APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0770

HCAI Special Seismic Certification Preapproval (OSP)

Type: [X] New [ ] Renewal

Manufacturer Information

Manufacturer: ABB Industrial Solutions

Manufacturer's Technical Representative: Mike Di Lillo

Mailing Address: 700 Avenue Thomas, St-Jean-sur-Richelieu, QC J2X2M9

Telephone: (450) 357-8756 Email: mike.dilillo@ca.abb.com

Product Information

Product Name: Panelboards

Product Type: Panelboards

Product Model Number: Various (See Attachment)

General Description: Modular Metering equipment including Lug Modules, Main-Breaker Modules, Switch Modules, Meter-Modules (Hot and Cold Metering).

Mounting Description: Rigid, Wall 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

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: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)

Contact Person: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513

Telephone: (972) 247-9657 Email: Jeremy@etldallas.com

Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.50 (z/h = 1), 1.125 (z/h = 0)

S_{DS} (Design spectral response acceleration at short period, g) = 2.0 at z/h=1, 2.5 at z/h=0

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 6

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1 and 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

HCAI Approval (For Office Use Only) - Approval Expires on 10/18/2029

Date: 10/18/2023

Name: Mohammad Karim Title: Supervisor, Health Facilities

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

Condition of Approval (if applicable):

SPECIAL SEISMIC CERTIFICATION
CERTIFIED COMPONENT MATRIX

2100749-CR-001-R1

TRU COMPLIANCE

Manufacturer:	ABB Industrial Solutions
Model Line:	RELIAMOD

TABLE 1

Certified Product Construction Summary:

Lug Modules: 16 ga, 12 ga & 10 ga Carbon Steel Enclosure
Main-Breaker Modules: 16ga, 14 ga, 12 ga & 10 ga Carbon Steel Enclosure
Switch Modules: 16 ga, 14 ga, 12 ga & 10 ga Carbon Steel Enclosure

Certified Options Summary:

Lug Modules: 400A to 2400A, 1PH/3W & 3PH/4W, 100kA IC Rating
Main-Breaker Modules: 400A to 2000A, 1PH/3W & 3PH/4W, 65kA to 100kA IC Rating, with and without Integral Pullbox
Switch Modules: 400A to 800A, 1PH/3W & 3PH/4W, 100kA IC Rating, with and without Integral Pullbox

Mounting Configuration:

Wall 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}= ***2.0 g*** ***z/h=1.0*** S_{DS}= ***2.5 g*** ***z/h=0.0*** I_P= ***1.5***

Model Line	Model	Dimensions (in)			Weight (lbs.)	Notes	UUT
		Depth	Width	Height			
Main-Module[1] (Lugs)	RMM_L4R	6.5	13.5	48.0	90	*400A MLO*	Extrap.
	RMM_L6R	6.5	16.5	48.0	100	*600A MLO*	Extrap.
	RMM_L8R	11.2	20.1	48.0	140	*800A MLO*	Extrap.
	RMM_L12R	11.2	20.1	48.0	140	*1200A MLO*	Extrap.
	RMM_L16R	18.0	33.0	61.0	285	*1600A MLO*	Extrap.
	RMM_L20R	18.0	33.0	61.0	285	*2000A MLO*	Extrap.
	RMM_L24R	18.0	33.0	61.0	290	*2400A MLO*	Extrap.
	RMM_L12RFTL	12.0	29.0	61.0	220	*1200A MLO FT*	Extrap.
	RMM_L16RFTL	18.0	33.0	61.0	310	*1600A MLO FT*	Extrap.
	RMM_L20RFTL	18.0	33.0	61.0	310	*2000A MLO FT*	Extrap.
	RMM_L24RFTL	18.0	33.0	61.0	325	*2400A MLO FT*	Extrap.
Main-Module (Breakers)	RMM_BL4R	11.2	20.1	48.0	140	*400A MCB*	Extrap.
	RMM_BH4R	11.2	20.1	48.0	140		Extrap.
	RMM_BL6R	11.2	20.1	48.0	140	*600A MCB*	Extrap.
	RMM_BH6R	11.2	20.1	48.0	140		Extrap.
	RMM_BL8R	11.2	20.1	48.0	160	*800A MCB*	Extrap.
	RMM_BH8R	11.2	20.1	48.0	160		Extrap.
	RMM_BL10R	11.2	20.1	48.0	180	*1000A MCB*	Extrap.
	RMM_BH10R	11.2	20.1	48.0	180		Extrap.
	RMM_BL12R	11.2	20.1	48.0	180	*1200A MCB*	Extrap.
	RMM_BH12R	11.2	20.1	48.0	180		Extrap.
	RMM_BEL4R	11.3	20.1	60.5	215	*400A MCB EUSERC*	Interp.
	RMM_BEH4R	11.3	20.1	60.5	215		Interp.

Notes:

1. *Lugs are depopulated version of breakers*

SPECIAL SEISMIC CERTIFICATION
CERTIFIED COMPONENT MATRIX

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TRU COMPLIANCE

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Main-Breaker Modules: 16ga, 14 ga, 12 ga & 10 ga Carbon Steel Enclosure
Switch Modules: 16 ga, 14 ga, 12 ga & 10 ga Carbon Steel Enclosure

Certified Options Summary:

Lug Modules: 400A to 2400A, 1PH/3W & 3PH/4W, 100kA IC Rating
Main-Breaker Modules: 400A to 2000A, 1PH/3W & 3PH/4W, 65kA to 100kA IC Rating, with and without Integral Pullbox
Switch Modules: 400A to 800A, 1PH/3W & 3PH/4W, 100kA IC Rating, with and without Integral Pullbox

Mounting Configuration:

Wall 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}= ***2.0 g*** ***z/h=1.0*** S_{DS}= ***2.5 g*** ***z/h=0.0*** I_P= ***1.5***

