



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY
APPLICATION #: OSP - 0316

OSHPD Special Seismic Certification Preapproval (OSP)

Type: [] New [X] Renewal

Manufacturer Information

Manufacturer: DANFOSS DRIVES

Manufacturer's Technical Representative: Joseph Horn

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

Telephone: (888) 326-3677 Email: On File

Product Information

Product Name: D-Frame Drives

Product Type: Variable Frequency Drives OSP-0316

Product Model Number: D1h, D2h, D5h, D6h, D7h & D8h frame sizes. See attachments for additional information.
(List all unique product identification numbers and/or part numbers)

General Description: Variable frequency drives for the control of induction motors.

Mounting Description: Rigid base mounted, rigid wall mounted and rigid wall/floor mounted. See attachments.

Applicant Information

Applicant Company Name: EASE

Contact Person: Jonathan Roberson, S.E.

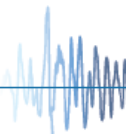
Mailing Address: 5877 Pine Ave, Suite 210, Chino Hills, CA. 91709

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: [Signature] Date: October 1, 2019

Title: Principal Structural Engineer Company Name: EASE





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
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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

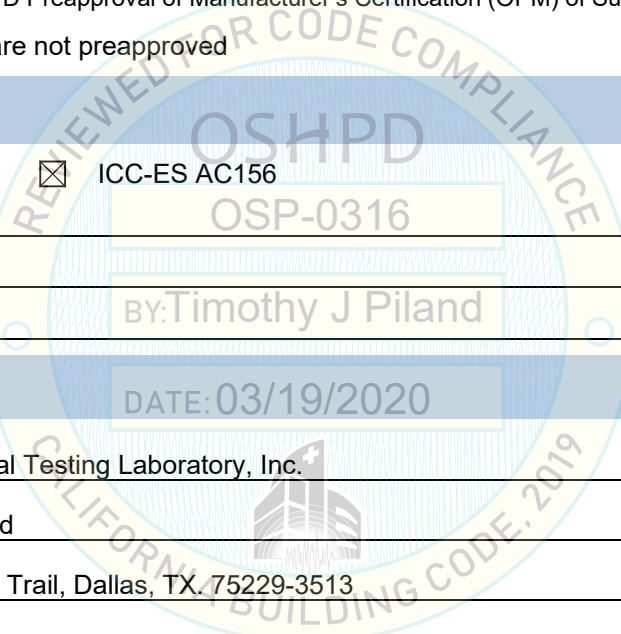
Telephone: (909) 606-7622 Email: j.roberson@easeco.com

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): _____



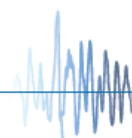
Testing Laboratory

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





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Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: [X] Yes [] No

Design Basis of Equipment or Components (Fp/Wp) = 1.95

Sds (Design spectral response acceleration at short period, g) = 2.6

ap (In-structure equipment or component amplification factor) = 2 1/2

Rp (Equipment or component response modification factor) = 6

Omega_0 (System overstrength factor) = 2

Ip (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 [X] No

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

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

Sd1 (Design spectral response acceleration at 1 second period, g) =

R (Response modification coefficient) =

Omega_0 (System overstrength factor) =

Cd (Deflection amplification factor) =

Ip (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 [X] No

List of Attachments Supporting Special Seismic Certification

[X] Test Report(s) [] Drawings [] Calculations [] Manufacturer's Catalog

[X] Other(s) (Please Specify): Attachments 1 & 2

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

Signature: [Signature] Date: March 19, 2020

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to: Sds (g) = 2.6 z/h = 1

Condition of Approval (if applicable):

