APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0184 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Carrier Corporation

Manufacturer's Technical Representative: Anthony Molavi

Mailing Address: 9701 Old Statesville Road, Charlotte, NC 28269

Telephone: (704) 921-3976 Email: Anthony.Molavi@carrier.utc.com

Product Information

Product Name: Carrier AquaSnap Chillers & Gemini Splits Systems

Product Type: Air-Cooled Chillers & Split Systems

Product Model Number: 30RAP (10-150 tons), 30MPA (15-74), 30MPW(15-74), 38AP (25-130), 09DP (018-130), 30XA and 30XV (80-500)
(List all unique product identification numbers and/or part numbers)

General Description: Air-cooled chillers. Seismic enhancements made to the test units and modifications required to address anomalies observed during testing shall be incorporated in the production units.

Mounting Description: Rigid base mounted (30RAP, 30MPA, 30MPW, 38AP, 09DP, 30XA and 30XV)
Neoprene or rigid base mounted (30XA and 30XV), refer to table 1

Applicant Information

Applicant Company Name: Carrier Corporation

Contact Person: Anthony Molavi

Mailing Address: 9701 Old Statesville Road, Charlotte, NC 28269

Telephone: (704) 921-3976 Email: Anthony.Molavi@carrier.utc.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: Anthony Molavi Date: 03/1/2018

Title: Engineering Manager Company Name: Carrier Corporation

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: Buehler & Buehler Structural Engineers, Inc.

Name: Scott R. Hooker California License Number: S3937

Mailing Address: 600 Q Street, Sacramento, CA 95811

Telephone: (916) 443-0303 Email: shooker@bbse.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: University at Buffalo, Dept. of Civil, Structural and Environmental Engineering

Contact Name: Mark C. Pitman

Mailing Address: 212 Ketter Hall, North Campus, Buffalo, NY 14260

Telephone: (716) 645-4377 Email: mpitman@buffalo.edu

Company Name: US Army ERDC-CERL (Army Lab)

Contact Name: Jim Wilcoski

Mailing Address: 2902 Newmark Dr, Champaign, IL

Telephone: (217) 373-6763 Email: james.wilcoski@usace.army.mil

Seismic Parameters

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

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

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

a_p (In-structure equipment or component amplification factor) = 1.0 (rigid), 2.5 (neoprene isolated) see table 1

R_p (Equipment or component response modification factor) = 2.5

Ω_0 (System overstrength factor) = 2

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = See Attachment

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) =

Ω_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): Equipment matrix

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

Signature: _____ Date: December 13, 2018

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to : S_{DS} (g) = See Above z/h = See Above

Condition of Approval (if applicable): This OSP excludes the hydronic pump package options for 30XA Models and includes the hydronic pump package options for 30RAP Models.

Special Seismic Certification
OSHPD Preapproval OSP-0184-10
Carrier 30XA, 30XV, 30RAP, 38AP, 09DP
30MPA and 30MPW Product Lines

Table 1a. Certified Product List (30RAP, 38AP, 09DP) Rigid Mount

S_{DS} (g) = 2.10 z/h = 1 F_p / W_p = 1.51

Model Number			Nominal Capacity	Tested/ Interpolated	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30RAP*	38AP*	09DP*						
30RAP010			10.5 tons	UUT-1 (RAP)	66.5	40.5	66.5	1,029
30RAP011			10.5 tons	Interpolated	66.5	40.5	66.5	1,087
30RAP015			10.5 tons	Interpolated	66.5	40.5	66.5	1,043
30RAP016			14.0 tons	Interpolated	66.5	40.5	66.5	1,125
		09DPS018	20.7 tons	Interpolated	88.5	40.5	66.5	656
		09DPS020	33.1 tons	Interpolated	88.5	40.5	66.5	755
	38AP025		25.0 tons	Interpolated	88.5	40.5	66.5	1,131
30RAP018			16.1 tons	UUT-1(2017)	88.5	40.5	66.5	1,410
30RAP020			18.8 tons	Interpolated	88.5	40.5	66.5	1,458
		09DPS030	37.7 tons	Interpolated	88.5	40.5	78.5	905
	38AP027		27.0 tons	Interpolated	88.5	40.5	78.5	1,294
	38AP030		30.0 tons	Interpolated	88.5	40.5	78.5	1,300
30RAP025			23.4 tons	Interpolated	88.5	40.5	78.5	1,567
30RAP030			27.6 tons	Interpolated	88.5	40.5	78.5	1,608
		09DPM035	43.3 tons	Interpolated	88.5	92.5	66.5	1,162
		09DPM040	54.9 tons	Interpolated	88.5	92.5	66.5	1,258
		09DPM050	66.4 tons	Interpolated	88.5	92.5	66.5	1,354
30RAP035			34.4 tons	Interpolated	88.5	92.5	66.5	2,850
30RAP040			38.9 tons	Interpolated	88.5	92.5	66.5	2,872
		09DPM060	75.3 tons	Interpolated	88.5	92.5	78.5	1,596
	38AP040		40.0 tons	Interpolated	88.5	92.5	78.5	2,148
	38AP050		50.0 tons	Interpolated	88.5	92.5	78.5	2,174
	38AP060		60.0 tons	Interpolated	88.5	92.5	78.5	2,299
30RAP045			43.1 tons	Interpolated	88.5	92.5	78.5	2,925
30RAP050			47.3 tons	Interpolated	88.5	92.5	78.5	2,950
30RAP055			51.8 tons	Interpolated	88.5	92.5	78.5	3,056
30RAP060			56.0 tons	UUT-3 (RAP)	88.5	92.5	78.5	3,062
		09DPM065	85.8 tons	Interpolated	110.8	88.5	78.5	1,694
	38AP065		59.6 tons	Interpolated	110.8	88.5	78.5	2,633
	38AP070		67.3 tons	Interpolated	110.8	88.5	78.5	2,522
30RAP070			68.9 tons	UUT-4 (RAP)	151.1	88.5	78.5	4,100
		09DPM075	107.6 tons	Interpolated	151.1	88.5	78.5	1,936
	38AP080		78.0 tons	Interpolated	151.1	88.5	78.5	2,700
30RAP080			77.4 tons	Interpolated	151.1	88.5	78.5	4,390
		09DPM085	115.6 tons	Interpolated	151.1	88.5	78.5	2,041
	38AP090		87.4 tons	Interpolated	151.1	88.5	78.5	2,943
30RAP090			84.0 tons	Interpolated	151.1	88.5	78.5	4,411
		09DPM095	129.4 tons	Interpolated	151.1	88.5	78.5	2,041
	38AP100		96.0 tons	Interpolated	151.1	88.5	78.5	2,952
30RAP100			98.7 tons	Interpolated	191.3	88.5	78.5	5,374
		09DPM115	149.4 tons	Interpolated	191.3	88.5	78.5	2,573
	38AP115		110.4 tons	Interpolated	191.3	88.5	78.5	3,319
30RAP115			111.8 tons	Interpolated	191.3	88.5	78.5	5,692
		09DPM130	172.0 tons	Interpolated	191.3	88.5	78.5	2,677
	38AP130		125.1 tons	Interpolated	191.3	88.5	78.5	3,461
30RAP130			127.5 tons	Interpolated	231.6	88.5	78.5	7,135
30RAP150			139.7 tons	UUT-5 (RAP)	231.6	88.5	78.5	7,500

30RAP: AquaSnap Air-Cooled Chillers w/ Refrigerant
38AP: Gemini Split System Commercial Air-Cooled Condensers w/ Refrigerant
30DP: Gemini Split System Air-Cooled Condensers w/ Refrigerant
*38AP (condensing unit) and 09DP (condenser) are derivatives of 30RAP chillers
*30RAP010, 060, 070, 150 tested models included hydronic packages

Table 1b. Certified Product Table (30MP) Rigid Mount

S_{DS} (g) = 1.81 z/h = 1 F_p / W_p = 1.30

Model Number	*Nominal Capacity*	*Tested/ Interpolated*	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30MPA015	13.9 tons	UUT-1 (MP)	57.0	32.12	65.1	626
30MPA016	14.8 tons	Interpolated	57.0	32.12	65.1	591
30MPW016	14.8 tons	Interpolated	57.0	32.12	65.1	680
30MPA020	18.2 tons	Interpolated	57.0	32.12	65.1	702
30MPW020	20.7 tons	Interpolated	57.0	32.12	65.1	790
30MPA030	27.7 tons	Interpolated	57.0	32.12	65.1	755
30MPW030	31.0 tons	Interpolated	57.0	32.12	65.1	992
30MPA032	30.0 tons	Interpolated	57.0	32.12	65.1	731
30MPW032	30.0 tons	UUT-5 (2017)	57.0	32.12	65.1	1055
30MPA040	35.3 tons	Interpolated	57.0	32.12	65.1	913
30MPW040	39.9 tons	Interpolated	57.0	32.12	65.1	1,099
30MPA045	41.2 tons	Interpolated	57.0	32.12	65.1	934
30MPW045	46.6 tons	UUT-2 (MP)	57.0	32.12	65.1	1,190
30MPA050	51.1 tons	Extrapolated	57.0	32.12	68.8	1,529
30MPW050	51.4 tons	UUT-3 (MP)	57.0	32.12	68.8	1,602
30MPA055	58.4 tons	Interpolated	57.0	32.12	68.8	1,544
30MPW055	58.6 tons	Interpolated	57.0	32.12	68.8	1,617
30MPA060	61.2 tons	Interpolated	57.0	32.12	68.8	1,568
30MPW060	62.1 tons	Interpolated	57.0	32.12	68.8	1,681
30MPA065	64.8 tons	Interpolated	57.0	32.12	68.8	1,599
30MPW065	65.6 tons	Interpolated	57.0	32.12	68.8	1,712
30MPA070	67.6 tons	Interpolated	57.0	32.12	68.8	1,606
30MPW070	68.5 tons	Interpolated	57.0	32.12	68.8	1,719
30MPA074	73.0 tons	Interpolated	57.0	32.12	68.8	1,637
30MPW074	74.1 tons	UUT-4 (MP)	57.0	32.12	68.8	1,790

30MPA: AquaSnap Air-Cooled Liquid Chillers w/o Condensers
30MPW: AquaSnap Water-Cooled Liquid Chillers w/ Condensers
*30MP can be applied as "Modular" combinations (may be installed separately).

Table 1c. Certified Product Table (30XA) - Rigid Mount

S_{DS} (g) = 2.00 @ z/h = 1.0 with Fp / Wp = 1.44 S_{DS} (g) = 2.40 @ z/h = 0.0 with Fp / Wp = 1.08

Model Number	Fixed / Variable	Nominal Capacity	Tested/ Interpolated	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30XA080	Fixed	75.6 tons	UUT-3 (30XA)	141	88	90.5	7,234
30XA082	Fixed	72.2 tons	Interpolated	141	88	90.5	7,391
30XA090	Fixed	84.8 tons	Interpolated	188	88	90.5	10,924
30XA092	Fixed	81.4 tons	Interpolated	188	88	90.5	11,048
30XA100	Fixed	93.9 tons	Interpolated	188	88	90.5	11,151
30XA102	Fixed	89.3 tons	Interpolated	188	88	90.5	11,275
30XA110	Fixed	102.4 tons	Interpolated	188	88	90.5	11,291
30XA112	Fixed	98.5 tons	Interpolated	188	88	90.5	11,528
30XA120	Fixed	110.7 tons	Interpolated	188	88	90.5	11,436
30XA122	Fixed	105.6 tons	Interpolated	188	88	90.5	11,646
30XA140	Fixed	132.8 tons	Interpolated	235	88	90.5	13,966
	Variable	131.7 tons	Interpolated	264	88	90.5	13,596
	Variable - S	142.0 tons	Interpolated	208	88	99	10,500
	Variable - M	143.8 tons	Interpolated	208	88	99	10,567
	Variable - H	145.4 tons	Interpolated	255	88	99	11,448
30XA142	Fixed	126.5 tons	Interpolated	235	88	90.5	14,423
30XA160	Fixed	152.3 tons	Interpolated	235	88	90.5	14,209
	Variable	149.5 tons	UUT-5 (30XV)	264	88	90.5	11,280
	Variable - S	158.7 tons	Interpolated	208	88	99	10,567
	Variable - M	162.6 tons	Interpolated	255	88	99	11,636
	Variable - H	163.5 tons	Interpolated	302	88	99	12,374
30XA162	Fixed	143.6 tons	Interpolated	235	88	90.5	14,635
30XA180	Fixed	171.3 tons	Interpolated	282	88	90.5	15,037
	Variable	169.2 tons	Interpolated	311	88	90.5	15,923
	Variable - S	176.3 tons	Interpolated	208	88	99	10,754
	Variable - M	180.7 tons	Interpolated	255	88	99	11,707
	Variable - H	182.0 tons	Interpolated	208	88	99	12,219
30XA182	Fixed	165.6 tons	Interpolated	282	88	90.5	15,382
30XA200	Fixed	194.0 tons	Interpolated	282	88	90.5	15,159
	Variable	190.2 tons	Interpolated	311	88	90.5	16,045
	Variable - S	195.1 tons	Interpolated	255	88	99	11,707
	Variable - M	198.5 tons	Interpolated	302	88	99	12,675
	Variable - H	200.4 tons	Interpolated	349	88	99	13,591
30XA202	Fixed	185.3 tons	Interpolated	282	88	90.5	15,461
30XA220	Fixed	211.7 tons	Interpolated	329	88	90.5	16,295
	Variable	211.9 tons	Interpolated	358	88	90.5	17,181
30XA222	Fixed	203.3 tons	Interpolated	329	88	90.5	16,639
30XA225	Variable - S	216.1 tons	Interpolated	252	88	99	13,283
	Variable - M	219.4 tons	Interpolated	299	88	99	14,204
	Variable - H	221.5 tons	Interpolated	346	88	99	14,943
30XA240	Fixed	228.1 tons	Interpolated	329	88	90.5	16,455
	Variable	225.4 tons	Interpolated	358	88	90.5	17,341
30XA242	Fixed	30XA262	Interpolated	329	88	90.5	16,799
30XA250	Variable - S	252.3 tons	Interpolated	299	88	99	14,981
	Variable - M	260.5 tons	Interpolated	346	88	99	16,311
	Variable - H	261.6 tons	Interpolated	393	88	99	17,050
30XA260	Fixed	250.9 tons	Interpolated	376	88	90.5	18,662
	Variable	251.4 tons	Interpolated	405	88	90.5	19,739
30XA262	Fixed	242.5 tons	Interpolated	376	88	90.5	18,846
30XA275	Variable - S	267.9 tons	Interpolated	299	88	99	15,429
	Variable - M	275.9 tons	Interpolated	346	88	99	16,364
	Variable - H	277.8 tons	Interpolated	393	88	99	17,103
30XA280	Fixed	268.5 tons	Interpolated	376	88	90.5	18,831
	Variable	266.0 tons	Interpolated	405	88	90.5	19,908
30XA282	Fixed	258.5 tons	Interpolated	376	88	90.5	19,033

Table 1c. Certified Product Table (30XA) - Rigid Mount cont.

