

DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR HCAI SPECIAL SEISMIC	OFFICE USE ONLY
CERTIFICATION PREAPPROVAL (OSP)	APPLICATION #: OSP-0301
HCAI Special Seismic Certification Preapproval (OSP)	
Type: New X Renewal	
Manufacturer Information	
Manufacturer: Haakon Industries, Ltd.	
Manufacturer's Technical Representative: Wade Gomer	
Mailing Address: 11851 Dyke Road, Richmond, BC V7A4X8	
Telephone: (604) 273-0161 Email: wade@haakon.cc	m
FORCODECOA	
Product Information	10,
Product Name: Air Conditioning Units	1 million and the second se
Product Type: Air Conditioning Units - Custom	2
Product Model Number: Various (See Attachment)	- m
General Description: Air conditioning unit cabinets with internal and extern	nal components as outline in the Product Matrices.
Mounting Description: Rigid, Floor Mounted	
Tested Seismic Enhancements: Seismic enhancements made to the test anomalies during the tests shall be incorp	units and/or modifications required to address porated into the production units.
Applicant Information	Le la
Applicant Company Name: Structural Integrity Associates Inc.	
Contact Person: Katie Braman	
Mailing Address: 233 SW Wilson Ave, Suite 101, Bend, OR 97702	
Telephone: (541) 526-1947 Email: Kbraman@struction	nt.com

Title: Program Manager

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

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY

HCA



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)
Company Name: STRUCTURAL INTEGRITY ASSOCIATES, INC.
Name: Andrew Coughlin California License Number: S6082
Mailing Address: 5215 Hellyer Ave, Suite 101, San Jose, CA 95138-1025
Telephone: (415) 635-8461 Email: acoughlin@structint.com
Certification Method
GR-63-Core X ICC-ES AC156 IEEE 344 IEEE 693 NEBS 3
Other (Please Specify):
EOR CODE CO.
Testing Laboratory
Company Name: Pacific Earthquake Engineering Research Center (PEER)
Contact Person: Amarnath Kasalanati
Mailing Address: 1301 South 46th St., Bldg. 420, Richmond CA 94804
Telephone: (510) 642-6475 By Email: Amarnath1@berkeley.edu
Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)
Contact Person: Jeremy Lange Q DATE: 11/04/2022
Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513
Telephone: (972) 247-9657 Email: Jeremy@etIdallas.com
BUILDING



STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

Seismic Parameters			
Design Basis of Equipment or Component	ts (Fp/Wp) = 4.50 (z/h = 1), 1.89 (z/h	= 0)	
SDS (Design spectral response acce	eleration at short period, g) = 2.00 (z/h	= 1), 2.50	(z/h = 0)
ap (Amplification factor) =	2.5		
Rp (Response modification factor) =	2.0		
Ω_0 (System overstrength factor) =	2.0		
lp (Importance factor) =	1.5		
z/h (Height ratio factor) =	1 and 0		
Natural frequencies (Hz) =	See Attachment		
Overall dimensions and weight =	See Attachment ODF		
HCAI Approval (For Office Use Only)	- Approval Expires on 11/04/2028	- T	
Date: 11/4/2022	OSP-0301	1 C	
Name: Mohammad Karim		Title:	Supervisor, Health Facilities
Special Seismic Certification Valid Up to: \$	SDS (g) = See Above	z/h =	See Above
Condition of Approval (if applicable):	DATE: 11/04/2022	6	
	EOPWIA BUILDING COD	102	



Custom Air Handling Units

1800711-CR-001-R4



Manufacturer:	Haakon Industries, Ltd.

TABLE 1

Certified Product Construction Summary:

Units shall be constructed in accordance with Haakon typical seismic details. 2"-4" deep 16ga-12ga insulated panels constructed of stainless steel(SS), galv. carbon steel(CS), or aluminum(AL). 22ga to 18ga solid or perforated wall liners (SS,CS,AL). 14ga to 10ga floor (SS,CS,AL). 22ga to 18ga floor liner (SS,CS,AL). 3.0-6.0 lb fiber board or pour foam insulation. 4" to 12" deep base framing perimeter c-channel. See Table 2.

Certified Options Summary:

With or without splits. Optional vestibule, casing cladding, or evaporative humidifier. Units within dimensions listed below certified for interior section, end section, or enclosed section. See representative unit drawings for more information on dimensional restrictions.

Mounting Configuration:

Base mounted - rigid

Model Line:

Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

Building Code:	CBC 2022	Seismic C	Certificatio	n Limits:		2.0 g z/h=1.0 I _P = 2.5 g z/h=0.0	1.5
Model Line	Model	Dir	nensions	(in)	Weight ¹	Notes	. 2
Model Line	Model	B Dépth	Width	Height	(lb)	Notes	UUT ²
		96.0	96.0	96.0	5,440	UUT: 85 psf; stainless steel, carbon steel	1
		DAIE		+/2022		5/	Interp.
	CAL	118.0	120.0	144.0	13,810	UUT: 140 psf, carbon steel	4
	1 Th	<u>anna</u>		<u>Albilli</u>	÷.,		Interp.
	Enclosures - 4 walls (No walls removed)	115.0	144.5	156.0	13,100	UUT: 114 psf; stainless steel, carbon steel, aluminum	2a
			UILD	ING			Interp.
Custom Air Handling		120.0	185.0	148.3	15,818	UUT: 103 psf; carbon steel	14
Units							Interp.
		120.0	195.8	148.3	10,615	UUT: 65 psf; carbon steel	13
							Interp.
-		120.0	240.0	156.0	13,100	UUT: 66 psf; stainless steel, carbon steel, aluminum	За
	Enclosures - 3 walls (Inlet or outlet wall	115.0	144.5	156.0	13,100	UUT: 114 psf; stainless steel, carbon steel, aluminum	2b
	removed)						Interp.

Additional Notes:

1. Max footprint weight of 140 psf for all interpolated and extrapolated sizes.

2. References to UUT2a, 2b, 2c, 3a, 3b and 3c indicate the component was tested in that configuration only. References to UUT2 or UUT3 indicate the component was tested in all configurations of that test unit.

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Manufacturer:	Haakon Industries, Lto	l.					TABLE	: 1		
Model Line:	Custom Air Handling Units									
Certified Product Cons	-									
constructed of stainles (SS,CS,AL). 14ga to 10ৄ	ted in accordance with s steel(SS), galv. carbor ga floor (SS,CS,AL). 22g ng perimeter c-channel	n steel(CS) a to 18ga fl	, or alumin oor liner (S	um(AL). 2	2ga to 18g	a solid o	r perforated wall liners			
Units within dimensior	mary: Optional vestibule, casi is listed below certified t drawings for more info	for interio	r section, e	end section	n, or enclo	sed sect	ion.			
Mounting Configuration Base mounted - rigid Note: Installed mounting con	on: nfiguration must be of simila	r configuratio	on and equiv	alent strengt						
Building Code:	CBC 2022	Seismic C	ertificatio	n Limits:	$S_{DS} = 2.0 g z/h$ $S_{DS} = 2.5 g z/h$			1.5		
Model Line	Model	Dir Dépth	nensions (Width	(in) Height	Weight ¹ (lb)		Notes	υυ		
	Enclosures - 3 walls (Inlet and outlet wall removed)	104.25	165.5	110.25	8,124	UUT: 68	3 psf; carbon steel	1		
		DATE	1.1.0	1/0000				Inte		
		113.5	240.0	152.0	15,554	UUT: 82	2 psf; carbon steel	1		
						Þ/		Inte		
o		120.0	240.0	156.0	13,100		5 psf; stainless steel, steel, aluminum	31		
Custom Air Handling Units		120.0	120.0	129.0	3,500	UUT: 35	5 psf; carbon steel	g		
UTIILS			UILD	ING				Inte		
	Enclosures - 2 walls (Inlet and outlet wall	115.0	144.5	156.0	13,100		L4 psf; stainless steel, steel, aluminum	20		
	removed)							Inte		
		120.0	240.0	156.0	13,100		5 psf; stainless steel, steel, aluminum	3		

Additional Notes:

1. Max footprint weight of 140 psf for all interpolated and extrapolated sizes.

2. References to UUT2a, 2b, 2c, 3a, 3b and 3c indicate the component was tested in that configuration only. References to UUT2 or UUT3 indicate the component was tested in all configurations of that test unit.

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units		Table Description: AHU Construction/Materials				
Building Code:	CBC 2022	Seismic Certification L	imits: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5		_	
Component Type	Manufacturer	Model FOR	CODE Description	Notes	5	UUT ¹	
		Charley MED	Carbon Steel	UUT: 2" depth; 16 ga.		2, 9, 10, 11, 13, 14	
Wall and Roof Casing	Haakon	Standard (2"-4" depth)		UUT: 4" depth; 16 ga.		4	
		(2 - 4 depth)	SP-03 Stainless Steel	UUT: 2" depth; 16 ga.		1	
			Aluminum	UUT: 2" depth; 12 ga.		3	
	Haakon		ammaGalv. Carbon Steel	UUT: 18, 20, 22 ga.		2, 3, 10, 11, 13, 14	
		Standard	Stainless Steel	UUT: 18, 20, 22 ga.		1	
Wall and Roof Liners			Aluminum S	UUT: 18 ga.		2, 3	
			Galv. Carbon Steel	UUT: 18, 20, 22 ga. UUT: 18, 20, 22 ga.		2, 3	
		Washdown / Thermal	Stainless Steel			1, 2, 3	
			Aluminum	UUT: 18 ga.		2, 3	
Bracing	Haakon	Standard	ILDIN Carbon Steel	Constructed using 2"x2	2"x1/4" angles	2b,2c,3b, 3c,13,14	
			Aluminum	Constructed using 2"x2"x1/4" angles		3c	
		Chandrand	Carbon Steel	UUT: 14 ga.		2, 3	
		Standard	Stainless Steel	UUT: 10, 12 ga.		1	
Floor	Haakon	Checkerplate	Carbon Steel	UUT: 12 ga., 0.125"		2, 3, 10, 11, 13, 14	
			Aluminum	UUT: 0.125", 0.1875"		2, 3	

1. References to UUT2a, 2b, 2c, 3a, 3b and 3c indicate the component was tested in that configuration only. References to UUT2 or UUT3 indicate the componer tested in all configurations of that test unit.

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units		/Materials	TABLE 2	
Building Code:	CBC 2022	Seismic Certification	Limits: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5	
Component Type	Manufacturer	Model	CODEDescription	Note	s UUT ¹
		NEP.	Galv. Carbon Steel	UUT: 22 ga.	2,3,10,1
Floor Liner	Haakon	Standard	Stainless Steel	UUT: 22 ga.	1
			Aluminum Z	UUT: 18 ga.	2, 3
		4" Height	DSP-0301	C4x5.4	1
				•••	Interp
		6"Height BY M	ohammad Karim	C6x8.2	4, 9, 10
Base Rail	Haakon	···///////////////////////////////////	Carbon Steel	•••	Interp
		8" Height	: 11/04/2022	C8x11.5	2,11,13,
			. 11/04/2022	•••	Interp
		12" Height		C12x20.7	3
		PAIA B	UILDING CODE		
Additional Notes: References to UUT	2a, 2b, 2c, 3a, 3b and 3c indicat	e the component was test	ed in that configuration only. Referen	ces to UUT2 or UUT3 indica	te the component was

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units	Table Descri	TABLE 3		
Building Code:	CBC 2022	Seismic Certification	Limits: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	$I_{P} = 1.5$	
Component Type	Manufacturer	Model	CODE Weight (lb)	Note	s ^{3,4,5} UUT
		122	94	Arrangement: 3, 3HA	. 5 ¹
		150	117	Classes I & II availabl	Intorn
		165	135		Interp.
		182	SP-0301 188		Interp.
		200	213		Interp
		222 BY: Mo	nammad Kara7a		Interp
EPF		245	317		Interp
(9-Bladed Wheel),		270	11/04/202478		Interp
EPQ	Haakon	-300	587	Arrangement: 3, 3HA, 3SM; Classes I, II & III available.	, 3SM; Interp
(12-Bladed Wheel)		330	732		able. Interp.
		365	923		Interp.
		402	1,096		Interp.
		445	1,551		Interp.
		490	JILDIN 1,776		Interp.
		542	2,183		Interp.
		600	2,365	Arrangement: 3, 3SM	
		660	2,932	Classes I, II & III avail	able. 6 ²

Additional Notes:

1. UUT: EPF, arrangement 3HA, class I, carbon steel wheel.

2. UUT: EPQ, arrangement 3SM, class III, carbon steel wheel.

3. Carbon steel airfoil wheels. Continuously welded carbon steel frames.

4. All plenum fans to be mounted on 1, 2, or 4" spring vibration isolators to AHU floor (see UUT summaries for tested configurations).

