



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

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

OFFICE USE ONLY

**APPLICATION #: OSP-0717**

**OSHPD Special Seismic Certification Preapproval (OSP)**

Type:  New  Renewal

**Manufacturer Information**

Manufacturer: Beacon Medaes (Atlas Copco Compressors, LLC.)

Manufacturer's Technical Representative: Tim Conner

Mailing Address: 1059 Paragon Way, Rock Hill, SC 29730

Telephone: (803) 817-5656

Email: tim.conner@beaconmedaes.com

**Product Information**

Product Name: Medical Gas and Vacuum Systems

Product Type: Medical Air and Vacuum Systems

Product Model Number: LifeLine "Oil-Free" Rotary Tooth Medical Air Duplex and Triplex Modular Systems with Variable Speed Drives

General Description: Medical air system of a modular base mounted design consisting of two compressor modules (duplex) or three compressor modules (triplex), a dryer/control module, and an air receiver module.

Mounting Description: Rigid, Floor Mounted

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

**Applicant Information**

Applicant Company Name: Dynamic Certification Laboratories

Contact Person: Kelly Laplace

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

Telephone: (775) 358-5085

Email: kelly@shaketest.com

Title: Business Manager





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

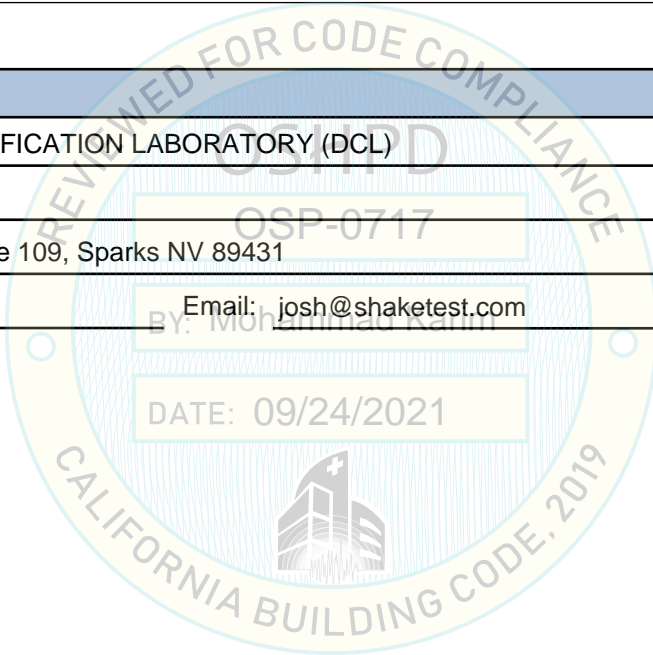
Company Name: THE VMC GROUP  
Name: Kenneth Tarlow California License Number: S2851  
Mailing Address: 980 9th Street, 16th Floor, Sacramento, CA 95814  
Telephone: (832) 627-2214 Email: ken.tarlow@thevmcgroup.com

**Certification Method**

GR-63-Core     ICC-ES AC156     IEEE 344     IEEE 693     NEBS 3  
 Other (Please Specify): \_\_\_\_\_

**Testing Laboratory**

Company Name: DYNAMIC CERTIFICATION LABORATORY (DCL)  
Contact Person: Josh Sailer  
Mailing Address: 1315 Greg St., Ste 109, Sparks NV 89431  
Telephone: (775) 358-5085 Email: josh@shaketest.com





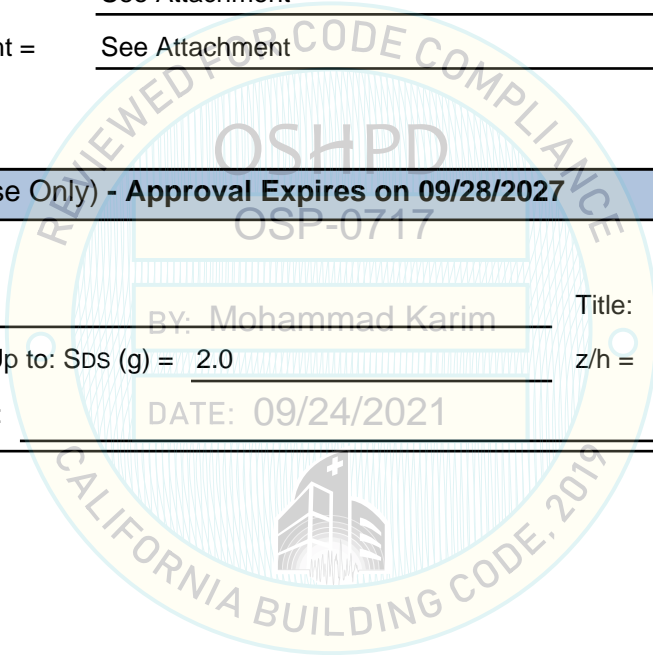
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**Seismic Parameters**

