APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0864

HCAI Special Seismic Certification Preapproval (OSP)

Type: [X] New [ ] Renewal

Manufacturer Information

Manufacturer: QuantumFlo

Manufacturer's Technical Representative: Robert Mann

Mailing Address: 2664 Jewett Ln, Sanford, FL 32771

Telephone: (407) 807-7050 Email: robert.mann@wilo.com

Product Information

Product Name: Control Panels for Prodigy, Genius, and WisperFlo Systems

Product Model Number(s): See attached

Product Category: Industrial Control Panels

Product Sub-Category: Pump Control Panels

General Description: Stand/skid mounted pump control panels with either one door or double door enclosures. Simplex, Duplex, Triplex, Quadplex, and Pentaplex configurations are available.

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

Tested Seismic Enhancements: None

Applicant Information

Applicant Company Name: DCL LLC

Contact Person: Rachel Wolfe

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

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

Title: Seismic Test Engineer

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

Seismic Parameters

Certified Response Spectral Acceleration Factors:(F_p/W_p)

Horizontal	(A Flx-H), g=	3.20	(A Rig-H), g=	2.40
Vertical	(A Flx-V), g=	1.67	(A Rig-V), g=	0.67

S_{DS} (Design spectral response acceleration at short period, g) = Sds 2.00 at z/h=1.0 and Sds 2.50 at z/h=0.0

Hf (Force amplification height factor) = 3.5 at z/h=1.0; 1.0 at z/h=0.0

Ru (Structure ductility redution factor) = 1.3 at z/h=1.0; 1.0 at z/h=0.0

I_p (Importance factor) = 1.5

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

HCAI Approval (For Office Use Only) - Approval Expires on 09/10/2031

Date: 9/10/2025

Name: Timothy Piland Title: Senior Structural Engineer

Condition of Approval (if applicable):

Special Seismic Certification
Table 1 - Certified Components

DCL Project Number: 40315-2401

Manufacturer: QuantumFlo

Product Line: Control Panels for Prodigy, Genius, and WisperFlo Systems

Mounting: Rigid and Isolated Wall Mount

Certified Seismic Levels: Sds = 2.00g, z/h=1; Sds = 2.5g, z/h=0

Model Number	Description	Max. Dimensions [in.]			Max. Weight [lb.]	Unit
		Depth	Width	Height		
21.80155-RF-V-UUBBXXXXX	Simplex or Duplex, Single Door, 1hp - 20hp, 208V - 460V	10.0	24.0	30.0	93.8	Extrapolated
21.81026-RF-V-UUBBXXXXX	Simplex or Duplex, Single Door, 1hp - 20hp, 208V - 460V	12.0	24.0	30.0	93.8 - 228	Extrapolated
21.80156-RF-V-UUBBXXXXX	Simplex or Duplex, Single Door, 1hp - 20hp, 208V - 460V	10.0	30.0	30.0		Extrapolated
21.81036-RF-V-UUBBXXXXX	Simplex or Duplex, Single Door, 1hp - 20hp, 208V - 460V	12.0	30.0	30.0		Extrapolated
21.81057-RF-V-UUBBXXXXX	Simplex or Duplex, Single Door, 1hp - 20hp, 208V - 460V	10.0	36.0	36.0		Extrapolated
21.81054-RF-V-UUBBXXXXX	Simplex or Duplex, Single Door, 1hp - 20hp, 208V - 460V	12.0	36.0	36.0		Extrapolated
21.80158-T20-208/3-UUBB00180	Triplex, Double Door, 20hp, 208V	13.0	48.0	36.0	228	UUT-01a,b
20.20180-RF-V-UUBBXXXXX	Triplex or Quadplex, Double Door, 7.5hp - 30hp, 208V - 460V	13.0	48.0	36.0	228 - 940	Interpolated
20.20174-RF-V-UUBBXXXXX	Pentaplex, Double Door, 1hp - 30hp, 208V - 460V	13.0	60.0	36.0		Interpolated
20.20178-RF-V-UUBBXXXXX	Simplex or Duplex, Double Door, 25hp - 40hp, 208V - 460V	13.0	48.0	48.0		Interpolated
20.20191-RF-V-UUBBXXXXX	Simplex or Duplex, Double Door, 50hp - 60hp, 208V - 460V	16.0	48.0	60.0		Interpolated
20.20177-RF-V-UUBBXXXXX	Quadplex, Double Door, 15hp - 30hp, 208V - 460V	13.0	60.0	48.0		Interpolated
20.80156-RF-V-UUBBXXXXX	Triplex, Double Door, 25hp to 50hp, 208V - 460V	13.0	60.0	60.0		Interpolated
20.80157-RF-V-UUBBXXXXX	Triplex, Double Door, 60hp, 208V - 460V	16.0	60.0	60.0		Interpolated
20.80161-RF-V-UUBBXXXXX	Quadplex, Double Door, 25hp - 50hp, 208 & 460V	13.0	72.0	60.0		Interpolated
20.80163-RF-V-UUBBXXXXX	Quadplex, Double Door, 25hp - 50hp, 208 & 460V	16.0	72.0	60.0		Interpolated
20.81251-RF-V-UUBBXXXXX	Pentaplex, Double Door, 40hp - 50hp, 460V	13.0	72.0	72.0		Interpolated
21.20182-Q60-460/3-UUBB99999	Quadplex, Double Door, 60hp, 460V	17.0	72.0	72.0	940	UUT-02a,b

