

# OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC	OFFICE USE ONLY
CERTIFICATION PREAPPROVAL (OSP)	APPLICATION #: OSP-0367
OSHPD Special Seismic Certification Preapproval (OSP)	
Type: New X Renewal	
Manufacturer Information	
Manufacturer: Trane Commercial Systems	
Manufacturer's Technical Representative: Wyatt Martinez	
Mailing Address: 101 William White Boulevard, Pueblo, CO 81001	
Telephone: (719) 585-4374 Email: wyatt.martinez@	∂trane.com
FORCODECO	ha
Product Information	1p1
Product Name: Chillers OSHPD	The second se
Product Type: Chillers - Air Cooled OSP-0367	CF
Product Model Number: RTAC 140-500 Ton	
General Description: Hermetic rotary refrigeration machines which prov	ide chilled water for water cooling systems.
Mounting Description: Base mounted on seismic elastomeric isolators or	base mounted on seismic spring isolators.
Tested Seismic Enhancements: DATE: 07/28/2021 Seismic enhancements made to the test anomalies during the tests shall be inco	st units and/or modifications required to address prorated into the production units.
Applicant Information	DH.
Applicant Company Name: VMC Group	
Contact Person: John Giuliano	
Mailing Address: 113 Main Street, Bloomingdale, NJ 07403	
Telephone: (973) 838-1780 Email: john.giuliano@tl	hevmcgroup.com
Title: President	

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

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY

OSP-0367

**OSHPD** 



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

California Licensed Structural Engineer Res	sponsible 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, Sacrar	mento, CA 95814
Telephone: (832) 627-2214	Email: ken.tarlow@thevmcgroup.com
Certification Method	
GR-63-Core X ICC-ES AC156	IEEE 344         IEEE 693         NEBS 3
Other (Please Specify):	
	EDRCODECO
Testing Laboratory	AND,
Company Name: UNIVERSITY OF CALIFORNIA, I	BERKELEY (PEER)
Contact Person: Wesley Neighbour	OSB 0267
Mailing Address: 1301 S. 46th Street, Building 420	, Richmond CA 94804
Telephone: (510) 665-3409	Email: _peer_center@berkeley.edu
DA	ATE: 07/28/2021
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OR	NUM CODY
	BUILDING

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Seismic Parameters								
Design Basis of Equipment or C	omponents	s (Fp/Wp) =	1.37 for Neoprene, 1.7	71 for Spring	Isolated			
SDS (Design spectral response acceleration at short period, g) = 2.28								
ap (Amplification factor) =		2.5						
Rp (Response modification	n factor) =	2.5 (for Ne	oprene); 2.0 (for Spring	Isolated)				
$\Omega_0$ (System overstrength f	actor) =	2.0						
Ip (Importance factor) =		1.5						
z/h (Height ratio factor) =		0						
Natural frequencies (Hz) =	=	See attach	iment					
Overall dimensions and w	eight =	See attach	mentCODE					
		EWEDF	CHDD	01/7				
OSHPD Approval (For Office	e Use Only	() - Approv	al Expires on 12/31/2	2025				
Date: 7/28/2021	A		OSP-0367	m				
Name: Mohammad Karim				Title:	Supervisor, Health Facilities			
Special Seismic Certification Val	lid U <mark>p to: S</mark>	DS (g) = $2.2$	28 28	z/h =	0			
Condition of Approval (if applical	ble):	DATE	: 07/28/2021					
	Cr	T. KORNI,	A BUILDING CO	DE-201				