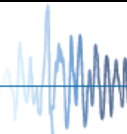


TABLE 1: DANFOSS VLT DRIVE & TRADITIONAL (P650) PANEL CHARACTERISTICS

Manufacturer									
DANFOSS DRIVES									
Product Line									
D-FRAME DRIVE MODEL ^[5]				BASE DRIVE MODEL		TRADITIONAL (P650) PANEL			
Danfoss VLT FC100 HVAC Drives				FC102		S102			
Danfoss VLT FC200 AQUA Drives				FC202		S202			
Danfoss VLT FC300 Industrial Drives				FC302 / 322		S302 / S322			
FRAME SIZE	DRIVE ^[1] HP RANGE	DRIVE / PANEL ^[2]	TYPE CODE ^[3]	MAX. DIMENSIONS (IN.)			MAX WT (LBS.)	MOUNT	BASIS ^[4]
				WIDTH	DEPTH	HEIGHT			
D1h	75 – 250	Drive	FC*	12.8	14.9	35.5	165	Wall	UUT-1
		Tier 2	S*	29.7	16.4	47.6	420	Wall	INT
		Tier 3	S*	46.3	16.4	47.6	585	Wall	INT
D2h	250 – 450	Drive	FC*	16.5	14.9	43.6	283	Wall	INT
		Tier 2	S*	33.5	16.4	62.6	630	Wall	INT
		Tier 3	S*	50.1	16.4	62.6	1070	Wall	UUT-3
D5h	75 – 250	Drive / Tier 1	FC*	12.8	15.0	52.1	219	Wall	INT
D6h	250 – 450	Drive / Tier 1	FC*	12.8	15.0	65.6	290	Wall	UUT-2
DRIVES WITH PEDESTAL BASE									
D1h	75 – 250	Drive / Tier 1	FC*	12.8	14.9	51.2	176	Floor	UUT-4
								Wall/Floor	UUT-5
D2h	250 – 450	Drive / Tier 1	FC*	16.5	14.9	59.3	300	Wall/Floor	INT
D5h	75 – 250	Drive / Tier 1	FC*	12.8	15.0	60.0	255	Wall/Floor	INT
D6h	250 – 450	Drive / Tier 1	FC*	12.8	15.0	73.4	301	Wall/Floor	INT
D7h	75 – 250	Drive / Tier 1	FC*	16.5	15.1	77.9	407	Wall/Floor	INT
D8h	250 – 450	Drive / Tier 1	FC*	16.5	15.8	89.9	540	Wall/Floor	UUT-6
Certified Enclosure									
IP 21 / UL Type 1 / NEMA Type 1 and IP 54 / UL Type 12 / NEMA Type 12 Carbon steel back panel with extruded aluminum sides and front cover.									
Certified Mounting									
<p><u>Floor (Rigid Base):</u> a free-standing, base mounted condition with the component rigidly attached to a supporting structure and no lateral support above the base.</p> <p><u>Wall/Floor:</u> component is rigidly attached to a supporting structure at its base, with additional lateral restraint at the top anchoring the component to an adjacent wall or other supporting structure.</p> <p><u>Wall:</u> fully supported by a building wall structure.</p>									
Certified Sub-Assemblies									
<ul style="list-style-type: none"> Control Transformers: GE 575,460 Primary 120V Secondary. Drive Fuses: Bussmann 315-800 Amps Main fuses: Bussmann 200-600 Amps Circuit Breakers: See Table 2 Electronically Controlled Bypass (ECB) or Electro-Mechanical Bypass (EMB or 3MB for NEMA/UL Type 3R) with or w/o: Common Run/Stop for Drive and Bypass, Bypass Undervoltage protection, Automatic Bypass, Run Permissive in Bypass, and/or Firemode via Bypass None, 2 or 3 contactor Bypass circuit Main Disconnect Switch, Drive Disconnect Switch and/or Main Circuit Breaker Brake IGBT Safe Stop RFI filter Class A1 & A2 A, B, C, D option cards 									
Notes									
<ol style="list-style-type: none"> Includes voltages of 380-690VAC 3 phase See Figure 1: Traditional Panel (P650) Tier Visual Identification Identification: Type Codes (T/C) are alphanumeric sequences which uniquely identifies the configuration of the unit. In the Table above, "*" indicates a variable defined as follows: <ul style="list-style-type: none"> Certified drive Type Codes are listed in Figure 2. Certified panel Type Codes are listed in Figure 3. Basis: <ul style="list-style-type: none"> UUT#: Indicates that a test specimen matching these characteristics was tested. INT (Interpolate): 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. Differences in function between each product series are accomplished through software/programming specific to each series. 									

