



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

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

OFFICE USE ONLY

APPLICATION #: **OSP – 0380-10**

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Powerex, Inc.

Manufacturer's Technical Representative: Joe Abt, Director of Engineering

Mailing Address: 150 Production Drive, Harrison, OH 45030

Telephone: (513) 367-3273 Email: jabt@powerexinc.com

Product Information

Product Name: Medical and Laboratory Scroll Air Units

Product Type: Mechanical Equipment

Product Model Number: See Attachment

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

General Description: Each unit contains scroll pumps, vertical tank, dew point monitor/probe desiccant, carbon monoxide monitor/sensor, controller, motors, tank drain, aftercooler, intake filter element, check valves and desiccant air dryers. Seismic enhancements made to the test units and required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigid or flexible base mount (neoprene)

Applicant Information


Applicant Company Name: The VMC Group

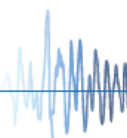
Contact Person: John Giuliano

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 8388-1780 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: 9/19/16
Title: President Company Name: The VMC Group





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
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STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY
OSH-FD-759 (REV 12/16/15)

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

Company Name: The VMC Group

Name: Ken Tarlow California License Number: SE-2851

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: Ken.tarlow@thevmcgroup.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): _____

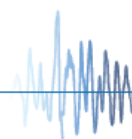
Testing Laboratory

Company Name: Dynamic Certification Laboratories

Contact Name: Kelly Laplace, Project Manager

Mailing Address: 1315 Greg Street, Suite 109, Sparks, NV 89431

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





OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT FACILITIES DEVELOPMENT DIVISION

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY
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Seismic Parameters

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

Neoprene isolated: 4.50 ($S_{DS} = 2.50$ g), 4.36 ($S_{DS} = 2.42$ g),
3.60 ($S_{DS} = 2.00$ g), 1.80 ($S_{DS} = 1.00$ g)

Design Basis of Equipment or Components (F_p/W_p) = Rigid: 2.4 ($S_{DS} = 2.0$ g)

S_{DS} (Design spectral response acceleration at short period, g) = 2.50, 2.42, 2.00, or 1.00 (See attachment)

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

R_p (Equipment or component response modification factor) = 2.5 (neoprene isolated), 1.5 (rigid)

Ω_0 (System overstrength factor) = 1.5

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = See attachments

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

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

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

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

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

R (Response modification coefficient) = _____

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = _____

I_p (Importance factor) = 1.5

Height to Center of Gravity above base = _____

Equipment or Component Natural Frequencies (Hz) = _____

Overall dimensions and weight (or range thereof) = _____

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

List of Attachments Supporting Special Seismic Certification

Test Report(s) Drawings Calculations Manufacturer's Catalog

Other(s) (Please Specify): _____

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

Signature: 

Date: 11/2/2016

Print Name: M. R. Karim

Title: SHFR

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

Condition of Approval (if applicable): _____

Special Seismic Certification
Certified Components - Medical Scroll



Manufacturer: Powerex

Product Line: Medical Scroll & Lab Scroll

Certified Product Construction: Powder-coated carbon steel frame

Mounting Description: Rigid or flexible base mount (neoprene)

