



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT  
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC  
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP – 0491 – 10

OSHPD 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: Control MPC

Product Type: Control Panels

Product Model Number: See Attachment

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

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 base mount

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John Giuliano

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

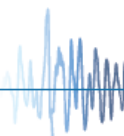
Telephone: (973) 8388-1780 Email: john.giuliano@thevmcgroup.com

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:  Date: 11/29/16

Title: President Company Name: The VMC Group

"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: The VMC Group

Name: Ken 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): \_\_\_\_\_

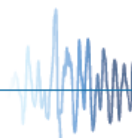
**Testing Laboratory**

Company Name: Dynamic Certification Laboratories

Contact Name: Kelly Laplace, Project Manager

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

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





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**Seismic Parameters**

Design in accordance with ASCE 7-10 Chapter 13: ☒ Yes ☐ No

Design Basis of Equipment or Components ( $F_p/W_p$ ) = 1.88 (Sds 2.5 g), 1.58 (Sds 2.1 g), 1.20 (Sds 1.6 g)

$S_{DS}$  (Design spectral response acceleration at short period, g) = 2.5, 2.1, or 1.6 (See attachment)

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

$R_p$  (Equipment or component response modification factor) = 6.0

$\Omega_0$  (System overstrength factor) = 1.5

$I_p$  (Importance factor) = 1.5

$z/h$  (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = See attachments

Overall dimensions and weight (or range thereof) = See attachments

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: ☐ Yes ☒ No

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

$S_{DS}$  (Design spectral response acceleration at short period, g) = \_\_\_\_\_

$S_{D1}$  (Design spectral response acceleration at 1 second period, g) = \_\_\_\_\_

$R$  (Response modification coefficient) = \_\_\_\_\_

$\Omega_0$  (System overstrength factor) = \_\_\_\_\_

$C_d$  (Deflection amplification factor) = \_\_\_\_\_

$I_p$  (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 ☒ No

**List of Attachments Supporting Special Seismic Certification**

☒ Test Report(s) ☒ Drawings ☐ Calculations ☒ Manufacturer's Catalog

☒ Other(s) (Please Specify): Certified Component Table Attachment

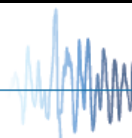
**OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2022**

Signature: Ali Sumer Date: March 13, 2017

Print Name: Ali Sumer Title: DSE

Special Seismic Certification Valid Up to :  $S_{DS}$  (g) = See Above  $z/h$  = See Above

Condition of Approval (if applicable): \_\_\_\_\_



## Special Seismic Certification Certified Components



**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

Model Number <sup>1</sup>	Number of Pumps Controlled	Power (HP)	Voltage	Max. Unit Dimensions (in.)			Max. Weight (lb.)	Sds (g), z/h=1 <sup>2</sup>	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	2.5	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	2.1	Interpolated
Control MPC-EC 2x X ESS 3x460V, 60Hz	2	1.5 to 40	3x460V					2.1	Interpolated
Control MPC-EC 3x X ESS 3x208-230/240V, 60Hz	3	1.5 to 25	3x208-230/240V					2.1	Interpolated
Control MPC-EC 3x X ESS 3x460V, 60Hz	3	1.5 to 40	3x460V					2.1	Interpolated
Control MPC-EC 4x X ESS 3x208-230/240, 60Hz	4	1.5 to 25	3x208-230/240V					2.1	Interpolated
Control MPC-EC 4x X ESS 3x460V, 60Hz	4	1.5 to 40	3x460V					2.1	Interpolated
Control MPC-EC 4x 40 ESS 3x460V, 60Hz	4	40	3x460V	64.0	21.8	82.9	850	2.1	UUT3
Control MPC-EC 2x X ESS 3x460V, 60Hz	2	50 to 60	3x460V	64.0 - 72.5	21.8	82.9	850 - 1,060	1.6	Interpolated
Control MPC-EC 3x X ESS 3x460V, 60Hz	3	50 to 60	3x460V					1.6	Interpolated
Control MPC-EC 4x X ESS 3x460V, 60Hz	4	50 to 60	3x460V					1.6	Interpolated
Control MPC-EC 4x 60 ESS 3x460V, 60Hz	4	60	3x460V	72.5	21.8	82.9	1,060	1.6	UUT2

Note:

1. The "X" in the interpolated model numbers denotes the rated power (HP) value of the unit.
2. Certification level is limited to the lower rating of either the Certified Components, as listed here, or the subcomponents, as listed on the Certified Subcomponent tables.

