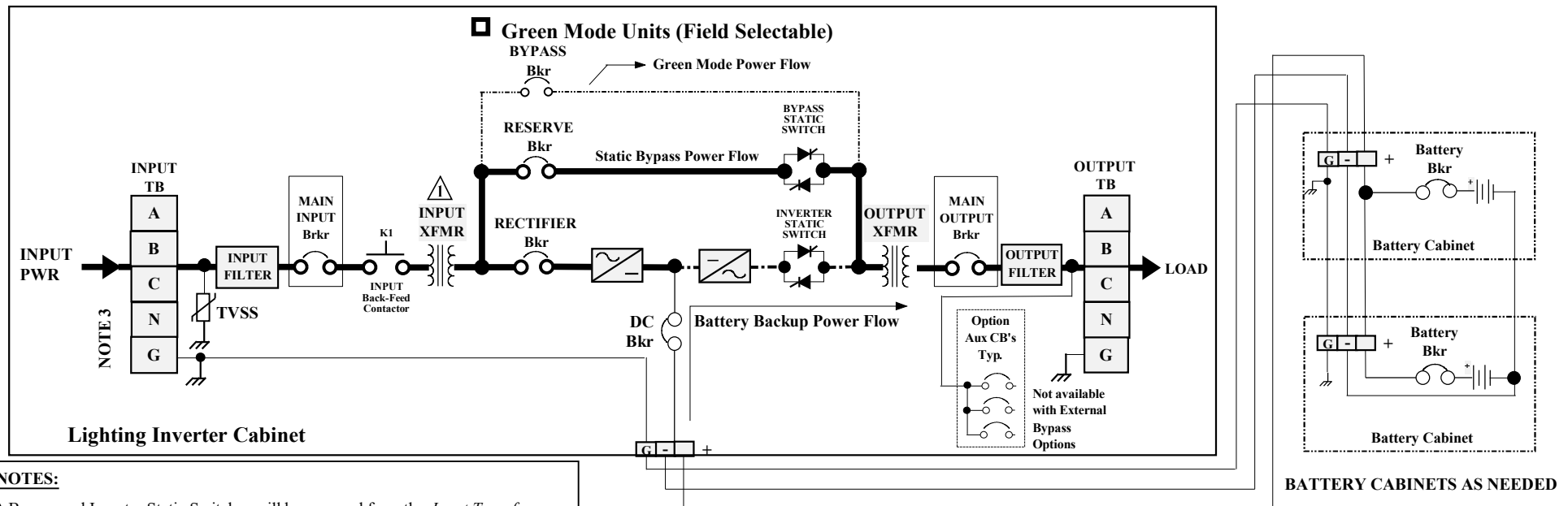
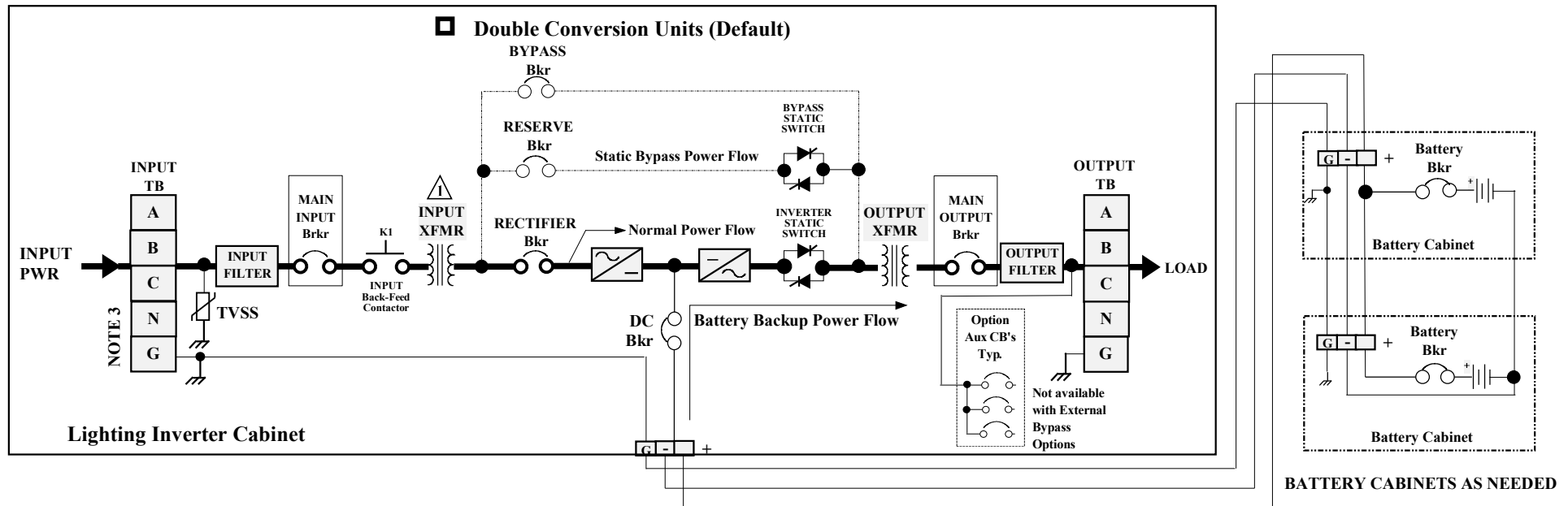