Model number	Hp	Vertical receiver gallons	Total number of pumps	Vertically stacked pumps or layers	Horizontally arrayed pumps	Maximum Dimensions (in) ¹			Max. Operating Weight (lb) ¹	Mounting	Sds (g), z/h=1	UUT
						Length	Width	Height				
Duplex												
MSD0203	2	80	2	2	1	50	31	78	1,040	Flexible base mount (neoprene)	2.50	UUT1
MSD0303	3	80	2	2	1	50	31	78	1,100		2.42	Interpolated
MSD0503	5	80	2	2	1	50	31	78	1,200		2.42	Interpolated
MSD1004	10	120	4	4	1	78	32	77	1,800		2.42	Interpolated
MSD1005	10	200	4	4	1	83	32	84	1,900		2.42	Interpolated
MSD1506	15	240	6	2	3	84	66	96	2,820		2.42	UUT4
Triplex												
MST0503	5	80	3	3	1	78	32	70	1650	Flexible base mount (neoprene)	2.42	Interpolated
MST1005	10	200	6	2	3	90	66	84	2800		2.42	
MST1505	15	200	9	3	3	90	66	84	3900		2.42	
Quadruplex												
MSQ0504	5	120	4	4	1	77	32	77	1,870	Flexible base mount (neoprene)	2.50	UUT3
MSQ1005	10	200	8	2	4	108	66	84	3,400		2.00	Interpolated
MSQ1006	10	240	8	2	4	108	66	96	3,530		2.00	Interpolated
MSQ1505	15	200	12	3	4	108	66	84	4,200		2.00	Interpolated
MSQ1506	15	240	12	3	4	108	66	96	4,360		2.00	UUT5b/UUT7
Pentaplex												
MSP0504	5	120	5	1	3 lower, 2 upper	84	66	77	2,475	Flexible base mount (neoprene)	2.00	Extrapolated ²
MSP0505	5	200	5	1	3 lower, 2 upper	84	66	84	2,600		2.00	
MSP1505	15	200	15	2, 3	3	90	148	84	5,100		2.00	
MSP1506	15	240	15	2, 3	3	90	148	96	5,300		2.00	
Hexaplex												
MSH0504	5	120	6	2	3	90	66	77	2,835	Flexible base mount (neoprene)	2.00	Extrapolated ²
MSH0505	5	200	6	2	3	90	66	84	2,975		2.00	
MSH1006	10	240	12	3	4	108	73	96	4,250		2.00	
MSH1506	15	240	18	3, 3	3	94	150	96	6,020		2.00	

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Special Seismic Certification
Certified Components - Medical Scroll



Manufacturer: Powerex

Product Line: Medical Scroll & Lab Scroll

Certified Product Construction: Powder-coated carbon steel frame

Mounting Description: Rigid or flexible base mount (neoprene)

Model number	Hp	Vertical receiver gallons	Total number of pumps	Vertically stacked pumps or layers	Horizontally arrayed pumps	Maximum Dimensions (in) ¹			Max. Operating Weight (lb) ¹	Mounting	Sds (g), z/h=1	UUT
						Length	Width	Height				
Continued from Previous Page												
Seven to Twelve Pump Systems												
MSS0504	5	120	7	2	4 lower, 3 upper	103	66	82	2,900	Flexible base mount (neoprene)	2.00	Extrapolated ²
MSS0505	5	200	7	2	4 lower, 3 upper	103	66	84	3,190		2.00	
MSO0505	5	200	8	2	4	103	66	84	3,350		2.00	
MSN0505	5	200	9	3	3	94	66	84	3,900		2.00	
MSJ0505	5	200	10	3	4 lower, 4 mid, 2 upper	104	66	84	3,700		2.00	
MSJ0506	5	240	10	3	4 lower, 4 mid, 2 upper	104	66	96	3,900		2.00	
MSK0505	5	200	11	3	4 lower, 4 mid, 3 upper	104	66	84	3,900		2.00	
MSK0506	5	240	11	3	4 lower, 4 mid, 3 upper	104	66	96	4,175		2.00	
MSL0505	5	200	12	3	4	104	66	84	4,100		2.00	
MSL0506	5	240	12	3	4	104	66	96	4,360		2.00	
7.5HP and 10HP Pump Systems												
MSD0753	7.5	80	2	2	1	66	61	68	2,205	Rigid or flexible base mount (neoprene)	1.00 (flexible base mount) or 2.00 (rigid base mount)	Extrapolated
MSD0754	7.5	120	2	2	1	66	61	78	2,260			Extrapolated
MSD10B4	10	120	2	2	1	66	61	78	2,350			Extrapolated
MSD15B4	15	120	4	4	1	66	61	78	2,860			UUT10
MSD20B4	20	120	4	4	1	66	61	78	2,970			Interpolated
MST0755	7.5	200	3	3	1	66	61	81	2,560			
MST10B5	10	200	3	3	1	66	61	81	3,200			
MST15B5	15	200	6	3	2	90	79	81	4,200			
MST15B6	15	240	6	3	2	90	79	93	4,300			
MST20B5	20	200	6	3	2	90	79	81	4,450			
MST20B6	20	240	6	3	2	90	79	93	4,550			
MSQ0755	7.5	200	4	4	1	61	66	81	2,900			
MSQ10B5	10	200	4	4	1	61	66	81	3,005			
MSQ15B5	15	200	8	4	2	90	79	81	4,650			
MSQ15B6	15	240	8	4	2	90	79	93	4,750			
MSQ20B5	20	200	8	4	2	90	79	81	5,000			
MSQ20B6	20	240	8	4	2	90	79	93	5,100		UUT11	

Notes:

1. Maximum dimensions and weights relate to options and receiver tank size.

2. Extrapolated medical scroll units are certified based upon testing of the UUT1, UUT3, UUT4 and UUT5b/UUT7 medical scroll units. Justification matrix is provided on the following page.

