

### DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR HCAI SPECIAL SEISMIC	OFFICE USE ONLY
CERTIFICATION PREAPPROVAL (OSP)	APPLICATION #: OSP-0393
HCAI Special Seismic Certification Preapproval (OSP)	
Type: New X 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@powerexir	nc.com
Product Information	MD
Product Name: Medical Gas and Vacuum Systems	
Product Type: Medical Air and Vacuum Systems	2
Product Model Number: See attachment	
General Description: Medical vacuum and laboratory vacuum units cont	tain pump <mark>s, a r</mark> eceiver tank, controller and filters.
Mounting Description: Rigid base mounted and neoprene pad mounted.,	See Certified Product Tables
Tested Seismic Enhancements: Seismic enhancements made to the test anomalies during the tests shall be inco	st units and/or modifications required to address or porated into the production units.
Applicant Information	
Applicant Company Name: Dynamic Certification Laboratories	00
Contact Person: Kelly Laplace	
Mailing Address: 1315 Greg Parkway #109, Sparks, NV 89431	
Telephone: (775) 358-5085 Email: Kelly@shaketes	st.com
Title: Business Manager	



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# DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)
Company Name: THE VMC GROUP
Name: Kenneth Tarlow California License Number: S2851
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Certification Method
GR-63-Core X ICC-ES AC156 IEEE 344 IEEE 693 NEBS 3
Other (Please Specify):
FOR CODE CO
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
O DATE: 01/24/2024
DATE: 01/24/2024
BUILDING



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OSP-0393



# DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

### Seismic Parameters

Design Basis of Equipment or Components	(Fp/Wp) = 1.40 (Rigid); 4.39 (Internally isolated), 3.51 (externally isolated with neoprene elements)
SDS (Design spectral response accel	eration at short period, g) = 1.95
ap (Amplification factor) =	1.0 (Rigid), 2.5 (internally isolated system), 2.5 (externally isolated with neoprene elements)
Rp (Response modification factor) =	2.5 (Rigid), 2.0 (internally isolated system), 2.5 (externally isolated with neoprene elements)
$\Omega_0$ (System overstrength factor) =	2.0
lp (Importance factor) =	1.5
z/h (Height ratio factor) =	1
Natural frequencies (Hz) =	See Attachment
Overall dimensions and weight =	See Attachment
III III	HCAI
HCAI Approval (For Office Use Only) -	Approval Expires on 01/24/2030
Date: 1/24/2024	
Name: Timothy Piland	BY: Timothy Piland Title: Senior Structural Engineer

z/h =

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Condition of Approval (if applicable):

Special Seismic Certification Valid Up to: SDS (g) = 1.95



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#### Table 1 - Certified Components - Stacked Systems, Lubricated Rotary Vane Pumps, Flexible Base Mount



DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

ounting: Flexible Base							Max	. Dimension	s (in)			
edical System Model	Laboratory System Model	HP	Tank Size <sup>1</sup> (gallons)	Total Number of Pumps	Vertically Stacked Pumps or Layers	Horizontally Arrayed Pumps	Length	Width <sup>2</sup>	Height	Max. Operating Weight (lb)	Mounting	Unit
	I					Stacked S	/stems	·				-
						Dupl	ex					
VPD0404	LVPD0404	5 (2)	120 V	2	2	1	55	64	76	1,340		UUT1
VPD0405	LVPD0405	5 (2)	200 V	2	2	1	55	64	83	1,600		Interpolated
VPD0504	LVPD0504	5 (2)	120 V	2	2	$R \downarrow Ul$	55	64	76	1,685		Interpolated
VPD0XXX	LVPD0XXX	5 (2)	200 V	2	2	1	70	45	80	1,940		UUT5 <sup>3</sup>
VPD0754	LVPD0754	7.5 (2)	120 V	2	2		55	64	76	1,760		Interpolated
VPD0755	LVPD0755	7.5 (2)	200 V	2	2	1	55	64	83	1,960	Flexible base (neoprene) w/ internal isolation	Interpolated
VPD1004	LVPD1004	10 (2)	120 V	2	2	1	55	64	76	2,050		Interpolated
VPD1005	LVPD1005	10 (2)	200 V	2	2		55	64	83	2,250		Interpolated
VPD1505	LVPD1505	15 (2)	200 V	2	2	NY ITA I VII A	70	90	87	4,280		Interpolated
VPD2005	LVPD2005	20 (2)	200 V	2	2		270 0	90	87	4,610		Interpolate
VPD2505	LVPD2505	25 (2)	200 V	2	2	031-0	0700	90	87	5,130		UUT2
					AN AN AN AN AN AN AN	Triplex (based on	2-stack plu	s 1)				
VPT0504	LVPT0504	5 (3)	120 V	3	2,1	2	55	96	76	1,950		Extrapolated
VPT0505	LVPT0505	5 (3)	200 V	3	2,1	imo²hy F	Pilān	96	83	2,350		Extrapolated
VPT0754	LVPT0754	7.5 (3)	120 V	3	2,1	2	55	96	76	2,400		Extrapolated
VPT0755	LVPT0755	7.5 (3)	200 V	3	2,1	2	55	96	83	2,600		Extrapolated
VPT1004	LVPT1004	10 (3)	120 V	3	2,1	2	55	96	76	3,000	Flexible base (neoprene) w/ internal isolation	Extrapolated
VPT1005	LVPT1005	10 (3)	200 V	3	2,1	-: 21/2	4 55	96	83	3,200		Extrapolated
VPT1505	LVPT1505	15 (3)	200 V	3	2,1	2	70	135	87	5,850		Extrapolated
VPT2005	LVPT2005	20 (3)	200 V	3	2,1	2	70	135	87	6,250		Extrapolated
VPT2505	LVPT2505	25 (3)	200 V	3	2,1	2	71	135	87	6,800		Extrapolated
						Triplex (3	stack)	NUA	1.			
VPT0304	LVPT0304	3 (3)	120 V	3	3	1	55	66	84	1,635		Extrapolated
VPT0404	LVPT0404	5 (3)	120 V	3	3	1 million	55	66	84	1,710		Extrapolated
VPT0504	LVPT0504	5 (3)	120 V	3	3	A CAMPANY	55	66	87	1,850		Extrapolate
VPTOXXX	LVPT0XXX	7.5 (2), 3 (1)	N/A	3	3	RI III D	55	32	85	1,680	Flexible base (neoprene) w/ internal isolation	UUT8 5
VPT0505	LVPT0505	5 (3)	200 V	3	3		55	66	87	1,975		Extrapolate
VPT0754	LVPT0754	7.5 (3)	120 V	3	3	1	55	66	87	2,425		Extrapolate
VPT0755	LVPT0755	7.5 (3)	200 V	3	3	1	55	66	87	2,550		Extrapolated

1. V in tank listing indicates vertical orientation.

2. When touchscreen controls are used, an additional 2 inch space is required between skids.

3. UUT5 as tested was a pump skid only to certify alternate pumps. Skids are structurally independent and flexibly connected.

4. See Justification Matrix for explanation of extrapolated units.

5. UUT8 tested with a 7.5 HP claw pump (upper position), 7.5 HP lubricated pump (middle position), and 3 HP lubricated pump (lower position). Units are modular in nature; UUT8 was tested without a receiver tank and control panel skid. Receiver tanks and control panels are bookended by UUT1 and UUT2.

#### LABORATORIES,LLC DCL Project Number: 43160-2301 Manufacturer: Powerex Product Line: Medical Vacuum and Laboratory Vacuum Mounting: Flexible Base Mount Max. Dimensions (in) **Total Number** Vertically Stacked Laboratory System Tank Size Horizontally Max, Operating Medical System Model ΗР Unit Mounting Model of Pumps Pumps or Layers Arrayed Pumps Weight (lb) (gallons) Length Height Width<sup>2</sup> Stacked Systems (Continued) Quadruplex VPQ0505 LVPQ0505 5 (4) 200 V 4 2,2 55 96 83 2,850 2 Extrapolated 4 VPQ0755 LVPQ0755 7.5 (4) 200 V 4 2,2 2 55 96 83 3,150 Extrapolated 4 VPQ1005 LVPQ1005 10 (4) 200 V 4 2,2 2 55 96 83 3.900 Extrapolated 4 Flexible base (neoprene) w/ internal isolation VPQ1505 LVPQ1505 15 (4) 200 V 4 2,2 2 70 135 87 7,150 Extrapolated <sup>4</sup> VPQ2005 LVPQ2005 20 (4) 200 V 4 2.2 2 70 135 87 7,750 Extrapolated 4 VPQ2505 LVPQ2505 25 (4) 200 V 4 2,2 71 135 87 8,600 2 Extrapolated 4 Penta, Hexa and Octoplex Variants Using Stack Cor The Same iction VPP2506 LVPP2506 25 (5) 240 V 5 2,2,1 3 80 180 96 9,800 Extrapolated <sup>4</sup> VPH2506 LVPH2506 25 (6) 240 V 2.2.2 80 10.200 6 225 96 3 Flexible base (neoprene) w/ internal isolation Extrapolated 4 VPO2506 LVPO2506 25 (8) 240 V 8 2,2,2,2 4 80 225 96 11,900 UUT2, UUT13 3 Expandable VPD0504-EX3 LVPD0504-EX3 5 (2) 120 V 2 (3) 2 1(2) 55 64 76 1,685 Extrapolated <sup>4</sup> VPD0505-EX3 LVPD0505-EX3 5 (2) 200 V 2 (3) 2 1(2) 55 64 83 1,905 Extrapolated 4 VPD0754-EX3 LVPD0754-EX3 7.5 (2) 120 V 2 (3) 2 76 1,760 1 (2) 55 64 Extrapolated <sup>4</sup> 2 (3) VPD0755-EX3 LVPD0755-EX3 7.5 (2) 200 V 1(2) 55 64 83 1,960 2 Extrapolated <sup>4</sup> VPD1004-EX3 LVPD1004-EX3 10 (2) 120 V 2 (3) 2 1(2) 55 64 76 2,050 Extrapolated LVPD1005-EX3 VPD1005-EX3 10 (2) 200 V 2 (3) 2 1(2) 55 64 83 2,250 Extrapolated 4 2 (3) VPD1505-EX3 LVPD1505-EX3 15 (2) 200 V 2 1 (2) 70 -90 87 4.280 Extrapolated 4 2 (3) VPD2005-EX3 LVPD2005-EX3 20 (2) 200 V 2 1(2) 70 90 87 4,610 Flexible base (neoprene) w/ internal isolation Extrapolated 4 VPD2505-EX3 LVPD2505-EX3 25 (2) 200 V 2 (3) 2 1 (2) 71 90 87 5,030 Extrapolated VPT0505-EX4 LVPT0505-EX4 5 (3) 200 V 3 (4) 2 2 55 96 83 2,350 Extrapolated <sup>4</sup> VPT0755-EX4 LVPT0755-EX4 7.5 (3) 200 V 3 (4) 2,600 2 2 55 96 83 Extrapolated <sup>4</sup> VPT1005-EX4 LVPT1005-EX4 10 (3) 200 V 3 (4) 2 2 55 96 83 3,200 Extrapolated <sup>4</sup> VPT1505-EX4 LVPT1505-EX4 15 (3) 200 V 3 (4) 2 70 87 5.850 2 135 Extrapolated 4 VPT2005-EX4 LVPT2005-EX4 20 (3) 200 V 3 (4) 2 2 70 135 87 6,250 Extrapolated 4 VPT2505-EX4 LVPT2505-EX4 25 (3) 200 V 3 (4) 135 87 6,800

1. V in tank listing indicates vertical orientation.

2. When touchscreen controls are used, an additional 2 inch space is required between skids.

3. Two-high 25 HP vacuum pump skid tested in UUT2. Octoplex controller tested in UUT13. 240 gallon tank tested in UUT4b. Dimensions and weight shown here for the VPO2506 are calculated, assuming octoplex system contains of four of the duplex pump stacks as tested in UUT2.

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4. See Justification Matrix for explanation of extrapolated units.

Extrapolated <sup>4</sup>



### **Special Seismic Certification** Table 1 - Certified Components (Continued) - Stacked Systems, Lubricated Rotary Vane Pumps, Flexible Base Mount

#### Table 2 - Justification Matrix for Extrapolation - Stacked Systems, Lubricated Rotary Vane Pumps, Flexible Base Mount



DCL Project Number: 43160-2301 Manufacturer: Powerex Product Line: Medical Vacuum and Laboratory Vacuum Mounting: Flexible Base Mount Units Used For Extrapolation Difference From Units Used For Extrapolation Unit UUT1 (VPD0404) VPT0504 VPT0505 VPT0754 VPT0755 The duplex units tested in UUT1 and UUT2 consist of (2) pumps mounted on one side of the vertical tank. The extrapolated triplex systems consist of (1) two-high pump skid mounted on one side of the VPT1004 vertical tank and (1) one-high pump skid mounted on the other side of the vertical tank. Each skid is structurally independent and flexibly connected. VPT1005 VPT1505 VPT2005 UUT2 (VPD2505) VPT2505 UUT1 (VPD0404) VPQ0505 VPQ0755 VPQ1005 The duplex units tested in UUT1 and UUT2 consist of (1) two-high pump skid mounted on one side of the vertical tank. The extrapolated quadraplex systems consist of (2) two-high pump skids mounted on opposing sides of the vertical tank. Each skid is structurally independent and flexibly connected. VPQ1505 VPQ2005 UUT2 (VPD2505) VPQ2505 UUT2 (VPD2505) VPP2505 The duplex unit tested in UUT2 consists of (2) 25 HP pumps mounted on one side of the vertical tank. The extrapolated pentaplex system has (1) two-high and (1) one-high pump skids mounted on one UUT2 (VPD2505) side of the vertical tank and (1) two-high pump skid mounted on the other side of the vertical tank. Extrapolated hexaplex and octoplex systems consist of (1) or (2) two-pump stacks mounted on one VPH2505 side of the vertical tank and (2) two-pump stacks mounted on the other side of the vertical tank. The pumps are mounted to independent skids. The octoplex controller was tested in UUT13. UUT2 (VPD2505) VPO2505 UUT1 (VPD0404) VPD0504-EX3 VPD0505-EX3 VPD0754-EX3 VPD0755-EX3 VPD1004-EX3 VPD1005-EX3 VPD1505-EX3 The extrapolated expandable units consist of an independent receiver tank/control panel skid and an independent pump skid. The tested units UUT1 and UUT2 consisted of independent receiver VPD2005-EX3 ank/control panel skid and an independent pump skid. VPD2505-EX3 VPT0505-EX4 VPT0755-EX4 VPT1005-EX4 VPT1505-EX4 VPT2005-EX4 UUT2 (VPD2505) VPT2505-EX4

### Table 2 - Justification Matrix for Extrapolation (Cont.) - Stacked Systems, Lubricated Rotary Vane Pumps, Flexible Base Mount



DCL Project Number: 43160-2301 Manufacturer: Powerex Product Line: Medical Vacuum and Laboratory Vacuum Mounting: Flexible Base Mount Units Used For Extrapolation Difference From Units Used For Extrapolation Unit VPD0504 UUT5 (VPD0XXX) UUTS consists of a representative frame and base platform with a pump (RA0155A 5 HP) similar to that of UUT1 in the lower position and a larger claw pump in the upper position. VPD0505 VPT0304 VPT0404 VPT0504 UUT8 consists of a representative base and frame structure. The top position is occupied by a claw pump heavier than the certified lubricated rotary vane models, with the lowest position occupied by UUT8 (VPT0XXX) the lightest of the certified lube models and the mid position by the largest pump in the certified list. Control and tank skids for certified units are the same as was tested in UUT1 and UUT2. VPT0505 VPT0754 VPT0755 Triplex System Duplex System DSP-0393 Timothy Piland 01/24 Quadruplex System Pentaplex System Hexaplex System Octoplex System

### Table 3 - Certified Components - Stacked Units, Oilless Claw Pumps, Flexible Base Mount



DCL Project Number: 43160-2301

#### Manufacturer: Powerex

#### Product Line: Medical Vacuum and Laboratory Vacuum

<i>Nounting:</i> Flexible Base							Ma	x. Dimensions	(in)			
Medical System Model	Laboratory System Model	НР	Tank Size <sup>1</sup>	Total Number of Pumps	Vertically Stacked Pumps or Layers			Length Width <sup>2</sup> Height		Maximum Operating Weight (lb)	Mounting	Unit
						Stacked Systems						
						Duplex						
CVPD0504A	LCPD0504	5 (2)	120 V	2	2	1	55	64	76	1,690		UUT3
CVPD0504B	LCPD0604	6.4 (2)	120 V	2	2	CODE	55	64	76	1,925		Interpolated
CVPD0754A	LCPD0704	7.0 (2)	120 V	2	2	CODE	55	64	76	2,175		Interpolated
CVPD0754B	LCPD0904	9.1 (2)	120 V	2	2	WWWWILL	55	64	76	2,400	Flexible base (neoprene) w/ internal isolation	Interpolated
CVPD1005	LCPD1005	10 (2)	200 V	2	2	1	55	64	83	2,875	isolation	Interpolated
CVPDXXXX	LCPDXXXX	15 (1), 5 (1)	N/A	2	2	1	70	45	80	1,940		UUT5 <sup>3</sup>
CVPD1505	LCPD1505	15 (2)	200 V	2	2		74	90	88	3,800		UUT4 <sup>4</sup>
					Triplex (	based on 2-stack plu	s 1 layout)		1			
CVPT0504A	LCPT0504	5 (3)	120 V	3	2, 1	2	55	96	76	2,150		Extrapolated
CVPT0505A	LCPT0505	5 (3)	200 V	4 3	2, 1	2D 120	2 55	96	83	2,275	Flexible base (neoprene) w/ internal	Extrapolated
CVPT0504B	LCPT0604	6.4 (3)	120 V	<b>D</b> 3	2, 1	2000	55	96	76	2,000		Extrapolated
CVPT0505B	LCPT0605	6.4 (3)	200 V	3	2, 1	2	55	96	83	2,150		Extrapolated
CVPT0755A	LCPT0705	7.0 (3)	200 V	3	2, 1	2	55	96	83	3,200	isolation	Extrapolated
CVPT0755B	LCPT0905	9.1 (3)	200 V	3	<b>BY 2,1</b> im	othv2Pila	DC 55	96	83	3,500		Extrapolated
CVPT1005	LCPT1005	10 (3)	200 V	3	2, 1	2	55	96	83	4,200		Extrapolated
CVPT1505	LCPT1505	15 (3)	200 V	3	2, 1	2	71	135	88	4,800		Extrapolated
						Triplex (3-stack)				· · · ·		
CVPTOXXXX	LCVPT0XXXX	7.5 (2), 3 (1)	N/A	3	DA 3 E.	01/24/2	0.554	32	85	1,680		UUT8 <sup>6</sup>
CVPT0304	LCVPT0304	3 (3)	120 V	73	3		55	66	84	2,200		Extrapolated
CVPT0504A	LCVPT0504	4-5 (3)	120 V	3	3		55	66	84	2,235		Extrapolated
CVPT0504B	LCVPT0604	5-6.4 (3)	120 V	3	3		55	66	87	2,360		Extrapolated
CVPT0505A	LCVPT0505	4-5 (3)	200 V	3	3	1	55	66	87	2,275	Flexible base (neoprene) w/ internal	Extrapolated
CVPT0505B	LCVPT0605	5-6.4 (3)	200 V	3	3	1	55	66	87	2,400	isolation	Extrapolated
CVPT0754A	LCVPT0754A	6.4-7.5 (2)	120 V	3	3	1.1.1	55	66	87	2,565		Extrapolated
CVPT0755A	LCVPT0755A	6.4-7.5 (2)	200 V	3	3	1	55	66	87	2,690		Extrapolated
CVPT0754B	LCVPT0754B	7.5-9.1 (2)	120 V	3	3 <b>R</b> I	ITI DIN	55	66	87	2,600		Extrapolated
CVPT0755B	LCVPT0755B	7.5-9.1 (2)	200 V	3	3		55	66	87	2,725		Extrapolated

1. V in tank listing indicates vertical or horizontal orientation.

2. When touchscreen controls are used, an additional 2 inch space is required between skids.

3. UUT5 was tested as a pump skid only to certify alternate pumps.

4. Two-high 15 HP vacuum pump skid tested in UUT4. Dimensions and weight shown here for the CVPO1506 are calculated, assuming octoplex system consists of four of the duplex pump stacks as tested in UUT4.