Design Basis of Equipment or Components ( $F_p/W_p$ ) =	2.4 (Dryer/control modules), 3.6 (Receiver tanks), 4.5 (Compressor modules)
SDS (Design spectral response acceleration at short period, g) =	2.0
$a_p$ (Amplification factor) =	1.0 (Dryer/control modules), 2.5 (Receiver tanks and compressor modules)
$R_p$ (Response modification factor) =	1.5 (Dryer/control modules), 2.5 (Receiver tanks), 2.0 (Compressor modules)
$\Omega_0$ (System overstrength factor) =	2.0
$I_p$ (Importance factor) =	1.5
$z/h$ (Height ratio factor) =	1
Natural frequencies (Hz) =	See Attachment
Overall dimensions and weight =	See Attachment

**OSHPD Approval (For Office Use Only) - Approval Expires on 09/28/2027**

Date:	9/24/2021	
Name:	Mohammad Karim	Title: Supervisor, Health Facilities
Special Seismic Certification Valid Up to: SDS (g) =	2.0	$z/h$ = 1
Condition of Approval (if applicable):	DATE: 09/24/2021	



## Special Seismic Certification

### Table 1: Certified Components- Medical Air Modular Systems



DCL Project No. 13153-2101

**Manufacturer:** Beacon Medaes

**Mounting Configuration:** Rigid Base Mount

**Product Line:** Z MED Medical Air Systems

**Product Type:** Medical Air Modular Systems

**Seismic Level:**  $S_{DS}$  (g) = 2.0, z/h = 1.0

Certified Medical Air Systems								
Model Numbers	System Size	HP	Receiver Gallons	Max Dimensions <sup>1</sup> (in.)			Max Operating Weight <sup>1</sup> (lb.)	Unit <sup>2</sup>
				Depth	Width	Height		
ZTM-22D-D240-DCV	Duplex	30	240	128	152	94	6,320	UUT-1a, UUT-1b <sup>3</sup> , UUT-1c
ZTM-22D-D400-DCV	Duplex	30	400	128	158	102	6,658	Interpolated
ZTM-37D-D240-DCV		50	240	130	180	94	8,820	Interpolated
ZTM-37D-D400-DCV		50	400	130	180	102	8,840	Interpolated
ZTM-55D-D400-DCV		75	400	130	186	102	9,642	Interpolated
ZTM-22T-D400-TCV	Triplex	30	400	142	243	102	10,633	Interpolated
ZTM-37T-D400-TCV		50	400	58	257	102	12,559	Interpolated
ZTM-55T-D400-TCV	Triplex	75	400	69	271	102	13,980	UUT-2a, UUT-2b, UUT-2c

Certified Medical Air Modules							
Model Numbers	HP	Receiver Gallons	Max Dimensions (in.)			Max Operating Weight (lb.)	Unit <sup>2</sup>
			Depth	Width	Height		
ZT22VSD Compressor module	30	N/A	46	87	64	2,450	UUT-1a
ZT37VSD Compressor module	50	N/A	46	96	74	3,155	Interpolated
ZT55VSD Compressor module	75	N/A	46	96	74	3,160	UUT-2a
CD65 Dryer/control module	N/A	N/A	53	34	67	890	UUT-1b <sup>3</sup>
CD110 Dryer/control module	N/A	N/A	54	50	72	1,750	UUT-3
CD150 Dryer/control module	N/A	N/A	58	56	72	2,362	Interpolated
CD185 Dryer/control module	N/A	N/A	58	59	74	2,402	Interpolated
CD300 Dryer/control module	N/A	N/A	69	68	79	3,600	UUT-2b
240G Receiver tank	N/A	240	32	32	93	530	UUT-1c
400G Receiver tank	N/A	400	36	36	102	900	UUT-2c

1. The maximum dimensions and weights of the certified systems represent those of the full system configurations, including the tested medical air modules. Maximum dimensions for the Certified Medical Air Systems are calculated, assuming the Duplex systems contain (2) compressor modules, (1) dryer/control module, and (1) receiver tank. The Triplex systems contain (3) compressor modules, (1) dryer/control module, and (1) receiver tank. The maximum dimensions are reference dimensions from the manufacturer-provided drawings to use as a guideline to provide room around the equipment for maintenance. The spacing between each module is variable based on the length of the flexible connections between each unit. Only a single compressor module was tested in UUT-1a and UUT-2a, due to the modules being structurally independent and flexibly attached.
2. The compressor module, dryer/control module, and receiver tank module are structurally independent and flexibly attached.
3. UUT-1b was tested without the dryer cover panels. The dryer cover panels shall not be part of the field installation.

