



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

**APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: OSP – 0531 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Neptronic

Manufacturer's Technical Representative: Christian Soumis

Mailing Address: 400 Bd Lebeau, Saint-Laurent, QC H4N 1R6, Canada

Telephone: (800) 361-2308

Email: soumis@neptronic.com

Product Information

Product Name: SKS, SKG, SKD-MS, MS and SKE

Product Type: Humidifiers and Steam Distribution Systems

Product Model Number: See Product Table Attached

(List all unique product identification numbers and/or part numbers)

General Description: SKS are steam to steam humidifiers, SKG 3000 are gas fired humidifiers, SKD-MS are steam grid distributors, MS are steam grid distributors, and SKE are electric humidifiers. Seismic enhancements made to the test units during the tests shall be incorporated into production units.

Mounting Description: Rigid Floor Mounted, Rigid Wall Mounted, Flexible Wall Mounted, Air Handler Mounted and Ceiling Suspended

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John P. Giuliano, PE

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780

Email: john.giuliano@thevmcgroup.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant:  Date: 02/12/2018

Title: President Company Name: The VMC Group

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



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

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

Company Name: The VMC Group

Name: Mr. Ken Tarlow California License Number: SE2851

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: ken.tarlow@thvmcgroup.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): OSP-0531-10
- BY: Ali Sumer
- DATE: 04/25/2019

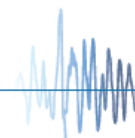
Testing Laboratory

Company Name: Dynamic Certification Laboratories

Contact Name: Kelly Laplace

Mailing Address: 1315 Greg Pkwy # 109, Sparks, NV 89431

Telephone: (775) 358-5085 Email: kelly@shaketest.com





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Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 1.5 (Rigid); 4.50 (Isolated)

S_{DS} (Design spectral response acceleration at short period, g) = 2.0

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

R_p (Equipment or component response modification factor) = 6.0 (Rigid); 2.0 (Isolated)

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = See Attachment

Overall dimensions and weight (or range thereof) = See Attachment

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: ☐ Yes ☒ No

Design Basis of Equipment or Components (V/W) = _____

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

S_{D1} (Design spectral response acceleration at 1 second period, g) = _____

R (Response modification coefficient) = OSP-0531-10

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = BY: Ali Sumer

I_p (Importance factor) = 1.5

Height to Center of Gravity above base = DATE: 04/25/2019

Equipment or Component Natural Frequencies (Hz) = _____

Overall dimensions and weight (or range thereof) = _____

Tank(s) designed in accordance with ASME BPVC, 2015: ☐ Yes ☒ No

List of Attachments Supporting Special Seismic Certification

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

☐ Other(s) (Please Specify): _____

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

Signature: [Signature] Date: April 24, 2019

Print Name: Ali Sumer Title: DSE

Special Seismic Certification Valid Up to : S_{DS} (g) = 2.0 z/h = 1.0

Condition of Approval (if applicable): _____

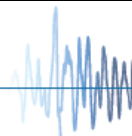


Table 1 - Product Line Matrix

Product	Material	Model	Max Rating	Max Package Dimensions [in]			Max Weight [lbs]	Mounting Configuration [Base/Wall/Suspended]	UUT		
				Length	Width	Height					
SKE4XXW (Outdoor)	Carbon Steel	SKE402W	2kW	14.00	25.80	31.00	130	Base	UUT 1		
		SKE403W	3.7kW						[Interpolated]		
		SKE404W	4kW						[Interpolated]		
		SKE406W	6kW						[Interpolated]		
		SKE408W	8kW	15.13	29.80	41.13	175		[Interpolated]		
		SKE410W	10kW						[Interpolated]		
		SKE414W	13.5kW						[Interpolated]		
		SKE415W	15kW						[Interpolated]		
		SKE416W	16kW						[Interpolated]		
		SKE420W	20kW						[Interpolated]		
		SKE422W	22kW						[Interpolated]		
		SKE425W	25kW						[Interpolated]		
		SKE430W	30kW						[Interpolated]		
		SKE432	32kW						[Interpolated]		
		SKE420LW	20kW		40.80		285		[Interpolated]		
		SKE440W	40kW						[Interpolated]		
		SKE444W	44kW						[Interpolated]		
		SKE450W	50kW						[Interpolated]		
		SKE452W	52kW						[Interpolated]		
		SKE460W	60kW						[Interpolated]		
		SKE463	63kW						[Interpolated]		
		SKE430XW	30kW						[Interpolated]		
		SKE440XW	40kW						[Interpolated]		
		SKE470W	70kW	28.60	38.00	55.80	590		[Interpolated]		
		SKE474W	74kW						[Interpolated]		
		SKE480W	80kW						[Interpolated]		
		SKE482W	82kW						[Interpolated]		
		SKE490W	90kW						UUT 2		
SKE4 (Indoor)	Carbon Steel	SKE402	2kW	14.00	19.75	22.25	102	Wall	[Extrapolated]		
		SKE403	3.7kW						[Extrapolated]		
		SKE404	4kW						[Extrapolated]		
		SKE406	6kW						UUT 3		
		SKE408	8kW	15.13	22.25	32.00	145		[Interpolated]		
		SKE410	10kW						[Interpolated]		
		SKE414	13.5kW						[Interpolated]		
		SKE415	15kW						[Interpolated]		
		SKE416	16kW						[Interpolated]		
		SKE420	20kW						[Interpolated]		
		SKE422	22kW						[Interpolated]		
		SKE425	25kW						[Interpolated]		
		SKE430	30kW						[Interpolated]		
		SKE432	32kW						[Interpolated]		
		SKE420L	20kW		33.25		210		[Interpolated]		
		SKE440	40kW						[Interpolated]		
		SKE444	44kW						[Interpolated]		
		SKE450	50kW						[Interpolated]		
		SKE452	52kW						[Interpolated]		
		SKE460	60kW						UUT 4		
SKS	Carbon Steel	SKS100SLP	100lbs/hr at 15PSI	45.80	19.70	44.10	487	Base	UUT 5		
		SKS130SLP	130lbs/hr at 15PSI				484		[Interpolated]		
		SKS190SLP	190lbs/hr at 15PSI				578		[Interpolated]		
		SKS290SLP	290lbs/hr at 15PSI	47.20	22.80	47.30	616		[Interpolated]		
		SKS390SLP	390lbs/hr at 15PSI	58.80			27.50		45.20	828	[Interpolated]
		SKS500SLP	500lbs/hr at 15PSI							822	[Interpolated]
		SKS690SLP	690lbs/hr at 15PSI							1,102	[Interpolated]
		SKS950SLP	950lbs/hr at 15PSI							1,168	[Interpolated]
		SKS1250SLP	1250 lbs/hr at 15PSI	30.00	60.30	1,574	UUT 6				

Table 1 - Product Line Matrix (Cont.)

