



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY
APPLICATION #: OSP - 0422

OSHPD Special Seismic Certification Preapproval (OSP)

Type: [] New [X] Renewal

Manufacturer Information

Manufacturer: Armstrong Fluid Technology

Manufacturer's Technical Representative: On File

Mailing Address: 23 Bertrand Ave, Toronto, Ontario, M1L2P3, Canada

Telephone: On File Email: On File

Product Information

Product Name: Variable Frequency Drives

Product Type: Control Panel, Drives

Product Model Number: See Attachment

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

General Description: Enclosures are cast aluminum body with plastic cover or extruded aluminum body with aluminum cover. Units contain controllers and disconnect switches. The certified model numbers listed are for Armstrong Variable Frequency Drives. The listed drives are certified for any intermediate surface-mounted attachment, including Armstrong Intelligent Variable Speed (or Design Envelope) Pumps types DE 4300 IVS, DE 4380 IVS, DE4302 IVS, DE 4382 IVS, DE 4312 IVS, DE 4392 IVS, DE 4030 IVS, DE 4280 IVS, DE 4360 IVS and DE 4600 IVS.

Mounting Description: Wall mount configuration (rigid and isolated).

Applicant Information

Applicant Company Name: DCL Labs, LLC.

Contact Person: Kelly Laplace

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

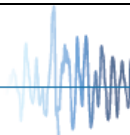
Telephone: (775) 358-5085 Email: kelly@shaketest.com

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: [Handwritten Signature] Date: 11/18/2020

Title: Business Manager Company Name: DCL Labs, LLC.

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





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

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

Company Name: VMC Group

Name: Kenneth Tarlow California License Number: SE-2851

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: 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): _____

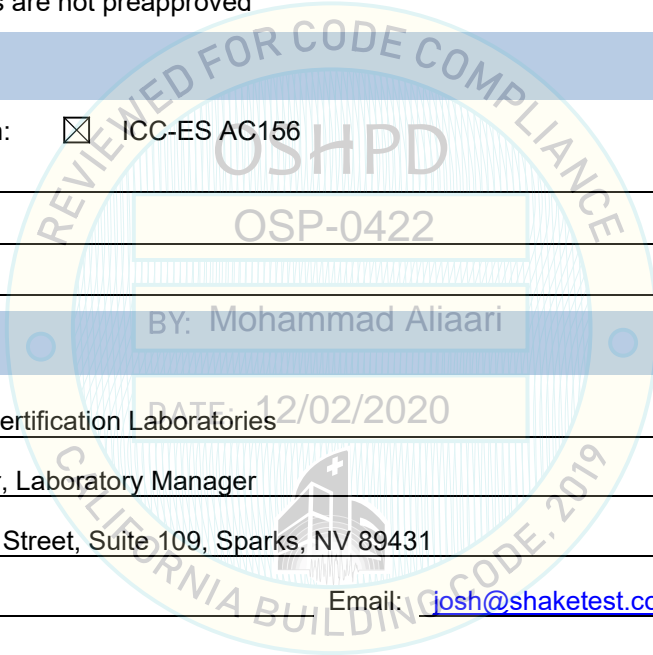
Testing Laboratory

Company Name: Dynamic Certification Laboratories

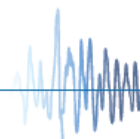
Contact Name: Josh Sailer, Laboratory Manager

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

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



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





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FACILITIES DEVELOPMENT DIVISION

Seismic Parameters

Design in accordance with ASCE 7-16 Chapter 13: [X] Yes [] No

Design Basis of Equipment or Components (Fp/Wp) = 1.88 (Rigid Mount); 5.63 (Isolated Mount)

Sds (Design spectral response acceleration at short period, g) = 2.50

ap (In-structure equipment or component amplification factor) = 2.5

Rp (Equipment or component response modification factor) = 6.0 (Rigid Mount); 2.0 (Isolated Mount)

Omega_0 (System overstrength factor) = 2.0

Ip (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 7-16 Chapter 15: [] Yes [X] No