5. Additional Options: Variable inlet vanes, inlet screen, inlet collar, belt guard, protective enclosure, piezometer ring.

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units	Table Description:	Plenum Fans (Horizontal Direc	t Drive)	TABLE 4
Building Code:	CBC 2022	Seismic Certification Limits:	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5	
Component Type	Manufacturer	Model FOR COL	E Weight (lb)	Notes ³	^{3,4,5} UUT
EPFN (9-Bladed Wheel), EPQN (12-Bladed Wheel)	Haakon	122 150 165 182 200 222 BY: Mohamm 245 270 300 330 365	94 117 135 301 188 213 ad Ka 272 317 4/202 587 732 923	Arrangement: 4; Classes I & II available. Arrangement: 4; Classes I, II & III availal	Interp. Interp. Interp. Interp. Interp.
2. EPFN, arrangement 3. Aluminum airfoil w	nt 4, class I, aluminum wheel, sta t 4, class III, aluminum wheel, st t 4, class III, aluminum wheel, st heels. Continuously welded carl be mounted on 1, 2, or 4" spring	402 Julio Julio Ju	1,096	configurations).	4 ²

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	Custom Air Handling Units		t Drive)	TABLE 5	
Building Code:	CBC 2022	Seismic Certification	Limits: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5	
Component Type	Manufacturer	Model FOR	CODE Weight (lb)	Notes	5 ^{3,4,5} UUT
		122	94	Arrangement: 4;	1 ¹
		150	117	Classes I & II available	Interp
		165	135 2		Interp
		182	OSP-0301 188		Interp
		200	213		Interp
		222 BY: Mo	hammad Kar ²⁷ A		Interp
EPQN		245	317		Interp
(12-Bladed Wheel)	Haakon	270	11/04/202478		Interp
		-300	587	Arrangement: 4;	Interp
		330	732	Classes I, II & III availa	able. Interp
		365	923		Interp
		402	1,096		Interp
		445	1,551		Interp
		490	JILDIN 1,776		Interp.
		542	2,183		7 ²
dditional Notes:					
	top of stand on isolators, alum				
	top of stand on isolators, alum neels. Continuously welded carl				
	-		J floor (see UUT summaries for tested	d configurations)	
•			, protective enclosure, piezometer rir	-	

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Ur					TABLE 6		
Building Code:	CBC 2022		Seismic	Certificatio	on Limits:	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5	
Model Line	Model	Di	mension ((in)	Weight	DE Material	Note	uUT
(Manufacturer)	Model	Depth	Width	Height	(lb)	OMateriat	NOLE	.5 001
	122	23.25	23.25	22.00	149		UUT: 4 Stack (class II) 2
	150	25.63	25.63	27.63	173			Inter
	165	28.25	28.25	28.76	250	Z		Inter
	182	32.00	32.00	36.69	373 -	0301		Inter
MDON	200	34.63	34.63	38.00	467	Carbon steel inlet cone;		Inter
MPQN	222	38.00	38.00	39.63	0h555	aluminum airfoil wheel; carbon		Inter
(Twin City Fan)	245	43.38	<mark>43</mark> .38	44.43	748	steel structural frame.		Inter
	270	47.13	47.13	46.38	944	4/2022		Inter
	300	51.63	51.63	52.06	1,164	14/2022		Inter
	330	56.13	56.13	54.56	1,397			Inter
	365	61.38	61.38	64.25	1,738		UUT: 2 Stack (class I)	2b, 2
				P. M				
				NA I		E CO		
				1	POILE	ING		

Additional Notes:

1. References to UUT2a, 2b, 2c, 3a, 3b and 3c indicate the component was tested in that configuration only. References to UUT2 or UUT3 indicate the component was tested in all configurations of that test unit.

2. Floor mounted on spring isolators.

3. Additional Options: Direct drive motor, 4-stack MPQN-122, triple stack configuration for up to MPQN-245, double stack up to MPQN-365, class I fan, class II fan, inlet screen, isolation gasket, shaft grounding ring, piezometer ring.

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units	Table L	Description: BC SWSI Fans		TABLE 7
Building Code:	CBC 2022	Seismic Certification Limit	S: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	<i>I_P</i> = 1.5	
Component Type	Manufacturer	Model FOR CO	DE Weight (lb)	Notes	^{1,2,3} UUT
		122	236	UUT: Arrangement 9, 0	Class IV, BC 5
		135	268		Interp
		150	315		Inter
		165 OSP	-0301 349		Inter
		182	436		Inter
		200 BY: Moham	mad Kar498		Inter
		222	617		Inter
		245	104/202818		Inter
BC SWSI	Twin City Fan	-270 DAIL: 11	941		Inter
		300	1,180		Inter
		330	1,412		Inter
		365	1,678		Inter
		402	2,056		Inter
		445	2,620		Inter
		490	3,037		Inter
		542	4,186		Inter
		600	5,235	UUT: Arrangement 9, 0	Class I, BC 5

1. Carbon steel wheel with flat single thickness blades, solid welded to the rim and back plate. Fan housing constructed of carbon steel sheet metal.

2. Floor mounted on spring isolators.

3. Additional Options: Horizontal fan; up, down, and horizontal discharge rotations; belt drive motor; duct outlet connection; slip-on outlet joint connection; SWSI arrangement 9; expansion bearing for high temperature airstreams; parallel and opposed blade dampers; class I, II, III and IV wheel.

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units	Table De	escription: BC / BAF DWDI Fans	TABL	E 8
Building Code:	CBC 2022	Seismic Certification Limits:	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5	
Component Type	Manufacturer	Model FOR CO	DE weight (lb)	Notes ^{1,2,3}	υυτ
		122	139	Airfoil, downblast, class I, BAF.	7
		135	159		Interp
		150	193		Interp
		4165 OSP-	0301 222		Interp
		P182	248		Interp
		200 DV: Nober	344		Inter
		O ₂₂₂ Dr. Monann	had Kal ₄₅₁		Inter
		245	509		Inter
		270 DATE: 11/	04/202639		Inter
BC / BAF DWDI	Twin City Fan	300	895		Inter
		330	1,015		Inter
		365	1,352		Inter
		402	1,690		Interp
		445	2,100		Interp
		490	2,310		Inter
		542	2,946		Inter
		600	4,150		Inter
		660	5,300	Airfoil, top, horizontal, arrangement 3, class II, BC.	8

1. Carbon steel wheel with flat single thickness blades, solid welded to the rim and back plate. Fan housing constructed of carbon steel sheet metal.

2. Floor mounted on spring isolators.

3. Additional Options: Horizontal fan; up, down, and horizontal discharge rotations; belt drive motor; duct outlet connection; slip-on outlet joint connection; DWDI arrangement 3; expansion bearing for high temperature airstreams; parallel and opposed blade dampers; class I or II wheel.

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units	Table Desc	cription: 686q Fans		TABLE	9
Building Code:	CBC 2022	Seismic Certification Limits:	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5		
Component Type	Manufacturer	Model FOR COL	E Weight (lb)	Note	es ^{1,3}	UUT ²
		1000	350			Extrap
						Extrap
		1532	410	9 blade wheel, 50% w	vidth, ICV, EGV	11
		OSP-0	301			Interp
		1852	485	9 blade wheel, 80% w	vidth, ICV, IFC, EGV	10
		BY: Mohamma	ad Karim			Interp
		2042	497	12 blade wheel, 100%	width, ICV, IS, EGV	11
			1/2027			Interp
		2052 DATE: 170	4/2022	12 blade wheel, 100%	width, ICV, IFC, EGV	11
686q Fans	AcoustiFLO					Interp
		2500	345	12 blade wheel, 50%	width	11
		P				Interp
		2502	405	12 blade wheel, 50%	width, EGV	10
		UILD	ING			Interp.
		2530	350	12 blade wheel, 50%	width, ICV	10
						Interp
		2812	490	12 blade wheel, 80%	width, IS, EGV	. 11
						Interp.
		2942	495	12 blade wheel, 90%	width. ICV. IS. EGV	10

Additional Notes:

1. Aluminum fan wheel, carbon steel fan housing.

2. UUT10 fans tested in a four fan array (2Wx2H). UUT11 fans tested in a five fan array (3 bottom, 2 top).

3. Options: 9 or 12 blade fan wheels, 50-100% wheel width, inlet silencer(IS), inlet check valve(ICV), exit guide vanes(EGV), oulet check valve(OCV).

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units	Table Des	scription: Fan Motors		TABLE	10
Building Code:	CBC 2022	Seismic Certification Limits:	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5		
Component Type	Manufacturer	Model FOR CO	DE weight (lb)	No	tes	UUT
		0.33 HP	20			4
						Interp
		10 HP	255	Dual voltage motors	. Motor voltage to	4
	Baldor	성. OSP-(0301	match overall unit v	-	Interp
		30 HP	335	ODP.	-	10, 11
		BY: Mohamm	ad Karim			Interp
		150 HP	1,775			6
		1HP DATE 44/0	53			5
Fan Motor		DATE: TH	14/2022	Dual voltage motors	. Motor voltage to	Interp
	TECO/Westinghouse	10 HP	287	match overall unit v	-	4
				ODP.		Interp
		150 HP	1,320			8
		1 HP	35			Extrap
		SUILD	ING	Dual voltage motors	. Motor voltage to	Extrap
	NIDEC Motor	5 HP	70	match overall unit v	-	11
	Corporation		•••	TEFC.	-	Interp
		30 HP	300			11

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units	Table Descrij	otion: Fan Motors		TABLE	10
Building Code:	CBC 2022	JEISIIIIL LEI LIIILULIUII LIIIIILS.	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	l _P = 1.5		
Component Type	Manufacturer	Model FOR CODI	Weight (lb)	Note	es	UUT
Fan Motor	WEG	5 HP 7.5 HP OSP-03 10 HP 25 HP DATE: 11/04/ PUILDIN	179	Dual voltage motors. match overall unit vol TEFC.	-	10 Intern 11 Intern 10, 1 Intern 10

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anufacturer: odel Line:	Haakon Industries, Ltd Custom Air Handling U				Table De	scription: Coils (Standard Coil F	Rack)	TABLE	11
Building Code:	CBC 2022		Seismic	Certificatio	on Limits:	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5		
Model Line	Model	Dir	mension (in) ¹	Weight ²	DE Material ⁴	Not		UUT
(Manufacturer)	Model	Depth	Width	Height	(lb)		NO	es	001
		6.0	24.0	24.0	63				Extra
		•••							Extra
	Standard Rack	10.0	J 113.0	43.5 BY: M	OSP- 775	0301	UUT: QTY. 3, tested in with mixed coil types aluminum fins, 12 fp tubes, 0.020" tube w	s. 6 rows, 0.0075" i, 0.625" Ø copper	3
	Design, 6 rows max				3888***8882				Inter
Water Coils (Haakon)	0.02"-0.035" tube wall thickness, 0.006"- 0.0095" fin thickness, 12 FPI max, stacked 1-	10.0	113.0	DATI 43.5	898	Copper tube w/ aluminum or copper fins, galv. carbon steel or stainless steel casing.	UUT: tested in 3-high coil types. 6 rows, 0.0 fins, 12 fpi, 0.625" Ø 0 0.020" tube wall thic	0095" aluminum copper tubes,	3
	3 high			P					Inter
		10.0	113.0	43.5	1,393	DINGCO	UUT: tested in 3-high coil types. 6 rows, 0.0 12 fpi, 0.625" Ø copp tube wall thickness.	075" copper fins,	3
						1			Inter

