



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0238

OSHPD Special Seismic Certification Preapproval (OSP)

Type: [] New [X] Renewal

Manufacturer Information

Manufacturer: Trane

Manufacturer's Technical Representative: Mike Lewis

Mailing Address: 1515 Mercer Road, Lexington, KY 40511

Telephone: (859) 259-2500 Email: mlewis@trane.com

Product Information

Product Name: Air Conditioning Units

Product Type: Air Conditioning Units - Packaged

Product Model Number: Size 3 through Size 120

General Description: Catalogued Air Conditioning Units (with internal vibration isolators) that can be made in multiple sizes as measured by the area of the coils. Stacked unit with components in more than one vertical level are outside the scope of this OSP.

Mounting Description: Rigid base mounted and rigid roof curb mounted without external vibration isolators with internal isolated subcomponents.

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: The VMC Group

Contact Person: John Giuliano

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: jwilson@thevmcgroup.com

Title: President





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

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: CLARK TESTING LABORATORY, INC.
Contact Person: Zachary E. Fischer
Mailing Address: 1801 Route 51 South, Jefferson Hills PA 15025
Telephone: (412) 387-1676 Email: zfischer@clarktesting.com

Company Name: UNIVERSITY OF CALIFORNIA, BERKELEY (PEER)
Contact Person: Amarnath Kasalanati
Mailing Address: 1301 South 46th Street, Bldg 420, Richmond CA 94804
Telephone: (510) 642-6475 Email: amarnath1@berkeley.edu

Company Name: QUALTECH/CURTISS WRIGHT/TRENTEC
Contact Person: Marie S. Nemier
Mailing Address: 4600 East Tech Drive, Cincinnati OH 45245
Telephone: (513) 528-9292 Email: info@curtisswright.com





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 4.16

SDS (Design spectral response acceleration at short period, g) = 1.85

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 2.0 (Internal isolated subcomponents)

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1

Natural frequencies (Hz) = See Attached UUT Sheets

Overall dimensions and weight = See Attached Certified Product Tables

OSHPD Approval (For Office Use Only) - Approval Expires on 12/31/2025

Date: 3/4/2021

Name: Timothy Piland Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: SDS (g) = 1.85 z/h = 1

Condition of Approval (if applicable): _____

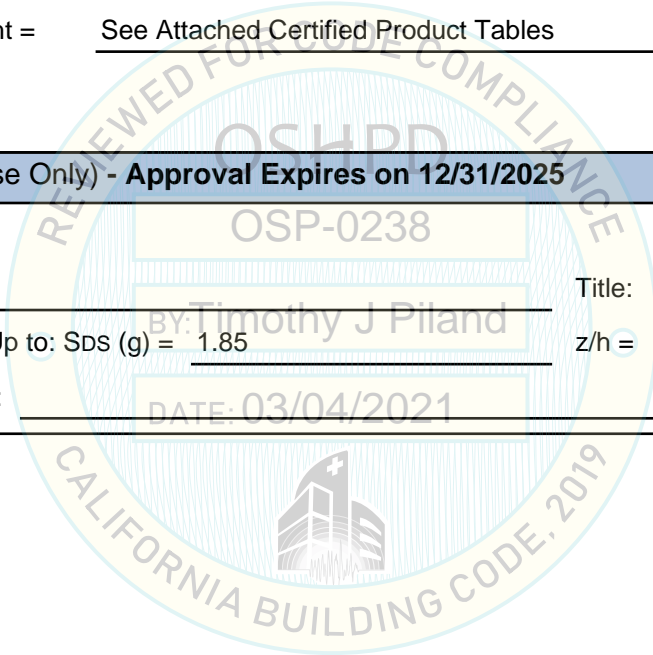


Table 1 - Product Sizes

Unit Dimensions	Height [in]	Width [in]	Max. Length [in]
Minimum	22.5	31.5	Unlimited
UUT-1	29	31.5	
UUTs 2A, 2B	120	182	
UUT-3	39	66	
UUT-4A	72	72	
UUT4B	55	89.5	
UUT-13	38	62	
UUT-14	119.75	155	
UUT-15	33.75	31.5	
UUT-16	119.75	182	
UUT-17	121	84	
Maximum	121.75	184	

Overall unit length is variable depending on the installed modules

Units are certified for "inline" applications only. No L-shaped, T-shaped or U-shaped units are permitted.

