



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR HCAI SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0167

HCAI Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: SMARDT, Inc.

Manufacturer's Technical Representative: Greg Tutwiler

Mailing Address: 1840 Trans Canada Highway, Dorval, QC H9P 1H7

Telephone: (514) 519-6012

Email: Greg.Tutwiler@smardt.com

Product Information

Product Name: Chillers

Product Type: Chillers - Water Cooled

Product Model Number: WA/WB/WE/HE 026 through WA/WB/WE/HE 500

General Description: Narrow and side-by-side water-cooled chillers.

Mounting Description: With Neoprene Pad, Floor Mounted

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

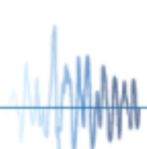
Contact Person: John Giuliano

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)

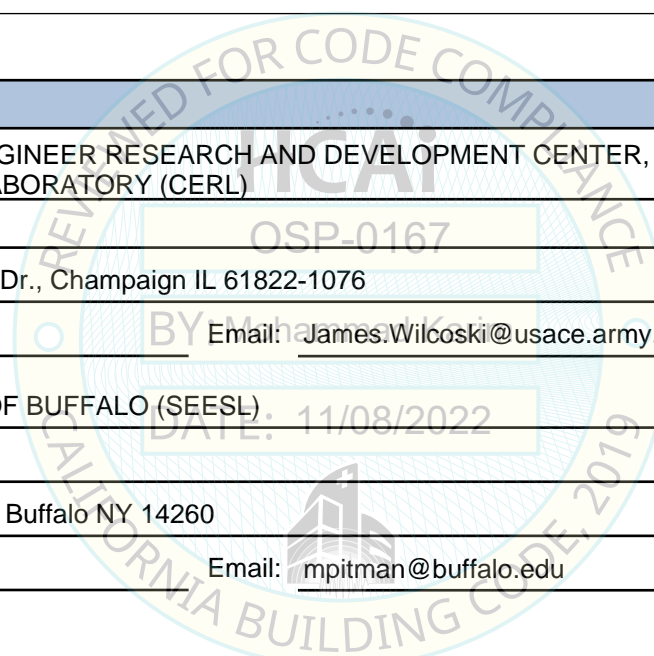
Company Name: THE VMC GROUP
Name: Kenneth Tarlow California License Number: S2851
Mailing Address: 980 9th Street, 16th Floor, Sacramento, CA 95814
Telephone: (832) 627-2214 Email: ken.tarlow@thevmcgroup.com

Certification Method

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

Testing Laboratory

Company Name: U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER, CONSTRUCTION ENGINEERING RESEARCH LABORATORY (CERL)
Contact Person: James Wilcoski
Mailing Address: 2902 Newmark Dr., Champaign IL 61822-1076
Telephone: (217) 373-6763 Email: James.Wilcoski@usace.army.mil
Company Name: UNIVERSITY OF BUFFALO (SEESL)
Contact Person: Mark Pitman
Mailing Address: 212 Ketter Hall, Buffalo NY 14260
Telephone: (716) 645-4377 Email: mpitman@buffalo.edu