1. Dimensions represent individual (non-stacked) coils and include casing.

2. Weights represent operating weights of individual coils including water weight.

3. All certified coils available with extended headers (tested on (1) of the (2) triple stacks in UUT3).

4. Combination of tube, fin, and row options can not exceed maximum certified weight.

5. Standard coil rack can be used when coil weight per coil height does not exceed 43 lb/in.

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lanufacturer: Iodel Line:	Haakon Industries, Ltd Custom Air Handling U				Table De	scription: Coils (Standard Coil F	lack)	TABLE	11
Building Code:	CBC 2022		Seismic	Certificati	on Limits:	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	l _P = 1.5		
Model Line	Model	Di	mension (in) ¹	Weight ²	DE Material ⁴	Not	oo ⁵	υυτ
(Manufacturer)	Model	Depth	Width	Height	(lb)	Material	NOU	es	001
		10.0	113.0	43.5	1,857 OSP-		UUT: tested in 3-high coil types. 6 rows, 0.0 12 fpi, 0.625" Ø coppe tube wall thickness.	095" copper fins,	3
	Standard Rack		0	BY: N	/ohamn	ad Karim			Inte
Water Coils (Haakon)	Design, 6 rows max 0.02"-0.035" tube wall thickness, 0.006"- 0.0095" fin thickness, 12 FPI max, stacked 1-	10.0	180.0	D.AT	587 ¹	Copper tube w/ aluminum or copper fins, galv. carbon steel or stainless steel casing.	UUT: tested in 3-high coil types. 6 rows, 0.0 fins, 8 fpi, 0.625" Ø co copper tube wall thic	075" aluminum opper tubes,0.02"	13
	3 high			P					Inte
		7.5	180.0	54.0	PUII 1,343	ING CO.	UUT: tested in 3-high coil types. 2 rows, 0.0 12 fpi, 0.625" Ø coppe copper tube wall thic	095" copper fins, er tubes, 0.035"	13
									Inte

3. All certified coils available with extended headers (tested on (1) of the (2) triple stacks in UUT3).

4. Combination of tube, fin, and row options can not exceed maximum certified weight.

5. Standard coil rack can be used when coil weight per coil height does not exceed 43 lb/in.

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Ianufacturer:Haakon Industries, Ltd.Iodel Line:Custom Air Handling Ur							TABLE	11
CBC 2022		Seismic (Certificatio	ion Limits: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$		I _P = 1.5		
Model				Weight ²	DE Material ⁴	Not	es⁵	UUT ³
	Depth	Width	Height	(lb)	And			·
Standard Rack Design, 6 rows max 0.02"-0.035" tube wall thickness, 0.006"- 0.0095" fin thickness, 12 FPI max, stacked 1-	8.5	180.0	54.0 BY: N	HC 0 ^{1,831} -(Ai 0301	coil types. 5 rows, 0.0 fins, 12 fpi, 0.625" Ø d	0095" aluminum copper tubes,	13
3 high		<u> </u>			Copper tube w/ aluminum or			Inter
	10.0	180.0	54.0	1,857	copper fins, galv. carbon steel			Inter
Standard Rack	12.5	24.0	24.0	280	or stainless steel casing.			Inter
Design, 12 rows max,								Inter
0.02" tube wall thickness, 0.006"- 0.0075" fin thickness, 6 FPI max, stacked 1 high	18.0	63.0	24.0	696 BUILC	DING CODE	0.625" Ø copper tube	es, 0.020" tube wall	1
	•		0	 t.				
	Model Standard Rack Design, 6 rows max 0.02"-0.035" tube wall thickness, 0.006"- 0.0095" fin thickness, 12 FPI max, stacked 1- 3 high Standard Rack Design, 12 rows max, 0.02" tube wall thickness, 0.006"- 0.0075" fin thickness, 6 FPI max, stacked 1 high individual (non-stacked rating weights of individual	ModelDirStandard Rack Design, 6 rows max 0.02"-0.035" tube wall thickness, 0.006"- 0.0095" fin thickness, 12 FPI max, stacked 1- 3 high8.512 FPI max, stacked 1- 3 high3 high10.0Standard Rack 12.5Design, 12 rows max, 0.02" tube wall thickness, 0.006"- 0.0075" fin thickness, 6 FPI max, stacked 1 high18.06 FPI max, stacked 1 highindividual (non-stacked) coils and rating weights of individual coils in111	ModelDimension (iStandard Rack Design, 6 rows max 0.02"-0.035" tube wall thickness, 0.006"- 0.0095" fin thickness, 12 FPI max, stacked 1- 3 high8.5180.012 FPI max, stacked 1- 3 high10.0180.0Standard Rack Design, 12 rows max, 0.02" tube wall 	ModelDimension (in)1Standard Rack Design, 6 rows max 0.02"-0.035" tube wall thickness, 0.006"- 0.0095" fin thickness, 12 FPI max, stacked 1- 3 high8.5180.054.012 FPI max, stacked 1- 3 high10.0180.054.010.0180.054.0Standard Rack Design, 12 rows max, 0.02" tube wall thickness, 0.006"- 0.0075" fin thickness, 0.02" tube wall thickness, 0.006"- 18.012.524.024.0Standard Rack Design, 12 rows max, 0.02" tube wall thickness, 0.006"- 0.0075" fin thickness, 6 FPI max, stacked 1 high18.063.024.0individual (non-stacked) coils and include casing. rating weights of individual coils including water weight10.010.010.0	ModelDimension (in)1Weight (ib)Standard Rack Design, 6 rows max 0.02"-0.035" tube wall thickness, 0.006"- 0.0095" fin thickness, 12 FPI max, stacked 1- 3 high8.5180.054.01,83110.0180.054.01,83110.0180.054.01,831Standard Rack Design, 12 rows max, 0.02" tube wall thickness, 0.006"- 18.010.0180.054.01,857Standard Rack Design, 12 rows max, 0.02" tube wall thickness, 0.006"- 1.0075" fin thickness, 18.018.063.024.06966 FPI max, stacked 1 high18.063.024.0696696individual (non-stacked) coils and include casing. rating weights of individual coils including water weight.10.010.010.0	Model Dimension (in) ¹ Weight (lb) Material ⁴ Standard Rack Design, 6 rows max .0.02"-0.035" tube wall thickness, 0.006"- 0.0095" fin thickness, 12 FPI max, stacked 1 3 high 8.5 180.0 54.0 1,831 301 10.0 180.0 54.0 1,831 301 Copper tube w/ aluminum or copper tube w/ aluminum or copper tibe w/ aluminum or copper fins, galv. carbon steel or stainless steel casing. Standard Rack Design, 12 rows max, 0.02" tube wall thickness, 0.006"- 0.0075" fin thickness, 6 FPI max, stacked 1 high 18.0 63.0 24.0 696 individual (non-stacked) coils and include casing. 18.0 63.0 24.0 696	Subsection Subsection <td>Model Dimension (in)¹ Weight (lb) Material⁴ Notes⁵ Standard Rack Design, 6 rows max 0.02°-0.035" tube wall thickness, 0.006° 0.0095" fin thickness, 12 FPI max, stacked 1 8.5 180.0 54.0 1.831 301 UUT: tested in 3-high stack with mixed coil types. 5 rows, 0.0095" aluminum fins, 12 fpi, 0.625" Ø copper tubes, 0.035" copper tube wall thickness, top coil. Standard Rack Design, 12 rows max, 0.02" tube wall thickness, 0.006" 180.0 54.0 1.857 Copper tube w/ aluminum or copper fins, galv. carbon steel or stainless steel casing. UUT: 12 rows, 0.0075" copper fins, 6 fpi, 0.625" Ø copper tubes, 0.020" tube wall thickness, 0.006" 0.02" tube wall thickness, 0.006" 18.0 63.0 24.0 696 IIII for thickness, top coil. IIIII for thickness, 0.0075" copper fins, 6 fpi, 0.625" Ø copper tubes, 0.020" tube wall thickness, stacked 1 high. individual (non-stacked) coils and include casing. IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII</td>	Model Dimension (in) ¹ Weight (lb) Material ⁴ Notes ⁵ Standard Rack Design, 6 rows max 0.02°-0.035" tube wall thickness, 0.006° 0.0095" fin thickness, 12 FPI max, stacked 1 8.5 180.0 54.0 1.831 301 UUT: tested in 3-high stack with mixed coil types. 5 rows, 0.0095" aluminum fins, 12 fpi, 0.625" Ø copper tubes, 0.035" copper tube wall thickness, top coil. Standard Rack Design, 12 rows max, 0.02" tube wall thickness, 0.006" 180.0 54.0 1.857 Copper tube w/ aluminum or copper fins, galv. carbon steel or stainless steel casing. UUT: 12 rows, 0.0075" copper fins, 6 fpi, 0.625" Ø copper tubes, 0.020" tube wall thickness, 0.006" 0.02" tube wall thickness, 0.006" 18.0 63.0 24.0 696 IIII for thickness, top coil. IIIII for thickness, 0.0075" copper fins, 6 fpi, 0.625" Ø copper tubes, 0.020" tube wall thickness, stacked 1 high. individual (non-stacked) coils and include casing. IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

5. Standard coil rack can be used when coil weight per coil height does not exceed 43 lb/in.

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling U				Table De	scription: Coils (Heavy Rack)		TABLE	12
Building Code:	CBC 2022		Seismic Certification Limits:			$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	$I_{P} = 1.5$	1	
Model Line	Model		mension (Weight ²	DE Material ⁴	Not	t es ^{5,6}	UUT ³
(Manufacturer)		Depth	Width	Height	(lb)				Extra
	-	6.0	24.0	24.0	63				Extrap Extrap
	-	•••							Extrap
			II I		OSP-	0301	UUT: tested in 3-hig coil types. 10 rows,		
	Heavy Rack Design,	15.0	160.0	42.0	2,505	m	fins, 12 fpi, 0.625" Ø		14
	10 rows max, 0.02"-0.035" tube wall	13.0	100.0			Copper tube w/ aluminum or	0.035" copper tube	••	1
Water Coils	thickness, 0.006"-			DI.IV	lohamn	copper fins, galv. carbon steel	middle coil.		
(Haakon)	0.0095" fin thickness,				••••	or stainless steel casing.			Inter
	12 FPI max, stacked 1-			DAH	<u>+: 11/(</u>	14/2022			
	3 high						UUT: tested in 3-hig		
		15.0	160.0	42.0	4,408		coil types. 10 rows, 12 fpi, 0.625" Ø copp	•••	14
							copper tube wall thi		
				VA			copper tube wattan		
				-	POILL	ING			
dditional Notes:									
•	ent individual (non-stack			-	a:abt				
•	operating weights of indi vailable with extended he			-	-	s in UUT3)			
	be, fin, and row options c				•				
					-	ight per coil height can not excee	ed 105 lbs/in.		
5. Heavy racks will be	• •					-			

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Manufacturer: Model Line:	Haakon Industries, Ltd Custom Air Handling U					TABLE 13			
Building Code:	CBC 2022		Seismic	Certificati	on Limits: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$		l _P = 1.5		
Model Line	Model	Di	Dimension (in)		Weight	DE Comaterial	Notes		UUT ¹
(Manufacturer)	Model	Depth	Width	Height	(lb)	Material	NOC	= 5	001
		4.0	12.0	12.0	8		UUT2: model 9000; U	UT10: model 1000	2, 10
Dampers									Interp
(Tamco)	1000 / 9000	4.0	48.0	48.0	90	Aluminum	UUT: model 9000		2
(Tanteo)			SF.		OSP-	0301			Interp
		4.0	60.0	60.0	127		UUT: model 1000		10
Airflow Measuring		18.0	13.5	R12.0	oh 22 mn	nad Karim			10
Dampers	Air IQ					Aluminum			Interp
(Tamco/Ebtron)		18.0	60.0	60.0	200	1/2022	UUT1: Tested with 3 i	nlet hoods	1, 10
Air Monitoring		12.0	12.0	12.0	25	412022			2
Dampers	AMD-42					Galv. Carbon Steel			Interp
(Greenheck)		12.0	46.0	46.0	98				2a, 2t
		5.0	12.0	12.0	17				2
						TNG			Interp
Demonstra		5.0	48.0	48.0	91_		UUT: VCD-33 (control	damper)	2a, 2b
Dampers (Greenheck)	VCD / SMD	5.0	48.0	50.0	71.5	Galv. Carbon Steel or Stainless Steel	UUT: SMD-401 (smoke	e damper)	2a, 2t
(Greenneck)						Steel			Interp
		5.0	60.0	60.0	140		UUT: VCD-23-304SS (o stainless steel)	control damper,	10
Additional Notes:			-						

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Manufacturer: Model Line:	Haakon Industries, Lto Custom Air Handling L				Table De	scription: Dampers & Louvers		TABLE 13
Building Code:	CBC 2022	51115	Seismic	Certificati	on Limits:	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5	
Model Line (Manufacturer)	Model		mension		Weight (lb)	DE Material	Notes	UUT
(Manufacturer)		Depth 2.0	Width 12.0	Height 12.0	2		Standard	Extrap
		2.0	12.0	12.0	13		Storm	Extra
					WAAN		5.0111	Extra
Louvers		4.0	47.0	48.0	 034P-	0301	UUT: Standard	2a, 2t
(Haakon)	Standard / Storm	4.0	48.0	50.0	122	Aluminum	UUT: Storm	2a, 2t
						ad Karim		Interp
		4.0	60.0	58.0	52		UUT: Standard	10
		4.0	61.0	60.0	181	1/2022	UUT: Storm	10
			C	DAH	+: 11/(4/2022		
					100007	O CEREFERENCE		
				P				
				NA I	A A A A A A A A A A A A A A A A A A A			
					PUILL	ING		

tested in all configurations of that test unit.