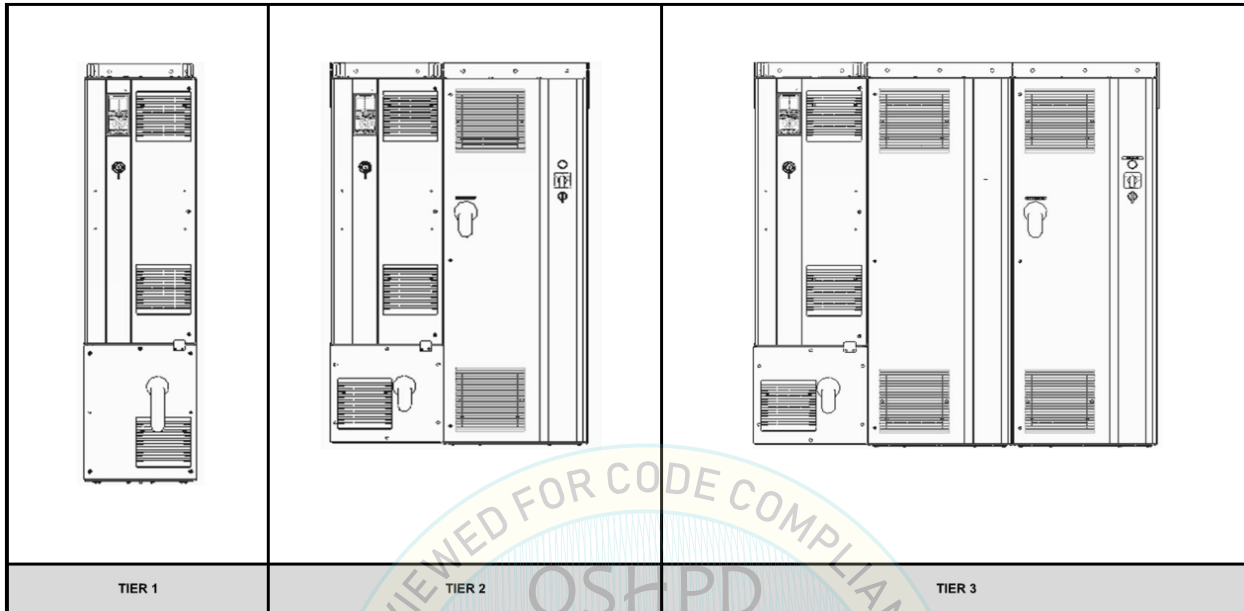


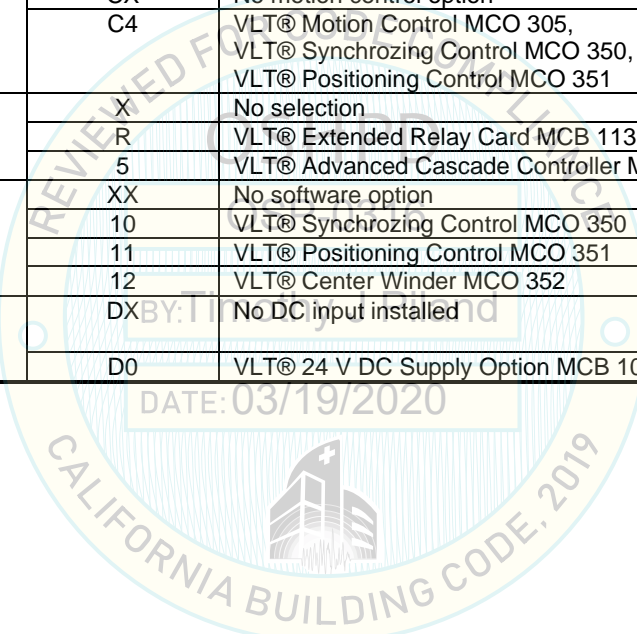
FIGURE 1: TRADITIONAL PANEL (P650) TIER VISUAL IDENTIFICATION

TABLE 2: DANFOSS VLT DRIVE CIRCUIT BREAKERS

Danfoss P/N	Amp Rating
34057800	250
34057900	400
34058000	600
34059900	800
177G5088	320
177G5089	400
177G5090	480
177G5091	600
177G5092	800

ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS

Character	Parameter	Allowed Value	Description
		AN	VLT® EtherNet/IP MCA 121
		AQ	VLT® Modbus TCP MCA 122
		AV	VLT® DeviceNet Converter MCA 194
31-32		BX	No application option
		B0	VLT® Analog I/O Option MCB 109
		B2	VLT® PTC Thermistor Card MCB 112
		B4	VLT® Sensor Input Card MCB 114
		BK	VLT® General Purpose MCB 101
31-32	Application	BK	VLT® General Purpose MCB 101
		BP	MCB 105 Relay Expansion
		BR	VLT® Encoder Input MCB 102
		BU	VLT® Resolver Input MCB 103
		BY	VLT® Extended Cascade Controller MCO 101
		BZ	VLT® Safety PLC I/O MCB 108
		B6	VLT® Safe Option MCB 150
33-34	Motion Control	CX	No motion control option
		C4	VLT® Motion Control MCO 305, VLT® Synchronizing Control MCO 350, VLT® Positioning Control MCO 351
35	Extended Relay	X	No selection
		R	VLT® Extended Relay Card MCB 113
		5	VLT® Advanced Cascade Controller MCO 10
36-37	Motion Software	XX	No software option
		10	VLT® Synchronizing Control MCO 350
		11	VLT® Positioning Control MCO 351
		12	VLT® Center Winder MCO 352
38-39	Control Power Backup Input	DXBY:TI	No DC input installed
		D0	VLT® 24 V DC Supply Option MCB 107



ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS

Character	Parameter	Allowed Value	Description
26	Display	X	Blank cover
		N	Numerical
		G	Graphical
27	Coating	C	Conformal
28	Adaptation A	X	No Adaptation
29	Adaptation B	X	No Adaptation
30-32	Software	XXX	Latest Release
33	Software Language	X	Standard Language Package
34	Options A	X	No Option
		4	DeviceNet MCA 104
		J	BACNet MCA 109
		Q	Modbus TCP
		G	Lon Works MCA 108
		L	Profinet MCA 120
		N	Ethernet/IP MCA 121
		0	Profibus DP V1
		Q	Modbus MCA 122
		T	3000 Converter (FC302only)
		U	5000 Converter (FC302only)
		6	CanOpen (FC302 only)
		8	EtherCAT (FC302 only)
35	Options B	X	No Option
		0	Analog I/O MCB 109
		2	PTC Thermistor Card
		4	Sensor Input Card
		K	General Purpose I/O MCB 101
		P	Relay Card MCB 105
		R	CL Encoder
		U	CL Resolver
		Y	Extended Cascade Control
Z	Safety PLC Interface		
36	Options C1	X	No Selection
		4	SyncPos
		5	Advanced Control
37	Options C2	X	No Selection
		R	Extended Relay Card
38-39	Options C3	XX	No software option
		10	Synchro. Control
		11	Positioning Control
		12	Center Winder
40	Options D	X	No option
		0	Interface for 24V dc MCB 107

ATTACHMENT 2: TEST SPECIMEN SUMMARY

TABLE 1: 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}
IBC 2015 / CBC 2016	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: D1h FRAME DRIVE

Description: VLT Automation Drive Coated PCB
 132 kW / 200 HP Fuses
 Three-phase 380-600 VAC Standard Cable Entries
 IP 21 /Type 1 enclosure Option Card:
 RFI Class A1 -MCA 121 Ethernet IP
 No Brake IGBT -MCB 101 General Purpose I/O
 Graphical Local Control Panel -MCO 351 Positioning control

Mounting: Wall mounted w/ (4) - 1/4" self-tapping screws w/ 1 - 1/4" OD fender washers

Dimensions: W (in.) D (in.) H (in.)
 12.8 14.5 33.2

Weight: 161 lbs.

Resonance X-Axis Y-Axis Z-Axis
Frequencies: --- --- ---

Typecode: FC-302N132T5E21H4XGC7XXSXXXANBKC4XXXDX P/N: 134H0949



UUT-2: D6h FRAME DRIVE

Description: VLT Automation Drive Coated PCB
 132 kW / 200 HP Mains Disconnect, contactor and fuse
 Three-phase 525-690 VAC Standard Cable Entries
 IP 54 /Type 12 enclosure Option Card:
 RFI Class A2 -MCA 121 Ethernet IP
 Brake IGBT -MCB 101 General Purpose I/O
 Graphical Local Control Panel -MCO 351 Positioning control
 Heater

Mounting: Wall mounted w/ (4) - 1/4" self-tapping screws w/ 1 - 1/4" OD fender washers

Dimensions: W (in.) D (in.) H (in.)
 12.8 14.625 63.6

Weight: 286.5 lbs.

