APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0831

HCAI Special Seismic Certification Preapproval (OSP)

Type: [X] New [ ] Renewal

Manufacturer Information

Manufacturer: SAI Advanced Power Solutions

Manufacturer's Technical Representative: Bethel Johnson

Mailing Address: 11333 Addison Ave., Suite 100, Franklin Park, IL 60131

Telephone: (708) 450-0990 Email: bethel.johnson@sai-aps.com

Product Information

Product Name: Profusion PDU & UL UL891 Switchboard

Product Model Number(s): Varies, see product table

Product Category: Switchgear/Switchboards

Product Sub-Category: Power Distribution Units

General Description: Profusion Power Distribution (300 kVA to 1060 kVA) and UL891 Switchboard

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.

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BY: Mohammad Karim
DATE: 01/28/2025
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Applicant Information

Applicant Company Name: Pre Compliance

Contact Person: Katie Braman

Mailing Address: 36 SW Wall St, Bend, OR 97702

Telephone: (541) 241-2310 Email: katie@go-pre.com

Title: Principal & Program Manager

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

Company Name: PRE COMPLIANCE

Name: Andrew Coughlin California License Number: S6082

Mailing Address: 36 SW Wall Street, Bend, OR 97702

Telephone: (415) 635-8461 Email: Andy@go-pre.com

Certification Method

- [ ] GR-63-Core
- [x] ICC-ES AC156
- [ ] IEEE 344
- [ ] IEEE 693
- [ ] NEBS 3
- [ ] Other (Please Specify):

Testing Laboratory

Company Name: CLARK TESTING LABORATORY, INC.

Contact Person: Scott Jamison

Mailing Address: 1801 Route 51, Jefferson Hills PA 15025

Telephone: (412) 387-1001 Email: sjamison@clarktesting.com

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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = PDU (1.0 @ z/h = 1, 1.02 @ z/h = 0), Switchboard (0.62 @ z/h = 1, 0.60 z/h=0)

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

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 6.0

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

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HCAI Approval (For Office Use Only) - Approval Expires on 01/28/2031

Date: 1/28/2025

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: S_{DS} (g) = See Product Tables z/h = 1

Condition of Approval (if applicable):

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENTS

Manufacturer: SAI Advanced Power Solutions
Product Type: Power Distribution Units (PDU)
Model Line: Profusion PDU

Seismic Parameters
S_{DS} = 1.33g for z/h=1
S_{DS} = 2.27g for z/h=0
I_p = 1.5

Building Codes
CBC 2022

TABLE 1

Mounting Configuration: Base Mounted - Rigid with or without floor stand

Construction Summary
Carbon Steel

Options Summary
Floor Stand

Model Line	Model	Max. Dimensions (in)			Wt. (lb)	Notes	UUT
		D	W	H			
Profusion PDU 300 kVA to 1060 kVA	P480-415-300	52	68	84	6,000		Extrap.
	P480-415-500	52	68	84	7,000		Extrap.
	P480-415-600	52	72	84	8,632		2
	P480-415-800	52	72	84	8,700		Interp.
	P480-415-1060	64	76	84	9,490	Tested on floor stand, PN: PFS-1	1

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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENTS

Manufacturer: SAI Advanced Power Solutions
Product Type: Switchgear
Model Line: UL 891 Switchboard

Seismic Parameters

S_{DS} = 0.83 g for z/h=1
S_{DS} = 1.33 g for z/h=0
I_p = 1.5

Building Codes

CBC 2022

TABLE 2

Mounting Configuration: Base Mounted - Rigid

Construction Summary

Carbon Steel

Options Summary

Mounted directly to floor

Model Line	Model	Max. Dimensions (in)			Wt. (lb)	Notes	UUT
		D	W	H			
Switchboard	UL 891 Switchboard	42	80	90	3614		3

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENTS

Manufacturer: SAI Advanced Power Solutions
Product Type: Power Distribution Units (PDU)
Model Line: Profusion PDU

Seismic Parameters		Building Codes
S_{DS} = 1.33g for z/h=1 S_{DS} = 2.27g for z/h=0	I_p = 1.5	CBC 2022

