APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0225

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: **Condair, Ltd.**

Manufacturer's Technical Representative: Brandon Crabtree

Mailing Address: 2470 Fenton Road, Ottawa, Ontario K1T 3T7 (CANADA)

Telephone: 613.822.0335 Email: brandon.crabtree@condair.com

Product Information

Product Name: SETC Steam Exchange, EL Electrode, SAM-e, Mini SAM-e

Product Type: Humidifiers and Steam Distributors

Product Model Number: Various (See Attachment)
(List all unique product identification numbers and/or part numbers)

General Description: SETC units are steam exchange humidifiers. EL units are electrode steam humidifiers. SAM-e and Mini SAM-e units are steam distributors.
Seismic enhancements made to the test units and modifications required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: SETC units are rigid floor mounted, EL units are rigid wall mounted, Mini SAM-e and SAM-e are in-duct units. SAM-e floor units can be installed only within rigid base mounted air handling units (AHU) without vibration isolators and the SAM-e floor units must be rigidly support at the base and top.

Applicant Information

Applicant Company Name: **Junker Engineering Group**

Contact Person: Dan Junker, SE

Mailing Address: 8950 Jefferson Ave. La Mesa, CA 91941

Telephone: 619.606.5058 Email: dan@junkereng.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2019.

Signature of Applicant: Date: 04.14.2020

Title: Principal Engineer Company Name: Junker Engineering Group

REVIEWED FOR OSHPD COMPLIANCE
OSHPD
OSP-0225
Timothy J Piland
DATE: 04/27/2020
CALIFORNIA BUILDING CODE 2019

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

Company Name: **Junker Engineering Group**

Name: Dan Junker, SE California License Number: S6178

Mailing Address: 8950 Jefferson Ave. La Mesa, CA 91941

Telephone: 619.606.5058 Email: dan@junkereng.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: NTS Huntsville (formerly Wyle Laboratories)

Contact Name: Brad Isbell, Test Engineer

Mailing Address: 7800 Highway 20 West, Huntsville, AL 35806

Telephone: 256-716-4295 Email: Brad.Isbell@nts.com

Company Name: ANCO Engineering, Inc.

Contact Name: Conor Byrne

Mailing Address: 1965-A 33rd Street, Boulder, CO 80301

Telephone: 303-443-7580 Email: conor@ancoengineer.com

Company Name: Clark Dynamic Testing Laboratory

Contact Name: Devon Lohr, General Manager

Mailing Address: 1801 Route 51, Bldg. 8, Jefferson Hills, PA 15025

Telephone: 412-387-1026 Email: dlohr@clarktesting.com

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 1.52

S_{DS} (Design spectral response acceleration at short period, g) = 2.03

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

R_p (Equipment or component response modification factor) = 6.0

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1

Equipment or Component Natural Frequencies (Hz) = See Attached Certified Component Summary

Overall dimensions and weight (or range thereof) = See Attached Certified Component Summary

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

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List of Attachments Supporting Special Seismic Certification

☐ Test Report(s) ☐ Drawings ☐ Calculations ☐ Manufacturer's Catalog

☒ Other(s) (Please Specify): JEG Certified Component Summary

OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2025

Signature: _____ Date: April 27, 2020

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to: S_{DS} (g) = 2.03 z/h = 1

Condition of Approval (if applicable):

Condair Ltd.- Humidifiers
I. Certified Component Summary

EL DUCT/EL SPACE									
	Width (in)	Depth (in)	Height (in)	Weight (lb)		Construction Material	S_{DS} (g)	F_p/W_p	UUT
				Dry	Wet				
EL DUCT 5	16.5	14.4	26.4	45.0	55.0	1mm CRS	2.03	1.52	Extrapolated
EL SPACE 5	16.5	14.4	35.4	83.0	113.0	1mm CRS	2.03	1.52	Extrapolated
EL DUCT 10	16.5	14.4	26.4	45.0	55.0	1mm CRS	2.03	1.52	Extrapolated
EL SPACE 10	16.5	14.4	35.4	83.0	113.0	1mm CRS	2.03	1.52	PR033136-TR-15 UUT1
EL DUCT 20	16.5	14.4	26.4	45.0	55.0	1mm CRS	2.03	1.52	Interpolated
EL SPACE 20	16.5	14.4	35.4	83.0	113.0	1mm CRS	2.03	1.52	Interpolated
EL DUCT 30	16.5	14.4	26.4	45.0	55.0	1mm CRS	2.03	1.52	Interpolated
EL SPACE 30	16.5	14.4	35.4	83.0	113.0	1mm CRS	2.03	1.52	Interpolated
EL DUCT 50	20.9	15.8	30.7	85.0	150.0	1mm CRS	2.03	1.52	Interpolated
EL SPACE 50	20.9	15.8	39.7	123.0	188.0	1mm CRS	2.03	1.52	Interpolated
EL DUCT 75	20.9	15.8	30.7	85.0	150.0	1mm CRS	2.03	1.52	Interpolated
EL SPACE 75	20.9	15.8	39.7	123.0	188.0	1mm CRS	2.03	1.52	Interpolated
EL DUCT 100	20.9	15.8	30.7	85.0	150.0	1mm CRS	2.03	1.52	Interpolated
EL SPACE 100	20.9	15.8	39.7	123.0	188.0	1mm CRS	2.03	1.52	PR033136-TR-15 UUT2
EL DUCT 150	20.9	15.8	30.7	120.0	245.0	1mm CRS	2.03	1.52	Interpolated
EL DUCT 200	39.4	15.8	30.7	120.0	245.0	1mm CRS	2.03	1.52	PR033136-TR-15 UUT3

Notes: 1. CRS = Cold Rolled Carbon Steel
2. All EL DUCT/EL SPACE units are wall-mounted.

SETC									
	Width (in)	Depth (in)	Height (in)	Weight (lb)		Construction Material	S_{DS} (g)	F_p/W	Testing Status
				Dry	Wet				
SETC-50	25.8	18.0	23.0	147.5	224.5	18 GA CRS	2.03	1.52	3316.01 UUT-3, UUT-4
SETC-100	44.5	20.8	31.8	202.0	377.0	18 GA CRS	2.03	1.52	Interpolated
SETC-175	44.5	20.8	31.8	202.0	377.0	18 GA CRS	2.03	1.52	Interpolated
SETC-250	44.5	27.2	31.8	202.0	377.0	18 GA CRS	2.03	1.52	Interpolated
SETC-375	44.5	27.2	31.8	202.0	377.0	18 GA CRS	2.03	1.52	Interpolated
SETC-525	44.5	42.7	31.8	202.0	377.0	18 GA CRS	2.03	1.52	Interpolated
SETC-750	44.5	42.7	31.8	202.0	377.0	18 GA CRS	2.03	1.52	Interpolated
SETC-1050	45.0	60.0	32.0	703.0	1384.0	18 GA CRS	2.03	1.52	PR033136-TR-15 UUT4

Notes: 1. CRS = Cold Rolled Carbon Steel
2. Floor Mounted Units

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Condair Ltd.- Humidifiers
I. Certified Component Summary

Mini SAM-e In-Duct								
	Width (in)	**Depth (in)**	**Height (in)**	**Weight (lb)**	**Construction Material**	**S_{DS} (g)**	**F_p/W**	**UUT**
12in x 8in	11.1	6.6	7.9-	12.0	Base: 1.5 mm 304 SS Steam tubes: 1.2 mm SS	2.03	1.52	15-0621 UUT1
12-24in x 8-24in	11.1 - 23.1	6.6	7.9 - 23.9	12.0- 30.0	Base: 1.5 mm 304 SS Steam tubes: 1.2 mm SS	2.03	1.52	Interpolated
24in x 24in	23.1	6.6	23.9	30.0	Base: 1.5 mm 304 SS Steam tubes: 1.2 mm SS	2.03	1.52	15-0621 UUT2

