## OFFICE USE ONLY APPLICATION FOR OSHPD SPECIAL SEISMIC **CERTIFICATION PREAPPROVAL (OSP)** APPLICATION #: OSP - 0539 - 10 **OSHPD Special Seismic Certification Preapproval (OSP)** New □ Renewal **Manufacturer Information** Manufacturer: Rypos, Inc. Manufacturer's Technical Representative: Gerry Maynard Mailing Address: 40 Kenwood Circle, Franklin, MA 02038 Telephone: 774-233-1027 Email: gmaynard@rypos.com **Product Information** Filter Module and Electronic Control Units Diesel Particulate Filter Product Type: Product Model Number: Various (see Certified Product Matrix) (List all unique product identification numbers and/or part numbers) Electrically regenerated diesel particulate filter and electronic control unit General Description: Mounting Description: Filter Module: Base mounted - rigid or isolated; Electronic Control Unit: Wall mounted - rigid or isolated **Applicant Information** Applicant Company Name: TRU Compliance, by Structural Integrity Associates, Inc. Contact Person: Andrew M. Coughlin, SE Mailing Address: 5215 Hellyer Ave., Suite 210, San Jose, CA 95138 Telephone: 844-878-0200 Email: acoughlin@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: Date: 8/29/2018 Title: Director, TRU Compliance Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

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





Page 1 of 3

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)
Company Name: TRU Compliance, by Structural Integrity Associates, Inc.
Name: Andrew M. Coughlin California License Number: S6082
Mailing Address: _5215 Hellyer Ave., Suite 210, San Jose, CA 95138
Telephone: 844-878-0200 Email: 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
<ul> <li>✓ Testing in accordance with:</li> <li>✓ Other (Please Specify):</li> </ul>
BY: Timothy J. Piland
Testing Laboratory  DATE: 01/10/2019
Company Name: Clark Testing
Contact Name: Pat Wetherill
Mailing Address: 1801 Route 51, Jefferson Hills, PA 15025
Telephone: 412-387-1001 Email: PWetherill@clarktesting.com





# OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT FACILITIES DEVELOPMENT DIVISION

Seismic Parameters
Design in accordance with ASCE 7-10 Chapter 13: ⊠ Yes □ No
1.44 Rigid; 4.50 Isolated ( $S_{DS} = 2.00 \ @ z/h = 1$ ) Design Basis of Equipment or Components ( $F_p/W_p$ ) = 1.44 Rigid; 2.40 Isolated ( $S_{DS} = 3.20 \ @ z/h = 0$ )
$S_{DS}$ (Design spectral response acceleration at short period, g) = 2.00 (z/h = 1); 3.20 (z/h = 0)
a <sub>p</sub> (In-structure equipment or component amplification factor) = Rigid: 1.0; Isolated: 2.5
R <sub>p</sub> (Equipment or component response modification factor) = Rigid: 2.5; Isolated: 2.0
$\Omega_0$ (System overstrength factor) = _2
I <sub>p</sub> (Importance factor) = 1.5
z/h (Height factor ratio) = 1 (S <sub>DS</sub> = 2.00); 0 (S <sub>DS</sub> = 3.20)
Equipment or Component Natural Frequencies (Hz) = See Product Matrices
Overall dimensions and weight (or range thereof) = See Product Matrices
Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15:   Yes  No
Design Basis of Equipment or Components (V/W) =
S <sub>DS</sub> (Design spectral response acceleration at short period, g) =
S <sub>D1</sub> (Design spectral response acceleration at 1 second period, g) =
R (Response modification coefficient) =
$\Omega_0$ (System overstrength factor) = BY: Timothy J. Piland
C <sub>d</sub> (Deflection amplificatio <mark>n fac</mark> tor) =
I <sub>p</sub> (Importance factor) = 1.5 DATE: 01/10/2019
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 ☒ No
List of Attachments Supporting Special Seismic Certification
☐ Test Report(s) ☐ Drawings ☐ Calculations ☐ Manufacturer's Catalog
Other(s) (Please Specify): Attachment
OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2022
0
Signature: Date: January 10, 2019
Print Name: Timothy J. Piland Title: SSE
Special Seismic Certification Valid Up to : S <sub>DS</sub> (g) = <u>See Above</u> z/h = <u>See Above</u>
Condition of Approval (if applicable):
ACIIDE

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OSHPD

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## SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

## **TRU PROJECT NO. 1700838**



Manufacturer:	Rypos, Inc.						TAI	BLE 1		
Model Line:	Dual Stack Filter Modules									
Certified Product Con JUT 1 and 2 tested in	s <b>truction Summary:</b> filter module housing (0	).25" thick A	.36 steel w	ith zinc pa	int)					
Certified Options Sun	nmary:									
Mounting Configurati										
	and isolated (A = isolated			DE	1 1:00		. 1			
Note: Installed mounting configuration must be of similar Building Code: CBC 2016		6.9	n and equiva	BB	S DS=	2.0 g z/ 3.2 g z/	/h=1.0			
Model Line	Model <sup>1</sup>	Dir Depth	mensions Width	(in) Height	Weight (lb)	Ž.	Notes	UUT		
Cilian Madula	050 0050		mo <b>33</b> iy	J. 21 <sub>ila</sub>	no <sup>8</sup> 12	0		1A, 1B		
Filter Module	960-0068	DATE:	013310	/2019	814	97		2A, 2B		
			+			,				
	100				<i>⟨</i> •••					
		1/1			10Dx					
		I	UILD	ING						
Note:										
	to enclosure. Serial nun	nbers listed	on the UL	JT Summa	ries reflect	internal c	components.			

## SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

## **TRU PROJECT NO. 1700838**



<b>Manufacturer:</b> F	Rypos, Inc.						TABLE	: ว	
<b>Model Line:</b>	Dual Stack Filter Modul	ual Stack Filter Modules							
Certified Product Consti	ruction Summary:	_	_	_	_			_	
ECU enclosure 0.090 thic	k aluminum alloy (505	2-H32)							
Certified Options Summ	aaru:								
certinea options samm	ury.								
Mounting Configuration			0.0						
Wall mounted - rigid and				DE	1				
Note: Installed mounting conf	iguration must be of similar	configuratio	n and equiva	alent strengtr	14		z/h=1.0		
Building Code: CBC 2016	5	Seismic (	Certificatio	on Limits:	7 50	_	z/h=0.0	1.5	
		Dir	mensions	(in)	Weight	2		T	
Model Line	Model <sup>1</sup>	Depth	Width	Height	(lb)	C	Notes	UUT	
		DV.Ti			AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		e Mount Technology	3A, 3B,	
ECU Module	970-0022	BY: 11	mothy 14.2	J. Pila 28.3	60		d Circuit Board	4A, 4B	
		DATE:		/2019		Through Hole Technology Printed Circuit Board		5A, 5B,	
	T.V	DAIL		/ 4019		Pillited	1 Cifcuit Board	6A, 6B	
						7			
	19	7>			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				
		TA,			30)				
			$_{IIID}$	ING					
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				1				+	
		<u> </u>	<u> </u>						
Note:		1 12		VIII C					

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## **TRU PROJECT NO. 1700838**



lanufactur Iodel Line:	, , ,	es				
UUT	Unit Description	Report Number	Testing Laboratory	S <sub>DS</sub>	z/h	Ι <sub>Ρ</sub>
1A	Filter Module (base mounted -isolated)	JID 17-01263 R3 (UUT 1)	Clark Testing	2.0 3.2	1 0	1.5
1B	Filter Module (base mounted -rigid)	JID 17-01263 R3 (UUT 4)	Clark Testing	2.0 3.2	1 0	1.5
2A	Filter Module (base mounted -isolated)	JID 17-01263 R3 (UUT 2)	Clark Testing	2.0 3.2	1 0	1.5
2B	Filter Module (base mounted -rigid)	JID 17-01263 R3 (UUT 3) OD R	Clark Testing	2.0 3.2	1 0	1.5
ЗА	ECU Module (wall mounted - isolated)	JID 17-01263 R3 (UUT 5A)	Clark Testing	2.0 3.2	1 0	1.5
4A	ECU Module (wall mounted - isolated)	JID 17-01263 R3 (UUT 5B)	Clark Testing	2.0 3.2	1 0	1.5
5A	ECU Module (wall mounted - isola <mark>ted)</mark>	JID 17-01263 R3 (UUT 5C)	Clark Testing	2.0 3.2	1 0	1.5
6A	ECU Module (wall mounted - isola <mark>ted)</mark>	UUT 5D)	Clark Testing	2.0 3.2	1 0	1.5
3B	ECU Module (wall mounted - rigid)	DAJID 17-01263 R3/ 2 0 1 (UUT 6A)	Clark Testing	2.0 3.2	1 0	1.5
4B	ECU Module (wall mounted - rigid)	JID 17-01263 R3 (UUT 6B)	Clark Testing	2.0 3.2	1 0	1.5
5B	ECU Module (wall mounted - rigid)	JID 17-01263 R3 (UUT 6C) DING	Clark Testing	2.0 3.2	1 0	1.5
6B	ECU Module (wall mounted - rigid)	JID 17-01263 R3 (UUT 6D)	Clark Testing	2.0 3.2	1 0	1.5
lote:						

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## **TRU PROJECT NO. 1700838**



**UUT 1A** 

Manufacturer: Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

960-0068 **Serial Number:** 1048973-1-18-1

**Product Construction Summary:** 

Model Number:

Filter Module Housing: 0.25" thick A36 steel with zinc paint

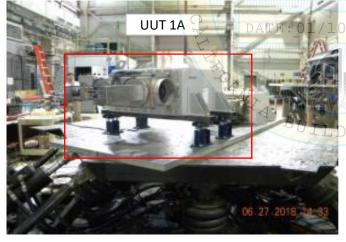
#### **Options/Subcomponent Summary:**

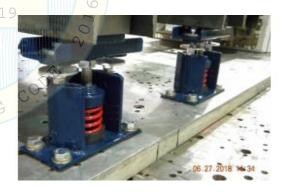
	UUT Properties											
Weight		Dimension (in)	OR CODE	Lowest Natural Frequency (Hz)								
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical						
812	63	33		3.06	2 41	4 83						

### **UUT Highest Passed Seismic Run Information**

<b>Building Code</b>	Test Criteria	S <sub>DS</sub> (g)	z/h	1 <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 2016	OSP=0:	2.0	1.0	C 115	2 20	2.40	2 12	0.05
	CC-ES AC156 (2015)	3.2	0.0	1.5	3.20	2.40	2.13	0.85

### **Test Mounting Details:**





UUT 1A was installed in a test housing that was base mounted-isolated. See installation drawing on the next page. Four (4) Mason SLRSO-B-450 isolators were used to mounted the housing to the shake table. Each isolator was mounted to the shake table with four (4) 5/8" -11 Grade 5 bolts with lock and flat washers torqued to 90ft-lbs. Four (4) 4"x 4"x 1.5 steel adaptor blocks were bolted to the top of each isolator with four (4) 1/2"-13 grade 5 bolts, washers, and lock washers, torqued to 75ft-lbs. Two C channels - C6X8.2 x 45.13" A36 Steel - were placed onto the top of the blocks. The module and C channel was mounted to the isoloators with one (1) 1"-8 grade 8 bolts with washers and lock washers at each isolator. The 1"-8 bolts were torqued to 220 ft-lbs.

## **TRU PROJECT NO. 1700838**

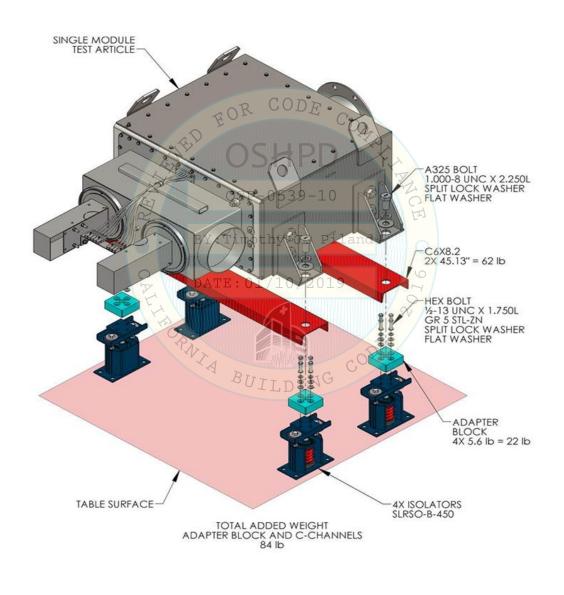


Manufacturer: Rypos, Inc.

Model Line: Dual Stack Filter Modules UUT 1A

**Model Number:** 960-0068 **Serial Number:** 1048973-1-18-1

**Test Housing Mounting Details** 



## TRU PROJECT NO. 1700838



**UUT 1A** 

Manufacturer: Rypos, Inc.

