



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

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

OFFICE USE ONLY

APPLICATION #: OSP-0087

HCAI Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Danfoss

Manufacturer's Technical Representative: Jesse Asper

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

Telephone: (717) 261-5051

Email: jesse.asper@danfoss.com

Product Information

Product Name: Industrial Control Panels

Product Type: Variable Frequency Drives and Starters

Product Model Number: VLT Drives, P650 Panels & P656 Panels

General Description: Drive for variable speed control of 3 phase induction motor with or without bypass backup. See Attachment 1.

Mounting Description: Rigid, Wall Mounted

Tested Seismic Enhancements: None

Applicant Information

Applicant Company Name: EASE LLC.

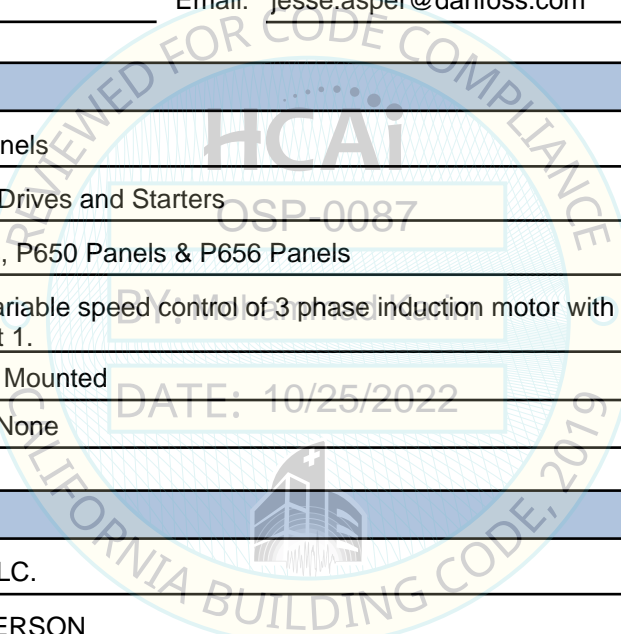
Contact Person: JONATHAN ROBERSON

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

Telephone: (909) 606-7622

Email: J.Roberson@EASECo.com

Title: Principal Engineer





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

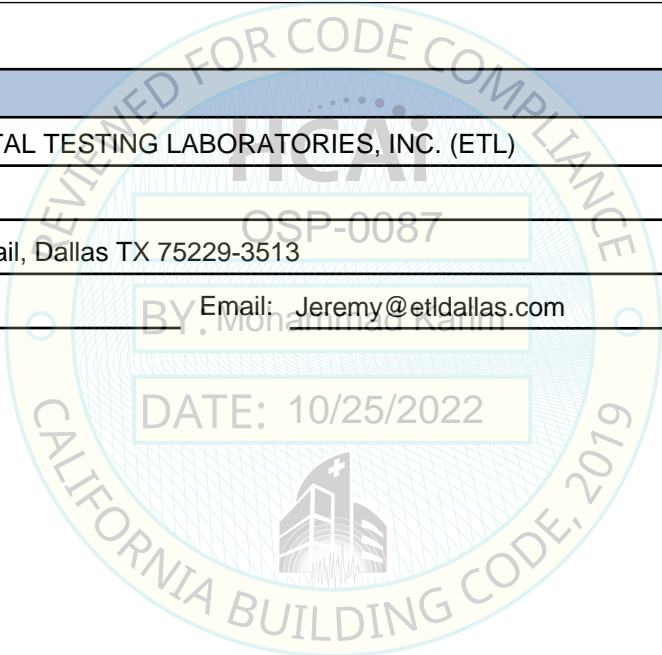
Company Name: EASE LLC
Name: Jonathan Roberson California License Number: S4197
Mailing Address: 5877 Pine Ave., Suite 210, Chino Hills, CA 91709
Telephone: (951) 295-1892 Email: jon@EASECo.com

Certification Method

GR-63-Core ICC-ES AC156 IEEE 344 IEEE 693 NEBS 3
 Other (Please Specify): _____

Testing Laboratory

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)
Contact Person: Jeremy Lange
Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513
Telephone: (972) 247-9657 Email: Jeremy@etldallas.com