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 3.53

SDS (Design spectral response acceleration at short period, g) = 1.96

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 2.5

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

HCAI Approval (For Office Use Only) - Approval Expires on 11/08/2028

Date: 11/8/2022

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: SDS (g) = 1.96 z/h = 1

Condition of Approval (if applicable): DATE: 11/08/2022

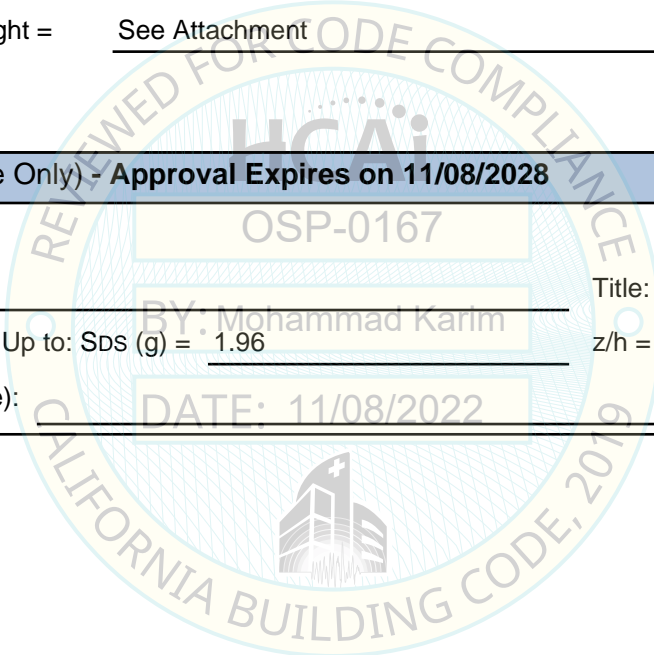


Table 1 - Certified Components: Water-Cooled Chillers

Model	Max Rating [Tons]	Configuration	Max Package Dimensions [in]			Max Weight [lbs]	z/h = 1.0 S _{ps}	UUT
			Length	Width	Height			
WA/WB/WE/HE 026	75	N	90	46	80	4,700	2.00	UUT-2
WA/WB/WE/HE 044	170	N	149	50	81	8,860	1.96	Interpolated
WA/WB/WE/HE 095	290	S	147	64	69	11,500	1.96	Interpolated
WA/WB/WE/HE 125	341	S	182	74	72	14,650	1.96	Interpolated
WA/WB/WE/HE 130	390	S	167	64	71	12,910	1.96	Interpolated
WA/WB/WE/HE 130	390	S	153	54	94	10,810	1.96	Interpolated
WA/WB/WE/HE 140	422	S	166	78	77	14,900	1.96	Interpolated
WA/WB/WE/HE 180	511	S	221	80	83	16,675	1.96	Interpolated
WA/WB/WE/HE 190	599	S	182	77	74	18,300	1.96	Interpolated
WA/WB/WE/HE 190	568	S	182	77	74	18,300	1.96	Interpolated
WA/WB/WE/HE 200	580	S	181	79	74	17,500	1.96	Interpolated
WA/WB/WE/HE 200	580	S	182	79	74	17,475	1.96	Interpolated
WA/WB/WE/HE 240	646	S	239	87	78	21,000	2.00	UUT-1
WA/WB/WE/HE 240	597	S	221	84	74	21,640	1.96	Interpolated
WA/WB/WE/HE 240	700	S	182	89	80	22,180	1.96	Interpolated
WA/WB/WE/HE 260	739	S	203	99	77	23,320	1.96	Interpolated
WA/WB/WE/HE 260	750	S	260	75	97	26,650	1.96	Interpolated
WA/WB/WE/HE 340	841	S	225	89	77	29,775	1.96	Interpolated
WA/WB/WE/HE 400	1050	S	228	104	99	34,250	1.96	Interpolated
WA/WB/WE/HE 500	1400	S	229	113	106	42,800	1.96	UUT-3

Table 2 - Certified Subcomponents

Component	Manufacturer	Part/Model Number	Description	Size	Material	Weight [lb]	UUT
Evaporators	SMARTD	WA/WB/WE/HE026	Shell and Tube - Flooded	78"L x 20"D	Carbon Steel	2,600	UUT-01
		WA/WB/WE/HE 044		126"L x 22"D		3,780	Interpolated
		WA/WB/WE/HE 095		126"L x 26"D		5,000	Interpolated
		WA/WB/WE/HE120		157"L x 26"D		6,150	Interpolated
		WA/WB/WE/HE 130		142"L x 26"D		5,450	Interpolated
		WA/WB/WE/HE130		126"L x 26"D		5,080	Interpolated
		WA/WB/WE/HE140		142"L x 30"D		5,760	Interpolated
		WA/WB/WE/HE180		197"L x 28"D		8,900	Interpolated
		WA/WB/WE/HE190		157"L x 30"D		8,620	Interpolated
		WA/WB/WE/HE190		157"L x 30"D		7,900	Interpolated
		WA/WB/WE/HE200		157"L x 30"D		9,550	Interpolated
		WA/WB/WE/HE200		157"L x 30"D		7,900	Interpolated
		WA/WB/WE/HE240		197"L x 32"D		10,170	UUT-02
		WA/WB/WE/HE240		197"L x 32"D		9,050	Interpolated
		WA/WB/WE/HE260		157"L x 32"D		11,120	Interpolated
		WA/WB/WE/HE260		197"L x 30"D		17,470	Interpolated
		WA/WB/WE/HE340		236"L x 34"D		11,500	Interpolated
WA/WB/WE/HE400	197"L x 40"D	14,500	Interpolated				
WA/WB/WE/HE500	197"L x 44"D	17,680	UUT-03				
Condensers	SMARTD	WA/WB/WE/HE 026	Shell and Tube - Flooded	78"L x 16"D	Carbon Steel	2,050	UUT-01
		WA/WB/WE/HE044		126"L x 16"D		2,750	Interpolated
		WA/WB/WE/HE095		126"L x 20"D		3,750	Interpolated
		WA/WB/WE/HE120		157"L x 22"D		5,550	Interpolated
		WA/WB/WE/HE130		142"L x 22"D		3,900	Interpolated
		WA/WB/WE/HE130		126"L x 20"D		3,780	Interpolated
		WA/WB/WE/HE140		142"L x 26"D		4,950	Interpolated
		WA/WB/WE/HE180		197"L x 24"D		7,650	Interpolated
		WA/WB/WE/HE190		157"L x 24"D		8,100	Interpolated
		WA/WB/WE/HE190		157"L x 24"D		6,650	Interpolated
		WA/WB/WE/HE200		157"L x 24"D		6,650	Interpolated
		WA/WB/WE/HE200		157"L x 24"D		6,650	Interpolated
		WA/WB/WE/HE 240		197"L x 26"D		8,520	UUT-02
		WA/WB/WE/HE 240		197"L x 26"D		7,950	Interpolated
		WA/WB/WE/HE260		157"L x 26"D		11,950	Interpolated
		WA/WB/WE/HE 260		197"L x 26"D		13,350	Interpolated
		WA/WB/WE/HE340		236"L x 32"D		12,150	Interpolated
WA/WB/WE/HE400	197"L x 32"D	11,550	Interpolated				
WA/WB/WE/HE 500	197"L x 36"D	15,500	UUT-03				