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Manufacturer: Model Line:	Haakon Industries, L Custom Air Handling				Table De	scription: Humidifier Grid		TABLE 14
Building Code:	CBC 2022		Seismic	Certificati	on Limits:	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5	
Model Line	Model		mension		Weight	DE Material	Not	es UU
(Manufacturer)		Depth	Width	Height	(lb)			
Humidifier (Condair)	SAM-e	9.0	140.0	125.0	172	Stainless Steel		2
Humidifier (DriSteem)	UltraSorb LV	5.0	140.0	125.0	0537-	0301 Stainless Steel		2
Humidifier		8.5	10.0	14.0	12		UUT: 4" header	10
(Armstrong)	Humidipack		0.	BY:N	lohamn	ad KaStainless Steel		Inter
(Anistrong)		8.5	144.0	134.0	490		UUT: 4" headers	10
					. 11/0	1/2022		
				DATI	- . I I/(14/2022		
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			Ċ					
				PAR				
				VA.	RI ITI T	ING		
					OILL	JINC		

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Manufacturer:	Haakon Industries, Lto				Table De	scription: Sound Attenuators		TABLE	15
Model Line:	Custom Air Handling L	Jnits						IADEE	13
Building Code:	CBC 2022		Seismic	Certificati	on Limits:	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	$I_{P} = 1.5$		
Model Line	Model	Di	mension	(in)	Weight	Dr	No	tes	υυτ
(Manufacturer)	Model	Depth	Width	Height	(lb)	Material	NO	tes	001
		36.0	6.0	12.0	36				Extrap.
Sound Attenuators						Stainless Steel or Galv. Carbon			Extrap.
(Haakon)	Standard	36.0	18.0	96.0	140	Stool	UUT: galv. carbon st	eel	1
(Haakon)			2		OSP-	0301			Interp.
		84.0	6.0	156.0	340		UUT: stainless steel		3
				BY: N	ohamn	had Karim			
					· 11/	4/2022			
				DAII	I I/\	412022			
					+				
				ANNAN -					
			, in the second se	PAN					
				NA.	DIT	TALCO C			
					POIL	DING			

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units		Table Description: UV Lights		TABLE	16
Building Code:	CBC 2022	Seismic Certificat	ion Limits: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5		
Component Type	Manufacturer	Model	R CODE Description	Note	25	UUT
		18"				3
		24"				3
UV Lights	Steril-Aire	.30"	Double Ended Fixture & Emitter	Stainless steel 16ga ra	ack tested.	3
		36"	OSP-0301		3	
		42"				3
			ohammad Karim			13
		CC-24				Interp
		CC-36	E. 11/04/2022			Interp
		CC-48	L. 11/04/2022			Interp
	American UV	CC-60				13
		CK-18				13
		CK-24				Interp
		CK-36	RUTIDING			Interp
UV Lights		CK-48	DILDING	16ga 304 Stainless Ste	eel UV light rack.	Interp
		CK-60				13
		VMOD2-18				13
		VMOD2-24				Interp
		VMOD2-36				13
	UVDI	VMAX2-21				13 Interp
		VMAX2-33				
		VMAX2-48				Interp
		VMAX2-61				13

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units	5	Table Description: +	leaters		TABLE 17
Building Code:	CBC 2022	Seismic Certifica	LIOH LIHHUS:	2.0 g z/h = 1.0 2.5 g z/h = 0.0	I _P = 1.5	
Component Type	Manufacturer	Model	R CODE Descr	iption	Not	es UUT
		500W		MD	UUT: 6.3 lbs	2
Baseboard Heater	King Electric					Interp
		1,500W	Cha WerMhree-KerMherkerKerK	2	UUT: 14 lbs	2
		3kW	OSP-0301	2	UUT: 40 lbs	2
Unit Heater	King Electric	····//////////////////////////////////				Inter
		5kW BY:	Mohammad Kari	m	UUT: 40 lbs	2
		BK <mark>T1 Th</mark> ermostat				2
Thermostat	King Electric	1-Pole Unit Mounted Thermostat	E: 11/04/2022	6/		2
		P		-OV		
		X.X				
			POILDING			

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OSP-0301

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1anufacturer: 1odel Line:	Haakon Industries, Ltd Custom Air Handling U				Table De	scription: Electrical Enclosure	es	TABLE 18	
Building Code:	CBC 2022		Seismic	Certificatio	on Limits:	$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	$I_{P} = 1.5$		
Model Line	Model		imension (in)		Weight	DE Material	Not	25	υυτ
(Manufacturer)		Depth	Width	Height	(lb)	and the second			
		6.0	12.0	12.0	12			-	Extra
								_	Extra
Enclosures		8.0	12.0	16.0	16	2			11
(Hoffman)	Electrical Enclosures		27		OSP-	30116ga Carbon Steel	NEMA 1 or NEMA 4		Inter
(nonnan)		12.0	36.0	48.0	131				14
				BY: N	lohamn	nad Karim 🔍 🔿			Inter
		12.0	36.0	60.0	165			-	2,3,4,
Enclosures (Hammond)	CSKO10104	4.0	10.0		6.81/(4/2016ga Carbon Steel	NEMA 1		13
Enclosure (Rittal)	WM121206NC	6.0	12.0	12.0	15.4	16ga Carbon Steel	NEMA 3R		13
				P. M					
				NA I					
					POILE	INO			
									,

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units	Table Description: Electrical & Miscellaneous Components	TABLE 19
Building Code:	CBC 2022	Seismic Certification Limits: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$ $I_{P} = 1.5$	
Component Type	Manufacturer	Model FOR CODE Description	Notes UUT
		16A	2
Disconnect	ABB		Interp
		400A	2
		59A OSP-0301	2
Contactor	ABB		Interp
		C ^{110A} BY: Mohammad Karim	2
		1A	2
Overload	ABB	C DATE: 11/04/2022	Interp
oventoud		110A DATE: 11/04/2022	2
		IA	2
MPP	ABB		Interp
		110A	2
		1A	2
Fuses	Feraz Shawmut/	UILDING	Interp
	Mersen	400A	2
		175A	2
Distribution Blocks	Feraz Shawmut/		Interp
	Mersen	380A	2
		75VA	2
Transformers	Square D		Interp
		2kVA	2

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1anufacturer: 1odel Line:	Haakon Industries, Ltd. Custom Air Handling Units	Table Description: Electrical & Miscellaneous Component	TABLE 19
Building Code:	CBC 2022	Seismic Certification Limits: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$ $I_{P} = 1.5$	
Component Type	Manufacturer	Model FOR CODE Description	Notes UUT
		15A	2
Circuit Breaker	Square D		Interp
		20A	2
		6V OSP-0301	2
Relays	Eaton / Cutler		Interp
	Hammer	240V BY: Mohammad Karim	2
Light Switch	Leviton	CSB1-20L	2
Receptacle	Leviton	011-7599-1	2
Controller	Carel	PC03 DATE: 11/04/2022	2
		AF-24	2
• · ·		NF-24	2
Actuators	Belimo	LF-24	2
		FSNF-120-S US UUT: Qty 5 actu	uators 10
		1HP UILDING	2
ACH550 VFD	ABB		Interp
		150HP	2
		5 HP	10
			Interp
ACH580 VFD	ABB	25 HP	10
			Interp
		60 HP	11
ACS150 VFD	ABB	1HP	2

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units		Table Description: Electrical & Miscellaneous Component					
Building Code:	CBC 2022	Seismic Certificati	on Limits: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5				
Component Type	Manufacturer	Model	R CODE Description	Note	es UUT			
Current Switches	Greystone	CS, MED	500 mA		2 Interp.			
		sc	500 mA - 0301		2			
Transducer	Greystone	ETP-9500	20 mA		2			
CO2 Detector	Greystone	CDD1A BY:	ohammad Karim		2			
Current Sensor	Greystone	CS SC	11/04/2022		2			
Freezestat	Greystone	LC300 DAT	11/04/2022		2			
Humidity Transducer	Greystone	RH200			2			
Humidity Transmitter	Greystone	RH110 RH210 RH310			2 2 2			
Pressure Switch	Greystone	AFS-222 AFS-262	UILDING		2			
		AFS460			2			
Pressure Transducer	Greystone	LP2			2			
Room Sensor	Greystone	TE500AE			2			
Smoke Detector	Greystone	SL-2000			2			
Probe Temperature	Greystone	TE200 TE500			2			
Sensors/ Transducers		TE511 TE512			2			

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Manufacturer: Model Line:	Haakon Industries, Ltd. Custom Air Handling Units		Table Description: Electrical & Miscellar	neous Components	TABLE 19
Building Code:	CBC 2022	Seismic Certificat	ion Limits: $S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5	
Component Type	Manufacturer	Model	R CODE Description	Not	es UUT
Temp. Transmitter	Greystone	TE500B			2
Ultra Low Pressure Transducer	Greystone	ULP	HCAI		2
		AAS-AirRailx8	OSP-0301		Extrap.
	Active Air Solutions /	•••	Aluminum rail, stainless steel needles,		Extrap.
Ionization Bar	Global Plasma	AAS-AirRailx363	10.516s/ftmad Karim	UUT: 36" length	10
	Solutions				Interp.
		AA <mark>S-Air</mark> Railx143	E: 11/04/2022	UUT: 143" length	10
Power Transformer	Active Air Solutions / Global Plasma Solutions	AAS-7504	High output power supply transformer	120/230VAC input, 24	W, 6lbs 10
Stratification Eliminator	Haakon	Standard	D' THE CODY	UUT: 60" diameter	За
Bellmouth Transition	Haakon	Standard	POILDING	UUT: 60"W x 60"H	3a
Indicator Lights	Schneider Electric	XB4BVB3	Green light, 0.18 lbs.		13
indicator Lights		XB4BVB4	Red light, 0.18 lbs.		13
Disconnect Switch	ABB	OT63F3	0.55 lbs.		13
		PHX3044102	0.1 lbs.		13
		PHX3045130	0.1 lbs.		13
Terminal Block	Phoenix Contact	PHX3045143	0.1 lbs.		13
		PHX3044115	0.1 lbs.		13
		PHX3045127	0.1 lbs.		13

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Manufacturer: Model Line:	Haakon Industries, Lto Custom Air Handling U					TABLE	20		
Building Code:	CBC 2022		Seismic Certification Limits			$S_{DS} = 2.0 g z/h = 1.0$ $S_{DS} = 2.5 g z/h = 0.0$	I _P = 1.5		
Model Line	Model		imension (Weight	DE Material	Not	es	UUT
(Manufacturer)		Depth	Width	Height	(lb)	Ale Ale			L
Filter Rack ¹	Angled Filter Rack		240.0	156.0	232	Stainless Steel or Galv. Carbon	UUT: Stainless steel ar	-	3
(Haakon)	HEPA Filter Rack		240.0	156.0	165	Steel	UUT: Stainless steel ar	-	3
(Haakon)	Type 8 Filter Rack		240.0	156.0	148		UUT: Stainless steel ar	nd galv. carbon steel	3
		12.0	24.0	12.0	OSP-	0301			3
	Biocell VXL		·						Interp
		12.0	24.0	24.0	lohamn	nad Karim			3
		12.0	12.0	20.0					3
	DriPak 2000				- 11/0	1/2022			Interp
		36.0	-24.0	24.0	11/(412022			3
	Varicel	12.0	12.0	20.0	+				3
									Interp
Filter - Front Load		36.0	24.0	24.0					3
(American Air)		12.0	12.0	20.0		E CO			3
	Megacel I				POIL	JING			Interp
		36.0	24.0	24.0					3
		1.0	10.0	10.0					3
	AmAir 1100								Interp
		4.0	25.0	29.0					3
		0.8	9.5	9.5					3
	Perfect Pleat Ultra								Interp
		2.0	24.5	24.5					3

