



**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION  
FACILITIES DEVELOPMENT DIVISION**

**APPLICATION FOR HCAI SPECIAL SEISMIC  
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

**APPLICATION #: OSP-0332**

**HCAI Special Seismic Certification Preapproval (OSP)**

Type:  New  Renewal

**Manufacturer Information**

Manufacturer: Rex Power Magnetics

Manufacturer's Technical Representative: Karnig Hasserjian

Mailing Address: 65 Basaltic Road, Concord, ON L4K 1G4

Telephone: (905) 695-8844

Email: karnig@rexpowermagnetics.com

**Product Information**

Product Name: Transformers

Product Type: Transformers – Dry Type

Product Model Number: Varies – See Attached tables

General Description: Dry-type transformer family. Floor mounted, aluminum and copper windings. Winding Type: Barrel w/Shield Disc, Disc w/ Shield Cast w/Shield. Nema 1, 2, 3R, or 12 enclosure. One or three phase and various options (see attached tables for further details)

Mounting Description: Rigid, Floor Mounted

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

**Applicant Information**

Applicant Company Name: TRU Compliance, by Structural Integrity Associates

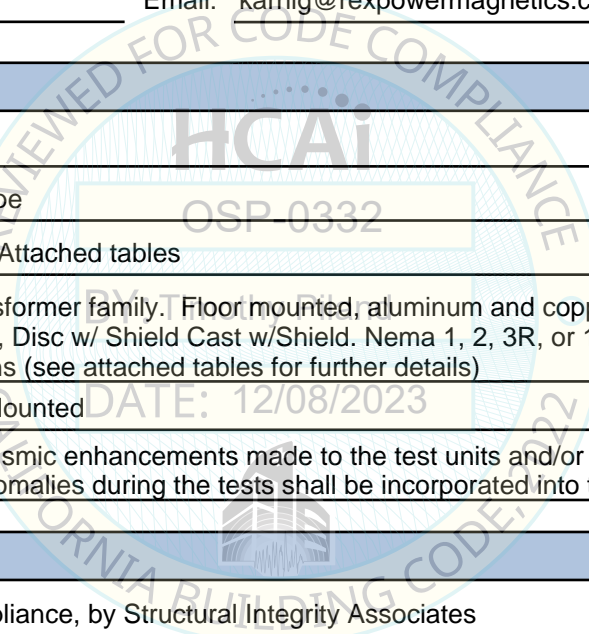
Contact Person: Daniel Zentner

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

Telephone: (541) 292-5839

Email: dzentner@structint.com

Title: Program Manager





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FACILITIES DEVELOPMENT DIVISION**

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

Company Name: STRUCTURAL INTEGRITY ASSOCIATES, INC.

Name: LACHEZAR HANDZHIYSKI California License Number: S6515

Mailing Address: 5215 Hellyer Avenue, Suite 210, San Jose, CA 95138

Telephone: (669) 437-0200 Email: Lhandzhiyski@StructInt.com

**Certification Method**

- GR-63-Core
- ICC-ES AC156
- IEEE 344
- IEEE 693
- NEBS 3
- Other (Please Specify): \_\_\_\_\_

**Testing Laboratory**

Company Name: U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER, CONSTRUCTION ENGINEERING RESEARCH LABORATORY (CERL)

Contact Person: James Wilcoski

Mailing Address: 2902 Newmark Dr., Champaign IL 61822-1076

Telephone: () - Email: James.wilcoski@usace.army.mil

Company Name: Pacific Earthquake Engineering Research Center (PEER)

Contact Person: Amarnath Kasalanati

Mailing Address: 1301 South 46th St., Bldg. 420, Richmond CA 94720-1729

Telephone: (510) 642-3437 Email: Amarnath1@berkeley.edu

Company Name: UNIVERSITY OF BUFFALO (SEESL)