Special Seismic Certification
Table 2 - Nomenclature Table

DCL Project Number: 40315-2401

Manufacturer: QuantumFlo

Product Line: Control Panels for Prodigy, Genius, and WisperFlo Systems

Nomenclature Chart

Model Number: A-QF-B-UUYYXXXX

Variable	Category	Allowable Value	Description	Unit
A	Enclosure	21.80155	30H x 24W x 10D, 1-door	Extrapolated
		21.81026	30H x 24W x 12D, 1-door	Extrapolated
		21.80156	30H x 30W x 10D, 1-door	Extrapolated
		21.81036	30H x 30W x 12D, 1-door	Extrapolated
		21.80157	36H x 36W x 10D, 1-door	Extrapolated
		21.81054	36H x 36W x 12D, 1-door	Extrapolated
		21.80158	36H x 48W x 12D, 2-door	UUT-01a,b
		20.20180	36H x 48W x 12D, 2-door	Interpolated
		20.20178	48H x 48W x 12D, 2-door	Interpolated
		20.20177	48H x 60W x 12D, 2-door	Interpolated
		20.80156	60H x 60W x 12D, 2-door	Interpolated
		20.80161	60H x 72W x 12D, 2-door	Interpolated
		20.81251	72H x 72W x 12D, 2-door	Interpolated
		20.20182	72H x 72W x 16D, 2-door	UUT-02a,b
R	Amount of VFDs	S	Simplex, one VFD	Extrapolated
		D	Duplex, two VFDs	Extrapolated
		T	Triplex, three VFDs	UUT-01a,b
		P[1]	Pentaplex, five VFDs	Interpolated
		Q	Quadplex, four VFDs	UUT-02a,b
F	VFD Horsepower	1	1hp	Extrapolated
		1.5	1.5hp	Extrapolated
		2	2hp	Extrapolated
		3	3hp	Extrapolated
		4	4hp	Extrapolated
		5	5hp	Extrapolated
		7.5	7.5hp	Extrapolated
		10	10hp	Extrapolated
		15	15hp	Extrapolated
		20	20hp	UUT-01a,b
		25	25hp	Interpolated
		30	30hp	Interpolated
		40	40hp	Interpolated
		50	50hp	Interpolated
		60	60hp	UUT-02a,b
V	Voltage/Phase	208/3	208V / 3 phase	UUT-01a,b
		230/3	230V / 3 phase	Interpolated
		460/3	460V / 3 phase	UUT-02a,b
UU	Serial Number	25 - 99	Build Year	UUT-01a,b & UUT-02a,b
BB		01 - 12	Build Month	UUT-01a,b & UUT-02a,b
XXXXX		00000 - 99999	Internally Applied Serial Number	UUT-01a,b & UUT-02a,b

Note:

1. The five VFD configuration (Pentaplex) will always be smaller and lighter than the tested four VFD configuration (Quadplex).