S_{DS} (g) = 2.00 @ z/h = 1.0 with Fp / Wp = 1.44 S_{DS} (g) = 2.40 @ z/h = 0.0 with Fp / Wp = 1.08

Model Number	*Fixed / Variable*	*Nominal Capacity*	*Tested/ Interpolated*	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30XA300	Fixed	287.5 tons	Interpolated	376	88	90.5	19,292
	Variable	281.3 tons	Interpolated	405	88	90.5	20,369
	Variable - S	288.3 tons	Interpolated	346	88	99	16,364
	Variable - M	294.1 tons	Interpolated	393	88	99	17,166
	Variable - H	296.6 tons	Interpolated	440	88	99	18,003
30XA302	Fixed	274.4 tons	Interpolated	376	88	90.5	19,764
30XA325	Fixed	306.6 tons	Interpolated	423	88	90.5	21,005
	Variable	304.2 tons	Interpolated	452	88	90.5	22,273
	Variable - S	312.3 tons	Interpolated	393	88	99	17,166
	Variable - M	320.4 tons	Interpolated	440	88	99	18,075
	Variable - H	322.4 tons	Interpolated	487	88	99	18,952
30XA327	Fixed	295.8 tons	Interpolated	423	88	90.5	21,477
30XA350	Fixed	324.1 tons	UUT-4 (30XA)	423	88	90.5	21,211
	Variable	320.7 tons	Interpolated	452	88	90.5	22,479
	Variable - S	346.8 tons	Interpolated	406	88	99	20,672
	Variable - M	350.6 tons	Interpolated	453	88	99	22,326
	Variable - H	351.9 tons	Interpolated	500	88	99	23,104
30XA352	Fixed	310.5 tons	Interpolated	423	88	90.5	21,683
30XA400	Fixed	383.6 tons	Interpolated	470	88	90.5	26,990
	Variable - S	400.0 tons	Interpolated	453	88	99	23,760
	Variable - M	403.9 tons	Interpolated	500	88	99	24,729
	Variable - H	407.5 tons	Interpolated	547	88	99	25,507
30XA401	Fixed	396.3 tons	Interpolated	470	88	90.5	25,102
30XA450	Fixed	426.7 tons	Interpolated	517	88	90.5	29,254
	Variable - S	453.4 tons	Interpolated	500	88	99	24,729
	Variable - M	454.6 tons	Interpolated	547	88	99	26,356
	Variable - H	457.9 tons	Interpolated	594	88	99	27,221
30XA451	Fixed	435.6 tons	Interpolated	517	88	90.5	26,075
30XA476	Fixed	459.2 tons	Interpolated	517	88	90.5	28,209
30XA500	Fixed	458.0 tons	Interpolated	517	88	90.5	29,547
	Variable - S	493.1 tons	Interpolated	547	88	99	26,356
	Variable - M	501.9 tons	Interpolated	594	88	99	27,337
	Variable - M	501.9 tons	UUT-1b (2017)	594	88	99	30,574
30XA501	Fixed	494.1 tons	Interpolated	517	88	90.5	30,574

30XA: AquaForce Air-Cooled Liquid Chillers **30XA variable also know as 30XV**: AquaForce Variable Speed Air-Cooled Liquid Chillers

Table 1d. Certified Product Table (30XA) - Neoprene Isolated Mount

S_{DS} (g) = 0.80 @ z/h = 1.0 with Fp / Wp = 1.44 S_{DS} (g) = 1.0 @ z/h = 0.0 with Fp / Wp = 0.60

Model Number	Fixed / Variable	Nominal Capacity	Tested/ Interpolated	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30XA080	Fixed	75.6 tons	Extrapolated	141	88	90.5	7,234
30XA082	Fixed	72.2 tons	Extrapolated	141	88	90.5	7,391
30XA090	Fixed	84.8 tons	Extrapolated	188	88	90.5	10,924
30XA092	Fixed	81.4 tons	Extrapolated	188	88	90.5	11,048
30XA100	Fixed	93.9 tons	Extrapolated	188	88	90.5	11,151
30XA102	Fixed	89.3 tons	Extrapolated	188	88	90.5	11,275
30XA110	Fixed	102.4 tons	Extrapolated	188	88	90.5	11,291
30XA112	Fixed	98.5 tons	Extrapolated	188	88	90.5	11,528
30XA120	Fixed	110.7 tons	Extrapolated	188	88	90.5	11,436
30XA122	Fixed	105.6 tons	Extrapolated	188	88	90.5	11,646
30XA140	Fixed	132.8 tons	Interpolated	235	88	90.5	13,966
	Variable	131.7 tons	Interpolated	264	88	90.5	13,596
	Variable - S	142.0 tons	Interpolated	208	88	99	11,175
	Variable - M	143.8 tons	Interpolated	208	88	99	12,058
	Variable - M	143.8 tons	UUT-2B	208	88	99	13,596
	Variable - H	145.4 tons	Interpolated	255	88	99	11,448
30XA142	Fixed	126.5 tons	Interpolated	235	88	90.5	14,423
30XA160	Fixed	152.3 tons	Interpolated	235	88	90.5	14,209
	Variable	149.5 tons	Interpolated	264	88	90.5	13,839
	Variable - S	158.7 tons	Interpolated	208	88	99	10,567
	Variable - M	162.6 tons	Interpolated	255	88	99	11,636
	Variable - H	163.5 tons	Interpolated	302	88	99	12,374
30XA162	Fixed	143.6 tons	Interpolated	235	88	90.5	14,635
30XA180	Fixed	171.3 tons	Interpolated	282	88	90.5	15,037
	Variable	169.2 tons	Interpolated	311	88	90.5	15,923
	Variable - S	176.3 tons	Interpolated	208	88	99	10,754
	Variable - M	180.7 tons	Interpolated	255	88	99	11,707
	Variable - H	182.0 tons	Interpolated	208	88	99	12,219
30XA182	Fixed	165.6 tons	Interpolated	282	88	90.5	15,382
30XA200	Fixed	194.0 tons	Interpolated	282	88	90.5	15,159
	Variable	190.2 tons	Interpolated	311	88	90.5	16,045
	Variable - S	195.1 tons	Interpolated	255	88	99	11,707
	Variable - M	198.5 tons	Interpolated	302	88	99	12,675
	Variable - H	200.4 tons	Interpolated	349	88	99	13,591
30XA202	Fixed	185.3 tons	Interpolated	282	88	90.5	15,461
30XA220	Fixed	211.7 tons	Interpolated	329	88	90.5	16,295
	Variable	211.9 tons	Interpolated	358	88	90.5	17,181
30XA222	Fixed	203.3 tons	Interpolated	329	88	90.5	16,639
30XA225	Variable - S	216.1 tons	Interpolated	252	88	99	13,283
	Variable - M	219.4 tons	Interpolated	299	88	99	14,204
	Variable - H	221.5 tons	Interpolated	346	88	99	14,943
30XA240	Fixed	228.1 tons	Interpolated	329	88	90.5	16,455
	Variable	225.4 tons	Interpolated	358	88	90.5	17,341
30XA242	Fixed	30XA262	Interpolated	329	88	90.5	16,799
30XA250	Variable - S	252.3 tons	Interpolated	299	88	99	14,981
	Variable - M	260.5 tons	Interpolated	346	88	99	16,311
	Variable - H	261.6 tons	Interpolated	393	88	99	17,050
30XA260	Fixed	250.9 tons	Interpolated	376	88	90.5	18,662
	Variable	251.4 tons	Interpolated	405	88	90.5	19,739
30XA262	Fixed	242.5 tons	Interpolated	376	88	90.5	18,846

Table 1d. Certified Product Table (30XA) - Neoprene Isolated Mount Cont.

S_{DS} (g) = 0.80 @ z/h = 1.0 with Fp / Wp = 1.44 S_{DS} (g) = 1.0 @ z/h = 0.0 with Fp / Wp = 0.60

Model Number	*Fixed / Variable*	*Nominal Capacity*	*Tested/ Interpolated*	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30XA275	Variable - S	267.9 tons	Interpolated	299	88	99	15,429
	Variable - M	275.9 tons	Interpolated	346	88	99	16,364
	Variable - H	277.8 tons	Interpolated	393	88	99	17,103
30XA280	Fixed	268.5 tons	Interpolated	376	88	90.5	18,831
	Variable	266.0 tons	Interpolated	405	88	90.5	19,908
30XA282	Fixed	258.5 tons	Interpolated	376	88	90.5	19,033
30XA300	Fixed	287.5 tons	Interpolated	376	88	90.5	19,292
	Variable	281.3 tons	Interpolated	405	88	90.5	20,369
	Variable - S	288.3 tons	Interpolated	346	88	99	16,364
	Variable - M	294.1 tons	Interpolated	393	88	99	17,166
	Variable - H	296.6 tons	Interpolated	440	88	99	18,003
30XA302	Fixed	274.4 tons	Interpolated	376	88	90.5	19,764
30XA325	Fixed	306.6 tons	Interpolated	423	88	90.5	21,005
	Variable	304.2 tons	Interpolated	452	88	90.5	22,273
	Variable - S	312.3 tons	Interpolated	393	88	99	17,166
	Variable - M	320.4 tons	Interpolated	440	88	99	18,075
	Variable - H	322.4 tons	Interpolated	487	88	99	18,952
30XA327	Fixed	295.8 tons	Interpolated	423	88	90.5	21,477
30XA350	Fixed	324.1 tons	Interpolated	423	88	90.5	21,211
	Variable	320.7 tons	Interpolated	452	88	90.5	22,479
	Variable - S	346.8 tons	Interpolated	406	88	99	20,672
	Variable - M	350.6 tons	Interpolated	453	88	99	22,326
	Variable - H	351.9 tons	Interpolated	500	88	99	23,104
30XA352	Fixed	310.5 tons	Interpolated	423	88	90.5	21,683
30XA400	Fixed	383.6 tons	Interpolated	470	88	90.5	26,990
	Variable - S	400.0 tons	Interpolated	453	88	99	23,760
	Variable - M	403.9 tons	Interpolated	500	88	99	24,729
	Variable - H	407.5 tons	Interpolated	547	88	99	25,507
30XA401	Fixed	396.3 tons	Interpolated	470	88	90.5	25,102
30XA450	Fixed	426.7 tons	Interpolated	517	88	90.5	29,254
	Variable - S	453.4 tons	Interpolated	500	88	99	24,729
	Variable - M	454.6 tons	Interpolated	547	88	99	26,356
	Variable - H	457.9 tons	Interpolated	594	88	99	27,221
30XA451	Fixed	435.6 tons	Interpolated	517	88	90.5	26,075
30XA476	Fixed	459.2 tons	Interpolated	517	88	90.5	28,209
30XA500*	Fixed	458.0 tons	Interpolated	517	88	90.5	29,547
	Variable - S	493.1 tons	Interpolated	547	88	99	26,356
	Variable - M	501.9 tons	Interpolated	594	88	99	27,337
	Variable - M	501.9 tons	UUT-1c (2017)	594	88	99	30,574
30XA501	Fixed	494.1 tons	Interpolated	517	88	90.5	30,574

30XA: AquaForce Air-Cooled Liquid Chillers **30XA variable also know as 30XV:** AquaForce Variable Speed Air-Cooled Liquid Chillers

Table 2a. Certified Sub-Component List (30RAP, 38AP and 09DP)

S_{DS} (g) = 2.10 z/h = 1 F_p / W_p = 1.51

Compressor - 30RAP and 38AP						
Part Number	***Nominal capacity***	***Voltage***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
ZP51K5E-TF5-498	4.0 tons	208/230V	Copeland	carbon steel housing	73	Extrapolate
ZP51K5E-TF7-498	4.0 tons	380V	Copeland	carbon steel housing	73	Extrapolate
ZP51K5E-TFD-498	4.0 tons	460V	Copeland	carbon steel housing	73	Extrapolate
ZP51K5E-TFE-498	4.0 tons	575V	Copeland	carbon steel housing	73	Extrapolate
ZP72KCE-TF5-498	6.0 tons	208/230V	Copeland	carbon steel housing	88	Extrapolate
ZP72KCE-TF7-498	6.0 tons	380V	Copeland	carbon steel housing	88	Extrapolate
ZP72KCE-TFD-498	6.0 tons	460V	Copeland	carbon steel housing	88	Extrapolate
ZP72KCE-TFE-498	6.0 tons	575V	Copeland	carbon steel housing	88	Extrapolate
ZP104KCE-TF5-155	9.0 tons	208/230V	Copeland	carbon steel housing	108	Extrapolate
ZP104KCE-TF7-155	9.0 tons	380V	Copeland	carbon steel housing	108	Extrapolate
ZP104KCE-TFD-155	9.0 tons	460V	Copeland	carbon steel housing	108	Extrapolate
ZP104KCE-TFE-155	9.0 tons	575V	Copeland	carbon steel housing	108	Extrapolate
ZP103KCE-TF5-155	9.0 tons	208/230V	Copeland	carbon steel housing	132	Extrapolate
ZP103KCE-TF7-155	9.0 tons	380V	Copeland	carbon steel housing	132	Extrapolate
ZP103KCE-TFD-155	9.0 tons	460V	Copeland	carbon steel housing	132	Extrapolate
ZP103KCE-TFE-155	9.0 tons	575V	Copeland	carbon steel housing	132	Extrapolate
ZP120KCE-TF5-155	10.0 tons	208/230V	Copeland	carbon steel housing	135	Interpolated
ZP120KCE-TF7-155	10.0 tons	380V	Copeland	carbon steel housing	135	Interpolated
ZP120KCE-TFD-155	10.0 tons	460V	Copeland	carbon steel housing	135	Interpolated
ZP120KCE-TFE-155	10.0 tons	575V	Copeland	carbon steel housing	135	Interpolated
ZP137KCE-TF5-155	11.0 tons	208/230V	Copeland	carbon steel housing	135	Interpolated
ZP137KCE-TF7-155	11.0 tons	380V	Copeland	carbon steel housing	135	Interpolated
ZP137KCE-TFD-155	11.0 tons	460V	Copeland	carbon steel housing	135	UUT-1 (RAP)
ZP137KCE-TFE-155	11.0 tons	575V	Copeland	carbon steel housing	135	Interpolated
ZP154KCE-TW5-455	13.0 tons	208/230V	Copeland	carbon steel housing	146	Interpolated
ZP154KCE-TW7-455	13.0 tons	380V	Copeland	carbon steel housing	146	Interpolated
ZP154KCE-TFD-155	13.0 tons	460V	Copeland	carbon steel housing	146	Interpolated
ZP154KCE-TWE-455	13.0 tons	575V	Copeland	carbon steel housing	146	Interpolated
ZP182KCE-TW5-455	15.0 tons	208/230V	Copeland	carbon steel housing	146	Interpolated
ZP182KCE-TW7-455	15.0 tons	380V	Copeland	carbon steel housing	146	Interpolated
ZP182KCE-TFD-155	15.0 tons	460V	Copeland	carbon steel housing	146	UUT-3 (RAP)
ZP182KCE-TWE-455	15.0 tons	575V	Copeland	carbon steel housing	146	Interpolated
ZP235KCE-TWC-250	20.0 tons	208/230V	Copeland	carbon steel housing	324	Interpolated
SH240A3ACC	20.0 tons	208/230V	Danfoss	carbon steel housing	238	UUT-4 (RAP)
ZP235KCE-TW7-250	20.0 tons	380V	Copeland	carbon steel housing	324	Interpolated
SH240A9ACC	20.0 tons	380V	Danfoss	carbon steel housing	238	Interpolated
ZP235KCE-TFD-250	20.0 tons	460V	Copeland	carbon steel housing	324	Interpolated
SH240A4ACC	20.0 tons	460V	Danfoss	carbon steel housing	238	Interpolated
ZP235KCE-TWE-250	20.0 tons	575V	Copeland	carbon steel housing	324	Interpolated
SH240A7ACC	20.0 tons	575V	Danfoss	carbon steel housing	238	Interpolated
ZP295KCE-TWC-250	25.0 tons	208/230V	Copeland	carbon steel housing	353	Interpolated
SH300A3ACC	25.0 tons	208/230V	Danfoss	carbon steel housing	245	Interpolated
ZP295KCE-TW7-250	25.0 tons	380V	Copeland	carbon steel housing	353	Interpolated
SH300A9ACC	25.0 tons	380V	Danfoss	carbon steel housing	245	Interpolated
ZP295KCE-TFD-250	25.0 tons	460V	Copeland	carbon steel housing	353	UUT-5 (RAP)
SH300A4ACC	25.0 tons	460V	Danfoss	carbon steel housing	245	UUT-5 (RAP)
ZP295KCE-TWE-250	25.0 tons	575V	Copeland	carbon steel housing	353	Interpolated
SH300A7ACC	25.0 tons	575V	Danfoss	carbon steel housing	245	Interpolated

Table 2a. Certified Sub-Component List (30RAP, 38AP and 09DP)

S_{DS} (g) = 2.10 z/h = 1 F_p / W_p = 1.51

Single/ Dual Fixed and Variable Speed Pump Options - 30RAP010 thru 30RAP60

Part Number	Nominal capacity	Voltage	Manufacturer	Material	Weight (lb)	Interpolated / Included With Test
38AP502549	1.5 Hp	208/230 460V	Armstrong	carbon steel housing	47	UUT-1 (RAP)
38AP502553	1.5 Hp	380V	Armstrong	carbon steel housing	47	Interpolated
38AP502554	1.5 Hp	575V	Armstrong	carbon steel housing	47	Interpolated
38AP502555	3.0 Hp	208/230 460V	Armstrong	carbon steel housing	72	Interpolated
38AP502556	3.0 Hp	380V	Armstrong	carbon steel housing	72	Interpolated
38AP502557	3.0 Hp	575V	Armstrong	carbon steel housing	72	Interpolated
38AP502558	3.0 Hp	208/230 460V	Armstrong	carbon steel housing	72	Interpolated
38AP502559	3.0 Hp	380V	Armstrong	carbon steel housing	72	Interpolated
38AP502560	3.0 Hp	575V	Armstrong	carbon steel housing	72	Interpolated
38AP502561	3.0 Hp	208/230 460V	Armstrong	carbon steel housing	72	Interpolated
38AP502562	3.0 Hp	380V	Armstrong	carbon steel housing	72	Interpolated
38AP502563	3.0 Hp	575V	Armstrong	carbon steel housing	72	Interpolated
38AP502564	5.0 Hp	208/230 460V	Armstrong	carbon steel housing	181	Interpolated
38AP502565	5.0 Hp	380V	Armstrong	carbon steel housing	181	Interpolated
38AP502566	5.0 Hp	575V	Armstrong	carbon steel housing	181	Interpolated
38AP502573	5.0 Hp	208/230 460V	Armstrong	carbon steel housing	211	Interpolated
38AP502574	5.0 Hp	380V	Armstrong	carbon steel housing	211	Interpolated
38AP502575	5.0 Hp	575V	Armstrong	carbon steel housing	211	Interpolated
38AP502576	5.0 Hp	208/230 460V	Armstrong	carbon steel housing	211	Interpolated
38AP502577	5.0 Hp	380V	Armstrong	carbon steel housing	211	Interpolated
38AP502578	5.0 Hp	575V	Armstrong	carbon steel housing	211	Interpolated
38AP502567	7.5 Hp	208/230 460V	Armstrong	carbon steel housing	219	Interpolated
38AP502568	7.5 Hp	380V	Armstrong	carbon steel housing	219	Interpolated
38AP502569	7.5 Hp	575V	Armstrong	carbon steel housing	219	Interpolated
38AP502570	10.0 Hp	208/230 460V	Armstrong	carbon steel housing	240	UUT-3 (RAP)
38AP502571	10.0 Hp	380V	Armstrong	carbon steel housing	240	Interpolated
38AP502572	10.0 Hp	575V	Armstrong	carbon steel housing	240	Interpolated

