APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0363

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: **DANFOSS DRIVES**

Manufacturer's Technical Representative: Mahamed Tabrez

Mailing Address: 8800 W. Bradley Road, Milwaukee, WI. 53224

Telephone: (414) 355-8800 Email: ON FILE

Product Information

Product Name: PHD Panels

Product Type: Variable Frequency Drive panels

Product Model Number: See Attachment 1, Table 1.
(List all unique product identification numbers and/or part numbers)

General Description: NEMA 1/12/3R rated carbon steel enclosures housing Danfoss VLT drives with additional tuned filter elements to mitigate harmonics.

Mounting Description: Rigid base mounted & rigid wall mounted. See attachments.

Applicant Information

Applicant Company Name: **EASE**

Contact Person: Jonathan Roberson, S.E.

Mailing Address: 5877 Pine Ave, Suite 210, Chino Hills, CA. 91709

Telephone: (909) 606-7622 Email: j.roberson@easeco.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: October 1, 2019

Title: Principal Structural Engineer Company Name: **EASE**

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

Company Name: **EASE**

Name: Jonathan Roberson, S.E. California License Number: S4197

Mailing Address: 5877 Pine Ave, Suite 210, Chino Hills, CA. 91709

Telephone: (909) 606-7622 Email: j.roberson@easeco.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: Environmental Testing Laboratory, Inc.

Contact Name: Brady Richard

Mailing Address: 11034 Indian Trail, Dallas, TX. 75229-3513

Telephone: (972) 247-9657 Email: brady@etldallas.com

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = **1.88g**

S_{DS} (Design spectral response acceleration at short period, g) = **2.60**

a_p (In-structure equipment or component amplification factor) = **1**

R_p (Equipment or component response modification factor) = **2½**

Ω_0 (System overstrength factor) = **2**

I_p (Importance factor) = **1.5**

z/h (Height factor ratio) = **1**

Equipment or Component Natural Frequencies (Hz) = **See Attachment 2**

Overall dimensions and weight (or range thereof) = **See Attachment 1**

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) =

Ω_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): **Attachments 1 & 2**

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

Signature: M. Aliaari Date: October 23, 2020

Print Name: Mohammad Aliaari Title: Senior Structural Engineer

Special Seismic Certification Valid Up to : S_{DS} (g) = 2.60 z/h = 1

Condition of Approval (if applicable):

TABLE 1: DANFOSS PHD PANELS

Manufacturer	**DANFOSS DRIVES**
Product Line	**PHD PANELS**
Type Code	**PHD#02…** [2]

PHD PANEL SIZE	DRIVE HP	VAC	BYPASS	APPROX. DIMENSIONS (IN.) [3] W	D	H	MAX. WT. (LB.)	MOUNT	BASIS [1]
Panel 1	25	480	3C	28.3	22.5	44.3	322	Wall	UUT-1
	1.5 – 25	480 / 600	N0, 3C	28.3	22.5	44.3	322	Wall	INT
Panel 2	1.5 – 25	480 / 600	3C, SS	38.3	23.5	55.3	390	Wall	INT
	25	480	SS	34.3	20.9	55.3	369	Wall	UUT-2
	30 – 75	480 / 600	N0, 3C	38.3	23.5	55.3	598	Wall	INT
	75	480	3C	38.3	23.5	55.3	598	Wall	UUT-3
Panel 3	75	480	SS	42.0	23.0	75.1	862	Floor	UUT-4
	30 – 75	480 / 600	SS	43.8	25.5	75.1	862	Floor	INT
	100 – 125	480 / 600	N0				957	Floor	INT
Panel 4	100 – 125	480 / 600	3C, SS	51.8	25.5	87.1	1256	Floor	INT
Panel 5	150 – 250	480	N0	45.8	38.4	79.1	1647	Floor	INT
	150 – 200	600							
Panel 6	150 – 250	480	3C, SS	64.8	38.4	87.1	1980	Floor	INT
	150 – 200	600							
Panel 7	300 – 450	480	N0	54.6	44.4	93.1	2361	Floor	INT
	250 – 400	600							
Panel 8	300 – 450	480	N0	51.0	33.0	97.1	2351	Floor	INT
	250 – 400	600							
Panel 9	300 – 450	480	3C, SS	91.6	44.4	93.1	3169	Floor	INT
	250 – 400	600							
Panel 10	500 – 600	480	N0	81.6	44.7	97.1	3412	Floor	INT
	450 – 650	600							
Panel 11	500 – 600	480	3C, SS	118.8	44.7	97.1	4225	Floor	INT
	450 – 650	600							
	600	480	3C	118.8	44.7	97.1	4225	Floor	UUT-5

