



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

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

OFFICE USE ONLY

APPLICATION #: OSP-0652

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Eaton

Manufacturer's Technical Representative: Eddie Wilkie

Mailing Address: 175 Vista Blvd, Arden, NC 28704

Telephone: (714) 523-1771

Email: EddieWilkie@Eaton.com

Product Information

Product Name: Transformers

Product Type: Transformers – Dry Type

Product Model Number: Breaker Integrated Transformer (BIT) RDT-3, RDT-3E, RKT-4, RKT-9, RKT-13, RKT-20, RKT-30, RKT-40, RKT-50

General Description: Dry type transformer with 3-phase air-cooled windings. Aluminum or copper windings with molded case circuit breaker.

Mounting Description: Rigid, Floor Mounted

Tested Seismic Enhancements: None

Applicant Information

Applicant Company Name: ISAT

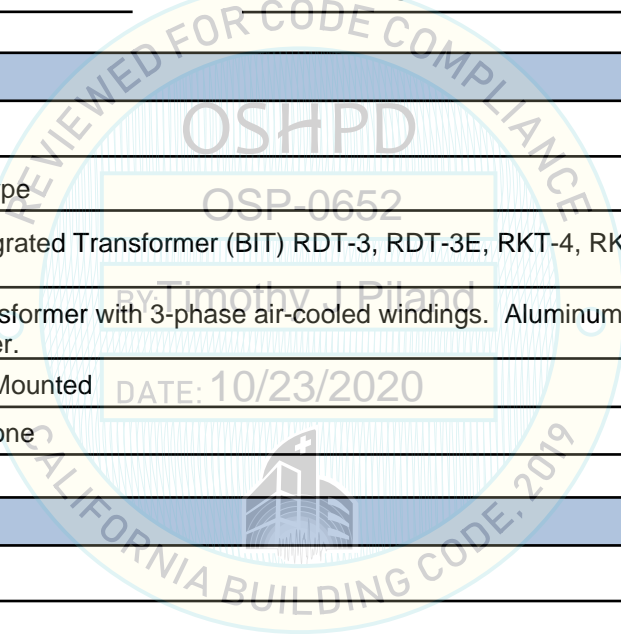
Contact Person: William Joerger

Mailing Address: 1020 Crews Rd, Suite Q, Matthews, NC 28105

Telephone: (510) 714-0216

Email: wvjoerger@isatsb.com

Title: Principal Structural Engineer





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

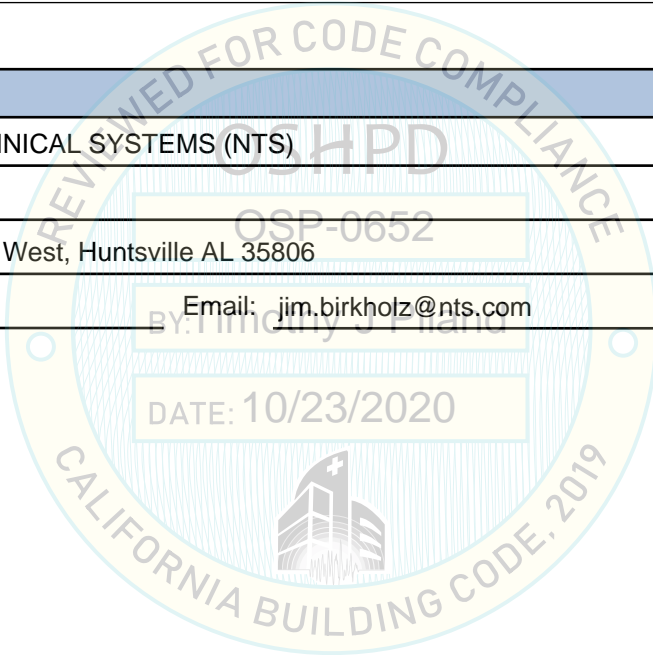
Company Name: ISAT SEISMIC BRACING
Name: WILLIAM JOERGER California License Number: S4545
Mailing Address: 14848 Northam Street, La Mirada, CA 90638
Telephone: (714) 920-6066 Email: wvjoerger@isatsb.com

Certification Method

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

Testing Laboratory

Company Name: NATIONAL TECHNICAL SYSTEMS (NTS)
Contact Person: Jim Birkholz
Mailing Address: 7800 Highway 20 West, Huntsville AL 35806
Telephone: (256) 716-4157 Email: jim.birkholz@nts.com





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.68

SDS (Design spectral response acceleration at short period, g) = 2.33

a_p (Amplification factor) = 1.0

R_p (Response modification factor) = 2.5

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1

Natural frequencies (Hz) = See Resonance Summary.

