



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT  
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC  
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP – 0128-10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Trane

Manufacturer's Technical Representative: Shawn Jennings

Mailing Address: 101 William White Boulevard, Pueblo CO 81001

Telephone: 719-585-4392 Email: Shawn.jennings@irco.com

Product Information

Product Name: CGAM

Product Type: Air Cooled Liquid Chiller with Scroll Compressors

Product Model Number: Sizes 20 Ton to 120 Ton

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

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

Mounting Description: Base mounted on external spring vibration isolators.

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John Wilson, Jr.

Mailing Address: 113 Main Street, Bloomindale NJ 07403

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

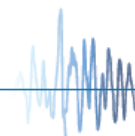
I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant:  Date: 12-1-16

Title: CEO Company Name: The VMC Group

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

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY  
OSH-FD-759 (REV 12/16/15)



OSHPD

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## 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: SE2851

Mailing Address: 980 9<sup>th</sup> Street, 16<sup>th</sup> Floor, Sacramento CA 95814

Telephone: 916-449-9918 Email: Ken.tarlow@thevmcgroup.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): \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

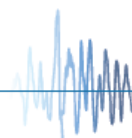
### Testing Laboratory

Company Name: UC Berkeley & Trentec

Contact Name: Don Clyde (UC Berkeley) & Timothy Geers (Trentec)

Mailing Address: 1301 South 46<sup>th</sup> Street, Richmond CA 94804 & 4600 East Tech Drive, Cincinnati OH 45245

Telephone: 510-665-3414 & 513-528-7900 Email: [dcl Clyde@berkeley.edu](mailto:dcl Clyde@berkeley.edu) & [tgeers@curtisswright.com](mailto:tgeers@curtisswright.com)





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

OSH-FD-759 (REV 12/16/15)

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### Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: ☒ Yes ☐ No

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

$S_{DS}$  (Design spectral response acceleration at short period, g) = 1.85

$a_p$  (In-structure equipment or component amplification factor) = 2.5

$R_p$  (Equipment or component response modification factor) = 2.0

$\Omega_0$  (System overstrength factor) = 1.5

$I_p$  (Importance factor) = 1.5

$z/h$  (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = See attachment

Overall dimensions and weight (or range thereof) = See attachment

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) = \_\_\_\_\_

$C_d$  (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): \_\_\_\_\_

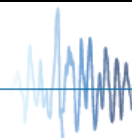
### OSHDP Approval (For Office Use Only) – Approval Expires on December 31, 2022

Signature: M. R. Karim Date: 2/6/2017

Print Name: M. R. Karim Title: SHFR

Special Seismic Certification Valid Up to :  $S_{DS}$  (g) = 1.85  $z/h$  = 1.0

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



**Table 1 - Product Matrix**

Chiller Model	Unit Size	Max Dimensions Within Range						UUT
		Efficiency	Length (in)	Width (in)	Height (in)	Estimated Max Operating Weight (lbs)	Shake Tested Weight (lbs)	
CGAM	020	High	113.8	50.4	84.7	2209		extrapolated
	026	High	113.8	50.4	84.7	2280	2111	1
	030	High	149.8	50.4	84.7	2879		interpolated
	035	High	149.8	50.4	84.7	2921		interpolated
	040	High	113.8	88.4	84.8	3697		interpolated
	052	High	113.8	88.4	84.8	3805		interpolated
	060	High	149.8	88.4	84.8	5033		interpolated
	070	High	149.8	88.4	84.8	5121		interpolated
	080	High	143.1	88.9	92.6	5692		interpolated
	090	High	143.1	88.9	92.6	5961		interpolated
	100	High	165.9	88.9	92.5	6759		interpolated
	110	High	165.9	88.9	92.5	6845		interpolated
	120	High	165.9	88.9	92.5	6883	6500	2

**Table 2 - Compressors**

Size	Voltage/freq	Manufacturer	UUT
10T LC	all- see unit voltage below	Trane	extrapolated
13T LC	all- see unit voltage below	Trane	1
15T LC	all- see unit voltage below	Trane	interpolated
15T	all- see unit voltage below	Trane	interpolated
20T	all- see unit voltage below	Trane	interpolated
25T	all- see unit voltage below	Trane	interpolated
30T	all- see unit voltage below	Trane	2
30T LSPM	all- see unit voltage below	Trane	extrapolated

**Table 3 - Unit Voltages**

Voltage/Frequency	UUT
200/60	extrapolated
230/60	extrapolated
380/60	extrapolated
400/50	extrapolated
460/60	1 & 2
575/60	extrapolated

All active components are identical across all voltages. Differences are in wiring.