Model	Model Nominal Capacity [Tons] Type <sup>1</sup> Freq Wi [Hz] Ope Co		Tuno <sup>1</sup> Freq Without		leasured Weight Max Without Operating			ns	S <sub>DS</sub> [g]	z/h	
liouol			Operating Weight Content [ lbs ] [ lbs ]		Length	Width	Height	Spring Isolators	2.11		
RTAC 140 SE	140	Standard	60	NIA FO	11,077 -	C196	89	98	2.28	0.0	Extrapolated
RTAC 140 HIGH	140	High	60		11,140	196	89	98	2.28	0.0	Extrapolated
RTAC 155 SE	155	Standard	60	10,300		196	89	98	2.28	0.0	UUT-01A, -01B
RTAC 170 SE	170	Standard	60 🦯		11,211	196	89	98	2.28	0.0	Interpolated
RTAC 155 HIGH	155	High	60		12,417	232	89	98	2.28	0.0	Interpolated
RTAC 170 HIGH	170	High	60 0-		S12,5636	7 232	89	98	2.28	0.0	Interpolated
RTAC 140 XE	140	XE	60		12,557	232	89	98	2.28	0.0	Interpolated
RTAC 185 SE	185	Standard	60		12,884	232	89	98	2.28	0.0	Interpolated
RTAC 200 SE	200	Standard	60	BY: Mo	ha13,1860	232	89	98	2.28	0.0	Interpolated
RTAC 185 HIGH	185	High	60	//////////////////////////////////////	14,298	268	89	98	2.28	0.0	Interpolated
RTAC 155 XE	155	XE	6 <mark>0</mark>	DATE.	-14,306	268	89	98	2.28	0.0	Interpolated
RTAC 200 HIGH	200	High	60	DATE.	14,676	268	89	98	2.28	0.0	Interpolated
RTAC 170 XE	170	XE	60	Ν/Α	14,698	268	89	98	2.28	0.0	Interpolated
RTAC 225 SE	225	Standard	60		14,671	268	89	98	2.28	0.0	Interpolated
RTAC 250 SE	250	Standard	60		14,937	268	89	98	2.28	0.0	Interpolated
RTAC 275 SE	275	Standard	60	RAU	19,613	360	89	98	2.28	0.0	Interpolated
RTAC 225 HIGH	225	High	60	, VA	16,392	G362	89	98	2.28	0.0	Interpolated
RTAC 185 XE	185	XE	60		16,382	362	89	98	2.28	0.0	Interpolated
RTAC 250 HIGH	250	High	60		16,392	362	89	98	2.28	0.0	Interpolated
RTAC 200 XE	200	XE	60		16,351	362	89	98	2.28	0.0	Interpolated
RTAC 275 HIGH	275	High	60		21,023	432	89	98	2.28	0.0	Interpolated
RTAC 250 XE	250	XE	60		20,558	432	89	98	2.28	0.0	Interpolated
RTAC 300 SE	300	Standard	60		21,181	432	89	98	2.28	0.0	Interpolated
RTAC 350 SE 500-T Evaporator	Modified 350	Standard	60	22,000	25,984	432	89	98	2.28	0.0	UUT-02A, -02B

### **Table 1- RTAC Chiller Matrix**

#### Notes:

1. High and XE units use identical components and structure as standard units, just different combinations or quantities of the same interpolated sub-components.

2. UUT-02A & 02B were RTAC 350 SE structures that were tested with the 500 Ton Evaporator

Top Box (all models)       30" x 25" x 9"       0.072" Galvanized Carbon Steel Enclosure; 0.0785"       UUT-01A, -01B, -02A, -0         Trane       230/380/460       Galvanized Carbon Steel Door; 0.108" Galvanized       UUT-01A, -01B, -02A, -0	Description	Manufacturer	WxHxD	Input Voltage [ VAC ]	Enclosure Material	UUT
Carbon Steel Backpanel	Top Box (all models)	Trane	30" x 25" x 9"	230/380/460	0.072" Galvanized Carbon Steel Enclosure; 0.0785" Galvanized Carbon Steel Door; 0.108" Galvanized	UUT-01A, -01B, -02A, -02B
Bottom Box (all models)         88 x 34 x 10.5"         UUT-01A, -01B, -02A, -03	Bottom Box (all models)		88" x 34" x 10.5"	20005	Carbon Steel Backpanel	UUT-01A, -01B, -02A, -02B