WAVE RIDER 4 LIGHTING INVERTER TYPICAL SINGLE LINE DIAGRAM



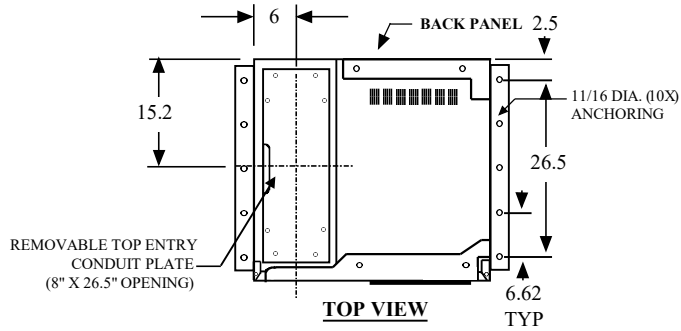
NOTES:

1. Bypass and Inverter Static Switches will be powered from the *Input Transformer* for different input and output voltage configurations.
2. Power Flow is through Static Bypass Switch **(WHEN IN GREEN MODE)** during Input Power Drop
3. **Optional Delta Units are available. Neutral not required.**
4. Battery Cabinet Quantity might vary depending on the Battery type.

TYPICAL WR4 LIGHTING INVERTER SINGLE LINE DIAGRAM		SHT 1 OF 1
CRUCIAL POWER PRODUCTS SPECIFICATION SUBJECT TO CHANGE WITHOUT NOTICE		
DRAWN : SS	4/17/24	420-TD-010
APPVD : HN	4/17/24	
		REV B

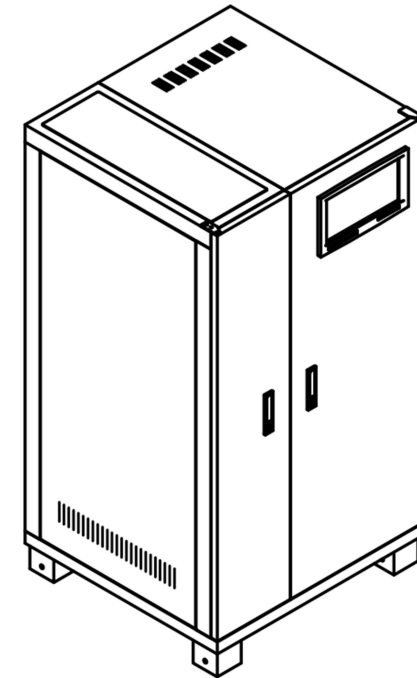
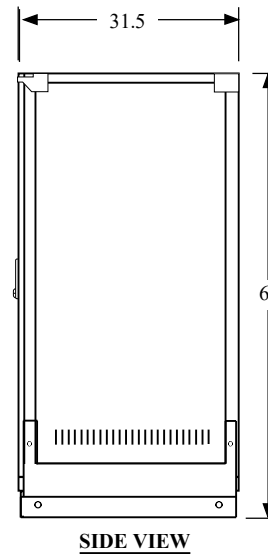
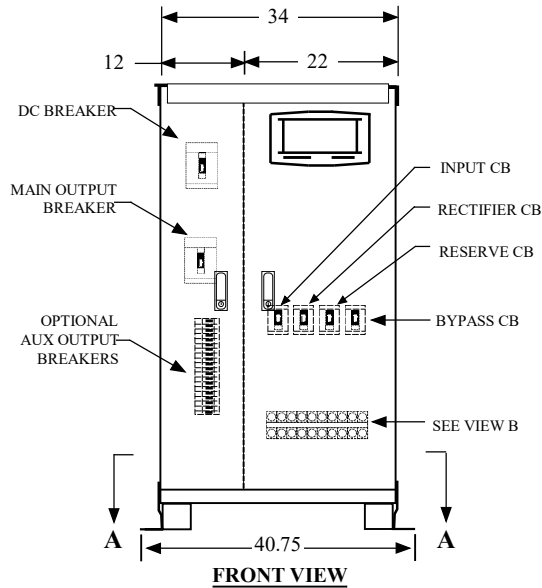
**ELECTRONIC
CABINET ONLY
(10 KVA THRU 60 KVA)**

