



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY
APPLICATION #: OSP - 0115

OSHPD Special Seismic Certification Preapproval (OSP)

Type: [ ] New [X] Renewal

Manufacturer Information

Manufacturer: ABB, Inc.

Manufacturer's Technical Representative: Oscar A. Saenz

Mailing Address: 500 W. Highway 94, Jefferson City, MO 65101

Telephone: (573) 659-6325 Email: oscar.a.saenz@abb.com

Product Information

Product Name: Transformer Product Family

Product Type: One and Three Phase Padmount, Horizontal and Unit Substation Transformers

Product Model Number: Varies (see attachment)
(List all unique product identification numbers and/or part numbers)

General Description: One and three phase, liquid filled distribution transformers including padmounted, horizontal,
and unit substation product families.

Mounting Description: Rigid - base mounted

Applicant Information

Applicant Company Name: TRU Compliance, by Structural Integrity Associates, Inc

Contact Person: Galen Reid

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

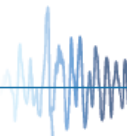
Telephone: 844-TRU-0200 Email: greid@structint.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in
accordance with the California Administrative Code, 2016.

Signature of Applicant: [Signature] Date: 2/18/2019

Title: Program Manager Company Name: TRU Compliance, by Structural Integrity Associates, Inc

\*Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dynamic Needs\*





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

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

Company Name: TRU Compliance, by Structural Integrity Associates, Inc

Name: Andy Coughlin, SE California License Number: S6082

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

Telephone: 844-TRU-0200 Email: [acoughlin@structint.com](mailto:acoughlin@structint.com)

**Supports and Attachments Preapproval**

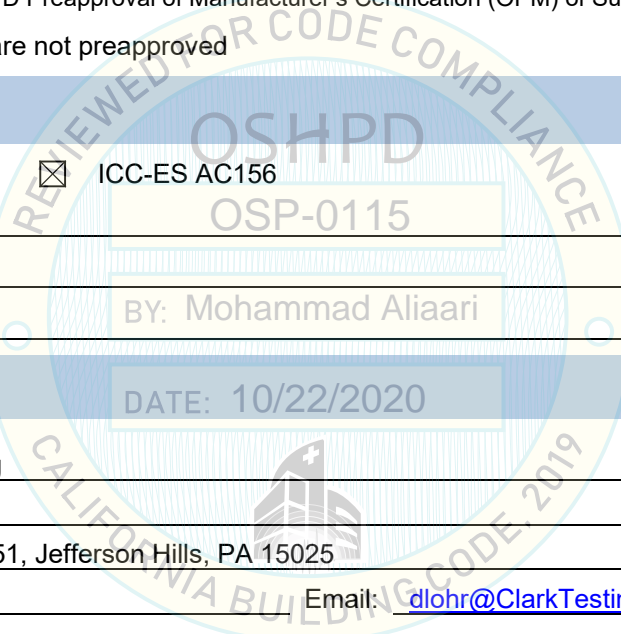
Supports and attachments are preapproved under OPM- \_\_\_\_\_  
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)

Supports and attachments are not preapproved

**Certification Method**

Testing in accordance with:  ICC-ES AC156

Other (Please Specify): \_\_\_\_\_



**Testing Laboratory**

Company Name: Clark Testing

Contact Name: Devon Lohr

Mailing Address: 1801 Route 51, Jefferson Hills, PA 15025

Telephone: (412) 387-1026 Email: [dlohr@ClarkTesting.com](mailto:dlohr@ClarkTesting.com)

Company Name: Environmental Testing Laboratory (ETL)

Contact Name: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas, TX 75229

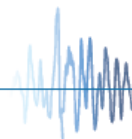
Telephone: (972) 247-9657 Email: [jeremy@etldallas.com](mailto:jeremy@etldallas.com)

Company Name: Engineer Research & Development Center -Construction Engineering Research Laboratory (ERDC-CERL)

Contact Name: James Wilcoski

Mailing Address: 2902 Newmark Drive, Champaign, IL 61822

Telephone: (217) 373-6763 Email: [james.wilcoski@usace.army.mil](mailto:james.wilcoski@usace.army.mil)





OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
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Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: [X] Yes [ ] No

Design Basis of Equipment or Components (Fp/Wp) = 1.01

Sds (Design spectral response acceleration at short period, g) = 2.25

ap (In-structure equipment or component amplification factor) = 1.0

Rp (Equipment or component response modification factor) = 2.5

Omega\_0 (System overstrength factor) = 2.0

Ip (Importance factor) = 1.5

z/h (Height factor ratio) = 0.0

Equipment or Component Natural Frequencies (Hz) = (See Attachment)

Overall dimensions and weight (or range thereof) = (See Attachment)

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: [ ] Yes [X] No

Design Basis of Equipment or Components (V/W) =

Sds (Design spectral response acceleration at short period, g) =

Sd1 (Design spectral response acceleration at 1 second period, g) =

R (Response modification coefficient) =

Omega\_0 (System overstrength factor) = by: Mohammad Aliaari

Cd (Deflection amplification factor) =

Ip (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, 2015: [ ] Yes [X] No

List of Attachments Supporting Special Seismic Certification

[X] Test Report(s) [ ] Drawings [ ] Calculations [ ] Manufacturer's Catalog

[X] Other(s) (Please Specify): Product Matrices

OSHPD Approval (For Office Use Only) - Approval Expires on December 31, 2025

Signature: M. Aliaari

Date: October 22, 2020

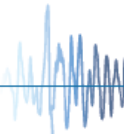
Print Name: Mohammad Aliaari

Title: Senior Structural Engineer

Special Seismic Certification Valid Up to : Sds (g) = 2.25

z/h = 0.0

Condition of Approval (if applicable):



# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.						<b>TABLE 1</b>	
<b>Model Line:</b> Transformer Product Family							
<b>Certified Product Construction Summary:</b> NEMA 3R Enclosure							
<b>Certified Options Summary:</b> Enclosure and Tank: Stainless Steel (SS) or Carbon Steel (CS). Windings: Copper, Aluminum or Copper-Aluminum Mix. Feed: Radial or Loop. Front: Live or Dead. See Tables 5-7 for certified subcomponents. ABB Transformers can be rebranded as Square D (Schneider Electric), Siemens, GE, Eaton, Sunbelt and Hitachi.							
<b>Mounting Configuration:</b> Base mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
<b>Building Code:</b> CBC 2019		<b>Seismic Certification Limits:</b> $S_{DS} = 2.25 g$ $z/h = 0.0$			$I_p = 1.5$		
Model Line	Model (kVA)	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
1 $\phi$ Padmount (Stainless Steel Tank)	10	45	42	36	1,366	UUT: Al windings, CS tank	7
	10	56	46	42	1,800		Interp.
	15	56	46	42	1,994		Interp.
	25	56	46	42	1,869		Interp.
	30	56	46	42	1,900		Interp.
	38	56	46	42	2,018		Interp.
	45	56	46	42	1,975		Interp.
	50	56	46	42	2,063		Interp.
	75	56	46	42	2,290		Interp.
	100	56	46	42	2,668		Interp.
	113	56	46	42	2,150		Interp.
	150	56	46	42	2,299		Interp.
	167	56	46	42	2,300		Interp.
	200	56	46	42	2,355		Interp.
	225	56	46	42	2,669		Interp.
250	56	46	42	2,725	UUT: Al windings, SS tank	6	
3 $\phi$ Padmount (Carbon Steel Tank)	75	50	57	48	2,300	UUT: Al windings, CS tank	1
	112	72	74	73	7,700		Interp.
	150	76	76	73	8,500		Interp.
	225	80	84	77	9,000		Interp.
	250	82	88	77	9,500		Interp.
	300	82	92	77	10,000		Interp.
	500	92	102	77	12,500		Interp.
	750	95	102	77	13,500		Interp.

# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.						<b>TABLE 1</b>	
<b>Model Line:</b> Transformer Product Family							
<b>Certified Product Construction Summary:</b> NEMA 3R Enclosure							
<b>Certified Options Summary:</b> Enclosure and Tank: Stainless Steel (SS) or Carbon Steel (CS). Windings: Copper, Aluminum or Copper-Aluminum Mix. Feed: Radial or Loop. Front: Live or Dead. See Tables 5-7 for certified subcomponents. ABB Transformers can be rebranded as Square D (Schneider Electric), Siemens, GE, Eaton, Sunbelt and Hitachi.							
<b>Mounting Configuration:</b> Base mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
<b>Building Code:</b> CBC 2019		<b>Seismic Certification Limits:</b>			$S_{DS} = 2.25g$	$z/h = 0.0$	$I_p = 1.5$
Model Line	Model (kVA)	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
3 $\phi$ Padmount (Carbon Steel Tank)	780	95	102	77	14,250		Interp.
	1000	95	102	81	15,000		Interp.
	1100	95	102	81	15,500		Interp.
	1200	95	102	81	16,000		Interp.
	1250	95	102	81	16,500		Interp.
	1500	110	135	81	18,200		Interp.
	1750	110	135	81	18,800		Interp.
	2000	116	135	94	19,000		Interp.
	2500	116	135	94	19,500		Interp.
	3000	116	135	94	19,850	UUT: Al-Cu windings, CS Tank	15
3 $\phi$ Padmount (Stainless Steel Tank)	75	50	57	48	2,300		Interp.
	112	72	74	73	7,700		Interp.
	150	76	76	73	8,500		Interp.
	225	80	84	77	9,000		Interp.
	250	82	88	77	9,500		Interp.
	300	82	92	77	10,000		Interp.
	500	89	102	77	12,500		Interp.
	750	89	102	77	13,500		Interp.
	780	89	102	77	14,250		Interp.
	1000	89	102	81	15,000		Interp.
	1100	89	102	81	15,500		Interp.
	1200	89	102	81	16,000		Interp.
	1250	89	102	81	16,500		Interp.
	1500	89	135	81	16,800		Interp.

# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>TABLE 1</b>
<b>Model Line:</b> Transformer Product Family	

**Certified Product Construction Summary:**  
NEMA 3R Enclosure

**Certified Options Summary:**  
Enclosure and Tank: Stainless Steel (SS) or Carbon Steel (CS). Windings: Copper, Aluminum or Copper-Aluminum Mix. Feed: Radial or Loop. Front: Live or Dead. See Tables 5-7 for certified subcomponents. ABB Transformers can be rebranded as Square D (Schneider Electric), Siemens, GE, Eaton, Sunbelt and Hitachi.

**Mounting Configuration:**  
Base mounted - rigid  
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

**Building Code:** CBC 2019      **Seismic Certification Limits:**  $S_{DS} = 2.25g$     $z/h = 0.0$        $I_P = 1.5$

Model Line	Model (kVA)	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
3 $\phi$ Padmount (Stainless Steel Tank)	1750	89	135	81	17,000		Interp.
	2000	89	135	81	17,050		Interp.
	2500	89	135	81	17,090	UUT: Cu Windings, SS Tank	5

# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>TABLE 2</b>
<b>Model Line:</b> Transformer Product Family	

**Certified Product Construction Summary:**  
NEMA 3R carbon steel enclosure and tank.

**Certified Options Summary:**  
Windings: Copper (all listed models) or Aluminum (model 225 only).  
See Tables 5-7 for certified subcomponents. ABB Transformers can be rebranded as Square D (Schneider Electric), Siemens, GE, Eaton, Sunbelt and Hitachi.

**Mounting Configuration:**  
Base mounted - rigid  
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

**Building Code:** *CBC 2019*      **Seismic Certification Limits:**       $S_{DS} = 2.25 g$      $z/h = 0.0$        $I_p = 1.5$

Model Line	Model (kVA)	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
3φ Substation Radial Feed Live Front	225	67	59	73	4,900	UUT: Al windings, CS tank	3
	300	51	46	73	6,035		Interp.
	500	52	50	73	7,192		Interp.
	750	51	53	73	9,150		Interp.
	1000	71	62	73	10,521		Interp.
	1500	67	66	73	12,427		Interp.
	2000	67	69	73	15,021		Interp.
	2500	93	69	73	15,900		Interp.
	3000	93	69	85	15,900	UUT: Cu windings, CS tank	4

# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>TABLE 3</b>
<b>Model Line:</b> Transformer Product Family	

**Certified Product Construction Summary:**  
NEMA 3R Stainless steel enclosure and tank.

**Certified Options Summary:**  
Windings: Copper (all listed models) or Aluminum (radial feed model 75 and loop feed model 45 only). See Tables 5-7 for certified subcomponents. ABB Transformers can be rebranded as Square D (Schneider Electric), Siemens, GE, Eaton, Sunbelt and Hitachi.

**Mounting Configuration:**  
Base mounted - rigid  
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

**Building Code:** CBC 2019      **Seismic Certification Limits:**  $S_{DS} = 2.25 g$     $z/h = 0.0$        $I_p = 1.5$

Model Line	Model (kVA)	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
3φ UCT Radial Feed Dead Front	75	32	68	53	3,640	UUT: Al windings, SS tank	9
	113	26	62	46	3,686		Interp.
	150	30	62	46	4,564		Interp.
	225	30	70	54	7,148		Interp.
	300	30	62	50	6,050		Interp.
	500	34	70	58	8,120		Interp.
	750	34	70	62	10,210		Interp.
	1000	36	70	62	10,070		Interp.
	1500	38	70	66	10,500		Interp.
3φ UCT Loop Feed Dead Front	45	30	56	38	3,200		Interp.
	50	30	58	46	3,828		Interp.
	75	30	70	46	4,600		Interp.
	113	30	58	42	3,608		Interp.
	150	34	70	54	5,795		Interp.
	225	30	60	46	4,657		Interp.
	300	34	70	58	6,406		Interp.
	500	34	70	58	7,980		Interp.
	750	38	70	62	8,960		Interp.
	1000	36	70	62	10,305		Interp.
	1500	57	79	76	10,500	UUT: Cu windings, SS tank	8



# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc. <b>Model Line:</b> Transformer Product Family						<b>TABLE 4</b>	
<b>Certified Product Construction Summary:</b> NEMA 3R Stainless steel enclosure and tank.							
<b>Certified Options Summary:</b> Windings: Copper, Aluminum or Mix Copper-Aluminum. See Table 5-7 for certified subcomponents. SEOR responsible for anchorage design. ABB Transformers can be rebranded as Square D (Schneider Electric), Siemens, GE, Eaton, Sunbelt and Hitachi.							
<b>Mounting Configuration:</b> Base mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
<b>Building Code:</b> CBC 2019		<b>Seismic Certification Limits:</b> $S_{DS} = 2.25 g$ $z/h = 0.0$				$I_p = 1.5$	
Model Line	Model (kVA)	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
1φ Horizontal	25	24	44	29	1,096	UUT: Al windings, SS tank	10
	50	24	40	30	1,074		Interp.
	75	28	40	30	1,513		Interp.
	100	24	40	32	1,393		Interp.
	167	24	40	42	2,223	UUT: Al-Cu windings, SS tank	11
1φ DUP Horizontal	25	24	47	32	1,513	UUT: Al windings, SS tank	12
	50	24	41	30	1,452		Interp.
	75	28	40	30	1,594		Interp.
	100	30	51	38	2,513	UUT: Al-Cu windings, SS tank	13

# SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc. <span style="float: right;"><b>Table Description:</b> Electrical Bushings</span>		<b>TABLE 5</b>			
<b>Model Line:</b> Transformer Product Family					
<b>Building Code:</b> CBC 2019		<b>Seismic Certification Limits:</b> $S_{DS} = 2.25 g$ $z/h = 0.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
Bushings - HV	ABB	2B10536H01	21.1 kV 200A - INTEGRAL STUD	UUT3: Qt.(6), UUT4: Qt.(3), UUT6: Qt.(2), UUT14: Qt.(3)	3,4,6,14
		1ZUA276301-AEB	25kV 200A BUSHING, 150BIL REM STUD	Qt.(2)	15
	Cooper	2637019B02	15.2/8.3kV 600A BUSHING	Qt.(1)	15
		DB635B150	35kV 600A BUSHING	Qt.(1)	15
	Crosslink Technology, Inc	90-345	15kV 450A EPOXY BUSHING, L-FRONT	Qt.(1)	15
		90-340	34.5kV 350A EPOXY BUSHING, L-FRONT	Qt.(1)	15
	ESNA/Elastimold	K1601-PC-T1	200A (589B821H10)	UUT8: Qt.(6), UUT9: Qt.(3), UUT10: Qt.(4), UUT11: Qt.(4), UUT12: Qt.(6), UUT13: Qt.(6)	8-13
		K650S1-NF	25kV 600A BUSHING	Qt.(1)	15
		750S1-NF	35kV 600A BUSHING	Qt.(1)	15
	H-J Enterprises	28C2465G01	15kV 200A PORC BUSHING W/2 HL SPD		Extrap.
		28C3929H01	15kV 600A PORC BUSHING W/2 HL SPD	Qt.(3) Brass alloy spade tested	1
		30C2137H01	15kV 600A PORC BUSHING W/ SNGL EYEBOLT		Interp.
		30C1975H01	15kV 800A PORC BUSHING W/ 2 HL SPD		Interp.
		28C2471G01	25kV 200A PORC BUSHING W/ SNGL EYEBOLT		Interp.
		30C1926H01	25kV 200A PORC BUSHING W/ SNGL EYEBOLT	Qt.(2)	7
	Warco	28C5998H01	15kV 110A PORC BUSHING W/2 HL SPD		Interp.
		29C1559H01	25kV 785A PORC BUSHING W/4 HL SPD		Interp.
		29C2098H01	35kV 110A PORC BUSHING W/2 HL SPD		Interp.
29C5629H01		35kV 110A PORC BUSHING W/4 HL SPD		Interp.	
1C19264H01		34.5kV 55A PORC BUSHING W/ SNGL EYEBOLT		Interp.	

TRU Compliance, by Structural Integrity Associates, Inc.

844-TRU-0200 | info@trucompliance.com

# SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>Table Description:</b> Electrical Bushings	<b>TABLE 5</b>
<b>Model Line:</b> Transformer Product Family		

**Building Code:** CBC 2019      **Seismic Certification Limits:**  $S_{DS} = 2.25 g$     $z/h = 0.0$        $I_p = 1.5$

Component Type	Manufacturer	Model	Description	Notes	UUT
Bushing - HV	Warco	28C4488H01	35kV 460A PORC BUSHING W/2 HL SPD	Qt.(3) Bronze spade tested	2
		29C5672H01	35kV 460A PORC BUSHING W/4 HL SPD	Qt.(2) Cu spades, (1) Bronze alloy spade	5
		29C4357H01	35kV 600A PORC BUSHING W/2 HL SPD		Extrap.
Bushing - LV	ABB	2B10357H01	0.625" DIA CU	UUT4: Qt.(4), UUT7: Qt.(3)	4,7
		2B10567H01	1.00" DIA CU	Qt.(3)	14
		28C2288H01	1.25" DIA CU	Qt.(3)	6
	Central Moloney	2B12889H01	0.625" DIA CU	UUT10: Qt.(2), UUT12: Qt.(3)	10,12
		1B24954H01	1.00" DIA CU	UUT11: Qt.(4), UUT13: Qt.(3)	11,13
		1B24955H01	1.25" DIA CU	UUT8: Qt.(4), UUT9: Qt.(4)	8,9
	Crosslink Technology, Inc	1C23252H01	875A CU BUSH, EPOXY INSULA 4-HOLE		Extrap.
		28C4159H01	3100A CU BUSH, EPOXY INSULA 6-HOLE		Extrap.
		29C1057H01	3150A AL BUSH, EPOXY INSUL, 4-HOLE		Extrap.
		28C1016H01	3150A AL BUSH, EPOXY INSUL, 6-HOLE	Qt.(4)	2
		28C1017H01	3150A AL BUSH, EPOXY INSUL, 8-HOLE		Interp.
		28C1018H01	3150A LV Bushing 10 Hole		Interp.
		28C1022H01	4300A CU BUSH, EPOXY INSULA 6-HOLE	Qt.(4)	3
		28C1079H01	4300A LV Bushing 6 Hole		Interp.
		28C1023H01	4300A CU BUSH, EPOXY INSULA 8-HOLE		Interp.
		28C1024H01	4300A CU BUSH, EPOXY INSULA 10-HOLE		Interp.
		28C1080H01	4300A CU BUSH, EPOXY INSULA 10-HOLE		Interp.
28C4372H01	4512A CU BUSH, EPOXY INSULA 6-HOLE		Interp.		
28C4822H01	4512A LV Bushing 10 Hole		Interp.		
28C4192H01	5400A CU BUSH, EPOXY INSULA 6-HOLE		Interp.		

# SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>Table Description:</b> Electrical Bushings	<b>TABLE 5</b>
<b>Model Line:</b> Transformer Product Family		

**Building Code:** CBC 2019      **Seismic Certification Limits:**  $S_{DS} = 2.25g$   $z/h = 0.0$        $I_p = 1.5$

Component Type	Manufacturer	Model	Description	Notes	UUT
Bushings - LV	Crosslink Technology, Inc	29C4310H01	5400A CU BUSH, EPOXY INSULA 6-HOLE		Interp.
		28C4566H01	5400A LV Bushing 8 Hole		Interp.
		30C4663H01	5400A LV Bushing 8 Hole		Interp.
		28C4565H01	5400A CU BUSH, EPOXY INSULA 10-HOLE		Interp.
		29C2998H01	5400A LV Bushing 12 Hole		Interp.
		29C2461H01	5400A LV Bushing 14 Hole		Interp.
		29C4583H01	5400A LV BUSH, 18 HOLE, CU SPADE	Qt.(1)	15
	Daheng	30C5033H01	3150A LV Bushing 6 Hole		Extrap.
		30C5034H01	3150A LV Bushing 8 Hole		Extrap.
		29C4432H01	3150A AL BUSH, EPOXY INSUL, 10-HOLE	Qt.(4)	5
		30C5035H01	3150A LV Bushing 10 Hole		Interp.
		30C5036H01	3150A LV Bushing 12 Hole		Interp.
		30C5037H01	3150A LV bushing, 16 HOLE	Qt.(1)	15
		30C5038H01	3150A LV Bushing 20 Hole		Interp.
		30C5193H01	4300A LV Bushing, 6 HOLE	Qt.(1)	15
		30C5039H01	4300A LV Bushing 8 Hole		Interp.
		30C5040H01	4300A LV Bushing 10 Hole		Interp.
		30C5041H01	4300A LV Bushing 12 Hole		Interp.
		30C5042H01	4300A LV Bushing 16 Hole		Interp.
		30C5238H01	4300A LV Bushing, 18 HOLE	Qt.(1)	15
ESNA/Elastimold	1601A4CS937	15KV INSERT BUSHING	Qt.(1)	15	
H-J Enterprises	28C4655H01	5400A CU-BUSH , EPOXY INSUL,8-HOLE	Qt.(4)	1	

# SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.		<b>Table Description:</b> Electrical Bushings			<b>TABLE 5</b>
<b>Model Line:</b> Transformer Product Family					
<b>Building Code:</b> CBC 2019		<b>Seismic Certification Limits:</b> $S_{DS} = 2.25 g$ $z/h = 0.0$ $I_p = 1.5$			
<b>Component Type</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Description</b>	<b>Notes</b>	<b>UUT</b>
Bushing - Inserts	ESNA/Elastimold	1B23941H01	15 kV class	Qt.(3)	7
		1B23942H01	25 kV class	Qt.(2)	6
		4931B50H01	21.1/36.6 kV class	Qt.(3)	14
Bushing - Standoff	H-J Enterprises	POB-014	5.0kV, 60 kV BIL	Qt.(1)	5
		POB-015	7.5kV, 75 kV BIL		Interp.
		POB-016	8.7kV, 95 kV BIL		Interp.
		POB-017	25kV, 110 kV BIL		Interp.
		PO 0097-001	25kV, 150 kV BIL	UUT5: Qt. (2), UUT7: Qt. (1)	5,7

# SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>Table Description:</b> Fuses	<b>TABLE 6</b>
<b>Model Line:</b> Transformer Product Family		

**Building Code:** CBC 2019      **Seismic Certification Limits:**  $S_{DS} = 2.25g$   $z/h = 0.0$        $I_p = 1.5$

Component Type	Manufacturer	Model	Description	Notes	UUT
Fusing (Isolation Link)	ABB	1B25455H01	ISOLATION LINK 1C11130G01 A1		Extrap.
		1B25455H02	ISOLATION LINK 1C11130G02 A2	Qt.(1)	7
		1B25455H03	ISOLATION LINK 1C11130G03 A3		Interp.
		1B25455H05	ISOLATION LINK 1C11130G05 A5		Interp.
		1B25455H06	ISOLATION LINK 1C11130G06 A6		Interp.
		1B25455H07	ISOLATION LINK 1C11130G07 A7	Qt.(1)	9
		RTE	3637803B01	ISOLATION LINK - MAGNEX E01	
	3637803B08		ISOLATION LINK - MAGNEX E03	Qt.(3)	10
	3637803B02		ISOLATION LINK - MAGNEX E06		Interp.
	3637803B09		ISOLATION LINK - MAGNEX E10		Interp.
	3637803B10		ISOLATION LINK - MAGNEX E12		Interp.
	3637803B03		ISOLATION LINK - MAGNEX E18/E25	Qt.(3)	11
	3637803B05	ISOLATION LINK - MAGNEX E30/E40/E50		Extrap. <sup>1</sup>	
Fusing (Link Bay-O-Net)	RTE	3A18440H01	125A MFR'S ID: 4038361C05CB	Qt.(3)	14
Expulsion Fuse	ABB	592B581G/5750D27G	15.0 kV LINK	Qt.(1) 5750D27G14 Tested	5
		779C667G	19.9kV LINK		Interp
		779G667G	23.0kV LINK		Interp
		345B995G	34.5kV LINK	Qt.(2) 345B995G32 Tested	5
	ERMCO	9F54DAA	5.2 kV LINK		Extrap.
		9F54DAB	5.2 kV LINK		Extrap.
		9F54DBA	8.4 kV LINK		Extrap.

<sup>1</sup>Subcomponent size and weight match tested subcomponent.

# SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b>	ABB, Inc.	<b>Table Description:</b> Fuses	<b>TABLE 6</b>
<b>Model Line:</b>	Transformer Product Family		

