



**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION  
FACILITIES DEVELOPMENT DIVISION**

**APPLICATION FOR HCAI SPECIAL SEISMIC  
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

**APPLICATION #: OSP-0491**

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

Type:  New  Renewal

**Manufacturer Information**

Manufacturer: Grundfos

Manufacturer's Technical Representative: Alan Cutruzzula, PE

Mailing Address: 5900 E Shields Avenue, Fresno, CA 93727

Telephone: (559) 294-3044 Email: acutruzzula@grundfos.com

**Product Information**

Product Name: Industrial Control Panels

Product Type: Pump Control Panels

Product Model Number: See Attachment

General Description: Controller, fuse holders and fuses, surge protector, control transformer, main disconnect switch, motor disconnect switch, various switches and pilot devices, relays, VFD and filter/fan.

Mounting Description: Rigid, Floor Mounted

Tested Seismic Enhancements: None

**Applicant Information**

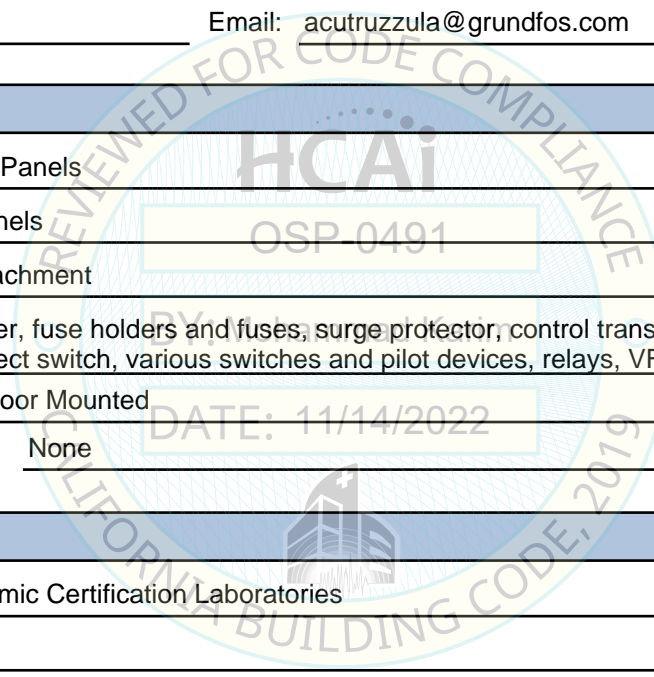
Applicant Company Name: Dynamic Certification Laboratories

Contact Person: Kelly Laplace

Mailing Address: 1315 Greg Pkwy # 109, Sparks, NV 89431

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

Title: Business Manager





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

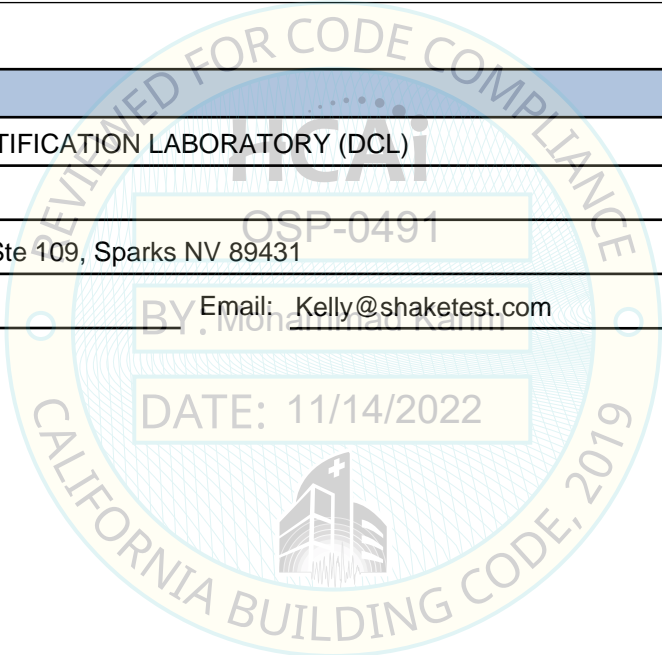
Company Name: THE VMC GROUP  
Name: Kenneth Tarlow California License Number: S2851  
Mailing Address: 980 9th Street, 16th Floor, Sacramento, CA 95814  
Telephone: (832) 627-2214 Email: ken.tarlow@thevmcgroup.com