**Model Line: Dual Stack Filter Modules** 

Model Number: 960-0068 1048973-1-18-1 Serial Number:

Isolator Details



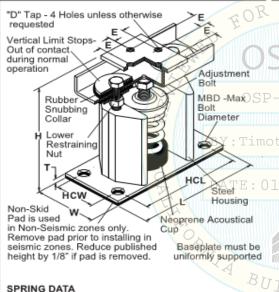
## MASON INDUSTRIES, Inc. Manufacturers of Vibration Control Products

350 Rabro Drive Hauppauge, NY 11788 631/348-0282 FAX 631/348-0279 Info@Mason-Ind.com

2101 W. Crescent Ave., Suite D Anaheim, CA 92801 714/535-2727 FAX 714/535-5738 nd.com Info@MasonAnaheim.com www.Mason-Ind.com

JOB NAME CUSTOMER CUSTOMER P.O. MASON M.I. DWG. NO

SERIES SPRING MOUNTS



	Spring	Free	Ratio	Ratio
Size	OD	Height	K <sub>x</sub> /K <sub>y</sub>	OD/OH
B	23/8	4	0.70-0.80	0.80 - 1.25

Illustration shows SLRSO-B housing which contains one (1) B spring. Not shown is SLRSO-1 housing which contains one (1) C spring, SLRSO-2 housing which contains two (2) C springs and SLRSO-4 which contains four (4) C springs.

41/8 0.90-1.10

0.92

All springs have an additional travel to solid equal to 50% of the rated deflection.

Housing load ratings expressed in G's are based on tests with bolted connections to steel top and bottom.

Size	Rated Capacity (lb)	Rated Defl. (in)	Spring Constant (lb/in)	Max. Horiz. Housing G Rating	Spring Color
SLRSO-B-65	65	2.10	31	21.6	Brown
SLRSO-B-85	85	2.10	40	16.5	Wht/Blk
SLRSO-B-115	115	2.00	57	12.2	Silver
SLRSO-B-150	150	2.00	75	9.3	Orange
SLRSO-B-280	280	1.60	174	5.0	Green
SLRSO-B-450	450	1-31	344	3.1	Red
SLRSO-B-750	750	1.12	670	1.9	White
SLRSO-B-1000	1000	1.00	1000	1.4	Blue
SLRSO-1-1000	1000	1.00	1000	4.4	Black
SLRSO-1-1350	1350	1.00	1350	3.3	Yellow
SLRSO-1-1750	1750	1.00	1750	2.5	Black*
SLRSO-1-2100	2100	1,00	2100	2.1	Yellow*
SLRSQ-1-2385	2385	1.00	2385	1.9	Yellow*
SLRSO-1-2650	2650	1.00	2650	1.7	Red*
SLRSO-1-2935	2935	4.00	2935	1.5	Red**
SLRSO-2-3500	3500	1.00	3500	1.8	Black*
SLRSO-2-4200	4200	1.00	4200	1.5	Yellow*
SLRSO-2-4770	4770	1.00	4770	1.3	Yellow*
SLRSO-4-5400	5400	1.00	5400	2.0	Yellow
SLR\$0-4-7000	7000	1.00	7000	1.6	Black*
SLRSO-4-8400	8400	1.00	8400	1.3	Yellow*
SLRSQ-4-9540	9540	1.00	9540	1.2	Yellow*
\$LRSO-4-10600	10600	1.00	10600	1.1	Red*
SLRSO-4-11740	11740	1.00	11740	0.9	Red**

\* with RED inner spring \*\* with GREEN inner spring

#### TYPE SLRSO DIMENSIONS (inches)

	W HCL D E
SLRSO-B 81/2 41/4 83/4 3/8 5/8 23	3/4 7 1/2 11/8
SLRSO-1 91/2 51/4 83/4 3/8 5/8 31	1/2 7 1/2 5/8 1 3/8
SLRSO-2 14 51/4 83/4 3/8 5/8 31	1/2 12 1/4 5/8 1 3/8
SLRSO-4 133/4 8 83/4 3/8 3/4 61	1/4 11 7/8 13/8





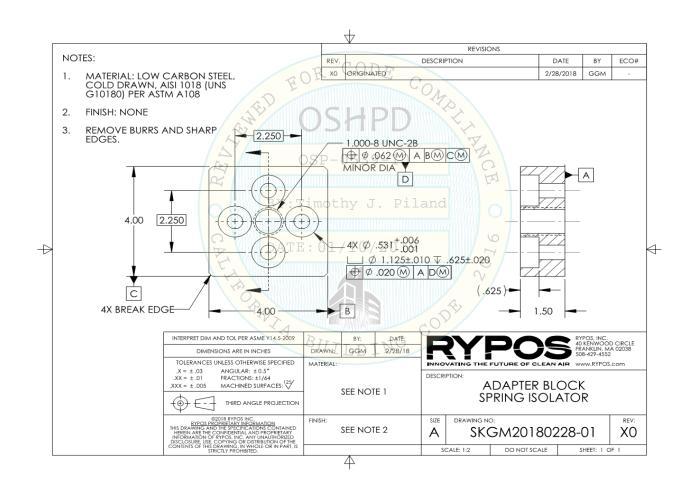
Manufacturer: Rypos, Inc.

Model Line: Dual Stack Filter Modules

UUT 1A

**Model Number:** 960-0068 **Serial Number:** 1048973-1-18-1

Adapter Block for Spring Isolator



## TRU PROJECT NO. 1700838



**UUT 1B** 

Manufacturer: Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

960-0068 **Serial Number:** 1048973-1-18-1

**Product Construction Summary:** 

Model Number:

Filter Module Housing: 0.25" thick A36 steel with zinc paint

Options/Subcomponent Summary:

**UUT Propertie** 

	o o i i i o o i i i o o i i i o o i o i										
Weight		Di <mark>mensio</mark> n (in)	UDITED	Lowest Natural Frequency (Hz)							
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical					
812	63	[ 33 ]	21	18.4	15.5	>33.3					
	-			VANAAAAAYYVAA		•					

UUT Highest Passed Seismic Run Information

h	Test Criteria moth	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 2016	OCC-ES AC156 (2015)	2.0 0 /3 <u>2</u> 0 1	1.0 9 0.0	1.50	3.20	2.40	2.13	0.85

### **Test Mounting Details:**





UUT 1B was installed in a test housing that was base mounted-rigid to the shake table with four (4) 1"-8 Grade 5 bolts with lock and flat washers.

