



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

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

OFFICE USE ONLY

APPLICATION #: OSP-0128

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Trane

Manufacturer's Technical Representative: Wyatt Martinez

Mailing Address: 101 William White Boulevard, Pueblo, CO 81001

Telephone: (719) 585-4374

Email: wyatt.martinez@trane.com

Product Information

Product Name: Chillers

Product Type: Chillers - Air Cooled

Product Model Number: Sizes 20 Ton to 120 Ton

General Description: Cataloged chillers available from 20 Ton to 120 Ton.

Mounting Description: Base mounted on external spring vibration isolators., Base mounted on external spring vibration isolators.

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: VMC Group

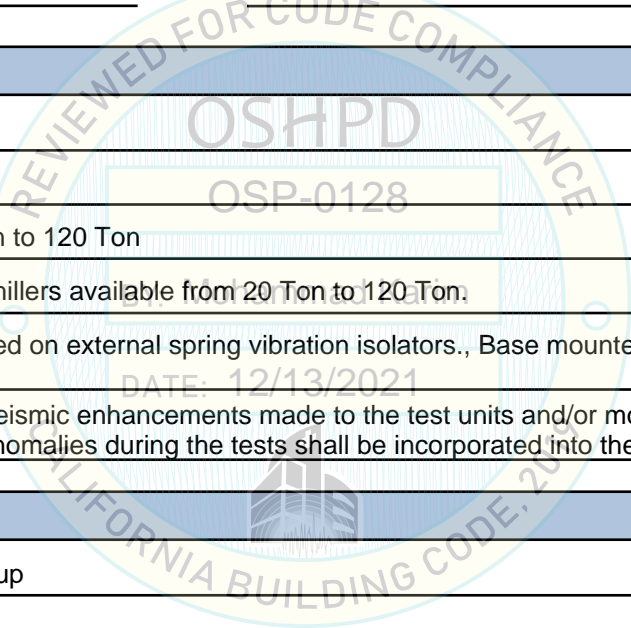
Contact Person: John Giuliano

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780

Email: john.giuliano@thvmcgroup.com

Title: President





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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

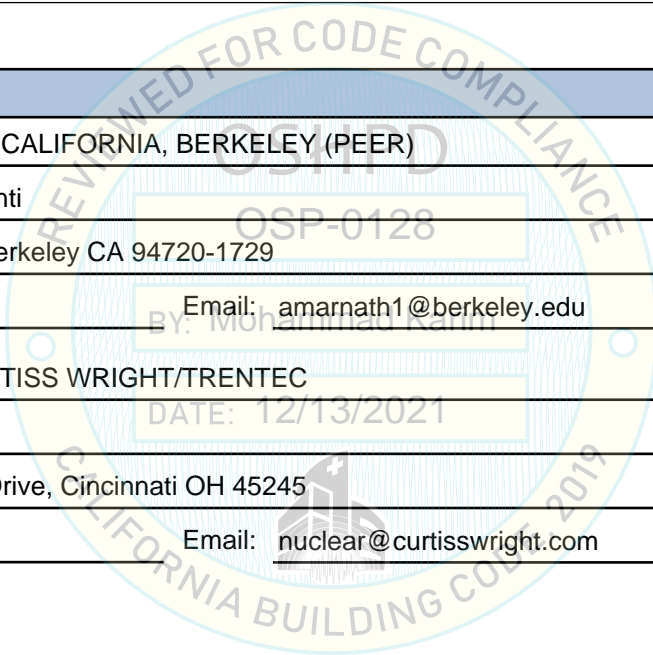
Certification Method

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

Testing Laboratory

Company Name: UNIVERSITY OF CALIFORNIA, BERKELEY (PEER)
Contact Person: Amarnath Kasalanti
Mailing Address: 325 Davis Hall, Berkeley CA 94720-1729
Telephone: (516) 642-6475 Email: amarnath1@berkeley.edu

Company Name: QUALTECH/CURTISS WRIGHT/TRENTEC
Contact Person: Timothy Geers
Mailing Address: 4600 East Tech Drive, Cincinnati OH 45245
Telephone: (513) 528-7900 Email: nuclear@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 spring isolated