Table 2 - Certified Subcomponents (Continued)

Component	Manufacturer	Part/Model Number	Description	Size	Material	Weight [lb]	UUT
Compressors	Danfoss	TTS300/TGS230	Turbocor compressor	31" x 20" x 19"	Aluminum	265	UUT-02
		TTH-375/TGH285	Turbocor compressor	31"x 23" x 19"		360	Interpolated
		TTS350/TG310/TGS490	Turbocor compressor	31" x 20" x 19"		290	Interpolated
		TTS400/TGS390	Turbocor compressor	31" x 20" x 19"		290	UUT-01
		TT-500	Turbocor compressor	31" x 20" x 19"		300	Interpolated
		TTS700/TGS520	Turbocor compressor	31" x 20" x 19"		300	Interpolated
		VTT 1600	Turbocor compressor	43" x 26" x 25"		1600	Interpolated
		VTX 1200/VTG1200	Turbocor compressor	43" x 26" x 30"		1600	UUT-03
Flow Controls	IFM	S115010	Thermal dispersion flow switch	4.4" x 2" x 2.5"	Carbon Steel	1	UUT-01
	Veris Industries	PW2XX05 S	Differential pressure transmitter	5.8" x 4" x 2.2"	Copper, Brass	1	UUT-01, UUT-02, UUT-03
Economizers	SMARDT	31-0103	Flash Tank Economizer	16" x 31.5"	Carbon Steel	287	UUT-03
Ball Valves	Henry Tech	937409	Ball Valve 1-1/8"	1 1/8"	Copper, Brass	4	UUT-01
Check Valves	RFF	P00769	CHECK VALVE 3-1/8"	3-1/8"	Cast Iron	8	UUT-02
		P02907	CHECK VALVE 4-1/8"	4-1/8"		12	UUT-01
	Bray	P04281	Waffer CHECK VALVE 6"	6"		17	UUT-03
Butterfly Valves	Bray	P04604	BUTTERFLY VALVE 4"	4"	Cast Iron	5	UUT-02
		P04603	BUTTERFLY VALVE 6"	6"		12	UUT-01
		P05100	BUTTERFLY VALVE 10"	10"		66	UUT-03
Solenoid Valve	Danfoss	P04279	SOLENOID VALVE	1-5/8"	Copper, Brass	10	UUT-01, UUT-02, UUT-03
Control Panel	Kiltech	E00586	2X Boxes	30" X 26" X 6"	Steel/Copper	290	UUT-02
		E00765	6X Boxes	30" X 26" X 6"		920	UUT-01
		E05450	7 Boxes	30" X 26" X 6"		800	UUT-03
Expansion Valve	Parker/Sporlan	P03102	EXPANSION VALVE 1-1/8" to 1-5/8"	1-1/8" to 1-5/8"	Copper, Brass	6	UUT-01, UUT-02
	Danfoss	P03808	ICM Valve 65B Module	3"	Steel/Plastic	14	UUT-03
Float Chamber Sensor	Henry Tech	P02852	Liquid Level Probe	N/A	Aluminum & Stainless Steel	3	UUT-01, UUT-02, UUT-03
Filter	Parker	P00327	Refrigerant Dryer Filter 1-1/8"	41 cu. in.	Copper	3	UUT-01, UUT-02, UUT-03
Cast Elbow Suction	Smardt	P04168	SUCT CAST ELBOW 4"	2-5/8" to 4"	Cast Aluminum	11	UUT-02
		P03658	SUCT CAST ELBOW 6"	3" to 6"		20	UUT-01
		P05047	SUCT CAST ELBOW 10"	6" to 9.75"		62	UUT-03
Cast Elbow Discharge	Smardt	P03235	DISCH. CAST ELBOW 3-1/8"	2.125" to 3.125"	Cast Aluminum	11	UUT-01, UUT-02
		P05046	DISCH. CAST ELBOW 6"	4" to 5.75"		32	UUT-03