Table 2 - Base Frame Construction

Baserrail Height	Material	Section	UUT	MFR
2.5	16 ga Galv Carbon Steel	Cold Formed	Interpolated	Trane
4			Interpolated	
6			13	
7.25			Extrapolated	
2.5	14 ga Galv Carbon Steel	Cold Formed	1, 4	
4			Interpolated	
6			13	
7.25			15	
6	10 ga Galv Carbon Steel	Cold Formed	2, 14, 16	
7.25			17	

Table 3a - Enclosure Construction, Wall/Roof Exterior Panels

Skin	Insulation	Panel Nominal Thickness	Wall/Roof Panel Material	Wall/Roof Panel Thickness ¹	Wall/Roof Panel Type	UUT	MFR
Outer	Interstitial Foam	2"	Galv Carbon Steel	22 ga (0.026")	Solid	1, 2, 4, 13, 14, 15, 17	Trane
Outer	Interstitial Foam	2"	Stainless Steel	22 ga	Solid	Interpolated	
Outer	Interstitial Foam	3"	Galv Carbon Steel	22 ga (0.026")	Solid	16	

¹Note that Trane uses a lower bound tolerance of 0.026" on the material.

Table 3b - Enclosure Const., Wall/Roof Interior Panels (Liners)

Skin	Insulation	Panel Nominal Thickness	Wall/Roof Panel Material	Wall/Roof Panel Thickness ¹	Wall/Roof Panel Type	UUT	MFR
Inner	Interstitial Foam	2"	Galv Carbon Steel	22 ga (0.026")	Solid	1, 2, 4, 13, 15, 17	Trane
Inner	Interstitial Foam	3"	Galv Carbon Steel	22 ga (0.026")	Solid	16	
Inner	Interstitial Foam	2"	Galv Carbon Steel	22 ga (0.026")	Perforated	2, 14	
Inner	Interstitial Foam	3"	Galv Carbon Steel	22 ga (0.026")	Perforated	Extrapolated	
Inner	Interstitial Foam	2"	Stainless Steel	22 ga (0.026")	Solid	2	
Inner	Interstitial Foam	2"	Stainless Steel	22 ga	Perforated	Interpolated	
Inner	Interstitial Foam	3"	Stainless Steel	22 ga (0.026")	Solid	16	

¹Note that Trane uses a lower bound tolerance of 0.026" on the material.

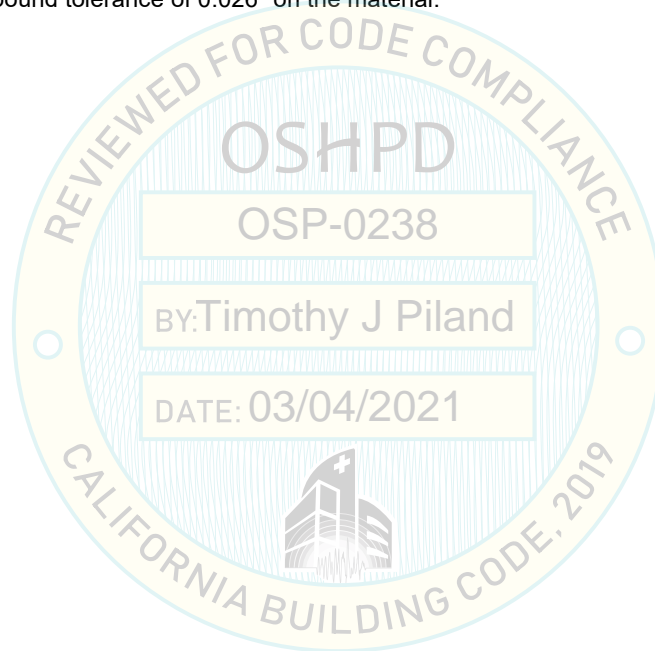


Table 4 - Steam Heating, Hydronic & DX Coils

Coils		Dimensions [in]		Properties							UUT	MFR	
		Width	Height	Casing Material	Tube Material	Tube Outer Diameter	Tube Wall Thickness	Fin Material	Fin Pitch	Tube Rows			Header Type
Steam	Single	27.5 to 68	22.5 to 109.75	Galvanized Carbon	Copper	1"	0.031"	Copper	42 to	1	Ductile Iron Casing	15	Trane
	2 Stacked	76 to 178	22.5 to 109.75	Stainless Steel	Red Brass		to 0.049"	Aluminum	132			Interpolated	
	3 Stacked	76 to 178	22.5 to 109.75	Stainless Steel	Red Brass		0.031" to 0.049"	Aluminum	132			Interpolated	
Hydronic	Single	27.5 to 89.5	22.5 to 109.75	Galvanized Carbon	Copper	1/2"	0.016"	Aluminum	84, 92	1, 2	Copper	1	
		57.5 to 31.25	Stainless Steel	5/8"	0.020"	103	6, 8	3					
		76 to 178	22.5 to 109.75	Stainless Steel	3/8"	0.012"	72	1	3				
	2 Stacked	76 to 178	22.5 to 109.75	Stainless Steel	Copper	to 5/8"	to 0.049"	Copper	to 168	to 10	Interpolated	2B	
	2 Stacked	184	120	Stainless Steel	Copper	5/8"	0.035"	Copper	168	8	Copper	17	
DX	Single	27.5 to 89.5	22.5 to 109.75	Galvanized Carbon	Copper	1/2"	0.016"	Aluminum	151	6	Copper	1	
	2 Stacked	76 to 178	22.5 to 109.75	Stainless Steel		1/2"	0.012"		72	4		Interpolated	
						3/8"	0.025"		168	8		16	