Special Seismic Certification
Certified Components - Medical Scroll



Manufacturer: Powerex
Product Line: Medical Scroll & Lab Scroll
Certified Product Construction: Powder-coated carbon steel frame
Mounting Description: Rigid or flexible base mount (neoprene)

Justification Matrix for Extrapolated Medical Scroll Units

Extrapolated Unit	Units Used for Extrapolation	Difference from Units Used for Extrapolation
MSP0504	UUT4 (MSD1504)	One less pump
MSP0505	UUT4 (MSD1504)	One less pump, larger 200 gal receiver (240 gal receiver tested in UUT5b/UUT7)
MSP1505	Interpolated unit MST1505	Has an additional pump skid like that tested in UUT4, includes 24" spacing between each of the skids
MSP1506	Interpolated unit MST1505	Has an additional pump skid like that tested in UUT4 and includes 24" spacing between each of the skids.
MSH0504	UUT4 (MSD1504)	Has 6 pumps in rack of 3, 3 layers
MSH0505	UUT4 (MSD1504)	Has 6 pumps in rack of 3, 3 layers, and larger 200 gal receiver (240 gal receiver tested in UUT5b/UUT7)
MSH1006	UUT5b/UUT7 (MSQ1506)	Includes 6" space between the two system frame modules.
MSH1506	Interpolated unit MST1505	Has additional pump skid and includes 24" spacing between each of the skids, with 240 gal receiver like that tested in UUT5
MSS0504	UUT5b/UUT7 (MSQ1506)	One less row of pumps, with smaller receiver tank (one pump less than interpolated MSQ1005)
MSS0505	UUT5b/UUT7 (MSQ1506)	One less row of pumps, with smaller receiver tank (one pump less than interpolated MSQ1005)
MSO0505	UUT5b/UUT7 (MSQ1506)	One less row of pumps, with smaller receiver tank
MSN0505	UUT5b/UUT7 (MSQ1506)	One less column of pumps, with smaller receiver tank
MSJ0505	UUT5b/UUT7 (MSQ1506)	Two fewer pumps in the top row, with smaller receiver tank
MSJ0506	UUT5b/UUT7 (MSQ1506)	Two fewer pumps in the top row
MSK0505	UUT5b/UUT7 (MSQ1506)	One less pump in the top row, with smaller receiver tank
MSK0506	UUT5b/UUT7 (MSQ1506)	One less pump in the top row
MSL0505	UUT5b/UUT7 (MSQ1506)	Smaller receiver tank
MSL0506	UUT5b/UUT7 (MSQ1506)	Software change only
MSD0753	UUT10 (MSD15B4)	Two fewer pump-motor assemblies in rack; tank is smaller from UUT 1
MSD0754	UUT10 (MSD15B4)	Two fewer pump-motor assemblies in rack.
MSD10B4	UUT10 (MSD15B4)	Two fewer pump-motor assemblies in rack, pump-motor assemblies as in UUT11