UNIT UNDER TEST (UUT) Summary Sheet

UUT-1

Test Report: UB-SEESL-2011-03

Model Line	Model Number	Manufacturer
Water Cooled Chillers	SWA240-5HGB-22S	SMARTD Inc.

Product Construction Summary

Carbon Steel

Options / Subcomponent Summary

SMARTD: Evaporator, SMARTD: Condenser, Danfoss: Compressor, IFM & Veris Industries: Flow Controls, Henry Tech & GB Industries: Ball Valves, RFF: Check Valves; Bray: Butterfly Valves; Solenoid Valve: Danfoss, Control Panel: Kiltch, Parker: Expansion Valve, Henry Tech" Float Chamber Sensor, Parker: Filter, SMARTD: Cast Elbow Suction & Discharge

UUT Properties						
Weight [lb]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
21,000	239.0	87.0	78.0	8.4	4.9	8.0

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.34	0.54	

Test Mounting Details

UUT-1 was mounted to the shake table with 1/2" thick neoprene pads using (28) 1.125" diameter 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-2

Test Report: UB-SEESL-2011-03

Model Line	Model Number	Manufacturer
Water Cooled Chillers	SWA026-1BF2-44N	SMARTD Inc.

Product Construction Summary

Carbon Steel

Options / Subcomponent Summary

SMARTD: Evaporator, SMARTD: Condenser, Danfoss: Compressor, Veris Industries: Flow Controls, RFF: Check Valves; Bray: Butterfly Valves; Solenoid Valve: Danfoss, Control Panel: Kiltech, Parker: Expansion Valve, Henry Tech" Float Chamber Sensor, Parker: Filter, SMARTD: Cast Elbow Suction & Discharge

UUT Properties						
Weight [lb]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
4,700	90.0	46.0	80.0	7.8	11.3	13.6

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.34	0.54	

Test Mounting Details

UUT-2 was mounted to the shake table with 1/2" thick neoprene pads using (8) 1.125" diameter 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-3

Test Report: B6439022.00

Model Line	Model Number	Manufacturer
Water Cooled Chillers	SWB500.4U-1H.2A2AS-Q	SMARTD Inc.

Product Construction Summary

Carbon Steel

Options / Subcomponent Summary

SMARTD: Evaporator, SMARTD: Condenser, Danfoss: Compressor, Veris Industries: Flow Controls, SMARTD: Economizers; Bray: Check Valves; Bray: Butterfly Valves; Solenoid Valve: Danfoss, Control Panel: Kiltech, Danfoss: Expansion Valve, Henry Tech" Float Chamber Sensor, Parker: Filter, SMARTD: Cast Elbow Suction & Discharge

UUT Properties						
Weight [lb]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
42,800	229.0	113.0	106.0	9.3	9.5	8.7

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 2022	ICC-ES AC156	1.96	1.0	1.5	3.14	2.35	1.31	0.53	

Test Mounting Details

UUT-3 was mounted to the shake table with 1/2" thick neoprene pads using (16) 1.125" diameter Grade 5 bolts.