Model Line	Model	Dimensions (in)			Weight (lbs.)	Notes	UUT
		Depth	Width	Height			
Main-Module (Breakers)	RMM_BEL6R	11.3	25.0	60.5	232	*600A MCB EUSERC*	Interp.
	RMM_BEH6R	11.3	25.0	60.5	232		Interp.
	RMM3BEH6R	11.3	25.0	60.5	232	*600A MCB w/ integrated pull-box*	2a
	RMM_BEL8R	11.3	25.0	60.5	260	*800A MCB EUSERC*	Extrap.
	RMM_BEH8R	11.3	25.0	60.5	260		Extrap.
	RMM_BEL10R	12.0	33.4	60.5	330	*1000A MCB EUSERC*	Extrap.
	RMM_BEH10R	12.0	33.4	60.5	330		Extrap.
	RMM_BEL12R	12.0	33.4	60.5	330	*1200A MCB EUSERC*	Extrap.
	RMM_BEH12R	12.0	33.4	60.5	330		Extrap.
	RMM_BB14R	15.0	25.0	57.0	500	*1400A Bottom Feed*	Extrap.
	RMM_BB16R	15.0	25.0	57.0	500	*1600A Bottom Feed*	Extrap.
	RMM_BT14R	15.0	25.0	59.0	510	*1400A Top Feed*	Extrap.
	RMM_BT16R	15.0	25.0	59.0	510	*1600A Top Feed*	Extrap.
	RMM_BB14RL	24.0	38.0	60.5	750	*1400A Bottom feed - 6 ports*	Extrap.
	RMM_BB16RL	24.0	38.0	60.5	750	*1600A Bottom feed - 6 ports*	Extrap.
	RMM_BB20RL	24.0	38.0	60.5	750	*2000A Bottom feed - 6 ports*	Extrap.
	RMM_BT14RL	24.0	38.0	60.5	750	*1400A Top feed - 6 ports*	Extrap.
	RMM_BT16RL	24.0	38.0	60.5	750	*1600A Top feed - 6 ports*	Extrap.
	RMM_BT20RL	24.0	38.0	60.5	750	*2000A Top feed - 6 ports*	Extrap.
	RMM_BB14RCLL	24.0	38.0	60.5	798	*1400A Comp Lug*	Interp.
	RMM_BB16RCLL	24.0	38.0	60.5	798	*1600A Comp Lug*	Interp.
	RMM3BB16RCLL	24.0	38.0	60.5	798	*1600A Breaker Comp Lug*	1a
	RMM_BB20RCLL	24.0	38.0	60.5	798	*2000A Comp Lug*	Interp.

SPECIAL SEISMIC CERTIFICATION
CERTIFIED COMPONENT MATRIX

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TRU COMPLIANCE

Manufacturer: ABB Industrial Solutions
Model Line: RELIAMOD

TABLE 1

Certified Product Construction Summary:
Lug Modules: 16 ga, 12 ga & 10 ga Carbon Steel Enclosure
Main-Breaker Modules: 16ga, 14 ga, 12 ga & 10 ga Carbon Steel Enclosure
Switch Modules: 16 ga, 14 ga, 12 ga & 10 ga Carbon Steel Enclosure

Certified Options Summary:
Lug Modules: 400A to 2400A, 1PH/3W & 3PH/4W, 100kA IC Rating
Main-Breaker Modules: 400A to 2000A, 1PH/3W & 3PH/4W, 65kA to 100kA IC Rating, with and without Integral Pullbox
Switch Modules: 400A to 800A, 1PH/3W & 3PH/4W, 100kA IC Rating, with and without Integral Pullbox

Mounting Configuration:
Wall 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}= ***2.0 g*** ***z/h=1.0*** S_{DS}= ***2.5 g*** ***z/h=0.0*** I_P= ***1.5***

Model Line	Model	Dimensions (in)			Weight (lbs.)	Notes	UUT
		Depth	Width	Height			
Main-Module (Switches)	RMM_F4R	11.2	20.1	48.0	160	*400A MFS*	Interp.
	RMM_F6R	12.7	20.1	55.0	235	*600A MFS*	Interp.
	RMM_F8R	12.7	20.1	55.0	265	*800A MFS*	Interp.
	RMM_F4RCLL	11.2	20.1	60.7	240	*400A EUSERC MFS*	Interp.
	RMM_F6RCLL	12.8	24.5	65.0	310	*600A EUSERC MFS*	Interp.
	RMM_F8RCLL	12.8	24.5	65.0	350	*800A EUSERC MFS*	Interp.
	RMM3FE8RCLL	12.8	24.5	65.0	350	*800A MFS w/ integrated pull-box*	3a

SPECIAL SEISMIC CERTIFICATION
CERTIFIED COMPONENT MATRIX

2100749-CR-001-R1

TRU COMPLIANCE

Manufacturer: ABB Industrial Solutions
Model Line: RELIAMOD

TABLE 2

Certified Product Construction Summary:
14 ga, 15 ga & 16 ga Carbon Steel Enclosure

Certified Options Summary:
Cold-Metering: 125A & 225A Socket, 1 to 6 stack, 4, 5 & 7 Jaw Ring-type Socket, 22kA to 100kA IC Rating, 800A 1PH/3PH & 1200A 1PH/3PH Hor. Busway Amp.
Hot-Metering Std.: 125A & 225A Socket, 2 to 6 stack, 4 Jaw Ring-type, 5 Jaw Ringless, 5 Jaw Ringless + Horn bypass Socket, 22kA to 100kA IC Rating, 800A 1PH/3PH & 1200A 1PH/3PH Hor. Busway Amp.
Hot-Metering Lever Bypass: 225A & 400A Socket, 1 to 4 stack, 5 & 7 Jaw Ringless Socket, 65kA to 100kA IC Rating, 800A 1PH/3PH & 1200A 1ph/3PH Hor. Busway Amp.