## **TRU PROJECT NO. 1700838**



**UUT 2A** 

*Manufacturer:* Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

960-0068 **Serial Number:** 1048973-1-18-2

**Product Construction Summary:** 

Model Number:

Filter Module Housing: 0.25" thick A36 steel with zinc paint

#### Options/Subcomponent Summary:

	UUT Properties										
Weight		Dimension (in)	OR CODE	Lowest	t Natural Frequen	cy (Hz)					
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical					
814	63	33		2,39	2.09	5.17					

### **UUT Highest Passed Seismic Run Information**

<b>Building Code</b>	Test Criteria	S <sub>DS</sub> (g)	z/h	1 <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 2016	OSP=0:	2.0	1.0	C 115	3.20	2.40	2 12	0.05
CBC 2016	CC-ES AC156 (2015)	3.2	0.0	1.5	3.20	2.40	2.13	0.85

#### **Test Mounting Details:**





UUT 2A was installed in a test housing that was base mounted-isolated. See installation drawing on the next page. Four (4) Mason SLRSO-B-450 isolators were used to mounted the housing to the shake table. Each isolator was mounted to the shake table with four (4) 5/8" -11 Grade 5 bolts with lock and flat washers torqued to 90ft-lbs. Four (4) 4"x 4"x 1.5" steel adaptor blocks were bolted to the top of each isolator with four (4) 1/2"-13 grade 5 bolts, washers, and lock washers, torqued to 75ft-lbs. Two C channels - C6X8.2 x 45.13" A36 Steel - were placed onto the top of the blocks. The module and C channel was mounted to the isolators with one (1) 1"-8 grade 8 bolts with washers and lock washers at each isolator. The 1"-8 bolts were torqued to 220 ft-lbs.

## **TRU PROJECT NO. 1700838**

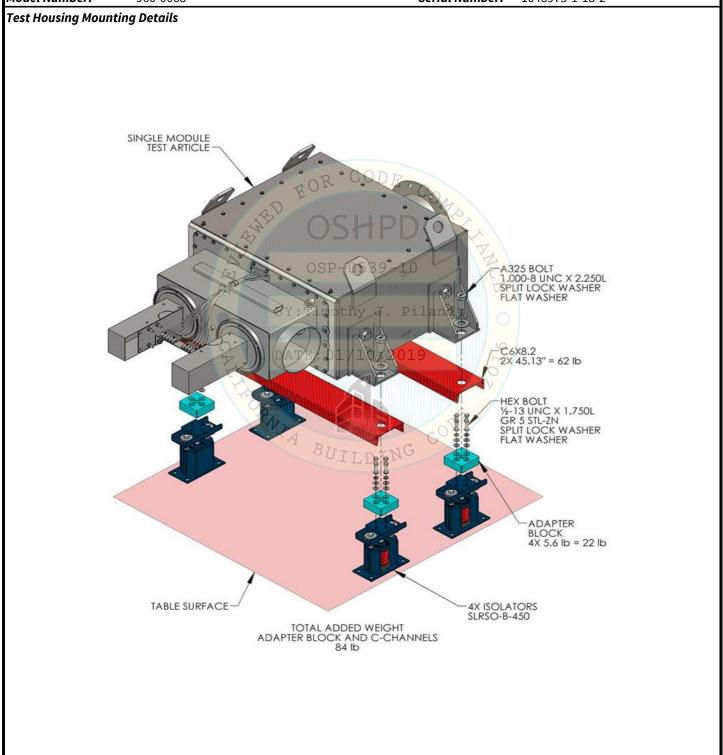


Manufacturer: Rypos, Inc.

Model Line: Dual Stack Filter Modules

UUT 2A

**Model Number:** 960-0068 **Serial Number:** 1048973-1-18-2



## TRU PROJECT NO. 1700838



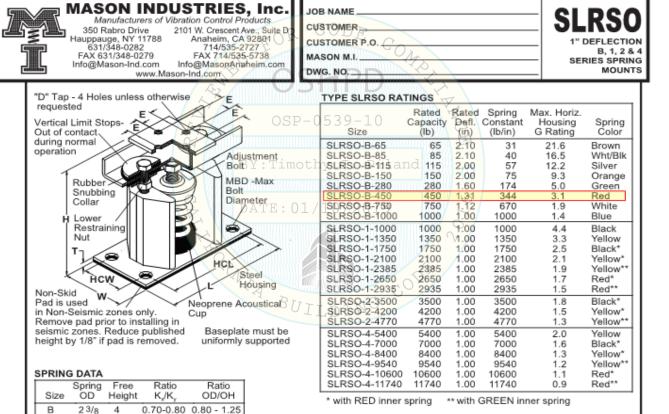
**UUT 2A** 

Manufacturer: Rypos, Inc.

**Model Line: Dual Stack Filter Modules** 

Model Number: 960-0068 1048973-1-18-2 Serial Number:

Isolator Details



## 41/8 0.90-1.10

0.92

С

27/8

Illustration shows SLRSO-B housing which contains one (1) B spring. Not shown is SLRSO-1 housing which contains on (1) C spring, SLRSO-2 housing which contains two (2) C springs and SLRSO-4 which contains four (4) C springs.

All springs have an additional travel to solid equal to 50% of the

Housing load ratings expressed in G's are based on tests with bolted connections to steel top and bottom.

#### TYPE SLRSO DIMENSIONS (inches)

Size	L.	W	Н	Т	MBD	HCW	HCL	D	E
SLRSO-B		4 1/4	83/4			23/4	7	1/2	1 1/8
SLRSO-1	9 1/2	51/4	83/4	3/8	5/8	3 1/2	7 1/2	5/8	13/8
SLRSO-2	14	51/4	83/4	3/8	5/8	31/2	12 1/4	5/8	13/8
SLRSO-4	133/4	8	83/4	3/8	3/4	6 1/4	11	7/8	13/8

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## **TRU PROJECT NO. 1700838**

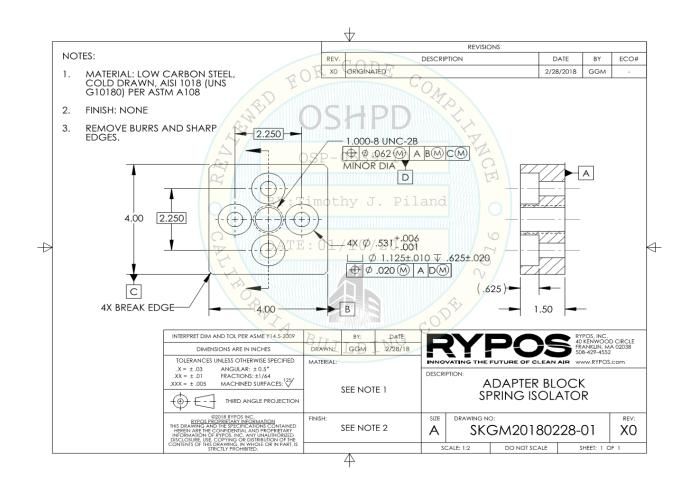


Manufacturer: Rypos, Inc.