**Building Code:** CBC 2019      **Seismic Certification Limits:**  $S_{DS} = 2.25 g$     $z/h = 0.0$        $I_p = 1.5$

Component Type	Manufacturer	Model	Description	Notes	UUT
Expulsion Fuse	ERMCO	9F54DBB	8.4 kV LINK		Extrap.
		9F54DDA	15.0 kV LINK		Extrap.
		9F54DDA	15.0 kV LINK		Extrap.
		9F54DCA	23.0 kV LINK	Qt.(3) 9F54DCA701 Tested	12
		9F54DCB	23.0 kV LINK	Qt.(3) 9F54DCB001 Tested	12
Expulsion Fuse (Type-DO-III)	ABB	3A21026H03	3AMP DUAL SEN FUSE 1B11144G03		Extrap.
		3A21027H03	5AMP DUAL ELE FUSE 1B11145G03		Extrap.
		3A21027H04	6AMP DUAL ELE FUSE 1B11145G04		Extrap.
		3A21025H04	6AMP CUR SEN FUSE 1B11143G04		Extrap.
		3A21027H05	8AMP DUAL ELE FUSE 1B11145G05	Qt.(1)	9
		3A21026H05	8AMP DUAL SEN FUSE 1B11144G05	Qt.(2)	9
		3A21025H06	10AMP CUR SEN FUSE 1B11143G06	Qt.(1)	7
		3A21027H06	12AMP DUAL ELE FUSE 1B11145G06		Interp.
		3A21027H07	15AMP DUAL ELE FUSE 1B11145G07		Interp.
		3A21026H08	15AMP DUAL SEN FUSE 1B11144G08		Interp.
		3A21025H08	15AMP CUR SEN FUSE 1B11143G08		Interp.
		3A21027H09	25AMP DUAL ELE FUSE 1B11145G09		Interp.
		3A21026H10	25AMP DUAL SEN FUSE 1B11144G10		Interp.
		3A21025H10	25AMP CUR SEN FUSE 1B11143G10		Interp.
		3A21027H11	40AMP DUAL ELE FUSE 1B11145G11		Interp.
3A21025H12	40AMP CUR SEN FUSE 1B11143G12		Interp.		
3A21027H12	50AMP DUAL ELE FUSE 1B11145G12		Interp.		

<sup>1</sup>Subcomponent size and weight match tested subcomponent.

# SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>Table Description:</b> Fuses	<b>TABLE 6</b>
<b>Model Line:</b> Transformer Product Family		

**Building Code:** CBC 2019      **Seismic Certification Limits:**  $S_{DS} = 2.25 g$     $z/h = 0.0$        $I_p = 1.5$

Component Type	Manufacturer	Model	Description	Notes	UUT
Expulsion Fuse (Type-DO-III)	ABB	3A21026H12	50AMP DUAL SEN FUSE 1B11144G12		Interp.
		3A21026H14	65AMP DUAL SEN FUSE 1B11144G14		Interp.
		3A21025H14	65AMP CUR SEN FUSE 1B11143G14	Qt.(1)	6
		3A21025H16	100AMP CUR SEN FUSE 1B11143G16		Extrap. <sup>1</sup>
		3A21025H17	140AMP CUR SEN FUSE 1B11143G17		Extrap. <sup>1</sup>
Current-Limiting Fuse	Cooper	CBUC38140D100	38kV, 140A	Qt.(2)	15
	Hi-Tech (30A-165A)	HTSS232	8.3 kV	Qt.(3) HTSS232040 Tested	9
		HTSS240	17.2 kV	Qt.(3) HTSS242150 Tested	14
		HTSS242	15.5 kV		Interp.
		HTSS252	23.0 kV	Qt.(2) HTSS252100 Tested	5
		HTSS372	38.0 kV	UUT5: Qt.(2) HTSS372100 Tested, UUT15: Qt.(2) HTSS372165 Tested	5, 15

<sup>1</sup>Subcomponent size and weight match tested subcomponent.



# SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>Table Description:</b> Misc. Electrical Components	<b>TABLE 7</b>
<b>Model Line:</b> Transformer Product Family		

**Building Code:** CBC 2019      **Seismic Certification Limits:**  $S_{DS} = 2.25 g$     $z/h = 0.0$        $I_p = 1.5$

Component Type	Manufacturer	Model	Description	Notes	UUT
Switch	RTE	8608C31H01	150A 6 DECK DV SWITCH	UUT4: Qt.(1), UUT8: Qt.(1)	4,8
		1B24985H01	150A 3 DECK DV SWITCH	UUT10: Qt.(1), UUT11: Qt.(1), UUT13: Qt.(1)	10,11,13
	ABB	1C23376H01	100A 1 DECK DV SWITCH	Qt.(1)	6
		1C08872H01	125A 3 DECK TAP CHANGES	UUT1: Qt.(1), UUT5: Qt.(1)	1,5
		1C08823H01	300A 1 DECK LBOR	Qt.(1)	7
		1C08825H01	300A 3 DECK LBOR	UUT5: Qt.(1), UUT6: Qt.(1)	5,6,
		1C08872H01	3PH TC	Qt.(1)	1
		29C2190H01	3PH TC SILVER CONTACTS	UUT3: Qt.(1), UUT4: Qt.(1)	3,4
		5543C55G47	300A 3 DECK LBOR W/ HANDLE	UUT8-11: Qt.(1) each, UUT13: Qt.(1)	8-11,13
	Cooper	LS4BH3T12M	T_BLADE, 4 POSITION SWITCH, "LS4" FAMILY, LOAD BREAK SWITCH	Qt.(1)	15
2237179C02M		300A TAP CHANGES	Qt.(1)	15	
Breaker	ERMCO	1B24028H01	T-12 BREAKER	Qt.(1)	7
		28C2517H01	T-13 BREAKER		Interp.
		2B11057H01	T-15 BREAKER	Qt.(1)	13
	RTE	29C2161H01	MAGNEX INTERRUPTER	Qt.(1)	10
		29C4597H01	MAGNEX INTERRUPTER	Qt.(1)	11
Gauges	Qualitrol	QUAL 020-550-01	LIQUID LEVEL GAUGE	UUT4: Qt.(1), UUT6: Qt.(1)	4,6
		QUAL 151-100-01	LIQUID TEMPERATURE GAUGE	UUT2: Qt.(1), UUT5: Qt.(1)	2,5
		QUAL 030-017-03	LIQUID LEVEL GAUGE	UUT1: Qt.(1), UUT2: Qt.(1)	1,2
	HJ	INT001-001K-SS	VACUUM PRESSURE GAUGE	UUT1: Qt.(1), UUT2: Qt.(1), UUT4: Qt.(4)	1,2,4
	Heartland	HLG-1065	LIQUID SIGHT GAUGE	UUT7-13: Qt.(1) each	7-13
	Elmek	572015-00-04	LIQUID LEVEL GAUGE	Qt.(1)	5

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# SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>Table Description:</b> Misc. Electrical Components	<b>TABLE 7</b>
<b>Model Line:</b> Transformer Product Family		

**Building Code:** CBC 2019      **Seismic Certification Limits:**  $S_{DS} = 2.25 g$   $z/h = 0.0$        $I_p = 1.5$

Component Type	Manufacturer	Model	Description	Notes	UUT
Pressure Relief	Hardware	3A25842H01	PRESSURE RELIEF	UUT10-13: Qt.(1) each	10-13
	Qualitrol	QUAL 201-020-01	PRESSURE RELIEF	UUT1-5: Qt.(1) each, UUT15: Qt.(1)	1-5, 15
		QUAL 202-014-02	PRESSURE RELIEF	UUT8,9: Qt.(1) each	8,9
		QUAL 208-60E	PRESSURE RELIEF	Qt.(1)	15
Control Cabinet	Weigmann	8D12182M13	CONTROL CABINET	Qt.(1)	1
Fans	Krenz Vent	A-9875	12" FAN	Qt.(1)	1
		...			Interp.
		A-8477	16" FAN	Qt.(2)	1
APID Pressure Rise Relay	Qualitrol	910-010-33	RAPID RISE RELAY	Qt.(1)	15
Current Transformer	ABB	1A3389	B/O CT 5485:5 MNTG INSIDE TANK	Qt.(1)	15
Thermometer	Qualitrol	120-005-03	DIRECT MT THERM	Qt.(1)	15
Under Oil Arrester	Cooper	CLU23C36	36kV, "CLU" Arresters	Qt.(1)	15