Enclosure	11 ga. (floor mounted) / 14 ga. (wall mounted) carbon steel. NEMA/UL rated 1 / 12 / 3R.
Mounting	RIGID BASE (FLOOR) MOUNTED: a free-standing, base mounted condition with the component rigidly attached to a supporting structure and no lateral support above the base. RIGID WALL MOUNTED: component is fully supported vertically and laterally by a building wall or partition.
Notes	1. BASIS: • UUT#: Indicates that a test specimen matching these characteristics was tested. • INT (Interpolate or Extrapolate): indicates a model that was not specifically tested, and by which seismic qualification was established through evaluation of testing of other, similar models in the product line. 2. Type Code defines the configuration of the PhD Panel. Each alphanumeric character defines a configurable option in the panel. For a complete listing of the Type Code characters recognized and accepted by this report, see Figure 1. 3. Dimensions listed for untested panels are for NEMA 3R enclosures. In most cases the dimensions of NEMA 1/12 enclosures will be smaller. The difference is the extent of the rain hood found on NEMA 3R versions.

FIGURE1: CERTIFIED DRIVE TYPE CODES

P	H	D		0	2													O	X	X								X	X
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Character	Parameter	Allowed Value	Description
1-3	Prefix	PHD	Panel product line
4-6	VLT Drive series	102	VLT® HVAC Drive (FC102)
		202	VLT® AQUA Drive (FC202)
7-9	Drive Power Size	1H5	1.5 HP
		002	2 HP
		003	3 HP
		005	5 HP
		7H5	7.5 HP
		010	10 HP
		015	15 HP
		020	20 HP
		025	25 HP
		030	30 HP
		040	40 HP
		050	50 HP
		060	60 HP
		075	75 HP
		100	100 HP
		125	125 HP
		150	150 HP
		200	200 HP
		250	250 HP
		300	300 HP
		350	350 HP
		400	400 HP
		450	450 HP
		500	500 HP
		550	550 HP
		600	600 HP
		650	650 HP
10-11	AC Line Voltage	T4	480 VAC
		T6	600 VAC
12-14	Enclosure	E01	Nema 1
		E12	Nema 12
		E3R	Nema 3R
15-16	RFI filter	NO	No Bypass
		3C	3 Contactor Bypass
		SS	SS Bypass
17	Switches	M	Main Fused Disconnect
		C	Main Circuit Breaker
18	Dv/dt output filter	X	No Filter
		D	Dv/Dt Output Filter
19	Motor Efficiency	X	NEC Table 430 Motor
		E	EISA Efficiency Motor (Premium Efficiency)
20	OSHPD	O	OSHPD Seismic Pre-Approval
21-22	Reserved for Future Use	XX	None (Reserved for Future Use)
23	RFI Filter	X	No RFI Filter
		1	Class A1/B Filter
		2	Class A2 Filter (Std)
24	Coating	X	No Coating
		C	Coating
25	Brake Chopper	X	No Option
		B	Brake Chopper
		T	Safe Stop
		U	BC & Safe Stop
26	A Options	X	No A Option
		0	Profibus DPV1(101)
		4	DeviceNet (104)
		G	LonWorks (108)