Model Line: Dual Stack Filter Modules UUT 2A

**Model Number:** 960-0068 **Serial Number:** 1048973-1-18-2

Adapter Block for Spring Isolator



## **TRU PROJECT NO. 1700838**



**UUT 2B** 

Manufacturer: Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

960-0068 **Serial Number:** 1048973-1-18-2

**Product Construction Summary:** 

Model Number:

Filter Module Housing: 0.25" thick A36 steel with zinc paint

### Options/Subcomponent Summary:

**UUT Properties** 

	001 Properties										
Weight		Dimension (in)	USTIFL	Lowest Natural Frequency (Hz)							
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical					
814	63	A 33	21	17.8	15.3	>33.3					
014	63	33	21	11.8	15.3	>33.3					

### UUT Highest Passed Seismic Run Information

				V V V T A A				
<b>Building Code</b>	Test Criteria moth	<b>S</b> <sub>DS</sub> (g)	z/h	l <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 2016	CC-ES AC156 (2015)	2.0	1.0	1 5	3.20	2.40	2 12	0.05
CBC 2016	CICC-ES ACI36 (2013)	0/3201	9 0.0	1.50	3.20	2.40	2.13	0.85

### **Test Mounting Details:**





UUT 2B was installed in a test housing that was base mounted-rigid to the shake table with four (4) 1"-8 Grade 5 bolts with lock and flat washers.

## **TRU PROJECT NO. 1700838**



**UUT 3A** 

*Manufacturer:* Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

Serial Number: 18069014

**Product Construction Summary:** 

Model Number:

ECU enclosure: 0.090" thick aluminum alloy 5052-H32

970-0022-00-00

### **Options/Subcomponent Summary:**

PCB (Surface Mount Technology Version)

	U	T			_	-	_	 43	-	_
u	u		r	16	O.	n	ρ	TI	e	5

Weight		Dimension (in)	<b>OCHDD</b>	Lowest Natural Frequency (Hz)			
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical	
60	7	14.2	28.3	N/A Z	N/A	N/A	

## UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	Ip	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 2016	BY: Timothy ICC-ES AC156 (2015)	<sup>2</sup> .0 P1	land 1.0		3.20	2.40	2 12	0.85
CBC 2016	ICC-ES AC136 (2013)	3.2	0.0	1.5	3.20	2.40	2.13	0.65

#### **Test Mounting Details:**







UUT 3A was installed onto a mounting frame and the secured to the test fixture with sixteen (16) 5/16"-18 Grade 8 bolts torqued to 25ft-lbs. The wall fixture was mounted with to four (4) Mason SLRSO-B-450 isolators using four (4) 1/2"-13 grade 5 bolts, washer, and lock washers. Each isolator was mounted to the shake table with four (4) 5/8"-11 grade 5 bolts with lock and flat washers, for a total of sixteen (16) 5/8"-11 grade 5 bolts.

## TRU PROJECT NO. 1700838



**UUT 3A** 

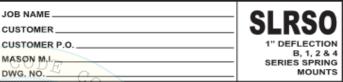
Manufacturer: Rypos, Inc.

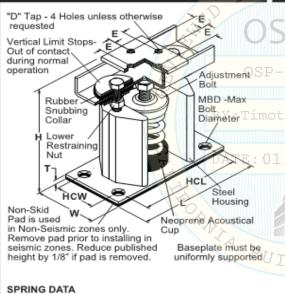
**Model Line:** Dual Stack Filter Modules

970-0022-00-00 **Serial Number:** 18069014

Model Number: Isolator Details







Size	Rated Capacity (lb)	Rated Defl. (in)	Spring Constant (lb/in)	Max. Horiz. Housing G Rating	Spring Color
SLRSO-B-65	65	2.10	31	21.6	Brown
SLR\$0-B-85	85	2.10	40	16.5	Wht/Blk
SLRSO-B-115	115	2.00	57	12.2	Silver
SLRSO-B-150	150	2:00	75	9.3	Orange
SLRSO-B-280	280	1.60	174	5.0	Green
SLRSO-B-450ar	450	1.31	344	3.1	Red
SLRSO-B-750	750	1.12	670	1.9	White
SLRSO-B-1000	1000	1.00	1000	1.4	Blue
SLRSO-1-1000	1000	1,00	1000	4.4	Black
Strso-1-1350	1350	1.00	1350	3.3	Yellow
SLRSO-1-1750	1750	1.00	1750	2.5	Black*
SLRSO-1-2100	2100	100	2100	2.1	Yellow*
SLRSO-1-2385	2385	1.00	2385	1.9	Yellow*
SLRSO-1-2650	2650	1,00	2650	1.7	Red*
SLRSO-1-2935	2935	1.00	2935	1.5	Red**
SLRSO-2-3500	3500	1.00	3500	1.8	Black*
SLRSO-2-4200	4200	1.00	4200	1.5	Yellow*
SLRSO-2-4770	4770	1.00	4770	1.3	Yellow*
SLRSQ-4-5400	5400	1.00	5400	2.0	Yellow
SLRSQ-4-7000	7000	1.00	7000	1.6	Black*
SLRSO-4-8400	8400	1.00	8400	1.3	Yellow*
SLRSO-4-9540	9540	1.00	9540	1.2	Yellow*
SLRSO-4-10600	10600	1.00	10600	1.1	Red*
SLRSO-4-11740	11740	1.00	11740	0.9	Red**

## Spring Free Ratio

Size	OD	Height	K <sub>x</sub> /K <sub>y</sub>	OD/OH
В	23/8	4	0.70-0.80	0.80 - 1.25
C	27/8	41/8	0.90-1.10	0.92

Illustration shows SLRSO-B housing which contains one (1) B spring. Not shown is SLRSO-1 housing which contains one (1) C spring, SLRSO-2 housing which contains two (2) C springs and SLRSO-4 which contains four (4) C springs.