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Subcomponents:** Enclosures and leg kit

Enclosures											
Model	Manufacturer	Enclosure Material	Leg Material	NEMA Rating	Overall Dimensions (in.)			Weight (lb.)	Mounting	Sds (g), z/h=1 <sup>1</sup>	Unit
					Width	Depth	Height				
WM483616NC	Rittal	Powder-coated carbon steel	Powder-coated carbon steel	12	36.0	16.0	48.0	205	Rigid base mounted	2.5	UUT1
TSFM634720NC	Rittal			12	47.0	20.0	63.0	365		2.1	Interpolated
TSFM716320NC	Rittal			12	63.0	20.0	71.0	499		2.1	UUT3
TSFM717120NC	Rittal			12	71.0	20.0	71.0	561		1.6	UUT2

Leg Kit					
Model	Manufacturer	Leg Material	Height (in.)	Sds (g), z/h=1 <sup>1</sup>	Unit
FSK1216C	Rittal	Powder-coated carbon steel	12	2.5	UUT1, UUT2, UUT3

### Notes:

1. Certification level is limited to the lower rating of either the Certified Subcomponents, as listed here, or the components, as listed on the Certified Components table.

# Special Seismic Certification Certified Subcomponents



**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Subcomponents:** Controllers

Controllers					
Model	Manufacturer	Description	Material	Sds (g), z/h=1 <sup>1</sup>	Unit
98146952	Grundfos	CU352 Controller	Composite	2.1	UUT1, UUT2, UUT3
96161730	Grundfos	IO351B Expansion Input/Output Module	Composite		UUT1, UUT2, UUT3

Note:

1. Certification level is limited to the lower rating of either the Certified Subcomponents, as listed here, or the components, as listed on the Certified Components table.

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Subcomponents:** Fuse holders and fuses

### Fuse Holders

Model	Manufacturer	Description	Material	Sds (g), z/h=1 <sup>1</sup>	Unit
DFCC2V	Schneider Electric	Class CC 2-pole Fuse Holder	Composite	2.1	UUT1, UUT2, UUT3
DFCC3V	Schneider Electric	Class CC 3-pole Fuseholder	Composite	2.1	Interpolated
CH30J3	Bussmann	Class J 3-pole 30A Fuse Holder	Composite	2.5	UUT1
CH60J3	Bussmann	Class J 3-pole 60A Fuse Holder	Composite	2.1	Interpolated
J60100-3CR	Bussmann	Class J 3-pole 61-100A Fuseblock	Composite	2.1	UUT2, UUT3

### Fuses

Model	Manufacturer	Description	Material	Sds (g), z/h=1 <sup>1</sup>	Unit
LP-CC1-1/2	Bussmann	Class CC Fuse 1.5A	Copper/Fiberglass	2.1	UUT1, UUT2, UUT3
LP-CC10	Bussmann	Class CC Fuse 10A	Copper/Fiberglass	2.1	Interpolated
LP-CC15	Bussmann	Class CC Fuse 15A	Copper/Fiberglass	2.1	Interpolated
LP-CC20	Bussmann	Class CC Fuse 20A	Copper/Fiberglass	2.1	Interpolated
LP-CC25	Bussmann	Class CC Fuse 25A	Copper/Fiberglass	2.1	Interpolated
LP-CC30	Bussmann	Class CC Fuse 30A	Copper/Fiberglass	2.1	Interpolated
LPJ-10SP	Bussmann	Class J Fuse 10A	Copper/Fiberglass	2.5	UUT1
LPJ-15SP	Bussmann	Class J Fuse 15A	Copper/Fiberglass	2.1	Interpolated
LPJ-20SP	Bussmann	Class J Fuse 20A	Copper/Fiberglass	2.1	Interpolated
LPJ-25SP	Bussmann	Class J Fuse 25A	Copper/Fiberglass	2.1	Interpolated
LPJ-30SP	Bussmann	Class J Fuse 30A	Copper/Fiberglass	2.1	Interpolated
LPJ-40SP	Bussmann	Class J Fuse 40A	Copper/Fiberglass	2.1	Interpolated
LPJ-50SP	Bussmann	Class J Fuse 50A	Copper/Fiberglass	2.1	Interpolated
LPJ-60SP	Bussmann	Class J Fuse 60A	Copper/Fiberglass	2.1	Interpolated
LPJ-80SP	Bussmann	Class J Fuse 80A	Copper/Fiberglass	2.1	UUT3
LPJ-100SP	Bussmann	Class J Fuse 100A	Copper/Fiberglass	1.6	UUT2

Note:

1. Certification level is limited to the lower rating of either the Certified Subcomponents, as listed here, or the components, as listed on the Certified Components table.