TABLE 3 — Circuit Breakers

Component (Manufacturer)	Model	Description	Notes	UUT
SACE EMAX2 E2.2 Fixed Air Circuit Breakers (ABB)	1SDA077363R1	E2.2V.A 800 EKIP, LSIG, 3P, 128 lbs		Extrap.
	1SDA077373R1	E2.2V.A 1200 EKIP, LSIG, 3P, 128 lbs		Extrap.
	1SDA077383R1	E2.2V.A 1600 EKIP, LSIG, 3P, 128 lbs		Extrap.
	1SDA077393R1	E2.2V.A 2000 EKIP, LSIG, 3P, 135 lbs		Extrap.
	1SDA077303R1	E2.2S.A 800 EKIP, LSIG, 3P, 128 lbs		Extrap.
	1SDA077313R1	E2.2S.A 1200 EKIP, LSIG, 3P, 128 lbs		2
	1SDA077323R1	E2.2S.A 1600 EKIP, LSIG, 3P, 128 lbs		1
	1SDA077333R1	E2.2S.A 2000 EKIP, LSIG, 3P, 135 lbs		Extrap.
TMAX XT2-XT5 Molded Case Cirbuit Breaker (ABB)	1SDX259984R1	XT2H, 3P, Ekip LSI, 125A, 3.53 lbs		1,2
	1SDA074802R1	XT2H, 3P,TMA, 125A, 3.53 lbs		Interp.
	1SDA074994R1	XT2L, 3P,Ekip LSI, 125A, 3.53 lbs		Interp.
	1SDA075447R1	XT4H, 3P, Ekip LSI, 250A, 7.72 lbs		Interp.
	1SDA075239R1	XT4H, 3P,TMA, 250A, 7.72 lbs		Interp.
	1SDA075387R1	XT4L, 3P, Ekip LSI, 250A, 7.72 lbs		Interp.
	1SDA102522R1	XT5H, 3P, TMA , 600A, 9.15 lbs		Interp.
	1SDA075387R1	XT5L, 3P, Ekip LSI, 600A, 9.15 lbs		Interp.
	1SDA102530R1	XT5H, 3P Ekip LSI 600A , 9.15 lbs		1,2

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENTS

Manufacturer: SAI Advanced Power Solutions
Product Type: Power Distribution Units (PDU)
Model Line: Profusion PDU

Seismic Parameters
S_{DS} = 1.33g for z/h=1
S_{DS} = 2.27g for z/h=0
I_p = 1.5

Building Codes
CBC 2022

TABLE 4 — Miscellaneous Electrical

Component (Manufacturer)	Model	Description	Notes	UUT
CPU (GE)	IC695CPE305	Rx3i Series, 1.1GHz, RS-232 Serial Port		2
HMI Touchscreen (B & R Industries)	4PPC30.101G-23B	10.1", 1 ETH, 2 USB, 1 RS485, 24VDC		1,2
Ethernet Port (MOXA)	852-1102	8-Port Ethernet Switch		1
Ethernet Port (Phoenix)	2702881	8-Port Ethernet Switch		2
Power Meter (Schneider Electric)	P480-415-300	Digital, Voltage/Frequ-50/60HZ		2
Power Meter (Socomec)	P480-415-500	DIRIS A-200 Power quality meter		1
Power Meter (Schweizer)	P480-415-600	Power Quality and Revenue Meter 125VDC		1
Power Supply (Socomec)	P480-415-800	30W Power Supply		1
Power Supply (Sola)	P480-415-1060	20A, 240W, 24VDC Output		1
	SDN1024100C	10A, 240W, 24VDC Output		2
Voltage Acquisition Module (Socomec)	48290102	DIRIS Digiware U-30 Voltage		1,2
Current Module (Socomec)	48290130	DIRIS Digiware I-35 3xI		1,2
Digital Inputs (Socomec)	48290140	DIRIS Digiware IO-10 4DI/2DO		1,2
Terminating Resistor (Socomec)	48290180	DIRIS Digiware Bus RJ45		1,2

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENTS

Manufacturer: SAI Advanced Power Solutions
Product Type: Power Distribution Units (PDU)
Model Line: Profusion PDU

Seismic Parameters		Building Codes
S_{DS} = 1.33g for z/h=1 S_{DS} = 2.27g for z/h=0	I_p = 1.5	CBC 2022