Table 5 - Variable Frequency Drives

Model	Max. Dimensions [in]			Max. Weight [lb]	Power	Voltage	UUT	MFR
	Width	Depth	Height					
X1317	24	14	44	198	0.5 to 120	200 to 575	Interpolated	Trane (Danfoss)
				99	7.5	460	15	
				96	10	200	13	
				171	100	460	14	
4951	32.5	12	44	214	0.5 to 125	200 to 575	Interpolated	Trane (Danfoss)
				214	120	460	16	
4955	9	11	48	59	5 to 25	200 to 575	Interpolated	ABB ACH580
	5	9	15	10	5	480		
	9	11	48	59	25	480		
	8	10	56	86	25	480	UUT-18*	

*UUT-18 referenced for VFD subcomponent only.

Table 6 - Starter

Model	Max. Dimensions [in]			Max. Weight [lb]	Power	Voltage	UUT	MFR
	Width	Depth	Height					
X1318	24	10	30	73	0.5 to 100	200 to 575	Interpolated	Trane (Whitepath)
	16	10	23	73	7.5	200	13	
	24	5	30	57	100	460	14	

Table 7 - Controller

Model	Max. Dimensions [in]			Max. Weight [lb]	UUT	Manufacturer
	Width	Depth	Height			
X1365****	19	11	30	65	Interpolated	Trane
	11	7	13	21	16	
	19	11	30	65	13	

Table 8 - Dampers

Model	Max. Dimensions [in]			UUT	MFR
	Width	Height	Diameter		
CD50	178	109.75	N/A	Interpolated	Ruskin
	27.5	22.5		17	
	178	109.75			
CD60	178	109.75	N/A	Interpolated	Ruskin & Greenheck
	27.5	22.5		1	
	178	109.75		2	
Backdraft	37.37	37.37	N/A	Interpolated	Ruskin & Greenheck
	13.62	13.62		15	
	37.37	37.37		16	
Traq	NA	NA	28	Interpolated	Trane
			13	15	
			28	2	

Table 9 - Miscellaneous Components

Description	Model Number	Dimensions [in]	Weight [lb]	Materials	UUT	Manufacturer
Blenders	Air 66" Series IV	66Wx11.6Dx66H	219	5052 Al	2	Blender Products, Inc.
Diffusers	4953-0122-0001 / 4953-0122-0013	18.2x16.5 / 34.5x104.2	11.5 / 161	16 ga. Perforated G40 steel	1, 2	Trane
Humidifier Grid	Humidipack	17.5Wx8.5Dx19H / 149Wx8.5Dx78H	53 / 1080	stainless steel	1, 3	Armstrong International
UV Lamp Array	4953-11896-0001~0003 - Ballast,	Ballast - 4Wx2Dx19H,25H, 36H Bulb - ø1.25, 17L, 23L, 35L	Ballast - 6	UV ballast, UV bulb	2	Ultraviolet Devices Inc.
	4951-3176-0001 - Ballast, X13161080010~030 bulbs	Ballast - 4Wx6Dx14H, Bulb - ø.75, 20.3L, 33.5L, 61.5L	Ballast - 20	UV ballast, UV bulb	16	UV Resources
TCACS (Trane Catalytic Air Cleaner System)	4951-2262	178Wx6Dx109H	603.5	transformer, steel, UV lights, titanium dioxide media	2	Genesis Air
MICP and Motor Overload Panel	4951-4***	20"Wx9"Dx39"H Maximum	90	Galv Carbon Steel	17	Trane