# Special Seismic Certification Certified Subcomponents



**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Subcomponents:** Surge protector

Surge Protector					
Model	Manufacturer	Description	Material	Sds (g), z/h=1 <sup>1</sup>	Unit
SDSA3650	Schneider Electric	Surge Protector 3 Phase 600VAC	Composite	2.1	UUT1, UUT2, UUT3

Note:

1. Certification level is limited to the lower rating of either the Certified Subcomponents, as listed here, or the components, as listed on the Certified Components table.



# Special Seismic Certification Certified Subcomponents



**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Subcomponents:** Control transformer

Control Transformer						
Model	Manufacturer	Description	Housing Material	Winding Material	Sds (g), z/h=1 <sup>1</sup>	Unit
9070T300D50	Schneider Electric	300VA Control Transformer 208/230/460/575 x 120	Carbon Steel	Copper	2.1	UUT1, UUT2, UUT3

Note:

1. Certification level is limited to the lower rating of either the Certified Subcomponents, as listed here, or the components, as listed on the Certified Components table.

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Subcomponents:** Main disconnect switches

Main Disconnect Switches					
Model	Manufacturer	Description	Material	Sds (g), z/h=1 <sup>1</sup>	Unit
LK4DU3CN	Schneider Electric	Nonfusible Compact Disconnect Switch 30A	Composite	2.5	UUT1
LK4GU3CN	Schneider Electric	Nonfusible Compact Disconnect Switch 60A	Composite	2.1	Interpolated
LK4JU3CN	Schneider Electric	Nonfusible Compact Disconnect Switch 100A	Composite	2.1	Interpolated
LK4JU3N	Schneider Electric	Nonfusible Disconnect Switch 100A	Composite	2.1	Interpolated
LK4MU3N	Schneider Electric	Nonfusible Disconnect Switch 200A	Composite	2.1	Interpolated
LK4QU3N	Schneider Electric	Nonfusible Disconnect Switch 400A	Composite	2.1	UUT2, UUT3

Note:

1. Certification level is limited to the lower rating of either the Certified Subcomponents, as listed here, or the components, as listed on the Certified Components table.

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Subcomponents:** Motor disconnect switches

Motor Disconnect Switches					
Model	Manufacturer	Description	Material	Sds (g), z/h=1 <sup>1</sup>	Unit
VVE2	Schneider Electric	Motor Disconnect Switch 25A	Composite	2.5	UUT1
VVE3	Schneider Electric	Motor Disconnect Switch 45A	Composite	2.1	Interpolated
VVE4	Schneider Electric	Motor Disconnect Switch 63A	Composite	2.1	UUT3
VCCF5	Schneider Electric	Motor Disconnect Switch 100A	Composite	1.6	UUT2

Note:

1. Certification level is limited to the lower rating of either the Certified Subcomponents, as listed here, or the components, as listed on the Certified Components table.

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Subcomponents:** Switches and pilot devices

Switches and Pilot Devices					
Model	Manufacturer	Description	Material	Sds (g), z/h=1 <sup>1</sup>	Unit
XB5AD25	Schneider Electric	2-position Maintained Selector Switch 1NO+1NC	Composite	2.1	UUT1, UUT2, UUT3
XB5AW34G5	Schneider Electric	Illuminated Pushbutton, Red, 1NO+1NC	Composite	2.1	UUT1, UUT2, UUT3
XB5AVG3	Schneider Electric	Pilot Light, Green, LED 120VAC	Composite	2.1	UUT1, UUT2, UUT3
XB5KSG	Schneider Electric	Annunciator, 120 VAC 85 dB	Composite	2.1	UUT1, UUT2, UUT3

Note:

1. Certification level is limited to the lower rating of either the Certified Subcomponents, as listed here, or the components, as listed on the Certified Components table.

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Subcomponents:** Relays

Relays					
Model	Manufacturer	Description	Material	Sds (g), z/h=1 <sup>1</sup>	Unit
RXM2AB2F7	Schneider Electric	Miniature Plug-in Relay, DPDT, 120VAC	Composite	2.1	UUT1, UUT2, UUT3
RXZE2S108M	Schneider Electric	Relay Socket	Composite	2.1	UUT1, UUT2, UUT3

Note:

1. Certification level is limited to the lower rating of either the Certified Subcomponents, as listed here, or the components, as listed on the Certified Components table.