Product	Material	Model	Max Rating	Max Package Dimensions [in]			Max Weight [lbs]	Mounting Configuration [Base/Wall/Suspended]	UUT
				Length	Width	Height			
SKD - MS-SD	Carbon Steel	12X12 - 36X36	12X12 - 36X36	8.80	38.00	42.00	40	Duct Mounted (Flange)	[Extrapolated]
MS-SD		12X12-36X36	12X12-36X36	8.50	38.00	42.00	42		[Extrapolated]
MS-SD		36X36	36X36	8.50	38.00	42.00	42		UUT 7
SKD - MS-HD		12X12-36X36	12X12-36X36	12.50	38.00	44.10	84		[Extrapolated]
MS-HD		12X12-36X36	12X12-36X36	13.50	38.00	44.50	84		[Extrapolated]
MS-HD		36X36	36X36	13.50	38.00	44.50	84		UUT 8
MS-SD	Carbon Steel	12X12 - 60X60	12X12 - 60X60	6.40	62.00	56.20	31	Duct Mounted	[Extrapolated]
SKD - MS-SD		12X12-60X60	12X12-60X60	5.40	56.80	55.60	31		[Extrapolated]
MS-SD		60X60	60X60	6.40	62.00	65.00	31		UUT 11
MS-HD		12X12 - 60X60	12X12 - 60X60	11.50	61.50	54.00	100		[Extrapolated]
SKD - MS-HD		12X12-60X60	12X12-60X60	10.50	55.50	54.00	100		[Extrapolated]
MS-HD		60X60	60X60	11.50	61.50	54.00	100		UUT 12
MS-SD		12X12 - 120X120	12X12 - 120X120	120.00	7.40	116.00	120	AHU Mounted ²	[Extrapolated]
SKD - MS-SD		12X12 - 120X120	12X12 - 120X120	116.80	9.00	115.60	139		[Extrapolated]
SKD - MS-SD		120X120	120X120	120.00	9.00	122.00	139		UUT-13
MS-HD		12X12 - 120X120	12X12 - 120X120	120.00	11.50	116.00	275		[Extrapolated]
SKD - MS-HD		12X12 - 120X120	12X12 - 120X120	116.00	12.00	116.00	275		[Extrapolated]
SKD- MS-HD		120X120	120X120	120.00	12.00	122.00	275		UUT-14
SKD - J	Carbon Steel	12X12 (single tube 0.5")	12X12	3.50	15.90	4.00	2	Duct mounted	UUT 9
SKD - J		36X36 (double tube 0.5")	36X36	17.80	45.50	4.00	16		UUT 10
MF SAM	Carbon Steel	36x36	36x36	5.00	36.00	5.00	3	Duct mounted	UUT 17
SKG	Carbon Steel	SKG3110	166,798 BTU/h	33.13	25.50	73.50	540	Base	UUT 15
		SKG3155	210,052 BTU/h						[Interpolated]
		SKG3180	235,844 BTU/h						[Interpolated]
		SKG3210	247,423 BTU/h						[Interpolated]
		SKG3265	376,850 BTU/h						[Interpolated]
		SKG3310	420,104 BTU/h						[Interpolated]
		SKG3350	457,475 BTU/h	63.63	51.50		1,280		[Interpolated]
		SKG3405	494,846 BTU/h						[Interpolated]
		SKG3505	693,319 BTU/h						[Interpolated]
		SKG3560	704,898 BTU/h						[Interpolated]
		SKG3610	742,269 BTU/h						[Interpolated]
		SKG3710	940,742 BTU/h						[Interpolated]
SKG3765	952,321 BTU/h	1,820	[Interpolated]						
SKG3810	989,692 BTU/h		UUT 16						

Note:

1) HD grids are bolted construction and SD grids are welded construction

 2) AHU Mounted grids are certified to S_{ps} 2.0 at roof

Table 2 - Certified Sub-Components

Component	Part Number	Description	Manufacturer	Max Weight [lbs]	Material	Mounting Config.	UUT
Heater Element	SE5991	2.5 kW / 240 V	CCI Thermal Technologies	1.000	Incoloy	Wall	[Extrapolated]
	SE5992	3 kW / 240 V	CCI Thermal Technologies	1.000			[Extrapolated]
	SE5980	1.2 kW / 400 V	CCI Thermal Technologies	1.003			[Extrapolated]
	SE5935	2 kW / 600 V	CCI Thermal Technologies	1.014			UUT 3
	SE5996	4 kW / 208 V	CCI Thermal Technologies	1.200			[Interpolated]
	SE5961	8.33 kW / 600 V	CCI Thermal Technologies	2.700			[Interpolated]
	SE5960	5.33 kW / 208 V	CCI Thermal Technologies	2.788			[Interpolated]
	SE5945	6 kW / 575 V	CCI Thermal Technologies	2.800			[Interpolated]
	SE5944	6 kW / 480 V	CCI Thermal Technologies	2.800			[Interpolated]
	SE5982	5 kW / 400 V	CCI Thermal Technologies	2.800			[Interpolated]
	SE5966	2.67 kW / 600 V	CCI Thermal Technologies	2.800			[Interpolated]
	SE5941	4 kW / 480 V	CCI Thermal Technologies	2.821			[Interpolated]
	SE5938	6 kW / 240 V	CCI Thermal Technologies	2.877			[Interpolated]
	SE5983	7.3 kW / 400 V	CCI Thermal Technologies	2.877			[Interpolated]
	SE5946	4.4 kW / 208 V	CCI Thermal Technologies	2.900			[Interpolated]
	SE5949	6.6 kW / 208 V	CCI Thermal Technologies	2.900			[Interpolated]
	SE5979	6 kW / 440 V	CCI Thermal Technologies	2.900			[Interpolated]
	SE5989	7.3 kW / 600 V	CCI Thermal Technologies	2.900			[Interpolated]
	SE5987	7.3 kW / 440 V	CCI Thermal Technologies	2.900			[Interpolated]
	SE5967	10 kW / 440 V	CCI Thermal Technologies	2.910			[Interpolated]
	SE5955	10 kW / 400 V	CCI Thermal Technologies	2.921			[Interpolated]
	SE5956	10 kW / 440 V	CCI Thermal Technologies	2.954			[Interpolated]
	SE5959	3.3 kW / 208 V	CCI Thermal Technologies	3.000			[Interpolated]
	SE5963	10 kW / 575 V	CCI Thermal Technologies	3.000			[Interpolated]
	SE5988	10 kW / 400 V	CCI Thermal Technologies	3.000			[Interpolated]
	SE5962	10 kW / 480 V	CCI Thermal Technologies	3.000			UUT 4
	SE5990	1.4 kW / 120 V	Zoppas Industries	1.000	Incoloy	Floor	[Extrapolated]
	SE5925	1.35 kW / 575 V	Zoppas Industries	1.000			UUT 1
	SE5994	2.5 kW / 208 V	Zoppas Industries	1.000			[Interpolated]
	SE5924	1.35 kW / 208 V	Zoppas Industries	1.014			[Interpolated]
	SE5934	2 kW / 480 V	Zoppas Industries	1.014			[Interpolated]
	SE5932	2 kW / 240 V	Zoppas Industries	1.025			[Interpolated]
	SE5933	2 kW / 208 V	Zoppas Industries	1.040			[Interpolated]
	SE5923	1.35 kW / 480 V	Zoppas Industries	1.180			[Interpolated]
	SE5993	4 kW / 240 V	Zoppas Industries	1.400			[Interpolated]
	SE5957	3.3 kW / 600 V	Zoppas Industries	2.700			[Interpolated]
	SE5981	2.5 kW / 400 V	Zoppas Industries	2.755			[Interpolated]
	SE5958	3.3 kW / 480 V	Zoppas Industries	2.755			[Interpolated]
	SE5940	4 kW / 208 V	Zoppas Industries	2.766			[Interpolated]
	SE5943	6 kW / 208 V	Zoppas Industries	2.800			[Interpolated]
	SE5948	4.4 kW / 575 V	Zoppas Industries	2.800			[Interpolated]
	SE5947	4.4 kW / 480 V	Zoppas Industries	2.800			[Interpolated]
	SE5942	4 kW / 575 V	Zoppas Industries	2.844			[Interpolated]
	SE5937	4 kW / 240 V	Zoppas Industries	2.866			[Interpolated]
	SE5950	6.6 kW / 480 V	Zoppas Industries	2.900			[Interpolated]
	SE5985	10.5 kW / 480 V	Zoppas Industries	2.900			[Interpolated]
	SE5939	10 kW / 575 V	Zoppas Industries	2.921			[Interpolated]
	SE5952	10 kW / 480 V	Zoppas Industries	2.921			[Interpolated]
	SE5951	6.6 kW / 575 V	Zoppas Industries	2.954			[Interpolated]
	SE5984	6 kW / 400 V	Zoppas Industries	3.921			UUT 2
Foam Sensor	SW FOAMSM-ASSY	Foam Sensor	Neptronic	0.440	Teflon	Wall / Floor	UUT 1, UUT 3
	SW FOAMMED-ASSY			0.550			[Interpolated]
	SW FOAMLG-ASSY			0.560			[Interpolated]
	SWSKE4FOAMSM			0.440			[Interpolated]
	SWSKE4FOAMMD			0.550			[Interpolated]
	SWSKE4FOAMLG			0.560			UUT 2, UUT 4

Table 2 - Certified Sub-Components (Cont.)

Component	Part Number	Description	Manufacturer	Max Weight [lbs]	Material	Mounting Config.	UUT
Transformer	DP10-4702	50VA	Marcus Transformer	2.300	Copper & Steel	Floor	[Extrapolated]
	SP3240	50VA	Marcus Transformer	2.300			[Extrapolated]
	DP10-1002	50VA	Marcus Transformer	2.300			[Extrapolated]
	DP10-2102	50VA	Marcus Transformer	2.300			[Extrapolated]
	DP10-3002	50VA	Marcus Transformer	2.300			[Extrapolated]
	DP10-8102	50VA	Marcus Transformer	2.300			[Extrapolated]
	SP3308	100VA	Marcus Transformer	2.800			UUT 1
	SP3310	100VA	Marcus Transformer	2.800			UUT 16
	SP3321	100VA	Marcus Transformer	2.800			[Interpolated]
	SP3365	100VA	Marcus Transformer	2.800			UUT 15
	SP3374	100VA	Marcus Transformer	2.800			[Interpolated]
	SP3312	100VA	Marcus Transformer	2.800			[Interpolated]
	SP3375	100VA	Marcus Transformer	2.800			[Interpolated]
	SP3349	100VA	Marcus Transformer	2.800			[Interpolated]
	SP3382	100VA	Marcus Transformer	2.822			[Interpolated]
	SP3373	100VA	Marcus Transformer	2.833			[Interpolated]
	SP3380	100VA	Marcus Transformer	2.900			UUT 5, UUT 6
	SP3323	100VA	Marcus Transformer	2.900			[Interpolated]
	SP3305	100VA	Marcus Transformer	2.900			[Interpolated]
	SP3329	100VA	Marcus Transformer	2.900			[Interpolated]
	SP3381	150VA	Marcus Transformer	5.665			[Interpolated]
	SP3383	150VA	Marcus Transformer	5.700			[Interpolated]
	SP3384	150VA	Marcus Transformer	5.700			[Interpolated]
	SP3386	150VA	Marcus Transformer	5.800			[Interpolated]
	SP3385	150VA	Marcus Transformer	5.842			[Interpolated]
	SP3388	200VA	Marcus Transformer	6.500			UUT 2
	SP3371	200VA	Marcus Transformer	6.500			[Interpolated]
	SP3376	200VA	Marcus Transformer	6.500			[Interpolated]
	SP3387	200VA	Marcus Transformer	7.322			[Interpolated]
	SP3351	350VA	Marcus Transformer	11.100			[Interpolated]
	SP3352	350VA	Marcus Transformer	11.100			[Interpolated]
	SP3353	350VA	Marcus Transformer	11.300			[Interpolated]
	SP3370	350VA	Marcus Transformer	11.350			UUT 15
	DP10-2011	50VA	TransfabTMS	2.300	Copper & Steel	Floor	UUT 2
	DP10-9011	50VA	TransfabTMS	2.300		Floor	[Interpolated]
	SP3341	100VA	TransfabTMS	2.900		Wall / Floor	UUT 1, UUT 3, UUT 4, UUT 16
Disconnect Switch	DP13-3004	40A	ABB	0.500	Steel & Plastic	Wall / Floor	UUT 1, UUT 3
	DP13-3005	63A	ABB	0.600			[Interpolated]
	DP13-3006	100A	ABB	0.880			UUT 4
	DP13-3007	160A	ABB	2.650		Floor	[Interpolated]
	DP13-3008	200A	ABB	3.950			UUT 2
Water Level Sensor	SWSKE4LEVASM	Water Level Sensor A	Neptronic	3.000	Electronic PCB	Wall / Floor	UUT 1, UUT 3, UUT 15
	SWPROBSM-ASSY	Water Level Sensor STD		3.000			[Interpolated]
	SWSKE4LEVBSM	Water Level Sensor B		3.000			[Interpolated]
	SWSKE4LEVCSM	Water Level Sensor C		3.000			[Interpolated]
	SWSKE4LEVDSM	Water Level Sensor D		3.000			[Interpolated]
	SWPROBMD-ASSY	Water Level Sensor STD		3.200			[Interpolated]
	SWPROBLAR-ASSY	Water Level Sensor STD		3.200			[Interpolated]
	SWSKE4LEVAMD	Water Level Sensor A		3.200		Floor	UUT 4
	SWSKE4LEVVALG	Water Level Sensor A		3.200			[Interpolated]
	SWSKE4LEVBM	Water Level Sensor B		3.200			[Interpolated]
	SWSKE4LEVBLG	Water Level Sensor B		3.200			[Interpolated]
	SWSKE4LEVCM	Water Level Sensor C		3.200			[Interpolated]
	SWSKE4LEVCLG	Water Level Sensor C		3.200			[Interpolated]
	SWSKE4LEVDM	Water Level Sensor D		3.200			[Interpolated]
	SWSKE4LEVDLG	Water Level Sensor D		3.200			UUT 2, UUT 6
	SWGWATLEV-SUB	Water Level Sensor STD		3.200			UUT 5
	SWGWATLEV-ASSY	Water Level Sensor STD		3.200			UUT 16