Overall dimensions and weight = See Product Range Summary

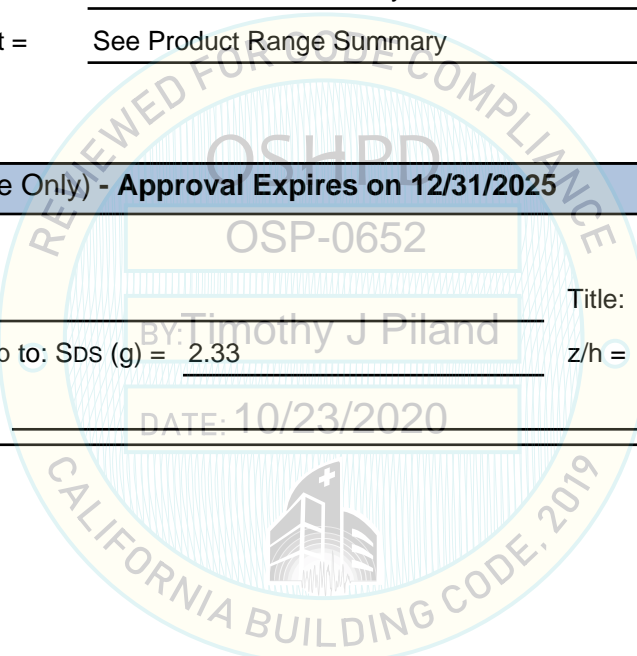
OSHPD Approval (For Office Use Only) - Approval Expires on 12/31/2025

Date: 10/23/2020

Name: Timothy Piland Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: SDS (g) = 2.33 z/h = 1

Condition of Approval (if applicable): DATE: 10/23/2020

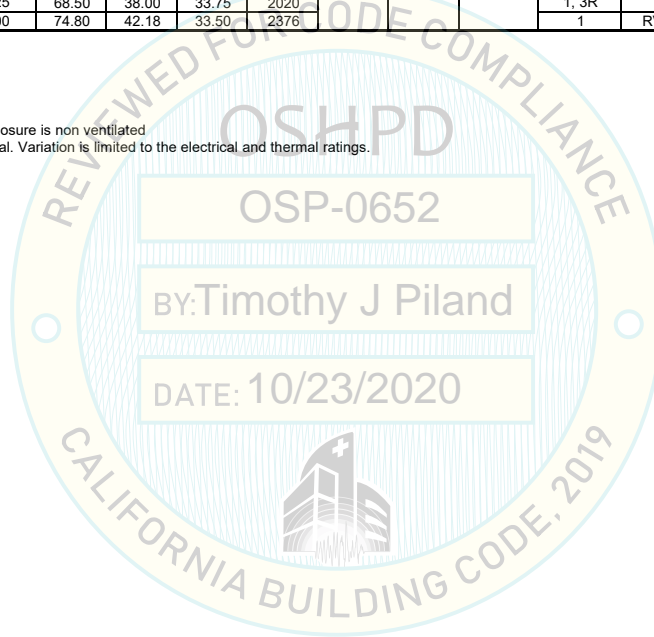


Certified Product Range Summary
Breaker Integrated Transformer (BIT) ¹
Rigid Floor Mounted

Manufacturer: Eaton Corporation
Model Line: Type Breaker Integrated Transformer (BIT)
Certified Product Construction Summary: NEMA 1 and NEMA 3R enclosure
Certified Options Summary: 3-phase air-cooled windings. Aluminum or copper windings with molded case circuit breaker
Certified Mounting Summary: Rigid Floor Mounted
Building Code: CBC 2019

