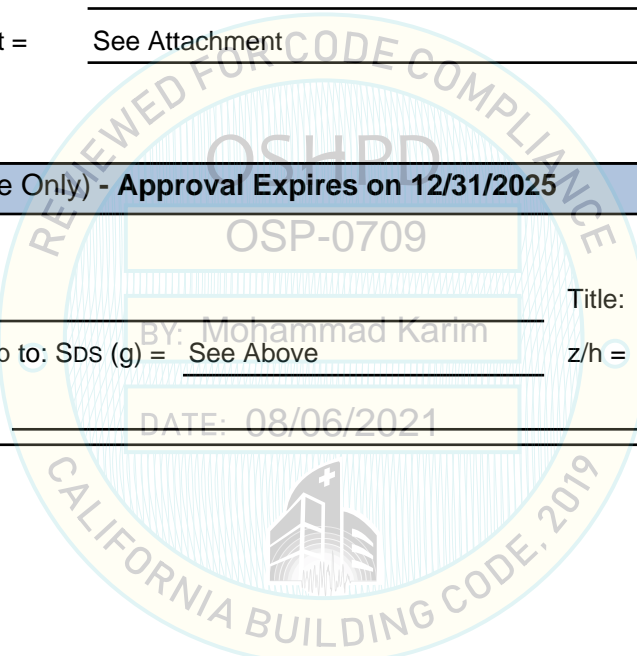
OSHPD Approval (For Office Use Only) - Approval Expires on 12/31/2025

Date: 8/6/2021

Name: Mohammad Karim Title: Supervisor, Health Facilities

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

Condition of Approval (if applicable): DATE: 08/06/2021



SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

2100211-CR-001-R0



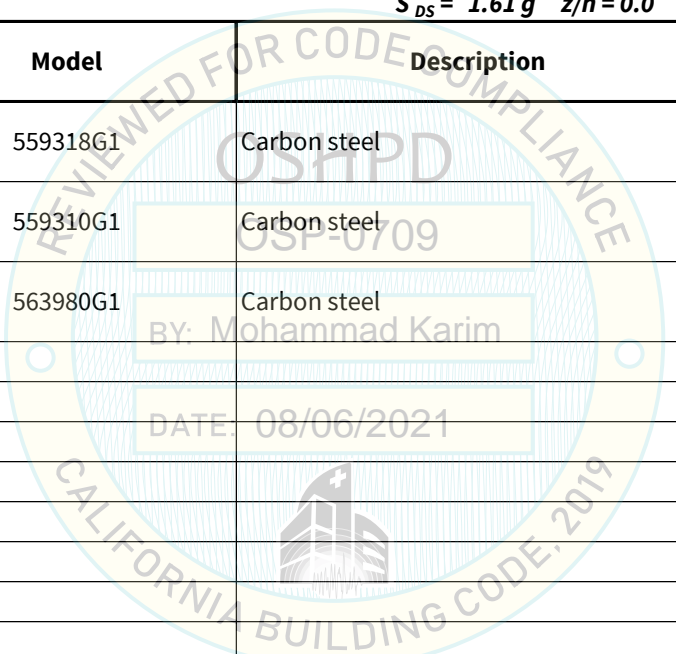
Manufacturer: Vertiv Corporation						TABLE 1	
Model Line: EXL-S1							
Certified Product Construction Summary: Carbon steel frame and skins							
Certified Options Summary: 600 kVA and 400kVA UPS with backfeed disconnect and sharing inductor							
Mounting Configuration: Base mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2019		Seismic Certification Limits:			$S_{DS} = 1.54 g$	$z/h = 1.0$	$I_p = 1.5$
					$S_{DS} = 1.61 g$	$z/h = 0.0$	
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
EXL-S1 UPS 600kVA	52SN600	38.9	74.75	79	2788		1
EXL-S1 UPS 400 kVA	52XX400AXX	35.4	80.9	76.9	3188.8		2

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

2100211-CR-001-R0



Manufacturer: Vertiv Corporation Model Line: EXL-S1		Table Description: Modules			TABLE 2	
Building Code: CBC 2019		Seismic Certification Limits:			$S_{DS} = 1.54 g$ $z/h = 1.0$ $S_{DS} = 1.61 g$ $z/h = 0.0$	
					$I_p = 1.5$	
Component Type	Manufacturer	Model	Description	Notes	UUT	
Power Module	Vertiv Corporation	559318G1	Carbon steel		1,2	
Boost Module	Vertiv Corporation	559310G1	Carbon steel		1,2	
Static Switch	Vertiv Corporation	563980G1	Carbon steel		1,2	



