



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION  
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR HCAI SPECIAL SEISMIC  
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0406

HCAI Special Seismic Certification Preapproval (OSP)

Type:  New  Renewal

Manufacturer Information

Manufacturer: Carrier Corporation

Manufacturer's Technical Representative: Anthony Molavi

Mailing Address: 9701 Old Statesville Road, Charlotte, NC 28269

Telephone: (704) 921-3976

Email: Anthony.Molavi@carrier.utc.com

Product Information

Product Name: Chillers

Product Type: Chillers - Water Cooled

Product Model Number: 23XRV Frame 2, 3, 4, and 5

General Description: 23XRV is a water-cooled chiller

Mounting Description: Rigid or vibration spring isolated with snubbers, Floor Mounted

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

Applicant Information

Applicant Company Name: Buehler Engineering, Inc

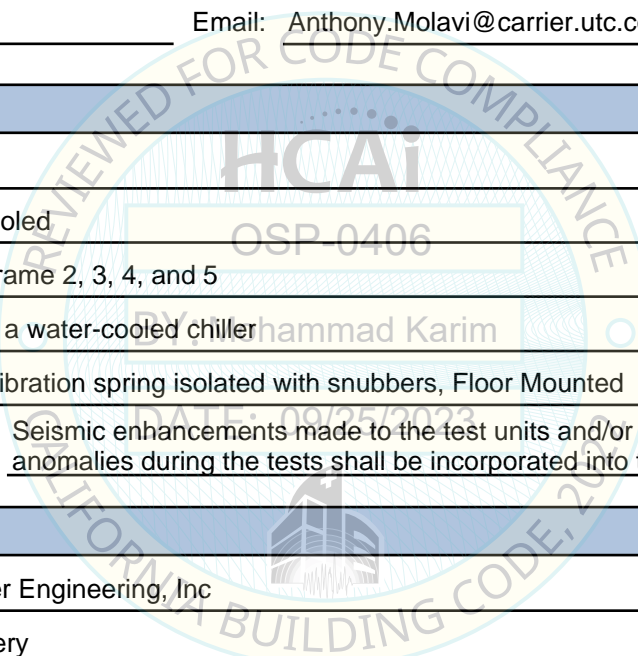
Contact Person: Gillian Montgomery

Mailing Address: 600 Q Street, Suite 200, Sacramento, CA 95811

Telephone: (916) 443-0303

Email: gmontgomery@buehlerengineering.com

Title: Buehler Engineering, Inc





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

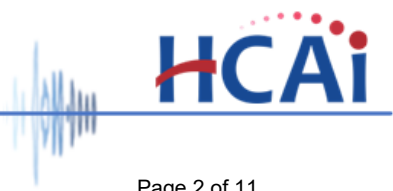
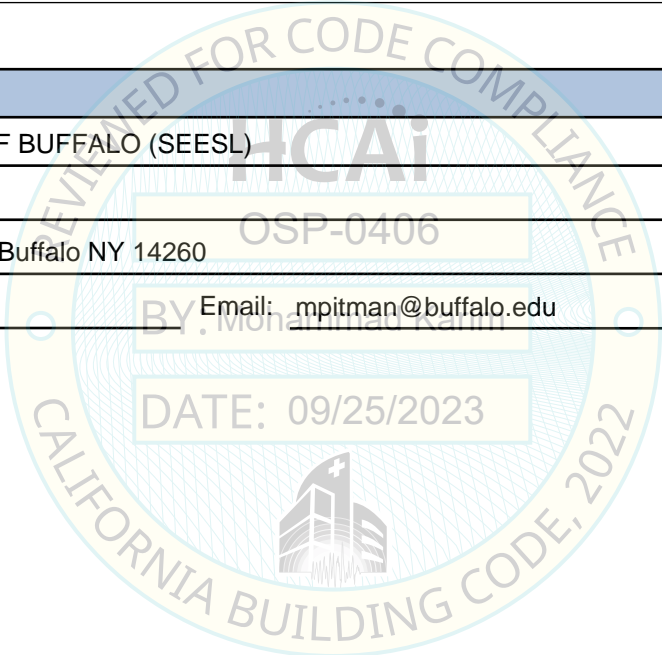
Company Name: BUEHLER ENGINEERING, INC.  
Name: Gillian Montgomery California License Number: S6852  
Mailing Address: 600 Q Street, Sacramento, CA 95811  
Telephone: (916) 443-0303 Email: gmontgomery@buehlerengineering.com

