



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT

APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0814

HCAI Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Taco Comfort

Manufacturer's Technical Representative: Brian Dorchik

Mailing Address: 1160 Cranston St, Cranston, RI 029207335

Telephone: (401) 275-5452

Email: BriDor@TacoComfort.com

Product Information

Product Name: Variable Frequency Drives

Product Model Number(s): DD-02 & DD-99

Product Category: Motor Control Centers

Product Sub-Category: Variable Frequency Drives and Starters

General Description: Variable Frequency Drives

Mounting Description: Rigid/flexible wall supported; Unit mounted to wall rigidly or with neoprene vibration isolators

Tested Seismic Enhancements: None

Applicant Information

Applicant Company Name: Dynamic Certification Laboratories

Contact Person: Kelly Laplace

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

Telephone: (775) 358-5085

Email: kelly@shaketest.com

Title: VP of Sales: Test and Measurement Division





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

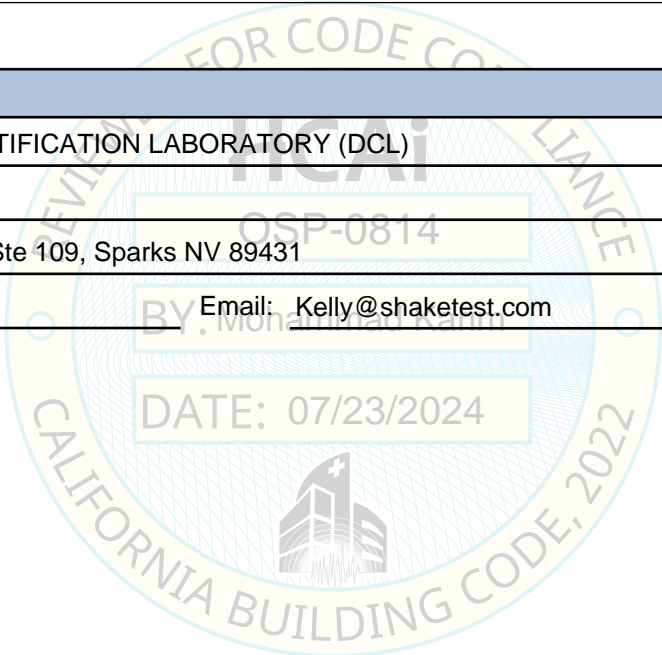
Company Name: THE VMC GROUP
Name: Kenneth Tarlow California License Number: S2851
Mailing Address: 980 9th Street, 16th Floor, Sacramento, CA 95814
Telephone: (832) 627-2214 Email: ken.tarlow@thevmcgroup.com

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: Kelly Laplace
Mailing Address: 1315 Greg St., Ste 109, Sparks NV 89431
Telephone: (775) 358-5085 Email: Kelly@shaketest.com





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.50 (Rigid; Sds 2.0g, z/h=1); 1.13 (Rigid; Sds 2.5g, z/h=0): 4.5
(Isolated: Sds=2.0; z/h=1) and 1.88 (Isolated: Sds=2.5; z/h=0)

SDS (Design spectral response acceleration at short period, g) = 2.0g at z/h=1.0 and 2.5g at z/h=0

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 6.0(Rigid), 2.0(Isolated)

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1 and 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