TABLE 4 — Miscellaneous Electrical

Component (Manufacturer)	Model	Description	Notes	UUT
Bluetooth (Socomec)	48290221	DIRIS Digiware M-50 Bluetooth		1,2
Transformer (Schneider Electric)	9070T1000D1	1kVA, Pri. 480, Sec. 120V		1,2
Surge Protector PSP C Series (Prosurge)	PSP277YC42T2FC	200kA (per phase)		2
	PSP277YC22T2FC	100kA (per phase)		1
Sensor (Socomec)	48290574	TF-80 150-600A ROGOWSKI		1
Transformer(JST/ AQ)	SGB-600/0.48/0.415			1,2
Relay (AMRAN)	CT101-202-XX			1,2

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENTS

Manufacturer: SAI Advanced Power Solutions
Product Type: Switchboard
Model Line: UL 891 Switchboard

Seismic Parameters
S_{DS} = 0.83 g for z/h=1
S_{DS} = 1.33 g for z/h=0
I_p = 1.5

Building Codes
CBC 2022

TABLE 5 — Circuit Breakers

Component (Manufacturer)	Model	Description	Notes	UUT
SACE EMAX2 E2.2 Fixed Air Circuit Breakers (ABB)	1SDA077363R1	E2.2V.A 800 EKIP, LSIG, 3P, 128 lbs		Extrap.
	1SDA077313R0	E2.2S.A 800 EKIP, LSIG, 3P, 128 lbs		Extrap.
	1SDA077373R1	E2.2V.A 1200 EKIP, LSIG, 3P, 128 lbs		Extrap.
	1SDA077313R1	E2.2S.A 1200 EKIP, LSIG, 3P, 128 lbs		Extrap.
	1SDA077383R1	E2.2V.A 1600 EKIP, LSIG, 3P, 128 lbs		Extrap.
	1SDA077323R1	E2.2S.A 1600 EKIP, LSIG, 3P, 128 lbs		3
	1SDA077393R1	E2.2V.A 2000 EKIP, LSIG, 3P, 135 lbs		Interp.
	1SDA077333R1	E2.2S.A 2000 EKIP, LSIG, 3P, 135 lbs		3
	1SDA078073R1	E2.2V-A 3200 EKIP, LSIG, 3P, 300 lbs		Interp.
	1SDA078893R1	E2.2S.A 4000 EKIP, LSIG, 3P, 486 lbs		3
	1SDA078903R1	E2.2V-A 4000 EKIP, LSIG, 3P, 486 lbs	Identcail to E2.2S.A 4000	Extrap.
	1SDA079153R1	E2.2V-A 5000 EKIP, LSIG, 3P, 486 lbs		Extrap.

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SPECIAL SEISMIC CERTIFICATION TESTING SUMMARY

UUT	Model	Test Report	Test Laboratory	S_{DS}	z/h	I_p
1	P480-415-1060	JID 23-01750	Clark Dynamic	1.27 2.27	1 0	1.5
2	P480-415-600	JID 23-01750	Clark Dynamic	2.0 2.5	1 0	1.5
3	UL 891 Switchboard	JID 23-01750	Clark Dynamic	0.83 1.33	1 0	1.5

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Notes:

SPECIAL SEISMIC CERTIFICATION UUT SUMMARY

UUT 1

Test Report# JID 23-01750

Manufacturer: SAI Advanced Power Solutions
Model Line: Profusion PDU
Model Number: P480-415-1060
Serial Number: 221507

Highest Passed Test Level

S_{DS}	z/h	I_p	A_{flx-h}	A_{rig-h}	A_{flx-v}	A_{rig-v}
1.27	1	1.5	2.27	1.52	1.52	0.61
2.27	0					

Dimensions/Weights

Depth (in)	Width (in)	Height (in)	Weight (lbs.)
64	76	84	9,490

Lowest Natural Frequency (Hz)

Front-Back	Side-Side	Vertical
4.4	5.2	20.8

Building Codes

CBC 2022

Test Criteria

ICC-ES AC156

Construction/Option Summary

Carbon Steel, mounted to floor stand PN: PFS-1

UUT Mounting Details:

UUT mounted on floor stand using eight (8) 5/8-11 Grade 5 hex bolts, washers, and lock washers. The eight legs of stand was welded to the shake table. Four (4) 1/4" fillet welds approximately 1-1/2" long per leg.