Contact Person: Yushan Fu

Mailing Address: 212 Ketter Hall, Buffalo NY 14260

Telephone: (716) 645-4377 Email: yushanfu@buffalo.edu





**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION  
FACILITIES DEVELOPMENT DIVISION**

**Seismic Parameters**

Design Basis of Equipment or Components ( $F_p/W_p$ ) = 1.48

SDS (Design spectral response acceleration at short period, g) = 2.05

$a_p$  (Amplification factor) = 1.0

$R_p$  (Response modification factor) = 2.5

$\Omega_0$  (System overstrength factor) = 2.0

$I_p$  (Importance factor) = 1.5

$z/h$  (Height ratio factor) = 1

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

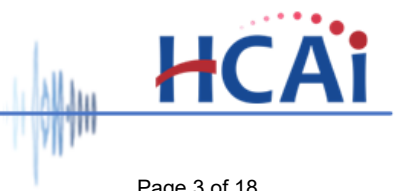
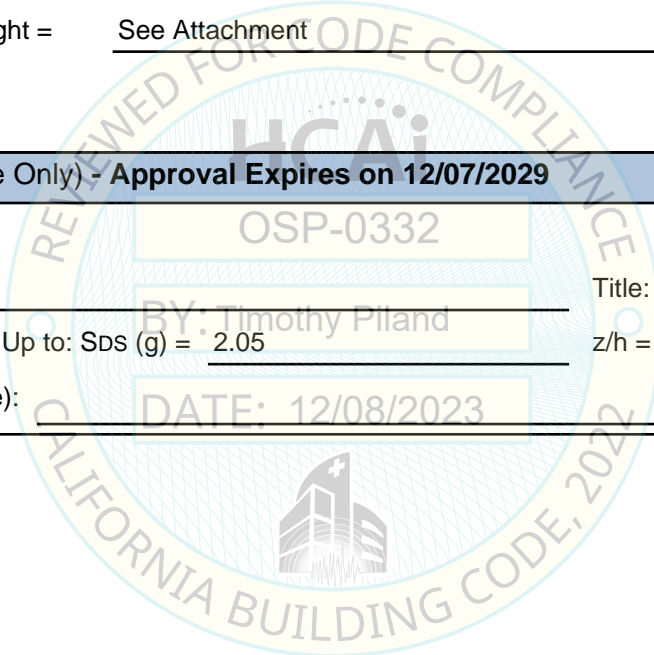
**HCAI Approval (For Office Use Only) - Approval Expires on 12/07/2029**

Date: 12/7/2023

Name: Timothy Piland Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: SDS (g) = 2.05 z/h = 1

Condition of Approval (if applicable): DATE: 12/08/2023





# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1900565-CR-001-R3



<b>Manufacturer:</b> Rex Power Magnetics	<b>TABLE 1</b>
<b>Model Line:</b> Dry Type Single & 3 Phase Power Transformers	

**Certified Product Construction Summary:**  
 Type A Enclosures: mild carbon steel sheet metal enclosure with sizes ranging from 3 to 7.  
 Type A = Transformers are mounted to enclosure and the enclosure is mounted to the floor. Designation type indicates intended use of the transformer which may affect the electrical characteristics.

**Certified Options Summary:**  
 Winding material: A - Aluminum or C - Copper; Single or Three Phase  
 Winding Type: Barrel, Barrel w/ Shield NEMA Type 1, 2, 3R, or 12 enclosure;  
 S - Single Phase Isolation, M - Single Phase Autotransformer, B - Three Phase - General Purpose Isolation,  
 D - Three Phase - Drive, R - Three Phase Autotransformer, 3PR - Single/Three Phase - Iron Core,  
 C - Single/Three Phase - Iron Core custom kVA  
 -NEMA 2 enclosures are the same construction as NEMA 1 with different gaskets, providing a drip shield.  
 -NEMA 12 enclosures are the same construction as NEMA 3R with different gaskets.

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

**Building Code: CBC 2022**      **Seismic Certification Limits:**       $S_{DS} = 2.05 g$      $z/h = 1.0$        $I_p = 1.5$   
 $S_{DS} = 2.05 g$      $z/h = 0.0$

