



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT

APPLICATION FOR HCAI SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0054

HCAI Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Electronic Systems Support

Manufacturer's Technical Representative: Ruben Narvaez

Mailing Address: 3233 W Kingsley Rd. Suite 200, Garland, TX 75041

Telephone: (972) 272-2468 Email: ruben.narvaez@ess.to

Product Information

Product Name: Battery Cabinets

Product Model Number(s): See Attachment

Product Category: UPS and Batteries

Product Sub-Category: Batteries

General Description: Light gage steel cabinets with rigid frame elements along all edges. The units are welded and screwed together to form the cabinets. The cabinets contain batteries and breakers.

Mounting Description: Base Mounted Rigid

Tested Seismic Enhancements: Seismic enhancements made to the test units and/or modifications required to address anomalies during the tests shall be incorporated into the production units.

Applicant Information

Applicant Company Name: Dynamic Certification Laboratories

Contact Person: Rachel Wolfe

Mailing Address: 1315 Greg Street, Sparks, NV 89431

Telephone: (775) 358-5085 Email: rachel.wolfe@shaketest.com

Title: Seismic Test Engineer



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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: S2851

Mailing Address: 980 9th Street, 16th Floor, Sacramento, CA 95814

Telephone: (832) 627-2214 Email: ken.tarlow@thevmcgroup.com

Certification Method

☐ GR-63-Core ☒ ICC-ES AC156 ☐ IEEE 344 ☐ IEEE 693 ☐ NEBS 3
☐ Other (Please Specify): _____

Testing Laboratory

Company Name: DYNAMIC CERTIFICATION LABORATORY (DCL)

Contact Person: Josh Sailer

Mailing Address: 1315 Greg St., Ste 109, Sparks NV 89431

Telephone: (775) 358-5085 Email: _____

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

Contact Person: Brady Richard

Mailing Address: 11034 Indian Trail, Dallas TX 75229

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



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Seismic Parameters

Certified Response Spectral Acceleration Factors:(F_p/W_p)

Horizontal (A Flx-H), g= 2.40 (A Rig-H), g= 1.80

Vertical (A Flx-V), g= 1.00 (A Rig-V), g= 0.40

S_{DS} (Design spectral response acceleration at short period, g) = 1.50

H_f (Force amplification height factor) = 3.5 at z/h=1; 1.0 at z/h=0

R_u (Structure ductility reduction factor) = 1.3 at z/h=1; 1.0 at z/h=0

I_p (Importance factor) = 1.5

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

HCAI Approval (For Office Use Only) - Approval Expires on 10/08/2031

Date: 10/8/2025

Name: Timothy Piland

Title: Senior Structural Engineer

Condition of Approval (if applicable): _____

OSP-0054

BY: Timothy J. Piland

DATE: 10/08/2025

Special Seismic Certification

Table 1 - Certified Components - 16V Battery Cabinets



DCL Project Number: 49106-2501

Manufacturer: Electronic Systems Support

Product Line: Battery Cabinets

Certified Construction: Powder-coated carbon steel frame

NEMA Rating: 1

Certified Options: Enclosures, batteries and breakers

Certified Mounting Description: Rigid base mounted

Certified Seismic Levels: Sds = 1.5g at z/h = 1.0 and z/h = 0

Factors for Force Amplification and Structure Ductility Reduction: $H_f = 3.5$ at $z/h=1.0$; 1.0 at $z/h=0$ and $R_p = 1.3$ at $z/h=1.0$; 1.0 at $z/h=0$

Model Number	Horizontally-Arrayed Batteries ¹	Vertically Stacked Batteries	Unit Battery Size	Battery Size Tested	Max. Dimensions (in)			Max. Weight (lb)	Unit
					Width ¹	Depth	Height		
Sx33800144BLxxxx	3	3	800	N/A	25.0	31.5	72.0	2,420	Extrapolated ²
ST35xxx144BL250D	3	3	925	800, 925	25.0	31.5	84.0 ²	2,600	UUT4 ⁴
Sx34800192BLxxxx	3	4	800	N/A	25.0	31.5	72.0	3,290	Interpolated
Sx34925192BLxxxx	3	4	925	N/A	25.0	31.5	72.0	3,350	Interpolated
Sx35800240BLxxxx	3	5	800	N/A	25.0	31.5	84.0	4,030	Interpolated
ST35925240BLA00A	3	5	925	925	25.0	31.5	84.0 ²	4,092	UUT2
Sx64550384BLxxxx	6	4	550	N/A	32.0	31.5	72.0	4,400	Interpolated
ST65550288BL250C	6	3	550	550	32.0	31.5	84.0 ²	3,300	UUT3
ST65550480BLA00B	6	5	550	550	32.0	31.5	84.0 ²	5,185	UUT1
Sx63800288BLxxxx	6 (3,3)	3	800	N/A	50.0	31.5	72.0	4,820	Extrapolated ⁵
Sx63925288BLxxxx	6 (3,3)	3	925	N/A	50.0	31.5	72.0	5,180	Extrapolated ⁵
Sx64800384BLxxxx	6 (3,3)	4	800	N/A	50.0	31.5	72.0	6,200	Extrapolated ⁵
Sx64925384BLxxxx	6 (3,3)	4	925	N/A	50.0	31.5	72.0	6,680	Extrapolated ⁵
Sx65800480BLxxxx	6 (3,3)	5	800	N/A	50.0	31.5	84.0	7,580	Extrapolated ⁵
Sx65925480BLxxxx	6 (3,3)	5	925	N/A	50.0	31.5	84.0	8,180	Extrapolated ⁵