5. See Justification Matrix for explanation of extrapolated units.

6. UUT8 was tested as a pump skid only to certify alternate pumps. UUT8 tested with a 7.5 HP claw pump (upper position), 7.5 HP lubricated pump (middle position), and 3 HP lubricated pump (lower position). Receiver tanks and control panels bookended by UUT3 and UUT4.

#### Table 3 - Certified Components (Continued) - Stacked Units, Oilless Claw Pumps, Flexible Base Mount



DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Mounting: Flexible Base	Mount											
Medical System Model	Laboratory System	НР	Tank Cine <sup>1</sup>	Total Number	Vertically Stacked	Horizontally	Ma	x. Dimensions	(in)	Maximum Operating	Mounting	Unit
Wedical System Woder	Model	ne.	Tank Size <sup>1</sup>	of Pumps	Pumps or Layers	Arrayed Pumps	Length	Width <sup>2</sup>	Height	Weight (lb)	Mounting	Offic
Stacked Systems												
						Quadruplex						
CVPQ0505A	LCPQ0505	5 (4)	200 V	4	2,2	2	55	96	83	2,500		Extrapolated <sup>3</sup>
CVPQ0505B	LCPQ0605	6.4 (4)	200 V	4	2,2	2	55	96	83	2,700		Extrapolated <sup>3</sup>
CVPQ0755A	LCPQ0705	7.0 (4)	200 V	4	2,2		55	96	83	3,600	Flexible base (neoprene) w/ internal	Extrapolated <sup>3</sup>
CVPQ0755B	LCPQ0905	9.1 (4)	200 V	4	2,2		55	96	83	4,000	isolation	Extrapolated <sup>3</sup>
CVPQ1005	LCPQ1005	10 (4)	200 V	4	2,2	2	55	96	83	4,900		Extrapolated <sup>3</sup>
CVPQ1505	LCPQ1505	15 (4)	200 V	4	2,2	. 2	71	135	88	5,600		Extrapolated <sup>3</sup>
				Pe	enta, Hexa and Octopl	ex Variants Using the	Same Stack C	onstruction				
CVPP1506	LCPP1506	15 (5)	240 V	5	2,2,1	2	180	80	96	6,200	Planthla have (a communa) of laterated	Extrapolated <sup>3</sup>
CVPH1506	LCPH1506	15 (6)	240 V	6	2,2,2	2	225	80	96	6,800	Flexible base (neoprene) w/ internal isolation	Extrapolated <sup>3</sup>
CVPO1506	LCPO1506	15 (7)	240 V	8	2,2,2,2	2	225	80	96	9,850		UUT4, UUT13 <sup>4</sup>
1. V in tank listing indicat	es vertical or horizontal o	rientation			()	SP-039	3					

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2. When touchscreen controls are used, an additional 2 inch space is required between skids.

3. See Justification Matrix for explanation of extrapolated units.

4. Octoplex controller tested in UUT13; two-high 15 HP vacuum pump skid tested in UUT4. Dimensions and weight shown here for the CVPO1506 are calculated, assuming octoplex system consists of four of the duplex pump stacks as tested in UUT4.



Table 4 - Justification Matrix for Extrapolation - Stacked Systems, Oilless Claw Pumps, Flexible Base Mount



DCL Project Number: 43160-2301

Mounting: Flexible Base Mou	unt	
Unit	Units Used For Extrapolation	Difference From Units Used For Extrapolation
CVPT0504A	UUT3 (CVPD0504A)	
CVPT0505A	<b>^</b>	
CVPT0504B		
CVPT0505B		The duplex units tested in UUT3 and UUT4 consist of (1) two-high pump skid mounted on one side of the vertical tank. The extrapolated triplex systems consist of (1) two-high pump skid m
CVPT0755A		one side of the vertical tank and (1) one-high pump skid mounted on the other side of the vertical tank. Each skid is structurally independent and flexibly connected.
CVPT0755B		FORLUDEC
CVPT1005	¥	
CVPT1505	UUT4 (CVPD1505)	
CVPQ0505A	UUT3 (CVPD0504A)	
CVPQ0505B	$\wedge$	
CVPQ0755A		The duplex units tested in UUT3 and UUT4 consist of (1) two-high pump skid mounted on one side of the vertical tank. The extrapolated quadraplex systems consist of (2) two-high pump sl
CVPQ0755B		on opposing sides of the vertical tank. Each skid is structurally independent and flexibly connected.
CVPQ1005	Ψ	
CVPQ1505	UUT4 (CVPD1505)	
CVPP1506	UUT4 (CVPD1505)	The duplex unit tested in UUT4 consists of (2) 15 HP pumps mounted on one side of the vertical tank. The extrapolated pentaplex system has (1) two-high and (1) one-high pump skids mounted on the other side of the vertical tank. Extrapolated hexaplex and octoplex systems consist of (1) or (2) two-high pump skids no
CVPH1506	UUT4 (CVPD1505)	one side of the vertical tank and (2) two-high pump skids mounted on the other side of the vertical tank. Each skid is structurally independent and flexibly connected. The octoplex controlle
CVPO1506	UUT4 (CVPD1505)	in UUT13.
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### (( Table 4 - Justification Matrix for Extrapolation (Cont.) - Stacked Systems, Claw Oilless, Flexible Base Mount DYNAMIC DCL Project Number: 43160-2301 Manufacturer: Powerex Product Line: Medical Vacuum and Laboratory Vacuum Mounting: Flexible Base Mount Unit Units Used For Extrapolation Difference From Units Used For Extrapolation UUTS demonstrates an alternate 15HP claw pump as the pump used in UUT4 is replaced by a similar, but structurally different pump designated MM1502. The MM1502 pump was tested in the upper UUT5 CVPD1505 position of the frame set. CVPT0303 CVPT0503A CVPT0504A CVPT0505A CVPT0504B UUT8 consists of a triplex stack utilizing a base and frame as tested in previously certified models. UUT8 had the 7.5 Oilless Claw pump featured in the highest (top) position and alternate pumps in the UUT8 lower positions. Tank and control skids are the same as tested in UUT3, UUT4. CVPT0505B CVPT0754A CVPT0754B CVPT0755A CVPT0755B Triplex System 393 Quadruplex System Duplex System INLE and a 0 Octoplex System Pentaplex System Hexaplex System BADGAL AS AT HAPT

**Special Seismic Certification** 

#### Table 5 - Certified Components - Tank-Over Systems, Lubricated Rotary Vane Pumps, Rigid or Flexible Base Mount



#### Manufacturer: Powerex

#### Product Line: Medical Vacuum and Laboratory Vacuum

Mounting: Rigid or Flex	ible Base Mount											
	Laboratory System		Tank Size <sup>1</sup>	Total Number	Vertically Stacked	Horizontally	Max.	Dimensio	ons (in)	Max. Operating Weight		
Nedical System Model	Model				Mounting	Unit						
							Tan	k Over S	ystems			
VPDT0302	LVPT0302	3 (2)	60 H	2	2	1	74	39	89	1,440		Extrapolated <sup>2</sup>
VPDT0402	LVPDT0402	5 (2)	60 H	2	2	1	74	39	89	1,590	Rigid or flexible base mount (neoprene) w/ internal isolation	Extrapolated <sup>2</sup>
VPDT0502	LVPDT0502	5 (2)	60 H	2	2	1	74	39	89	1,815		Extrapolated <sup>2</sup>
VPDT0XXX	LVPDT0XXX	7.5 (1), 3 (1)	60 H	2	2	1	74	39	89	1,450	Rigid base w/ internal isolation	UUT6 <sup>3,4</sup>
VPDT0752	LVPDT0752	7.5 (2)	60 H	2	2	1	74	39	89	2,295	Rigid or flexible base mount (neoprene) w/ internal isolation	Extrapolated <sup>2</sup>
. H in tank listing indica	ites horizontal orier	itation							<u> AXXX</u>	MAN S.		
See Justification Mate	ix for explanation o	f extrapolated u	nits.						ΗM			
UUT6 tested with a 7	5 HP lubricated rota	ary vane pump i	n the middle tie	er and a 3 HP lubr	icated rotary vane pu	ump in the bottom t	ier of the	system.	ΔW			
See UUT7, tested in f	exible base mounte	d condition for	bookending of t	tank-over system:	s.							

4. See UUT7, tested in flexible base mounted condition for bookending of tank-over systems.

	pump in the bottom tier of the system.	Z
REI	OSP-0393	<b>C</b>
	BY: Timothy Piland	
CAL	DATE: 01/24/2024	22
170	PNIA BUILDING COS	5-1



### **Special Seismic Certification** Table 6 - Justification Matrix for Extrapolation - Tank-Over Systems, Lubricated Rotary Vane Pumps, Rigid or Flexible Base Mount DYNAMIC CERTIFICATION DCL Project Number: 43160-2301 Manufacturer: Powerex Product Line: Medical Vacuum and Laboratory Vacuum Mounting: Rigid or Flexible Base Mount Units Used For Extrapolation Difference From Units Used For Extrapolation Unit VPDT0302 UUT6 consisted of a frame and base structure with (1) 3 HP vacuum pump in the lower tier, (1) 7.5 HP vacuum pump in the middle tier, and a 60 gallon horizontal tank rigidly bolted at the top level. VPDT0402 UUT6 (VPDT0XXX) The system is plumbed and has an electrical control panel mounted to the frame. The tested lubricated rotary vane pumps encompass the range for the tank-over systems. Also see UUT7 for VPDT0502 bookending of tank-over systems. VPDT0752 Tank-Over Construction Duplex: FRECEIVER REMOVABLE FOR EASE 2' MNPT DUTLET PANEL MANUAL DRAIN 00 89.0 59.27

1.00

4X 0.75

53.00

55.00

69.49

1.00

### Table 7 - Certified Components - Tank-Over Units, Oilless Claw Pumps, Rigid or Flexible Base Mount



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

Mounting:	Rigid or	Flexible Base Mount

	Laboratory System			Total Number	Vertically Stacked	Horizontally	Max	. Dimensior	ıs (in)	Maximum Operating Weight	Mounting	
Medical System Model	vstem Model Model HP	Tank Size <sup>1</sup>	of Pumps	Pumps or Layers	Arrayed Pumps	1 au ath			Unit			
	Woder			or Fullips	Pullips of Layers	Anayeu Fullips	Length	Width Heigh	Height	(lb)		
						Tank Over	r Systems					
CVPDT0302	LCVPT0302	3 (2)	60 H	2	2	1	74	39	89	1,600	Rigid or flexible base (neoprene) w/ internal isolation	Extrapolated <sup>2</sup>
CVPDT0XXX	LCVPT0XXXX	7.5 (1), 3 (1)	60 H	2	2	1	74	39	89	1,910	Flexible base (neoprene) w/ internal isolation	UUT7 <sup>3,4</sup>
CVPDT0502A	LCVPDT0502	4-5 (2)	60 H	2	2	1	74	39	89	1,860		Extrapolated <sup>2</sup>
CVPDT0502B	LCVPDT0602	5-6.4 (2)	60 H	2	2	hR LU	74-	39	89	1,910	Rigid or flexible base (neoprene) w/ internal isolation	Extrapolated <sup>2</sup>
CVPDT0752A	LCVPDT0702	6.4-7.5 (2)	60 H	2	2		74	39	89	2,030	Rigid of hexible base (heopfene) wy internal isolation	Extrapolated <sup>2</sup>
CVPDT0752B	LCVPDT0752	7.5-9.1 (2)	60 H	2	2	2	74	39	89	2,145		Extrapolated <sup>2</sup>
1. H in tank listing indicat	es vertical or horizontal	orientation										
							VV VVV					

2. See Justification Matrix for explanation of extrapolated units.

3. UUT7 was tested with a 7.5 HP oilless claw pump in the top position and a 3 HP oilless cla

4. See UUT6 for bookending of tank-over systems.

aw pump in the botto	m position.
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	BY: Timothy Piland
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### Table 8 - Justification Matrix for Extrapolation - Tank-Over Systems, Oilless Claw Pumps, Rigid or Flexible Base Mount



#### DCL Project Number: 43160-2301

Mounting: Rigid or Flexible Ba		
Unit	Units Used For Extrapolation	Difference From Units Used For Extrapolation
CVPDT0302		
CVPDT0502A		
CVPDT0502B	UUT7	UUT7 consists of a frame and base structure with (1) 3 HP oilless claw vacuum pump in the lower tier, (1) 7.5 HP oilless claw vacuum pump in the middle tier, and a 60 gallon horizontal tank rigidly be
CVPDT0752A		the top level. The system is plumbed and has an electrical control panel mounted to the frame. The tested oilless claw pumps encompass the range for tank-over construction.
CVPDT0752B		

### Table 9 - Certified Components - Tank Mounted Vertical Systems, Oilless Rotary Vane Pumps, Rigid or Flexible Base Mount



Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum
Mounting: Bigid or Elovible Base Mount

Medical System	Laboratory System		Tank Size	Total Number	Vertically Stacked	Horizontally	Max.	Dimensio	ns (in)	Maximum Operating			
Model	Model <sup>1</sup>	HP	(gallons)	of Pumps	Pumps or Layers	Arrayed Pumps	Length	Width	Height	Weight (lb)	Tested Mounting	Certified Mounting	Unit
						Tank N	/ounted Ve	ertical Syst	tems with	Oilless Rotary Vane Pun	nps		
VVOTD0153	LVVOD0153	1.5	80	2	1	2	43	30	74	710	Rigid base		UUT21 <sup>2,4</sup>
VVOTD0203	LVVOD0203	2	80	2	1	2	53	34	80	930	N/A		Interpolated
VVOTD0303	LVVOD0303	3	80	2	1	2	53	34	80	1,100	N/A		Interpolated
VVOTD0304	LVVOD0304	3	120	2	1	2	53	34	89	1,180	N/A	Rigid or flexible base (neoprene) w/ internal isolation	Interpolated
VVOTD0403	LVVOD0403	4	80	2	1	2	53	34	80	1,125	N/A	Rigid of hexible base (heopfene) wy internal isolation	Interpolated
VVOTD0404	LVVOD0404	4	120	2	1	2	53	34	89	1,200	N/A		Interpolated
VVOTD0503	LVVOD0503	5	80	2	1	2	53	34	90	1,320	N/A		Interpolated
VVOTD0504	LVVOD0504	5	120	2	1	2	53	34	90	1,170	Flexible base (neoprene)		UUT23 3,4
UUT21 tested with UUT23 tested with	cal to medical systems 80 gal tank, one 1.5 H 120 gal tank and two in rigid base configura	IP lubric 5 HP oil	ated rotary vai less rotary van	ne pump and one ie pumps.			iguration a	nd serves		ber bookend.	N.C.F.		

BY: Timothy Piland DATE: 01/24/2024



DYNAMIC CERTIFICATION LABORATORIES,LLC

### Table 10 - Certified Components - Tank Mounted Vertical Systems, Lubricated Rotary Vane or Oilless Claw Pumps, Rigid Base Mount



