APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0053 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Square D by Schneider Electric

Manufacturer's Technical Representative: Jeffrey A. Gatscher, Fellow Engineer

Mailing Address: 330 Weakley Lane, Smyrna, TN 37167

Telephone: 615-459-8466 Email: jeff.gatscher@schneider-electric.com

Product Information

Product Name: HVL/cc Metal-enclosed Load Interrupting Switchgear Systems

Product Type: Switchgear – Medium Voltage (2.4kV to 38kV), Metal-Enclosed

Product Model Number: HVL/cc (2.4V to 38kV) Metal-Enclosed Load Interrupting Switchgear systems with bus Ampacity ratings from 600A to 1200A (see Certified Product Listing tables).
(List all unique product identification numbers and/or part numbers)

General Description: Distribution and Auxiliary/Meter bay Metal-Enclosed Load Interrupting Switchgear sections packaged in NEMA Type 1 and Type 3R sheet metal framed enclosures. Options consist of over toggle, motor operated, and stored energy mechanism operated gas insulated switches. Sub-components consist of voltage transformers, control power transformers, meters, protective relays, and surge capacitors (see Certified Major Sub-Components table). Seismic enhancements made to the test units and modifications required to address anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigid floor mount.

Applicant Information

Applicant Company Name: Square D by Schneider Electric

Contact Person: Phillip E. Riemer

Mailing Address: 1010 Airpark Center Drive, Nashville, TN 37217

Telephone: 615-844-8448 Email: phillip.riemer@schneider-electric.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2013.

Signature of Applicant: Phillip Riemer Date: June 24, 2014

Title: Offer Manager Company Name: Schneider Electric

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

Company Name: Forell/Elsesser Engineers, Inc.

Name: Marco Scanu, SE California License Number: S4454

Mailing Address: 160 Pine Street, 6th Floor, San Francisco, CA 94111

Telephone: 415-837-0700 Email: m.scanu@forell.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)

☒ Special Seismic Certification is not preapproved

Certification Method

☒ Testing in accordance with: ☒ ICC-ES AC156

☐ Other (Please Specify): _____

Testing Laboratory 1

Company Name: Wyle Laboratories

Contact Name: Don Smith – Manager, Commercial Test Services

Mailing Address: 7800 Highway 20 West, Huntsville, AL 35806

Telephone: 256-716-4221 Email: don.smith@wyle.com

Testing Laboratory 2

Company Name: University at Buffalo – SEESL Laboratory

Contact Name: Mark Pitman – Technical Services Manager

Mailing Address: 136 Ketter Hall, SEESL Building, Buffalo, NY 14260

Telephone: 716-645-4377 Email: mpitman@eng.buffalo.edu

Testing Laboratory 3

Company Name: UC Berkeley – PEER Laboratory

Contact Name: Wesley Neighbour – Laboratory Manager

Mailing Address: 1301 S. 46th Street, Building 420, Richmond, CA 94804

Telephone: 510-665-3409 Email: wdn@berkeley.edu

Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: ☒ Yes ☐ No

Design Basis of Equipment or Components (F_p/W_p) = See Certified Product Listing Tables

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

a_p (In-structure equipment or component amplification factor) = 2.5

R_p (Equipment or component response modification factor) = 6.0

Ω_0 (System overstrength factor) = 2.5

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0 (also evaluated at grade elevation z/h = 0)

Equipment or Component Natural Frequencies (Hz) = See UUT Summary tables

Overall dimensions and weight (or range thereof) = See Certified Product Listing tables

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) = _____

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = _____

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, 2010: ☐ Yes ☒ No

List of Attachments Supporting Special Seismic Certification

☒ Test Report(s) ☐ Drawings ☒ Calculations ☒ Manufacturer's Catalog

☒ Other(s) (Please Specify): Certified Product Listing Tables, Certified Major Sub-Components Listing Tables, UUT Summary Tables

OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2019

Signature: _____ Date: August 18, 2014

Print Name: Timothy J. Piland Title: SSE

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

Condition of Approval (if applicable): _____

Certified Product Listing
HVL/cc Medium Voltage Metal-Enclosed Load Interrupter Switchgear

Manufacturer: Square D by Schneider Electric

Product Category: Switchgear – Medium Voltage Metal-Enclosed (2.4kV to 38kV)

Product Line Models: HVL/cc

Product Options: Distribution and Auxiliary/Meter bay Metal-Enclosed Switchgear sections packaged in NEMA Type 1 and 3R enclosures with bus ampacity ratings from 600A to 1200A and switch ampacity from 600A to 1200A. Options consist of over toggle, motor operated, and stored energy mechanism operated gas insulated switches. Sub-components consist of voltage transformers, control power transformers, meters, protective relays, and surge capacitors (see Certified Major Sub-Components table).

Product Mounting: Rigid floor mount

HVL/cc Medium Voltage Metal-Enclosed Load Interrupting Switchgear

Section Type[1]	Voltage Rating (kV)	Ampacity Rating[2] (A)	NEMA Enclosure Type[3]	Width (in.)	Depth[4] (in.)	Height[5] (in.)	Weight (lbs)	Test Status	Certification Level[6]			
									Grade (z/h = 0)		Roof (z/h = 1)	
									S_{DS} (g)	F_p/W_p	S_{DS} (g)	F_p/W_p
Distribution and Auxiliary / Meter Bay	2.4 – 38	600 – 1200	1	11	37.25	90	210	Extrapolated	2.07	0.93	1.88	1.41
			3R	11	47.25	99.75	440	Extrapolated	2.07	0.93	1.88	1.41
			1	14	60	90	310	Interpolated	2.07	0.93	1.88	1.41
			1	14.75	37.25	90	609	Wyle 50246-1, UUT-1a	2.38	1.07	2.28	1.71
			3R	14.75	47.25	99.75	700	Interpolated	2.07	0.93	1.88	1.41
			1	17.75	37.25	90	210	Interpolated	2.07	0.93	1.88	1.41
			1	20	37.25	90	600	Interpolated	2.07	0.93	1.88	1.41
			3R	20	47.25	99.75	800	Interpolated	2.07	0.93	1.88	1.41
			1	24	56.12	108	510	Interpolated	2.07	0.93	1.88	1.41
			3R	24	56.12	118.45	710	Interpolated	2.07	0.93	1.88	1.41
			1	29.5	37.25	90	700	Interpolated	2.07	0.93	1.88	1.41
			3R	29.5	47.25	99.75	1,325	SEESL 2014-11R4, UUT-3b	2.10	0.95	1.88	1.41
			1	29.5	59.12	108	795	Interpolated	2.07	0.93	1.88	1.41
			3R	29.5	69.25	118.45	1,060	Interpolated	2.07	0.93	1.88	1.41
			1	38	54.5	90	1,200	Interpolated	2.07	0.93	1.88	1.41
			3R	38	60	99.75	1,400	Interpolated	2.07	0.93	1.88	1.41
			1	39.37	59.12	108	1,685	Wyle 71369R13, UUT-1	2.07	0.93	1.98	1.49
			3R	39.37	69.25	118.45	1,800	Extrapolated	2.07	0.93	1.88	1.41