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

Sds (Design spectral response acceleration at short period, g) =

Sd1 (Design spectral response acceleration at 1 second period, g) =

R (Response modification coefficient) =

Omega_0 (System overstrength factor) = by: Mohammad Aliaari

Cd (Deflection amplification factor) =

Ip (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 [X] No

List of Attachments Supporting Special Seismic Certification

[X] Test Report(s) [] Drawings [] Calculations [X] Manufacturer's Catalog

[X] Other(s) (Please Specify): Attachments

OSHPD Approval (For Office Use Only) - Approval Expires on December 31, 2025

Signature: M. Aliaari

Date: December 02, 2020

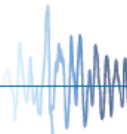
Print Name: Mohammad Aliaari

Title: Senior Structural Engineer

Special Seismic Certification Valid Up to : Sds (g) = See Above

z/h = 1

Condition of Approval (if applicable):



Special Seismic Certification



Certified Components

Manufacturer: Armstrong Fluid Technology

Product Line: Variable Frequency Drives

Certified Product Construction: Cast aluminum body with plastic cover or extruded aluminum body with aluminum cover

Certified Options: 208-230/480V , enclosures, controllers, disconnect switches

Mounting Description: Rigid or isolated wall mount

Seismic Levels: S_{DS} = 2.50g, z/h = 1.0

Variable Frequency Drives

Model Number	Manufacturer	Power		Voltage	Tested Enclosure Material	Certified Enclosure Material	Tested NEMA Rating	Certified NEMA Rating	Dimensions, in.			Weight, lb.	Unit		
		kW	Hp						Height	Width	Depth				
751110-364	Armstrong	1.1	1.5	208-230 / 480V	Cast aluminum body with plastic cover	N/A	4X	4, 4X, 12	16.5	9.5	9.3	27	UUT1a,b		
755110-364/81/68		1.1	1.5		N/A		N/A		16.5	9.5	9.3	27	Interpolated		
751121-364/81/68 to 77522B-H64/81/68		1.5-30	2-40		N/A		N/A		16.5 - 26.7	9.5 - 12.1	9.3 - 12.2	27 - 99	Interpolated		
755230-364/81/68		37	50		N/A		Cast aluminum body with plastic cover or extruded aluminum body with aluminum cover		N/A	N/A	26.7	12.1	12.2	99	Interpolated
751240-364/81/68		45	60		N/A		N/A		N/A	N/A	26.7	12.1	12.2	99	Interpolated
751251-381/68 to 77526B-H81/68		55-75	75-100		N/A		N/A		N/A	N/A	26.7 - 30.3	12.1 - 14.6	12.2 - 13.2	99 - 143	Interpolated
751271-381/68 to 77534B-H81/68		90-250	125-350		N/A		N/A		N/A	N/A	35.5 - 68.3	12.8 - 16.6	16.5	135 - 300	Interpolated
751355-381		315	450		N/A		Extruded aluminum body with aluminum cover		N/A	12	N/A	68.3	16.6	16.5	434

Special Seismic Certification



Certified Subcomponents

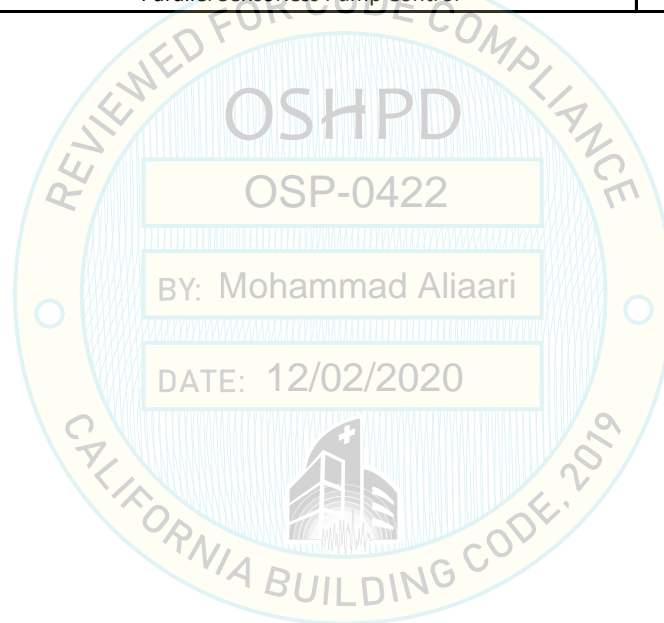
Manufacturer: Armstrong Fluid Technology

