



**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT**

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

OFFICE USE ONLY

APPLICATION #: OSP-0327

HCAI Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Multistack, LLC

Manufacturer's Technical Representative: Darrin Anderson

Mailing Address: 1065 Maple Ave, Sparta, WI 54656

Telephone: (608) 366-2400

Email: DAnderson@multistack.com

Product Information

Product Name: ASP Air Cooled Modular Packaged Water Chillers

Product Model Number(s): See attachments

Product Category: Chillers

Product Sub-Category: Chillers - Air Cooled

General Description: 15 to 60 cooling ton chillers. Chillers that utilize R410A refrigerant are kept on the certification for field repairs.

Mounting Description: Base Mounted Rigid

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: DCL Labs, LLC

Contact Person: Nastya Veyngerova

Mailing Address: 1315 Greg St, Sparks, NV 89431

Telephone: (775) 358-5085

Email: nastya.veyngerova@shaketest.com

Title: Seismic Test Engineer





**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT**

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

Company Name: THE VMC GROUP

Name: Kenneth Tarlow California License Number: S2851

Mailing Address: 980 9th Street, 16th Floor, Sacramento, CA 95814

Telephone: (832) 627-2214 Email: ken.tarlow@thevmcgroup.com

Certification Method

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

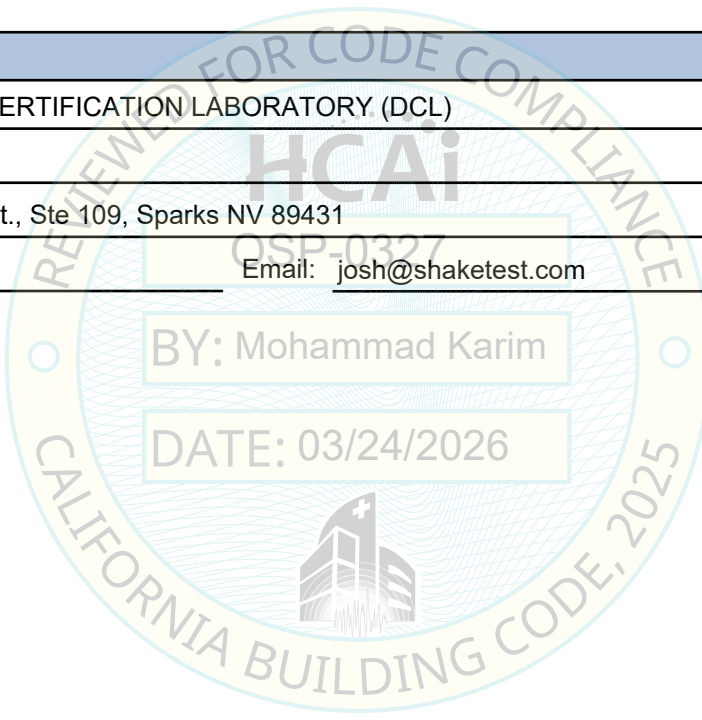
Testing Laboratory

Company Name: DYNAMIC CERTIFICATION LABORATORY (DCL)

Contact Person: Josh Sailer

Mailing Address: 1315 Greg St., Ste 109, Sparks NV 89431

Telephone: (775) 358-5085 Email: josh@shaketest.com





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Seismic Parameters

Certified Response Spectral Acceleration Factors:(Fp/Wp)

Horizontal	(A Flx-H), g=	<u>3.20 (R454B); 2.51 (R410A)</u>	(A Rig-H), g=	<u>2.15 (R454B); 1.69 (R410A)</u>
Vertical	(A Flx-V), g=	<u>1.67 (R454B); 1.05 (R410A)</u>	(A Rig-V), g=	<u>0.67 (R454B); 0.42 (R410A)</u>

SDS (Design spectral response acceleration at short period, g) = 2.00 with z/h=1 and 2.50 with z/h=0 (R454B); 1.57 with z/h=1 and 0 (R410A)

Hf (Force amplification height factor) = 3.5 at z/h=1.0; 1.0 at z/h=0

Ru (Structure ductility reduction factor) = 1.3 at z/h=1.0; 1.0 at z/h=0

Ip (Importance factor) = 1.5

z/h (Height ratio factor) = 1

HCAI Approval (For Office Use Only) - Approval Expires on 03/24/2032

Date: 3/24/2026

Name: Mohammad Karim Title: Supervisor, Health Facilities

Condition of Approval (if applicable): BY: Mohammad Karim



Special Seismic Certification
Table 1 - Certified Components - R454B



DCL Project Number: 08721-2501

Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Certified Product Construction: Galvanneal Carbon Steel