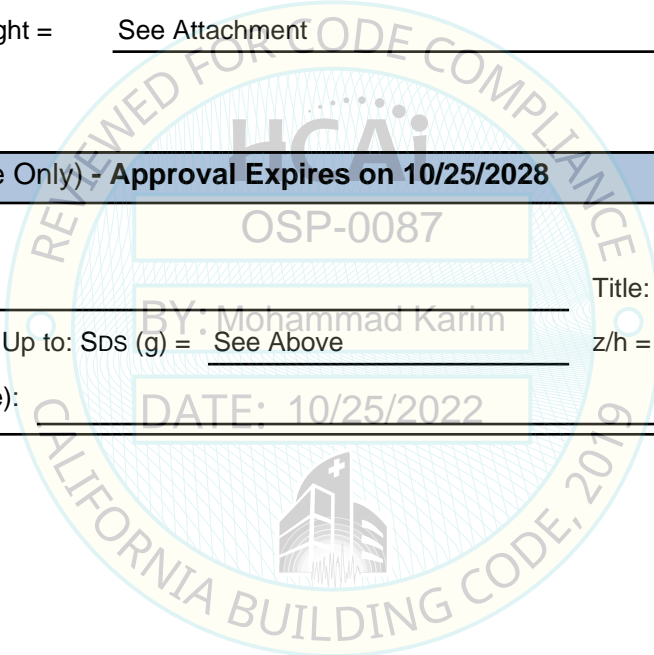
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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) =	1.95 Tables 3 & 4 1.19 Table 2, Attachment 1
SDS (Design spectral response acceleration at short period, g) =	2.60 Tables 3 & 4 1.58 Table 2, Attachment 1
a_p (Amplification factor) =	2 1/2
R_p (Response modification factor) =	6
Ω_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 10/25/2028

Date:	10/25/2022	OSP-0087	
Name:	Mohammad Karim	BY: Mohammad Karim	Title: Supervisor, Health Facilities
Special Seismic Certification Valid Up to: SDS (g) =	See Above	DATE: 10/25/2022	z/h = 1
Condition of Approval (if applicable):			



ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS

TABLE 1: DANFOSS VLT DRIVE PRODUCTS [A]

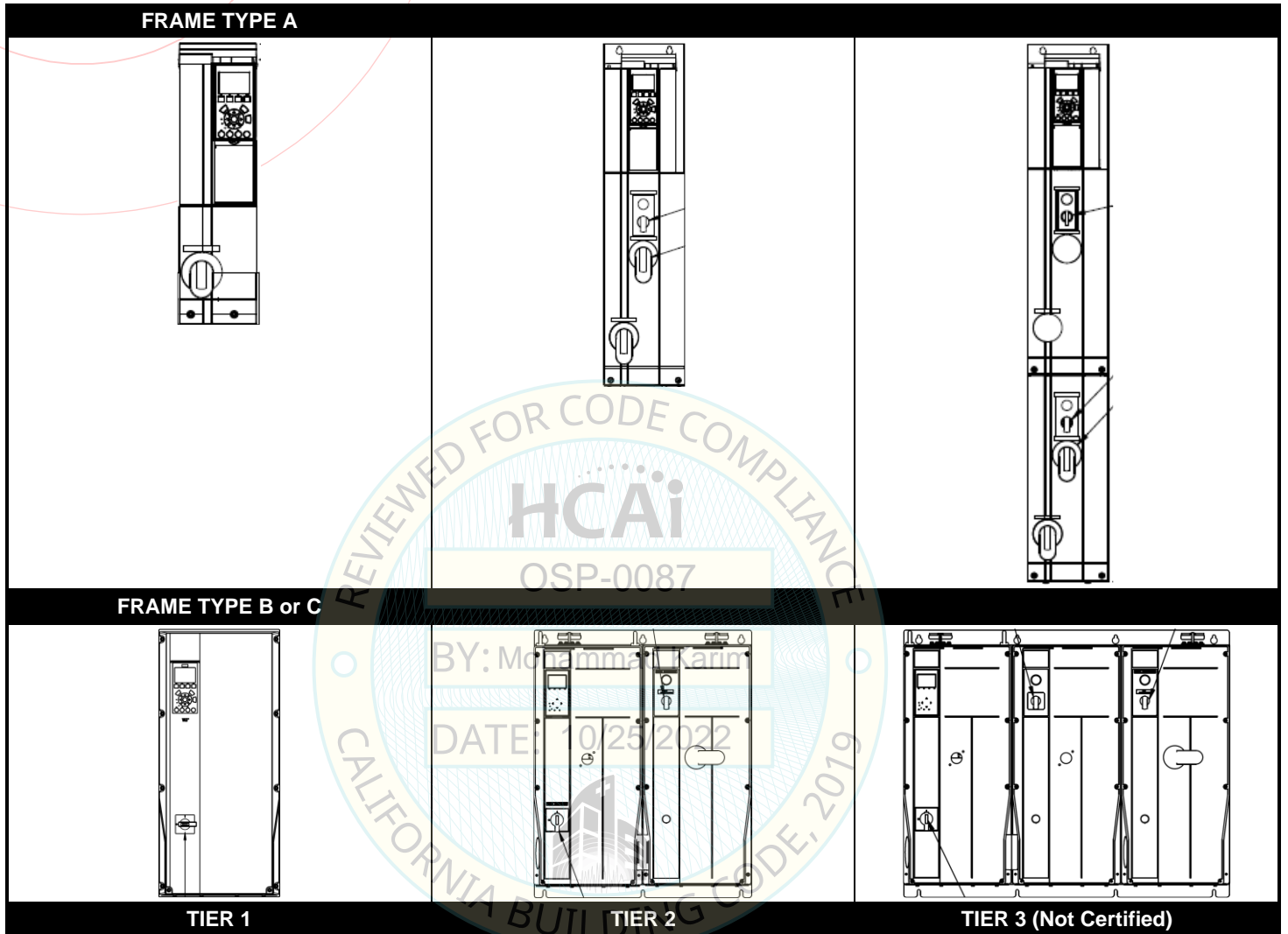
PRODUCT LINE	DRIVE MODELS			NOTES
	DRIVE CHASSIS	TRADITIONAL PANEL (P650)	VERTICAL PANEL (P656)	
Danfoss VLT FC100 HVAC Drives	FC101	N/A	N/A	Table 4
	FC102	S102	S102	Table 2 (P650)
	FC103	S103	S103	Table 3 (P656)
Danfoss VLT FC200 AQUA Drives	FC202	S202	FC202	Table 2 (P650) Table 3 (P656)
Danfoss VLT FC300 INDUSTRIAL Drives	FC301	S301	N/A	Table 2 (P650)
	FC302	S302	S302	Table 3 (P656)
	FC322	S322	S322	