All springs have an additional travel to solid equal to 50% of the rated deflection.

Housing load ratings expressed in G's are based on tests with bolted connections to steel top and bottom.

#### TYPE SLRSO DIMENSIONS (inches)

Size	L.	W	Н.	Т	MBD	HCW	HCL	D	E
SLRSO-B		4 1/4	8 3/4	3/8	5/g	23/4	7	1/2	11/8
SLRSO-1	9 1/2	51/4	83/4	3/8	5/g	3 1/2	7 1/2	5/8	13/8
SLRSO-2		51/4	83/4	3/8	5/8	31/2	12 1/4	5/8	13/8
SLRSO-4	133/4	8	8 3/4	3/8	3/4	61/4	11	7/8	13/8

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## **TRU PROJECT NO. 1700838**



**UUT 4A** 

Manufacturer: Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

Serial Number: 18069013

**Product Construction Summary:** 

Model Number:

ECU enclosure: 0.090" thick aluminum alloy 5052-H32

970-0022-00-00

### Options/Subcomponent Summary:

PCB (Surface Mount Technology Version)

**UUT Properties** 

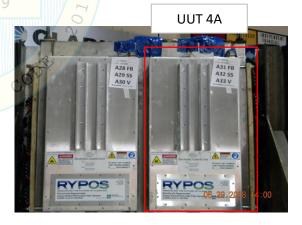
			o o i i i operares	1			
Weight		Dimension (in	OCHDD	Lowest Natural Frequency (Hz)			
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical	
60	7	14.2	28.3	N/A Z	N/A	N/A	
			U3P-U339-10		· ·		

### UUT Highest Passed Seismic Run Information

			<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>	1/1/W				
Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>P</sub>	$A_{FLX-H}(g)$	$A_{RIG-H}(g)$	$A_{FLX-V}(g)$	$A_{RIG-V}(g)$
CBC 2016	ICC-ES AC156 (2015)	<sup>7</sup> <sup>J</sup> 2.0 <sup>P1</sup>	1.0	1.5	3.20	2.40	2.13	0.85
		3.2	0.0					

**Test Mounting Details:** 





UUT 4A was installed onto a mounting frame and secured to the test fixture with sixteen (16) 5/16"-18 Grade 8 bolts torqued to 25ft-lbs. The wall fixture was mounted with to four (4) Mason SLRSO-B-450 isolators using four (4) 1/2"-13 grade 5 bolts, washer, and lock washers. Each isolator was mounted to the shake table with four (4) 5/8"-11 grade 5 bolts with lock and flat washers, for a total of sixteen (16) 5/8"-11 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.

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## TRU PROJECT NO. 1700838



**UUT 4A** 

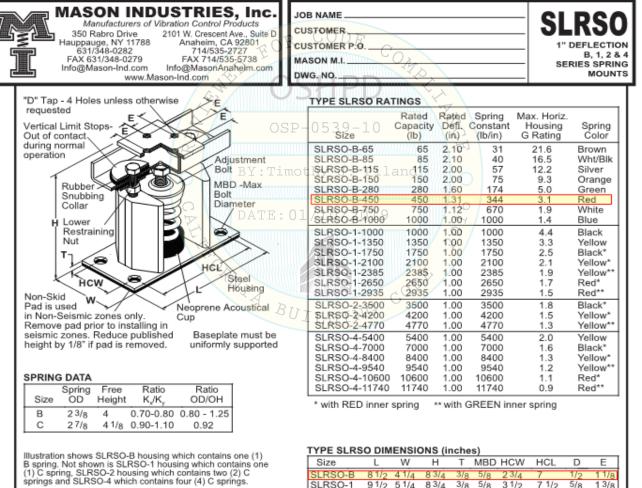
Manufacturer: Rypos, Inc.

**Model Line: Dual Stack Filter Modules** 

> 970-0022-00-00 Serial Number: 18069013

**Test Housing Details** 

Model Number:



Į	Size	L_	W	н		MBD	HCW	HCL	D	E
	SLRSO-B	8 1/2	4 1/4	8 3/4	3/8	5/8	23/4	7	1/2	1 1/8
	SLRSO-1	9 1/2	51/4	8 3/4	3/8	5/8	3 1/2	7 1/2	5/8	13/8
	SLRSO-2	14	51/4	83/4	3/8	5/8	31/2	12 1/4	5/8	13/8
	SLRSO-4	133/4	8	8 3/4	3/8	3/4	6 1/4	11	7/8	13/8

Housing load ratings expressed in G's are based on tests with bolted connections to steel top and bottom.

All springs have an additional travel to solid equal to 50% of the rated deflection.

## TRU PROJECT NO. 1700838



**UUT 5A** 

Manufacturer: Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

**Serial Number:** 16369668

**Product Construction Summary:** 

Model Number:

ECU enclosure: 0.090" thick aluminum alloy 5052-H32

970-0022-00-01

### **Options/Subcomponent Summary:**

PCB (Through-Hole Technology Version)

**UUT Properties** 

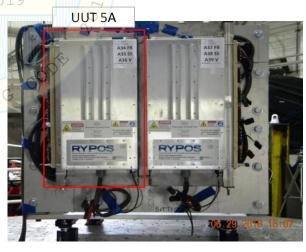
	OUT TOPOTOES									
Weight		Dimension (in)	OCHDD	Lowest Natural Frequency (Hz)						
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical				
60	7	14.2	28.3	N/A Z	N/A	N/A				
			U.S.P. = U.S.S.P. = 1 U			,				

### 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 2016	BY: Timothy ICC-ES AC156 (2015)	<sup>7</sup> <sup>J</sup> 2.0 <sup>P1</sup>	1.0		3.20	2.40	2 12	0.85
CDC 2016	ICC-L3 AC136 (2013)	3.2	0.0	1.5	3.20	2.40	2.13	0.65

### **Test Mounting Details:**





UUT 5A was installed onto a mounting frame and secured to the test fixture with sixteen (16) 5/16"-18 Grade 8 bolts torqued to 25ft-lbs. The wall fixture was mounted with to four (4) Mason SLRSO-B-450 isolators using four (4) 1/2"-13 grade 5 bolts, washer, and lock washers. Each isolator was mounted to the shake table with four (4) 5/8"-11 grade 5 bolts with lock and flat washers, for a total of sixteen (16) 5/8"-11 grade 5 bolts.