Special Seismic Certification
Table 3 - Certified Subcomponents

DCL Project Number: 40315-2401

Product Line: Control Panels for Prodigy, Genius, and WisperFlo Systems

Model Number	Manufacturer	Description	Material	Max. Weight [lb.]	Unit
Enclosures					
21.80155	QuantumFlo	30H x 24W x 10D, 1-door	Painted Carbon Steel	53	Extrapolated
21.81026		30H x 24W x 12D, 1-door		57	Extrapolated
21.80156		30H x 30W x 10D, 1-door		73	Extrapolated
21.81036		30H x 30W x 12D, 1-door		89	Extrapolated
21.80157		36H x 36W x 10D, 1-door		102	Extrapolated
21.81054		36H x 36W x 12D, 1-door		114	Extrapolated
21.80158		36H x 48W x 12D, 2-door		131	UUT-01a,b
20.20180		36H x 48W x 12D, 2-door		132	Interpolated
20.20174		36H x 60W x 12D, 2-door		191	Interpolated
20.20178		48H x 48W x 12D, 2-door		223	Interpolated
20.20177		48H x 60W x 12D, 2-door		379	Interpolated
20.20191		60H x 48W x 16D, 2-door		407	Interpolated
20.80156		60H x 60W x 12D, 2-door		436	Interpolated
20.80157		60H x 60W x 16D, 2-door		466	Interpolated
20.80161		60H x 72W x 12D, 2-door		490	Interpolated
20.80163		60H x 72W x 16D, 2-door		520	Interpolated
20.81251		72H x 72W x 12D, 2-door		557	Interpolated
20.20182		72H x 72W x 16D, 2-door		570	UUT-02a,b
Rotary Disconnect Switches					
GS2EU3N	Schneider Electric	Rotary Disconnect, J-Fuses, 30A	Plastic, Resin	5	Extrapolated
GS2GU3N		Rotary Disconnect, J-Fuses, 60A		5	Extrapolated
GS2JU3N		Rotary Disconnect, J-Fuses, 100A		6	UUT-01a,b
GS2MU3N		Rotary Disconnect, J-Fuses, 200A		8	Interpolated
GS2QU3N		Rotary Disconnect, J-Fuses, 400A		15	UUT-02a,b

Special Seismic Certification
Table 4 - Certified Subcomponents

DCL DYNAMIC CERTIFICATION LABORATORIES,LLC

DCL Project Number: 40315-2401

Product Line: Control Panels for Prodigy, Genius, and WisperFlo Systems

Model Number	Manufacturer	Description	Material	Max. Weight [lb.]	Unit
Variable Frequency Drives					
20.19821	QuantumFlo[1]	VFD, 208v, 1hp	Plastic, Aluminum, Circuit Boards	2.4	Extrapolated
20.19822		VFD, 208v, 1.5hp		2.6	Extrapolated
20.19801		VFD, 230v, 1hp		3.0	Extrapolated
20.19823		VFD, 208v, 2hp		3.0	Extrapolated
20.19853		VFD, 460v, 1hp		3.3	Extrapolated
20.19802		VFD, 230v, 1.5hp		3.5	Extrapolated
20.19824		VFD, 208v, 3hp		3.5	Extrapolated
20.19855		VFD, 460v, 1.5hp		3.5	Extrapolated
20.19854		VFD, 460v, 2hp		3.5	Extrapolated
20.19803		VFD, 230v, 2hp		4.0	Extrapolated
20.19804		VFD, 230v, 3hp		4.0	Extrapolated
20.19826		VFD, 208v, 4hp		4.0	Extrapolated
20.19856		VFD, 460v, 3hp		4.0	Extrapolated
20.19858		VFD, 460v, 4hp		4.2	Extrapolated
20.19862		VFD, 460v, 5hp		4.2	Extrapolated
20.19828		VFD, 208v, 5hp		4.4	Extrapolated
20.19864		VFD, 460v, 7.5hp		4.6	Extrapolated
20.19806		VFD, 230v, 4hp		6.0	Extrapolated
20.19831		VFD, 230v, 5hp		7.3	Extrapolated
20.19831		VFD, 208v, 7.5hp		7.3	Extrapolated
20.19832		VFD, 208v, 10hp		7.3	Extrapolated
20.19834		VFD, 230v, 7.5hp		7.5	Extrapolated
20.19834		VFD, 208v, 15hp		7.5	Extrapolated
20.19866		VFD, 460v, 10hp		7.7	Extrapolated
20.19868		VFD, 460v, 15hp		7.7	Extrapolated
20.19836		VFD, 230v, 10hp		13.2	Extrapolated
20.19836		VFD, 208v, 20hp		13.2	UUT-01a,b
20.19872		VFD, 460v, 20hp		13.2	Interpolated
20.20821		VFD, 230v, 15hp		30.8	Interpolated
20.20822		VFD, 230v, 20hp		30.8	Interpolated
20.20823		VFD, 230v, 25hp		30.8	Interpolated
20.20821		VFD, 208v, 25hp		30.8	Interpolated
20.20822		VFD, 208v, 30hp		30.8	Interpolated
20.20823		VFD, 208v, 40hp		30.8	Interpolated
20.20838		VFD, 460v, 25hp		30.8	Interpolated
20.20839		VFD, 460v, 30hp		30.8	Interpolated
20.20841		VFD, 460v, 40hp		30.8	Interpolated
20.20824		VFD, 230v, 30hp		48.4	Interpolated
20.20824		VFD, 208v, 50hp		48.4	Interpolated
20.20842		VFD, 460v, 50hp		48.4	Interpolated
20.20825		VFD, 208v, 60hp		66.0	Interpolated
20.20843		VFD, 460v, 60hp		66.0	UUT-02a,b