Model Line	Enclosure Designation	kVA <sup>1</sup>	Dimensions (in)			Weight (lbs.) <sup>3</sup>	Notes <sup>4</sup>	UUT
			Depth	Width	Height			
Enclosure Type: A Models: BA, BC, DA, DC, RA, RC, 3PR, xxxC Three Phase	0	≤ 5	7.0	9.5	8.0	50		Interp.
	1	≤ 10	9.0	12.0	9.3	60		Interp.
	2	≤ 15	11.0	11.0	14.0	70		Interp.
	3	≤ 20	11.0	15.5	14.0	85		Interp.
	4	≤ 30	16.0	15.8	21.0	150		Interp.
	5	≤ 45	16.0	20.5	25.0	260		Interp.
	6	≤ 75	20.8	20.5	30.0	400		Interp.
	7	≤ 150	21.8	24.5	36.0	639		Interp.
	7	75	19.3	27.4	31.5	540	BA75J-M/S1/Z, Al Barrel w/ shield, NEMA 3R	2
7 <sup>2</sup>	75	21.9	24.5	36.0	639	BC75J-M/Z3 Cu Barrel, NEMA 3R	6	

**Notes:**  
 1. kVA is referring to transformers "two winding" kVA.  
 2. Enclosures 4 and 7 have different dimensions than previously tested (UUT1 and UUT2) dimension in order for enclosures to meet code requirement. New dimensions are still bounded by tested units.  
 3. 150 kVA rated unit can not exceed 639 lbs.  
 4. Custom enclosure Type A sizes are permitted. Custom enclosures must not exceed dimensions or weight of UUT6.

# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1900565-CR-001-R3



<b>Manufacturer:</b> Rex Power Magnetics	<b>TABLE 2</b>
<b>Model Line:</b> Dry Type Single & 3 Phase Power Transformers	

**Certified Product Construction Summary:**  
 Type B Enclosures: mild carbon steel sheet metal enclosure with sizes ranging from 8 to 12.  
 Type B = transformer mounted directly to exposed base rails rather than the enclosure. Designation type indicates intended use of the transformer which may affect the electrical characteristics.

**Certified Options Summary:**  
 Winding material: A - Aluminum or C - Copper; Single or Three Phase  
 Winding Type: Barrel, Barrel W/ Shield, Disc, Disc w/ Shield, Cast, Cast w/ shield NEMA Type 1, 2, 3R, or 12 enclosure;  
 Fans (YAHOA Electric Co.), Thermometer and controller (Qualitrol / Precimeasure)  
 S - Single Phase Isolation, M - Single Phase Autotransformer, B - Three Phase - General Purpose Isolation, D - Three Phase - Drive, R - Three Phase Autotransformer, 3PR - Single/Three Phase - Iron Core, C - Single/Three Phase - Iron Core custom kVA  
 -NEMA 2 enclosures are the same construction as NEMA 1 with different gaskets, providing a drip shield.  
 -NEMA 12 enclosures are the same construction as NEMA 3R with different gaskets.

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

**Building Code: CBC 2022**      **Seismic Certification Limits:**       $S_{DS} = 2.05 g$      $z/h = 1.0$        $I_p = 1.5$   
 $S_{DS} = 2.05 g$      $z/h = 0.0$

Model Line	Enclosure Designation	kVA <sup>1</sup>	Dimensions (in)			Weight (lbs.) <sup>3</sup>	Notes <sup>4</sup>	UUT
			Depth	Width	Height			
Enclosure Type B Model: SA, SC, MA, MC Single Phase	8	25	29.8	30.8	31.8	450	SA25-J-K, Al Disc Coil	3
	8S <sup>2</sup>	≤ 300	29.0	27.0	47.0	1,000		Interp.
	9	55	38.0	40.0	44.3	680	SC55X-CX, Cu, Barrel Cast, Coil 55 kVA	5
	9S <sup>2</sup>	≤ 600	32.0	32.0	52.0	3,000		Interp.
	10	≤ 750	50.0	46.0	66.0	4,000		Interp.
	11	≤ 1000	55.0	60.0	71.0	5,000		Interp.
	12	≤ 1500	56.0	73.0	79.5	6,744		Interp.
Enclosure Type B Model: BA, BC, DA, DC, RA, RC, 3PR, xxxC Three Phase	8	≤ 300	33.5	30.8	44.0	1,000		Interp.
	9	≤ 600	38.0	40.0	52.0	3,000		Interp.
	10	≤ 750	50.0	46.0	66.0	4,000		Interp.
	11	≤ 1000	55.0	60.0	71.0	5,000		Interp.
	12	≤ 1500	56.0	73.0	79.5	6,744		Interp.
	12	1000	56.0	73.0	79.8	6,744	BC1000U-Q/C&C/X/Z3, Al/Cu Barrel Hybrid 1000 kVA	7