Notes:
1. Dimensions and weights are for individual sections. Section types may be installed alone or bayed together.
2. Copper bus only.
3. NEMA Enclosure Types 1 and 3R are constructed of carbon steel sheet with powder-coated finish.
4. Maximum depth does not include optional 24” rear extension (see Certified Major Sub-Components table).
5. Maximum height does not include optional 48” maximum top hat extension (see Certified Major Sub-Components table).
6. Certification level is limited to the lower rating of either the product section, as listed here, or the internal sub-components, as listed on the Certified Major Sub-Components table.

HVL/cc Switchgear Enclosure Extensions								
Option Type	Manufacturer	Description / Identifier	Notes	Test Status	Certification Level[2]			
					Grade (z/h = 0)		Roof (z/h = 1)	
					S_{DS} (g)	F_p/W_p	S_{DS} (g)	F_p/W_p
Rear Extension	Square D	24” rear depth extension	1	Interpolated	3.30	1.49	1.78	1.34
	Square D	30” rear depth extension	1	Wyle 58835R11, UUT-1a	3.30	1.49	1.78	1.34
Top Extension	Square D	12” Top Mounted Enclosure Extension	1	Interpolated	3.30	1.49	1.78	1.34
	Square D	24” Top Mounted Enclosure Extension	1	Interpolated	3.30	1.49	1.78	1.34
	Square D	36” Top Mounted Enclosure Extension	1	Interpolated	3.30	1.49	1.78	1.34
	Square D	48” Top Mounted Enclosure Extension	1	Wyle 58835R11, UUT-1a	3.30	1.49	1.78	1.34

Notes:
1. Enclosure extensions are constructed of carbon steel sheet, with powder-coated finish.
2. Certification level is limited to the lower rating of either the internal sub-components, as listed here, or the product section, as listed on the Certified Product table.

Load Interrupter Switch										
Voltage Rating (kV)	Ampacity Rating (A)	Switch Type[1]	Manufacturer	Part No. / Identifier	Notes	Test Status[2]	Certification Level[3]			
							Grade (z/h = 0)		Roof (z/h = 1)	
							S_{DS} (g)	F_p/W_p	S_{DS} (g)	F_p/W_p
5	600	OTM, SEM	Schneider Electric	44046-754-66, 44046-753-66		Wyle 50246-1, UUT-1	2.38	1.07	2.28	1.71
5 – 17.5	600 – 1200	OTM, SEM	Schneider Electric	44*		Interpolated	2.07	0.93	1.88	1.41
17.5	1200	OTM, SEM	Schneider Electric	44044-241-51		SEESL 2014-11R4, UUT-3b	2.10	0.95	1.88	1.41
25.8 – 38	600	OTM, SEM	Schneider Electric	44*		Interpolated	2.07	0.93	1.88	1.41
27	600	OTM, SEM	Schneider Electric	44044-242-51		Wyle 71369R13, UUT-1	2.07	0.93	1.98	1.49

Notes:
1. Switch type is either OTM (over-throw mechanism) or SEM (stored energy mechanism). Both switch types can be manually or motor operated. See sub-components table for motor operator certification. Switch type of tested units is underlined.
2. The sub-components listed here include part numbers which provided identify configuration, manufacturer, and materials. Tested sub-components and interpolated/extrapolated items have the same manufacturer and materials and have similar configuration and construction as the tested units.
3. Certification level is limited to the lower rating of either the internal components, as listed here, or the product section, as listed on the Certified Product table.

Voltage Transformers									
Primary Voltage (V)	Secondary Voltage (V)	Manufacturer	Part No. / Identifier	Notes	Test Status[1]	Certification Level[2]			
						Grade (z/h = 0)		Roof (z/h = 1)	
						S_{DS} (g)	F_p/W_p	S_{DS} (g)	F_p/W_p
2400	120	ITI/GE	PTG3160242FGC1 PTG42SD03823FFB		SEESL 2014-11R4, UUT-1	2.11	0.95	1.92	1.44
3000	120	ITI/GE	PTG3*, PTG4*, PT5*		Interpolated	2.10	0.95	1.88	1.41
4200	120	ITI/GE	PTG3*, PTG4*, PTG5*		Interpolated	2.10	0.95	1.88	1.41
7200	120	ITI/GE	PTG4*, PTG5*		Interpolated	2.10	0.95	1.88	1.41
8400	120	ITI/GE	PTG3*, PTG4*, PTG5*		Interpolated	2.10	0.95	1.88	1.41
12000	120	ITI/GE	PTG5*		Interpolated	2.10	0.95	1.88	1.41
12470	120	ITI/GE	PTG52SD02293FFG		PEER STI 2014-04R1, UUT-1	2.70	1.22	1.88	1.41
13200	120	ITI/GE	PTG5*, PTG6*		Interpolated	2.10	0.95	1.88	1.41
13800	120	ITI/GE	PTG5*, PTG6*		Interpolated	2.10	0.95	1.88	1.41
16500	120	ITI/GE	PTG5*, PTG6*		Interpolated	2.10	0.95	1.88	1.41
20780	120	ITI/GE	PTG5*, PTG6*		Interpolated	2.10	0.95	1.88	1.41
22860	120	ITI/GE	PTG5*, PTG6*		Interpolated	2.10	0.95	1.88	1.41
23000	120	ITI/GE	PTG5*, PTG6*		Interpolated	2.10	0.95	1.88	1.41
24940	120	ITI/GE	PTG5*, PTG6*		Interpolated	2.10	0.95	1.88	1.41
26400	120	ITI/GE	PTG5*, PTG6*		Interpolated	2.10	0.95	1.88	1.41
27000	120	ITI/GE	PT61125SD03591		SEESL 2014-11R4, UUT-2	2.10	0.95	1.88	1.41