DCL Project Number: 43160-2301

Manufacturer: Powerex

### Product Line: Medical Vacuum and Laboratory Vacuum

Model         HP         (gallons)         of Pumps         Pumps or Layers         Arrayed Pumps         Length         Width         Height         Weight (lb)         Lested Mounting         Length         Width         Height         Weight (lb)         Rigid base           VVTD0204         LVVD0203         1.5         8.0         2         1         2         44         50         75.5         88.0         N/A           VVTD0304         LVVD0303         3         8.0         2         1         2         54         37         84.5         1,260         N/A         N/A           VVTD0304         LVVD0403         4         8.0         2         1         2         54         37         84.5         1,500         N/A           VVTD0504         LVVD0403         5         8.0	Model         HP         (gallons)         of Pumps         Pumps or Layers         Arrayed Pumps         Length         Width         Height         Weight (b)         Fested Mounting         Length         Width         Height         Weight (b)         Height (b)         Height (b)         Length         Height         Height         Weight (b)         Height (b)         Height (b)         Height (b)         Height (b)         Height (b)         Height (b)	Model         MP         (galon)         of Pumps         Pumps or Layers         Arrayed Pumps         Length         Width         Height         Weight (b)         Tested Mounting         Length         Height	Model         MP         (galon)         Of Pumps         Pumps or Layers         Arrayed Pumps         Length         Width         Height         Weight         Tested Mounting         Letthed Mounting         Le	Medical System	Laboratory System		Tank Size	Total Number	Vertically Stacked	Horizontally	Max.	Dimension	ns (in)	Maximum Operating	Tested Manualise	Contificat Managina	
Tank Mounted Vertical Systems with Lubricated Rotary Vane Pumps         VVTD0153       LVVD0153       1.5       80       2       1       2       43       30       74       710       Rigid base         VVTD0203       LVVD0203       2       80       2       1       2       42       30       75       835       N/A         VVTD0204       LVVD0204       2       120       2       1       2       42       30       75       835       N/A         VVTD0204       LVVD0203       3       80       2       1       2       55       30       85       -1,260       Rigid base         VVTD0304       LVVD0303       3       80       2       1       2       54       37       84,5       1,350       N/A         VVTD0403       LVVD0404       4       120       2       1       2       54       37       84,5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVTD0504       LVD0504       5       120       2       1       2       55       48	V/TD0133         Livb0153         1.5         80         2         1         2         43         30         74         710         Rigid base           V/TD023         Livb0203         1         2         42         30         75         835         N/A           V/TD0204         Livb0203         2         80         2         1         2         42         30         75         835         N/A           V/TD0204         Livb0203         3         80         2         1         2         44         50         75.5         880         N/A           V/TD0303         Livb0303         3         80         2         1         2         54         37         84.5         1,350         N/A           V/TD0404         4         120         2         1         2         54         37         84.5         1,350         N/A           V/TD0404         4         120         2         1         2         54         37         84.5         1,500         N/A           V/TD0504         LVVD0503         5         80         2         1,500         N/A         Rigid base         UU           V/TD0	Tark Mounted Vertical Systems with Lubricated Rotary Vane Pumps           VVTD0153         LVVD0153         1.5         80         2         1         2         43         30         74         710         Rigid base           VVTD0203         LVVD0203         2         80         2         1         2         42         30         75         835         N/A           VVTD0204         LVVD0203         2         80         2         1         2         44         50         75.5         880         N/A           VVTD0304         LVVD0303         3         80         2         1         2         45         30         85         -1,260         Rigid base         UUT           VVTD0403         LVVD0403         4         80         2         1         2         54         37         84.5         1,500         N/A           VVTD0403         LVVD0403         5         80         2         1         2         54         37         84.5         1,500         N/A           VVTD0504         LVVD0503         5         80         2         1         2         55         30         85         1,670         Rigid base	VTD0133         LVVD0153         1.5         80         2         1         2         43         30         74         710         Rigid base           VTD0203         LVVD0153         1.5         80         2         1         2         42         30         75         835         N/A           VTD0204         LVVD0203         2         80         2         1         2         42         30         75         835         N/A           VTD0204         LVVD0203         3         80         2         1         2         45         30         75         835         N/A           VTD0304         LVVD0303         3         80         2         1         2         54         37         84         1/475         N/A           VTD0403         LVVD0404         4         120         2         1         2         54         37         84.5         1,350         N/A           VTD0503         LVVD0403         5         80         2         1         2         58         37         84.5         1,350         N/A           VTD0503         LVVD0503         5         80         2         1         <			HP									Tested Mounting	Certified Mounting	Unit
VVTD0133       LVVD0153       1.5       80       2       1       2       43       30       74       710       Rigid base         VVTD0203       LVVD0203       2       80       2       1       2       42       30       75       835       N/A         VVTD0204       LVVD0204       2       120       2       1       2       44       50       75.5       880       N/A         VVTD0204       LVVD0204       3       80       2       1       2       54       37       84       1,475       N/A         VVTD0403       LVVD0304       3       120       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0304       4       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0404       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVTD0504       LVD0503       5       80       2       1       2       55       30       85       1,260       Rigid base       1,260       Rigid base	VIVD0153       1.5       80       2       1       2       43       30       74       710       Rigid base         V/T0203       LVV00203       2       80       2       1       2       42       30       75       835       N/A         V/T0204       LVV00204       2       120       2       1       2       44       50       75       835       N/A         V/T0204       LVV00204       3       80       2       1       2       55       30       35       1,250       Rigid base       N/A         V/T00304       LVV00304       3       120       2       1       2       54       37       84       1,475       N/A         V/T00404       LVV00504       4       120       2       1       2       54       37       84.5       1,350       N/A         V/T00404       LVV0503       5       80       2       1       2       55       37       84.5       1,500       N/A         V/T0503       LVV0503       5       80       2       1       2       55       37       84.5       1,500       N/A         V/T0503       LV050504	VVTD0153       1.5       80       2       1       2       43       30       74       710       Rigid base         VVTD0203       LVVD0203       2       80       2       1       2       42       30       75       835       N/A         VVTD0204       LVVD0203       2       120       2       1       2       42       30       75       835       N/A         VVTD0204       LVVD0203       3       80       2       1       2       44       50       75       835       N/A         VVTD0304       LVVD0204       3       120       2       1       2       54       37       84       1475       N/A         VVTD0403       LVVD0404       4       120       2       1       2       54       37       84.5       1,500       N/A         VVTD0404       LVVD0403       5       120       2       1       2       54       37       84.5       1,500       N/A         VVTD0504       LVVD0503       5       80       2       1       2       55       35       85       1,670       Rigid base         VVTD0504       LVD0503       3	WTD0153       LVVD0153       1.5       80       2       1       2       43       30       74       710       Rigid base         WTD023       LVVD023       2       80       2       1       2       42       30       75       835       N/A         WTD024       LVVD023       2       120       2       1       2       44       50       75       835       N/A         WTD033       1       80       2       1       2       44       50       75       830       N/A         WTD033       1       80       2       1       2       54       37       84       1,475       N/A         WTD0403       LVVD0434       4       80       2       1       2       54       37       84.5       1,500       N/A         VTD0404       LVVD043       4       80       2       1       2       54       37       84.5       1,500       N/A         VTD0504       LVVD0504       5       120       2       1       2       55       43       87       1,500       N/A         VTD0504       LVVD0503       5       80       2											pricated Rotary Vane P	umps		
VVTD0203       LVVD0203       2       80       2       1       2       42       30       75       835       N/A         VVTD0204       LVVD0204       2       120       2       1       2       44       50       75.5       880       N/A         VVTD0303       LVVD0303       3       80       2       1       2       55       30       85       4,260       Rigid base         VVTD0304       LVVD0303       3       80       2       1       2       54       37       84       1,475       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0504       LVVD0503       5       120       2       1       2       55       30       85       1,670       Rigid base         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V	VITD0203       LVVD0203       2       80       2       1       2       42       30       75       835       N/A         VITD0204       LVVD0204       2       120       2       1       2       44       50       75.5       880       N/A         VITD0203       LVVD0304       3       80       2       1       2       54       37       84.4       1/475       N/A         VITD0404       LVVD0303       4       80       2       1       2       54       37       84.5       1,350       N/A         VITD0404       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VITD0404       LVV00503       5       80       2       1       2       54       37       84.5       1,500       N/A         VITD0503       LVV00504       5       120       2       1       2       58       87       1,670       Rigid base       VIA         VITD0203V       LCV00203       2       80       2       1       2       55       30       85       1,670       Rigid base       VIA	VVTD0203       LVVD0203       2       80       2       1       2       42       30       75       835       N/A         VVTD0204       LVVD0204       2       120       2       1       2       44       50       75       880       N/A         VVTD0204       LVVD0303       3       80       2       1       2       55       30       85       4,260       Rigid base         VVTD0304       LVVD0303       3       80       2       1       2       54       37       84       1,475       N/A         VVTD0404       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0403       4       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0404       LVVD0503       5       80       2       1       2       58       37       87.5       1,500       N/A         VTD0503       LVD0503       5       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD05	VVTD0203       LVVD0203       2       80       2       1       2       42       30       75       835       N/A         VVTD0204       LVVD0204       2       120       2       1       2       44       50       75.5       880       N/A         VVTD0303       LVVD0303       3       80       2       1       2       54       30       85       1,260       Rigid base         VVTD0304       LVVD0303       3       80       2       1       2       54       37       84       1,475       N/A         VVTD0404       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0403       4       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0503       LVD0503       5       80       2       1       2       58       85       1,670       Rigid base         VVTD0504       LVD0503       3       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0504AV	VVTD0153	LVVD0153	1.5	80	2	1			1			I I		UUT21 <sup>2</sup>
VVTD0303       3       80       2       1       2       55       40       85       1,260       Rigid base         VVTD0304       LVVD0304       3       120       2       1       2       54       37       84       1475       N/A         VVTD0403       LVVD0403       4       80       2       1       2       54       37       84,5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84,5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       54       37       84,5       1,500       N/A         VVT0504       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVT0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       Rigid base         CVTD0203V       LCVD0203       2       80       2       1       2       59       35       84       1,650       N/A       Rigid base       Rigid bas	VVTD0303       LVVD0303       3       80       2       1       2       55       30       85       1,260       Rigid base         VVTD0304       LVVD0304       3       120       2       1       2       54       37       84       1,475       N/A         VVTD0403       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,350       N/A         VVTD0503       LVVD0504       5       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0504       LVVD0504       5       120       2       1       2       58       37       85       1,670       Rigid base       UU         VTD0504       LVD0504       5       120       2       1       2       55       30       85       1,670       Rigid base       N/A         VTD0303       LCVD0203       2       80       2       1       2       59       35       85       1,670       N/A	VVTD0303       1       80       2       1       2       55       30       85       1,260       Rigid base         VVTD0304       LVVD0304       3       120       2       1       2       54       37       84       1/475       N/A         VVTD0403       LVVD0404       4       80       2       1       2       54       37       84       1/475       N/A         VVTD0403       LVVD0404       4       120       2       1       2       54       37       84,5       1,350       N/A         VVTD0503       LVVD0503       5       80       2       1       2       54       37       84,5       1,350       N/A         VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVTD0504       LVVD0504       5       120       2       1       2       55       80       85       1,260       N/A         VTD0503       LCVD0203       2       80       2       1,20       2       1       2       55       80       85       1,260       Rigid base       1       1	VVTD0303       1       80       2       1       2       55       30       85       1,260       Rigid base         VVTD0304       LVVD0304       3       120       2       1       2       54       37       84       1,475       N/A         VVTD0403       LVVD0404       4       80       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       54       37       84.5       1,500       N/A         VVTD5040       LVVD0503       5       120       2       1       2       58       37       87       1,260       N/A         VVTD5040       LVVD0503       5       120       2       1       2       55       30       85       1,260       N/A         VTD0203V       LCVD0203       2       80       2       1,50       N/A       Rigid base       UUT2         CVTD0203V       LCVD0203       3       80       2 <td></td> <td></td> <td></td> <td></td> <td>2</td> <td>1</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Interpolat</td>					2	1	2							Interpolat
VTD0304       LVVD0304       3       120       2       1       2       54       37       84       1/475       N/A       Rigid base w/ internal isolation         VTD0403       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,350       N/A         VTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,500       N/A         VTD0503       LVVD0504       5       80       2       1       2       58       37       87       1,260       N/A         VTD0504       LVVD0504       5       120       2       1       2       55       30       85       1,670       Rigid base         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0203       3       80       2       1       2       59       35       84       1,650       N/A <td>VVTD0304       1.VVD0304       3       1.20       2       1       2       5.4       3.7       8.4       1.475       N/A       Rigid base w/ internal isolation       Interp         VVTD0403       LVVD0403       4       80       2       1       2       54       3.7       84.5       1.350       N/A       <t< td=""><td>VVTD0304         IVVD0304         3         120         2         1         2         54         37         84         1,475         N/A           VVTD0403         IVVD0403         4         80         2         1         2         54         37         84,5         1,350         N/A           VVTD0404         IVVD0404         4         120         2         1         2         54         37         84,5         1,350         N/A           VVTD0404         IVVD0404         4         120         2         1         2         54         37         84,5         1,500         N/A           VVTD0503         IVVD0503         5         80         2         1         2         58         37         87         1,260         N/A           VTD0504         IVVD0504         5         120         2         1         2         59         35         85         1,670         Rigid base         UTT           CVTD0203         IVVD0503         3         80         2         1         2         55         30         85         1,260         N/A           CVTD0203V         ICVD0203         3         80         &lt;</td><td>VYTD0304       1 VVD0304       3       1 20       2       1       2       54       37       84       1 475       N/A       Rigid base w/ internal isolation       Internal isolation         VVTD0403       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0503       5       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0504       5       120       2       1       2       58       37       87       1,260       N/A         VVTD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT2         CVTD0203V       LCVD0203       2       80       2       1       2       55       40       85       1,670       Rigid base       Rigid base w/ internal isolation       Internal         CVTD0203V       LCVD0203       3       80       2       1       2       <t< td=""><td>VVTD0204</td><td>LVVD0204</td><td>2</td><td>120</td><td>2</td><td>1</td><td>2</td><td>44</td><td>50</td><td>75.5</td><td>880</td><td>N/A</td><td></td><td>Interpolat</td></t<></td></t<></td>	VVTD0304       1.VVD0304       3       1.20       2       1       2       5.4       3.7       8.4       1.475       N/A       Rigid base w/ internal isolation       Interp         VVTD0403       LVVD0403       4       80       2       1       2       54       3.7       84.5       1.350       N/A       N/A <t< td=""><td>VVTD0304         IVVD0304         3         120         2         1         2         54         37         84         1,475         N/A           VVTD0403         IVVD0403         4         80         2         1         2         54         37         84,5         1,350         N/A           VVTD0404         IVVD0404         4         120         2         1         2         54         37         84,5         1,350         N/A           VVTD0404         IVVD0404         4         120         2         1         2         54         37         84,5         1,500         N/A           VVTD0503         IVVD0503         5         80         2         1         2         58         37         87         1,260         N/A           VTD0504         IVVD0504         5         120         2         1         2         59         35         85         1,670         Rigid base         UTT           CVTD0203         IVVD0503         3         80         2         1         2         55         30         85         1,260         N/A           CVTD0203V         ICVD0203         3         80         &lt;</td><td>VYTD0304       1 VVD0304       3       1 20       2       1       2       54       37       84       1 475       N/A       Rigid base w/ internal isolation       Internal isolation         VVTD0403       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0503       5       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0504       5       120       2       1       2       58       37       87       1,260       N/A         VVTD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT2         CVTD0203V       LCVD0203       2       80       2       1       2       55       40       85       1,670       Rigid base       Rigid base w/ internal isolation       Internal         CVTD0203V       LCVD0203       3       80       2       1       2       <t< td=""><td>VVTD0204</td><td>LVVD0204</td><td>2</td><td>120</td><td>2</td><td>1</td><td>2</td><td>44</td><td>50</td><td>75.5</td><td>880</td><td>N/A</td><td></td><td>Interpolat</td></t<></td></t<>	VVTD0304         IVVD0304         3         120         2         1         2         54         37         84         1,475         N/A           VVTD0403         IVVD0403         4         80         2         1         2         54         37         84,5         1,350         N/A           VVTD0404         IVVD0404         4         120         2         1         2         54         37         84,5         1,350         N/A           VVTD0404         IVVD0404         4         120         2         1         2         54         37         84,5         1,500         N/A           VVTD0503         IVVD0503         5         80         2         1         2         58         37         87         1,260         N/A           VTD0504         IVVD0504         5         120         2         1         2         59         35         85         1,670         Rigid base         UTT           CVTD0203         IVVD0503         3         80         2         1         2         55         30         85         1,260         N/A           CVTD0203V         ICVD0203         3         80         <	VYTD0304       1 VVD0304       3       1 20       2       1       2       54       37       84       1 475       N/A       Rigid base w/ internal isolation       Internal isolation         VVTD0403       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0503       5       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0504       5       120       2       1       2       58       37       87       1,260       N/A         VVTD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT2         CVTD0203V       LCVD0203       2       80       2       1       2       55       40       85       1,670       Rigid base       Rigid base w/ internal isolation       Internal         CVTD0203V       LCVD0203       3       80       2       1       2 <t< td=""><td>VVTD0204</td><td>LVVD0204</td><td>2</td><td>120</td><td>2</td><td>1</td><td>2</td><td>44</td><td>50</td><td>75.5</td><td>880</td><td>N/A</td><td></td><td>Interpolat</td></t<>	VVTD0204	LVVD0204	2	120	2	1	2	44	50	75.5	880	N/A		Interpolat
VTD0403       LVVD0403       4       80       2       1       2       54       37       84,5       1,350       N/A         VTD0404       LVVD0404       4       120       2       1       2       54       37       84,5       1,500       N/A         VTD0404       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base         Tank Mounted Vertical Systems with Oilless Claw pumps         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0203       3       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0203       3       80       2       1       2       55       30       85       1,260       N/A         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35 <td< th=""><td>VVTD0403       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,500       N/A         VVTD0404       LVVD0503       5       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT         VTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A         VTD0303V       LCVD0203       3       80       2       1       2       55       30       85       1,260       N/A         VTD0303V       LCVD0203       3       80       2       1       2       59       35       84       1,650       N/A         T/D05</td><td>VVTD0403       LVVD0403       4       80       2       1       2       54       37       84,5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84,5       1,350       N/A         VVTD0404       LVVD0503       5       80       2       1       2       54       37       84,5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVT0504       LVVD0504       5       120       2       1       2       58       37       87       1,260       N/A         VT00504       LVVD0504       5       120       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0203       3       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0203       3       80       2       1       2       59       35       84       1,650       N/A         CVTD0504AV       LCVD</td><td>VVTD0403       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0503       5       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVT00504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0203       3       80       2       1       2       59       35       84       1,650       N/A         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       85       1,670       Rigid base       UUT2</td><td>VVTD0303</td><td>LVVD0303</td><td>3</td><td>80</td><td>2</td><td>1</td><td>2</td><td>55</td><td>30</td><td>85</td><td>1,260</td><td>Rigid base</td><td></td><td>UUT22</td></td<>	VVTD0403       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,500       N/A         VVTD0404       LVVD0503       5       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT         VTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A         VTD0303V       LCVD0203       3       80       2       1       2       55       30       85       1,260       N/A         VTD0303V       LCVD0203       3       80       2       1       2       59       35       84       1,650       N/A         T/D05	VVTD0403       LVVD0403       4       80       2       1       2       54       37       84,5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84,5       1,350       N/A         VVTD0404       LVVD0503       5       80       2       1       2       54       37       84,5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVT0504       LVVD0504       5       120       2       1       2       58       37       87       1,260       N/A         VT00504       LVVD0504       5       120       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0203       3       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0203       3       80       2       1       2       59       35       84       1,650       N/A         CVTD0504AV       LCVD	VVTD0403       LVVD0403       4       80       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,350       N/A         VVTD0404       LVVD0503       5       80       2       1       2       54       37       84.5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVT00504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0203       3       80       2       1       2       59       35       84       1,650       N/A         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       85       1,670       Rigid base       UUT2	VVTD0303	LVVD0303	3	80	2	1	2	55	30	85	1,260	Rigid base		UUT22
VTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,500       N/A         VTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base	VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UU       UU         VVTD0503V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A       Rigid base       UU       UU       Interp       UU       UU       UU       Interp       UU       Interp       UU       Interp       UU       Interp       UU       Interp       UU       Interp       Interp       Interp       Interp       UU       Interp       Inte	VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A       N/A       N/A       N/A       Interpo         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base       N/A       Interpo         CVTD0203V       LCVD0203       3       80       2       1       2       59       35       84       1,650       N/A       N/A       N/A       Interpo	VVTD0404       LVVD0404       4       120       2       1       2       54       37       84.5       1,500       N/A         VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT2         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A       N/A       N/A       UUT2         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base       N/A	VVTD0304	LVVD0304	3	120	2	1	2	54	37	84	1,475	N/A	Rigid base w/ internal isolation	Interpolat
VTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         CVTD0504W       LCVD0303       3       80       2       1       2       55       30       85       1,260       N/A         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         CVTD0504BV       LCVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base         IUT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       Image: Stand pump and one 2.5 HP oilless claw pump.       Image: Stand pump and one 2.5 HP oilless claw	VTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT         VTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A         VTD0303V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A         VTD0303V       LCVD0203       3       80       2       1       2       55       30       85       1,260       N/A         VTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         VTD0504BV       LCVD0504AV       4       120       2       1       2       59       35       85       1,670       Rigid base       UUT         vstems identical to medical systems (software change only).       Iterate with 80 gal tank, one 3 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       Iterate with 80 gal tank, one 3 HP lubric	VVD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVT0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT         CVTD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base       Interpo         CVTD0303V       LCVD0303       3       80       2       1       2       55       30       85       1,260       Rigid base       Interpo         CVTD0504AV       LCVD0303       3       80       2       1       2       59       35       84       1,650       N/A       Rigid base       UUT         CVTD0504AV       LCVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT         sb systems identical to medical systems (software change only).       UT2 <t< td=""><td>VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       Interpol         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A       N/A       N/A       N/A       UUT2         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A       <td< td=""><td>VVTD0403</td><td>LVVD0403</td><td>4</td><td>80</td><td>2</td><td>1</td><td>2</td><td>54</td><td>37</td><td>84.5</td><td>1,350</td><td>N/A</td><td></td><td>Interpolat</td></td<></td></t<>	VVTD0503       LVVD0503       5       80       2       1       2       58       37       87       1,260       N/A         VVTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       Interpol         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A       N/A       N/A       N/A       UUT2         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       N/A       N/A <td< td=""><td>VVTD0403</td><td>LVVD0403</td><td>4</td><td>80</td><td>2</td><td>1</td><td>2</td><td>54</td><td>37</td><td>84.5</td><td>1,350</td><td>N/A</td><td></td><td>Interpolat</td></td<>	VVTD0403	LVVD0403	4	80	2	1	2	54	37	84.5	1,350	N/A		Interpolat
VVTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base         Tank Mounted Vertical Systems with Oilless Claw pumps         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,670       Rigid base         CVTD0203V       LCVD0303       3       80       2       1       2       55       30       85       1,260       Rigid base         CVTD0504AV       LCVD0504AV       4       120       2       1       2       55       30       85       1,670       Rigid base         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         CVTD0504BV       LCVD05044       5       120       2       1       2       59       35       85       1,670       Rigid base         JUT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5 HP oilless claw pump.       BY: TIMOthy Piland         JUT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       JUT24 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless daw p	VTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UU         VTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base       UU         VTD0303V       LCVD0203       3       80       2       1       2       35       56       82       1,500       N/A         VTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         VTD0504BV       LCVD0504AV       4       120       2       1       2       59       35       85       1,670       Rigid base         VTD0504BV       LCVD0504AV       4       120       2       1       2       59       35       85       1,670       Rigid base       UU         vstems identical to medical systems (software change only).       Iterate with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5 HP oilless claw pump.       Iterate with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       Iterate with 120 gal tank, one 5 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       Iterate with 120 gal tank, on	VVTD0504       LVVD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT         CVTD0504       5       120       2       1       2       59       35       85       1,670       Rigid base       1 <td>VVTD0504         LVVD0504         5         120         2         1         2         59         35         85         1,670         Rigid base         UUT2           CVTD0504         5         120         2         1         2         59         35         85         1,670         Rigid base         UUT2           CVTD0203         2         80         2         1         2         55         30         85         1,260         Rigid base         Rigid base         UUT2           CVTD0303         3         80         2         1         2         56         82         1,500         N/A           CVTD0504AV         LCVD0504         4         120         2         1         2         59         35         84         1,650         N/A           CVTD0504AV         LCVD0504         5         120         2         1         2         59         35         84         1,650         N/A           Aigid base         LCVD0504         5         120         2         1         2         59         35         85         1,670         Rigid base         UUT2           &lt;</td> <td>VVTD0404</td> <td>LVVD0404</td> <td>4</td> <td>120</td> <td>2</td> <td>1</td> <td>2</td> <td>54</td> <td>37</td> <td>84.5</td> <td>1,500</td> <td>N/A</td> <td></td> <td>Interpolat</td>	VVTD0504         LVVD0504         5         120         2         1         2         59         35         85         1,670         Rigid base         UUT2           CVTD0504         5         120         2         1         2         59         35         85         1,670         Rigid base         UUT2           CVTD0203         2         80         2         1         2         55         30         85         1,260         Rigid base         Rigid base         UUT2           CVTD0303         3         80         2         1         2         56         82         1,500         N/A           CVTD0504AV         LCVD0504         4         120         2         1         2         59         35         84         1,650         N/A           CVTD0504AV         LCVD0504         5         120         2         1         2         59         35         84         1,650         N/A           Aigid base         LCVD0504         5         120         2         1         2         59         35         85         1,670         Rigid base         UUT2           <	VVTD0404	LVVD0404	4	120	2	1	2	54	37	84.5	1,500	N/A		Interpolat
Tark Mounted Vertical Systems with Oilless Claw pumps         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base       Rigid base w/ internal isolation         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base       Zigid base <td>Tark Mounted Vertical Systems with Oilless Claw pumps         VTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         VTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base         VTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         VTD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base         ystems identical to medical systems (software change only).       r21 tested with 80 gal tank, one 3. HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       FTIMOTHY PILAND       O         122 tested with 80 gal tank, one 3. HP lubricated rotary vane pump and one 2. HP oilless claw pump.       FUE oilless claw pump.       FUE oilless claw pump.       FUE oilless claw pump.         122 tested with 80 gal tank, one 5. HP lubricated rotary vane pump and one 2. HP oilless claw pump.       FUE oilless claw pump.       FUE oilless claw pump.       FUE oilless claw pump.         724 tested with 80 gal tank, one 5. HP lubricated rotary vane pump and one 1. SHP oilless claw pump.       FUE oilless</td> <td>Tank Mounted Vertical Systems with Oilless Claw pumps         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base         CVTD0504AV       LCVD0504V       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base       Interpo         CVTD0504BV       LCVD0504       5       120       2       1       2       59       35       84       1,650       N/A       Rigid base       UUT         UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       Differentiation       Rigid base       0       UUT         UT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       Differentiation       0</td> <td>Tark Mounted Vertical Systems with Oilless Claw pumps         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base       UUT2.         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base         UUT2.       2       10       2       59       35       85       1,670       Rigid base         UUT2.       2       10       2       59       35       85       1,670       Rigid base       UUT2.         UUT2.       2       10       2       59       35       85       1,670       Rigid base       UUT2.         UUT2.       2       10       2       59       35       85       1,670       Rigid base       UUT2.</td> <td>VVTD0503</td> <td>LVVD0503</td> <td>5</td> <td>80</td> <td>2</td> <td>1</td> <td>2</td> <td>58</td> <td>37</td> <td>87</td> <td>1,260</td> <td>N/A</td> <td></td> <td>Interpolat</td>	Tark Mounted Vertical Systems with Oilless Claw pumps         VTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         VTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base         VTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         VTD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base         ystems identical to medical systems (software change only).       r21 tested with 80 gal tank, one 3. HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       FTIMOTHY PILAND       O         122 tested with 80 gal tank, one 3. HP lubricated rotary vane pump and one 2. HP oilless claw pump.       FUE oilless claw pump.       FUE oilless claw pump.       FUE oilless claw pump.         122 tested with 80 gal tank, one 5. HP lubricated rotary vane pump and one 2. HP oilless claw pump.       FUE oilless claw pump.       FUE oilless claw pump.       FUE oilless claw pump.         724 tested with 80 gal tank, one 5. HP lubricated rotary vane pump and one 1. SHP oilless claw pump.       FUE oilless	Tank Mounted Vertical Systems with Oilless Claw pumps         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base         CVTD0504AV       LCVD0504V       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base       Interpo         CVTD0504BV       LCVD0504       5       120       2       1       2       59       35       84       1,650       N/A       Rigid base       UUT         UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       Differentiation       Rigid base       0       UUT         UT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       Differentiation       0	Tark Mounted Vertical Systems with Oilless Claw pumps         CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base       UUT2.         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base         UUT2.       2       10       2       59       35       85       1,670       Rigid base         UUT2.       2       10       2       59       35       85       1,670       Rigid base       UUT2.         UUT2.       2       10       2       59       35       85       1,670       Rigid base       UUT2.         UUT2.       2       10       2       59       35       85       1,670       Rigid base       UUT2.	VVTD0503	LVVD0503	5	80	2	1	2	58	37	87	1,260	N/A		Interpolat
CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       84       1,650       N/A         CVT00504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base         .ab systems identical to medical systems (software change only).       JUT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 2.5HP oilless claw pump.       BY: TIMOTHY Piland       O         JUT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2.5HP oilless claw pump.       BY: TIMOTHY Piland       O         JUT24 tested with 120 gal tank one 5 HP lubricated rotary vane pump and one 2.5HP oilless claw pump.       EV       O       EV       EV       EV	VTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         VTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A         /TD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         /TD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base         ystems identical to medical systems (software change only).       T21 tested with 80 gal tank, one 3.15 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       T22 tested with 80 gal tank, one 3.4 HP lubricated rotary vane pump and one 2.4 Poilless claw pump.       T21 tested with 80 gal tank, one 5.4 HP lubricated rotary vane pump and one 2.4 Poilless claw pump.       T21 tested with 120 gal tank, one 5.4 HP lubricated rotary vane pump and one 5.4 HP uping       T1000000000000000000000000000000000000	CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base         CVTD0504AV       LCVD0504V       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base       Interpo         CVTD0504BV       LCVD0504       5       120       2       1       2       59       35       84       1,650       N/A       Rigid base       UUT         vtD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT         vtD120 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       Difference       Difference       UUT       UUT         UT21 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       Difference       EV	CVTD0203V       LCVD0203       2       80       2       1       2       55       30       85       1,260       Rigid base         CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       84       1,650       N/A         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base         UUT2:       ab systems identical to medical systems (software change only).       UUT2:       UUT2:       1       2       59       35       85       1,670       Rigid base       UUT2:         ut12:       tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       UT2:       UT2	VVTD0504	LVVD0504	5	120	2	1	2	59	35	85	1,670	Rigid base		UUT24 <sup>4</sup>
CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base w/ internal isolation         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base         ab systems identical to medical systems (software change only).       JUT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       JUT21 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       JUT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.         JUT24 tested with 120 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       JUT24 tested with 120 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.	VTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base w/ internal isolation       Interp         /TD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base w/ internal isolation       Interp         /TD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT         systems identical to medical systems (software change only).       2       1       2       59       35       85       1,670       Rigid base       UUT         22 tested with 80 gal tank, one 3. HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       2       59       35       85       1,670       Rigid base       0         22 tested with 80 gal tank, one 3. HP lubricated rotary vane pump and one 2. HP oilless claw pump.       2       59       35       85       1,670       Rigid base       0         22 tested with 80 gal tank, one 3. HP lubricated rotary vane pump and one 2. HP oilless claw pump.       2       5       8       1       0       0       0       0       0       0       0 <td< td=""><td>CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       50       N/A       Rigid base w/ internal isolation       Interpo         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base w/ internal isolation       Interpo         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT:         ab systems identical to medical systems (software change only).       UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       Dr. Timothy Piland       UUT:       UUT:         UT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       UT21 tested with 120 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       UT21 tested with 120 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       UT21 tested with 120 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.</td><td>CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base w/ internal isolation       Interpol         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base       Interpol         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT2:         ab systems identical to medical systems (software change only).       UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       BY: TIMOthy Pland       Operating the system of the system is and one 3.5 HP oilless claw pump.       BY: TIMOthy Pland       Operating the system plane of the system plane</td><td></td><td></td><td></td><td></td><td></td><td></td><td>Tar</td><td>nk Mounte</td><td>d Vertical</td><td>Systems w</td><td>ith Oilless Claw pumps</td><td>1</td><td></td><td></td></td<>	CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       50       N/A       Rigid base w/ internal isolation       Interpo         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base w/ internal isolation       Interpo         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT:         ab systems identical to medical systems (software change only).       UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       Dr. Timothy Piland       UUT:       UUT:         UT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       UT21 tested with 120 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       UT21 tested with 120 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       UT21 tested with 120 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.	CVTD0303V       LCVD0303       3       80       2       1       2       35       56       82       1,500       N/A       Rigid base w/ internal isolation       Interpol         CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base       Interpol         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base       UUT2:         ab systems identical to medical systems (software change only).       UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       BY: TIMOthy Pland       Operating the system of the system is and one 3.5 HP oilless claw pump.       BY: TIMOthy Pland       Operating the system plane of the system plane							Tar	nk Mounte	d Vertical	Systems w	ith Oilless Claw pumps	1		
CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       84       1,650       N/A         db systems identical to medical systems (software change only).       UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       BY: Timothy Piland       Output       UT22 tested with 20 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       UT24 tested with 120 gal tank, one 5 HP lubricated rotary vane pump and one 5 HP oilless claw pump.       Image: Comparison of the	T/TD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base w/ internal isolation       Internal         T/TD0504BV       LCVD0604       5       120       2       1       2       59       35       84       1,650       N/A       Rigid base       UUT         systems identical to medical systems (software change only).       Systems (antical to react a system score SHE hubricated rotary vane pump and one 1.5HP oilless claw pump.       EXPENDENT Piland       UUT         722 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       EXPENDENT Piland       Openational isolation       Internal isolation       UUT	CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base w/ internal isolation       Interpo         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       84       1,650       N/A       Interpo       Interpo       UUT.         ab systems identical to medical systems (software change only).       UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       BY: Timothy Piland       UUT.       UUT.         UT22 tested with 80 gal tank, one 3.4 HP lubricated rotary vane pump and one 2.4 HP oilless claw pump.       EXP: Timothy Piland	CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Rigid base w/ internal isolation       Interpol         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       84       1,650       N/A       Rigid base       UUT2         ab systems identical to medical systems (software change only).       UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       BY: Timothy Piland       UUT2         UT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       BY: Timothy Piland       Open tested with 120 gal tank, one 5 HP lubricated rotary vane pump and one 5 HP oilless claw pump.       Interpol	CVTD0203V	LCVD0203	2	80	2	1 / / /	2	55	30	85	1,260	Rigid base		UUT22
CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       84       1,650       N/A         cvTD0504BV       LCVD0604       5       120       2       1       2       59       35       85       1,670       Rigid base         ab systems identical to medical systems (software change only).       UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       BY: Timothy Piland       Operational tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.         UT21 tested with 120 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.       Examples of the piland of the pila	VTD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Interp         VTD0504BV       LCVD0604       5       120       2       1       2       59       35       84       1,650       N/A       UUT         vsystems identical to medical systems (software change only).       Interp       2       59       35       85       1,670       Rigid base       UUT         v21 tested with 80 gal tank, one 3. HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       Interp       Interp       Interp       Interp         v22 tested with 80 gal tank, one 3. HP lubricated rotary vane pump and one 2. HP oilless claw pump.       Interp       Interp       Interp       Interp         v24 tested with 120 gal tank, one 5. HP lubricated rotary vane pump and one 2. HP oilless claw pump.       Interp       Interp       Interp       Interp	CYTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Interpo         CYTD0504BV       LCVD0604       5       120       2       1       2       59       35       84       1,650       N/A       Interpo         ab systems identical to medical systems (software change only).       UT21 tested with 80 gal tank, one 3.15 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       BY: TIMOthy Piland       0	CVTD0504AV       LCVD0504AV       4       120       2       1       2       59       35       84       1,650       N/A       Interpol         CVTD0504BV       LCVD0604       5       120       2       1       2       59       35       84       1,650       N/A       UUT2         ab systems identical to medical systems (software change only).       UT21 tested with 80 gal tank, one 3.15 HP lubricated rotary vane pump and one 1.5HP oilless claw pump.       BY: TIMOthy Piland       0       <	CVTD0303V	LCVD0303	3	80	2	1	2	35	56	- 82 0	93 1,500	N/A	Rigid base w/ internal isolation	Interpolat
ab systems identical to medical systems (software change only). IUT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump. IUT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.	systems identical to medical systems (software change only). 121 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump. 122 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump. 124 tested with 120 gal tank, one 5 HB lubricated rotary vane pump and one 5 HP oilless claw pump.	ab systems identical to medical systems (software change only). UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump. UT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump. UT24 tested with 120 gal tank, one 5 HP lubricated rotary vane pump and one 5 HP oilless claw pump.	ab systems identical to medical systems (software change only). UT21 tested with 80 gal tank, one 1.5 HP lubricated rotary vane pump and one 1.5HP oilless claw pump. UT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.	CVTD0504AV	LCVD0504AV	4	120	2	1	2	59	35	84	1,650	N/A	Rigid base wy internal isolation	Interpolat
JUT22 tested with 80 gal tain, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.	224 ested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP olless claw pump.	UT22 tested with 30 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.	UT22 tested with 80 gal tank, one 3 HP lubricated rotary vane pump and one 2 HP oilless claw pump.	CVTD0504BV	LCVD0604	5	120	2	1	2 2	59	35	85	1,670	Rigid base		UUT24 <sup>4</sup>
BUILDING									CRL	DA		: 01	/24	/2024	2022		
									CALT	DA	A B		/24 +	/2024	St. OV		