**Notes:**  
 1. kVA is referring to transformers "two winding" kVA.  
 2. Enclosures 8S and 9S (single phase only) have different dimensions than enclosures 8 and 9 in order for enclosures to meet code requirements. New dimensions are still bounded by tested units.  
 3. 1500 kVA rated unit can not exceed 6,744 lbs.  
 4. Custom enclosure Type B sizes are permitted. Custom enclosures must not exceed dimensions or weight of UUT7.

# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1900565-CR-001-R3



<b>Manufacturer:</b> Rex Power Magnetics	<b>TABLE 3</b>
<b>Model Line:</b> Dry Type Single & 3 Phase Power Transformers	

**Certified Product Construction Summary:**  
 Type C Enclosures: mild carbon steel sheet metal enclosure with sizes ranging from 13 to 22.  
 Type C = transformer mounted directly to enclosed base rails rather than the enclosure. Designation type indicates intended use of the transformer which may affect the electrical characteristics.

**Certified Options Summary:**  
 Winding material: A - Aluminum or C - Copper; Single or Three Phase  
 Winding Type: Barrel, Barrel W/ Shield, Disc, Disc w/ Shield, Cast, Cast w/ shield NEMA Type 1, 2, 3R, or 12 enclosure;  
 Fans (YAHOA Electric Co.), Thermometer and controller (Qualitrol / Precimeasure)  
 S - Single Phase Isolation, M - Single Phase Autotransformer, B - Three Phase - General Purpose Isolation, D - Three Phase - Drive, R - Three Phase Autotransformer, 3PR - Single/Three Phase - Iron Core, C - Single/Three Phase - Iron Core custom kVA  
 -NEMA 2 enclosures are the same construction as NEMA 1 with different gaskets, providing a drip shield.  
 -NEMA 12 enclosures are the same construction as NEMA 3R with different gaskets.

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

**Building Code: CBC 2022**      **Seismic Certification Limits:**       $S_{DS} = 2.05g$      $z/h = 1.0$        $I_p = 1.5$   
 $S_{DS} = 2.05g$      $z/h = 0.0$

Model Line	Enclosure Designation	kVA <sup>1</sup>	Dimensions (in)			Weight (lbs.)	Notes <sup>3</sup>	UUT
			Depth	Width	Height			
Enclosure Type C Model: SA, SC, MA, MC,xxxC Single Phase	13	≤ 1750	48.0	80.0	91.5	7,000		Interp.
	14	≤ 2000	60.0	90.0	91.5	9,000		Interp.
	15	≤ 2250	60.0	90.0	100.0	10,000		Interp.
	16	≤ 2500	60.0	100.0	91.5	10,500		Interp.
	17	≤ 2750	60.0	100.0	110.0	12,000		Interp.
	18	≤ 3000	60.0	110.0	110.0	13,000		Interp.
	19	≤ 3250	60.0	110.0	120.0	14,000		Interp.
	20	≤ 3500	72.0	110.0	110.0	16,000		Interp.
	21	≤ 3750	72.0	120.0	120.0	18,000		Interp.
	22	≤ 4000	72.0	130.0	130.0	21,000		Interp.

**Notes:**  
 1. kVA is referring to transformers "two winding" kVA.  
 2. Transformer cores and coils are also certified for standalone installation. They are supported and mounted independently from the enclosures.  
 3. Custom enclosure Type C sizes are permitted. Custom enclosures must not exceed dimensions or weight of UUT4.

# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1900565-CR-001-R3



<b>Manufacturer:</b> Rex Power Magnetics	<b>TABLE 3</b>
<b>Model Line:</b> Dry Type Single & 3 Phase Power Transformers	

**Certified Product Construction Summary:**  
 Type C Enclosures: mild carbon steel sheet metal enclosure with sizes ranging from 13 to 22.  
 Type C = transformer mounted directly to enclosed base rails rather than the enclosure. Designation type indicates intended use of the transformer which may affect the electrical characteristics.