Mounting Configuration:
Wall 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}= ***2.0 g*** ***z/h=1.0*** S_{DS}= ***2.5 g*** ***z/h=0.0*** I_P= ***1.5***

Model Line	Model	Dimensions (in)			Weight (lbs.)	Notes	UUT
		Depth	Width	Height			
Meter-Module (Hot-Metering Std.)	RMS__212H_	9.8	13.8	45.3	110		Extrap.
	RMS__312H_	9.8	13.8	45.3	115		Extrap.
	RMS__412H_	9.8	13.8	54.3	135	*125A HOT, 100kA IC*	Extrap.
	RMS__512H_	9.8	13.8	63.3	155		Extrap.
	RMS__612H_	9.8	13.8	72.3	175		Extrap.
	RMS__212L_	9.0	13.3	46.5	103		Interp.
	RMS__312L_	9.0	13.3	46.5	108		Interp.
	RMS__412L_	9.0	13.3	55.5	123	*125A HOT, 22kA IC*	Interp.
	RMS__512L_	9.0	13.3	64.5	138		Interp.
	RMS__612L_	9.0	13.3	73.5	154		Interp.
	RMS212612LRLR	9.0	13.3	70.5	151		2c
	RMS__222H_	9.5	18.0	58.0	185		Interp.
	RMS__322H_	9.5	18.0	58.0	190		Interp.
	RMS__422H_	9.5	18.0	70.0	225	*225A HOT, 100kA IC*	Interp.
	RMS__522H_	9.5	18.0	82.0	254		Interp.
	RMS212522HRLR	9.5	18.0	82.0	254		3c
	RMS__222L_	9.5	18.0	60.0	180		Extrap.
	RMS__322L_	9.5	18.0	60.0	185	*225A HOT, 22kA IC*	Extrap.
	RMS__422L_	9.5	18.0	72.0	220		Extrap.
	RMS__522L_	9.5	18.0	84.0	250		Extrap.

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

2100749-CR-001-R1

TRU COMPLIANCE

Manufacturer: ABB Industrial Solutions
Model Line: RELIAMOD

TABLE 2

Certified Product Construction Summary:
14 ga, 15 ga & 16 ga Carbon Steel Enclosure

Certified Options Summary:
Cold-Metering: 125A & 225A Socket, 1 to 6 stack, 4, 5 & 7 Jaw Ring-type Socket, 22kA to 100kA IC Rating, 800A 1PH/3PH & 1200A 1PH/3PH Hor. Busway Amp.
Hot-Metering Std.: 125A & 225A Socket, 2 to 6 stack, 4 Jaw Ring-type, 5 Jaw Ringless, 5 Jaw Ringless + Horn bypass Socket, 22kA to 100kA IC Rating, 800A 1PH/3PH & 1200A 1PH/3PH Hor. Busway Amp.
Hot-Metering Lever Bypass: 225A & 400A Socket, 1 to 4 stack, 5 & 7 Jaw Ringless Socket, 65kA to 100kA IC Rating, 800A 1PH/3PH & 1200A 1ph/3PH Hor. Busway Amp.

Mounting Configuration:
Wall 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}= ***2.0 g*** ***z/h=1.0*** S_{DS}= ***2.5 g*** ***z/h=0.0*** I_P= ***1.5***

Model Line	Model	Dimensions (in)			Weight (lbs.)	Notes	UUT
		Depth	Width	Height			
Meter-Module (Hot-Metering Lever Bypass)	RMS__122CHLB_	10.0	19.4	51.1	170	*225A HOT, 100kA IC*	Interp.
	RMS__222CHLB_	10.0	19.4	51.1	200		Interp.
	RMS__322CHLB_	10.0	19.4	68.1	255		Interp.
	RMS__422CHLB_	10.0	19.4	82.3	304		Interp.
	RMS312422CHLBR	10.0	19.4	82.3	304		1c
	RMS__140CHLBRB	11.1	23.1	42.3	180	*400A HOT, 65kA IC*	Extrap.
	RMS__240CHLBRB	11.1	23.1	70.3	270		Extrap.
	RMS__140CHLBR	11.1	19.9	51.1	195	*400A HOT, 100kA IC*	Extrap.
Meter-Module (Cold-Metering)	RMSC__312H_	9.1	14.0	45.3	115	*125A HOT, 100kA IC*	Extrap.
	RMSC__412H_	9.1	14.0	54.5	135		Extrap.
	RMSC__612H_	9.1	14.0	72.5	170		Extrap.
	RMSC__312L_	8.0	13.3	45.3	100	*125A HOT, 22kA IC*	Extrap.
	RMSC__612L_	8.0	13.3	72.5	145		Extrap.
	RMSC__122H_	9.1	18.1	34.0	130	*225A HOT, 100kA IC*	Extrap.
	RMSC__322H_	9.1	18.1	58.0	190		Extrap.
	RMSC__422H_	9.1	18.1	70.0	215		Extrap.
	RMSC__122L_	9.1	18.1	32.0	125	*225A HOT, 22kA IC*	Extrap.
	RMSC__322L_	9.1	18.1	56.0	175		Extrap.

SPECIAL SEISMIC CERTIFICATION
CERTIFIED COMPONENT MATRIX

2100749-CR-001-R1

TRU COMPLIANCE

Manufacturer:	ABB Industrial Solutions	***Table Description:*** Accessories	**TABLE 3**
Model Line:	RELIAMOD		

Building Code: CBC 2022 ***Seismic Certification Limits:*** S_{DS} = 2.0 g z/h = 1.0 S_{DS} = 2.5 g z/h = 0.0 I_P = 1.5

Model Line (Manufacturer)	Model	Dimension (in)			Weight (lbs.)	Material	Notes	UUT
		Depth	Width	Height				
SPD [1] (ABB)	RMM_1SURGE	10.0	15.0	25.0	76	16 ga Carbon Steel Enclosure	*130kA IC*	Interp.
	RMM_2SURGE	12.8	15.0	25.0	83		*200kA IC*	Interp.
	RMM_3SURGE	12.8	15.0	25.0	83		*300kA IC*	Interp.
	RMM33SURGE	12.8	15.0	25.0	83		*300kA IC*	1b
Pull-Box [2] (ABB)	RMM_P4R	7.6	16.8	43.0	80	16 ga Carbon Steel Enclosure	*400A*	Interp.
	RMM_P8R	11.7	25.0	50.2	140		*800A*	Interp.
	RMM_P12R	11.8	33.0	54.4	180		*1200A*	Interp.
Elbow [1] (ABB)	RELBOW312N3R	5.3	12.0	25.0	64	16 ga Carbon Steel Enclosure	*12"*	2b
	RELBOW316N3R	5.3	16.0	25.0	84		*16"*	3b
Spacer [1] (ABB)	RSPACER3127	7.0	5.3	25.0	40	16 ga Carbon Steel Enclosure		Interp.
Adapter [1] (ABB)	RADAPTOR312LEFT	7.0	6.0	30.0	45	16 ga Carbon Steel Enclosure	*Adapter (Left)*	Interp.
	RADAPTOR312RIGHT	7.0	6.0	30.0	45		*Adapter (Right)*	Interp.