**Certification Method**

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

**Testing Laboratory**

Company Name: UNIVERSITY OF BUFFALO (SEESL)  
Contact Person: Mark Pitman  
Mailing Address: 212 Ketter Hall, Buffalo NY 14260  
Telephone: (716) 645-4377 Email: mpitman@buffalo.edu





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**Seismic Parameters**

Design Basis of Equipment or Components ( $F_p/W_p$ ) = 1.44 for rigid, 4.5 for isolated

SDS (Design spectral response acceleration at short period, g) = 2.00

$a_p$  (Amplification factor) = 1.0 for rigid, 2.5 for isolated

$R_p$  (Response modification factor) = 2.5 for rigid, 2.0 for isolated

$\Omega_0$  (System overstrength factor) = 2.0

$I_p$  (Importance factor) = 1.5

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

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

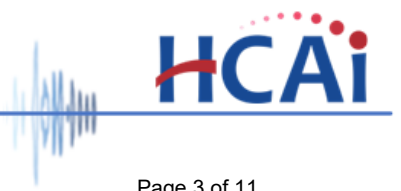
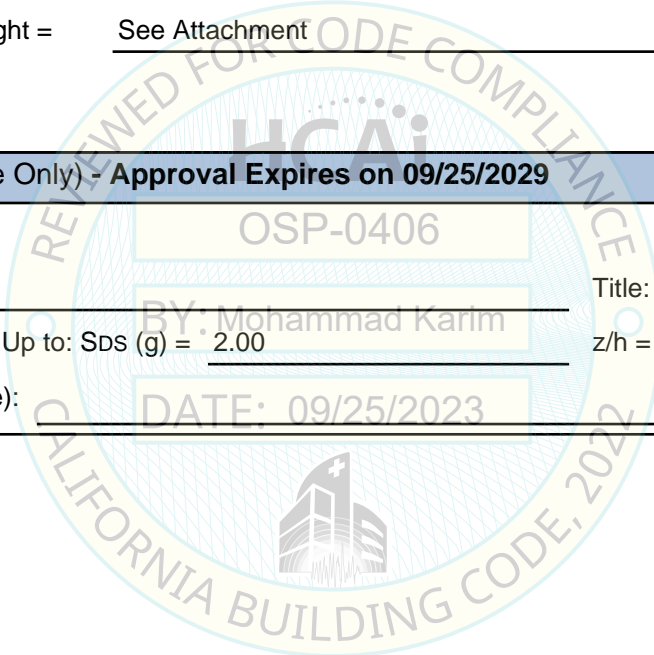
**HCAI Approval (For Office Use Only) - Approval Expires on 09/25/2029**

Date: 9/25/2023

Name: Mohammad Karim Title: Supervisor, Health Facilities

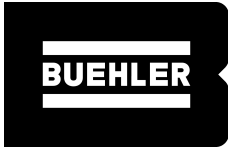
Special Seismic Certification Valid Up to: SDS (g) = 2.00 z/h = 1

Condition of Approval (if applicable): DATE: 09/25/2023



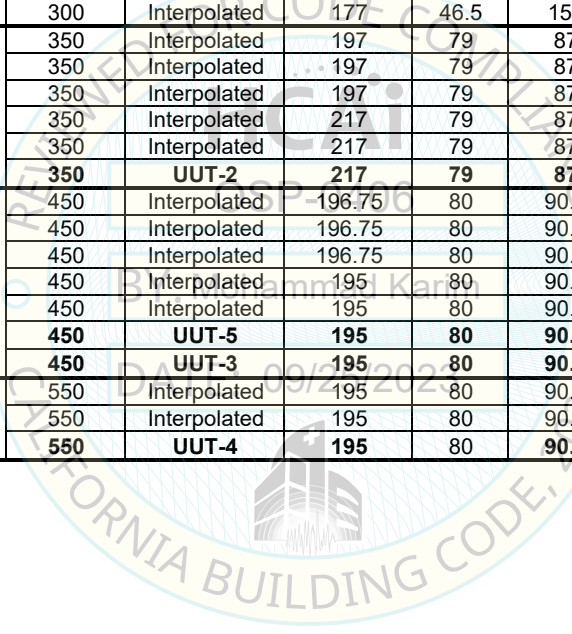


Special Seismic Certification  
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Carrier 23XRV Product Line