Notes: 1. Mini SAM-e components (except mounting hardware) constructed of 304 Stainless Steel

SAM-e In-Duct								
	Width (in)	**Depth (in)**	**Height (in)**	**Weight (lb)**	**Construction Material**	**S_{DS} (g)**	**F_p/W**	**UUT**
18in x 18in	13.1	8.5	15.0	21.0	Base: 2.2 mm 304 SS Steam tubes: 1.2 mm SS	2.03	1.52	15-0621 UUT3
18-60in x 18-60in	13.1 - 55.1	8.5	15.0 - 47.5	21.0 - 145.0	Base: 2.2 mm 304 SS Steam tubes: 1.2 mm SS	2.03	1.52	Interpolated
60in x 60in	55.1	8.5	47.5	145.0	Base: 2.2 mm 304 SS Steam tubes: 1.2 mm SS	2.03	1.52	15-0621 UUT4

Notes: 1. SAM-e components (except mounting hardware) constructed of 304 Stainless Steel

SAM-e Floor								
	Width (in)	**Depth (in)**	**Height (in)**	**Weight (lb)**	**Construction Material**	**S_{DS} (g)**	**F_p/W**	**UUT**
18in x 18in	13.1	8.5	15.0	21.0	Base: 2.2 mm 304 SS Steam tubes: 1.2 mm SS	2.03	1.52	15-0621 UUT5
18-144in x 18-144in	13.1 - 139.1	8.5	15.0 - 131.5	21.0 - 669.0	Base: 2.2 mm 304 SS Steam tubes: 1.2 mm SS	2.03	1.52	Interpolated
144in x 144in	139.1	8.5	131.5	669.0	Base: 2.2 mm 304 SS Steam tubes: 1.2 mm SS	2.03	1.52	15-0621 UUT6

Notes: 1. SAM-e components (except mounting hardware) constructed of 304 Stainless Steel
2. Units can be installed only within rigid based mounted air handling units (AHU) without vibration isolators and the floor units must be rigidly supported at the base and top.

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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

EL DUCT/EL SPACE Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Steam Cylinder			
202	Condair Ltd.	1519002	PR033136-TR-15 UUT1
203	Condair Ltd.	1519003	Interpolated
204	Condair Ltd.	1519004	Interpolated
303	Condair Ltd.	1519023	Interpolated
305	Condair Ltd.	1519025	Interpolated
309	Condair Ltd.	1519029	Interpolated
311	Condair Ltd.	1519031	Interpolated
321	Condair Ltd.	1509020	Interpolated
407	Condair Ltd.	1519047	Interpolated
411	Condair Ltd.	1519051	Interpolated
421	Condair Ltd.	1519040	Interpolated
603	Condair Ltd.	1519083	Interpolated
605	Condair Ltd.	1519085	Interpolated
621	Condair Ltd.	1519080	PR033136-TR-15 UUT2, UUT3
Fill Valve			
Single Valve 0.5 l/min.	Invensys	2573515	PR033136-TR-15 UUT1
Single Valve 1.2 l/min.	Invensys	2573522	Interpolated
Single Valve 2.0 l/min.	Invensys	2573523	Interpolated
Single Valve 3.3 l/min.	Invensys	2573524	PR033136-TR-15 UUT2, UUT3
Dual Valve 3.3 l/min & 0.5l/min.	Invensys	2574133	PR033136-TR-15 UUT1
Dual Valve 3.3 l/min & 1.2l/min.	Invensys	2574134	Interpolated
Dual Valve 3.3 l/min & 2.0l/min.	Invensys	2574135	Interpolated
Dual Valve 3.3 l/min & 3.3l/min.	Invensys	2574136	PR033136-TR-15 UUT2, UUT3
Drain Valve	Asco electric	1456000	PR033136-TR-15 UUT1, UUT2, UUT3
Fill Cup Assembly	Condair Ltd.	2574143	PR033136-TR-15 UUT1
Large Fill Cup Assembly	Condair Ltd.	2574142	PR033136-TR-15 UUT2, UUT3
Small Steam Line 0.875"	Goodyear	2574131	PR033136-TR-15 UUT1
Large Steam Line 1.75"	Goodyear	2574132	PR033136-TR-15 UUT2, UUT3
Reusable Cable Tie			
200 Cyl Size	HellermannTyton	2574138	PR033136-TR-15 UUT1
600 Cyl Size	HellermannTyton	2574139	PR033136-TR-15 UUT2, UUT3
Cylinder Plugs			
Cylinder Plugs	Condair Ltd.	2577737	PR033136-TR-15 UUT1
Cylinder Plugs	Condair Ltd.	2573529	Interpolated
Super Plug	Condair Ltd.	2574140	Interpolated
Super Plug	Condair Ltd.	2574141	PR033136-TR-15 UUT2, UUT3
High Water Sensor Plug	Condair Ltd.	2577738	PR033136-TR-15 UUT1, UUT2, UUT3

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Timothy
DATE: 04/27/2020

Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

EL DUCT/EL SPACE Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Blower Pack			
Distribution Assembly	Condair Ltd.	2573805	PR033136-TR-15 UUT1, UUT2
Diffuser Assembly	Condair Ltd.	2573806	PR033136-TR-15 UUT1, UUT2
Switch Assembly	APEM	2573807	PR033136-TR-15 UUT1, UUT2
Thermostat Assembly	Selco	2573808	PR033136-TR-15 UUT1, UUT2
Relay Assembly	American Zettler	2573809	PR033136-TR-15 UUT1, UUT2
Capacitor 8uF	Hartland Controls	2573810	PR033136-TR-15 UUT1, UUT2
Capacitor 20uF	Hartland Controls	2573811	PR033136-TR-15 UUT1, UUT2
Fan Assembly	EBM-PAPST 2ME068	2573812	PR033136-TR-15 UUT1, UUT2
Spare fastener kit	Wiedmuller	2573813	PR033136-TR-15 UUT1, UUT2
Power Cable	Qualitec Electronics	2573814	PR033136-TR-15 UUT1, UUT2
Main Contactor			
30 amps/ single phase	Hartland Controls	2574148	PR033136-TR-15 UUT1
30 amps/ three phase	Hartland Controls	2574149	Interpolated
40 amps/ three phase	Hartland Controls	2574150	Interpolated
50 amps/ three phase	Hartland Controls	2574151	Interpolated
62 amps/ three phase	Hartland Controls	2574152	PR033136-TR-15 UUT2, UUT3
Terminal Block			
95 amps, 2 pole	Cooper/Bussman	2574153	PR033136-TR-15 UUT1
95 amps, 3 pole	Cooper/Bussman	2574154	Interpolated
150 amps, 3 pole	Cooper/Bussman	2574155	PR033136-TR-15 UUT2
310 amps, 3 pole	Cooper/Bussman	2574156	PR033136-TR-15 UUT3
Driver Board	Condair Ltd.	2570437	PR033136-TR-15 UUT1, UUT2, UUT3
Switches			
On/Off	Multicomp	2569654	PR033136-TR-15 UUT1, UUT2, UUT3
SPST 208-240V	APEM	1473010	PR033136-TR-15 UUT1, UUT2, UUT3
Interlock IDM 423	Lamp Industries	1323091	PR033136-TR-15 UUT1, UUT2, UUT3
Fuses			
3A	Little Fuse	2523523	PR033136-TR-15 UUT1, UUT2
4A	Little Fuse	2559659	PR033136-TR-15 UUT3
Ground Clamp (small)	Ilsco	2574158	PR033136-TR-15 UUT1
Ground Clamp (large)	Ilsco	2574370	PR033136-TR-15 UUT2, UUT3
PCB Fault Remote	Condair Ltd.	2574171	PR033136-TR-15 UUT1, UUT2, UUT3
Integrated Controller			
EL processor	Condair Ltd.	2576572	PR033136-TR-15 UUT1, UUT2, UUT3

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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