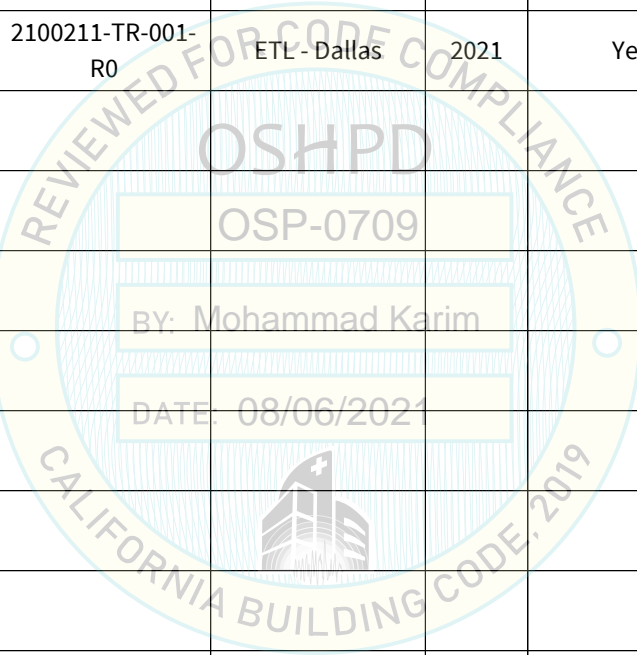
UNIT UNDER TEST (UUT) SUMMARY SHEET



2100211-CR-001-R0

Manufacturer: Vertiv Corporation
Model Line: EXL-S1

UUT	Unit Description	Report Number	Testing Lab	Year Tested	ISO 17025 Accredited?	S _{DS}	z/h	I _p
1	EXL-S1 UPS 600kVA	15392A Rev. 2 Seismic Certification Test Report and Report 15392A Rev. 2_Addendum 1	ETL - Dallas	2019	Yes	1.54 1.61	1.0 0.0	1.5
2	EXL-S1 UPS 400kVA	2100211-TR-001- R0	ETL - Dallas	2021	Yes	1.81 2.21	1.0 0.0	1.5



Notes:

UNIT UNDER TEST (UUT) SUMMARY SHEET

2100211-CR-001-R0



Manufacturer: Vertiv Corporation	UUT 1
Model Line: EXL-S1	
Model Number: 52SN600	
Serial Number: FEMAN62	

Product Construction Summary:
Carbon steel frame and skins

Options/Subcomponent Summary:
Power Module x 3 (PN: 559318G1), Boost Module x 1 (PN: 559310G1), Static Switch x1 (PN:563980G1)

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2788	38.9	74.75	79	7.88	8.29	17.48

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 (2015)	1.54	1.0	1.5	2.46	1.85	1.07	0.43
		1.61	0.0					

Test Mounting Details:



UUT base mounted-rigid to shake table with eight (8) L-brackets provided by the manufacturer (PN: 567256G1). Each L- bracket is attached to the front of the unit with four (4) M12X50 bolts. Each bracket was attached to the shake table with a 1/2" Grade 8 bolt with flat washer.

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

Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



2100211-CR-001-R0

Manufacturer: Vertiv Corporation	UUT 2
Model Line: EXL-S1	
Model Number: 52XX400AXX Serial Number: FEMAN42	

Product Construction Summary:
Carbon steel frame and skins

Options/Subcomponent Summary:
Power Module x 2 (PN: 559318G1), Boost Module x 1 (PN: 559310G1), Static Switch x1 (PN:563980G1)

<i>UUT Properties</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
3188.8	35.4	80.9	76.9	7.4	22.1	8.3

<i>UUT Highest Passed Seismic Run Information</i>									
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 (2015)	1.81	1.0	1.5	2.91	2.18	1.47	0.59	
		2.21	0.0						

Test Mounting Details:



UUT base mounted-rigid to shake table with eight (8) L-brackets and (13) Grade 8 bolts provided by the manufacturer. Five (5) L-brackets (PN: 544556P1) attached to the front of the unit with 7/8" Grade 8 bolts. (3) L-brackets (PN: 566378P1 x2 & PN: 571493P1) to the back of the unit with with 7/8" Grade 8 bolts. Each L- bracket is attached to the front of the unit with four (4) M12X50 bolts.

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

Contents were included in testing per operating conditions.