**Table 1. 30XRV Approved Unit List**

<i>Model Number</i>	<i>Frame Size</i>	<i>Nominal Tons</i>	<i>Tested/ Interpolated</i>	<i>Length (in)</i>	<i>Width (in)</i>	<i>Height (in)</i>	<i>Operating Weight (lbs)</i>
23XRVA1	2	300	Extrapolated	156.5	46.5	152	14,495
23XRVA2							
23XRVA3							
23XRVA4							
23XRVA5							
23XRVA6							
23XRVB1		300	Interpolated	177	46.5	152	15,244
23XRVB2							
23XRVB3							
23XRVB4							
23XRVB5							
<b>23XRVB6</b>							
23XRVB6	300	Interpolated	177	46.5	152	17,000	
23XRV30	3	350	Interpolated	197	79	87	18,247
23XRV31							
23XRV32							
23XRV35							
23XRV36							
<b>23XRV37</b>							
23XRV40		4	450	Interpolated	196.75	80	90.5
23XRV41							
23XRV42							
23XRV45							
23XRV46							
<b>23XRV47</b>							
<b>23XRV47</b>							
23XRV50	5						
23XRV51							
<b>23XRV52</b>							





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**Carrier 23XRV Product Line**



**Table 2. Certified Sub-Component List: 23XRV**

<b>Compressor</b>					
<i>Frame Type</i>	<i>Part #</i>	<i>Weight (lb)</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
P	1TP3002/3003	2759	Carrier	Carbon Steel	UUT-1
Q	1TQ3002/3003	3488	Carrier	Carbon Steel	UUT-3
R	1TR3002/3003	4150	Carrier	Carbon Steel	UUT-2 & UUT-4

<b>Motor</b>					
<i>Motor Type</i>	<i>Part #</i>	<i>Weight (lb)</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
J	5TP0415	277	Baldor	Carbon Steel	UUT-1
H	5TP0415	277	Baldor	Carbon Steel	Interpolated
P	5T8PRQ21	602	Baldor	Carbon Steel	Interpolated
Q	5T8QRQ21	716	Baldor	Carbon Steel	Interpolated
R	5T8RRQ21	716	Baldor	Carbon Steel	UUT-2 & UUT-4
S	5T8SRQ21	716	Baldor	Carbon Steel	Interpolated
T	5T8TRQ21	716	Baldor	Carbon Steel	Interpolated
U	5T8URQ21	716	Baldor	Carbon Steel	Interpolated
V	5T8VRQ21	716	Baldor	Carbon Steel	UUT-3

<b>VFD/Control Panel</b>						
<i>Part No.</i>	<i>VFD Drive Amperage (A)</i>		<i>Weight (lb)</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
23XR033500FA	335 in	335 out	1029	Rockwell	Carbon Steel	UUT-1
23XR033500FB	230 in	230 out	1029	Rockwell	Carbon Steel	Interpolated
23XR04021301	230 in	230 out	1029	Rockwell	Carbon Steel	Interpolated
23XR04001301	389 in	389 out	1029	Rockwell	Carbon Steel	Interpolated
23XR04001301	445 in	445 out	1029	Rockwell	Carbon Steel	Interpolated
23XR04021303	469 in	469 out	1029	Rockwell	Carbon Steel	Interpolated
23XR04021301	230 in	230 out	1650	Rockwell	Carbon Steel	Interpolated
23XR04001306	389 in	389 out	1650	Rockwell	Carbon Steel	Interpolated
23XR04001304	440 in	442 out	1650	Rockwell	Carbon Steel	UUT-2, UUT-3, UUT-4
23XR04001306	445 in	445 out	1650	Rockwell	Carbon Steel	Interpolated
23XR04001305	520 in	442 out	1650	Rockwell	Carbon Steel	Interpolated
23XR04001307	600 in	600 out	1650	Rockwell	Carbon Steel	Interpolated

\* Whitepath manufactures low-voltage components. Rockwell manufactures high-voltage components.