# Special Seismic Certification

## Table 2: Beacon Medaes Air System Model Number Chart



DCL Project No. 13153-2101

**Mounting Configuration:** Rigid Base Mount

**Product Line:** Z MED Medical Air Systems

**Product Type:** Medical Air Modular Systems

**Seismic Level:**  $S_{DS} (g) = 2.0$ ,  $z/h = 1.0$

### Model Number Layout

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**A**    **B**                    **C**    **D**                    **E**    **F**                    **G**    **H**                    **J**

Variable	Definition	Allowable Value	Allowable value Description	Unit
A	Technology	ZT	Z-Med Compressor- Air Cooled	UUT-1a,b,c and UUT-2a,b,c
B	System Type	BM	Modular	UUT-1a,b,c and UUT-2a,b,c
C	HP	22	22kW	UUT-1a, UUT-1b, UUT-1c
		37	37kW	Interpolated
		55	55kW	UUT-2a, UUT-2b, UUT-2c
D	System Size	D	Duplex	UUT-1a, UUT-1b, UUT-1c
		T	Triplex	UUT-2a, UUT-2b, UUT-2c
E	Dryer Type	D	Desiccant Dryer	UUT-1a,b,c and UUT-2a,b,c
F	Tank Size	000	No Tank	Extrapolated
		240	240 Gallon (Galvanized)	UUT-1a, UUT-1b, UUT-1c
		400	400 Gallon (Galvanized)	UUT-2a, UUT-2b, UUT-2c
G	Panel Size	D	Duplex Control Panel	UUT-1a, UUT-1b, UUT-1c
		T	Triplex Control Panel	UUT-2a, UUT-2b, UUT-2c
H	Voltage	C	460/3/60	UUT-1a,b,c and UUT-2a,b,c
J	Starting Method	V	Variable Speed System	UUT-1a,b,c and UUT-2a,b,c