Mounting: Rigid Base Mount

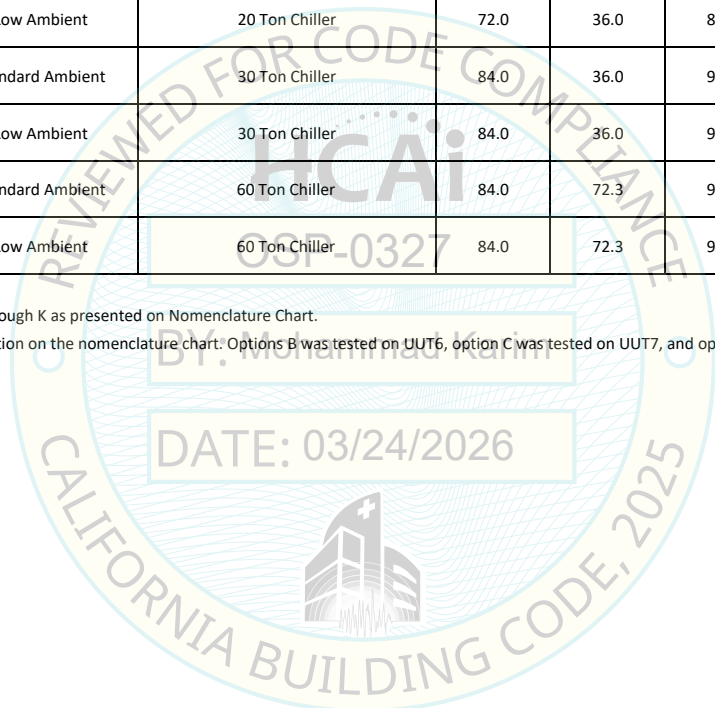
Certified Seismic Levels: Sds=2.00g with z/h=1.0 and Sds=2.50g with z/h=0.0

Factors for Force Amplification and Structure Ductility Reduction: $H_f = 3.5$ at z/h=1.0; 1.0 at z/h=0 and $R_{\mu} = 1.3$ at z/h=1.0; 1.0 at z/h=0

Model Number ¹	Ambient Temperature	Description	Max. Dimensions [in.]			Max. Weight [lb.]	Unit
			Depth	Width	Height		
ASP015KxxxxxxxFA	Standard Ambient	15 Ton Chiller	58.0	31.5	95.3	1275	Extrapolated
ASP015KNAB.2BKByFA ²	Low Ambient	15 Ton Chiller	58.0	31.5	95.3	1470	UUT6
ASP020KxxxxxxxFA	Standard Ambient	20 Ton Chiller	72.0	36.0	85.0	1985	Interpolated
ASP020KxxxxxxxFA	Low Ambient	20 Ton Chiller	72.0	36.0	85.0	2160	Interpolated
ASP030KxxxxxxxFA	Standard Ambient	30 Ton Chiller	84.0	36.0	97.0	2410	Interpolated
ASP030KxxxxxxxFA	Low Ambient	30 Ton Chiller	84.0	36.0	97.0	2610	Interpolated
ASP060KxxxxxxxFA	Standard Ambient	60 Ton Chiller	84.0	72.3	97.3	4360	Interpolated
ASP060KNCC.2ELByFA ²	Low Ambient	60 Ton Chiller	84.0	72.3	97.3	4360	UUT7

Note:

- xxxxxxx represents options D through K as presented on Nomenclature Chart.
- y represents fan configuration option on the nomenclature chart. Options B was tested on UUT6, option C was tested on UUT7, and option D was tested on both.



**Special Seismic Certification
Nomenclature Chart - R454B**



DCL Project Number: 08721-2501

Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Sample Part Number: ABCDEF.GHIJKLM

