APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0380

HCAI Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Powerex, Inc.

Manufacturer's Technical Representative: Joe Abt

Mailing Address: 150 Production Drive, Harrison, OH 45030

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

Product Information

Product Name: Medical Gas and Vacuum Systems

Product Type: Medical Air and Vacuum Systems

Product Model Number: See attachment

General Description: Medical air and laboratory air units contain pumps, a receiver tank, controller and dryers. Medical gas automatic changeover manifolds are contained in wall mounted enclosures.

Mounting Description: Medical air and laboratory air units are rigidly base mounted or mounted using neoprene pads, Medical gas automatic changeover manifolds are rigidly wall mounted.

Tested Seismic Enhancements: Seismic enhancements made to the test units and/or modifications required to address anomalies during the tests shall be incorporated into the production units.

Applicant Information

Applicant Company Name: Dynamic Certification Laboratories

Contact Person: Kelly Laplace

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

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

Title: Business Manager

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

Company Name: THE VMC GROUP

Name: Kenneth Tarlow California License Number: S2851

Mailing Address: 980 9th Street, 16th Floor, Sacramento, CA 95814

Telephone: (832) 627-2214 Email: ken.tarlow@thevmcgroup.com

Certification Method

☐ GR-63-Core ☒ ICC-ES AC156 ☐ IEEE 344 ☐ IEEE 693 ☐ NEBS 3

☐ Other (Please Specify):

Testing Laboratory

Company Name: DYNAMIC CERTIFICATION LABORATORY (DCL)

Contact Person: Kelly Laplace

Mailing Address: 1315 Greg St., Ste 109, Sparks NV 89431

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

Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) =	3.6 for systems externally isolated with neoprene pads, 4.5 for rigid base mounted internally isolated systems, and 2.4 for rigid wall or base mounted units (with no internal isolations)
S_{DS} (Design spectral response acceleration at short period, g) =	2.0
a_p (Amplification factor) =	2.5
R_p (Response modification factor) =	2.5 (systems isolated with neoprene); 2.0 (internally isolated systems - rigid base mount); 6.0 (Rigidly mounted to wall or at base (without internal isolation))
Ω_0 (System overstrength factor) =	2.0
I_p (Importance factor) =	1.5
z/h (Height ratio factor) =	1
Natural frequencies (Hz) =	See Attachment
Overall dimensions and weight =	See Attachment

HCAI Approval (For Office Use Only) - Approval Expires on 01/23/2030

Date:	1/23/2024		
Name:	Timothy Piland	Title:	Senior Structural Engineer
Special Seismic Certification Valid Up to: S_{DS} (g) =	2.0	z/h =	1
Condition of Approval (if applicable):			

Special Seismic Certification

Table 1 - Certified Components - Stacked Units, Scroll Air Systems (Systems Containing 2,3 and 5 HP Pumps, Flexible Base Mount)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Flexible Base Mount

Systems Containing 2, 3, and 5 HP Pumps												
Medical Model Number	Laboratory Model Number [1]	HP Per Set	Vertical Receiver	Total Number of Pumps	Vertically Stacked Pumps or Layers	Horizontally Arrayed Pumps	Maximum Dimensions (in) [2]			Max. Operating Weight (lb) [2]	Mounting [3]	Unit
							Length	Width	Height			
Duplex												
MSD0203	LSD0203	2	80	2	2	1	50	31	78	1,040	Flexible base (neoprene) w/ internal isolation	UUT1
N/A	LSD0203 (tested with alternate dryer)	2	80	2	2	1	74	32	62	1,090		UUT2
MSD0303	LSD0303	3	80	2	2	1	50	31	78	1,100		Interpolated
MSD0503	LSD0503	5	80	2	2	1	50	31	78	1,200		Interpolated
MSD1004	LSD1004	10	120	4	4	1	78	32	77	1,800		Interpolated
MSD1005	N/A	10	200	4	4	1	83	32	84	1,900		Interpolated
MSD1506	N/A	15	240	6	2	3	84	66	96	2,820		UUT4a/4b [4]
Triplex												
MST0503	N/A	5	80	3	3	1	78	32	70	1650	Flexible base (neoprene) w/ internal isolation	Interpolated
N/A	LST0504	5	120	3	3	1	83	32	77	1,790		Interpolated
MST1005	LST1005	10	200	6	2	3	90	66	84	2800		Interpolated
MST1505	N/A	15	200	9	3	3	90	66	84	3900		Interpolated
Quadruplex												
MSQ0504	LSQ0504	5	120	4	4	1	77	32	77	1,870	Flexible base (neoprene) w/ internal isolation	UUT3
MSQ1005	LSQ1005	10	200	8	2	4	108	66	84	3,400		Interpolated
MSQ1006	N/A	10	240	8	2	4	108	66	96	3,530		Interpolated
MSQ1505	N/A	15	200	12	3	4	108	66	84	4,200		Interpolated
MSQ1506	N/A	15	240	12	3	4	108	66	96	4,260		UUT5b/UUT7 [4]
Pentaplex												
MSP0504	N/A	5	120	5	1, 2	2	84	66	77	2,475	Flexible base (neoprene) w/ internal isolation	Extrapolated [5]
MSP0505	N/A	5	200	5	1, 2	2	84	66	84	2,600		Extrapolated [5]
MSP1505	N/A	15	200	15	2, 3	3	90	148	84	5,100		Extrapolated [5]
MSP1506	N/A	15	240	15	2, 3	3	90	148	96	5,300		Extrapolated [5]

Table Continued on Next Page

1. Lab scroll units differ from medical scroll units by software change only.
2. Maximum dimensions and weights relate to options and receiver tank size.
3. Pump skids feature internal isolation. Skids with only dryers and tanks do not.
4. For units comprised of more than one skid, skids are structurally independent and flexibly attached. Flexible attachments are required between separate skids.
5. Extrapolated unit justification matrix is provided in Table 2.

Special Seismic Certification

Table 1 - Certified Components - Stacked Units, Scroll Air Systems (Continued)

(Systems Containing 2,3 and 5 HP Pumps, Flexible Base Mount)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Flexible Base Mount

Systems Containing 2, 3, and 5 HP Pumps												
Medical Model Number	Laboratory Model Number [1]	HP Per Set	Vertical Receiver	Total Number of Pumps	Vertically Stacked Pumps or Layers	Horizontally Arrayed Pumps	Maximum Dimensions (in) [2]			Max. Operating Weight (lb) [2]	Mounting [3]	Unit
							Length	Width	Height			
Hexaplex												
MSH0504	N/A	5	120	6	2	3	90	66	77	2,835	Flexible base (neoprene) w/ internal isolation	Extrapolated [4,5]
MSH0505	N/A	5	200	6	2	3	90	66	84	2,975		Extrapolated [4,5]
MSH1006	N/A	10	240	12	3	4	108	73	96	4,250		Extrapolated [4,5]
MSH1506	N/A	15	240	18	3, 3	3	94	150	96	6,020		Extrapolated [4,5]
Seven to Twelve Pump Systems												
MSS0504	N/A	5	120	7	2	4 lower, 3 upper	103	66	82	2,900	Flexible base (neoprene) w/ internal isolation	Extrapolated [4,5]
MSS0505	N/A	5	200	7	2	4 lower, 3 upper	103	66	84	3,190		Extrapolated [4,5]
MSO0505	N/A	5	200	8	2	4	103	66	84	3,350		Extrapolated [4,5]
MSN0505	N/A	5	200	9	3	3	94	66	84	3,900		Extrapolated [4,5]
MSJ0505	N/A	5	200	10	3	4 lower, 4 mid, 2 upper	104	66	84	3,700		Extrapolated [4,5]
MSJ0506	N/A	5	240	10	3	4 lower, 4 mid, 2 upper	104	66	96	3,900		Extrapolated [4,5]
MSK0505	N/A	5	200	11	3	4 lower, 4 mid, 3 upper	104	66	84	3,900		Extrapolated [4,5]
MSK0506	N/A	5	240	11	3	4 lower, 4 mid, 3 upper	104	66	96	4,175		Extrapolated [4,5]
MSL0505	N/A	5	200	12	3	4	104	66	84	4,100		Extrapolated [4,5]
MSL0506	N/A	5	240	12	3	4	104	66	96	4,360		Extrapolated [4,5]

1. Lab scroll units differ from medical scroll units by software change only.
2. Maximum dimensions and weights relate to options and receiver tank size.
3. Pump skids feature internal isolation. Skids with only dryers and tanks do not.
4. For units comprised of more than one skid, skids are structurally independent and flexibly attached. Flexible attachments are required between separate skids.
5. Extrapolated unit justification matrix is provided in Table 2.

Special Seismic Certification
Table 2 - Justification Matrix for Extrapolation - Stacked Units, Scroll Air Systems
(Systems Containing 2, 3 and 5 HP Pumps, Flexible Base Mount)

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Flexible Base Mount

Systems Containing 2, 3 and 5 HP Pumps			
Extrapolated Unit (Medical)	Extrapolated Unit (Laboratory)	Units Used for Extrapolation	Difference From Units Used for Extrapolation
MSP0504	N/A	UUT4 (MSD1504)	One fewer pump
MSP0505	N/A	UUT4 (MSD1504)	One fewer pump and larger 200 gal receiver (240 gal receiver tested in UUT5b/UUT7)
MSP1505	N/A	Interpolated unit MST1505	Has an additional pump skid similar to UUT4 and includes 24" spacing between each of the skids
MSP1506	N/A	Interpolated unit MST1505	Has an additional pump skid similar to UUT4 and includes 24" spacing between each of the skids
MSH0504	N/A	UUT4 (MSD1504)	Has 6 pumps in a two-high, three-wide configuration
MSH0505	N/A	UUT4 (MSD1504)	Has 6 pumps in a two-high, three-wide configuration and larger 200 gal receiver (240 gal receiver tested in UUT5b/UUT7)
MSH1006	N/A	UUT5b/UUT7 (MSQ1506)	Includes 6" space between the two system frame modules
MSH1506	N/A	Interpolated unit MST1505	Has additional pump skid and includes 24" spacing between each of the skids with 240 gal receiver similar to UUT5
MSS0504	N/A	UUT5b/UUT7 (MSQ1506)	One less row of pumps and a smaller receiver tank (one pump less than interpolated MSQ1005)
MSS0505	N/A	UUT5b/UUT7 (MSQ1506)	One less row of pumps and a smaller receiver tank (one pump less than interpolated MSQ1005)
MSO0505	N/A	UUT5b/UUT7 (MSQ1506)	One less row of pumps and a smaller receiver tank
MSN0505	N/A	UUT5b/UUT7 (MSQ1506)	One less column of pumps and a smaller receiver tank
MSJ0505	N/A	UUT5b/UUT7 (MSQ1506)	Two fewer pumps in the top row and a smaller receiver tank
MSJ0506	N/A	UUT5b/UUT7 (MSQ1506)	Two fewer pumps in the top row
MSK0505	N/A	UUT5b/UUT7 (MSQ1506)	One fewer pump in the top row and a smaller receiver tank
MSK0506	N/A	UUT5b/UUT7 (MSQ1506)	One fewer pump in the top row
MSL0505	N/A	UUT5b/UUT7 (MSQ1506)	Smaller receiver tank
MSL0506	N/A	UUT5b/UUT7 (MSQ1506)	Software change only

Special Seismic Certification
Table 3 - Certified Components - Stacked Units, Scroll Air Systems
(Systems Containing 2, 3 and 5 HP Pumps, Rigid Base Mount)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Systems Containing 2, 3, and 5 HP Pumps													
Medical Model Number	Laboratory Model Number [1]	HP Per Set	Vertical Receiver Gallons	Total Number of Pumps	Vertically Stacked Pumps or Layers	Horizontally Arrayed Pumps	# Independently Mounted & Plumbed Assemblies	Maximum Dimensions (in) [2]			Max. Operating Weight (lb) [2]	Mounting [3]	Unit
								Length	Width	Height			
Duplex													
MSD02A3	LSD02A3	2	80	2	2	1	1	50	34	74	1,090	Rigid base w/ internal isolation	UUT32
MSD03A3	LSD03A3	3	80	2	2	1	1	50	34	74	1,120		Interpolated
MSD05A3	LSD05A3	5	80	2	2	1	1	50	34	74	1,300		Interpolated
MSD10A4	LSD10A4	10	120	4	4	1	2	51	73	75	2,120		Interpolated
MSD10A5	LSD10A5	10	200	4	4	1	2	51	73	85	2,360		Interpolated
MSD10A6	LSD10A6	10	240	4	4	1	2	51	73	94	2,470		Interpolated
MSD15A5	LSD15A5	15	200	6	2	3	2	60	73	86	3,030		Interpolated
MSD15A6	LSD15A6	15	240	6	2	3	2	60	73	94	3,090		Interpolated
Triplex													
MST03A3	LST03A3	3	80	3	3	1	2	51	73	74	1585	Rigid base w/ internal isolation	Interpolated
MST05A3	LST05A3	5	80	3	3	1	2	51	73	74	1826		Interpolated
MST05A4	LST05A4	5	120	3	3	1	2	51	73	75	1,936		Interpolated
MST10A4	LST10A4	10	120	6	3	2	2	60	73	75	2,995		Interpolated
MST10A5	LST10A5	10	200	6	3	2	2	60	73	86	3230		Interpolated
MST10A6	LST10A6	10	240	6	3	2	2	60	73	94	3320		Interpolated
MST15A4	LST15A4	15	120	9	3	3	2	73	73	75	3930		Interpolated
MST15A5	LST15A5	15	200	9	3	3	2	73	73	86	4201		Interpolated
MST15A6	LST15A6	15	240	9	3	3	2	73	73	94	4260		Interpolated
Quadruplex													
MSQ05A4	LSQ05A4	5	120	4	4	1	1	51	73	75	2,180	Rigid base w/ internal isolation	Interpolated
MSQ10A5	LSQ10A5	10	200	8	2	4	2	60	73	86	3,790		Interpolated
MSQ10A6	LSQ10A6	10	240	8	2	4	2	60	73	94	3,840		Interpolated
MSQ15A5	LSQ15A5	15	200	12	3	4	2	73	73	86	5,620		Interpolated
MSQ15A6	LSQ15A6	15	240	12	3	4	2	73	73	94	5,680		Interpolated
Pentaplex													
MSP15A5	LSP15A5	15	200	15	3,4,4,4	4	2	85	73	86	6,080	Rigid base w/ internal isolation	Interpolated
MSP15A6	LSP15A6	15	240	15	3,4,4,4	4	2	86	73	91	6,140		UUT33i,ii [4]
Hexaplex													
MSH05A4	LSH05A4	5	120	6	2	3	2	60	75	75	2,990	Rigid base w/ internal isolation	Interpolated
MSH05A5	LSH05A5	5	200	6	2	3	2	60	75	86	3,230		Interpolated
MSH10A6	LSH10A6	10	240	12	3	4	2	73	73	94	5,680		Interpolated
MSH15A5	LSH15A5	15	200	18	3	6	3	85	113	86	7,750		Extrapolated [5]
MSH15A6	LSH15A6	15	240	18	3	6	3	85	113	94	7,810		Extrapolated [5]
Nine-plex													
MSN05A5	LSN05A5	5	200	9	3	3	2	73	73	86	4,680	Rigid base w/ internal isolation	Interpolated

1. Lab scroll units differ from medical scroll units by software change only.
2. Maximum dimensions and weights relate to options and receiver tank size.
3. Pump skids feature internal isolation. Skids with only dryers and tanks do not.
4. For units comprised of more than one skid, skids are structurally independent and flexibly attached. Flexible attachments are required between separate skids.
5. Extrapolated unit justification matrix is provided in Table 4.