**Special Seismic Certification**  
**Table 3: Certified Subcomponents**



DCL Project No. 13153-2101

Product Type: Medical Air Modular Systems

Seismic Level:  $S_{ps} (g) = 2.0$ ,  $z/h = 1.0$

Compressor Subassembly					
Part Number	Manufacturer	Description	Weight (lb.)	Material	Unit
8153121482	Atlas Copco	ZT22VSD-MED WP 10 APC 460 60	2,513	Carbon steel, aluminum	UUT-1a
8153120281	Atlas Copco	ZT37VSD-MED WP 8,6 APC 460 60	3,155	Carbon steel, aluminum	Interpolated
8153120292	Atlas Copco	ZT55VSD-MED WP 8,6 APC 460 60	3,274	Carbon steel, aluminum	UUT-2a
Compressor Gearbox Assembly					
Part Number	Manufacturer	Description	Weight (lb.)	Material	Unit
1622 5997 80	Atlas Copco	COMPRESSOR GEARBOX	385	Cast iron, carbon steel	UUT-1a, UUT-2a
Compressor Element					
Part Number	Manufacturer	Description	Weight (lb.)	Material	Unit
1616 7117 81	Atlas Copco	ZT22VSD ELEMENT LP	117	Cast iron, carbon steel	UUT-1a
1616 7107 81	Atlas Copco	ZT22VSD ELEMENT HP	86	Cast iron, carbon steel	UUT-1a
1616 7275 81	Atlas Copco	ZT37VSD/ZT55VSD ELEMENT LP	198	Cast iron, carbon steel	UUT-2a
1616 7271 81	Atlas Copco	ZT37VSD/ZT55VSD ELEMENT HP	132	Cast iron, carbon steel	UUT-2a
Compressor Motor					
Part Number	Manufacturer	Description	Weight (lb.)	Material	Unit
1625 8800 03	WEG	MOTOR 22KW VSD 460V 60Hz	262	Cast iron, carbon steel, copper	UUT-1a
1625 8610 24	WEG	MOTOR 37KW VSD 460V 60Hz	438	Cast iron, carbon steel, copper	Interpolated
1625 8610 21	WEG	MOTOR 55KW VSD 460V 60Hz	440	Cast iron, carbon steel, copper	UUT-2a
Compressor Control panel					
Part Number	Manufacturer	Description	Weight (lb.)	Material	Unit
1625 8800 23	Atlas Copco	CUBICLE ZT22VSD-P-ID	122	Carbon steel	UUT-1a
1900 2193 01	Atlas Copco	CUBICLE ZT37VSD-P-ID	138	Carbon steel	Interpolated
1900 2193 02	Atlas Copco	CUBICLE ZT55VSD-P-ID	143	Carbon steel	UUT-2a
Compressor Fan					
Part Number	Manufacturer	Description	Weight (lb.)	Material	Unit
1622 0103 33	Atlas Copco	ZT22 FAN ASSEMBLY 460V 60HZ	68	Carbon steel, copper	UUT-1a
1613 8532 10	Atlas Copco	ZT37/55 FAN ASSEMBLY 460V 60HZ	103	Carbon steel, copper	UUT-2a
Aftercooler					
Part Number	Manufacturer	Description	Weight (lb.)	Material	Unit
1622 4935 00	Atlas Copco	ZT22 INTERCOOLER	25	Aluminum	UUT-1a
1622 5284 80	Atlas Copco	ZT22 AFTERCOOLER	40	Aluminum	UUT-1a
1622 4939 00	Atlas Copco	ZT37/55 INTERCOOLER	25	Aluminum	UUT-2a
1622 5249 81	Atlas Copco	ZT37/55 AFTERCOOLER	68	Aluminum	UUT-2a
Dryer Subassembly					
Part Number	Manufacturer	Description	Weight (lb.)	Material	Unit
8102334193	Atlas Copco	CD65S DESICCANT DRYER	370	Carbon steel, aluminum	UUT-1b
8102289678	Atlas Copco	CD110+ DESICCANT DRYER	800	Carbon steel	UUT-3
8102289694	Atlas Copco	CD150+ DESICCANT DRYER	1,050	Carbon steel	Interpolated
8102289710	Atlas Copco	CD185+ DESICCANT DRYER	1,070	Carbon steel	Interpolated
8102289751	Atlas Copco	CD300+ DESICCANT DRYER	1,525	Carbon steel	UUT-2b
Dryer Controller					
Part Number	Manufacturer	Description	Weight (lb.)	Material	Unit
4107008188	Atlas Copco	MKS CENTRAL CONTROLLER CD65	225	Carbon steel, aluminum, plastic	UUT-1b
4107008188	Atlas Copco	MKS CENTRAL CONTROLLER CD110-CD300	235	Carbon steel, aluminum, plastic	UUT-3, UUT-2b
Sensors					
Part Number	Manufacturer	Description	Weight (lb.)	Material	Unit
4107655419	Kahn	SSR SF72 2-WIRE DP SENSOR	1	Stainless steel, plastic, ceramic	UUT-1b, UUT-2b, UUT-3
4107656427	GFG	SSR CO TRANSMITTER 4035-22C	2	Carbon steel	UUT-1b, UUT-2b, UUT-3
4107651142	GEMS	TDC PRESSURE 0-250 PSI 4-20MA	1	Stainless steel, plastic	UUT-1b, UUT-2b, UUT-3
Receiver Tank					
Part Number	Manufacturer	Description	Weight (lb.)	Material	Unit
4107655947	SPV	TNK 240G VERT AIR W/2" NPT	509	Carbon steel	UUT-1c
4107655948	SPV	TNK 400G VERT AIR W/2" NPT	791	Carbon steel	UUT-2c



## Special Seismic Certification

### Table 4: Tested Components- Medical Air Modular Systems



DCL Project No. 13153-2101

**Manufacturer:** Beacon Medaes

**Mounting Configuration:** Rigid Base Mount

**Product Line:** Z MED Medical Air Systems

**Product Type:** Medical Air Modular Systems

**Seismic Level:**  $S_{DS}$  (g) = 2.0, z/h = 1.0

Model Numbers	HP	Receiver Gallons	Dimensions (in.)			Operating Weight (lb.)	Unit <sup>1</sup>
			Depth	Width	Height		
Tested Modules							
ZT22VSD Compressor module	30	N/A	46	87	64	2,450	UUT-1a
CD65 Dryer/control module	N/A	N/A	53	34	67	890	UUT-1b <sup>2</sup>
240G Receiver tank	N/A	200	32	32	93	530	UUT-1c
ZT55VSD Compressor module	75	N/A	46	96	74	3,160	UUT-2a
CD300 Dryer/control module	N/A	N/A	69	68	79	3,600	UUT-2b
400G Receiver tank	N/A	400	36	36	102	900	UUT-2c
CD110 Dryer/control module	N/A	N/A	54	50	72	1,750	UUT-3

1. The compressor module, dryer/control module, and receiver tank module are structurally independent and flexibly attached. Each module was tested separately. Only a single compressor module was tested in UUT-1a and UUT-2a.