SETC 50-1050 Subcomponents			
Subcomponent	**Manufacturer**	**Part No.***	**Testing Status**
Cabinet			
Service door, SE 50	Condair Ltd.	2520283	3316.01 UUT3,UUT4
Service door mini	Condair Ltd.	2523709	Interpolated
Service door, single	Condair Ltd.	2524402	Interpolated
Service door, double	Condair Ltd.	2524401	Interpolated
Service door triple	Condair Ltd.	2523704	PR033136-TP-15 UUT4
Door, Front GS-SE	Condair Ltd.	2535268 (2523597)	PR033136-TP-15 UUT4
Panel, electrical cabinet	Condair Ltd.	2535266 (2523589)	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4
Panel, SE 50 rear	Condair Ltd.	2520292	3316.01 UUT3,UUT4
Panel, tank rear	Condair Ltd.	2523593	PR033136-TP-15 UUT4
Panel, SE 50 electrical rear	Condair Ltd.	2520281	3316.01 UUT3,UUT4
Panel, electrical rear	Condair Ltd.	2523590	PR033136-TP-15 UUT4
Panel, SE 50 tank top	Condair Ltd.	2520300	3316.01 UUT3,UUT4
Panel, top tank mini	Condair Ltd.	2523707	Interpolated
Panel, top tank single	Condair Ltd.	2524395	Interpolated
Panel, top tank single	Condair Ltd.	2524396	Interpolated
Panel, top tank	Condair Ltd.	2523701	PR033136-TP-15 UUT4
Panel, SE 50 top	Condair Ltd.	2520291	3316.01 UUT3,UUT4
Panel, top plumbing	Condair Ltd.	2523706	Interpolated
Panel, top plumbing	Condair Ltd.	2524399	Interpolated
Panel, top plumbing	Condair Ltd.	2524400	Interpolated
Panel, top plumbing	Condair Ltd.	2523703	PR033136-TP-15 UUT4
Panel, SE 50 tank left	Condair Ltd.	2520295	3316.01 UUT3,UUT4
Panel, left	Condair Ltd.	2523705	Interpolated
Panel, left	Condair Ltd.	2524393	Interpolated
Panel, left	Condair Ltd.	2524394	Interpolated
Panel, left	Condair Ltd.	2523598	PR033136-TP-15 UUT4
Panel, electrical Bottom	Condair Ltd.	2520290	3316.01 UUT3,UUT4
Panel, electrical Bottom	Condair Ltd.	2523708	Interpolated
Panel, electrical Bottom	Condair Ltd.	2524398	Interpolated
Panel, electrical Bottom	Condair Ltd.	2523702	PR033136-TP-15 UUT4
Panel, SE 50 tank bottom	Condair Ltd.	2520297	3316.01 UUT3,UUT4
Base, assembly single tank	Condair Ltd.	2525209	Interpolated
Base, assembly double tank	Condair Ltd.	2525210	Interpolated
Base, assembly triple tank	Condair Ltd.	2525211	PR033136-TP-15 UUT4
Panel, SE 50 tank front	Condair Ltd.	2520267	3316.01 UUT3,UUT4
Panel, SE 50 tank front	Condair Ltd.	2520264	3316.01 UUT3,UUT4
Panel, SE 50 electrical front	Condair Ltd.	2520270	3316.01 UUT3,UUT4
Panel, SE 50 right	Condair Ltd.	2520282	3316.01 UUT3,UUT4
Enclosure, SE 50 transformer	Condair Ltd.	2549857	3316.01 UUT3,UUT4
Panel, processor display	Condair Ltd.	2542453	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4

* Part numbers in ( ) are part numbers from an outdated numbering system. Parts have not changed construction.

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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

SETC 50-1050 Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Electrical			
Processor board	Condair Ltd.	2553861	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4
Remote fault board	Condair Ltd.	2550184	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4
Driver board	Condair Ltd.	2535504	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4
Transformer, 120/240 - 24 VAC, 150 VA	Hammond Power solutions	PH150PG	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4
Water tank			
Cover plate clean out port	Condair Ltd.	2520461	3316.01 UUT3,UUT4
Cover plate clean out port	Condair Ltd.	2547539	PR033136-TP-15 UUT4
Tank	Condair Ltd.	2520458	3316.01 UUT3,UUT4
Tank	Condair Ltd.	2553711	Interpolated
Tank,single HE	Condair Ltd.	2569326	Interpolated
Tank, double HE	Condair Ltd.	2569328	Interpolated
Tank, triple HE	Condair Ltd.	2569326	PR033136-TP-15 UUT4
Heat exchanger, mini	Condair Ltd.	2520460	3316.01 UUT3,UUT4
Heat exchanger, mini	Condair Ltd.	2530901	Interpolated
Heat exchanger	Condair Ltd.	2530902	PR033136-TP-15 UUT4
Steam trap	Condair Ltd.	1508849	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4
Fill Valve, dual	Invensys	127.462.0	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4
Drain pump	Hanning Elektro-Werke	612.049.119	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4
Float board	Condair Ltd.	2511137	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4
Float chamber mounting bracket	Condair Ltd.	1113777	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4
Float chamber	Condair Ltd.	1115933	3316.01 UUT3,UUT4 PR033136-TP-15 UUT4

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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

Mini SAM-e Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Header/Separator			
12" Duct Width	Condair Ltd.	1509811	15-0621 UUT1
	Condair Ltd.	1509814	Interpolated
18" Duct Width	Condair Ltd.	1509812	Interpolated
	Condair Ltd.	1509832	Interpolated
24" Duct Width	Condair Ltd.	1509833	Interpolated
	Condair Ltd.	1509813	15-0621 UUT2
Tubes			
8" Duct Height	Condair Ltd.	1509788	15-0621 UUT1
10" Duct Height	Condair Ltd.	1509789	Interpolated
12" Duct Height	Condair Ltd.	1509790	Interpolated
	Condair Ltd.	1509797	Interpolated
	Condair Ltd.	1509804	Interpolated
14" Duct Height	Condair Ltd.	1509791	Interpolated
	Condair Ltd.	1509798	Interpolated
	Condair Ltd.	1509805	Interpolated
16" Duct Height	Condair Ltd.	1509792	Interpolated
	Condair Ltd.	1509799	Interpolated
	Condair Ltd.	1509806	Interpolated
18" Duct Height	Condair Ltd.	1509793	Interpolated
	Condair Ltd.	1509800	Interpolated
	Condair Ltd.	1509807	Interpolated
20" Duct Height	Condair Ltd.	1509794	Interpolated
	Condair Ltd.	1509801	Interpolated
	Condair Ltd.	1509808	Interpolated
22" Duct Height	Condair Ltd.	1509795	Interpolated
	Condair Ltd.	1509802	Interpolated
	Condair Ltd.	1509810	Interpolated
24" Duct Height	Condair Ltd.	1509796	Interpolated
	Condair Ltd.	1509803	Interpolated
	Condair Ltd.	1509810	15-0621 UUT2
Tube Insulation			
8" Duct Height	Condair Ltd.	2538866	15-0621 UUT1
10" Duct Height	Condair Ltd.	2538867	Interpolated
12" Duct Height	Condair Ltd.	2538868	Interpolated
14" Duct Height	Condair Ltd.	2538869	Interpolated
16" Duct Height	Condair Ltd.	2538870	Interpolated
18" Duct Height	Condair Ltd.	2538871	Interpolated
20" Duct Height	Condair Ltd.	2538872	Interpolated
22" Duct Height	Condair Ltd.	2538873	Interpolated
24" Duct Height	Condair Ltd.	2538874	15-0621 UUT2

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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

