APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0482

HCAI Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Post Glover Resistors, Inc.

Manufacturer's Technical Representative: Jonathan Nash

Mailing Address: 1369 Cox Avenue, Erlanger, KY 41018

Telephone: (859) 372-8919 Email: jonathan.nash@postglover.com

Product Information

Product Name: Power Isolation and Correction Systems

Product Type: Grounding Systems

Product Model Number: See Attachment

General Description: Units consist of enclosure, insulator, current transformer, voltage transformer, sensing resistor, terminal block and resistors.

Mounting Description: Rigid, Floor Mounted

Tested Seismic Enhancements: None

Applicant Information

Applicant Company Name: Dynamic Certification Laboratories

Contact Person: Kelly Laplace

Mailing Address: 1315 Greg Pkwy # 109, Sparks, NV 89431

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

Title: Business Manager

REVIEWED FOR CODE COMPLIANCE HCAi OSP-0482 BY: Mohammad Rahim DATE: 08/22/2022 CALIFORNIA BUILDING CODE, 2019

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: Joshua Sailer

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

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

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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 2.71

S_{DS} (Design spectral response acceleration at short period, g) = 2.26

a_p (Amplification factor) = 1.0

R_p (Response modification factor) = 1.5

Ω_0 (System overstrength factor) = 1.5

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

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HCAI Approval (For Office Use Only) - Approval Expires on 08/22/2028

Date: 8/22/2022

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: S_{DS} (g) = 2.26 z/h = 1

Condition of Approval (if applicable):

Special Seismic Certification
Table 1 - Certified Components

DCL Project Number: 92756-2201

Manufacturer: Post Glover Resistors, Inc.

Product Line: Neutral Grounding Device

Mounting Description: Rigid base mounted

Certified Seismic Level: S_{DS} = 2.26g, z/h = 1

Model [1]	Enclosure Type	Voltage L-L	Voltage L-N	Secondary Voltage	Time	Current	Dimensions (in)			Resistor Banks	Weight (lb)	Unit
							Length	Width	Height			
M -GTR080C5D0-EGK0A01G0	NEMA 3R	13800	8000	228	Cont/385C	5	42	48	60	3	1,260	UUT1
M -GTR076C5D0-EGK0A01G0	NEMA 3R	13200	7620	218	Cont/385C	5	42	48	60	3	1,260	Extrapolated
M -GTR072C5D0-EGK0A01G0	NEMA 3R	12470	7200	206	Cont/385C	5	42	48	60	3	1,260	Extrapolated
M -GTR069C5D0-EGK0A01G0	NEMA 3R	12000	6930	198	Cont/385C	5	42	48	60	3	1,260	Extrapolated
M -GTR063C5D0-EGK0A01G0	NEMA 3R	11000	6350	181	Cont/385C	5	42	48	60	3	1,260	Extrapolated
M -GTR042C5D0-EGK0A01G0	NEMA 3R	7200	4160	118	Cont/385C	5	42	48	60	2	1,218	Extrapolated
M -GTR040C5D0-EGK0A01G0	NEMA 3R	6900	3985	113	Cont/385C	5	42	48	60	2	1,218	Extrapolated
M -GTR038C5D0-EGK0A01G0	NEMA 3R	6600	3810	109	Cont/385C	5	42	48	60	2	1,218	Extrapolated
M -GTR024C5D0-EGK0A01G0	NEMA 3R	4160	2400	68	Cont/385C	5	42	48	60	1	1,176	Extrapolated
M -GTR019C5D0-EGK0A01G0	NEMA 3R	3300	1905	54	Cont/385C	5	42	48	60	1	1,176	Extrapolated
M -GTR014C5D0-EGK0A01G0	NEMA 3R	2400	1385	39	Cont/385C	5	42	48	60	1	1,176	Extrapolated
MU-GTR080C5D0-EGK0A01G0	NEMA 3R	13800	8000	228	Cont/385C	5	42	48	60	3	1,260	Extrapolated
MU-GTR076C5D0-EGK0A01G0	NEMA 3R	13200	7620	218	Cont/385C	5	42	48	60	3	1,260	Extrapolated
MU-GTR072C5D0-EGK0A01G0	NEMA 3R	12470	7200	206	Cont/385C	5	42	48	60	3	1,260	Extrapolated
MU-GTR069C5D0-EGK0A01G0	NEMA 3R	12000	6930	198	Cont/385C	5	42	48	60	3	1,260	Extrapolated
MU-GTR063C5D0-EGK0A01G0	NEMA 3R	11000	6350	181	Cont/385C	5	42	48	60	3	1,260	Extrapolated
MU-GTR042C5D0-EGK0A01G0	NEMA 3R	7200	4160	118	Cont/385C	5	42	48	60	2	1,218	Extrapolated
MU-GTR040C5D0-EGK0A01G0	NEMA 3R	6900	3985	113	Cont/385C	5	42	48	60	2	1,218	Extrapolated
MU-GTR038C5D0-EGK0A01G0	NEMA 3R	6600	3810	109	Cont/385C	5	42	48	60	2	1,218	Extrapolated
MU-GTR024C5D0-EGK0A01G0	NEMA 3R	4160	2400	68	Cont/385C	5	42	48	60	1	1,176	Extrapolated
MU-GTR019C5D0-EGK0A01G0	NEMA 3R	3300	1905	54	Cont/385C	5	42	48	60	1	1,176	Extrapolated
MU-GTR014C5D0-EGK0A01G0	NEMA 3R	2400	1385	39	Cont/385C	5	42	48	60	1	1,176	Extrapolated