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



**Manufacturer:** ABB, Inc.  
**Model Line:** Transformer Product Family

UUT	Unit Description	Report Number	Testing Laboratory	S <sub>DS</sub>	z/h	I <sub>p</sub>
1	NEMA 3R Painted carbon steel enclosure without skirt.	T5051	Clark Testing	2.25	0	1.5
2	NEMA 3R Painted carbon steel enclosure without skirt.	T5051	Clark Testing	2.25	0	1.5
3	NEMA 3R Painted carbon steel enclosure without skirt.	T5051	Clark Testing	2.25	0	1.5
4	NEMA 3R Painted carbon steel enclosure without skirt.	T5051	Clark Testing	2.25	0	1.5
5	NEMA 3R Painted carbon steel enclosure.	13512	Environmental Testing Laboratory (ETL)	2.25	0	1.5
6	NEMA 3R Painted carbon steel enclosure.	13512	Environmental Testing Laboratory (ETL)	2.25	0	1.5
7	NEMA 3R Painted carbon steel enclosure.	13512	Environmental Testing Laboratory (ETL)	2.25	0	1.5
8	NEMA 3R Stainless steel enclosure and tank without skirt.	13512	Environmental Testing Laboratory (ETL)	2.25	0	1.5
9	NEMA 3R Stainless steel enclosure and tank without skirt.	13512	Environmental Testing Laboratory (ETL)	2.25	0	1.5
10	NEMA 3R Stainless steel enclosure and tank without skirt.	13512	Environmental Testing Laboratory (ETL)	2.25	0	1.5
11	NEMA 3R Stainless steel enclosure and tank without skirt.	13512	Environmental Testing Laboratory (ETL)	2.25	0	1.5
12	NEMA 3R Stainless steel enclosure and tank without skirt.	13512	Environmental Testing Laboratory (ETL)	2.25	0	1.5
13	NEMA 3R Stainless steel enclosure and tank without skirt.	13512	Environmental Testing Laboratory (ETL)	2.25	0	1.5

**Notes:**

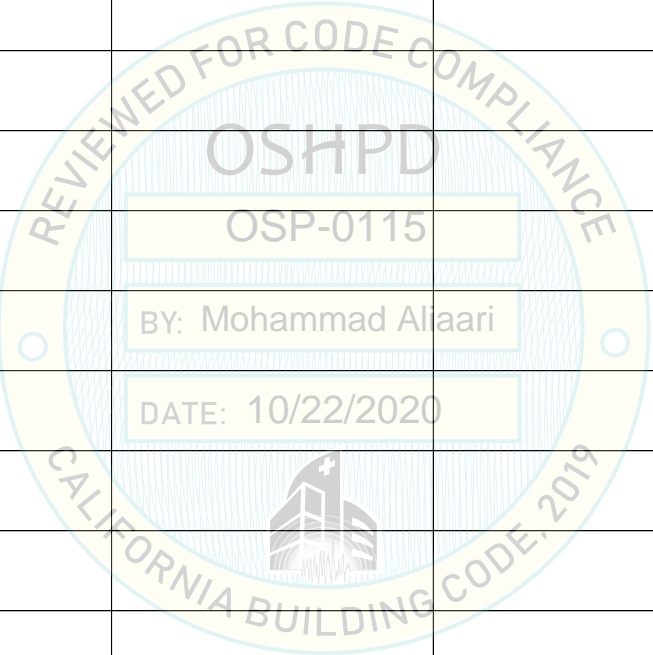
# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



**Manufacturer:** ABB, Inc.  
**Model Line:** Transformer Product Family

UUT	Unit Description	Report Number	Testing Laboratory	S <sub>DS</sub>	z/h	I <sub>p</sub>
14	NEMA 3R Painted carbon steel enclosure without skirt.	13512	Environmental Testing Laboratory (ETL)	2.25	0	1.5
15	NEMA 3R Painted carbon steel enclosure and tank without skirt.	1801293-TR-001 R0	ERDC-CERL	2.25	0	1.5



**Notes:**

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 1</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 75 kVA	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
NEMA 3R Painted carbon steel enclosure without skirt.

**Options/Subcomponent Summary:**  
Carbon steel tank. Aluminum windings. Phase: 3φ. Radial feed. Dead front. Bushing-HV: H-J Enterprises (3) 28C3929H01 15KV 600A Porc Bushing w/2 hole brass alloy spade. Bushing - Integral: H-J Enterprises (4) 28C4655H01 5400A Cu Bushing, Epoxy Insul w/ 8-Hole. Switch: ABB (1) 1C08872H01 125A 3 Deck Tap Changes, ABB (1) 1C08872H01 3PH TC. Gauges: Qualitrol (1) QUAL 030-017-03; HJ (1) INT001-001K-SS. Pressure Relief: Qualitrol (1) QUAL 201-020-01. Control Cabinet: Weigmann (1) 8D12182M13. Fans: Krenz Vent (1) A-9875 12" Fan, (2) A-8477 16" Fan.

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2,300	50.2	56.9	48.3	26.1	26.9	N/A

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (4) 1"-8 Grade 5 hex-head bolts, washers, and lock washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 2</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 3000 kVA	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
NEMA 3R Painted carbon steel enclosure without skirt.

**Options/Subcomponent Summary:**  
Carbon steel tank. Aluminum windings. Phase: 3φ. Loop feed. Dead front. Bushing-HV: Warco (3) 28C4488H01 35kV 460A Porc Bushing w/2 hole bronze spade. Bushing - Integral: Crosslink Technology (4) 28C1016H01 3150A Al bushing, Epoxy Insul w/ 6-Hole. Gauges: Qualitrol (1) QUAL 151-100-01, (1) QUAL 030-017-03; HJ (1) INT001-001K-SS. Pressure Relief: Qualitrol (1) QUAL 201-020-01.

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
14,400	74.8	100.6	72	14.3	25.2	N/A

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (4) 1"-8 and (2) 1/2"-13 Grade 5 hex-head bolts, washers, and lock washers.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 3</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 225 kVA	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
NEMA 3R Painted carbon steel enclosure without skirt.

