



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT  
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC  
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP – 0519 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: Gardner Denver Inc.

Manufacturer's Technical Representative: David Akins, Senior Application Engineer

Mailing Address: 1800 Gardner Denver Expressway, Quincy, IL 62305

Telephone: (217) 222-5400

Email: [dave.akers@gardnerdenver.com](mailto:dave.akers@gardnerdenver.com)

Product Information

Product Name: Medical Scroll Systems

Product Type: Mechanical Equipment

Product Model Number: See Attachments

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

General Description: The units are 208 – 575V, and consist of scroll compressor pumps, tanks, dew point monitors, carbon monoxide monitors, controllers, motors, tank drains, aftercoolers, intake filter elements, check valves and dryers. Seismic enhancements made to the test units and required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigidly base mounted. Compressor pump skids feature internal isolation.

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John Giuliano

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780

Email: [John.giuliano@thvmcgroup.com](mailto:John.giuliano@thvmcgroup.com)

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

Signature of Applicant:

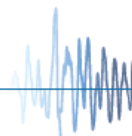
Date: 5/15/17

Title: President

Company Name: The VMC Group

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

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



OSHPD

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**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT  
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**California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)**

Company Name: The VMC Group

Name: Ken Tarlow California License Number: SE-2851

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (916) 449-9918 Email: [Ken.tarlow@thevmcgroup.com](mailto:Ken.tarlow@thevmcgroup.com)

**Supports and Attachments Preapproval**

- ☐ Supports and attachments are preapproved under OPM-  
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
- ☒ Supports and attachments are not preapproved

**Certification Method**

- ☒ Testing in accordance with: ☒ ICC-ES AC156
- ☐ Other (Please Specify): \_\_\_\_\_

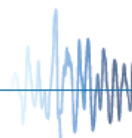
**Testing Laboratory**

Company Name: DCL Labs

Contact Name: Kelly Laplace

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

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





OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT  
FACILITIES DEVELOPMENT DIVISION

**Seismic Parameters**

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

Design Basis of Equipment or Components ( $F_p/W_p$ ) = See attachment

$S_{DS}$  (Design spectral response acceleration at short period, g) = 2.00

$a_p$  (In-structure equipment or component amplification factor) = 1.0 or 2.5 (for internally isolated components)

$R_p$  (Equipment or component response modification factor) = 1.5 or 2.0 (for internally isolated components)