Notes:

1. *SPDs, Spacers, and Adapters are interpolated based on the 300kA SPD tested in UUT1b and the Elbows tested in UUT2b and UUT3b. All of these accessories use similar construction and mounting. The 300kA SPD is the heaviest accessory and the Elbows are the most seismically vulnerable.*

2. *The Pull-Boxes are not modular and are attached individually to the walls. They are interpolated based on the modular Pull-Boxes integrated into the tested Main-Modules (Table 1). The modular Pull-Boxes are heavier, larger, and more seismically vulnerable.*

SPECIAL SEISMIC CERTIFICATION
CERTIFIED SUBCOMPONENT MATRIX

2100749-CR-001-R1

TRU COMPLIANCE

Manufacturer:	ABB Industrial Solutions	***Table Description:*** Beakers and Switches	**TABLE 4**
Model Line:	RELIAMOD		

Building Code: CBC 2022 ***Seismic Certification Limits:*** S_{DS} = 2.0 g z/h = 1.0 I_P = 1.5; S_{DS} = 2.5 g z/h = 0.0

Component Type	Manufacturer	Model	Description	Notes	UUT
Breaker	ABB	THQL	Breakers with Load Connectors	*Weight: 1 lbs.*	2c
		TEY		*Weight: 2 lbs.*	Interp.
		A1		*Weight: 1.5 lbs.*	Interp.
		A2		*Weight: 2 lbs.*	Interp.
		XT3		*Weight: 7 lbs.*	3c
		XT4		*Weight: 9 lbs.*	3c
		XT5	Breaker with Load or Line Connectors	*Weight: 12 lbs.*	Interp.
		XT6	Breakers with Line Connectors	*Weight: 27 lbs.*	2a
		XT7		*Weight: 66 lbs.*	3a
		T8		*Weight: 160 lbs.*	1a
Switches	ABB	XT5	Switches	*400A*	Interp.
		XT6		*600A*	2a
		XT7		*800A*	3a

UNIT UNDER TEST (UUT) SUMMARY SHEET

2100749-CR-001-R1

Manufacturer: ABB Industrial Solutions

Model Line: RELIAMOD

UUT	Unit Description	Report Number	Testing Lab	Year Tested	ISO 17025 Accredited?	S_{DS}	z/h	I_P
1a	RMM3BB16RCLL (1600A Breaker Comp Lug)	2100749-TR-001	Environmental Testing Lab (ETL)	2022	Yes	2.0 2.5	1.0 0.0	1.5
1b	RMM33SURGE (300kA SPD)	2100749-TR-001	Environmental Testing Lab (ETL)	2022	Yes	2.0 2.5	1.0 0.0	1.5
1c	RMS312422CHLBR (225A XT LVBP, hot-metering, 4-gang)	2100749-TR-001	Environmental Testing Lab (ETL)	2022	Yes	2.0 2.5	1.0 0.0	1.5
2a	RMM3BEH6R (600A MCB w/ integrated pull-box)	2100749-TR-001	Environmental Testing Lab (ETL)	2022	Yes	2.0 2.5	1.0 0.0	1.5
2b	RELBOW312N3R (12-inch elbow)	2100749-TR-001	Environmental Testing Lab (ETL)	2022	Yes	2.0 2.5	1.0 0.0	1.5
2c	RMS212612LRLR (THQL, hot-metering, 6-gang)	2100749-TR-001	Environmental Testing Lab (ETL)	2022	Yes	2.0 2.5	1.0 0.0	1.5
3a	RMM3FE8RCLL (800A MFS w/ integrated pull-box)	2100749-TR-001	Environmental Testing Lab (ETL)	2022	Yes	2.0 2.5	1.0 0.0	1.5
3b	RELBOW316N3R (16-inch elbow)	2100749-TR-001	Environmental Testing Lab (ETL)	2022	Yes	2.0 2.5	1.0 0.0	1.5
3c	RMS212522HRLR (225A XT, hot-metering, 5-gang)	2100749-TR-001	Environmental Testing Lab (ETL)	2022	Yes	2.0 2.5	1.0 0.0	1.5

Notes:

UNIT UNDER TEST (UUT) SUMMARY SHEET

2100749-CR-001-R1

UUT 1a

Manufacturer:	*ABB Industrial Solutions*
Model Line:	*RELIAMOD*
Model Number:	*RMM3BB16RCLL (1600A Breaker Comp Lug)*
Serial Number:	*N/A*
Test Report:	*2100749-TR-001*

UUT Properties

Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
798	24.0	38.0	60.5	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}(g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.67	0.67
		2.5	0.0					

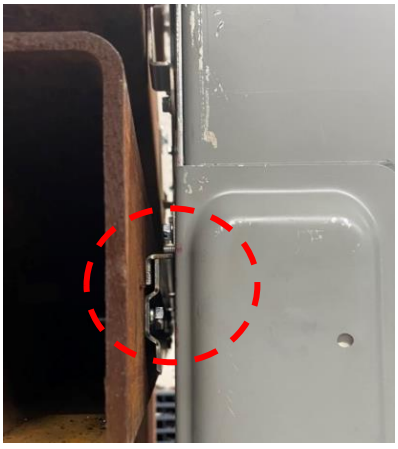
Product Construction Summary:

Main-Breaker Modules: 12 ga Carbon Steel Enclosure and 10 ga Carbon Steel Cover; 3-PHASE