**Options/Subcomponent Summary:**  
Carbon steel tank. Aluminum windings. Phase: 3φ. Radial feed. Live front. Bushing - Integral: Crosslink Technology (4) 28C1022H01 4300A Cu Bushing, Epoxy Insul w/ 6-Hole. Switch: ABB (1) 29C2190H01 3PH TC. Pressure Relief: Qualitrol (1) QUAL 201-020-01. Bushing HV-Deadfront: ABB (6) 2B10536H01

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
4,900	67.3	59	73	13.1	14.3	N/A

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (4) 1"-8 Grade 5 hex-head bolts, washers, and lock washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 4</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 3000 kVA	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
NEMA 3R Painted carbon steel enclosure without skirt.

**Options/Subcomponent Summary:**  
Carbon steel tank. Copper windings. Phase: 3φ. Radial feed. Live front. Bushing - LV: ABB (4) 2B10357H01 0.625" DIA CU. Switch: RTE (1) 8608C31H01 150A 6 DECK DV; ABB (1) 29C2190H01 3PH TC. Gauges: Qualitrol (1) QUAL 020-550-01, HJ (4) INT001-001K-SS. Pressure Relief: Qualitrol (1) QUAL 201-020-01. Bushing HV-Deadfront: ABB (3) 2B10536H01

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
15,900	93.1	69	85	10.3	10.7	N/A

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (4) 1"-8 Grade 5 hex-head bolts, washers, and lock washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.



# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 5</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 2500 kVA	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
NEMA 3R Painted carbon steel enclosure.

**Options/Subcomponent Summary:**  
Stainless steel tank. Copper windings. Phase: 3φ. Loop feed. Live front. Bushing-HV: Warco (2) 29C5672H01 35kV 460A Porc Bushing w/ 4 hole spades (1) Cu and (1) Bronze alloy. Bushing - Integral: Daheng (4) 29C4432H01 3150A Al Bushing, Epoxy Insul w/10-Hole. Expulsion Fuses: ABB(1) 5750D27G14 15kV Link, (2) 345B995G32 34.5kV Link. Bushing - Standoff: H-J Enterprises (1) POB-014 5.0kV, (2) PO 0097-001 25kV. Switch: ABB (1) 1C08872H01 125A 3 Deck Tap Changes, (1) 1C08825H01 3 Deck Lbor. Current - Limiting Fuse: Hi-Tech (2) HTSS252100 23kV, (2) HTSS372100 38kV. Gauges: Qualitrol (1) QUAL 151-100-01; Elmek (1) 572015-00-04. Pressure Relief: Qualitrol (1) QUAL 201-020-01.

<b>UUT Properties</b>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
17,090	89	135	81	5.9	10.0	28.1

<b>UUT Highest Passed Seismic Run Information</b>									
Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)	
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60	

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (4) 1" Grade 5 bolts.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 6</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 250 kVA	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
NEMA 3R Painted carbon steel enclosure.

**Options/Subcomponent Summary:**  
Stainless steel tank. Aluminum windings. Phase: 1φ. Loop feed. Dead front. Bushing-LV: ABB (3) 28C2288H01 1.25" DIA CU. Expulsion Fuse (Type-DO-III): ABB (1) 3A21025H14 65AMP CUR SEN FUSE 1B11143G14. Bushing Inserts: ESNA/ELASTIMOLD (2)1B23942H01 25kV Class. Switch: ABB (1) 1C23376H01 100A 1 Deck DV, (1) 1C08825H01 300A 3 Deck Lbor. Gauges: Qualitrol (1) QUAL 020-550-01. Spade: ABB (3) 6-Hole LV Bronze Spade 1.25" Stud, 0.5" thick. Bushing HV-Deadfront: ABB (2) 2B10536H01

<i>UUT Properties</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2,725	56.0	46.0	42.0	11.5	12.2	14.6

<i>UUT Highest Passed Seismic Run Information</i>								
Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (2) 1/2" Grade 8 bolts.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 7</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 10 kVA	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
NEMA 3R Painted carbon steel enclosure.

**Options/Subcomponent Summary:**  
Carbon steel tank. Aluminum windings. Phase: 1φ. Radial feed. Live front. Bushing-HV: HJ-Enterprises (2) 30C1926H01 25kV 200A Porc Bushing w/ single eyebolt. Bushing-LV: ABB (3) 2B10357H01 0.625" DIA CU. Fusing: (1) 1B25455H02 Isolation Link 1C11130G02 A2. Expulsion Fuse (Type-DO-III): ABB (1) 3A21025H06 10AMP CUR SEN FUSE 1B11143G06. Bushing Inserts: ESNA/ELASTIMOLD (3) 1B23941H01 15 kV Class. Bushing - Standoff: H-J Enterprises (1) PO 0097-001 25kV. Switch: ABB (1) 1C08823H01 300A 1 Deck Lbor. Breaker: ERMCO (1) 1B24028H01 T-12. Gauges: Heartland (1) HLG-1065.

<i>UUT Properties</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1,366	45.0	42.0	36.0	11.3	15.0	11.8

<i>UUT Highest Passed Seismic Run Information</i>								
Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (2) 1/2" Grade 8 bolts.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 8</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 1500 kVA	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
NEMA 3R Stainless steel enclosure and tank without skirt.

**Options/Subcomponent Summary:**  
Copper windings. Loop feed. Dead front. Bushing-LV: Central Moloney (4) 1B24955H01 1.25" DIA CU. Switch: RTE (1) 8608C31H01 150A 6 Deck DV; ABB (1) 5543C55G47 300A 3 Deck Lbor. Gauges: Heartland (1) HLG-1065. Pressure Relief: Qualitrol (1) QUAL 202-014-02. Bushing HV-Deadfront: ESNA/ELASTIMOLD (6) 589B821H10

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
10,500	57.0	79.0	76.0	9.2	9.3	>33

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>P</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (4) 1" Grade 5 bolts.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 9</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 75 kVA	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
NEMA 3R Stainless steel enclosure and tank without skirt.

**Options/Subcomponent Summary:**  
Aluminum windings. Radial feed. Dead front. Bushing-LV: Central Moloney (4) 1B24955H01 1.25" DIA CU. Fusing: ABB (1) 1B25455H07 Isolation Link 1C11130G07A7. Expulsion Fuse (Type-DO-III): ABB (2) 3A21026H05 8AMP DUAL SEN FUSE 1B11144G05, (1) 3A21027H05 8AMP SUAL ELE FUSE 1B11145G05. Switch: ABB (1) 5543C55G47 300A 3 Deck Lbor. Current-Limiting Fuse: Hi-Tech (3) HTSS232040 8.3kV. Gauges: Heartland (1) HLG-1065. Pressure Relief: Qualitrol (1) QUAL 202-014-02.Spade: ABB (4) 6-Hole LV Bronze Spade 1.25" Stud, 0.5" thick. Bushing HV-Deadfront: ESNA/ELASTIMOLD (3) 589B821H10

<i>UUT Properties</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
3,640	32.0	68.0	53.0	15.0	15.6	31.9

<i>UUT Highest Passed Seismic Run Information</i>								
Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25/0	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (4) 1" Grade 5 bolts.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET



1801293-CR-001 R0

<b>Manufacturer:</b> ABB, Inc.	<b>UUT 10</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 25 kVA <span style="float: right;"><b>Serial Number:</b> N/A</span>	

**Product Construction Summary:**  
NEMA 3R Stainless steel enclosure and tank without skirt.

**Options/Subcomponent Summary:**  
Aluminum windings. Bushing-LV: Central Moloney (2) 2B12889H01 0.625" DIA CU. Fusing: RTE (3) 3637803B08 Isolation Link - Magnex E03. Switch: RTE (1) 1B24985H01 150A 3 Deck DV; ABB (1) 5543C55G47 300A 3 Deck Lbor. Breaker: RTE (1) 29C2161H01 Magnex Interrupter. Gauges: Heartland (1) HLG-1065. Pressure Relief: Hardware (1) 3A25842H01. Spade: ABB (3) 8-Hole LV Bronze Spade 1.25" Stud, 0.5" thick. Bushing HV-Deadfront: ESNA/ELASTIMOLD (4) 589B821H10

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1,096	24.0	44.0	29.0	31.7	9.9	25.9

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (2) 1" Grade 5 bolts.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 11</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 167 kVA <span style="float: right;"><b>Serial Number:</b> N/A</span>	

**Product Construction Summary:**  
NEMA 3R Stainless steel enclosure and tank without skirt.

**Options/Subcomponent Summary:**  
Aluminum-Copper windings. Bushing-LV: Central Moloney (4) 1B24954H01 1" DIA CU. Fusing: RTE (3) 3637803B03 Isolation Link - Magnex E18/25. Switch: RTE (1) 1B24985H01 150A 3 Deck DV; ABB (1) 5543C55G47 300A 3 Deck Lbor. Breaker: RTE (1) 29C4597H01 Magnex Interrupter. Gauges: Heartland (1) HLG-1065. Pressure Relief: Hardware (1) 3A25842H01. Bushing HV-Deadfront: ESNA/ELASTIMOLD (4) 589B821H10

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2,223	24.0	40.0	42.0	18.7	5.8	>33

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (2) 1" Grade 5 bolts.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 12</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 25 kVA	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
NEMA 3R Stainless steel enclosure and tank without skirt.

**Options/Subcomponent Summary:**  
Aluminum windings. Bushing-LV: Central Moloney (3) 2B12889H01 0.625" DIA CU. Expulsion Fuse: ERMCO (3) 9F54DCA701 23kV, (3) 9F54DCB001 23kV. Gauges: Heartland (1) HLG-1065. Pressure Relief: Hardware (1) 3A25842H01. Bushing HV-Deadfront: ESNA/ELASTIMOLD (6) 589B821H10

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1,513	24.0	47.0	32.0	N/A	11.1	26.2

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (2) 1" Grade 5 bolts.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.



# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 13</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 100 kVA <span style="float: right;"><b>Serial Number:</b> N/A</span>	

**Product Construction Summary:**  
NEMA 3R Stainless steel enclosure and tank without skirt.

**Options/Subcomponent Summary:**  
Aluminum-Copper windings. Bushing-LV: Central Moloney (3) 1B24954H01 1" DIA CU. Switch: RTE (1) 1B24985H01 150A 3 Deck DV, ABB (1) 5543C55G47 300A 3 Deck Lbor. Breaker: ERMCO (1) 2B11057H01 T-15. Gauges: Heartland (1) HLG-1065. Pressure Relief: Hardware (1) 3A25842H01. Bushing HV-Deadfront: ESNA/ELASTIMOLD (6) 589B821H10

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2,513	30.0	51.0	38.0	>33	5.9	15.9

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (2) 1" Grade 5 bolts.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 14</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 780 kVA <span style="float: right;"><b>Serial Number:</b> N/A</span>	

**Product Construction Summary:**  
NEMA 3R Painted carbon steel enclosure without skirt.

**Options/Subcomponent Summary:**  
Carbon steel tank. Aluminum-Copper windings. Phase: 3φ. Radial feed. Dead front. Bushing-LV: ABB (3) 2B10567H01 1" DIA CU. Fusing (Link Bay-O-Net): RTE (3) 3A18440H01 125A Mfr's ID-4038361C03CB. Bushing-Inserts: ESNA/ELASTIMOLD (3) 4931B50H01 21.1/36.6 kV Class. Current-Limiting Fuse: Hi-Tech (3) HTSS242150 17.2kV. Bushing HV-Deadfront: ABB (3) 2B10536H01

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
9,990	71.0	70.0	72.0	10.4	29.7	10.9

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156 10/22/2.25/0	0.0	1.5	2.25	0.90	1.50	0.60	

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (4) 1" Grade 5 bolts.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.

# UNIT UNDER TEST (UUT) SUMMARY SHEET

1801293-CR-001 R0



<b>Manufacturer:</b> ABB, Inc.	<b>UUT 15</b>
<b>Model Line:</b> Transformer Product Family	
<b>Model Number:</b> 3000 kVA	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
NEMA 3R Painted carbon steel enclosure and tank without skirt.

**Options/Subcomponent Summary:**  
Copper windings(low voltage). Aluminum windings(high voltage). Phase: 3φ. Loop and Radial feed. Live Front and Dead Front. Bushings-HV: ABB (2) 1ZUA276301-AEB 25kV 200A, Cooper (1) 2637019B02 15.2/8.3kV 600A, Cooper (1) DB635B150 35kV 600A, Crosslink (1) 90-345 15kV 450A, Crosslink (1) 90-340 34.5kV 350A, Elastimold (1) K650S1-NF 25kV 600A, Elastimold (1) 750S1-NF 35kV 600A. Bushings-LV: Crosslink (1) 29C4583H01 5400A 18 hole, Daheng (1) 30C5037H01 3150A 16 hole, Daheng (1) 30C5193H01 4300A 6 hole, Daheng (1) 30C5238H01 4300A 18 hole, Elastimold (1) 1601A4CS937 15kV insert bushing. Switches: Cooper (1) 2237179C02M 300A tap changer, Cooper (1) LS4BH3T12M 4 position. Fuses: Cooper (2) CBUC38140D100 38KV 140A current limiting, HI-TECH (2) HTSS372165 38KV 165A current limiting. Current Transformer: ABB (1) 1A3389. Under Oil Arrester: Cooper (1) CLU23C36 36kV. Thermometer: Qualitrol (1) 120-005-03. APID Pressure Rise Relay: Qualitrol (1) 910-010-33. Pressure Relief Devices: Qualitrol (1) 201-020-01, Qualitrol (1) 208-60E.

<i>UUT Properties</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
19,850	116.4	134.6	93.5	13.0	20.0	>33.3

<i>UUT Highest Passed Seismic Run Information</i>								
Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>P</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	10/22/2.25	0.0	1.5	2.25	0.90	1.50	0.60

**Test Mounting Details:**



Rigid floor mounted. Unit mounted to shake table with (4) 1" Grade 8 bolts, lock washers and flat washers.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.