Character	Category	Allowable Value	Description	Unit
A	Series	ASP	Air Cooled Modular	UUT6, UUT7
B	Module Nominal Capacity	015	15 Tons	UUT6
		020	20 Tons	Interpolated
		030	30 Tons	Interpolated
		060	60 Tons	UUT7
C	Compressor	K	Danfoss DSH	UUT6, UUT7
D	AHRI Certified	C	Certified	Same as Tested
		N	Not Certified	UUT6, UUT7
E	Voltage	D	200/3/50	Extrapolated
		A	208/3/60	UUT 6
		L	230/3/60	Interpolated
		E	380/3/50	Interpolated
		I	400/3/50	Interpolated
		J	415/3/50	Interpolated
		H	460/3/60	Interpolated
		C	575/3/60	UUT7
F	Compressor RLA	B	Medium	UUT 6
		C	High	UUT 7
G	Config. Code Version	2	Version 2	UUT6, UUT7
H	Frame Size	B	31.5 x 58	UUT6
		C	36 x 72	Interpolated
		D	36 x 84	Interpolated
		E	72 x 84	UUT7
I	Table Construction	K	V (2 Coil)	UUT6
		L	W (4 Coil)	UUT7
J	Ambient Rating ¹	A	Standard	Depopulated
		B	Low Ambient to -20°F	UUT6, UUT7
K	Fan Configuration	A	Standard On/Off	Depopulated ²
		B	Standard VFD	UUT6
		C	Standard VFD Line Reactor	UUT7
		D	ECM-1	UUT6, UUT7
L	Refrigerant	F	R454B	UUT6, UUT7
M	Number of Circuits	A	1	UUT6, UUT7

Notes:

- Standard Ambient option is a depopulated version of Low Ambient option. Low Ambient option includes an additional receiver that can hold extra refrigerant. UUT 6 and UUT 7 were tested in Low Ambient configuration.
- Option A is a depopulated version of option B as it does not have a VFD.

Special Seismic Certification
Table 2 - Certified Components - R410A



DCL Project Number: 08721-2501

Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Certified Product Construction: Powder Coated Carbon Steel

Mounting: Rigid Base Mount

Certified Seismic Levels: Sds=1.57g with z/h=1.0 and z/h=0.0

Factors for Force Amplification and Structure Ductility Reduction: H_r = 3.5 at z/h=1.0; 1.0 at z/h=0 and R_μ = 1.3 at z/h=1.0; 1.0 at z/h=0

Certified Options: 10 to 30 cooling ton capacity, Copeland Scroll (ZP) compressors, single or dual refrigerant circuit, 460V, direct electrical connection, air cooled units, standard ambient, brazed stainless steel evaporator, copper tube with aluminum fin condenser, standard fan configuration with R410A refrigerant.

Model Number	Description	Max. Dimensions [in.]			Max. Weight [lb.]	Unit ¹
		Depth	Width	Height		
ASP010X	10 Ton Chiller	58.0	32.0	75.0	1120	UUT2
ASP015X	15 Ton Chiller	58 to 84	32 to 36	75 to 88	1120 to 2030	Interpolated
ASP020X	20 Ton Chiller					Interpolated
ASP030X	30 Ton Chiller	84.0	36.0	88.0	2030	UUT5

Note:

1. The units are no longer in production and are listed for field replacements.



**Special Seismic Certification
Nomenclature Chart - R410A**



DCL Project Number: 08721-2501

Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Sample Part Number: ABCDEFGHIJKLMNQP-Q

Character	Category	Allowable Value	Description
A	Series	ASP	Air Cooled Modular
B	Module Nominal Capacity	010	10 Tons
		015	15 Tons
		020	20 Tons
		030	30 Tons
C	Compressor Type	A	Copeland Scroll (ZR)
		X	Copeland Scroll (ZP)
		N	None
D	AHRI Certified	C	Certified
		N	Not Certified
E	No. of Refrigerant Circuits	1	Single
		2	Dual
F	Frame Designation	1	32" x 58"
		2	36" x 72"
		3	36" x 84"
G	Voltage	A	208/3/60
		L	230/3/60
		H	460/3/60
H	Power Connection	1	Direct Connection
		2	Multiple Module Connections
I	Application	A	Air Cooled
		C	Remote Condenser
		D	Cond Unit
		H	Heat Recovery
J	Ambient	S	Standard
		H	High
K	AHRI Version	1	Standard
L	Evaporator	A	Brazed SS
		B	Brazed SMO
		N	None
M	Condenser	A	Cu Tube Al Fin
		B	Bronzeglow
		H	Heresite
N	Condenser Coating	E	Electrofin
		L	N/A
		S	Standard
O	Fan Configuration	H	High Static
		L	Low Sound
P	Auxiliary Condenser	-	N/A
Q	Refrigerant	-410A	R-410A
		-134A	R-134A

Special Seismic Certification
Table 3 - Certified Subcomponents - Danfoss DSH



DCL Project Number: 08721-2501

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Certified Seismic Levels: Sds=2.00g with z/h=1.0 and Sds=2.50g with z/h=0.0

Model Number	Manufacturer	Description	Material	Weight [lb.]	Unit
Compressors*					
DSH180E	Danfoss	15 Ton Tandem Compressor Set	Iron, Aluminum, Copper, Plastic	305	UUT6
DSH210E		15 Ton Tandem Compressor Set		330	Interpolated
DSH240E		20 Ton Tandem Compressor Set		330	Interpolated
DSH280E		20 Ton Tandem Compressor Set		345	Interpolated
DSH322E		30 Ton Tandem Compressor Set		350	Interpolated
DSH368E		30 Ton Tandem Compressor Set		360	Interpolated
DSH760E		60 Ton Tandem Compressor Set		615	UUT7

* Each unit contains one tandem compressor set.