Notes:

1. The sub-components listed here include part numbers which provided identify configuration, manufacturer, and materials. Tested sub-components and interpolated items have the same manufacturer and materials and have similar configuration and construction as the tested units.
2. Certification level is limited to the lower rating of either the internal sub-components, as listed here, or the product section, as listed on the Certified Product table.

Control Power Transformers[1]

Power Rating (kVA)	Primary Voltage (V)	Secondary Voltage (V)	Manufacturer	Part No. / Identifier	Notes	Test Status[2]	Certification Level[3]			
							Grade (z/h = 0)		Roof (z/h = 1)	
							S_{DS} (g)	F_p/W_p	S_{DS} (g)	F_p/W_p
5	2400	240/120	ITI/GE	CPTS3605242A		SEESL 2014-11R4, UUT-2	2.10	0.95	1.88	1.41
	4160	240/120	ITI/GE	CPTS36054161A		Interpolated	2.10	0.95	1.88	1.41
	4800	240/120	ITI/GE	CPTS3605482A		Interpolated	2.10	0.95	1.88	1.41
	7200	240/120	ITI/GE	CPTS5955722A		Interpolated	2.10	0.95	1.88	1.41
	12000	240/120	ITI/GE	CPTS5955123A		Interpolated	2.10	0.95	1.88	1.41
	12470	240/120	ITI/GE	CPTS59551242A		Interpolated	2.10	0.95	1.88	1.41
	13200	240/120	ITI/GE	CPTS59551322A		Interpolated	2.10	0.95	1.88	1.41
10	2400	240/120	ITI/GE	CPTS36010242A		Interpolated	2.10	0.95	1.88	1.41
	4160	240/120	ITI/GE	CPTS360104161A		Interpolated	2.10	0.95	1.88	1.41
	4800	240/120	ITI/GE	CPTS36010482A		Interpolated	2.10	0.95	1.88	1.41
	7200	240/120	ITI/GE	CPTS59510722A		Interpolated	2.10	0.95	1.88	1.41
	12000	240/120	ITI/GE	CPTS59510123A		Interpolated	2.10	0.95	1.88	1.41
	12470	240/120	ITI/GE	CPTS595101242A		Interpolated	2.10	0.95	1.88	1.41
	13200	240/120	ITI/GE	CPTS595101322A		Interpolated	2.10	0.95	1.88	1.41
15	2400	240/120	ITI/GE	CPTS36015242A		Interpolated	2.10	0.95	1.88	1.41
	4160	240/120	ITI/GE	CPTS360154161A		Interpolated	2.10	0.95	1.88	1.41
	4800	240/120	ITI/GE	CPTS36015482A		Interpolated	2.10	0.95	1.88	1.41
	7200	240/120	ITI/GE	CPTS59515722A		Interpolated	2.10	0.95	1.88	1.41
	12000	240/120	ITI/GE	CPTS59515123A		Interpolated	2.10	0.95	1.88	1.41
	12470	240/120	ITI/GE	CPTS595151242A		PEER STI 2014-04R1, UUT-1	2.70	1.22	1.88	1.41
	13200	240/120	ITI/GE	CPTS595151322A		Interpolated	2.10	0.95	1.88	1.41
25	2400	240/120	ITI/GE	CPT36025242A		Interpolated	2.10	0.95	1.88	1.41
	4160	240/120	ITI/GE	CPT360254161A		SEESL 2014-11R4, UUT-2	2.10	0.95	1.88	1.41
	4800	240/120	ITI/GE	CPT36025482A		Extrapolated	2.10	0.95	1.88	1.41
37.5	2400	240/120	ITI/GE	CPT360375242A		Extrapolated	2.10	0.95	1.88	1.41
	4160	240/120	ITI/GE	CPT3603754161A		Extrapolated	2.10	0.95	1.88	1.41
	4800	240/120	ITI/GE	CPT360375482A		Extrapolated	2.10	0.95	1.88	1.41

Notes:

1. Single phase control power transformers. Winding material not disclosed in ITI/GE supplier catalog.
2. The sub-components listed here include part numbers which provided identify configuration, manufacturer, and materials. Tested sub-components and interpolated/extrapolated items have the same manufacturer and materials and have similar configuration and construction as the tested units.
3. Certification level is limited to the lower rating of either the internal sub-components, as listed here, or the product section, as listed on the Certified Product table.

Surge Arresters

Name / Description	Voltage Rating (kV)	MCOV (kV)	Manufacturer	Part No. / Identifier	Notes	Test Status[1]	Certification Level[2]			
							Grade (z/h = 0)		Roof (z/h = 1)	
							S_{DS} (g)	F_p/W_p	S_{DS} (g)	F_p/W_p
Distribution, Intermediate, Station Class	3	2.55	General Electric	9L20FXX003XHS		SEESL 2014-11R4, UUT-1	2.11	0.95	1.92	1.44
	6 – 12	5.1 – 10.2	General Electric	9L*		Interpolated	2.10	0.95	1.88	1.41
	15	12.7	General Electric	9L20FXX015XHS		PEER STI 2014-04R1, UUT-1	2.70	1.22	1.88	1.41
	18	15.3	General Electric	9L*		Interpolated	2.10	0.95	1.88	1.41
	24	19.5	General Electric	9L20FXX024XHS		SEESL 2014-11R4, UUT-2	2.10	0.95	1.88	1.41
	27 – 36	22 – 29	General Electric	9L*		Extrapolated	2.10	0.95	1.88	1.41

Notes:
1. The sub-components listed here include part numbers which provided identify configuration, manufacturer, and materials. Tested sub-components and interpolated/extrapolated items have the same manufacturer and materials and have similar configuration and construction as the tested units.
2. Certification level is limited to the lower rating of either the internal sub-components, as listed here, or the product section, as listed on the Certified Product table.