Single/ Dual Fixed and Variable Speed Pump Options - 30RAP070 thru 30RAP150

Part Number	Nominal capacity	Voltage	Manufacturer	Material	Weight (lb)	Interpolated / Included With Test
38AP502756	3.0 Hp	208/230, 460V	Armstrong	carbon steel housing	172	Interpolated
38AP502752	3.0 Hp	380V	Armstrong	carbon steel housing	172	Interpolated
38AP502750	3.0 Hp	575V	Armstrong	carbon steel housing	172	Interpolated
38AP503619 (with VFD)	3.0 Hp	575V	Armstrong	carbon steel housing	202.8	Interpolated
38AP503620 (with VFD)	3.0 Hp	380V	Armstrong	carbon steel housing	202.8	Interpolated
38AP503621 (with VFD)	3.0 Hp	208/230V	Armstrong	carbon steel housing	202.8	UUT-4 (RAP)
38AP503646 (with VFD)	3.0 Hp	460V	Armstrong	carbon steel housing	202.8	Interpolated
38AP502618 (with VFD)	3.0 Hp	208/230, 460V	Armstrong	carbon steel housing	596	Interpolated
38AP502617 (dual)	3.0 Hp	380V	Armstrong	carbon steel housing	596	Interpolated
38AP502616 (dual)	3.0 Hp	575V	Armstrong	carbon steel housing	596	Interpolated
38AP503637 (dual, with VFD)	3.0 Hp	575V	Armstrong	carbon steel housing	626.8	Interpolated
38AP503638 (dual, with VFD)	3.0 Hp	380V	Armstrong	carbon steel housing	626.8	Interpolated
38AP50363 (dual, with VFD)	3.0 Hp	208/230V	Armstrong	carbon steel housing	626.8	Interpolated
38AP503651 (dual, with VFD)	3.0 Hp	460V	Armstrong	carbon steel housing	626.8	Interpolated
38AP502762	5.0 Hp	208/230, 460V	Armstrong	carbon steel housing	181	Interpolated
38AP502760	5.0 Hp	380V	Armstrong	carbon steel housing	181	Interpolated
38AP502759	5.0 Hp	575V	Armstrong	carbon steel housing	181	Interpolated
38AP503301 (with VFD)	5.0 Hp	575V	Armstrong	carbon steel housing	211.8	Interpolated
38AP503408 (with VFD)	5.0 Hp	380V	Armstrong	carbon steel housing	211.8	Interpolated
38AP503409 (with VFD)	5.0 Hp	208/230V	Armstrong	carbon steel housing	211.8	Interpolated
38AP503416 (with VFD)	5.0 Hp	460V	Armstrong	carbon steel housing	211.8	Interpolated
38AP503622 (with VFD)	5.0 Hp	575V	Armstrong	carbon steel housing	211.8	Interpolated
38AP503623 (with VFD)	5.0 Hp	380V	Armstrong	carbon steel housing	211.8	Interpolated
38AP503624 (with VFD)	5.0 Hp	208/230V	Armstrong	carbon steel housing	211.8	Interpolated
38AP503647 (with VFD)	5.0 Hp	460V	Armstrong	carbon steel housing	211.8	Interpolated
38AP503702	5.0 Hp	208/230, 460V	Armstrong	carbon steel housing	227	Interpolated
38AP503701	5.0 Hp	380V	Armstrong	carbon steel housing	227	Interpolated
38AP503700	5.0 Hp	575V	Armstrong	carbon steel housing	227	Interpolated

Table 2a. Certified Sub-Component List (30RAP, 38AP and 09DP)

S_{DS} (g) = 2.10 z/h = 1 F_p / W_p = 1.51

Single/ Dual Fixed and Variable Speed Pump Options - 30RAP070 thru 30RAP150 cont						
Part Number	***Nominal capacity***	***Voltage***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
38AP503712 (with VFD)	5.0 Hp	575V	Armstrong	carbon steel housing	466.8	Interpolated
38AP503713 (with VFD)	5.0 Hp	380V	Armstrong	carbon steel housing	466.8	Interpolated
38AP503714 (with VFD)	5.0 Hp	208/230V	Armstrong	carbon steel housing	466.8	Interpolated
38AP503715 (with VFD)	5.0 Hp	460V	Armstrong	carbon steel housing	466.8	Interpolated
38AP503730	5.0 Hp	208/230, 460V	Armstrong	carbon steel housing	334	Interpolated
38AP503729	5.0 Hp	380V	Armstrong	carbon steel housing	334	Interpolated
38AP503728	5.0 Hp	575V	Armstrong	carbon steel housing	334	Interpolated
38AP503740 (with VFD)	5.0 Hp	575V	Armstrong	carbon steel housing	364.8	Interpolated
38AP503741 (with VFD)	5.0 Hp	380V	Armstrong	carbon steel housing	364.8	Interpolated
38AP503742 (with VFD)	5.0 Hp	208/230V	Armstrong	carbon steel housing	364.8	Interpolated
38AP503743 (with VFD)	5.0 Hp	460V	Armstrong	carbon steel housing	364.8	Interpolated
38AP502615 (dual)	5.0 Hp	208/230, 460V	Armstrong	carbon steel housing	496	Interpolated
38AP502614 (dual)	5.0 Hp	380V	Armstrong	carbon steel housing	496	Interpolated
38AP502613 (dual)	5.0 Hp	575V	Armstrong	carbon steel housing	496	Interpolated
38AP503438 (dual, with VFD)	5.0 Hp	575V	Armstrong	carbon steel housing	526.8	Interpolated
38AP503439 (dual, with VFD)	5.0 Hp	380V	Armstrong	carbon steel housing	526.8	Interpolated
38AP503440 (dual, with VFD)	5.0 Hp	208/230V	Armstrong	carbon steel housing	526.8	Interpolated
38AP503441 (dual, with VFD)	5.0 Hp	460V	Armstrong	carbon steel housing	526.8	Interpolated
38AP503434 (dual, with VFD)	5.0 Hp	575V	Armstrong	carbon steel housing	526.8	Interpolated
38AP503435 (dual, with VFD)	5.0 Hp	380V	Armstrong	carbon steel housing	526.8	Interpolated
38AP503436 (dual, with VFD)	5.0 Hp	208/230V	Armstrong	carbon steel housing	526.8	Interpolated
38AP503452 (dual, with VFD)	5.0 Hp	460V	Armstrong	carbon steel housing	526.8	Interpolated
38AP503442 (dual, with VFD)	5.0 Hp	575V	Armstrong	carbon steel housing	526.8	Interpolated
38AP503443 (dual, with VFD)	5.0 Hp	380V	Armstrong	carbon steel housing	526.8	Interpolated
38AP503444 (dual, with VFD)	5.0 Hp	208/230V	Armstrong	carbon steel housing	526.8	Interpolated
38AP503445 (dual, with VFD)	7.5 Hp	460V	Armstrong	carbon steel housing	526.8	Interpolated
38AP502706	7.5 Hp	208/230, 460V	Armstrong	carbon steel housing	229	Interpolated
38AP502704	7.5 Hp	380V	Armstrong	carbon steel housing	229	Interpolated
38AP502703	7.5 Hp	575V	Armstrong	carbon steel housing	229	Interpolated
38AP503417 (with VFD)	7.5 Hp	575V	Armstrong	carbon steel housing	259.8	Interpolated
38AP503418 (with VFD)	7.5 Hp	380V	Armstrong	carbon steel housing	259.8	Interpolated
38AP503419 (with VFD)	7.5 Hp	208/230V	Armstrong	carbon steel housing	259.8	Interpolated
38AP503420 (with VFD)	7.5 Hp	460V	Armstrong	carbon steel housing	259.8	Interpolated
38AP503613 (with VFD)	7.5 Hp	575V	Armstrong	carbon steel housing	259.8	Interpolated
38AP503614 (with VFD)	7.5 Hp	380V	Armstrong	carbon steel housing	259.8	Interpolated
38AP503615 (with VFD)	7.5 Hp	208/230V	Armstrong	carbon steel housing	259.8	Interpolated
38AP503648 (with VFD)	7.5 Hp	460V	Armstrong	carbon steel housing	259.8	Interpolated
38AP503705	7.5 Hp	208/230, 460V	Armstrong	carbon steel housing	270	Interpolated
38AP503704	7.5 Hp	380V	Armstrong	carbon steel housing	270	Interpolated
38AP503703	7.5 Hp	575V	Armstrong	carbon steel housing	270	Interpolated
38AP503716 (with VFD)	7.5 Hp	575V	Armstrong	carbon steel housing	300.8	Interpolated
38AP503717 (with VFD)	7.5 Hp	380V	Armstrong	carbon steel housing	300.8	Interpolated
38AP503718 (with VFD)	7.5 Hp	208/230V	Armstrong	carbon steel housing	300.8	Interpolated
38AP503719 (with VFD)	7.5 Hp	460V	Armstrong	carbon steel housing	300.8	Interpolated
38AP503733	7.5 Hp	208/230, 460V	Armstrong	carbon steel housing	363	Interpolated
38AP503732	7.5 Hp	380V	Armstrong	carbon steel housing	363	Interpolated
38AP503731	7.5 Hp	575V	Armstrong	carbon steel housing	363	Interpolated
38AP503744 (with VFD)	7.5 Hp	575V	Armstrong	carbon steel housing	393.8	Interpolated
38AP503745 (with VFD)	7.5 Hp	380V	Armstrong	carbon steel housing	393.8	Interpolated
38AP503746 (with VFD)	7.5 Hp	208/230V	Armstrong	carbon steel housing	393.8	Interpolated
38AP503747 (with VFD)	7.5 Hp	460V	Armstrong	carbon steel housing	393.8	Interpolated
38AP502611 (dual)	7.5 Hp	208/230, 460V	Armstrong	carbon steel housing	496	Interpolated
38AP502610 (dual)	7.5 Hp	380V	Armstrong	carbon steel housing	496	Interpolated
38AP502607 (dual)	7.5 Hp	575V	Armstrong	carbon steel housing	496	Interpolated

Table 2a. Certified Sub-Component List (30RAP, 38AP and 09DP)

S_{DS} (g) = 2.10 z/h = 1 F_p / W_p = 1.51

Single/ Dual Fixed and Variable Speed Pump Options - 30RAP070 thru 30RAP150 cont						
Part Number	*Nominal capacity*	*Voltage*	*Manufacturer*	*Material*	*Weight (lb)*	*Interpolated / Included With Test*
38AP503631 (dual, with VFD)	7.5 Hp	575V	Armstrong	carbon steel housing	557.6	Interpolated
38AP503632 (dual, with VFD)	7.5 Hp	380V	Armstrong	carbon steel housing	557.6	Interpolated
38AP503633 (dual, with VFD)	7.5 Hp	208/230V	Armstrong	carbon steel housing	557.6	Interpolated
38AP503655 (dual, with VFD)	7.5 Hp	460V	Armstrong	carbon steel housing	557.6	Interpolated
38AP503470 (dual, with VFD)	7.5 Hp	575V	Armstrong	carbon steel housing	679.6	Interpolated
38AP503471 (dual, with VFD)	7.5 Hp	380V	Armstrong	carbon steel housing	679.6	Interpolated
38AP503472 (dual, with VFD)	7.5 Hp	208/230V	Armstrong	carbon steel housing	679.6	Interpolated
38AP503473 (dual, with VFD)	7.5 Hp	460V	Armstrong	carbon steel housing	679.6	Interpolated
38AP503474 (dual, with VFD)	7.5 Hp	575V	Armstrong	carbon steel housing	679.6	Interpolated
38AP503475 (dual, with VFD)	7.5 Hp	380V	Armstrong	carbon steel housing	679.6	Interpolated
38AP503476 (dual, with VFD)	7.5 Hp	208/230V	Armstrong	carbon steel housing	679.6	Interpolated
38AP503494 (dual, with VFD)	7.5 Hp	460V	Armstrong	carbon steel housing	679.6	Interpolated
38AP502621 (dual)	7.5 Hp	208/230, 460V	Armstrong	carbon steel housing	536	Interpolated
38AP502620 (dual)	7.5 Hp	380V	Armstrong	carbon steel housing	536	Interpolated
38AP502619 (dual)	7.5 Hp	575V	Armstrong	carbon steel housing	536	Interpolated
38AP503640 (dual, with VFD)	7.5 Hp	575V	Armstrong	carbon steel housing	597.6	Interpolated
38AP503641 (dual, with VFD)	7.5 Hp	380V	Armstrong	carbon steel housing	597.6	Interpolated
38AP503642 (dual, with VFD)	7.5 Hp	208/230V	Armstrong	carbon steel housing	597.6	Interpolated
38AP503654 (dual, with VFD)	7.5 Hp	460V	Armstrong	carbon steel housing	597.6	Interpolated
38AP502700	10.0 Hp	208/230, 460V	Armstrong	carbon steel housing	250	Interpolated
38AP502702	10.0 Hp	380V	Armstrong	carbon steel housing	250	Interpolated
38AP502701	10.0 Hp	575V	Armstrong	carbon steel housing	250	Interpolated
38AP503421 (with VFD)	10.0 Hp	575V	Armstrong	carbon steel housing	280.8	Interpolated
38AP503422 (with VFD)	10.0 Hp	380V	Armstrong	carbon steel housing	280.8	Interpolated
38AP503423 (with VFD)	10.0 Hp	208/230V	Armstrong	carbon steel housing	280.8	Interpolated
38AP503424 (with VFD)	10.0 Hp	460V	Armstrong	carbon steel housing	280.8	Interpolated
38AP503611 (with VFD)	10.0 Hp	575V	Armstrong	carbon steel housing	280.8	Interpolated
38AP503612 (with VFD)	10.0 Hp	380V	Armstrong	carbon steel housing	280.8	Interpolated
38AP503610 (with VFD)	10.0 Hp	208/230V	Armstrong	carbon steel housing	280.8	Interpolated
38AP503649 (with VFD)	10.0 Hp	460V	Armstrong	carbon steel housing	280.8	Interpolated
38AP503708	10.0 Hp	208/230, 460V	Armstrong	carbon steel housing	297	Interpolated
38AP503707	10.0 Hp	380V	Armstrong	carbon steel housing	297	Interpolated
38AP503706	10.0 Hp	575V	Armstrong	carbon steel housing	297	Interpolated
38AP503720 (with VFD)	10.0 Hp	575V	Armstrong	carbon steel housing	327.8	Interpolated
38AP503721 (with VFD)	10.0 Hp	380V	Armstrong	carbon steel housing	327.8	Interpolated
38AP503722 (with VFD)	10.0 Hp	208/230V	Armstrong	carbon steel housing	327.8	Interpolated
38AP503723 (with VFD)	10.0 Hp	460V	Armstrong	carbon steel housing	327.8	Interpolated
38AP503736	10.0 Hp	208/230, 460V	Armstrong	carbon steel housing	334	Interpolated
38AP503735	10.0 Hp	380V	Armstrong	carbon steel housing	334	Interpolated
38AP503734	10.0 Hp	575V	Armstrong	carbon steel housing	334	Interpolated
38AP503748 (with VFD)	10.0 Hp	575V	Armstrong	carbon steel housing	364.8	Interpolated
38AP503749 (with VFD)	10.0 Hp	380V	Armstrong	carbon steel housing	364.8	Interpolated
38AP503750 (with VFD)	10.0 Hp	208/230V	Armstrong	carbon steel housing	364.8	Interpolated
38AP503751 (with VFD)	10.0 Hp	460V	Armstrong	carbon steel housing	364.8	Interpolated
38AP502606 (dual)	10.0 Hp	208/230, 460V	Armstrong	carbon steel housing	718	Interpolated
38AP502603 (dual)	10.0 Hp	380V	Armstrong	carbon steel housing	718	Interpolated
38AP502602 (dual)	10.0 Hp	575V	Armstrong	carbon steel housing	718	Interpolated
38AP503628 (dual, with VFD)	10.0 Hp	575V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503629 (dual, with VFD)	10.0 Hp	380V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503630 (dual, with VFD)	10.0 Hp	208/230V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503657 (dual, with VFD)	10.0 Hp	460V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503495 (dual, with VFD)	10.0 Hp	575V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503497 (dual, with VFD)	10.0 Hp	380V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503498 (dual, with VFD)	10.0 Hp	208/230V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503499 (dual, with VFD)	10.0 Hp	460V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503500 (dual, with VFD)	10.0 Hp	575V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503507 (dual, with VFD)	10.0 Hp	380V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503508 (dual, with VFD)	10.0 Hp	208/230V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503509 (dual, with VFD)	10.0 Hp	460V	Armstrong	carbon steel housing	779.6	Interpolated