Product Line: Variable Frequency Drives

Subcomponent: VFD Controller

VFD Controller

Model Number	Manufacturer	Description	Voltage	Material	Unit
PSPC	Armstrong	Parallel Sensorless Pump Control	24 VDC	Aluminum	UUT1a,b, UUT2a,b



Special Seismic Certification



Certified Subcomponents

Manufacturer: Armstrong Fluid Technology

Product Line: Variable Frequency Drives

Subcomponent: Fused Disconnect Switch Integrated into the VFD

Fused Disconnect Switch

Model Number*	Manufacturer	Description	Voltage	Material	Unit
N/A	Armstrong	1.1 kW (1.5 Hp) VFD with integrated fused disconnect switch	200-240	Stainless Steel and Plastic	UUT1a,b
N/A	Armstrong	1.1-37 kW (1.5-50 Hp) VFD with integrated fused disconnect switch	200-240/380-480		Interpolated
N/A	Armstrong	37 kW (50 Hp) VFD with integrated fused disconnect switch	480		UUT2a,b

*Fused disconnect switch is integral to the VFD and does not have a separate manufacturer's model number.

BY: Mohammad Aliaari

DATE: 12/02/2020



Special Seismic Certification
Certified Subcomponents



Manufacturer: Armstrong Fluid Technology

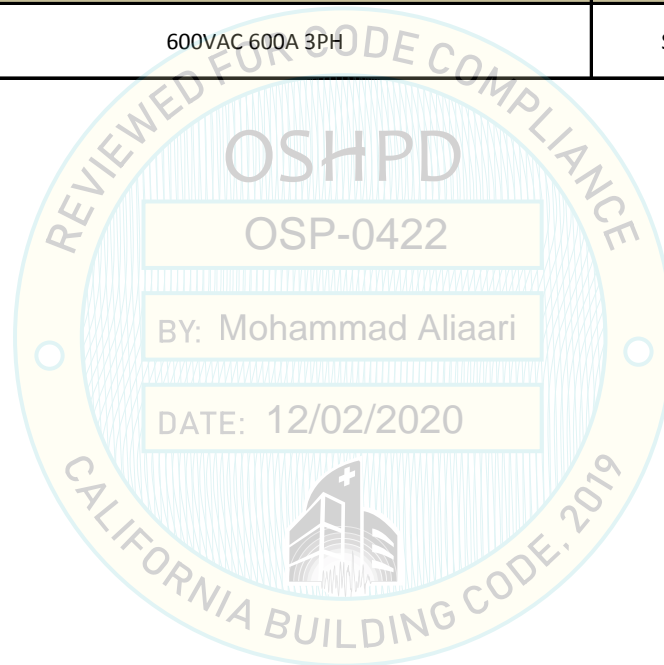
Product Line: Variable Frequency Drives

Subcomponent: Non-Fusible Disconnect Switch

Non-Fusible Disconnect Switch

Model Number	Manufacturer	Description	Material	Unit
OT600U03	ABB	600VAC 600A 3PH	Stainless Steel and Plastic	UUT2a,b*

*Manufacturing process is ISO 9001 certified.



Special Seismic Certification



Tested Components

Manufacturer: Armstrong Fluid Technology

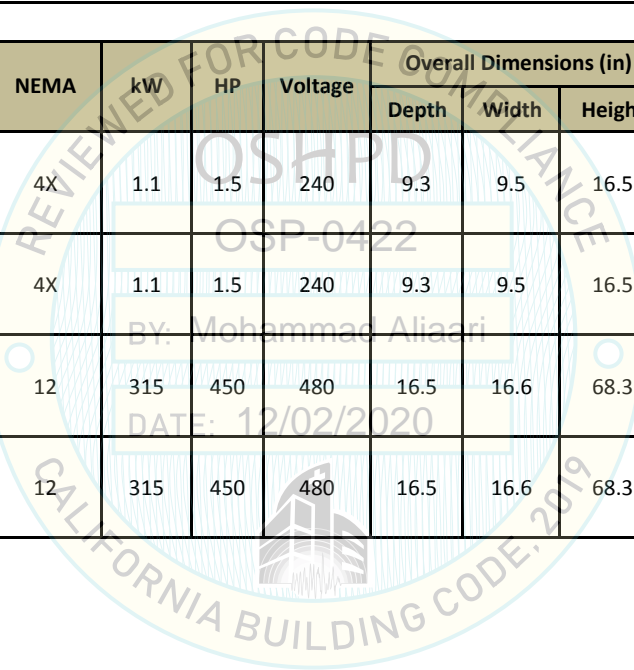
Product Line: Variable Frequency Drives

Tested Product Construction: Cast aluminum body with plastic cover and extruded aluminum body with aluminum cover