### Table 11 - Certified Components - Enclosed Medical/Laboratory Vacuum Systems, Lubricated Rotary Vane and Oilless Claw Pumps, Rigid Base Mount

#### DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

#### Mounting: Rigid Base Mount

and the Laterage details with the 1	tak ala sa dalah mukan 1		Tatal UD	Number of	Vertically Stacked	Horizontally			imensions (in) osed Vacuum L		Max. Operating Weight (lb) of	Mounting	Unit
Medical Air Model Number <sup>1</sup>	Lab Air Model Number <sup>1</sup>	HP Per Pump	Total HP	Vacuum Enclosures	Pumps Per Enclosure	Arrayed Pumps Per Enclosure	Tank Size (gallons) <sup>2</sup>	Length	Width	Height	Individual Enclosed Vacuum Unit <sup>3</sup>	Mounting	Unit
			Duple				vith structurally independe	- 0		0			
MVEVD0404 - TEST	LVEVD0404 - TEST	4.6	9	1	2	1	N/A	65	34	66	1.340	1	UUT37 <sup>4</sup>
MVEVD0404	LVEVD0404	4.6	9	1	2		120 V	65	34	66	1,340		Interpolat
MVEVD0504	LVEVD0504	5	10	1	2	RGU	120 V	82	34	77	1,650		Interpolat
MVECD0203	LVECD0203	2	4	1	2	1//////////////////////////////////////	80 V	65	34	66	1,905	-	Interpolat
MVECD0203	LVECD0303	3	6	1	2	1	80 V	65	34	66	1,925	-	Interpolat
MVECD0404	LVECD0404	4	8	1	2	1	120 V	65	34	66	1,925		Interpolat
MVECD0504	LVECD0404	5	10	1	2		120 V	65	34	66	1,925	Rigid base w/ internal	Interpolat
MVEVD0754	LVEVD0754	7.5	10	1	2		120 V	82	34	77	2,000	isolation	Interpolat
MVECD0604	LVECD0604	6	13			1	120 V	65	34	66		lisolation	
		-			2			VYXX ·			2,295	4	Interpolat
MVECD0754	LVECD0754	7.5	15 22.5		2	OSP-C	39 120 V N/A	82	34	77	2,295	4	Interpola
MVEVCDXXX	LVEVCDXXX	7.5, 15			2	-		82	1		2,540	-	UUT38
MVECD1005	LVECD1005	10	20	1	2	1	200 V	82	34	77	2,730		Interpolat
MVECD1505	LVECD1505	15	30	1	$D^2/.T$	1	200 V	82	34	77	2,750		Interpolat
			Triple	ex Systems (3-sta	ack individually enclo	sed vacuum units w	ith structurally independe	ent and flexibly	connected tai	nks)			
MVECT0404	LVECT0405	4	12	1	3	100000	120 V	82	34	77	2,725		Interpolat
MVECT0504	LVECT0505	5	15	1	Anna 3 Maria	1	120 V	82	34	77	2,725	Rigid base w/	Interpolat
MVECT0605	LVECT0605	6	18	1		· (1/)	200 V	82	34	77	3,080	internal	Interpolat
MVECT0755	LVECT0755	7.5	22.5	1		. YHZ	4/2 200 v 4	82	34	77	3,080	isolation	Interpolat
MVECT0755 - TEST	LVECT0755 - TEST	7.5	22.5	1			N/A	82	34	77	3,080	1	UUT39
			Triplex	(2-stack plus 1 la	yout, structurally inc	lependent and flexi	bly connected individually	enclosed vac	um units and	tanks)			
MVEVT0405	LVEVT0405	4.6	13.8	2	2, 1 partial fill		200 V	65	34	66	1,340		Extrapolat
MVEVT0505	LVEVT0505	5	15	2	2, 1 partial fill	1	200 V	65	34	77	1,650		Extrapolat
MVECTS0404	LVECTS0404	4	12	2	2, 1 partial fill	1	120 V	65	34	66	1,925		Extrapolat
MVECTS0504	LVECTS0504	5	15	2	2, 1 partial fill	1	120 V	65	34	66	1,925	Rigid base w/	Extrapolat
MVEVT0755	LVEVT0755	7.5	22.5	2	2, 1 partial fill	1	200 V	65	34	77	2,000	internal	Extrapolat
MVECTS0605	LVECTS0605	6	18	2	2, 1 partial fill		200 V	65	34	66	2,295	isolation	Extrapolat
MVECTS0755	LVECTS0755	7.5	22.5	2	2, 1 partial fill		200 V	65	34	66	2,295	1	Extrapolat
MVECT1005	LVECT1005	10	30	2	2, 1 partial fill	1	200 V	82	34	77	2,730	]	Extrapolate
MVECT1505	LVECT1505	15	45	2	2, 1 partial fill	1	200 V	82	34	77	2,750		Extrapolate
						d vacuum units wit	h structurally independen					_	
MVEVQ0405	LVEVQ0405	4.6	18.4	2	2	1	200 V	65	34	66	1,350	Rigid base w/	Extrapolat
MVEVQ0505	LVEVQ0505	5	20	2	2	1	200 V	82	34	77	1,650	internal	Extrapolat
MVECQ0405	LVECQ0405	4	16	2	2	1	200 V	65	34	66	1,925	isolation	Extrapolat
MVECQ0505	LVECQ0505	5	20	2	2	1	200 V	65	34	66	1,925		Extrapolat

#### Notes:

1. Lab units are physically identical to medical air units (software change only). The fourth character of the model number can have "V" for lubricated vane pumps, "C" for oilless claw pumps. Systems more than 10 HP or 3-stack systems only feature oilless claw pumps. 2. Systems use structurally independent and flexibly connected tanks, tested in or interpolated by UUT30a, rigidly mounted to the structure. Tank dimensions and weights are listed in Table 13. V stands for vertical orientation.