Table 2a. Certified Sub-Component List (30RAP, 38AP and 09DP)

S_{DS} (g) = 2.10 z/h = 1 F_p / W_p = 1.51

Single/ Dual Fixed and Variable Speed Pump Options - 30RAP070 thru 30RAP150 cont						
Part Number	*Nominal capacity*	*Voltage*	*Manufacturer*	*Material*	*Weight (lb)*	*Interpolated / Included With Test*
38AP502624 (dual)	10.0 Hp	208/230, 460V	Armstrong	carbon steel housing	576	Interpolated
38AP502623 (dual)	10.0 Hp	380V	Armstrong	carbon steel housing	576	Interpolated
38AP502622 (dual)	10.0 Hp	575V	Armstrong	carbon steel housing	576	Interpolated
38AP503643 (dual, with VFD)	10.0 Hp	575V	Armstrong	carbon steel housing	637.6	Interpolated
38AP503644 (dual, with VFD)	10.0 Hp	380V	Armstrong	carbon steel housing	637.6	Interpolated
38AP503645 (dual, with VFD)	10.0 Hp	208/230V	Armstrong	carbon steel housing	637.6	Interpolated
38AP503656 (dual, with VFD)	10.0 Hp	460V	Armstrong	carbon steel housing	637.6	Interpolated
38AP502716	15.0 Hp	208/230, 460V	Armstrong	carbon steel housing	343	Interpolated
38AP502715	15.0 Hp	380V	Armstrong	carbon steel housing	343	Interpolated
38AP502714	15.0 Hp	575V	Armstrong	carbon steel housing	343	Interpolated
38AP503616 (with VFD)	15.0 Hp	575V	Armstrong	carbon steel housing	373.8	Interpolated
38AP503617 (with VFD)	15.0 Hp	380V	Armstrong	carbon steel housing	373.8	Interpolated
38AP503618 (with VFD)	15.0 Hp	208/230V	Armstrong	carbon steel housing	373.8	Interpolated
38AP503650 (with VFD)	15.0 Hp	460V	Armstrong	carbon steel housing	373.8	Interpolated
38AP503711	15.0 Hp	208/230, 460V	Armstrong	carbon steel housing	426	Interpolated
38AP503710	15.0 Hp	380V	Armstrong	carbon steel housing	426	Interpolated
38AP503709	15.0 Hp	575V	Armstrong	carbon steel housing	426	Interpolated
38AP503724 (with VFD)	15.0 Hp	575V	Armstrong	carbon steel housing	456.8	Interpolated
38AP503725 (with VFD)	15.0 Hp	380V	Armstrong	carbon steel housing	456.8	Interpolated
38AP503726 (with VFD)	15.0 Hp	208/230V	Armstrong	carbon steel housing	456.8	Interpolated
38AP503727 (with VFD)	15.0 Hp	460V	Armstrong	carbon steel housing	456.8	Interpolated
38AP503739	15.0 Hp	208/230, 460V	Armstrong	carbon steel housing	422	Interpolated
38AP503738	15.0 Hp	380V	Armstrong	carbon steel housing	422	Interpolated
38AP503737	15.0 Hp	575V	Armstrong	carbon steel housing	422	Interpolated
38AP503752 (with VFD)	15.0 Hp	575V	Armstrong	carbon steel housing	452.8	Interpolated
38AP503753 (with VFD)	15.0 Hp	380V	Armstrong	carbon steel housing	452.8	Interpolated
38AP503754 (with VFD)	15.0 Hp	208/230V	Armstrong	carbon steel housing	452.8	Interpolated
38AP503755 (with VFD)	15.0 Hp	460V	Armstrong	carbon steel housing	452.8	Interpolated
38AP502605 (dual)	15.0 Hp	208/230, 460V	Armstrong	carbon steel housing	718	Interpolated
38AP502601 (dual)	15.0 Hp	380V	Armstrong	carbon steel housing	718	Interpolated
38AP502600 (dual)	15.0 Hp	575V	Armstrong	carbon steel housing	718	Interpolated
38AP503626 (dual, with VFD)	15.0 Hp	575V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503627 (dual, with VFD)	15.0 Hp	380V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503625 (dual, with VFD)	15.0 Hp	208/230V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503658 (dual, with VFD)	15.0 Hp	460V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503510 (dual, with VFD)	15.0 Hp	575V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503512 (dual, with VFD)	15.0 Hp	380V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503513 (dual, with VFD)	15.0 Hp	208/230V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503514 (dual, with VFD)	15.0 Hp	460V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503518 (dual, with VFD)	15.0 Hp	575V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503519 (dual, with VFD)	15.0 Hp	380V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503520 (dual, with VFD)	15.0 Hp	208/230V	Armstrong	carbon steel housing	779.6	Interpolated
38AP503521 (dual, with VFD)	15.0 Hp	460V	Armstrong	carbon steel housing	779.6	UUT-5 (RAP)

Condenser Coils - Microchannel (30RAP, 38AP, and 09DP)					
Part Number	*Length (in) - Height(in) - # Ckt - # Rows*	*Manufacturer*	*Material*	*Weight (lb)*	*Interpolated / Included With Test*
38AP400945	57 - 44.1 - 1 - 1	Delphi	Aluminum Tubing, Fins and Headers	55	UUT-1 (RAP)
38AP404986	57 - 47.9 - 1 - 1	Delphi	Aluminum Tubing, Fins and Headers	55	UUT-1 (2017)
38AP400943	79 - 47.9 - 2 - 1	Delphi	Aluminum Tubing, Fins and Headers	65	Interpolated
38AP400948	79 - 47.9 - 1 - 1	Delphi	Aluminum Tubing, Fins and Headers	65	Interpolated
38AP400947	79 - 59.9 - 2 - 1	Delphi	Aluminum Tubing, Fins and Headers	65	Interpolated
38AP400946	79 - 59.9 - 1 - 1	Delphi	Aluminum Tubing, Fins and Headers	65	UUT-3 (RAP)
38AP400944	79 - 44.1 - 1 - 1	Delphi	Aluminum Tubing, Fins and Headers	65	UUT-4 (RAP) UUT-5 (RAP)

Table 2a. Certified Sub-Component List (30RAP, 38AP and 09DP)

S_{DS} (g) = 2.10 z/h = 1 F_p / W_p = 1.51

Evaporator BPHE (Brazed Plate Heat Exchanger) - 30RAP					
Part Number	***# plates***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
P80	40	Swep	Stainless Steel	22.4	UUT-1 (RAP)
P80	52	Swep	Stainless Steel	27.5	Interpolated
P80	62	Swep	Stainless Steel	31.8	Interpolated
P80	82	Swep	Stainless Steel	40.3	Interpolated
P80	96	Swep	Stainless Steel	46.3	Interpolated
P120T	62	Swep	Stainless Steel	80.6	UUT-1 (2017)
DP200	86	Swep	Stainless Steel	99.4	Interpolated
DP200	106	Swep	Stainless Steel	117.9	Interpolated
DP200	114	Swep	Stainless Steel	125.3	Interpolated
DP400	74	Swep	Stainless Steel	137.5	Interpolated
DP400	90	Swep	Stainless Steel	160.4	UUT-3 (RAP)
ACH230	210	Alfa Laval	Stainless Steel	197	UUT-4 (RAP)
ACH230	242	Alfa Laval	Stainless Steel	228	Interpolated
ACH500	114	Alfa Laval	Stainless Steel	245	Interpolated
ACH500	126	Alfa Laval	Stainless Steel	267	Interpolated
ACH500	146	Alfa Laval	Stainless Steel	304	Interpolated
ACH500	162	Alfa Laval	Stainless Steel	334	Interpolated
ACH500	186	Alfa Laval	Stainless Steel	378	UUT-5 (RAP)

Fan Motor(s) - (30RAP, 38AP and 09DP)						
Part Number	***Nominal capacity***	***Voltage***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
5K49ZN6473X	3.0 Hp	460V	Regal Beloit	Carbon Steel	45	UUT-1 (RAP)
5K49ZN6475S	3.0 Hp	575V	Regal Beloit	Carbon Steel	45	Interpolated
5K49ZN6474S	3.0 Hp	380V	Regal Beloit	Carbon Steel	45	Interpolated
5K49ZN6472S	3.0 Hp	208/230V	Regal Beloit	Carbon Steel	45	Interpolated
5K49QN3209S	2.0 Hp	575V	Regal Beloit	Carbon Steel	38	Interpolated
5K49QN3208S	2.0 Hp	380V	Regal Beloit	Carbon Steel	38	Interpolated
5K49QN3207S	2.0 Hp	208/230V	Regal Beloit	Carbon Steel	38	Interpolated
5K49QN3204S	2.0 Hp	460V	Regal Beloit	Carbon Steel	38	UUT-3 (RAP)

* Part 5K49ZN6473X and 5K49ZN6472S also installed on UUT-4 (RAP)
* Part 5K49QN3204S also installedtested in UUT-5 (RAP)

Control Panel - (30RAP, 38AP and 09DP)						
Part Number	***Panel Size***	***Voltage***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
C30RAP01065-20001	10 ton	460V	Whitepath	Galv Steel housing	75	UUT-1 (RAP)
C30RAP010, 011, 016, 018, 020, 025, 030	15 - 30 ton	208/230, 380, 460, 575V	Whitepath	Galv Steel housing	75	UUT-1 (2017)
C38AP_025, 027, 030	25 - 30 ton	208/230, 380, 460, 575V	Whitepath	Galv Steel housing	100	Interpolated
C09DPS018, 020, 030	18 - 30 ton	208/230, 380, 460, 575V	Whitepath	Galv Steel housing	100	Interpolated
C30RAP035, 040, 045, 050, 055, 060	35 - 55 ton	208/230, 380, 460, 575V	Whitepath	Galv Steel housing	125	Interpolated
C38AP_040, 050, 060	40 - 60 ton	208/230, 380, 460, 575V	Whitepath	Galv Steel housing	125	Interpolated
09DPM035, 040, 050, 060	35 - 60 ton	208/230, 380, 460, 575V	Whitepath	Galv Steel housing	75	Interpolated
C30RAP0606J-H0CFC	60 ton	460V	Whitepath	Galv Steel housing	150	UUT-3 (RAP)
C30RAP07055-CL300	70 ton	208/230V	Whitepath	Galv Steel housing	175	UUT-4 (RAP)
C38AP_065, 070, 080, 090, 100, 115, 130	65 - 130 ton	208/230, 380, 460, 575V	Whitepath	Galv Steel housing	175	Interpolated
09DPM065, 075, 085, 095, 115, 130	65 - 130 ton	208/230, 380, 460, 575V	Whitepath	Galv Steel housing	75	Interpolated
C30RAP070, 080, 090, 100, 115, 130, 150	70 - 150 ton	208/230, 380, 460, 575V	Whitepath	Galv Steel housing	175	Interpolated
C30RAP1506J-NM5CO	150 ton	460V	Whitepath	Galv Steel housing	175	UUT-5 (RAP)

* Control panel numbers dynamically driven and are supplier decoded to provide required base panel and options, difference is softwa

Table 2b. Certified Sub-Component List (30MP)

S_{DS} (g) = 1.81 z/h = 1 F_p / W_p = 1.30

Compressor - 30MP						
Part Number	***Nominal capacity***	***Voltage***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
ZPT180	15.0 tons	208/230, 380, 460, 575V	Copeland	carbon steel housing	135	UUT-1 (MP)
ZPT176	16.0 tons	208/230, 380, 460, 575V	Copeland	carbon steel housing	135	Interpolated
ZPT240	20.0 tons	208/230, 380, 460, 575V	Copeland	carbon steel housing	146	Interpolated
ZPT364	30.0 tons	208/230, 380, 460, 575V	Copeland	carbon steel housing	146	UUT-5 (2017)
ZPY462	38.0 tons	208/230, 380, 460, 575V	Copeland	carbon steel housing	146	Interpolated
ZPY546	45.0 tons	208/230, 380, 460, 575V	Copeland	carbon steel housing	146	UUT-2 (MP)
GSD80590	50.0 tons	208/230, 380, 400, 460, 575V	Bitzer	carbon steel housing	680	UUT-3 (MP)
GSD80870	74.0 tons	208/230, 380, 400, 460, 575V	Bitzer	carbon steel housing	741	UUT-4 (MP)

Condenser BPHE (30MPW only)					
Part Number	***# plates***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
B80	82	Swep	Stainless Steel	40	UUT-1 (MP)
B85	144	Swep	Stainless Steel	49	Interpolated
B85	160	Swep	Stainless Steel	53	Interpolated
B120T	128	Swep	Stainless Steel	137	Interpolated
B120T	186	Swep	Stainless Steel	188	UUT-2 (MP)
B120T	222	Swep	Stainless Steel	216	Interpolated
B120T	250	Swep	Stainless Steel	241	Interpolated
ACH240	158	Alfa Laval	Stainless Steel	178	UUT-5 (2017)
CBH112-248-AH	248	Alfa Laval	Stainless Steel	231	UUT-3 (MP)
CBH112-300-AH	300	Alfa Laval	Stainless Steel	244	UUT-4 (MP)

Evaporator BPHE					
Part Number	***# plates***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
P80	72	Swep	Stainless Steel	36	UUT-1 (MP)
P80	82	Swep	Stainless Steel	40	Interpolated
P80	100	Swep	Stainless Steel	47	Interpolated
F85	88	Swep	Stainless Steel	34	Interpolated
P120T	74	Swep	Stainless Steel	81	Interpolated
P120T	100	Swep	Stainless Steel	118	Interpolated
P120T	120	Swep	Stainless Steel	138	UUT-2 (MP)
F200T	148	Swep	Stainless Steel	158	Interpolated
ACH240	78	Alfa Laval	Stainless Steel	148	UUT-5 (2017)
ACH220EQ-170M	170	Alfa Laval	Stainless Steel	143	UUT-3 (MP)
ACH220EQ-230M	230	Alfa Laval	Stainless Steel	190	UUT-4 (MP)

Control Panel						
Model Number	***Panel Size***	***Voltage***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
C30MPA01560-00005	15 ton	460V	Gaston	Galv Steel housing	125	UUT-1 (MP)
C30MPA016, 020, 030, 032, 040, 045	15 - 45 ton	208/230, 380, 460,	Gaston	Galv Steel housing	125	Interpolated
C30MPW016, 020, 030, 032, 040, 045	15 - 45 ton	208/230, 380, 460, 575V	Gaston	Galv Steel housing	150	Interpolated
C30MPW03260-00005	32 ton	460V	Gaston	Galv Steel housing	125	UUT-5 (2017)
C30MPW04560-01155	45 ton	460V	Gaston	Galv Steel housing	150	UUT-2 (MP)
C30MPW05061-0000B	50 ton	460V	Gaston	Galv Steel housing	175	UUT-3 (MP)
C30MPA050, 055, 060, 065, 070	50 - 70 ton	208/230, 380, 460, 575V	Gaston	Galv Steel housing	175	Interpolated
C30MPW050, 055, 060, 065, 070	50 - 70 ton	208/230, 380, 460, 575V	Gaston	Galv Steel housing	175	Interpolated
C30MPW07451A00167	74 ton	208/230V	Gaston	Galv Steel housing	200	UUT-4 (MP)

Table 2c1. Certified Sub-Component List (30XA/30XV) Rigid

S_{DS} (g) = 2.00 @ z/h = 1.0 with Fp / Wp = 1.44 S_{DS} (g) = 2.40 @ z/h = 0.0 with Fp / Wp = 1.08

Compressor

Part Number	Manufacturer	Material	Weight (lb)	Interpolated / Included With Test
06TS	Carrier	Cast Iron	867	UUT-3 (30XA) UUT-5 (30XA)
06TT	Carrier	Cast Iron	1460	UUT-5 (30XV)
06ZCE1	Carrier	Cast Iron	1710	Interpolated
06TU	Carrier	Cast Iron	2108	UUT-4 (30XA)
06ZFC2	Carrier	Cast Iron	2196	Interpolated
06ZJG3	Carrier	Cast Iron	2910	UUT-1b (2017)