Condensers*					
715	Multistack, LLC	3/8" Cu tubing/6 Rows/Al Fins	Aluminum, Copper	75	UUT6
716		3/8" Cu tubing/6 Rows/Al Fins		75	UUT6
720		7 mm Cu tubing/4 Rows/Al Fins		90	Interpolated
721		7 mm Cu tubing/4 Rows/Al Fins		90	Interpolated
730F		7 mm Cu Tubing/4 Rows/Al Fins		160	UUT7
731F		7 mm Cu Tubing/4 Rows/Al Fins		160	UUT7

* Four condensers are used on the UUT7, two condensers are used for every other size water chiller.

BPHE Evaporators					
P/F85Hx72	SWEP	20.7" x 4.7" x 6.5"	Stainless Steel, Copper	30	UUT6
P/F120Tx34		20.7" x 9.6" x 4.7"		55	Interpolated
P/F120Tx44		20.7" x 9.6" x 5.5"		65	Interpolated
P/F250ASx90		24.4" x 8.0" x 9.4"		95	Interpolated
P/F200Tx64		20.7" x 9.6" x 8.7"		115	Interpolated
P/F200Tx80		20.7" x 9.6" x 10.3"		130	Interpolated
P/F400Tx110		27.3" x 12" x 12.6"		215	UUT7

Fan Motor					
56HZ	Leeson	1 HP	Iron, Copper	40	UUT6
184T		2 HP		70	UUT7

Fans					
30" Diameter	Multiwing	PPG Axial Fan	Aluminum, Plastic	20	UUT6, UUT7
710mm Diameter	Ziehl-Abegg	ECM Fan		80	UUT6, UUT7

Receivers					
VR1020MU1	Standard Refrigeration	Ø 10.75" x 21"	Iron	70	UUT6
VR1218MU1		Ø 12.75" x 20"		87	Interpolated
VR1224MU1		Ø 12.75" x 25"		115	Interpolated
RHH1260M		Ø 12.75" x 15" x 60"		272	UUT7

Special Seismic Certification
Table 4 - Certified Subcomponents - Copeland Scroll (ZP)



DCL Project Number: 08721-2501

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Certified Seismic Levels: Sds=1.57g with z/h=1.0 and z/h=0.0

Compressors				
Model Number	Manufacturer	Description	Weight (lb)	Unit
ZPT122	Copeland	5 Ton Compressor	88	UUT2
ZRT136		5 Ton Compressor	86	UUT2
ZPT206		7.5 Ton Compressor	103	Interpolated
ZPT208		7.5 Ton Compressor	105	
ZRT216		7.5 Ton Compressor	132	
ZPT244		10 Ton Compressor	107	
ZRT250		10 Ton Compressor	135	UUT5
ZPT364		15 Ton Compressor	146	
ZRT380		15 Ton Compressor	146	

*The only difference between ZP and ZR compressors is the refrigerant. The heavier refrigerant was tested.

**Each unit contains two compressors.

Condensers				
Model Number	Manufacturer	Description	Weight (lb)	Unit
715	Multistack, LLC	3/8" Cu tubing/6 Rows/Al Fins	100	UUT2
716		3/8" Cu tubing/6 Rows/Al Fins	100	UUT2
715		3/8" Cu tubing/6 Rows/Al Fins	100	Interpolated
716		3/8" Cu tubing/6 Rows/Al Fins	100	
720		7 mm Cu tubing/4 Rows/Al Fins	180	
721		7 mm Cu tubing/4 Rows/Al Fins	180	
730F		7 mm Cu Tubing/4 Rows/Al Fins	230	UUT5
731F		7 mm Cu Tubing/4 Rows/Al Fins	230	UUT5