NOTES:

- A) Seismic Certification is limited to the models listed in this table possessing the physical, mechanical and electrical characteristics and product options presented in the tables noted above.
- B) Identification: Labels are provided on both the panels and the drive chassis. The labels include a Typecode (T/C), Material Number, and a Serial Number (S/N):
 - a. Type Codes (T/C) are alphanumeric sequences that reflect physical, mechanical and electrical features and options present in the panel or drive.
 - b. Material Numbers are alphanumeric sequences that are unique to a particular project
 - c. Serial Numbers (S/N) are unique numbers assigned to a panel or drive

TABLE 2: DANFOSS VLT DRIVE CHASSIS & TRADITIONAL PANEL CONFIGURATION (P650) CHARACTERISTICS

PANEL SIZE	DRIVE [1] HP RANGE	TIER [2]	MAX. DIMENSIONS (IN.) [3]			MAX WT (LBS.)	BASIS [4]
			WIDTH	DEPTH	HEIGHT		
NEMA/UL TYPE 1 / TYPE 12 / TYPE 4X ENCLOSURES							
A2 Frame	0.33 - 5	1	3.5 to 5.2	8.1 to 8.7	13.4 to 19.1	30	INT
		2	7.6	8.3 to 8.8	31.7	40	INT
A3 Frame	1-10	1	5.1 to 5.3	8.1 to 8.7	10.6 to 19.1	30	INT
		2	7.6	8.3 to 8.8	31.7	40	UUT1 & UUT2
A5 Frame	0.5-10	1	9.5	8	16.5	35	INT
		2	19.2	8.6	18.9	55	INT
B1 Frame	7.5-25	1	9.5	10.2	18.9	65	INT
		2	19.1	10.8	21.5	85	INT
B2 Frame	14-50	1	9.5	10.2	25.6	79	INT
		2	19.1	10.9	28.2	105	INT
C1 Frame	20-75	1	12.1	12.2	26.8	100	INT
		2	24.4	12.7	29.9	145	INT
C2 Frame	40-125	1	14.6	13.2	30.3	130	INT
		2	29.3	13.8	33.5	221	UUT3
NEMA/UL TYPE 3R ENCLOSURES							
1	0.5HP - 10HP	N/A	28.8	11	30	225	INT
2	5HP - 25HP	N/A	31.1	12.25	38	300	INT
3	15HP - 40HP	N/A	31.1	12.25	38	300	UUT7
4	25HP - 75HP	N/A	38.2	15.6	47.1	360	UUT5 & UUT6
CERTIFIED ENCLOSURE	NEMA/UL Type 1 NEMA/UL Type 3R (NEMA 3R Drive are identical to NEMA 12 Drive except for addition of 6mm diameter weep hole at bottom.) NEMA/UL Type 4X (identical to NEMA 12 enclosure with the addition of a protective spray-on coating). NEMA/UL Type 12						
MOUNTING	Wall-mounted: fully supported by a building wall structure. NEMA 3R enclosures may either be surface-mounted to wall or mounted to 12 ga. Unistrut/ Power-Strut backing which is surface mounted to wall at the top and bottom of the unit. Strut backing shall project not more than 1 5/8" from the face of the wall.						
NOTES	<ol style="list-style-type: none"> Includes voltages of 200 - 240VAC Single or 3- Phase, 380 - 480VAC Single Phase, 380 - 500VAC 3- Phase, 525 - 600VAC 3 Phase (A, B & C Frames), 525-690VAC 3 phase (D Frames). See Figure 1: Traditional Panel (P650) Tier Visual Identification Depth dimension excludes door handle. Width of NEMA 3R enclosures excludes rain hoods. BASIS: <ul style="list-style-type: none"> • UUT#: Indicates that a test specimen matching these characteristics was tested as part of this testing program. • INT (Interpolate/Extrapolate): indicates a model that was not specifically tested, and by which seismic certification is established through evaluation of testing of other, similar models in the product line. 						