$\Omega_0$  (System overstrength factor) = 2.0

$I_p$  (Importance factor) = 1.5

$z/h$  (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = See Attachment

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

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

Design Basis of Equipment or Components ( $V/W$ ) = \_\_\_\_\_

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

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

$R$  (Response modification coefficient) = \_\_\_\_\_

$\Omega_0$  (System overstrength factor) = \_\_\_\_\_

$C_d$  (Deflection amplification factor) = \_\_\_\_\_

$I_p$  (Importance factor) = 1.5

Height to Center of Gravity above base = \_\_\_\_\_

Equipment or Component Natural Frequencies (Hz) = \_\_\_\_\_

Overall dimensions and weight (or range thereof) = \_\_\_\_\_

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

**List of Attachments Supporting Special Seismic Certification**

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

☒ Other(s) (Please Specify): OSP Product Summary

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

Signature: \_\_\_\_\_

Date: July 27, 2017

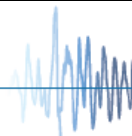
Print Name: Timothy J. Piland

Title: SSE

Special Seismic Certification Valid Up to :  $S_{DS}$  (g) = 2.00

$z/h$  = 1

Condition of Approval (if applicable): \_\_\_\_\_



## Special Seismic Certification

### Certified Components - Medical Scroll



**Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)

**Product Line:** Medical Scroll Systems

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

**Mounting Description:** Rigid base mount

Base Mount Systems														
Gardner Denver Model Number	Champion Model Number	Allied Healthcare Model Number	Hp	Vertical receiver gallons	Total number of pumps	Vertically stacked pumps or layers	Max. Dimensions (in) <sup>1</sup>			Max. Operating Weight (lb)	Mounting	Fp/Wp <sup>2</sup>	Sds (g), z/h=1	UUT
							Depth	Width	Height					
Duplex														
BENV5D-8-M	BCAS5D-8-M	DOS050-80BDD	5	80	2	2	50.0	128.0	55.4	1,124	Rigid base mount	2.4 or 4.5	2.00	UUT1.1, 1.2, 1.3
BENV5D-12-M	BCAS5D-12-M	DOS050-120BDD	5	120	2	2	50.0	128.0	77.4	1,279			2.00	Interpolated
BENV5D-8-M	BCAS7D-8-M	DOS075-80BDD	7.5	80	2	2	50.0	128.0	55.4	1,240			2.00	Interpolated
BENV5D-12-M	BCAS7D-12-M	DOS075-120BDD	7.5	120	2	2	50.0	128.0	77.4	1,395			2.00	Interpolated
BENV5D-8-M	BCAS10D-8-M	DOS100-80BDD	10	80	2	2	50.0	128.4	55.4	1,322			2.00	Interpolated
BENV5D-12-M	BCAS10D-12-M	DOS100-120BDD	10	120	2	2	50.0	128.4	77.4	1,477			2.00	Interpolated
Triplex														
BENV5T-8-M	BCAS5T-8-M	TOS050-80BDD	5	80	3	3	50.0	129.5	55.4	2,238	Rigid base mount	2.4 or 4.5	2.00	Interpolated
BENV5T-12-M	BCAS5T-12-M	TOS050-120BDD	5	120	3	3	50.0	129.5	77.4	2,288			2.00	Interpolated
BENV5T-8-M	BCAS7T-8-M	TOS075-80BDD	7.5	80	3	3	50.0	129.9	55.4	2,551			2.00	Interpolated
BENV5T-12-M	BCAS7T-12-M	TOS075-120BDD	7.5	120	3	3	50.0	129.9	77.4	2,601			2.00	Interpolated
BENV5T-8-M	BCAS10T-8-M	TOS100-80BDD	10	80	3	3	50.0	129.9	55.4	2,567			2.00	Interpolated
BENV5T-12-M	BCAS10T-12-M	TOS100-120BDD	10	120	3	3	50.0	129.5	77.4	2,617			2.00	Interpolated
Quadruplex														
BENV5Q-8-M	BCAS5Q-8-M	QOS050-80BDD	5	80	4	4	50.0	129.9	71.8	3,011	Rigid base mount	2.4 or 4.5	2.00	Interpolated
BENV5Q-12-M	BCAS5Q-12-M	QOS050-120BDD	5	120	4	4	50.0	129.9	77.4	3,061			2.00	Interpolated
BENV5Q-8-M	BCAS7Q-8-M	QOS075-80BDD	7.5	80	4	4	50.0	129.9	72.1	3,267			2.00	Interpolated
BENV5Q-12-M	BCAS7Q-12-M	QOS075-120BDD	7.5	120	4	4	50.0	129.9	77.4	3,317			2.00	Interpolated
BENV5Q-8-M	BCAS10Q-8-M	QOS100-80BDD	10	80	4	4	70.0	130.24	72.2	3,544			2.00	Interpolated
BENV5Q-12-M	BCAS10Q-12-M	QOS100-120BDD	10	120	4	4	70.0	130.24	77.4	3,594			2.00	UUT2.1, 2.2, 2.3

Note:

1. Unit dimension includes total length of compressor, receiver and dryer skids, installed with 24" between each skid. Skids are attached through flexible connections only. Maximum unit height is for a 120 gallon receiver.