Special Seismic Certification
Table 4 - Justification Matrix for Extrapolation - Stacked Units, Scroll Air Systems
(Systems Containing 2, 3 and 5 HP Pumps, Rigid Base Mount)

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Systems Containing 2, 3 and 5 HP Pumps			
Extrapolated Unit (Medical)	Extrapolated Unit (Laboratory)	Units Used for Extrapolation	Difference From Units Used for Extrapolation
MSH15A5	N/A	UUT32/UUT33 (MST15A5)	Same pump rack duplicated with tank, dryer, and controller from UUT4
MSH15A6	N/A	UUT32/UUT33 (MST15A6)	Same pump rack duplicated with tank, dryer, and controller from UUT4

Special Seismic Certification
Table 5 - Certified Components - Stacked Units, Scroll Air Systems
(Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount, Partially Welded Compressor Skid Design)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301
Manufacturer: Powerex
Product Line: Medical Air and Laboratory Air
Mounting: Rigid Base Mount

Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount												
Medical Air Model Number	Laboratory Air Model Number [1]	HP Per Set	Vertical Receiver Gallons	Total Number of Pumps	Vertically Stacked Pumps or Layers	Horizontally Arrayed Pumps	Maximum Dimensions (in) [2]			Max. Operating Weight (lb.)[2]	Mounting [4]	Unit
							Length	Width	Height			
Systems with 80 to 240 Gallon Tanks												
Duplex												
MSD0753	LSD0753	7.5	80	2	2	1	61	66	68	2,205	Rigid base w/ internal isolation	Extrapolated [5]
MSD0754	LSD0754	7.5	120	2	2	1	61	66	78	2,260		Extrapolated [5]
MSD10B4	LSD10B4	10	120	2	2	1	61	66	78	2,310		Extrapolated [5]
MSD15B4	LSD15B4	15	120	4	4	1	61	66	78	2,390		UUT10a/10b [6]
MSD20B4	LSD20B4	20	120	4	4	1	61	66	78	2,500		Interpolated
Triplex												
MST0755	LST0755	7.5	200	3	3	1	61	66	81	2,400	Rigid base w/ internal isolation	Interpolated
MST10B5	LST10B5	10	200	3	3	1	61	66	81	2,550		Interpolated
MST15B5	LST15B5	15	200	6	3	2	79	90	81	4,200		Interpolated
MST15B6	LST15B6	15	240	6	3	2	79	90	93	4,300		Interpolated
MST20B5	LST20B5	20	200	6	3	2	79	90	81	4,450		Interpolated
MST20B6	LST20B6	20	240	6	3	2	79	90	93	4,550		Interpolated
Quadruplex												
MSQ0755	LSQ0755	7.5	200	4	4	1	66	61	81	2,650	Rigid base w/ internal isolation	Interpolated
MSQ10B5	LSQ10B5	10	200	4	4	1	66	61	81	2,750		Interpolated
MSQ15B5	LSQ15B5	15	200	8	4	2	79	90	81	4,450		Interpolated
MSQ15B6	LSQ15B6	15	240	8	4	2	79	90	93	4,550		Interpolated
MSQ20B5	LSQ20B5	20	200	8	4	2	79	90	81	4,700		Interpolated
MSQ20B6	LSQ20B6	20	240	8	4	2	79	90 [3]	93	4,800		UUT11aii/bii [6]
Pentaplex												
MSP15B6	LSP15B6	15	240	10	4 max, partial fill	3	76	138	93	7,000	Rigid base w/ internal isolation	Extrapolated [5]
MSP20B6	LSP20B6	20	240	10	4 max, partial fill	3	76	138	93	7,200		Extrapolated [5]
Hexaplex												
MSH15B6	LSH15B6	15	240	12	4	3	76	138	93	8,200	Rigid base w/ internal isolation	Extrapolated [5]
MSH20B6	LSH20B6	20	240	12	4	3	76	138	93	8,600		Extrapolated [5]

Table Continued on Next Page

1. Lab scroll units differ from medical scroll units by software change only.
2. Maximum dimensions and weights are calculated, and take into account options and receiver tank size.
3. Maximum width shown for 11aii/bii is an overall width dimension that includes an 18" separation between the two equipment skids.
4. Pump skids feature internal isolation. Skids with dryers and tanks do not.
5. Extrapolated unit justification matrix is provided in Table 6.
6. For units comprised of more than one skid, skids are structurally independent and flexibly attached. Flexible attachments are required between separate skids.

Special Seismic Certification

Table 5 - Certified Components - Stacked Units, Scroll Air Systems (Continued)

(Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount, Partially Welded Compressor Skid Design)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount												
Medical Air Model Number	Laboratory Air Model Number [1]	HP Per Set	Vertical Receiver Gallons	Total Number of Pumps	Vertically Stacked Pumps or Layers	Horizontally Arrayed Pumps	Maximum Dimensions (in) [2]			Max. Operating Weight (lb) [2]	Mounting [3]	Unit
							Length	Width	Height			
Systems with 400 or 660 Gallon Tanks (Tank separately mounted and flexibly plumbed)												
Pentaplex												
MSP15B7	LSP15B7	15	400	10	4 max, partial fill	3	96	158	102	7,400	Rigid base w/ internal isolation	Extrapolated [4,5], w/ UUT12c tank
MSP20B7	LSP20B7	20	400	10	4 max, partial fill	3	96	158	102	7,600		Extrapolated [4,5], w/ UUT12c tank
MSP15B8	LSP15B8	15	660	10	4 max, partial fill	3	99	163	127	8,100		Extrapolated [4,5], w/ UUT15b tank
MSP20B8	LSP20B8	20	660	10	4 max, partial fill	3	99	163	127	8,300		Extrapolated [4,5], w/ UUT15b tank
Hexaplex												
MSH15B7	LSH15B7	15	400	12	4	3	96	158	102	8,600	Rigid base w/ internal isolation	Extrapolated [4,5], w/ UUT12c tank
MSH20B7	LSH20B7	20	400	12	4	3	96	158	102	9,000		Extrapolated [4,5], w/ UUT12c tank
MSH15B8	LSH15B8	15	660	12	4	3	99	163	127	9,300		Extrapolated [4,5], w/ UUT15b tank
MSH20B8	LSH20B8	20	660	12	4	3	99	163	127	9,700		Extrapolated [4,5], w/ UUT15b tank
400 and 660 Gallon Tanks												
Tank Model No.	Description						Max. Dimensions (in)			Weight (lb)	Mounting	Unit
							Length	Width	Height			
AR063700AV	400 gal						38	47	102	640	Rigid base	UUT12c
AR660000AV	660 gal						42	42	127	1,500		UUT15b

1. Lab scroll units differ from medical scroll units by software change only.
2. Maximum dimensions and weights are calculated, and take into account options and receiver tank size.
3. Pump skids feature internal isolation. Skids with dryers and tanks do not.
4. Extrapolated unit justification matrix is provided in Table 6.
5. For units comprised of more than one skid, skids are structurally independent and flexibly attached. Flexible attachments are required between separate skids.

Special Seismic Certification

Table 6 - Justification Matrix for Extrapolation - Stacked Units, Scroll Air Systems

(Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount, Partially Welded Compressor Skid Design)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Systems Containing 7.5 and 10 HP Pumps			
Extrapolated Unit (Medical)	Extrapolated Unit (Laboratory)	Units Used for Extrapolation	Difference From Units Used for Extrapolation
MSD0753	LSD0753	UUT10 (MSD15B4)	Two fewer pump-motor assemblies in rack; tank is smaller from UUT1
MSD0754	LSD0754	UUT10 (MSD15B4)	Two fewer pump-motor assemblies in rack
MSD10B4	LSD10B4	UUT10 (MSD15B4)	Two fewer pump-motor assemblies in rack; same pump-motor assemblies as in UUT11
MSP15B6	LSP15B6	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506)	10 total pumps; one 2-high compressor stack (depopulated variant of UUT10a without controller) and two 4-high compressor stacks identical to UUT11aii using 7.5 HP pumps and motors instead of 10 HP. Controller is a depopulated variant of the controller tested on UUT7 (10 of 12 circuits). The tank/dryer skid is identical to UUT5b and featuring dryers tested in UUT6 or UUT9
MSP20B6	LSP20B6	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506)	10 total pumps; one 2-high compressor stack (depopulated 10 hp variant of UUT10a without controller) and two 4-high compressor stacks identical to UUT11aii. Controller is a depopulated variant of the controller tested on UUT7 (10 of 12 circuits). The tank/dryer skid is identical to UUT5b and featuring dryers tested in UUT6 or UUT9
MSH15B6	LSH15B6	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506)	12 total pumps; one 4-high compressor stack (10HP variant of UUT10a) and two 4-high compressor stacks which are 7.5 HP variants of UUT11aii. Controller is a variant of the controller tested on UUT7 (using 12 circuits). The tank/dryer skid is identical to UUT5b and featuring dryers tested in UUT6 or UUT9
MSH20B6	LSH20B6	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506)	12 total pumps; one 4-high compressor stack (variant of UUT10a without controller) and two 4-high compressor stacks identical to UUT11aii using 7.5 HP pumps and motors instead of 10 HP. Controller is a variant of the controller tested on UUT7 (using 12 circuits). The tank/dryer skid is identical to UUT5b and featuring dryers tested in UUT6 or UUT9
MSP15B7	LSP15B7	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506), UUT12c (400gal receiver)	Same as MSP15B6 above, except tank/dryer skid deletes receiver tank and added separately mounted/flexibly plumbed 400gal receiver as in UUT12c
MSP20B7	LSP20B7	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506), UUT12c (400gal receiver)	Same as MSP20B6 above, except tank/dryer skid deletes receiver tank, add separately mounted/flexibly plumbed 400gal receiver as in UUT12c
MSP15B8	LSP15B8	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506), UUT15b (660gal receiver)	Same as MSP15B6 above, except tank/dryer skid deletes receiver tank, add separately mounted/flexibly plumbed 660gal receiver as in UUT15b
MSP20B8	LSP20B8	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506), UUT15b (660gal receiver)	Same as MSP20B6 above, except tank/dryer skid deletes receiver tank, add separately mounted/flexibly plumbed 660gal receiver as in UUT15b
MSH15B7	LSH15B7	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506), UUT12c (400gal receiver)	Same as MSH15B6 above, except tank/dryer skid deletes receiver tank; add separately mounted/flexibly plumbed 400gal receiver as in UUT12c
MSH20B7	LSH20B7	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506), UUT12c (400gal receiver)	Same as MSH20B6 above, except tank/dryer skid deletes receiver tank; add separately mounted/flexibly plumbed 400gal receiver as in UUT12c
MSH15B8	LSH15B8	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506), UUT15b (660gal receiver)	Same as MSH15B6 above, except tank/dryer skid deletes receiver tank; add separately mounted/flexibly plumbed 660gal receiver as in UUT15b
MSH20B8	LSH20B8	UUT10 (MSD15B4), UUT11 (MSQ20B6), UUT7 (MSQ1506), UUT15b (660gal receiver)	Same as MSH20B6 above, except tank/dryer skid deletes receiver tank; add separately mounted/flexibly plumbed 660gal receiver as in UUT15b

Special Seismic Certification

Table 7 - Certified Components - Stacked Units, Scroll Air Systems

(Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount, Bolted Compressor Skid Design)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301
Manufacturer: Powerex
Product Line: Medical Air and Laboratory Air
Mounting: Rigid Base Mount

Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount												
Medical Air Model Number	Laboratory Air Model Number [1]	HP Per Set	Vertical Receiver Gallons	Total Number of Pumps	Vertically Stacked Pumps or Layers	Horizontally Arrayed Pumps	Maximum Dimensions (in) [2]			Max. Operating Weight (lb) [2]	Mounting [3]	Unit
							Length	Width	Height			
Systems with 120 to 240 Gallon Tanks												
Duplex												
MSD07C4	LSD07C4	7.5	120	2	2	1	60	69	75.5	1,950	Rigid base w/ internal isolation	Extrapolated
MSD07C5	LSD07C5	7.5	200	2	2	1	60	69	82	2,020		Extrapolated
MSD10C4	LSD10C4	10	120	2	2	1	60	69	75.5	2,150		Extrapolated
MSD10C5	LSD10C5	10	200	2	2	1	60	69	82	2,200		Extrapolated
MSD10C6	LSD10C6	10	240	2	2	1	60	69	94	2,250		Extrapolated
MSD15C5	LSD15C5	15	200	4	4	1	60	69	82	2,775		Extrapolated
MSD15C6	LSD15C6	15	240	4	4	1	60	69	94	2,850		Extrapolated
MSD15C4	LSD15B4	15	120	4	4	1	60	69	75.5	2,860		Extrapolated
MSD20C4	LSD20B4	20	120	4	4	1	60	69	75.5	2,970		Extrapolated
MSD20C5	LSD20C5	20	200	4	4	1	60	69	82	3,020		Extrapolated
MSD20C6	LSD20C6	20	240	4	4	1	60	69	94	3,175		Extrapolated
Triplex												
MST07C4	LST07C4	7.5	120	3	3	1	60	69	75.5	2,210	Rigid base w/ internal isolation	Extrapolated
MST10C4	LST10C4	10	120	3	3	1	60	69	75.5	2300		Extrapolated
MST07C5	LST07C5	7.5	200	3	3	1	60	69	82	2,430		Extrapolated
MST10C6	LST10C6	10	240	3	3	1	60	69	94	2,500		Extrapolated
MST10C5	LST10C5	10	200	3	3	1	60	69	82	2,700		Extrapolated
MST15C5	LST15C5	15	200	6	3	2	70.5	69	82	3,760		Extrapolated
MST15C6	LST15C6	15	240	6	3	2	70.5	69	82	3,830		Extrapolated
MST20C5	LST20C5	20	200	6	3	2	70.5	69	82	4,160		Extrapolated
MST20C6	LST20C6	20	240	6	3	2	70.5	69	82	4,229		Extrapolated
Quadruplex												
MSQ07C5	LSQ07C5	7.5	200	4	4	1	60	69	82	3,080	Rigid base w/ internal isolation	Extrapolated
MSQ07C6	LSQ07C6	7.5	240	4	4	1	60	69	94	3,150		Extrapolated
MSQ10C5	LSQ10C5	10	200	4	4	1	60	69	82	3,310		Extrapolated
MSQ10C6	LSQ10C6	10	240	4	4	1	60	69	94	3,375		UUT35 [4]
MSQ15C5	LSQ15C5	15	200	8	4	2	70.5	69	82	4,495		Interpolated
MSQ15C6	LSQ15C6	15	240	8	4	2	70.5	69	94	4,562		Interpolated
MSQ20C5	LSQ20C5	20	200	8	4	2	70.5	69	82	5,495		Interpolated
MSQ20C6	LSQ20C6	20	240	8	4	2	70.5	69	94	5,568		Interpolated
Pentaplex												
MSP10C5	LSP10C5	10	200	5	3,2	2	70.5	69	82	3,810	Rigid base w/ internal isolation	Extrapolated [5,6]
MSP10C6	LSP10C6	15	240	5	3,2	2	70.5	69	94	3,910		Extrapolated [5,6]
MSP15C5	LSP15C5	15	200	10	3,3,4	3	90.5	69	87	5,920		Extrapolated [5,6]
MSP15C6	LSP15C6	15	240	10	3,3,4	3	90.5	69	94	5,995		Extrapolated [5,6]
MSP20C6	LSP20C6	20	240	10	3,3,4	3	90.5	69	94	6,680		Extrapolated [5,6]

Table Continued on Next Page

1. Lab scroll units differ from medical scroll units by software change only.
2. Maximum dimensions and weights are calculated, and take into account options and receiver tank size.
3. Compressor skids feature internal isolation. Receiver/dryer skids do not.
4. The weight and dimensions of the described model include compressor skid UUT35 plus the tank/dryer skid frame tested with UUT10a, dryer tested in UUT33i, and 240 gallon tank tested with UUT30a. UUT35 is the most seismically vulnerable compressor skid.
5. For units comprised of more than one skid, skids are structurally independent and flexibly connected. Flexible attachments are required between separate skids.
6. Extrapolated unit justification matrix is provided in Table 8.

Special Seismic Certification
Table 7 - Certified Components - Stacked Units, Scroll Air Systems (Continued)
(Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount, Bolted Compressor Skid Design)

DCL DYNAMIC CERTIFICATION LABORATORIES, LLC

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount												
Medical Air Model Number	Laboratory Air Model Number [1]	HP Per Set	Vertical Receiver Gallons	Total Number of Pumps	Vertically Stacked Pumps or Layers	Horizontally Arrayed Pumps	Maximum Dimensions (in) [2]			Max. Operating Weight (lb) [2]	Mounting [3]	Unit
							Length	Width	Height			
Hexaplex and greater												
MSH10C5	LSH10C5	10	200	6	3	2	70.5	69	82	4,200	Rigid base w/ internal isolation	Interpolated
MSH10C6	LSH10C6	10	240	6	3	2	70.5	69	82	4,300		Interpolated
MSO10C6	LSO10C6	10	240	8	4	2	70.5	69	94	5,570		Interpolated
MSN10C6	LSN10C6	10	240	9	3	3	90.5	69	94	6,230		Interpolated
MSH15C5	LSH15C5	15	200	12	4	3	90.5	69	87	6,610		Interpolated
MSH15C6	LSH15C6	15	240	12	4	3	90.5	69	94	6,690		Interpolated
MSH20C6	LSH20C6	20	240	12	4	3	90.5	69	94	7,470		UUT36 [4]
Expandable models (Factory built with structure and controls for accommodating additional pump-motor sets)												
MSD07C4xxx-EX3	LSD07C4xxx-EX3	7.5	120	2, expandable to 3	2 exp. to 3	1	60	69	75.5	2,210	Rigid base w/ internal isolation	Extrapolated [5,6]
MSD07C5xxx-EX3	LSD07C5xxx-EX3	7.5	200	2, expandable to 3	2 exp. to 3	1	60	69	82	2,430		Extrapolated [5,6]
MSD07C6xxx-EX3	LSD07C6xxx-EX3	7.5	240	2, expandable to 3	2 exp. to 3	1	60	69	94	2,500		Extrapolated [5,6]
MSD10C5xxx-EX3	LSD10C5xxx-EX3	10	200	2, expandable to 3	2 exp. to 3	1	60	69	82	2,700		Extrapolated [5,6]
MSD10C6xxx-EX3	LSD10C6xxx-EX3	10	240	2, expandable to 3	2 exp. to 3	1	60	69	94	2,500		Extrapolated [5,6]
MST07C5xxx-EX4	LST07C5xxx-EX4	7.5	200	3, expandable to 4	3 exp. to 4	1	60	69	82	3,080		Extrapolated [5,6]
MST07C6xxx-EX4	LST07C6xxx-EX4	7.5	240	3, expandable to 4	3 exp. to 4	1	60	69	94	3,150		Extrapolated [5,6]
MST10C5xxx-EX4	LST10C5xxx-EX4	10	200	3, expandable to 4	3 exp. to 4	1	60	69	82	3,310		Extrapolated [5,6]
MST10C6xxx-EX4	LST10C6xxx-EX4	10	240	3, expandable to 4	3 exp. to 4	1	60	69	94	3,375		Extrapolated [5,6]
MSD15C5xxx-EX3	LSD15C5xxx-EX3	15	200	4, expandable to 6	2 exp. to 3	2	70.5	69	82	3,760		Extrapolated [5,6]
MSD15C6xxx-EX3	LSD15C6xxx-EX3	15	240	4, expandable to 6	2 exp. to 3	2	70.5	69	94	3,830		Extrapolated [5,6]
MSD20C5xxx-EX3	LSD20C5xxx-EX3	20	200	4, expandable to 6	2 exp. to 3	2	70.5	69	82	4,160		Extrapolated [5,6]
MSD20C6xxx-EX3	LSD20C6xxx-EX3	20	240	4, expandable to 6	2 exp. to 3	2	70.5	69	82	4,229		Extrapolated [5,6]
MST15C5xxx-EX4	LST15C5xxx-EX4	15	200	6, expandable to 8	3 exp. to 4	2	70.5	69	82	4,495		Extrapolated [5,6]
MST15C6xxx-EX4	LST15C6xxx-EX4	15	240	6, expandable to 8	3 exp. to 4	2	70.5	69	94	4,562		Extrapolated [5,6]
MST20C5xxx-EX4	LST20C5xxx-EX4	20	200	6, expandable to 8	3 exp. to 4	2	70.5	69	82	5,495		Extrapolated [5,6]
MST20C6xxx-EX4	LST20C6xxx-EX4	20	240	6, expandable to 8	3 exp. to 4	2	70.5	69	94	5,568		Extrapolated [5,6]
MSQ15C5xxx-EX5	LSQ15C5xxx-EX5	15	200	8, expandable to 10	2,3,3 exp. to 3,3,4	3	90.5	69	82	5,920		Extrapolated [5,6]
MSQ15C6xxx-EX5	LSQ15C6xxx-EX5	15	240	8, expandable to 10	2,3,3 exp. to 3,3,4	3	90.5	69	94	5,995		Extrapolated [5,6]
MSP15C6xxx-EX6	LSP15C6xxx-EX6	15	240	10, expandable to 12	3,3,4 exp. to 4,4,4	3	90.5	69	94	6,690		Extrapolated [5,6]
MSP20C6xxx-EX6	LSP20C6xxx-EX6	20	240	10, expandable to 12	3,3,4 exp. to 4,4,4	3	90.5	69	94	7,470		Extrapolated [5,6]