HCAI Approval (For Office Use Only) - Approval Expires on 07/25/2030

Date: 7/23/2024

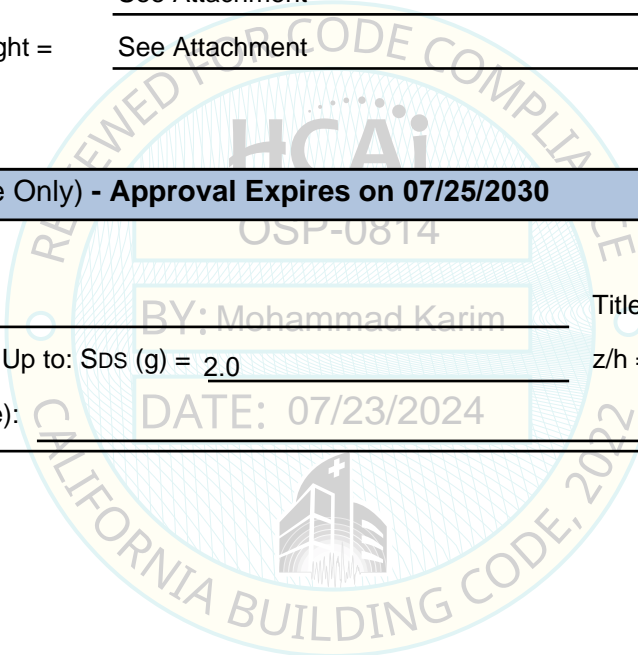
Name: Mohammad Karim

Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: SDS (g) = 2.0

z/h = 1

Condition of Approval (if applicable):



Special Seismic Certification

Table 1- Certified Components



DCL Project Number: 94722-2401

Product Line: Variable Frequency Drives

Mounting: Rigid and Isolated Wall Mounted, With and Without Manufacturer-Provided Isolators

Certified Seismic Levels: Sds 2.0 g, z/h=1.0 (Sds 2.5 g, z/h=0)

Model Number	Manufacturer	Power		Voltage	Enclosure Material	Frame Size	NEMA Rating ¹	Dimensions (in)			Max Weight (lb)	Unit	
		kW	Hp					Height	Width	Depth			
DD-XX	Taco	1	2	200-240 Single Phase	Aluminum body with plastic cover	A5	12, 4X	16.5	9.5	9.3	27	Extrapolated	
DD-02		1-4	2-5	200-240 Three Phase		A5	12	16.5	9.5	9.3	27	UUT-01a,b	
DD-XX		1-8	2-10	380-480 Three Phase		A5	12, 4X	16.5	9.5	9.3	35	Interpolated	
DD-XX		2-6	2-8	200-240 Single Phase		B1		18.9	9.5	12.1	65	Interpolated	
DD-XX		6-11	8-15	200-240 Three Phase		B1		18.9	9.5	12.1	65	Interpolated	
DD-XX		11-18	15 -25	380-480 Three Phase		B1		18.9	9.5	12.1	65	Interpolated	
DD-XX		8	10	200-240 Single Phase		B2		25.6	9.5	12.1	70	Interpolated	
DD-XX		15	20	200-240 Three Phase		B2		25.6	9.5	12.1	70	Interpolated	
DD-XX		22-30	30-40	380-480 Three Phase		B2		25.6	9.5	12.1	70	Interpolated	
DD-XX		15	20	200-240 Single Phase		C1		26.9	12.1	14.1	100	Interpolated	
DD-XX		18-30	25-40	200-240 Three Phase		C1		26.9	12.1	14.1	100	Interpolated	
DD-XX		37-55	50-75	380-480 Three Phase		C1		26.9	12.1	14.1	100	Interpolated	
DD-XX		22	30	200-240 Single Phase		C2		30.0	14.3	15.0	121	Interpolated	
DD-XX		37-45	50-60	200-240 Three Phase		C2		30.0	14.3	15.0	121	Interpolated	
DD-99		75-90	100-125	380-480 Three Phase		C2		4X	30.0	14.3	15.0	121	UUT-02a,b

Note:

1. Nema 4X enclosures have additional gasketing but are otherwise identical to the Nema 12 enclosures.

**Special Seismic Certification
Certified Options**



DCL Project Number: 94722-2401

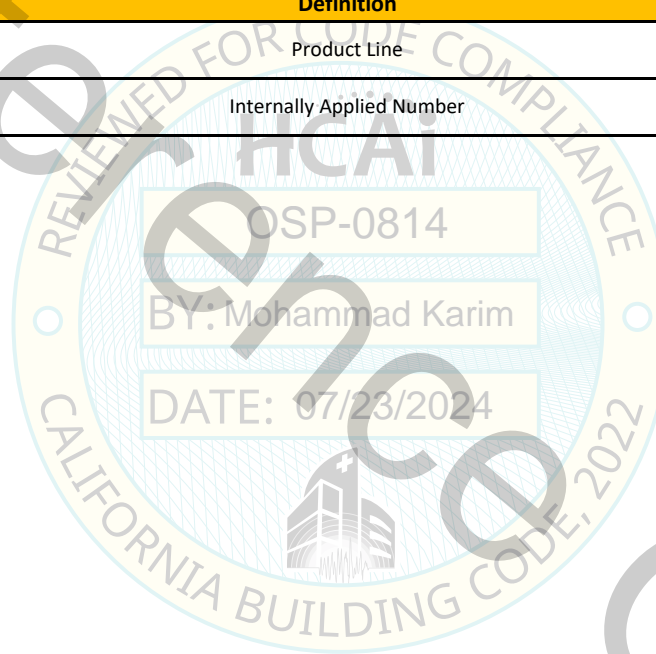
Manufacturer: Taco

Mounting: Rigid and Isolated Wall Mounted, With and Without Manufacturer-Provided Isolators

Certified Seismic Levels: Sds 2.0 g, z/h=1.0 (Sds 2.5 g, z/h=0)

Sample Part Number: AA-XX

Allowable Value	Definition	Unit
DD	Product Line	UUT-01a,b and UUT-02a,b
00-99	Internally Applied Number	UUT-01a,b and UUT-02a,b



Only

Special Seismic Certification
Table 2- Certified Subcomponents



Project Number: 94722-2401

Product Line: Variable Frequency Drives

Enclosures			
Manufacturer	Size	Material	Unit
Taco	16.5" x 9.5" x 9.3"	Aluminum body with plastic cover	UUT-01a,b
Taco	16.5" x 9.5" x 9.3"	Aluminum body with plastic cover	Interpolated
Taco	18.9" x 9.5" x 12.1"	Aluminum body with plastic cover	Interpolated
Taco	26.9" x 12.1" x 14.1"	Aluminum body with plastic cover	Interpolated
Taco	30.0" x 14.3" x 15.0"	Aluminum body with plastic cover	UUT-02a,b
Modulating Pump Controller ¹			
Manufacturer	Description	Material	Unit
Taco	VFD with modular pump controller	Plastic and PCB	UUT-01a,b
Fused Disconnect Switch			
Manufacturer	Description	Material	Unit
Taco	VFD with integrated fused disconnect switch	Stainless steel and plastic	UUT-01a,b
Non-Fusible Disconnect Switch			
Manufacturer	Description	Material	Unit
Taco	VFD with Integrated mechanical disconnect switch C1 and C2	Stainless steel and plastic	UUT-02a,b

Notes

1. Each Drive has a built in controller, this controller is an added accessory, approximately 1 lb.

Special Seismic Certification
Table 3- Tested Units



DCL Project Number: 94722-2401

Product Line: Variable Frequency Drives

Mounting: Rigid and Isolated Wall Mounted, With and Without Manufacturer-Provided Isolators

Certified Seismic Levels: Sds 2.0 g, z/h=1.0 (Sds 2.5 g, z/h=0)