\* Control box assembled by Whitepath and VFD manufactured by Rockwell

<b>Oil Vaporizer &amp; Sump</b>					
<i>Model #</i>	<i>Weight (lb)</i>	<i>Model #</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
23XR04018301	693	TP	Carrier	Carbon Steel	UUT-1
23XR04010601	693	TQ	Carrier	Carbon Steel	Interpolated
23XR04010601	693	TR	Carrier	Carbon Steel	UUT-2, UUT-3 & UUT-4
23XR04075201*	735	multiple	Carrier	Carbon Steel	UUT-5

\* units with 1-piece vaporizer is limited to units in a rigid mount configuration and further limited to maximum unit size of 23XRV47 (Frame 4)

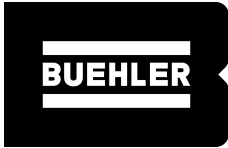
<b>Oil Pump</b>					
<i>Part Number</i>	<i>Capacity (GPH)</i>	<i>Weight (lb)</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
23XR05003201	0.05	7	Tuthill	Carbon Steel	UUT-1, UUT-2, UUT-3, UUT-4

<b>Muffler (including discharge pipe)</b>					
<i>Part Number</i>	<i>Capacity</i>	<i>Weight (lb)</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
23XR14006301	N/A	584	Carrier	Carbon Steel	UUT-1
23XR34006901	N/A	597	Carrier	Carbon Steel	UUT-3
23XR54009301	N/A	747	Carrier	Carbon Steel	UUT-2, UUT-4

<b>Economizer</b>					
<i>Part Number</i>	<i>Capacity</i>	<i>Weight (lb)</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
23XR24002101	N/A	174	Carrier	Carbon Steel	UUT-1
23XR54002101	N/A	542	Carrier	Carbon Steel	UUT-2, UUT-3, UUT-4



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**Carrier 23XRV Product Line**



**Table 2. Certified Sub-Component List: 23XRV cont**

<b>Heat Exchanger (Cooler) and Heat Exchanger (Condenser)</b>						
<b>Frame</b>	<b>Size</b>	<b>Weight (lb)</b>		<b>Manufacturer</b>	<b>Material</b>	<b>Interpolated / Tested</b>
		<b>Cooler</b>	<b>Condenser</b>			
2	A1	3904	5068	Carrier	Carbon Steel Shell / Cooper Tubes	Extrapolated
	A2	4009	5237	Carrier	Carbon Steel Shell / Cooper Tubes	Extrapolated
	A3	4182	5391	Carrier	Carbon Steel Shell / Cooper Tubes	Extrapolated
	A4	4315	5652	Carrier	Carbon Steel Shell / Cooper Tubes	Extrapolated
	A5	4520	5769	Carrier	Carbon Steel Shell / Cooper Tubes	Extrapolated
	A6	4725	6007	Carrier	Carbon Steel Shell / Cooper Tubes	Extrapolated
	B1	4236	5485	Carrier	Carbon Steel Shell / Cooper Tubes	Extrapolated
	B2	4352	5677	Carrier	Carbon Steel Shell / Cooper Tubes	Extrapolated
	B3	4558	5853	Carrier	Carbon Steel Shell / Cooper Tubes	Extrapolated
	B4	4706	6037	Carrier	Carbon Steel Shell / Cooper Tubes	Extrapolated
	B5	4946	6296	Carrier	Carbon Steel Shell / Cooper Tubes	Extrapolated
	<b>B6</b>	<b>5117</b>	<b>6558</b>	<b>Carrier</b>	<b>Carbon Steel Shell / Cooper Tubes</b>	<b>UUT-1</b>
3	30	5012	4481	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
	31	5261	4761	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
	32	5523	5044	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
	35	5385	5497	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
	36	5669	5815	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
		<b>37</b>	<b>5967</b>	<b>6139</b>	<b>Carrier</b>	<b>Carbon Steel Shell / Cooper Tubes</b>
4	40	6321	6327	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
	41	6558	6600	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
	42	6766	6871	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
	45	6909	7031	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
	46	7181	7343	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
		<b>47</b>	<b>7421</b>	<b>7654</b>	<b>Carrier</b>	<b>Carbon Steel Shell / Cooper Tubes</b>
5	50	7553	7863	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
	51	7870	8135	Carrier	Carbon Steel Shell / Cooper Tubes	Interpolated
		<b>52</b>	<b>8069</b>	<b>8391</b>	<b>Carrier</b>	<b>Carbon Steel Shell / Cooper Tubes</b>