SAM-e (In-Duct) Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Header/Separator			
18" Duct Width	Condair Ltd.	1503269	15-0621 UUT3
	Condair Ltd.	1503309	Interpolated
24" Duct Width	Condair Ltd.	1503270	Interpolated
	Condair Ltd.	1503310	Interpolated
30" Duct Width	Condair Ltd.	1503271	Interpolated
	Condair Ltd.	1503311	Interpolated
36" Duct Width	Condair Ltd.	1503272	Interpolated
	Condair Ltd.	1503312	Interpolated
	Condair Ltd.	1506789	Interpolated
	Condair Ltd.	1506797	Interpolated
42" Duct Width	Condair Ltd.	1503273	Interpolated
	Condair Ltd.	1503313	Interpolated
48" Duct Width	Condair Ltd.	1503274	Interpolated
	Condair Ltd.	1503314	Interpolated
	Condair Ltd.	1506790	Interpolated
	Condair Ltd.	1506798	Interpolated
54" Duct Width	Condair Ltd.	1503275	Interpolated
	Condair Ltd.	1503315	Interpolated
60" Duct Width	Condair Ltd.	1503316	Interpolated
	Condair Ltd.	1506791	Interpolated
	Condair Ltd.	1506799	Interpolated
	Condair Ltd.	1503276	15-0621 UUT4
Steam Tubes			
18" Duct Height	Condair Ltd.	1503388	15-0621 UUT3
24" Duct Height	Condair Ltd.	1503389	Interpolated
	Condair Ltd.	1503411	Interpolated
30" Duct Height	Condair Ltd.	1503390	Interpolated
	Condair Ltd.	1503412	Interpolated
	Condair Ltd.	1509391	Interpolated
36" Duct Height	Condair Ltd.	1503391	Interpolated
	Condair Ltd.	1503413	Interpolated
	Condair Ltd.	1509392	Interpolated
	Condair Ltd.	1503440	Interpolated
42" Duct Height	Condair Ltd.	1503392	Interpolated
	Condair Ltd.	1503414	Interpolated
	Condair Ltd.	1509393	Interpolated
	Condair Ltd.	1503441	Interpolated

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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

SAM-e (In-Duct) Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Steam Tubes			
48" Duct Height	Condair Ltd.	1503393	Interpolated
	Condair Ltd.	1503415	Interpolated
	Condair Ltd.	1509394	Interpolated
	Condair Ltd.	1503442	Interpolated
54" Duct Height	Condair Ltd.	1503394	Interpolated
	Condair Ltd.	1503416	Interpolated
	Condair Ltd.	1509395	Interpolated
	Condair Ltd.	1503443	Interpolated
60" Duct Height	Condair Ltd.	1503395	Interpolated
	Condair Ltd.	1503417	Interpolated
	Condair Ltd.	1509396	Interpolated
	Condair Ltd.	1503444	15-0621 UUT4
In-Duct Mounting Frame			
18"/24" Duct Height	Condair Ltd.	1504697	15-0621 UUT3
30"/36" Duct Height	Condair Ltd.	1503469	Interpolated
42"/48"/54"/60" Duct Height	Condair Ltd.	1503470	15-0621 UUT4
Tube Insulation			
18" Duct Height	Condair Ltd.	2538844	15-0621 UUT3
24" Duct Height	Condair Ltd.	2538845	Interpolated
30" Duct Height	Condair Ltd.	2538846	Interpolated
36" Duct Height	Condair Ltd.	2538847	Interpolated
42" Duct Height	Condair Ltd.	2538848	Interpolated
48" Duct Height	Condair Ltd.	2538849	Interpolated
54" Duct Height	Condair Ltd.	2538850	Interpolated
60" Duct Height	Condair Ltd.	2538851	15-0621 UUT4

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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

SAM-e (Floor) Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Header/Separator			
18" Width	Condair Ltd.	1503269	15-0621 UUT5
	Condair Ltd.	1503309	Interpolated
24" Width	Condair Ltd.	1503270	Interpolated
	Condair Ltd.	1503310	Interpolated
30" Width	Condair Ltd.	1503271	Interpolated
	Condair Ltd.	1503311	Interpolated
36" Width	Condair Ltd.	1503272	Interpolated
	Condair Ltd.	1503312	Interpolated
	Condair Ltd.	1506789	Interpolated
	Condair Ltd.	1506797	Interpolated
42" Width	Condair Ltd.	1503273	Interpolated
	Condair Ltd.	1503291	Interpolated
	Condair Ltd.	1503313	Interpolated
48" Width	Condair Ltd.	1503274	Interpolated
	Condair Ltd.	1503292	Interpolated
	Condair Ltd.	1503314	Interpolated
	Condair Ltd.	1506790	Interpolated
	Condair Ltd.	1506798	Interpolated
54" Width	Condair Ltd.	1503275	Interpolated
	Condair Ltd.	1503293	Interpolated
	Condair Ltd.	1503315	Interpolated
60" Width	Condair Ltd.	1503276	Interpolated
	Condair Ltd.	1503294	Interpolated
	Condair Ltd.	1503316	Interpolated
	Condair Ltd.	1506791	Interpolated
	Condair Ltd.	1506799	Interpolated
66" Width	Condair Ltd.	1503277	Interpolated
	Condair Ltd.	1503295	Interpolated
	Condair Ltd.	1503317	Interpolated
72" Width	Condair Ltd.	1503278	Interpolated
	Condair Ltd.	1503296	Interpolated
	Condair Ltd.	1503318	Interpolated
	Condair Ltd.	1503331	Interpolated
	Condair Ltd.	1506792	Interpolated
	Condair Ltd.	1506800	Interpolated
78" Width	Condair Ltd.	1503279	Interpolated
	Condair Ltd.	1503297	Interpolated
	Condair Ltd.	1503319	Interpolated
	Condair Ltd.	1503332	Interpolated

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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

SAM-e (Floor) Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Header/Separator			
84" Width	Condair Ltd.	1503280	Interpolated
	Condair Ltd.	1503298	Interpolated
	Condair Ltd.	1503320	Interpolated
	Condair Ltd.	1503333	Interpolated
	Condair Ltd.	1506794	Interpolated
	Condair Ltd.	1506801	Interpolated
90" Width	Condair Ltd.	1503281	Interpolated
	Condair Ltd.	1503299	Interpolated
	Condair Ltd.	1503321	Interpolated
	Condair Ltd.	1503334	Interpolated
96" Width	Condair Ltd.	1503282	Interpolated
	Condair Ltd.	1503300	Interpolated
	Condair Ltd.	1503322	Interpolated
	Condair Ltd.	1503335	Interpolated
	Condair Ltd.	1506795	Interpolated
	Condair Ltd.	1506802	Interpolated
102" Width	Condair Ltd.	1503283	Interpolated
	Condair Ltd.	1503301	Interpolated
	Condair Ltd.	1503323	Interpolated
	Condair Ltd.	1503336	Interpolated
108" Width	Condair Ltd.	1503284	Interpolated
	Condair Ltd.	1503302	Interpolated
	Condair Ltd.	1503324	Interpolated
	Condair Ltd.	1503337	Interpolated
	Condair Ltd.	1506796	Interpolated
	Condair Ltd.	1506807	Interpolated
	Condair Ltd.	1506803	Interpolated
114" Width	Condair Ltd.	1503285	Interpolated
	Condair Ltd.	1503303	Interpolated
	Condair Ltd.	1503325	Interpolated
	Condair Ltd.	1503338	Interpolated
120" Width	Condair Ltd.	1503286	Interpolated
	Condair Ltd.	1503304	Interpolated
	Condair Ltd.	1503326	Interpolated
	Condair Ltd.	1503339	Interpolated
	Condair Ltd.	1507729	Interpolated
	Condair Ltd.	1506808	Interpolated
	Condair Ltd.	1506804	Interpolated

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04/27/2020
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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

