



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

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

OFFICE USE ONLY

APPLICATION #: **OSP – 0137-10**

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: **TRANE**

Manufacturer's Technical Representative: **Tom Troyanek**

Mailing Address: **3600 Pammel Creek Road, La Crosse, WI. 54601**

Telephone: **On File** Email: **On File**

Product Information

Product Name: **TR200 Drives & Panels**

Product Type: **Variable Frequency Drives**

Product Model Number: **SEE ATTACHMENT 1**

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

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

Mounting Description: **Rigid Wall Mounted**

Applicant Information

Applicant Company Name: **EASE LLC.**

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**

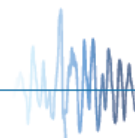
I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant:  Date: **June 30, 2017**

Title: **PRINCIPAL ENGINEER** Company Name: **EASE LLC.**

"Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dynamic Needs"

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY
OSH-FD-759 (REV 12/16/15)



OSHPD

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**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 LLC.**
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 1

Supports and Attachments Preapproval

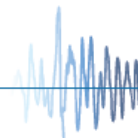
- ☐ Supports and attachments are preapproved under OPM-
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
- ☒ Supports and attachments are not preapproved

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: ☒ Yes ☐ No

Design Basis of Equipment or Components (F_p/W_p) = 1.95g Table 3 | 1.19g Table 2, Attachment 1

S_{DS} (Design spectral response acceleration at short period, g) = 2.60 Table 3 | 1.58 Table 2, Attachment 1