Continued on Next Page

1. Lab scroll units differ from medical scroll units by software change only.
2. Maximum dimensions and weights are calculated, and take into account options and receiver tank size.
3. Compressor skids feature internal isolation. Tank/dryer skids do not.
4. The weight and dimensions of the described model include pump skid UUT36 plus the tank/dryer skid frame tested with UUT11bii, dryer tested in UUT33i, and 240 gallon tank tested with UUT30a. UUT36 is the largest and heaviest compressor skid.
5. Extrapolated unit justification matrix is provided in Table 8.
6. For units comprised of more than one skid, skids are structurally independent and flexibly connected. Flexible attachments are required between separate skids.

Special Seismic Certification
Table 7 - Certified Components - Stacked Units, Scroll Air Systems (Continued)
(Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount, Bolted Compressor Skid Design)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount												
Medical Air Model Number [1]	Laboratory Air Model Number [1]	HP Per Set	Vertical Receiver Gallons	Total Number of Pumps	Vertically Stacked Pumps or Layers	Horizontally Arrayed Pumps	Maximum Dimensions (in) [2]			Max. Operating Weight (lb) [2]	Mounting [3]	Unit
							Length	Width	Height			
Systems with 400 or 660 Gallon Tanks (Tank separately mounted and flexibly plumbed)												
Pentaplex (dimensions and weight without the separately mounted tank)												
MSP15C7	LSP15C7	15	400	10	4 max, partial fill	3	90.5	69	87	5,350	Rigid base w/ internal isolation	Extrapolated [4,5]
MSP15C8	LSP15C8	15	660	10	4 max, partial fill	3	90.5	69	87	5,350		Extrapolated [4,5]
MSP20C7	LSP20C7	20	400	10	4 max, partial fill	3	90.5	69	87	6,130		Extrapolated [4,5]
MSP20C8	LSP20C8	20	660	10	4 max, partial fill	3	90.5	69	87	6,130		Extrapolated [4,5]
Hexaplex												
MSH15C7	LSH15C7	15	400	12	4	3	90.5	69	87	6,060	Rigid base w/ internal isolation	Extrapolated [4,5]
MSH15C8	LSH15C8	15	660	12	4	3	90.5	69	87	6,060		Extrapolated [4,5]
MSH20C7	LSH20C7	20	400	12	4	3	90.5	69	87	6,930		Extrapolated [4,5]
MSH20C8	LSH20C8	20	660	12	4	3	90.5	69	87	6,930		Extrapolated [4,5]

1. Lab scroll units differ from medical scroll units by software change only.
2. Maximum dimensions and weights are calculated, and take into account options and receiver tank size.
3. Compressor skids feature internal isolation.
4. Extrapolated unit justification matrix is provided in Table 8.
5. For units comprised of more than one skid, skids are structurally independent and flexibly connected. Flexible attachments are required between separate skids.

Special Seismic Certification
Table 8 - Justification Matrix for Extrapolation - Stacked Units, Scroll Air Systems
(Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount, Bolted Compressor Skid Design)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Systems Containing 7.5 and 10 HP Pumps			
Extrapolated Unit (Medical)	Extrapolated Unit (Laboratory)	Units Used for Extrapolation	Difference From Units Used for Extrapolation
MSD07C4	LSD07C4	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems feature (1) two-high by one-wide compressor skid while both tested units featured four-high compressor skids. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10a and UUT11bii.
MSD07C5	LSD07C5		
MSD10C4	LSD10C4		
MSD10C5	LSD10C5		
MSD10C6	LSD10C6		
MSD15C5	LSD15C5	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems feature (1) four-high by one-wide compressor skid that is equivalent or lighter weight to UUT35. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10a and UUT11bii.
MSD15C6	LSD15C6		
MSD15C4	LSD15B4		
MSD20C4	LSD20B4		
MSD20C5	LSD20C5		
MSD20C6	LSD20C6		
MST07C4	LST07C4	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems feature (1) three-high by one-wide compressor skid with equivalent or lighter weight to the skid tested in UUT35. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10a and UUT11bii.
MST10C4	LST10C4		
MST07C5	LST07C5		
MST10C6	LST10C6		
MST10C5	LST10C5	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems feature (1) three-high by two-wide compressor skid while both tested units featured four-high compressor skids. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10a and UUT11bii.
MST15C5	LST15C5		
MST15C6	LST15C6		
MST20C5	LST20C5		
MST20C6	LST20C6		
MSQ07C5	LSQ07C5	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems feature (1) four-high by one-wide compressor skid that are equivalent or lighter weight to UUT35. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10a and UUT11bii.
MSQ07C6	LSQ07C6		
MSQ10C5	LSQ10C5		
MSP10C5	LSP10C5	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems feature (1) three-high by one-wide and (1) two-high by one-wide structurally independent and flexibly connected compressor skids. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10a and UUT11bii.
MSP10C6	LSP10C6		
MSP15C5	LSP15C5	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems feature (2) three-high by one-wide and (1) four-high by one-wide structurally independent and flexibly connected compressor skids. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10a and UUT11bii.
MSP15C6	LSP15C6		
MSP20C6	LSP20C6		
MSH10C5	LSH10C5	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems feature (3) three-high by two-wide structurally independent and flexibly connected compressor skids. UUUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10a and UUT11bii.
MSH10C6	LSH10C6		
MSN10C6	LSN10C6	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems feature (2) three-high by three-wide structurally independent and flexibly connected compressor skids. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT11bii.
MSD07C4xxx-EX3	LSD07C4xxx-EX3	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems initially feature (1) two-high by one-wide compressor skid that can be later populated by (1) pump in the top position to create (1) three-high by one-wide compressor skid. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10a and UUT11bii.
MSD07C5xxx-EX3	LSD07C5xxx-EX3		
MSD07C6xxx-EX3	LSD07C6xxx-EX3		
MSD10C5xxx-EX3	LSD10C5xxx-EX3		
MSD10C6xxx-EX3	LSD10C6xxx-EX3		
MST07C5xxx-EX4	LST07C5xxx-EX4	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems initially feature (1) three-high by one-wide compressor skid that can be later populated by (1) pump in the top position to create (1) four-high by one-wide compressor skid. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10a and UUT11bii.
MST07C6xxx-EX4	LST07C6xxx-EX4		
MST10C5xxx-EX4	LST10C5xxx-EX4		
MST10C6xxx-EX4	LST10C6xxx-EX4		

Special Seismic Certification

Table 8 - Justification Matrix for Extrapolation - Stacked Units, Medical and Laboratory Scroll (Continued)

(Systems Containing 7.5 and 10 HP Pumps, Rigid Base Mount, Bolted Compressor Skid Design)

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Systems Containing 7.5 and 10 HP Pumps			
Extrapolated Unit (Medical)	Extrapolated Unit (Laboratory)	Units Used for Extrapolation	Difference From Units Used for Extrapolation
MSD15C5xxx-EX3	LSD15C5xxx-EX3	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems initially feature (1) two-high by two-wide compressor skid that can be later populated by (2) pumps in the top position to create (1) three-high by two-wide compressor skid. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10b and UUT11bii.
MSD15C6xxx-EX3	LSD15C6xxx-EX3		
MSD20C5xxx-EX3	LSD20C5xxx-EX3		
MSD20C6xxx-EX3	LSD20C6xxx-EX3		
MST15C5xxx-EX4	LST15C5xxx-EX4	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems initially feature (1) three-high by one-wide compressor skid that can be later populated by (1) pump in the top position to create (1) four-high by one-wide compressor skid. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10b and UUT11bii.
MST15C6xxx-EX4	LST15C6xxx-EX4		
MST20C5xxx-EX4	LST20C5xxx-EX4		
MST20C6xxx-EX4	LST20C6xxx-EX4		
MSQ15C5xxx-EX5	LSQ15C5xxx-EX5	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems initially feature (1) two-high by one-wide and (2) three-high by one-wide structurally independent and flexibly connected compressor skids. Two compressor skids can be later populated by (3) pumps in the top position of each skid to create a system of (3) three-high by one-wide and (1) four-high by one-wide structurally independent and flexibly connected compressor skids. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10b and UUT11bii.
MSQ15C6xxx-EX5	LSQ15C6xxx-EX5		
MSP15C6xxx-EX6	LSP15C6xxx-EX6	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems initially feature (2) three-high by one-wide and (1) four-high by one-wide structurally independent and flexibly connected compressor skids. Two compressor skids can be later populated by (3) pumps in the top position of each skid to create a system of (3) four-high by one-wide structurally independent and flexibly connected compressor skids. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Tank and dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10b and UUT11bii.
MSP20C6xxx-EX6	LSP20C6xxx-EX6		
MSP15C7	LSP15C7	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems feature (1) maximum of four-high by three-wide partially compressor skid lighter than the compressor skid tested in UUT36. The structurally independent and flexibly attached tank options were tested in UUT12C and UUT15b. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10b and UUT11bii.
MSP20C7	LSP20C7		
MSP15C8	LSP15C8		
MSP20C8	LSP20C8		
MSH15C7	LSH15C7	UUT35 (MSQ10C6 compressor skid), UUT36 (MSH20C6 compressor skid)	The extrapolated systems feature (1) four-high by three-wide compressor skid the same weight or lighter than UUT36. The structurally independent and flexibly attached tank options were tested in UUT12C and UUT15b. UUT35 represents the most seismically vulnerable compressor skid (four-high by one-wide) while UUT36 represents the largest and heaviest compressor skid (four-high by three-wide). Dryer skids have identical subcomponents bookended in Tables 25 and 26 with a rigid platform base similar to what was tested in UUT10b and UUT11bii.
MSH20C7	LSH20C7		
MSH15C8	LSH15C8		
MSH20C8	LSH20C8		

Special Seismic Certification

Table 9 - Certified Components - Compact Duplex Scroll Air Systems

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Medical Air Model Number	Lab Air Model Number [1]	Hp	Vertical Receiver (gallons)	Total Number of Compressors	Vertically Stacked Pumps Per Enclosure	Horizontally Arrayed Pumps Per Enclosure	Maximum Dimensions (in)			Max. Operating Weight (lb.)	Mounting [2]	Unit
							Length	Width	Height			
MSD07C3	LSD07C3	7.5	80	2	1	2	46.5	34.5	75.5	1,440	Rigid base w/ internal isolation	Extrapolated [3]
MSD10C3	LSD10C3	10	80	2	1	2	46.5	34.5	75.5	1,490		UUT34

1. Lab units are physically identical to medical air units (software change only).

2. Compressor pump-motor sets are isolated.

3. Extrapolated model is less seismically vulnerable than UUT34 and all subcomponents were tested or certified in other configurations. Subcomponents of the extrapolated model were directly tested in or certified by UUT1, UUT10a, UUT32, UUT35, and UUT42.

Special Seismic Certification

Table 10 - Certified Components - Reciprocating Piston Compressor Stacked Units, Flexible Base Mount (Compressor Skids), Rigid Base Mount (Tank/Dryer/Controller Skids)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air, Laboratory Air, and Instrument Air

Mounting: Flexible Base Mount (Compressor Skids), Rigid Base Mount (Tank/Dryer/Controller Skids)

Medical Air Model Number	Laboratory Air Model Number [1]	Instrument Air Model Number [1]	HP	Vertical Receiver Gallons	Total Number of Pumps	Vertically Stacked Pumps or Layers	Horizontally Arrayed pump-motor sets	Maximum Dimensions (in) [2]			Max. Operating Weight (lb) [2]	Mounting [3]	Unit
								Length	Width [2]	Height			
Duplex													
MAPD0303	LAPD0303	N/A	3	80	2	2	1	54	71	68	1,250	Flexible base (neoprene) - [pump skid]; rigid base mount [tank/dryer/controller skid]	Extrapolated
N/A	N/A	IOPDXX04	3, 5	120	2	2	1	54	71	81	1,720		UUT42 [4]
MAPD0504	LAPD0504	N/A	5	120	2	2	1	54	71	82	1,950		Interpolated
MAPD0754	LAPD0754	IOPD0754	7.5	120	2	2	1	60	71	82	2,160	Flexible base mount (neoprene) w/ internal isolation [pump skid]; rigid base mount [tank/dryer/controller skid]	Interpolated
MAPD1004	LAPD1004	IOPD1004	10	120	2	2	1	60	71	82	2,260		Interpolated
MAPD1504	LAPD1504	IOPD1504	15	120	2	2	1	60	71	82	2,360		Interpolated
MAPD1005	LAPD1005	N/A	10	200	2	2	1	65	73	84	2,450		Interpolated
MAPD1505	LAPD1505	N/A	15	200	2	2	1	65	73	84	2,550		Interpolated
MAPD1006	LAPD1006	N/A	10	240	2	2	1	65	73	96	2,450		Interpolated
N/A	N/A	IOPDXX06	7.5, 15	240	2	2	1	65	73	96	2,560		UUT43a,b [5]
MAPD1506	LAPD1506	N/A	15	240	2	2	1	65	73	96	2,800		Extrapolated [5]
Triplex													
MAPT0504	LAPT0504	N/A	5	120	3	2,1	1	54	105	82	2,250	Flexible base (neoprene) - [pump skid]; rigid base mount [tank/dryer/controller skid]	Extrapolated [6,7]
MAPT0505	LAPT0505	N/A	5	200	3	2,1	1	65	105	84	2,370		Extrapolated [6,7]
MAPT0754	LAPT0754	IOPT0754	7.5	120	3	2,1	1	54	105	82	2,950	Flexible base mount (neoprene) w/ internal isolation [pump skid]; rigid base mount [tank/dryer/controller skid]	Extrapolated [6,7]
MAPT0755	LAPT0755	IOPT0755	7.5	200	3	2,1	1	65	105	84	3,050		Extrapolated [6,7]
MAPT1005	LAPT1005	IOPT1005	10	200	3	2,1	1	65	105	84	3,115		Extrapolated [6,7]
MAPT1006	LAPT1006	IOPT1006	10	240	3	2,1	1	65	105	94	3,200		Extrapolated [6,7]
MAPT1506	LAPT1506	IOPT1506	15	240	3	2,1	1	65	105	94	3,650		Extrapolated [6,7]
Quadplex													
MAPQ0505	LAPQ0505	N/A	5	200	4	2,2	1	65	105	84	3,110	Flexible base (neoprene) - [pump skid]; rigid base mount [tank/dryer/controller skid]	Extrapolated [6,7]
MAPQ0755	LAPQ0755	IOPQ0755	7.5	200	4	2,2	1	65	105	84	3,800	Flexible base mount (neoprene) w/ internal isolation [pump skid]; rigid base mount [tank/dryer/controller skid]	Extrapolated [6,7]
MAPQ1006	LAPQ1006	IOPQ1006	10	240	4	2,2	1	65	105	94	3,950		Extrapolated [6,7]
MAPQ1506	LAPQ1506	IOPQ1506	15	240	4	2,2	1	65	105	94	4,250		Extrapolated [6,7]

Continued on Next Page

1 Laboratory Air models differ from Medical by software only. Instrument Air Models differ from Medical in software and by use of higher pressure rated receiver tanks tested in UUT42 and UUT43b.

2. Maximum dimensions and weights are calculated and take into account options and receiver tank size. The width dimension includes a 4-inch gap between skids. Compressor skids have identical dimensions.