### **Table 2a - Control Panel Construction**

## Table 2b - Control Panel Components

Description	Manufacturer	Input Voltage [ VAC ]	Output Rating [RLA]	UUT				
Operator Interface	Dynaview	240	N/A	UUT-01A, -01B, -02A, -02B				
VFD	Danfoss TR1	200/230/380/460	200/230/380/460	UUT-01A, -01B, -02A, -02B				
Transformer	Eaton/Cutler Hammer or	230/380/460	120/240	UUT-01A, -01B, -02A, -02B				
X-Line Starter	Trane	200/230/380/460	200/230/380/460	UUT-02A, -02B				
Y-Delta Starter	Trane	Ry 230/380/460nad K	arim 200/230/380/460	UUT-01A, -01B				
Motor Starter	Trane	230/380/460	200/230/380/460	UUT-01A, -01B, -02A, -02B				
Disconnect	Schneider PowerPact	230/380/460	200/230/380/460	UUT-01A, -01B, -02A, -02B				
Terminal Block	Marathon	DA 230/380/4608/202	200/230/380/460	UUT-01A, -01B, -02A, -02B				
Circuit Breaker	Schneider PowerPact	230/380/460	200/230/380/460	UUT-01A, -01B, -02A, -02B				
Table 3 - Compressors								

## Table 3 - Compressors

Description	Manufacturer	Туре	Input Voltage [ VAC ]	Output Rating [RLA]	UUT
M3			ARUNDING	275X/300H/350S	UUT-01A, -01B
M4	Trano	Potony	200 460	139 - 320	UUT-01A, -01B
N3	Tane	Kolary 200 - 400	168 - 386	UUT-02A, -02B	
N4				350H/300X	UUT-02A, -02B

### **Table 4 - Condenser Coils**

Manufacturer	Length	Height x Depth	Fin Material	Tube Material & Diameter	# Rows	UUT
Trane	9' (shortest) 21' (longest)	42"x5"	0.0042" Thick Aluminum	Copper, 3/8" OD	3	UUT-01A, -01B UUT-02A, -02B

## Table 5 - Evaporators

Description	MFR	Arrangement	Shell Diameter & Wall Dimensions [ in ]	Tons/Eff	UUT
M1	Trane	2 or 3 pass	17.5 / 0.23	0.072" Galvanized Carbon Steel Enclosure; 0.0785" Galvanized Carbon Steel Door; 0.108" Galvanized Carbon Steel Backpanel	Extrapolated
M2	Trane	2 or 3 pass	17.5 / 0.23	130H/ <b>155S</b>	UUT-01A, -01B
N1	Trane	2 or 3 pass	17.5 / 0.23	140G/170S	Interpolated
N2	Trane	2 or 3 pass	17.5 / 0.23	155H	Interpolated
N3	Trane	2 or 3 pass	17.5 / 0.23	170H/140X	Interpolated
N4	Trane	2 or 3 pass	17.5 / 0.23	185S	Interpolated
N5	Trane	2 or 3 pass	17.5 / 0.23	200S	Interpolated
N6	Trane	2 or 3 pass	17.5 / 0.23	185H/155X	Interpolated
Y-Delta Starter	Trane	2 or 3 pass	0 17.5 / 0.23	225S	Interpolated
N8	Trane	2 or 3 pass	17.5 / 0.23	200H/170X/185X /225H/250S/250H	Interpolated
R1	Trane	2 or 3 pass	23 / 0.23	250S	Interpolated
R2	Trane 🦯	2 or 3 pass	23 / 0.23	275S	Interpolated
R3	Trane	2 or 3 pass	23/0.23	250H/200X	Interpolated
R4	Trane	2 or 3 pass	23/0.23	300S	Interpolated
R5	Trane	2 or 3 pass	23 / 0.23	275H/250X	Interpolated
R6	Trane	2 or 3 pass	amm 23 / 0.23m	275X/300H/350S	Interpolated
T1	Trane	2 or 3 pass	26.5 / 0.23	350S	Interpolated
T2	Trane	2 or 3 pass	26.5 / 0.23	375S	Interpolated
T3	Trane	2 or 3 pass	7/2826.570.23	350H/300X	Interpolated
T4	Trane	2 or 3 pass	26.5 / 0.23	400S	Interpolated
T5	Trane	2 or 3 pass	26.5 / 0.23	375H	Interpolated
T6	Trane	2 or 3 pass	26.5 / 0.23	450S	Interpolated
T7	Trane	2 or 3 pass	26.5 / 0.23	350X/400H/450H/ <b>500S</b>	UUT-02A, -02B

