



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT  
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC  
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP – 0539 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ 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](mailto:gmaynard@rypos.com)

Product Information

Product Name: Filter Module and Electronic Control Units

Product Type: Diesel Particulate Filter

Product Model Number: Various (see Certified Product Matrix)

(List all unique product identification numbers and/or part numbers)

General Description: Electrically regenerated diesel particulate filter and electronic control unit

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

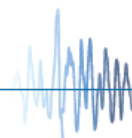
Email: [acoughlin@structint.com](mailto:acoughlin@structint.com)

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"







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

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

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

Name: 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](mailto:acoughlin@structint.com)

**Supports and Attachments Preapproval**

- ☐ Supports and attachments are preapproved under OPM-  
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
- ☒ Supports and attachments are not preapproved

**Certification Method**

- ☒ Testing in accordance with: ☒ ICC-ES AC156
- ☐ Other (Please Specify): OSP-0539-10

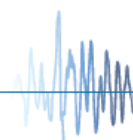
**Testing Laboratory**

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](mailto: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

Design Basis of Equipment or Components ( $F_p/W_p$ ) = 1.44 Rigid; 4.50 Isolated ( $S_{DS} = 2.00$  @  $z/h = 1$ )  
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 ( $z/h = 0$ )

$a_p$  (In-structure equipment or component amplification factor) = Rigid: 1.0; Isolated: 2.5

$R_p$  (Equipment or component response modification factor) = Rigid: 2.5; Isolated: 2.0

$\Omega_0$  (System overstrength factor) = 2

$I_p$  (Importance factor) = 1.5

$z/h$  (Height factor ratio) = 1 ( $S_{DS} = 2.00$ ); 0 ( $S_{DS} = 3.20$ )

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 ( $V/W$ ) = \_\_\_\_\_

$S_{DS}$  (Design spectral response acceleration at short period, g) = \_\_\_\_\_

$S_{D1}$  (Design spectral response acceleration at 1 second period, g) = \_\_\_\_\_

$R$  (Response modification coefficient) = \_\_\_\_\_

$\Omega_0$  (System overstrength factor) = BY: Timothy J. Piland

$C_d$  (Deflection amplification factor) = \_\_\_\_\_

$I_p$  (Importance factor) = 1.5

Height to Center of Gravity above base = \_\_\_\_\_

Equipment or Component Natural Frequencies (Hz) = \_\_\_\_\_

Overall dimensions and weight (or range thereof) = \_\_\_\_\_

Tank(s) designed in accordance with ASME BPVC, 2015: ☐ Yes ☒ 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

Signature: [Signature] Date: January 10, 2019

Print Name: Timothy J. Piland Title: SSE

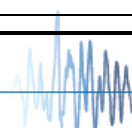
Special Seismic Certification Valid Up to :  $S_{DS}$  (g) = See Above  $z/h$  = See Above

Condition of Approval (if applicable): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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





**TRU PROJECT NO. 1700838**

[illegible]



**TRU PROJECT NO. 1700838**

[illegible]



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



| <b>Manufacturer:</b> Rypos, Inc.             |   |                             |                    |                 |        |                |
|--|---|-----------------------------|--------------------|-----------------|--------|----------------|
| <b>Model Line:</b> Dual Stack Filter Modules |   |                             |                    |                 |        |                |
| UUT  | Unit Description                          | Report Number               | Testing Laboratory | S <sub>DS</sub> | z/h    | I <sub>p</sub> |
| 1A   | Filter Module<br>(base mounted -isolated) | JID 17-01263 R3<br>(UUT 1)  | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
| 1B   | Filter Module<br>(base mounted -rigid)    | JID 17-01263 R3<br>(UUT 4)  | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
| 2A   | Filter Module<br>(base mounted -isolated) | JID 17-01263 R3<br>(UUT 2)  | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
| 2B   | Filter Module<br>(base mounted -rigid)    | JID 17-01263 R3<br>(UUT 3)  | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
| 3A   | ECU Module<br>(wall mounted - isolated)   | JID 17-01263 R3<br>(UUT 5A) | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
| 4A   | ECU Module<br>(wall mounted - isolated)   | JID 17-01263 R3<br>(UUT 5B) | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
| 5A   | ECU Module<br>(wall mounted - isolated)   | JID 17-01263 R3<br>(UUT 5C) | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
| 6A   | ECU Module<br>(wall mounted - isolated)   | JID 17-01263 R3<br>(UUT 5D) | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
| 3B   | ECU Module<br>(wall mounted - rigid)      | JID 17-01263 R3<br>(UUT 6A) | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
| 4B   | ECU Module<br>(wall mounted - rigid)      | JID 17-01263 R3<br>(UUT 6B) | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
| 5B   | ECU Module<br>(wall mounted - rigid)      | JID 17-01263 R3<br>(UUT 6C) | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
| 6B   | ECU Module<br>(wall mounted - rigid)      | JID 17-01263 R3<br>(UUT 6D) | Clark Testing      | 2.0<br>3.2      | 1<br>0 | 1.5            |
|  |   |                             |                    |                 |        |                |
|  |   |                             |                    |                 |        |                |
|  |   |                             |                    |                 |        |                |
|  |   |                             |                    |                 |        |                |
|  |   |                             |                    |                 |        |                |

Note:



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



|                      |                           |                                      |
|----------------------|---------------------------|--------------------------------------|
| <b>Manufacturer:</b> | Rypos, Inc.               | <b>UUT 1A</b>                        |
| <b>Model Line:</b>   | Dual Stack Filter Modules |                                      |
| <b>Model Number:</b> | 960-0068                  |                                      |
|                      |                           | <b>Serial Number:</b> 1048973-1-18-1 |

**Product Construction Summary:**  
Filter Module Housing: 0.25" thick A36 steel with zinc paint

**Options/Subcomponent Summary:**

| UUT Properties                             |                     |                     |        |                               |                        |                        |                        |                        |
|--|---------------------|---------------------|--------|-------------------------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in)      |                     |        | Lowest Natural Frequency (Hz) |                        |                        |                        |                        |
|  | Depth               | Width               | Height | Front-Back                    | Side-Side              | Vertical               |                        |                        |
| 812  | 63                  | 33                  | 21     | 3.06                          | 2.41                   | 4.83                   |                        |                        |
| 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                                   | ICC-ES AC156 (2015) | 2.0                 | 1.0    | 1.5                           | 3.20                   | 2.40                   | 2.13                   | 0.85                   |
|  |                     | 3.2                 | 0.0    |                               |                        |                        |                        |                        |