Table 10a - Filter Rack

Filter Rack Type			Frame Material Options	Max. Dimensions Width x Height	Size						UUT	MFR
Load Access	Type	Holds Filter Type			3	...	10	...	100	120		
Side Loading	Flat	2"	22 gage galvanized carbon steel filter holding tracks with 18 gage galvanized carbon steel vertical supports and blockoffs	Rack assembly and blockoffs fill inside unit dimensions for all unit sizes	X	X	X	X	X	X	Interpolated	Trane
		4" (UUT13)			X	X	X	X	X	13		
		CMDS 2"/ 4" Combo Bag/ Cartridge (BC) (UUT14)			X	X	X	X	X	Interpolated		
					X	X	X	X	X	14		
	Angled	2" (UUT1 and UUT2)	22 gage filter holding tracks with 18 gage vertical supports and blockoffs	Rack assembly and blockoffs fill inside unit dimensions for all unit sizes	X	X	X	X	X	X	1, 2A	
4"		X			X	X	X	X	Interpolated			
Front Loading	Flat	2" (UUT 13)	14 gage galvanized carbon steel filter holding rack with 18 gage galvanized carbon steel blockoffs	Rack assembly and blockoffs fill inside unit dimensions for all unit sizes	X	X	X	X	X	X	13, 14	Trane
		4" (UUT13 and UUT Bag (B) (UUT13 and Cartridge (C)										
HEPA	Flat	HEPA (UUT1 and UUT2)	14 gage filter holding rack with 18 gage blockoffs	Rack assembly and blockoffs fill inside unit dimensions for all unit sizes	X	X	X	X	X	X	1, 2A	Qualex
HEPA	Flat	HEPA	10 gage filter holding panel with 10 gage channel supports	Rack assembly fills inside unit dimensions for all unit sizes	X	X	X	X	X	X	15, 16	Trane

All filters racks are made from Galvanized CS

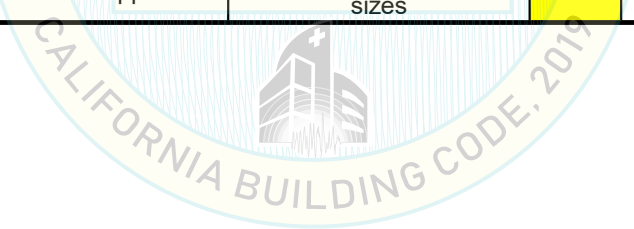


Table 10b - Filter Media

Filter Media Type				Filter Media Materials	Size						UUT	MFR
Filter Size	Filter Type		MERV Rating		3	...	10	...	100	120		
2"	Permanent		2	Aluminum	X	X	X	X	X	X	13, 14	Airguard Industries
	Throwaway		5	Fiberglass	X	X	X	X	X	X	13, 14	
	Pleated	Coated	7	cotton/polyester	X	X	X	X	X	X	Interpolated	
		Regular	8		X	X	X	X	X	X	1, 2A	
Regular		13	X		X	X	X	X	X	14		
4"	Pleated	Coated	7	cotton/polyester	X	X	X	X	X	X	13	
		Regular	8		X	X	X	X	X	X	Interpolated	
	High Efficiency	65%	11	cotton/polyester	X	X	X	X	X	X	13	
		85%	12		X	X	X	X	X	X	Interpolated	
		95%	14		X	X	X	X	X	X	14	
	Standard		11	cotton/polyester	X	X	X	X	X	X	14	
			13		X	X	X	X	X	X	14	
12"	Cartridge	65%	11	Synthetic	X	X	X	X	X	X	14	
		85%	12		X	X	X	X	X	X	Interpolated	
		95%	15		X	X	X	X	X	X	14	
18"	Short Bag	65%	12	Synthetic	X	X	X	X	X	X	13	
		85%	13		X	X	X	X	X	X	Interpolated	
		95%	14		X	X	X	X	X	X	14	
30"	Long Bag	65%	12	Synthetic	X	X	X	X	X	X	13	
		85%	13		X	X	X	X	X	X	Interpolated	
		95%	14		X	X	X	X	X	X	14	
-	HEPA	99.97%	17	microglass paper media / corrugated aluminum separators	X	X	X	X	X	X	1, 2A, 15, 16	

Table 11 - Sound Attenuator

Model	Type	Max. Dimensions [in]			Max. Weight [lb]	UUT	Manufacturer
		Height	Width	Depth			
X4509	Rectangular Dissipative, Fiberglass Lined, or Film Lined	107.25	145	60	2220	Interpolated	Vibro-Acoustics
		28.75	56.6	36	149	13	
		107.25	145	60	2220	14	