Condenser Coils

Option	Type	Manufacturer	Material	Weight (lb)	Interpolated / Included With Test
-, 1, 2, 6, 8, 9, F, H, J, N, Q, R (30XA) '-, 1, 2 (30XV)	Aluminum Fin/ Copper Tube	Carrier	Galv. Steel housing, Aluminum and Copper	138.5 (30XA)	UUT-3 (30XA)
4, 5, C, D, L, M, T, V (30XA)	MCHX (Micro-channel heat exchanger)	Delphi	Aluminum	77.4 (30XA)	UUT-4 (30XA) UUT-5 (30XV)
4, 5 (30XV)	MCHX (Micro-channel heat exchanger)	Danfoss	Aluminum	85 (30XV)	UUT-1b (2017)

Cooler

Option	Type	Manufacturer	Material	Weight (lb) Max	Interpolated / Included With Test
30XA					
-, 7	Integral Cooler w/o Heater, Standard Pass	Carrier	Carbon Steel and Copper	1277	Extrapolated
0	Integral Cooler w/ Heater, Standard Pass	Carrier	Carbon Steel and Copper	1665	Interpolated
3	Integral Cooler w/ Heater, Minus One Pass	Carrier	Carbon Steel and Copper	1277	UUT-3 (30XA)
5	Integral Cooler w/ Heater, Plus One Pass	Carrier	Carbon Steel and Copper	1396	Interpolated
7	Integral Cooler w/ Heater, Standard Pass, Full End Screen	Carrier	Carbon Steel and Copper	1860	Interpolated
G	Integral Cooler w/o Heater, Standard Pass, Full End Screen	Carrier	Carbon Steel and Copper	2321	Interpolated
K	Integral Cooler w/ Heater, Minus One Pass, Full End Screen	Carrier	Carbon Steel and Copper	2523	Interpolated
M	Integral Cooler w/ Heater, Plus One Pass, Full End Screen	Carrier	Carbon Steel and Copper	2523	UUT-4 (30XA)
30XV					
-, 4, 6	Integral Cooler w/o Heater, Standard Pass	Carrier	Carbon Steel and Copper	3525	Interpolated
0, 5, 7	Integral Cooler w/ Heater, Standard Pass	Carrier	Carbon Steel and Copper	3525	UUT-5 (30XV) UUT-1b
1	Integral Cooler w/ Heater, Minus One Pass	Carrier	Carbon Steel and Copper	3525	Interpolated
B, C, D, F, G, H	Integral Cooler w/ Heater, Plus One Pass	Carrier	Carbon Steel and Copper	3525	Interpolated
2, 8, 9	Integral Cooler w/ Heater, Standard Pass, Comfort Brine	Carrier	Carbon Steel and Copper	3525	Interpolated
3	Integral Cooler w/o Heater, Standard Pass, Process Brine	Carrier	Carbon Steel and Copper	3525	Interpolated

*note coolers of 30XA and 30XV units are substanitally similar

Table 2c1. Certified Sub-Component List (30XA/30XV) Rigid

S_{DS} (g) = 2.00 @ z/h = 1.0 with Fp / Wp = 1.44 S_{DS} (g) = 2.40 @ z/h = 0.0 with Fp / Wp = 1.08

Control Panel					
Model Number	***Model***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
30XA					
-	NavigatorTM Disp	Schneider	Painted Carbon Steel	300	UUT-3
0	Navigator Disp, EMM	Schneider	Painted Carbon Steel	300	Interpolated
1	Navigator Disp, Service Opt	Schneider	Painted Carbon Steel	300	Interpolated
2	Navigator Disp, EMM, Service Opt	Schneider	Painted Carbon Steel	300	Interpolated
3	Touch PilotTM Disp	Schneider	Painted Carbon Steel	325	UUT-5
4	Touch Pilot Disp, EMM	Schneider	Painted Carbon Steel	300	Interpolated
5	Touch Pilot Disp, Service Opt	Schneider	Painted Carbon Steel	300	Interpolated
6	Touch Pilot Disp, EMM, Service Opt	Schneider	Painted Carbon Steel	300	Interpolated
7	Navigator Disp, BACnet Trans	Schneider	Painted Carbon Steel	325	Interpolated
8	Navigator Disp, BACnet Trans, EMM	Schneider	Painted Carbon Steel	325	Interpolated
9	Navigator Disp, BACnet Translator, Service Opt	Schneider	Painted Carbon Steel	325	Interpolated
B	Navigator Disp, BACnet Translator, EMM, Service Opt	Schneider	Painted Carbon Steel	300	Interpolated
C	Touch Pilot Disp, BACnet Trans	Schneider	Painted Carbon Steel	300	Interpolated
D	Touch Pilot Disp, BACnet Translator, EMM	Schneider	Painted Carbon Steel	300	Interpolated
F	Touch Pilot Disp, BACnet Translator, Service Opt	Schneider	Painted Carbon Steel	325	Interpolated
J	Touch Pilot Disp, BACnet Translator, EMM, Service Opt	Schneider	Painted Carbon Steel	325	Interpolated
H	Navigator Disp, LON Translator	Schneider	Painted Carbon Steel	325	Interpolated
G	Navigator Disp, LON Trans, EMM	Schneider	Painted Carbon Steel	325	Interpolated
K	Navigator Disp, LON Translator, Service Opt	Schneider	Painted Carbon Steel	325	Interpolated
L	Navigator Disp, LON Translator, EMM, Service Opt	Schneider	Painted Carbon Steel	325	Interpolated
M	Touch Pilot Disp, LON Trans	Schneider	Painted Carbon Steel	325	Interpolated
N	Touch Pilot Disp, LON Translator, EMM	Schneider	Painted Carbon Steel	325	Interpolated
P	Touch Pilot Disp, LON Translator, Service Opt	Schneider	Painted Carbon Steel	325	Interpolated
Q	Touch Pilot Disp, LON Translator, EMM, Service Opt	Schneider	Painted Carbon Steel	350	UUT-4
R	Navigator Disp, UPC/Ivue	Schneider	Painted Carbon Steel	325	Interpolated
S	Navigator Disp, UPC/Ivue, EMM	Schneider	Painted Carbon Steel	325	Interpolated
T	Navigator Disp, UPC/Ivue, Service Opt	Schneider	Painted Carbon Steel	325	Interpolated
V	Navigator Disp, UPC/Ivue, EMM, Service Opt	Schneider	Painted Carbon Steel	325	Interpolated
W	Touch Pilot Disp, UPC/Ivue	Schneider	Painted Carbon Steel	325	Interpolated
X	Touch Pilot Disp, UPC/Ivue, EMM	Schneider	Painted Carbon Steel	350	Interpolated
Y	Touch Pilot Disp, UPC/Ivue, Service Opt	Schneider	Painted Carbon Steel	350	Interpolated
Z	Touch Pilot Disp, UPC/Ivue, EMM, Service Opt	Schneider	Painted Carbon Steel	350	Interpolated
30XV					
-, 0, 1, 2, 3, 4	End Mount Panel with Compressor	UTEC	Painted Carbon Steel	2600	UUT-1b

Schneider is formally Square D

Table 2c1. Certified Sub-Component List (30XA/30XV) Rigid

S_{DS} (g) = 2.00 @ z/h = 1.0 with Fp / Wp = 1.44 S_{DS} (g) = 2.40 @ z/h = 0.0 with Fp / Wp = 1.08

VFDs

Part Number	Nominal Capacity	Voltage	Manufacturer	Material	Weight (lb)	Interpolated / Included With Test
HR46ZQ003	7.5kW	208-230V	Danfoss	Aluminum	51	Interpolated
HR46ZS003	11kW	208-230V	Danfoss	Aluminum	51	Interpolated
HR46ZS004	11kW	575V	Danfoss	Aluminum	51	Interpolated
HR46ZT002	15kW	380/460V	Danfoss	Aluminum	51	UUT-5 (30XV)
HR46ZT003	15kW	575V	Danfoss	Aluminum	51	Interpolated
HR46ZT004	15kW	208-230V	Danfoss	Aluminum	60	Interpolated
HR46ZT005	15kW	380/460V	Danfoss	Aluminum	51	Interpolated
HR46ZT006	15kW	575V	Danfoss	Aluminum	51	Interpolated
HR46ZU002	18kW	380/460V	Danfoss	Aluminum	51	Interpolated
HR46ZU003	18kW	575V	Danfoss	Aluminum	51	Interpolated
HR46ZU005	18kW	380/460V	Danfoss	Aluminum	51	Interpolated
HR46ZU006	18kW	575V	Danfoss	Aluminum	51	Interpolated
HR46ZV001	22kW	380/460V	Danfoss	Aluminum	60	Interpolated
HR46ZV002	22kW	575V	Danfoss	Aluminum	60	Interpolated
HR46ZV003	22kW	380/460V	Danfoss	Aluminum	60	UUT-1b
HR46ZV004	22kW	575V	Danfoss	Aluminum	60	Interpolated
HR46ZW001	30kW	380/460V	Danfoss	Aluminum	60	UUT-5 (30XV)
HR46ZW002	30kW	575V	Danfoss	Aluminum	60	Interpolated
HR46ZY001	55kW	380/460V	Danfoss	Aluminum	99	Interpolated
HR46ZY002	55kW	575V	Danfoss	Aluminum	99	UUT-5 (30XV)
HR46ZY003	75kW	380/460V	Danfoss	Aluminum	143	Interpolated
HR46ZY004	75kW	575V	Danfoss	Aluminum	143	Interpolated
HR46ZY005	110kW	380/460V	Danfoss	Aluminum	135	Interpolated
HR46ZY006	132kW	380/460V	Danfoss	Aluminum	135	Interpolated
HR46ZY007	132kW	575V	Danfoss	Aluminum	135	Interpolated
HR46ZY008	160kW	380/460V	Danfoss	Aluminum	135	Interpolated
HR46ZY009	160kW	575V	Danfoss	Aluminum	135	Interpolated
HR46ZY014	160kW	208-230V	Danfoss	Aluminum	275	Interpolated
HR46ZY010	200kW	380/460V	Danfoss	Aluminum	275	Interpolated
HR46ZY015	200kW	575V	Danfoss	Aluminum	275	Interpolated
HR46ZY011	250kW	380/460V	Danfoss	Aluminum	275	Interpolated
HR46ZY012	250kW	575V	Danfoss	Aluminum	275	Interpolated
HY46ZY022	250kW	380/460V	Danfoss	Aluminum	275	Interpolated
HR46ZY013	315kW	575V	Danfoss	Aluminum	275	UUT-5 (30XA)
HR46ZY013	315kW	575V	Danfoss	Aluminum	275	Interpolated
HY46ZY019	315kW	380/460V	Danfoss	Aluminum	275	Interpolated
HY46ZY020	315kW	575V	Danfoss	Aluminum	275	Interpolated
HY46ZY016	400kW	380/460V	Danfoss	Aluminum	520	UUT-1b
HY46ZY017	560kW	575V	Danfoss	Aluminum	520	Interpolated

Accessories

Option	Type	Manufacturer	Material	Weight (lb)	Interpolated / Included With Test
All Models	Security Grill	Carrier	Carbon Steel	10	UUT-1b
All Models	Hail Guard	Carrier	Carbon Steel	20	UUT-1b

Table 2c2. Certified Sub-Component List (30XA/30XV) Neoprene Isolated

S_{DS} (g) = 0.80 @ z/h = 1.0 with Fp / Wp = 1.44 S_{DS} (g) = 1.0 @ z/h = 0.0 with Fp / Wp = 0.60

Compressor

Part Number	*Manufacturer*	*Material*	*Weight (lb)*	*Interpolated / Included With Test*
06TS	Carrier	Cast Iron	867	Extrapolated
06TT	Carrier	Cast Iron	1460	Extrapolated
06ZCE1	Carrier	Cast Iron	1710	UUT-2b
06TU	Carrier	Cast Iron	2108	Interpolated
06ZFC2	Carrier	Cast Iron	2196	Interpolated
06ZJG3	Carrier	Cast Iron	2910	UUT-1c

Condenser Coils

Option	*Type*	*Manufacturer*	*Material*	*Weight (lb)*	*Interpolated / Included With Test*
-, 1, 2, 6, 8, 9, F, H, J, N, Q, R (30XA) '-, 1, 2 (30XV)	Aluminum Fin/ Copper Tube	Carrier	Galv. Steel housing, Aluminum and Copper	138.5	UUT-2b
4, 5 (30XV)	MCHX (Micro-channel heat exchanger)	Danfoss	Aluminum	85	UUT-1c

Cooler

Option	*Type*	*Manufacturer*	*Material*	*Weight (lb) Max*	*Interpolated / Included With Test*
30XA					
-, 7	Integral Cooler w/o Heater, Standard Pass	Carrier	Carbon Steel and Copper	1277	Extrapolated
0	Integral Cooler w/ Heater, Standard Pass	Carrier	Carbon Steel and Copper	1665	Interpolated
3	Integral Cooler w/ Heater, Minus One Pass	Carrier	Carbon Steel and Copper	1277	Interpolated
5	Integral Cooler w/ Heater, Plus One Pass	Carrier	Carbon Steel and Copper	1396	Interpolated
7	Integral Cooler w/ Heater, Standard Pass, Full End Screen	Carrier	Carbon Steel and Copper	1860	Interpolated
G	Integral Cooler w/o Heater, Standard Pass, Full End Screen	Carrier	Carbon Steel and Copper	2321	Interpolated
K	Integral Cooler w/ Heater, Minus One Pass, Full End Screen	Carrier	Carbon Steel and Copper	2523	Interpolated
M	Integral Cooler w/ Heater, Plus One Pass, Full End Screen	Carrier	Carbon Steel and Copper	2523	Interpolated
30XV					
-, 4, 6	Integral Cooler w/o Heater, Standard Pass	Carrier	Carbon Steel and Copper	3525	Extrapolated
0, 5, 7	Integral Cooler w/ Heater, Standard Pass	Carrier	Carbon Steel and Copper	1100	UUT-2b
0, 5, 7	Integral Cooler w/ Heater, Standard Pass	Carrier	Carbon Steel and Copper	3525	UUT-1c
1	Integral Cooler w/ Heater, Minus One Pass	Carrier	Carbon Steel and Copper	3525	Interpolated
B, C, D, F, G, H	Integral Cooler w/ Heater, Plus One Pass	Carrier	Carbon Steel and Copper	3525	Interpolated
2, 8, 9	Integral Cooler w/ Heater, Standard Pass, Comfort Brine	Carrier	Carbon Steel and Copper	3525	Interpolated
3	Integral Cooler w/o Heater, Standard Pass, Process Brine	Carrier	Carbon Steel and Copper	3525	Interpolated

*note coolers are substantially similar in 30XA and 30XV units

Table 2c2. Certified Sub-Component List (30XA/30XV) Neoprene Isolated

S_{DS} (g) = 0.80 @ z/h = 1.0 with Fp / Wp = 1.44 S_{DS} (g) = 1.0 @ z/h = 0.0 with Fp / Wp = 0.60