**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 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.

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

TRU PROJECT NO. 1700838

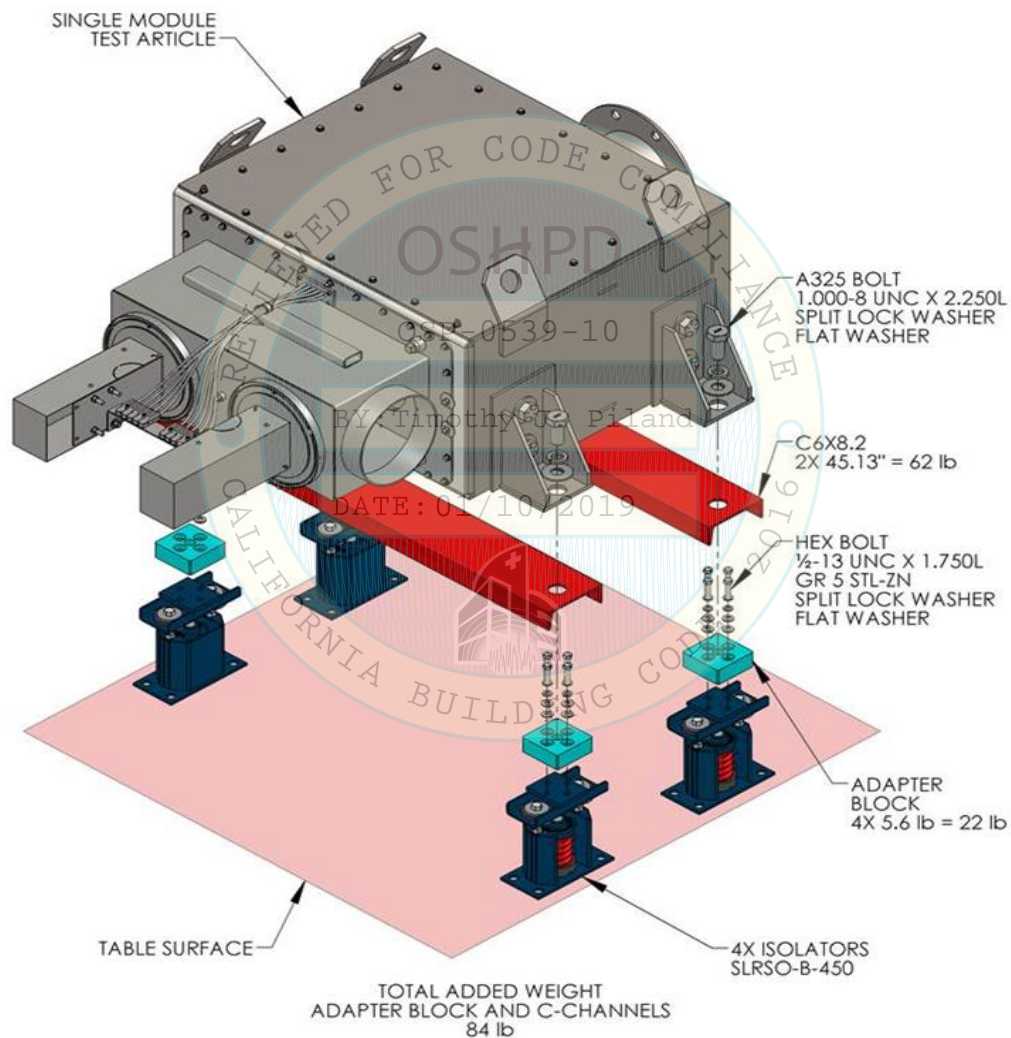
**TRU**  
COMPLIANCE

**Manufacturer:** Rypos, Inc.  
**Model Line:** Dual Stack Filter Modules  
**Model Number:** 960-0068

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

**UUT 1A**

## Test Housing Mounting Details





# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838

**TRU**  
COMPLIANCE

**Manufacturer:** Rypos, Inc.  
**Model Line:** Dual Stack Filter Modules  
**Model Number:** 960-0068

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

**UUT 1A**

## Isolator Details

**MASON INDUSTRIES, Inc.**  
Manufacturers of Vibration Control Products  
350 Rabro Drive 2101 W. Crescent Ave., Suite D  
Hauppauge, NY 11788 Anaheim, 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

JOB NAME \_\_\_\_\_

CUSTOMER \_\_\_\_\_

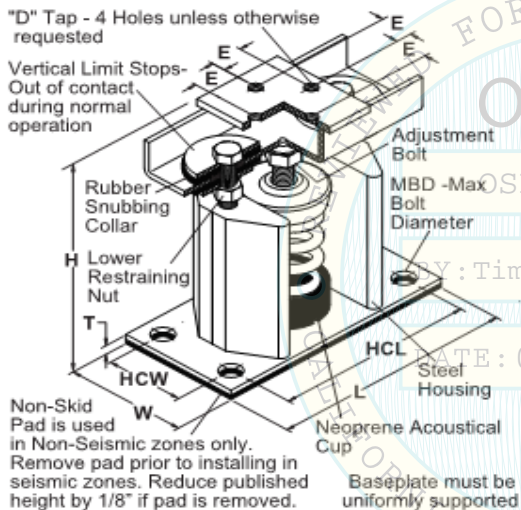
CUSTOMER P.O. \_\_\_\_\_

MASON M.I. \_\_\_\_\_

DWG. NO. \_\_\_\_\_

**SLRSO**

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



### SPRING DATA

| Size | Spring OD | Free Height | Ratio K <sub>s</sub> /K <sub>y</sub> | Ratio OD/OH |
|------|-----------|-------------|--------------------------------------|-------------|
| B    | 2 3/8     | 4           | 0.70-0.80                            | 0.80 - 1.25 |
| C    | 2 7/8     | 4 1/8       | 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 RATINGS

| 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*      |
| 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**     |
| 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**        |

\* with RED inner spring

\*\* with GREEN inner spring

### TYPE SLRSO DIMENSIONS (inches)

| Size    | L      | W     | H     | T   | MBD | HCW   | HCL    | D   | E     |
|---------|--------|-------|-------|-----|-----|-------|--------|-----|-------|
| SLRSO-B | 8 1/2  | 4 1/4 | 8 3/4 | 3/8 | 5/8 | 2 3/4 | 7      | 1/2 | 1 1/8 |
| SLRSO-1 | 9 1/2  | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 7 1/2  | 5/8 | 1 3/8 |
| SLRSO-2 | 14     | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 12 1/4 | 5/8 | 1 3/8 |
| SLRSO-4 | 13 3/4 | 8     | 8 3/4 | 3/8 | 3/4 | 6 1/4 | 11     | 7/8 | 1 3/8 |