2. Fp/Wp is 2.4 for receiver and dryer skids, and 4.5 for internally isolated compressor skids.

## Special Seismic Certification

### Certified Components - Medical Scroll



**Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)

**Product Line:** Medical Scroll Systems

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

**Mounting Description:** Rigid base mount

Tank Mount Systems														
Gardner Denver Model Number	Champion Model Number	Allied Healthcare Model Number	Hp	Horizontal receiver gallons	Total number of pumps	Vertically stacked pumps or layers	Max. Dimensions (in)			Max. Operating Weight (lb)	Mounting	Fp/Wp	Sds (g), z/h=1	UUT
							Depth	Width	Height					
Duplex														
HENVS3D-8-M	HCAS3D-8-M	DOS030-80TDD	3	80	2	2	65	33	62	1,400	Rigid base mount	4.5	2.00	UUT3
HENVS3D-12-M	HCAS3D-12-M	DOS030-120TDD	3	120	2	2	69	34	66	1,500			2.00	Interpolated
HENVS3D-24-M	HCAS3D-24-M	DOS030-240TDD	3	240	2	2	86	40	72	1,700			2.00	Interpolated
HENVS5D-8-M	HCAS5D-8-M	DOS050-80TDD	5	80	2	2	65	34	62	1,400			2.00	Interpolated
HENVS5D-12-M	HCAS5D-12-M	DOS050-120TDD	5	120	2	2	69	34	66	1,500			2.00	Interpolated
HENVS5D-24-M	HCAS5D-24-M	DOS050-240TDD	5	240	2	2	86	40	72	1,700			2.00	Interpolated
HENVS7D-8-M	HCAS7D-8-M	DOS075-80TDD	7.5	80	2	2	65	34	62	1,400			2.00	Interpolated
HENVS7D-12-M	HCAS7D-12-M	DOS075-120TDD	7.5	120	2	2	69	34	66	1,500			2.00	Interpolated
HENVS7D-24-M	HCAS7D-24-M	DOS075-240TDD	7.5	240	2	2	86	40	72	1,700			2.00	Interpolated
HENVS10D-8-M	HCAS10D-8-M	DOS100-80TDD	10	80	2	2	65	34	62	1,400			2.00	Interpolated
HENVS10D-12-M	HCAS10D-12-M	DOS100-120TDD	10	120	2	2	69	34	66	1,500			2.00	Interpolated
HENVS10D-24-M	HCAS10D-24-M	DOS100-240TDD	10	240	2	2	86	40	72	1,700			2.00	UUT4

# Special Seismic Certification

## Model Chart - Gardner Denver Brand



**Manufacturer:** Gardner Denver

**Product Line:** Medical Scroll Systems

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

**Mounting Description:** Rigid base mount

### Gardner Denver Medical Scroll System Model Chart

#### ABCDE-F-G

Variable	Definition	Allowable Value	Allowable Value Description	Unit
A	System Type	B	Base mount	UUT1,2
		H	Tank Mount	UUT3,4
B	Models	ENV	EnviroAire	UUT1,2, 3, 4
C	Compressor Type	S	Scroll Medical Air Compressor	UUT1,2, 3, 4
D	Horsepower	3	3 HP	UUT3
		5	5 HP	UUT1
		7	7.5 HP	Interpolated
		10	10 HP	UUT2,4
E	System Size	D	Duplex	UUT1,3, 4
		T	Triplex	Interpolated
		Q	Quadruplex	UUT2
F	Receiver Tank Size	8	80 Gallon	UUT1,3
		12	120 Gallon	UUT2
		24	240 Gallon	UUT4
G	Industry	M	Medical	UUT1,2, 3, 4

## Special Seismic Certification

### Model Chart - Champion Brand



**Manufacturer:** Gardner Denver (branded Champion)

**Product Line:** Medical Scroll Systems

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

**Mounting Description:** Rigid base mount

#### Champion Medical Scroll System Model Chart

#### ABCDE-F-G

Variable	Definition	Allowable Value	Allowable Value Description	Unit
A	System Type	B	Base mount	UUT1,2
		H	Tank Mount	UUT3,4
B	Models	CA	CA Models	UUT1,2, 3, 4
C	Compressor Type	S	Scroll Medical Air Compressor	UUT1,2, 3, 4
D	Horsepower	3	3 HP	UUT3
		5	5 HP	UUT1
		7	7.5 HP	Interpolated
		10	10 HP	UUT2,4
E	System Size	D	Duplex	UUT1,3, 4
		T	Triplex	Interpolated
		Q	Quadruplex	UUT2
F	Receiver Tank Size	8	80 Gallon	UUT1,3
		12	120 Gallon	UUT2
		24	240 Gallon	UUT4
G	Industry	M	Medical	UUT1,2, 3, 4

## Special Seismic Certification

### Model Chart - Allied Healthcare Brand



**Manufacturer:** Gardner Denver (branded Allied Healthcare)

**Product Line:** Medical Scroll Systems

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

**Mounting Description:** Rigid base mount

#### Allied Healthcare Medical Scroll System Model Chart

#### ABC-DE

Variable	Definition	Allowable Value	Allowable Value Description	Unit
A	System Size	DO	Duplex	UUT1,3, 4
		TO	Triplex	Interpolated
		QO	Quadruplex	UUT2
B	Compressor Type	S	Scroll Medical Air Compressor	UUT1,2, 3, 4
C	Horsepower	030	3 HP	UUT3
		050	5 HP	UUT1
		075	7.5 HP	Interpolated
		100	10 HP	UUT2,4
D	Receiver Tank Size	80	80 Gallon	UUT1,3
		120	120 Gallon	UUT2
		240	240 Gallon	UUT4
E	System Type	BDD	Base mount	UUT1,2
		TDD	Tank Mount	UUT3,4



## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)

**Product Line:** Medical Scroll

**Certified Subcomponents:** Scroll pumps and tanks

### Scroll Pump

Model No.	Manufacturer	Description	Material	Unit
BC-52KL	CoAire	Compressor pump	Aluminum	UUT1, UUT3
SRL-5.5CBUM	Hitachi	Compressor pump	Aluminum	Extrapolated <sup>1</sup>
SRL-7.5CBUM	Hitachi	Compressor pump	Aluminum	UUT2, UUT4

1. Extrapolated pump is less than 10 HP.

### Vertical Tank

Model No.	Manufacturer	Description	Material	Unit
CC1123746	Samuel Pressure Vessel Group	80 gal	Vinyl lined carbon steel	UUT1
P09487A	Samuel Pressure Vessel Group	120 gal	Vinyl lined carbon steel	UUT2

### Horizontal Tank

Model No.	Manufacturer	Description	Material	Unit
302SMD645	Morganton Pressure Vessel LLC	80 gal	Vinyl lined carbon steel	UUT3
303SMD645	Morganton Pressure Vessel LLC	120 gal	Vinyl lined carbon steel	Interpolated
304SMD645	Morganton Pressure Vessel LLC	240 gal	Vinyl lined carbon steel	UUT4

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)

**Product Line:** Medical Scroll

**Certified Subcomponents:** Dew point monitor/probe desiccant, carbon monoxide monitor/sensor and controllers

Dew Point Monitor/ Probe Desiccant				
Model No.	Manufacturer	Description	Material	Unit
DMT143N1FUA1C3A0ASA	Vaisala	Dew point sensor	Stainless Steel	UUT1,2,3,4
Carbon Monoxide Monitor/ Sensor				
Model No.	Manufacturer	Description	Material	Unit
4035-22	GFG Instrumentation	CO Sensor	Aluminum	UUT1,2,3,4
Controllers - Base Mount Systems				
Model No.	Manufacturer	Description	Material	Unit
301SMD466	ACPI Systems Inc.	Duplex, 5HP, 208/230/60/3	NEMA4/12 carbon steel enclosure	UUT1
305SMD466	ACPI Systems Inc.	Duplex, 5HP, 460/60/3		Interpolated
309SMD466	ACPI Systems Inc.	Duplex, 5HP, 575/60/3		Interpolated
302SMD466	ACPI Systems Inc.	Duplex, 7.5HP, 208/230/60/3		Interpolated
306SMD466	ACPI Systems Inc.	Duplex, 7.5HP, 460/60/3		Interpolated
310SMD466	ACPI Systems Inc.	Duplex, 7.5HP, 575/60/3		Interpolated
303SMD466	ACPI Systems Inc.	Duplex, 10HP, 208/230/60/3		Interpolated
307SMD466	ACPI Systems Inc.	Duplex, 10HP, 460/60/3		Interpolated
311SMD466	ACPI Systems Inc.	Duplex, 10HP, 575/60/3		Interpolated
300SMT466	ACPI Systems Inc.	Triplex, 5HP, 208/230/60/3		Interpolated
303SMT466	ACPI Systems Inc.	Triplex, 5HP, 460/60/3		Interpolated
306SMT466	ACPI Systems Inc.	Triplex, 5HP, 575/60/3		Interpolated
301SMT466	ACPI Systems Inc.	Triplex, 7.5HP, 208/230/60/3		Interpolated
304SMT466	ACPI Systems Inc.	Triplex, 7.5HP, 460/60/3		Interpolated
307SMT466	ACPI Systems Inc.	Triplex, 7.5HP, 575/60/3		Interpolated
302SMT466	ACPI Systems Inc.	Triplex, 10HP, 208/230/60/3		Interpolated
305SMT466	ACPI Systems Inc.	Triplex, 10HP, 460/60/3		Interpolated
308SMT466	ACPI Systems Inc.	Triplex, 10HP, 575/60/3		Interpolated
300SMQ466	ACPI Systems Inc.	Quadraplex, 5HP, 208/230/60/3		Interpolated
303SMQ466	ACPI Systems Inc.	Quadraplex, 5HP, 460/60/3		Interpolated
306SMQ466	ACPI Systems Inc.	Quadraplex, 5HP, 575/60/3		Interpolated
301SMQ466	ACPI Systems Inc.	Quadraplex, 7.5HP, 208/230/60/3		Interpolated
304SMQ466	ACPI Systems Inc.	Quadraplex, 7.5HP, 460/60/3		Interpolated
307SMQ466	ACPI Systems Inc.	Quadraplex, 7.5HP, 575/60/3		Interpolated
302SMQ466	ACPI Systems Inc.	Quadraplex, 10HP, 208/230/60/3		Interpolated
306SMQ466	ACPI Systems Inc.	Quadraplex, 10HP, 460/60/3		Interpolated
308SMQ466	ACPI Systems Inc.	Quadraplex, 10HP, 575/60/3		UUT2