Special Seismic Certification
Certified Components - Lab Scroll



Manufacturer: Powerex

Product Line: Medical Scroll & Lab Scroll

Certified Product Construction: Powder-coated carbon steel frame

Mounting Description: Rigid or flexible

Model Number	Hp	Vertical receiver gallons	Total number of pumps	Vertically stacked pumps or layers	Horizontally arrayed pumps	Max. Dimensions (in) ¹			Max. Operating Weight (lb) ¹	Mounting	Sds (g), z/h=1	UUT
						Length	Width	Height				
Duplex Systems												
LSD0203	2	80	2	2	1	74	32	62	1,200	Flexible base mount (neoprene)	2.50	UUT2
LSD0303	3	80	2	2	1	74	32	62	1,350		2.42	Extrapolated ²
LSD0503	5	80	2	2	1	83	32	68	1,400		2.42	
LSD1004	10	120	4	4	1	83	32	77	1,870		2.42	
Triplex Systems												
LST0504	5	120	3	3	1	83	32	77	1,600	Flexible base mount (neoprene)	2.42	Extrapolated ²
LST1005	10	200	6	2	3	94	66	83	2,800		2.42	
Quadruplex Systems												
LSQ0504	5	120	4	4	1	83	32	77	1,870	Flexible base mount (neoprene)	2.50	Extrapolated ²
LSQ1005	10	200	8	2	4	107	66	84	3,350		2.00	
7.5HP and 10HP Pump Systems (Structurally the same as MSxxxx systems³)												
LSD0753	7.5	80	2	2	1	66	61	68	2,205	Rigid or flexible base mount (neoprene)	1.00 (flexible base mount) or 2.00 (rigid base mount)	Extrapolated
LSD0754	7.5	120	2	2	1	66	61	78	2,260			Extrapolated
LSD10B4	10	120	2	2	1	66	61	78	2,350			Extrapolated
LSD15B4	15	120	4	4	1	66	61	78	2,860			UUT10
LSD20B4	20	120	4	4	1	66	61	78	2,970			Interpolated
LST0755	7.5	200	3	3	1	66	61	81	2,560			
LST10B5	10	200	3	3	1	66	61	81	3,200			
LST15B5	15	200	6	3	2	90	79	81	4,200			
LST15B6	15	240	6	3	2	90	79	93	4,300			
LST20B5	20	200	6	3	2	90	79	81	4,450			
LST20B6	20	240	6	3	2	90	79	93	4,550			
LSQ0755	7.5	200	4	4	1	61	66	81	2,900			
LSQ10B5	10	200	4	4	1	61	66	81	3,005			
LSQ15B5	15	200	8	4	2	90	79	81	4,650			
LSQ15B6	15	240	8	4	2	90	79	93	4,750			
LSQ20B5	20	200	8	4	2	90	79	81	5,000			
LSQ20B6	20	240	8	4	2	90	79	93	5,100			

Notes:

1. Maximum dimensions and weights include the largest dryer and receiver tank size.
2. Extrapolated lab scroll units are certified based upon testing UUT2, UUT3, and interpolated Medical Scroll units:
3. Lab scroll units differ from medical scroll units by software change only.

**Special Seismic Certification
Certified Components - Lab Scroll**



Manufacturer: Powerex

Product Line: Medical Scroll & Lab Scroll

Certified Product Construction: Powder-coated carbon steel frame

Mounting Description: Rigid or flexible

Justification Matrix for Extrapolated Laboratory Scroll Units

Extrapolated Unit	Units Used for Extrapolation	Difference from Units Used for Extrapolation
LSD0303	UUT2 (LSD0203)	Identical except with larger HP pumps
LSD0503	UUT3 (MSQ0504)	Similar to UUT3, with two fewer pumps
LSD1004	UUT3 (MSQ0504)	Identical to UUT3, with a software change only
LST0504	UUT3 (MSQ0504)	Similar to UUT3, with one less pump
LST1005	Interpolated unit MST1005	Remote piping optional (not mandatory, like in Medical Scroll units)
LSQ0504	UUT3 (MSQ0504)	Remote piping optional (not mandatory, like in Medical Scroll units)
LSQ1005	Interpolated unit MSQ1005	Remote piping optional (not mandatory, like in Medical Scroll units)
LSD0753	UUT10 (MSD15B4)	Two fewer pump-motor assemblies in rack; tank is smaller from UUT 1
LSD0754	UUT10 (MSD15B4)	Two fewer pump-motor assemblies in rack.
LSD10B4	UUT10 (MSD15B4)	Two fewer pump-motor assemblies in rack, pump-motor assemblies as in UUT11

Special Seismic Certification Certified Subcomponents



Manufacturer: Powerex

Product Line: Medical Scroll & Lab Scroll

Certified Subcomponents: Scroll pumps, vertical tanks, dew point monitor/probe desiccant, carbon monoxide monitor/sensor and controllers

Scroll Pump

Model No.	Manufacturer	Description	Material	Sds (g), z/h=1	Unit
SLAE03EB	Powerex	2HP and 3HP Scroll	Die cast aluminum	2.50	UUT1, UUT2
SLAE05E	Powerex	5HP Scroll		2.50	UUT3
SLAE05EHP	Powerex	5HP Scroll (145 psig Optional Units)		2.50	Extrapolated*
SLAE075	Powerex	7.5HP Scroll Pump	Die cast aluminum	2.00	UUT10
SLAE10	Powerex	10 HP Scroll Pump	Die cast aluminum	2.00	UUT11

*Note: Extrapolated component is identical in construction and manufacture as the component tested in UUT3.