Ω_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

OSHPD Approval (For Office Use Only) - Approval Expires on 12/14/2027

Date: 12/13/2021

Name: Mohammad Karim Title: Supervisor, Health Facilities

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

Condition of Approval (if applicable): DATE: 12/13/2021

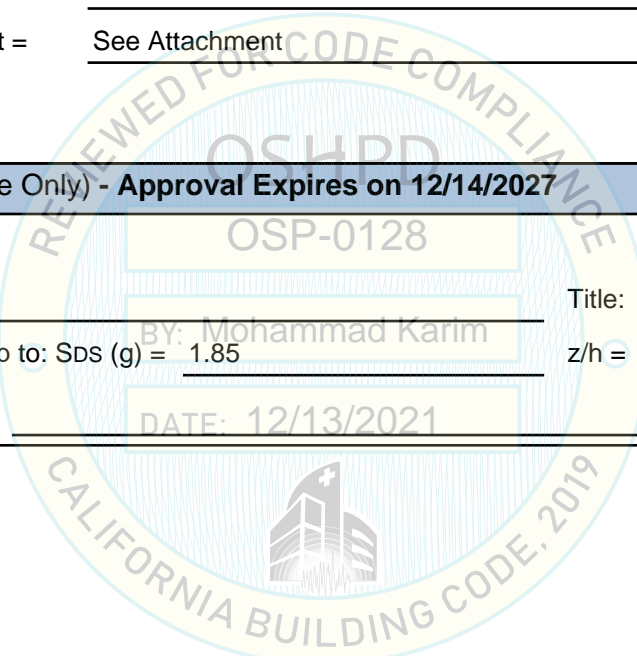


Table 1 - Certified Product Matrix

Model	Nominal Capacity [ton]	Efficiency	Frequency [Hz]	Max. Dimensions			Max. Operating Weight [lb]	Seismic Parameters		Installation Method	UUT
				Length [in]	Width [in]	Height [in]		S _{DS} [g]	z/h		
CGAM020	020	High	60	113.8	50.4	84.7	2208	1.85	1	Spring Isolated	Extrapolated
CGAM026	026			113.8	50.4	84.7	2278*				UUT-1
CGAM030	030			149.8	50.4	84.7	2880				Interpolated
CGAM035	035			149.8	50.4	84.7	2920				
CGAM040	040			113.8	88.4	84.8	3697				
CGAM052	052			113.8	88.4	84.8	3806				
CGAM060	060			149.8	88.4	84.8	5033				
CGAM070	070			149.8	88.4	84.8	5121				
CGAM080	080			143.1	88.2	92.6	5692				
CGAM090	090			143.1	88.2	92.6	5961				
CGAM100	100			165.9	88.2	92.5	6759				
CGAM110	110			165.9	88.2	92.5	6845				
CGAM120	120			165.9	88.2	92.5	6884**				UUT-2

*UUT-1, measured weight is 2111 lbs. Maximum operating weight of CGAM026 is 2278 lbs.

**UUT-2, measured weight is 6500 lbs. Maximum operating wight of CGAM120 is 6884 lbs.

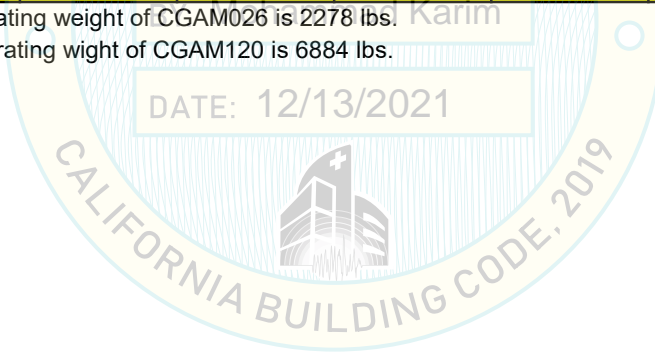


Table 2 - Certified Compressors

Size	MFR	Type	Voltage	UUT
10T LC	Trane	Scroll		Extrapolated
13T LC			460	UUT-1
15T LC				Interpolated
15T				Interpolated
20T				Interpolated
25T				Interpolated
30T			460	UUT-2
30T LSPM				Extrapolated

Voltages range from 208 to 575.