Table 2 - Certified Sub-Components (Cont.)

Component	Part Number	Description	Manufacturer	Max Weight [lbs]	Material	Mounting Config.	UUT
Contactor	SP3114	SDU Blower	Honeywell	0.350	Steel & Plastic	Wall / Floor	UUT 3
	SP3029	25A / 600V / 2P	TE Connectivity (Tyco)	0.500			UUT 15
	SP3080	32A / 600VAC	Lovato Electric	0.700			UUT 3
	SP3100	50A / 600V / 3P	Lovato Electric	0.900			UUT 4
	SP3084	90A	Lovato Electric	3.430		Floor	UUT 2
Display	SW SK300DISPLAY	Alphanumeric Display	Neptronic	1.000	Plastic	Wall / Floor	UUT 1, UUT 3, UUT 5
	SWSKE4DISPLAYA			1.500			[Interpolated]
	SWSKE4DISPLAYB			1.500		Floor	UUT 4
	SWSKE4DISPLAYC			1.500			[Interpolated]
	SWSKE4DISPLAYD			1.500			UUT 2, UUT 6
	NWSKGAZDISPLAYSS	Display Board	Neptronic	1.500	Plastic	Floor	UUT 15, UUT 16
	NWSKGDISPLAYA			1.500			[Extrapolated]
	NWSKGDISPLAYB			1.500			[Extrapolated]
	NWSKGASMAINSS	Control PCB	Neptronic	3.000	Plastic	Wall / Floor	UUT 15, UUT 16
	NWSGAZSLAVESS			3.000			UUT 16
	NWSGAZSLAVEWSS			3.000			[Interpolated]
	NWSKGAZCONNECTSS			3.000			[Interpolated]
	NWSKGMAINA			3.000			[Interpolated]
	NWSKGMAINB			3.000			[Interpolated]
	NWSKGMAINC			3.000			[Interpolated]
	NWSKGMAIND			3.000			[Interpolated]
	NWSKGSLAVEA			3.000			[Interpolated]
	NWSKGSLAVEB			3.000			[Interpolated]
	NWSKGSLAVEC			3.000			[Interpolated]
	NWSKGSLAVED			3.000			[Interpolated]
	NWSKE4MAIND			4.200			UUT 1, UUT 3, UUT 5
	NWSKE4MAINC			4.300			[Interpolated]
	NWSKE4MAINB			4.400			[Interpolated]
	NWSKE4MAINA			4.500			UUT 2, UUT 4, UUT 6
Flow Switch	SPSPA1-01	Main Printed Circuit Board	Huba Control	0.100	Plastic	Wall	UUT 3
Cooling Fan	SP3001	SKE XL Outside Fan	EBM papst	1.200	Plastic	Floor	UUT 2
Thermostat	TR024-EXT1	SKE XL Outside Control Thermostat	Neptronic	0.300	Plastic	Floor	UUT 2
Power Relay	SP3113	N/A	Carlo Gavazzi	0.500	Plastic	Floor	UUT 2
Limit Switch	SP3035	High Temperature Switch 220F	Neptronic	0.033	Plastic & Steel	Wall / Floor	UUT 1, UUT 2, UUT 3, UUT 4, UUT 5, UUT 6, UUT 15, UUT 16
Igniter	SPG2006	Igniter Hot Surface	Neptronic	0.200	Ceramic	Floor	UUT 15, UUT 16
	SPG2018-230	Igniter Hot Surface		0.300			UUT 15
	SPG2019	Igniter Hot Surface		0.500	Steel & Ceramic		UUT 16
	SPG2050	Spark Igniter		0.500			UUT 16
Blower	SPG2017-120	120V	Ametek	4.900	Alumnnium	Floor	UUT 15, UUT 16
Electronic Controller	SPG2001	Hot Surface Ignition Control	Fenwal	0.500	Plastic	Floor	UUT 15, UUT 16
	SPG2051	Spark Ignition Control		0.500			UUT 15, UUT 16
Water Inlet Valves	SPG6007	2 Outlet 90 Degrees	Ametek	0.300	Plastic	Floor	UUT 15, UUT 16
	SPG4104	2 Outlet 180 Degrees		0.400			[Interpolated]
	SPG6008	3 Outlet		0.500		Wall / Floor	UUT 1, UUT 2, UUT 3, UUT 4, UUT 5, UUT 6
Drain Pump	SPG4101	24VAC	Hanning	1.200	Plastic	Wall / Floor	UUT 1, UUT 2, UUT 3, UUT 4, UUT 15, UUT 16
Solid State Relay	SP3102	50A	Crydom	0.165	Steel & Plastic	Floor	UUT 1
	SP3103	90A		0.165		Wall	UUT 3
	SP3105	125A	Carlo Gavazzi	0.165		Floor	UUT 15
SDU Blower	SP3011	SDU I 120V	EBM papst	2.300	Steel	Wall	UUT 3
	SP3012	SDU I 240V	EBM papst	2.300		Floor	[Interpolated]
	SP3009	SDU II or III	EBM papst	4.100			UUT 16
	SP3014	SDU III	Jin Yih Shyang Ent. Co. LTD	10.700			UUT 16
Gas Valve	SPG2010	24VAC	Honeywell	1.500	Aluminum	Floor	UUT 15, UUT 16