Note:

1. The standard product model number is M/MU-GTR0xxC5D0-EGK0y01GO, where:

   i. M units are physically identical to MU units; the U only indicates that the product is UL listed
   ii. xx can be from 14 to 80, and indicates the input voltage of the model as calculated from the resistance, related to the number of resistor banks placed within the electrical circuit. Three resistor banks were present in the tested units. Three, two or one resistor banks are present in the interpolated units.
   iii. y can be A or 0, for a NEMA 3R or NEMA 1 enclosure

Table 1 - Certified Components continued on next page

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Special Seismic Certification

Table 1 - Certified Components (Continued)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 92756-2201

Manufacturer: Post Glover Resistors, Inc.

Product Line: Neutral Grounding Device

Mounting Description: Rigid base mounted

Certified Seismic Level: S_{DS} = 2.26g, z/h = 1

Model [1]	Enclosure Type	Voltage L-L	Voltage L-N	Secondary Voltage	Time	Current	Dimensions (in)			Resistor Banks	Weight (lb)	Unit
							Length	Width	Height			
M-GTR080C5D0-EGK0001G0	NEMA 1	13800	8000	228	Cont/385C	5	42	48	60	3	1,200	UUT2
M-GTR076C5D0-EGK0001G0	NEMA 1	13200	7620	218	Cont/385C	5	42	48	60	3	1,200	Extrapolated
M-GTR072C5D0-EGK0001G0	NEMA 1	12470	7200	206	Cont/385C	5	42	48	60	3	1,200	Extrapolated
M-GTR069C5D0-EGK0001G0	NEMA 1	12000	6930	198	Cont/385C	5	42	48	60	3	1,200	Extrapolated
M-GTR063C5D0-EGK0001G0	NEMA 1	11000	6350	181	Cont/385C	5	42	48	60	3	1,200	Extrapolated
M-GTR042C5D0-EGK0001G0	NEMA 1	7200	4160	118	Cont/385C	5	42	48	60	2	1,158	Extrapolated
M-GTR040C5D0-EGK0001G0	NEMA 1	6900	3985	113	Cont/385C	5	42	48	60	2	1,158	Extrapolated
M-GTR038C5D0-EGK0001G0	NEMA 1	6600	3810	109	Cont/385C	5	42	48	60	2	1,158	Extrapolated
M-GTR024C5D0-EGK0001G0	NEMA 1	4160	2400	68	Cont/385C	5	42	48	60	1	1,116	Extrapolated
M-GTR019C5D0-EGK0001G0	NEMA 1	3300	1905	54	Cont/385C	5	42	48	60	1	1,116	Extrapolated
M-GTR014C5D0-EGK0001G0	NEMA 1	2400	1385	39	Cont/385C	5	42	48	60	1	1,116	Extrapolated
MU-GTR080C5D0-EGK0001G0	NEMA 1	13800	8000	228	Cont/385C	5	42	48	60	3	1,200	Extrapolated
MU-GTR076C5D0-EGK0001G0	NEMA 1	13200	7620	218	Cont/385C	5	42	48	60	3	1,200	Extrapolated
MU-GTR072C5D0-EGK0001G0	NEMA 1	12470	7200	206	Cont/385C	5	42	48	60	3	1,200	Extrapolated
MU-GTR069C5D0-EGK0001G0	NEMA 1	12000	6930	198	Cont/385C	5	42	48	60	3	1,200	Extrapolated
MU-GTR063C5D0-EGK0001G0	NEMA 1	11000	6350	181	Cont/385C	5	42	48	60	3	1,200	Extrapolated
MU-GTR042C5D0-EGK0001G0	NEMA 1	7200	4160	118	Cont/385C	5	42	48	60	2	1,158	Extrapolated
MU-GTR040C5D0-EGK0001G0	NEMA 1	6900	3985	113	Cont/385C	5	42	48	60	2	1,158	Extrapolated
MU-GTR038C5D0-EGK0001G0	NEMA 1	6600	3810	109	Cont/385C	5	42	48	60	2	1,158	Extrapolated
MU-GTR024C5D0-EGK0001G0	NEMA 1	4160	2400	68	Cont/385C	5	42	48	60	1	1,116	Extrapolated
MU-GTR019C5D0-EGK0001G0	NEMA 1	3300	1905	54	Cont/385C	5	42	48	60	1	1,116	Extrapolated
MU-GTR014C5D0-EGK0001G0	NEMA 1	2400	1385	39	Cont/385C	5	42	48	60	1	1,116	Extrapolated