SAM-e (Floor) Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Header/Separator			
126" Width	Condair Ltd.	1503287	Interpolated
	Condair Ltd.	1503305	Interpolated
	Condair Ltd.	1503327	Interpolated
	Condair Ltd.	1503340	Interpolated
132" Width	Condair Ltd.	1503288	Interpolated
	Condair Ltd.	1503306	Interpolated
	Condair Ltd.	1503328	Interpolated
	Condair Ltd.	1503341	Interpolated
	Condair Ltd.	1507730	Interpolated
	Condair Ltd.	1506809	Interpolated
	Condair Ltd.	1506805	Interpolated
	Condair Ltd.	1506810	Interpolated
138" Width	Condair Ltd.	1503289	Interpolated
	Condair Ltd.	1503307	Interpolated
	Condair Ltd.	1503329	Interpolated
	Condair Ltd.	1503342	Interpolated
	Condair Ltd.	1507730	Interpolated
	Condair Ltd.	1506809	Interpolated
	Condair Ltd.	1506805	Interpolated
	Condair Ltd.	1506810	Interpolated
144" Width	Condair Ltd.	1503308	Interpolated
	Condair Ltd.	1503330	Interpolated
	Condair Ltd.	1503343	Interpolated
	Condair Ltd.	1507731	Interpolated
	Condair Ltd.	1507732	Interpolated
	Condair Ltd.	1506808	Interpolated
	Condair Ltd.	1506811	Interpolated
	Condair Ltd.	1503290	15-0621 UUT6
Steam Tubes			
18" Height	Condair Ltd.	1503388	15-0621 UUT5
24" Height	Condair Ltd.	1503389	Interpolated
	Condair Ltd.	1503411	Interpolated
30" Height	Condair Ltd.	1503390	Interpolated
	Condair Ltd.	1503412	Interpolated
	Condair Ltd.	1509391	Interpolated
36" Height	Condair Ltd.	1503391	Interpolated
	Condair Ltd.	1503413	Interpolated
	Condair Ltd.	1509392	Interpolated
	Condair Ltd.	1503440	Interpolated

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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

SAM-e (Floor) Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Steam Tubes			
42" Height	Condair Ltd.	1503392	Interpolated
	Condair Ltd.	1503414	Interpolated
	Condair Ltd.	1509393	Interpolated
	Condair Ltd.	1503441	Interpolated
48" Height	Condair Ltd.	1503393	Interpolated
	Condair Ltd.	1503415	Interpolated
	Condair Ltd.	1509394	Interpolated
	Condair Ltd.	1503442	Interpolated
54" Height	Condair Ltd.	1503394	Interpolated
	Condair Ltd.	1503416	Interpolated
	Condair Ltd.	1509395	Interpolated
	Condair Ltd.	1503443	Interpolated
60" Height	Condair Ltd.	1503395	Interpolated
	Condair Ltd.	1503417	Interpolated
	Condair Ltd.	1509396	Interpolated
	Condair Ltd.	1503444	Interpolated
66" Height	Condair Ltd.	1503396	Interpolated
	Condair Ltd.	1503418	Interpolated
	Condair Ltd.	1509397	Interpolated
	Condair Ltd.	1503445	Interpolated
72" Height	Condair Ltd.	1503397	Interpolated
	Condair Ltd.	1503419	Interpolated
	Condair Ltd.	1509398	Interpolated
	Condair Ltd.	1503446	Interpolated
78" Height	Condair Ltd.	1503398	Interpolated
	Condair Ltd.	1503220	Interpolated
	Condair Ltd.	1509399	Interpolated
	Condair Ltd.	1503447	Interpolated
84" Height	Condair Ltd.	1503399	Interpolated
	Condair Ltd.	1503421	Interpolated
	Condair Ltd.	1509400	Interpolated
	Condair Ltd.	1503448	Interpolated
90" Height	Condair Ltd.	1503400	Interpolated
	Condair Ltd.	1503422	Interpolated
	Condair Ltd.	1509401	Interpolated
	Condair Ltd.	1503449	Interpolated

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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

SAM-e (Floor) Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Steam Tubes			
96" Height	Condair Ltd.	1503401	Interpolated
	Condair Ltd.	1503423	Interpolated
	Condair Ltd.	1509402	Interpolated
	Condair Ltd.	1503450	Interpolated
102" Height	Condair Ltd.	1503402	Interpolated
	Condair Ltd.	1503424	Interpolated
	Condair Ltd.	1509403	Interpolated
	Condair Ltd.	1503451	Interpolated
108" Height	Condair Ltd.	1503403	Interpolated
	Condair Ltd.	1503425	Interpolated
	Condair Ltd.	1509404	Interpolated
	Condair Ltd.	1503452	Interpolated
114" Height	Condair Ltd.	1503404	Interpolated
	Condair Ltd.	1503426	Interpolated
	Condair Ltd.	1509405	Interpolated
	Condair Ltd.	1503453	Interpolated
120" Height	Condair Ltd.	1503405	Interpolated
	Condair Ltd.	1503427	Interpolated
	Condair Ltd.	1509406	Interpolated
	Condair Ltd.	1503454	Interpolated
126" Height	Condair Ltd.	1503406	Interpolated
	Condair Ltd.	1503428	Interpolated
	Condair Ltd.	1509407	Interpolated
	Condair Ltd.	1503455	Interpolated
132" Height	Condair Ltd.	1503407	Interpolated
	Condair Ltd.	1503429	Interpolated
	Condair Ltd.	1509408	Interpolated
	Condair Ltd.	1503456	Interpolated
138" Height	Condair Ltd.	1503408	Interpolated
	Condair Ltd.	1503430	Interpolated
	Condair Ltd.	1509409	Interpolated
	Condair Ltd.	1503457	Interpolated
144" Height	Condair Ltd.	1503409	Interpolated
	Condair Ltd.	1503431	Interpolated
	Condair Ltd.	1509410	Interpolated
	Condair Ltd.	1503458	15-0621 UUT6

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Condair Ltd.- Humidifiers
II. Certified Subcomponent Summary

SAM-e (Floor) Subcomponents			
Subcomponent	**Manufacturer**	**Part No.**	**Testing Status**
Tube Insulation			
18" Height	Condair Ltd.	2538844	15-0621 UUT5
24" Height	Condair Ltd.	2538845	Interpolated
30" Height	Condair Ltd.	2538846	Interpolated
36" Height	Condair Ltd.	2538847	Interpolated
42" Height	Condair Ltd.	2538848	Interpolated
48" Height	Condair Ltd.	2538849	Interpolated
54" Height	Condair Ltd.	2538850	Interpolated
60" Height	Condair Ltd.	2538851	Interpolated
66" Height	Condair Ltd.	2538852	Interpolated
72" Height	Condair Ltd.	2538853	Interpolated
78" Height	Condair Ltd.	2538854	Interpolated
84" Height	Condair Ltd.	2538855	Interpolated
90" Height	Condair Ltd.	2538856	Interpolated
96" Height	Condair Ltd.	2538857	Interpolated
Tube Insulation			
102" Height	Condair Ltd.	2538858	Interpolated
108" Height	Condair Ltd.	2538859	Interpolated
114" Height	Condair Ltd.	2538860	Interpolated
120" Height	Condair Ltd.	2538861	Interpolated
126" Height	Condair Ltd.	2538862	Interpolated
132" Height	Condair Ltd.	2538863	Interpolated
138" Height	Condair Ltd.	2538864	Interpolated
144" Height	Condair Ltd.	2538865	15-0621 UUT6
Mounting Frame			
16" to 27"	Condair Ltd.	1503469	15-0621 UUT5
28" to 51"	Condair Ltd.	1503470	Interpolated
52" to 99"	Condair Ltd.	1503471	Interpolated
100" to 147"	Condair Ltd.	1503472	15-0621 UUT6

Note: See last page for seismic brace components.

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Condair Ltd.- Humidifiers
III. UUT Summary



Test Report PR033136-TR-15 – UUT1

EL SPACE 010
1 mm Cold formed carbon steel
16.5”W x 14.4”D x 35.4”H, 83 lbs dry, 113 lbs wet
Wall-mounted using: (4) – 3/8 dia. bolts
UUT full of contents and tested with and without water in tank

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC156	2.84	1	4.54	3.41	1.89	0.76

Natural Frequencies			Test Results
F-B	S-S	V	
N/A	N/A	N/A	The UUT maintained structural integrity and functionality after the AC156 test.