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 1

30353-1701a; UUT-1

Model Line	Model Number	Manufacturer
SKE4	SKE 402W	Neptronic

Product Construction Summary

Powder Coated Carbon Steel Enclosure

Options / Subcomponent Summary

Heater Element: Zoppas Industries; Transformer: Marcus Transformer & Transfab TMS; Water Level Sensor: Neptronic; Display: Neptronic; Limit Switch: Neptronic; Water Inlet Valves: Ametek; Solid State Relay: Crydom; Drain: Hanning; Disconnect Switch: ABB

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
130	14.0	25.8	31.0	>33.3	>33.3	>33.3

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

UUT-1 was mounted directly to the shake table using eight (8) 1/4" grade 5 bolts.



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 2

30353-1701a; UUT-2

Model Line	Model Number	Manufacturer
SKE4	SKE 490W	Neptronic

Product Construction Summary

Powder Coated Carbon Steel Enclosure

Options / Subcomponent Summary

Heater Element: Zoppas Industries; Transformer: Marcus Transformer & Transfab TMS; Water Level Sensor: Neptronic; Display: Neptronic; Limit Switch: Neptronic; Water Inlet Valves: Ametek; Solid State Relay: Crydom; Drain: Hanning; Disconnect Switch: ABB; Cooling Fan: EBM papst; Thermostat: Neptronic; Power Relay: Carlo Gavazzi; Contactor: Lovato Electric

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
590	28.6	38.0	55.8	15.0	15.0	>33.3

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

UUT-2 was mounted directly to the shake table using eight (8) 3/8" grade 5 bolts.



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 3A

30353-1701b; UUT-3A

Model Line	Model Number	Manufacturer
SKE4	SKE-406M-480-3	Neptronic

Product Construction Summary

Powder Coated Carbon Steel Enclosure

Options / Subcomponent Summary

Heater Elements: CCI Thermal Technologies; Foam Sensor: Neptronic; Transformer: Transfab TMS; Disconnect Switch: ABB; Water Level Sensor: Neptronic; Contactor: Honeywell; Display: Neptronic; Limit Switch: Neptronic; Drain Pump: Hanning; Flow Switch: Huba Control; Cooling Fan: EBM papst; Solid State Relay: Crydom

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
102	13.80	19.40	29.50	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

UUT-3A was attached to the wall fixture using two (2) manufacturer supplied brackets. These brackets were attached to the unit using three (3) 1/4" grade 8 bolts. The brackets were attached to the wall fixture using (4) 1/4" grade 8 bolts.



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 3B

30353-1701b; UUT-3B

Model Line	Model Number	Manufacturer
SKE4	SKE-406M-480-3	Neptronic

Product Construction Summary

Powder Coated Carbon Steel Enclosure

Options / Subcomponent Summary

Heater Elements: CCI Thermal Technologies; Foam Sensor: Neptronic; Transformer: Transfab TMS; Disconnect Switch: ABB; Water Level Sensor: Neptronic; Contactor: Honeywell; Display: Neptronic; Limit Switch: Neptronic; Drain Pump: Hanning; Flow Switch: Huba Control; Cooling Fan: EBM papst; Solid State Relay: Crydom

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
102	13.80	19.40	29.50	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

UUT-3B was attached to the wall fixture using two (2) manufacturer supplied brackets. These brackets were attached to the unit using three (3) 1/4" grade 8 bolts. The brackets were attached to the wall fixture using (4) 1/4" grade 8 bolts. The wall fixture was mounted to the table with (4) MSSH-1E-400 spring isolators.



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 4A

30353-1701b; UUT-4A

Model Line	Model Number	Manufacturer
SKE4	SKE-460M-480-3	Neptronic

Product Construction Summary

Powder Coated Carbon Steel Enclosure

Options / Subcomponent Summary

Heater Elements: Zoppas Industries; Foam Sensor: Neptronic; Transformer: Transfab TMS; Disconnect Switch: ABB; Water Level Sensor: Neptronic; Contactor: Lovato Electric; Display: Neptronic; Limit Switch: Neptronic; Drain Pump: Hanning;

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
210	15.00	22.50	32.00	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

UUT-4A was attached to the wall fixture using two (2) manufacturer supplied brackets. These brackets were attached to the unit using three (6) 1/4" grade 8 bolts. The brackets were attached to the wall fixture using (4) 1/4" grade 8 bolts.



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 4B

30353-1701b; UUT-4B

Model Line	Model Number	Manufacturer
SKE4	SKE-460M-480-3	Neptronic

Product Construction Summary

Powder Coated Carbon Steel Enclosure

Options / Subcomponent Summary

Heater Elements: Zoppas Industries; Foam Sensor: Neptronic; Transformer: Transfab TMS; Disconnect Switch: ABB; Water Level Sensor: Neptronic; Contactor: Lovato Electric; Display: Neptronic; Limit Switch: Neptronic; Drain Pump: Hanning;

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
210	15.00	22.50	32.00	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

UUT-4B was attached to the wall fixture using two (2) manufacturer supplied brackets. These brackets were attached to the unit using three (6) 1/4" grade 8 bolts. The brackets were attached to the wall fixture using (4) 1/4" grade 8 bolts. The wall fixture was mounted to the table with (4) MSSH-1E-400 spring isolators.