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838

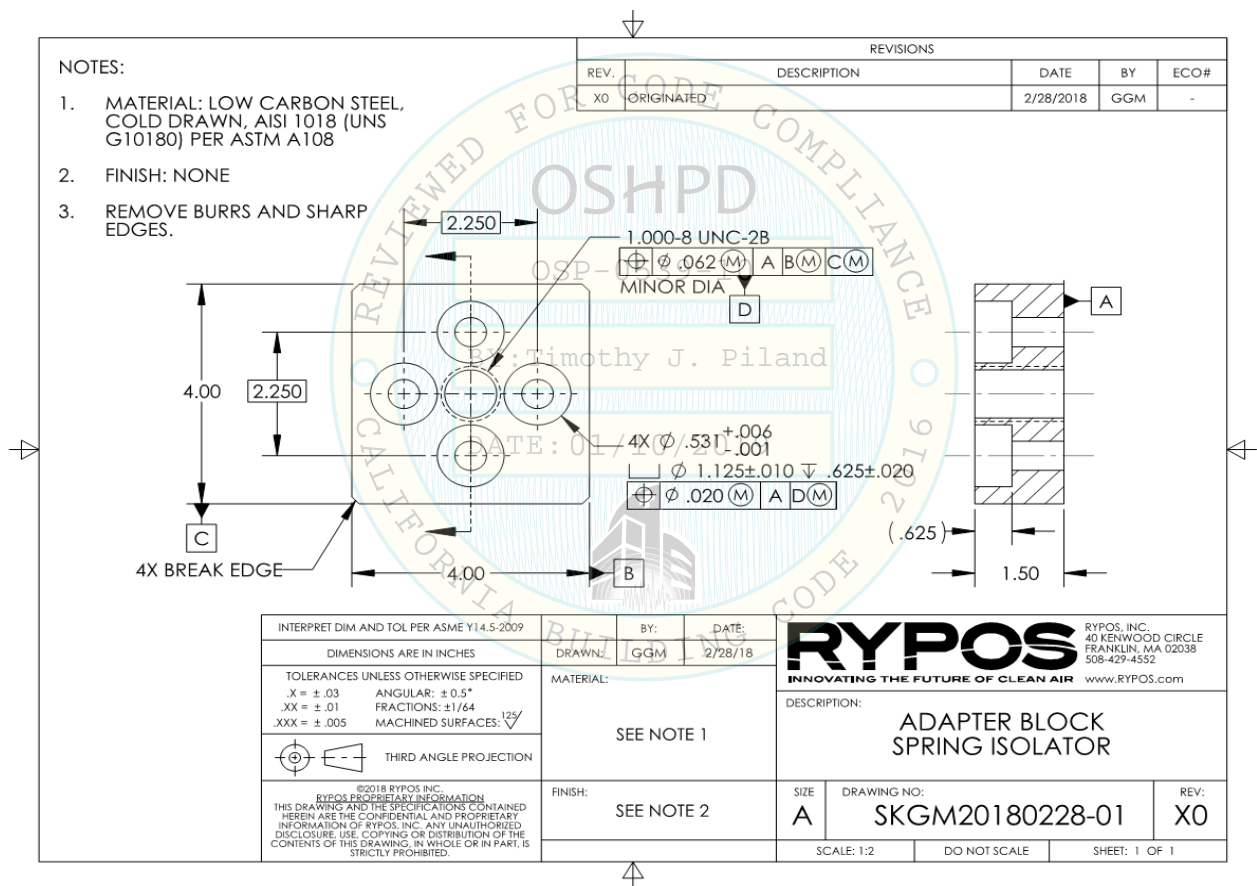


**Manufacturer:** Rypos, Inc.  
**Model Line:** Dual Stack Filter Modules  
**Model Number:** 960-0068

**UUT 1A**

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

## Adapter Block for Spring Isolator





# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



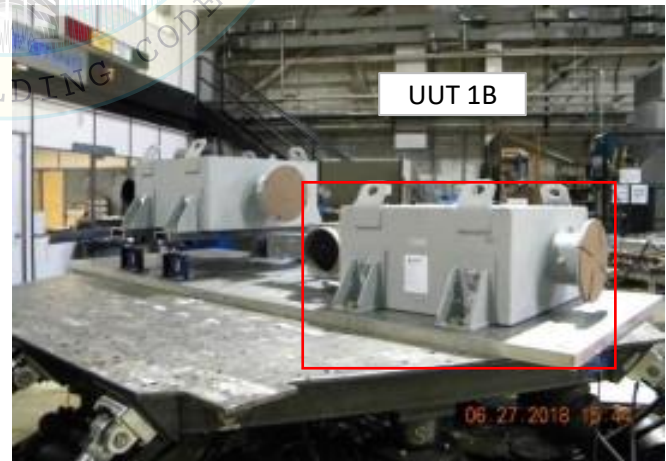
|                      |                           |                                      |
|----------------------|---------------------------|--------------------------------------|
| <b>Manufacturer:</b> | Rypos, Inc.               | <b>UUT 1B</b>                        |
| <b>Model Line:</b>   | Dual Stack Filter Modules |                                      |
| <b>Model Number:</b> | 960-0068                  |                                      |
|                      |                           | <b>Serial Number:</b> 1048973-1-18-1 |

**Product Construction Summary:**  
Filter Module Housing: 0.25" thick A36 steel with zinc paint

**Options/Subcomponent Summary:**

| UUT Properties                             |                |                     |        |                               |           |                |                        |                        |                        |                        |
|--|----------------|---------------------|--------|-------------------------------|-----------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in) |                     |        | Lowest Natural Frequency (Hz) |           |                |                        |                        |                        |                        |
|  | Depth          | Width               | Height | Front-Back                    | Side-Side | Vertical       |                        |                        |                        |                        |
| 812  | 63             | 33                  | 21     | 18.4                          | 15.5      | >33.3          |                        |                        |                        |                        |
| UUT Highest Passed Seismic Run Information |                |                     |        |                               |           |                |                        |                        |                        |                        |
| h  |                | 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) |        | 2.0                           | 1.0       | 1.5            | 3.20                   | 2.40                   | 2.13                   | 0.85                   |
|  |                |                     |        | 3.2                           | 0.0       |                |                        |                        |                        |                        |

**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.  
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

TRU PROJECT NO. 1700838



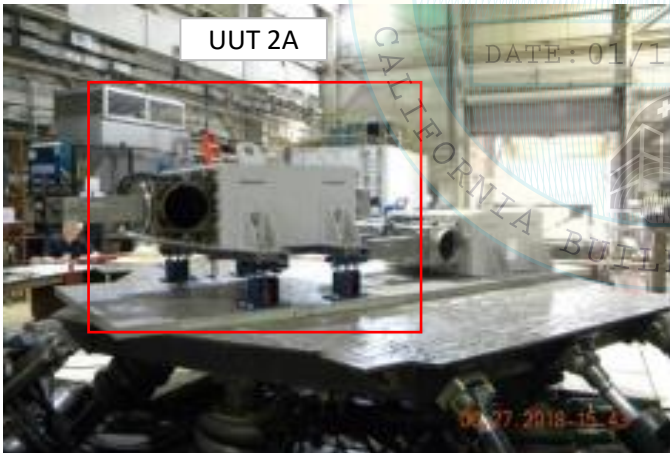
|                      |                           |                                      |
|----------------------|---------------------------|--------------------------------------|
| <b>Manufacturer:</b> | Rypos, Inc.               | <b>UUT 2A</b>                        |
| <b>Model Line:</b>   | Dual Stack Filter Modules |                                      |
| <b>Model Number:</b> | 960-0068                  |                                      |
|                      |                           | <b>Serial Number:</b> 1048973-1-18-2 |

**Product Construction Summary:**  
Filter Module Housing: 0.25" thick A36 steel with zinc paint

**Options/Subcomponent Summary:**

| UUT Properties                             |                     |       |                     |                               |                |                        |                        |                        |                        |
|--|---------------------|-------|---------------------|-------------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in)      |       |                     | Lowest Natural Frequency (Hz) |                |                        |                        |                        |                        |
|  | Depth               | Width | Height              | Front-Back                    | Side-Side      | Vertical               |                        |                        |                        |
| 814  | 63                  | 33    | 21                  | 2.39                          | 2.09           | 5.17                   |                        |                        |                        |
| 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                                   | ICC-ES AC156 (2015) |       | 2.0                 | 1.0                           | 1.5            | 3.20                   | 2.40                   | 2.13                   | 0.85                   |
|  |                     |       | 3.2                 | 0.0                           |                |                        |                        |                        |                        |