Vertical Tank

Model No.	Manufacturer	Description	Material	Sds (g), z/h=1	Unit
AR027300ST	Powerex	80 gallon	Welded carbon steel*	2.50	UUT1, UUT2
AR027400ST	Powerex	120 gallon		2.50	UUT3
AR051201AJ	Powerex	200 gallon		2.42	Interpolated
AR051201AJ	Powerex	240 gallon		2.42	UUT4b, UUT5b

*In accordance with ASME BPVC Section VIII. Tanks have an allowable working pressure rating of 200 psig.

Dew Point Monitor/ Probe Desiccant

Model No.	Manufacturer	Description	Material	Sds (g), z/h=1	Unit
PDPM1001AJ	Powerex	Dew Point Monitor/ Probe Desiccant	Probe housing of stainless steel	2.50	UUT1, UUT2, UUT3

Carbon Monoxide Monitor/ Sensor

Model No.	Manufacturer	Description	Material	Sds (g), z/h=1	Unit
03481-005	Enmet	Carbon Monoxide Monitor/ Sensor	FRP housing with circuit board and integrated sensor	2.50	UUT1, UUT2, UUT3

Controllers

Model No.	Manufacturer	Description	Material	Sds (g), z/h=1	Unit
BASIC_PSM	Powerex	NEMA 12 enclosure; No Touchscreen	Painted carbon steel electrical cabinet	2.50	UUT1
HMI_PXMI	Powerex	NEMA 12 enclosure: Human Machine Interface: Touchscreen		2.50	Interpolated
PBMI_PXMI	Powerex	NEMA 12 enclosure: Powerex Building Management Integrator: HMI panel with additional communications card		2.50	UUT2, UUT3

Special Seismic Certification Certified Subcomponents



Manufacturer: Powerex

Product Line: Medical Scroll & Lab Scroll

Certified Subcomponents: Motors, tank drains, aftercooler, intake filter elements and check valves

Motors

Model No.	Manufacturer	Description	Material	Sds (g), z/h=1	Unit
00218OT3E145T_ or 00218OT3ECD145T_	WEG	2HP motor (ECD version varies paint color and data label)	Carbon steel shell with welded foot	2.50	UUT1, UUT2
00318OT3E182T_	WEG	3HP motor		2.50	Interpolated
00518OT3E184T_	WEG	5HP motor		2.50	UUT3
00736OT2E184T	WEG	7.5HP motor		2.00	UUT10
01036OT3E213T	WEG	10HP motor		2.00	UUT11

Tank Drain

Model No.	Manufacturer	Description	Material	Sds (g), z/h=1	Unit
2523	Jorc	Timer Drain	Cast brass body with integrated solenoid valve and DIN connector- mounted solid state timer	2.50	UUT1, UUT3
ED3004N	Parker-Domnick Hunter/Zander*	No-Loss Drain	Die cast body and molded polymer housing	2.50	UUT2

*Note: Zander is a division of Parker-Domnick Hunter

Aftercooler

Model No.	Manufacturer	Description	Material	Sds (g), z/h=1	Unit
DH062	Thermal Transfer	Aftercooler	Copper header tanks, copper cross tubes and copper fins	2.50	UUT1, UUT2, UUT3
DH106	Thermal Transfer	Aftercooler		2.00	UUT10, UUT11

Intake Filter Elements

Model No.	Manufacturer	Description (Powerex Unit)	Material	Sds (g), z/h=1	Unit
CSL-843	Solberg	MSD0203, MSD0303, MSD0503, MST0503, MSP1505	Powder-coated stamped carbon steel	2.50	UUT1
CSL-849	Solberg	MSQ0504, MSH0504, MSD1504, SDT1005, MSP1505		2.50	UUT2
CSL-851	Solberg	MSN0504, MST1505, MSQ1005, MSQ1505, MSL0505, MSQ0505		2.50	UUT7

Check Valve

Model No.	Manufacturer	Description	Material	Sds (g), z/h=1	Unit
IP087700AV	Powerex	Check Valve	Anodized die cast aluminum	2.50	UUT1, UUT2, UUT3
CB50	Control Devices Inc.	Check Valve	Cast Brass	2.00	UUT11