Options/Subcomponent Summary:

Description	*Mfr.*	*Part Number*
Breaker	*ABB*	*T8*

Mounting Details



Test Mounting Details:

UUT1 was wall mounted - rigid to a wall fixture. The mounting brackets (1 large [Serial No.: 2100303422P7] and 2 Small [Serial No.: 2100303422P3]) were mounted to the wall fixture using twelve (12) 5/16" Grade 5 bolts and lock washers.
UUT1a was mounted to the wall fixture using six (6) Grade 5 bolts, flat 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

2100749-CR-001-R1

UUT 1b

Manufacturer:	*ABB Industrial Solutions*
Model Line:	*RELIAMOD*
Model Number:	*RMM33SURGE (300kA SPD)*
Serial Number:	*N/A*
Test Report:	*2100749-TR-001*

UUT Properties

Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
83	12.8	15.0	25.0	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}(g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.67	0.67
		2.5	0.0					

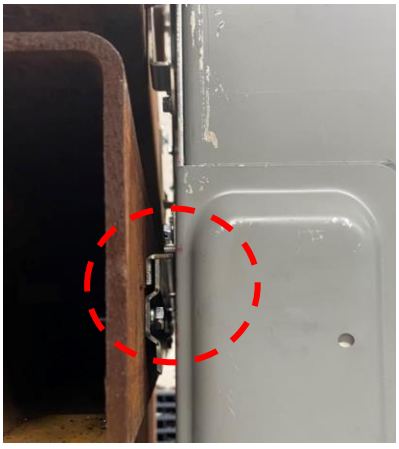
Product Construction Summary:

16 ga Carbon Steel Enclosure and Cover; 3-PHASE

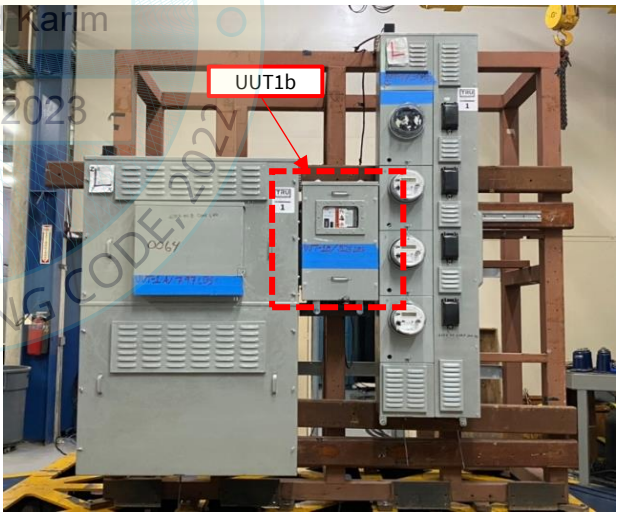
Options/Subcomponent Summary:

Description	*Part Number*
N/A	*N/A*

Mounting Details



Test Mounting Details:



UUT1 was wall mounted - rigid to a wall fixture. The mounting brackets (1 large [Serial No.: 2100303422P7] and 2 Small [Serial No.: 2100303422P3]) were mounted to the wall fixture using twelve (12) 5/16" Grade 5 bolts and lock washers.
UUT1b was mounted to the wall fixture using four (4) Grade 5 bolts, flat 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

2100749-CR-001-R1

UUT 1c

Manufacturer:	*ABB Industrial Solutions*
Model Line:	*RELIAMOD*
Model Number:	*RMS312422CHLBR (225A XT LVBP, hot-metering, 4-gang)*
Serial Number:	*N/A*
Test Report:	*2100749-TR-001*

UUT Properties

Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
304	10.0	19.4	82.3	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}(g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.67	0.67
		2.5	0.0					

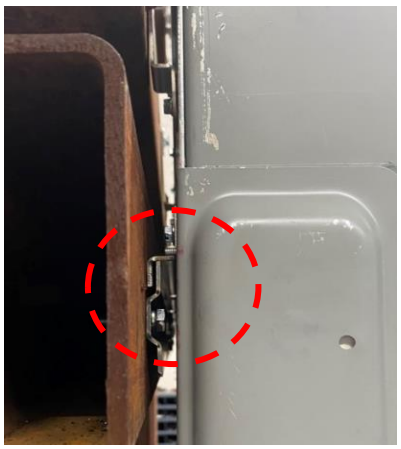
Product Construction Summary:

15 ga Carbon Steel Enclosure and 16 ga Carbon Steel Cover;
3-PHASE-IN, 3-PHASE-OUT

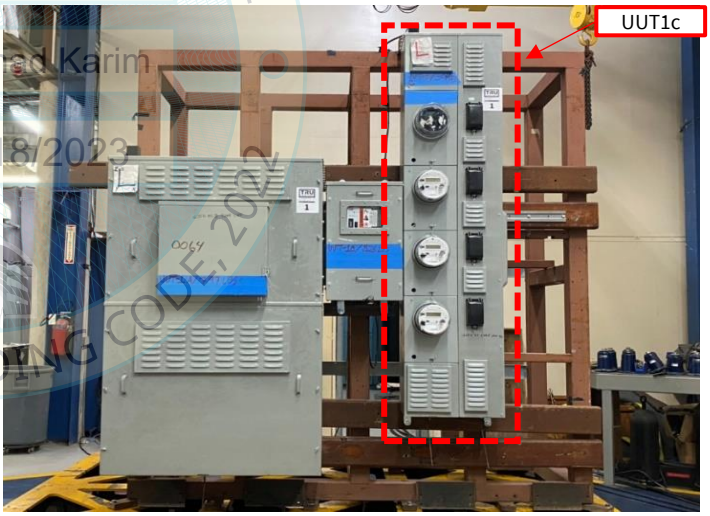
Options/Subcomponent Summary:

Description	*Part Number*
N/A	*N/A*

Mounting Details



Test Mounting Details:



UUT1 was wall mounted - rigid to a wall fixture. The mounting brackets (1 large [Serial No.: 2100303422P7] and 2 Small [Serial No.: 2100303422P3]) were mounted to the wall fixture using twelve (12) 5/16" Grade 5 bolts and lock washers.
UUT1c was mounted to the wall fixture using four (4) Grade 5 bolts, flat 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

2100749-CR-001-R1

UUT 2a

Manufacturer:	*ABB Industrial Solutions*
Model Line:	*RELIAMOD*
Model Number:	*RMM3BEH6R (600A MCB w/ integrated pull-box)*
Serial Number:	*N/A*
Test Report:	*2100749-TR-001*

UUT Properties

Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
232	11.3	25.0	60.5	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}(g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.67	0.67
		2.5	0.0					

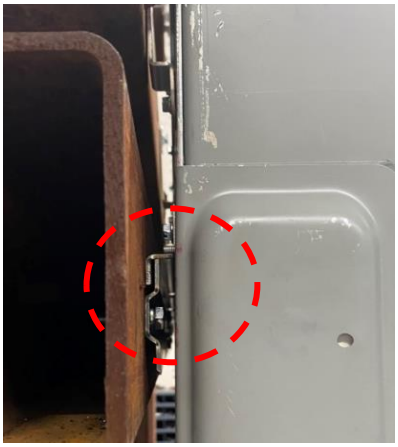
Product Construction Summary:

Main-Breaker Modules: 14 ga Carbon Steel Enclosure and 10 ga Carbon Steel Cover; 3-PHASE

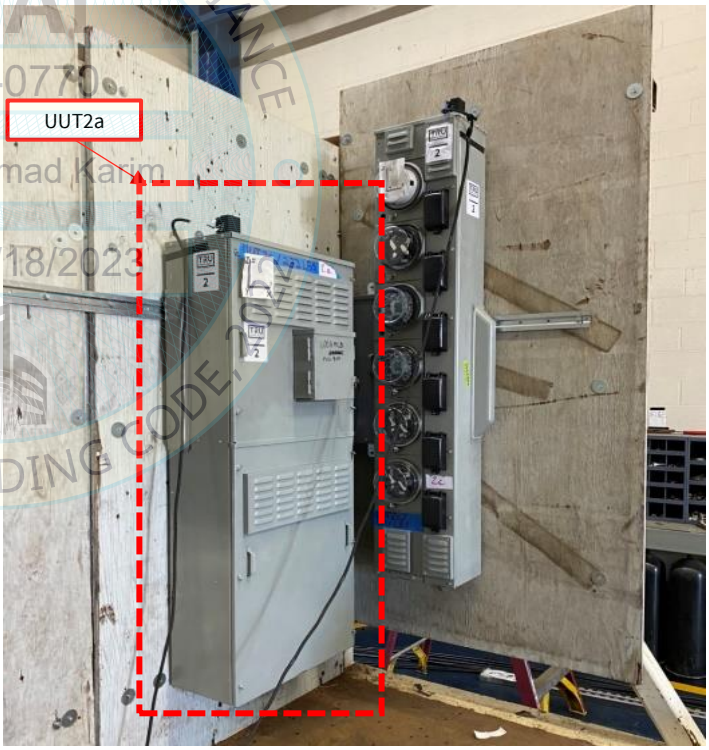
Options/Subcomponent Summary:

Description	*Mfr.*	*Part Number*
Breaker	*ABB*	*XT6*
Switches	*ABB*	*XT6*

Mounting Details



Test Mounting Details:



UUT2 was wall mounted - rigid to a wall fixture. The mounting brackets (2 large [Serial No.: 2100303422P7]) were mounted to the wall fixture using eleven (11) 5/16" Grade 5 bolts and lock washers.
UUT2a was mounted to the wall fixture using four (4) Grade 5 bolts, flat 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

2100749-CR-001-R1

UUT 2b

Manufacturer:	*ABB Industrial Solutions*
Model Line:	*RELIAMOD*
Model Number:	*RELBOW312N3R (12-inch elbow)*
Serial Number:	*N/A*
Test Report:	*2100749-TR-001*

UUT Properties

Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
64	5.3	12.0	25.0	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}(g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.67	0.67
		2.5	0.0					

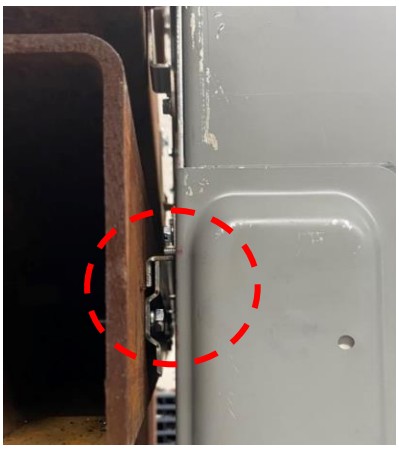
Product Construction Summary:

16 ga Carbon Steel Enclosure and Cover; 3-PHASE

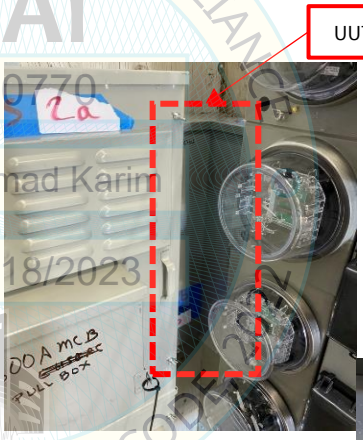
Options/Subcomponent Summary:

Description	*Part Number*
N/A	*N/A*

Mounting Details



Test Mounting Details:



UUT2 was wall mounted - rigid to a wall fixture. The mounting brackets (2 large [Serial No.: 2100303422P7]) were mounted to the wall fixture using eleven (11) 5/16" Grade 5 bolts and lock washers.
UUT2b was mounted to the wall fixture using four (4) Grade 5 bolts, flat 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

2100749-CR-001-R1

UUT 2c

Manufacturer:	*ABB Industrial Solutions*
Model Line:	*RELIAMOD*
Model Number:	*RMS212612LRLR (THQL, hot-metering, 6-gang)*
Serial Number:	*N/A*
Test Report:	*2100749-TR-001*