Note: Tier 3 is shown for identification purposes only. See Table 1 for approved tiers.

FIGURE 1: TRADITIONAL PANEL (P650) TIER VISUAL IDENTIFICATION

TABLE 3: DANFOSS VLT DRIVE VERTICAL PANEL CONFIGURATION (P656) CHARACTERISTICS

PANEL SIZE	DRIVE [1] HP RANGE	TIER [2]	MAX. DIMENSIONS (IN.)			MAX WT (LBS.)	BASIS [3]
			WIDTH	DEPTH	HEIGHT		
B3 Frame	7.5 – 25	1	9.1	11.5	30.0	39	UUT A1
		2	9.2	16.0	41.8	90	UUT A2
B4 Frame	20 – 50	1	9.8	11.3	34.5	72	UUT A3
		2	9.8	17.7	43.3	112	INT
C3 Frame	25 – 75	1	12.7	14.8	39.6	112	INT
		2	12.7	18.0	54.4	180	INT
C4 Frame	40 - 125	1	15.2	14.8	45.8	170	INT
		2	15.2	18.1	59.7	268	UUT A4
CERTIFIED ENCLOSURE	IP21 / NEMA/UL Type 1 enclosures with carbon steel back panels. B3 Frames have carbon Steel stiffening elements and plastic drive cover. All other Frame sizes have extruded aluminum stiffening elements with carbon steel covers.						
MOUNTING	Wall-mounted: fully supported by a building wall structure.						
NOTES	<ol style="list-style-type: none"> Includes voltages of 200 - 208VAC, 200 - 240VAC, 380 - 480VAC, and 525 - 600VAC 3 Phase See Figure 2: Vertical Panel (P656) Tier Visual Identification BASIS: <ul style="list-style-type: none"> UUT#: Indicates that a test specimen matching these characteristics was tested as part of this testing program. INT (Interpolate/Extrapolate): indicates a model that was not specifically tested, and by which seismic certification is established through evaluation of testing of other, similar models in the product line. 						