*Two condensers are used for every size water chiller

BPHE Evaporators				
Model Number	Manufacturer	Description	Weight (lb)	Unit
P/F120Tx34	SWEP	20.7" x 9.6" x 4.7"		UUT2
P/F120Tx44		20.7" x 9.6" x 5.6"		Interpolated
P/F200Tx64		20.7" x 9.6" x 7.9"		
P/F200Tx80		20.7" x 9.6" x 9.3"		UUT5

Expansion Valves				
Model Number	Manufacturer	Description	Weight (lb)	Unit
SERI-D	Parker Hannifin	2-10 Ton		UUT2
SERI-G		10-25 Ton		Interpolated
SERI-J		25-45 Ton		UUT5

Controller / Display				
Model Number	Manufacturer	Description	Weight (lb)	Unit
pCO3	Carel	Carel original software		UUT2, UUT5
pCO5		Carel software upgrade		Extrapolated*
pCO5+		Carel software upgrade		Extrapolated*
C.pCO		Carel software upgrade		Extrapolated*

*Controllers/Displays are identical to those tested in UUT2 and UUT5. Software change only.

Solenoid Valve				
Model Number	Manufacturer	Description	Weight (lb)	Unit
3524-13	Parker Hannifin	5/8" diameter valve		UUT2
4036-13		1 1/8" diameter valve		UUT5

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Special Seismic Certification
Table 5 - Certified Subcomponents - Copeland Scroll (ZP) (cont.)



DCL Project Number: 08721-2501

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Certified Seismic Levels: Sds=1.57g with z/h=1.0 and z/h=0.0

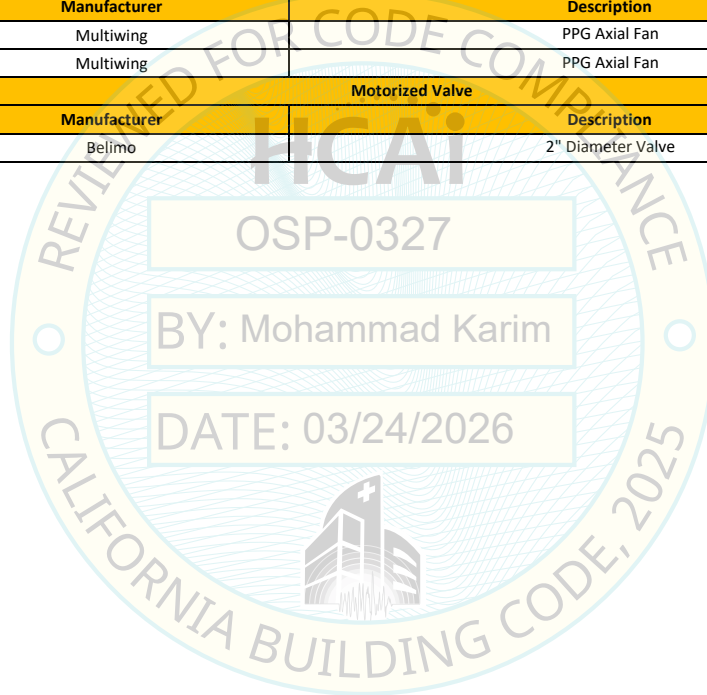
Fan Motor			
Model Number	Manufacturer	Description	Unit
A6T11NB65A	Leeson	1 HP	UUT2
C182T17FB29E	Leeson	2 HP	UUT5

VFDs				
Model Number	Manufacturer	Description	Weight (lb)	Unit
4A0004B	Yaskawa	J1000 Drive Model CIMR-J; 3-Phase, 400V Class (4.3"Wx5.0"Hx5.4"D)	3.8	UUT2, UUT5
2A0012B	Yaskawa	J1000 Drive Model CIMR-J; 3-Phase, 200V Class (4.3"Wx5.0"Hx5.4"D)	3.8	Extrapolated*

*Within the confines of the tested options. Dimensions, weight, design and construction of extrapolated components are the same as what was tested in UUT2 and UUT5.