Table 12 - Fans Components

Model	Fan Type	Drive	Shaft	Fan Qty.	Size	HP	Housing Material	Blade Material	UUT	MFR	
FA/FB/FC	Housed	Belt	Horizontal	1	9 to 40	0.75 to 75	Carbon Steel/ Galvanized Steel	Galvanized Steel	Interpolated	Comefri	
FC/FB					9	3			1		
FC/FA					10	5			13		
FC/FA					15	5			3		
FC/FB					40	40			2B		
AB/BB/BC/ AA/AF					9 to 44	0.75 to 100			Interpolated		
BC/BB					9	5			1		
AF/AB					25	40			4A		
AF/AB					40	100			Interpolated		
AF/AB					44	100			14		
AF/BC/PA/P B	Plenum	Belt	Horizontal	1	10 to 55	0.75 to 75	Carbon Steel/ Galvanized Steel	Aluminum/ Steel	Interpolated	Chicago Blower / Comefri	
AF/PB					18	10			3	Chicago Blower	
AF/PB					32	40			4B	Comefri	
AF/PA					55	75			3	Chicago Blower	
AF/NF/NR/ NW/SW					Direct	6			10 to 30	1 to 30	Carbon Steel/ Galvanized Steel
AF	1	10.5	7.5	15			Trane				
AF/NR	4	22	5	15							
AF	4	30	30	16							
AF/SF	6	24.5	20	2A				Lau			

Table 13 - Motors For Fans

Fan Type	Motor Drive	HP	Max. Motor Wt. [lb]	UUT	Manufacturer
Housed	Belt	0.75 to 100	1239	Interpolated	Baldor
		3	91	1	
		5	108	1	
		40	578	1, 2B	
		100	1239	4A	
Plenum	Belt	0.75 to 75	889	Interpolated	
		10	185	15	
		40	578	4B	
		75	889	4B	
	Direct	0.75 to 30	481	Interpolated	
		5	108	16	
		7.5	159	15	
		30	481	16	
		20	315	2A	

Table 14 - Motorized Impeller Fan Component

Horizontal & vertical shaft both offered
 Offering includes the use of Qty 1 to Qty 15 fans
 Aluminum impeller wheel, steel inlet nozzle, steel supporting structure
 Rigid mounted

Desc.	Max. KW	Voltage	Shaft Orientation	Max. Wt. One Fan [lb]	Fan Array Wide x High	Max. Fan Qty	Max. Fan Assembly [lbs]	UUT	Manufacturer
EBM 280 - 630	14	200 - 575	Horizontal	244.2	5x3	15	1710	Interpolated	EBM Pabst
EBM 280	1	240	Horizontal	30	1x1	1	30	15	
EBM 560	14	480	Horizontal	244.2	1x1	1	244.2	17	
EBM 630	6	480	Horizontal	157	3x1	3	471	16	
EBM 560	6	480	Horizontal	114	1x3	3	342	17	
EBM 280 - 630	14	200 - 575	Vertical	244.2	N/A	N/A	N/A	Interpolated	
EBM 280	1	240	Vertical	30				15	
EBM 630	6	480	Vertical	157				16	
EBM 560	14	480	Vertical	244.2				17	

12 Fans option horizontal configuration has a maximum possible weight of 1367 lbs
 Vertical fans are never stacked or connected and will be tested as a 1x1 of the largest size.

Table 15 - Electric Heat Component

Max. Output [Kw]	Max. Weight [lbs]	MFR	UUT
578.8	1191	Indeeco	Interpolated
3 - 26.3	109		15
52 - 578.8	1191		16



UNIT UNDER TEST (UUT) Summary Sheet

UUT-1

EL:9573

Model Line	Model Number	Manufacturer
Performance Climate Changer	PCC/CSAA Size 3	Trane

Product Construction Summary

Galvanized Carbon Steel Base Frame, Galvanized Carbon Steel Enclosure

Options / Subcomponent Summary

DX Coil : Trane ; Hydronic Coil : Trane ; LV DDC Controller: Trane ; Damper: Ruskin ; Diffuser: Trane ; Humidifier : Armstrong ; Angled Filter: Trane Frame & Airguard Media ; HEPA Filter: Qualex Frame & Airguard Media ; Housed Fans : Comefri Fan & Baldor Motor

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
2485	300	31.5	29	15.37	7.04	12.66

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{Ds}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	1.85	1.00	1.5	2.96	2.22	1.24	0.5

Test Mounting Details

Base Mounted to VMC P6000S Rigid Roof Curb with intermittantly spaced Qty (14) 1/8" Thick x 3" Long welds & (14) 1/2" dia SAE Grade 5 bolts (UUT welded to plates & plates bolted to Roof Curb main body). Roof Curb base mounted to shake table with intermittantly spaced Qty (28) 1/2" dia SAE Grade 5 Bolts.