## TRU PROJECT NO. 1700838



**UUT 5A** 

*Manufacturer:* Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

970-0022-00-01 **Serial Number:** 16369668

Model Number: Isolator Details



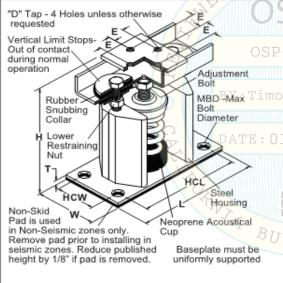
### MASON INDUSTRIES, Inc.

Manufacturers of Vibration Control Products
350 Rabro Drive 2101 W. Crescent Ave., Suite D
Hanaheim, CA 92801
631/348-0282 714/535-2727
FAX 631/348-0279 FAX 714/535-5738
Info@Mason-Ind.com Info@MasonAnaheim.com
www.Mason-Ind.com

TYPE SLRSO RATINGS

SLRSO

1" DEFLECTION B, 1, 2 & 4 SERIES SPRING MOUNTS



### SPRING DATA

Size	Spring OD	Free Height	Ratio K <sub>x</sub> /K <sub>y</sub>	Ratio OD/OH
В	23/8	4	0.70-0.80	0.80 - 1.25
C	27/8	41/8	0.90-1.10	0.92

Illustration shows SLRSO-B housing which contains one (1) B spring. Not shown is SLRSO-1 housing which contains one (1) C spring, SLRSO-2 housing which contains two (2) C springs and SLRSO-4 which contains four (4) C springs.

All springs have an additional travel to solid equal to 50% of the rated deflection.

Housing load ratings expressed in G's are based on tests with bolted connections to steel top and bottom.

0 5 <b>38ize</b> 1 0	Rated Capacity (lb)	Rated Defl. (in)	Spring Constant (lb/in)	Max. Horiz. Housing G Rating	Spring Color
SLRSO-B-65	65	2.10	31	21.6	Brown
SLRSO-B-85	85	2.10	40	16.5	Wht/Blk
SLRSO-B-115	115	2.00	57	12.2	Silver
SLRSO-B-150	and 50	2.00	75	9.3	Orange
SLRSO-B-280	280	1.60	174	5.0	Green
SLRSO-B-450	450	1.31	344	3.1	Red
SLRSO-B-750	750	1.12	670	1.9	White
SLRSQ-B-1000	1000	1.00	1000	1.4	Blue
SLRSO-1-1000	1000	1.00	1000	4.4	Black
SLRSO-1-1350	1350	1.00	1350	3.3	Yellow
SLRSO-1-1750	1750	1.00	1750	2.5	Black*
SLRSO-1-2100	2100	1.00	2100	2.1	Yellow*
SLRSO-1-2385	2385	1.00	2385	1.9	Yellow**
SLRSO-1-2650	2650	1.00	2650	1.7	Red*
SLRSO-1-2935	2935	1.00	2935	1.5	Red**
SLRSO-2-3500	3500	1.00	3500	1.8	Black*
SLRSO-2-4200	4200	1.00	4200	1.5	Yellow*
SLRSQ-2-4770	4770	1.00	4770	1.3	Yellow**
SLRSO-4-5400	5400	1.00	5400	2.0	Yellow
SLRSO-4-7000	7000	1.00	7000	1.6	Black*
SLRSO-4-8400	8400	1.00	8400	1.3	Yellow*
SLRSO-4-9540	9540	1.00	9540	1.2	Yellow**
SLRSO-4-10600	10600	1.00	10600	1.1	Red*
SLRSO-4-11740	11740	1.00	11740	0.9	Red**

### TYPE SLRSO DIMENSIONS (inches)

Size	L_	W	Н_		MBD	HCW	HCL	D	E
SLRSO-B	8 1/2	4 1/4	8 3/4	3/8			7	1/2	11/8
SLRSO-1	9 1/2	5 1/4	8 3/4			3 1/2	7 1/2	5/8	13/8
SLRSO-2	14	51/4	83/4	3/8	5/8	31/2	12 1/4	5/8	13/8
SLRSO-4	133/4	8	8 3/4	3/8	3/4	6 1/4	11	7/8	13/8

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## **TRU PROJECT NO. 1700838**



**UUT 6A** 

*Manufacturer:* Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

970-0022-00-01 **Serial Number:** 16459739

**Product Construction Summary:** 

Model Number:

ECU enclosure: 0.090" thick aluminum alloy 5052-H32

### Options/Subcomponent Summary:

PCB (Through-Hole Technology Version)

IIIIT Dranari	inc
UUT Propert	162

	001710001111									
Weight		Dimension (in)	OCHDD	Lowest Natural Frequency (Hz)						
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical				
60	7	14.2	28.3	N/A Z	N/A	N/A				
			U.S.P. = U.S.S. = 1 U.S.P. = 1 U.							

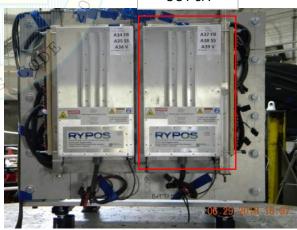
### UUT Highest Passed Seismic Run Information

				ALC LET				
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 2016	ICC-ES AC156 (2015)	<sup>7</sup> J <sub>2.0</sub> P1	land 1.0	1.5	3.20	2.40	2.13	0.85
		3.2	0.0					

### **Test Mounting Details:**







UUT 6A was installed onto a mounting frame and secured to the test fixture with sixteen (16) 5/16"-18 Grade 8 bolts torqued to 25ft-lbs. The wall fixture was mounted with to four (4) Mason SLRSO-B-450 isolators using four (4) 1/2"-13 grade 5 bolts, washer, and lock washers. Each isolator was mounted to the shake table with four (4) 5/8"-11 grade 5 bolts with lock and flat washers, for a total of sixteen (16) 5/8"-11 grade 5 bolts.