Fans			
Model Number	Manufacturer	Description	Unit
24.5" Diameter	Multiwing	PPG Axial Fan	UUT2
30" Diameter	Multiwing	PPG Axial Fan	UUT5

Motorized Valve			
Model Number	Manufacturer	Description	Unit
SY1	Belimo	2" Diameter Valve	UUT2, UUT5



Special Seismic Certification
Table 6 - Tested Units - R454B



DCL Project Number: 08721-2501

Manufacturer: Multistack, LLC

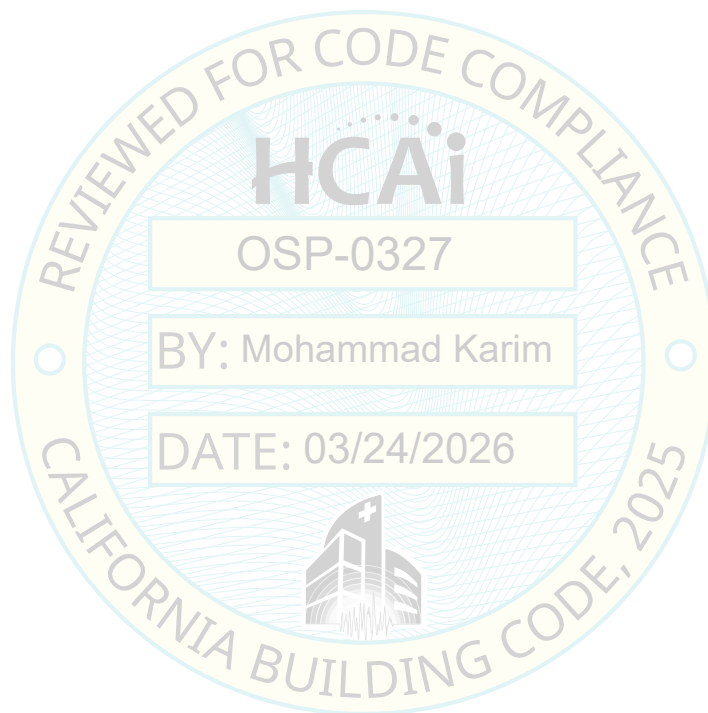
Product Line: ASP Air Cooled Modular Packaged Water Chillers

Mounting: Rigid Base Mount

Certified Seismic Levels: Sds=2.00g with z/h=1.0 and Sds=2.50g with z/h=0.0

Factors for Force Amplification and Structure Ductility Reduction: $H_r = 3.5$ at $z/h=1.0$; 1.0 at $z/h=0$ and $R_w = 1.3$ at $z/h=1.0$; 1.0 at $z/h=0$

Model Number	Description	Dimensions [in.]			Weight [lb.]	Unit
		Length	Width	Height		
ASP015KNAB.2BKByFA	15 Ton Chiller	58.0	31.5	95.3	1470	UUT6
ASP060KNCC.2ELByFA	60 Ton Chiller	84.0	72.3	97.3	4360	UUT7



Special Seismic Certification
Table 7 - Tested Units - R410A



DCL Project Number: 08721-2501

Manufacturer: Multistack, LLC

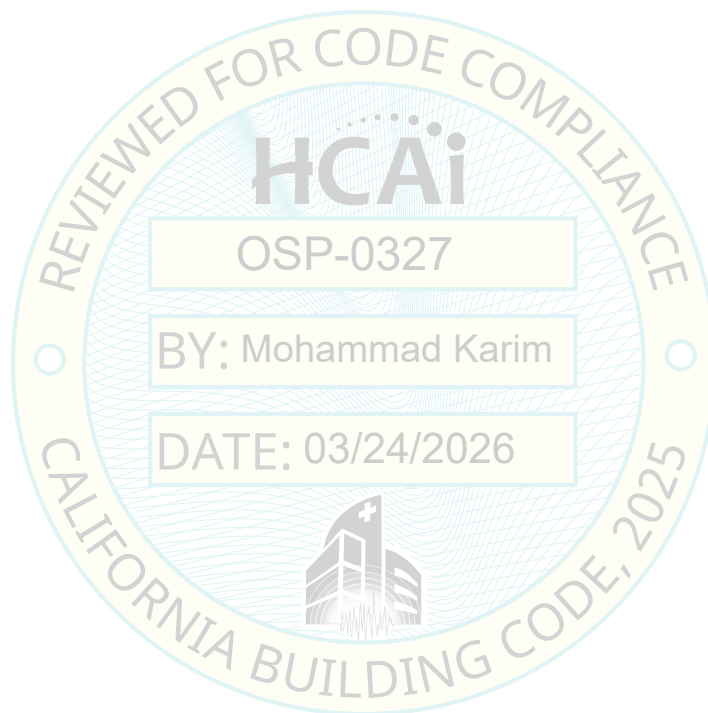
Product Line: ASP Air Cooled Modular Packaged Water Chillers

Mounting: Rigid Base Mount

Certified Seismic Levels: $S_{ds}=1.57g$ with $z/h=1.0$ and $z/h=0.0$

Factors for Force Amplification and Structure Ductility Reduction: $H_f = 3.5$ at $z/h=1.0$; 1.0 at $z/h=0$ and $R_{f1} = 1.3$ at $z/h=1.0$; 1.0 at $z/h=0$