**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.

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

TRU PROJECT NO. 1700838

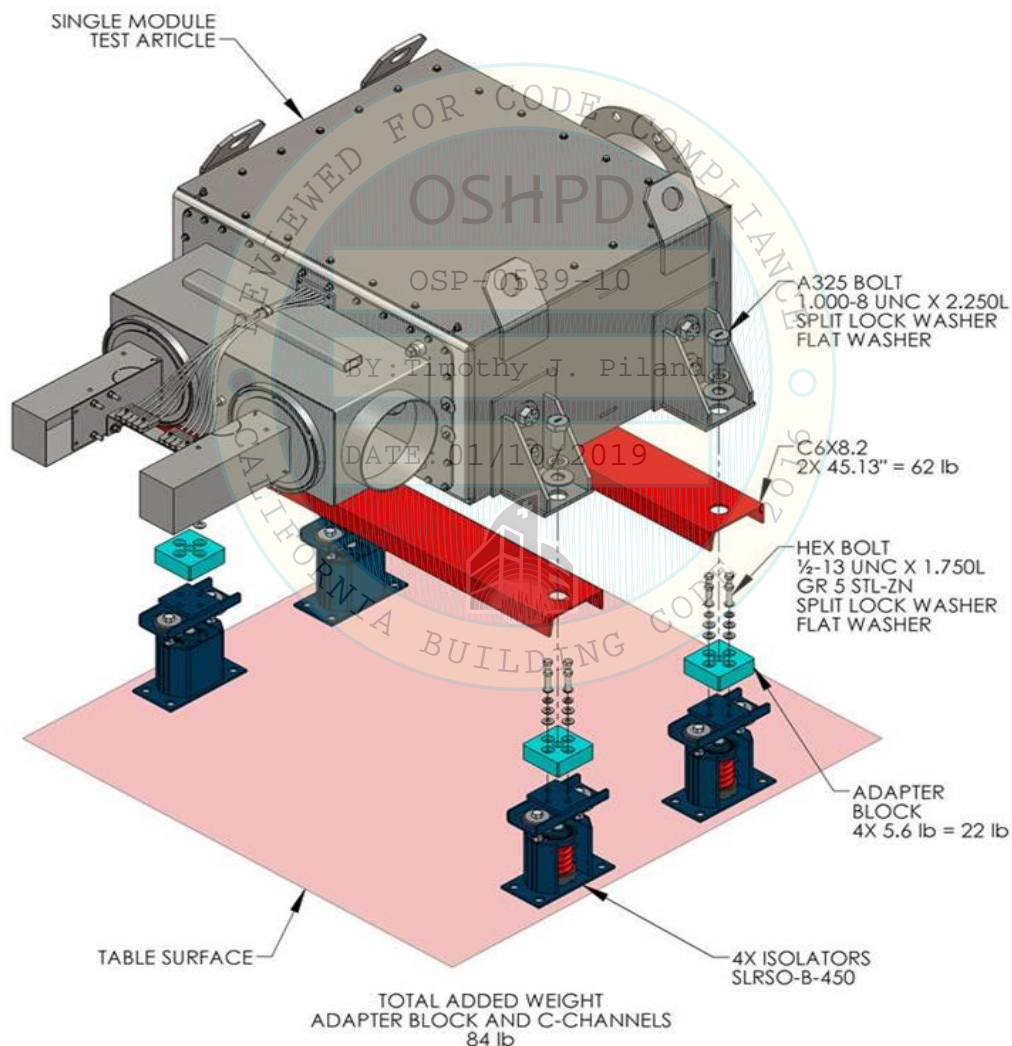
**TRU**  
COMPLIANCE

**Manufacturer:** Rypos, Inc.  
**Model Line:** Dual Stack Filter Modules  
**Model Number:** 960-0068

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

**UUT 2A**

## Test Housing Mounting Details





# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838

**TRU**  
COMPLIANCE

**Manufacturer:** Rypos, Inc.  
**Model Line:** Dual Stack Filter Modules  
**Model Number:** 960-0068

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

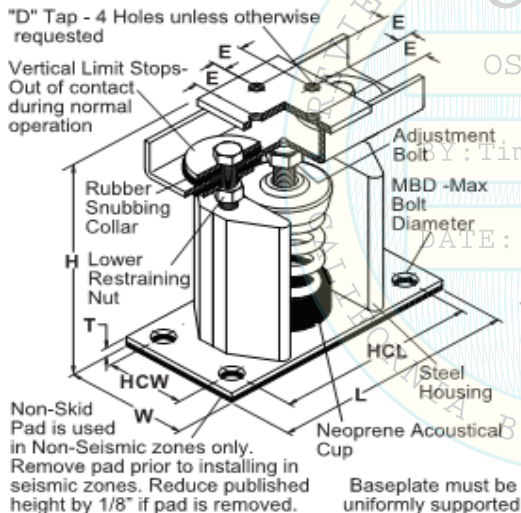
**UUT 2A**

## Isolator Details



**JOB NAME** \_\_\_\_\_  
**CUSTOMER** \_\_\_\_\_  
**CUSTOMER P.O.** \_\_\_\_\_  
**MASON M.I.** \_\_\_\_\_  
**DWG. NO.** \_\_\_\_\_

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



### SPRING DATA

| Size | Spring OD | Free Height | Ratio $K_s/K_c$ | Ratio OD/OH |
|------|-----------|-------------|-----------------|-------------|
| B    | 2 3/8     | 4           | 0.70-0.80       | 0.80 - 1.25 |
| C    | 2 7/8     | 4 1/8       | 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 RATINGS

| 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*      |
| 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**     |
| 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**        |

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

### TYPE SLRSO DIMENSIONS (inches)

| Size    | L      | W     | H     | T   | MBD | HCW   | HCL    | D   | E     |
|---------|--------|-------|-------|-----|-----|-------|--------|-----|-------|
| SLRSO-B | 8 1/2  | 4 1/4 | 8 3/4 | 3/8 | 5/8 | 2 3/4 | 7      | 1/2 | 1 1/8 |
| SLRSO-1 | 9 1/2  | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 7 1/2  | 5/8 | 1 3/8 |
| SLRSO-2 | 14     | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 12 1/4 | 5/8 | 1 3/8 |
| SLRSO-4 | 13 3/4 | 8     | 8 3/4 | 3/8 | 3/4 | 6 1/4 | 11     | 7/8 | 1 3/8 |