Note:

1. The standard product model number is M/MU-GTR0xxC5D0-EGK0y01GO, where:

   i. M units are physically identical to MU units; the U only indicates that the product is UL listed

   ii. xx can be from 14 to 80, and indicates the input voltage of the model as calculated from the resistance, related to the number of resistor banks placed within the electrical circuit. Three resistor banks were present in the tested units. Three, two or one resistor banks are present in the extrapolated units.

   iii. y can be A or 0, for a NEMA 3R or NEMA 1 enclosure

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Special Seismic Certification
Table 2 - Certified Subcomponents

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 92756-2201

Certified Seismic Level: S_{DS} = 2.26g, z/h = 1.0

ENCLOSURES

Model Number	Manufacturer	Dimensions (in)			Material	Coating	Notes	Unit
		Length	Width	Height				
GTRMC005-01	Post Glover	42	48	60	Carbon Steel	Mill Galvanized	NEMA 3R	UUT1
GTRMC005-01-PG		42	48	60	Carbon Steel	Galvanneal, Painted	NEMA 3R	Extrapolated
GTRMC005-01	Post Glover	42	48	60	Carbon Steel	Mill Galvanized	NEMA 1	UUT2
GTRMC005-01-PG		42	48	60	Carbon Steel	Galvanneal, Painted	NEMA 1	Extrapolated

INSULATORS

Model Number	Manufacturer	Notes	Material	Unit
I15	Meister Intl.	Stand off, 15kV, 110 kV BIL	Porcelain	UUT1, UUT2

CURRENT TRANSFORMER

Model Number	Manufacturer	Notes	Material	Unit
21-201	Spectrum Ind.	200:5 current ratio, C20	Fe core & Cu Winding	UUT1, UUT2

SENSING RESISTOR

Model Number	Manufacturer	Notes	Material	Unit
ER-600VC	Bradford Stuart Ind.	600V	Plastic	UUT1, UUT2

TERMINAL BLOCK

Model Number	Manufacturer	Notes	Material	Unit
304	Kulka	600V, 4 pole	Phenolic	UUT1, UUT2

RESISTORS

Manufacturer	Material	Grid Width	Bank Width	Number of Banks	Bank Type	Grid Thickness	Unit
Post Glover	18SR stainless	610 mm	811 mm	2 + 1	EN	20 Ga	UUT1, UUT2
Post Glover	18SR stainless or 13-4SR stainless	610 mm	811 mm	3, 2 or 1	EN	20 Ga - 14 Ga	Extrapolated[1]

1. Tested unit contained 3 banks (2 + 1). Resistor bank material and 3-bank resistor configuration tested featured the lowest seismic withstand capacity. Weights of extrapolated resistor banks do not exceed those of the tested units.

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Special Seismic Certification
Table 3 - Tested Units

DCL Project Number: 92756-2201

Manufacturer: Post Glover Resistors, Inc.

Product Line: Neutral Grounding Device

Model	Enclosure Type	Voltage L-L	Voltage L-N	Secondary Voltage	Time	Current	Dimensions (in)			Weight (lb)	Sds (g), z/h=1	Unit
							Length	Width	Height			
M-GTR080C5D0-EGK0A01G0	NEMA 3R	13800	8000	228	Cont/385C	5	42	48	60	1,260	2.26	UUT1
M-GTR080C5D0-EGK0001G0	NEMA 1	13800	8000	228	Cont/385C	5	42	48	60	1,200	2.26	UUT2

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UUT1
UNIT UNDER TEST (UUT)
Summary Sheet

DCL Project Number: 92756-2201

Manufacturer: Post Glover Resistors, Inc.