Model Line	# of Phases	Size (kVA)	Dimensions (in)			Weight Max (lb)	Sds (g)	Fp/Wp	Maximum tested C.G. Height (In)	NEMA Enclosure Type ^{2,5}	UUT Identifier	Test Specimen by winding material	
			Height (max)	Width (max)	Depth (max)							Cu	AL
RDT-3, RDT-3E ³ , RKT-4 ⁴ , RKT-9 ⁴ , RKT-13 ⁴ , RKT-20 ⁴ , RKT-30 ⁴ , RKT-40 ⁴ , RKT-50 ⁴	3	15	45.37	24.88	21.13	320	2.33	1.68	28.58	1, 3R		*	*
		30	45.37	24.88	21.13	450				1, 3R		*	*
		45	45.25	25.00	21.00	478				1	RV48M28F4516SBES	*	UUT 4
		45	45.25	25.00	21.12	518				1	RV48M28F4516CUSBES	UUT 5	^
		75	51.50	30.50	24.00	705				1, 3R			^
		112.5	59.50	34.50	31.50	1480				1	RV48M28F1216SBES		UUT 6
		112.5	59.50	34.50	31.50	1244				1, 3R			^
		150	59.50	34.50	31.50	1465				1, 3R			^
		225	68.50	38.00	33.75	2020				1, 3R			^
		300	74.80	42.18	33.50	2376				1	RV48M28F3316SBES		UUT 8

- ^ = Interpolated
- * = Extrapolated
- 1. Manufactured by Eaton.
- 2. All enclosures made from mild carbon steel.
- 3. RDT-3E construction similar to RDT-3 except enclosure is non ventilated
- 4. Construction for RDT and RKT models are identical. Variation is limited to the electrical and thermal ratings.
- 5. NEMA 3R includes additional drip shield.





Powering Business Worldwide

Breaker Integrated Transformer
 Certified Major Component Data

Molded Case Circuit Breakers (MCCB) 3 Poles									
Model	Current Range (Amperes)	Number of poles	Maximum Voltage (Vac)	Dimensions /Weights				Manufacturer	UUT
				Width (in)	Depth (In)	Height (In)	Weight (lbs)		
JGE3150FAGC	150	3	600	4.13	3.57	7.00	6.00	EATON	4,5
JG*****	50-250		600	4.13	3.57	7.00	6.00	EATON	Interpolated
LGE3400FAGC	400		600	5.48	4.09	10.13	16.00	EATON	6
LG*****	250-630		600	5.48	4.09	10.13	16.00	EATON	Interpolated
NG*****	800-1200		600	8.25	5.50	16.00	45.00	EATON	Interpolated
NGS312033EC	1200		600	8.25	5.50	16.00	45.00	EATON	8





Powering Business Worldwide

Certified Enclosure Summary Breaker Integrated Transformer (BIT)

Breaker Integrated Transformer (BIT)					
NEMA Enclosure Type ^{1,2}	Dimensions (In)			Specimen	Manufacturer
	Width	Depth	Height		
1, 3R	24.88	21.13	45.37	Extrapolated	EATON
1	25.00	21.00	45.25	UUT 4	EATON
1	25.00	21.12	45.25	UUT 5	EATON
1, 3R	30.50	24.00	51.50	Interpolated	EATON
1	34.50	31.50	59.50	UUT 6	EATON
1, 3R	38.00	33.75	68.50	Interpolated	EATON
1	42.18	33.50	74.80	UUT 8	EATON

1. All enclosures made from mild carbon steel (CS)

2. NEMA 3R includes additional drip shield

BY: Timothy J Piland

DATE: 10/23/2020

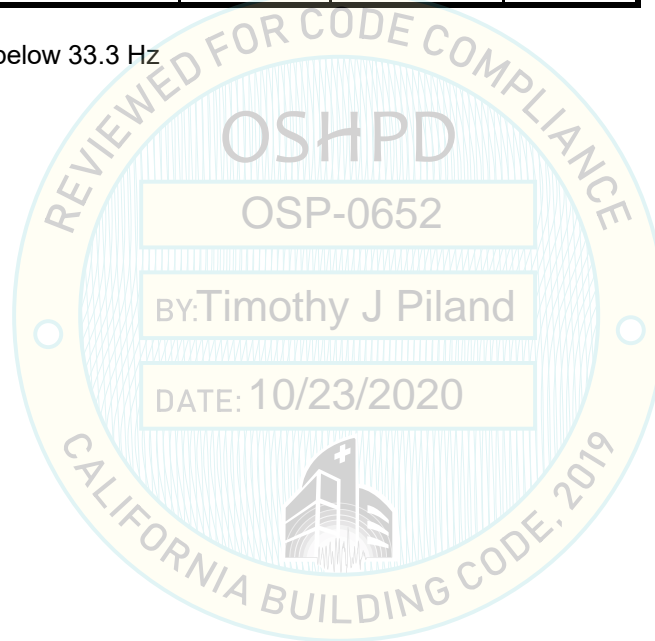


Powering Business Worldwide

Breaker Integrated Transformer Resonance Frequency Summary

Report	UUT Number	Resonant Frequency		
		Front to Back (Hz)	Side to Side (Hz)	Vertical (Hz)
PR087462	4	17.1	18.4	*
PR087462	5	14.8	16.2	*
PR087462	6	11.4	10.1	*
PR087462	8	32	5.5	29.3