Special Seismic Certification
Table 5 - Tested Units

DCL Project Number: 40315-2401

Manufacturer: QuantumFlo

Product Line: Control Panels for Prodigy, Genius, and WisperFlo Systems

Mounting: Rigid and Isolated Wall Mount

Certified Seismic Levels: Sds = 2.00g, z/h=1; Sds = 2.5g, z/h=0

Model Number	Description	Enclosure Material	Dimensions [in.]			Weight [lb.]	Unit
			Depth	Width	Height		
21.80158-T20-208/3-UUBB00180	Triplex, Double Door, 20 HP, 208V	Painted Carbon Steel	13.0	48.0	36.0	228	UUT-01a,b
21.20182-Q60-460/3-UUBB99999	Quadplex, Double Door, 60 HP, 460V		17.0	72.0	72.0	940	UUT-02a,b

UNIT UNDER TEST (UUT) Summary Sheet

UUT-01a

DCL Project Number: 40315-2401

Manufacturer: QuantumFlo

Product Line: Control Panels for Prodigy, Genius, and WisperFlo Systems

Model Number: 21.80158-T20-208/3-UUBB00180

Product Construction Summary: Double Door Painted Carbon Steel Enclosure

Options / Component Summary:
100A rotary disconnect switch, and three 208V VFDs.

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 before and after the AC 156 test.

UUT Properties

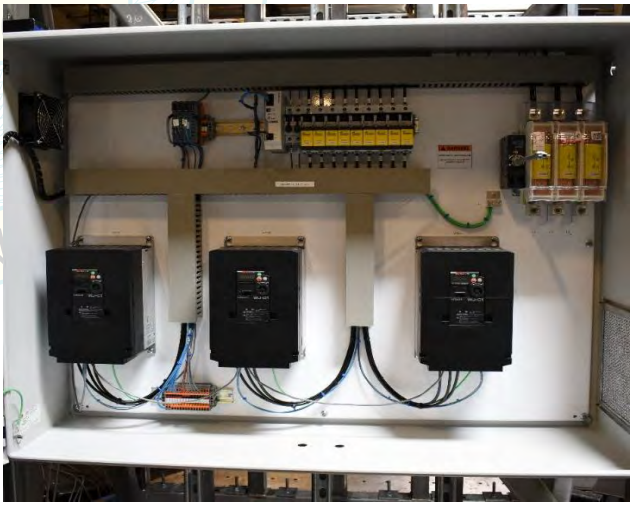
Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back (Lateral)	Side-Side (Longitudinal)	Vertical
228	48.0	13.0	36.0	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	H_f	Rμ	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES AC156	2.0	1.0	3.5	1.3	1.5	3.20	2.40	N/A	N/A
		2.5	0.0	1.0	1.0		N/A	N/A	1.67	0.67

Unit Mounting Description: The unit was wall mounted to the DCL wall fixture using (4) 3/8'' Grade 5 bolts, flat washers, 1.6" x 1.6" x 0.3" carbon steel plate washers and channel nuts. The bolts were spaced 34.5'' apart in the side-side direction measured on-center and 46.5'' apart in the vertical direction measured on-center. For the rigid setup the wall fixture was attached directly to the shake table.

UUT-01a overall view.