**Table 4a - Control Panel Construction**

Unit Size	Dimensions (mm)			Material	Manufacturer	UUT
	L	W	H			
20-35T	948	213	1090	2mm Steel enclosure and doors	Trane	1
40-70T	1905	213	830	2mm Steel enclosure and doors	Trane	interpolated
80-130T	2254	284	829	2.5mm Steel enclosure and 2mm steel doors	Trane	2

**Table 4b - Control Panel Components**

Description	Mfr/Model	Input Voltage	Output Rating Range [Voltage/Current/Power]	UUT
Operator Interface (Main Controller)	Dynaview CH530	24 VDC	N/A	1 & 2
Transformer	Precision, Inc X13560266xxx	200/230/380/400/460/575 VAC	115/24 VAC 60hz, 110/24 VAC 50hz	1 & 2
Circuit Breaker	Schneider PowerPact	200/230/380/400/460/575 VAC	200/230/380/400/460/575 VAC	1 & 2
Remote Interface Modules	BacNet, LonTalk, Tracer	24 VDC	N/A	1 & 2
Fan VFD	Trane/Danfoss TR1	200/230/380/400/460 VAC	200/230/380/400/460 VAC	2
Compressor Contactors	Schneider Tesys D	200/230/380/400/460/575 VAC	200/230/380/400/460/575 VAC	1 & 2

**Table 5 - Evaporators**

Style	Model	LxWxH (maximum) (mm)	Max # of plates	Maximum weight (lb)	Plate and connection material	Manufacturer	UUT
Brazed plate heat exchanger	P80	119x299x526	96	46	Stainless Steel	Swep	1
Brazed plate heat exchanger	DP200	243x370.5x525	78	93	Stainless Steel	Swep	interpolated
Brazed plate heat exchanger	DP400	304x651x694	222	350	Stainless Steel	Swep	2

**Table 6a - Fans**

Trane Number	Model Number	Material	Manufacturer	UUT
X38011041030	Skinny IV Fan	Plastic	King's Eco Plastics	1 & 2

**Table 6b - Fan Motors**

Trane Number	Model Number	Output Rating [HP]	Input Voltage [VAC]	Weight (lbs.)	Type	Manufacturer	UUT
X70371174010	P56AE86A05R or similar	1.3	200-230 VAC	48	TEAO	Regal Beloit	extrapolated
X70371174020	P56AE87A05R or similar	1.3	380 VAC	48	TEAO	Regal Beloit	extrapolated
X70371174030	P56AE89A05R or similar	1.3	575VAC	47	TEAO	Regal Beloit	extrapolated
X70371174040	P56AE86A05R or similar	1.3	400-480VAC	47	TEAO	Regal Beloit	1 & 2
X70371174050	P56AE94A05R or similar	1.3	400-480VAC	48	TEAO	Regal Beloit	extrapolated
X70371175010	P56AE90A05R or similar	1.3	200-230 VAC	51	TEAO 2 Speed	Regal Beloit	extrapolated
X70371175030	P56AE92A05R or similar	1.3	400-480VAC	51	TEAO 2 Speed	Regal Beloit	extrapolated

All part numbers represent the same motor, but with different internal wiring.

**Table 7 - Condenser Coils**

Unit Size	LxWxH (mm) each coil	Rows	Type	Manufacturer	Material	UUT
20T, 26T	2311x115x1727	2 or 3	Round tube and fin	Trane	Fins- Al; Tubes; Cu; Frame- Steel	1
30T, 35T	3226x115x1727	2 or 3	Round tube and fin	Trane	Fins- Al; Tubes; Cu; Frame- Steel	interpolated
40T, 52T	2311x115x1727	2 or 3	Round tube and fin	Trane	Fins- Al; Tubes; Cu; Frame- Steel	interpolated
60T, 70T	3226x115x1727	2 or 3	Round tube and fin	Trane	Fins- Al; Tubes; Cu; Frame- Steel	interpolated
80T, 90T	3075x115x1070	3	Round tube and fin	Trane	Fins- Al; Tubes; Cu; Frame- Steel	interpolated
100T, 110T, 120T	3659x115x1067	3	Round tube and fin	Trane	Fins- Al; Tubes; Cu; Frame- Steel	2



## UNIT UNDER TEST (UUT) Summary Sheet

**UUT-1**

VMA-45097-A3

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 <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	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-650 Spring Vibration Isolators. Isolators bolted to shake table (QTY-16, 5/8"-Dia, SAE Grade 5 Bolts).



All units were filled with contents and maintained structural integrity and functionality after shake table test.



## UNIT UNDER TEST (UUT) Summary Sheet

**UUT-2**

VMA-45097-A3

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 <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	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-6500N Spring Vibration Isolators with 2-1/2"X5"X1/4" shim. Isolators bolted to shake table (QTY-24, 5/8"-Dia, SAE Grade 5 Bolts).



All units were filled with contents and maintained structural integrity and functionality after shake table test.