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)

**Product Line:** Medical Scroll

**Certified Subcomponents:** Controllers (continued)

Controllers - Tank Mount Systems				
Model No.	Manufacturer	Description	Material	Unit
300SMD466	ACPI Systems Inc.	Duplex, 3HP, 208/230/60/3	NEMA4/12 carbon steel enclosure	UUT3
304SMD466	ACPI Systems Inc.	Duplex, 3HP, 460/60/3		Interpolated
308SMD466	ACPI Systems Inc.	Duplex, 3HP, 575/60/3		Interpolated
301SMD466	ACPI Systems Inc.	Duplex, 5HP, 208/230/60/3		Interpolated
305SMD466	ACPI Systems Inc.	Duplex, 5HP, 460/60/3		Interpolated
309SMD466	ACPI Systems Inc.	Duplex, 5HP, 575/60/3		Interpolated
302SMD466	ACPI Systems Inc.	Duplex, 7.5HP, 208/230/60/3		Interpolated
306SMD466	ACPI Systems Inc.	Duplex, 7.5HP, 460/60/3		Interpolated
310SMD466	ACPI Systems Inc.	Duplex, 7.5HP, 575/60/3		Interpolated
303SMD466	ACPI Systems Inc.	Duplex, 10HP, 208/230/60/3		Interpolated
307SMD466	ACPI Systems Inc.	Duplex, 10HP, 460/60/3		Interpolated
311SMD466	ACPI Systems Inc.	Duplex, 10HP, 575/60/3		UUT4

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)

**Product Line:** Medical Scroll

**Certified Subcomponents:** Motors

Motors				
Model No.	Manufacturer	Description	Material	Unit
042830/2016	WEG	Motor 3HP 200-208/3/60	Rolled carbon steel	UUT3
023044/2016	WEG	Motor 3HP 230-460/3/60		Interpolated
023047/2016	WEG	Motor 3HP 575/3/60		Interpolated
043775/2016	WEG	Motor 5HP 200-208/3/60		UUT1
023051/2016	WEG	Motor 5HP 230-460/3/60		Interpolated
023053/2016	WEG	Motor 5HP 575/3/60		Interpolated
046370/2016	WEG	Motor 7.5HP 200-208/3/60		Interpolated
052806/2016	WEG	Motor 7.5HP 230-460/3/60		Interpolated
052813/2016	WEG	Motor 7.5HP 575/3/60		Interpolated
049302/2016	WEG	Motor 10HP 200-208/3/60		Interpolated
052817/2016	WEG	Motor 10HP 230-460/3/60		Interpolated
052824/2016	WEG	Motor 10HP 575/3/60		UUT2,UUT4

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)

**Product Line:** Medical Scroll

**Certified Subcomponents:** Tank drains, aftercooler, intake filter element and check valve

Tank Drain				
Model No.	Manufacturer	Description	Material	Unit
DV720-66	Air System Products, Inc.	Timer Drain	Plastic / Brass	UUT1,2,3,4
Aftercooler				
Model No.	Manufacturer	Description	Material	Unit
300SMB292	WUXI Hongsheng Heat Exchanger	Air-Cooled Heat Exchanger	Aluminum	UUT1,UUT3
301SMB292	WUXI Hongsheng Heat Exchanger	Air-Cooled Heat Exchanger	Aluminum	UUT2,UUT4
Intake Filter Element				
Model No.	Manufacturer	Description	Material	Unit
CSL0001209	Solberg MFG, Inc.	"L" Style Inlet Filter	Steel, w/polyester element	UUT1,2,3,4
Check Valve				
Model No.	Manufacturer	Description	Material	Unit
742044	Hitachi	1/2NPT, In-Line Lift	Brass	UUT1,2,3,4