<b>Waterbox (Cooler / Condenser)</b>					
<b>Frame</b>	<b>Waterbox Type</b>		<b>Manufacturer</b>	<b>Material</b>	<b>Interpolated / Tested</b>
	<b>Nozzle In Head (NIH) Weight (lb)</b>	<b>Marine Water Box (MWB) Weight (lb)</b>			
2	265	-	Macor	Carbon Steel	UUT-1
	-	812	Macor	Carbon Steel	Interpolated
3	636	860	Macor	Carbon Steel	Interpolated
4	1007	-	Macor	Carbon Steel	UUT-3
	-	2162	Macor	Carbon Steel	Interpolated
5	1316	-	Macor	Carbon Steel	Interpolated
	-	2655	Macor	Carbon Steel	UUT-4

<b>Seismic Strap / Bracket</b>					
<b>Part Number</b>	<b>Weight (lb)</b>	<b>Manufacturer</b>	<b>Material</b>	<b>Interpolated / Tested</b>	
19XB45002301 / 23XR05011801-01	~ 20 / ~ 7.5	Carrier	Carbon Steel	UUT-1, UUT-2, UUT-3, UUT-4	

<b>Spring Isolator</b>					
<b>Part Number</b>	<b>Weight (lb)</b>	<b>Manufacturer</b>	<b>Material</b>	<b>Interpolated / Tested</b>	
SLF-4-8400	~ 35	Mason	Carbon Steel	UUT-2	
SLF-4-9540	~ 35	Mason	Carbon Steel	UUT-4	

<b>Seismic Snubber</b>					
<b>Part Number</b>	<b>Weight (lb)</b>	<b>Manufacturer</b>	<b>Material</b>	<b>Interpolated / Tested</b>	
Z1011-25000	~ 60	Mason	Carbon Steel	UUT-2 & UUT-4	

**UUT-1 Test Summary**

**Testing Lab:** University at Buffalo  
**Testing Report:** No. UB CSEE/SEESL-2014-12 dated July 2, 2014  
**Testing Unit Num:** UUT-1

Model Number	Tonnage	Operating Weight (lbs)	Mounting	Excitation Direction	Frequency* (Hz)	Length (in)	Width (in)	Height (in)
23XRVB6B6EPJR35_	300	13,770	Rigid Mount at Base	X	15.0	181.75	46.4	89
				Y	8.8			
				Z	21.0			

\* Frequencies are for units prior to ICC ES AC-156 testing.  
 Model Number is based on nomenclature from the 2014 Catalog

Identification No.	Attachment Method	Seismic Parameters							
		Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	Horizontal		Vertical	
23XRVB6B6EPJR35	Hard mount	CBC 2022	AC 156	2.00	1.0	3.2g	2.4g	1.33g	0.54g
(4) 3/4" Ø Grade 8 bolts per leg (4 total legs)									



**Figure 1: Unit on the shake table**

Notes: The UUTs were full of contents during the test.  
 After the test, the UUT was functional and the structural integrity of the component attachment and force-resisting systems was maintained.