Control Panel					
Model Number	***Model***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
30XA					
-	NavigatorTM Disp	UTEC	Painted Carbon Steel	300	Extrapolated
0	Navigator Disp, EMM	UTEC	Painted Carbon Steel	300	Extrapolated
1	Navigator Disp, Service Opt	UTEC	Painted Carbon Steel	300	Extrapolated
2	Navig Disp, EMM, Service Opt	UTEC	Painted Carbon Steel	300	Extrapolated
3	Touch PilotTM Disp	UTEC	Painted Carbon Steel	325	Extrapolated
4	Touch Pilot Disp, EMM	UTEC	Painted Carbon Steel	300	Extrapolated
5	Touch Pilot Disp, Service Opt	UTEC	Painted Carbon Steel	300	Extrapolated
6	Touch Pilot Disp, EMM, Service Opt	UTEC	Painted Carbon Steel	300	Extrapolated
7	Navigator Disp, BACnet Trans	UTEC	Painted Carbon Steel	325	Extrapolated
8	Navig Disp, BACnet Trans, EMM	UTEC	Painted Carbon Steel	325	Extrapolated
9	Navigator Disp, BACnet Translator, Service Opt	UTEC	Painted Carbon Steel	325	Extrapolated
B	Navigator Disp, BACnet Translator, EMM, Service Opt	UTEC	Painted Carbon Steel	300	Extrapolated
C	Touch Pilot Disp, BACnet Trans	UTEC	Painted Carbon Steel	300	Extrapolated
D	Touch Pilot Disp, BACnet Translator, EMM	UTEC	Painted Carbon Steel	300	Extrapolated
F	Touch Pilot Disp, BACnet Translator, Service Opt	UTEC	Painted Carbon Steel	325	Extrapolated
J	Touch Pilot Disp, BACnet Translator, EMM, Service Opt	UTEC	Painted Carbon Steel	325	Extrapolated
H	Navigator Disp, LON Translator	UTEC	Painted Carbon Steel	325	Extrapolated
G	Navig Disp, LON Trans, EMM	UTEC	Painted Carbon Steel	325	Extrapolated
K	Navigator Disp, LON Translator, Service Opt	UTEC	Painted Carbon Steel	325	Extrapolated
L	Navigator Disp, LON Translator, EMM, Service Opt	UTEC	Painted Carbon Steel	325	Extrapolated
M	Touch Pilot Disp, LON Trans	UTEC	Painted Carbon Steel	325	Extrapolated
N	Touch Pilot Disp, LON Translator, EMM	UTEC	Painted Carbon Steel	325	Extrapolated
P	Touch Pilot Disp, LON Translator, Service Opt	UTEC	Painted Carbon Steel	325	Extrapolated
Q	Touch Pilot Disp, LON Translator, EMM, Service Opt	UTEC	Painted Carbon Steel	350	Extrapolated
R	Navigator Disp, UPC/Ivue	UTEC	Painted Carbon Steel	325	Extrapolated
S	Navigator Disp, UPC/Ivue, EMM	UTEC	Painted Carbon Steel	325	Extrapolated
T	Navigator Disp, UPC/Ivue,	UTEC	Painted Carbon Steel	325	Extrapolated
V	Navigator Disp, UPC/Ivue, EMM, Service Opt	UTEC	Painted Carbon Steel	325	Extrapolated
W	Touch Pilot Disp, UPC/Ivue	UTEC	Painted Carbon Steel	325	Extrapolated
X	Touch Pilot Disp, UPC/Ivue, EMM	UTEC	Painted Carbon Steel	350	Extrapolated
Y	Touch Pilot Disp, UPC/Ivue, Service Opt	UTEC	Painted Carbon Steel	350	Extrapolated
Z	Touch Pilot Disp, UPC/Ivue, EMM, Service Opt	UTEC	Painted Carbon Steel	350	Extrapolated
30XV					
-, 0, 1, 2, 3, 4 (30XV080 - 140)	End Mount Panel (7" Touch Pilot Display w/options)	UTEC	Painted Carbon Steel	850	UUT-2b
-, 0, 1, 2, 3, 4 (30XV140- 500)	End Mount Panel with Compressor VFDs (7" Touch	UTEC	Painted Carbon Steel	2600	UUT-1c

*note control pabnels are substantially similar in 30XA and 30XV units

Table 2c2. Certified Sub-Component List (30XA/30XV) Neoprene Isolated

S_{DS} (g) = 0.80 @ z/h = 1.0 with Fp / Wp = 1.44 S_{DS} (g) = 1.0 @ z/h = 0.0 with Fp / Wp = 0.60

VFDs						
Part Number	***Nominal Capacity***	***Voltage***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
HR46ZQ003	7.5kW	208-230V	Danfoss	Aluminum	51	Interpolated
HR46ZS003	11kW	208-230V	Danfoss	Aluminum	51	Interpolated
HR46ZS004	11kW	575V	Danfoss	Aluminum	51	Interpolated
HR46ZT002	15kW	380/460V	Danfoss	Aluminum	51	Interpolated
HR46ZT003	15kW	575V	Danfoss	Aluminum	51	Interpolated
HR46ZT004	15kW	208-230V	Danfoss	Aluminum	60	UUT-2b
HR46ZT005	15kW	380/460V	Danfoss	Aluminum	51	Interpolated
HR46ZT006	15kW	575V	Danfoss	Aluminum	51	Interpolated
HR46ZU002	18kW	380/460V	Danfoss	Aluminum	51	Interpolated
HR46ZU003	18kW	575V	Danfoss	Aluminum	51	Interpolated
HR46ZU005	18kW	380/460V	Danfoss	Aluminum	51	Interpolated
HR46ZU006	18kW	575V	Danfoss	Aluminum	51	Interpolated
HR46ZV001	22kW	380/460V	Danfoss	Aluminum	60	Interpolated
HR46ZV002	22kW	575V	Danfoss	Aluminum	60	Interpolated
HR46ZV003	22kW	380/460V	Danfoss	Aluminum	60	UUT-1c
HR46ZV004	22kW	575V	Danfoss	Aluminum	60	Interpolated
HR46ZW001	30kW	380/460V	Danfoss	Aluminum	60	Interpolated
HR46ZW002	30kW	575V	Danfoss	Aluminum	60	Interpolated
HR46ZY001	55kW	380/460V	Danfoss	Aluminum	99	Interpolated
HR46ZY002	55kW	575V	Danfoss	Aluminum	99	Interpolated
HR46ZY003	75kW	380/460V	Danfoss	Aluminum	143	Interpolated
HR46ZY004	75kW	575V	Danfoss	Aluminum	143	Interpolated
HR46ZY005	110kW	380/460V	Danfoss	Aluminum	135	Interpolated
HR46ZY006	132kW	380/460V	Danfoss	Aluminum	135	Interpolated
HR46ZY007	132kW	575V	Danfoss	Aluminum	135	Interpolated
HR46ZY008	160kW	380/460V	Danfoss	Aluminum	135	Interpolated
HR46ZY009	160kW	575V	Danfoss	Aluminum	135	Interpolated
HR46ZY014	160kW	208-230V	Danfoss	Aluminum	275	UUT-2b
HR46ZY010	200kW	380/460V	Danfoss	Aluminum	275	Interpolated
HR46ZY015	200kW	575V	Danfoss	Aluminum	275	Interpolated
HR46ZY011	250kW	380/460V	Danfoss	Aluminum	275	Interpolated
HR46ZY012	250kW	575V	Danfoss	Aluminum	275	Interpolated
HY46ZY022	250kW	380/460V	Danfoss	Aluminum	275	Interpolated
HR46ZY013	315kW	575V	Danfoss	Aluminum	275	Interpolated
HR46ZY013	315kW	575V	Danfoss	Aluminum	275	Interpolated
HY46ZY019	315kW	380/460V	Danfoss	Aluminum	275	Interpolated
HY46ZY020	315kW	575V	Danfoss	Aluminum	275	Interpolated
HY46ZY016	400kW	380/460V	Danfoss	Aluminum	520	UUT-1c
HY46ZY017	560kW	575V	Danfoss	Aluminum	520	Interpolated

Accessories					
Option	***Type***	***Manufacturer***	***Material***	***Weight (lb)***	***Interpolated / Included With Test***
All Models	Security Grill	Carrier	Carbon Steel	10	UUT-1c
All Models	Hail Guard	Carrier	Carbon Steel	20	UUT-1c

Special Seismic Certification
OSHPD Preapproval OSP-0184-10
Carrier 30XA, 30RAP, 38AP, 09DP, 30MPA and 30MPW Product Lines

UUT-1 (2017) Test Summary

Testing Lab: Buffalo SEESL Lab
Testing Report: UB CSEE/SEESL-2017-06
Testing Unit Num: UUT-1

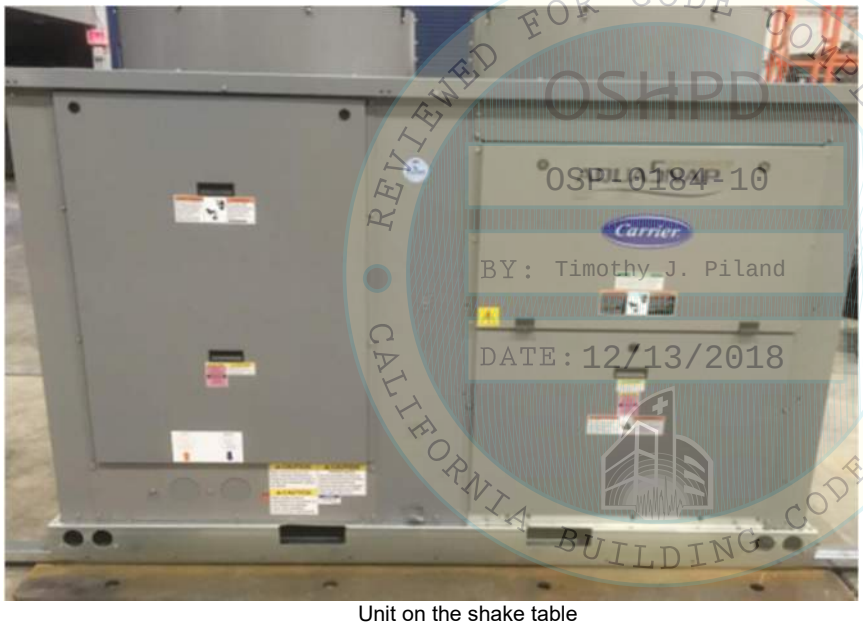
Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30RAP0186DC0D100-1	16.1 tons	Rigid Mont	X	Front - Back	9.5	88.5	40.5	66.5	1,410
			Y	Side - Side	13.0				
			Z	Vertical	10.8				

* Frequencies are for units prior to ICC ES AC-156 testing.

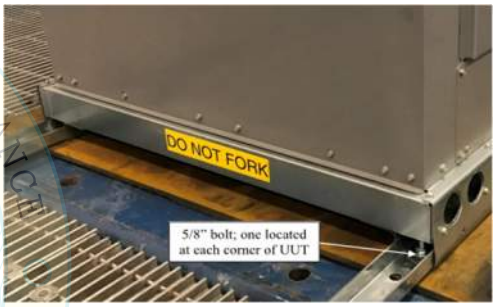
Attachment Method: UUT attached to 1/2" steel interface plate with 5/8"-13 UNC Grade 5 bolt, nuts and washers each corner (4 total). Steel plate to shake table with eight (8) 1 1/8"-7 UNC Grade 8 bolts and nuts

Seismic Parameters

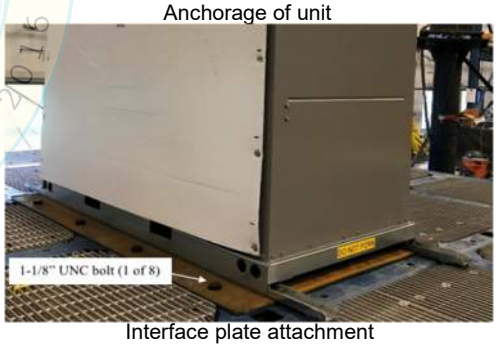
Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	2.50	1.0	4.00g	3.00g	1.67g	0.67g



Unit on the shake table



Anchorage of unit



Interface plate attachment

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT (RAP) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Condenser Coils - Microchannel	38AP44986	Delphi	Aluminum Tubing, Fins and Headers
Evaporator BPHE	P120T	Swep	Stainless Steel
Control Panel	C30RAP07055-CL300	Whitepath	Galv Steel housing

UUT-1 (RAP) Summary Tested Sub-Component

Testing Lab: Buffalo SEESL Lab
Testing Report: UB-SEESL-2011-07 (08/15/2011)
Testing Unit Num: UUT1 (30RAP010)

Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30RAP01065-20001	10.5 tons	Rigid Mont	X	Front - Back	12.4	66.5	40.5	66.5	1,029
			Y	Side - Side	7.4				
			Z	Vertical	15.5				

* Frequencies are for units prior to ICC ES AC-156 testing.

Attachment Method: 3 - 3/4" A307 bolts at each corner of the unit

Seismic Parameters								
Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	2.50	1.0	4.00g	3.00g	1.67g	0.67g

Unit on the shake table

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-1 (RAP) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	ZP137KCE-TFD-155	Copeland	carbon steel housing
Pump	38AP502549	Armstrong	carbon steel housing
Condenser Coils - Microchannel	38AP400945	Delphi	Aluminum Tubing, Fins and Headers
Evaporator BPHE	P80 - 40	SWEP	Stainless Steel
Fan Motor	5K49ZN6473X	Regal Beloit	Carbon Steel
Control Panel	C30RAP01065-20001	Whitepath	Galv Steel housing

UUT-3 (RAP) Test Summary

Testing Lab: Buffalo SEESL Lab
Testing Report: UB-SEESL-2011-07 (08/15/2011)
Testing Unit Num: UUT3

Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30RAP0606J-H0CFC	56.0 tons	Rigid Mont	X	Front - Back	9.9	88.5	92.5	78.5	3,062
			Y	Side - Side	5.8				
			Z	Vertical	9.8				

* Frequencies are for units prior to ICC ES AC-156 testing.

Attachment Method	3 - 3/4" A307 bolts at ea corner of the unit
Seismic Enhancement	Internal Seismic Bracing on condenser coils.

Seismic Parameters

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	2.50	1.0	4.00g	3.00g	1.67g	0.67g

Unit on the shake table

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-3 (RAP) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	ZP182KCE-TFD-155	Copeland	carbon steel housing
Pump	38AP502570	Armstrong	carbon steel housing
Condenser Coils - Microchannel	38AP400946	Delphi	Aluminum Tubing, Fins and Headers
Evaporator BPHE	DP400 - 90	SWEP	Stainless Steel
Fan Motor	5K49QN3204S	Regal Beloit	Carbon Steel
Control Panel	C30RAP0606J-H0CFC	Whitepath	Galv Steel housing

UUT-4 (RAP) Test Summary

Testing Lab: US Army Corp CERL Lab
Testing Report: B&B 2012-0273.00 (09/30/2013)
Testing Unit Num: UUT-4

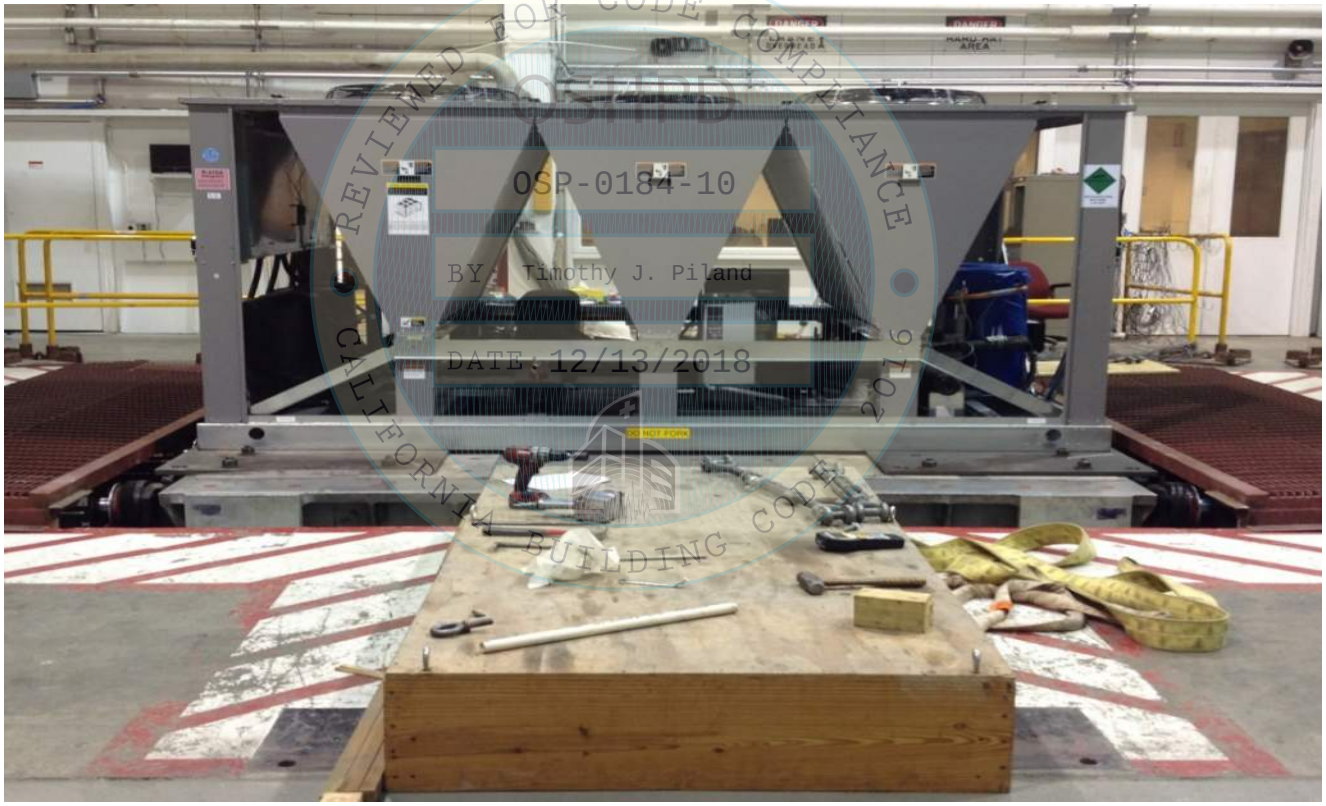
Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30RAP07055-CL300	68.9 tons	Rigid Mont	X	Front - Back	7.5	151.1	88.5	78.5	4,100
			Y	Side - Side	13.0				
			Z	Vertical	18.0				

* Frequencies are for units prior to ICC ES AC-156 testing.