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)

**Product Line:** Medical Scroll

**Certified Subcomponents:** Desiccant air dryers

Desiccant Air Dryers				
Manufacturer's Model No.	Manufacturer	Material	Weight (lb)	Unit
BVM13A1E-DUPLEX	Parker AirTek	Carbon Steel	324	UUT1.1
BVM21A1E-DUPLEX	Parker AirTek	Carbon Steel	340	Interpolated
BVM33A1E-DUPLEX	Parker AirTek	Carbon Steel	422	Interpolated
BVM45A1E-DUPLEX	Parker AirTek	Carbon Steel	585	Interpolated
BVM54A1E-DUPLEX	Parker AirTek	Carbon Steel	601	Interpolated
BVM74A1E-DUPLEX	Parker AirTek	Carbon Steel	641	Interpolated
BVM100A1E-DUPLEX	Parker AirTek	Carbon Steel	918	UUT2.1
HR5-16-12-047	PureGas	Carbon Steel	29	UUT3
HR6-25-12-058	Pure Gas	Carbon Steel	34	Interpolated
HR6.5-35-12-068	Pure Gas	Carbon Steel	59	Interpolated
HR7-50-12-079	PureGas	Carbon Steel	65	UUT4

## Special Seismic Certification

### Tested Units



**Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)

**Product Line:** Medical Scroll Systems

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

**Mounting Description:** Rigid base mount

Model Number	Receiver Size (gal)	Dryer Model Number	Total number of pumps	Vertically stacked pumps or layers	Dimensions (inches)			Weight (lb)	Mounting	Fp/Wp	Sds (g), z/h=1	UUT
					Depth	Width	Height					
BENVS5D-8-M (desiccant dryer skid)	N/A	BVM13A1E-DUPLEX	N/A	N/A	50.0	22.4	36.3	310	Rigid base mount	2.4	2.00	UUT1.1
BENVS5D-8-M (receiver skid)	80	N/A	N/A	N/A	37.3	32.0	55.4	560		2.4	2.00	UUT1.2
BENVS5D-8-M (compressor skid)	N/A	N/A	2	2	34.0	27.0	43.4	620		4.5	2.00	UUT1.3
BENVS10Q-12-M (desiccant dryer skid)	N/A	BVM100A1E-DUPLEX	N/A	N/A	70.0	27.9	62.9	1,110		2.4	2.00	UUT2.1
BENVS10Q-12-M (receiver skid)	120	N/A	N/A	N/A	38.0	32.0	77.4	920		2.4	2.00	UUT2.2
BENVS10Q-12-M (compressor skid)	N/A	N/A	4	4	50.0	22.4	72.2	1,320		4.5	2.00	UUT2.3
HENVS3D-8-M	80	HR5-16-12-047	2	2	65.0	33.0	61.7	1,190		4.5	2.00	UUT3
HENVS10D-24-M	240	HR7-50-12-079	2	2	86.0	40.0	71.7	1,910		4.5	2.00	UUT4

# UUT1.1, 1.2, 1.3

## UNIT UNDER TEST Summary Sheet

**Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)

**Product Line:** Medical Scroll Systems

**Model Number:** BENVSSD-8-M

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

### Options / Component Summary:

208V, scroll pump with 5 HP WEG motor, 80 gallon vertical receiver tank, dew point monitor, CO monitor, 5 HP duplex controller with NEMA 4/12 enclosure, tank drain, aftercooler, intake filter element, check valve and desiccant air dryers.