3. Max weights and dimensions represent the maximum dimensions and weights of a single enclosed system. Systems with multiple enclosed vacuum units have structurally independent and flexibly connected enclosed vacuum units with internally isolated pumps.

4. UUT37 was tested with (2) 5 HP lubricated vane pumps. UUT37 was not tested with a structurally independent tank.

5. UUT38 was a hybrid model tested with (1) 15 HP oilless claw pump in the top position and (1) 7.5 HP lubricated vane pump in the bottom position to certify subcomponents. UUT38 was not tested with a structurally independent tank.

6. Applicable models require the enclosure panel retrofits described in the Unit Mounting Description of the UUT39 Unit Under Test (UUT) Summary Sheet.

7. UUT39 was tested with (3) 7.5 HP oilless claw pumps. UUT39 is the heaviest possible vacuum enclosure. UUT39 was not tested with a structurally independent tank.

8. An extrapolation justification matrix is provided in Table 12.

DYNAMIC

CERTIFICATION

# Table 11 - Certified Components (Continued) - Enclosed Medical/Laboratory Vacuum Systems, Lubricated Rotary Vane or Oilless Claw Pumps, Rigid Base Mount



DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Medical Air Model Number <sup>1</sup>	Lab Air Model Number <sup>1</sup>	HP Per Pump	Total HP	Number of Vacuum	Vertically Stacked Pumps Per	Horizontally Arrayed Pumps	Tank Size (gallons) <sup>2</sup>	1	imensions (in osed Vacuum		Max. Operating Weight (lb) of	Mounting	Unit
viedical Air Model Number	Lab Air Model Number	in rei rump	Total IIF	Enclosures	Enclosure	Per Enclosure	Tank Size (gallons)	Length	Width	Height	Individual Enclosed Vacuum Unit <sup>3</sup>	Wounting	Offic
			Quadru	plex (2-stack ind	ividually enclosed va	cuum units with str	ucturally independent an	d flexibly conn	ected tanks)				
MVEVQ0755	LVEVQ0755	7.5	30	2	2		200 V	65	34	77	2,000		Extrapolated
MVECQ0605	LVECQ0605	6	24	2	2		200 V	65	34	66	2,295	Rigid base	Extrapolated
MVECQ0755	LVECQ0755	7.5	30	2	2	1.	200 V	65	34	66	2,295	w/internal	Extrapolate
MVECQ1005	LVECQ1005	10	40	2	2		200 V	82	34	77	2,730	isolation	Extrapolated
MVECQ1505	LVECQ1505	15	60	2	2	1	200 V	82	34	77	2,750		Extrapolated
			Pentaplex (1	-stack and 2-stac	ck individually enclos	ed vacuum units wi	th structurally independe	nt and flexibly	connected tar	nks)			
MVECPS0505	LVECPS0505	5	25	3	2,2,1 partial fill		200 V	65	34	66	1,925	Rigid base	Extrapolate
MVECPS0755	LVECPS0755	7.5	37.5	3	2,2,1 partial fill	1	200 V	65	34	66	2,295	w/ internal	Extrapolate
MVECP1505	LVECP1505	15	75	3	2,2,1 partial fill	SD103	QQ 200 V	82	34	77	2,750	isolation	Extrapolate
			Pentaplex (2	-stack and 3-stac	k individually enclos	ed vacuum units wi	th structurally indepen <mark>de</mark>	nt and flexibly	connected tar	nks)			
MVECP0505	LVECP0505	5	25	2	2, 3	1	200 V	82	34	77	2,725	Rigid base w/ internal	Extrapolate
MVECP0755	LVECP0755	7.5	37.5	2	RV <sup>2,3</sup> Tim	otht Dil	and 200 V	82	34	77	3,080	isolation	Extrapolate
	1		Hexap	olex (2-stack indiv	vidually enclosed vac	uum units with stru	cturally independent and	flexibly conne	cted tanks)				
MVECHS0505	LVECHS0505	5	30	3	2,2,2	1	200 V	82	34	77	1,925	Rigid base	Extrapolate
MVECHS0755	LVECHS0755	7.5	45	3	2,2,2	1	200 V	82	34	77	2,295	w/ internal	Extrapolate
MVECH1505	LVECH1505	15	90	3	2,2,2	01/24	200 V	82	34	77	2,750	isolation	Extrapolate
			Hexap	olex (3-stack indiv	vidually enclosed vac	uum units with stru	cturally independent and	flexibly conne	ted tanks)				
MVECH0505	LVECH0505	5	30	2	3,3	1	200 V	82	34	77	2,725	Rigid base w/ internal	Extrapolate
MVECH0755	LVECH0755	7.5	45	2	3,3		200 V	82	34	77	3,080	isolation	Extrapolate
	Expa	andable Duplex to	Triplex (depopu	llated 3-stack ind	ividually enclosed va	cuum units with str	ucturally independent and	d flexibly conn	ected tanks, e	xpandable to 3	-stack system)		
MVECD0404-EX3	LVECD0404-EX3	4	8 exp to 12	1	2 exp to 3	1	120 V	82	34	77	2,725		Extrapolate
MVECD0504-EX3	LVECD0504-EX3	5	10 exp to 15	1	2 exp to 3	1	120 V	82	34	77	2,725	Rigid base w/internal	Extrapolate
MVECD0605-EX3	LVECD0605-EX3	6	12 exp to 18	1	2 exp to 3	1	200 V	82	34	77	3,080	isolation	Extrapolate
MVECD0755-EX3	LVECD0755-EX3	7.5	15 exp to 22.5	1	2 exp to 3	1	200 V	82	34	77	3,080		Extrapolate
	Expanda	ble Triplex to Qua	adruplex (1-stack	and 2-stack indi	vidually enclosed va	cuum units with stru	ucturally independent and	flexibly conne	cted tanks, ex	pandable to 2-	stack only system)		
MVECT0405-EX4	LVECT0404-EX4	4	8 exp to 12	2	2, 1 exp to 2	1	200 V	65	34	66	1,925		Extrapolat
MVECT0504-EX4	LVECT0504-EX4	5	10 exp to 15	2	2, 1 exp to 2	1	200 V	65	34	66	1,925		Extrapolat
MVECT0605-EX4	LVECT0605-EX4	6	12 exp to 18	2	2, 1 exp to 2	1	200 V	65	34	66	2,295	Rigid base w/internal	Extrapolat
MVECT0755-EX4	LVECT0755-EX4	7.5	15 exp to 22.5	2	2, 1 exp to 2	1	200 V	65	34	66	2,295	isolation	Extrapolat
MVECT1005-EX4	LVECT1005-EX4	10	30 exp to 40	2	2, 1 exp to 2	1	200 V	82	34	77	2,730		Extrapolate
MVECT1505-EX4	LVECT1505-EX4	15	45 exp to 60	2	2, 1 exp to 2	1	200 V	82	34	77	2,750		Extrapolate

Notes:

1. Lab units are physically identical to medical air units (software change only). The fourth character of the model number can have "V" for lubricated vane pumps, "C" for oilless claw pumps. Systems more than 10 HP or 3-stack systems only feature oilless claw pumps. 2. Systems use structurally independent and flexibly connected tanks, tested in or interpolated by UUT30a, rigidly mounted to the structure. Tank dimensions and weights are listed in Table 13. V stands for vertical orientation.

3. Max weights and dimensions represent the maximum dimensions and weights of a single enclosed system. Systems with multiple enclosed vacuum units have structurally independent and flexibly connected enclosed vacuum units with internally isolated pumps.

4. An extrapolation justification matrix is provided in Table 12.

5. Applicable models require the enclosure panel retrofits described in the Unit Mounting Description of the UUT39 Unit Under Test (UUT) Summary Sheet.

	ion Matrix for Extrapo	lation - Enclosed Medical/Laboratory Vacuum sy umps, Rigid Base Mount	stems
CL Project Number: 43160-2	301		
anufacturer: Powerex			
oduct Line: Medical Vacuum	and Laboratory Vacuum		
ounting: Rigid Base Mount			
	Extrapolated Unit (Laboratory)	Units Used for Extrapolation	Difference From Units Used for Extrapolation
MVEVT0404	LVEVT0404	UUT37 (MVEVD0404 - TEST)	
MVEVT0504	LVEVT0504		
MVECTS0404	LVECTS0404		Extrapolated triplex systems include (1) one-high partial fill enclosed vacuum system in addition to (1) two-high
MVECTS0504	LVECTS0504		enclosed system. Both enclosed systems are structurally independent and flexibly attached. UUT37 is the smalles
MVEVT0754	LVEVT0754	P(0)F	enclosed system, UUT38 tested the heaviest pumps of each technology, and UUT39 is the heaviest single enclose
MVECTS0605	LVECTS0605	CONCODE	vacuum system. Structurally independent and flexibly connected tanks are directly mounted to the structure and w
MVECTS0755	LVECTS0755		bookended by the tanks tested in UUT30a on a rigid base platform.
MVECT1005	LVECT1005		
MVECT1505	LVECT1505	UUT38 (MVEVCDXXX), UUT39 (MVECT0755 - TEST)	
MVEVQ0405	LVEVQ0405	UUT37 (MVEVD0404)	
MVEVQ0505	LVEVQ0505		
MVECQ0405	LVECQ0405		
MVECQ0505	LVECQ0505	44 OSP-039	Extrapolated quadplex systems include (2) separate, structurally independent and flexibly connected enclosed
MVECQ0605	LVECQ0605	03F-039	
MVEVQ0755	LVEVQ0755		heaviest single enclosed vacuum system. Structurally independent and flexibly connected tanks are directly mount
MVECQ0755	LVECQ0755		the structure and were bookended by the tanks tested in UUT30a on a rigid base platform.
MVECQ1005	LVECQ1005	■ V. Timothy Pilar	ad a land
MVECQ1505	LVECQ1505	UUT38 (MVEVCDXXX), UUT39 (MVECT0755 - TEST)	
MVECPS0505	LVECPS0505	UUT37 (MVEVD0404 - TEST)	
MVECPS0755	LVECPS0755		Extrapolated pentaplex systems include a combination of either (1) two-high and (1) three-high enclosed systems (2) two-high and (1) one-high enclosed systems with all seperate enclosed systems being structurally independent
MVECP1505	LVECP1505	O $UA   C U1/24/2$	flexibly attached. UT37 is the smallest enclosed systems UUT38 tested the heaviest pumps of each technology, at
			UUT39 is the heaviest single enclosed vacuum system. Structurally independent and flexibly connected tanks ar
MVECP0505	LVECP0505	V	directly mounted to the structure and were bookended by the tanks tested in UUT30a on a rigid base platform
MVECP0755	LVECP0755	UUT38 (MVEVCDXXX), UUT39 (MVECT0755 - TEST)	
MVECHS0505	LVECHS0505	UUT37 (MVEVD0404 - TEST)	Extrapolated hexaplex systems include a combination of either (3) two-high or (2) three-high enclosed systems with
MVECHS0755	LVECHS0755		separate enclosed systems being structurally independent and flexibly attached. UT37 is the smallest enclosed sys
MVECH1505	LVECH1505		UUT38 tested the heaviest pumps of each technology, and UUT39 is the heaviest single enclosed vacuum system
MVECH0505	LVECH0505	RITION	Structurally independent and flexibly connected tanks are directly mounted to the structure and were bookended
MVECH0755	LVECH0755	UUT38 (MVEVCDXXX), UUT39 (MVECT0755 - TEST)	the tanks tested in UUT30a on a rigid base platform.
MVECD0404-EX3	LVECD0404-EX3	UUT37 (MVEVD0404 - TEST)	
MVECD0504-EX3	LVECD0504-EX3	, ∧	Extrapolated expandable systems are initially built with (1) partially filled three-high system with two pumps and be populated by one pump to create (1) three-high enclosed system. UUT37 is the smallest enclosed system, UU
MVECD0605-EX3	LVECD0605-EX3	$\downarrow$	tested the heaviest pumps of each technology, and UUT39 is the heaviest single enclosed vacuum system. Structur independent and flexibly connected tanks are directly mounted to the structure and were bookended by the tan
MVECD0755-EX3	LVECD0755-EX3	UUT38 (MVEVCDXXX), UUT39 (MVECT0755 - TEST)	tested in UUT30a on a rigid base platform.
MVECT0405-EX4	LVECT0404-EX4	UUT37 (MVEVD0404 - TEST)	
MVECT0504-EX4	LVECT0504-EX4	· · · ·	Extrapolated expandable systems are initially built with (1) two-high enclosed system and (1) partially filled two-h
MVECT0605-EX4	LVECT0605-EX4		enclosed system that can be populated with one pump to create a system with (2) two-high enclosed systems. UU
			is the smallest enclosed system, UUT38 tested the heaviest pumps of each technology, and UUT39 is the heavie single enclosed vacuum system. Each enclosed system is structurally independent and flexibly connected. Structur
MVECT0755-EX4	LVECT0755-EX4		independent and flexibly connected tanks are directly mounted to the structure and were bookended by the tan
MVECT1005-EX4	LVECT1005-EX4	V	tested in UUT30a on a rigid base platform.
MVECT1505-EX4	LVECT1505-EX4	UUT38 (MVEVCDXXX), UUT39 (MVECT0755 - TEST)	

### Table 13 - Certified Subcomponents - Stacked Systems, Flexible Base Mount



## DCL Project Number: 43160-2301 Manufacturer: Powerex

		Lubricated Rot	ary Vane Vacuum Pumps					
Model <sup>1</sup>	Manufacturer	Material	Dimensions (in) L x W x H	HP	Voltage Tested	Voltage Certified	Max Weight (lb.)	Unit
RA0063	Busch		28 x 19 x 12	3	208V		172	UUT8
RC0101	Busch		29 x 19 x 12	5	208V		198	UUT1
RA0101	Busch		29 x 19 x 12	5	N/A		198	Interpolated
RA0155A	Busch		31.5 x 20 x 13.5	5	460V		243	UUT5
RC0155	Busch		38 x 22 x 16.5	5	N/A		435	Interpolated
RC0205	Busch		41 x 24 x 16.5	7.5 or 8	N/A		435	Interpolated
RA0205	Busch	Cast iron lubricated vane vacuum pumps with face-mounted TEFC motor, carbon steel and aluminum body. Pump has rubber isolation feet.	41 x 24 x 16.5	7.5 or 8	208V	208-230/460	435	UUT8
RC0305	Busch		44 x 24 x 16.5	10	N/A		520	Interpolated
RA0255	Busch		44 x 24 x 16.5	10	N/A		520	Interpolated
RA0305	Busch		44 x 24 x 16.5	10	N/A		520	Interpolated
RC0400	Busch		54 x 38 x 26.5	15	N/A	]	1084	Interpolated
RC0502	Busch		65.5 x 38 x 26.5	20	N/A		1285	Interpolate
RC0630	Busch		0 2 0 269 x 40 x 26.5	25	460V	]	1527	UUT2

		Oilless C	law Vacuum Pumps					
Model	Manufacturer	Material RV Timoth	Dimensions (in)	HP	Voltage Tested	Voltage Certified	Max Weight (lb.)	Unit
MM1102	Busch	O DI. IIIO	40 x 17 x 16	4.5 to 5	230V		450	UUT3
MM1142	Busch		42 x 17 x 16	5 to 6.4	N/A		450	Interpolated
MM1202	Busch		43 x 20 x 18	6.4 to 7	N/A		610	Interpolated
MM1252	Busch	Cast iron oilless claw vacuum pumps with face-mounted TEFC motor, carbon steel	43 x 20 x 18	7.5 to 9.1	208V / 230V	208-230/460	620	UUT8
MM1322	Busch	and aluminum body. Pump has rubber isolation feet.	48 x 20 x 18	9 to 10.2	N/A	208-230/400	655	Interpolated
MM1402	Busch		48 x 20 x 18	9 to 10.2	N/A		706	Interpolated
MM1502	Busch		54.5 x 20 x 18	15	460V		717	UUT5
MI1502	Busch		48 x 31 x 27	15	460V	]	860	UUT4
		PNIA BUI	LDING CODT					

### Table 13 - Certified Subcomponents (Continued) - Stacked Systems, Flexible Base Mount



#### DCL Project Number: 43160-2301

#### Manufacturer: Powerex Product Line: Medical Vacuum and Laboratory Vacuum

			Tanks				
Model <sup>1</sup>	Manufacturer	Material	Dimensions (in)	Capacity (gal)	Orientation	Max Weight (lb.)	Unit
AR0274xxxx		Carbon steel, ASME	24" Dia x 71" H	120		325	UUT1, UUT3
AR0512xxxx	Campbell Hausfeld <sup>2</sup>	construction 200 psig <sup>3</sup>	30" Dia x 77" H	200	Vertical	500	UUT4
AR05130xAJ			30" Dia x 89"H	240		580	UUT4b
VES04767		Carbon steel, ASME	24" Dia x 70" H	120		325	UUT31b
VES07303	Morganton	construction 200 psig <sup>3</sup>	30" Dia x 80" H	200	Vertical	500	Interpolated
VES07072			30" Dia x 92"H	240		580	UUT30b
1. xxxx in model number is f	or variations in paint color	and threaded port sizes, not affecting structural elements.	ODE COM				

2. Campbell Hausfeld is alternately branded as Twin Lakes Manufacturing.

<ol> <li>Construction in accordance</li> </ol>	e with ASME BPVC Section	VIII. Tanks have an allowable working pressure rating of 200 psig.						
			Controllers	7				
Model	Manufacturer	Description	Material		NEMA Rating	Dimensions (in)	Max Weight (lb.)	Unit
BASIC_PVM (24x20x8)	Powerex	No Touchscreen	Powder coated carbon steel	K	12	24"H x 20"W x 8"D	235	Extrapolated <sup>1</sup>
BASIC_PVM (30x24x8)	Powerex	No Touchscreen	Powder coated carbon steel	()	12	30"H x 24"W x 8"D	245	Extrapolated <sup>1</sup>
BASIC_PVM (36x30x8)	Powerex	No Touchscreen	Powder coated carbon steel		12	36"H x 30"W x 8"D	280	Extrapolated <sup>1</sup>
HMI_PXMI (30x24x8)	Powerex	Human Machine Interface: Touchscreen	Powder coated carbon steel		12	30"H x 24"W x 8"D	250	UUT1
HMI_PXMI (36x30x8)	Powerex		Powder coated carbon steer		12	36"H x 30"W x 8"D	295	Interpolated
PBMI_PXMI (30x24x8)	Powerex	Powerex Building Management Integrator: HMI panel with additional	NY PIIANO Powder coated carbon steel		12	30"H x 24"W x 8"D	250	Interpolated
PBMI_PXMI (36x30x8)	Powerex	communications card	Powder coaled carbon steel		12	36"H x 30"W x 8"D	295	UUT2
PBMI_VFD (42x30x12)	Powerex	Same as PMXI, but with lead pump VFD	Powder coated carbon steel		12	42"H x 30"W x 12"D	315	UUT3, UUT4
PBMI_PXMI (42 x 30 x12)	Powerex	Powerex Building Management Integrator: HMI panel with additional communications card. Control configured for up to 8 pumps.	Powder coated carbon steel	5	12	42"H x 30"W x 12"D	315	UUT13

1. BASIC\_PVM controller can be extrapolated because it is a depopulated version of the controllers tested in UUT 1, 2, 3 and 4. OPNIA BUILDING CODE