**UUT-1 Summary Sub-Component List Tested**

Sub-Component	Part Number	Manufacturer	Material
Compressor	1TP3002/3003	Carrier	Carbon Steel
Cooler	See Nomenclature	Carrier	Carbon Steel Shell / Cooper Tubes
Condenser	See Nomenclature	Carrier	Carbon Steel Shell / Cooper Tubes
Motor	5TP0415	Baldor	Carbon Steel
VFD/Control Box	23XR033500FA	Rockwell	Carbon Steel
Oil Vaporizer & Sump	23XR04018301	Carrier	Carbon Steel
Oil Pump	23XR05003201	Tuthill	Carbon Steel
Muffler	23XR1400	Carrier	Carbon Steel
Economizer	23XR2400	Carrier	Carbon Steel
Waterbox - NIH	See Nomenclature	Macor	Carbon Steel
Seismic Strap / Bracket	19XB45002301 / 23XR05011801-01	Carrier	Carbon Steel

**UUT-2 Test Summary**

**Testing Lab:** University at Buffalo  
**Testing Report:** No. UB CSEE/SEESL-2010-11 dated November 18, 2010  
**Testing Unit Num:** UUT-2

Model Number	Tonnage	Operating Weight (lbs)	Mounting	Excitation Direction	Frequency* (Hz)	Length (in)	Width (in)	Height (in)
23XRV3737NRVAA5_	350	20,223	Base with Isolators	X	2.7	184.75	76	86.625
				Y	2.0			
				Z	2.8			

\* Frequencies are for units prior to ICC ES AC-156 testing.  
 Model Number is based on nomenclature from the 2009 Catalog

Identification No.	Attachment Method	Seismic Parameters							
		Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	Horizontal		Vertical	
23XRV3737NRVAA5	Vibration spring isolated with snubbers (4) 1" Ø bolts per leg (4 total legs) (4) Spring Isolator and (8) Seismic Snubbers	CBC 2022	AC 156	2.00	1.0	A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	A <sub>FLX-V</sub>	A <sub>RIG-V</sub>
						3.2g	2.4g	1.33g	0.54g



**Figure 1: Unit on the shake table**

Notes: The UUTs were full of contents during the test.  
 After the test, the UUT was functional and the structural integrity of the component attachment and force-resisting systems was maintained.

**UUT-2 Summary Sub-Component List Tested**

Sub-Component	Part Number	Manufacturer	Material
Compressor	1TR3002/3003	Carrier	Carbon Steel
Cooler	See Nomenclature	Carrier	Carbon Steel Shell / Cooper Tubes
Condenser	See Nomenclature	Carrier	Carbon Steel Shell / Cooper Tubes
Motor	5T8RRQ21	Baldor	Carbon Steel
VFD/Control Box	23XR04001304	Rockwell	Carbon Steel
Oil Vaporizer & Sump	23XR04010601	Carrier	Carbon Steel
Oil Pump	23XR05003201	Tuthill	Carbon Steel
Muffler	23XR54009301	Carrier	Carbon Steel
Economizer	23XR54002101	Carrier	Carbon Steel
Waterbox - NIH	See Nomenclature	Macor	Carbon Steel
Seismic Strap / Bracket	19XB45002301 / 23XR05011801-01	Carrier	Carbon Steel
Spring Isolator	SLF-4-8400	Mason	Carbon Steel
Seismic Snubber	Z1011-25000	Mason	Carbon Steel