**WAVE RIDER 4 INVERTER CABINET
SHAKER TABLE TEST CERTIFIED BY (HCAI)**

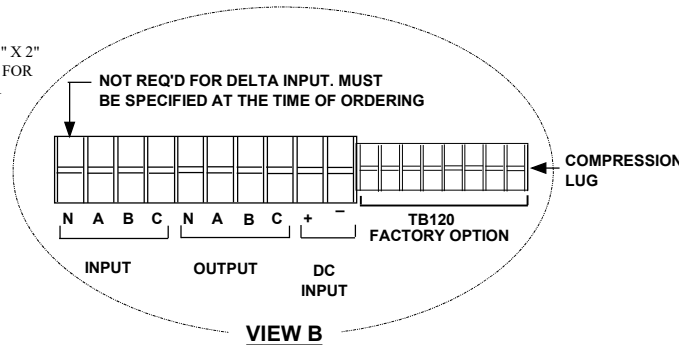
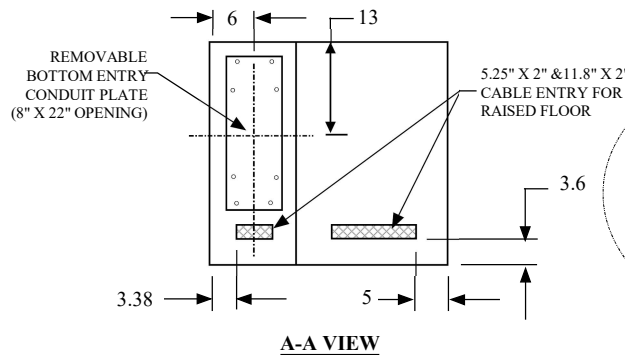


NOTES:

- 1) CONSTRUCTION: INDOOR, COLOR BLACK.
- 2) KNOCKOUTS ON CONDUIT PLATES TO BE DONE BY INSTALLING CONTRACTOR
- 3) DIMENSIONS ARE IN INCHES