### Table 14 - Certified Subcomponents - Tank-Over Systems, Rigid or Flexible Base Mount



DCL Project Number: 43160-2301 Manufacturer: Powerex

Model         Manufacturer         Material         Dimensions (in) L x W x H         HP         Votage Tested           RA0063         Busch
RC0101       Busch         RA0101       Busch         RA0101       Busch         RA0105       Busch         RA01055       Busch         RC0205       Busch         RA02050       Busch         MM1144       Busch         MM1102       Busch         MM1102       Busch         MM1102       Busch         MM1142       Busch         MM1122       Busch         MM1202       Busch         MM122       Busch         MM122       Busch         MM122       Busch         MM1252       Busch         Model <sup>1</sup> Manufacturer         Model number is or variations in a plan edd port sizes, not affecting structural elements: amphell Hausfeld <sup>2</sup> Carbon steel, ASME construction 200 psig <sup>3</sup> exit model number is or variations in a allowable working pressure rating of 200 psig.       Controllers         Model       Manufacturer
RA0101       Busch       Cast ion lubricated vane vacuum pumps with face-mounted TEFC motor, carbon steel and aluminum body with rubber isolation feet attached to the pump       29 x 19 x 12       5       N/A         RA0155A       Busch       aluminum body with rubber isolation feet attached to the pump       31.5 x 20 x 13.5       5       460V         RC0205       Busch       Alux 24 x 16.5       7.5 or 8       N/A         MM1144       Busch       Alux 24 x 16.5       7.5 or 8       208V         MM1102       Busch       Oilless claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, Cfare motor with aluminum finned shell with rubber isolation feet attached to the pump       41 x 17 x 16       4.5 to 5       230V         MM1120       Busch       Oilless claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, Cfare motor with aluminum finned shell with rubber isolation feet attached to the pump       41 x 17 x 16       4.5 to 5       230V         MM1202       Busch       Oilless claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, Cfare motor with aluminum finned shell with rubber isolation feet attached to the pump       43 x 20 x 18       6.4 to 7       N/A         MM252       Busch       Carbon steel, ASME construction 200 pig 3       20° Dia x 47° L       60       H         xxxx in model number is for variations in paint color and threaded port sizes, not affecting structural
RA015SA       Busch       Cast iron lubricated vane vacuum pumps with face-mounted TEFC motor, carbon steel and aluminum body with rubber isolation feet attached to the pump       31.5 x 20 x 13.5       5       460V         RC0205       Busch       Busch       Alt x24 x 16.5       5       N/A         RA0205       Busch       Alt x24 x 16.5       7.5 or 8       N/A         MM1144       Busch       Alt x24 x 16.5       7.5 or 8       N/A         MM1102       Busch       Olless claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, C-free motor with aluminum finned shell with rubber isolation feet attached to the pump       41 x 24 x 16.5       7.5 or 8       208V         MM1142       Busch       Olless claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, C-free motor with aluminum finned shell with rubber isolation feet attached to the pump       43 x 20 x 18       6.4 to 7       N/A         MM1252       Busch       Material       Dimensions (in)       Capacity (gal)       Or         AR8029xxx       Campbell Hausfeld <sup>2</sup> Carbon steel, ASME construction 200 psig       20" Dia x 47" L       60       H         wax in model number is for variations in paint color and threaded port sizes, not affecting structural elements- anappell Hausfeld is alternately branded as Twin takes Manufacturing.       600       H         Model       Manufacturer
RA0155A       Busch       aluminum body with rubber isolation feet attached to the pump       31.5 x 20 x 13.5       5       4600         RC0155       Busch       38 x 22 x 16.5       5       N/A         RA0205       Busch       41 x 24 x 16.5       7.5 or 8       208V         MM1144       Busch       41 x 24 x 16.5       7.5 or 8       208V         MM1142       Busch       0illess claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, C-face motor with aluminum finned shell with rubber isolation feet attached to the pump       43 x 20 x 18       6.4 to 7       N/A         MM1202       Busch       Oilless claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, C-face motor with aluminum finned shell with rubber isolation feet attached to the pump       43 x 20 x 18       6.4 to 7       N/A         MM1202       Busch       Material       Dimensions (in)       Capacity (gal)       Or         Model <sup>1</sup> Manufacturer       Carbon steel, ASME construction 200 psig <sup>3</sup> 20" Dia x 47" L       60       H         axox in model number is for variations in paint color and threaded port sizes, not affecting structural elements-       ampbell Hausfeld is alter-mately branded as Twin Lakes Manufacturing.       ant x 20 x 18       6.4 to 7       H         oxin model number is for variations in paint color and threaded port sizes, not affecting structural e
RC0155       Busch       33 × 22 × 16.5       5       N/A         RC0205       Busch       41 × 24 × 16.5       7.5 or 8       N/A         RA0205       Busch       41 × 24 × 16.5       7.5 or 8       N/A         MM1144       Busch       41 × 24 × 16.5       7.5 or 8       208v         MM1102       Busch       0illess claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, Cface motor with aluminum finned shell with rubber isolation feet attached to the pump       40 × 17 × 16       4.5 to 5       230v         MM1202       Busch       0illess claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, Cface motor with aluminum finned shell with rubber isolation feet attached to the pump       40 × 17 × 16       4.5 to 5       230v         MM1202       Busch       0illess claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, Cface motor with aluminum finned shell with rubber isolation feet attached to the pump       43 × 20 × 18       6.4 to 7       N/A         MM1252       Busch       Carbon steel, ASME       Dimensions (in)       Capacity (gal)       Or         AR8029xxx       Campbell Hausfeld <sup>2</sup> Carbon steel, ASME       20° Toia × 47° L       60       H         axti in model number is for variations in paint color and threaded port sizes, not affecting structurular elements.       20° Toia × 47° L       60<
RA0205       Busch       41 x 24 x 16.5       7.5 or 8       208V         MM1144       Busch       41 x 17 x 16       3       208V         MM1102       Busch       0illess claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, Crace motor with aluminum finned shell with rubber isolation feet attached to the pump       40 x 17 x 16       3       208V         MM1202       Busch       0illess claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, Crace motor with aluminum finned shell with rubber isolation feet attached to the pump       40 x 17 x 16       4.5 to 5       230V         MM1252       Busch       6.4 to 7       N/A         MM1252       Busch       6.4 to 7       N/A         Model <sup>1</sup> Manufacturer       Material       Dimensions (in)       Capacity (gal)       Or         AR8029xxx       Campbell Hausfeld <sup>2</sup> Construction 200 psig <sup>3</sup> 20" Dia x 47" L       60       H         xxx in model number is for variations in paint color and threaded port sizes, not affecting structural elements-       20" Dia x 47" L       60       H         mspell Hausfeld is alternately branded as Twin Lakes Manufacturing.       Scontrollers       Scontrollers       Scontrollers       20" Dia x 47" L       60       H         ASIC_PVM (24x20x8)       Maderial       Material <td< td=""></td<>
MM1144       Busch       41 x 17 x 16       3       208V         MM1102       Busch       Oilless claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, Cface motor with aluminum finned shell with rubber isolation feet attached to the pump       40 x 17 x 16       4.5 to 5       230V         MM1202       Busch       motor with aluminum finned shell with rubber isolation feet attached to the pump       43 x 20 x 18       6.4 to 7       N/A         MM1252       Busch       Material       Dimensions (in)       Capacity (gal)       Or         Model <sup>1</sup> Manufacturer       Material       Dimensions (in)       Capacity (gal)       Or         AR8029xxx       Campbell Hausfeld <sup>2</sup> Carbon steel, ASME construction 200 psig <sup>3</sup> 20" Dia x 47" L       60       H         cox in model number is for variations in paint color and threaded port sizes, not affecting structural elements.       20" Dia x 47" L       60       H         ampbell Hausfeld is alternately branded as Twin Lakes Manufacturing.       Controllers       Controllers       Controllers       20" Dia x 47" L       60       H         Model       Manufacturer       Description       Material       NEMA rating       Dim         ASIC_PVM (24x20x8)       Material       NEMA rating       Dim
MM1102       Busch       Olless claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, C-face motor with aluminum finned shell with rubber isolation feet attached to the pump       40 x 17 x 16       4.5 to 5       230V         MM1202       Busch       Busch       action of the pump       43 x 20 x 18       6.4 to 7       N/A         MM1252       Busch       Attack action of the pump       Model *       Attack action of the pump       43 x 20 x 18       6.4 to 7       N/A         Model *       Manufacturer       Material       Dimensions (in)       Capacity (gal)       Offer         AR8029xxx       Campbell Hausfeld 2       Carbon steel, ASME construction 200 psig 3       20" Dia x 47" L       60       H         xxx in model number is for variations in paint color and threaded port sizes, not affecting structural elements.       angebell Hausfeld 5       60       H         Model       Manufacturer       Description       Material       NEMA rating       Dimensions (in)       Capacity (gal)       O         AR8029xxx       Campbell Hausfeld Port sizes, not affecting structural elements.       angebell material of 200 psig.       Dimensions (in)       Capacity (gal)       O         Model       Manufacturer       Bescription       Material       NEMA rating       Dimensions (in)       Adv
MM1142       Busch       Oilless claw pumps with integrated lubricated cast iron drive gearbox, exhaust box, Cface       42 x 17 x 16       5 to 6.4       N/A         MM1202       Busch       motor with aluminum finned shell with rubber isolation feet attached to the pump       43 x 20 x 18       6.4 to 7       N/A         MM1252       Busch       43 x 20 x 18       6.4 to 7       N/A         MM1252       Busch       43 x 20 x 18       6.4 to 7       N/A         Model <sup>1</sup> Manufacturer       Material       Dimensions (in)       Capacity (gal)       Or         AR8029xxx       Campbell Hausfeld <sup>2</sup> Carbon steel, ASME construction 200 psig <sup>3</sup> 20" Dia x 47" L       60       H         xxi in model number is for variations in paint color and threaded port sizes, not affecting structural elements. instructed in accordance with ASME BPVC Section VIII. Tanks have an allowable working pressure rating of 200 psig.       Controllers       Controllers         Model       Manufacturer       Description       Material       NEMA rating       Dim         ASIC_PVM (24x20x8)       Oil       Material       NEMA rating       Dim
MM1142       Busch       motor with aluminum finned shell with rubber isolation feet attached to the pump       42 x 17 x 16       5 to 6.4       N/A         MM1202       Busch       43 x 20 x 18       6.4 to 7       N/A         MM1252       Busch       43 x 20 x 18       6.4 to 7       N/A         MM1252       Busch       43 x 20 x 18       6.4 to 7       N/A         MM1252       Busch       43 x 20 x 18       6.4 to 7       N/A         Model <sup>1</sup> Manufacturer       Material       Dimensions (in)       Capacity (gal)       Or         AR8029xxx       Campbell Hausfeld <sup>2</sup> Carbon steel, ASME construction 200 psig       20" Dia x 47" L       60       H         xxx in model number is for variations in paint color and threaded port sizes, not affecting structural elements.       annufacturing.       60       H         onstructed in accordance with ASME BPVC Section VIII. Tanks have an allowable working pressure rating of 200 psig.       Controllers       Controllers       20" Material       NEMA rating       Dim         Model       Manufacturer       Description       Material       NEMA rating       Dim         ASIC_PVM (24x20x8)       Material       NEMA rating       Dim
MM1202       Busch       6.4 to 7       N/A         MM1252       Busch       43 x 20 x 18       6.4 to 7       N/A         MM1252       Busch       43 x 20 x 18       7.5 to 9.1       208V / 230V         Tank         Model 1       Manufacturer       Material       Dimensions (in)       Capacity (gal)       Or         AR8029xxx       Campbell Hausfeld 2       Construction 200 psig 3       20" Dia x 47" L       60       H         construction 200 psig 3       20" Dia x 47" L       60       H         construction 200 psig 3       20" Dia x 47" L       60       H         construction 200 psig 3       20" Dia x 47" L       60       H         construction 200 psig 3       20" Dia x 47" L       60       H         constructural elements.         ampbell Hausfeld is alternately branded as Twin Lakes Manufacturing.       constructed in accordance with ASME BPVC Section VIII. Tanks have an allowable working pressure rating of 200 psig.         Model       Manufacturer       Description       Material       NEMA rating       Dim         ASIC_PVM (24x20x8)       Material       NEMA rating       Dim
Model       Manufacturer       Material       Dimensions (in)       Capacity (gal)       Or         AR8029xxx       Campbell Hausfeld <sup>2</sup> Carbon steel, ASME construction 200 pig <sup>3</sup> 20" Dia x 47" L       60       H         exx in model number is for variations in paint color and threaded port sizes, not affecting structural elements. ampbell Hausfeld is alternately branded as Twin Lakes Manufacturing. onstructed in accordance with ASME BPVC Section VIII. Tanks have an allowable working pressure rating of 200 psig.       Controllers       Controllers         Model       Manufacturer       Description       Material       NEMA rating       Dim         ASIC_PVM (24x20x8)       24"H:       24"H:       24"H:       24"H:
Model <sup>1</sup> Manufacturer       Material       Dimensions (in)       Capacity (gal)       Or         AR8029xxx       Campbell Hausfeld <sup>2</sup> Carbon steel, ASME construction 200 pig <sup>3</sup> 20" Dia x 47" L       60       H         exxx in model number is for variations in paint color and threaded port sizes, not affecting structural elements. ampbell Hausfeld is alternately branded as Twin Lakes Manufacturing. onstructed in accordance with ASME BPVC Section VIII. Tanks have an allowable working pressure rating of 200 psig.       Controllers       Controllers         Model       Manufacturer       Description       Material       NEMA rating       Dim         ASIC_PVM (24x20x8)       24"H:       24"H:       24"H:       24"H:
Model <sup>1</sup> Manufacturer       Material       Dimensions (in)       Capacity (gal)       Or         AR8029xxx       Campbell Hausfeld <sup>2</sup> Carbon steel, ASME construction 200 psig <sup>3</sup> 20" Dia x 47" L       60       H         exx in model number is for variations in paint color and threaded port sizes, not affecting structural elements.       20" Dia x 47" L       60       H         exx in model number is for variations in paint color and threaded port sizes, not affecting structural elements.       20" Dia x 47" L       60       H         constructed in accordance with ASME BPVC Section VIII. Tanks have an allowable working pressure rating of 200 psig.       20" Dia x 47" L       60       H         Model       Manufacturer       Description       Material       NEMA rating       Dim         ASIC_PVM (24x20x8)       20       Material       NEMA rating       Dim
AR8029xxx       Campbell Hausfeld <sup>2</sup> Carbon steel, ASME construction 200 psig <sup>3</sup> 20" Dia x 47" L       60       H         xxx in model number is for variations in paint color and threaded port sizes, not affecting structural elements.       ampbell Hausfeld is alternately branded as Twin Lakes Manufacturing.       60       H         onstructed in accordance with ASME BPVC Section VIII. Tanks have an allowable working pressure rating of 200 psig.       DATE: 0.00000000000000000000000000000000000
AR8029xxx       Campbell Hausfeld <sup>2</sup> construction 200 psig <sup>3</sup> 20" Dia x 47" L       60       H         oxx in model number is for variations in paint color and threaded port sizes, not affecting structural elements.       ampbell Hausfeld is alternately branded as Twin Lakes Manufacturing.       ampbell Hausfeld is alternately branded as Twin Lakes Manufacturing.       ampbell Hausfeld is alternately branded as Twin Lakes Manufacturing.       ampbell Hausfeld is alternately branded as Twin Lakes Manufacturing.       because the state of the s
xx in model number is for variations in paint color and threaded port sizes, not affecting structural elements.  Ampbell Hausfeld is alternately branded as Twin Lakes Manufacturing.  DATE: 01242024  Controllers  Model Manufacturer Description Material NEMA rating Dim ASIC_PVM (24x20x8)
Model         Manufacturer         Description         Material         NEMA rating         Dim           ASIC_PVM (24x20x8)
ASIC_PVM (24x20x8)
ASIC_PVM (30x24x8) Powerex No Touchscreen Powder coated carbon steel 12 30"H :
ASIC_PVM (36x30x8) 36"H :
HMI_PXMI (30x24x8) Powerex Human Machine Interface: Touchscreen Powder coated carbon steel 12 30"H :
HMI PXMI (36x30x8) 36"H 2
PBMI PXMI (30x24x8) 30°H 3

### Table 15 - Certified Subcomponents - Tank Mounted Vertical Systems, Rigid or Flexible Base Mount



#### DCL Project Number: 43160-2301

Manufacturer: Powerex									
Product Line: Medical Vacuu	um and Laboratory Vacuu	m							
				Oilless Rotary Vane Pumps					
Model	Manufacturer	Material		Dimensions (L x W x H, in)	HP	Voltage tested	Voltage available	Max Weight (lb.)	Unit
SV1025	Busch			20 x 10 x 11	1.5	208V		64	UUT21
SV1040	Busch	Oilless vane type vacuum pumps with flange		22 x 10 x 11	2	N/A		91	Interpolate
SV1063	Busch	motor assembly and rubber isolation fe	et on	30 x 17 x 14	3	N/A	208-230/460	181	Interpolate
SV1080	Busch	pump/motor		31 x 17 x 14	4	N/A		198	Interpolate
SV1100	Busch			33 x 17 x 14	5	460V		265	UUT23
				D CODE					
				Tanks E					-
Model <sup>1</sup>	Manufacturer	Material		Dimensions (in)	Capacity (gal)	Ту	pe	Max Weight (lb.)	Unit
AR0630xxx	Campbell Hausfeld <sup>2</sup>	Carbon steel, ASME		24" Dia x 53" H	80	Conve	ntional	176	UUT21
AR0568xxx	campbell hausteld	construction 200 psig <sup>3</sup>	1.0	30" Dia x 53" H	120	Conve	ntional	325	UUT23
		14	Sure ruting						
. Construction is in accordar		4	JA	OSP-0393	<u>i</u> <u>C</u>				
Туре	Model	Manufacturer	JA	OSP_0393 Controllers Description	Material	NEMA Rating	Dimensions	Max Weight (lb.)	Unit
Түре	Model	X	JA	OSP-0393 Controllers	Material	NEMA Rating	(W x H x D, in)	<u> </u>	
		Manufacturer	JA	Controllers Description NEMA 12 enclosure integrated to enclosure frame, containing PLC	Powder costed carbon		(W x H x D, in) 20 x 24 x 8	235	UUT21
Type Basic Duplex controller	Model PVM239xxAB or CB <sup>1</sup>	X	JA	Controllers Description NEMA 12 enclosure integrated to enclosure frame, containing PLC transformers, relays, motor contactor and motor protector circuit	Powder costed carbon	NEMA Rating	(W x H x D, in) 20 x 24 x 8 24 x 24 x 8	235 240	UUT21 Interpolate
Type Basic Duplex controller Premium Duplex controller includes HMI	Model PVM239xxAB or CB <sup>1</sup> PBMIV269xxAB or CB <sup>1</sup>	Manufacturer Powerex		Controllers Description NEMA 12 enclosure integrated to enclosure frame, containing PLC	Powder coated carbon steel	12	(W x H x D, in) 20 x 24 x 8	235	UUT21