Special Seismic Certification Certified Subcomponents



Manufacturer: Powerex

Product Line: Medical Scroll & Lab Scroll

Certified Subcomponents: Desiccant air dryers

Desiccant Air Dryers										
Manufacturer's Model No. ³	Manufacturer	Material	Dimensions (in)			Weight (lb)	Sds (g), z/h=1	Unit		
			Length	Width	Height					
PMD10	Powerex	Powder coated welded carbon steel tanks; powder coated welded carbon steel mounting frame	17	28	53	200	2.50	Extrapolated		
PMD17			17	28	53	200	2.50	Extrapolated		
PMD30			17	28	64	330	2.50	UUT3		
PMD35			17	28	64	330	2.42	Interpolated		
PMD45			17	28	72	360	2.42	Interpolated		
PMD55			17	28	72	360	2.42	Interpolated		
PMD60			35	28	67	660	2.42	Interpolated		
PMD71			35	28	67	660	2.42	Interpolated		
PMD90			35	28	76	720	2.42	Interpolated		
PMD110			35	28	76	720	2.42	Interpolated		
PMD111			35	28	76	720	2.42	UUT4b		
PMD07T			Powerex		18	28	37	185	2.50	UUT1
PMD10T	18	28			37	185	2.50	Interpolated ¹		
PMD17T	18	28			37	185	2.50	Interpolated ¹		
PLD10	Powerex	Powder coated welded carbon steel tanks; powder coated welded carbon steel mounting frame	17	28	53	200	2.50	Extrapolated		
PLD17			17	28	53	200	2.50	Extrapolated		
PLD30			17	28	64	330	2.50	UUT3		
PLD35			17	28	64	330	2.42	Interpolated		
PLD45			17	28	72	360	2.42	Interpolated		
PLD55			17	28	72	360	2.42	Interpolated		
PLD60			35	28	67	660	2.42	Interpolated		
PLD71			35	28	67	660	2.42	Interpolated		
PLD90			35	28	76	720	2.42	Interpolated		
PLD111			35	28	76	720	2.42	UUT4b		
PLD07T			Powerex		18	28	37	185	2.50	UUT1
PLD10T					18	28	37	185	2.50	Interpolated ¹
PLD17T	18	28			37	185	2.50	Interpolated ¹		
DME050RX	Parker-Domnick Hunter/Zander ²	Aluminum extruded towers; powder coated welded carbon steel mounting frame	22	9	56	176	2.42	UUT5b		
DME060RX			22	9	63	198	2.42	Interpolated		
DME080RX			22	9	73	229	2.42	UUT6d		
DME015	Parker-Domnick Hunter/Zander ²		12	11	33	81	2.42	UUT6b		
DME025			12	11	53	103	2.42	Interpolated		
DME030			12	11	59	114	2.42	Interpolated		
DME050			22	9	56	176	2.42	Interpolated		
DME060			22	9	63	198	2.42	UUT6c		
KMT3	Parker-Domnick Hunter/Zander ²		8	12	32	37	2.50	UUT2		
KMT4			8	12	54	54	2.42	UUT6a		
NDL110	Nano Psi	Aluminum extruded towers; powder coated carbon steel mounting frame	17	13	48	172	2.00	UUT9		
NDL120			17	13	52	209	2.00	Interpolated		
NDL130			17	13	56	262	2.00	UUT11		
NDL2110			25	12	47	366	2.00	UUT9		

Notes

1. The PMD10T/PLD10T and PMD17T/PLD17T are identical to the PMD07T/PLD07T, only with a slightly smaller internal orifice diameter (within 8-thousandths of an inch).
2. Zander is a division of Parker-Domnick Hunter
3. Dryers with PLD designation are structurally identical to PMD models in chart above.

Special Seismic Certification



Tested Units

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll

Tested Product Construction: Powder-coated carbon steel frame

Tested Options:

460 V, scroll pumps, vertical tanks, dew point monitor/probe desiccant, carbon monoxide monitor/sensor, controllers, motors, tank drains, aftercooler, intake filter elements, check valves and desiccant air dryers

Mounting Description: Rigid or flexible base mount (neoprene)