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

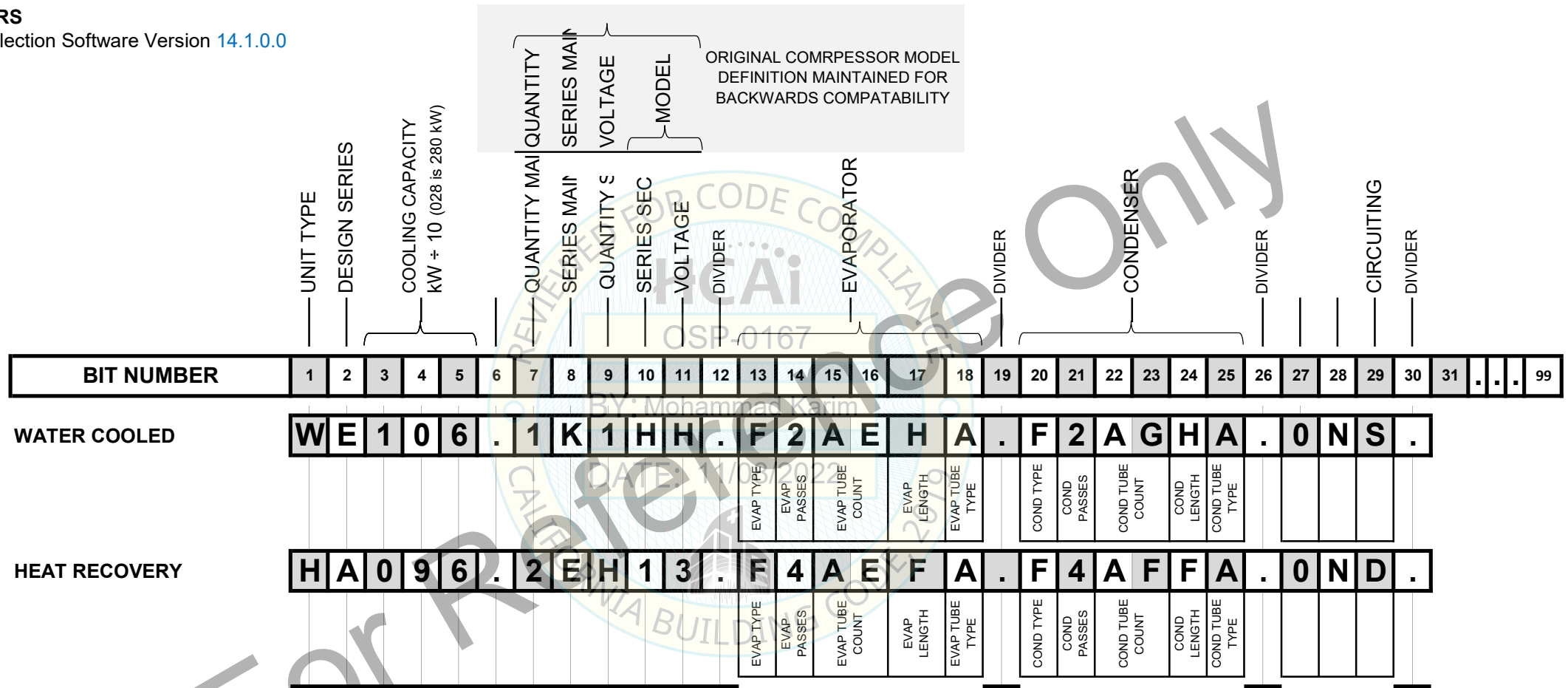


COMPRESSOR

MODEL NUMBERS

Smartd Chiller Selection Software Version 14.1.0.0

Displayed values:



WATER COOLED

WE106.1K1HH.F2AEHA.F2AGHA.0NS.

HEAT RECOVERY

HA096.2EH13.F4AEFA.F4AFFA.0ND.

UNIT TYPE # 1

- H ... Heat Recovery (Water Cooled Condenser)
- W ... Water cooled range, Indoor

Design Series # 2

- A ... First Design Series
- B ... Second Design Series
- E ... Third Design Series

COMPRESSOR SERIES # 8, #10

- (ASSIGNED BY SMARTD)
- A ... TGS-310
 - B ... TTS-300
 - D ... TTS-300 MT
 - E ... TTS-350
 - F ... TGS-230
 - G ... TGS-490
 - H ... TTS-400
 - J ... TGS-390
 - K ... TTS-700
 - L ... TT-500
 - M ... TGS-520
 - N ... TTH 375
 - O ... TTH 375 MT
 - P ... TGH 285
 - Q ... TGH 285 MT
 - U ... VTT 1200
 - V ... VTG 1200
 - X ... VTX 1600

COMPRESSOR VOLTAGE # 11

- (ASSIGNED BY TURBOCOR)
- D ... 380V 60 Hz
 - E ... 380V 50 Hz
 - F ... 575V 60 Hz
 - G ... 460V 60 Hz
 - H ... 400V 50Hz
 - J ... 400V 60Hz

ECONOMISER # 27

- T ... flash Tank economiser for full chiller

HEAT EXCHANGER TYPE # 13 & 20

- F ... Shell and tube (flooded)

CONDENSER TUBES # 25

- A ... 3/4" C+SL (0.63mm) - Cu - Wieland
- B ... 1" C+LW (0.63mm) - Cu - Wieland

EVAPORATOR TUBES # 18

- A ... 3/4" GEWA-B4 HSL (0.63) - Cu - Wieland
- B ... 1" GEWA-B4 HSL (0.63) - Cu - Wieland