2. UUT-1b was tested without the dryer cover panels. The dryer cover panels shall not be part of the field installation.

# UNIT UNDER TEST (UUT) SUMMARY SHEET



## UUT-1a

**DCL Project Number: 13153-2101**

**Manufacturer:** Beacon Medaes

**Product Line:** Z MED Medical Air Systems

**Model Number:** ZT22VSD Compressor Module

**Mounting:** Rigid Base Mount

**Product Construction Summary:** Powder-coated carbon steel enclosure

**Options / Component Summary:**

Compressor subassembly, gearbox assembly, compressor element, compressor motor, control panel, compressor fan, and aftercooler

**Unit Mounting Description:**

UUT-1a was rigidly base mounted to the shake table interface plate using the manufacturer's (4) carbon steel anchor pads (Beacon Medaes Part #8092290694). Each anchor pad was fastened to the mounting locations on UUT1a using (2) M10 Class 8.8 bolts. The anchor pads were bolted to the shake table interface plate using a total of (8) 5/8" Grade 5 bolts, (8) round washers, and (8) 4"x4"x1/4" carbon steel plate washers. The 5/8" bolts were spaced approximately 8" apart on center width-wise on each anchor pad. The furthest-most bolts were spaced approximately 43-1/2" apart on center width-wise while the innermost bolts were spaced approximately 27-1/2" on center width-wise. The bolts were spaced approximately 43" on center depth-wise. Each bolt was torqued to approximately 110ft-lb.

**Beacon Medaes Anchor Pad Model Number:** 8092290694

**UUT Properties**

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2,450	46	87	64	5.5	7.5	10.5

**Seismic Test Parameters**

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2019	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.33	0.53



Figure 1. Overall view of UUT-1a

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



# UNIT UNDER TEST (UUT) SUMMARY SHEET



## UUT-1b

**DCL Project Number: 13153-2101**

**Manufacturer:** Beacon Medaes

**Product Line:** Z MED Medical Air Systems

**Model Number:** CD65 Dryer/ Control Module

**Mounting:** Rigid Base Mount

**Product Construction Summary:** Powder-coated carbon steel frame

**Options / Component Summary:**

Dryer subassembly, dryer controller, and sensors

**Unit Mounting Description:**

UUT-1b was rigidly base mounted to the shake table interface plate using the manufacturer's mounting locations. (4) 5/8" Grade 5 bolts and round washers spaced approximately 30" on center width-wise and approximately 50-1/2" on center depth-wise were used. Each bolt was torqued to approximately 110ft-lb.

**UUT Properties**

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
890	53	34	67	4.0	8.0	7.6

**Seismic Test Parameters**

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2019	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.33	0.53



Figure 1. Overall view of UUT-1b

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

# UNIT UNDER TEST (UUT)

## Summary Sheet



### UUT-1c

**DCL Project Number: 13153-2101**

**Manufacturer:** Beacon Medaes

**Product Line:** Z MED Medical Air Systems

**Model Number:** 240G Receiver Tank

**Mounting:** Rigid Base Mount

**Product Construction Summary:** Powder-coated carbon steel

**Options / Component Summary:**

Receiver tank

**Unit Mounting Description:**

UUT-1c was rigidly base mounted to the shake table interface plate using the manufacturer's mounting locations. (4) ½" Grade 5 bolts, (4) round washers, and (4) 1-1/4"x1-1/4"x1/4" galvanized steel plate washers were used. The bolts were spaced approximately 18-1/2" on center, both width-wise and depth-wise. Each bolt was torqued to approximately 55ft-lb.