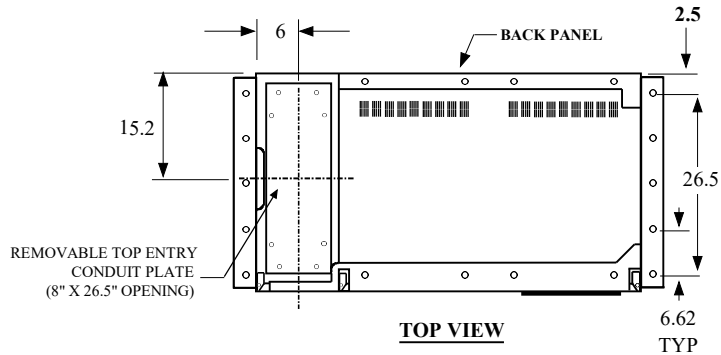
ISOMETRIC VIEW



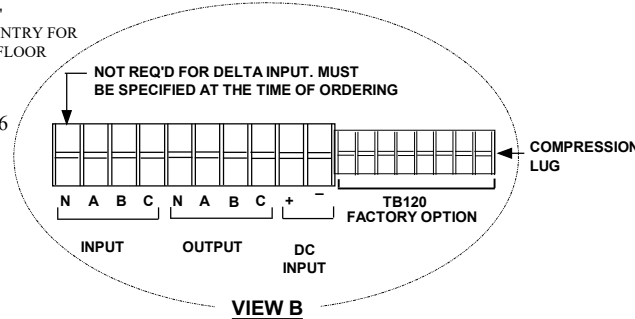
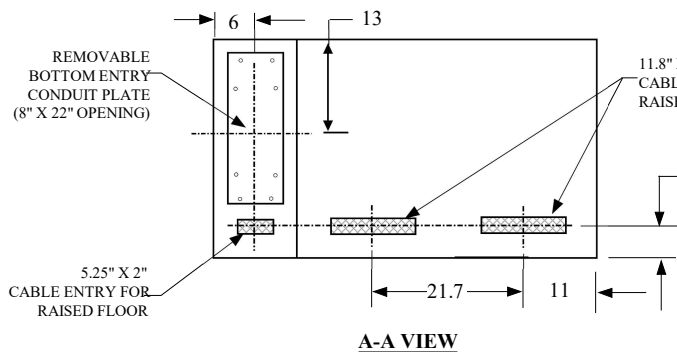
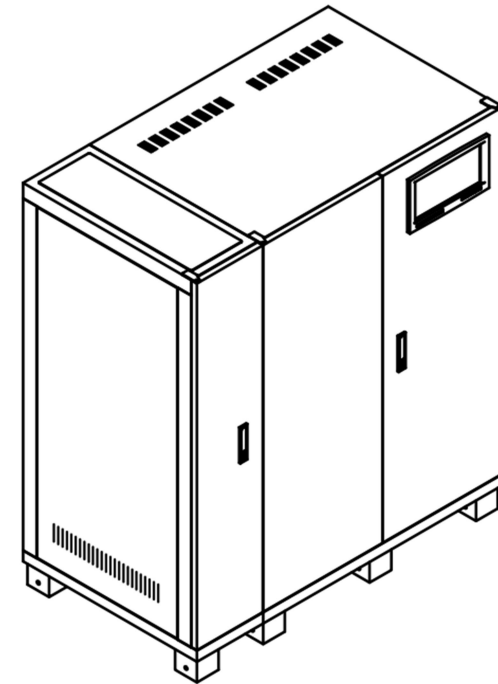
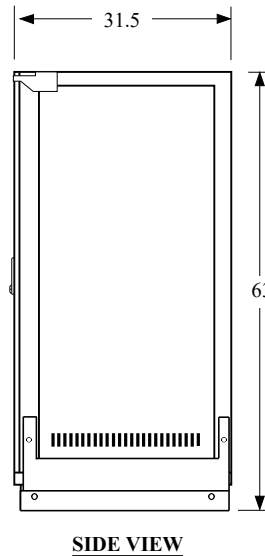
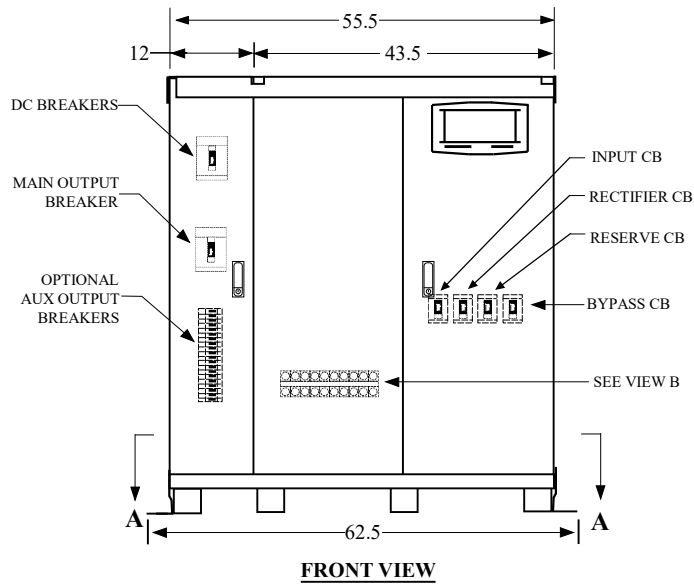
WAVE RIDER 4 SHAKER TABLE TESTED INVERTER CABINET		SHT 1 OF 1
CRUCIAL POWER PRODUCTS SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE		
DRAWN : SHERRIS.	04/17/24	420-SV-TD-011
APPVD : HN	04/17/24	
		REV B