3. Compressor skids with Compressors 7.5 HP or greater have isolated pump/motor sets. Compressor skids with compressors 5 HP or under are not internally isolated.

4. UUT42 was tested with (1) 3 HP pump in the bottom position and (1) 5 HP pump in the top position. The receiver tested was 120 gal with a 300 psi-rated construction. The unit tested with a 4-inch gap between compressor and receiver skids and were flexibly connected.

5. UUT43a is a compressor skid tested with (1) 7.5 HP pump in the bottom position and (1) 15 HP pump in the top position. UUT43b is the heaviest tank/dryer/controller skid. Both skids were tested in the same shake with a 4-inch gap.

6. Extrapolated unit justification matrix is provided in Table 11.

7. For units comprised of more than one skid, skids are structurally independent and flexibly attached. Flexible attachments are required between separate skids.

Special Seismic Certification

Table 10 - Certified Components - Reciprocating Piston Compressor Stacked Units (Continued), Flexible Base Mount (Compressor Skids), Rigid Base Mount (Tank/Dryer/Controller Skids)

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air, Laboratory Air, and Instrument Air

Mounting: Flexible Base Mount (Compressor Skids), Rigid Base Mount (Tank/Dryer/Controller Skids)

Medical Air Model Number	Laboratory Air Model Number [1]	Instrument Air Model Number [1]	HP	Vertical Receiver Gallons	Total Number of Pumps	Vertically Stacked Pumps or Layers	Horizontally Arrayed pump-motor sets	Maximum Dimensions (in) [2]			Max. Operating Weight (lb) [2]	Mounting [3]	Unit
								Length	Width	Height			
Expandable - Duplex to Triplex													
MAPD0505-EX3	LAPD0505-EX3	N/A	5	200	2 exp to 3	1,1 exp to 2,1	1	54	105	84	2,370	Flexible base (neoprene) - [pump skid]; rigid base mount [tank/dryer/controller skid]	Extrapolated [4,5]
MAPD0755-EX3	LAPD0755-EX3	IOPD0755-EX3	7.5	200	2 exp to 3	1,1 exp to 2,1	1	65	105	84	3,050	Flexible base mount (neoprene) w/ internal isolation [pump skid]; rigid base mount [tank/dryer/controller skid]	Extrapolated [4,5]
MAPD1006-EX3	LAPD1006-EX3	IOPD1006-EX3	10	240	2 exp to 3	1,1 exp to 2,1	1	65	105	94	3,200		Extrapolated [4,5]
MAPD1506-EX3	LAPD1506-EX3	IOPD1506-EX3	15	240	2 exp to 3	1,1 exp to 2,1	1	65	105	94	3,650		Extrapolated [4,5]
Expandable - Triplex to Quadplex													
MAPT0506-EX4	LAPT0506-EX4	N/A	5	240	3 exp to 4	2,1 exp to 2,2	1	54	105	96	2,800	Flexible base (neoprene) - [pump skid]; rigid base mount [tank/dryer skid]	Extrapolated [4,5]
MAPT0756-EX4	LAPT0756-EX4	IOPT0756-EX4	7.5	240	3 exp to 4	2,1 exp to 2,2	1	65	105	84	3,800	Flexible base mount (neoprene) w/ internal isolation [pump skid]; rigid base mount [tank/dryer skid]	Extrapolated [4,5]
MAPT1006-EX4	LAPT1006-EX4	IOPT1006-EX4	10	240	3 exp to 4	2,1 exp to 2,2	1	65	105	94	3,950		Extrapolated [4,5]
MAPT1506-EX4	LAPT1506-EX4	IOPT1506-EX4	15	240	3 exp to 4	2,1 exp to 2,2	1	65	105	94	4,250		Extrapolated [4,5]

1 Laboratory Air models differ from Medical by software only. Instrument Air Models differ from Medical in software and by use of higher pressure rated receiver tanks tested in UUT42 and UUT43b.
2. Maximum dimensions and weights are calculated and take into account options and receiver tank size. The width dimension includes a 4-inch gap between skids. Compressor skids have identical dimensions.
3. Compressor skids with Compressors 7.5 HP or greater have isolated pump/motor sets. Compressor skids with compressors 5 HP or under are not internally isolated.
4. Extrapolated unit justification matrix is provided in Table 11.
5. For units comprised of more than one skid, skids are structurally independent and flexibly attached. Flexible attachments are required between separate skids.

Special Seismic Certification

Table 11 - Justification Matrix for Extrapolation - Reciprocating Piston Compressor Stacked Units

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air, Laboratory Air, and Instrument Air

Mounting: Flexible Base Mount (Compressor Skids), Rigid Base Mount (Tank/Dryer/Controller Skids)

Systems Containing Reciprocating Piston Compressors				
Extrapolated Unit (Medical)	Extrapolated Unit (Laboratory)	Extrapolated Unit (Instrument)	Units Used for Extrapolation	Difference From Units Used for Extrapolation
MAPT0504	LAPT0504	N/A	UUT42 (IOPDXX04)	Additional structurally independent and flexibly attached 1-high partial fill compressor-skid. UUT42 represents the lightest and heaviest compressor/motor assemblies on a 2-high compressor skid without internal isolation.
MAPT0505	LAPT0505	N/A		
MAPT0754	LAPT0754	IOPT0754	UUT42 (IOPDXX04)	Additional structurally independent and flexibly attached 1-high partial fill compressor-skid. UUT42 represents the lightest and heaviest compressor/motor assemblies on a 2-high compressor skid without internal isolation. UUT43 represents the largest/heaviest and smallest/lightest compressors on a 2-high skid with internal isolation.
MAPT0755	LAPT0755	IOPT0755		
MAPT1005	LAPT1005	IOPT1005		
MAPT1006	LAPT1006	IOPT1006		
MAPT1506	LAPT1506	IOPT1506	UUT43a,b (IOPDXX06)	
MAPQ0505	LAPQ0505	N/A	UUT42 (IOPDXX04)	Systems use (2) identical, structurally independent and flexibly attached 2-high compressor skids. UUT42 represents the lightest and heaviest compressor/motor assemblies on a 2-high compressor skid without internal isolation. UUT43 represents the largest/heaviest and smallest/lightest compressors on a 2-high skid with internal isolation.
MAPQ0755	LAPQ0755	IOPQ0755		
MAPQ1006	LAPQ1006	IOPQ1006		
MAPQ1506	LAPQ1506	IOPQ1506	UUT43a,b (IOPDXX06)	
MAPD0505-EX3	LAPD0505-EX3	N/A	UUT42 (IOPDXX04)	Systems are initially installed with (2) structurally independent and flexibly attached one-high compressor skids. One skid can be populated by (1) additional compressor to create a system with (1) 1-high and (1) 2-high compressor skids. UUT42 represents the lightest and heaviest compressor/motor assemblies on a 2-high compressor skid without internal isolation. UUT43 represents the largest/heaviest and smallest/lightest compressors on a 2-high skid with internal isolation.
MAPD0755-EX3	LAPD0755-EX3	IOPD0755-EX3		
MAPD1006-EX3	LAPD1006-EX3	IOPD1006-EX3		
MAPD1506-EX3	LAPD1506-EX3	IOPD1506-EX3	UUT43a,b (IOPDXX06)	
MAPT0506-EX4	LAPT0506-EX4	N/A	UUT42 (IOPDXX04)	Systems are initially installed with (2) structurally independent and flexibly attached one-high compressor skids. One skid can be populated by (1) additional compressor to create a system with (1) one-high and (1) two-high compressor skids. UUT42 represents the lightest and heaviest compressor/motor assemblies on a 2-high compressor skid without internal isolation. UUT43 represents the largest/heaviest and smallest/lightest compressors on a 2-high skid with internal isolation.
MAPT0756-EX4	LAPT0756-EX4	IOPT0756-EX4		
MAPT1006-EX4	LAPT1006-EX4	IOPT1006-EX4		
MAPT1506-EX4	LAPT1506-EX4	IOPT1506-EX4	UUT43a,b (IOPDXX06)	

Special Seismic Certification

Table 12 - Certified Components - Rotary Tooth Oil Free Air Systems

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Medical Air Model Number	Lab Air Model Number [1]	HP	Vertical Receiver Gallons	Number of Compressor Enclosures	Number of Compressors per Enclosure	Maximum Dimensions (in) [2]			Max. Operating Weight (lb) [3]	Mounting [4]	Unit
						Length	Width	Height			
Duplex Systems											
MDRC05074FA5	LDRC05072FA5	50 x 2	400	2	1	232	116	102	8,260	Rigid base w/ internal isolation	UUT12a,b,c [5, 6]
Triplex Systems											
MTRC05074FA5	LTRC05074KA5	50 x 3	400	3	1	332	116	102	11,190	Rigid base w/ internal isolation	Same As [7]
Quadruplex Systems											
MQRC05074FA5	LQRC05074FA5	50 x 4	400	4	1	412	152	102	14,120	Rigid base w/ internal isolation	Same As [7]
MQRC05084FA5	LQRC05084FA5	50 x 4	660	4	1	412	166	127	14,980	Rigid base w/ internal isolation	Same As [7] with tank from UUT15b [8]

1. Lab units are physically identical to medical air units (software change only).
2. Dimensions include 24 inch spacing between system components. System component skids are independently mounted and flexibly connected. Flexible connections are required between separate skids.
3. Weight is sum of all system components.
4. Compressor pump skids are internally isolated. Dryer and receiver tank skids are not.
5. Only one compressor enclosure tested in UUT12a (systems consist of 2 to 4 identical enclosures independently mounted and flexibly connected).
6. Dimensions and weight shown for the MDRC05074FA5 system are calculated assuming the duplex system contains two of the compressor enclosures tested in UUT12a along with the dryer/controller and 400 gallon receiver tank tested in UUT12b and UUT12c.
7. Units are the same as the unit tested, except with additional enclosures identical to that tested in UUT12a, all independently mounted and flexibly connected.
8. Dimensions and weight shown for the MQRC05084FA5 system are calculated assuming the quadruplex system contains four of the compressor enclosures tested in UUT12a along with the dryer/controller tested in UUT12b and the 660 gallon receiver tank tested in UUT15b.

Special Seismic Certification

Table 13 - Certified Components - Scroll Enclosed (SE) Air Systems

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Medical Air Model Number [1]	Lab Air Model Number [1,2]	HP Per Pump	Total HP	Vertical Receiver (gallons)	Number of Compressor Enclosures	Vertically Stacked Pumps Per Enclosure	Horizontally Arrayed Pumps Per Enclosure	Maximum Dimensions (in)			Max. Operating Weight (lb)	Mounting [3]	Unit
								Length	Width	Height			
Duplex Systems (individual enclosed compressor units with structurally independent and flexibly attached tank/dryer/control skids)													
MSED1003x5	LSED1003x5	5	10 x 2	80	2	2	1	94	80	71	2,650	Rigid base w/ internal isolation	Extrapolated
MSED1504x5	LSED1504x5	5	15 x 2	120	2	3	1	94	80	79	2,980		Extrapolated
MSED2004x5 [1]	LSED2004x5	5	20 x 2	120	2	4	1	94	80	79	3,280		UUT14a,b [4]
MSED2005x5	LSED2005x5	5	20 x 2	200	2	4	1	94	80	84	3,380		Interpolated
MSED3006x5	LSED3006x5	5	30 x 2	240	2	3, 3	2	95	140	96	5,100		Interpolated
MSED4006x5	LSED4006x5	5	40 x 2	240	2	4, 4	2	95	140	96	5,500		Interpolated
MSED15B4x5	LSED15B4x5	7.5	15 x 2	120	2	2	1	99	104	79	3,050		Interpolated
MSED20B4x5	LSED20B4x5	10	20 x 2	120	2	2	1	99	104	79	3,170		Interpolated
MSED22B4x5	LSED22B4x5	7.5	22.5 x 2	120	2	3	1	99	104	79	4,000		Interpolated
MSED30B5x5	LSED30B5x5	10	30 x 2	200	2	3	1	99	104	84	4,700		Interpolated
MSED50B6x5	LSED50B6x6	10	50 x 2	240	2	2, 3	2	99	165	96	5,600		Interpolated
Triplex Systems (individual enclosed compressor units with structurally independent and flexibly attached tank/dryer/control skids)													
MSET1004x5	LSET1004x5	5	10 x 3	120	3	2	1	95	125	79	3,550	Rigid base w/ internal isolation	Interpolated
MSET1505x5	LSET1505x5	5	15 x 3	200	3	3	1	95	125	84	4,750		Interpolated
MSET2005x5	LSET2005x5	5	20 x 3	200	3	4	1	95	125	84	4,800		Interpolated
MSET2006x5	LSET2006x5	5	20 x 3	240	3	4	1	95	125	96	4,900		Interpolated
MSET3006x5	LSET3006x5	5	30 x 3	240	3	3, 3	1	96	223	96	6,500		Interpolated
MSET4006x5	LSET4006x5	5	40 x 3	240	3	4, 4	2	96	223	96	8,200		Interpolated
MSET20B6x5	LSET20B6x5	10	20 x 3	240	3	2	1	99	175	96	4,052		Interpolated
MSET2256x5	LSET2256x5	7.5	22.5 x 3	240	3	3	1	99	175	96	4,850		Interpolated
MSET30B6x5	LSET30B6x5	10	30 x 3	240	3	3	1	99	175	96	6,550		Interpolated
MSET40B6x5	LSET40B6x5	10	40 x 3	240	3	2, 2	2	99	259	96	7,316		Interpolated
MSET50B7x5	LSET50B7x5	10	50 x 3	400	3	2, 3	2	99	259	96	8,552		Interpolated
MSET60B7x5	LSET60B7x5	10	60 x 3	400	3	3, 3	2	99	259	96	9,452		Interpolated

Continued on Next Page

1. In model numbers listed, the "x" can be 2 = 208V, 3 = 230V, or 4 = 460V. UUT14a,b was MSED200425 (208V) and UUT15a,b was LSEQ60B845 (460V).

2. Lab units are physically identical to medical air units (software change only)

3. Compressor pump skids are internally isolated. Dryer and receiver tank skids are not.

4. Dimensions and weight shown here for the MSED2004xx system are calculated assuming the duplex system contains two of the compressor enclosures tested in UUT14a along with a skid containing a controller, tank, dryers, and other subcomponents as shown in the Scroll Enclosed certified subcomponent tables.

Special Seismic Certification

Table 14 - Certified Components - Scroll Enclosed (SE) Air Systems (Continued)

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Mounting: Rigid Base Mount

Medical Air Model Number [1]	Lab Air Model Number [1,2]	HP Per Pump	Total HP	Vertical Receiver (gallons)	Number of Compressor Enclosures	Vertically Stacked Pumps Per Enclosure	Horizontally Arrayed Pumps Per Enclosure	Maximum Dimensions (in)			Max. Operating Weight (lb)	Mounting [3]	Unit
								Length	Width	Height			
Quadruplex Systems (individual enclosed compressor units with structurally independent and flexibly attached tank/dryer/control skids)													
MSEQ1505x5	LSEQ1505x5	5	15 x 4	200	4	3	1	132	100	84	5,050	Rigid base w/ internal isolation	Interpolated
MSEQ2006x5	LSEQ2006x5	5	20 x 4	240	4	4	1	132	100	96	6,150		Interpolated
MSEQ3007x5	LSEQ3007x5	5	30 x 4	400	4	3, 3	2	212	126	109	8,730		Interpolated
MSEQ4007x5	LSEQ4007x5	5	40 x 4	400	4	4, 4	2	212	126	109	9,890		Interpolated
MSEQ2256x5	LSEQ2256x5	7.5	22.5 x 4	240	4	3	1	99	246	96	5,900		Interpolated
MSEQ30B6x5	LSEQ30B6x5	10	30 x 4	240	4	3	1	99	246	96	6,400		Interpolated
MSEQ40B6x5	LSEQ40B6x5	10	40 x 4	240	4	2, 2	2	220	122	96	9,400		Interpolated
MSEQ40B7x5	LSEQ40B7x5	10	40 x 4	400	4	2, 2	2	220	122	102	10,100		Interpolated
MSEQ45B8x5	LSEQ45B8x5	7.5	45 x 4	660	4	3, 3	2	220	122	127	11,700		Interpolated
MSEQ50B8x5	LSEQ50B8x5	10	50 x 4	660	4	2, 3	2	220	122	127	11,800		Interpolated
MSEQ60B8x5 [1]	LSEQ60B8x5	10	60 x 4	660	4	3, 3	2	220	150	127	13,200		UUT15a,b [4]

1. In model numbers listed, the "x" can be 2 = 208V, 3 = 230V, or 4 = 460V. UUT14a,b was MSED200425 (208V) and UUT15a,b was LSEQ60B845 (460V).

2. Lab units are physically identical to medical air units (software change only)

3. Compressor pump skids are internally isolated. Dryer and receiver tank skids are not.

4. Dimensions and weight shown here for the MSEQ60B8x5 system are calculated assuming the quadruplex system contains four of the compressor enclosures tested in UUT15a, one 660 gallon tank as tested in UUT15b, and a skid containing a controller, dryers, and other subcomponents as shown in the Scroll Enclosed certified subcomponent tables.