Internal Components	Manufacturer	Part No.
Steam Cylinder 202	Condair Ltd.	1519002
Single Fill Valve 0.5 l/min.	Invensys	2573515
Dual Fill Valve 3.3 l/min & 0.5 l/min.	Invensys	2574133
Drain Valve (all models)	Asco electric	1456000
Fill Cup Assembly	Condair Ltd.	2574143
Small Steam Line 0.875"	Goodyear	2574131
Reusable Cable Tie 200 Cyl Size	HellermannTyton	2574138
Cylinder Plug	Condair Ltd.	2577737
High Water Sensor Plug	Condair Ltd.	2577738
Distribution Assembly	Condair Ltd.	2573805
Diffuser Assembly	Condair Ltd.	2573806
Switch Assembly	APEM	2573807
Thermostat Assembly	Selco	2573808
Relay Assembly	American Zettler	2573809
Capacitor 8uF	Hartland Controls	2573810
Capacitor 20uF	Hartland Controls	2573811
Fan Assembly	EBM-PAPST 2ME068	2573812
Spare fasterner kit	Wiedmuller	2573813
Power Cable	Qualitec Electronics	2573814
Main Contactor 30 amps/ one phase	Hartland Controls	2574148
Transformer (75 VA 208/24 VAC)	ATC Frost	2574160
Transformer (150 VA 208, 240V to 120V)	Brownsburg Elect.	2571460
Terminal Block 95 amps, 2 pole	Cooper/Bussman	2574153
Driver Board	Condair Ltd.	2570437
On/Off Switch	Multicomp	2569654
SPST 208-240V	APEM	1473010
Interlock IDM 423	Lamp Industries	1323091
3A Fuse	Little Fuse	2523523
Ground Clamp (Small)	Ilsco	2574158
PCB Fault Remote	Condair Ltd.	2574171
Integrated Controller EL processor	Condair Ltd.	2576572

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Condair Ltd.- Humidifiers
III. UUT Summary



Test Report PR033136-TR-15 – UUT2

EL SPACE 100
1 mm Cold formed carbon steel
20.9”W x 15.8”D x 39.7”H, 123 lbs dry, 188 lbs wet
Wall-mounted using: (4) – 3/8 dia. bolts
UUT full of contents and tested with and without water in tank.

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC156	2.85	1	4.56	3.42	1.90	0.76

Natural Frequencies			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test.
N/A	N/A	N/A	

Internal Components	Manufacturer	Part No.
Steam Cylinder 621	Condair Ltd.	1519080
Single Fill Valve 3.3 l/min.	Invensys	2573524
Dual Fill Valve 3.3 l/min & 3.3 l/min.	Invensys	2574136
Drain Valve (all models)	Asco electric	1456000
Large Fill Cup Assembly	Condair Ltd.	2574142
Large Steam Line 1.75"	Goodyear	2574132
Reusable Cable Tie 600 Cyl Size	HellermannTyton	2574139
Super Cylinder Plug	Condair Ltd.	2574141
High Water Sensor Plug	Condair Ltd.	2577738
Distribution Assembly	Condair Ltd.	2573805
Diffuser Assembly	Condair Ltd.	2573806
Switch Assembly	APEM	2573807
Thermostat Assembly	Selco	2573808
Relay Assembly	American Zettler	2573809
Capacitor 8uF	Hartland Controls	2573810
Capacitor 20uF	Hartland Controls	2573811
Fan Assembly	EBM-PAPST 2ME068	2573812
Spare fasterner kit	Wiedmuller	2573813
Power Cable	Qualitec Electronics	2573814
Main Contactor 62 amps/ three phase	Hartland Controls	2574152
Transformer (75 VA 208/24 VAC)	ATC Frost	2574160
Transformer (150 VA 208, 240V to 120V)	Brownsburg Elect.	2571460
Terminal Block 150 amps, 3 pole	Cooper/Bussman	2574155
Driver Board (all models)	Condair Ltd.	2570437
On/Off Switch	Multicomp	2569654
SPST 208-240V	APEM	1473010
Interlock IDM 423	Lamp Industries	1323091
3A Fuse	Little Fuse	2523523
Ground Clamp (Large)	Ilsco	2574370
PCB Fault Remote	Condair Ltd.	2574171
Integrated Controller EL processor	Condair Ltd.	2576572

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DATE 04/27/2020

Condair Ltd.- Humidifiers
III. UUT Summary

Test Report PR033136-TR-15 – UUT3

EL DUCT 200
1 mm Cold formed carbon steel
20.9”W x 15.8”D x 39.7”H, 120 lbs dry, 245 lbs wet
Wall-mounted using: (4) – 3/8 dia. bolts
UUT full of contents and tested with and without water in tank.



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Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC156	2.84	1	4.54	3.41	1.89	0.76

Natural Frequencies			Test Results
F-B	S-S	V	
N/A	N/A	N/A	The UUT maintained structural integrity and functionality after the AC156 test.

Internal Components	Manufacturer	Part No.
Steam Cylinder 621	Condair Ltd.	1519080
Single Fill Valve 3.3 l/min.	Invensys	2573524
Dual Fill Valve 3.3 l/min & 3.3 l/min.	Invensys	2574136
Drain Valve (all models)	Asco electric	1456000
Large Fill Cup Assembly	Condair Ltd.	2574142
Large Steam Line 1.75"	Goodyear	2574132
Reusable Cable Tie 600 Cyl Size	HellermannTyton	2574139
Super Cylinder Plug	Condair Ltd.	2574141
High Water Sensor Plug	Condair Ltd.	2577738
Main Contactor 62 amps/ three phase	Hartland Controls	2574152
Transformer (150 VA 208/24VAC)	Brownsburg Elect.	2574166
Terminal Block 310 amps, 3 pole	Cooper/Bussman	2574156
Driver Board (all models)	Condair Ltd.	2570437
On/Off Switch	Multicomp	2569654
SPST 208-240V	APEM	1473010
Interlock IDM 423	Lamp Industries	1323091
4A Fuse	Little Fuse	2559659
Ground Clamp (Large)	Ilsco	2574370
PCB Fault Remote	Condair Ltd.	2574171
Integrated Controller EL processor	Condair Ltd.	2576572

Condair Ltd.- Humidifiers
III. UUT Summary

Test Report PR033136-TR-15 – UUT4

SETC 1050
18 GA Cold formed carbon steel
45”W x 60”D x 32”H, 703 lbs dry, 1384 lbs wet
Floor-mounted using: (24) – 3/8” dia. bolts
UUT full of contents and tested with and without water in tank.



Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC156	2.77	1	4.43	3.33	1.86	0.75

Natural Frequencies			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test.
15 Hz	16 Hz	25 Hz	

Internal Components	Manufacturer	Part No.
Cabinet		
Service door triple	Condair Ltd.	2523704
Door, Front GS-SE	Condair Ltd.	2535268
Panel, electrical cabinet	Condair Ltd.	2535266
Panel, tank rear	Condair Ltd.	2523593
Panel, electrical rear	Condair Ltd.	2523590
Panel, top tank	Condair Ltd.	2523701
Panel, top plumbing	Condair Ltd.	2523703
Panel, left	Condair Ltd.	2523598
Panel, electrical Bottom	Condair Ltd.	2523702
Base, assembly triple tank	Condair Ltd.	2525211
Panel, processor display	Condair Ltd.	2542453
Electrical		
Processor board	Condair Ltd.	2553861
Remote fault board	Condair Ltd.	2550184
Driver board	Condair Ltd.	2535504
Transformer, 120/240 - 24 VAC, 150 VA	Hammond Power solutions	PH150PG
Water tank		
Cover plate clean out port	Condair Ltd.	2547539
Tank, triple HE	Condair Ltd.	2569326
Heat exchanger	Condair Ltd.	2530902
Steam trap	Condair Ltd.	1508849
Fill Valve, dual	Invensys	127.462.0
Drain pump	Hanning Elektro-Werke	612.049.119
Float board	Condair Ltd.	2511137
Float chamber mounting bracket	Condair Ltd.	1113777
Float chamber	Condair Ltd.	1115933

REVIEWED FOR CODE COMPLIANCE
OSP-0225
BY: Timothy J Reland
DATE: 04/27/2020
CALIFORNIA BUILDING CODE 2019

Condair Ltd.- Humidifiers
III. UUT Summary

Test Report 3316.01 – UUT3, UUT4

SETC-50
18 GA Cold formed carbon steel
25.75”W x 18”D x 23”H, 148 lbs dry (UUT3), 225 lbs wet (UUT4)
Floor-mounted using: (8) – 3/8”-16 Grade 5 bolts
UUT full of contents and tested with and without water in tank.



Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC 156	2.77	1	4.43	3.32	1.86	0.75

Natural Frequencies			Test Results
F-B	S-S	V	
5.7 Hz	15 Hz	N/A	The UUT maintained structural integrity and functionality after the AC156 test.

Internal Components	Manufacturer	Part No.
Cabinet		
Panel, SE 50 tank front	Condair Ltd.	2520267
Panel, SE 50 electrical front	Condair Ltd.	2520270
Panel, electrical cabinet	Condair Ltd.	2535266 (2523589)
Panel, SE 50 tank bottom	Condair Ltd.	2520297
Panel, SE 50 electrical bottom	Condair Ltd.	2520290
Panel, SE 50 right	Condair Ltd.	2520282
Service Door, SE 50	Condair Ltd.	2520283
Panel, SE 50 rear	Condair Ltd.	2520292
Panel, SE 50 electrical rear	Condair Ltd.	2520281
Enclosure, SE 50 transformer	Condair Ltd.	2549857
Panel, SE 50 tank top	Condair Ltd.	2520300
Panel, SE 50 top	Condair Ltd.	2520291
Panel, SE 50 tank left	Condair Ltd.	2520295
Panel, SE 50 tank front	Condair Ltd.	2520264
Panel, processor display	Condair Ltd.	2542453
Electrical		
Processor board	Condair Ltd.	2553861
Driver board	Condair Ltd.	2535504
Remote fault board	Condair Ltd.	2550184
Transformer,120/240-24VAC,150VA	Hammond Power Solutions	PH150PG
Water tank		
Cover plate clean out port	Condair Ltd.	2520461
Tank	Condair Ltd.	2520458
Heat exchanger, mini	Condair Ltd.	2520460
Steam trap	Condair Ltd.	1508849
Fill Valve, dual	Invensys	127.462.0
Drain pump	Hanning Elektro-Werke	612.049.119
Float board	Condair Ltd.	2511137
Float chamber mounting bracket	Condair Ltd.	1113777
Float chamber	Condair Ltd.	1115933

* Part number in ( ) are part numbers from an outdated numbering system. Parts have not changed construction.

REVIEWED FOR CODE COMPLIANCE OSP-0225 BY Timothy J Piland DATE 04/27/2020 CALIFORNIA BUILDING CODE 2019

Condair Ltd.- Humidifiers
III. UUT Summary

Test Report 15-0621 – UUT1

Mini SAM-e 12x8
Header: 1.5 mm 304 Stainless Steel
Steam tubes: 1.2 mm 304 Stainless Steel
11.1"W x 6.6"D x 7.9" H, 12 lbs
UUT full of contents during test.



REVIEWED FOR CODE COMPLIANCE
OSHPD
BY: Timothy J Piland
DATE: 04/27/2020
PER 2019 CALIFORNIA BUILDING CODE

Duct-mounted using: standard duct installation kit supplied with each Mini SAM-e. The kit includes a top rail that braces the steam tubes which then screw mounts to the side of the duct using #10 x ¾ inch sheet metal screws (2 required per rail). Two top rails required for 3" center Mini SAM-e, one top rail required for Mini SAM-e 6 inch centers. Base of the SAM-e is secured with two ¼" sheet metal screws that secure the steam entry side of the steam header.

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC156	2.11	1	3.37	2.53	1.41	0.56

Natural Frequencies			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test.
N/A	N/A	N/A	

Internal Components	Manufacturer	Part No.
12" Duct Width Header/Separator	Condair Ltd.	1509811
8" Duct Height Tube	Condair Ltd.	1509788
8" Duct Height Tube Insulation	Condair Ltd.	2538866

Condair Ltd.- Humidifiers
III. UUT Summary

Test Report 15-0621 – UUT2

Mini SAM-e 24x24
Header: 1.5 mm 304 Stainless Steel
Steam tubes: 1.2 mm 304 Stainless Steel
23.1”W x 6.6”D x 23.9”H, 30 lbs
UUT full of contents during test.



Duct-mounted using: standard duct installation kit supplied with each Mini SAM-e. The kit includes a top rail that braces the steam tubes which then screw mounts to the side of the duct using #10 x ¾ inch sheet metal screws (2 required per rail). Two top rails required for 3” center Mini SAM-e, one top rail required for Mini SAM-e 6 inch centers. Base of the SAM-e is secured with two ¼” sheet metal screws that secure the steam entry side of the steam header.

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC156	2.09	1	3.35	2.51	1.40	0.56

Natural Frequencies			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test.
N/A	N/A	N/A	

Internal Components	Manufacturer	Part No.
24" Duct Width Header/Separator	Condair Ltd.	1509813
24" Duct Height Tube	Condair Ltd.	1509810
24" Duct Height Tube Insulation	Condair Ltd.	2538874

REVIEWED FOR CODE COMPLIANCE
OSHPD
OSP-0225
BY: Timothy J Piland
DATE: 04/27/2020
CALIFORNIA BUILDING CODE, 2019

Condair Ltd.- Humidifiers
III. UUT Summary

Test Report 15-0621 – UUT3

SAM-e Ducted 18x18
Header: 2.2 mm 304 Stainless Steel
Steam tubes: 1.2 mm 304 Stainless Steel
13.1”W x 8.5”D x 15”H, 21 lbs
UUT full of contents during test.



REVIEWED FOR CODE COMPLIANCE
OSHPD
OSP 0225
BY: Timothy J Piland
DATE: 04/27/2020
CALIFORNIA BUILDING CODE, 2019

Duct-mounted using: seismic duct mount kit supplied with each seismic SAM-e. The base of the SAM-e (duct mount) is secured with 4 manifold mounting brackets. Each floor mount bracket is secured to the base of the SAM-e with two 5/16” hex locknuts, which are then in turn secured to the duct floor with (4) #10 x ¾ inch sheet metal screws.
The top of the SAM-e mounting frame (duct mount) is secured to the duct ceiling with (4) #10 x ¾ inch sheet metal screws.

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC156	2.03	1	3.25	2.44	1.36	0.55

Natural Frequencies			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test.
N/A	N/A	N/A	

Internal Components	Manufacturer	Part No.
18" Duct Width Header/Separator	Condair Ltd.	1503269
18" Duct Height Tube	Condair Ltd.	1503388
18"/24" In-Duct Mounting Frame	Condair Ltd.	1504697
18" Duct Height Tube Insulation	Condair Ltd.	2538844

Condair Ltd.- Humidifiers
III. UUT Summary

Test Report 15-0621 – UUT4

SAM-e Ducted 60x60
Header: 2.2 mm 304 Stainless Steel
Steam tubes: 1.2 mm 304 Stainless Steel
55.1”W x 8.5”D x 47.5”H, 145 lbs
UUT full of contents during test.