UUT Properties

Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
151	9.0	13.3	70.5	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}(g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.67	0.67
		2.5	0.0					

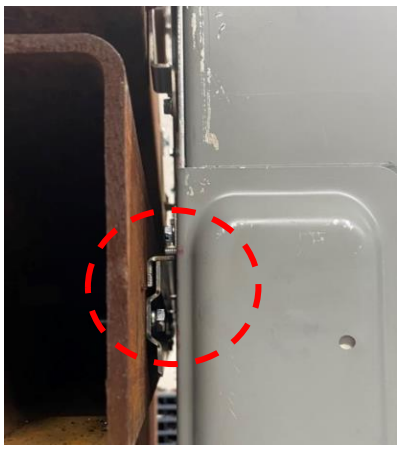
Product Construction Summary:

16 ga Carbon Steel Enclosure and Cover;
3-PHASE-IN, 1-PHASE-OUT

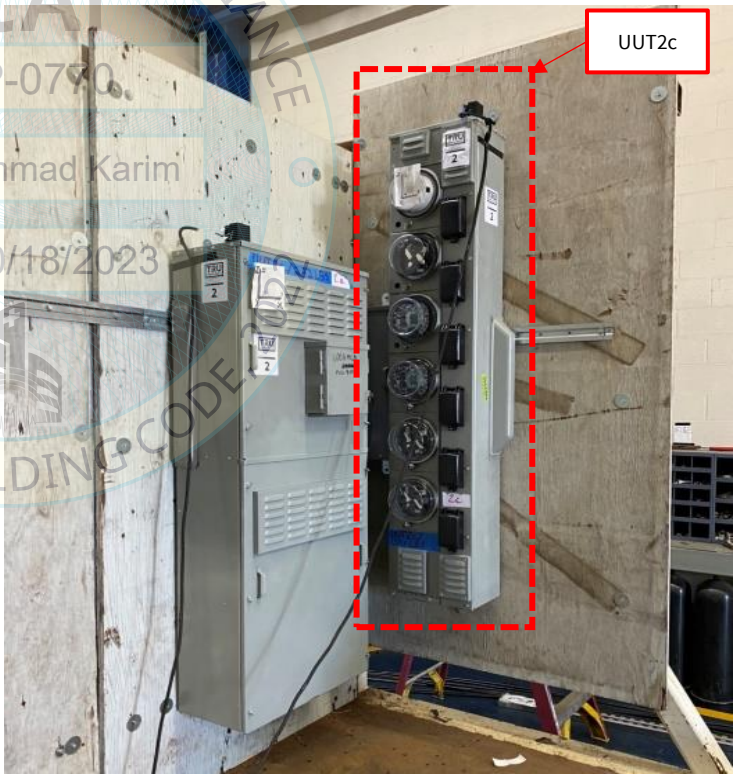
Options/Subcomponent Summary:

Description	*Mfr.*	*Part Number*
Breaker	*ABB*	*THQL*

Mounting Details



Test Mounting Details:



UUT2 was wall mounted - rigid to a wall fixture. The mounting brackets (2 large [Serial No.: 2100303422P7]) were mounted to the wall fixture using eleven (11) 5/16" Grade 5 bolts and lock washers.
UUT2c was mounted to the wall fixture using two (2) Grade 5 bolts, flat 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

2100749-CR-001-R1

UUT 3a

Manufacturer:	*ABB Industrial Solutions*
Model Line:	*RELIAMOD*
Model Number:	*RMM3FE8RCLL (800A MFS w/ integrated pull-box)*
Serial Number:	*N/A*
Test Report:	*2100749-TR-001*

UUT Properties

Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
350	12.8	24.5	65.0	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}(g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.67	0.67
		2.5	0.0					

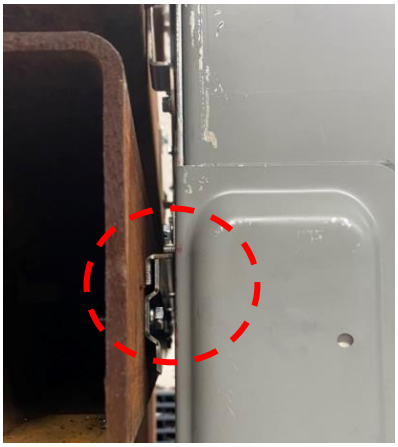
Product Construction Summary:

Main-Breaker Modules: 14 ga Carbon Steel Enclosure and 10 ga Carbon Steel Cover; 3-PHASE

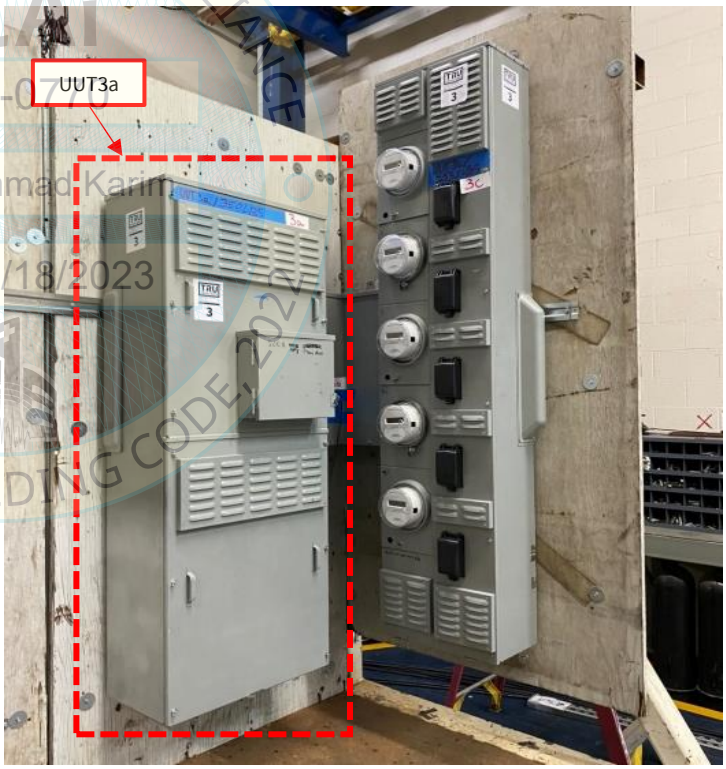
Options/Subcomponent Summary:

Description	*Mfr.*	*Part Number*
Breaker	*ABB*	*XT7*
Switches	*ABB*	*XT7*

Mounting Details



Test Mounting Details:



UUT3 was wall mounted - rigid to a wall fixture. The mounting brackets (2 large [Serial No.: 2100303422P7]) were mounted to the wall fixture using eleven (11) 5/16" Grade 5 bolts and lock washers.
UUT3a was mounted to the wall fixture using four (4) Grade 5 bolts, flat 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

2100749-CR-001-R1

UUT 3b

Manufacturer:	*ABB Industrial Solutions*
Model Line:	*RELIAMOD*
Model Number:	*RELBOW316N3R (16-inch elbow)*
Serial Number:	*N/A*
Test Report:	*2100749-TR-001*

UUT Properties

Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
84	5.3	16.0	25.0	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}(g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.67	0.67
		2.5	0.0					

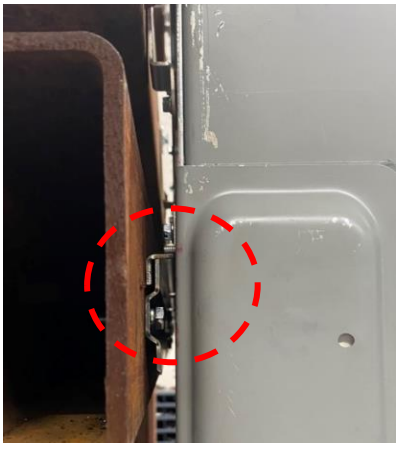
Product Construction Summary:

16 ga Carbon Steel Enclosure and Cover; 3-PHASE

Options/Subcomponent Summary:

Description	*Part Number*
N/A	*N/A*

Mounting Details



Test Mounting Details:

UUT3 was wall mounted - rigid to a wall fixture. The mounting brackets (2 large [Serial No.: 2100303422P7]) were mounted to the wall fixture using eleven (11) 5/16" Grade 5 bolts and lock washers.
UUT3b was mounted to the wall fixture using four (4) Grade 5 bolts, flat 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

2100749-CR-001-R1

UUT 3c

Manufacturer:	*ABB Industrial Solutions*
Model Line:	*RELIAMOD*
Model Number:	*RMS212522HRLR (225A XT, hot-metering, 5-gang)*
Serial Number:	*N/A*
Test Report:	*2100749-TR-001*

UUT Properties

Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
254	9.5	18.0	82.0	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}(g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.67	0.67
		2.5	0.0					

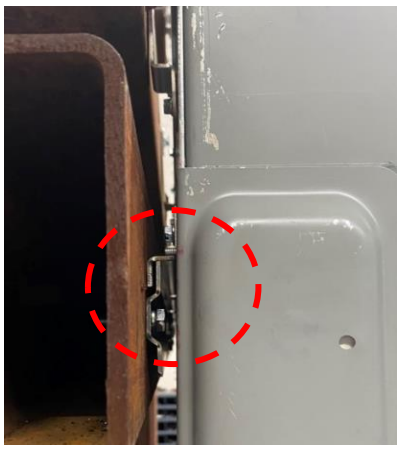
Product Construction Summary:

16 ga Carbon Steel Enclosure and Cover;
3-PHASE-IN, 1-PHASE-OUT

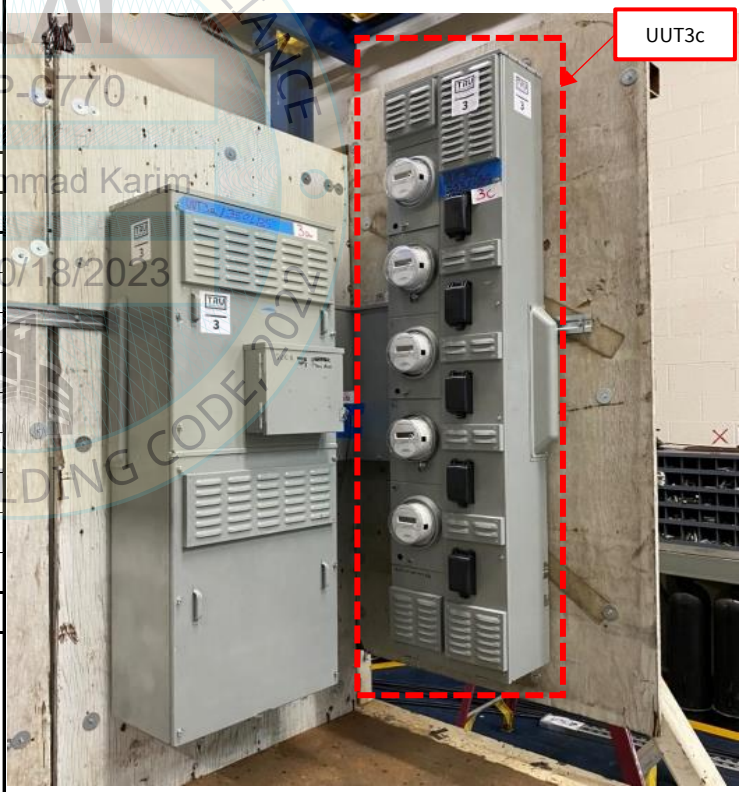
Options/Subcomponent Summary:

Description	*Mfr.*	*Part Number*
Breakers	*ABB*	*XT3, XT4*

Mounting Details



Test Mounting Details:



UUT3 was wall mounted - rigid to a wall fixture. The mounting brackets (2 large [Serial No.: 2100303422P7]) were mounted to the wall fixture using eleven (11) 5/16" Grade 5 bolts and lock washers.
UUT3c was mounted to the wall fixture using four (4) Grade 5 bolts, flat 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.