**ELECTRONIC
CABINET ONLY
(80 KVA THRU 160 KVA)**

**WAVE RIDER 4 INVERTER CABINET
SHAKER TABLE TEST CERTIFIED BY (HCAI)**



- NOTES:**
- 1) CONSTRUCTION: INDOOR, COLOR BLACK.
 - 2) KNOCKOUTS ON CONDUIT PLATES TO BE DONE BY INSTALLING CONTRACTOR
 - 3) DIMENSIONS ARE IN INCHES

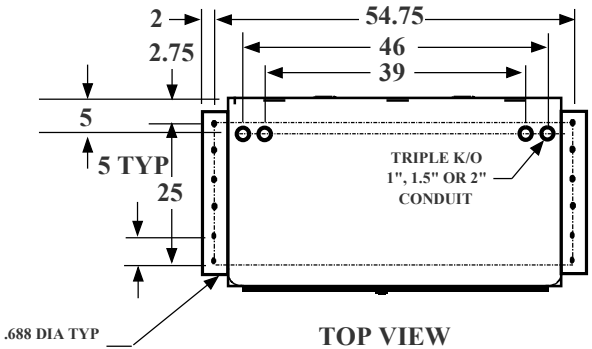


WAVE RIDER 4 SHAKER TABLE TESTED INVERTER CABINET		SHT 1 OF 1
SPECIFICATION SUBJECT TO CHANGE WITHOUT NOTICE		
DRAWN :SHERRIS.	04/17/24	420-SV-TD-012
APPVD: HN	04/17/24	
		REV B

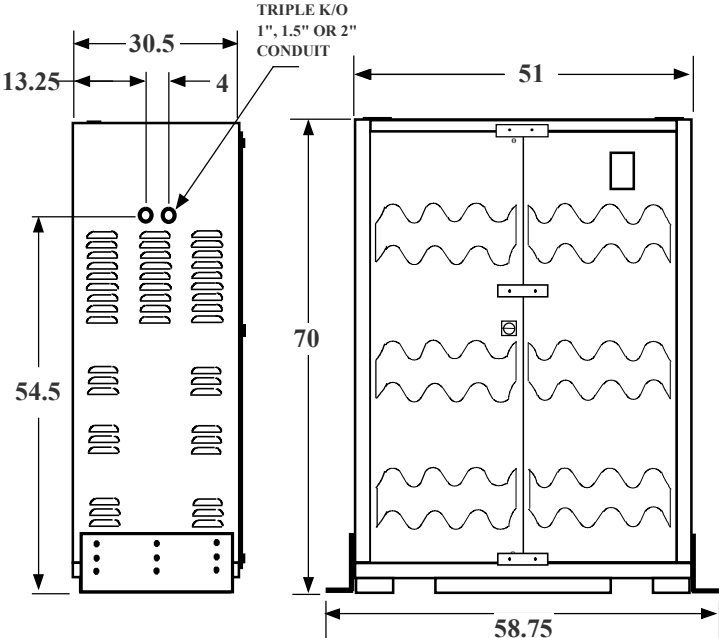
BATTERY CABINET (10 KVA THRU 60 KVA) STANDARD VRLA BATTERY

SHAKER TABLE TEST CERTIFIED BY (HCAI)

RECOMMENDED SYSTEM LAYOUT

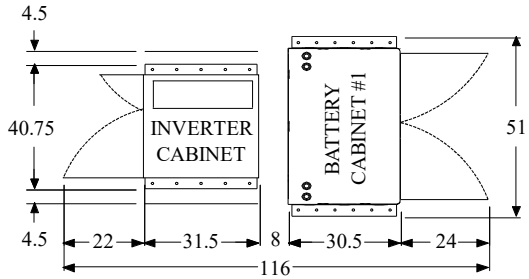
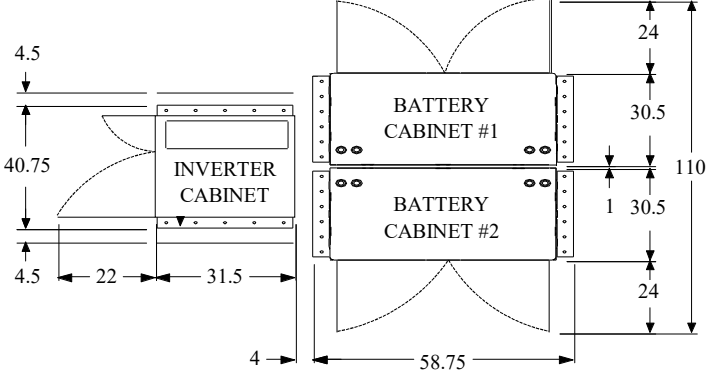
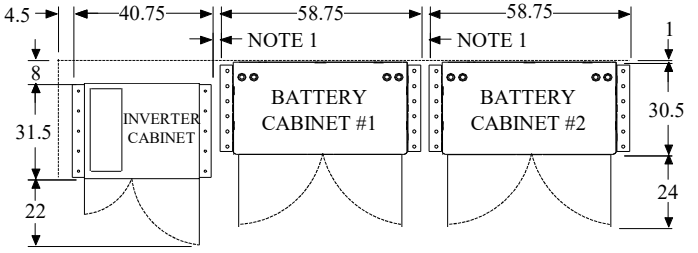