Notes:

- For systems containing 800 or 925 batteries, a 6-battery horizontal array is two structurally-independent cabinets installed side-by-side, each containing a 3-battery horizontal array.
- Tested unit used a full height enclosure (84"). However, a 3- and 4- vertically stacked units use a 72" tall enclosure.
- Unit is extrapolated based on UUT4 Test. The units are similar in construction to UUT4.
- Multiple batteries were used in the UUTs to cover the battery types offered in the full product line. A distinct model number cannot be associated with the actual tested units since they utilize multiple battery types.
- Unit is extrapolated based on UUT2 and UUT4 test (extrapolated unit is two structurally-independent 25-inch wide enclosures installed side-by-side, as tested in UUT2 and UUT4).

Nomenclature Notes:

Options (designated as "x" in certified model numbers):

Digit 2: Cabinet color (T, A, C, E)

Digit 13-15: Breaker size in Amps (250 - A00 for 250Amp - 1000Amp breakers); reference certified breakers subcomponent table

Digit 16: Breaker option (A, B, C, D, E, F, G, H, K); reference breaker option subcomponent table

Special Seismic Certification

Table 2 - Nomenclature Chart - 16V Battery Cabinet Nomenclature Chart



DCL Project Number: 45798-1901

Manufacturer: Electronic Systems Support

Product Line: Battery Cabinets

Sample Part Number: STWHCDBFGU

Character	Category	Digit	Allowable Value	Description	Unit
S	System	1	S	Battery Cabinets	UUT1, UUT2, UUT3, UUT4
T	Cabinet Type	2	T	Top Breaker, Gray	UUT1, UUT2, UUT3, UUT4
			A	Top Breaker, Black	Same as
			C	Top Breaker, White	Same as
			E	Top Breaker, Liebert Black	Same as
W	Number of Blocs Wide	3	3 ¹	Three Blocs Wide	UUT2, UUT4
			6	Six Blocs Wide	UUT1, UUT3
H	Number of Blocs High	4	3	Three Blocs High	Extrapolated
			4	Four Blocs High	Extrapolated
			5	Five Blocs High	UUT1, UUT2, UUT3, UUT4
C	Type of Cell	5 - 7	550	16HX550F	UUT1, UUT3
			800	16HX800F	UUT4
			925	16HX925F	UUT2, UUT4
D	System Voltage	8 - 10	144	144 Volts	UUT4
			192	192 Volts	Interpolated
			240	240 Volts	UUT2
			288	288 Volts	UUT3
			384	384 Volts	Interpolated
			480	480 Volts	UUT1
B	Breaker	11	B	Breaker	UUT1, UUT2, UUT3, UUT4
F	Options	12	L	Locked	UUT1, UUT2, UUT3, UUT4
G	Breaker Size (in Amps)	13 - 15	250	280 Amps	UUT3, UUT4
			300	300 Amps	Interpolated
			400	400 Amps	Interpolated
			600	600 Amps	Interpolated
			800	800 Amps	Interpolated
U	Breaker Options	16	A00	1000 Amps	UUT1, UUT2
			A	24 VDC Shunt Trip/Aux. Contact	UUT2
			B	48 VDC Shunt Trip/Aux. Contact	UUT1
			C	24 UVR/Aux. Contact	UUT3
			D	48 UVR/Aux. Contact	UUT4
			H	120 VDC Shunt Trip/Aux. Contact	Extrapolated ²
			E	250 VDC Shunt Trip/Aux. Contact	Extrapolated ²
			G	250 UVR/Aux. Contact	Extrapolated ²
			K	120 UVR/Aux. Contact	Extrapolated ²
			F	Aux. Contact (only)	UUT1, UUT2, UUT3, UUT4

Note:

1. Only available for 800/925 with a system voltage up to 240.

2. Extrapolated breaker options are bookended by options tested in UUT5 and UUT6.

Special Seismic Certification

Table 3 - Certified Components - 12V Battery Cabinets



DCL Project Number: 49106-2501

Manufacturer: Electronic Systems Support

Product Line: Battery Cabinets

Certified Construction: Powder-coated carbon steel frame

NEMA Rating: 1

Certified Options: Enclosures, batteries and breakers

Certified Mounting Description: Rigid base mounted

Certified Seismic Levels: Sds = 1.5g at z/h = 1.0 and z/h = 0

Factors for Force Amplification and Structure Ductility Reduction: $H_f = 3.5$ at $z/h=1.0$; 1.0 at $z/h=0$ and $R_p = 1.3$ at $z/h=1.0$; 1.0 at $z/h=0$