Note: All tubes are 1" Copper with 0.025" Wall A BUILDING

## Table 6a - Fans

Description	MFR	# Blades	Blade Material	UUT
Standard	Revcor	3	Aluminum	UUT-01A, -01B, -02A, -02B
Low Noise	Kenco	9	Plastic	UUT-01A, -01B, -02A, -02B

## Table 6b - Fan Motors

Model Number	MFR	Output Rating	Input Voltage [VAC ]	Туре	UUT
P56C75A05	AO Smith Corp.	1.5 HP	200 - 230	TEAO	UUT-01A,-01B
P56C76A05	AO Smith Corp.	1.5 HP	380	TEAO	Interpolated
P56C77A05	AO Smith Corp.	1.5 HP	460	TEAO	UUT-02A, -02B
P56AD62A05	AO Smith Corp.	1.5 HP	200 - 230	TEAO Inverter Duty	UUT-01A, -01B
P56AD64A05	AO Smith Corp.	1.5 HP	380 - 460	TEAO Inverter Duty	UUT-02A, -02B

ALTHED BC CE	ROUP		UN	IT UNI Sumi	DER TE mary S	EST (U) Sheet	UT)	ا Neop)	JUT-01 <i>I</i> rene Isc	A plated)
									PEER	STI 2013-15
N	er		Ν	Manufacture	r					
RTAC A	ir-Cooled Chill	ers		F	RTAC 155 S	E		Tran	e (Ingersoll F	Rand)
			P	roduct Con	struction S	Summary				
Galvanized car	bon steel, mou	inted on a w	elded struct	ural carbon	steel base					
			Opt	tions / Subo	component	Summary				
Control Panels,	Compressors,	Condenser	Coils, Evapo	orators, Fan	is, Fan Mot	ors, Input Vo	ltage 200-46	0VAC		
				UUT	Properties			-		
Measured				Dimensio	ons [ in. ]	COA		Lowes	st Nat. Freq	[ Hz ]
Weight Without Operating Content [Ibs.]	Max Operating Weight [ lbs. ]	Leng	gth	OWid	ath+P	He	ight	F-B	S-S	v
10,300	11,116	5	058	9-0 <del>36</del>	(	98	6.4	5.8	11.2	
			UUT High	nest Passed	d Seismic I	Run Informa	ation			
Building	Code	riteria BY	\$ <sub>DS</sub> (g) a	mnz/ad	Karim	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 2	2019	ICC-ES	AC156	2.28	0	1.50	2.28	0.91	1.52	0.61
UUT-01A was b UNC Grade 8 B on center lengt	polted to the test polted. The distant h-wise. The bold	at fixture bear ince between ts were space to were space to were space to were space to were space to were space to were space	ams through the first set ced 86" on c	3/4"- thick \ c of bolts was enter width-	Anting Der MC Group s 46" on cer wise.	Shear Flex hter length-v	Elastomeric I vise while the	Neoprene Iso remaining b	olators using olts were sp	(8) 5/8" aced 53"
ine UUI was	operational b the co	erore and a mponent a	nd attachme	g and was f ent system	and force-	resisting sy	stems were	maintained	structural I	ntegrity of