Special Seismic Certification

Table 15 - Certified Components - Medical Gas Automatic Changeover Manifolds

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Gas Automatic Changeover Manifolds

Mounting: Rigid Wall Mount

Powerex Model Number	Gas Containers[1,2]	Control	Cabinet	Delivery Pressure (psi)	Supply Pressure Indication Range	Max Dimensions (in)			Max Weight (lb)	Mounting	Unit
						Width	Depth	Height			
MFLD-CYL-NFPA-O2-N4	C x C	Digital	NEMA 4	55	N/A	17.5	10.0	20.5	69	Rigid wall	UUT40
MFLD-CYL-NFPA-AIR-N4	C x C	Digital	NEMA 4	55	N/A	17.5	10.0	20.5	72	Rigid wall	Interpolated
MFLD-CYL-NFPA-N2O-N4				55							
MFLD-CYL-NFPA-CO2-N4				55							
MFLD-CYL-NFPA-HYP-N4				100							
MFLD-CYL-NFPA-N2-N4				180							
MFLD-CYL-NFPA-INST-N4				180							
MFLD-CYL-NFPA-O2	C x C	Digital	Standard	55	N/A	17.5	10.0	20.5	72	Rigid wall	Interpolated
MFLD-CYL-NFPA-AIR				55							
MFLD-CYL-NFPA-N2O				55							
MFLD-CYL-NFPA-CO2				55							
MFLD-CYL-NFPA-HYP				100							
MFLD-CYL-NFPA-N2				180							
MFLD-CYL-NFPA-INST				180							
MFLD-LIQ-NFPA-O2-N4-230	L x L	Digital	NEMA 4	55	230	17.5	10.0	20.5	72	Rigid wall	Interpolated
MFLD-LIQ-NFPA-O2-N4-350				55	350						
MFLD-LIQ-NFPA-N2O-N4-230				55	230						
MFLD-LIQ-NFPA-N2O-N4-350				55	350						
MFLD-LIQ-NFPA-CO2-N4-230				55	230						
MFLD-LIQ-NFPA-CO2-N4-350				55	350						
MFLD-LIQ-NFPA-HYP-N4-230				100	230						
MFLD-LIQ-NFPA-HYP-N4-350				100	350						
MFLD-LIQ-NFPA-N2-N4-230				180	230						
MFLD-LIQ-NFPA-N2-N4-350				180	350						
MFLD-LIQ-NFPA-O2-230	L x L	Digital	Standard	55	230	17.5	10.0	20.5	72	Rigid wall	Interpolated
MFLD-LIQ-NFPA-O2-350				55	350						
MFLD-LIQ-NFPA-N2O-230				55	230						
MFLD-LIQ-NFPA-N2O-350				55	350						
MFLD-LIQ-NFPA-CO2-230				55	230						
MFLD-LIQ-NFPA-CO2-350				55	350						
MFLD-LIQ-NFPA-HYP-230				100	230						
MFLD-LIQ-NFPA-HYP-350				100	350						
MFLD-LIQ-NFPA-N2-230				180	230						
MFLD-LIQ-NFPA-N2-350	L x L	Digital	Standard	180	350	17.5	10.0	20.5	72	Rigid wall	UUT41

1. Gas Containers: C x C = Cylinder x Cylinder; L x L = Liquid x Liquid
2. Gas container is not supplied by Powerex.

Special Seismic Certification
Table 16 - Certified Subcomponents - Stacked Units, Scroll Air Systems
(Systems Containing 2, 3 and 5 HP Pumps, Compressor Skids, Flexible Base Mount)

DCL Project Number: 43160-2301
Manufacturer: Powerex
Product Line: Medical Air and Laboratory Air

Subcomponent [MFR]	Model	Notes	Max Weight (lb)	Unit
Scroll pumps [POWEREX] Note: pumps are die cast aluminum	SLAE03EB	2 or 3 HP	35	UUT1, UUT2
	SLAE05E	5 HP	42	UUT3
	SLAE05EHP	5 HP	42	Same as UUT3
Controllers [POWEREX] Note: electrical cabinets are painted carbon steel	BASIC_PSM	30" x 30" x 8" NEMA 12 enclosure; no touchscreen	240	UUT1
	HMI_PXMI	30" x 30" x 8" or 30" x 42" x 12" NEMA 12 enclosure; Human Machine Interface: touchscreen	245	Interpolated
	PBMI_PXMI	30" x 42" x 12" NEMA 12 enclosure; Powerex Building Management Integrator: HMI panel with additional communications card	246	UUT2, UUT3
Motors [WEG] Note: motors have a carbon steel shell with welded feet Note: All motors are 208-230V / 460V	00218OT3E145T_	2 HP	39	UUT1, UUT2
	00218OT3ECD145T_	2 HP	45	Interpolated
	00318OT3E182T_	3 HP	72	Interpolated
	00518OT3E184T_	5 HP	85	UUT3

Special Seismic Certification
Table 17 - Certified Subcomponents - Stacked Units, Scroll Air Systems
(Systems Containing 2, 3 and 5 HP Pumps, Tank and Dryer Skid, Flexible Base Mount)

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Subcomponent [MFR]	Model	Notes	Max Weight (lb)	Unit
Vertical tanks [CAMPBELL HAUSFELD, also branded TWIN LAKES] Note: tanks are welded carbon steel	AR027300ST	80 gal	176	UUT1, UUT2
	AR027400ST	120 gal	325	UUT3
Vertical tanks [CAMPBELL HAUSFELD, also branded TWIN LAKES] Note: tanks are welded carbon steel	AR051201AJ	200 gal	500	Extrapolated
	AR051301AJ	240 gal	580	UUT4b, UUT5b
Vertical tanks [Morganton] Note: tanks are welded carbon steel	VES07285	80 gal	177	UUT30b , UUT31b
	VES04865	120 gal	325	Interpolated
	VES04767	120 gal	325	UUT 31b
	VES07303	200 gal	500	Interpolated
	VES07072	240 gal	580	UUT 30b

Special Seismic Certification
Table 18 - Certified Subcomponents - Stacked Units, Scroll Air Systems
(Systems Containing 2, 3 and 5 HP Pumps, Tank and Dryer Skid, Flexible Base Mount)

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Subcomponent [MFR]	Model [1]	Max Dimensions (in)			Max Weight (lb)	Unit
		Length	Width	Height		
Desiccant dryers [POWEREX] Note: dryers consist of powder coated welded carbon steel tanks and a powder coated welded carbon steel mounting frame	PMD10	17	28	53	200	Extrapolated
	PMD17	17	28	53	200	Extrapolated
	PMD30	17	28	64	330	UUT3
	PMD35	17	28	64	330	Interpolated
	PMD45	17	28	72	360	Interpolated
	PMD55	17	28	72	360	Interpolated
	PMD60	35	28	67	660	Interpolated
	PMD71	35	28	67	660	Interpolated
	PMD90	35	28	76	720	Interpolated
	PMD110	35	28	76	720	Interpolated
	PMD111	35	28	76	720	UUT4b
	PMD07T	18	28	37	185	UUT1
	PMD10T	18	28	37	185	Same As[2]
	PMD17T	18	28	37	185	Same As[2]
Desiccant dryers [POWEREX] Note: dryers consist of powder coated welded carbon steel tanks and a powder coated welded carbon steel mounting frame	PLD10	17	28	53	200	Extrapolated
	PLD17	17	28	53	200	Extrapolated
	PLD30	17	28	64	330	UUT3
	PLD35	17	28	64	330	Interpolated
	PLD45	17	28	72	360	Interpolated
	PLD55	17	28	72	360	Interpolated
	PLD60	35	28	67	660	Interpolated
	PLD71	35	28	67	660	Interpolated
	PLD90	35	28	76	720	Interpolated
	PLD111	35	28	76	720	UUT4b
	PLD07T	18	28	37	185	UUT1
	PLD10T	18	28	37	185	Same As[2]
	PLD17T	18	28	37	185	Same As[2]
Desiccant dryers [PARKER-DOMNICK, alternately branded HUNTER/ZANDER] Note: dryers consist of aluminum extruded towers and a powder coated welded carbon steel mounting frame	DME050RX	22	9	56	176	UUT5b
	DME060RX	22	9	63	198	Interpolated
	DME080RX	22	9	73	229	UUT6
	DME015	12	11	33	81	UUT6
	DME025	12	11	53	103	Interpolated
	DME030	12	11	59	114	Interpolated
	DME050	22	9	56	176	Interpolated
	DME060	22	9	63	198	UUT6
	KMT3	8	12	32	37	UUT2
	KMT4	8	12	54	54	UUT6
Desiccant dryers [NANO PSI] Note: dryers consist of aluminum extruded towers and a powder coated carbon steel mounting frame	NDL110	17	13	48	172	UUT9
	NDL120	17	13	52	209	Interpolated
	NDL130	17	13	56	262	Interpolated
	NDL2110	25	12	47	366	UUT9

1. Dryers with PLD designation are structurally identical to PMD models in this table.
2. The PMD10T/PLD10T and PMD17T/PLD17T are identical to the PMD07T/PLD07T.

Special Seismic Certification
Table 19 - Certified Subcomponents - Stacked Units, Scroll Air Systems
(Systems Containing 2, 3, 5, 7.5 and 10 HP Pumps, Partially Welded Compressor Skids, Rigid Base Mount)

DCL Project Number: 43160-2301
Manufacturer: Powerex
Product Line: Medical Air and Laboratory Air

Subcomponent [MFR]	Model	Notes	Max Weight (lb)	Unit
Scroll pumps [POWEREX] Note: pumps are die cast aluminum	SLAE03EB	2 or 3 HP	35	UUT32
	SLAE05E	5 HP	42	UUT33ii
	SLAE05EHP		42	Same as UUT33ii
	SLAE075	7.5 HP	80	UUT10a
	SLAE075HP		80	Same as UUT10a
	SLAE10	10 HP	80	UUT11aii
	SLAE10HP		80	Same as UUT11aii
Controllers [POWEREX] Note: electrical cabinets are painted carbon steel	BASIC_PSM	30" x 24" x 8" NEMA 12 enclosure; no touchscreen	220	UUT10a
		30" x 30" x 8" NEMA 12 enclosure; no touchscreen	240	UUT32
	HMI_PXMI	30" x 24" x 8", 30" x 30" x 8" or 30" x 42" x 12" NEMA 12 enclosure; Human Machine Interface: touchscreen	245	Interpolated
	PBMI_PXMI	30" x 42" x 12" NEMA 12 enclosure: Powerex Building Management Integrator; HMI panel with additional communications card	246	UUT11aii
Motors for medical and lab skid mount [WEG] Note: motors have a carbon steel shell with welded feet Note: All motors are 208-230V / 460V	00218OT3E145T_	2 HP	39	UUT32
	00218OT3ECD145T_	2 HP	45	Interpolated
	00318OT3E182T_	3 HP	72	Interpolated
	00518OT3E184T_	5 HP	85	UUT33ii
	00736OT2E184T	7.5 HP	72	UUT10a
	01036OT3E213T	10 HP	126	UUT11aii

Special Seismic Certification
Table 20 - Certified Subcomponents - Stacked Units, Scroll Air Systems
(Systems Containing 7.5 and 10 HP Pumps, Bolted Compressor Skids, Rigid Base Mount)

DCL Project Number: 43160-2301
Manufacturer: Powerex
Product Line: Medical Air and Laboratory Air

Subcomponent [MFR]	Model	Notes	Max Weight (lb)	Unit
Scroll pumps [POWEREX] Note: pumps are die cast aluminum	SLAE075, SLAE075HP	7.5 HP	80	UUT35
	SLAE10, SLAE10HP	10 HP	80	UUT36
Motors for medical and lab skid mount [WEG] Note: motors have a carbon steel shell with welded feet Note: All motors are 208-230V / 460V	00736OT2E184T	7.5 HP	72	UUT35
	01036OT3E213T	10 HP	126	UUT36
Controllers [POWEREX] Note: electrical cabinets are painted carbon steel	BASIC_PSM	30" x 30" x 8" NEMA 12 enclosure; no touchscreen	240	UUT35
	HMI_PXMI	30" x 30" x 8" or 30" x 42" x 12" NEMA 12 enclosure; Human Machine Interface: touchscreen	245	Interpolated
	PBMI_PXMI	30" x 42" x 12" NEMA 12 enclosure; Powerex Building Management Integrator: HMI panel with additional communications card	246	UUT36

Special Seismic Certification

Table 21 - Certified Subcomponents - Stacked Units, Reciprocating Piston Compressor Stacked Systems (Compressor Skids, Flexible Base Mount)

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air, Laboratory Air, and Instrument Air

Subcomponent [MFR]	Model	Notes	Max Weight (lb)	Unit
Reciprocating Pumps [POWEREX] Note: pumps are die cast aluminum and cast iron	OPS030	3 HP	46	UUT42
	OPT050	5 - 7.5 HP	97	UUT42
	OPT100	7.5-10 HP	138	UUT43a
	OPT150	15 HP	145	UUT43a
Motors [WEG] Note: motors have a carbon steel shell with welded feet Note: All motors are 208-230V / 460V	00318OT3E145T-S	3HP, 4 pole construction	72	UUT42
	00518OT3E184T-S	5 HP, 4 pole construction	85	UUT42
	00718OT3E213T-S	7.5 HP, 4 pole construction	116	UUT43a
	01018OT3E215T-S	10 HP, 4 pole construction	137	Interpolated
	01518ET3E254T-S	15HP, 4 pole construction	175	UUT43a
Internal Spring Isolators[1] [Vibration Isolation Co.]	SEQ	Carbon steel, painted	6	UUT43a

1. Internal spring isolators are only featured on pump and motor options greater than or equal to 7.5 HP.

Special Seismic Certification

Table 22 - Certified Subcomponents - Stacked Units, Scroll and Reciprocating Piston Air Systems (All Stacked Systems, Tank/Dryer/Controller Skids, Rigid Base Mount)

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air, Laboratory Air, and Instrument Air

Subcomponent [MFR]	Model	Notes	Max Weight (lb)	Unit
Vertical tanks [CAMPBELL HAUSFELD, ALSO BRANDED TWIN LAKES] Note: tanks are welded carbon steel	AR027400ST	120 gal	325	UUT10b
	AR051201AJ	200 gal	500	Interpolated
	AR051301AJ	240 gal	580	UUT11bii
Vertical tanks [MANCHESTER TANK] Note: tanks are welded carbon steel with ASME 165 PSIG construction	AR063700AV	400 gal	640	UUT12c
	AR660000AV	660 gal	1500	UUT15b
Vertical tanks [Morganton] Note: tanks are welded carbon steel	AR0684xxxx / VES07285	80 gal, 3 stamped feet, 200 psig construction	177	UUT30a, UUT31a
	AR0685xxxx / VEC05011 - previously VES04767	120 gal, ring base, 4 mounts, 200 psig construction	325	UUT31a
	AR0687xxxx / VEC04870, was VES07303	200 gal, ring base, 4 mounts, 200 psig construction	500	Interpolated
	AR0688xxxx / VEC07072, was VES07072	240 gal, ring base, 4 mounts, 200 psig construction	580	UUT30a
	AR0705xxxx / VES09600	120 gal, ring base, 4 mounts, 300 psig construction	395	UUT42
	AR0707xxxx	200 gal, ring base, 4 mounts, 300 psig construction	577	Interpolated
	AR0708xxxx / VES0010366	240 gal, ring base, 4 mounts, 300 psig construction	665	UUT43b
Controllers [POWEREX] Note: electrical cabinets are painted carbon steel	BASIC_PSM	30" x 30" x 8" NEMA 12 enclosure; no touchscreen	240	UUT42
	HMI_PXMI	30" x 30" x 8" or 30" x 42" x 12" NEMA 12 enclosure; Human Machine Interface: touchscreen	245	Interpolated
	PBMI_PXMI	30" x 42" x 12" NEMA 12 enclosure; Powerex Building Management Integrator: HMI panel with additional communications card	246	UUT43b

Special Seismic Certification

Table 23 - Certified Subcomponents - Stacked Units, Scroll and Reciprocating Piston Air Systems (All Stacked Systems, Tank/Dryer/Controller Skids, Rigid Base Mount)

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air, Laboratory Air, and Instrument Air

Subcomponent [MFR]	Model	Max Dimensions (in)			Max Weight (lb)	Unit
		Length	Width	Height		
Desiccant dryers [POWEREX] Note: dryers consist of powder coated welded carbon steel tanks, powder coated welded carbon steel mounting frame, and powder coated carbon steel mounting platform	PMD10	17	28	53	200	Extrapolated
	PMD17	17	28	53	200	Extrapolated
	PMD30	17	28	64	330	Extrapolated
	PMD35	17	28	64	330	Extrapolated
	PMD45	17	28	72	360	UUT10b
	PMD55	17	28	72	360	Interpolated
	PMD60	35	28	67	660	Interpolated
	PMD71	35	28	67	660	Interpolated
	PMD90	35	28	76	720	Interpolated
	PMD110	35	28	76	720	Interpolated
	PMD111	35	28	76	720	UUT4b [1]
Desiccant dryers [POWEREX] Note: dryers consist of powder coated welded carbon steel tanks, powder coated welded carbon steel mounting frame, and powder coated carbon steel mounting platform	PLD10	17	28	53	200	Extrapolated
	PLD17	17	28	53	200	Extrapolated
	PLD30	17	28	64	330	Extrapolated
	PLD35	17	28	64	330	Extrapolated
	PLD45	17	28	72	360	UUT10b
	PLD55	17	28	72	360	Interpolated
	PLD60	35	28	67	660	Interpolated
	PLD71	35	28	67	660	Interpolated
	PLD90	35	28	76	720	Interpolated
	PLD111	35	28	76	720	UUT4b [1]
Desiccant dryers [NANO PSI] Note: dryers consist of aluminum extruded towers, powder coated carbon steel mounting frame, and powder coated carbon steel mounting platform	NDL110	17	13	48	172	Extrapolated
	NDL120	17	13	52	209	Extrapolated
	NDL130	17	13	56	262	UUT11bii
	NDL2110	25	12	47	366	UUT9 [2]
Desiccant dryers [Trident] Note: dryers consist of aluminum extruded towers, powder coated carbon steel mounting frame, and powder coated carbon steel mounting platform	PD204A	6	13	41	50	UUT32
	PD205A	8	15	38	65	Interpolated
	PD206A	8	15	48	90	Interpolated
	PD207A	12	19	40	110	Interpolated
	PD208A	12	21	47	135	Interpolated
	PD209A	15	17	63	235	Interpolated
	PD210A	15	17	75	265	Interpolated
	PD211A	23	18	64	470	Interpolated
	PD212A	23	18	76	525	Interpolated
	PD213A	30	18	64	565	UUT33i

1. UUT4b, which serves as the upper bookend, was tested on neoprene pads.
2. UUT9, which serves as the upper bookend, was tested on neoprene pads.