UUT-01a interior view.

UNIT UNDER TEST (UUT) Summary Sheet

UUT-01b

DCL Project Number: 40315-2401

Manufacturer: QuantumFlo

Product Line: Control Panels for Prodigy, Genius, and WisperFlo Systems

Model Number: 21.80158-T20-208/3-00180

Product Construction Summary: Double Door Painted Carbon Steel Enclosure

Options / Component Summary:
100A rotary disconnect switch, and three 208V VFDs.

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 before and after the AC 156 test.

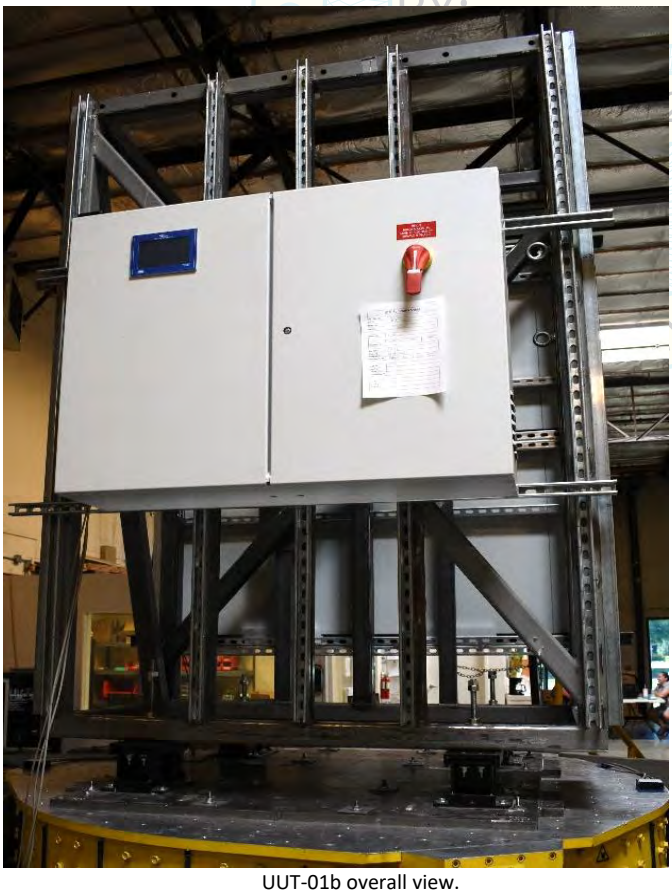
UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back (Lateral)	Side-Side (Longitudinal)	Vertical
228	48.0	13.0	36.0	N/A	N/A	N/A

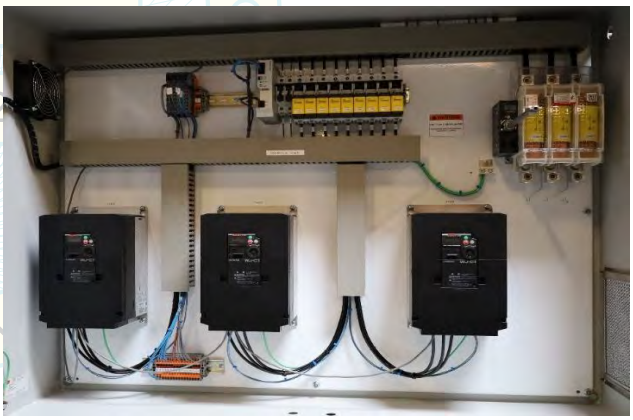
Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	H_f	Rμ	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES AC156	2.0	1.0	3.5	1.3	1.5	3.20	2.40	N/A	N/A
		2.5	0.0	1.0	1.0		N/A	N/A	1.67	0.67

Unit Mounting Description: The unit was wall mounted to the DCL wall fixture using (4) 3/8'' Grade 5 bolts, flat washers, 1.6" x 1.6" x 0.3" carbon steel plate washers and channel nuts. The bolts were spaced 34.5'' apart in the side-side direction measured on-center and 46.5'' apart in the vertical direction measured on-center. For the isolated setup the wall fixture was mounted to the shake table using (4) VMC MSSH-1E spring isolators.



UUT-01b overall view.



UUT-01b interior view.