**UUT Properties**

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
530	32	32	93	17.0	16.5	>33.3

**Seismic Test Parameters**

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2019	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.33	0.53



Figure 1. Overall view of UUT-1c

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

# UNIT UNDER TEST (UUT)

## Summary Sheet



### UUT-2a

**DCL Project Number: 13153-2101**

**Manufacturer:** Beacon Medaes

**Product Line:** Z MED Medical Air Systems

**Model Number:** ZT55VSD Compressor Module

**Mounting:** Rigid Base Mount

**Product Construction Summary:** Powder-coated carbon steel enclosure

**Options / Component Summary:**

Compressor subassembly, gearbox assembly, compressor element, compressor motor, control panel, compressor fan, and aftercooler

**Unit Mounting Description:**

UUT-2a was rigidly base mounted to the shake table interface plate using the manufacturer's (4) carbon steel anchor pads (Beacon Medaes Part #8092290694). Each anchor pad was fastened to the mounting locations on UUT-2a using (2) M10 Class 8.8 bolts. The anchor pads were bolted to the shake table interface plate using a total of (8) 5/8" Grade 5 bolts, (8) round washers, and (8) 4"x4"x1/4" carbon steel plate washers. The 5/8" bolts were spaced approximately 8" apart on center width-wise on each anchor pad. The furthest-most bolts were spaced approximately 46-1/2" apart on center width-wise while the innermost bolts were spaced approximately 30-1/2" on center width-wise. The bolts were spaced approximately 43" on center depth-wise. Each bolt was torqued to approximately 110ft-lb.

Beacon Medaes Anchor Pad Model Number: 8092290694

**UUT Properties**

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
3,160	46	96	74	7.0	6.5	14.0

**Seismic Test Parameters**

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2019	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.33	0.53



Figure 1. Overall view of UUT-2a

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

# UNIT UNDER TEST (UUT)

## Summary Sheet

### UUT-2b



**DCL Project Number: 13153-2101**

**Manufacturer:** Beacon Medaes

**Product Line:** Z MED Medical Air Systems

**Model Number:** CD300 Dryer/ Control Module

**Mounting:** Rigid Base Mount

**Product Construction Summary:** Powder-coated carbon steel frame

**Options / Component Summary:**

Dryer subassembly, dryer controller, and sensors

**Unit Mounting Description:**

UUT-2b was rigidly base mounted to the shake table interface plate using the manufacturer's mounting locations. (8) 5/8" Grade 5 bolts and round washers spaced approximately 26", 4-1/2", and 26" width-wise and approximately 47" on center depth-wise were used. Each bolt was torqued to approximately 110ft-lb.

#### UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
3,600	69	68	79	5.0	5.0	23.0

#### Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2019	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.33	0.53



Figure 1. Overall view of UUT-2b

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



# UNIT UNDER TEST (UUT)

## Summary Sheet



### UUT-2c

**DCL Project Number: 13153-2101**

**Manufacturer:** Beacon Medaes

**Product Line:** Z MED Medical Air Systems

**Model Number:** 400G Receiver Tank

**Mounting:** Rigid Base Mount

**Product Construction Summary:** Powder-coated carbon steel

**Options / Component Summary:**

Receiver tank

**Unit Mounting Description:**

UUT-2c was rigidly base mounted to the shake table interface plate using the manufacturer's mounting locations. (4) ½" Grade 5 bolts, (4) round washers, and (4) 1-1/4"x1-1/4"x1/4" galvanized steel plate washers were used. The bolts were spaced approximately 23" on center, both width-wise and depth-wise. Each bolt was torqued to approximately 55ft-lb.

**UUT Properties**

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
900	36	36	102	13.5	14.0	>33.3

**Seismic Test Parameters**

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2019	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.33	0.53



Figure 1. Overall view of UUT-2c

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

# UNIT UNDER TEST (UUT) Summary Sheet



## UUT-3

**DCL Project Number: 13153-2101**

**Manufacturer:** Beacon Medaes

**Product Line:** Z MED Medical Air Systems

**Model Number:** CD110 Dryer/ Control Module

**Mounting:** Rigid Base Mount

**Product Construction Summary:** Powder coated carbon steel frame

**Options / Component Summary:**

Dryer subassembly, dryer controller, and sensors

**Unit Mounting Description:**

UUT-3 was rigidly base mounted to the shake table interface plate using the manufacturer's mounting locations. (8) 5/8" Grade 5 bolts and round washers were used. Each bolt was spaced approximately 21", 4", and 21" on center width-wise and approximately 44" on center depth-wise. Each bolt was torqued to approximately 110ft-lb.

**UUT Properties**

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1,750	54	50	72	6.5	6.5	18.5

**Seismic Test Parameters**

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2019	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.33	0.53



**Figure 1.** Overall view of UUT-3

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