Special Seismic Certification

Table 24 - Certified Subcomponents - Compact Scroll Air Systems, Rigid Base Mount

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Subcomponent [MFR]	Model	Notes	Max Weight (lb)	Unit
Scroll pumps [POWEREX] Note: material is die cast aluminum	SLAE075 and SLAE075HP	7.5 HP	80	Extrapolated [1,2]
	SLAE10 and SLAE10HP	10 HP	80	UUT34
Motors for medical and lab skid mount [WEG] Note: material is carbon steel shell with welded foot Note: All motors are 208-230V / 460V	00736OT2E184T	7.5 HP	72	Extrapolated [1,2]
	01036OT3E213T	10 HP	126	UUT34
Controllers [POWEREX] Note: material is painted carbon steel electrical cabinet	BASIC_PSM	30" x 30" x 8" NEMA 12 enclosure; no touchscreen	240	Extrapolated [1,3]
	HMI_PXMI	30" x 30" x 8" or 30" x 42" x 12" NEMA 12 enclosure; Human Machine Interface: touchscreen	245	Extrapolated [1,3]
	PBMI_PXMI	30" x 42" x 12" NEMA 12 enclosure; Powerex Building Management Integrator: HMI panel with additional communications card	246	UUT34
Desiccant dryers [Trident] Note: dryers consist of aluminum extruded towers, powder coated carbon steel mounting frame, and powder coated carbon steel mounting platform	PD206A	8" x 15" x 48"	90	Extrapolated[1,4]
	PD207A	12" x 19" x 40"	110	Extrapolated[1,4]
	PD208A	12" x 21" x 47"	135	UUT34
Air reciever tank [Morgenton] Note: tank is welded carbon steel	VES07285; AR0684xxx	80 gal	177	UUT34

1. Extrapolated subcomponents were tested or certified in other configurations. UUT34 is the most seismically vulnerable configuration of the model line.
2. The SLAE075 pump and 00736OT2E184T motor were tested in UUT10a and UUT35.
3. The Basic_PSM controller was tested in UUT1, UUT10a, UUT35, and UUT42.
4. A smaller PD204A Dryer was tested in UUT32.

Special Seismic Certification

Table 25 - Certified Subcomponents - Rotary Tooth Oil Free Air Systems, Rigid Base Mount

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Subcomponent [MFR]	Model	Notes	Material	Max Weight (lb)	Unit
Pump [POWEREX]	PCC5000AV	50 HP	Cast iron flange mounted motor with a welded steel platform, bolted framing and sheet metal.	1020	UUT12a
Motor [WEG]	03736ET3Y200L-W22	380/460V, 50 HP	Cast iron construction, flange mounted	584	UUT12a
Vertical tanks [MANCHESTER TANK]	AR063700AV	400 gal	Welded carbon steel (ASME, 165 PSIG)	640	UUT12c
	AR660000AV	660 gal	Welded carbon steel (ASME, 165 PSIG)	1500	UUT15b
Controllers [1] [POWEREX]	PXTM215X1AJ	208-230V / 460V, Duplex 50 HP	Painted carbon steel electrical cabinet, NEMA 12	250	Extrapolated
	PXTM218AXAJ	208-230V / 460V, Duplex 50 HP	Painted carbon steel electrical cabinet, NEMA 12	251	UUT14b
	PXTM315X1AJ	208-230V / 460V, Triplex 50 HP	Painted carbon steel electrical cabinet, NEMA 12	260	Interpolated
	PXTM415X1AJ	208-230V / 460V, Quadruplex 50 HP	Painted carbon steel electrical cabinet, NEMA 12	261	UUT12b
Desiccant dryers [NANO PSI]	NDL2120	16"Lx25"Wx61"H	Aluminum extruded towers; powder coated carbon steel mounting frame	450	UUT12b
	NDL2130	16"Lx25"Wx75"H		750	Interpolated
	NDL3130	16"Lx31"Wx75"H		800	Interpolated
	NDL4130	16"Lx38"Wx75"H		1160	UUT12b

1. Controllers are universal voltage design. Each controller operates compressors of any voltage (208-230V / 460V) and requires 120 VAC input.

Special Seismic Certification

Table 26 - Certified Subcomponents - Scroll Enclosed (SE) Air Systems, Rigid Base Mount

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Subcomponent [MFR]	Model	Notes	Max Weight (lb)	Unit
Scroll pumps [POWEREX] Note: pumps are die cast aluminum	SED1007	5 HP (2)	825	Extrapolated
	SED15B7	7.5 HP (2)	840	Interpolated
	SED20B7	10 HP (2)	900	Interpolated
	SET1507	5 HP (3)	965	Extrapolated
	SET2257	7.5 HP (3)	1110	Interpolated
	SEQ2007	5 HP (4)	1125	UUT14a
	SET30B7	10 HP (3)	1250	Interpolated
	SEQ40B7	10 HP (4)	1600	Interpolated
	SEH3007	5 HP (6)	1640	Interpolated
	SEP50B7	10 HP (5)	1875	Interpolated
	SEO4007	5 HP (8)	2000	Interpolated
	SEH45B7	7.5 HP (6)	2050	Interpolated
	SEH60B7	10 HP (6)	2150	UUT15a
Scroll Pumps [Powerex] Note: pumps are die cast aluminum with carbon steel bearings and shafts.	SLAE05E SLAE05EHP	5 HP	42	UUT14a
	SLAE075 SLAE075HP	7.5 HP	80	Interpolated
	SLAE10 SLAE10HP	10 HP	80	UUT15a
Motors [WEG] Note: motors are TEFC design with a carbon steel shell and welded feet	00518ET3E184T-SRT	208-230V / 460V, 5 HP	71	UUT14a
	00736ET3E213T-S	208-230V / 460V, 7.5 HP	72	Interpolated
	01036ET3E215T-S	208-230V / 460V, 10 HP	126	UUT15a
Controllers [POWEREX] Note: electrical cabinets are painted carbon steel Note: lower case "x" in model number is 4 for 460V, 3 for 230V, and 2 for 208V	HMI_PXMI	30" x 30" x 8" NEMA 12 enclosure; Human Machine Interface: Touchscreen	245	Extrapolated [1]
	PBMI_PXMI	30" x 42" x 12" NEMA 12 enclosure; Powerex Building Management Integrator: HMI panel w/ additional communications card	246	UUT10a, UUT11aii

Continued on Next Page

1. Extrapolated controller is a depopulated version of that tested in UUT10a and UUT11aii

Special Seismic Certification

Table 27 - Certified Subcomponents - Scroll Enclosed (SE) Air Systems, Rigid Base Mount (Continued)

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Subcomponent [MFR]	Model	Notes	Max Weight (lb)	Unit
Controllers [POWEREX] Note: electrical cabinets are painted carbon steel Note: lower case "x" in model number is 4 for 460V, 3 for 230V, and 2 for 208V	PXEM218AxAJ	NEMA 12 enclosure, 10 HP duplex	200	UUT14b
	PXEM218FxAJ	NEMA 12 enclosure, 15 HP duplex	205	Interpolated
	PXEM318AxAJ	NEMA 12 enclosure, 10 HP triplex	205	Interpolated
	PXEM318FxAJ	NEMA 12 enclosure, 15 HP triplex	205	Interpolated
	PXEM418AxAJ	NEMA 12 enclosure, 10 HP quadruplex	210	Interpolated
	PXEM218GxAJ	NEMA 12 enclosure, 20 HP duplex	210	Interpolated
	PXEM218IxAJ	NEMA 12 enclosure, 30 HP duplex	210	Interpolated
	PXEM418FxAJ	NEMA 12 enclosure, 15 HP quadruplex	215	Interpolated
	PXEM318GxAJ	NEMA 12 enclosure, 20 HP triplex	215	Interpolated
	PXEM318IxAJ	NEMA 12 enclosure, 30 HP triplex	215	Interpolated
	PXEM418GxAJ	NEMA 12 enclosure, 20 HP quadruplex	220	Interpolated
	PXEM418IxAJ	NEMA 12 enclosure, 30 HP quadruplex	220	Interpolated
	PXEM218KxAJ	NEMA 12 enclosure, 40 HP duplex	220	Interpolated
	PXEM215XxAJ	NEMA 12 enclosure, 22.5-60 HP duplex	220	Interpolated
	PXEM318KxAJ	NEMA 12 enclosure, 40 HP triplex	225	Interpolated
	PXEM315XxAJ	NEMA 12 enclosure, 22.5-60 HP triplex	225	Interpolated
	PXEM418KxAJ	NEMA 12 enclosure, 40 HP quadruplex	230	UUT14b
	PXEM415XxAJ	NEMA 12 enclosure, 22.5-60 HP quadruplex	230	UUT12b
Vertical tanks [CAMPBELL HAUSFELD, ALSO BRANDED TWIN LAKES] Note: tanks are welded carbon steel	AR027400ST	120 gal	176	UUT10b
	AR051201AJ	200 gal	500	Interpolated
	AR051301AJ	240 gal	580	UUT11bii
Vertical tanks [MANCHESTER TANK] Note: tanks have ASME 165 PSIG construction with welded carbon steel	AR063700AV	400 gal	640	UUT12c
	AR660000AV	660 gal	1500	UUT15b
Vertical tanks [Morganton] Note: tanks are welded carbon steel	VES07285	80 gal	177	UUT30a, 31a
	VES04767	120 gal	177	UUT31a
	VES04865	120 gal	325	Interpolated
	VES07303	200 gal	500	Interpolated
	VES07072	240 gal	580	UUT30a

Special Seismic Certification

Table 29 - Certified Subcomponents (Continued) - Scroll Enclosed (SE) Air Systems, Rigid Base Mount

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Subcomponent [MFR]	Model	Max Dimensions (in)			Max Weight (lb)	Unit
		Length	Width	Height		
Desiccant dryers [POWEREX] Note: dryers consist of powder coated and welded carbon steel tanks, powder coated welded carbon steel mounting frame, and powder coated carbon steel mounting platform.	PMD10	17	28	53	200	Extrapolated
	PMD17	17	28	53	200	Extrapolated
	PMD30	17	28	64	330	Extrapolated
	PMD35	17	28	64	330	Extrapolated
	PMD45	17	28	72	360	UUT10b
	PMD55	17	28	72	360	Interpolated
	PMD60	35	28	67	660	Interpolated
	PMD71	35	28	67	660	Interpolated
	PMD90	35	28	76	720	Interpolated
	PMD110	35	28	76	720	Interpolated
	PMD111	35	28	76	720	UUT4b [1]
Desiccant dryers [POWEREX] Note: dryers consist of powder coated welded carbon steel tanks, powder coated welded carbon steel mounting frame, and powder coated carbon steel mounting platform	PLD10	17	28	53	200	Extrapolated
	PLD17	17	28	53	200	Extrapolated
	PLD30	17	28	64	330	Extrapolated
	PLD35	17	28	64	330	Extrapolated
	PLD45	17	28	72	360	UUT10b
	PLD55	17	28	72	360	Interpolated
	PLD60	35	28	67	660	Interpolated
	PLD71	35	28	67	660	Interpolated
	PLD90	35	28	76	720	Interpolated
	PLD111	35	28	76	720	UUT4b [1]
Desiccant dryers [NANO PSI] Note: dryers consist of aluminum extruded towers, powder coated carbon steel mounting frame, and powder coated carbon steel mounting platform.	NDL110	17	13	48	172	Extrapolated
	NDL120	17	13	52	209	Extrapolated
	NDL130	17	13	56	262	UUT11bii
	NDL2110	25	12	47	366	Interpolated
	NDL2120	16	25	61	450	UUT12b
	NDL2130	16	25	75	750	Interpolated
	NDL3130	16	31	75	800	Interpolated
	NDL4130	16	38	75	1160	UUT12b

1. UUT4b, which serves as the upper bookend, was tested on neoprene pads (see Table 18)

Special Seismic Certification

Table 30 - Certified Subcomponents - Medical Gas Automatic Changeover Manifolds, Rigid Wall Mount

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Gas Automatic Changeover Manifolds

Model	Manufacturer	Description	Material	Max Weight (lb)	Unit
ST981050AV	Powerex	Dome loaded spring assisted regulator	Brass, Stainless steel	5	UUT40, UUT41
ST9810 Series	Powerex	Spring loaded regulator	Brass, Stainless steel	5	UUT40, UUT41
ST980978AV	Powerex	Enclosure, right and left sides	Carbon steel, Powder coated	5	UUT40, UUT41
ST980972AV	Powerex	Enclosure subplate	Carbon steel, Powder coated	8	UUT40, UUT41
ST980974AV	Powerex	Enclosure cover	Carbon steel, Powder coated	8	UUT40, UUT41
ST980740AV	Powerex	Enclosure hinge	Stainless steel	<1	UUT40, UUT41
PE004100AV	Unitronics	PLC/HMI	Plastic	2	UUT40, UUT41
ST980970AV	Powerex	High Pressure connector block	Brass	2	UUT40, UUT41
ST981011AV	Fibox	NEMA 4 electrical box	Fiberglass, Plastic	2	UUT40, UUT41
ST9890975AV	Powerex	Wall mount plate	Carbon steel, Powder coated	4	UUT40, UUT41
1/2 NPT (CGA)	Superior	Inline CGA connect check valve	Brass	<1	UUT40, UUT41
1/2 NPT	Superior	Inline NPT port check valve	Brass	<1	UUT40, UUT41
ST189301AV	Stauff	Pipe -Tube clamp	Carbon steel, Plastic	<1	UUT40, UUT41