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.



UNIT UNDER TEST (UUT) Summary Sheet

UUT-2A

UUT-2A, PEER STI 2011-10

Model Line	Model Number	Manufacturer
Performance Climate Chamber	PCC/CSAA Size 120	Trane

Product Construction Summary

Galvanized Carbon Steel Base Frame, Galvanized Carbon Steel & Stainless Steel Enclosure

Options / Subcomponent Summary

Steam Coil : Trane ; LV DDC Controller: Trane ; Damper: Ruskin ; Traq Damper : Trane ; Blender: Blender Products ; UV Lamp Array: Ultraviolet Devices ; TCACS : Genesis ; Angled Filter : Trane Frame & Airguard Media ; HEPA Filter : Qualex Frame & Airguard Media ;
Plenum Fan : Lau Fan & Baldor Motor/AO Smith Motor

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
20360	325	182	120	2.8	3.7	4.3

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{Ds}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	2	1.00	1.5	3.2	2.4	1.34	0.54

Test Mounting Details

Base Mounted to VMC P6000S Rigid Roof Curb with intermittantly spaced Qty (40) 1/2" dia SAE Grade 8 Bolts. Roof Curb base mounted to shake table with intermittantly spaced Qty (40) 1/2" dia SAE Grade 8 Bolts.



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.



UNIT UNDER TEST (UUT) Summary Sheet

UUT-2B

UUT-1B, PEER STI 2011-10

Model Line	Model Number	Manufacturer
Performance Climate Changer	PCC/CSAA Size 120	Trane

Product Construction Summary

Galvanized Carbon Steel Base Frame, Galvanized Carbon Steel & Stainless Steel Enclosure

Options / Subcomponent Summary

Hydronic Coil : Trane ; Diffuser : Trane ; Housed Fan : Comefri Fan & Baldor Motor

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
14920	314	182	120	2.8	2.9	2.8

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	2	1.00	1.5	3.2	2.4	1.34	0.54

Test Mounting Details

Base Mounted to VMC P6000S Rigid Roof Curb with intermittantly spaced Qty (40) 1/2" dia SAE Grade 8 Bolts. Roof Curb base mounted to shake table with intermittantly spaced Qty (40) 1/2" dia SAE Grade 8 Bolts.



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.



UNIT UNDER TEST (UUT) Summary Sheet

UUT-3

UUT-1, PEER STI 2010-7

Model Line	Model Number	Manufacturer
T Series	Size 10	Trane

Product Construction Summary

Galvanized Carbon Steel Base Frame, Galvanized Carbon Steel Enclosure

Options / Subcomponent Summary

Hydronic Coil : Trane ; Humidifier : Armstrong ; Housed Fan : Comefri Fan & Baldor Motor ;
Plenum Fan : Chicago Blower Fan & Baldor Motor

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
4092	295	66	39	8.2	8.4	10.1

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{Ds}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	1.85	1.00	1.5	2.96	2.22	1.24	0.5

Test Mounting Details

Base Mounted to VMC P6000S Rigid Roof Curb with intermittantly spaced Qty (14) 1/8" Thick x 3" Long welds. Roof Curb base mounted to shake table with intermittantly spaced Qty (28) 1/2" dia SAE Grade 8 Bolts.



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.



UNIT UNDER TEST (UUT) Summary Sheet

UUT-4A

UUT-1, Q9018.0

Model Line	Model Number	Manufacturer
Performance Climate Changer	PCC/CSAA Size 30	Trane

Product Construction Summary

Galvanized Carbon Steel Base Frame, Galvanized Carbon Steel Enclosure

Options / Subcomponent Summary

Housed Fan : Comefri Fan & Baldor Motor Q MP580 LV Controller: Trane

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
2500	72	72	72	4	2.2	1.6

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{Ds}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	1.85	1.00	1.5	2.96	2.22	1.24	0.5

Test Mounting Details

Base Mounted to shake table with Qty (4) 1/2" dia SAE Grade 8 Bolts. (1) Bolt per UUT corner.



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.



UNIT UNDER TEST (UUT) Summary Sheet

UUT-4B

UUT-2, Q9018.0

Model Line	Model Number	Manufacturer
Performance Climate Changer	PCC/CSAA Size 30	Trane

Product Construction Summary

Galvanized Carbon Steel Base Frame, Galvanized Carbon Steel Enclosure

Options / Subcomponent Summary

Plenum Fan : Comefri Fan & Baldor Motor

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
1774	56.5	89.5	55	2.4	1.7	2.1

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	1.85	1.00	1.5	2.96	2.22	1.24	0.5

Test Mounting Details

Base Mounted to shake table with Qty (4) 1/2" dia SAE Grade 8 Bolts. (1) Bolt per UUT corner.