THE CERT	GROUP		UNIT UNDER TEST (UUT) Summary Sheet				UUT-01B (Spring Isolated)		
								PEER	STI 2013-15
	Model Line		N	lodel Numb	er		Manufacturer		
RTAC	Air-Cooled Chil	llers	RTAC 155 SE				Trane (Ingersoll Rand)		
		I	Product Co	nstruction \$	Summary				
Galvanized ca	arbon steel, mo	unted on a welded	structural carbor	n steel base					
			Options / Sub	componen	t Summarv				
Control Panels	s, Compressors	s, Condenser Coils,	Evaporators, Fa	ins, Fan Mot	ors, Input Vo	oltage 200-46	60VAC		
			UU.	T Properties	6				
Measured			Dimensi	ons [ in. ]	CON		Lowest Nat. Freq. [ Hz ]		
Weight Without Operating Content [Ibs.]	Max Operating Weight [ Ibs. ]	Length	Ow	Owidth P		Height		S-S	~
10,300	11,116	195	<u>Q</u>	89 98		98	3.1	3.2	6.1
	· · ·	UU	T Highest Passe	ed Seismic	Run Inform	ation			
Building Code		T <mark>est Cr</mark> iteria	BY: S <sub>DS</sub> (g) 2	mnz/nad	Karım	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	CBC 2019		2.28	0 1/28/20	1.50 D1	2.28	0.91	1.52	0.61
			Test M	ounting De	tails				
beams using ( while the rema	boited to eight 16) 5/8" UNC C aining distances	Fixture	orators using (8) isolator). The di- ors were 53" on	orace betw stance betw center lengt	A Roa. The seen the first h-wise. The	spring isolato set of isolato isolators were	rs were bolte rs was 46" o e spaced 86°	ea to the test n center leng " on center w	nxture gth-wise ridth-wise.
The UUT was	s operational I the co	before and after sh omponent and atta	naking and was achment system	full of oper and force	ating conte resisting sy	ent during the ystems were	e tests. The maintained	structural i I.	ntegrity of



D IBC CEAN	GROUP	U	NIT UNI Sum	DER TE mary S	EST (U) Sheet	UT)	ا Spr)	UUT-02E ing Isola	3 ated)	
								PEER	STI 2013-15	
	Model Line		Model Number				Manufacturer			
RTAC A	Air-Cooled Chil	lers	RTAC 350 SE 500-T Evaporator					Trane (Ingersoll Rand)		
		•	Product Con	struction S	Summary					
Galvanized ca	rbon steel, mou	unted on a welded strue	ctural carbon	steel base						
Control Panels	Compressors	O Condenser Coils Eva	ptions / Sub	component	Summary	ltage 200-46				
	, 001101033013		100101013, 1 01	13, 1 411 100	oro, input ve	Mage 200-40	0140			
			UUT	Properties	5					
Measured			Dimensio	ons [ in. ]	COL		Lowest Nat. Freq. [ Hz ]			
Weight Without Operating Content [lbs.]	Max Operating Weight [ Ibs. ]	Length	Owie	ath P	Height		F-B	S-S	v	
22,000	25,984	435	-0	P-036 9	98		2.8	3.0	4.9	
		UUT Hi	ghest Passe	d Seismic I	Run Inform	ation			L	
Building Code T		T <mark>est Cr</mark> iteria B	S <sub>DS</sub> (g) a	mn <sub>z/n</sub> d	Karim	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 2	2019	ICC-ES AC156	2.28	0	1.50	2.28	0.91	1.52	0.61	
			Test Mo	Dunting Det	ails					
UUT-02b was I beams using (4 86" apart on ce	bolted to twelve ta) 5/8" UNC G enter width-wise	e MSSH-1E spring isola rade 8 bolts (4 per isol a.	ators using (12 ator). The bol	2) 5/8" Grac ts were spa	le 2 Rod. Th ced 140", 10	e spring isola po", 90", and	ators were bo 71" apart on	blted to the te center lengt	∍st fixture h-wise, and	
The UUT was	s operational b the c	before and after shaki component and attach	ng and was t ment system	full of oper and force	ating conte resisting s	nt during the ystems was	e tests. The maintained	structural i	ntegrity of	