Tested Options: 208-230/480V , enclosures, controllers, disconnect switches

Tested Mounting Description: Rigid and isolated wall mount

Model Number	Manufacturer	Enclosure Material	NEMA	kW	HP	Voltage	Overall Dimensions (in)			Weight (lb)	Mounting	Sds (g), z/h=1	Unit
							Depth	Width	Height				
751110-364	Armstrong	Cast aluminum body with plastic cover	4X	1.1	1.5	240	9.3	9.5	16.5	27	Rigid wall mount	2.50	UUT1a
751110-364			4X	1.1	1.5	240	9.3	9.5	16.5	27	Isolated wall mount	2.50	UUT1b
751355-381		Extruded aluminum body with aluminum cover	12	315	450	480	16.5	16.6	68.3	434	Rigid wall mount	2.50	UUT2a
751355-381			12	315	450	480	16.5	16.6	68.3	434	Isolated wall mount	2.50	UUT2b



UNIT UNDER TEST - Summary Sheet



UUT1 (a,b)

Manufacturer: Armstrong Fluid Technology

Product Line: Variable Frequency Drives

Model Number: 751110-364

Product Construction Summary: Cast aluminum body with plastic cover, NEMA 4X

Options / Subcomponent Summary: 240V with controller and disconnect switch

Unit Mounting Description:

UUT1a,b were mounted to the DCL wall fixture with four 1/4-inch diameter Grade 5 bolts spaced approximately 8.5-inches on-center widthwise and 15.8-inches on-center heightwise.

Rigid wall mount (UUT1a): The DCL wall fixture was rigidly attached to the shake table using M12 threaded rod spaced approximately 8-inches on-center.

Isolated wall mount (UUT1b): The DCL wall fixture was attached to (4) Mason Industries, Inc. SLFADA350-104 vibration spring isolators with two 3/4-inch diameter Grade 5 bolts per isolator. The isolators were welded to the DCL shake table interface plate which was attached to the shake table with M12 threaded rod spaced approximately 8-inches on-center.

UUT Properties

UUT1 (a,b)	Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Depth	Width	Height	Front-Back	Side-Side	Vertical
	27	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 2019	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.67	0.67



Rigid test setup (UUT1a)



Isolated test setup (UUT1b)

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.

UNIT UNDER TEST - Summary Sheet



UUT2 (a,b)

Manufacturer: Armstrong Fluid Technology

Product Line: Variable Frequency Drives

Model Number: 751355-381

Product Construction Summary: Extruded aluminum body with aluminum cover, NEMA 12

Options / Subcomponent Summary: 480V with controller and disconnect switch

Unit Mounting Description:

UUT2a,b were mounted to the DCL wall fixture with a total of six 3/8-inch diameter Grade 5 bolts. Four 3/8-inch diameter Grade 5 bolts were located on the top of the unit with the outermost bolts spaced approximately 15-inches on-center widthwise and the innermost bolts spaced approximately 11-inches on-center widthwise. The bottom of the unit contained two 3/8-inch diameter Grade 5 bolts spaced approximately 11-inches on-center widthwise. Overall, the bolts were spaced approximately 68-inches on-center heightwise.

Rigid wall mount (UUT2a): The DCL wall fixture was rigidly attached to the shake table using M12 threaded rod spaced approximately 8-inches on-center.

Isolated wall mount (UUT2b): The DCL wall fixture was attached to (4) Mason Industries, Inc. SLFADA350-104 vibration spring isolators with two 3/4-inch diameter Grade 5 bolts per isolator. The isolators were welded to the DCL shake table interface plate which was attached to the shake table with M12 threaded rod spaced approximately 8-inches on-center.

UUT Properties

UUT2 (a,b)	Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
		Depth	Width	Height	Front-Back	Side-Side	Vertical
	434	16.5	16.6	68.3	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 2019	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.67	0.67



Rigid test setup (UUT2a)



Isolated test setup (UUT2b)

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.