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838

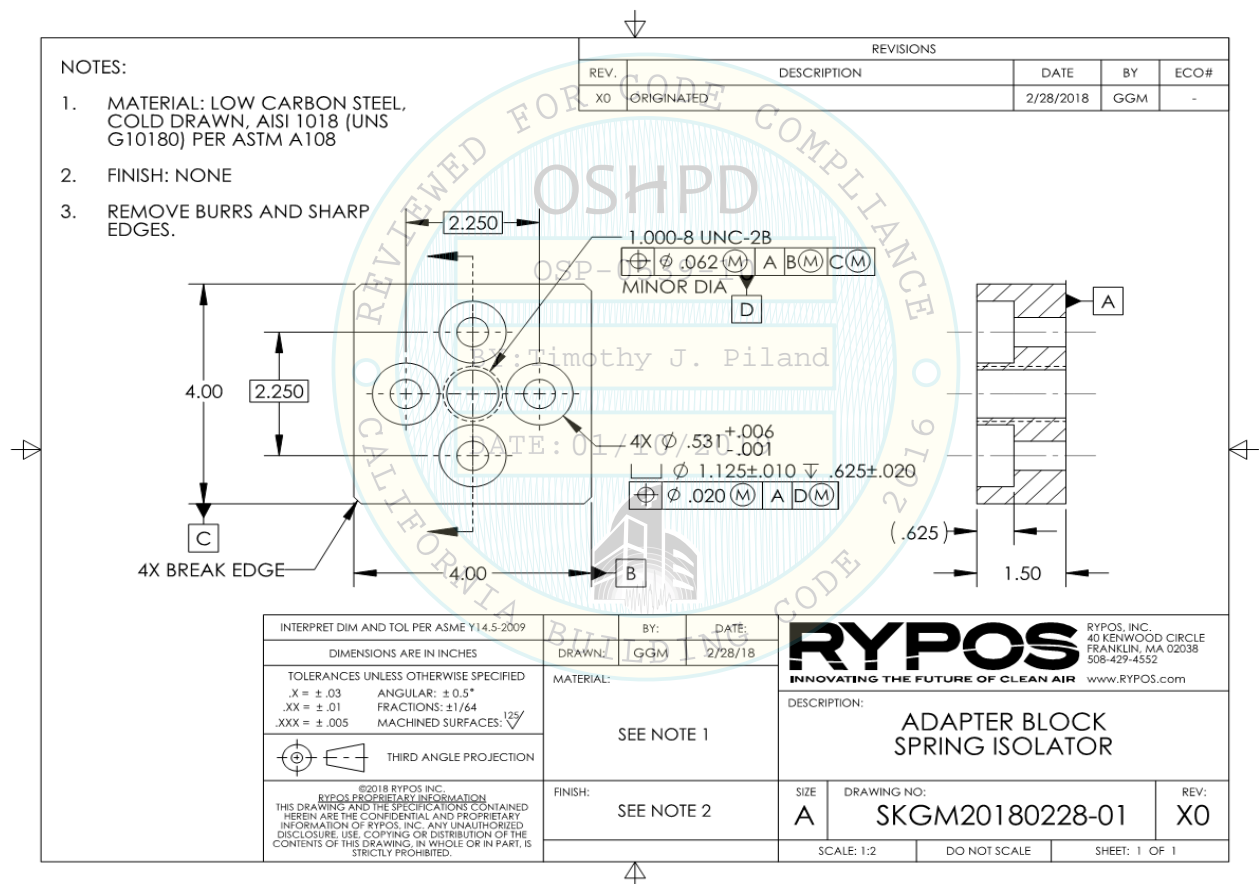


**Manufacturer:** Rypos, Inc.  
**Model Line:** Dual Stack Filter Modules  
**Model Number:** 960-0068

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

**UUT 2A**

## Adapter Block for Spring Isolator





# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



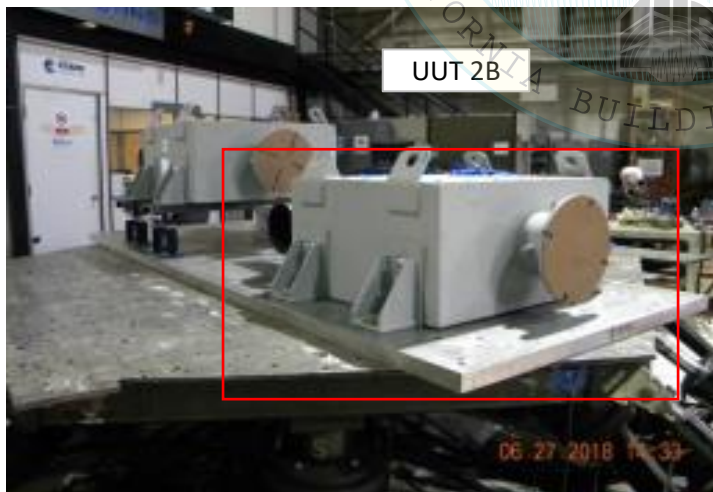
|                      |                           |                                      |
|----------------------|---------------------------|--------------------------------------|
| <b>Manufacturer:</b> | Rypos, Inc.               | <b>UUT 2B</b>                        |
| <b>Model Line:</b>   | Dual Stack Filter Modules |                                      |
| <b>Model Number:</b> | 960-0068                  |                                      |
|                      |                           | <b>Serial Number:</b> 1048973-1-18-2 |

**Product Construction Summary:**  
Filter Module Housing: 0.25" thick A36 steel with zinc paint

**Options/Subcomponent Summary:**

| UUT Properties                             |                     |       |                     |                               |                |                        |                        |                        |                        |
|--|---------------------|-------|---------------------|-------------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in)      |       |                     | Lowest Natural Frequency (Hz) |                |                        |                        |                        |                        |
|  | Depth               | Width | Height              | Front-Back                    | Side-Side      | Vertical               |                        |                        |                        |
| 814  | 63                  | 33    | 21                  | 17.8                          | 15.3           | >33.3                  |                        |                        |                        |
| 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                                   | ICC-ES AC156 (2015) |       | 2.0                 | 1.0                           | 1.5            | 3.20                   | 2.40                   | 2.13                   | 0.85                   |
|  |                     |       | 3.2                 | 0.0                           |                |                        |                        |                        |                        |

**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.  
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

TRU PROJECT NO. 1700838



|                       |                           |               |
|-----------------------|---------------------------|---------------|
| <b>Manufacturer:</b>  | Rypos, Inc.               | <b>UUT 3A</b> |
| <b>Model Line:</b>    | Dual Stack Filter Modules |               |
| <b>Model Number:</b>  | 970-0022-00-00            |               |
| <b>Serial Number:</b> |                           | 18069014      |

**Product Construction Summary:**  
ECU enclosure: 0.090" thick aluminum alloy 5052-H32

**Options/Subcomponent Summary:**  
PCB (Surface Mount Technology Version)

| UUT Properties                             |                     |       |                     |                               |                |                        |                        |                        |                        |
|--|---------------------|-------|---------------------|-------------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in)      |       |                     | Lowest Natural Frequency (Hz) |                |                        |                        |                        |                        |
|  | 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 |                     |       |                     |                               |                |                        |                        |                        |                        |
| 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) |       | 2.0                 | 1.0                           | 1.5            | 3.20                   | 2.40                   | 2.13                   | 0.85                   |
|  |                     |       | 3.2                 | 0.0                           |                |                        |                        |                        |                        |

## 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.

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

TRU PROJECT NO. 1700838

**TRU**  
COMPLIANCE

**Manufacturer:** Rypos, Inc.  
**Model Line:** Dual Stack Filter Modules  
**Model Number:** 970-0022-00-00

**Serial Number:** 18069014

**UUT 3A**

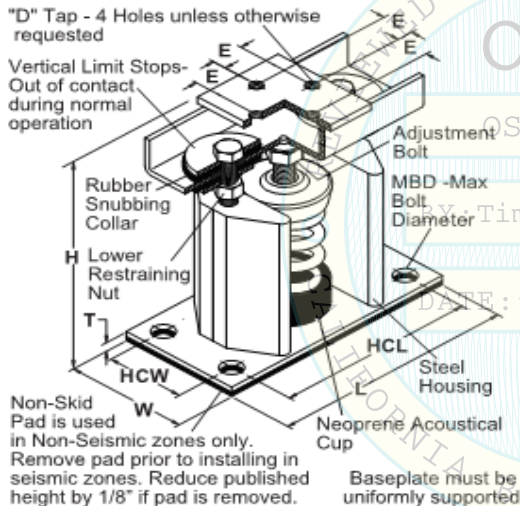
## Isolator Details



**MASON INDUSTRIES, Inc.**  
Manufacturers of Vibration Control Products  
350 Rabro Drive 2101 W. Crescent Ave., Suite D  
Hauppauge, NY 11788 Anaheim, 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

**JOB NAME** \_\_\_\_\_  
**CUSTOMER** \_\_\_\_\_  
**CUSTOMER P.O.** \_\_\_\_\_  
**MASON M.I.** \_\_\_\_\_  
**DWG. NO.** \_\_\_\_\_

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



### TYPE SLRSO RATINGS

| 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*      |
| 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**     |
| 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**        |