Model Number	Battery Quantity	Battery Manufacturer	Breaker	Amps	Max. Dimensions (in)			Max. Weight (lb)	Unit
					Width	Depth	Height		
ETC40xx04xxxxxxxx	4	Energysys, C&D, East Penn, CSB, GNB, Flamm	Square D	100-600	40.0	29.5	76.8 - 78.7	820	Extrapolated
ETC40xx05xxxxxxxx	5								Extrapolated
ETC40AE06xxxxxB16F	6			100	40.0	29.5	78.7	820	UUT6
ETC40xx04xxxxxxxx	4			100-600	40.0	29.5	76.8 - 78.7	820 - 4,710	Interpolated
ETC40xx05xxxxxxxx	5								Interpolated
ETC40xx06xxxxxxxx	6								Interpolated
ETC40xx08xxxxxxxx	8								Interpolated
ETC40xx10xxxxxxxx	10								Interpolated
ETC40xx12xxxxxxxx	12								Interpolated
ETC40xx15xxxxxxxx	15								Interpolated
ETC40xx18xxxxxxxx	18								Interpolated
ETC40xx20xxxxxxxx	20								Interpolated
ETC40xx24xxxxxxxx	24								Interpolated
ETC40xx27xxxxxxxx	27								Interpolated
ETC40xx29xxxxxxxx	29								Interpolated
ETC40xx30xxxxxxxx	30								Interpolated
ETC40xx32xxxxxxxx	32								Interpolated
ETC40xx40xxxxxxxx	40								Interpolated
ETC40AE40xxxxxH04E	40			600	40.0	29.5	78.7	4,710	UUT5

Notes:

1. Multiple batteries were used in the UUTs to cover all the battery types offered in the full product line. A distinct model number cannot be associated with the actual tested units since they utilize multiple battery types.

Nomenclature Notes:

Options (designated as "x" in certified model numbers):

Digit 6: Cabinet color (A, B, C, D, E, F, G, H, I)

Digit 7: Cabinet height, 76.8" to 78.7" (C, D, E, F, G, H, J)

Digit 10-14: Battery model per manufacturer; reference certified batteries subcomponent table

Digit 15: B or H, for breaker or breaker with handle; reference certified breakers subcomponent table

Digit 16-17: 02 to 16 for 100 to 600 Amp breaker; reference certified breakers subcomponent table

Digit 18: Breaker option (A, B, C, D, E, F, G, H, J, K); reference breaker option subcomponent table for explanation of designation in certified component nomenclature

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Table 4 - Nomenclature Chart - 12V Battery Cabinet Nomenclature Chart



DCL Project Number: 45798-1901

Manufacturer: Electronic Systems Support

Product Line: Battery Cabinets

Sample Part Number: ABCDEFGHJKL					
Character	Category	Digit	Allowable Value	Description	Unit
A	System	1	E	ESS	UUT5, UUT6
B	Type of Battery	2	T	Top Terminal	UUT5, UUT6
C	Type of Cabinet	3	C	Cabinet	UUT5, UUT6
D	Cabinet Model	4 and 5	40	Width	UUT5, UUT6
E	Cabinet Color	6	A	Black	UUT5, UUT6
			B	Beige	Same as tested
			C	Liebert Gray	Same as tested
			D	Mitsubishi Beige	Same as tested
			E	MGE White	Same as tested
			F	Toshiba Black	Same as tested
			G	GE White	Same as tested
			H	Liebert Black	Same as tested
F	Height (inches)	7	I	Eaton Black	Same as tested
			C	80	Extrapolated ¹
			D	79	Extrapolated ¹
			E	78.7	UUT5, UUT6
			F	78.4	Same as tested
			G	78	Same as tested
			H	77.3	Extrapolated ¹
			J	76.8	Extrapolated ¹
G	Battery Quantity	8 and 9	4	4 Batteries	Interpolated ²
			5	5 Batteries	Interpolated ²
			6	6 Batteries	UUT6
			8	8 Batteries	Interpolated
			10	10 Batteries	Interpolated
			12	12 Batteries	Interpolated
			15	15 Batteries	Interpolated
			18	18 Batteries	Interpolated
			20	20 Batteries	Interpolated
			24	24 Batteries	Interpolated
			27	27 Batteries	Interpolated
			29	29 Batteries	Interpolated
			30	30 Batteries	Interpolated
			32	32 Batteries	Interpolated
			40	40 Batteries	UUT5

Continued on next page

Note:

1. 84 inch high cabinet were tested in UUT1, UUT2, UUT3 and UUT4.
2. Cabinets with four and five batteries can weigh more than, same as or less than the tested six battery configuration.

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Table 5 - Nomenclature Chart - 12V Battery Cabinet Nomenclature Chart

(continued)