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Subcomponents:** VFD

VFD						
Model	Manufacturer	Description	Enclosure	Material	Sds (g), z/h=1 <sup>1</sup>	Unit
96754517	Grundfos	CUE 3x200-240V 1.5HP	A2	Composite, aluminum, carbon steel housing	2.5	UUT1
96754520	Grundfos	CUE 3x200-240V 2HP	A2	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754532	Grundfos	CUE 3x200-240V 3HP	A2	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754535	Grundfos	CUE 3x200-240V 5HP	A3	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754536	Grundfos	CUE 3x200-240V 7.5HP	B3	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754538	Grundfos	CUE 3x200-240V 10HP	B3	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754539	Grundfos	CUE 3x200-240V 15HP	B3	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754552	Grundfos	CUE 3x200-240V 20HP	B4	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754553	Grundfos	CUE 3x200-240V 25HP	B4	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754677	Grundfos	CUE 3x380-500V 1.5HP	A2	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754678	Grundfos	CUE 3x380-500V 2HP	A2	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754679	Grundfos	CUE 3x380-500V 3HP	A2	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754681	Grundfos	CUE 3x380-500V 5HP	A2	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754692	Grundfos	CUE 3x380-500V 7.5HP	A3	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754693	Grundfos	CUE 3x380-500V 10HP	A3	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754694	Grundfos	CUE 3x380-500V 15HP	B3	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754695	Grundfos	CUE 3x380-500V 20HP	B3	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754696	Grundfos	CUE 3x380-500V 25HP	B3	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754697	Grundfos	CUE 3x380-500V 30HP	B4	Composite, aluminum, carbon steel housing	2.1	Interpolated
96754698	Grundfos	CUE 3x380-500V 40HP	B4	Composite, aluminum, carbon steel housing	2.1	UUT3
96754699	Grundfos	CUE 3x380-500V 50HP	B4	Composite, aluminum, carbon steel housing	1.6	Interpolated
96754700	Grundfos	CUE 3x380-500V 60HP	C3	Composite, aluminum, carbon steel housing	1.6	UUT2

Note:

1. Certification level is limited to the lower rating of either the Certified Subcomponents, as listed here, or the components, as listed on the Certified Components table.

## Special Seismic Certification Certified Subcomponents



**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Certified Subcomponents:** Filter/fan units

Filter/Fan Units					
Model	Manufacturer	Description	Material	Sds (g), z/h=1 <sup>1</sup>	Unit
3241.110	Rittal	Filter/Fan Unit, 147 CFM, 115VAC	Composite	2.5	UUT1
3243.110	Rittal	Filter/Fan Unit, 353 CFM, 115VAC	Composite	2.1	Interpolated
3245.510	Rittal	Filter/Fan Unit, 530 CFM, 115VAC	Composite	2.1	UUT2, UUT3
3110.000	Rittal	Enclosure Internal Thermostat	Composite	2.1	UUT1, UUT2, UUT3

Note:

1. Certification level is limited to the lower rating of either the Certified Subcomponents, as listed here, or the components, as listed on the Certified Components table.

## Special Seismic Certification

### Tested Components



**Manufacturer:** Grundfos

**Product Line:** Control MPC

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

**Tested 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

**Tested Mounting Description:** Rigid base mounted

Model Number	Number of Pumps Controlled	HP	Power	Dimensions (in)			Weight (lb)	Sds (g), z/h=1	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	2.50	UUT1
Control MPC-EC 4x 40 ESS 3x460V, 60Hz	4	40	3x460V	64.0	21.8	82.9	850	2.10	UUT3
Control MPC-EC 4x 60 ESS 3x460V, 60Hz	4	60	3x460V	72.5	21.8	82.9	1,060	1.60	UUT2



**UUT1****UNIT UNDER TEST (UUT) Summary Sheet****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 2016	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 eight 1/2-inch diameter Grade 5 bolts.

**UUT2****UNIT UNDER TEST (UUT) Summary Sheet****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
UUT2	1,060	72.5	21.8	82.9	2.0	7.0	32.3

**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 2016	ICC-ES AC156	1.6	1.0	1.5	2.56	1.92	1.07	0.43

**Unit Mounting Description:**

The unit was mounted to the DCL shake table interface plate with four 1/2-inch diameter Grade 5 bolts.

## UUT3



### UNIT UNDER TEST (UUT) Summary Sheet

**Manufacturer:** Grundfos

**Product Line:** Control MPC

**Model Number:** Control MPC-EC 4x 60 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 2016	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 four 1/2-inch diameter Grade 5 bolts and 2-inch square 1/4-inch thick plate washers.