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

### SPRING DATA

| Size | Spring OD | Free Height | Ratio K <sub>s</sub> /K <sub>y</sub> | Ratio OD/OH |
|------|-----------|-------------|--------------------------------------|-------------|
| B    | 2 3/8     | 4           | 0.70-0.80                            | 0.80 - 1.25 |
| C    | 2 7/8     | 4 1/8       | 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     | H     | T   | MBD | HCW   | HCL    | D   | E     |
|---------|--------|-------|-------|-----|-----|-------|--------|-----|-------|
| SLRSO-B | 8 1/2  | 4 1/4 | 8 3/4 | 3/8 | 5/8 | 2 3/4 | 7      | 1/2 | 1 1/8 |
| SLRSO-1 | 9 1/2  | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 7 1/2  | 5/8 | 1 3/8 |
| SLRSO-2 | 14     | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 12 1/4 | 5/8 | 1 3/8 |
| SLRSO-4 | 13 3/4 | 8     | 8 3/4 | 3/8 | 3/4 | 6 1/4 | 11     | 7/8 | 1 3/8 |



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



|                       |                           |               |
|-----------------------|---------------------------|---------------|
| <b>Manufacturer:</b>  | Rypos, Inc.               | <b>UUT 4A</b> |
| <b>Model Line:</b>    | Dual Stack Filter Modules |               |
| <b>Model Number:</b>  | 970-0022-00-00            |               |
| <b>Serial Number:</b> |                           | 18069013      |

**Product Construction Summary:**  
ECU enclosure: 0.090" thick aluminum alloy 5052-H32

**Options/Subcomponent Summary:**  
PCB (Surface Mount Technology Version)

| UUT Properties                             |                     |       |                     |                               |                |                        |                        |                        |                        |
|--|---------------------|-------|---------------------|-------------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in)      |       |                     | Lowest Natural Frequency (Hz) |                |                        |                        |                        |                        |
|  | 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 |                     |       |                     |                               |                |                        |                        |                        |                        |
| 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) |       | 2.0                 | 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.



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



**Manufacturer:** Rypos, Inc.  
**Model Line:** Dual Stack Filter Modules  
**Model Number:** 970-0022-00-00

**Serial Number:** 18069013

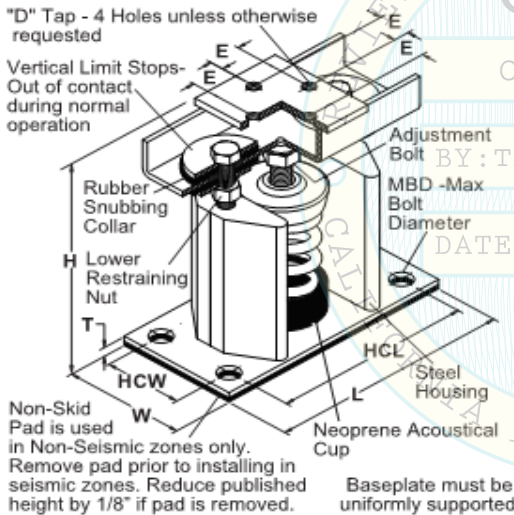
**UUT 4A**

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

**JOB NAME** \_\_\_\_\_  
**CUSTOMER** \_\_\_\_\_  
**CUSTOMER P.O.** \_\_\_\_\_  
**MASON M.I.** \_\_\_\_\_  
**DWG. NO.** \_\_\_\_\_

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



### TYPE SLRSO RATINGS

| 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*      |
| 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**     |
| 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**        |

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

### SPRING DATA

| Size | Spring OD | Free Height | Ratio K <sub>s</sub> /K <sub>e</sub> | Ratio OD/OH |
|------|-----------|-------------|--------------------------------------|-------------|
| B    | 2 3/8     | 4           | 0.70-0.80                            | 0.80 - 1.25 |
| C    | 2 7/8     | 4 1/8       | 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     | H     | T   | MBD | HCW   | HCL    | D   | E     |
|---------|--------|-------|-------|-----|-----|-------|--------|-----|-------|
| SLRSO-B | 8 1/2  | 4 1/4 | 8 3/4 | 3/8 | 5/8 | 2 3/4 | 7      | 1/2 | 1 1/8 |
| SLRSO-1 | 9 1/2  | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 7 1/2  | 5/8 | 1 3/8 |
| SLRSO-2 | 14     | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 12 1/4 | 5/8 | 1 3/8 |
| SLRSO-4 | 13 3/4 | 8     | 8 3/4 | 3/8 | 3/4 | 6 1/4 | 11     | 7/8 | 1 3/8 |



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



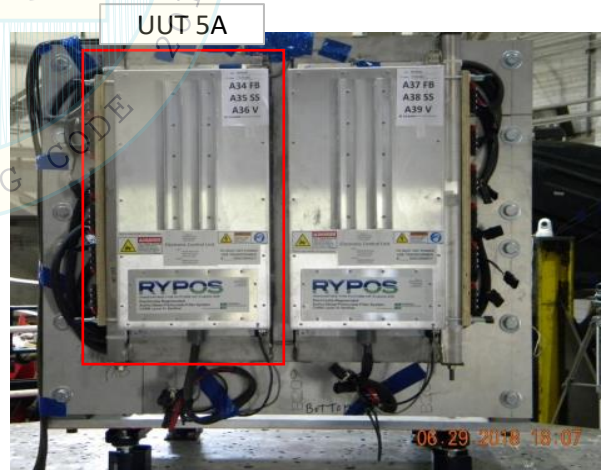
|                      |                           |                                |
|----------------------|---------------------------|--------------------------------|
| <b>Manufacturer:</b> | Rypos, Inc.               | <b>UUT 5A</b>                  |
| <b>Model Line:</b>   | Dual Stack Filter Modules |                                |
| <b>Model Number:</b> | 970-0022-00-01            |                                |
|                      |                           | <b>Serial Number:</b> 16369668 |

**Product Construction Summary:**  
ECU enclosure: 0.090" thick aluminum alloy 5052-H32

**Options/Subcomponent Summary:**  
PCB (Through-Hole Technology Version)

| UUT Properties                             |                     |       |                     |                               |                |                        |                        |                        |                        |
|--|---------------------|-------|---------------------|-------------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in)      |       |                     | Lowest Natural Frequency (Hz) |                |                        |                        |                        |                        |
|  | 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 |                     |       |                     |                               |                |                        |                        |                        |                        |
| 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) |       | 2.0                 | 1.0                           | 1.5            | 3.20                   | 2.40                   | 2.13                   | 0.85                   |
|  |                     |       | 3.2                 | 0.0                           |                |                        |                        |                        |                        |

**Test Mounting Details:** DATE: 01/10/2019



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.  
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

TRU PROJECT NO. 1700838



**Manufacturer:** Rypos, Inc.  
**Model Line:** Dual Stack Filter Modules  
**Model Number:** 970-0022-00-01

**Serial Number:** 16369668

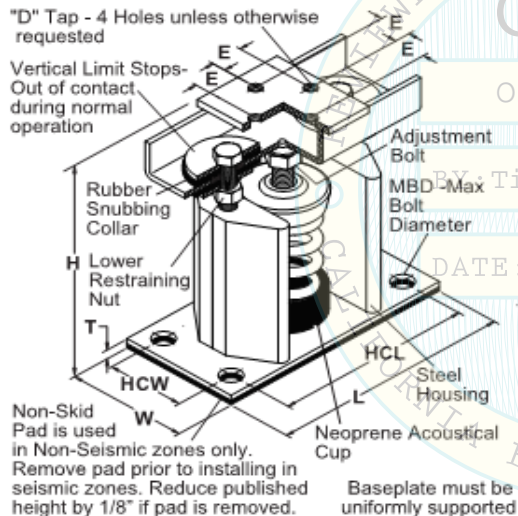
**UUT 5A**

## 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  
Info@MasonAnaheim.com  
www.Mason-Ind.com

**JOB NAME** \_\_\_\_\_  
**CUSTOMER** \_\_\_\_\_  
**CUSTOMER P.O.** \_\_\_\_\_  
**MASON M.I.** \_\_\_\_\_  
**DWG. NO.** \_\_\_\_\_