Special Seismic Certification
Table 31 - Tested Units

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Type	Model number	Total number of pumps	Vertically stacked pumps or layers	Horizontally arrayed pumps	Dimensions (inches)			Weight (lb.)	Mounting	Unit
					Length	Width	Height			
Scroll Stacked Air Systems Note: indicated length and/or height are combined overall dimensions for the individual unit skids	MSD0203(4L5)	2	2	1	50.0	31.0	78.0	1,040	Flexible base (neoprene), w/ internal isolation	UUT1
	LSD0203(4L5)	2	2	1	74.0	32.0	62.0	1,090	Flexible base (neoprene), w/ internal isolation	UUT2
	MSQ0504(4P5)	4	4	1	77.0	32.0	77.0	1,870	Flexible base (neoprene), w/ internal isolation	UUT3
	MSD1506(4L5) (controller/pump skid)	6	2	3	84 [1]	34.0	96 [1]	1,510	Flexible base (neoprene), w/ internal isolation	UUT4a
	MSD1506(4L5) (receiver/dryer skid)	N/A	N/A	N/A		32.0		1,310	Flexible base (neoprene)	UUT4b
	MSQ1506(4L5) (controller/pump skid)	12	3	4	108 [2]	34.0	96 [2]	2,950	Flexible base (neoprene), w/ internal isolation	UUT7
	MSQ1506(4L5) (receiver/dryer skid)	N/A	N/A	N/A		32.0		1,310	Flexible base (neoprene)	UUT5b
	Dryer skid	N/A	N/A	N/A	98.0	32.0	79.0	1,060	Flexible base (neoprene)	UUT6
	MSD15B4(4K5) (partially welded controller/compressor skid)	4	4	1	61.0	32.5	78.0	1,550	Rigid base, w/ internal isolation	UUT10a
	MSD15B4(4K5) (receiver/dryer skid)	N/A	N/A	N/A	61.0	33.5	76.0	840	Rigid base	UUT10b
	MSQ20B6(2P5) (partially welded controller/compressor skid)	8	7	2	79.0	33.5 [3]	78.0	3,120	Rigid base, w/ internal isolation	UUT11aii
	MSQ20B6(2P5) (receiver/dryer skid)	N/A	N/A	N/A	79.0	43.0 [3]	93.0	1,680	Rigid base	UUT11bii
	Dryer skid (NDL110 and NDL2110 dryers)	N/A	N/A	N/A	55.0	31.5	67.0	800	Flexible base (neoprene)	UUT9
	MSD02A3	2	2	N/A	50.5	30.5	75.0	1,060	Rigid base, w/ internal isolation	UUT 32
	MSP15A6 (receiver/dryer/controller skid)	N/A	N/A	N/A	86.0	34.0	91.0	2,110	Rigid base	UUT 33i
	MSP15A6 (pump skid)	15	2,3	3	86.0	34.0	80.0	4,030	Rigid base, w/ internal isolation	UUT 33ii
	MSQ10C6 (bolted compressor/controller skid)	4	4	1	60.0	34.5	80.5	1,770	Rigid base, w/ internal isolation	UUT35
	MSH20C6 (bolted compressor/controller skid)	12	4	3	90.5	35.0	89.5	4,590	Rigid base, w/ internal isolation	UUT36
Reciprocating Piston Compressor Stacked Units	IOPDXX04	2	2	1	54.0	71.0	81.0	1,720	Flexible base (neoprene), w/ internal isolation [compressor skid]; Rigid base [tank/dryer/controller skid]	UUT42
	IOPDXX06 (compressor skid)	2	2	1	51.5	34.5	71.0	1,270	Flexible base (neoprene), w/ internal isolation	UUT43a
	IOPDXX06 (tank/dryer/controller skid)	N/A	N/A	N/A	65.0	34.5	96.0	1,290	Rigid base	UUT43b
Compact Duplex Scroll Air Systems	LSD10C3	2	1	2	46.5	34.5	75.5	1,490	Rigid base, w/ internal isolation	UUT34
Rotary Tooth Oil Free Air Systems	MDRC05074FA5 (pump skid)	1	1	1	77.5	39.4	65.2	2,930	Rigid base, w/ internal isolation	UUT12a
	MDRC05074FA5 (dryer/controller skid)	N/A	N/A	N/A	32.0	99.2	80.3	1,760	Rigid base	UUT12b
	MDRC05074FA5 (400 gallon receiver tank)	N/A	N/A	N/A	38.2	47.2	101.5	640	Rigid base	UUT12c
Scroll Enclosed Compressed Air Systems Note: compressor enclosures are structurally independent and flexibly connected. Only one compressor enclosure tested in each UUT14a and UUT15a.	MSED200425 (pump skid)	4	4	1	46.4	35.2	61.2	1,030	Rigid base, w/ internal isolation	UUT14a
	MSED200425 (controller skid); 2 controllers tested: PXEM218G2AJ and PXEM418G2AJ	N/A	N/A	N/A	55.0	39.8	79.4	560	Rigid base	UUT14b
	LSEQ60B845 (pump skid)	6	3,3	2	51.0	73.8	61.2	2,740	Rigid base, w/ internal isolation	UUT15a
	LSEQ60B845 (660 gallon receiver tank)	N/A	N/A	N/A	42.0	42.0	126.5	1,500	Rigid base	UUT15b
Miscellaneous	Platform base, 80 gallon vertical tank, 240 gallon vertical tank	N/A	N/A	N/A	33.5	60.0	94.0	1,010	Rigid base	UUT 30a
	Platform base, 80 gallon vertical tank, 240 gallon vertical tank	N/A	N/A	N/A	33.5	60.0	94.0	1,010	Flexible base (neoprene)	UUT 30b
	Ladder Frame base, 80 gallon vertical tank, 120 gallon vertical tank	N/A	N/A	N/A	32.0	55.0	75.0	630	Rigid base	UUT 31a
	Ladder Frame base, 80 gallon vertical tank, 120 gallon vertical tank	N/A	N/A	N/A	32.0	55.0	75.0	630	Flexible base (neoprene)	UUT 31b

1. Length and height are combined dimensions of UUT4a and UUT4b.
2. Length and height are combined dimensions of UUT7 and UUT5b.
3. Overall width dimension for UUT11aii/bii is 90", which includes an 18" separation between the two equipment skids.

Special Seismic Certification
Table 31 - Tested Units (Continued)

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Gas Automatic Changeover Manifolds

Type	Powerex Model	Control	Gas Container Type[1]	Cabinet	Delivery Pressure	Dimensions (inches)			Weight (lb.)	Mounting	Unit
						Depth	Width	Height			
Medical Gas Automatic Changeover Manifolds	MFLD-CYL-NFPA-O2-N4	Digital	C x C	NEMA 4	55 PSIG	10.0	17.5	20.5	69	Rigid wall	UUT40
	MFLD-LIQ-NFPA-N2-350	Digital	L x L	Standard	180 PSIG	10.0	17.5	20.5	72	Rigid wall	UUT41

1. C x C = Cylinder x Cylinder, and L x L = Liquid x Liquid

UUT1 - DCL Test Report 33299-1301

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSD0203(4L5)

Product Construction Summary: Powder coated structural steel skid and frame. Unit is internally isolated.

Options / Component Summary: 2HP scroll pumps with WEG motors, 80 gallon vertical receiver tank, BASIC_PSM controller in NEMA 12 enclosure, 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)	Tuested Unit	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,040	UUT1	50.0	31.0	78.0	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 2022	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 (4) Airloc model 32 neoprene pads and (4) 3/8"-diameter, Grade 5 bolts and flat washers spaced at approximately 30'' widthwise and 48'' lengthwise on-center.

UUT1 Overall View

UUT2 - DCL Test Report 33299-1301

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: LSD0203(4L5)

Product Construction Summary: Powder coated structural steel skid and frame. Unit is internally isolated.

Options / Component Summary: 2HP scroll pumps with WEG motors, 80 gallon vertical receiver tank, PBMI_PXMI controller in NEMA 12 enclosure, 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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,090	UUT2	74.0	32.0	62.0	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 2022	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 (4) Airloc model 32 neoprene pads and (4) 1/2"-diameter, Grade 5 bolts and flat washers spaced at approximately 31'' widthwise and 72'' lengthwise on-center.

UUT2 Overall View

UUT3 - DCL Test Report 33299-1301

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSQ0504(4P5)

Product Construction Summary: Powder coated structural steel skid and frame. Unit is internally isolated.

Options / Component Summary: 5HP scroll pumps with WEG motors, 120 gallon vertical receiver tank, PBMI_PXMI controller in NEMA 12 enclosure, 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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,870	UUT3	77.0	32.0	77.0	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 2022	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 (4) Airloc model 32 neoprene pads and (4) 1/2"-diameter, Grade 5 bolts and flat washers spaced at approximately 31'' widthwise and 75'' lengthwise on-center.

UUT3 Overall View

UUT4a - DCL Test Report 33299-1301

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSD1506(4L5) (controller/compressor skid)

Product Construction Summary: Powder coated structural steel skid and frame. Unit is internally isolated.

Options / Component Summary: 5HP scroll pumps with WEG motors, PBMI_PXMI controller in NEMA 12 enclosure.

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,510	UUT4a	84.0*	34.0	96.0*	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 2022	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 UUT4a and UUT4b.

Unit Mounting Description:

The unit was base mounted to the shake table interface frame through the skid using (4) Airloc model 32 neoprene pads and (4) 1/2"-diameter, Grade 5 bolts and flat washers spaced approximately 32'' widthwise and 74'' lengthwise on-center.

UUT4a Overall View

UUT4b - DCL Test Report 33299-1301

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSD1506(4L5) (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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,310	UUT4b	84.0*	32.0	96.0*	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 2022	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 UUT4a and UUT4b.

Unit Mounting Description:

The unit was base mounted to the shake table interface frame through the skid using (4) Airloc model 32 neoprene pads and (4) 1/2"-diameter, Grade 5 bolts and flat washers spaced approximately 30'' widthwise and 74'' lengthwise on-center.

UUT4b Overall View

UUT5b - DCL Test Report 33299-1301

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSQ1506(4L5) (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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,310	UUT5b	108.0*	32.0	96.0*	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 2022	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 (4) Airloc model 32 neoprene pads and (4) 1/2"-diameter, Grade 5 bolts and flat washers spaced approximately 30'' widthwise and 78'' lengthwise on-center.

UUT5b Overall View

UUT6 - DCL Test Report 33299-1301

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,060	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 2022	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 using (4) Airloc model 32 neoprene pads and (4) 1/2"-diameter, Grade 5 bolts and flat washers spaced approximately 30'' widthwise and 95'' lengthwise on-center.

UUT6 Overall View

UUT7 - DCL Test Report 34796-1401c

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSQ1506(4L5) (controller/compressor skid)

Product Construction Summary: Powder coated structural steel skid and frame. Unit is internally isolated.

Options / Component Summary: 5HP scroll pumps with WEG motors, PBMI_PXMI controller in NEMA 12 enclosure.

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
2,950	UUT7	108.0*	34.0	96.0*	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 2022	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 (4) Airloc model 32 neoprene pads and (4) 1/2"-diameter, Grade 5 bolts and flat washers spaced approximately 32'' widthwise and 95'' lengthwise on-center.

UUT7 Overall View

UUT9 - DCL Test Report 39372-1601b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

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)		
	Tested Unit	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 2022	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 (4) Airloc model 32 neoprene pads and (4) 1/2"-diameter, Grade 5 bolts and flat washers spaced at approximately 30'' widthwise and 53'' lengthwise on-center.

UUT9 Overall View

UUT10a,b - DCL Test Report 39372-1601b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSD15B4(4K5) partially welded controller/compressor skid (UUT10a) and receiver/dryer skid (UUT10b)

Product Construction Summary: Powder coated structural steel skid and frame. UUT10a is internally isolated.

Options / Component Summary: 7.5 HP scroll pumps with WEG motors, 120 gallon vertical receiver tank, BASIC_PSM controller, PMD45 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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,550	UUT10a	61.0	32.5	78.0	6.5	4.5	24.0
840	UUT10b	61.0	33.5	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 2022	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 (4) 1/2"-diameter, Grade 5 bolts and flat washers spaced at approximately 30.5'' widthwise and 57.5'' lengthwise on-center for both skids.

UUT10a,b Overall View

UUT11aii,bii - DCL Test Report 39372-1601b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSQ20B6(2P5) partially welded controller/pump skid (UUT11aii) and receiver/dryer skid (UUT11bii)

Product Construction Summary: Powder coated structural steel skid and frame. UUT11aii is internally isolated.

Options / Component Summary: 10 HP scroll pumps with WEG motors, 240 gallon vertical receiver tank, PBMI_PXMI controller, NDL130 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)	Tested Unit	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
3,120	UUT11aii	79.0	33.5	78.0	3.0	3.0	7.5
1,680	UUT11bii	79.0	43.0	93.0	4.5	4.0	17.0
4,800	Total	79.0	90.0 *	93.0	NA	NA	NA

*Overall width dimension that includes an 18" separation between the two equipment skids.

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 2022	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 (4) 1/2"-diameter, Grade 5 bolts and flat washers spaced at approximately 31' widthwise and 74'' lengthwise on-center for UUT11aii and 42'' widthwise and 74'' lengthwise on-center for UUT11bii.

UUT11aii, UUT11bii Overall View

UUT12a - DCL Test Report 41182-1701a

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MDRC05074FA5 (pump skid)

Product Construction Summary: Painted carbon steel enclosure. Unit is internally isolated.

Options / Component Summary: 50 HP pumps with WEG motors.

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
2,930	UUT12a	77.5	39.4	65.2	5.5	6.0	28.0

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 2022	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 with (4) 7/16"-diameter Grade 8 bolts, flat washers, and (4) 3"x3"x1/4" galvanized finish low carbon steel washers spaced approximately 38'' widthwise and 34'' lengthwise on-center. Pre-test retrofit: the side panels were bolted to the enclosure frame with an additional (4) 5/16-inch diameter Grade 5 bolts, nuts, and washers each.

UUT12a Overall View and Mounting Hardware

UUT12b - DCL Test Report 41182-1701a

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MDRC05074FA5 (dryer/controller skid)

Product Construction Summary: Powder coated structural steel skid and frame.

Options / Component Summary: Quadruplex controller, NDL2120 and NDL4130 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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,760	UUT12b	32.0	99.2	80.3	5.0	10.5	>33.3

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 2022	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 with (4) 1/2"-diameter Grade 5 bolts and flat washers spaced approximately 96'' widthwise and 30'' lengthwise on-center with (4) 3"x3"x3/16" galvanized finish low carbon steel washers.

UUT12b Front View

UUT12b Side View

UUT12c - DCL Test Report 41182-1701a

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MDRC05074FA5 (400 gallon receiver tank)

Product Construction Summary: Painted carbon steel

Options / Component Summary: 400 gallon vertical receiver tank

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
640	UUT12c	38.2	47.2	101.5	14.0	14.5	>33.3

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 2022	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 with (4) 1/2"-diameter Grade 8 bolts spaced approximately 19'' widthwise and 19'' lengthwise on-center, each with a 1/2" Grade 8 washer, 5/8" Grade 8 washer, and 2"x2"x3/16" low carbon steel black oxide finish plate washer.

UUT12c Overall View and Mounting Hardware

UUT14a - DCL Test Report 41182-1701a

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSED200425 (pump skid)

Product Construction Summary: Painted carbon steel enclosure. Unit is internally isolated.

Options / Component Summary: 5 HP pumps with WEG motors.

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,030	UUT14a	46.4	35.2	61.2	4.5	5.5	>33.3

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 2022	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 with (4) 1/2"-diameter Grade 5 bolts and washers spaced approximately 28'' widthwise and 33'' lengthwise on-center with (4) 1 1/2"x1 1/2"x1/4" galvanized finish low carbon steel washers.

UUT14a Overall View

UUT14b - DCL Test Report 41182-1701a

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSED200425 (controller skid); 2 controllers tested: PXEM218G2AJ and PXEM418G2AJ

Product Construction Summary: Powder coated structural steel skid.

Options / Component Summary: Custom skid with duplex and quadruplex PXE controllers.

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
560	UUT14b	55.0	39.8	79.4	11.0	9.5	>33.3

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 2022	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 with (4) 1/2"-diameter Grade 5 bolts, flat washers, and plain finish 1 1/4"x1 1/4" x 3/8" malleable iron bevel washers spaced approximately 30'' widthwise and 52" lengthwise on-center. Each control panel was braced to the skid with one piece of B-Line B45 14 gage galvanized carbon steel channel attached with B-Line B230 brackets (one bracket per channel end) and two Grade 2, 1/2"-diameter bolts and nuts with flat washers per bracket.

UUT14b - duplex panel

UUT14b - quadruplex panel

UUT15a - DCL Test Report 41182-1701a

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: LSEQ60B845 (pump skid)

Product Construction Summary: Painted carbon steel enclosure. Unit is internally isolated.

Options / Component Summary: 10 HP pumps with WEG motors.

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
2,740	UUT15a	51.0	73.8	61.2	5.0	6.0	>33.3

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 2022	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 with (4) 1/2"-diameter Grade 5 bolts, flat washers, and 1 1/2"x1 1/2"x1/4" galvanized finish low carbon steel plate washers spaced approximately 72'' widthwise and 37'' lengthwise on-center. Pre-test retrofit: the top diaphragm corners were welded together, and the side panels were bolted to the frame with an additional four 5/16-inch diameter Grade 5 bolts, nuts and washers each.

UUT15a Overall View and Mounting Hardware

UUT15b - DCL Test Report 41182-1701a

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: LSEQ60B845 (660 gallon receiver tank)

Product Construction Summary: Carbon steel

Options / Component Summary: 660 gallon vertical receiver tank

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,500	UUT15b	42.0	42.0	126.5	14.5	9.5	>33.3

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 2022	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 with (4) 1/2"-diameter Grade 8 bolts, flat washers, and 3"x3"x3/16" galvanized finish low carbon steel washers spaced approximately 20'' widthwise and 20'' lengthwise on-center.

UUT15b Overall View

UUT30a - DCL Test Report 42747-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: VES07285 (80gal tank) , VES07072 (240gal tank)

Product Construction Summary: Powder coated structural steel skid

Options / Component Summary: Platform frame mounted tanks

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,010	UUT30a	33.5	60.0	94.0	4.0	5.5	31.5

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT30a was base mounted with (4) 1/2'' diameter Grade 5 bolts and flat washers spaced approximately 50'' widthwise and 31'' lengthwise on center.

UUT30a Overall View

UUT31a - DCL Test Report 42747-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: VES07285 (80gal tank) , VES04767 (120gal tank)

Product Construction Summary: Powder coated structural steel skid

Options / Component Summary: Ladder frame mounted tanks

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
630	UUT31a	32	55	75	8.5	11.5	>33.3

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT31a was base mounted with four 1/2'' diameter Grade 5 bolts, flat washers, and 1 1/4"x1 1/4" x 3/8" malleable iron bevel washers spaced approximately 53'' widthwise and 30'' lengthwise on-center.

UUT31a Overall View

UUT30b - DCL Test Report 42747-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: VES07285 (80gal tank) , VES07072 (240gal tank)

Product Construction Summary: Powder coated structural steel skid

Options / Component Summary: Platform frame mounted tanks

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,010	UUT30b	33.5	60.0	94.0	3.0	3.5	10.5

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT30b was base mounted with (4) 1/2'' diameter Grade 5 bolts and flat washers spaced approximately 50'' widthwise and 31'' lengthwise on-center through an Airloc model 32 neprene pad.

UUT30b Overall View

UUT31b - DCL Test Report 42747-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: VES07285 (80gal tank) , VES04767 (120gal tank)

Product Construction Summary: Powder coated structural steel skid

Options / Component Summary: Ladder frame mounted tanks

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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
630	UUT31b	32	55	75	8.0	9.5	16.0

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT31b was base mounted with four 1/2'' diameter Grade 5 bolts, flat washers, and 1 1/4"x1 1/4" x 3/8" malleable iron bevel washers spaced approximately 53'' widthwise and 30'' lengthwise on-center through an Airloc model 32 neprene pad.