1. Maximum dimensions listed, smaller sizes available. Total depth matches installed filter.

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Manufacturer: Model Line:	Haakon Industries, L Custom Air Handling				Table Description: Filters		TABLE 20
Building Code:	CBC 2022		Seismic	Certificati	$\begin{array}{c} 1.0 \\ 0.0 \end{array} \hspace{1.5cm} I_P = \hspace{1.5cm} 1.5 \end{array}$		
Model Line	Model	Di	mension	(in)	Weight DE Material	N	otes UUT
(Manufacturer)	Model	Depth	Width	Height	(lb)	N	001
		12.0	20.0	12.0			3
	Hi-Flo ES						Inter
		30.0	24.0	24.0	7	-	3
	Durafil ES	12.0	12.0	20.0	OSP-0301		3
			· · · · //				Inter
		12.0	12.0	24.0	ohammad Karim	0	3
		12.0	12.0	12.0			3
	Riga-Flo ph				• 11/04/2022		Inter
Filter - Front Load		12.0	24.0	12.0	. 11/04/2022	5	3
(Camfil Farr)	30/30	1.0	10.0	10.0			3
							Inter
		4.0	25.0	29.0			3
		1.0	16.0	12.0			3
	AP-Eleven				DILDING		Inter
		4.0	24.5	24.5			3
		1.75	19.38	15.38			3
	AP-Thirteen						Inter
		3.75	25.0	25.0			3

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UNIT UNDER TEST (UUT) SUMMARY SHEET

1800711-CR-001-R4



Manufa	<i>cturer:</i> Haakon Indu	stries, Ltd.						
Model L	<i>ine:</i> Custom Air H	andling Units						
υυτ	Unit Description	Report Number	Testing Lab	Year Tested	ISO 17025 Accredited?	S _{DS}	z/h	I _P
1	AHU Cabinet (0 Walls Removed) ¹	12346, Rev. 0 (UUT1)	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
2a	AHU Cabinet (0 Walls Removed) ¹	12346, Rev. 0 (UUT2)	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
2b	AHU Cabinet (1 Wall Removed) ¹	12346, Rev. 0 (UUT2)	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
2c	AHU Cabinet (2 Walls Removed) ¹	12346, Rev. 0 (UUT2)	Environmental Testing Laboratory SP-0(ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
За	AHU Cabinet (0 Walls Removed) ¹	12346, Rev. 0 (UUT3) MO	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
3b	AHU Cabinet (1 Wall Removed) ¹	12346, Rev. 0 E: (UUT3)	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
3c	AHU Cabinet (2 Walls Removed) ¹	12346, Rev. 0 (UUT3)	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
4	AHU Cabinet (0 Walls Removed) ¹	12346, Rev. 0 (UUT4)	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
5	Fan Skid	12346, Rev. 0 (UUT5)	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
6	Fan Skid	12346, Rev. 0 (UUT6)	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
7	Fan Skid	12346, Rev. 0 (UUT7)	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
Notos								

Notes:

1. Wall removal certifies units for use in configurations shown in the attached drawings.

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UNIT UNDER TEST (UUT) SUMMARY SHEET

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Manufa Model L	<i>cturer:</i> Haakon Indu	stries, Ltd. andling Units						
UUT	Unit Description	Report Number	Testing Lab	Year Tested	ISO 17025 Accredited?	S _{DS}	z/h	IP
8	Fan Skid	12346, Rev. 0 (UUT8)	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
9	AHU Cabinet (2 Walls Removed) ¹	12346, Rev. 0 (UUT9)	Environmental Testing Laboratory (ETL)	2012	Yes	2.5 2.5	1.0 0.0	1.5
10	AHU Cabinet (1 Wall Removed) ¹	1800711-TR-001 R0 (UUT10)	Pacific Earthquake Engineering Research Center (PEER)	2019	Yes	2.0 3.1	1.0 0.0	1.5
11	AHU Cabinet (1 Wall Removed) ¹	1800711-TR-001 R0 (UUT11)	Pacific Earthquake Engineering Research Center (PEER)	2019	Yes	2.0 2.7	1.0 0.0	1.5
13	AHU Cabinet (0 Walls Removed) ¹	1800711-TR-002-R0 (UUT13)	Pacific Earthquake Engineering Research Center (PEER)	2022	Yes	2.0 2.5	1.0 0.0	1.5
14	AHU Cabinet (0 Walls Removed) ¹	1800711-TR-002-R0 (UUT14)	Pacific Earthquake Engineering Research Center (PEER)	2022	Yes	2.0 2.5	1.0 0.0	1.5
		PRNIA BU	JILDING CO	54.1				
Notes:	emoval certifies units for		own in the attached dr	wings				

UNIT UNDER TEST (UUT) SUMMARY SHEET

1800711-CR-001-R4



Manufacturor	Uppkon In	ductria	va 1+d										
Manufacturer: Model Line:	Haakon In Custom Ai								UUT 1				
Model Line: Model Number:		Custom Air Handling Units Test Prototype					Serial Number: N/A						
		type				Serialini	iniber:	N/A					
Product Construe Tested with four	-												
2" 16 ga stainless			18 ga SS sta	andard a	nd thermal/w	/ashdow/	n liners	3-lh insula	ation 10	12 ga SS i	floor 22		
ga SS floor liner.	-		-			1051100101	in third 5.	5 15 115010		12 50 55	1001.22		
Options/Subcom													
Model 122 EPQN	-	-	24x60 cooli	ng coil 🤅	R6" sound att	enuator	throo inl	at hoods	60v60 Ta	mco/Ehtr	on inlet		
damper.		nators)	, 24700 0000	ng con, .		enuator,		et noous,			on inter		
Please refer to Pr	oduct Matrix for	compo	nent details.										
			F	ORC	ODE C	Mo							
			NED	1017	Properties								
Weight		Dimension (in)				Lowest Natural			Frequency (Hz)				
(lb)	Depth	Depth 🖌			OS Height 01		Front-Back		Side-Side		Vertical		
5,440	96.0		96.0		96.0	6.6		8.1		7.2			
			UUT Highes	t Passec	Seismic Run	Informa	tion						
Buildir	ng Code		Test Crite	eria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g		
CBC 2022		0	ICC-ES AC	156	1/04/2.5	$2^{1.0}$	1.5	4.00	3.00	1.67	0.67		
Test Mounting De	atails.	Z		100000	2.5	0.0	6						
			ORNIA	BUI		con	ſ	アードアー					
Unit mounted to	test fixture using	; ten (10	0) grade 5 3/4	4" diame	eter hex head	bolts.							
Unit maintained	structural integri	ty and	remained fui	nctional			uiremen	t after sha	ke table t	test.			
Contents were in	cluded in testing	per op	erating cond	litions.									

OSP-0301






Manufacturer:	Haakon I	ndustrie	es, Ltd.								
Model Line:	Custom A	ir Hand	ling Units							UT 2	a
Model Number:	Test Prot	otype				Serial Nı	ımber:	N/A			
Product Construe	-										
Tested with four	•		10		. I. J /I. I.				10		
4" 16 ga carbon s washdown/thern			-			-			-	1975" 8.0	125" ٨
checkerplate floo			-								
Options/Subcom	-	-		•	0		0				
48x48 Ultra Tek D		-	amco Damp	er. (2) 12x1	L2, 46x46, 4	8x50, 48x	48 Gree	nheck Dan	npers. 47	x48 Haak	on stor
louver. 48x50 Haa					$h h \sim$	ers. (4) St	ack mod	del 122 MF	QN fans.	2kW hea	ter.
Nema-3R enclosu	ire. Please refer	to Prod	luct Matrix fo	r compone	ent details.	On.					
			NEV								
				UUT Pr	operties		Z		_	A A	
Weight (lb)	Danath	Di	mension (in)	<u>nsp</u>	0201	-		st Natural		T	
13,100	Depth 115.0	12	Width 144.5		eight 01 56.0	Front 4	-Back		- Side .6		tical
13,100	115.0		UUT Highes					3	.0	4	.2
Buildir	ng Code	+ P	Test Crite	vionum	S _{DS} (g)	z/h	I P	A(g)	Anic II (g)	A _{FLX-V} (g)	Anc v(
	-				2.5	1.0					
CBC	2022	Ç	ICC-ES AC	156	2.5	2 0.0	1.5	4.00	3.00	1.67	0.67
Test Mounting De	etails:	R	- WINDER		ALLAL -	AAAA	2]
Tamco damper				Ultr	atech dampe	er			1	on storm, iheck dam	nor
		ale.									per
	N		P.V	BLIT	TNIG		Y				
				- Charles	11			V			
				Ser.							-
				SF						1	
	0			N		NOV	a stre		in the		
	-12-	4			II	T		2			
1 22				X						11	
		Right						Left			2
							1		r		
E 21 ·	H.			178		11	Natural I	=			
		\wedge			Contraction of the second			and the second sec			1
Tamco, Gree	enheck			Greenhe	eck damper				V Haa	akon stand	ard,
dampers									Gre	enheck sm	noke
Jnit mounted to	test fixture usin	g ten (1	0) grade 5 3/4	4" diamete	er hex head	bolts.					
Unit mounted to Unit maintained s Contents were in	structural integ	rity and	remained fui	nctional pe			uiremen	t after sha	ke table	test.	





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Model Line: Model Number:	Custom Air Handling Units Test Prototype	Serial Number:	N/A	00125
Manufacturer:	Haakon Industries, Ltd.			UUT 2b

Product Construction Summary:

Tested with three (3) walls in place (inlet wall removed). Carbon steel(CS) bracing added in place of removed wall (see bracing dwg). 4" 16 ga CS casing. 22, 20, 18 ga standard and washdown/thermal galv. CS liners. 22, 20, 18 ga washdown/thermal stainless steel(SS) liners. 18 ga washdown/thermal aluminum(AL) liners. 3-lb insulation. 0.1875" & 0.125" AL checkerplate floor. 14 ga CS floor. 12ga & 0.125" CS checkerplate. 22 ga CS floor liner. 18 ga AL floor liner. CS C8x11.5 base rail.

Options/Subcomponent Summary:

48x48 Ultra Tek Dampers. 12x12, 48x48 Tamco Damper. (2) 12x12, 46x46, 48x50, 48x48 Greenheck Dampers. 47x48 Haakon storm louver. 48x50 Haakon standard louver. Dri-Steem & Nortec steam humidifiers. (4) Stack model 122 MPQN fans. (2) Stack model 365 MPQN fans (2" spring isolators – upgraded to seismic grade isolators after initial isolator fail). 2kW heater. Nema-3R enclosure. Please refer to Product Matrix for component details.

			UUT Properties		-				
Weight		Dimension (in)	งพี่เราไปโหะเอรไซซ์ (Marilan)		Lowe	st Natural	Frequer	ncy (Hz)	
(lb)	Depth	Width	OS Height 01	Front-	Back	Side	-Side	Ver	tical
13,100	115.0	144.5	156.0	4.	1	2	.9	4	.5
		UUT Highest I	Passed Seismic Run	Informat	ion 💍				
Build	ing Code	Test Criter	ia S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g
CB	C 2022		6 11/04/2.5 2.5	$2\frac{1.0}{0.0}$	1.5	4.00	3.00	1.67	0.67
Test Mounting L	Details:	TROP	Ultratech damp	er	150		1	on storm, iheck dam	per
	Front		Greenheck damper		1	Left		akon stand	
		l]				enheck sm	
Unit maintained	l structural integi	g ten (10) grade 5 3/4" rity and remained func g per operating condit	tional per manufac		iremen	t after sha	ke table	test.	





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Manufacturer:	Haakon Industries, Ltd.			UUT 2c
Model Line:	Custom Air Handling Units			00120
Model Number:	Test Prototype	Serial Number:	N/A	
Product Constructi	on Summary:			

Tested with two (2) walls in place (inlet and outlet walls removed). Carbon steel(CS) bracing added in place of removed walls (see bracing dwg). 4" 16 ga CS casing. 22, 20, 18 ga standard and washdown/thermal galv. CS liners. 22, 20, 18 ga washdown/thermal stainless steel(SS) liners. 18 ga washdown/thermal aluminum(AL) liners. 3-lb insulation. 0.1875" & 0.125" AL checkerplate floor. 14 ga CS floor. 12ga & 0.125" CS checkerplate. 22 ga CS floor liner. 18 ga AL floor liner. CS C8x11.5 base rail.

