



**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-0422**

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

Type:  New  Renewal

**Manufacturer Information**

Manufacturer: Armstrong Fluid Technology

Manufacturer's Technical Representative: Nicolae Comanescu

Mailing Address: 23 Bertrand Ave, Toronto, ON M1L 2P3

Telephone: (647) 795-0173

Email: ncomanescu@armstrongfluidtechnology.com

**Product Information**

Product Name: Variable Frequency Drives

Product Model Number(s): See Attachment

Product Category: Industrial Control Panels

Product Sub-Category: Variable Frequency Drives and Starters

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 4200H, DE 4280 IVS, DE 4360 IVS, DE 4600 IVS, DE 4332 IVS and DE 4362 IVS.

Mounting Description: Any Vertical Surface Mounted Rigid (tested wall mounted both rigid and flexible) -

Tested Seismic Enhancements: None

**Applicant Information**

Applicant Company Name: DCL Labs, LLC.

Contact Person: Kelly Laplace

Mailing Address: 1315 Greg Street, Suite 109, Sparks, NV 894316091

Telephone: (775) 358-5085

Email: kelly.laplace@thevmcgroup.com

Title: Vice President 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): \_\_\_\_\_

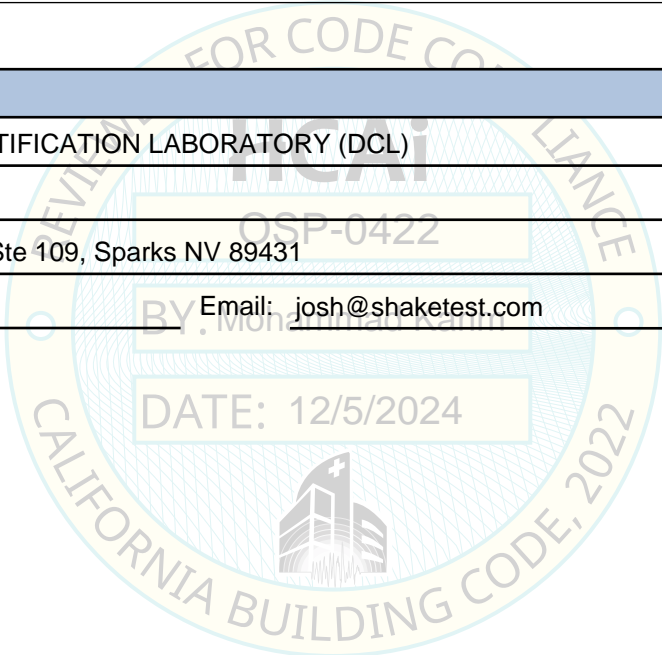
**Testing Laboratory**

Company Name: DYNAMIC CERTIFICATION LABORATORY (DCL)

Contact Person: 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 ( $F_p/W_p$ ) = 1.88 (Rigid Mount); 5.63 (Isolated Mount)

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

$a_p$  (Amplification factor) = 2.5

$R_p$  (Response modification factor) = 6.0 (Rigid Mount); 2.0 (Isolated Mount)

$\Omega_0$  (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

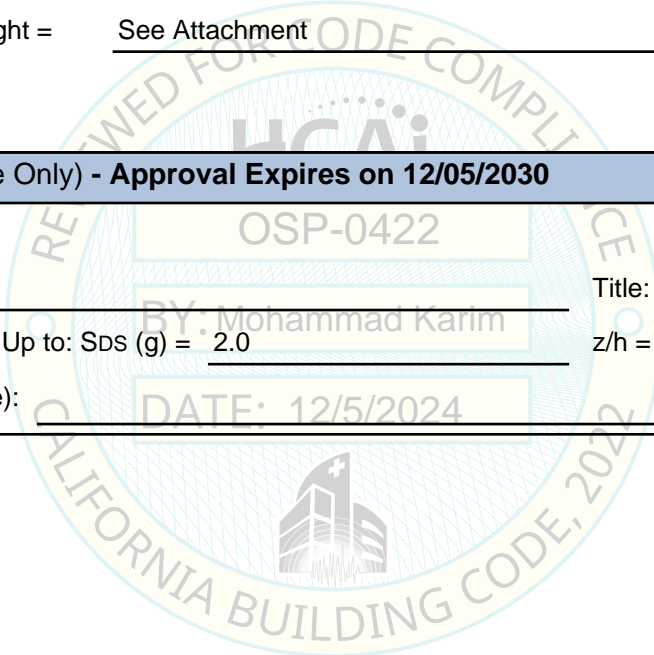
**HCAI Approval (For Office Use Only) - Approval Expires on 12/05/2030**