**Certified Options Summary:**  
 Winding material: A - Aluminum or C - Copper; Single or Three Phase  
 Winding Type: Barrel, Barrel W/ Shield, Disc, Disc w/ Shield, Cast, Cast w/ shield NEMA Type 1, 2, 3R, or 12 enclosure;  
 Fans (YAHOA Electric Co.), Thermometer and controller (Qualitrol / Precimeasure)  
 S - Single Phase Isolation, M - Single Phase Autotransformer, B - Three Phase - General Purpose Isolation, D - Three Phase - Drive, R - Three Phase Autotransformer, 3PR - Single/Three Phase - Iron Core, C - Single/Three Phase - Iron Core custom kVA  
 -NEMA 2 enclosures are the same construction as NEMA 1 with different gaskets, providing a drip shield.  
 -NEMA 12 enclosures are the same construction as NEMA 3R with different gaskets.

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

**Building Code: CBC 2022**      **Seismic Certification Limits:**       $S_{DS} = 2.05g$      $z/h = 1.0$        $I_p = 1.5$   
 $S_{DS} = 2.05g$      $z/h = 0.0$

Model Line	Enclosure Designation	kVA <sup>1</sup>	Dimensions (in)			Weight (lbs.)	Notes <sup>3</sup>	UUT
			Depth	Width	Height			
Enclosure Type C Model: BA, BC, DA, DC, RA, RC, 3PR,xxxC Three Phase	13	1500	48.0	80.0	91.5	11,100	BC1500U-P/E1/Z3,Cu Coil	8
	14	≤ 2500	60.0	90.0	91.5	11,000		Interp.
	15	≤ 3000	60.0	90.0	100.0	12,000		Interp.
	16	≤ 3500	60.0	100.0	91.5	12,000		Interp.
	17	≤ 4000	60.0	100.0	110.0	15,000		Interp.
	18	≤ 5000	60.0	110.0	110.0	16,000		Interp.
	19	≤ 5500	60.0	110.0	120.0	18,000		Interp.
	20	≤ 6000	72.0	110.0	110.0	19,000		Interp.
	21	≤ 7000	72.0	120.0	120.0	23,000		Interp.
	22	≤ 4000	72.0	130.0	124.0	26,500		Interp.
	22	6000	72.0	150.0	124.0	26,500	SC55X-CX, Cu-Disc single leg w/ shield, Al-Barrel, Al-Barrel Cast single leg	4

**Notes:**  
 1. kVA is referring to transformers "two winding" kVA.  
 2. Transformer cores and coils are also certified for standalone installation. They are supported and mounted independently from the enclosures.  
 3. Custom enclosure Type C sizes are permitted. Custom enclosures must not exceed dimensions or weight of UUT4.





# UNIT UNDER TEST (UUT) SUMMARY SHEET

1900565-CR-001-R3



<b>Manufacturer:</b> Rex Power Magnetics <b>Model Line:</b> Dry Type Single & 3 Phase Power Transformers								
UUT	Unit Description (Type-Size-NEMA)	Report Number (UUT #)	Testing Lab	Year Tested	ISO 17025 Accredited?	S <sub>DS</sub>	z/h	I <sub>p</sub>
1	SC007F-C1 (7.5 kVA) (Type A - Size 4 - NEMA 1)	2012-0471-TR-001, Rev.00 (UUT1)	ERDC-CERL	2013	No <sup>1</sup>	2.50	1.0	1.5
2	BA75J-M/S1/Z (75 kVA) (Type A - Size 7 - NEMA 3R)	2012-0471-TR-001, Rev.00 (UUT2)	ERDC-CERL	2013	No <sup>1</sup>	2.50	1.0	1.5
3	SA25-J-K (25 kVA) (Type B - Size 8 - NEMA 3R)	2012-0471-TR-001, Rev.00 (UUT3)	ERDC-CERL	2013	No <sup>1</sup>	2.50	1.0	1.5
4	BC6000X-X/X (6000 kVA) (Type C - Size 22 - NEMA 1)	2012-0471-TR-001, Rev.00 (UUT4)	ERDC-CERL	2013	No <sup>1</sup>	2.10	1.0	1.5
5	SC55X-CX (55 kVA) (Type B - Size 9 - NEMA 3R)	2012-0471-TR-001, Rev.00 (UUT5)	ERDC-CERL	2013	No <sup>1</sup>	2.50	1.0	1.5
6	BC75J-M/Z3 (75 kVA) (Type A - Size 7 - NEMA 3R)	1900565-TR-001 (UUT6)	Pacific Earthquake Engineering Research Center (PEER)	2022	Yes	2.10	1.0	1.5
7	BC1000U-Q/C&C/X/Z3 (1000 kVA) (Type B - Size 12 - NEMA 3R)	1900565-TR-001 (UUT7)	Pacific Earthquake Engineering Research Center (PEER)	2022	Yes	2.10	1.0	1.5
8	BC1500U-P/E1/Z3 (1500 kVA) (Type C - Size 13 - NEMA 1)	1900565-TR-002 (UUT8)	Structural & Earthquake Engineering & Simulation Laboratory (SEESL)	2022	Yes	2.05	1.0	1.5