High Frequency Transient Surge Suppressors

Name / Description	Voltage Rating (kV)	Frequency (Hz)	Manufacturer	Part No. / Identifier	Notes	Test Status[1]	Certification Level[2]			
							Grade (z/h = 0)		Roof (z/h = 1)	
							S_{DS} (g)	F_p/W_p	S_{DS} (g)	F_p/W_p
Zorc	3 – 5	50/60	Simotech	M*		Extrapolated	2.10	0.95	1.88	1.41
	4.16	50/60	Simotech	M3-4.16kV		SEESL 2014-11R4, UUT-4	2.10	0.95	1.88	1.41
	5 – 15	50/60	Simotech	M*		Interpolated	2.10	0.95	1.88	1.41
	12.5	50/60	Simotech	M3-12.5kV		SEESL 2014-11R4, UUT-4	2.10	0.95	1.88	1.41
	22 – 40	50/60	Simotech	M*		Extrapolated	2.10	0.95	1.88	1.41

Notes:
1. The sub-components listed here include part numbers which provided identify configuration, manufacturer, and materials. Tested sub-components and interpolated/extrapolated items have the same manufacturer and materials and have similar configuration and construction as the tested units.
2. Certification level is limited to the lower rating of either the internal sub-components, as listed here, or the product section, as listed on the Certified Product table.

Load Interrupter Switch Motor Operator								
Name / Description	Manufacturer	Part No. / Identifier[1]	Notes	Test Status	Certification Level[2]			
					Grade (z/h = 0)		Roof (z/h = 1)	
					S_{DS} (g)	F_p/W_p	S_{DS} (g)	F_p/W_p
Motor Operator	Square D	44046-123-54		Wyle 71369R13, UUT-1	2.07	0.93	1.98	1.49

Notes:
1. A single motor operator part is used on all HVL/cc switchgear with the motor operator option, regardless of switch type and switch rating.
2. Certification level is limited to the lower rating of either the internal sub-components, as listed here, or the product section, as listed on the Certified Product table.

UUT Summary
HVL/cc MV Load Current Interrupter Switchgear

UUT Product Information			
Manufacturer	**Product Category**	**Product Line Model**	**Model Number**
Square D by Schneider Electric	Metal Enclosed Switchgear – Medium Voltage	2.4–17.5 kV NEMA Type 1 HVL/cc Load Current Interrupter Switchgear	FO# 17440675-007

UUT Test Report Association				
Test Lab	**Report No.**	**Report Date**	**Test Run No.**	**UUT Designation**
Wyle Laboratories	50246-1	02/18/2004	5	UUT-1 Configuration 1

UUT Notes / Description

1. The UUT is a medium voltage (2.4kV – 17.5kV) metal-enclosed HVL/cc load current interrupter switch assembly consisting of a 14.75” wide x 37.25” deep upright distribution switch section (UUT-1a) connected to a 14.75” wide x 37.25” deep inverted distribution switch section (UUT-1b) packaged in NEMA Type 1 enclosures. UUT-1a section weight is approximately 609 lbs and UUT-1b section weight is approximately 609 lbs.
2. NEMA Type 1 enclosures are constructed of carbon steel sheet, with powder-coated finish.
3. UUT full of contents.

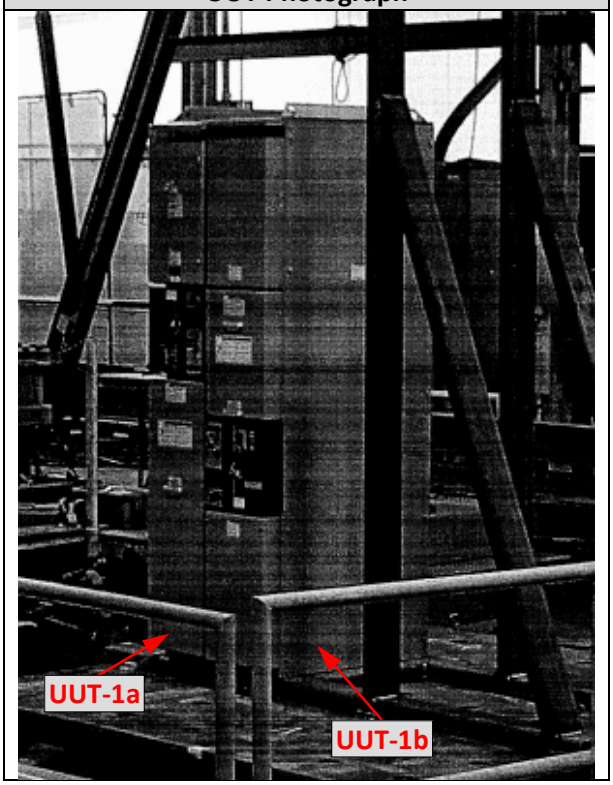
UUT Properties (As Tested)								
Weight (lbs.)	**Dimensions (in.)**			**Lowest Natural Frequency (Hz)**			**Shake-Table Attachment**	
	Height	**Width**	**Depth**	**F-B**	**S-S**	**V**	**Type**	**Anchorage**
1,218	90	29.5	37.25	11.5	5.3	17	Rigid floor mount	(8) 3/8-16 grade 5 bolts and Belleville conical spring washers at 35 ft-lbs torque

UUT Seismic Test Parameters								
Building Codes	**Test Criteria**	S_{DS} **(g)**	***z/h***	I_p	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	2.38	0	1.5	2.38	0.95	1.59	0.64
		2.28	1	1.5	3.65	2.74	1.53	0.62