Table 3a - Certified Control Panel Construction

Unit Size	MFR	Dimensions [mm]			Material	UUT
		L	W	H		
20-35T	Trane	948	213	1090	2mm Steel enclosure and doors	UUT-1
40-70T	Trane	1905	213	830		Interpolated
80-120T	Trane	2254	284	829		UUT-2

Table 3b - Certified Control Panel Components

Description	Manufacturer	Input Voltage	Output [Voltage/ Current/Power]	UUT
Operator Interface	Dynaview	24 VDC	N/A	UUT-1, UUT-2
Transformer	Precision, Inc	200/230/380/400/460/575 VAC	115/24 VAC 60hz, 110/24 VAC 50hz	UUT-1, UUT-2
Circuit Breaker	Schneider PowerPact	200/230/380/400/460/575 VAC	200/230/380/400/460/575	UUT-1, UUT-2
Remote Interface Modules	BacNet, LonTalk, Tracer	24 VDC	N/A	UUT-1, UUT-2
Fan VFD	Trane/ Danfoss TR1	200/230/380/400/460 VAC	200/230/380/400/460 VAC	UUT-2
Compressor Contactors	Schneider Tesys D	200/230/380/400/460/575 VAC	200/230/380/400/460/575 VAC	UUT-1, UUT-2

Table 4 - Certified Evaporators

Model	MFR	Style	Max # of plates	Tons/ Efficiency	Plate and Connection Material	UUT
P80	Swep	Brazed plate heat exchanger	96	20-130	Stainless Steel	UUT-1
DP200		Brazed plate heat exchanger	78	20-130		Interpolated
DP400		Brazed plate heat exchanger	222	20-130		UUT-2

Table 5a - Certified Fans

Description	Manufacturer	# of Blades	Blade Material	UUT
Skinny IV Fan	King's Eco Plastics	11	Plastic	UUT-1, UUT-2

Table 5b - Certified Fan Motors

Model Number	MFR	Input Voltage [VAC]	Output Rating [HP]	Type	UUT
P56AE86A05R	Regal Beloit	200-230 VAC	1.3	TEAO	Extrapolated
P56AE87A05R		380 VAC	1.3	TEAO	Extrapolated
P56AE89A05R		575VAC	1.3	TEAO	Extrapolated
P56AE86A05R		400-480VAC	1.3	TEAO	UUT-1, UUT-2
P56AE94A05R		400-480VAC	1.3	TEAO	Extrapolated
P56AE90A05R		200-230 VAC	1.3	TEAO 2 Speed	Extrapolated
P56AE92A05R		400-480VAC	1.3	TEAO 2 Speed	Extrapolated

Table 6 - Certified Condenser Coils

Unit Size	MFR	Coil Dimension [in]			# of Rows	UUT
		Length	Depth	Height		
20T, 26T	Trane	91	4.5	68	2 or 3	UUT-1
30T, 35T	Trane	127	4.5	68	2 or 3	Interpolated
40T, 52T	Trane	91	4.5	68	2 or 3	Interpolated
60T, 70T	Trane	127	4.5	68	2 or 3	Interpolated
80T, 90T	Trane	121	4.5	42	3	Interpolated
100T, 110T, 120T	Trane	144	4.5	42	3	UUT-2

For all units, 0.0042" thick fins, 3/8" diameter tube

For all units, materials used are: fins- Al; tubes; Cu; frame- Steel



UNIT UNDER TEST (UUT) Summary Sheet

UUT-1

PEER-STI/2010-10; UUT-1

Model Line	Model Number	Manufacturer
CGAM	26	Trane

Product Construction Summary

Carbon Steel Base Frame, Carbon Steel Panels

Options / Subcomponent Summary

Compressor: Trane ; Control Panel: Trane ; Evaporator: Swep ; Fan: King's Eco Plastics ; Fan Motor: Regal Beloit ; Coil: Trane

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
2111	113.8	50.4	84.7	2.2	1.7	3.8

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 2019	ICC-ES AC156	1.85	1.00	1.5	2.96	2.22	1.85	0.74

Test Mounting Details

UUT base mounted to Qty (4) VMC MSSH-1E Spring Vibration Isolators. Isolators bolted to shake table (QTY-16, 5/8"-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-2

Trentec Q9019.0; UUT-1

Model Line	Model Number	Manufacturer
CGAM	120	Trane

Product Construction Summary

Carbon Steel Base Frame, Carbon Steel Panels

Options / Subcomponent Summary

Compressor: Trane ; Control Panel: Trane ; Evaporator: Swep ; Fan: King's Eco Plastics ; Fan Motor: Regal Beloit ; Coil: Trane

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
6500	165.9	88.9	92.5	2.4	1.3	4.7

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 2019	ICC-ES AC156	1.85	1.00	1.5	2.96	2.22	1.85	0.74

Test Mounting Details

UUT base mounted to Qty (6) VMC M2SS-1E Spring Vibration Isolators. Isolators bolted to shake table (QTY-24, 5/8"-Dia, SAE Grade 8 Bolts).



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