Product Line: Neutral Grounding Device

Model Number: M-GTR080C5D0-EGK0A01G0

Product Construction Summary:

NEMA 3R enclosure; carbon steel coated by mill galvanized corrosion protection

Options / Component Summary:

Enclosure, insulator, current transformer, sensing resistor, terminal block and resistors

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.

UUT Properties

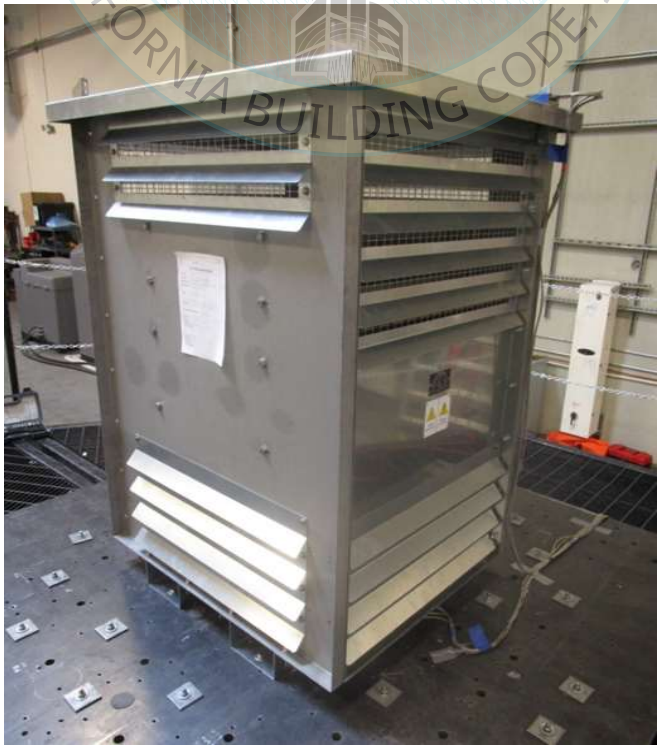
Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1,260	42	48	60	8.5	11.0	17.0

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.26	1.0	1.5	3.62	2.71	1.51	0.60

Unit Mounting Description:

Unit was rigidly attached to shake table interface frame with (4) 1/2" diameter Grade 5 bolts



Overall view of UUT1

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UUT2
UNIT UNDER TEST (UUT)
Summary Sheet

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 92756-2201

Manufacturer:	Post Glover Resistors, Inc.
Product Line:	Neutral Grounding Device
Model Number:	M-GTR080C5D0-EGK0001G0

Product Construction Summary:

NEMA 1 enclosure; carbon steel coated by mill galvanized corrosion protection

Options / Component Summary:

Enclosure, insulator, current transformer, sensing resistor, terminal block and resistors

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.

UUT Properties

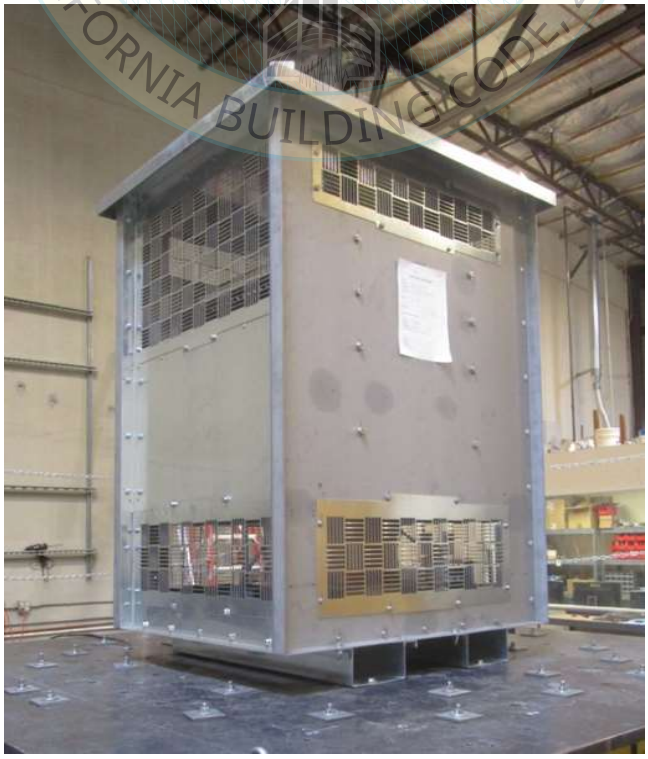
Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1,200	42	48	60	7.0	7.5	17.5

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.26	1.0	1.5	3.62	2.71	1.51	0.60

Unit Mounting Description:

Unit was rigidly attached to shake table interface frame with (4) 1/2" diameter Grade 5 bolts



Overall view of UUT2

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