UUT Seismic Test Results

✓ The UUT maintained structural integrity and functionality as confirmed in post test inspection and active operation validation checks

UUT Photograph



UUT Major Components		
Description	**Manufacturer**	**Part No. / Identifier**
Enclosure – NEMA Type 1	Square D	14.75W x 37.25D x 90H
1200A Main Bus, Copper, Tin Plated	Square D	1200A Copper, Tin Plated, Bus
Fuse, Current Limiting, 100E, 5.5kV, Type DIN/E	Square D by Bussman	55GDMSJ100E
Fuse, Current Limiting, 50E, 5.5kV, Type DIN/E	Square D by Bussman	55GDMSJD50E
Switch, SEM, 5kV, 600A, Ungroundable	Square D	44046-754-66
Switch, OTM, 5kV, 600A, Ungroundable	Square D	44046-753-66

UUT Summary
HVL/cc MV Load Current Interrupter Switchgear

UUT Product Information			
Manufacturer	**Product Category**	**Product Line Model**	**Model Number**
Square D by Schneider Electric	Metal Enclosed Switchgear – Medium Voltage	2.4–17.5 kV NEMA Type 3R HVL/cc Load Current Interrupter Switchgear	FO# 34206074-001

UUT Test Report Association				
Test Lab	**Report No.**	**Report Date**	**Test Run No.**	**UUT Designation**
University at Buffalo SEESL	UB CSEE/SEESL-2014-11 Rev 4	08/12/2014	1-2	UUT-3

UUT Notes / Description

1. The UUT is a floor mounted medium voltage (2.4kV – 17.5kV) metal-enclosed HVL/cc load current interrupter switchgear line up consisting of a 14.75" wide x 47.25" deep HVL/cc Transition Section (UUT-3a) connected to a 29.5" wide x 47.25" deep HVL/cc Distribution Section (UUT-3b). UUT-3a section weight is approximately 545 lbs and UUT-3b section weight is approximately 1,325 lbs. Both sections are packaged as NEMA Type 3R outdoor enclosure
2. NEMA Type 3R enclosure is constructed of carbon steel sheet, with powder-coated finish
3. UUT full of contents

UUT Properties (As Tested)								
Weight (lbs.)	**Dimensions (in.)**			**Lowest Natural Frequency (Hz)**			**Shake-Table Attachment**	
	Height	**Width**	**Depth**	**F-B**	**S-S**	**V**	**Type**	**Anchorage**
1,870	99.75	44.25	57.25	15.2	10.3	>33.3	Rigid floor mount	(4) 1/2-13 Grade 5 studs with Belleville conical spring washers, and nuts torqued to 75 ft.-lbs.

UUT Seismic Test Parameters								
Building Codes	**Test Criteria**	S_{DS} **(g)**	z/h	I_p	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	2.10	0	1.5	2.10	0.84	1.41	0.57
		1.88	1	1.5	3.01	2.26	1.26	0.51

UUT Seismic Test Results

✓ The UUT maintained structural integrity and functionality as confirmed in post test inspection and active operation validation checks

UUT Photograph

UUT Major Components		
Description	**Manufacturer**	**Part No. / Identifier**
Enclosure – NEMA Type 3R	Square D	14.75W x 47.25D x 99.75H
Enclosure – NEMA Type 3R	Square D	29.5W x 47.25D x 99.75H
1200A Main Bus, Copper, Silver Plated	Square D	1200A Copper, Silver Plated, Bus
Fuse, Current Limiting, 10E, 17.5kV, Type DIN/E	Square D	175GDMSJD10E
Fuse, Current Limiting, 100E, 17.5kV, Type DIN/E	Square D	175GXMSJD100E
Fuse, Current Limiting, 450E, 5.5kV, Type DIN/E	Square D	55GFMSJD450E
Switch, OTM, 17.5kV, 1200A, Ungroundable	Square D	44044-241-51

UUT Summary
HVL/cc MV Load Current Interrupter Switchgear

UUT Product Information			
Manufacturer	**Product Category**	**Product Line Model**	**Model Number**
Square D by Schneider Electric	Metal Enclosed Switchgear – Medium Voltage	27–38 kV NEMA Type 1 HVL/cc Load Current Interrupter Switchgear	FO# 17-32879443-235

UUT Test Report Association				
Test Lab	**Report No.**	**Report Date**	**Test Run No.**	**UUT Designation**
Wyle Laboratories	71369R13	12/09/2013	10	UUT-1

UUT Notes / Description

1. The UUT is a medium voltage (27kV – 38kV) metal-enclosed HVL/cc load current interrupter SEM (stored energy mechanism) switch assembly packaged in a NEMA Type 1 enclosure.
2. NEMA Type 1 enclosure is constructed of carbon steel sheet, with powder-coated finish.
3. UUT full of contents

UUT Properties (As Tested)								
Weight (lbs.)	**Dimensions (in.)**			**Lowest Natural Frequency (Hz)**			**Shake-Table Attachment**	
	Height	**Width**	**Depth**	**F-B**	**S-S**	**V**	**Type**	**Anchorage**
1,685	108	39.37	59.13	10.5	6.1	33.3	Rigid floor mount	(6) 3/8-16 grade 5 bolts and Belleville conical washers at 35 ft-lbs torque

UUT Seismic Test Parameters								
Building Codes	**Test Criteria**	S_{DS} **(g)**	***z/h***	I_p	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	2.07	0	1.5	2.07	0.83	1.39	0.56
		1.98	1	1.5	3.17	2.38	1.33	0.53

UUT Seismic Test Results

✓ The UUT maintained structural integrity and functionality as confirmed in post test inspection and active operation validation checks