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



### SPRING DATA

| Size | Spring OD | Free Height | Ratio $K_s/K_r$ | Ratio OD/OH |
|------|-----------|-------------|-----------------|-------------|
| B    | 2 3/8     | 4           | 0.70-0.80       | 0.80 - 1.25 |
| C    | 2 7/8     | 4 1/8       | 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 RATINGS

| 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*      |
| 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**     |
| 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**        |

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

### TYPE SLRSO DIMENSIONS (inches)

| Size    | L      | W     | H     | T   | MBD | HCW   | HCL    | D     | E     |
|---------|--------|-------|-------|-----|-----|-------|--------|-------|-------|
| SLRSO-B | 8 1/2  | 4 1/4 | 8 3/4 | 3/8 | 5/8 | 2 3/4 | 7      | 1 1/2 | 1 1/8 |
| SLRSO-1 | 9 1/2  | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 7 1/2  | 5/8   | 1 3/8 |
| SLRSO-2 | 14     | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 12 1/4 | 5/8   | 1 3/8 |
| SLRSO-4 | 13 3/4 | 8     | 8 3/4 | 3/8 | 3/4 | 6 1/4 | 11     | 7/8   | 1 3/8 |



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



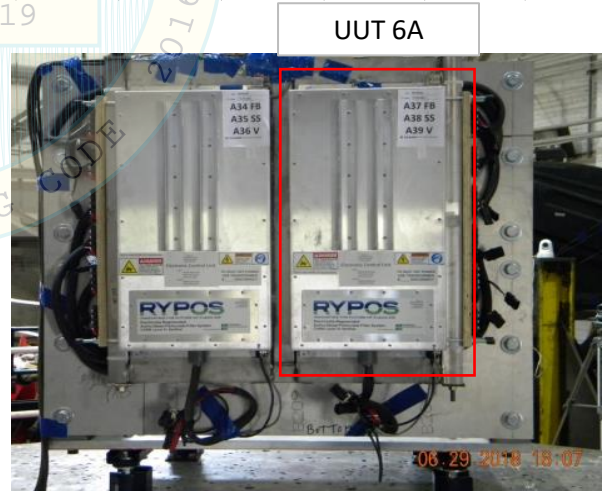
|                       |                           |               |
|-----------------------|---------------------------|---------------|
| <b>Manufacturer:</b>  | Rypos, Inc.               | <b>UUT 6A</b> |
| <b>Model Line:</b>    | Dual Stack Filter Modules |               |
| <b>Model Number:</b>  | 970-0022-00-01            |               |
| <b>Serial Number:</b> |                           | 16459739      |

**Product Construction Summary:**  
ECU enclosure: 0.090" thick aluminum alloy 5052-H32

**Options/Subcomponent Summary:**  
PCB (Through-Hole Technology Version)

| UUT Properties                             |                     |       |                     |                               |                |                        |                        |                        |                        |
|--|---------------------|-------|---------------------|-------------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in)      |       |                     | Lowest Natural Frequency (Hz) |                |                        |                        |                        |                        |
|  | 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 |                     |       |                     |                               |                |                        |                        |                        |                        |
| 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) |       | 2.0                 | 1.0                           | 1.5            | 3.20                   | 2.40                   | 2.13                   | 0.85                   |
|  |                     |       | 3.2                 | 0.0                           |                |                        |                        |                        |                        |

**Test Mounting Details:** DATE: 01/10/2019



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.

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

TRU PROJECT NO. 1700838

**TRU**  
COMPLIANCE

**Manufacturer:** Rypos, Inc.  
**Model Line:** Dual Stack Filter Modules  
**Model Number:** 970-0022-00-01

**Serial Number:** 16459739

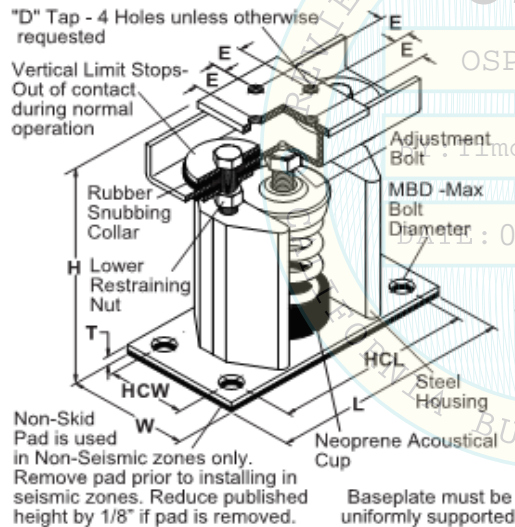
**UUT 6A**

## 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  
Info@MasonAnaheim.com  
www.Mason-Ind.com

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

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



### SPRING DATA

| Size | Spring OD | Free Height | Ratio K <sub>y</sub> /K <sub>z</sub> | Ratio OD/OH |
|------|-----------|-------------|--------------------------------------|-------------|
| B    | 2 3/8     | 4           | 0.70-0.80                            | 0.80 - 1.25 |
| C    | 2 7/8     | 4 1/8       | 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 RATINGS

| 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*      |
| 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**     |
| 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**        |

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

### TYPE SLRSO DIMENSIONS (inches)

| Size    | L      | W     | H     | T   | MBD | HCW   | HCL    | D   | E     |
|---------|--------|-------|-------|-----|-----|-------|--------|-----|-------|
| SLRSO-B | 8 1/2  | 4 1/4 | 8 3/4 | 3/8 | 5/8 | 2 3/4 | 7      | 1/2 | 1 1/8 |
| SLRSO-1 | 9 1/2  | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 7 1/2  | 5/8 | 1 3/8 |
| SLRSO-2 | 14     | 5 1/4 | 8 3/4 | 3/8 | 5/8 | 3 1/2 | 12 1/4 | 5/8 | 1 3/8 |
| SLRSO-4 | 13 3/4 | 8     | 8 3/4 | 3/8 | 3/4 | 6 1/4 | 11     | 7/8 | 1 3/8 |



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



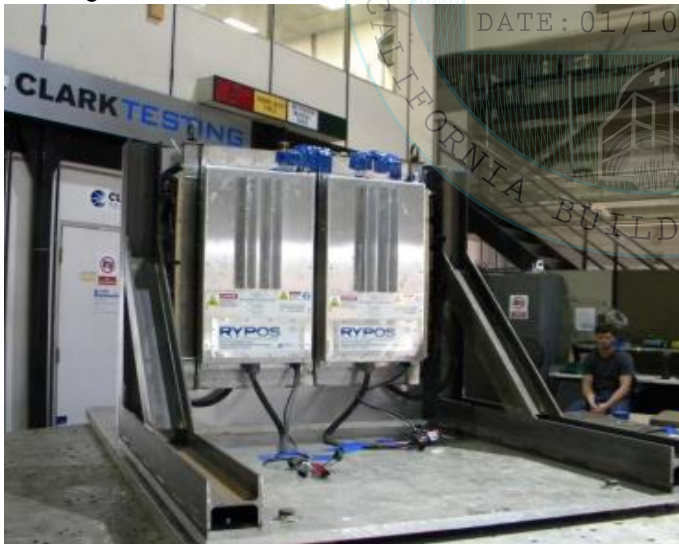
|                       |                           |               |
|-----------------------|---------------------------|---------------|
| <b>Manufacturer:</b>  | Rypos, Inc.               | <b>UUT 3B</b> |
| <b>Model Line:</b>    | Dual Stack Filter Modules |               |
| <b>Model Number:</b>  | 970-0022-00-00            |               |
| <b>Serial Number:</b> |                           | 18069014      |

|   |
|---|
| <b>Product Construction Summary:</b>                |
| ECU enclosure: 0.090" thick aluminum alloy 5052-H32 |

|  |
|--|
| <b>Options/Subcomponent Summary:</b>   |
| PCB (Surface Mount Technology Version) |

| UUT Properties                             |                |                     |                     |                               |                |                        |                        |                        |                        |
|--|----------------|---------------------|---------------------|-------------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in) |                     |                     | Lowest Natural Frequency (Hz) |                |                        |                        |                        |                        |
|  | 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 |                |                     |                     |                               |                |                        |                        |                        |                        |
| 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) | 2.0                 | 1.0                           | 1.5            | 3.20                   | 2.40                   | 2.13                   | 0.85                   |
|  |                |                     | 3.2                 | 0.0                           |                |                        |                        |                        |                        |

**Test Mounting Details:**



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.