### Table 16 - Certified Subcomponents - Tank Mounted Vertical Systems, Rigid Base Mount



DCL Project Number: 43160-2301

Manufacturer: Powerex

Manufacturer: Powerex								
	acuum and Laboratory Va	acuum						
Model	Manufacturer	Material	Dimensions (L x W x H, in)	HP	Voltage Tested	Voltage Available	Max Weight (lb.)	Unit
			Lubricated Rotary Vane Pumps					
RA0025	Busch		25 x 14 x 10.5	1.5	208V		80	UUT21
RA0040	Busch	Cast iron lubricated rotary vane pumps with face-mounted TEFC motor,	26 x 14 x 10.5	2	N/A		95	Interpolate
RA0063	Busch	carbon steel and aluminum body with rubber isolation feet on	28 x 19 x 12	3	460V	208-230/460	172	UUT22
RA0101	Busch	pump/motor	29 x 19 x 12	5	N/A		198	Interpolate
RA0155A	Busch		31.5 x 20 x 13.5	5	460V		243	UUT24
			Oilless Claw Pumps					
MM1104	Busch		40 x 17 x 16	2	460V		407	UUT22
MM1144	Busch	Oilless claw pumps with integrated lubricated cast iron drive gearbox,	41 x 17 x 16	3	N/A	200 220/460	407	Interpolate
MM1102	Busch	exhaust box, C-face motor with aluminum finned shell with rubber isolation feet on pump/motor	40 x 17 x 16	4.5 to 5	N/A	208-230/460	450	Interpolate
MM1142	Busch	isolation rect on pump motor	42 x 17 x 16	5 to 6.4	460V		450	UUT24
	•					•	•	
			Tanks	Y				
Model <sup>1</sup>	Manufacturer	Material	Dimensions (in)	Capacity (gal)	Туре		Max Weight (lb.)	Unit
AR0630xxx		Carbon steel, ASME	C D24" Dia x 53" H 2	80			176	UUT21
100500	Campbell Hausfeld <sup>2</sup>	construction 200 psig <sup>3</sup>		120	Conventio	nal	225	4
AR0568xxx			30" Dia x 53" H				325	UUT23 <sup>4</sup>
AR0273xxx	Campbell Hausfeld <sup>2</sup>	Carbon steel, ASME	24" Dia x 50.5" H	80	Frame		170	UUT22
AR0614xxx		construction 200 psig <sup>3</sup>	30" Dia x 52" H	120			310	UUT24
VES07285		Carbon steel, ASME	24" Dia x 49" H	80			170	UUT31a
VES04865	Morganton	construction 200 psig <sup>3</sup>	30" Dia x 52" H	120	Frame		325	Interpolated
VES07072			30" Dia x 92"H	240			580	UUT30a
. xxx in model number is	s for variations in paint c	olor and threaded port sizes, not affecting structural elements.	F· 01/24/2024					
. Campbell Hausfeld is a	Iternately branded as Tv	vin Lakes Manufacturing.						
. Construction is in acco	rdance with ASME BPVC	Section VIII. Tanks have an allowable working pressure rating of 200 psig.	8181888892788388888888888888	S O'				
. UUT23, which serves a	as an upper bookend, wa	s tested on neoprene pads.	1911997 - 191999999999999					
				, , , , , , , , , , , , , , , , , , , ,				
			Controllers					
Туре	Model	Manufacturer	Description	Material	NEMA Rating	Dimensions (W x H x D, in)	Max Weight (lb.)	Unit
Basic Duplex controller	PVM239xxAB		DUNES			20 x 24 x 8	235	UUT21
sasic pupiex controller	or CB <sup>1</sup>		NEMA 12 enclosure integrated to enclosure frame,			24 x 24 x 8	240	Interpolate
	DD1 411 /2 CO 4 D	Devieren	containing PLC, transformers, relays, motor	Powder coated carbon	12	30 x 30 x 8	265	Interpolate
Premium Duplex controller includes HMI	PBMIV269xxAB or CB <sup>1</sup>	Powerex	contactor and motor protector circuit breaker for	steel	12	24 x 36 x 8	275	Interpolate
Long offer includes FIVI	ULCB		up to 2 motors, optional HMI and optional VFD.			30 x 36 x 8	205	
						30 x 30 x 8	295	Interpolate

1. Where first x = 1,2,3,5,7,A for HP, Second x = 2, 3, 4 for voltage (208, 230, 460V), and A or C relates to the value of the temperature switch. The panel size is determined by the amperage draw of the system.

2. Where first x = 1,2,3,5,7,A for HP, Second x = 2, 3, 4 for voltage (208, 230, 460V).

### Table 17 - Certified Subcomponents - Enclosed Medical/Laboratory Vacuum Systems, Rigid Base Mount



#### DCL Project Number: 43160-2301

			Lubricated Rotary	Vane Vacuum Pumps				
Model	Manufacturer	Material	Dimensions (in) L x W x H	НР	Voltage Tested	Voltage Certified <sup>1</sup>	Max Weight (lb.)	Unit
RC0101	Busch		29 x 19 x 12	5	460V		198	UUT37
RA0101	Busch	1 <u> </u>	29 x 19 x 12	5	N/A		198	Interpolated
RA0155A	Busch	Cast iron lubricated vane vacuum pump with face- mounted TEFC motor, carbon steel and aluminum body.	31.5 x 20 x 13.5	5	N/A	208-230/460	243	Interpolated
RC0155	Busch	Pump has rubber isolation feet.	38 x 22 x 16.5	5	N/A	208-230/400	362	Interpolated
RC0205	Busch		41 x 24 x 16.5	7.5 or 8	N/A		435	Interpolated
RA0205	Busch		41 x 24 x 16.5	7.5 or 8	460V		435	UUT38
mps with different vo	oltages are physically ic	lentical and only differ in wiring.		MA				
				Vacuum Pumps			1 1	
Model	Manufacturer	Material	Dimensions (in) L x W x H	НР	Voltage Tested	Voltage Certified <sup>1</sup>	Max Weight (lb.)	Unit
MM1102	Busch		40 x 17 x 16	4.5 to 5	N/A		450	Extrapolated
MM1142	Busch		42 x 17 x 16	5 to 6.4	N/A		450	Extrapolated
MM1202	Busch	Cast iron oilless claw vacuum pump with face-mounted	43 x 20 x 18 -	03964 to 7	N/A		610	Extrapolated
MM1252	Busch	TEFC motor, carbon steel and aluminum body. Pump	43 x 20 x 18	7.5 to 9.1	460V	208-230/460	620	UUT39
MM1322	Busch	has rubber isolation feet.	48 x 20 x 18	9 to 10.2	N/A	-	655	Interpolated
MM1402	Busch		A8 x 20 x 18	9 to 10.2	N/A		706	Interpolated
MM1502	Busch		54.5 x 20 x 18 OLLY		460V		717	UUT38
Model	Manufacturer	Description	DATE: 0 °	trollers/2024 Material	Dime	nsions (in)	Max Weight (lb.)	Unit
BASIC PVM	Powerex	No Touchscreen		Powder coated carbon steel		20"W x 8"D	240	UUT37
HMI_PXMI	Powerex	Human Machine Interface: Touc	chscreen	Powder coated carbon steel		24"W x 8"D	245	UUT39
PBMI VFD	Powerex	Same HMI_PXMI with lead pun		Powder coated carbon steel		30"W x 12"D	246	UUT38
			Encl	losures	¥ /			
Model	Manufacturer	Material	1/7.	Dimensions (in) (L x W x I	H)		Max Weight (lb.)	Unit
Small	Powerex	Powder coated carbon steel	ADU	65 x 34 x 66			540	UUT37
Large	Powerex	Powder coated carbon steel	- BUIL	82 x 34 x 77			750	UUT38, UUT39
	•	· · · ·					•	
			Та	inks <sup>1</sup>				
Model	Manufacturer	Material		Dimensions (in)		Capacity (gal)	Max Weight (lb.)	Unit
VES07285	4			24" Dia x 49" H		80	177	UUT30a <sup>3</sup>
VES04865	Morganton	Carbon steel, ASME		30" Dia x 52" H 30" Dia x 80" H		120	325	Interpolated
VES07303	4	construction 200 psig <sup>2</sup>			200	500	Interpolated	
VES07072				30" Dia x 92"H		240	580	UUT30a <sup>3</sup>

### Table 18 - Tested Units

DCL Project Number: 43160-2301

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number	Туре	Pump HP	Tanl	< Size (gal)	Vertically Stacked	Horizontally	l	Dimensions (inche	is)	Weight (lb)	Mounting	Unit
woder Number	Type	Pullphr	ran	(gai)	Pumps	Arrayed Pumps	Length	Width	Height	Weight (iD)	woulding	Unit
						Stacked S	ystems					
VPD04042L1	Duplex	(2) 5HP		120	2	1	55.0	64.0	76.0	1,340		UUT1
VPQ2505S5588940	Duplex	(2) 25HP		200	2	1	70.0	90.0	87.0	5,130		UUT2
CVPD0504A3F1	Duplex	(2) 5HP		120	2	1	55.0	64.0	76.0	1,690		UUT3
CVPQ150S5588940	Duplex	(2) 15HP		200	2	1	74.0	90.0	88.0	3,800	Flexible base (neoprene) w/ internal isolation	UUT4
VPD0xxx/CVPD0xxx	Duplex	(1) 15HP, (1) 5HP		N/A	2	RU	70.0	45.0	80.0	1,940		UUT5
VPT0xxx/CVPT0xxx	Triplex	(2) 7.5HP, (1) 3HP		N/A	3	1	55.0	32.0	85.0	1,680		UUT8
VPO150x/CVPO150x controller	Octoplex controller	N/A		N/A	N/A	N/A	55.0	32.0	65.0	410		UUT1
					$N^{\prime}$	Tank Over	Systems					
VPDT0xxx	Duplex	(1) 7.5HP, (1) 3HP		60	2		74.0	39.0	89.0	1,450	Rigid base w/ internal isolation	UUT6
CVPDT0xxx	Duplex	(1) 7.5HP, (1) 3HP		60	2		74.0	39.0	89.0	1,910	Flexible base (neoprene) w/ internal isolation	UUT7
					AM	Medical Air Stacked	Scroll Systems 1		K			
MSD15064L5 (receiver/dryer skid)	Duplex	15		240	2	OSP-(	84.0	32.0	96.0	1,510	Flexible base (neoprene) w/ internal isolation	UUT4
MSD15064L5 (receiver/dryer skid)	N/A	N/A		240	N/A	N/A	84.0	32.0	96.0	1,310	Flexible base (neoprene)	UUT4
					RV• τ							
/TD0153 / VVOTD0153	Duplex	<ul><li>(1) 1.5 HP lube vane,</li><li>(1) 1.5 HP oilless vane</li></ul>	80	Conventional		2	43.0	30.0	74.0	710	Rigid base w/ internal isolation	UUT2
VTD0303 / CVTD0203V	Duplex	<ul><li>(1) 3 HP lube vane,</li><li>(1) 2 HP oilless claw</li></ul>	80	Frame		2	55.0	30.0	85.0	1,260	Rigid base w/ internal isolation	UUT2
VVOTD0504	Duplex	(2) 5 HP oilless vane	120	Conventional	AL A	2//2	4/53.0 24	- 34.0	90.0	1,170	Flexible base (neoprene) w/ internal isolation	UUT2
/TD0504 / CVTD0504BV	Duplex	<ul><li>(1) 5 HP lube vane,</li><li>(1) 5 HP oilless claw</li></ul>	120	Frame		2	59.0	35.0	85.0	1,670	Rigid base w/ internal isolation	UUT2
						Enclosed Vacu	um Systems				· · · · · · · · · · · · · · · · · · ·	
MVEVD0404 - TEST	Duplex	(2) 5 HP Lube Vane	N/A	N/A	2		65.0	34.0	66.0	1,340	Rigid base w/ internal isolation	UUT3
MVEVCDXXX	Duplex	<ul><li>(1) 15 HP Oilless Claw,</li><li>(1) 7.5 HP Lube Vane</li></ul>	N/A	N/A	2	1	82.0	34.0	77.0	2,540	Rigid base w/ internal isolation	UUT3
MVECT0755 - TEST	Triplex	(3) 7.5 HP Oilless Claw	N/A	N/A	3 >	1	82.0	34.0	77.0	3,080	Rigid base w/ internal isolation	UUT3
						Morganto	n Tanks	5				
VES07285 (80 Gal);	Tank Skid	80 gallon and 240 gallon vertical tank on a platform frame base <sup>2</sup>	80, 240	Frame	N/A	DON/ALD	33.5	60.0	94.0	1,010	Rigid base	UUT30
VES07072 (240 Gal)		80 gallon and 240 gallon vertical tank on a platform frame base <sup>2</sup>	80, 240	Frame	N/A	N/A	33.5	60.0	94.0	1,010	Flexible base (neoprene)	UUT30
VES07285 (80 Gal);	Tapk Skid	80 gallon, 120 gallon vertical tank on a ladder frame base <sup>2</sup>	80, 120	Frame	N/A	N/A	32.0	55.0	75.0	630	Rigid base	UUT3:
VES04767 (120 Gal)	Tank Skid	80 gallon, 120 gallon vertical tank on a ladder frame base <sup>2</sup>	80, 120	Frame	N/A	N/A	32.0	55.0	75.0	630	Flexible base (neoprene)	UUT31

1. Medical Air Stacked Scroll System included here for bookending of Campbell Hausfeld 240 gallon vertical tank.

2. The frame bases tested are rigid frame bases.



### UUT1 - DCL Test Report 34796-1401a



### UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: VPD0404(2L1)

Product Construction Summary: Powder coated carbon steel skid and frame

Options / Component Summary: Duplex system. 5 HP 208V lubricated vane vacuum pumps, 120 gallon vertical receiver tank, HMI\_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 (ii	n)	Lowest Natural Frequency (Hz)					
UUT1			Length	Width	Height	Front-Back	Side-Side	Vertical			
	1,34	0	C (55	-64- (	76	7.0	6.5	21.3			
	-		Seismic	Test Paramet	ers						
Building Code	Test Criteria	Sds (g)	z/h	lp	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)			
CBC 2022	CBC 2022 ICC-ES AC156 2.50 1.0 1.5 4.00 3.00 1.68 0.68										

### Unit Mounting Description:

Unit Mounting Description: Base mounted using Airloc model 32 neoprene vibration isolation pads. Both skids were anchored to the shake table interface plate with (4) 1/2"-diameter Grade 5 bolts and washers spaced approximately 30" widthwise and 53" lengthwise on-center for each skid (eight total). Timothy Piland





UUT1, view from front right

UUT1, view from left

### UUT2 - DCL Test Report 34796-2301a



### UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: VPQ2505(S5588940)

Product Construction Summary: Powder coated carbon steel skid and frame

**Options / Component Summary:** Duplex system. 25 HP 460V lubricated rotary vane vacuum pumps, 200 gallon vertical receiver tank, 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.

			UU	T Properties						
	Operating Weight (lb) - 5,130			Dimensions (ii	n)	Lowest Natural Frequency (Hz)				
UUT2			Length	Width	Height	Front-Back	Side-Side	Vertical		
			- 70R (	O LOE	87	4.50	3.80	10.25		
		15	Seismic	Test Paramet	ers		-			
Building Code	Test Criteria	Sds (g)	z/h	lp 🖉	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)		
CBC 2022	CBC 2022 ICC-ES AC156 1.95 1.0 1.5 3.12 2.34 1.31 0.53									
				V Y X X X X X X X X X X X X X X X X X X						

### Unit Mounting Description:

Base mounted using Airloc model 32 neoprene vibration isolation pads. Both skids were anchored to the shake table interface plate with (4) 1/2"-diameter Grade 5 bolts and washers spaced approximately 88" widthwise and 34" lengthwise on-center for each skid (eight total).



UUT2, view from front

UUT2, view from left

### UUT3 - DCL Report 34796-1401a



### **UNIT UNDER TEST (UUT) Summary Sheet**

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: CVPD0504(A3F1)

Product Construction Summary: Powder coated carbon steel skid and frame

**Options / Component Summary:** Duplex system. 5HP 230V oilless claw pumps, 120 gallon vertical receiver tank, PBMI\_VFD 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 (ii	ו)	Lowest Natural Frequency (Hz)					
UUT3	Operating wo	Operating Weight (lb)		Width	Height	Front-Back	Side-Side	Vertical			
	1,690			OL64E	76	6.25	6.25	13.00			
	-	15	Seismic	Test Paramet	ers						
Building Code	Test Criteria	Sds (g)	z/h	lp ol	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)			
CBC 2022	CBC 2022 ICC-ES AC156 2,50 1.0 1.5 4.00 3.00 1.68 0.68										
				ΫΧλΑΛΎΫΧΧΑΛΑΎΫ	YXXXXXXXXXXXXX						

### Unit Mounting Description:

Base mounted using Airloc model 32 neoprene vibration isolation pads. Both skids were anchored to the shake table interface plate with (4) 1/2"-diameter Grade 5 bolts and washers spaced approximately 30" widthwise and 48" lengthwise for each skid (eight total). The 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 (2) 1/2" Grade 2 bolts and nuts with flat washers per bracket.

## DATE: 01/24/2024



UUT3, view from front



UUT3, view from left

## UUT4 - DCL Test Report 34796-1401a



### **UNIT UNDER TEST (UUT) Summary Sheet**

#### Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

*Model Number:* CVPQ150S5588940 (CVPD1505, since 2-high vacuum pump stack was tested; also, S was substituted for 5 in the test specimen model number because this was a "special" build for the test)

Product Construction Summary: Powder coated carbon steel skid and frame

**Options / Component Summary:** Duplex system. 15 HP 460V oilless claw pumps, 200 gallon vertical receiver tank, PBMI\_VFD 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.

			UU	T Properties				
				Dimensions (i	n)	Lowest Natural Frequency (Hz)		
UUT4		Operating Weight (lb)		Width	Height	Front-Back	Side-Side	Vertical
	3,800	)	74	90	88	4.50	4.75	11.75
	-	1E	Seismic	Test Paramet	ers		-	
Building Code	Test Criteria	Sds (g)	z/h	lp	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.06	1.0	1.5	3.30	2.47	1.38	0.56

### Unit Mounting Description:

Base mounted using Airloc model 32 neoprene vibration isolation pads. Both skids were anchored to the shake table interface plate with (4) 1/2"-diameter Grade 5 bolts and washers (eight total).

OSP-0393







UUT4, view from left

### UUT4a - DCL Test Report 33299-1301



### **UNIT UNDER TEST (UUT) Summary Sheet**

#### Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSD15064L5 (controller/pump skid)

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

**Options / Component Summary:** 

5HP scroll pump with WEG motor, 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										
	On exerting M(sight (lb)		C	)imensions (ir	ו)	Lowest Natural Frequency (Hz)				
UUT4a		Operating Weight (lb)		Width	Height	Front-Back	Side-Side	Vertical		
	1,510	)	84*R	$O_{34}E$	96*	6.8	5.5	12.0		
			Seismic T	Test Paramete	ers		-			
Building Code	Test Criteria	Sds (g)	z/h	lp	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 four Airloc model 32 neoprene pads and (4) 1/2"diameter, Grade 5 bolts and washers spaced approximately 32" widthwise and 74" lengthwise on-center.

OSP-0393



### UUT4b - DCL Test Report 33299-1301

### UNIT UNDER TEST (UUT) Summary Sheet



Manufacturer: Powerex

Product Line: Medical Air and Laboratory Air

Model Number: MSD15064L5 (receiver/dryer skid)

Product Construction Summary: Powder coated structural steel skid and frame

Options / Component Summary: 240 gallon vertical receiver tank and PMD111 desiccant air dryer.