UUT Photograph

UUT Major Components		
Description	**Manufacturer**	**Part No. / Identifier**
Enclosure – NEMA Type 1	Square D	39.37W x 59.13D x 108H
600A Main Bus, Copper, Tin Plated	Square D	600A Copper, Tin Plated, Bus
Fuse, Current Limiting, 65E, 25.8kV, Type DIN/E	Square D by Bussman	258GXQSJD65E
Surge Arrester, Distribution Class, Heavy Duty, 27kV, 22kV MCOV	General Electric	9L20FXX027XHS
Switch, SEM, 27kV, 600A, Motor Operated, Ungroundable	Square D	44044-242-51
Motor Operator, HVL/cc, Ungroundable, 120VAC	Square D	44046-123-54

UUT Summary
HVL/cc MV Load Current Interrupter Switchgear

UUT Product Information			
Manufacturer	**Product Category**	**Product Line Model**	**Model Number**
Square D by Schneider Electric	Switchgear – Medium Voltage Metal Enclosed	2.4–17.5 kV NEMA Type 1 HVL/cc Load Current Interrupter Switchgear	FO# 17-30373199-001

UUT Test Report Association				
Test Lab	**Report No.**	**Report Date**	**Test Run No.**	**UUT Designation**
Wyle Laboratories	58835R11	11/10/2011	5	UUT-1

UUT Notes / Description

1. The UUT is a medium voltage (2.4kV – 17.5kV) metal-enclosed HVL/cc load current interrupter switch assembly consisting of a 14.75" wide x 37.25" deep distribution section (UUT-1a) connected to a 14.75" wide x 37.25" deep auxiliary transition section (UUT-1b) packaged in NEMA Type 1 enclosures with 4" base channels. A 30" rear extension and a 48" pull box top extension were added to the standard NEMA Type 1 enclosure (UUT-1a) making the UUT total height at 142" and UUT total depth at 67.25". UUT-1a section weight is approximately 1,035 lbs and UUT-1b section weight is approximately 520 lbs.
2. NEMA Type 1 enclosures and optional extensions and base channels are constructed of carbon steel sheet, with powder-coated finish.
3. UUT full of contents.

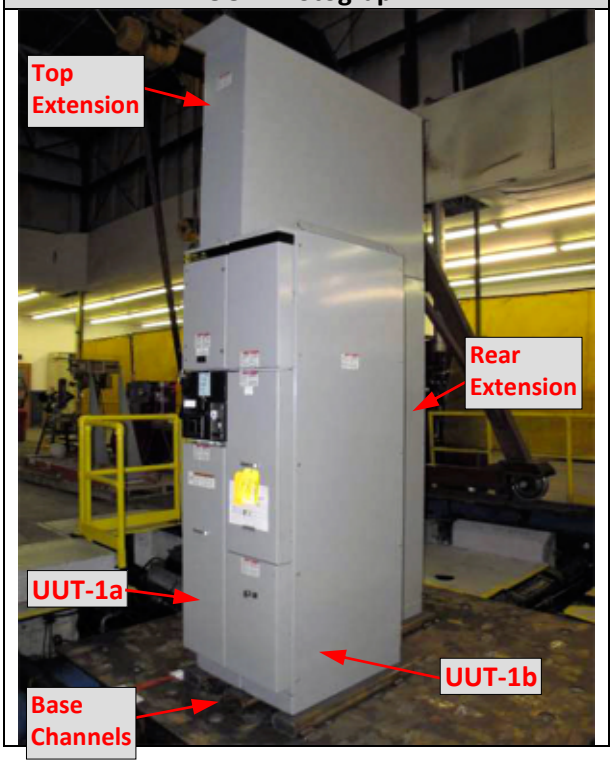
UUT Properties (As Tested)								
Weight (lbs.)	**Dimensions (in.)**			**Lowest Natural Frequency (Hz)**			**Shake-Table Attachment**	
	Height	**Width**	**Depth**	**F-B**	**S-S**	**V**	**Type**	**Anchorage**
1,555	142	29.5	67.25	15	3.95	14.5	Rigid floor mount	(10) 3/8-16 grade 5 bolts and Belleville conical spring washers at 35 ft-lbs torque

UUT Seismic Test Parameters								
Building Codes	**Test Criteria**	S_{DS} **(g)**	z/h	I_p	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	3.30	0	1.5	3.30	1.32	2.21	0.89
		1.78	1	1.5	2.85	2.14	1.19	0.48

UUT Seismic Test Results

✓ The UUT maintained structural integrity and functionality as confirmed in post test inspection and active operation validation checks

UUT Photograph



UUT Major Components		
Description	**Manufacturer**	**Part No. / Identifier**
Enclosure – NEMA Type 1	Square D	14.75W x 37.25D x 90H
Enclosure Base Channel	Square D	14.75W x 37.25D x 4H
Enclosure Base Channel	Square D	14.75W x 30D x 4H
Enclosure Rear Extension	Square D	14.75W x 30D x 90H
Enclosure Top Extension	Square D	14.75W x 67.25D x 48H
600A Main Bus, Copper, Tin Plated	Square D	600A Copper, Tin Plated, Bus
Switch, OTM, 5kV, 600A, Ungroundable	Square D	44044-241-51
Fuse, Current Limiting, 65E, 17.5kV, Type DIN/E	Square D by Bussman	175GFMSJD65E

UUT Summary
HVL MV Metal Enclosed Load Interrupter Switchgear

UUT Product Information			
Manufacturer	**Product Category**	**Product Line Model**	**Model Number**
Square D by Schneider Electric	Metal Enclosed Switchgear – Medium Voltage	5–15 kV, NEMA 1, HVL Load Interrupter Switchgear	FO# 34206074-002

UUT Test Report Association				
Test Lab	**Report No.**	**Report Date**	**Test Run No.**	**UUT Designation**
University at Buffalo SEESL	UB CSEE/SEESL-2014-11 Rev 4	08/12/2014	1-2	UUT-4

UUT Notes / Description

1. The UUT is a floor mounted medium voltage (5kV – 15kV) metal-enclosed HVL load interrupter switchgear line up consisting of a 38" wide x 54.5" deep distribution section (UUT-4a) connected to a 38" wide x 54.5" deep distribution section (UUT-4b). UUT-4a section weight is approximately 1,505 lbs and UUT-4b section weight is approximately 1,470 lbs. Both sections are packaged as NEMA Type 1 indoor enclosures.
2. NEMA Type 1 enclosures are constructed of carbon steel sheet, with powder-coated finish
3. UUT full of contents