Date: 12/5/2024

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): DATE: 12/5/2024



# Special Seismic Certification



## Table 1 - Certified Components

**DCL Project Number:** 14236-2401

**Manufacturer:** Armstrong Fluid Technology

**Product Line:** Variable Frequency Drives

**Certified Options:** 200-240/380-480/600V , enclosures, controllers, disconnect switches

**Mounting:** Rigid or Isolated Wall Mount

**Certified Seismic Levels:** Sds=2.50g, z/h=1.0

Variable Frequency Drives													
Model Number	Manufacturer	Power		Voltage [V] <sup>1</sup>	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	200 - 240	Cast aluminum body with plastic cover	N/A	4X	4, 4X, 12	16.5	9.5	9.3	27	UUT1a,b
755110-381/368		1.1	1.5	200 - 600	N/A	N/A	16.5		9.5	9.3	27	Interpolated	
751121-364/381/368 to 77522B-H64/H81/H68		1.5-30	2-40		N/A	N/A	16.5 - 26.7		9.5 - 12.1	9.3 - 12.2	27 - 99	Interpolated	
755230-364/381/368		37	50		N/A	Cast aluminum body with plastic cover or extruded aluminum body with aluminum cover	N/A		26.7	12.1	12.2	99	Interpolated
751240-364/381/368		45	60		N/A	N/A	N/A		26.7	12.1	12.2	99	Interpolated
751251-381/368 to 77526B-H81/H68		55-75	75-100		N/A	N/A	N/A		26.7 - 30.3	12.1 - 14.6	12.2 - 13.2	99 - 143	Interpolated
751271-381/368 to 77534B-H81/H68		90-250	125-350		N/A	N/A	N/A		35.5 - 68.3	12.8 - 16.6	16.5	135 - 300	Interpolated
751355-381		315	450		380 - 480	Extruded aluminum body with aluminum cover	N/A		12	68.3	16.6	16.5	434

Notes:  
 1. All the VFDs are 3-phase with different voltage ratings. Physical configuration for units of the same size does not change with voltage. Units with 68 in the model number have voltage rating of 600V.

## Special Seismic Certification



### Table 2 - Certified Subcomponents

DCL Project Number: 14236-2401

Product Line: Variable Frequency Drives

VFD Controller					
Model Number	Manufacturer	Description	Voltage	Material	Unit
PSPC	Armstrong	Parallel sensorless pump control	24 VDC	Aluminum	UUT1a,b, UUT2a,b
Fused Disconnect Switch					
Model Number <sup>1</sup>	Manufacturer	Description	Voltage	Material	Unit
N/A	Armstrong	1.1 kW (1.5 Hp) VFD with integrated fused disconnect switch	240	Stainless Steel, Plastic	UUT1a,b
N/A		1.1-37 kW (1.5-50 Hp) VFD with integrated fused disconnect switch	240 - 600		Interpolated
N/A		37 kW (50 Hp) VFD with integrated fused disconnect switch	480		UUT2a,b
Non-Fusible Disconnect Switch <sup>2</sup>					
Model Number	Manufacturer	Description	Material		Unit
OT600U03	ABB	600VAC 600A 3PH	Stainless Steel, Plastic		UUT2a,b

Notes:

- Fused disconnect switch is integral to the VFD and does not have a separate manufacturer's model number.
- Manufacturing process is ISO 9001 certified.



**Special Seismic Certification**



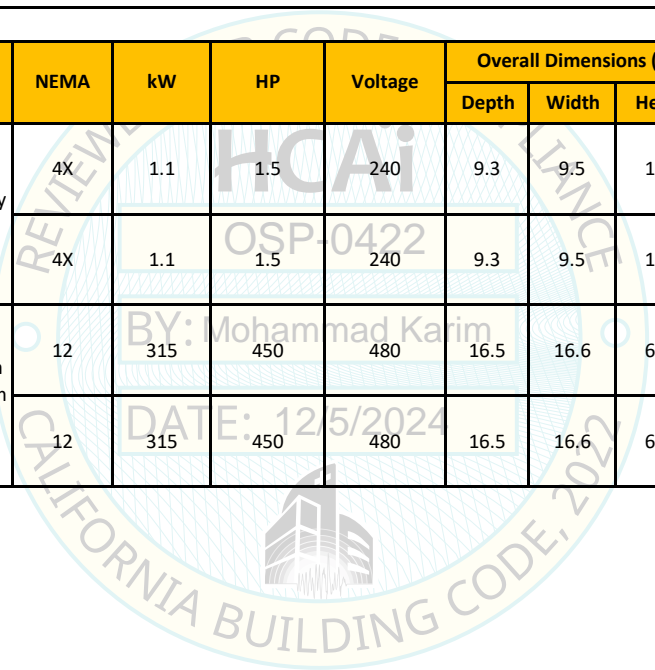
**Table 3 - Tested Components**

**DCL Project Number:** 14236-2401

**DCL Test Report Number:** 23070-1401

**Product Line:** Variable Frequency Drives

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 (UUT) Summary Sheet



## UUT1a,b

DCL Test Report Number: 23070-1401

**Manufacturer:** Armstrong Fluid Technology

**Product Line:** Variable Frequency Drives

**Model Number:** 751110-364

**Mounting:** Rigid and Isolated Wall Mount

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

**Options / Subcomponent Summary:** 240V with controller and 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.

### Unit Mounting Description:

UUT1a,b was mounted to the DCL wall fixture with (4) 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

Operating Weight (lb)	Dimensions (inches)			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 2022	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.67	0.67



Overall view of UUT1a



Overall view of UUT1b

# UNIT UNDER TEST (UUT) Summary Sheet



## UUT2a,b

**DCL Test Report Number:** 23070-1401

**Manufacturer:** Armstrong Fluid Technology

**Product Line:** Variable Frequency Drives

**Model Number:** 751110-381

**Mounting:** Rigid and Isolated Wall Mount

**Product Construction Summary:** Extruded aluminum body with aluminum cover, Nema 12

**Options / Subcomponent Summary:** 480V with controller and 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.

### Unit Mounting Description:

UUT2a,b was mounted to the DCL wall fixture with (6) 3/8-inch diameter Grade 5 bolts. (4) 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 (2) 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

Operating Weight (lb)	Dimensions (inches)			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 2022	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.67	0.67



Overall view of UUT2a



Overall view of UUT2b