* No resonance below 33.3 Hz



UUT 4 Summary Sheet

Manufacturer: Eaton Corporation

Product Line: Breaker Integrated Transformers

Model Number (Frame): RV48M28F4516SBES

Product Construction Summary: DTTD Unit Substation, 3Ph 45kVA NEMA Enclosure Type 1, Aluminum Windings, Molded Case Circuit Breaker model JGE3150FAGC

Enclosure is constructed of powder coated carbon steel.

Options/Component Summary: Aluminum Windings, NEMA Enclosure Type 1.

UUT Properties (As Tested)

Weight (lbs.)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Width	Depth	Height	Front-Back	Side-Side	Vertical
478	25.00	21.00	45.25	17.1	18.4	>33

Seismic Test Parameters

Building Code	Test Criteria	Tested C.G. Height (In)	S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2019	ICC-ES AC156	16.9	2.33	1	1.5	3.73	2.80	1.56	0.63

UUT maintained structural integrity and functionality as confirmed in post test inspection and operation checks.



UUT 4 was mounted to a rigid frame using 4 (1/2") bolts. The steel frame was welded to the shake table.

PR087462-01

UUT 5 Summary Sheet

Manufacturer: Eaton Corporation

Product Line: Breaker Integrated Transformers

Model Number (Frame): RV48M28F4516CUSBES

Product Construction Summary: DTTD Unit Substation, 3Ph 45kVA NEMA Enclosure Type 1, Copper windings, Molded Case Circuit Breaker model JGE3150FAGC

Enclosure is constructed of powder coated carbon steel.

Options/Component Summary: Copper Windings, NEMA Enclosure Type 1.

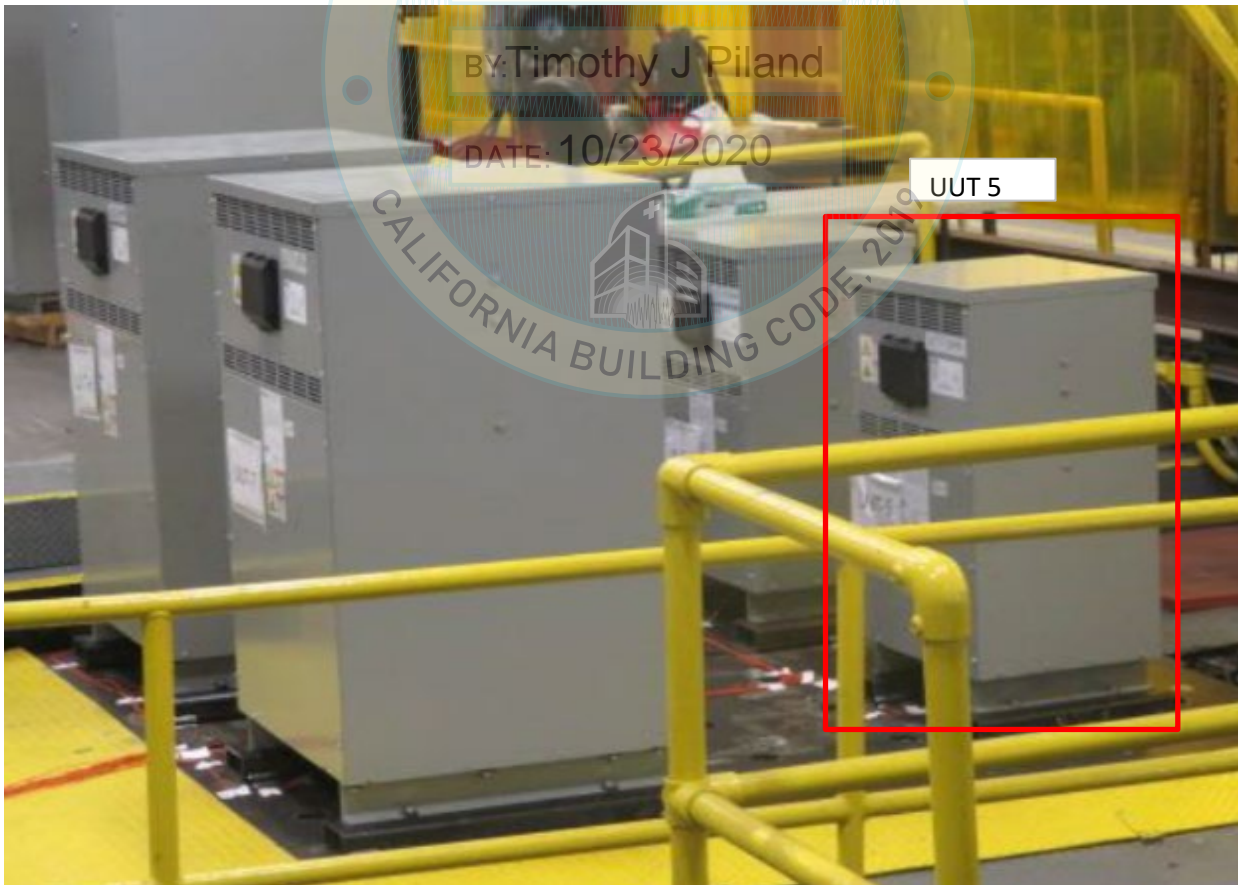
UUT Properties (As Tested)