UUT Properties (As Tested)								
Weight (lbs.)	**Dimensions (in.)**			**Lowest Natural Frequency (Hz)**			**Shake-Table Attachment**	
	Height	**Width**	**Depth**	**F-B**	**S-S**	**V**	**Type**	**Anchorage**
2,975	90	76	54.5	15.5	8.9	>33.3	Rigid floor mount	(6) 3/8-16 grade 8 hex head bolts with Bellville conical spring washers at 44 ft-lbs torque

UUT Seismic Test Parameters								
Building Codes	**Test Criteria**	S_{DS} **(g)**	***z/h***	I_p	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	2.10	0	1.5	2.10	0.84	1.41	0.57
		1.88	1	1.5	3.01	2.26	1.26	0.51

UUT Seismic Test Results

✓ The UUT maintained structural integrity and functionality as confirmed in post test inspection and active operation validation checks

UUT Photograph

UUT Major Components		
Description	**Manufacturer**	**Part No. / Identifier**
Enclosure – NEMA Type 1	Square D	38W x 54.5D x 90H
2000A Main Bus, Copper, Silver Plated	Square D	2000A Copper, Silver Plated, Bus
Switch, OTM, 15kV, 1200A, Upright	Square D	44036-340-50
Switch, SEM, 15kV, 600A, Motor Operated, Upright	Square D	44040-803-50
Zorc Surge Suppressor, 3 Pole, 12500V	Simotech	M3-12.5kV
Zorc Surge Suppressor, 3 Pole, 4160V	Simotech	M3-4.16kV
Fuse, Current Limiting, 200E, 15.5kV, Type DIN/E	Square D	155GXQSJD200E
Fuse, Power, 400E, 14.4kV, Type RBA400	Westinghouse Electric	423D815A47
Fuse, Current Limiting, 100E, 15.5kV, Type CS-3	Ferraz	A155F2D0R0100E
Surge Arrester, Distribution Class, Heavy Duty, 18kV, 15.3kV MCOV	General Electric	9L20FXX018XHS
Relay, Transformer Differential, Sepam	Schneider Electric	T87

UUT Summary
MasterClad Medium Voltage Switchgear

UUT Product Information			
Manufacturer	**Product Category**	**Product Line Model**	**Model Number**
Square D by Schneider Electric	Metal-clad Switchgear – Medium Voltage	5–15 kV NEMA Type 3R, Non Walk-In, MasterClad Switchgear	FO# 34089617-006

UUT Test Report Association				
Test Lab	**Report No.**	**Report Date**	**Test Run No.**	**UUT Designation**
University at Buffalo SEESL	UB CSEE/SEESL-2014-11 Rev 4	08/12/2014	2-2	UUT-1

UUT Notes / Description

1. The UUT is a floor mounted medium voltage (5–15 kV) metal-clad switchgear 36" wide x 109" deep MasterClad, 1200A 1-High, Distribution Section packaged as a NEMA Type 3R outdoor, non walk-in enclosure
2. The NEMA Type 3R enclosure is constructed of carbon steel sheet, with powder-coated finish
3. UUT full of contents

UUT Properties (As Tested)								
Weight (lbs.)	**Dimensions (in.)**			**Lowest Natural Frequency (Hz)**			**Shake-Table Attachment**	
	Height	**Width**	**Depth**	**F-B**	**S-S**	**V**	**Type**	**Anchorage**
4,240	109	36	109	13.9	7.5	22	Rigid floor mount	(4) 1/2"-13 Grade 8 hex head bolts with Belleville conical spring washers torqued to 107 ft.-lbs

UUT Seismic Test Parameters								
Building Codes	**Test Criteria**	S_{DS} **(g)**	z/h	I_p	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	2.11	0	1.5	2.11	0.84	1.41	0.57
		1.92	1	1.5	3.07	2.30	1.29	0.52

UUT Seismic Test Results

✓ The UUT maintained structural integrity and functionality as confirmed in post test inspection and active operation validation checks

UUT Photograph

UUT Major Components		
Description	**Manufacturer**	**Part No. / Identifier**
Enclosure – NEMA Type 3R, Carbon Steel Sheet	Square D	36W x 109D x 109H
1200A Main Bus, Copper, Silver Plated	Square D	1200A Copper, Silver Plated, Bus
Relay, Generator Protection, Standard	Schweitzer Engineering Labs	SEL-300G
Relay, Motor Management Relay	Schweitzer Engineering Labs	SEL-849
Relay, Motor Protection	GE/Mutilin	GE 239
Power Meter, ION 7650	Schneider Electric	S7750A0C0B6C1A0A
Relay, Substation Protection, Advanced, Sepam	Schneider Electric	S42
Voltage Transformer, Type PTG3, (2400:120V)	ITI/GE	PTG3160242FGC1
Voltage Transformer, Type PTG4, (2400:120V)	ITI/GE	PTG42SD03823FFB
Circuit Breaker, VR, Vacuum, 4.76kV, 40kA, 1200A, MOC	Square D	VR-05025-12
Surge Arrester, Distribution Class, Heavy Duty, 3kV, 2.55kV MCOV	General Electric	9L20FXX003XHS

UUT Summary
MasterClad Medium Voltage Switchgear

UUT Product Information			
Manufacturer	**Product Category**	**Product Line Model**	**Model Number**
Square D by Schneider Electric	Metal-clad Switchgear – Medium Voltage	5–15 kV NEMA Type 3R, Non Walk-In, MasterClad / HVL Switchgear	FO# 17-30209756-002

UUT Test Report Association				
Test Lab	**Report No.**	**Report Date**	**Test Run No.**	**UUT Designation**
UC Berkeley – PEER Laboratory	PEER – STI/2014-04R (Rev01)	08/05/2014	6	UUT-1

UUT Notes / Description

1. The UUT is a floor mounted medium voltage (5–15 kV) metal-clad switchgear lineup consisting of a 36” wide x 109” deep MasterClad, 2000A 1-High, Distribution Section (UUT-1a) connected to a 48” wide x 109” deep HVL Auxiliary Metering Section (UUT-1b). MasterClad Section weight is approximately 4,146 lbs and HVL Section weight is approximately 3,554 lbs. Both switchgear sections are packaged as NEMA Type 3R outdoor, non walk-in enclosures.
2. The NEMA Type 3R enclosures are constructed of carbon steel sheet, with powder-coated finish.
3. UUT full of contents.