## TRU PROJECT NO. 1700838



**UUT 6A** 

*Manufacturer:* Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

970-0022-00-01

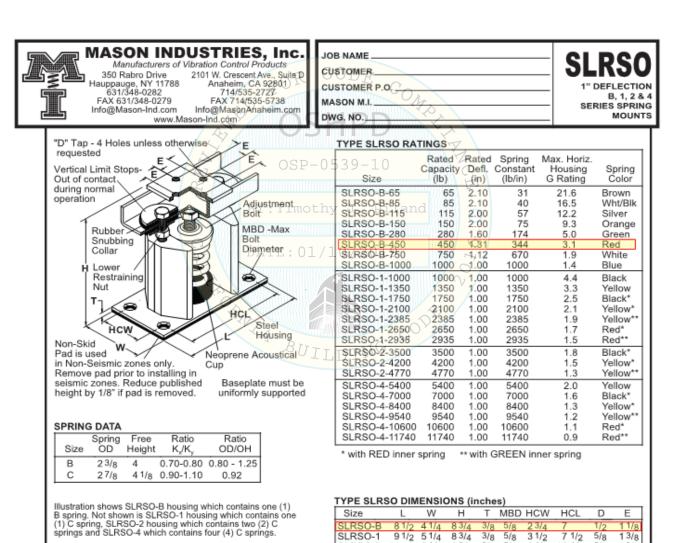
All springs have an additional travel to solid equal to 50% of the rated deflection.

connections to steel top and bottom.

Housing load ratings expressed in G's are based on tests with bolted

**Serial Number:** 16459739

Model Number: Isolator Details



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31/2

6 1/4 11

12 1/4

5/8

7/8

13/8

13/8

SLRSO-2 14

133/4 8

SLRSO-4

51/4

83/4

83/4

3/8 5/8

3/8 3/4

## **TRU PROJECT NO. 1700838**



**UUT 3B** 

Manufacturer: Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

970-0022-00-00 **Serial Number:** 18069014

**Product Construction Summary:** 

Model Number:

Weight

ECU enclosure: 0.090" thick aluminum alloy 5052-H32

### **Options/Subcomponent Summary:**

PCB (Surface Mount Technology Version)

10	UUT Properties				
in)		Lowest	Natural Frequen	cy (Hz)	
	Height	Front-Back	Side-Side	Vertical	

 (lb)
 Depth
 Width
 Height
 Front-Back
 Side-Side
 Vertical

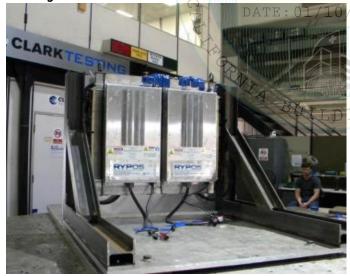
 60
 7
 14.2
 28.3
 N/A
 N/A
 N/A
 N/A

LILLE POR CONTRACTOR

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	F.	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 2016	ICC-ES AC156 (2015) thy	2.0 3.2 PI	1.0	1.5	3.20	2.40	2.13	0.85

**Test Mounting Details:** 



Dimension (i



UUT 3B was installed onto a mounting frame and secured to the test fixture with sixteen (16) 5/16"-18 Grade 8 bolts, washers, and lock washers. The fixture was mounted base-rigid to the shake table with four (4) 1"-8 bolts, torqued to 220 ft-lbs. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

## **TRU PROJECT NO. 1700838**



**UUT 4B** 

Manufacturer: Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

**Model Number:** 970-0022-00-00 **Serial Number:** 18069013

**Product Construction Summary:** 

ECU enclosure: 0.090" thick aluminum alloy 5052-H32

### **Options/Subcomponent Summary:**

PCB (Surface Mount Technology Version)

\	UU	T	Pro	p	er	ti	es
---	----	---	-----	---	----	----	----

Weight		Dimension (in)		Lowest Natural Frequency (Hz)				
(lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical		
60	7	14.2	28.3	N/A	N/A	N/A		

### UUT Highest Passed Seismic Run Information

Е	Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I I	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 2016	ICC-ES AC156 (2015) thy	2.0 3.2 P1	1.0	1.5	3.20	2.40	2.13	0.85

**Test Mounting Details:** 





UUT 4B was installed onto a mounting frame and secured to the test fixture with sixteen (16) 5/16"-18 Grade 8 bolts, washers, and lock washers. The fixture was mounted base-rigid to the shake table with four (4) 1"-8 bolts, torqued to 220 ft-lbs. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

## **TRU PROJECT NO. 1700838**



**UUT 5B** 

Manufacturer: Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

970-0022-00-01 **Serial Number:** 16369668

**Product Construction Summary:** 

Model Number:

ECU enclosure: 0.090" thick aluminum alloy 5052-H32

### Options/Subcomponent Summary:

PCB (Through-Hole Technology Version)

			UUT Pro	perties						
Weight	Dimension (in)				Lowest Natural Frequency (Hz)					
(lb)	Depth	Width	Height		Front-Back		Side-Side		Vertical	
60	7	7 14.2		3.3	N/A		N/A		N/A	
-		<b>UUT</b> Highest	Passed Se	ismic Run	Informa	tion				
Buildi	ing Code	Test Criter	osp-us ia	S <sub>DS</sub> (g)	z/h	F.	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 2016		ICC-ES AC156	(2015) + b-	2.0	1.0	1.5	3.20	2.40	2.13	0.85

3.2

### **Test Mounting Details:**





UUT 5B was installed onto a mounting frame and secured to the test fixture with sixteen (16) 5/16"-18 Grade 8 bolts, washers, and lock washers. The fixture was mounted base-rigid to the shake table with four (4) 1"-8 bolts, torqued to 220 ft-lbs. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

## **TRU PROJECT NO. 1700838**



**UUT 6B** 

Manufacturer: Rypos, Inc.

**Model Line:** Dual Stack Filter Modules

970-0022-00-01 **Serial Number:** 16459739

**Product Construction Summary:** 

Model Number:

ECU enclosure: 0.090" thick aluminum alloy 5052-H32

### **Options/Subcomponent Summary:**

PCB (Through-Hole Technology Version)

			<b>UUT Properties</b>							
Weight	Dimension (in)				Lowest Natural Frequency (Hz)					
(lb)	Depth	Width	Height		Front-Back		Side-Side		Vertical	
60	7	7 14.2		7	N/A		/A	N/A		
		<b>UUT Highest</b>	Passed Seismic R	un Inform	ation					
Building Code		Test Criter	ia S <sub>DS</sub> (g	z/h	l <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 2016		ICC-ES AC156 (	2.0	1.0	1.5	3.20	2.40	2.13	0.85	

### **Test Mounting Details:**





UUT 6B was installed onto a mounting frame and secured to the test fixture with sixteen (16) 5/16"-18 Grade 8 bolts, washers, and lock washers. The fixture was mounted base-rigid to the shake table with four (4) 1"-8 bolts, torqued to 220 ft-lbs. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.