DCL Project Number: 45798-1901

Manufacturer: Electronic Systems Support

Product Line: Battery Cabinets



Sample Part Number: ABCDEFGHJKL						
Character	Category	Digit	Manufacturer	Allowable Value	Model Number	Unit
H	Battery Model Per Manufacturer	10 - 14	EnerSys	HX205	12HX205	UUT6
				HX300	12HX300	Interpolated
				HX330	12HX330	Interpolated
				XE760	12XE760	Interpolated
				HX400	12HX400	Interpolated
				HX800	6HX800	Interpolated
				XE040	12XE1040	Interpolated
				HX560	12HX560	Interpolated
				XH505	12HX505	Interpolated
			C & D	XH540	12HX540	UUT5
				210MR	UPS12-210MR	UUT6
				300MR	UPS12-300MR	Interpolated
				305PL	UPS12-305PLP	Interpolated
				305PM	UPS12-305PLM	Interpolated
				350MR	UPS12-350MR	Interpolated
				355PL	UPS12-355PLP	Interpolated
				355PM	UPS12-355PLM	Interpolated
				620MR	UPS6-620MR	Interpolated
				400MR	UPS12-400MR	Interpolated
				405PL	UPS12-405PLP	Interpolated
				405PM	UPS12-405PLM	Interpolated
				490ML	UPS12-490MLP	Interpolated
				490MR	UPS12-490MR	Interpolated
				495PL	UPS12-495PLP	Interpolated
				545PL	UPS12-545PLP	Interpolated
				495PM	UPS12-495PLM	Interpolated
				545PM	UPS12-545PLM	Interpolated
			East Penn	540MR	UPS12-540MR	UUT5
				HR200	45HR2000	UUT6
				HR300	24HR3000	Interpolated
				HR350	27HR3500	Interpolated
				HR400	31HR4000	Interpolated
				HRC95	HRC950	Interpolated
				HR500	31HR5000	Interpolated
			CSB	HR550	31HR5500	UUT5
				XPL22	XPL2200	Extrapolated
				HL200	HRL12200W	UUT6
				XPL27	XPL2700	Interpolated
				XL250	XHRL12250W	Interpolated
				XPL35	XPL3500	Interpolated
				HL280	HRL12280W	Interpolated
				XL36W	XHRL12360WG	Interpolated
				XPL42	XPL4200	Interpolated
				XL360	XHRL12360W	Interpolated
				HL33W	HRL12330WG	Interpolated
				HL330	HRL12330W	Interpolated
				XPL47	XPL4700	Interpolated
				XL41G	XHRL12410WG	Interpolated
				XL410	XHRL12410W	Interpolated
				HL390	HRL12390W	Interpolated
				XPL57	XPL5700	Interpolated
				XL475	XHRL12475W	Interpolated
				XL500	XHRL12500W	Interpolated
				HL540	HRL12540W	UUT5

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Table 6 - Nomenclature Chart - 12V Battery Cabinet Nomenclature Chart

(continued)

DCL Project Number: 45798-1901



Manufacturer: Electronic Systems Support

Product Line: Battery Cabinets

Sample Part Number: ABCDEFGHJKL						
Character	Category	Digit	Manufacturer	Allowable Value	Model Number	Unit
H	Battery Model Per Manufacturer	10 - 14	GNB	SV120	S12V120	Extrapolated
				SV170	S12V170	Extrapolated
				SV285	S12V285	UUT6
				SV300	S12V300	Interpolated
				SV370	S12V370	Interpolated
				SV500	S12V500	Interpolated
				SV550	S12V550	UUT5
			Fiamm	FL200	12FLX200	UUT6
				FL250	12FLX250	Interpolated
				FL300	12FLX300	Interpolated
				FL350	12FLX350	Interpolated
				FL400	12FLX400	Interpolated
				FL500	12FLX500	Interpolated
				FL540	12FLX540	UUT5
Character	Category	Digit	Allowable Value	Description	Unit	
J	Breaker	15	B	Breaker	UUT6	
			H	Breaker With Handle Option	UUT5	
K	Amps	16 - 17	04	600 Amps	UUT5	
			05	500 Amps	Interpolated	
			06	450 Amps	Interpolated	
			07	400 Amps	Interpolated	
			08	350 Amps	Interpolated	
			09	300 Amps	Interpolated	
			10	250 Amps	Interpolated	
			11	225 Amps	Interpolated	
			12	200 Amps	Interpolated	
			13	175 Amps	Interpolated	
			14	150 Amps	Interpolated	
			15	125 Amps	Interpolated	
			16	100 Amps	UUT6	
			L	Breaker Option	18	A
B	48 VDC Shunt Trip/Aux. Contact	Extrapolated ¹				
C	24 UVR/Aux. Contact	Extrapolated ¹				
D	48 UVR/Aux. Contact	Extrapolated ¹				
E	120 VDC Shunt Trip/Aux. Contact	UUT5				
F	250 VDC Shunt Trip/Aux. Contact	UUT6				
G	120 UVR/Aux. Contact	Extrapolated ²				
H	250 UVR/Aux. Contact	Extrapolated ²				
K	Aux. Contact (Only)	UUT5, UUT6				
J	24 VDC UVR with Bell Alarm/Aux. Contact	Extrapolated ²				

Notes:

1. Extrapolated breaker options are bookended by options tested in UUT1, UUT2, UUT3 and UUT4.

2. Under voltage release (UVR) option features a coil that requires power to allow a breaker to turn on. The shunt option features the same coil, that when energized pushes a lever to trip a breaker and turn it off.

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Table 7 - Certified Subcomponents for 12V and 16V Battery Cabinets



DCL Project Number: 49106-2501

Product Line: Battery Cabinets

Certified Seismic Level: Sds = 1.5g at z/h = 1.0 and z/h = 0

Enclosures										
Cabinet Type	Manufacturer	Construction	Material	Dimensions (in)			NEMA Rating	Weight (lb)	Unit	
				Width	Depth	Height				
16V Battery Cabinets	ESS	Welded	Powder-Coated Carbon Steel	25.0	31.5	72.0	1	360	Extrapolated ¹	
				25.0	31.5	84.0	1	422	UUT2, UUT4	
				32.0	31.5	72.0	1	490	Interpolated	
				32.0	31.5	84.0	1	550	UUT1, UUT3	
				50.0	31.5	72.0	1	640	Extrapolated ²	
				50.0	31.5	84.0	1	750	Extrapolated ³	
12V Battery Cabinets	ESS	Welded		40.0	29.5	76.8 - 78.4	1	538 - 543	Extrapolated ⁴	
				40.0	29.5	78.7	1	545	UUT5, UUT6	
Batteries: 16V Battery Cabinets										
Model Number	Designation in Certified Component Nomenclature (Digits 5-7)	Manufacturer	Case Material	Type	Voltage	Approx. Dimensions (in)			Approx. Weight (lb)	Unit
						Width	Depth	Height		
16HX550F-FR	550	Energysys	Thick-Walled Plastic	Lead-Acid	16	4.6	27.2	12.3	151	UUT1, UUT3
16HX800F-FR	800					7.0	27.2	12.3	232	UUT4
16HX925F-FR	925					7.0	27.2	12.3	248	UUT2, UUT4