**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 ( $F_p/W_p$ ) = 1.58

SDS (Design spectral response acceleration at short period, g) = 2.1

$a_p$  (Amplification factor) = 2.5

$R_p$  (Response modification factor) = 6.0

$\Omega_0$  (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

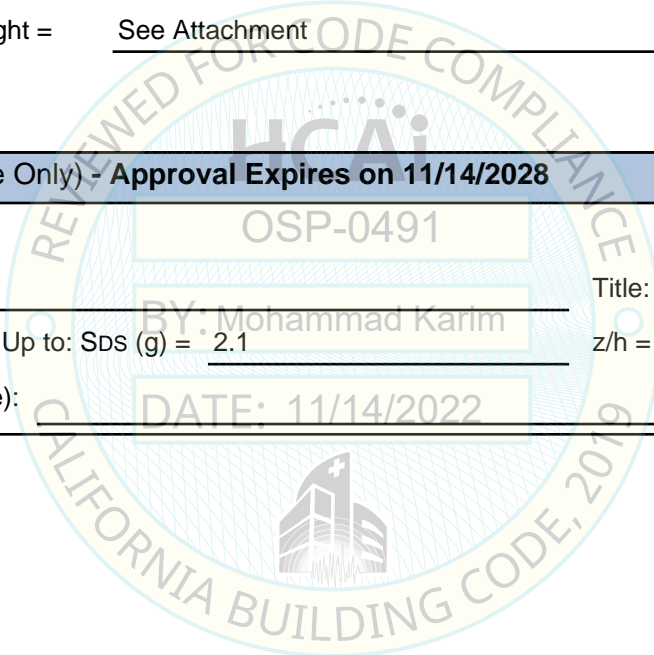
**HCAI Approval (For Office Use Only) - Approval Expires on 11/14/2028**

Date: 11/14/2022

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: SDS (g) = 2.1 z/h = 1

Condition of Approval (if applicable): DATE: 11/14/2022



# Special Seismic Certification

## Table 1: Certified Components



**DCL Project Number:** 45148-2201

**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Construction:** Powder-coated carbon steel enclosure, NEMA 12

**Certified Options:** Controller, fuse holders and fuses, surge protector, control transformer, main disconnect switch, motor disconnect switch, various switches and pilot devices, relays, VFD and filter/fan

**Mounting Description:** Rigid base mounted with Legs

**Certified Seismic Level:**  $S_{DS}=2.1g$ ;  $z/h=1.0$

Model Number <sup>1</sup>	Number of Pumps Controlled	Power (HP)	Voltage	Max. Unit Dimensions (in.)			Max. Weight (lb.)	Unit
				Width	Depth	Height		
Control MPC-EC 2x 1.5 ESS 3x208-230/240V, 60Hz	2	1.5	3x208-230/240V	37.4	17.5	59.5	268	UUT1
Control MPC-EC 2x X ESS 3x208-230/240V, 60Hz	2	1.5 to 25	3x208-230/240V	37.4 - 64.0	17.5 - 21.8	59.5 - 82.9	268 - 850	Interpolated
Control MPC-EC 2x X ESS 3x460V, 60Hz	2	1.5 to 40	3x460V					Interpolated
Control MPC-EC 3x X ESS 3x208-230/240V, 60Hz	3	1.5 to 25	3x208-230/240V					Interpolated
Control MPC-EC 3x X ESS 3x460V, 60Hz	3	1.5 to 40	3x460V					Interpolated
Control MPC-EC 4x X ESS 3x208-230/240, 60Hz	4	1.5 to 25	3x208-230/240V					Interpolated
Control MPC-EC 4x X ESS 3x460V, 60Hz	4	1.5 to 40	3x460V					Interpolated
Control MPC-EC 4x 40 ESS 3x460V, 60Hz	4	40	3x460V	64.0	21.8	82.9	850	UUT3

Note:

1. The "X" in the interpolated model numbers denotes the rated power (HP) value of the unit.

**Special Seismic Certification**  
**Table 2: Certified Subcomponents**



DCL Project: 45148-2201

Certified Seismic Level:  $S_{DS}=2.1g$ ,  $z/h=1.0$

Enclosures									
Model	Manufacturer	Enclosure Material	Leg Material	NEMA Rating	Overall Dimensions (in.)			Weight (lb.)	Unit
					Width	Depth	Height		
WM483616NC	Rittal	Powder-coated carbon steel	Powder-coated carbon steel	12	36.0	16.0	48.0	205	UUT1
TSM634720NC	Rittal			12	47.0	20.0	63.0	365	Interpolated
TSM716320NC	Rittal			12	63.0	20.0	71.0	499	UUT3

Leg Kits					
Model	Manufacturer	Height (in.)	Leg Material	Weight (lb.)	Unit
FSK1216C	Rittal	12	Powder-coated carbon steel	5.1	UUT1
9963.523	Rittal	12	Powder-coated carbon steel	20.0	UUT3

Filter/Fan Units					
Model	Manufacturer	Description	Material	Weight (lb.)	Unit
3241.110	Rittal	Filter/Fan Unit, 147 CFM, 115VAC	Composite	5.0	UUT1
3243.110	Rittal	Filter/Fan Unit, 353 CFM, 115VAC	Composite	7.9	Interpolated
3245.510	Rittal	Filter/Fan Unit, 530 CFM, 115VAC	Composite	8.3	UUT3
3110.000	Rittal	Enclosure Internal Thermostat	Composite	<1.0	UUT1, UUT3

Fuse Holders					
Model	Manufacturer	Description	Material	Weight (lb.)	Unit
DFCC2V	Schneider Electric	Class CC 2-pole Fuse Holder	Composite	<1.0	UUT1, UUT3
DFCC3V	Schneider Electric	Class CC 3-pole Fuseholder	Composite	<1.0	Interpolated
CH30J3	Bussmann	Class J 3-pole 30A Fuse Holder	Composite	1.5	UUT1
CH60J3	Bussmann	Class J 3-pole 60A Fuse Holder	Composite	1.5	Interpolated
JM60100-3CR <sup>1</sup>	Bussmann	Class J 3-pole 61-100A Fuse Block	Composite	1.0	UUT3

Fuses					
Model	Manufacturer	Description	Material	Weight (lb.)	Unit
LP-CC1-1/2	Bussmann	Class CC Fuse 1.5A	Copper/Fiberglass	<1.0	UUT1, UUT3
LP-CC2	Bussmann	Class CC Fuse 2A	Copper/Fiberglass	<1.0	Interpolated
LP-CC3	Bussmann	Class CC Fuse 3A	Copper/Fiberglass	<1.0	Interpolated
LP-CC4	Bussmann	Class CC Fuse 4A	Copper/Fiberglass	<1.0	Interpolated
LP-CC5	Bussmann	Class CC Fuse 5A	Copper/Fiberglass	<1.0	Interpolated
LP-CC10	Bussmann	Class CC Fuse 10A	Copper/Fiberglass	<1.0	Interpolated
LP-CC15	Bussmann	Class CC Fuse 15A	Copper/Fiberglass	<1.0	Interpolated
LP-CC20	Bussmann	Class CC Fuse 20A	Copper/Fiberglass	<1.0	Interpolated
LP-CC25	Bussmann	Class CC Fuse 25A	Copper/Fiberglass	<1.0	Interpolated
LP-CC30	Bussmann	Class CC Fuse 30A	Copper/Fiberglass	<1.0	Interpolated
LPJ-10SP	Bussmann	Class J Fuse 10A	Copper/Fiberglass	<1.0	UUT1
LPJ-15SP	Bussmann	Class J Fuse 15A	Copper/Fiberglass	<1.0	Interpolated
LPJ-20SP	Bussmann	Class J Fuse 20A	Copper/Fiberglass	<1.0	Interpolated
LPJ-25SP	Bussmann	Class J Fuse 25A	Copper/Fiberglass	<1.0	Interpolated
LPJ-30SP	Bussmann	Class J Fuse 30A	Copper/Fiberglass	<1.0	Interpolated
LPJ-40SP	Bussmann	Class J Fuse 40A	Copper/Fiberglass	<1.0	Interpolated
LPJ-50SP	Bussmann	Class J Fuse 50A	Copper/Fiberglass	<1.0	Interpolated
LPJ-60SP	Bussmann	Class J Fuse 60A	Copper/Fiberglass	<1.0	Interpolated
LPJ-80SP	Bussmann	Class J Fuse 80A	Copper/Fiberglass	<1.0	UUT3