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

		UU	T Properties						
Operating Weight (lb) -			Dimensions (i	n)	Lowest Natural Frequency (Hz)				
		Length	Width	Height	Front-Back	Side-Side	Vertical		
1,310	)	84*	32	96*	5.5	5.0	22.5		
		Seismic	Test Paramet	ers					
Test Criteria	Sds (g)	z/h	lp	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)		
CBC 2022 ICC-ES AC156 2.42 1.0 1.5 3.87 2.90 1.61 0.65									
	1,310 Test Criteria	1,310 Test Criteria Sds (g)	Operating Weight (lb)     Length       1,310     84*       Seismic       Test Criteria       Sds (g)     z/h	Operating Weight (lb)     Length     Width       1,310     84*     32       Seismic Test Paramet       Test Criteria     Sds (g)     z/h     Ip	Dimensions (in)       Operating Weight (lb)     Length     Width     Height       1,310     84*     32     96*       Seismic Test Parameters       Test Criteria     Sds (g)     z/h     Ip     Aflx-H (g)	Dimensions (in)     Lowest N       Operating Weight (lb)     Length     Width     Height     Front-Back       1,310     84*     32     96*     5.5       Seismic Test Parameters       Test Criteria     Sds (g)     Z/h     Ip     Afix-H (g)     Arig-H (g)	Dimensions (in)     Lowest Natural Freque       Operating Weight (lb)     Length     Width     Height     Front-Back     Side-Side       1,310     84*     32     96*     5.5     5.0       Seismic Test Parameters       Test Criteria     Sds (g)     z/h     Ip     Aflx-H (g)     Arig-H (g)     Aflx-V (g)		

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

### Unit Mounting Description:

Base mounted using Airloc model 32 neoprene vibration isolation pads. The skid was mounted to the shake table interface frame using (4) 1/2"-diameter, Grade 5 bolts and washers spaced approximately 30" widthwise and 82" lengthwise on-center.



UUT4b Overall View

## UUT5 - DCL Test Report 39372-1601a



### **UNIT UNDER TEST (UUT) Summary Sheet**

#### Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: VPD0XXX/CVPD0XXX

Product Construction Summary: Powder coated carbon steel skid and frame

**Options / Component Summary:** Duplex system. 5 HP 460V lubricated vane vacuum pump in bottom position, 5 HP 460V oilless claw pump in 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.

			UU	T Properties						
	Operating Weight (lb) —			Dimensions (i	n)	Lowest Natural Frequency (Hz)				
UUT5			Length	Width	Height	Front-Back	Side-Side	Vertical		
	1,940	)	70	045F	80	6.0	4.0	10.0		
		.5	Seismic	Test Paramet	ers		-			
Building Code	Test Criteria	Sds (g)	z/h	lp	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)		
CBC 2022	CBC 2022 ICC-ES AC156 2.00 1.0 1.5 3.20 2.40 1.33 0.53									
						1				

### Unit Mounting Description:

Base mounted using Airloc model 32 neoprene vibration isolation pads. The skid was anchored to the shake table interface plate with (4) 1/2"-diameter Grade 5 bolts and washers spaced at approximately 43" widthwise and 68" lengthwise on-center.



UUT5 Overall View

## UUT6 - DCL Test Report 39372-1601a

### UNIT UNDER TEST (UUT) Summary Sheet



Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: VPDT0XXX

Product Construction Summary: Powder coated carbon steel skid and frame

*Options / Component Summary:* Duplex tank-over system. 3 HP 208V lubricated rotary vane vacuum pump in the bottom position, 7.5 HP 208V lubricated rotary vane pump in the middle position, 60 gallon horizontal tank in the top position, 24" BASIC\_PVM 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)		Dimensions (in	n)	Lowest Natural Frequency (Hz)					
	Operating Weight (lb)	Length	Width	Height	Front-Back	Side-Side	Vertical			
UUT 6	1,450	70 (74 to outside of pipe)	32 (39 to outside of pipe)	89	6.5	6.0	13.0			
Seismic Test Parameters										

Building Code	Test Criteri <mark>a</mark>	🗸 Sds (g)	z/h	lp	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC1 <mark>56</mark>	2.00	1.0	1.5	<mark>3.2</mark> 0	<mark>2</mark> .40	1.33	0.53

### Unit Mounting Description: O BY: Himothy Pliand O

The skid was anchored to the shake table interface plate with (4) 1/2"-diameter Grade 5 bolts and washers spaced at approximately 30" widthwise and 54" lengthwise on-center.



**UUT6** Overall View

## UUT7 - DCL Test Report 39372-1601a

### **UNIT UNDER TEST (UUT) Summary Sheet**



Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: CVPDT0XXX

Product Construction Summary: Powder coated carbon steel skid and frame

Options / Component Summary: Duplex tank-over system. 3 HP 208V oilless claw vacuum pump in the bottom position, 7.5 HP 208V oilless claw pump in the middle position, 60 gallon horizontal tank in the top position, 42" PBMI\_VFD 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.

		UU	T Properties					
UUT7	Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)			
		Length	Width	Height	Front-Back	Side-Side	Vertical	
	1,910	70	32	89	4.5	4.5	11.0	
		(74 to outside of pipe)	(39 to outside of pipe)					
Seismic Test Parameters								
Building Code	Tost Critoria Sds (g)		2-0292		Arig $\amalg$ (g)	$\Delta f   \mathbf{y} \rangle \langle (\mathbf{g})$	Aria V (a)	

Building Code	Test Criteria 🕻	Sds (g)	z/h	-0393 Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC15 <mark>6</mark>	2.00	1.0	1.5	<u>3.20</u>	<mark>2</mark> .40	1.33	0.53
Unit Mounting Description: O BY: Timothy Piland O								

Base mounted using Airloc model 32 neoprene vibration isolation pads. The skid was anchored to the shake table interface plate with (4) 1/2"-diameter Grade 5 bolts and washers spaced at approximately 30" widthwise and 54" lengthwise on-center.



**UUT7** Overall View
# UUT8 - DCL Test Report 39372-1601a



### UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

*Model Number:* VPT0XXX/CVPT0XXX

Product Construction Summary: Powder coated carbon steel skid and frame

Options / Component Summary: Triplex system. 3HP 208V lubricated vane vacuum pump in the bottom position, 7.5 HP 208V lubricated rotary vane pump in the middle position, 7.5 HP 208V oilless claw pump 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.

			UU	T Properties							
	Operating W	oight (lb)	Dimensions (in) Lowest Natural Fre				latural Freque	quency (Hz)			
UUT8	Operating w	eigint (ib)	Length	Width	Height	Front-Back	ont-Back Side-Side	Vertical			
	1,680 55 32 85 4.0 3.5							11.5			
		6	Seismic	Test Paramet	ters		-				
Building Code	Test Criteria	Sds (g)	z/h	lp	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)			
CBC 2022	CBC 2022 ICC-ES AC156 2.00 1.0 1.5 3.20 2.40 1.33 0.53										
Unit Mounting De	Unit Mounting Description:										

#### Unit Mounting Description:

Base mounted using Airloc model 32 neoprene vibration isolation pads. The skid was anchored to the shake table interface plate with (4) 1/2"-diameter Grade 5 bolts and washers spaced at approximately 30" widthwise and 53" lengthwise on-center.



**UUT8** Overall View

# UUT13 - DCL Test Report 41182-1701a



## **UNIT UNDER TEST (UUT) Summary Sheet**

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: VPO150x/CVPO150x controller

Product Construction Summary: Powder coated structural steel skid

**Options / Component Summary:** PBMI\_PXMI octoplex 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.

			UU	T Properties				
	Operating W	oight (lb)		Dimensions (i	ons (in) Lowest Natural Frequency (			
UUT13	Operating w	eigiit (ib)	Length	Width	Height	Front-Back	Side-Side	Vertical
	410		55	32	65	9.0	9.0	>33.3
			Seismic	Test Paramet	ers			
Building Code	Test Criteria	Sds (g)	z/h	lp	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
					YYYYYYYY		-	

### Unit Mounting Description:

Base mounted using Airloc model 32 neoprene vibration isolation pads. The skid was attached to the shake table interface plate with (4) 1/2"-diameter Grade 5 bolts, washers, and 1 1/4"x1 1/4" x 3/8" malleable iron plain finish bevel washers spaced at 30" widthwise and 53" lengthwise on-center . The 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 (2) Grade 2, 1/2"-diameter bolts and nuts with flat washers per bracket.



**UUT13 Overall View** 

# UUT21 - DCL Test Report 41182-1701b



### **UNIT UNDER TEST (UUT) Summary Sheet**

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: VVTD0153 / VVOTD0153

Product Construction Summary: Powder coated structural steel skid

Options / Component Summary: 1.5 HP 208V lubricated rotary vane pump, 1.5 HP 208V oilless rotary vane pump, 80 gallon conventional tank and duplex PVM 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.

			UU	T Properties							
	Operating W	aight (lh)	Dimensions (in) Lowest Natural				Natural Freque	ral Frequency (Hz)			
UUT21	Operating w	eight (ib)	Length	Width	Height	Front-Back	Side-Side	Vertical			
	710		43	30	74	15.0	13.5	15.0			
			Seismic	Test Parame	ters						
Building Code	Test Criteria	Sds (g)	z/h	· Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)			
CBC 2022	CBC 2022 ICC-ES AC156 2.00 1.0 1.5 3.20 2.40 1.33 0.53										
Unit Mounting De	scription:		011111111-XX		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	7.	-				

### Unit Mounting Description:

The unit was base mounted with (3) 1/2"-diameter Grade 5 bolts and washers spaced approximately 27" on-center from each other in a triangular pattern.



# UUT22 - DCL Test Report 41182-1701b



### **UNIT UNDER TEST (UUT) Summary Sheet**

#### Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: VVTD0303 / CVTD0203V

Product Construction Summary: Powder coated structural steel skid

Options / Component Summary: 3 HP 460V lubricated rotary vane pump, 2 HP 460V oilless claw pump, 80 gallon frame tank and duplex PBM controller with HMI

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.

			UU	T Properties					
	Operating W	aight (lh)		Dimensions (in) Lowest Natural Frequency (H					
UUT22	Operating w	eight (ib)	Length	Width	Height	Front-Back	Side-Side	Vertical	
	1,260	1,260 55 30 85 4.5 4.5							
		.5	Seismic	Test Paramet	ers				
Building Code	Test Criteria	Sds (g)	z/h	lp	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 De	Unit Mounting Description:								

### Unit Mounting Description:

The unit was base mounted with (4) 1/2"-diameter Grade 5 bolts, washers, and 1 1/4" x1 1/4" x 3/8" plain finish malleable iron bevel washers spaced approximately 38" widthwise and 30" lengthwise on-center.



**UUT22** Overall View

# UUT23 - DCL Test Report 41182-1701b



### **UNIT UNDER TEST (UUT) Summary Sheet**

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: VVOTD0504

Product Construction Summary: Powder coated structural steel skid

Options / Component Summary: 5 HP 460V oilless rotary vane pumps, 80 gallon conventional tank and duplex PBM controller with HMI

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.

			UL	IT Properties							
	Operating W	aight (lb)		Dimensions (in) Lowest Natural Frequency (Hz)							
UUT23	Operating w	eigint (in)	Length	Width	Height	Front-Back	Side-Side	Vertical			
	1,170	כ	53	034F	90	7.5 7.5 28					
		.5	Seismic	Test Paramet	ters						
Building Code	Test Criteria	Sds (g)	z/h	lp	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 De	scription:	S/P				2	•				

### Unit Mounting Description:

The unit was base mounted with (4) Airloc model 32 neoprene pads, (4) 1/2"-diameter Grade 5 bolts, washers, and 2"x2"x3/16" low carbon steel black oxide finish plate washers spaced approximately 19" widthwise and 19" lengthwise on-center.



**UUT23 Overall View** 

# UUT24 - DCL Test Report 41182-1701b



## **UNIT UNDER TEST (UUT) Summary Sheet**

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: VVTD0504 / CVTD0504BV

Product Construction Summary: Powder coated structural steel skid

**Options / Component Summary:** 5 HP 460V lubricated rotary vane pump, 5 HP 460V oilless claw oilless rotary vane pump, 120 gallon frame tank and premium PBM controller with VFD

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.

			UU	T Properties					
	Operating W	oight (lb)		Dimensions (i	n)	Lowest Natural Frequency (Hz)			
UUT24	Operating Weight (lb)		Length	Width	Height	Front-Back	Side-Side	Vertical	
	1,670	)	59	035F	85		>33.3		
	•	.5	Seismic	Test Paramet	ers				
Building Code	Test Criteria	Sds (g)	z/h	lp	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	
						1			

### Unit Mounting Description:

The unit was base mounted with (4) 1/2"-diameter Grade 5 bolts, washers, and 1 1/4" x1 1/4" x3/8" plain finish malleable iron bevel washers spaced approximately 38" widthwise and 31" lengthwise on-center. The right and left sides were braced with (1) 2.5" wide, 1/4" thick structural steel angle, with each end of the angle attached to the vertical members of the UUT frame with (1) 1/2"-diameter Grade 5 bolt and (4) 4"x4"x1/4" galvanized finish low carbon steel washers at each attachment location.



UUT24 Overall View

## UUT30a - DCL Test Report 42747-1801



## UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

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 W	oight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)				
UUT30a			Length	Width	Height	Front-Back	Side-Side	Vertical		
	1,010 34 60 94					4.0	5.5	31.5		
			Seismic	Test Paramet	ers					
Building Code	Test Criteria	Sds (g)	z/h	lp	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 rigidly base mounted with (4) 1/2" diameter Grade 5 bolts and washers spaced approximately 50" widthwise and 31" lengthwise on-center.



UUT30a Overall View

## UUT30b - DCL Test Report 42747-1801

# UNIT UNDER TEST (UUT) Summary Sheet



Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

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 W	night (lh)	Dimensions (in)			Lowest Natural Frequency (Hz)				
UUT30b			Length	Width	Height	Front-Back	Side-Side	Vertical		
	1,010	)	34	60	94	3.0	10.5			
			Seismic	Test Paramet	ers					
Building Code	Test Criteria	Sds (g)	z/h	lp	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 flexibly base mounted with (4) 1/2" diameter Grade 5 bolts and washers spaced approximately 50" widthwise and 31" lengthwise on-center through an Airloc model 32 neprene pad. 2-0393



# UUT31a - DCL Test Report 42747-1801



### UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

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.

			UU	T Properties					
	Operating Wo	oight (lb)	Dimensions (in) Lowest Natura				latural Freque	ural Frequency (Hz)	
UUT31a		eight (ib)	Length	Width	Height	Front-Back	Side-Side	Vertical	
	630.0	)	32	55	75	8.5	11.5	>33.3	
			Seismic	Test Paramet	ers				
Building Code	Test Criteria	Sds (g)	z/h	lp	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 rigidly base mounted with (4) 1/2" diameter Grade 5 bolts and washers spaced approximately 53" widthwise and 30" lengthwise on-center and (4) 1 1/4"x1 1/4" x 3/8" malleable iron bevel washers.



UUT31a Overall View

# UUT31b - DCL Test Report 42747-1801



## UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

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.

		UU	T Properties					
Operating W	aight (lb)	Dimensions (in)			Lowest N	Natural Frequency (Hz)		
	eight (ib)	Length	Width	Height	Front-Back	Side-Side	Vertical	
630		32	55	75	8.0	9.5	16.0	
		Seismic	Test Paramet	ers				
Test Criteria	Sds (g)	z/h	lp	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)	
ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53	
	630 Test Criteria	Test Criteria Sds (g)	Operating Weight (lb) Length   630 32   Seismic   Test Criteria Sds (g) z/h	Operating Weight (Ib) Length Width   630 32 55   Seismic Test Paramet   Test Criteria Sds (g) z/h Ip	Dimensions (in)   Operating Weight (lb) Length Width Height   630 32 55 75   Seismic Test Parameters   Test Criteria Sds (g) z/h Ip Aflx-H (g)	Dimensions (in) Lowest N   Operating Weight (lb) Length Width Height Front-Back   630 32 55 75 8.0   Seismic Test Parameters   Test Criteria Sds (g) Z/h Ip Aflx-H (g) Arig-H (g)	Dimensions (in) Lowest Natural Frequencies   Operating Weight (lb) Length Width Height Front-Back Side-Side   630 32 55 75 8.0 9.5   Seismic Test Parameters   Test Criteria Sds (g) z/h Ip Aflx-H (g) Arig-H (g) Aflx-V (g)	

### Unit Mounting Description:

UUT 31b was flexibly base mounted with (4) 1/2" diameter Grade 5 bolts and washers spaced approximately 53" widthwise and 30" lengthwise on-center and (4) 1 1/4"x1 1/4" x 3/8" malleable iron bevel washers through an Airloc model 32 neprene pad.



UUT31b Overall View

# UUT37 - DCL Test Report 43160-2301a



## **UNIT UNDER TEST (UUT) Summary Sheet**

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: MVEVD0404 - TEST

Product Construction Summary: Powder-Coated Carbon Steel

Options / Component Summary: 5 HP 460V lubricated vane pumps, BASIC\_PVM controller and small 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.

			UU	T Properties					
	Operating Weight (lb)			Dimensions (	in)	Lowest Natural Frequency (Hz)			
UUT37	Operating wo	eight (ib)	Length	Width	Height	Front-Back	Side-Side	Vertical	
	1,340	)	65.0	34.0	66.0	12.0	15.0	20.5	
			Seismic	Test Parame	ters				
Building Code	Test Criteria	Sds (g)	z/h	lp 💦	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:									

#### Unit Mounting Description:

UUT37 was attached to the steel shake table interface plate with (4) 1/2" Grade 5 bolts and flat washers 36" widthwise and 59.8" lengthwise on-center through (4) 2.8" x 2.0" x 0.2" manufacturer-provided carbon steel brackets attached to the unit. The brackets are attached to the unit with (2) 5/16" Grade 5 bolts and flat washers spaced 1.6" apart.



**UUT37** Overall View

# UUT38 - DCL Test Report 43160-2301a



### **UNIT UNDER TEST (UUT) Summary Sheet**

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: MVEVCDXXX

Product Construction Summary: Powder-Coated Carbon Steel

Options / Component Summary: 15 HP 460V lubricated vane pump in the bottom position, 15 HP 460V oilless claw pump in the top position, PBMI\_VFD controller and large 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.

			U	UT Properties				
	Operating W	aight (lb)		Dimensions (i	in)	Lowest Natural Frequency (Hz)		
UUT38	Operating w	eigint (in)	Length	Width	Height	Front-Back	Side-Side	Vertical
	2,540 82.0 34.0 77.0 5.5						8.0	11.0
			Seismi	c Test Parame	ters			
Building Code	Test Criteria	Sds (g)	z/h	lp 🖉	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 De	scription:				XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	7.		

### Unit Mounting Description:

UUT38 was attached to the steel shake table interface plate with (4) 1/2" Grade 5 bolts and flat washers spaced 36" widthwise and 76.8" lengthwise on-center through (4) 2.8" x 2.0" x 0.2" manufacturer-provided carbon steel brackets attached to the unit. The brackets are attached to the unit with (2) 5/16" Grade 5 bolts and flat washers spaced 1.6" apart.



# UUT39 - DCL Test Report 43160-2301a



## **UNIT UNDER TEST (UUT) Summary Sheet**

Manufacturer: Powerex

Product Line: Medical Vacuum and Laboratory Vacuum

Model Number: MVECT0755 - TEST

Product Construction Summary: Powder-Coated Carbon Steel

Options / Component Summary: 7.5 HP 460V oilless claw pumps, HMI\_PXMI controller and large 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								
UUT39	Operating Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
			Length	Width	Height	Front-Back	Side-Side	Vertical
	3,080		82.0	34.0	77.0	4.0	8.0	13.0
Seismic Test Parameters								
Building Code	Test Criteria	Sds (g)	z/h	lp 💦	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:								

#### Unit Mounting Description:

UUT39 was attached to the steel shake table interface plate with (4) 1/2" Grade 5 bolts and flat washers spaced 36" widthwise and 76.8" lengthwise on-center through (4) 2.8" x 2.0" x 0.2" manufacturer-provided carbon steel brackets attached to the unit. The brackets are attached to the unit with (2) 5/16" Grade 5 bolts and flat washers spaced 1.6" apart. Retrofits: all side panels were fastened with (8) 1/4" Grade 5 bolts and (16) flat washers spaced 32.4" lengthwise and 20.0" vertically on-center each. The front control panel was fastened with (4) 1/4" Grade 5 bolts and (8) flat washers spaced 29.1" widthwise and 17.9" vertically.