**Notes:**  
 1. ERDC-CERL was not ISO 17025 accredited at the time of testing but has been reviewed by TRU Compliance and found to meet the requirements for ICC-ES AC156 testing. Review form is on file with TRU Compliance.



# UNIT UNDER TEST (UUT) SUMMARY SHEET


1900565-CR-001-R3



<b>Manufacturer:</b>	Rex Power Magnetics	<b>UUT 2</b>
<b>Model Line:</b>	Dry Type Single & 3 Phase Power Transformers	
<b>Model Number:</b>	BA75J-M/S1/Z (75 kVA)	
<b>Serial Number:</b>	N/A	
<b>Test Report:</b>		2012-0471-TR-001, Rev.00 (UUT2)

UUT Properties						
Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
540	19.3	27.4	31.5	5.90	6.50	>33.33

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 2022	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.67	0.67	
		2.50	0.0						

Product Construction Summary:		Test Mounting Details:	
Enclosure Size 7 - Type A - NEMA 3R type enclosure, ventilated, mild carbon steel sheet metal			
Options/Subcomponent Summary:			
Description	Part Number		
Aluminum disc wound coil (Rex Power)	Type B		
		<p>UUT2 was base mounted - rigid to the test fixture using four (4) 1/2" Grade 5 bolts and washers.</p> <p>Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.</p>	



# UNIT UNDER TEST (UUT) SUMMARY SHEET


1900565-CR-001-R3



<b>Manufacturer:</b>	Rex Power Magnetics	<b>UUT 4</b>
<b>Model Line:</b>	Dry Type Single & 3 Phase Power Transformers	
<b>Model Number:</b>	BC6000X-X/X (6000 kVA)	
<b>Serial Number:</b>	N/A	
<b>Test Report:</b>		2012-0471-TR-001, Rev.00 (UUT4)

UUT Properties						
Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
26,500	72.0	150.0	124.0	8.20	2.10	17.50

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 2022	ICC-ES AC156	2.10	1.0	1.5	3.36	2.52	1.40	0.56	
		2.10	0.0						

<b>Product Construction Summary:</b>	<b>Test Mounting Details:</b>
Enclosure Size 22 - Type C - NEMA 1 type enclosure, ventilated, mild steel sheet metal. Transformer windings are supported on their own mild carbon structural steel frame, separate from the enclosure.	

Options/Subcomponent Summary:	
Description	Part Number
Copper disc winding with shield (Rex Power)	Type B
Aluminum barrel winding (Rex Power)	Type B
Copper cast winding (Rex Power)	Type B
200mm (~8") cooling fan (YAHOA Electric Fans)	G20060HA1-B-C
280mm (~11") cooling fan (YAHOA Electric Fans)	TG28080HA1 BL-C
Digital thermometer with controller (Precimeasure)	118 ETM
Digital thermometer with controller (Qualitrol)	2242

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED FUNCTIONAL PER MANUFACTURER REQUIREMENT AFTER SHAKE TABLE TEST. CONTENTS WERE INCLUDED IN TESTING PER OPERATING CONDITIONS.



UUT4 was base mounted - rigid to the test fixture using eight (8) 1/2" Grade 5 bolts for the enclosure and twelve (12) 1" Grade 5 bolts for the transformer assembly.