Options/Subcomponent Summary:

12x12, 48x48 Tamco Dampers. (2) 12x12 Greenheck Dampers. Dri-Steem & Nortec steam humidifiers. (4) Stack model 122 MPQN fans. (2) Stack model 365 MPQN fans (2" spring isolators – upgraded to seismic grade isolators after initial isolator fail). 2kW heater. Nema-3R enclosure. Please refer to Product Matrix for component details.

			UUT P	Properties		4				
Weight		Dimension (in) ^{,,,,,} ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			Lowes	t Natural	Frequen	icy (Hz)	
(lb)	Depth	Width	OSF	leight 01	Front	t-Back	Side	-Side	Ver	tical
13,100	115.0	144.5		156.0	4	.3	2	.8	4	.5
		UUT Highes	st Passed	Seismic Run	Informa	tion				
Buildi	ng Code	Test Crit	eria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
СВС	2022		156 11	/04/2.5	2 1.0 0.0	1.5	4.00	3.00	1.67	0.67

Test Mounting Details:



Unit mounted to test fixture using ten (10) grade 5 3/4" diameter hex head bolts. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.





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Manufacturer: Model Line:		ndustries, Ltd. Air Handling Units						U	UT 3	a
Model Number:	Test Prot	•			Serial Nu	umber:	N/A			
Product Construe							,			
ested with four	(4) walls in plac	e.								
2" 12 ga AL casing	g. 22, 20, 18 ga	standard and washdo	wn/therm	al galv. CS	liner. 22	, 20, 18 §	ga washdo	wn/therr	mal stainl	ess
teel(SS) liner. 18	ga standard an	nd washdown/therma	l AL liner.	6-lb insula	tion. 14 g	ga CS flo	or. 0.1875	,0.125" A	L checke	rplate.
2 ga, 0.125" CS c	heckerplate. 22	2 ga CS floor liner. 18 g	ga AL floor	liner. CS C	12x20.7 l	oase rail	•			
Options/Subcom	ponent Summa	ıry:								
	-	d, type 8, HEPA). 84" s	IR LU			36, & 42"	UV lights.	(6) 42"x1	.10" cooli	ng coils
		" bellmouth transition	Nema-1	enclosure.	DAN.					
Please refer to Pr	oduct Matrix for	r component details.			NP/					
		L.	UUT Pro	operties		T				
Weight		Dimension (in)				Lowes	st Natura	Frequer	icy (Hz)	
(lb)	Depth	Width	OSHei	ight 01	Front	-Back	Side	-Side	Ver	tical
13,100	120.0	240.0	15	6.0	6	.9	>3	3.3	>3	3.3
		UUT Highest	Passed Se	ismic Run	Informa	tion 💍			1	
Buildir	ng Code	Test Criter	ria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (§
CBC	2022	ICC-ES AC1	56 11/	2.5	2 1.0	1.5	4.00	3.00	1.67	0.67
		Z		2.5	0.0	~~				
Fest Mounting De	etails:					\sim				
		Alte			202	1×	1			1
		AMA	BLIT	TRIG		0			-	
	1 million	a fight of		JII A	S.C.				1	
				March .	(m					
	· Forester	e e A		A -			1			
	H	and the H		-	E al	11/20				
						States and the second				
		i iii			11	10				
	0			A.	A					
	0									
	0				No.					
	0	0	Ti.							
	0	a	T2							

Unit mounted to test fixture using ten (10) grade 5 3/4" diameter hex head bolts. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.





1800711-CR-001-R4



Manufacturer:	Haakon Ir	ndustrie	es, Ltd.								
Model Line:	Custom A	ir Hand	ling Units						U	UT 3	5D
Model Number:	Test Proto	otype				Serial Nı	ımber:	N/A			
Product Constru Tested with three dwg). 2" 12 ga aluminu stainless steel(SS checkerplate. 12	e (3) walls in plac m(AL) casing. 22 5) liner. 18 ga sta	ce (inlet 2, 20, 18 ndard a	ga standard and washdow	and wash /n/therma	idown/theri I AL liner. 6	nal galv. -lb insula	CS liner. Ition. 14	. 22, 20, 18 ga CS floo	8 ga wash or. 0.1875	idown/th	ermal
40"W x 156"H Fi Jema-1 enclosur	ponent Summa lter rack (angled re. roduct Matrix for	l, type 8	F		enuator. 18	, 24, 30, 3 MB	86, & 42"	UV lights.	(6) 42"x1	10" cooli	ng coils
Weight		Dii	mension (in)		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX		Lowes	st Natural	Frequen	cy (Hz)	
(lb)	Depth	14	Width	OSR	eight 01	Front	-Back	Side	-Side	Ver	tical
13,100	120.0		240.0		56.0	12	2.7	13	3.4	>3	3.3
			UUT Highes	t Passed S	eismic Run	Informa	tion 👝				
Buildi	ng Code		Test Crite	eria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (
CBC	2022		ICC-ES AC	156 1 1	/04/ <u>2.5</u> 2.5	2 ^{1.0} 0.0	1.5	4.00	3.00	1.67	0.67
Test Mounting D	etails:			BUT				K	7		

Unit mounted to test fixture using ten (10) grade 5 3/4" diameter hex head bolts. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.





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Model Line: Custom Air Handling Units Model Line: Custom Air Handling Units Model Line: Test Prototype Serial Number: N/A Product Construction Summary: Ested with two (2) walls in place (inlet and outlet walls removed). Carbon steel(CS) & aluminum(AL) bracing added in place removed walls (see bracing dwg). Product Carbon steel(CS) & aluminum(AL) bracing added in place removed walls (see bracing dwg). 2' 12 ga AL casing. 22, 20, 18 ga standard and washdown/thermal galv. CS liner. 22, 20, 18 ga washdown/thermal stainless steel(SS) liner. 18 ga standard and washdown/thermal AL liner. 6-1b insulation. 14 ga CS floor. 0.1875, 0.125" AL checkerplate 12 ga, 0.125" CS checkerplate. 22 ga CS floor liner. 18 ga AL floor liner. CS C12x20.7 base rail. Options/Subcomponent Summary: QuUP Properties Q40 W 156"H Filter rack (angled, type 8, HEPA). 84" sound attenuator. 18, 24, 30, 36, & 42" UV lights. (6) 42"x110" cooling cc Nema-1 enclosure. Please refer to Product Matrix for component details. UUP Properties Weight Dimension (in) Lowest Natural Frequency (Hz) (lb) Depth Width Height Front-Back Side Vertical. 13,100 120.0 240.0 156.0 12.7 13.4 >33.3 UUT Highest Passed Seismic Run Information Est Mounting Details: CBC 2022 ICC ES AC156 12.5	Manufacturer:	Haakon Ir	ndustrie	es, Ltd.								
Product Construction Summary: Tested with two (2) walls in place (inlet and outlet walls removed). Carbon steel(CS) & aluminum(AL) bracing added in place removed walls (see bracing dwg). 2" 12 ga AL casing. 22, 20, 18 ga standard and washdown/thermal galv. CS liner. 22, 20, 18 ga washdown/thermal stainless steel(SS) liner. 18 ga standard and washdown/thermal AL liner. 6-lb insulation. 14 ga CS floor. 0.1875, 0.125" AL checkerplate 12 ga, 0.125" CS checkerplate. 22 ga CS floor liner. 18 ga AL floor liner. CS C12x20.7 base rail. Options/Subcomponent Summary: 240"W x 156"H Filter rack (angled, type 8, HEPA). 84" sound attenuator. 18, 24, 30, 36, & 42" UV lights. (6) 42"x110" cooling cc Nema-1 enclosure. Please refer to Product Matrix for component details. UUT Properties Weight Dimension (in) UUT Properties UUT Highest Passed Seismic Run Information UUT Highest Passed Seismic Run Information CBC 2022 ICC_ES AC156	Model Line:	Custom A	ir Hand	ling Units								5C
Tested with two (2) walls in place (inlet and outlet walls removed). Carbon steel(CS) & aluminum(AL) bracing added in place removed walls (see bracing dwg). 2" 12 ga AL casing. 22, 20, 18 ga standard and washdown/thermal galv. CS liner. 22, 20, 18 ga washdown/thermal stainless steel(SS) liner. 18 ga standard and washdown/thermal AL liner. 6-lb insulation. 14 ga CS floor. 0.1875, 0.125" AL checkerplate 12 ga, 0.125" CS checkerplate. 22 ga CS floor liner. 18 ga AL floor liner. CS C12x20.7 base rail. Options/Subcomponent Summary: 240"W x 156"H Filter rack (angled, type 8, HEPA). 84" sound attenuator. 18, 24, 30, 36, & 42" UV lights. (6) 42"x110" cooling cc Nema-1 enclosure. Please refer to Product Matrix for component details. UUT Properties Weight UUT Properties Weight Dimension (in) Lowest Natural Frequency (Hz) Ib Depth Width Height I Front-Back Side-Side Vertical 13,100 120.0 240.0 156.0 12.7 13.4 >33.3 UUT Highest Passed Seismic Run Information Building Code Test Criteria CBC 2022 I CC C ESAC156 1 /(<u>4,25</u> 0 .0) 1 ,5 4 .00 3 .00 1 .67 0 .0	Model Number:	Test Proto	otype				Serial Nu	umber:	N/A			
UUT Properties Weight 100 0 240.0 Lowest Natural Frequency (Hz) UUT Properties UUT Highest Passed Seismic Run Information UUT Highest Passed Seismic Run Information CBC 2022 ICC-ES AC156 1,5 4.00 3.00	Tested with two (2) removed walls (see 2"12 ga AL casing. steel(SS) liner.18 g	walls in place bracing dwg). 22, 20, 18 ga s a standard and	e (inlet a standar d wash	d and washd down/therma	own/the al AL line	rmal galv. CS r. 6-lb insula	5 liner. 22 ation. 14 g	2, 20, 18 g ga CS floc	a washdo	own/therr	nal stainl	ess
(lb)DepthWidthOS HeightFront-BackSide-SideVertical13,100120.0240.0 156.0 12.7 13.4 > 33.3 UUT Highest Passed Seismic Run InformationBuilding CodeTest CriteriaSps (g) z/h IpA _{FLX-H} (g)A _{FLX-Y} (g) <t< th=""><th>240"W x 156"H Filte Nema-1 enclosure.</th><th>er rack (angled</th><th>l, type 8</th><th>F</th><th></th><th></th><th>3, 24, 30, 3</th><th>36, & 42"</th><th>UV lights.</th><th>. (6) 42"x1</th><th>.10" cooli</th><th>ng coils</th></t<>	240"W x 156"H Filte Nema-1 enclosure.	er rack (angled	l, type 8	F			3, 24, 30, 3	36, & 42"	UV lights.	. (6) 42"x1	.10" cooli	ng coils
(lb)DepthWidthOS HeightFront-BackSide-SideVertical13,100120.0240.0 156.0 12.7 13.4 > 33.3 UUT Highest Passed Seismic Run InformationBuilding CodeTest Criteria $S_{DS}(g)$ z/h I_P $A_{FLX-H}(g)$ $A_{FLX-V}(g)$ $A_{FLX-V}(g)$ $A_{RIG-H}(g)$ $A_{FLX-V}(g)$ $A_{RIG-H}(g)$ CBC 2022ICC-ES AC156 $11/2.5$ 2.5 0.0 1.5 4.00 3.00 1.67 0.6	Weight		Dii	mension (in)				Lowes	t Natura	l Frequer	cy (Hz)	
UUT Highest Passed Seismic Run Information Building Code Test Criteria S _{DS} (g) Z/h I _P A _{FLX-H} (g) A _{FLX-V} (g) A _F	-	Depth	4			Height 01	Front		1		- · ·	tical
Building Code Test Criteria S _{DS} (g) Z/h Ip A _{FLX-H} (g) A _{FLX-V} (13,100	120.0		240.0		-	12	2.7	13	3.4	>3	3.3
CBC 2022 ICC-ES AC156 11/ 042.5 2.5 2.0 1.5 4.00 3.00 1.67 0.0				UUT Highes	t Passed	Seismic Run	Informa	tion 💦				
CBC 2022 ICC-ES AC156 I/ 2.5 0.0 1.5 4.00 3.00 1.67 0.6	Building	Code		Test Crite	eria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (
	CBC 2)22	C	ICC-ES AC	156 1			1.5	4.00	3.00	1.67	0.67
	Test Mounting Deta	ails:			St.	DIAN G						

Unit mounted to test fixture using ten (10) grade 5 3/4" diameter hex head bolts. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.