Notes:

1. Extrapolated cabinet is based on the testing of UUT2 and UUT4. These cabinets are the same footprint as UUT2 and UUT4, but 12 inches shorter and house one horizontal tier less (up to four horizontal tiers instead of five).
2. Extrapolated cabinet is two structurally-independent 25"-wide cabinets, installed side-by-side. Cabinets were tested in UUT2 and UUT4. These cabinets are the same footprint as the tested units, but 12 inches shorter and house one horizontal tier less (up to four horizontal tiers instead of five).
3. Extrapolated cabinet is two structurally-independent 25"-wide cabinets, installed side-by-side. Cabinets were tested in UUT2 and UUT4.
4. Extrapolated cabinet is based on the UUT5 and UUT6 testing. No additional batteries are added and the batteries stay in the same location.

BY: Timothy J. Piland

DATE: 10/08/2025

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Table 8 - Certified Subcomponents for 12V and 16V Battery Cabinets (continued)



DCL Project Number: 49106-2501

Product Line: Battery Cabinets

Certified Seismic Level: Sds = 1.5g at z/h = 1.0 and z/h = 0

Batteries: 12V Battery Cabinets										
Model Number	Designation in Certified Component Nomenclature (Digits 10-14)	Manufacturer	Case Material	Type	Voltage	Approx. Dimensions (in)			Approx. Weight (lb)	Unit
						Width	Depth	Height		
12HX205	HX205	Energys	Thick-Walled Plastic	Lead-Acid	12	5.5	8.9	8.1	43	UUT6
12HX300	HX300					6.9	10.2	8.2	60	Interpolated
12HX330	HX330					6.8	11.8	8.4	71	Interpolated
12XE760	XE760					6.8	13.0	8.6	77	Interpolated
12HX400	HX400					6.8	13.3	8.3	80	Interpolated
6HX800	HX800					6.8	13.4	8.3	80	Interpolated
12XE1040	XE040					6.8	13.3	10.8	97	Interpolated
12HX560	HX560					6.8	13.3	10.7	99	Interpolated
12HX505	XH505					6.8	13.3	10.7	103	Interpolated
12HX540	XH540					6.8	13.3	10.7	106	UUT5
UPS12-210MR	210MR	C & D	Polypropylene	Lead-Acid	12	5.5	9.0	8.1	40	UUT6
UPS12-300MR	300MR					6.8	10.3	8.0	58	Interpolated
UPS12-305PLP	305PL					6.8	10.3	7.9	58	Interpolated
UPS12-305PLM	305PM					6.8	10.3	7.9	58	Interpolated
UPS12-350MR	350MR					6.8	12.0	8.1	67	Interpolated
UPS12-355PLP	355PL					6.8	12.0	7.9	67	Interpolated
UPS12-355PLM	355PM					6.8	12.0	7.9	67	Interpolated
UPS6-620MR	620MR					7.0	12.6	8.9	72	Interpolated
UPS12-400MR	400MR					6.8	13.4	8.5	76	Interpolated
UPS12-405PLP	405PL					6.8	13.4	8.4	76	Interpolated
UPS12-405PLM	405PM					6.8	13.4	8.4	76	Interpolated
UPS12-490MRLP	490ML					6.8	13.4	8.5	83	Interpolated
UPS12-490MR	490MR					6.8	13.6	10.9	100	Interpolated
UPS12-495PLP	495PL					6.8	13.6	10.8	100	Interpolated
UPS12-545PLP	545PL					6.8	13.6	10.8	100	Interpolated
UPS12-495PLM	495PM					6.8	13.6	10.8	100	Interpolated
UPS12-545PLM	545PM					6.8	13.6	10.8	100	Interpolated
UPS12-540MR	540MR					6.8	13.6	10.9	100	UUT5
45HR2000	HR200					East Penn	Polypropylene	Lead-Acid	12	5.5
24HR3000	HR300	6.6	10.2	8.2	56					Interpolated
27HR3500	HR350	6.6	12.0	8.2	66					Interpolated
31HR4000	HR400	6.7	12.9	8.7	74					Interpolated
HRC950	HRC95	6.8	13.5	11.0	93					Interpolated
31HR5000	HR500	6.8	13.5	11.2	98					Interpolated
31HR5500	HR550					6.8	13.5	11.2	98	UUT5
XPL2200	XPL22	CSB	Polyphenylene Ether	Lead-Acid	12	5.5	9.0	8.1	36	Extrapolated
HRL12200W	HL200					5.5	9.0	8.2	38	UUT6
XPL2700	XPL27					5.5	9.0	8.1	40	Interpolated
XHRL12250W	XL250					5.5	9.0	8.1	41	Interpolated
XPL3500	XPL35					6.6	10.3	8.4	57	Interpolated
HRL12280W	HL280					6.6	10.3	8.4	57	Interpolated
XHRL12360WG	XL36W					6.6	10.9	8.4	62	Interpolated
XPL4200	XPL42					6.6	10.3	8.4	62	Interpolated
XHRL12360W	XL360					6.6	10.3	8.4	62	Interpolated
HRL12330WG	HL33W					6.6	12.8	8.4	65	Interpolated
HRL12330W	HL330					6.7	12.2	8.4	65	Interpolated
XPL4700	XPL47					6.6	12.2	8.4	71	Interpolated
XHRL12410WG	XL41G					6.7	12.8	8.4	72	Interpolated
XHRL12410W	XL410					6.7	12.2	8.4	72	Interpolated
HRL12390W	HL390					6.7	13.5	8.6	73	Interpolated
XPL5700	XPL57					6.6	13.5	8.5	80	Interpolated
XHRL12475W	XL475					6.7	13.5	8.5	80	Interpolated
XHRL12500W	XL500					6.7	13.5	8.5	81	Interpolated
HRL12540W	HL540					6.7	13.5	10.8	97	UUT5