Attachment Method: Unit base plates at each leg were welded to adapter plates

Seismic Parameters

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	2.10	1.0	3.36g	2.52g	1.40g	0.56g



Unit on the shake table

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-4 (RAP) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	ZP182KCE-TW5-455	Copeland	carbon steel housing
Compressor	SH240A3ACC	Danfoss	carbon steel housing
Pump	38AP503621 (with VFD)	Armstrong	carbon steel housing
Condenser Coils - Microchannel	38AP400944	Delphi	Aluminum Tubing, Fins and Headers
Evaporator BPHE	ACH230	Alfa Laval	Stainless Steel
Fan Motor	5K49ZN6473X / 5K49ZN6472S	Regal Beloit	Carbon Steel
Control Panel	C30RAP07055-CL300	Whitepath	Galv Steel housing

UUT-5 (RAP) Test Summary

Testing Lab: US Army Corp CERL Lab
Testing Report: B&B 2012-0273.00 (09/30/2013)
Testing Unit Num: UUT-5

Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30RAP1506J-NM5C0	139.7 tons	Rigid Mont	X	Front - Back	6.2	231.6	88.5	78.5	7,500
			Y	Side - Side	8.0				
			Z	Vertical	15.0				

* Frequencies are for units prior to ICC ES AC-156 testing.

Attachment Method: Unit is bolted to fixture with 6-3/6" dia bolts at ea leg

Seismic Parameters

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	2.10	1.0	3.36g	2.52g	1.40g	0.56g

Unit on the shake table

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-5 (RAP) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	ZP295KCE-TFD-250	Copeland	carbon steel housing
Compressor	SH300A4ACC	Danfoss	carbon steel housing
Pump	38AP503521 (dual, with VFD)	Armstrong	carbon steel housing
Condenser Coils - Microchannel	38AP400944	Delphi	Aluminum Tubing, Fins and Headers
Evaporator BPHE	ACH500	Alfa Laval	Stainless Steel
Fan Motor	5K49QN3204S	Regal Beloit	Carbon Steel
Control Panel	C30RAP1506J-NM5CO	Whitepath	Galv Steel housing

Special Seismic Certification
OSHPD Preapproval OSP-0184-10
Carrier 30XA, 30RAP, 38AP, 09DP, 30MPA and 30MPW Product Lines

UUT-5 (2017) Test Summary

Testing Lab: University at Buffalo SEESL Lab
Testing Report: UB CSEE/SEESL-2017-06
Testing Unit Num: UUT-2

Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30MPW03260-00005	30.0 tons	Rigid Mont	X	Front - Back	9.6	57	32	65	1,055
			Y	Side - Side	8.8				
			Z	Vertical	22.6				

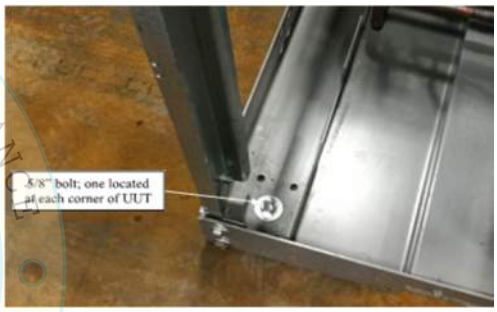
* Frequencies are for units prior to ICC ES AC-156 testing.

Attachment Method: UUT attached to 1/2" steel interface plate with 5/8"-13 UNC Grade 5 bolt, nuts and washers each corner (4 total). Steel plate to shake table with eight (8) 1 1/8"-7 UNC Grade 8 bolts and nuts

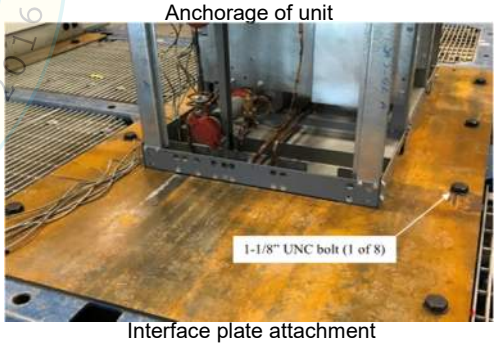
Seismic Parameters

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	2.50	1.0	4.00g	3.00g	1.67g	0.67g

Unit on the shake table



Anchorage of unit



Interface plate attachment

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-5 (2017) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	ZPT364	Copeland	carbon steel housing
Condenser BPHE	ACH240-158	Alfa Laval	Stainless Steel
Evaporator BPHE	ACH240-78	Alfa Laval	Stainless Steel
Control Panel	C30MPW03260-00005	Gaston	Galv Steel housing

UUT-1 (MP) Test Summary

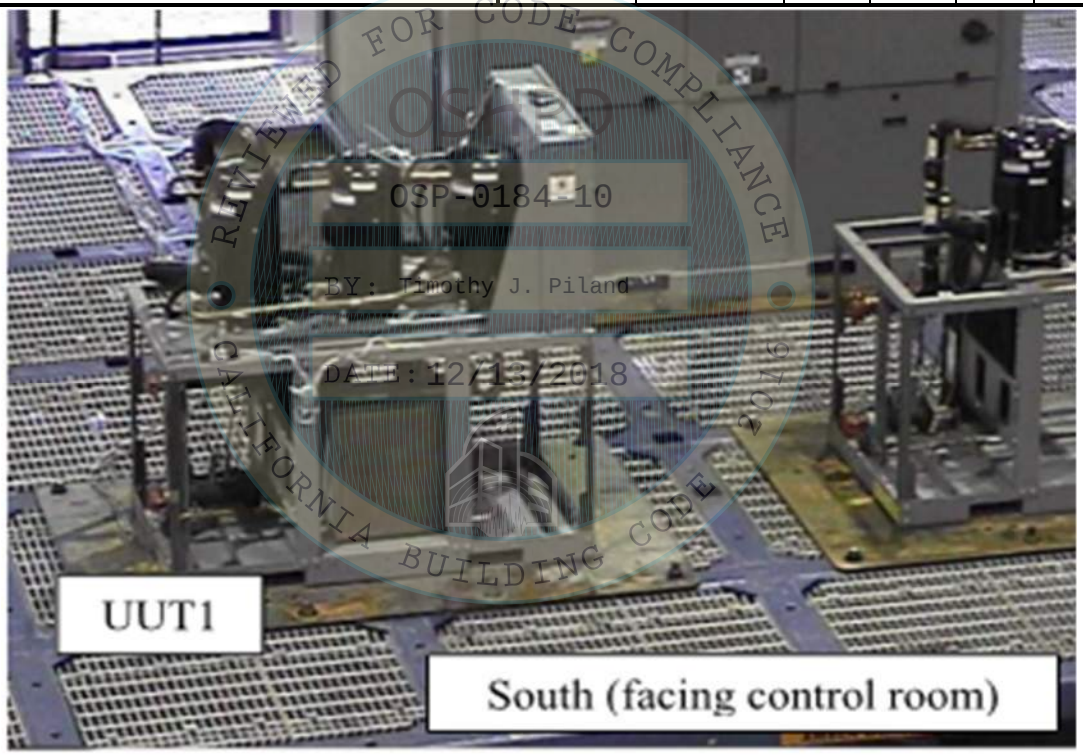
Testing Lab: University at Buffalo SEESL Lab
Testing Report: UB-SEESL-2011-07 (08/15/2011)
Testing Unit Num: UUT1 (MPA015)

Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30MPA01560-00005	13.9 tons	Rigid Mont	X	Front - Back	8.4	57	32	65	626
			Y	Side - Side	9.5				
			Z	Vertical	23.9				

* Frequencies are for units prior to ICC ES AC-156 testing.
* Unit dimensions are catalog values, lab report dimensions are reported at different datums

Attachment Method: 1/2" dia A307 bolts at each corner (4 total)

Seismic Parameters								
Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	1.81	1.0	2.90g	2.17g	1.21g	0.48g



Unit on the shake table

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-1 (MP) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	ZPT180	Copeland	carbon steel housing
Condenser BPHE	B80 - 82	SWEP	Stainless Steel
Evaporator BPHE	P80 - 72	SWEP	Stainless Steel
Control Panel	C30MPA01560-00005	Gaston	Galv Steel housing

UUT-2 (MP) Test Summary

Testing Lab: University at Buffalo SEESL Lab
Testing Report: UB-SEESL-2011-07 (08/15/2011)
Testing Unit Num: UUT2

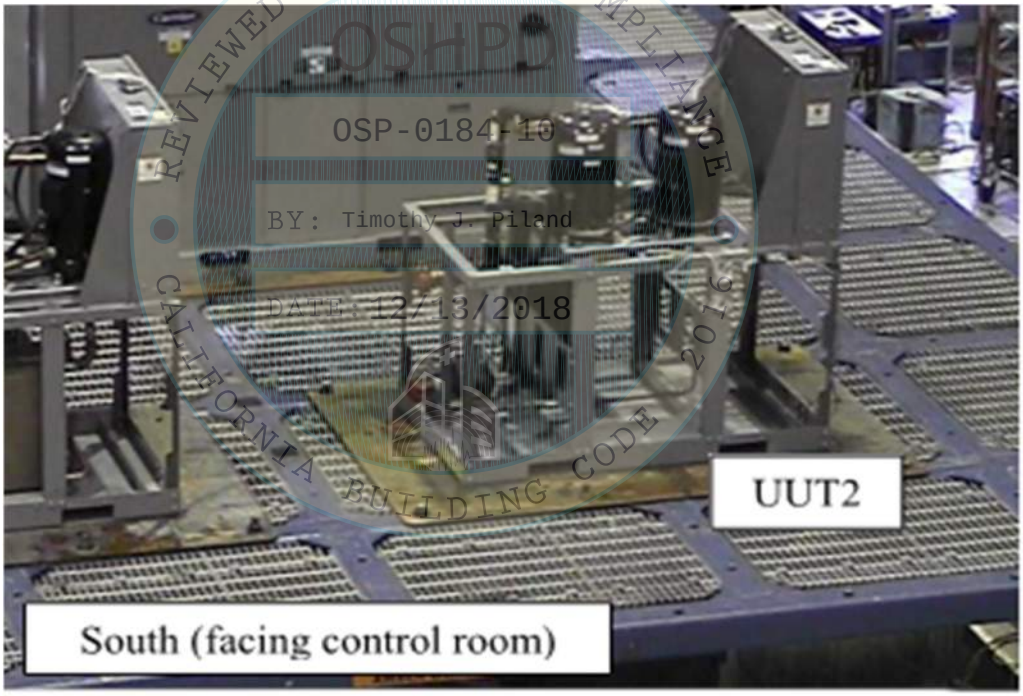
Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30MPW04560-01155	45.0 tons	Rigid Mont	X	Front - Back	6.2	57	32	65	1,190
			Y	Side - Side	6.0				
			Z	Vertical	16.8				

* Frequencies are for units prior to ICC ES AC-156 testing.
* Unit dimensions are catalog values, lab report dimensions are reported at different datums

Attachment Method: 1/2" dia A307 bolts at each corner (4 total)

Seismic Parameters

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	1.81	1.0	2.90g	2.17g	1.21g	0.48g



Unit on the shake table

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-2 (MP) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	ZPY546	Copeland	carbon steel housing
Condenser BPHE	B120T - 86	SWEP	Stainless Steel
Evaporator BPHE	P120T - 120	SWEP	Stainless Steel
Control Panel	C30MPW04560-01155	Gaston	Galv Steel housing

UUT-3 (MP) Test Summary

Testing Lab: University at Buffalo SEESL Lab
Testing Report: UB CSEE/SEESL-2015-42 (07/20/2015)
Testing Unit Num: UUT-3

Model Number	*Nominal Capacity*	*Mounting*	*Excitation Direction*		*Frequency* (Hz)*	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30MPW05061A0000B	50.0 tons	Rigid Mont	X	Front - Back	7.7	57	32	68.8	1,625
			Y	Side - Side	6.3				
			Z	Vertical	20.8				

* Frequencies are for units prior to ICC ES AC-156 testing.
* Unit dimensions are catalog values, lab report dimensions are reported at different datums

Attachment Method: 1/2" dia A307 bolts at each corner (4 total)

Seismic Parameters

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	1.81	1.0	2.90g	2.17g	1.21g	0.48g

Unit on the shake table

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-3 (MP) Summary Tested Sub-Component

Sub-Component	*Part Number*	*Manufacturer*	*Material*
Compressor	GSD80590	Bitzer	carbon steel housing
Condenser BPHE	CBH112-248-AH	Alfa Laval	Stainless Steel
Evaporator BPHE	ACH220EQ-170M	Alfa Laval	Stainless Steel
Control Panel	C30MPW05061-0000B	Gaston	Galv Steel housing

UUT-4 (MP) Test Summary

Testing Lab: University at Buffalo SEESL Lab
Testing Report: UB CSEE/SEESL-2015-42 (07/20/2015)
Testing Unit Num: UUT-4

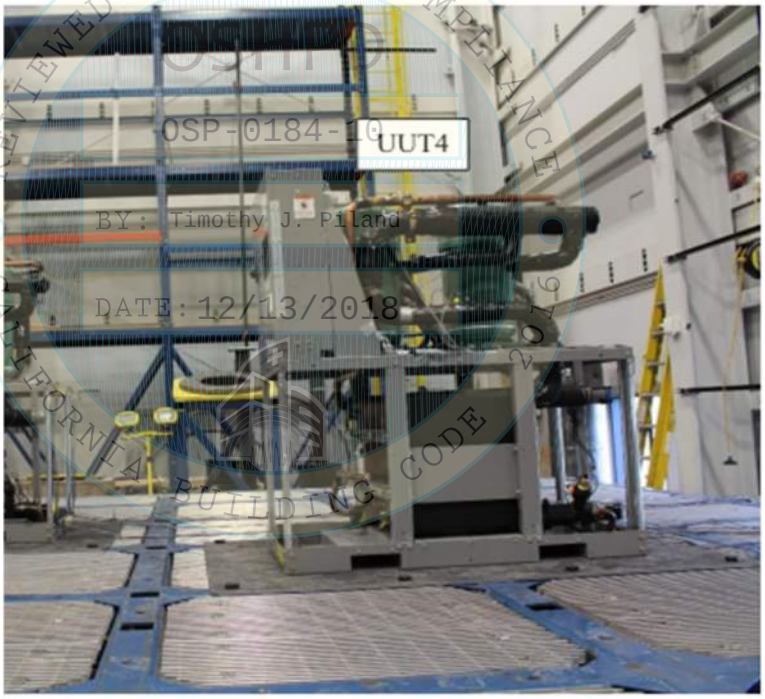
Model Number	*Nominal Capacity*	*Mounting*	*Excitation Direction*		*Frequency* (Hz)*	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30MPW07451A00167	74.0 tons	Rigid Mont	X	Front - Back	6.2	57	32	68.8	1,790
			Y	Side - Side	6.1				
			Z	Vertical	17.8				

* Frequencies are for units prior to ICC ES AC-156 testing.
* Unit dimensions are catalog values, lab report dimensions are reported at different datums

Attachment Method: 1/2" dia A307 bolts at each corner (4 total)

Seismic Parameters

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	1.81	1.0	2.90g	2.17g	1.21g	0.48g



Unit on the shake table

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-4 (MP) Summary Tested Sub-Component

Sub-Component	*Part Number*	*Manufacturer*	*Material*
Compressor	GSD80870	Bitzer	Carbon Steel Housing
Condenser BPHE	CBH112-300-AH	Alfa Laval	Stainless Steel
Evaporator BPHE	ACH220EQ-230M	Alfa Laval	Stainless Steel
Control Panel	C30MPW07451A00167	Gaston	Galv Steel housing

Special Seismic Certification
OSHPD Preapproval OSP-0184-10
Carrier 30XA, 30RAP, 38AP, 09DP, 30MPA and 30MPW Product Lines

UUT-2B (XV) Test Summary

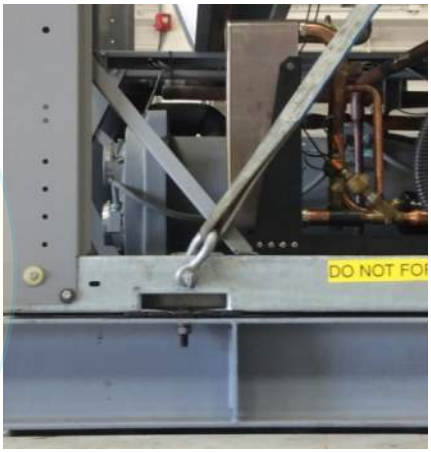
Testing Lab: Army Corp Lab
Testing Report: 2016-0315.00
Testing Unit Num: UUT-2b

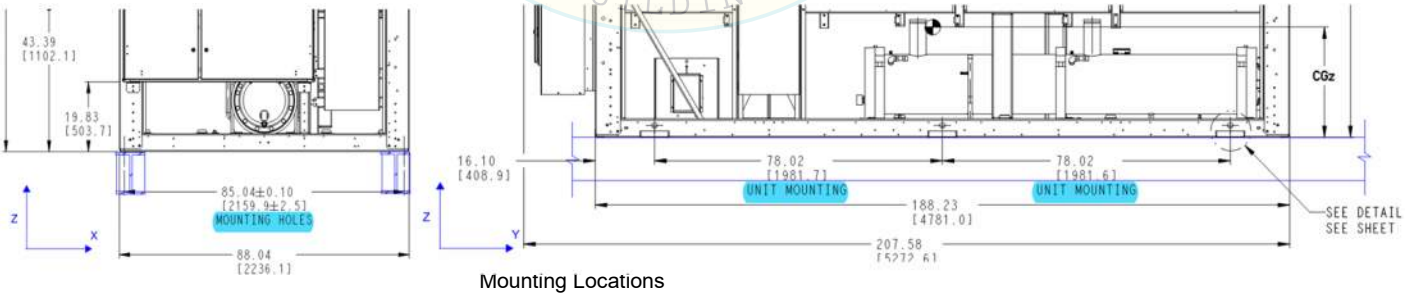
Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30XV140	143.8 tons	Neoprene Isolated mount	X	Front - Back	10.5	208	88	99	13,596
			Y	Side - Side	8.2				
			Z	Vertical	7.1				

* Frequencies are for units prior to ICC ES AC-156 testing.