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



|                       |                           |               |
|-----------------------|---------------------------|---------------|
| <b>Manufacturer:</b>  | Rypos, Inc.               | <b>UUT 4B</b> |
| <b>Model Line:</b>    | Dual Stack Filter Modules |               |
| <b>Model Number:</b>  | 970-0022-00-00            |               |
| <b>Serial Number:</b> |                           | 18069013      |

**Product Construction Summary:**  
ECU enclosure: 0.090" thick aluminum alloy 5052-H32

**Options/Subcomponent Summary:**  
PCB (Surface Mount Technology Version)

| UUT Properties                             |                |                     |                     |                               |                |                        |                        |                        |                        |
|--|----------------|---------------------|---------------------|-------------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in) |                     |                     | Lowest Natural Frequency (Hz) |                |                        |                        |                        |                        |
|  | 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 |                |                     |                     |                               |                |                        |                        |                        |                        |
| 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) | 2.0                 | 1.0                           | 1.5            | 3.20                   | 2.40                   | 2.13                   | 0.85                   |
|  |                |                     | 3.2                 | 0.0                           |                |                        |                        |                        |                        |

## 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.



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



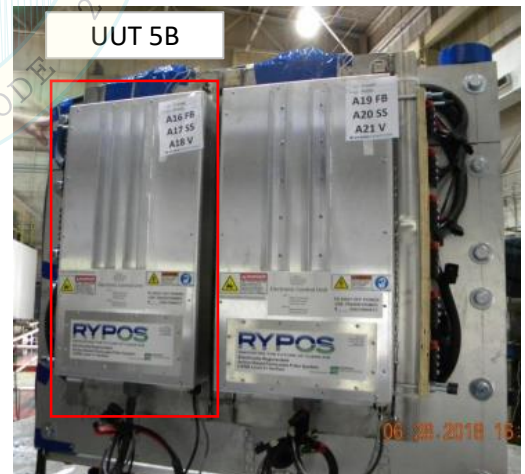
|                       |                           |               |
|-----------------------|---------------------------|---------------|
| <b>Manufacturer:</b>  | Rypos, Inc.               | <b>UUT 5B</b> |
| <b>Model Line:</b>    | Dual Stack Filter Modules |               |
| <b>Model Number:</b>  | 970-0022-00-01            |               |
| <b>Serial Number:</b> |                           | 16369668      |

**Product Construction Summary:**  
ECU enclosure: 0.090" thick aluminum alloy 5052-H32

**Options/Subcomponent Summary:**  
PCB (Through-Hole Technology Version)

| UUT Properties                             |                |                     |                     |                               |                |                        |                        |                        |                        |
|--|----------------|---------------------|---------------------|-------------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in) |                     |                     | Lowest Natural Frequency (Hz) |                |                        |                        |                        |                        |
|  | 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 |                |                     |                     |                               |                |                        |                        |                        |                        |
| 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) | 2.0                 | 1.0                           | 1.5            | 3.20                   | 2.40                   | 2.13                   | 0.85                   |
|  |                |                     | 3.2                 | 0.0                           |                |                        |                        |                        |                        |

**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.



# UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700838



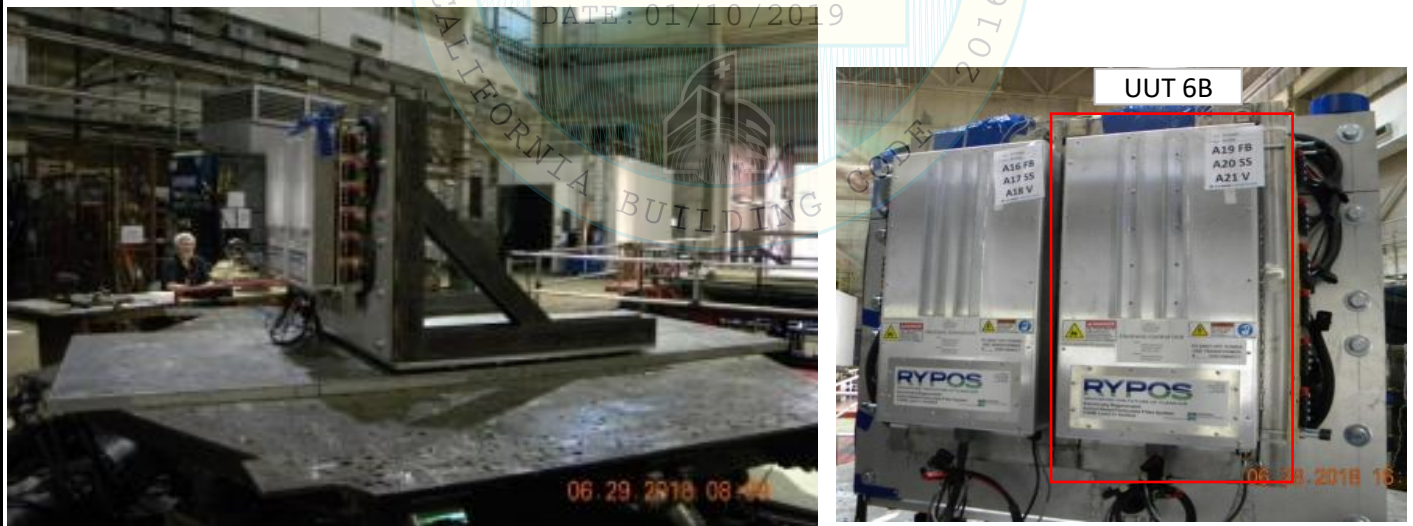
|                       |                           |               |
|-----------------------|---------------------------|---------------|
| <b>Manufacturer:</b>  | Rypos, Inc.               | <b>UUT 6B</b> |
| <b>Model Line:</b>    | Dual Stack Filter Modules |               |
| <b>Model Number:</b>  | 970-0022-00-01            |               |
| <b>Serial Number:</b> |                           | 16459739      |

**Product Construction Summary:**  
ECU enclosure: 0.090" thick aluminum alloy 5052-H32

**Options/Subcomponent Summary:**  
PCB (Through-Hole Technology Version)

| UUT Properties                             |                |                     |                     |                               |                |                        |                        |                        |                        |
|--|----------------|---------------------|---------------------|-------------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight (lb)                                | Dimension (in) |                     |                     | Lowest Natural Frequency (Hz) |                |                        |                        |                        |                        |
|  | 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 |                |                     |                     |                               |                |                        |                        |                        |                        |
| 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) | 2.0                 | 1.0                           | 1.5            | 3.20                   | 2.40                   | 2.13                   | 0.85                   |
|  |                |                     | 3.2                 | 0.0                           |                |                        |                        |                        |                        |

**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.