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.



UNIT UNDER TEST (UUT) Summary Sheet

UUT-13

PEER STI 2013-18

Model Line	Model Number	Manufacturer
Performance Climate Changer	PCC/CSAA Size 10	Trane

Product Construction Summary

Galvanized Carbon Steel Base Frame, Galvanized Carbon Steel Enclosure

Options / Subcomponent Summary

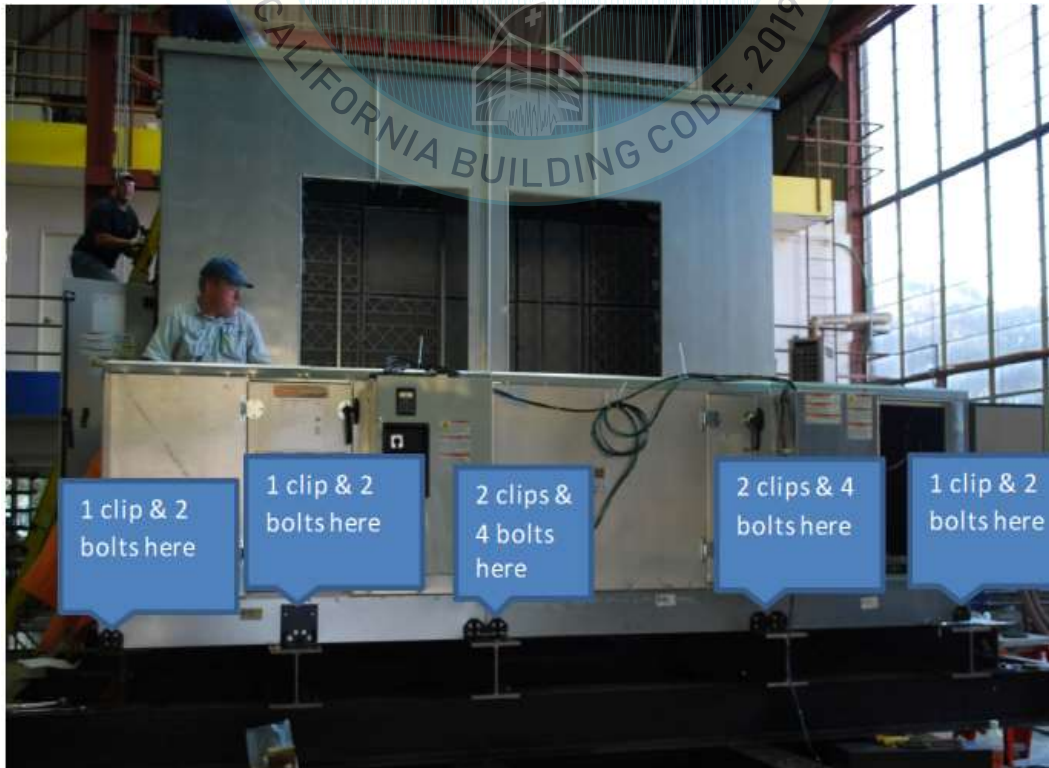
TR150 VFD: Trane ; UC600 LV Controller: Trane ; Starter : Trane ; Filter Frame: Trane ; Filter Media: Airguard Industries ; Housed Fan: Comefri Fan & Regal/Beloit Motor ; Sound Attenuator: Vibro/Acoustics

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
2050	156	62	38	22.9	11.3	33.3+

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{Ds}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	1.85	1.00	1.5	2.96	2.22	1.24	0.5

Test Mounting Details

Base mounted unit with intermittantly spaced Qty (28) 1/2" dia SAE Grade 8 Bolts. (50" maximum spacing). Fixture rigidly on table.



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.



UNIT UNDER TEST (UUT) Summary Sheet

UUT-14

PEER STI 2013-18

Model Line	Model Number	Manufacturer
Performance Climate Changer	PCC/CSAA Size 100	Trane

Product Construction Summary

Galvanized Carbon Steel Base Frame, Galvanized Carbon Steel Enclosure

Options / Subcomponent Summary

TR150 VFD: Trane ; Starter : Trane ; Filter Frame: Trane ; Filter Media: Airguard Industries ;
Housed Fan: Comefri Fan & Regal/Beloit Motor ; Sound Attenuator: Vibro/Acoustics

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
13450	277	155	119.75	8.6	8.3	33.3+

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{Ds}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	1.85	1.00	1.5	2.96	2.22	1.24	0.5

Test Mounting Details

Base mounted unit with intermittantly spaced Qty (32) 1/2" dia SAE Grade 8 Bolts. (48" maximum spacing). Fixture rigidly on table.