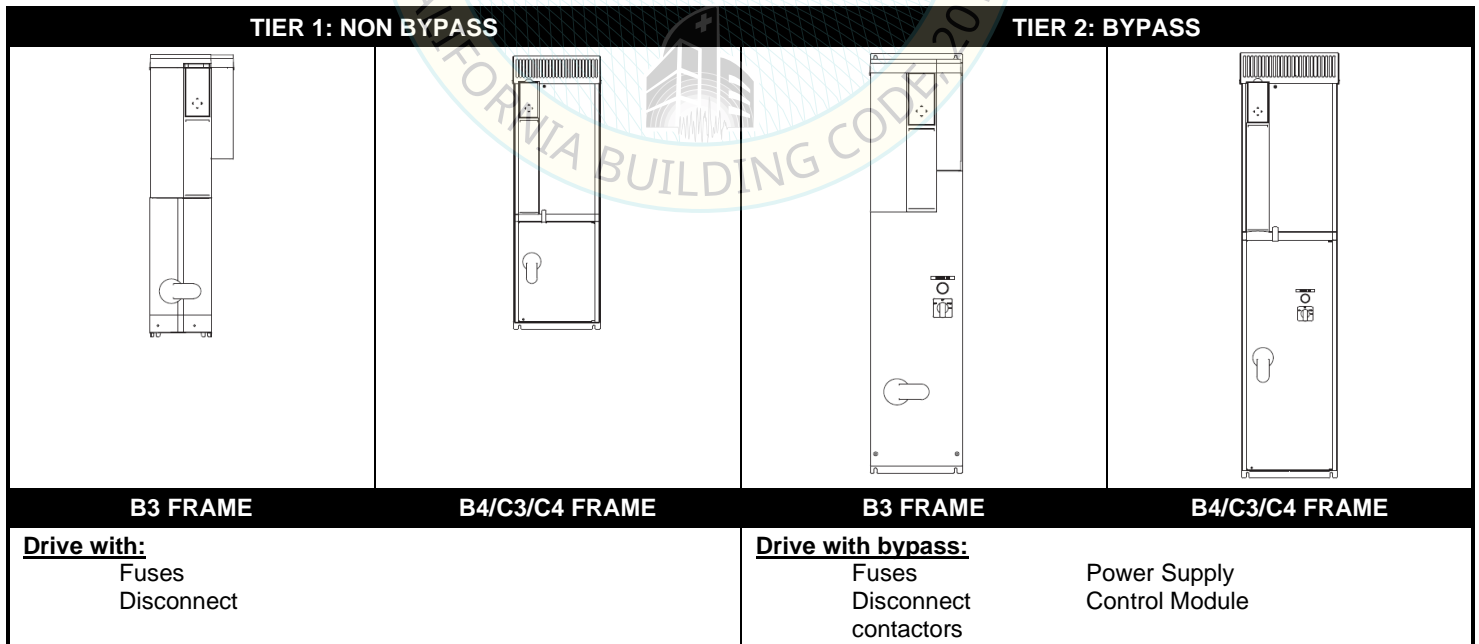
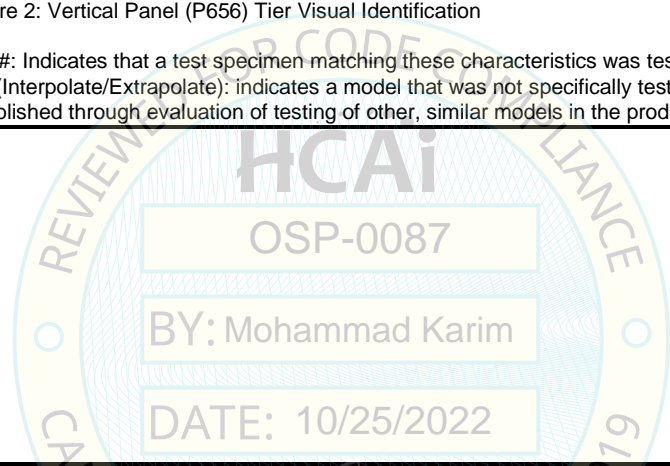
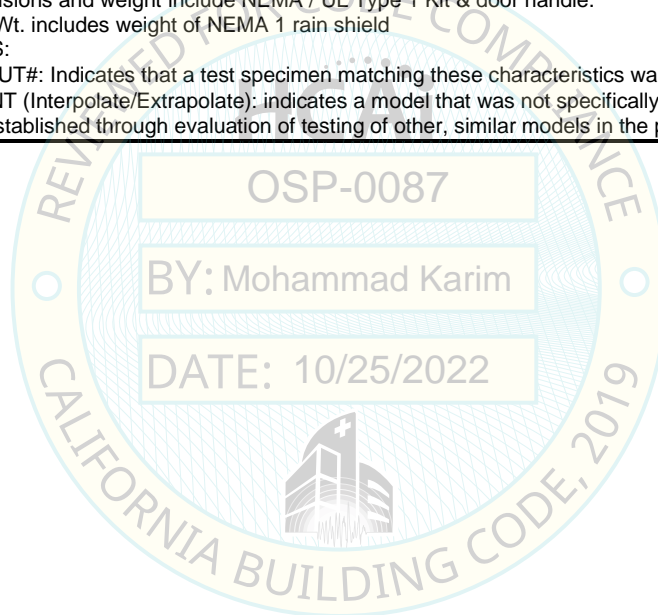