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 5

30353-1701c; UUT-5

Model Line	Model Number	Manufacturer
SKS	SKS-100-SLPA	Neptronic

Product Construction Summary

Powder Coated Carbon Steel Enclosure on Carbon Steel Seismic Legs

Options / Subcomponent Summary

Display: Neptronic; Limit Switch: Neptronic; Transformer: Marcus; Water Inlet Valve: T&P

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
498	45.8	19.7	31.0	20.3	>33.3	>33.3

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

UUT-5 was mounted to the shake table using twelve (12) 3/8" grade 5 bolts.



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 6

30353-1701c; UUT-6

Model Line	Model Number	Manufacturer
SKS	SKS-1250-SLPA	Neptronic

Product Construction Summary

Powder Coated Carbon Steel Enclosure on Carbon Steel Seismic Legs

Options / Subcomponent Summary

Display: Neptronic; Limit Switch: Neptronic; Transformer: Marcus; Water Inlet Valve: T&P

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
1,540	58.8	30.0	47.8	13.5	10.5	30.5

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS} (g)	z/h	I_p	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

UUT-6 was mounted to the shake table using twelve (12) 3/8" grade 5 bolts.



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 7

30353-1701g; UUT-7

Model Line	Model Number	Manufacturer
MS	MS-SD 36x36	Neptronic

Product Construction Summary

Carbon Steel Tubes and Carbon Steel Header with Welded Construction

Options / Subcomponent Summary

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
305	101.0	38.0	42.0	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

The UUT was attached to (2) 36" square, 16 gauge carbon steel ducts. The UUT was secured to the duct flanges using (28) #10 screws on each side. Each end of the duct had a 2" wide, 1/4" thick carbon steel angle fastened to the top and bottom of the duct with (6) 3/8" grade 5 bolts and washers per angle. The duct was suspended with (4) 1/2" ASTM A307 Grade B threaded rods with two nuts above and below the angle through holes. Each threaded rod was stiffened with a 24" length of 1" carbon steel angle, and (3) rod stiffening clips per channel. The duct was laterally braced with (4) Mason SCBH-2 seismic sway braces and 1/4" steel cable, set at 45 degrees.

1" Steel Angle



2" x 1/4" Steel Angle

Mason SCBH-2

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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 8

30353-1701g; UUT-8

Model Line	Model Number	Manufacturer
MS	MS-HD 36x36	Neptronic

Product Construction Summary

Carbon Steel Tubes and Carbon Steel Header with Bolted Construction

Options / Subcomponent Summary

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
345	106.0	38.0	44.5	N/A	N/A	N/A

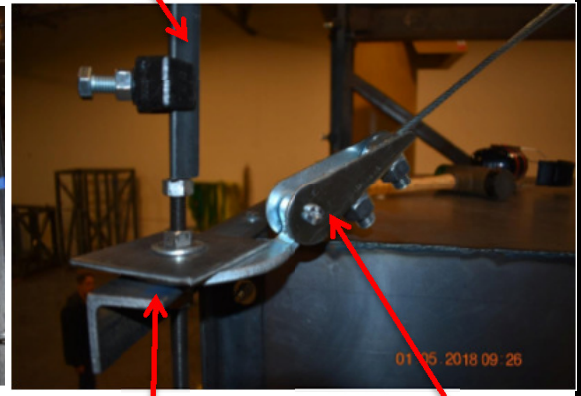
UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

The UUT was attached to (2) 36" square, 16 gauge carbon steel ducts. The UUT was secured to the duct flanges using (28) #10 screws on each side. Each end of the duct had a 2" wide, 1/4" thick carbon steel angle fastened to the top and bottom of the duct with (6) 3/8" grade 5 bolts and washers per angle. The duct was suspended with (4) 1/2" ASTM A307 Grade B threaded rods with two nuts above and below the angle through holes. Each threaded rod was stiffened with a 24" length of 1" carbon steel angle, and (3) rod stiffening clips per channel. The duct was laterally braced with (4) Mason SCBH-2 seismic sway braces and 1/4" steel cable, set at 45 degrees.

1" Steel Angle



2" x 1/4" Steel Angle

Mason SCBH-2

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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 9

30353-1701f; UUT-9

Model Line	Model Number	Manufacturer
SKD-J	SKD-J 12x12 (Single Tube)	Neptronic

Product Construction Summary

Carbon Steel Tubes with Welded Construction

Options / Subcomponent Summary

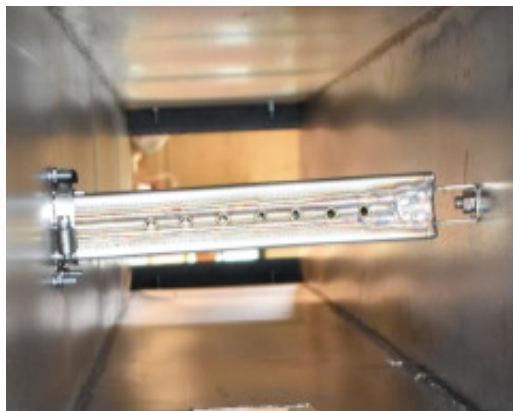
UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
98	95.0	12.0	12.0	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

The UUT was attached to a 12" square, 16 gauge carbon steel duct. The UUT was secured to the duct using (1) 3/8" grade 5 bolt on one end of the duct and (6) 1/4" TEK screws on the other side of the duct. Each end of the duct had a 2" wide, 1/4" thick carbon steel angle fastened to top and bottom of the duct with (2) 3/8" grade 5 bolts. The duct was suspended with (4) lengths of 1/2" ASTM A307 Grade B threaded rod with two nuts above and below the through holes. Each threaded rod was stiffened with a 24" length of 12 gauge unistrut and 3 rod stiffening clips per angle. The duct was laterally braced with (4) Mason SCBH-2 seismic sway braces and 3/16" cable set at 45 degrees.