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.



UNIT UNDER TEST (UUT) Summary Sheet

UUT-15

VMA-48642-01E

Model Line	Model Number	Manufacturer
Performance Climate Changer	PCC/CSAA Size 3	Trane

Product Construction Summary

Galvanized Carbon Steel Base Frame, Galvanized Carbon Steel Enclosure

Options / Subcomponent Summary

Steam Coil: Trane ; TR150 VFD: Trane ; Traq Damper: Trane ; Backdraft Damper: Ruskin ; HEPA Filter Frame: Trane ; HEPA Filter Media: Airguard Industries ; Plenum Fan: Trane ; Plenum Fan Motor: Baldor ; Motorized Impeller Fan: EBM Pabst ; Electric Heat: Indeeco

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
1400	172.8	31.5	33.75	23	33.3+	18.5

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{Ds}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	1.85	1.00	1.5	2.96	2.22	1.24	0.5

Test Mounting Details

Base mounted to shake table with intermittantly spaced Qty (22) 1/2" dia. SAE Grade 8 bolts



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.



UNIT UNDER TEST (UUT) Summary Sheet

UUT-16

VMA-48642-01E

Model Line	Model Number	Manufacturer
Performance Climate Changer	PCC/CSAA Size 120	Trane

Product Construction Summary

Galvanized Carbon Steel Base Frame, Galvanized Carbon Steel and Stainless Steel Enclosure

Options / Subcomponent Summary

DX Coil: Trane ; TR150 VFD: Trane ; UC600 LV Controller: Trane ; Backdraft Damper: Greenheck ; UV Lamp Array: UV Resources ; HEPA Filter Frame: Trane ; HEPA Filter Media: Airguard Industries ; Plenum Fan: Trane ; Plenum Fan Motor: Baldor ; Motorized Impeller Fan: EBM Pabst ; Electric Heat: Indeeco

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
16040	261.5	182	119.75	7.5	9.25	13

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{Ds}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	1.85	1.00	1.5	2.96	2.22	1.24	0.5

Test Mounting Details

Base mounted to VMC P6000S Rigid Roof Curb with intermittantly spaced Qty (18) 1/8" thick x 3" long welds.
Roof curb base mounted to shake table with intermittantly spaced Qty (28) 1/2" Dia. SAE Grade 8 bolts.



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.



UNIT UNDER TEST (UUT) Summary Sheet

UUT-17

UUT-1, JID 20-00265

Model Line	Model Number	Manufacturer
Performance Climate Changer	PCC/CSAA Size 120	Trane

Product Construction Summary

Galvanized Carbon Steel Base Frame, Galvanized Carbon Steel Enclosure

Options / Subcomponent Summary

Hydronic Coil: Trane ; CD50 Damper: Ruskin ; MICP Motor Overload Panel: Trane ;
EBM 560 4.5 kW Motorized Impeller Fan: EBM Pabst ;

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
12228	182	84	121	3.94	4.38	11.68

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{Ds}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	1.85	1.00	1.5	2.96	2.22	1.24	0.5

Test Mounting Details

Base mounted to VMC P6000S Rigid Roof Curb with intermittantly spaced Qty (20) 1/8" thick x 3" long welds.
Roof curb base mounted to shake table with intermittantly spaced Qty (20) 1/2" Dia. SAE Grade 5 bolts.



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.



UNIT UNDER TEST (UUT) Summary Sheet

UUT-18
(For VFD
Subcomponent)

UUT-6a, DCL 30686-1801

Model Line	Model Number	Manufacturer
ACx580	ACH580-VCR-065A-4	ABB

Product Construction Summary

Plastic Type 1 Enclosure with Carbon Steel R4 Base

Options / Subcomponent Summary

Variable Frequency Drive: ABB

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Depth	Width	Height	F-B	S-S	V
86	10	8	56	20	15	>33.3

UUT Highest Passed Seismic Run Information								
Building Code	Test Criteria	S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	2	1.00	1.5	3.2	3	1.33	0.53

Test Mounting Details

UUT was mounted to wall fixture using (4) 5/16" grade 8 bolts. Wall fixture was rigidly mounted to the table using M12 threaded rods spaced 8" on center.



All units were filled with contents and maintained structural integrity and functionality after AC-156 test.