Continued on the next page

Special Seismic Certification

Table 9 - Certified Subcomponents for 12V and 16V Battery Cabinets (continued)



DCL Project Number: 49106-2501

Product Line: Battery Cabinets

Certified Seismic Level: Sds = 1.5g at z/h = 1.0 and z/h = 0

Batteries: 12V Battery Cabinets (continued)												
Model Number	Designation in Certified Component Nomenclature (Digits 10-14)	Manufacturer	Case Material	Type	Voltage	Approx. Dimensions (in)			Approx. Weight (lb)	Unit		
						Width	Depth	Height				
S12V120	SV120	GNB	Reinforced polypropylene container and cover	Lead-Acid	12	6.5	6.8	5.9	27	Extrapolated		
S12V170	SV170					6.6	7.8	7.0	36	Extrapolated		
S12V285	SV285					6.9	10.3	8.8	61	UUT6		
S12V300	SV300					6.9	10.3	8.8	63	Interpolated		
S12V370	SV370					6.9	12.1	8.8	74	Interpolated		
S12V500	SV500					6.8	13.6	10.9	106	Interpolated		
S12V550	SV550					6.8	13.6	10.9	106	UUT5		
12FLX200	FL200	Fiamm	Thick-wall ABS case	Lead-Acid	12	5.4	9.0	8.4	41	UUT6		
12FLX250	FL250					6.5	10.7	7.7	52	Interpolated		
12FLX300	FL300					6.9	10.3	8.6	60	Interpolated		
12FLX350	FL350					6.9	11.9	8.6	68	Interpolated		
12FLX400	FL400					6.9	13.3	8.5	76	Interpolated		
12FLX500	FL500					6.9	13.3	10.9	102	Interpolated		
12FLX540	FL540					6.9	13.3	10.9	106	UUT5		
Breakers												
Model No.	Manufacturer	Material	Approx. Dimensions (in)			Weight (lb.)	Number of Poles	Ampere Rating	System VDC	Handle Option	Unit	
			Width	Depth	Height							
PowerPact J	Square D	Thermal-magnetic, molded case	4.1	3.4	7.5	5.3	2, 3	100-250	500	Handle Extension	UUT6	
PowerPact J										No Handle Extension	UUT3, UUT4	
LH-DC			6.0	3.9	11.0	16	2, 3	300-400		Handle Extension	Interpolated	
LH-DC										No Handle Extension	Interpolated	
LG3-DC			5.5	4.5	13.5	17	3	300-600		Handle Extension	Interpolated	
LG3-DC										No Handle Extension	Interpolated	
LG4-DC			7.3	4.5	13.5	26	4	700-1000		Handle Extension	Interpolated	
LG4-DC										No Handle Extension	Interpolated	
MH-DC			9.0	4.5	14.0	38	3	450-1000		No Handle Extension	Extrapolated ¹	
MH-DC										No Handle Extension	UUT1, UUT2, UUT5	
Breaker Options												
Options			Digit 16, 16V Battery Cabinet Nomenclature		Digit 18, 12V Battery Cabinet Nomenclature		Manufacturer		Material		Unit	
24 VDC Shunt Trip / Auxiliary Contact			A		A		Square D		Thermal-magnetic, molded case		UUT2	
48 VDC Shunt Trip / Auxiliary Contact			B		B						UUT1	
24 Under Voltage Release / Auxiliary Contact			C		C						UUT3	
48 Under Voltage Release / Auxiliary Contact			D		D						UUT4	
120 VDC Shunt Trip / Auxiliary Contact			H		E						UUT5	
250 VDC Shunt Trip / Auxiliary Contact			E		F						UUT6	
120 VDC Under Voltage Release / Auxiliary Contact			K		G						Extrapolated ²	
250 VDC Under Voltage Release/ Auxiliary Contact			G		H						Extrapolated ²	
24 VDC Under Voltage Release / Bell Alarm / Auxiliary Contact			N/A		J						Extrapolated ²	
Auxiliary Contact (Only)			F		K		UUT1, UUT2, UUT3, UUT4, UUT5, UUT6					

Note:

1. Breaker is a depopulated version of what was tested in UUT5.
2. Under voltage release option features a coil that requires power to allow a breaker to turn on. The shunt option features the same coil, that when energized pushes a lever to trip a breaker and turn it off. Extrapolated units are similar in construction to options tested in UUT5 and UUT6.