1800711-CR-001-R4



Model Line:	Haakon II	ndustries, Ltd.								л
· · · · ·	Custom A	ir Handling Units							JUT	4
Model Number:	Test Prot	otype			Serial N	umber:	N/A			
Product Construc	tion Summary:	:								
Tested with four (
2" 16 ga carbon si	teel(CS) casing.	CS C6x8.2 base rail.								
Options/Subcom		-								
		ng isolators). (2) EPF		02 fans (2"	spring is	olators).	Nema-3R	enclosur	e.	
Please refer to Pr	oduct Matrix fo	r component details.								
		- (DR CO	DFC						
		OF			Ms					
		NEV								
		<u>S</u>	UUT Pro	operties		T				
Weight		Dimension (in)					st Natural	Frequer	ncy (Hz)	
(lb)	Depth	Width	OSHe	ight 01	Front	-Back	Side	-Side	Ver	tical
13,810	118.0	120.0		4.0		.4	5	.9	10).9
		UUT Highest	Passed Se	eismic Run	Informa	tion 🔵		1	•	
Buildin	g Code	Test Crite	ria	S _{DS} (g)	z/h	l _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (
CBC	2022	ICC-ES ACT	156 11/	42.5	2 1.0	1.5	4.00	3.00	1.67	0.67
		Y H		2.5	0.0					
		PAT	RIT		602		/			
			BUIL							

Contents were included in testing per operating conditions.

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Manufacturer:	Haakon In	ndustries	l td								
Model Line:	Custom A								(JUT	5
Model Number:	Test Proto					Serial Nu	umber:	N/A			
Product Construc Fan Skid											
Options/Subcom	-	-									
EPF model 122 fa Please refer to Pr					fan. EPQN	model 12	22 (vertio	cal) fan. (a	ill 2" sprir	ng isolato	rs)
		compon	HED F	ORCO		OMp					
W-1-1-4					operties		Z	4. 1. 4			
Weight (lb)	Depth		ension (in) Width		ight01	Eropt	-Back	t Natural	-Side		tical
6,540	141.0	12	110.0	_	0.0		- Баск .5	-	- Side 9		.7
0,010	111.0		X7V X7	t Passed Se							• •
Buildir	ng Code		Test Crit	monann	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC	2022	CP	IC <mark>C-ES AC</mark>	156 11/	042.5	2 ^{1.0} 0.0	1.5	4.00	3.00	1.67	0.67
Test Mounting De	etails:				HHHH	AAAA	2				
BC SWSI 600			RAVIA	BUIL	TNG						
EPF 122						F			EP	QN 122]
Unit mounted to Unit maintained s		-	-				uirement	after sha		SWSI 122	
Contents were in	-	-		•		urerieq					







Manufacturer:	Haakon In	dustries	Itd								
Model Line:	Custom Ai								L	JUT	6
Model Number:	Test Proto					Serial N	umber:	N/A			
Product Construct											
Fan Skid											
Options/Subcomp	oonent Summar	v:									
EPQ model 660 fa		-									
Please refer to Pro	oduct Matrix for	compor	ent details								
			- (RCO	DEC						
			CD FL		NIX NY	Nr.					
			J.L.	UUT Pro	nortios						
Weight		Dim	ension (in)		perties		Lowes	t Natura	l Frequen	cv (Hz)	
(lb)	Depth		Width	OSHei	ght 01	Front	-Back	1	-Side		tical
5,910	84.0		146.0	13	5.0	1	.8	2	2.6	3	.9
			JUT Highest	Passed Se	ismic Run	Informa	tion 📃				1
Buildin	g Code		Test Crite	ria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC2	2022	C	ICC-ES AC1	56 11/	2.5 2.5 2.5	$2^{1.0}_{0.0}$	1.5	4.00	3.00	1.67	0.67
Test Mounting De	tails:	K	PRESERV.		anna anna anna anna anna anna anna ann		0		ļ		
, , , , , , , , , , , , , , , , , , ,		1		R.S.	CHARKS	Mar 1		1			
			P	DUL UA		0	1	-			
			A	PT IT I	TNIG	E					
				POIL	JING			100			
								1			
						â					
		1			Lett	T					
		- Tawing	1711		the second		VP-	-			
		1 V.				$\cdot \Box$		a com			
		IN STATE	1			AL	-				
			1				G.,	and the			
				and all				2/			
			hin is	- St	125			-			
		-1	-		-			14			
	1		K	in the	1.1	111	100	1			
Unit mounted to t	-		-								
Unit maintained s Contents were inc	-				r manutac	turer req	uirement	t after sha	ake table i	est.	
	iuucu iii testiilg	, per ope	rating condi						ural Inter		





1800711-CR-001-R4



	Паакон н	ndustries, Ltd.								7
Model Line:	Custom A	Air Handling Units							JUT	(
Model Number:	Test Prot	otype			Serial Ni	umber:	N/A			
Product Construc Fan Skid	ction Summary	:								
Options/Subcom	ponent Summa	ıry:								
	=	olators). BAF DWDI m	nodel 122	fan (1" sprir	ng isolato	ors).				
Please refer to Pr	oduct Matrix fo	r component details.								
			RC	ODFC						
		OFL	DR CO		Ms					
		NEV								
		- Ki	UUT P	roperties		Z			4 x	
Weight		Dimension (in)		0.0201			st Natural			
(lb)	Depth	Width		eight 01		-Back		-Side		tical
5,050	132.0	118.0		80.0		.8	2	.4	9	.0
Buildin	ng Code	UUT Highest Test Crite		S _{DS} (g)	z/h		A (g)	A (g)	A _{FLX-V} (g)	<u>م</u> (
	-			2.5	1.0					
CBC	2022	ICC-ES ACI	156	/04/202	2 0.0	1.5	4.00	3.00	1.67	0.67
						0				
Test Mounting De	etails:									
Test Mounting De	etails:				4		8	-		
Test Mounting De	etails:	TOPNIL			ODY		8	1		
Test Mounting De	etails:	TORNIA	BUT	DING	PODE		1			
Test Mounting De	etails:	FORNIA	BUIL	DING	Popt					
Test Mounting De	etails:	FORNIA	BUIL	DING	Poof					
Test Mounting De	etails:	FORNIA	BUIL	DING	Popt					
Test Mounting De	etails:	FORNIA	BUIL	DING	Poor		H			
Test Mounting De	etails:	FORNIA	BUIL	DING	100th					
Test Mounting De	etails:	FORNIA	BUI	DING	HOD'S			10.00		
Test Mounting De	etails:	FORNIA	BUIL	DING	100t		- Aller			
Test Mounting De	etails:	FORNIA	BUIL		Poot		tanke,	AND READ		
Test Mounting De	etails:	FORNIA	BUIL	DING	POOT		Tanks -			
Test Mounting De	etails:	FORNIA	BUIL		PODE		tanks -			
Test Mounting De	etails:	FORNIA	BUIL							

Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

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1800711-CR-001-R4



r: Haakon Industries, Ltd.							•	JUT	0
Custom A	Air Handling Units						L L		0
Test Prot	otype			Serial N	umber:	N/A			
tion Summary	:								
ponent Summa	ıry:								
60 fan (2" sprin	g isolators).								
oduct Matrix fo	r component details	•							
	IED FO	ORCO	DE C	OMS					
		UUT Pr							
	Dimension (in)	Ant West Marent			Lowes	st Natural Frequer			
Depth	Width	_		Front-Back		Side-Side		Vertical	
138.0	130.0					4	.2	4	.2
					tion 💍			1	
g Code	Test Crite	eria	S _{DS} (g)		I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (
2022	ICC-ES AC	$04^{2.5}_{202}$		1.5	4.00	3.00	1.67	0.67	
	Z		2.5	0.0	7 N				ļ
				NKKO					
	tion Summary Donent Summa 60 fan (2" sprin Dduct Matrix fo Depth	Dimension (in) Depth Width 138.0 130.0 UUT Highes g Code Test Crit 2022 ICC-ES AC	bonent Summary: 60 fan (2" spring isolators). oduct Matrix for component details. UUT Pri Dimension (in) Depth Width S He 138.0 130.0 15 UUT Highest Passed So g Code Test Criteria 2022 ICC-ES AC156 11/	bonent Summary: 60 fan (2" spring isolators). boduct Matrix for component details. UUT Properties Dimension (in) Depth 138.0 130.0 130.0 153.0 UUT Highest Passed Seismic Run g Code Test Criteria S _{DS} (g) 2022 ICC-ES AC156 11/ 2.5	ponent Summary: 60 fan (2" spring isolators). boduct Matrix for component details. UUT Properties Dimension (in) Depth Width S Height O Front 138.0 130.0 153.0 2 UUT Highest Passed Seismic Run Informa ig Code Test Criteria S _{DS} (g) z/h 2022 ICC-ESAC156 11/ 2.5 0.0	bonent Summary: 60 fan (2" spring isolators). oduct Matrix for component details. UUT Properties Dimension (in) Depth Width Height Front-Back 138.0 130.0 153.0 2.5 UUT Highest Passed Seismic Run Information Ig Code Test Criteria Sps (g) Z/h p 2022 ICC-ES AC156 11 2.5 0.0 1.5 2.5 0.0 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	The second seco	tion Summary: bonent Summary: 60 fan (2" spring isolators). boduct Matrix for component details. UUT Properties Dimension (in) UUT Properties Dimension (in) Lowest Natural Frequer Depth Width Height Front-Back Side-Side 138.0 130.0 153.0 2.5 4.2 UUT Highest Passed Seismic Run Information g Code Test Criteria Sps (g) Z/h Ip A _{FLXH} (g) A _{RIG-H} (g) 3.00 3	tion Summary: bonent Summary: 60 fan (2" spring isolators). oduct Matrix for component details. UUT Properties Dimension (in) Depth Width Height Front-Back Side-Side UUT Highest Passed Seismic Run Information Ig Code Test Criteria Sps (g) Z/h Ip AFLX+H (g) ARIG-H (g) AFLX+V (g) ARIG-H (g) AFLX-V (g) 1.5 4.00 3.00 1.67

Contents were included in testing per operating conditions.