Model Number	Description	Dimensions [in.]			Weight [lb.]	Unit
		Length	Width	Height		
ASP010X	10 Ton Chiller	58.0	32.0	75.0	1120	UUT2
ASP030X	30 Ton Chiller	84.0	36.0	88.0	2030	UUT5



UNIT UNDER TEST (UUT) Summary Sheet



UUT6

DCL Report Number: 08721-2501

Test Dates: 2/10/26 - 2/11/26

Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Model Number: ASP015KNAB.2BKByFA

Product Construction Summary: Galvanneal Carbon Steel

Options / Component Summary:

Subcomponent Type	Model Number	Manufacturer	Material
Compressor	DSH180E	Danfoss	Iron, Aluminum, Copper, Plastic
Condenser	715	Multistack, LLC	Aluminum, Copper
Condenser	716	Multistack, LLC	Aluminum, Copper
BPHE Evaporators	P/F85Hx72	SWEP	Stainless Steel, Copper
Fan Motor	56HZ	Leeson	Iron, Copper
Fan	30" Diameter	Multiwing	Aluminum, Plastic
Fan	710mm Diameter	Ziehl-Abegg	Aluminum, Plastic
Receiver	VR1020MU1	Standard Refrigeration	Iron

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained before and after the AC 156 test.

UUT Properties

Dry Weight (lb)	Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,470	1,500	58.0	31.5	95.3	4.75	5.25	17.25

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	H _f	R _u	I _p	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES	2.00	1.0	3.5	1.3	1.5	3.20	2.15	N/A	N/A
	AC156-24	2.50	0.0	1.0	1.0		N/A	N/A	1.67	0.67

Unit Mounting Description: UUT6 was rigidly base mounted to the DCL shake table interface plate using (4) ½"-13 x 2" Grade 5 bolts, flat washers and 3" x 3" x ¼" carbon steel plate washers. The bolts were spaced 51.3" in lengthwise direction measured on-center and 23.0" in widthwise direction measured on-center.



UNIT UNDER TEST (UUT) Summary Sheet



UUT7

DCL Report Number: 08721-2501

Test Dates: 2/10/26 - 2/11/26

Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Model Number: ASP060KNCC.2ELByFA

Product Construction Summary: Galvanneal Carbon Steel

Options / Component Summary:

Subcomponent Type	Model Number	Manufacturer	Material
Compressor	DSH760E	Danfoss	Iron, Aluminum, Copper, Plastic
Condenser	730F	Multistack, LLC	Aluminum, Copper
Condenser	731F	Multistack, LLC	Aluminum, Copper
BPHE Evaporators	P/F400Tx110	SWEP	Stainless Steel, Copper
Fan Motor	184T	Leeson	Iron, Copper
Fan	30" Diameter	Multiwing	Aluminum, Plastic
Fan	710mm Diameter	Ziehl-Abegg	Aluminum, Plastic
Receiver	RHH1260M	Standard Refrigeration	Iron

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained before and after the AC 156 test.

UUT Properties

Dry Weight (lb)	Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
4,360	4,660	84.0	72.3	97.3	6.00	4.50	23.75

Seismic Test Parameters

Building Code	Test Criteria	S _{ds} (g)	z/h	H _r	R _μ	I _p	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES	2.00	1.0	3.5	1.3	1.5	3.20	2.15	N/A	N/A
	AC156-24	2.50	0.0	1.0	1.0		N/A	N/A	1.67	0.67

Unit Mounting Description: UUT7 was rigidly base mounted to the DCL shake table interface plate using (8) ½"-13 x 2" Grade 5 bolts, flat washers and 3" x 3" x ¼" carbon steel plate washers. The bolts were spaced 38.8", 6.3" and 32.5" in lengthwise direction measured on-center and 63.5" in widthwise direction measured on-center.



UNIT UNDER TEST (UUT) Summary Sheet



UUT2

DCL Report Number: 91410-1101

Test Dates: June 14, 2011 and January 8, 2013

Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Model Number: ASP010X

Product Construction Summary: Powder coated carbon steel

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained before and after the AC 156 test.