UUT31b Overall View

UUT32 - DCL Test Report 43305-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSD02A3

Product Construction Summary: Powder coated structural steel skid

Options / Component Summary: Medical air and laboratory air unit with Trident PD204A desiccant 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)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
1,060	UUT32	51	31	75	4.5	9.5	21.0

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT32 was base mounted with (4) 1/2"-diameter Grade 5 bolts and flat washers spaced approximately 30'' widthwise and 20'' lengthwise on-center.

UUT32 Overall View

UUT33i,ii - DCL Test Report 43305-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSP15A6

Product Construction Summary: Powder coated structural steel skid

Options / Component Summary: Medical air and laboratory air unit with Trident PD213A desiccant 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

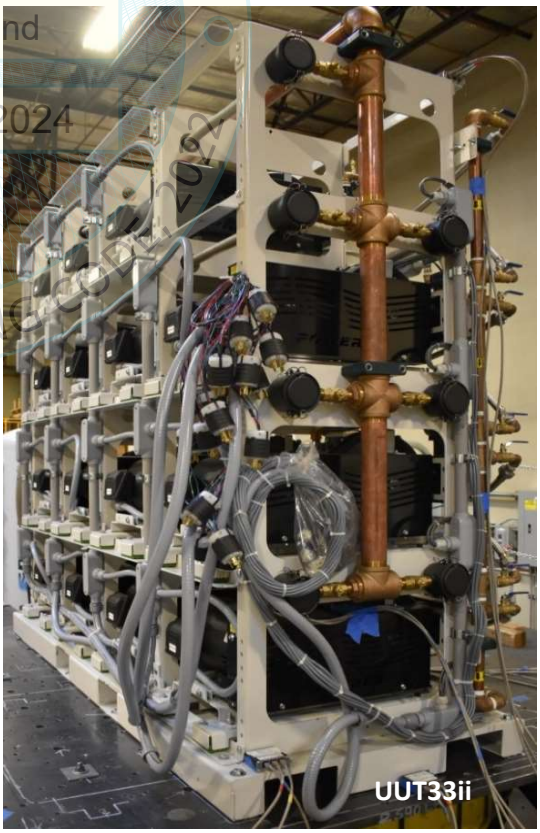
Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
	Tested Unit	Length	Width	Height	Front-Back	Side-Side	Vertical
2,110	UUT33i	86	34	91	5.0	6.5	27.5
4,030	UUT33ii	86	34	80	5.5	4.0	22.0

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT33i and 33ii were base mounted with (8) 1/2"-diameter Grade 5 bolts and flat washers spaced approxmately 31'' widthwise and 20'' lengthwise on-center for both skids.



UUT33i and UUT33ii Overall Views

UUT34 - DCL Test Report 43160-2301b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: LSD10C3

Product Construction Summary: Painted carbon steel

Options / Component Summary: Duplex system. Scroll compressor assemblies (10 hp), PBMI_PXMI controller in NEMA 12 enclosure, PD208A desicant dryer, 80 gallon air reciever tank.

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

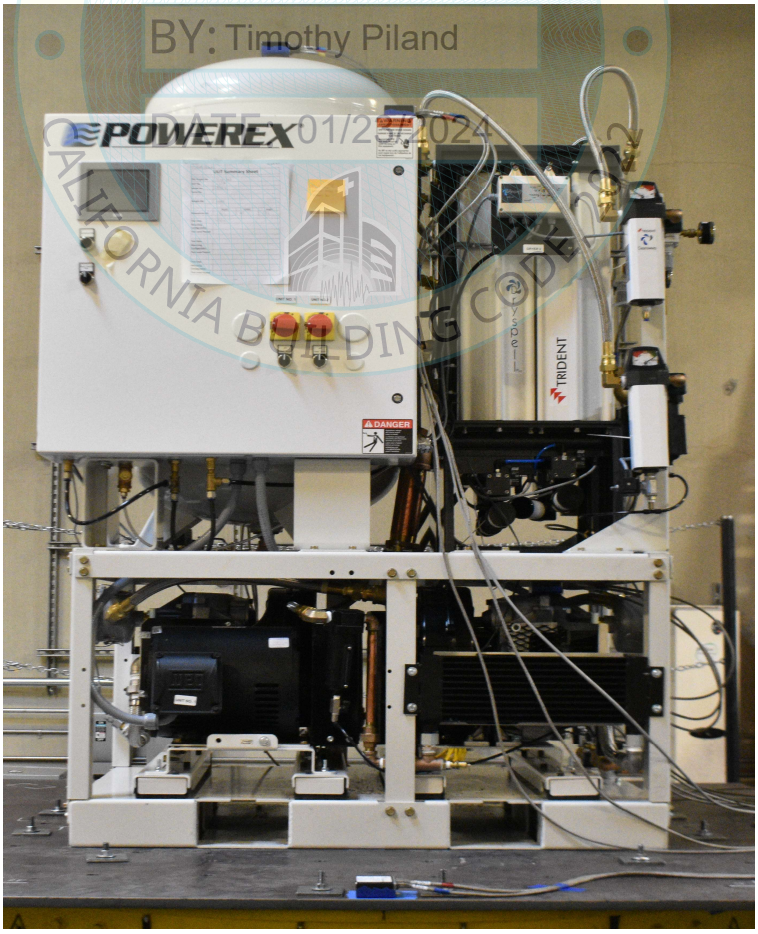
Operating Weight (lb)	Tested unit	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,490	UUT34	46.5	34.5	75.5	6.0	6.5	15.5

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT34 wase rigidly base mounted to the DCL interference plate with (4) ½" Grade 5 bolts and (8) flat washers. The bolts were spaced 30.5" apart widthwise and 44" apart lengthwise on-center.



UUT34 Overall View

UUT35 - DCL Test Report 43160-2301b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSQ10C6

Product Construction Summary: Carbon steel

Options / Component Summary: Quadruplex system. Scroll compressor assembies (7.5 hp) and BASIC_PSM controller in NEMA 12 enclosure.

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

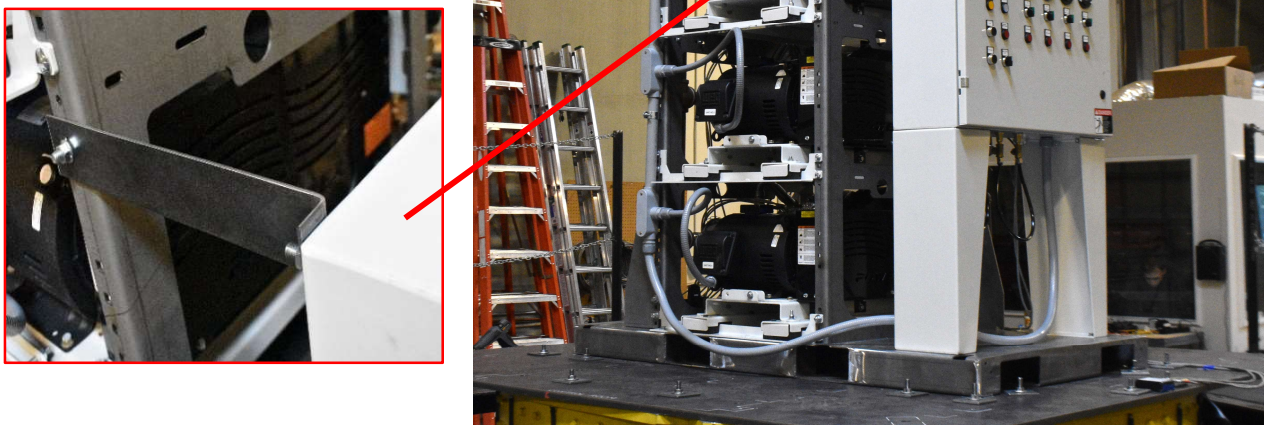
Operating Weight (lb)	Tested unit	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,770	UUT35	60.0	34.5	80.5	4.5	6.5	14.5

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT35 was rigidly base mounted to the DCL interference plate with (4) ½" Grade 5 bolts and flat washers spaced 54.5" apart lengthwise and 32.5" apart widthwise on-center. Pre-test retrofit: a 12" long and 2" wide L-shaped bracket made of 1/8" carbon steel was added between the compressor stack and top of the controller. The bracket was attached to the controlled and skid frame with two 5/16" Grade 5 bolts, washers, and serrated nuts, one at each end of the bracket.



UUT35 Overall View and Pre-Test Retrofit

UUT36 - DCL Test Report 43160-2301b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSH20C6

Product Construction Summary: Painted carbon steel

Options / Component Summary: Twelve pump system. Scroll compressor assemblies (10 hp) and PBMI_PXMI controller in NEMA 12 enclosure.

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)	Tested unit	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
4,590	UUT36	90.5	35.0	89.5	5.0	4.0	14.0

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT36 was rigidly base mounted to the DCL interference plate with (8) ½" Grade 5 bolts and flat washers spaced 33.3", 19.1", and 34.6" apart lengthwise and 32.5" apart widthwise on-center.

UUT36 Overall View

UUT40 - DCL Test Report 43160-2301b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air Gas Manifolds

Model Number: MFLD-CYL-NFPA-O2-N4

Product Construction Summary: Painted carbon steel

Options / Component Summary: NEMA 4 enclosure, regulators and valves, HMI/PLC controller.

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

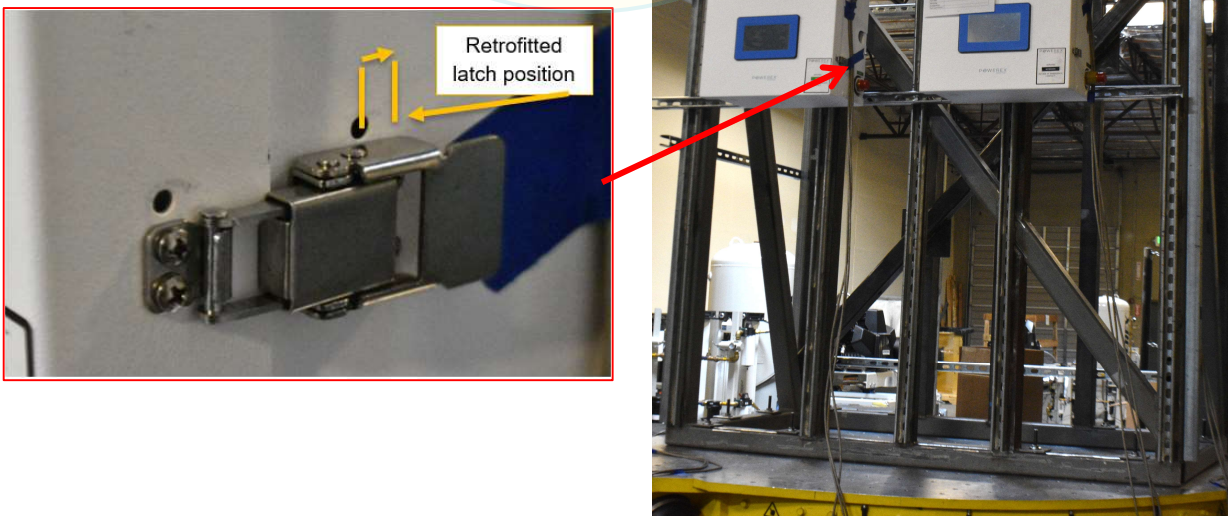
Operating Weight (lb)	Tested unit	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
69	UUT40	10.0	17.5	20.5	N/A	N/A	N/A

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT40 was rigidly wall mounted to the DCL wall fixture using a manufacturer-provided support with (4) 3/8" Grade 5 bolts, flat washers, 1¾" x1¾" x¼" carbon steel washers, and channel nuts. The bolts were spaced 10.8" apart widthwise and 18.5" apart vertically on-center. The manufacturer-provided support was a rectangular 20"x12"x0.11" carbon steel frame with a depth of 1.3". The manifold was attached to the support with (4) 5/16" Grade 5 bolts spaced 18.5" vertically, 8" widthwise on the top row, and 5" widthwise on the bottom row on-center. Retrofit: the bottom latches were moved approximately 3/16" back lengthwise from their previous position.



UUT40 Overall View and Retrofit

UUT41 - DCL Test Report 43160-2301b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air Gas Manifolds

Model Number: MFLD-CYL-NFPA-O2-N4

Product Construction Summary: Painted carbon steel

Options / Component Summary: NEMA 4 enclosure, regulators and valves, HMI/PLC controller.

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

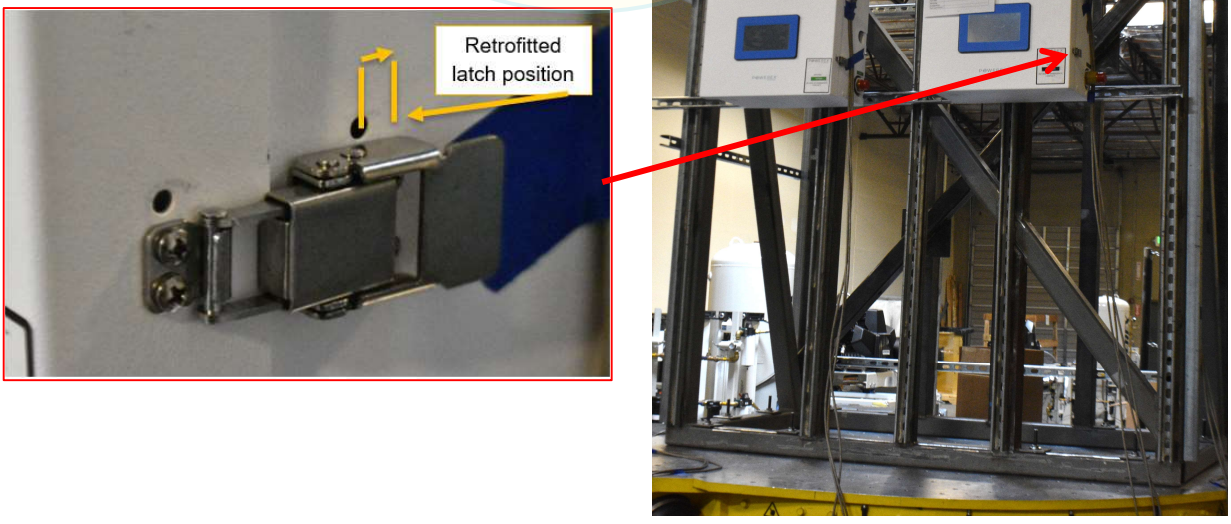
Operating Weight (lb)	Tested unit	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
72	UUT41	10.0	17.5	20.5	N/A	N/A	N/A

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT41 was rigidly wall mounted to the DCL wall fixture using a manufacturer-provided support with (4) 3/8" Grade 5 bolts, flat washers, 1¾" x1¾" x¼" carbon steel washers, and channel nuts. The bolts were spaced 10.8" apart widthwise and 18.5" apart vertically on-center. The manufacturer-provided support was a rectangular 20"x12"x0.11" carbon steel frame with a depth of 1.3". The manifold was attached to the support with (4) 5/16" Grade 5 bolts spaced 18.5" vertically, 8" widthwise on the top row, and 5" widthwise on the bottom row on-center. Retrofit: the bottom latches were moved approximately 3/16" back lengthwise from their previous position.



UUT41 Overall View and Retrofit

UUT42 - DCL Test Report 43160-2301b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: IOPDXX04

Product Construction Summary: Painted Carbon Steel

Options / Component Summary: Duplex system. 120 gallon vertical tank, dryers, BASIC_PSM controller in NEMA 12 enclosure, (1) 3 HP compressor in the bottom position and (1) 5 HP compressor in the top position.

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)	Tested unit	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,720	UUT42	54.0	71.0	81.0	5.0	7.0	20.5

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

* The width of UUT42 was obtained by adding the width of each skid together along with the tested 4" gap between the skids.

Unit Mounting Description:

UUT42 consisted of a compressor skid and a tank/dryer/controller skid. The compressor skid was flexibly base mounted to the DCL interface plate with (4) ½" Grade 5 bolts, flat washers, and 4"x4"x1" Airloc 32 neoprene pads. The tank/dryer/controller skid was rigidly base mounted to the DCL interface plate with (4) ½" Grade 5 bolts and (8) flat washers. The bolts on each skid were spaced 31" apart widthwise and 49" apart lengthwise measured on-center. Both skids were tested with a gap of 4".

UUT42 Overall View

UUT43a,b - DCL Test Report 43160-2301b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: IOPDXX06

Product Construction Summary: Painted Carbon Steel

Options / Component Summary: Duplex system. 240 gallon vertical tank, dryers, PBMI_PXMI controller in NEMA 12 enclosure, (1) 7.5 HP compressor in the bottom position and (1) 15 HP compressor in the top position. Both compressors were mounted to the compressor skid with spring isolators.

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)	Tested unit	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
1,270	UUT43a	51.5	34.5	71.0	3.0	5.0	8.0
1,290	UUT43b	65.0	34.5	96.0	4.5	6.0	30.0

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 2022	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT43a,b consisted of a compressor skid referred to as UUT43a and a tank/dryer/controller skid referred to as UUT43b . UUT43a was flexibly base mounted to the DCL interface plate with (4) ½" Grade 5 bolts, flat washers, and 4"x4"x1" Airloc 32 neoprene pads. UUT43b was rigidly base mounted to the DCL interface plate with (4) ½" Grade 5 bolts and (8) flat washers. The bolts on UUT43a were spaced 31" apart widthwise and 49" apart lengthwise measured on-center. The bolts on UUT43b were spaced 31" apart widthwise and 58" apart lengthwise measured on-center. The units were tested with a gap of 4" between the skids.

UUT43a,b Overall View