2" x 1/4" Steel Angle



12 Gauge Unistrut

Mason SCBH-2

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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 10

30353-1701f; UUT-10

Model Line	Model Number	Manufacturer
SKD-J	SKD-J 36x36 (Double Tube)	Neptronic

Product Construction Summary

Carbon Steel Tubes with Welded Construction

Options / Subcomponent Summary

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
290	95.0	36.0	36.5	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS} (g)	z/h	I_p	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

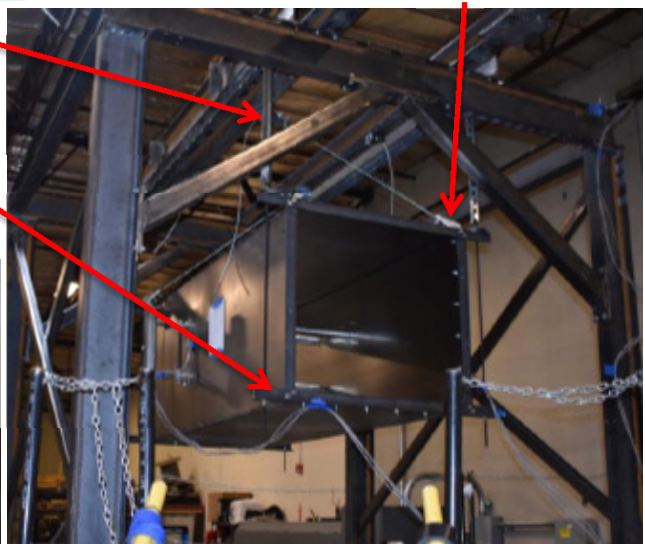
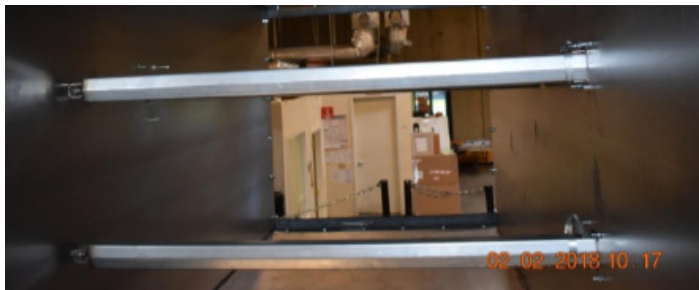
Test Mounting Details

The UUT was attached to a 36" square, 16 gauge carbon steel duct. The UUT was secured to the duct using (2) 3/8" grade 5 bolt on one end of the duct and (8) 3/8" grade 5 bolts on the other side of the duct. Each end of the duct had a 2" wide, 1/4" thick carbon steel angle fastened to top and bottom of the duct with (6) 3/8" grade 5 bolts and to the sides with (5) 3/8" grade 5 bolts. The duct was suspended with (4) lengths of 1/2" ASTM A307 Grade B threaded rod with two nuts above and below the through holes. Each threaded rods was stiffened with a 20" length of 12 gauge unistrut and 3 rod stiffening clips per angle. The duct was laterally braced with (4) Mason SCBH-2 seismic sway braces and 1/4" cable set at 45 degrees.

Mason SCBH-2

12 Gauge Unistrut

2" x 1/4" Steel Angle



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 11

30353-1701g; UUT-11

Model Line	Model Number	Manufacturer
MS	MS-SD 60x60	Neptronic

Product Construction Summary

Carbon Steel Tubes and Carbon Steel Header with Welded Construction

Options / Subcomponent Summary

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
570	95.0	62.0	65.0	N/A	N/A	N/A

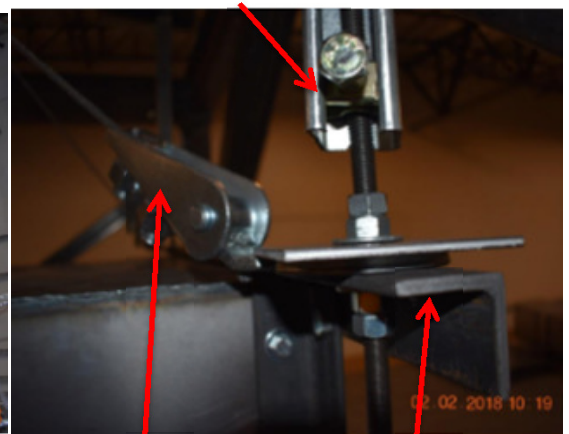
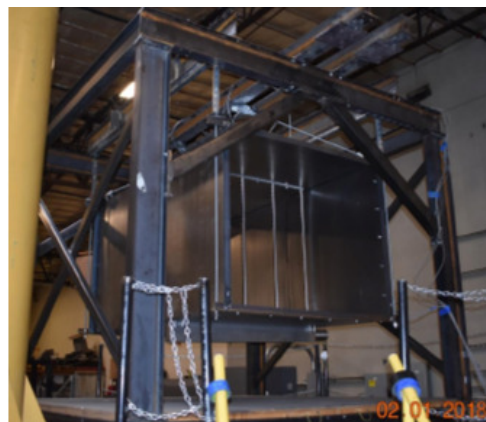
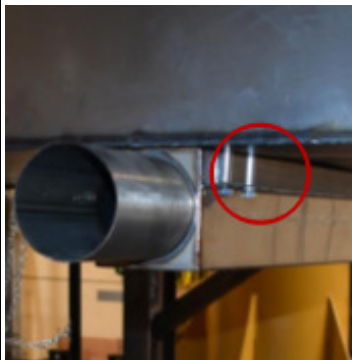
UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

The UUT was attached to a 60" square, 16 gauge carbon steel duct. The UUT was secured to the duct using (8) 3/8" grade 5 bolts on the bottom and (4) 3/8" grade 5 bolts on the top. Each end of the duct had a 2" wide, 1/4" thick carbon steel angle fastened to the top and bottom of the duct with (6) 3/8" grade 5 bolts and washers per angle. The duct was suspended with (4) 1/2" ASTM A307 Grade B threaded rods with two nuts above and below the angle through holes. Each threaded rod was stiffened with a 18" length of 12 gauge unistrut, and (3) rod stiffening clips per section. The duct was laterally braced with (4) Mason SCBH-2 seismic sway braces and 3/8" steel cable, set at 45 degrees.

12 Gauge Unistrut



Mason SCBH-2

2" x 1/4" Steel Angle

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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 12

30353-1701g; UUT-12

Model Line	Model Number	Manufacturer
MS	MS-HD 60x60	Neptronic

Product Construction Summary

Carbon Steel Tubes and Carbon Steel Header with Bolted Construction

Options / Subcomponent Summary

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
560	95.0	61.5	54.0	N/A	N/A	N/A

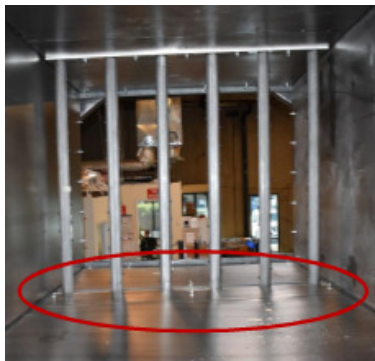
UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

The UUT was attached to a 60" square, 16 gauge carbon steel duct. The UUT was secured to the duct using (6) 3/8" grade 5 bolts on the bottom and (5) 3/8" grade 5 bolts on the top. Each end of the duct had a 2" wide, 1/4" thick carbon steel angle fastened to the top and bottom of the duct with (6) 3/8" grade 5 bolts and washers per angle. The duct was suspended with (4) 1/2" ASTM A307 Grade B threaded rods with two nuts above and below the angle through holes. Each threaded rod was stiffened with a 18" length of 12 gauge unistrut, and (3) rod stiffening clips per section. The duct was laterally braced with (4) Mason SCBH-2 seismic sway braces and 3/8" steel cable, set at 45 degrees.