**Notes:**

1. Discontinued Bussmann Model J60100-3CR has been replaced with Bussmann model JM60100-3CR. The materials, configuration, function, and attachment location are identical. Both models weigh about 1 pound.

**Special Seismic Certification**  
**Table 2: Certified Subcomponents Continued**



DCL Project: 45148-2201

Certified Seismic Level:  $S_{DS}=2.1g$ ,  $z/h=1.0$

VFD							
New Model Number <sup>1</sup>	Old Model Number	Manufacturer	Description	Enclosure	Material	Weight (lb.)	Unit
99616637	96754517	Grundfos	CUE 3x200-240V 1.5HP	A2	Composite, aluminum, carbon steel housing	10.8	UUT1
99616638	96754520	Grundfos	CUE 3x200-240V 2HP	A2	Composite, aluminum, carbon steel housing	10.8	Interpolated
99616639	96754532	Grundfos	CUE 3x200-240V 3HP	A2	Composite, aluminum, carbon steel housing	10.8	Interpolated
99616641	96754535	Grundfos	CUE 3x200-240V 5HP	A3	Composite, aluminum, carbon steel housing	14.6	Interpolated
99616642	96754536	Grundfos	CUE 3x200-240V 7.5HP	B3	Composite, aluminum, carbon steel housing	26.5	Interpolated
99616643	96754538	Grundfos	CUE 3x200-240V 10HP	B3	Composite, aluminum, carbon steel housing	26.5	Interpolated
99616644	96754539	Grundfos	CUE 3x200-240V 15HP	B3	Composite, aluminum, carbon steel housing	26.5	Interpolated
99616645	96754552	Grundfos	CUE 3x200-240V 20HP	B4	Composite, aluminum, carbon steel housing	51.8	Interpolated
99616646	96754553	Grundfos	CUE 3x200-240V 25HP	B4	Composite, aluminum, carbon steel housing	51.8	Interpolated
99616709	96754677	Grundfos	CUE 3x380-500V 1.5HP	A2	Composite, aluminum, carbon steel housing	10.8	Interpolated
99616710	96754678	Grundfos	CUE 3x380-500V 2HP	A2	Composite, aluminum, carbon steel housing	10.8	Interpolated
99616711	96754679	Grundfos	CUE 3x380-500V 3HP	A2	Composite, aluminum, carbon steel housing	10.8	Interpolated
99616713	96754681	Grundfos	CUE 3x380-500V 5HP	A2	Composite, aluminum, carbon steel housing	10.8	Interpolated
99616714	96754692	Grundfos	CUE 3x380-500V 7.5HP	A3	Composite, aluminum, carbon steel housing	14.6	Interpolated
99616715	96754693	Grundfos	CUE 3x380-500V 10HP	A3	Composite, aluminum, carbon steel housing	14.6	Interpolated
99616716	96754694	Grundfos	CUE 3x380-500V 15HP	B3	Composite, aluminum, carbon steel housing	26.5	Interpolated
99616717	96754695	Grundfos	CUE 3x380-500V 20HP	B3	Composite, aluminum, carbon steel housing	26.5	Interpolated
99616718	96754696	Grundfos	CUE 3x380-500V 25HP	B3	Composite, aluminum, carbon steel housing	26.5	Interpolated
99616719	96754697	Grundfos	CUE 3x380-500V 30HP	B4	Composite, aluminum, carbon steel housing	51.8	Interpolated
99616720	96754698	Grundfos	CUE 3x380-500V 40HP	B4	Composite, aluminum, carbon steel housing	51.8	UUT3