Resonance X-Axis Y-Axis Z-Axis
Frequencies: --- --- ---

Typecode: FC-302N132T7H54H2BGCEXXSXXXANBKC4XXXDX P/N:134H0931



UUT-3: D2h FRAME TIER 3 PANEL

Description: VLT HVAC Drive Coated PCB
 250 kW / 350 HP Fuses
 Three-phase 380-480 VAC Standard Cable Entries
 IP 54 /Type 12 enclosure (Drive) 2 Contactor Bypass
 Type 1 enclosure (Panel) Main Circuit Breaker
 RFI Class A2 Drive Disconnect Switch
 No Brake IGBT Drive Fusing
 Graphical Local Control Panel EMB 2 Package
 Line Reactor Standard RFI
 Output dV/dt Filter

Mounting: Wall mounted using (16) - 1/4" self-tapping screws w/ 1 - 1/4" OD Fender washers

Dimensions: W (in.) D (in.) H (in.)
 49.7 14.6 61.125

Weight: 1070 lbs.

Resonance X-Axis Y-Axis Z-Axis
Frequencies: --- --- ---

Typecode: FC-102N250T4E54H2XGC7XXSXXXAXBXCXXXXDX P/N: 131Z8887



ATTACHMENT 2: TEST SPECIMEN SUMMARY

UUT-4: D1h FRAME DRIVE

Description: VLT Automation Drive
132 kW / 200 HP
Three-phase 525-690 VAC
IP 21 /Type 1 enclosure
RFI Class A2
No Brake IGBT
Graphical Local Control Panel
Pedestal base

Coated PCB
Fuses
Standard Cable Entries
Option Card:
-MCA 121 Ethernet IP
-MCB 101 General Purpose I/O
-MCO 351 Positioning control

Mounting: Rigid Base (Floor) Mounted using
(4) 1/2" Grade 5 Allen Head Cap Screws w/ washers

Dimensions: W (in.) D (in.) H (in.)
12.8 14.5 48.9

Weight: 142 lbs.

Resonance X-Axis Y-Axis Z-Axis
Frequencies: 15.6 15.4 12. 8

Typecode: FC-302N132T7E21H2XGC7XXSXXXXANBKC4XXXDX P/N:134H0952



UUT-5: D1h FRAME DRIVE

Description: VLT Automation Drive
132 kW / 200 HP
Three-phase 525-690 VAC
IP 54 /Type 12 enclosure
RFI Class A2
Brake IGBT
Graphical Local Control Panel
Pedestal Base

Coated PCB
Fuses
Standard Cable Entries
Option Card:
-MCA 121 Ethernet IP
-MCB 101 General Purpose I/O
-MCO 351 Positioning control

Mounting: Wall/Floor mounted using (4) - 3/8 " Bolts to the floor and
(4) - 1/4" self-tapping screws at top anchor point.

Dimensions: W (in.) D (in.) H (in.)
12.75 14.5 48.875

Weight: 142 lbs.

Resonance X-Axis Y-Axis Z-Axis
Frequencies: --- --- ---

Typecode: FC-302N132T7E54H2XGC7XXSXXXXANBKC4XXXDX P/N:134H0950



UUT-6: D8h FRAME DRIVE

Description: VLT Automation Drive
250 kW / 350 HP
Three-phase 380-500 VAC
IP 54 /Type 12 enclosure
RFI Class A1
Brake IGBT
Graphical Local Control Panel
Heater

Coated PCB
Mains Disconnect, contactor and fuse
Standard Cable Entries
Option Card:
-MCA 121 Ethernet IP
-MCB 101 General Purpose I/O
-MCO 351 Positioning control

Mounting: Wall/Floor mounted using (4) - 3/8" gr 8 bolts to floor plate and
(2) - 1/4" self-tapping screws at top anchor point.

Dimensions: W (in.) D (in.) H (in.)
16.6 14.625 80.25

Weight: 540 lbs.

Resonance X-Axis Y-Axis Z-Axis
Frequencies: --- --- ---

Typecode: FC-302N250T5H54H4BGCEXXSXXXXANBKC4XXXDX P/N: 134H0930