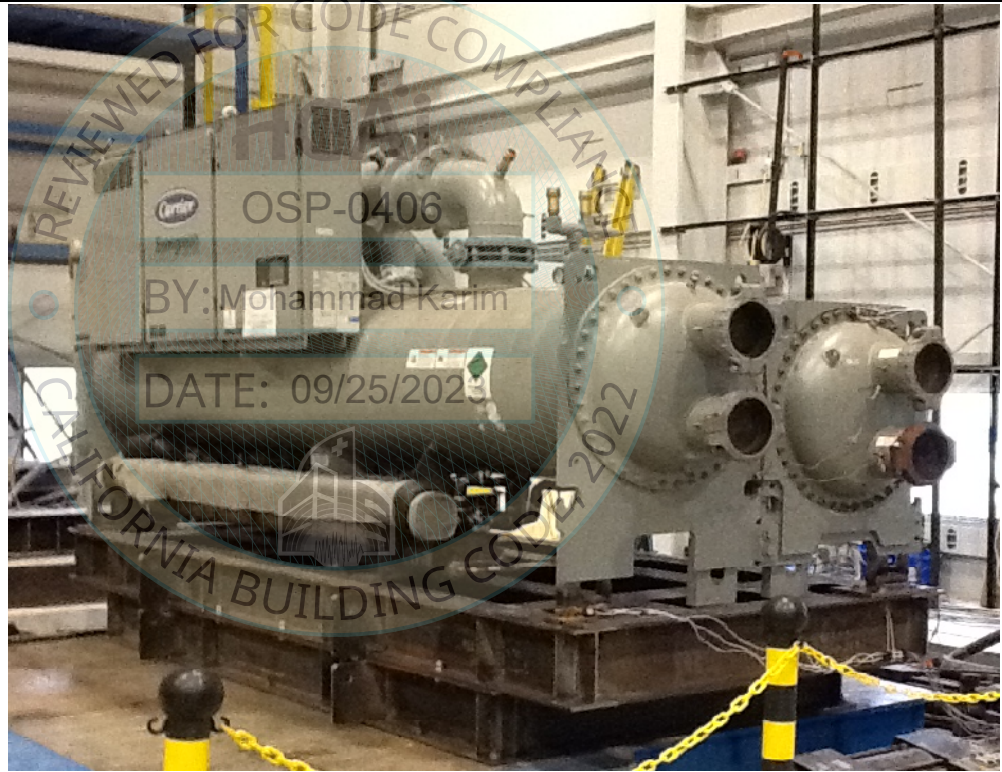
**UUT-3 Test Summary**

**Testing Lab:** University at Buffalo  
**Testing Report:** No. UB CSEE/SEESL-2014-12 dated July 2, 2014  
**Testing Unit Num:** UUT-3

Model Number	Tonnage	Operating Weight (lbs)	Mounting	Excitation Direction	Frequency* (Hz)	Length (in)	Width (in)	Height (in)
23XRV4747ERVAA50	450	20,370	Rigid Mount at Base	X	6.8	175.25	83.75	90.75
				Y	10.8			
				Z	22.4			

\* Frequencies are for units prior to ICC ES AC-156 testing.  
 Model Number is based on nomenclature from the 2014 Catalog

Identification No.	Attachment Method	Seismic Parameters							
		Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	Horizontal		Vertical	
						A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	A <sub>FLX-V</sub>	A <sub>RIG-V</sub>
23XRV4747ERVAA50	Hard mount (4) 3/4"Ø Grade 8 bolts per leg (4 total legs)	CBC 2022	AC 156	2.00	1.0	3.2g	2.4g	1.33g	0.54g



**Figure 1: Unit on the shake table**

Notes: The UUTs were full of contents during the test.  
 After the test, the UUT was functional and the structural integrity of the component attachment and force-resisting systems was maintained.

**UUT-3 Summary Sub-Component List Tested**

Sub-Component	Part Number	Manufacturer	Material
Compressor	1TQ3002/3003	Carrier	Carbon Steel
Cooler	See Nomenclature	Carrier	Carbon Steel Shell / Cooper Tubes
Condenser	See Nomenclature	Carrier	Carbon Steel Shell / Cooper Tubes
Motor	5T8VRQ21	Baldor	Carbon Steel
VFD/Control Box	23XR04001304	Rockwell	Carbon Steel
Oil Vaporizer & Sump	23XR04010601	Carrier	Carbon Steel
Oil Pump	23XR05003201	Tuthill	Carbon Steel
Muffler	23XR34006901	Carrier	Carbon Steel
Economizer	23XR54002101	Carrier	Carbon Steel
Waterbox - NIH	See Nomenclature	Macor	Carbon Steel
Seismic Strap / Bracket	19XB45002301 / 23XR05011801-01	Carrier	Carbon Steel

**UUT-4 Test Summary**

**Testing Lab:** University at Buffalo  
**Testing Report:** No. UB CSEE/SEESL-2010-11 dated November 18, 2010  
**Testing Unit Num:** UUT-4

Model Number	Tonnage	Operating Weight (lbs)	Mounting	Excitation Direction	Frequency* (Hz)	Length (in)	Width (in)	Height (in)
23XRV5252NRVAA3	550	25,093	Base with Isolators	X	4.5	172.5	83.75	90.75
				Y	4.0			
				Z	6.9			

\* Frequencies are for units prior to ICC ES AC-156 testing.  
 Model Number is based on nomenclature from the 2009 Catalog