TOP VIEW



LEFT VIEW

FRONT VIEW



STANDARD VRLA BATTERY		
KVA/KW	BATTERY CABINET QTY 90 MIN.	BATTERY CABINET QTY 120 MIN.
10KVA/8KW	1	1
20KVA/16KW	1	1
30KVA/24KW	1	1
40KVA/32KW	2	2
50KVA/40KW	2	2
60KVA/48KW	2	2

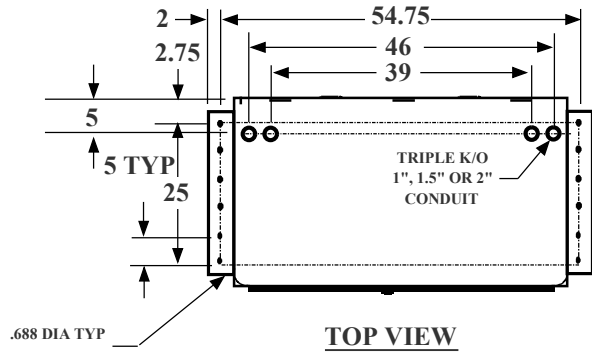
- NOTES:**
- 1) SPACING IS OPTIONAL NOT REQUIRED BY MFR.
 - 2) CONSTRUCTION: NEMA1 INDOOR.
 - 3) DIMENSIONS ARE IN INCHES.

WAVE RIDER 4 SHAKER TABLE TESTED BATTERY CABINET (51" WIDE)		SHT 1 OF 1
CRUCIAL POWER PRODUCTS SUBJECT TO CHANGE WITHOUT NOTICE		
DRAWN : SHERRIS.	4/17/24	420-SV-TD-013
APPVD: HN	4/17/24	
		REV A

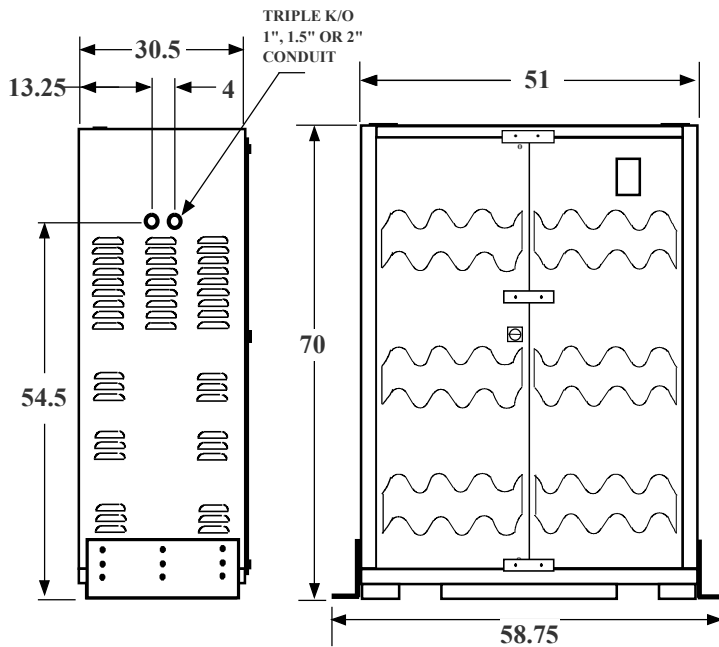
BATTERY CABINET (10 KVA THRU 60 KVA) LONG LIFE BATTERY