Main Disconnect Switches						
Model <sup>2</sup>	Manufacturer	Description	Material	Weight (lb.)	Unit	
VLS3P030R2	Schneider Electric	Nonfusible Compact Disconnect Switch 30A	Composite	<1.0	UUT1	
VLS3P063R2	Schneider Electric	Nonfusible Compact Disconnect Switch 60A	Composite	<1.0	Interpolated	
VLS3P100R2	Schneider Electric	Nonfusible Compact Disconnect Switch 100A	Composite	<1.0	Interpolated	
LK4JU3N	Schneider Electric	Nonfusible Disconnect Swtich 100A	Composite	5.0	Interpolated	
LK4MU3N	Schneider Electric	Nonfusible Disconnect Switch 200A	Composite	5.0	Interpolated	
LK4QU3N	Schneider Electric	Nonfusible Disconnect Switch 400A	Composite	14.1	UUT3	

Motor Disconnect Switches					
Model	Manufacturer	Description	Material	Weight (lb.)	Unit
VVE2	Schneider Electric	Motor Disconnect Switch 25A	Composite	<1.0	UUT1
VVE3	Schneider Electric	Motor Disconnect Switch 45A	Composite	<1.0	Interpolated
VVE4	Schneider Electric	Motor Disconnect Switch 63A	Composite	<1.0	UUT3

Notes:

- VFD model numbers have been updated due to software and driver operator interface changes. The mass, materials, configuration, function, and attachment locations remain unchanged.
- Discontinued Schneider Electric models LK4DU3CN, LK4GU3CN, and LK4JU3CN have been replaced with Schneider Electric models VLS3P030R2, VLS3P063R2, and VLS3P100R2 respectively. The materials, configuration, function, and attachment locations are identical. The models all weigh less than one pound.

## Special Seismic Certification

### Table 2: Certified Subcomponents Continued



DCL Project: 45148-2201

Certified Seismic Level:  $S_{DS}=2.1g$ ,  $z/h=1.0$

Surge Protector					
Model	Manufacturer	Description	Material	Unit	
SDSA3650	Schneider Electric	Surge Protector 3 Phase 600VAC	Composite	UUT1, UUT3	
Control Transformer					
Model	Manufacturer	Description	Housing Material	Winding Material	Unit
9070T300D50	Schneider Electric	300VA Control Transformer 208/230/460/575 x 120	Carbon Steel	Copper	UUT1, UUT3
Controllers					
Model	Manufacturer	Description	Material	Unit	
98146952	Grundfos	CU352 Controller	Composite	UUT1, UUT3	
96161730	Grundfos	I0351B Expansion Input/Output Module	Composite	UUT1, UUT3	
Relays					
Model	Manufacturer	Description	Material	Unit	
RXM2AB2F7	Schneider Electric	Miniature Plug-in Relay, DPDT, 120VAC	Composite	UUT1, UUT3	
RXZE2S108M	Schneider Electric	Relay Socket	Composite	UUT1, UUT3	
Switches and Pilot Devices					
Model	Manufacturer	Description	Material	Unit	
XB5AD25	Schneider Electric	2-position Maintained Selector Switch 1NO+1NC	Composite	UUT1, UUT3	
XB5AW34G5	Schneider Electric	Illuminated Pushbutton, Red, 1NO+1NC	Composite	UUT1, UUT3	
XB5AVG3	Schneider Electric	Pilot Light, Green, LED 120VAC	Composite	UUT1, UUT3	
XB5KSG	Schneider Electric	Annunciator, 120 VAC 85 dB	Composite	UUT1, UUT3	