FIGURE 2: VERTICAL PANEL (P656) TIER VISUAL IDENTIFICATION

TABLE 4: DANFOSS VLT BASIC (FC101) DRIVE CHASSIS CHARACTERISTICS

FRAME SIZE	DRIVE ^[1] HP RANGE	MAX. DIMENSIONS (IN.) ^[2]			MAX WT ^[3] (LBS.)	BASIS ^[4]
		WIDTH	DEPTH	HEIGHT		
H1 Frame	0.33 – 2	3.2	6.8	11.5	6	UUT B1
H2 Frame	3 – 5.4	3.8	7.7	12.7	9	INT
H3 Frame	5 – 10	4.2	8.3	13.7	11	INT
H4 Frame	7.5 – 20	5.6	9.7	14.8	17	INT
H5 Frame	15 – 30	6.4	10.3	16.5	23	UUT B2
H6 Frame	20 – 60	10.3	9.6	26.1	60	UUT B3
H7 Frame	30 – 120	13.0	13.2	31.8	90	INT
H8 Frame	50 – 125	15.4	13.2	37.2	124	UUT B4
CERTIFIED ENCLOSURE	NEMA/UL Type 1 H1-H5 includes carbon steel mounting features, with plastic covers. H6-H8 includes carbon steel mounting features and sides and plastic covers.					
MOUNTING	Wall-mounted: fully supported by a building wall structure.					
NOTES	<ol style="list-style-type: none"> Includes voltages of 200 - 208VAC, 200 - 240VAC, 380 - 480VAC, and 525 - 600VAC 3 Phase Dimensions and weight include NEMA / UL Type 1 Kit & door handle. Max. Wt. includes weight of NEMA 1 rain shield BASIS: <ul style="list-style-type: none"> UUT#: Indicates that a test specimen matching these characteristics was tested as part of this testing program. INT (Interpolate/Extrapolate): indicates a model that was not specifically tested, and by which seismic certification is established through evaluation of testing of other, similar models in the product line. 					



ATTACHMENT 2: TEST UNIT SUMMARY

TABLE 1: SHAKE TABLE TEST PARAMETERS: UUT-1 THROUGH UUT-7

TEST CRITERIA	Sds	z/h	Ip	AFLX-H	ARIG-H	AFLX-V	ARIG-V
ICC-ES AC156	2.05	1.0	1.5	3.28	2.46	1.37	0.55

UUT-1: Traditional (P650) 10 Hp 460V drive panel w/ ECB control

DESCRIPTION: A3 Frame Tier 2 NEMA 1 Enclosure with:

- Drive Fuses 30 Amp
- Main Fuses 25 Amp
- 3 contactor bypass,
- Main Disconnect Switch with Main Fusing
- Drive Disconnect Switch
- Standard RFI Filter H2 / A2
- Option A Card: BACNet
- Option C Card: Electronically Controlled Bypass(ECB) control
- Graphical Display

Unit was full of content during test.

MOUNTING: Wall Mounted w/ (4) – ¼” TEK screws & standard washers (wide series) to 16ga backing.

DIMENSIONS: 8.3”(max)W x 8.75”(max)D x 31.74”(max)H

WEIGHT: 40 lbs.

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



UUT-2: Traditional (P650) 10 Hp 460V drive panel w/ EMB2 control

DESCRIPTION: A3 Frame Tier 2 NEMA 1 Enclosure with:

- Drive Fuses 30 Amp
- Main Fuses 25 Amp
- 2 contactor bypass,
- Electro-Mechanical Bypass (EMB) control
- Main Circuit Breaker 176U5604 - 20Amp
- Drive Disconnect Switch,
- Drive Fusing,
- Standard RFI Filter H2 / A2
- Graphical Display

Unit was full of content during test.

MOUNTING: Wall Mounted w/ (4) – ¼” TEK screws & standard washers (wide series) to 16ga backing.

DIMENSIONS: 7.63”(max)W x 8.75”(max)D x 31.74”(max)H

WEIGHT: 40 lbs.

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



UUT-3: Traditional (P650) 125Hp 460V panel

DESCRIPTION: C2 Frame Tier 2 NEMA 1 Enclosure with:

- Drive Fuses 250 Amp
- Main Fuses 250 Amp
- Transformer 375 VA
- 3 contactor bypass
- Main Disconnect Switch with Main Fusing
- Electro-Mechanical Bypass (EMB) control
- Standard RFI Filter H2 / A2
- Graphical Display

Unit was full of content during test.

MOUNTING: Wall Mounted w/ (6) – ¼” TEK screws & standard washers (wide series) to 16ga backing.

DIMENSIONS: 29.3”(max)W x 13.8”(max)D x 33.5”(max)H

WEIGHT: 221 lbs.

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



ATTACHMENT 2: TEST UNIT SUMMARY

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UUT-5: 75HP 460V Drives in NEMA 3R Enclosure

- DESCRIPTION: NEMA 3R Enclosure with:
- Drive Fuses 150 Amp
 - Main Fuses 150 Amp
 - Transformer 375VA
 - 3 contactor bypass,
 - Main Disconnect Switch with Main Fusing
 - Electro-Mechanical Bypass (EMB) control
 - Standard RFI Filter H2 / A2
 - Graphical Display

Unit was full of content during test.

MOUNTING Wall Mounted w/ (4) – ¼” TEK screws & standard washers (wide series) though integral mounting flange to 12ga backing.

DIMENSIONS: 38.2” W x 15.6” D x 47.1” H

WEIGHT: 360 lb.