SHAKER TABLE TEST CERTIFIED BY (HCAI)

RECOMMENDED SYSTEM LAYOUT

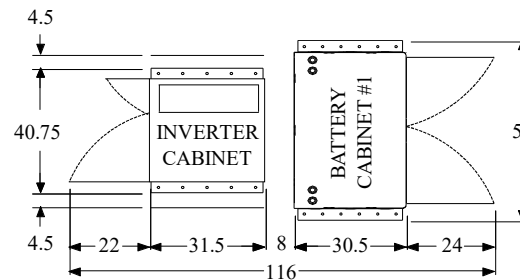
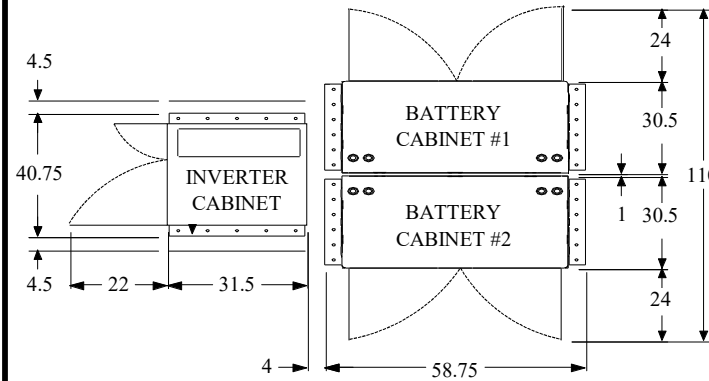
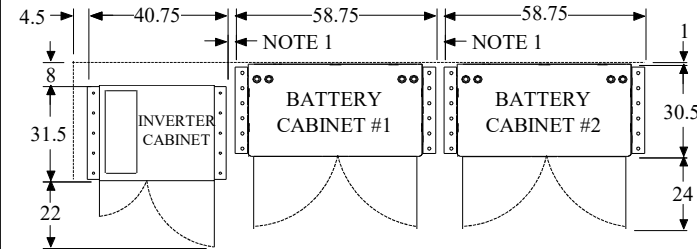


TOP VIEW



LEFT VIEW

FRONT VIEW



LONG LIFE BATTERY		
KVA/KW	BATTERY CABINET QTY 90 MIN.	BATTERY CABINET QTY 120 MIN.
10KVA/8KW	1	1
20KVA/16KW	1	1
30KVA/24KW	1	1
40KVA/32KW	1	2
50KVA/40KW	2	2
60KVA/48KW	2	2

NOTES:

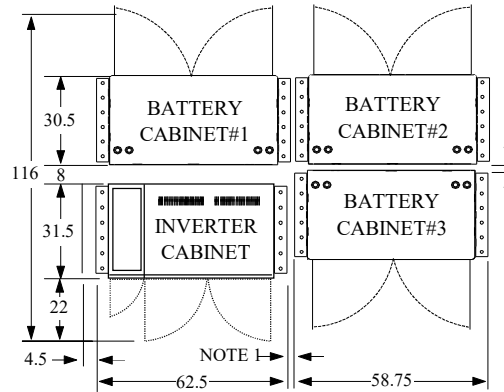
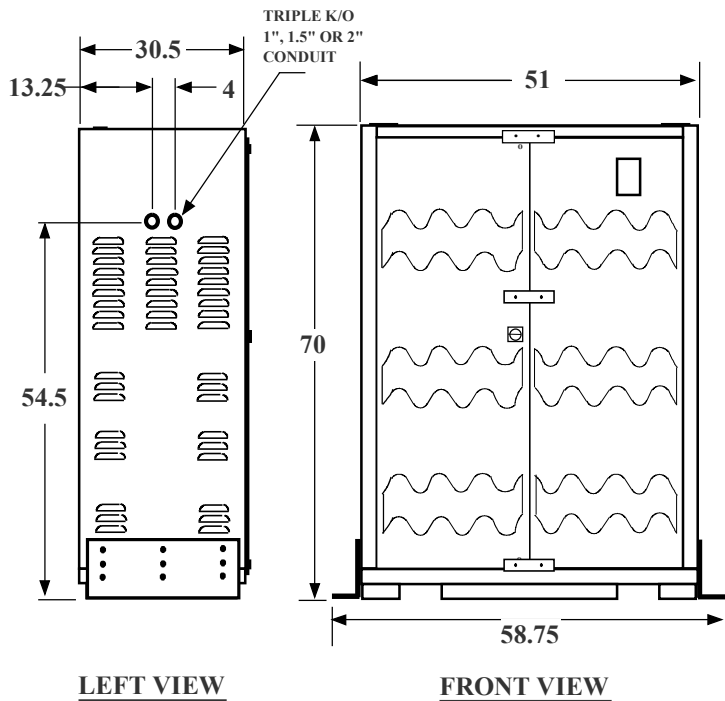
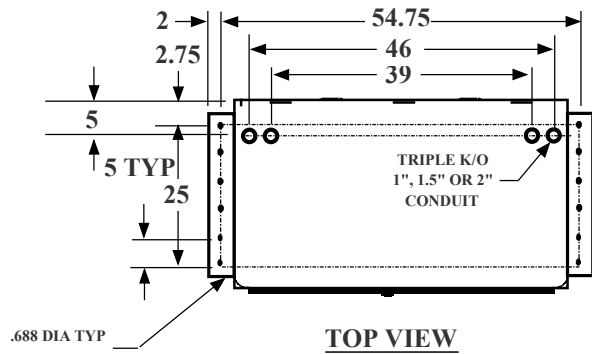
- 1) SPACING IS OPTIONAL NOT REQUIRED BY MFR.
- 2) CONSTRUCTION: NEMA1 INDOOR.
- 3) DIMENSIONS ARE IN INCHES.