1800711-CR-001-R4



Manufacturer:	Haakon I	ndustrie	es, Ltd.								•
Model Line:	Custom A	Air Hanc	lling Units							JUT	9
Model Number:	Test Prot	otype				Serial Nu	mber:	N/A			
Product Construc	tion Summary	:									
Tested with two (2	2) walls in place	e.									
2" 16 ga carbon st	eel(CS) casing.	. CS C6x	8.2 base rail.								
Options/Subcomp	oonent Summa	ary:									
Evaporative Humi	idifier.										
Please refer to Pro	oduct Matrix fo	r compo	onent details.								
					205						
				RCC	JDEC						
			OFC			Ms					
				///////////////////////////////////////							
			N								
				UUT P	roperties		T				
Weight		Di	mension (in)	mWerline			Lowes	st Natural	Frequer	ncy (Hz)	
Weight (lb)	Depth	Di	mension (in) Width	mWerline	roperties leight 01	Front	Lowes	T	Frequer		tical
-	Depth 120.0	Di		OSF			Lowes Back	Side		Ver	tical
(lb)		Di	Width	OSH	eight 01 129.0	Front 5.	Lowes Back	Side	-Side	Ver	
(lb)	120.0	Di	Width 120.0	OSH 1 Passed S	eight 01 129.0	Front 5.	Lowes Back	Side >3	- Side 3.3	Ver	.1
(lb) 3,500 Buildin	120.0 g Code	Di	Width 120.0 UUT Highest Test Criter	OSH 1 Passed S ria	eight 01 129.0 Seismic Run	Front 5. Informa	Lowes Back 9 tion I _P	Side >3 A _{FLX-H} (g)	-Side 3.3 А _{RIG-H} (g)	Ver 6 A _{FLX-V} (g)	A _{RIG-V} (g
(lb) 3,500	120.0 g Code	Di de Cr	Width 120.0 UUT Highest	OSH 1 Passed S ria	eight 01 129.0 Seismic Run S _{DS} (g)	Front 5. Informat z/h	Lowes -Back 9 tion	Side >3	- Side 3.3	Ver 6	.1
(lb) 3,500 Buildin CBC	120.0 g Code 2022	Di Jy CR	Width 120.0 UUT Highest Test Criter	OSH 1 Passed S ria	eight 01 129.0 Seismic Run S _{DS} (g)	Front 5. Informat z/h 1.0	Lowes Back 9 tion I _P	Side >3 A _{FLX-H} (g)	-Side 3.3 А _{RIG-H} (g)	Ver 6 A _{FLX-V} (g)	A _{RIG-V} (g
(lb) 3,500 Buildin CBC	120.0 g Code 2022	Di	Width 120.0 UUT Highest Test Criter	OSH 1 Passed S ria	eight 01 129.0 Seismic Run S _{DS} (g)	Front 5. Informat z/h 1.0	Lowes Back 9 tion I _P	Side >3 A _{FLX-H} (g)	-Side 3.3 А _{RIG-H} (g)	Ver 6 A _{FLX-V} (g)	A _{RIG-V} (g
(lb) 3,500 Buildin CBC	120.0 g Code 2022	Di	Width 120.0 UUT Highest Test Criter	OSH 1 Passed S ria	eight 01 129.0 Seismic Run S _{DS} (g)	Front 5. Informat z/h 1.0	Lowes Back 9 tion I _P	Side >3 A _{FLX-H} (g)	-Side 3.3 А _{RIG-H} (g)	Ver 6 A _{FLX-V} (g)	A _{RIG-V} (g
(lb) 3,500 Buildin CBC	120.0 g Code 2022	Di	Width 120.0 UUT Highest Test Criter	OSH 1 Passed S ria	eight 01 129.0 Seismic Run S _{DS} (g)	Front 5. Informat z/h 1.0	Lowes Back 9 tion I _P	Side >3 A _{FLX-H} (g)	-Side 3.3 А _{RIG-H} (g)	Ver 6 A _{FLX-V} (g)	.1 A _{RIG-V} (g
(lb) 3,500 Buildin	120.0 g Code 2022	Di	Width 120.0 UUT Highest Test Criter	OSH 1 Passed S ria	eight 01 129.0 Seismic Run S _{DS} (g)	Front 5. Informat z/h 1.0	Lowes Back 9 tion I _P	Side >3 A _{FLX-H} (g)	-Side 3.3 А _{RIG-H} (g)	Ver 6 A _{FLX-V} (g)	.1 A _{RIG-V} (g

Unit mounted to test fixture using ten (10) grade 5 3/4" diameter hex head bolts. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

1800711-CR-001-R4





TRU Compliance, by Structural Integrity Associates, Inc. 844-TRU-0200 | info@trucompliance.com

1800711-CR-001-R4



Manufacturer:	Haakon Industries, Ltd.			
Model Line:	Custom Air Handling Units			UUT 10
Model Number:	Test Prototype	Serial Number:	19-5574-	473-C
Product Constructi	on Summary:			

Tested with three (3) walls in place.

2" 16 ga. carbon steel(CS) casing. 22 ga CS standard liners. 3-lb insulation. 12 ga CS checkerplate floor. 22 ga CS floor liners. CS C6x8.2 base rails.

Options/Subcomponent Summary:

Active Air Solutions AAS-AirRailx36 ionization bar (36" length). Active Air Solutions AAS-AirRailx143 ionization bar (143" length). Active Air Solutions AAS-7504 power transformer. Armstrong Humidipack humidifier (144"W x 134"H x 8.5"D). Armstrong Humidipack humidifier (24"W x 24"H x 8.5"D). 686q AcoustiFLO fan array (4W x 4H standard configuration) with one (1) Baldor fan motor and three (3) WEG fan motors. Two (2) ABB ACH580 VFD's. Tamco model 1000 damper (12"W x 12"H, parallel horizontal blades) with Ebtron air measurement station (13.5"W x 12"H) and Belimo FSNF120-S US actuator. Tamco model 1000 damper (60"W x 60"H, parallel horizontal blades) with Ebtron air measurement station and four (4) FSNF120-S US Belimo actuators. Haakon storm louver (61"W x "60"H, vertical blades). Haakon standard louver (60"W x 58"H, horizontal blades). Greenheck VCD23-304SS damper (60"W x 60"H, parallel horizontal blades).

		G G	JUT Properties						
Weight		Dimension (in)		Lowest Natural Frequency (Hz)					
(lb)	Depth	Depth Width Y Moha Height		rinFron	Front-Back		-Side	Vertical	
15,554	113.5	240.0	152.0		4.1	6	.8	8	.3
		UUT Highest Pa	ssed Seismic Run	Informe	ation				
Buildi	ng Code	Test Criteria	S _{DS} (g)	z/h	, Hp.	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CPC	2022	ICC-ES AC156	2.0	1.0		3.20	2.40	2.07	0.83
LDU	. 2022	ICC-ES ACISO		NYYN	1.5	5.20	2.40	2.07	0.03

0.0

Test Mounting Details:



Unit was mounted to a wide flange beam test frame using thirty (30) 5/16" fillet welds (spaced at 8" O.C. max. along both sides). Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.





1800711-CR-001-R4



Manufacturer:	Haakon I	ndustries, Ltd.							1
Model Line:	Custom A	Air Handling Units					U	UT 1	
Model Number:	Test Prot	otype		Serial Nu	mber:	19-5574-	474-C		
Product Construct Tested with three 2" 16 ga. carbon st C8x11.5 base rails.	(3) walls in pla teel(CS) casing		ners. 3-lb insulation.	12 ga CS o	checkerp	olate flooi	r. 22 ga CS	5 floor lin	ers. CS
	an array (stagg	ary: gered configuration, 3 otors. Hoffman electr	ical panel (36"W x 60). MMP p				
			UUT Properties		2				
Weight		Dimension (in)	เทเพียงมีการออร์กรณ์การสีรรมมีร	Lowest Natura			Frequer	icy (Hz)	
(lb)	Depth	Width	OS Height $O1$	Front-Back		Side-Side		Vertical	
8,124	104.3	165.5	110.3	4.		17	7.8	13.4	
			Passed Seismic Run						<u> </u>
Building CBC 2		ICC-ESACI	2.0	z/h 2 1.0 0.0	I _P	А _{FLX-H} (g) 3.20	А_{RIG-Н} (g) 2.40	Α_{FLX-V} (g) 1.80	A _{RIG-V} (§
Test Mounting Dea		PRNIA		COUT			E C		

Unit was mounted to a wide flange beam test frame using ten (10) 3/4"-10 SAE grade 8 bolts with leveling washers, spring washers and nuts (spaced at 24" O.C. max. along both sides). Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

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11/04/2022

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Manufacturer:	Haakon Industries, Ltd.		11117 13
Model Line:	Custom Air Handling Units		UUT 13
Model Number:	Test Prototype	Serial Number: N/A	
Product Constructi	on Summary:		
Tested with four (4)	walls in place.		
4" 16 ga carbon ste	el(CS) casing. 22 ga CS standard li	ners. 3-lb insulation. 1/8" CS checkerplate floor.	No floor liners. CS C8x11.5
base rails. Standard	d CS split frame 6" upstream from	coil rack.	
Options/Subcompo	onent Summary:		
Stainless steel 3-hig	gh standard coil rack (16-12 ga, Ha	akon). (1) 18"H x 180"W 6 row coil (bottom, 5/8"	O.D. CU tubes, 0.02" tube
wall, 8 fpi, 0.0075"	AL fins, Haakon). (1) 54"H x 180"W	2 row coil (middle, 5/8" O.D. CU tubes, 0.035" tu	be wall, 12 fpi, 0.0095" CU
fins, Haakon). (1) 54	4"H x 180"W 5 row coil (top, 5/8" O	D. CU tubes, 0.035" tube wall, 12 fpi, 0.0095" AL	fins, Haakon). CC-18 UV
light (American UV)	CC-60 UV light (American UV) CK	-18 UV light (American UV) CK-60 UV light (Amer	rican UV)VMOD2-18 UV

light (American UV). CC-60 UV light (American UV). CK-18 UV light (American UV). CK-60 UV light (American UV). VMOD2-18 UV light (UVDI). VMOD2-36 UV light (UVDI). VMAX2-21 UV light (UVDI). VMAX2-61 UV light (UVDI). 16ga 304 stainless steel UV light rack (Haakon). (2) UV light power supply panels (UVDI). CK series UV light power supply pannel (American UV). CSK010104 IP20 electrical panel (Hammond Manufacturing). 12"H x 12"W x 6"D UV light control box (Haakon).

			UUT Properties						
Weight		Dimension (in)			Lowe	st Natural	Frequer	ncy (Hz)	
(lb)	Depth	epth Width Vo		arinfr	ont-Ba <mark>ck</mark>	Side-Side		Vertical	
10,615	120.0	195.75	148.25		9.2	15.6		8.5	
		UUT Highest	Passed Seismic R	In Infor	mation				
Buildi	ng Code	Test Criter	ia S _{DS} (g	z/ł		A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g
CPC	. 2022	ICC-ES AC15	2.0	1.0		3.20	2.40		0.67
CBC 2022		ICC-ES ACI:	2.5	0.0	1.5	3.20	2.40	1.67	0.67

Test Mounting Details:



Unit was mounted to the shake table using twelve (12) 3/4"-10 SAE grade 8 bolts with leveling washers and flat washers. 3 on the end of each short side spaced at 12" O.C. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.





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Manufacturer:	Haakon In	dustrie	es, Ltd.								Л
Model Line:	Custom Ai	r Hand	ling Units						U		.4
Model Number:	Test Proto	type				Serial Nu	ımber:	N/A			
Product Constru	ction Summary:										
Tested with four	(4) walls in place	•									
-	steel(CS) casing. 2	-			sulation.	1/8" CS cł	neckerpla	ate floor.	No floor l	iners. CS	C8x11.5
base rails. Stand	ard CS split frame	e 6" up	stream from co	oil rack.							
Options/Subcon	nponent Summar	y:									
Stainless steel 3-	high heavy coil ra	ack (12	ga, Haakon). (1) 42"H x	160''W 10	row coil (middle, 5	5/8" O.D. (CU tubes,	0.035" tı	ıbe wall,
12 fpi, 0.0095" Al	_ fins, Haakon). (1	.) 42"H	x 160"W 10 rov	w coil (top	o, 5/8" O.D	. CU tube	s, 0.035"	tube wall	l, 12 fpi, 0	.0095" Cl	J fins,
Haakon). 48"H x	36"W x 12"D NEM	IA 4 ele	ctrical box (Ho	offman).	DE						
	ed empty due to s	hippin	g damage: 42"	Hx 160"W	10 row co	il (botton	n,5/8"" (D.D. CU tu	bes. 0.02	" tube wa	all, 8 fpi,
0.0075" AL fins, H	laakon).		ED.			Ms,					
				UUT Pro	operties		-				
Weight		Die	mension (in)	n Went Marenet			Lowes	t Natural	Frequer	ncy (Hz)	
(lb)	Depth	2F	Width	OSRe	ight 01	Front	-Back	Side	-Side	Ver	tical
15,818	120.0		185.0	148	8.25	9	.5	9	.5	8.5	
			UUT Highest	Passed Se	eismic Run	Informa	tion 💦			-	
Buildi	ng Code		Test Criter	ia	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC	2022		ICC-ES AC1	56 11/	2.0	2 1.0	1.5	3.20	2.40	1.67	0.67
СВС	, 2022		166-13461		2.5	0.0	91	5.20	2.40	1.07	0.07
Test Mounting D	etails:	T.			ARRAN .		2				
			O			K	KI		2.00		
			PAL	1	AAA-	H LO	1				
			PRNIA	D		(P)	-			1	
8			4	JUILE	DIAN						-
						T	-				
	1 - and	+		-			T				-
1000					A DANK	2000					and a
	the second se	1		ALL -			11			100	

Unit was mounted to the shake table using twelve (12) 3/4"-10 SAE grade 8 bolts with leveling washers and flat washers. 3 on the end of each short side spaced at 12" O.C.

Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions, with the exception of the lower coil. The lower coil, identical to the middle coil, was damaged in shipping. The identical middle coil, more seismically vulnerable due to position, passed the seismic test. Unit can not exceed the tested weight.

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