UNIT UNDER TEST (UUT) Summary Sheet

UUT-02a

DCL Project Number: 40315-2401

Manufacturer: QuantumFlo

Product Line: Control Panels for Prodigy, Genius, and WisperFlo Systems

Model Number: 21.20182-Q60-460/3-UUBB99999

Product Construction Summary: Double Door Painted Carbon Steel Enclosure

Options / Component Summary:
400A rotary disconnect switch, and four 460V VFDs.

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 before and after the AC 156 test.

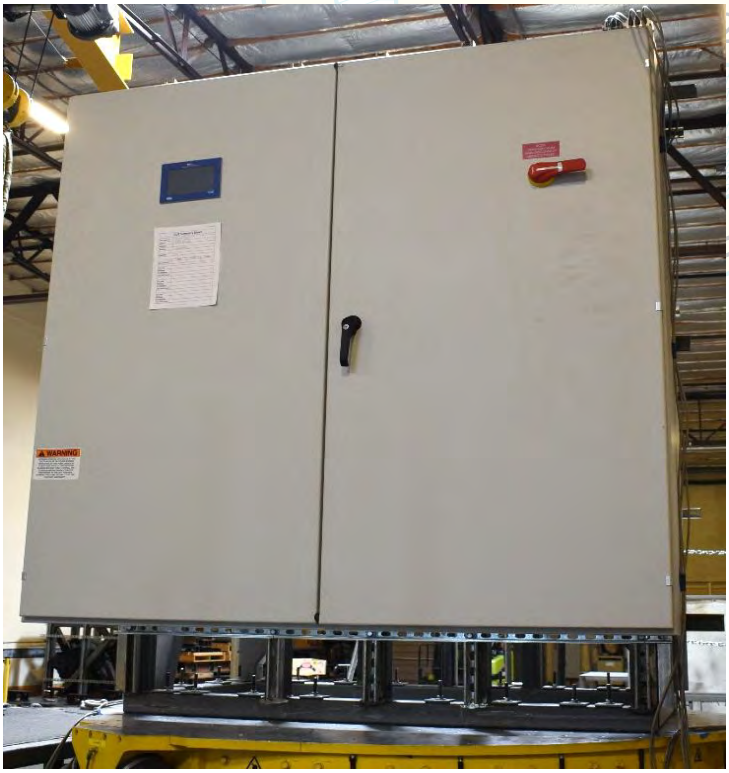
UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back (Lateral)	Side-Side (Longitudinal)	Vertical
940	72.0	17.0	72.0	N/A	N/A	N/A

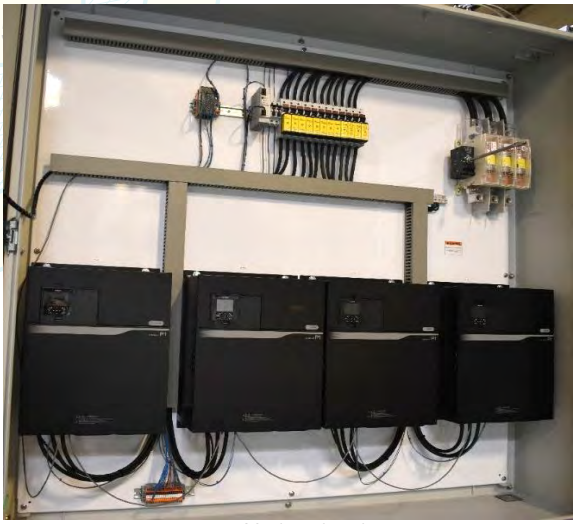
Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	H_f	Rμ	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES AC156	2.0	1.0	3.5	1.3	1.5	3.20	2.40	N/A	N/A
		2.5	0.0	1.0	1.0		N/A	N/A	1.67	0.67

Unit Mounting Description: The unit was wall mounted to the DCL wall fixture using (8) 3/8'' Grade 5 bolts, flat washers, nuts and (2) 1.6" x 1.6" x 0.3" carbon steel plate washers per bolt. The bolts were spaced 35.0'' and 34.9" apart in the side-side measured on-center and 35.1" and 34.8" apart in the vertical direction measured on-center. For the rigid setup the wall fixture was attached directly to the shake table.



UUT-02a overall view.



UUT-02a interior view.