UUT Properties

Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1,120	58	32	75	5.3	7.5	13.3

Seismic Test Parameters

Building Code	Test Criteria	S _{ds} (g)	z/h	H _r	R _μ	I _p	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES	1.57	1.0	3.5	1.3	1.5	2.51	1.88	N/A	N/A
	AC156-24	1.57	0.0	1.0	1.0		N/A	N/A	1.05	0.42

Unit Mounting Description: The unit was base-mounted to the DCL steel shake table interface plate with four 1/2-inch diameter Grade 5 bolts. The bolts were spaced 23 inches on center widthwise and 51-3/16 inches on center length wise. The shake table interface plate was attached to the shake table with M12 threaded rod, spaced approximately 8-inches on-center.



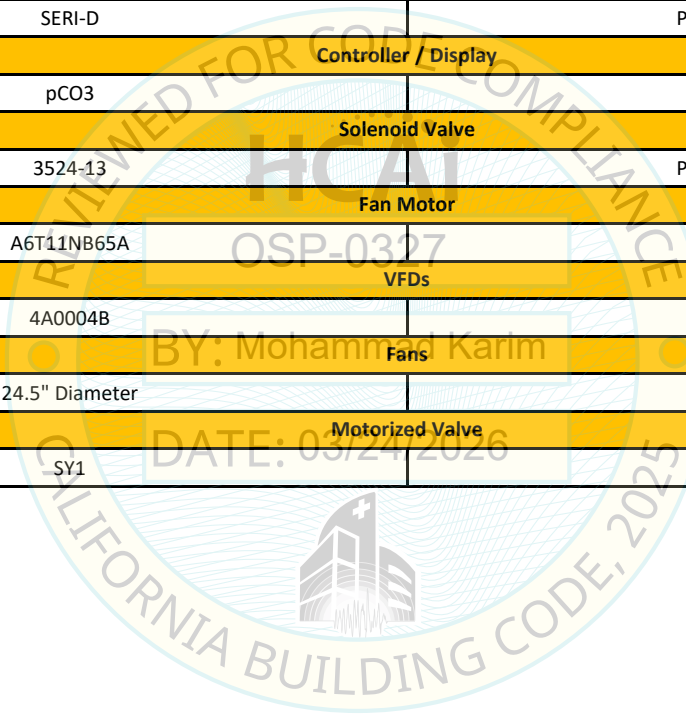
UNIT UNDER TEST (UUT) Summary Sheet



UUT2

Options / Component Summary:

Model Number	Manufacturer
Compressors	
ZPT122	Copeland
ZRT136	
Condensers	
715	Multistack, LLC
716	
BPHE Evaporators	
P/F120Tx34	SWEP
Expansion Valves	
SERI-D	Parker Hannifin
Controller / Display	
pCO3	Carel
Solenoid Valve	
3524-13	Parker Hannifin
Fan Motor	
A6T11NB65A	Leeson
VFDs	
4A0004B	Yaskawa
Fans	
24.5" Diameter	Multiwing
Motorized Valve	
SY1	Belimo



UNIT UNDER TEST (UUT) Summary Sheet



UUT5

DCL Report Number: 91410-1101

Test Dates: June 14, 2011 and January 8, 2013

Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Model Number: ASP030X

Product Construction Summary: Powder coated carbon steel

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained before and after the AC 156 test.

UUT Properties

Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2,030	84	36	88	4.3	4.5	9.8

Seismic Test Parameters

Building Code	Test Criteria	S _{ds} (g)	z/h	H _r	R _μ	I _p	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES	1.93	1.0	3.5	1.3	1.5	3.09	2.32	N/A	N/A
	AC156-24	1.93	0.0	1.0	1.0		N/A	N/A	1.29	0.51

Unit Mounting Description: The unit was base-mounted to the DCL steel shake table interface plate with six 1/2-inch diameter Grade 5 bolts. The bolts were spaced 27-1/2 inches on center widthwise and 38-11/16 inches on center length wise. The shake table interface plate was attached to the shake table with M12 threaded rod, spaced approximately 8-inches on-center.



UNIT UNDER TEST (UUT) Summary Sheet



UUT5

Options / Component Summary:

Model Number	Manufacturer
Compressors	
ZPT364	Copeland
ZRT380	Copeland
Condensers	
730F	Multistack, LLC
731F	Multistack, LLC
BPHE Evaporators	
P/F200Tx80	SWEP
Expansion Valves	
SERI-J	Parker Hannifin
Controller / Display	
pCO3	Carel
Solenoid Valve	
4036-13	Parker Hannifin
Fan Motor	
C182T17FB29E	Leeson
VFDs	
4A0004B	Yaskawa
Fans	
30" Diameter	Multiwing
Motorized Valve	
SY1	Belimo