a_p (In-structure equipment or component amplification factor) = 2½

R_p (Equipment or component response modification factor) = 6

Ω_0 (System overstrength factor) = 2

I_p (Importance factor) = 1½

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) = 1.0

Ω_0 (System overstrength factor) = 1.0

C_d (Deflection amplification factor) = 1.0

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, 2022

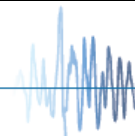
Signature:  Date: July 19, 2017

Print Name: Timothy J. Piland Title: SSE

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

Condition of Approval (if applicable): _____

Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dynamic Needs



ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS

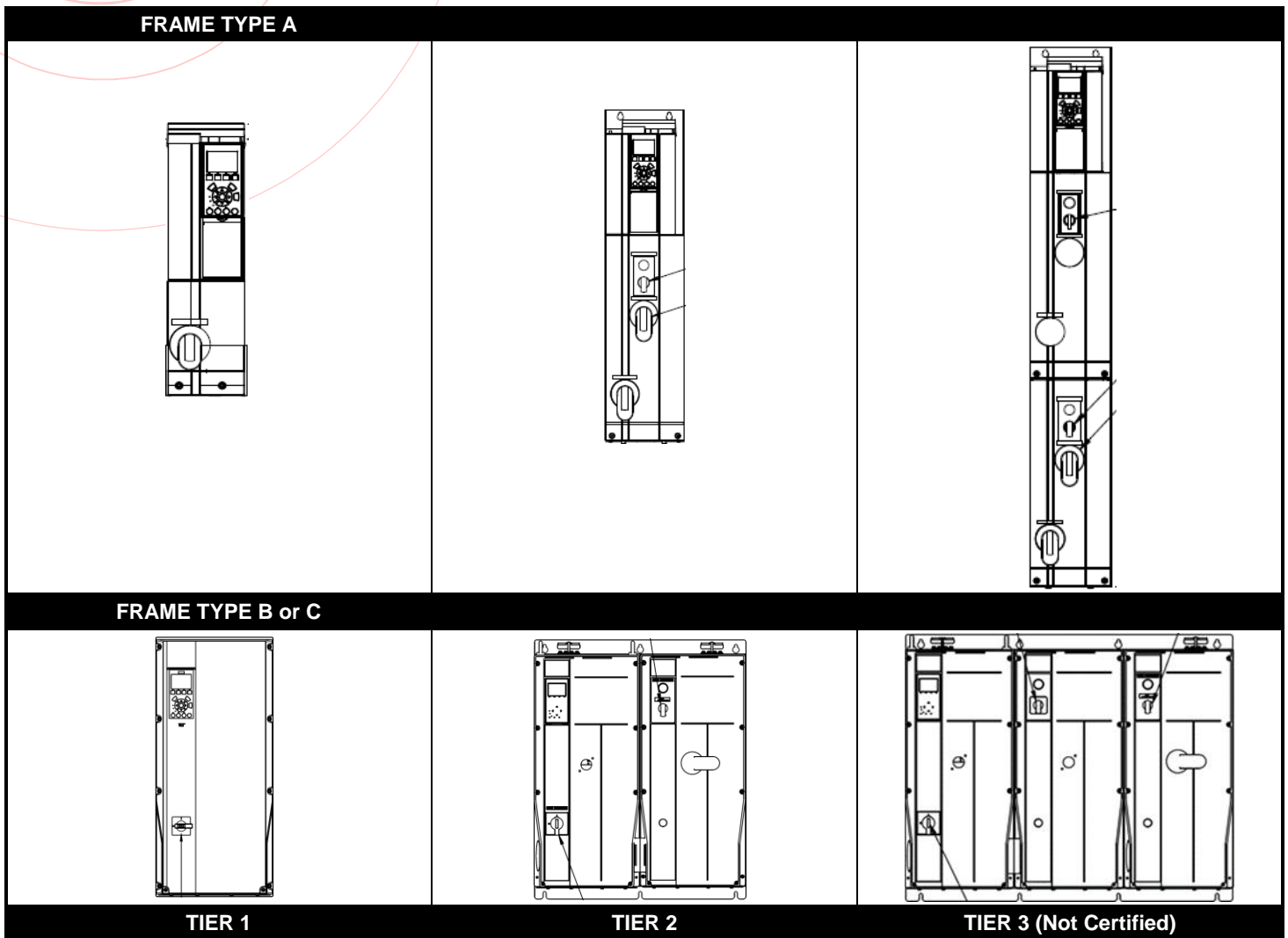
ATTACHMENT PAGE | 1 OF 3

TABLE 1: TRANE TR200 DRIVE PRODUCTS ^A

PRODUCT LINE	DRIVE MODELS		
	DRIVE CHASSIS	CLASSIC PANEL	COMPACT VERTICAL PANEL
Trane TR200 HVAC Drives	TR-200 See Table 2	T200 See Table 2	TR-200 See Table 3
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 project. C) Serial Numbers (S/N) are unique numbers assigned to a panel or drive.			

TABLE 2: TRANE TR200 DRIVE CHASSIS & CLASSIC PANEL CONFIGURATION 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	1. 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). 2. See Figure 1: Traditional Panel (P650) Tier Visual Identification 3. Depth dimension excludes door handle. Width of NEMA 3R enclosures excludes rain hoods. 4. 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: CLASSIC PANEL TIER VISUAL IDENTIFICATION

ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS

ATTACHMENT PAGE | 3 OF 3

TABLE 3: TRANE TR-200 COMPACT VERTICAL PANEL 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: Compact Vertical Panel 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. 						

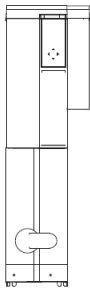
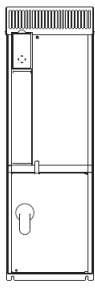
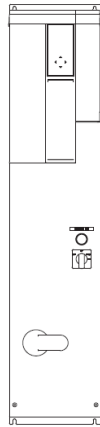
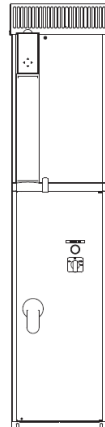
TIER 1: NON BYPASS		TIER 2: BYPASS	
			
B3 FRAME	B4/C3/C4 FRAME	B3 FRAME	B4/C3/C4 FRAME
Drive with: Fuses Disconnect		Drive with bypass: Fuses Disconnect contactors Power Supply Control Module	

FIGURE 2: COMPACT VERTICAL PANEL TIER VISUAL IDENTIFICATION

ATTACHMENT 2: TEST UNIT SUMMARY

ATTACHMENT PAGE | 1 OF 4

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

TEST CRITERIA	S _{ds}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC156	2.05	1.0	1.5	3.28	2.46	1.37	0.55

UUT-1: Classic Panel 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: Classic Panel 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: Classic Panel 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

ATTACHMENT PAGE | 2 OF 4

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

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

ATTACHMENT PAGE | 3 OF 4

UUT- A1: Compact Vertical Non-Bypass 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: Compact Vertical Bypass 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: Compact Vertical Non Bypass 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

ATTACHMENT PAGE | 4 OF 4

UUT-A4: Compact Vertical Bypass 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.