Model Number	Receiver Size	Dryer Model Number	Total number of pumps	Vertically stacked pumps or layers	Horizontally arrayed pumps	Dimensions (inches)			Weight (lb)	Mounting	Sds (g), z/h=1	UUT	
						Length	Width	Height					
MSD02034L5	80 Gal	PMD07T	2	2	1	50	31	78	1,040	Flexible base (neoprene)	2.50	UUT1	
LSD02034L5	80 Gal	KMT3	2	2	1	74	32	62	1,090		2.50	UUT2	
MSQ05044P5	120 Gal	PMD30	4	4	1	77	32	77	1,870		2.50	UUT3	
MSD15064L5 (controller/pump skid)	N/A	N/A	6	2	3	84 ¹	34	96 ¹	1,510		2.50	UUT4a	
MSD15064L5 (receiver/dryer skid)	240 Gal	PMD111	N/A	N/A	N/A		32		1,310		2.42	UUT4b	
MSQ15064L5 (controller/pump skid)	N/A	N/A	12	3	4	108 ¹	34	96 ¹	2,950		2.00	UUT7	
MSQ15064L5 (receiver/dryer skid)	240 Gal	DME050RX	n/a	n/a	n/a		32		1,310		2.42	UUT5b	
Dryer skid	N/A	KMT4, DME015, DME 060, DME 080RX	N/A	N/A	N/A	98	32	79	965		2.42	UUT6	
MSD15B44K5 (controller/pump skid)	N/A	N/A	4	4	1	61 ¹	33	78 ¹	1,550		Rigid base mount	2.00	UUT10a
MSD15B44K5 (receiver/dryer skid)	120 gal	PMD45	N/A	N/A	N/A		34		840			2.00	UUT10b
MSQ20B62P5 (controller/pump skid)	N/A	N/A	8	7	2	79 ¹	34	93 ¹	3,120	Flexible base (neoprene)	1.00	UUT11ai	
MSQ20B62P5 (receiver/dryer skid)	240 gal	Nano NDL130	N/A	N/A	N/A		43		1,680		1.00	UUT11bi	
MSQ20B62P5 (controller/pump skid)	N/A	N/A	8	7	2	79 ¹	34	93 ¹	3,120	Rigid base mount	2.00	UUT11aii	
MSQ20B62P5 (receiver/dryer skid)	240 gal	Nano NDL130	N/A	N/A	N/A		43		1,680		2.00	UUT11bii	
Dryer skid (NDL110 and NDL2110 dryers)	N/A	NDL110, NDL2110	N/A	N/A	N/A	55	31.5	67	800	Flexible base (neoprene)	2.00	UUT9	

1. Complete dimensions of unit when the two skids are installed next to each other.

UUT1

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: MSD02034L5

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary:

2HP scroll pump with WEG motor, 80 gallon vertical receiver tank, dew point monitor, CO monitor, BASIC_PSM controller in NEMA 12 enclosure, timer drain, aftercooler, intake filter element, check valve, and PMD07T desiccant air dryer.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,040	UUT1	50	31	78	6.3	5.8	24.3

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



The unit was base mounted to the shake table interface frame through the skid using neoprene pads and four 3/8"-diameter, Grade 5 bolts.

UUT2

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: LSD02034L5

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary:

2HP scroll pump with WEG motor, 80 gallon vertical receiver tank, dew point monitor, CO monitor, PBMI_PXMI controller in NEMA 12 enclosure, no-loss drain, aftercooler, intake filter element, check valve, and KMT3 desiccant air dryer.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,090	UUT2	74	32	62	8.8	8.0	13.5

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



The unit was base mounted to the shake table interface frame through the skid using neoprene pads and four 1/2"-diameter, Grade 5 bolts.

UUT3

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: MSQ05044P5

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary:

5HP scroll pump with WEG motor, 120 gallon vertical receiver tank, dew point monitor, CO monitor, PBMI_PXMI controller in NEMA 12 enclosure, timer drain, aftercooler, intake filter element, check valve, and PMD30 desiccant air dryer.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,870	UUT3	77	32	77	6.5	5.0	14.5

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



The unit was base mounted to the shake table interface frame through the skid using neoprene pads and four 1/2"-diameter, Grade 5 bolts.

UUT4a

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: MSD15064L5 (controller/pump skid)

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary:

5HP scroll pump with WEG motor, dew point monitor, CO monitor, PBMI_PXMI controller in NEMA 12 enclosure, timer drain, aftercooler, intake filter element and check valve.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,510	UUT4a	84*	34	96*	6.8	5.5	12.0

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.67	0.67

*Note: Length and height are combined dimensions for UUT4a and UUT4b.

Unit Mounting Description:



The unit was base mounted to the shake table interface frame through the skid using neoprene pads and four 1/2"-diameter, Grade 5 bolts.