Special Seismic Certification

Table 10 - Tested Components



DCL Project Number: 49106-2501

Manufacturer: Electronic Systems Support

Product Line: Battery Cabinets

Certified Options: Enclosures, batteries and breakers

Certified Mounting Description: Rigid base mounted

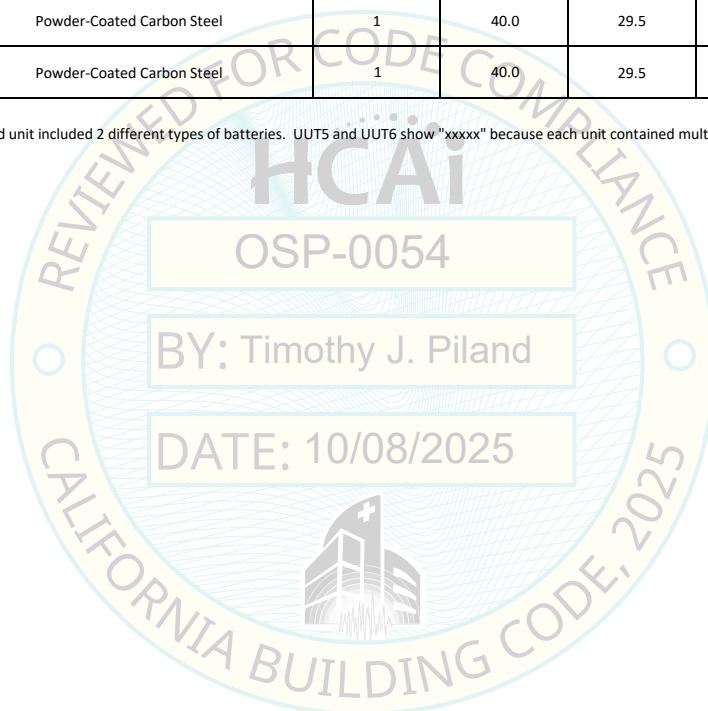
Certified Seismic Levels: $S_{ds} = 1.5g$ at $z/h = 1.0$ and $z/h = 0$

Factors for Force Amplification and Structure Ductility Reduction: $H_f = 3.5$ at $z/h=1.0$; 1.0 at $z/h=0$ and $R_d = 1.3$ at $z/h=1.0$; 1.0 at $z/h=0$

Model Number ¹	Construction Material	NEMA Rating	Dimensions (in)			Weight (lb)	Unit
			Width	Depth	Height		
ST65550480BLA00B	Powder-Coated Carbon Steel	1	32.0	31.5	84.0	5,185	UUT1
ST35925240BLA00A	Powder-Coated Carbon Steel	1	25.0	31.5	84.0	4,092	UUT2
ST65550288BL250C	Powder-Coated Carbon Steel	1	32.0	31.5	84.0	3,300	UUT3
ST35xxx144BL250D	Powder-Coated Carbon Steel	1	25.0	31.5	84.0	2,600	UUT4
ETC40AE40xxxxxH04E	Powder-Coated Carbon Steel	1	40.0	29.5	78.7	4,710	UUT5
ETC40AE06xxxxxB16F	Powder-Coated Carbon Steel	1	40.0	29.5	78.7	820	UUT6

Note:

1. UUT4 shows "xxx" because the tested unit included 2 different types of batteries. UUT5 and UUT6 show "xxxxx" because each unit contained multiple types of batteries.



UNIT UNDER TEST (UUT) Summary Sheet



UUT1

Report Number: MakeltRight 90220-0901 Test Report

Manufacturer: ESS

Product Line: Battery Cabinets

Model Number: ST65550480BLA00B

Product Construction Summary: Powder-Coated Carbon Steel, NEMA 1.

Options / Component Summary:

Rigid base mounted. Enersys 16HX550F-FR lead acid batteries, Square D 450-1000 Amp breaker with handle extension and 48 VDC shunt trip / auxiliary contact.

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 after the AC 156 test.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
5,185	32.0	31.5	84.0	4.8	5.8	>33.3

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	H _r	R _μ	I _p	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES AC156	1.5	1.0	3.5	1.3	1.5	2.40	1.80	N/A	N/A
		1.5	0.0	1.0	1.0		N/A	N/A	1.00	0.40

Unit Mounting Description:

The unit was rigid base-mounted to the shake table interface plate using (6) 1/2-inch diameter Grade 5 bolts and flat washers. The bolts were spaced 11 inches on center length-wise and 29 inches on center width-wise.

BY: Timothy J. Piland



Overall view of UUT1

UNIT UNDER TEST (UUT) Summary Sheet



UUT2

Report Number: MakeltRight 90220-0901 Test Report

Manufacturer: ESS

Product Line: Battery Cabinets

Model Number: ST35925240BLA00A

Product Construction Summary: Powder-Coated Carbon Steel, NEMA 1.

Options / Component Summary:

Rigid base mounted. Enersys 16HX925F-FR lead acid batteries, Square D 450-1000 Amp breaker with handle extension and 24 VDC shunt trip / auxiliary contact.