Unit maintained structural integrity and remained operational per manufacturer requirement following shake table test. All contents were included in the unit per operating conditions.

List of Included Subcomponents

Description	Model #
SACE EMAX2 Breaker	1SDA077323R1
TMAX XT2-XT5 Breaker	1SDX259984R1
TMAX XT2-XT5 Breaker	1SDA102530R1
Ethernet Port	852-1102
HMI Touchscreen	4PPC30.101G-23B
Power Meter	P480-415-500
Power Meter	P480-415-600
Power Supply	P480-415-800
Power Supply	P480-415-1060
Voltage Acquisition Module	48290102
Current Module	48290130
Digital Inputs	48290140
Terminating Resistor	48290180
Bluetooth	48290221
Transformer	9070T1000D1
Surge Protector PSP C Series	PSP277YC22T2FC
Sensor	48290574
Transformer	SGB-600/0.48/0.415
Relay	CT101-202-XX

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SPECIAL SEISMIC CERTIFICATION UUT SUMMARY

UUT 2

Test Report# JID 23-01750

Manufacturer: SAI Advanced Power Solutions
Model Line: Profusion PDU
Model Number: P480-415-600
Serial Number: 2216186-000-007

Highest Passed Test Level

S_{DS}	z/h	I_p	A_{flx-h}	A_{rig-h}	A_{flx-v}	A_{rig-v}
2.0	1	1.5	3.2	2.4	1.68	0.68
2.5	0					

Dimensions/Weights

Depth (in)	Width (in)	Height (in)	Weight (lbs.)
52	72	84	8,632

Lowest Natural Frequency (Hz)

Front-Back	Side-Side	Vertical
6.8	12.0	26.3

Building Codes

CBC 2022

Test Criteria

ICC-ES AC156

Construction/Option Summary

Carbon Steel

UUT Mounting Details:

UUT was mounted to the shake table using eight (8) 3/4"-10 SAE grade 5 hex bolts with washers, and lock washers torqued to 150 ft.-lbs.

Unit maintained structural integrity and remained operational per manufacturer requirement following shake table test. All contents were included in the unit per operating conditions.

List of Included Subcomponents

Description	Model #
SACE EMAX2 Breaker	1SDA077313R1
TMAX XT2-XT5 Breaker	1SDX259984R1
TMAX XT2-XT5 Breaker	1SDA102530R1
Ethernet Port	2702881
HMI Touchscreen	4PPC30.101G-23B
Power Meter	P480-415-300
Power Meter	P480-415-600
Power Supply	SDN1024100C
CPU	IC695CPE305
Voltage Acquisition Module	48290102
Current Module	48290130
Digital Inputs	48290140
Terminating Resistor	48290180
Bluetooth	48290221
Transformer	9070T1000D1
Surge Protector PSP C Series	PSP277YC42T2FC
Relay	CT101-202-XX
Transformer	SGB-600/0.48/0.415

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SPECIAL SEISMIC CERTIFICATION UUT SUMMARY

UUT 3

Test Report# JID 23-01750

Manufacturer: SAI Advanced Power Solutions
Model Line: Switchboard
Model Number: UL891 Switchboard
Serial Number: RR21964

Highest Passed Test Level

S_{DS}	z/h	I_p	A_{flx-h}	A_{rig-h}	A_{flx-v}	A_{rig-v}
0.83	1	1.5	1.33	1.0	0.89	0.35
1.33	0					

Dimensions/Weights

Depth (in)	Width (in)	Height (in)	Weight (lbs.)
42	80	90	3,614

Lowest Natural Frequency (Hz)

Front-Back	Side-Side	Vertical
8.74	5.13	30.73

Building Codes

CBC 2022

Test Criteria

ICC-ES AC156

Construction/Option Summary

UUT Mounting Details:

UUT was mounted to the shake table using eight (8) 1/2"-13 SAE grade 5 hex bolts with washers, and lock washers torqued to 50 ft.-lbs.

Unit maintained structural integrity and remained operational per manufacturer requirement following shake table test. All contents were included in the unit per operating conditions.

List of Included Subcomponents

Description	Model #
SACE EMAX2 Breaker 1600	1SDA077323R1
SACE EMAX2 Breaker 2000	1SDA077333R1
SACE EMAX2 Breaker 4000	1SDA078893R1

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