Weight (lbs.)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Width	Depth	Height	Front-Back	Side-Side	Vertical
518	25.00	21.13	45.25	14.8	16.2	>33

Seismic Test Parameters

Building Code	Test Criteria	Tested C.G. Height (In)	S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2019	ICC-ES AC156	16.9	2.33	1	1.5	3.73	2.80	1.56	0.63

UUT maintained structural integrity and functionality as confirmed in post test inspection and operation checks.



UUT 5 was mounted to a rigid frame using 4 (1/2") bolts. The steel frame was welded to the shake table.

PR087462-01

UUT 6 Summary Sheet

Manufacturer: Eaton Corporation

Product Line: Breaker Integrated Transformers

Model Number (Frame): RV48M28F1216SBES

Product Construction Summary: DTD Unit Substation, 3Ph 112.5 kVA NEMA Enclosure Type 1, Aluminum windings, Molded Case Circuit Breaker model LGE3400FAGC

Enclosure is constructed of powder coated carbon steel.

Options/Component Summary: Aluminum Winding, NEMA Enclosure Type 1.

UUT Properties (As Tested)

Weight (lbs.)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Width	Depth	Height	Front-Back	Side-Side	Vertical
1480	34.50	31.50	59.50	11.4	10.1	>33

Seismic Test Parameters

Building Code	Test Criteria	Tested C.G. Height (In)	S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2019	ICC-ES AC156	23.2	2.33	1	1.5	3.73	2.80	1.56	0.63

UUT maintained structural integrity and functionality as confirmed in post test inspection and operation checks.



UUT 6 was mounted to a rigid frame using 4 (1/2") bolts. The steel frame was welded to the shake table.

PR087462-01

UUT 8 Summary Sheet

Manufacturer: Eaton Corporation

Product Line: Breaker Integrated Transformers

Model Number (Frame): RV48M28F3316SBES

Product Construction Summary: DTTD Unit Substation, 3Ph 300 kVA NEMA Enclosure Type 1, Aluminum windings, Molded Case Circuit Breaker model NGS312033EC

Enclosure is constructed of powder coated carbon steel.

Options/Component Summary: Aluminum Winding, NEMA Enclosure Type 1.

UUT Properties (As Tested)

Weight (lbs.)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Width	Depth	Height	Front-Back	Side-Side	Vertical
2376	42.12	33.50	74.80	32	5.5	29.3

Seismic Test Parameters

Building Code	Test Criteria	Tested C.G. Height (In)	S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2019	ICC-ES AC156	28.58	2.33	1	1.5	3.73	2.80	1.56	0.63

UUT maintained structural integrity and functionality as confirmed in post test inspection and operation checks.



UUT 8 was mounted to a rigid frame using 8 (1/2") bolts. The steel frame was welded to the shake table.

PR087462-01