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 after the AC 156 test.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
4,092	25.0	31.5	84.0	6.6	3.6	17.7

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	H _r	R _μ	I _p	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES AC156	1.5	1.0	3.5	1.3	1.5	2.40	1.80	N/A	N/A
		1.5	0.0	1.0	1.0		N/A	N/A	1.00	0.40

Unit Mounting Description:

The unit was rigid base-mounted to the shake table interface plate using (6) 1/2-inch diameter Grade 5 bolts and flat washers. The bolts were spaced 11 inches on center length-wise and 23 inches on center width-wise.

BY: Timothy J. Piland



Overall view of UUT2

UNIT UNDER TEST (UUT) Summary Sheet



UUT3

Report Number: DCL 42217-1401_Test Report

Manufacturer: ESS

Product Line: Battery Cabinets

Model Number: ST65550288BL250C

Product Construction Summary: Powder-Coated Carbon Steel, NEMA 1.

Options / Component Summary:

Rigid base mounted. Energysys 16HX550F-FR lead acid batteries, Square D 100-250 Amp breaker with no handle extension and 24V under voltage release / auxiliary contact.

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 after the AC 156 test.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
3,300	32.0	31.5	84.0	10.8	13.8	>33.3

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	H _r	R _μ	I _p	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES AC156	2.0	1.0	3.5	1.3	1.5	3.20	2.40	N/A	N/A
		2.0	0.0	1.0	1.0		N/A	N/A	1.33	0.53

Unit Mounting Description:

The unit was rigid base-mounted to the shake table interface plate using (6) 1/2-inch diameter Grade 5 bolts and flat washers. The bolts were spaced 11 inches on center length-wise and 29 inches on center width-wise.

BY: Timothy J. Piland



Overall view of UUT3

UNIT UNDER TEST (UUT) Summary Sheet



UUT4

Report Number: DCL 42217-1401_Test Report

Manufacturer: ESS

Product Line: Battery Cabinets

Model Number: ST35xxx144BL250D

Product Construction Summary: Powder-Coated Carbon Steel, NEMA 1.

Options / Component Summary:

Rigid base mounted. Energysys 16HX800F-FR and 16HX925F-FR lead acid batteries, Square D 100-250 Amp breaker with no handle extension and 48V under voltage release / auxiliary contact.

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 after the AC 156 test.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2,600	25.0	31.5	84.0	10.8	8.0	19.0

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	H _r	R _μ	I _p	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES AC156	2.0	1.0	3.5	1.3	1.5	3.20	2.40	N/A	N/A
		2.0	0.0	1.0	1.0		N/A	N/A	1.33	0.53

Unit Mounting Description:

The unit was rigid base-mounted to the shake table interface plate using (6) 1/2-inch diameter Grade 5 bolts and flat washers. The bolts were spaced 11 inches on center length-wise and 23 inches on center width-wise.

BY: Timothy J. Piland



Overall view of UUT4

UNIT UNDER TEST (UUT) Summary Sheet



UUT5

Report Number: DCL 42217-1401_Test Report

Manufacturer: ESS

Product Line: Battery Cabinets

Model Number: ETC40AE40xxxxH04E

Product Construction Summary: Powder-Coated Carbon Steel, NEMA 1.

Options / Component Summary:

Rigid base mounted. Energysys 12HX540, C&D UPS12-540MR, East Penn 31HR5500, CSB HRL12540W, GNB S12V550 and Fiamm 12FLX540 lead acid batteries, Square D 450-1000 Amp breaker with handle extension and 120VDC shunt trip / auxiliary contact.

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 after the AC 156 test.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
4,710	40.0	29.5	78.7	7.8	8.3	19.8

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	H _r	R _μ	I _p	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES AC156	2.0	1.0	3.5	1.3	1.5	3.20	2.40	N/A	N/A
		2.0	0.0	1.0	1.0		N/A	N/A	1.33	0.53

Unit Mounting Description:

The unit was rigid base-mounted to the shake table interface plate using (6) 5/8-inch diameter Grade 5 bolts and flat washers. The bolts were spaced 24 inches on center length-wise and 18 inches on center width-wise.

BY: Timothy J. Piland



Overall view of UUT5

UNIT UNDER TEST (UUT) Summary Sheet



UUT6

Report Number: DCL 42217-1401_Test Report

Manufacturer: ESS

Product Line: Battery Cabinets

Model Number: ETC40AE06xxxxxB16F

Product Construction Summary: Powder-Coated Carbon Steel, NEMA 1.

Options / Component Summary:

Rigid base mounted. Energysys 12HX205, C&D UPS12-210MR, East Penn 45HR2000, CSB HRL12200W, GNB S12V285 and Fiamm 12FLX200 lead acid batteries, Square D 100-250 Amp breaker with handle extension and 240VDC shunt trip / auxiliary contact.

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 after the AC 156 test.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
820	40.0	29.5	78.7	13.8	18.8	30.5

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	H _r	R _μ	I _p	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES AC156	2.0	1.0	3.5	1.3	1.5	3.20	2.40	N/A	N/A
		2.0	0.0	1.0	1.0		N/A	N/A	1.33	0.53

Unit Mounting Description:

The unit was rigid base-mounted to the shake table interface plate using (6) 5/8-inch diameter Grade 5 bolts and flat washers. The bolts were spaced 24 inches on center length-wise and 18 inches on center width-wise.

BY: Timothy J. Piland



Overall view of UUT6