12 Gauge Unistrut



Mason SCBH-2 2" x 1/4" Steel Angle

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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 13

30894-1801; UUT-13

Model Line	Model Number	Manufacturer
MS	SKD - MS-SD	Neptronic

Product Construction Summary

Carbon Steel Tubes and Carbon Steel Header with Welded Construction

Options / Subcomponent Summary

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
139	120	9	122	6	5.5	17

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	2.40	1.33	0.53

Test Mounting Details

UUT-13 was attached at the bottom to 1 5/8" 12ga strut with (8) 5/16" diameter Grade 5 bolts with washers. UUT-13 was attached at the top with (9) 5/16" diameter Grade 5 bolts into 1 5/8" 12ga strut. UUT-13 was then rigidly mounted into an Alliance AHU-1 air handling box. The box was rigidly mounted to the DCL interface using (12) 3/4" diameter Grade 5 bolts with 3/4" malleable beveled wedge washers. Bolts were spaced 54.5" apart widthwise and 51.5" apart lengthwise. Cross bracing requirements for Alliance AHU-1: Gripple G538 cables and 1/8" gusset plates in the corners.



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 14

30894-1801; UUT-14

Model Line	Model Number	Manufacturer
MS	SKD - MS-HD	Neptronic

Product Construction Summary

Carbon Steel Tubes and Carbon Steel Header with Bolted Construction

Options / Subcomponent Summary

UUT Properties						
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
275	120	12	122	6	5.5	17

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	2.40	1.33	0.53

Test Mounting Details

UUT-14 was attached at the bottom to 1 5/8" 12ga strut with (12) 3/8" diameter ASTM A574 socket head cap screws with washer. UUT-14 was attached at the top with (9) 3/8" diameter ASTM A574 socket head cap screws into 1 5/8" 12ga strut. UUT-13 was then rigidly mounted into an Alliance AHU-1 air handling box. The box was rigidly mounted to the DCL interface using (12) 3/4" diameter Grade 5 bolts with 3/4" malleable beveled wedge washers. Bolts were spaced 54.5" apart widthwise and 51.5" apart lengthwise. Cross bracing requirements for Alliance AHU-1: Gripple G538 cables and 1/8" gusset plates in the corners..



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 15

30353-1701d; UUT-15

Model Line	Model Number	Manufacturer
SKG	SKG 3110-1NAW	Neptronic

Product Construction Summary

Powder Coated Carbon Steel Enclosure

Options / Subcomponent Summary

Water Level Sensor: Neptronic; Contactor: TE Connectivity; Transformer: Marcus; Displays: Neptronic; Limit Switch: Neptronic; Ignitor Hot Surface: Neptronic; Hot Surface Ignition Control: Fenwal; 3 Water Outlet Valves: Ametek; Drain Pump: Hanning; Gas Valve: Honeywell; Blower: Ametek

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
540	33.1	25.5	73.5	15	10.3	>33.3

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

UUT-15 was mounted to the shake table using eight (8) 3/8" grade 8 bolts.



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 16

30353-1701d; UUT-16

Model Line	Model Number	Manufacturer
SKG	SKG 3810-1NAW	Neptronic

Product Construction Summary

Powder Coated Carbon Steel Enclosure

Options / Subcomponent Summary

Water Level Sensor: Neptronic; Contactor: TE Connectivity; Transformer: Marcus; Displays: Neptronic; Limit Switch: Neptronic; Ignitor Hot Surface: Neptronic; Spark Igniter: Neptronic; Hot Surface Ignition Control: Fenwal; Spark Ignition Control: Fenwal; 2 Water Outlet Valves: Ametek; Drain Pump: Hanning; Gas Valve: Honeywell; Blower: Ametek

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
1,820	63.5	51.5	73.5	8.5	16.5	>33.3

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

Test Mounting Details

UUT-16 was mounted to the shake table using twelve (12) 3/8" grade 8 bolts.



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



UNIT UNDER TEST (UUT) SUMMARY SHEET

UUT 17

30353-1701f; UUT-17

Model Line	Model Number	Manufacturer
MF SAM	MF SAM 36	Neptronic

Product Construction Summary

Carbon Steel Tubes with Welded Construction

Options / Subcomponent Summary

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
298	95.0	36.0	36.5	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.50	0.00	1.50	2.50	1.00	1.67	0.67
CBC 2016	ICC-ES AC156	2.00	1.00	1.50	3.20	3.00	1.33	0.53

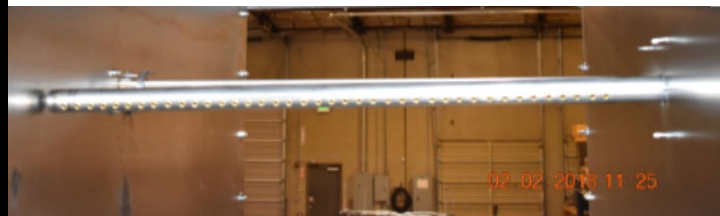
Test Mounting Details

The UUT was attached to a 36" square, 16 gauge carbon steel duct. The UUT was secured to the duct using (1) 3/8" grade 5 bolt on one end of the duct and (5) 1/4" TEK screws on the other side of the duct. Each end of the duct had a 2" wide, 1/4" thick carbon steel angle fastened to top and bottom of the duct with (6) 3/8" grade 5 bolts and to the sides with (5) 3/8" grade 5 bolts. The duct was suspended with (4) lengths of 1/2" ASTM A307 Grade B threaded rod with two nuts above and below the through holes. Each threaded rods was stiffened with a 20" length of 12 gauge unistrut and 3 rod stiffening clips per angle. The duct was laterally braced with (4) Mason SCBH-2 seismic sway braces and 1/4" cable set at 45 degrees.

Mason SCBH-2



12 Gauge Unistrut



2" x 1/4" Steel Angle

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