UUT Properties (As Tested)								
Weight (lbs.)	**Dimensions (in.)**			**Lowest Natural Frequency (Hz)**			**Shake-Table Attachment**	
	Height	**Width**	**Depth**	**F-B**	**S-S**	**V**	**Type**	**Anchorage**
7,700	109	84	109	7.0	5.1	17.8	Rigid floor mount	(6) tie-down welds. Each tie-down filet weld was 0.12” by 12” long, with (3) front and (3) back

UUT Seismic Test Parameters								
Building Codes	**Test Criteria**	S_{DS} **(g)**	**z/h**	I_p	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	2.70	0	1.5	2.70	1.08	1.81	0.73
		1.88	1	1.5	3.00	2.26	1.26	0.51

UUT Seismic Test Results

✓ The UUT maintained structural integrity and functionality as confirmed in post test inspection and active operation validation checks

UUT Photograph

UUT Major Components

Description	Manufacturer	Part No. / Identifier
Master-Clad Enclosure – NEMA Type 3R, Carbon Steel Sheet	Square D	36W x 109D x 109H
HVL Enclosure – NEMA Type 3R, Carbon Steel Sheet	Square D	48W x 109D x 109H
2000A Main Bus, Copper, Silver Plated	Square D	2000A Copper, Silver Plated, Bus
Circuit Breaker, VR, Vacuum, 15.0kV, 25kA, 2000A MOC	Square D	VR-15050-20
Surge Arrester, Distribution Class, Heavy Duty, 15kV, 12.7kV MCOV	General Electric	9L20FXX015XHS
Control Power Transformer, 15kVA, (12470:120V)	ITI/GE	CPTS595151242A
Voltage Transformer, Type PTG5, (12470:120V)	ITI/GE	PTG52SD02293FFG
Relay, Substation Protection, Advanced, Sepam	Schneider Electric	S24
Power Meter, ION 7330	Schneider Electric	S7330A0B0B0E0A0
Switch, V.T. Grounding Disconnect, Non Load Break, 3 Pole, 12kV	Square D	44039-398-52

UUT Summary
MasterClad Medium Voltage Switchgear

UUT Product Information			
Manufacturer	**Product Category**	**Product Line Model**	**Model Number**
Square D by Schneider Electric	Metal-clad Switchgear – Medium Voltage	27–38 kV NEMA Type 3R, Non Walk-In, MasterClad Switchgear	FO# 34089617-001

UUT Test Report Association				
Test Lab	**Report No.**	**Report Date**	**Test Run No.**	**UUT Designation**
University at Buffalo SEESL	UB CSEE/SEESL-2014-11 Rev 4	08/12/2014	3-2	UUT-2

UUT Notes / Description

1. The UUT is a floor mounted medium voltage (27–38 kV) metal-clad switchgear lineup consisting of a 36" wide x 127" deep MasterClad Distribution Section (UUT-2a) connected to a 36" wide x 127" deep MasterClad, 2000A 1-High, Distribution Section (UUT-2b). UUT-2a section weight is approximately 4,692 lbs and UUT-2b section weight is approximately 4,998 lbs. Both switchgear sections are packaged as NEMA Type 3R outdoor, non walk-in enclosures
2. The NEMA Type 3R enclosures are constructed of carbon steel sheet, with powder-coated finish
3. UUT full of contents

UUT Properties (As Tested)								
Weight (lbs.)	**Dimensions (in.)**			**Lowest Natural Frequency (Hz)**			**Shake-Table Attachment**	
	Height	**Width**	**Depth**	**F-B**	**S-S**	**V**	**Type**	**Anchorage**
9,690	109	72	127	10.3	5.1	16	Rigid floor mount	(6) 1/2"-13 Grade 8 hex head bolts with Belleville conical spring washers torqued to 107 ft.-lbs

UUT Seismic Test Parameters								
Building Codes	**Test Criteria**	S_{DS} **(g)**	***z/h***	I_p	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	2.10	0	1.5	2.10	0.84	1.41	0.57
		1.88	1	1.5	3.01	2.26	1.26	0.51

UUT Seismic Test Results

✓ The UUT maintained structural integrity and functionality as confirmed in post test inspection and active operation validation checks

UUT Photograph

UUT Major Components		
Description	**Manufacturer**	**Part No. / Identifier**
Enclosure – NEMA Type 3R, Carbon Steel Sheet	Square D	36W x 127D x 109H
2000A Main Bus, Copper, Silver Plated	Square D	2000A Copper, Silver Plated, Bus
Relay, Lockout, 125VDC / 120VAC	Electroswitch	7805D
Relay, Breaker Management	GE/Mutilin	GE C60
Power Meter, Powerlogic PM 870	Schneider Electric	870
Circuit Breaker, VR, Vacuum, 27kV, 40kA, 2000A, MOC	Square D	VR-27040-20
Surge Arrester, Distribution Class, Heavy Duty, 24kV, 19.5kV MCOV	General Electric	9L20FXX024XHS
Control Power Transformer, 5kVA, (2400:120V)	ITI/GE	CPTS3605242A
Control Power Transformer, 25kVA, (4160:120V)	ITI/GE	CPT360254161A
Fuse, Current Limiting, 7E, 25.8kV, Type EJ0-1	General Electric	9F60DNJ007
Circuit Breaker, Molded Case, J-frame, 250A 240V	Square D	JDL26250C
Voltage Transformer, Type PT6 (27000:120V)	ITI/GE	PT61125SD03591