REVIEWED FOR CODE COMPLIANCE
OSP-0225
By: Jimmy Phan
DATE: 04/27/2020
CALIFORNIA BUILDING CODE 2019

Duct-mounted using: seismic duct mount kit supplied with each seismic SAM-e. The base of the SAM-e (duct mount) is secured with 4 manifold mounting brackets. Each floor mount bracket is secured to the base of the SAM-e with two 5/16” hex locknuts, which are then in turn secured to the duct floor with (4) #10 x ¾ inch sheet metal screws. The top of the SAM-e mounting frame (duct mount) is secured to the duct ceiling with (4) #10 x ¾ inch sheet metal screws.

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC156	2.27	1	3.63	2.72	1.52	0.61

Natural Frequencies			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test.
N/A	N/A	N/A	

Internal Components	Manufacturer	Part No.
60" Duct Width Header/Separator	Condair Ltd.	1503276
60" Duct Height Tube	Condair Ltd.	1503444
42"/48"/54"/60" In-Duct Mounting Frame	Condair Ltd.	1503470
60" Duct Height Tube Insulation	Condair Ltd.	2538851

Condair Ltd.- Humidifiers
III. UUT Summary

Test Report 15-0621 – UUT5

SAM-e Floor 18x18
Header: 2.2 mm 304 Stainless Steel
Steam tubes: 1.2 mm 304 Stainless Steel
13.1”W x 8.5”D x 15”H, 21 lbs
UUT full of contents during test.



REVIEWED FOR CODE COMPLIANCE
OSHPD
OSP-0225

SAM-e Floor components are rigidly supported at the base and top with seismic brace kits with use limited to rigid base mounted Air Handling Units (AHU) without vibration isolators. The seismic brace kit is comprised of standard and optional parts already available for order. The base of the SAM-e Floor is secured with 4 manifold floor mounting brackets. Each floor mount bracket is secured to the base of the SAM-e with two 5/16” hex locknuts, which in turn are secured to the floor with two 5/16 dia. bolts. The top of the SAM-e mounting frame is secured using the SAM-e seismic brace that connects to the top rail of the SAM-e and in turn is secured to the ceiling of the air handler with two 5/16” dia. bolts per span of seismic brace.

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC156	2.14	1	3.42	2.57	1.43	0.58

Natural Frequencies			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test.
N/A	N/A	N/A	

Internal Components	Manufacturer	Part No.
18" Width Header/Separator	Condair Ltd.	1503269
18" Height Tube	Condair Ltd.	1503388
18" Height Tube Insulation	Condair Ltd.	2538844
SAM-e Mounting Frame 16” to 27”	Condair Ltd.	1503469
Brace Back Steam Supply	Condair Ltd.	2584135
Brace Front Steam Supply	Condair Ltd.	2584136
1 x Seismic Brace 18 in.	Condair Ltd.	2583078

Condair Ltd.- Humidifiers
III. UUT Summary

Test Report 15-0621 – UUT6

SAM-e Floor 144x144
Header: 2.2 mm 304 Stainless Steel
Steam tubes: 1.2 mm 304 Stainless Steel
139.1”W x 8.5”D x 131.5”H
UUT full of contents during test.



REVIEWED FOR CODE COMPLIANCE
OSHPD PREAPPROVAL
OSP-0225
BY: Timothy J. Tjelmeland
DATE: 04/27/2020
OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT

SAM-e Floor components are rigidly supported t the base and top with seismic brace kits with use limited to rigid base mounted Air Handling Units (AHU) without vibration isolators. The seismic brace kit is comprised of standard and optional parts already available for order. The base of the SAM-e Floor is secured with 4 manifold floor mounting brackets. Each floor mount bracket is secured to the base of the SAM-e with two 5/16” hex locknuts, which in turn are secured to the floor with two 5/16 dia. bolts. The top of the SAM-e mounting frame is secured using the SAM-e seismic brace that connects to the top rail of the SAM-e and in turn is secured to the ceiling of the air handler with two 5/16” dia. bolts per span of seismic brace.

Building Code	Test Criteria	S_{DS} (g)	z/h	Horizontal		Vertical	
				A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC156	2.17	1	3.47	2.60	1.45	0.59

Natural Frequencies			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test.
N/A	N/A	N/A	

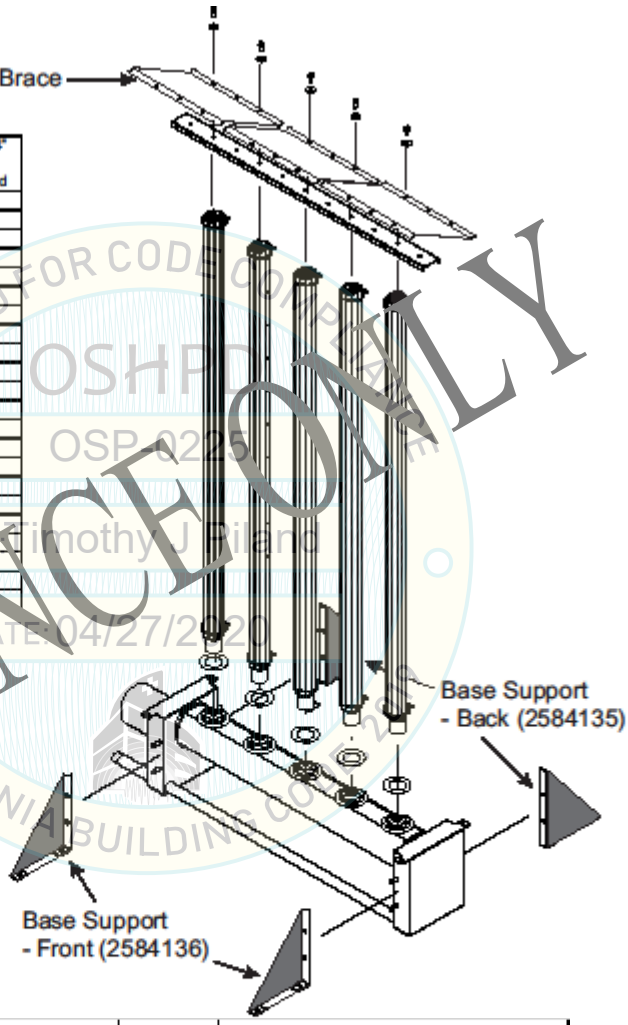
Internal Components	Manufacturer	Part No.
144" Width Header/Separator	Condair Ltd.	1503290
144" Height Tube	Condair Ltd.	1503458
144" Height Tube Insulation	Condair Ltd.	2538865
SAM-e Mounting Frame 100” to 147”	Condair Ltd.	1503472
Brace Back Steam Supply	Condair Ltd.	2584135
Brace Front Steam Supply	Condair Ltd.	2584136
6 x Seismic Brace 24 in.	Condair Ltd.	2583079

Installation Drawings

Seismic SAM-e floor mount

Seismic Brace ordering info (by width of SAM-e)

SAM-e width	Seismic brace 12" 2583077 Quantity Required	Seismic brace 18" 2583078 Quantity Required	Seismic brace 24" 2583079 Quantity Required
18"		1	
24"			1
30"	1	1	
36"		2	
42"		1	1
48"			2
54"		3	
60"	1		2
66"		1	2
72"			3
78"	1	1	2
84"	2	1	2
90"		5	
96"			4
102"	1	1	3
108"		6	
114"		1	4
120"			5
126"		7	
132"		1	6
138"		1	5
144"			6



Subcomponent	Manufacturer	Part No.	Testing Status
Brace Back Steam Supply	Nortec Humidity Inc.	2584135	15-0621 UUT5, UUT6
Brace Front Steam Supply	Nortec Humidity Inc.	2584136	15-0621 UUT5, UUT6
Seismic Brace			
12 in.	Nortec Humidity Inc.	2583077	Extrapolated
18 in.	Nortec Humidity Inc.	2583078	15-0621 UUT5
24 in.	Nortec Humidity Inc.	2583079	15-0621 UUT6

SAM-e Seismic Exploded View
Showing top brace and front and back base supports

REFERENCE ONLY
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OSHPD
OSP-0225
BY Timothy J Eiland
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