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

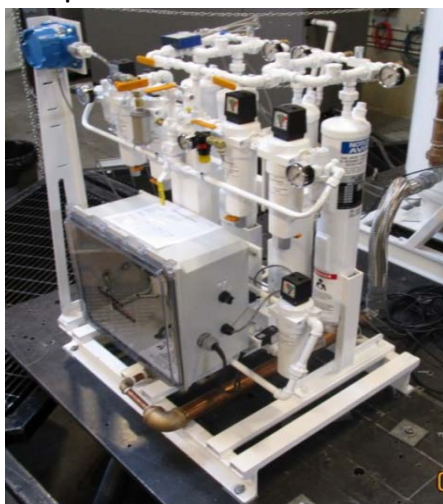
### UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Depth	Width	Height	Side-Side (X)	Front-Back (Y)	Vertical (Z)
310	UUT1.1 (desiccant dryer skid)	50.0	22.4	36.3	18.0	20.0	>33.3
560	UUT1.2 (receiver skid)	37.3	32.0	55.4	16.0	16.0	>33.3
620	UUT1.3 (compressor skid)	34.0	27.0	43.4	9.0	8.0	>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 2016	ICC-ES AC156	2.00	1.0	1.5	3.20	3.00	1.67	0.67

### Unit Mounting Description:



UUT1.1



UUT1.2



UUT1.3

Each UUT was base mounted to the steel shake table interface plate with four 3/8" diameter Grade 5 bolts, one on each corner of the skid.



## UUT2.1, 2.2, 2.3

### UNIT UNDER TEST Summary Sheet

**Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)

**Product Line:** Medical Scroll Systems

**Model Number:** BENVS10Q-12-M

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

**Options / Component Summary:**

575V, scroll pump with 10 HP WEG motor, 120 gallon vertical receiver tank, dew point monitor, CO monitor, 10 HP quadruplex controller with NEMA 4/12 enclosure, tank drain, aftercooler, intake filter element, check valve and desiccant air dryers.

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

#### UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Depth	Width	Height	Side-Side (X)	Front-Back (Y)	Vertical (Z)
1,100	UUT2.1 (desiccant dryer skid)	70.0	27.9	62.9	14.0	8.0	>33.3
920	UUT2.2 (receiver skid)	38.0	32.0	77.4	13.0	9.0	>33.3
1,320	UUT2.3 (compressor skid)	50.0	22.4	72.2	5.0	10.0	28.0

#### Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.00	1.0	1.5	3.20	3.00	1.67	0.67

#### Unit Mounting Description:



UUT2.1



UUT2.2



UUT2.3

UUT2.1 was base mounted to the steel shake table interface plate with four 3/8" diameter Grade 5 bolts, one on each corner of the skid. UUT2.2 and UUT2.3 were base mounted with four 1/2" diameter Grade 5 bolts, one on each corner of the skid.

**UUT3****UNIT UNDER TEST Summary Sheet****Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)**Product Line:** Medical Scroll Systems**Model Number:** HENV3D-8-M**Product Construction Summary:** Powder coated carbon steel frame**Options / Component Summary:**

208V, scroll pump with 3 HP WEG motor, 80 gallon horizontal receiver tank, dew point monitor, CO monitor, 3 HP duplex controller with NEMA 4/12 enclosure, tank drain, aftercooler, intake filter element, check valve and desiccant air dryers.

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

**UUT Properties**

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Depth	Width	Height	Side-Side (X)	Front-Back (Y)	Vertical (Z)
1,190	UUT3	65.0	33.0	61.7	8.0	8.0	22.0

**Seismic Test Parameters**

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.00	1.0	1.5	3.20	3.00	1.67	0.67

**Unit Mounting Description:**

UUT3 was base mounted with four 1/2" diameter Grade 5 bolts, one on each corner of the skid.

**UUT4****UNIT UNDER TEST Summary Sheet****Manufacturer:** Gardner Denver (also branded Champion and Allied Healthcare)**Product Line:** Medical Scroll Systems**Model Number:** HENVS10D-24-M**Product Construction Summary:** Powder coated carbon steel frame**Options / Component Summary:**

575V, scroll pump with 10 HP WEG motor, 240 gallon horizontal receiver tank, dew point monitor, CO monitor, 10 HP duplex controller with NEMA 4/12 enclosure, tank drain, aftercooler, intake filter element, check valve and desiccant air dryers.

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

**UUT Properties**

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Depth	Width	Height	Side-Side (X)	Front-Back (Y)	Vertical (Z)
1,910	UUT4	86.0	40.0	71.7	6.0	5.0	>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 2016	ICC-ES AC156	2.00	1.0	1.5	3.20	3.00	1.67	0.67

**Unit Mounting Description:**

UUT4 was base mounted with four 1/2" diameter Grade 5 bolts, one on each corner of the skid.