UUT4b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: MSD15064L5 (receiver/dryer skid)

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary:

240 gallon vertical receiver tank and PMD111 desiccant air dryer.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,310	UUT4b	84*	32	96*	5.5	5.0	22.5

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.42	1.0	1.5	3.87	2.90	1.61	0.65

*Note: Length and height are combined dimensions for UUT4a and UUT4b.

Unit Mounting Description:



The unit was base mounted to the shake table interface frame through the skid using neoprene pads and four 1/2"-diameter, Grade 5 bolts.

UUT5b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: MSQ15064L5 (receiver/dryer skid)

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary:

240 gallon vertical receiver tank and DME050RX desiccant air dryer.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,310	UUT5b	108*	32	96*	6.3	5.5	17.5

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.42	1.0	1.5	3.87	2.90	1.61	0.65

*Note: Length and height are combined dimensions for UUT7 and UUT5b.

Unit Mounting Description:



The unit was base mounted to the shake table interface frame through the skid using neoprene pads and four 1/2"-diameter, Grade 5 bolts.

UUT6

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: Desiccant air dryers KMT4, DME015, DME060 and DME080RX

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary: KMT4, DME015, DME060 and DME080RX desiccant air dryers

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)			
		Length	Width	Height	Front-Back	Side-Side	Vertical
965	UUT6	98	32	79	7.5	5.0	8.0

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.42	1.0	1.5	3.87	2.90	1.61	0.65

Unit Mounting Description:



The unit was base mounted to the shake table interface frame using neoprene pads and four 1/2"-diameter, Grade 5 bolts.

UUT7

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: MSQ15064L5 (controller/pump skid)

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary:

5HP scroll pumps with WEG motors, dew point monitor, CO monitor, PBMI_PXMI controller in NEMA 12 enclosure, timer drain, aftercooler, intake filter element and check valve.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
2,950	UUT7	108*	34	96*	4.5	4.0	4.0

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

*Note: Length and height are combined dimensions for UUT7 and UUT5b.

Unit Mounting Description:



The unit was base mounted to the shake table interface frame through the skid using neoprene pads and four 1/2"-diameter, Grade 5 bolts.

UUT9

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: Desiccant air dryers NDL110 and NDL2110

Product Construction Summary:

Powder coated structural steel skid and frame

Options / Component Summary: NDL110 and NDL2110 desiccant air dryers.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
800	UUT9	55.0	31.5	67.0	6.5	6.5	19.5

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:



The unit was base mounted to the shake table interface frame through the skid using neoprene pads and four 1/2"-diameter, Grade 5 bolts.

UUT10a,b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: MSD15B44K5 controller/pump skid (UUT10a) and receiver/dryer skid (UUT10b)

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary: 7.5 HP scroll pumps with WEG motors, CO monitor, BASIC_PSM controller, aftercooler and intake filter element

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,550	UUT10a	61.0	33.0	78.0	6.5	4.5	24.0
840	UUT10b	61.0	34.0	76.0	4.0	6.0	23.0

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:



Each skid was base mounted to the shake table interface frame with four 1/2"-diameter, Grade 5 bolts.

UUT11ai,bi



UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: MSQ20B62P5 controller/pump skid (UUT11ai) and receiver/dryer skid (UUT11bi)

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary: 710 HP scroll pumps with WEG motors, CO monitor, PBMI_PXMI controller, aftercooler, intake filter element and check valve.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
3,120	UUT11ai	79.0	34.0	78.0	3.0	3.0	7.5
1,680	UUT11bi	79.0	43.0	93.0	4.5	4.0	17.0

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	1.00	1.0	1.5	1.60	1.20	0.67	0.27

Unit Mounting Description:



Each skid was base mounted to the shake table interface frame using neoprene pads and four 1/2"-diameter, Grade 5 bolts.

UUT11aii,bii

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Scroll and Lab Scroll Units

Model Number: MSQ20B62P5 controller/pump skid (UUT11aii) and receiver/dryer skid (UUT11bii)

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary: 710 HP scroll pumps with WEG motors, CO monitor, PBMI_PXMI controller, aftercooler, intake filter element and check valve.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
3,120	UUT11aii	79.0	34.0	78.0	3.0	3.0	7.5
1,680	UUT11bii	79.0	43.0	93.0	4.5	4.0	17.0

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:



Each skid was base mounted to the shake table interface frame with four 1/2"-diameter, Grade 5 bolts.