Table continues next page

FIGURE1: CERTIFIED DRIVE TYPE CODES *(continued)*

Character	Parameter	Allowed Value	Description
26	A Options	J	BACNet (109)
		L	Profinet SRT (120)
		N	Ethernet IP (121)
		Q	Modbus
27	B Options	X	No B Option
		0	Analog I/O (109)
		2	Thermistor Card (112)
		4	Sensor Input (114)
		K	General Purpose I/O (101)
		P	Relay Card (105)
		Y	Extended Cascade Control
28	C Options	X	No C Option
		5	Cascade Control
29	D Options	X	No Option
		0	24VDC Backup
30-31	Reserved for Future Use	XX	None (Reserved for Future Use)

TABLE 2: SHAKE TABLE TEST PARAMETERS

BUILDING CODE	TEST CRITERIA	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2019	ICC-ES AC156	2.6	1.0	1.5	4.16	3.12	1.74	0.70

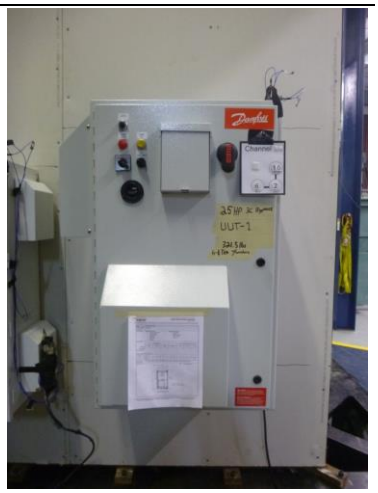
All test specimens below maintained structural integrity and functionality at the conclusion of all testing.

UUT-1: 25HP 3C BYPASS

Description:

Standard Components
25 HP AQUA Drive
480 V 3-Phase
NEMA 3R Enclosure
3 Contactor Bypass
Main Fused Disconnect
Class A2 Input RFI Filter
Brake Chopper
Option Card A (Profinet SRT)
Option Card B (Analog I/O (109))
Option Card C(Cascade Control)
24V DC Backup

Additional Components
XT Circuit Breaker
dv/dt Filter
Additional 1.5HP HVAC (for add'l option cards)
Class A1 Input RFI Filter
Comm. Card A (LonWorks)
Option Card B (Relay Card)



Mounting: Rigid Wall mounted using (6) – 3/8" dia. Grade 8 bolts

Dimensions:	W (in.)	D (in.)	H (in.)
	28.3	22.5	44.3

Weight: 322 lbs.

Resonance Frequencies:	X-Axis	Y-Axis	Z-Axis
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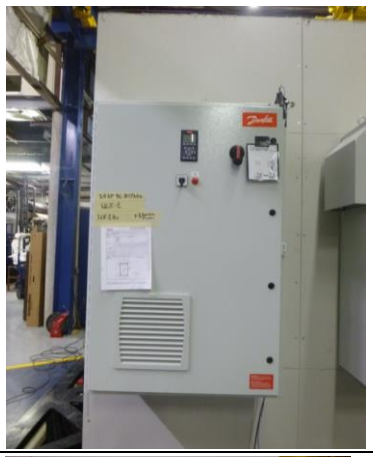
Typecode PHD202025T4E3R3CMXNX2CBL050 P/N: 177X0194

UUT-2: 25HP SS BYPASS

Description:

Standard Components
25 HP HVAC Drive
480 V 3-Phase
NEMA 1 Enclosure
Soft Start Bypass
Main Fused Disconnect
Class A2 Input RFI Filter
Brake Chopper
Option Card A (Modbus TCP)
Option Card B (Gen Purpose I/O)
24V DC Backup



Mounting: Rigid Wall mounted using (8) – 3/8" dia. Grade 8 bolts

Dimensions:	W (in.)	D (in.)	H (in.)
	34.3	20.9	55.3

Weight: 369 lbs.