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



UUT-6: 75HP 460V Drives in NEMA 3R Enclosure on Unistrut Backing

- DESCRIPTION: NEMA 3R Enclosure with:
- Drive Fuses 150 Amp
 - Main Fuses 150 Amp
 - Transformer 375VA
 - 3 contactor bypass,
 - Main Disconnect Switch with Main Fusing
 - Electro-Mechanical Bypass (EMB) control
 - Standard RFI Filter H2 / A2
 - Graphical Display

Unit was full of content during test.

MOUNTING Wall Mounted w/ (4) – ¼” hex head bolts, standard washers (wide series) though integral mounting flange to Unistrut channel nuts installed in Unistrut P1000.

DIMENSIONS: 38.2” W x 15.6” D x 47.1” H

WEIGHT: 358 lb.

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



UUT-7: 40HP 460V Drives in NEMA 3R Enclosure on Unistrut Backing

- DESCRIPTION: NEMA 3R Enclosure with IP00 Drive:
- Drive Fuses 80 Amp
 - Main Fuses 90 Amp
 - Transformer 375VA
 - 3 contactor bypass,
 - Main Disconnect Switch
 - 100KAIC
 - Electro-Mechanical Bypass (EMB) control
 - 3% Input Reactor
 - Standard RFI Filter H2 / A2
 - Graphical Display
 - Option A Card: MCA-109 BACNet Top Entry
 - Option B Card: MCB-109 Analog I/O
 - Option D Card: MCB-107 24VDC Backup

Unit was full of content during test.

MOUNTING Wall Mounted w/ (4) – ¼” hex head bolts, standard washers (wide series) though integral mounting flange to Unistrut channel nuts installed in Unistrut P1000.

DIMENSIONS: 31.1” W x 12.25” D x 38” H

WEIGHT: 250 lb.

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



ATTACHMENT 2: TEST UNIT SUMMARY

TABLE 2: SHAKE TABLE TEST PARAMETERS: UUT-A1 THROUGH UUT-A4

TEST CRITERIA	S _{ds}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC156	2.6	1.0	1.5	4.16	3.12	1.74	0.70

UUT- A1: Vertical Non-Bypass (P656) Tier 1 Panel, 7.5 HP, 230 V (200 – 240V)

DESCRIPTION: B3 Frame Tier 1 NEMA 1 Enclosure with:

- Drive Fuses: 50 amp
- RFI Filter H1 / A1/B
- Main Disconnect Switch
- Nema1 Enclosure
- Graphical Display

Unit was full of content during test.

MOUNTING Wall Mounted w/ (4) – ¼” TEK screws & standard washers (wide series) to 16ga backing.

DIMENSIONS: 9.1” W x 11.5” D x 30.0” H

WEIGHT: 36.5 lbs

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



UUT-A2: Vertical Bypass (P656) Panel, 25 HP, 460 V

DESCRIPTION: B3 Frame Tier 2 NEMA 1 enclosure with:

- Drive Fuses: 60 amp
- Main Fuses: 50 amp
- 3 Contactor Bypass
- Standard RFI Filter H2 / A2
- Main Disconnect Switch
- Electro-Mechanical Bypass (EMB2) Control
- Graphical Display

Unit was full of content during test.

MOUNTING Wall Mounted w/ (4) – ¼” TEK screws & standard washers (wide series) to 16ga backing.

DIMENSIONS: 9.2” W x 16” D x 41.8” H

WEIGHT: 81 lbs

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



UUT-A3: Vertical Non Bypass (P656) Panel, 25 HP, 230 V (200 – 240 V)

DESCRIPTION: B4 Frame Tier 1 NEMA 1 Enclosure with:

- Drive Fuses: 80 amp, 300 V
- Main Disconnect Switch
- Standard RFI Filter H2 / A2
- Graphical Display

Unit was full of content during test.

MOUNTING Wall Mounted w/ (4) – ¼” TEK screws & standard washers (wide series) to 16ga backing.

DIMENSIONS: 9.8” W x 11.3” D x 34.5” H

WEIGHT: 66 lbs

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



ATTACHMENT 2: TEST UNIT SUMMARY

UUT-A4: Vertical Bypass (P656) Panel, 125 HP, 460 V (380 – 480V), C4 Frame

- DESCRIPTION: C4 Frame Tier 2 NEMA 1 Enclosure with:
- Circuit Breaker: 174N6850 - 200 amp
 - Drive Fuses: 250 amp
 - 3 Contactor Bypass
 - Option C Card: Electronically Controlled Bypass (ECB) control
 - Transformer: 100VA
 - Standard RFI Filter H2 / A2
 - Graphical Display

Unit was full of content during test.