**Special Seismic Certification**  
**Table 3: Tested Units**



**DCL Project Number:** 45148-2201

**Manufacturer:** Grundfos

**Product Line:** Control MPC

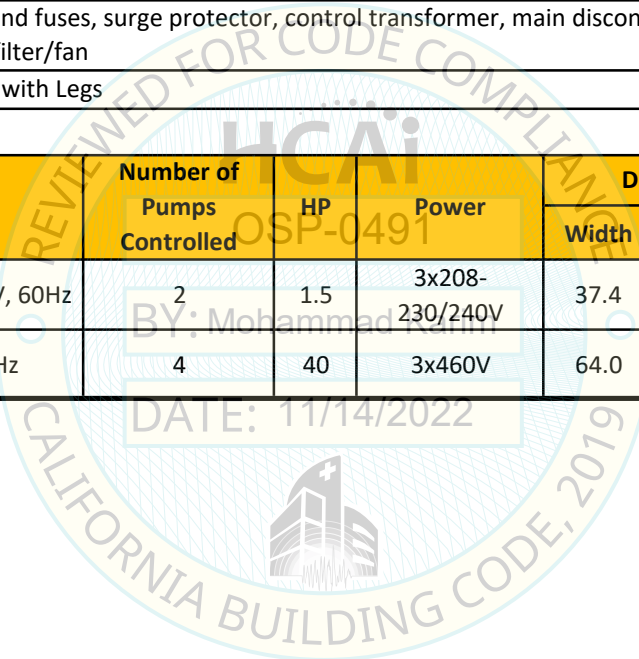
**Certified Construction:** Powder-coated carbon steel enclosure, NEMA 12

**Certified Options:** Controller, fuse holders and fuses, surge protector, control transformer, main disconnect switch, motor disconnect switch, various switches and pilot devices, relays, VFD and filter/fan

**Mounting Description:** Rigid base mounted with Legs

**Certified Seismic Level:**  $S_{DS}=2.1g$ ;  $z/h=1.0$

Model Number	Number of Pumps Controlled	HP	Power	Dimensions (in)			Weight (lb)	Unit
				Width	Depth	Height		
Control MPC-EC 2x 1.5 ESS 3x208-230/240V, 60Hz	2	1.5	3x208-230/240V	37.4	17.5	59.5	268	UUT1
Control MPC-EC 4x 40 ESS 3x460V, 60Hz	4	40	3x460V	64.0	21.8	82.9	850	UUT3





# UUT1

## DCL Test Report 38320-1401 UNIT UNDER TEST (UUT) Summary Sheet



DCL Project Number: 45148-2201

Manufacturer: Grundfos

Product Line: Control MPC

Model Number: Control MPC-EC 2x 1.5 ESS 3x208-230/240V, 60Hz

**Product Construction Summary:**

Powder-coated carbon steel cabinet

**Options / Component Summary:**

208V unit with controller, fuses, surge protector, control transformer, main disconnect switch, motor disconnect switch and various other switches and pilot devices, relays, VFD and filter/fan.

**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.

**UUT Properties**

Unit	Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
		Width	Depth	Height	Front-Back	Side-Side	Vertical
UUT1	268	37.4	17.5	59.5	7.5	16.0	19.0

**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 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

**Unit Mounting Description:** The unit was mounted to the DCL shake table interface plate with (8) 1/2-inch diameter Grade 5 bolts. The panel was attached to the provided Rittal FSK1216C leg kit with (3) M10 bolts per leg.



Overall View of UUT1

# UUT3

## DCL Test Report 45095-1601

### UNIT UNDER TEST (UUT) Summary Sheet



DCL Project Number: 45148-2201

Manufacturer: Grundfos

Product Line: Control MPC

Model Number: Control MPC-EC 4x 40 ESS 3x460V, 60Hz

**Product Construction Summary:**

Powder-coated carbon steel cabinet

**Options / Component Summary:**

460V unit with controller, fuses, surge protector, control transformer, main disconnect switch, motor disconnect switch and various other switches and pilot devices, relays, VFD and filter/fan.

**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.**

*UUT Properties*

Unit	Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
		Width	Depth	Height	Front-Back	Side-Side	Vertical
UUT3	850	64.0	21.8	82.9	12.0	8.3	>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 2022	ICC-ES AC156	2.1	1.0	1.5	3.36	2.52	1.40	0.56

**Unit Mounting Description:** The unit was mounted to the DCL shake table interface plate with (4) 1/2-inch diameter Grade 5 bolts and 2-inch square 1/4-inch thick plate washers. The panel was attached to the pre-installed Rittal model 9963.523 leg kit with (4) M12 bolts per leg.



Overall View of UUT3