Attachment Method	Seismic Parameters							
	Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
					A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
Unit was attached with 3/4"Ø grade 5 bolts and Mason Industries, Inc. Model #: 6x10SWN neoprene pads (6 total)	CBC 2016	AC 156	2.00 2.50	1.00 0.00	3.20g	2.40g	1.68g	0.68g

Unit on the shake table


Bolted base connection with neoprene pad



Mounting Locations

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-2B (XV) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	06ZCE1 & 06ZCE1	Carrier	Cast Iron
Condenser	30XV80000501 & 30XV80000601	Carrier	Galv Steel Frame, Aluminum & Copper
Cooler	30XV80002401	Carrier	Carbon Steel and Copper
Fan Motor	HD52AZ466	Wolong	Carbon Steel and Copper
Control Box	C30XV-1405M-0--3-L	UTEC	Painted Carbon Steel
VFD	HR46ZT004 & HR46ZY014	Danfoss	Aluminum

Special Seismic Certification
OSHPD Preapproval OSP-0184-10
Carrier 30XA, 30RAP, 38AP, 09DP, 30MPA and 30MPW Product Lines

UUT-1B (XV) Test Summary

Testing Lab: Army Corp Lab
Testing Report: 2016-0315.00
Testing Unit Num: UUT-1b

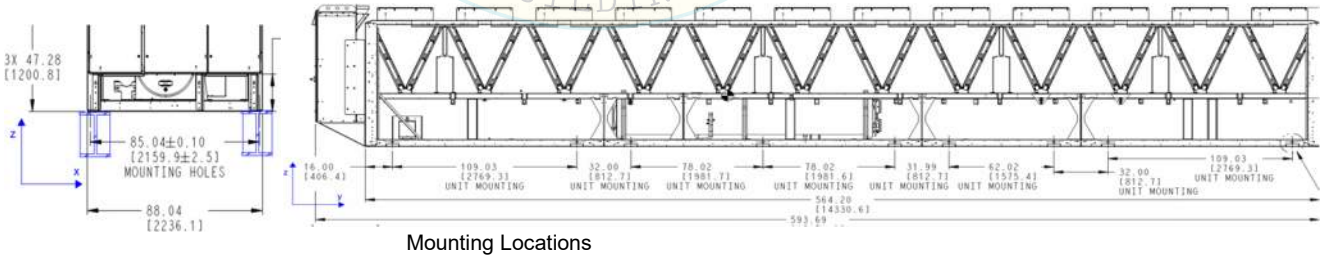
Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30XV500	501.9 tons	Rigid Mount	X	Front - Back	12.8	594	88	99	30,574
			Y	Side - Side	10.8				
			Z	Vertical	19.3				

* Frequencies are for units prior to ICC ES AC-156 testing.

Attachment Method	Seismic Parameters							
	Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
					A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
Unit was attached with 3/4"Ø grade 5 bolts (18 total)	CBC 2016	AC 156	2.00 2.50	1.00 0.00	3.20g	2.40g	1.68g	0.68g

Unit on the shake table


Bolted base connection



Mounting Locations

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT1-B (XV) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	06ZJG3 & 06ZJG3	Carrier	Cast Iron
Condenser	30XV50048601	Danfoss	Aluminum
Cooler	30XV80002805	Carrier	Carbon Steel and Copper
Fan Motor	HD52AZ466	Wolong	Carbon Steel and Copper
Control Box	C30XVA5006M4016F-0	UTEC	Painted Carbon Steel
VFD	HR46ZV003 & HY46ZY019	Danfoss	Aluminum
Security Grill	multiple	Carrier	Carbon Steel
Hail Guard	multiple	Carrier	Carbon Steel

Special Seismic Certification
OSHPD Preapproval OSP-0184-10
Carrier 30XA, 30RAP, 38AP, 09DP, 30MPA and 30MPW Product Lines

UUT-1C (XV) Test Summary

Testing Lab: Army Corp Lab
Testing Report: 2016-0315.00
Testing Unit Num: UUT-1c

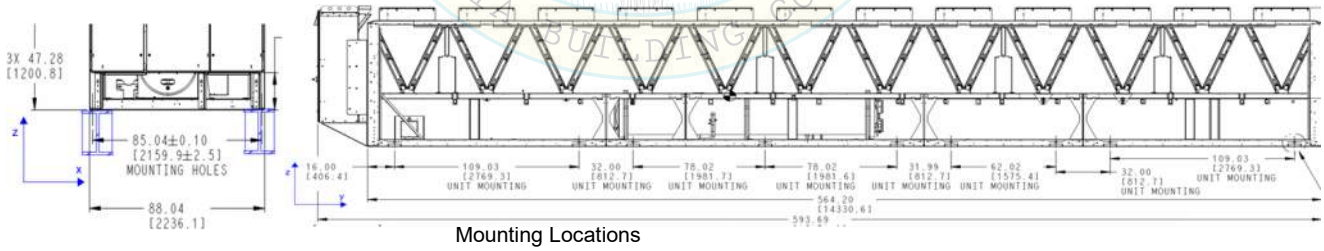
Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30XV500	501.9 tons	Neoprene Isolated mount	X	Front - Back	10.0	599	88	99	30,574
			Y	Side - Side	6.3				
			Z	Vertical	7.5				

* Frequencies are for units prior to ICC ES AC-156 testing.

Attachment Method	Seismic Parameters							
	Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
					A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
Unit was attached with 3/4"Ø grade 5 bolts and Mason Industries, Inc. Model #: 6x10SWN neoprene pads (18 total)	CBC 2016	AC 156	0.80 1.00	1.00 0.00	1.28g	0.96g	0.67g	0.27g

Unit on the shake table

Bolted base connection with neoprene pad



Mounting Locations

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-1C (XV) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	06ZJG3 & 06ZJG3	Carrier	Cast Iron
Condenser	30XV5004	Danfoss	Aluminum
Cooler	30XV80002805	Carrier	Carbon Steel and Copper
Fan Motor	HD52AZ466	Wolong	Carbon Steel and Copper
Control Box	C30XVA5006M4016F-0	UTEC	Painted Carbon Steel
VFD	HR46ZV003 & HY46ZY019	Danfoss	Aluminum
Security Grill	multiple	Carrier	Carbon Steel
Hail Guard	multiple	Carrier	Carbon Steel

UUT-3 (XA) Test Summary

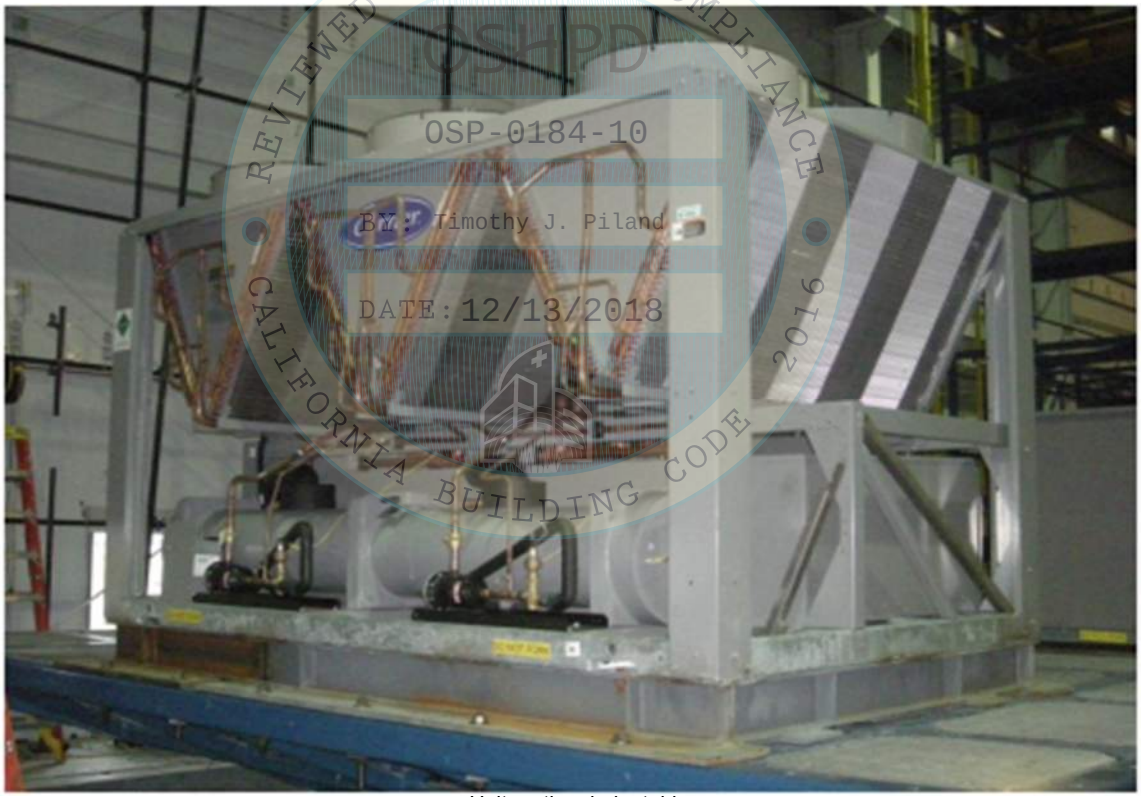
Testing Lab: University at Buffalo SEESL Lab
Testing Report: UB-SEESL-2011-06 (05/11/2011)
Testing Unit Num: UUT-3

Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30XA080	75.6 tons	Rigid Mont	X	Front - Back	7.2	141	88	90.5	7,234
			Y	Side - Side	7.4				
			Z	Vertical	9.6				

* Frequencies are for units prior to ICC ES AC-156 testing.

Attachment Method: Unit is bolted to table with (4) 1-1/4" dia Grade 5 bolts

Seismic Parameters								
Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	2.50	1.0	4.00g	3.00g	1.67g	0.67g



Unit on the shake table

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-3 (XA) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	06TSA137SG1C	Carrier	Cast Iron
Condenser	00PSN000058601A & 00PSN000058701A	Carrier	Galv Steel housing, Aluminum & Copper
Cooler	00PSN800012526A	Carrier	Carbon Steel and Copper
Fan Motor	00PPG000007202A	Marathon	Carbon Steel and Copper
Control Box	C30XA080-350	Schneider	Painted Carbon Steel

UUT-4 (XA) Test Summary

Testing Lab: University at Buffalo SEESL Lab
Testing Report: UB-SEESL-2011-06 (05/11/2011)
Testing Unit Num: UUT-4

Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30XA350	324.1 tons	Rigid Mont	X	Front - Back	5.5	423	88	90.5	21,211
			Y	Side - Side	6.2				
			Z	Vertical	10.1				

* Frequencies are for units prior to ICC ES AC-156 testing.

Attachment Method: Unit is bolted to table with (14) 1-1/4" dia Grade 5 bolts

Seismic Parameters								
Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	2.40	1.0	3.84g	2.88g	1.60g	0.66g

Unit on the shake table

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-4 (XA) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	06TUA483SW1C & 06TUA554SW1C	Carrier	Cast Iron
Condenser	00PSN000058601A & 00PSN000058701A	Carrier	Galv Steel housing, Aluminum & Copper
Cooler	00PSN800012526A	Carrier	Carbon Steel and Copper
Fan Motor	00PPG000007202A	Marathon	Carbon Steel and Copper
Control Box	C30XA080-350	Schneider	Painted Carbon Steel

UUT-5 (XV) Test Summary

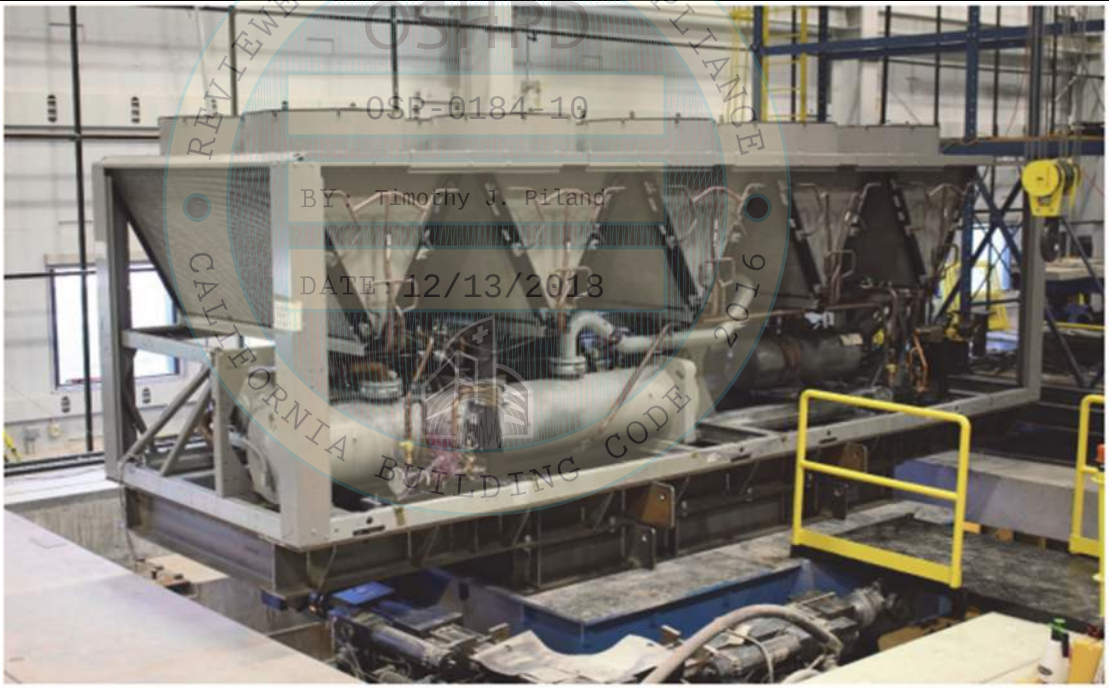
Testing Lab: University at Buffalo SEESL Lab
Testing Report: UB CSEE/SEESL-2015-15 (11/07/2014)
Testing Unit Num: n/a

Model Number	Nominal Capacity	Mounting	Excitation Direction		Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
30XV160	149.5 tons	Rigid Mont	X	Front - Back	8.5	264	88	90.5	11,280
			Y	Side - Side	6.0				
			Z	Vertical	9.3				

* Frequencies are for units prior to ICC ES AC-156 testing.

Attachment Method: Unit is bolted to table with (8) 3/4" dia Grade 8 bolts

Seismic Parameters								
Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	AC 156	2.50	1.0	4.00g	3.00g	1.67g	0.67g



Unit on the shake table

Notes: The UUTs were full of contents during the test.
Unit maintained structural integrity and remained functional per manufacture requirements after shake table test

UUT-5 (XV) Summary Tested Sub-Component

Sub-Component	Part Number	Manufacturer	Material
Compressor	06TSA137SG1C	Carrier	Cast Iron
Condenser - MCHX	00PSN000058601A & 00PSN000058701A	Delphi	Galv Steel housing, Aluminum & Copper
Cooler	00PSN800012916A	Carrier	Carbon Steel and Copper
Fan Motor	00PPG000007202A	Schneider	Carbon Steel and Copper
Control Box	C30XA080-350	Marathon	Painted Carbon Steel
VFD	HR46ZT002, HR46ZW001, HR46ZY002, HR46ZY013	Danfoss	Aluminum