Identification No.	Attachment Method	Seismic Parameters							
		Building Code	Test Criteria	S <sub>ds</sub> (g)	z/h	Horizontal		Vertical	
						A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	A <sub>FLX-V</sub>	A <sub>RIG-V</sub>
23XRV5252NRVAA3	Vibration spring isolated with snubbers (4) 1" Ø bolts per leg (4 total legs) (4) Spring Isolator and (8) Seismic Snubbers	CBC 2022	AC 156	2.00	1.0	3.2g	2.4g	1.33g	0.54g



**Figure 1: Unit on the shake table**

**Notes:** The UUTs were full of contents during the test.  
 After the test, the UUT was functional and the structural integrity of the component attachment and force-resisting systems was maintained.

**UUT-4 Summary Sub-Component List Tested**

Sub-Component	Part Number	Manufacturer	Material
Compressor	1TR3002/3003	Carrier	Carbon Steel
Cooler	See Nomenclature	Carrier	Carbon Steel Shell / Cooper Tubes
Condenser	See Nomenclature	Carrier	Carbon Steel Shell / Cooper Tubes
Motor	5T8RRQ21	Baldor	Carbon Steel
VFD/Control Box	23XR04001304	Rockwell	Carbon Steel
Oil Vaporizer & Sump	23XR04010601	Carrier	Carbon Steel
Oil Pump	23XR05003201	Tuthill	Carbon Steel
Muffler	23XR54009301	Carrier	Carbon Steel
Economizer	23XR54002101	Carrier	Carbon Steel
Waterbox - MWB	See Nomenclature	Macor	Carbon Steel
Seismic Strap / Bracket	19XB45002301 / 23XR05011801-01	Carrier	Carbon Steel
Spring Isolator	SLF-4-9540	Mason	Carbon Steel
Seismic Snubber	Z1011-25000	Mason	Carbon Steel

**UUT-5 Test Summary**

**Testing Lab:** University at Buffalo  
**Testing Report:** 2023-08 dated May 25, 2023  
**Testing Unit Num:** UUT-5

Model Number	Tonnage	Operating Weight (lbs)	Mounting	Excitation Direction	Frequency* (Hz)	Length (in)	Width (in)	Height (in)
23XRV4747ERVAA50	450	19,800	Base with Isolators	X	6.9	175.25	83.75	90.75
				Y	5.5			
				Z	13.8			

\* Frequencies are for units prior to ICC ES AC-156 testing.  
 Model Number is based on nomenclature from the 2009 Catalog

Identification No.	Attachment Method	Seismic Parameters							
		Building Code	Test Criteria	S <sub>ds</sub> (g)	z/h	Horizontal		Vertical	
						A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	A <sub>FLX-V</sub>	A <sub>RIG-V</sub>
23XRV4747ERVAA50	Hard mount (4) 3/4" Ø Grade 8 bolts per leg (4 total legs)	CBC 2022	AC 156	2.00	1.0	3.2g	2.4g	1.33g	0.54g



**Figure 1: Unit on the shake table**

Notes: The UUTs were full of contents during the test.  
 After the test, the UUT was functional and the structural integrity of the component attachment and force-resisting systems was maintained.

**UUT-5 Summary Sub-Component List Tested**

Sub-Component	Part Number	Manufacturer	Material
Compressor	1TQ3002/3003	Carrier	Carbon Steel
Cooler	See Nomenclature	Carrier	Carbon Steel Shell / Cooper Tubes
Condenser	See Nomenclature	Carrier	Carbon Steel Shell / Cooper Tubes
Motor	5T8VRQ21	Baldor	Carbon Steel
VFD/Control Box	23XR04001304	Rockwell	Carbon Steel
Oil Vaporizer & Sump	23XR04075201	Carrier	Carbon Steel
Oil Pump	23XR05003201	Tuthill	Carbon Steel
Muffler	23XR34006901	Carrier	Carbon Steel
Economizer	23XR54002101	Carrier	Carbon Steel
Waterbox - NIH	See Nomenclature	Macor	Carbon Steel
Seismic Strap / Bracket	19XB45002301 / 23XR05011801-01	Carrier	Carbon Steel