UNIT UNDER TEST (UUT) Summary Sheet

UUT-02b

DCL Project Number: 40315-2401

Manufacturer: QuantumFlo

Product Line: Control Panels for Prodigy, Genius, and WisperFlo Systems

Model Number: 21.20182-Q60-460/3-UUBB99999

Product Construction Summary: Double Door Painted Carbon Steel Enclosure

Options / Component Summary:
400A rotary disconnect switch, and four 460V VFDs.

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 before and after the AC 156 test.

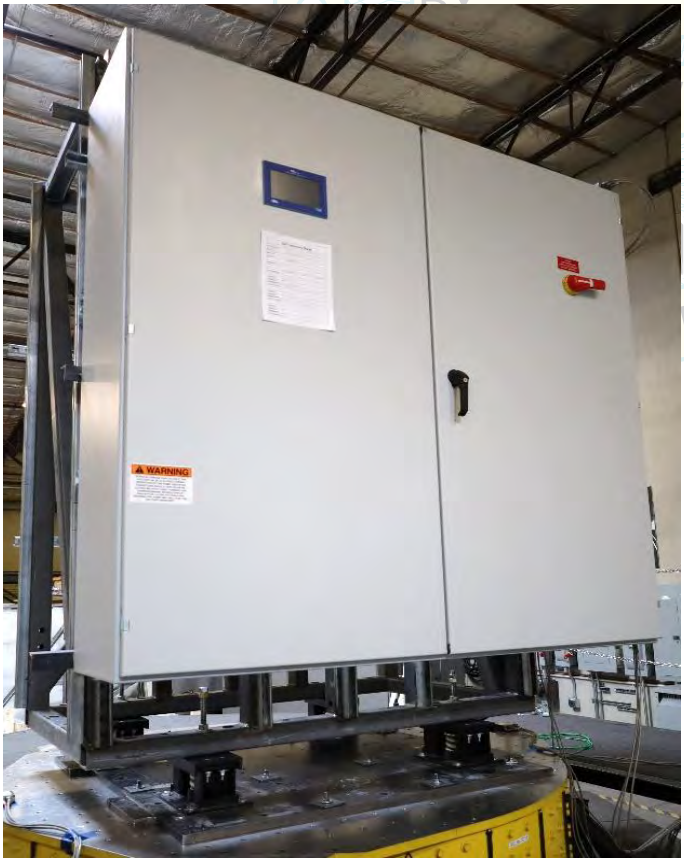
UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back (Lateral)	Side-Side (Longitudinal)	Vertical
940	72.0	17.0	72.0	N/A	N/A	N/A

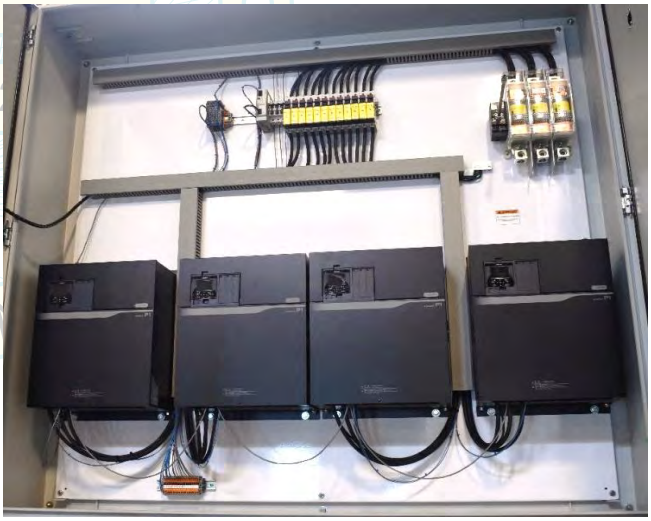
Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	H_f	Rμ	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2025	ICC-ES AC156	2.0	1.0	3.5	1.3	1.5	3.20	2.40	N/A	N/A
		2.5	0.0	1.0	1.0		N/A	N/A	1.67	0.67

Unit Mounting Description: The unit was wall mounted to the DCL wall fixture using (8) 3/8'' Grade 5 bolts, flat washers, nuts and (2) 1.6" x 1.6" x 0.3" carbon steel plate washers per bolt. The bolts were spaced 35.0'' and 34.9" apart in the side-side measured on-center and 35.1" and 34.8" apart in the vertical direction measured on-center. For the isolated setup the wall fixture was mounted to the shake table using (4) VMC MSSH-1E spring isolators.



UUT-02b overall view.


UUT-02b interior view.