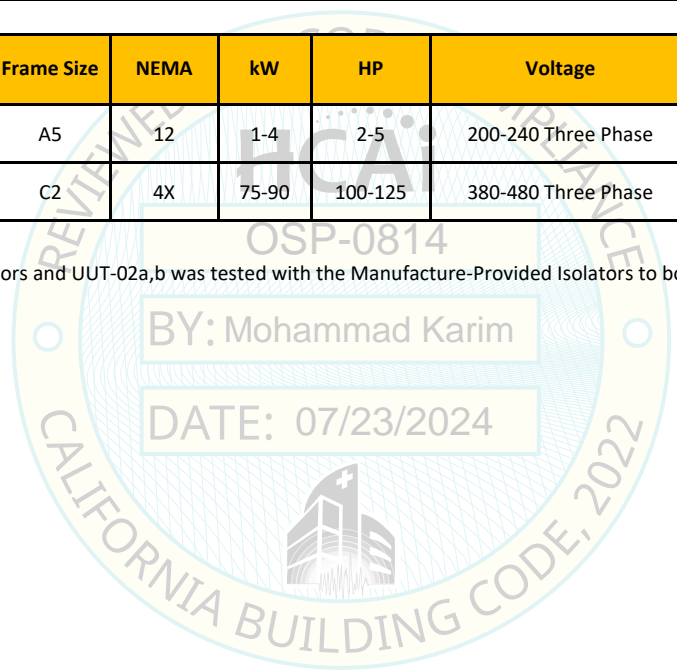
Model Number	Manufacturer	Enclosure Material	Frame Size	NEMA	kW	HP	Voltage	Overall Dimensions (in)			Weight (lb)	Unit ¹
								Height	Width	Depth		
DD-02	Taco	Aluminum body with plastic cover	A5	12	1-4	2-5	200-240 Three Phase	16.5	9.5	9.3	27	UUT-01a,b
DD-99			C2	4X	75-90	100-125	380-480 Three Phase	30.0	14.3	15.0	121	UUT-02a,b

Note:

1. UUT-01a,b was tested without Manufacture-Provided Isolators and UUT-02a,b was tested with the Manufacture-Provided Isolators to bookend rigidity

BY: Mohammad Karim

DATE: 07/23/2024



UNIT UNDER TEST (UUT) Summary Sheet



UUT-01a,b

Manufacturer: Taco

Product Line: Variable Frequency Drives

Model Number: DD-02

Product Construction Summary: Aluminum body with plastic cover

Options / Component Summary: VFD with modulating pump controller, and fused disconnect switch.

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

Tested unit	Dimensions (in)				Lowest Natural Frequency (Hz)		
	Operating Weight (lb)	Length	Width	Height	Front-Back	Side-Side	Vertical
UUT-01a,b	26.6	9.3	9.5	16.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	N/A	N/A
		2.5	0.0		N/A	N/A	1.67	0.67

Unit Mounting Description:

The unit was mounted to the wall fixture using (4) ¼” Grade 5 bolts, 1.6” x 1.6” x 0.3” carbon steel plate washers, flat washers, and channel nuts. The ¼” bolts were spaced 8.5” apart in the side-side direction, and 15.8” apart in the vertical direction.

For UUT-01a the wall fixture was mounted rigidly to the shake table. For UUT-01b the wall frame was mounted to the shake table using (4) VMC MSSH-1E-650 isolators.



UUT-01a overall picture



UUT-01b overall picture

UNIT UNDER TEST (UUT) Summary Sheet



UUT-02a,b

Manufacturer: Taco

Product Line: Variable Frequency Drives

Model Number: DD-99

Product Construction Summary: Aluminum body with plastic cover

Options / Component Summary: VFD with integrated mechanical disconnect switch

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

Tested unit	Dimensions (in)				Lowest Natural Frequency (Hz)		
	Operating Weight (lb)	Depth	Width	Height	Front-Back	Side-Side	Vertical
UUT-02a,b	120.6	15.0	14.3	30.0	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	N/A	N/A
		2.5	0.0		N/A	N/A	1.67	0.67

Unit Mounting Description:

The unit was mounted to the wall fixture using (4) M8 40mm diameter by 40mm long rubber buffer vibration isolators, containing zinc plated carbon steel, with an identification number of RB8X40X40MCLZ and manufactured by Belmetric. The unit attachments also consisted of (2) lock washers, flat washers, and nuts per isolator. The isolators were spaced 13.0" apart in the side-side direction, and 29.3" apart in the vertical direction.

For UUT-02a the DCL wall fixture was mounted rigidly to the shake table. For UUT-02b the wall frame was mounted to the shake table using (4) VMC MSSH-1E-650 isolators.



UUT-02a overall picture



UUT-02b overall picture