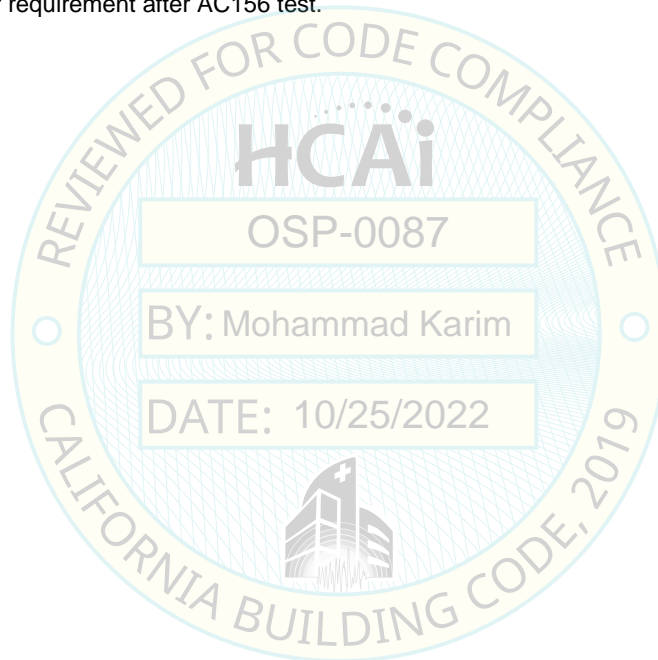


MOUNTING Wall Mounted w/ (4) – ¼” TEK screws & standard washers (wide series) to 16ga backing.

DIMENSIONS: 15.2” W x 18.1” D x 59.7” H

WEIGHT: 234 lbs

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



ATTACHMENT 2: TEST UNIT SUMMARY

TABLE 3: SHAKE TABLE TEST PARAMETERS: UUT-B1 THROUGH UUT-B4

TEST CRITERIA	S _{ds}	z/h	I _p	A _{FLX-H}	A _{RIg-H}	A _{FLX-V}	A _{RIg-V}
ICC-ES AC156	2.6	1.0	1.5	4.16	3.12	1.74	0.70

UUT- B1: H1 Frame 2 HP Drive

DESCRIPTION: Product Group: Danfoss
 Product Line FC101-HVAC
 Power Size 1.5KW
 Voltage 380 to 480 VAC 3 Phase
 Enclosure IP20 Open Chassis with NEMA 1 Enclosure Kit
 RFI Filter H4 / A1
 Display Local Control Panel
 Unit was full of content during test.

MOUNTING Wall Mounted w/ (4) – ¼” TEK screws & standard washers (wide series) to 16ga backing.

DIMENSIONS: 3.2” W X 6.81” D X 11.54” H

WEIGHT: 5 LBS

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



UUT-B2: H5 Frame VLT Basic 30 HP Drive

DESCRIPTION: Product Group: Danfoss
 Product Line FC101-HVAC
 Power Size 22 KW
 Voltage 380 to 480 VAC 3 Phase
 Enclosure IP20 Open Chassis with NEMA 1 Enclosure Kit
 RFI Filter H4 / A1
 Display Local Control Panel
 Unit was full of content during test.

MOUNTING Wall Mounted w/ (4) – ¼” TEK screws & standard washers (wide series) to 16ga backing.

DIMENSIONS: 6.34” W X 10.24” D X 16.46” H

WEIGHT: 22 LBS

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



UUT-B3: H6 Frame 50 HP Drive

DESCRIPTION: Product Group: Danfoss
 Product Line FC101-HVAC
 Power Size 37KW
 Voltage 380 to 480 VAC 3 Phase
 Enclosure IP20 Open Chassis with back plate & NEMA 1 Enclosure Kit
 RFI Filter H3 / A1/B
 Display Local Control Panel
 Unit was full of content during test.

MOUNTING Wall Mounted w/ (4) – ¼” TEK screws & standard washers (wide series) to 16ga backing.

DIMENSIONS: 10.24” W X 9.53” D X 26.1” H

WEIGHT: 54 LBS

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.



ATTACHMENT 2: TEST UNIT SUMMARY

ATTACHMENT PAGE | 6 OF 6

UUT-B4: H8 Frame 125 HP Drive

DESCRIPTION: Product Group: Danfoss
Product Line FC101-HVAC
Power Size 90 KW
Voltage 380 to 480 VAC 3 Phase
Enclosure IP20 Open Chassis with back plate & NEMA 1 Enclosure Kit
RFI Filter H4 / A1
Display Local Control Panel
Unit was full of content during test.



MOUNTING: Wall Mounted w/ (4) – 1/4" TEK screws & standard washers (wide series) to 16ga backing.

DIMENSIONS: 15.35" W X 13.2" D X 37.13" H

WEIGHT: 113 LBS + 11LB rain shield

Unit maintained structural integrity and remained functional per manufacturer requirement after AC156 test.