Resonance Frequencies:	X-Axis	Y-Axis	Z-Axis
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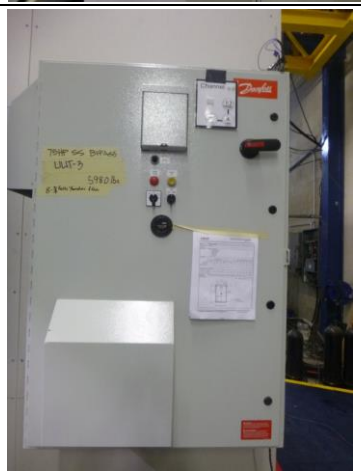
Typecode PHD102025T4E01SSMXNX2CBQKX0 P/N: 177X0881

UUT-3: 75HP 3C BYPASS

Description:

Standard Components
75 HP AQUA Drive
480 V 3-Phase
NEMA 3R Enclosure
3 Contactor Bypass
Main Circuit Breaker
Class A1 Input RFI Filter
Brake Chopper
Option Card A (Profibus DPV1)
Option Card B Relay Card)
Option Card C (Cascade Control)
24V DC Backup

Additional Components
dv/dt Filter
XT Circuit Breaker



Mounting: Rigid Wall mounted using (8) – 3/8" dia. Grade 8 bolts

Dimensions:	W (in.)	D (in.)	H (in.)
	38.3	23.5	55.3

Weight: 598 lbs.

Resonance Frequencies:	X-Axis	Y-Axis	Z-Axis
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Typecode PHD202075T4E3R3CCXNX1CB0P50 P/N: 177X0195

UUT-4: 75HP SS BYPASS

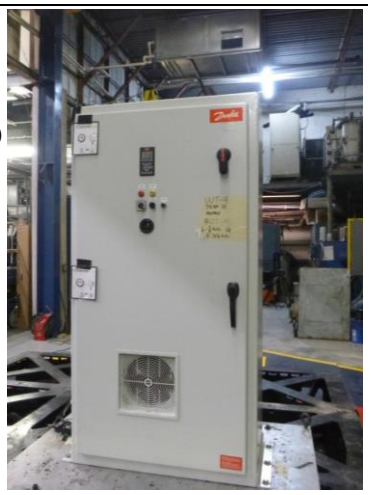
Description:

Standard Components

75 HP AQUA Drive
480 V 3-Phase
NEMA 12 Enclosure
Soft Starter Bypass
Main Circuit Breaker
dv/dt Filter
Class A1 Input RFI Filter
Brake Chopper
Option Card A (Profibus DPV1)
Option Card B (Gen Purpose I/O)
Option Card C (Cascade Control)
24V DC Backup

Additional Components

XT Circuit Breaker
75HP Contactor for 3C Bypass
75HP Overload for 3C Bypass
Additional 3HP AQUA (for add'l card options)
Class A2 Input RFI Filter
Option Card A (Device net)
Option Card B (Sensor Input)



Mounting: Rigid base mount w/ (6) – 5/8" dia. bolts + (2) – ½" dia. Bolts

Dimensions:	W (in.)	D (in.)	H (in.)
	42	23	75.1

Weight: 862 lbs.

Resonance Frequencies:	X-Axis	Y-Axis	Z-Axis
	11.9	16.0	29.9

Typecode PHD202075T4E12SSCDNX1CBQP50 P/N: 177X0200

UUT-5: 600HP SS BYPASS

Description:

Standard Components

600 HP HVAC Drive
480 V 3-Phase
NEMA 3R Enclosure
Softstart Bypass
Circuit Breaker
dv/dt Output Filter
Brake Chopper
24V DC Backup
Option Card A (BACNet)
Option Card B (Gen. Purpose I/O)
Class A2 Input RFI Filter

Additional Components

650HP Overload for 3C Bypass
Additional 1.5 Aqua Drive (for additional option cards)
Class A1 Input RFI Filter
Option Card A (Ethernet)
Option Card B (Relay)
Option Card C (Cascade Control)

Mounting: Rigid base mount w/ (15) – 5/8" dia. bolts

Dimensions:	W (in.)	D (in.)	H (in.)
	118.8	44.7	97.1

Weight: 4225 lbs.

Resonance Frequencies:	X-Axis	Y-Axis	Z-Axis
	5.8	7.5	11.3

Typecode PHD102600T4E3RSSCDNX2CBJKX0 P/N: 177X0880