WAVE RIDER 4 SHAKER TABLE TESTED BATTERY CABINET (51" WIDE)		SHT 1 OF 1
CRUCIAL POWER PRODUCTS SUBJECT TO CHANGE WITHOUT NOTICE		
DRAWN : SHERRIS.	4/17/24	420-SV-TD-014
APPVD : HN	4/17/24	
		REV A

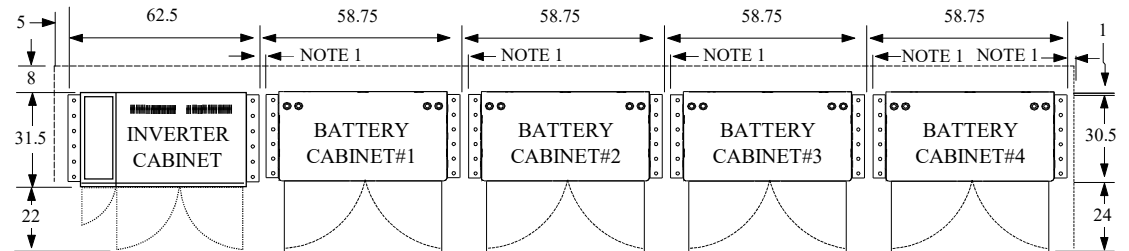
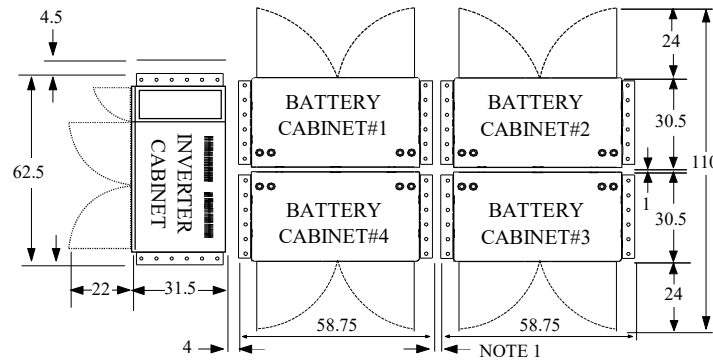
BATTERY CABINET (80 KVA THRU 160 KVA) STANDARD VRLA BATTERY

SHAKER TABLE TEST CERTIFIED BY (HCAI)

RECOMMENDED SYSTEM LAYOUT



STANDARD VRLA BATTERY		
KVA/KW	BATTERY CABINET QTY 90 MIN.	BATTERY CABINET QTY 120 MIN.
80KVA/64KW	2	3
100KVA/80KW	3	4
120KVA/96KW	4	4
160KVA/128KW	LONG LIFE BATTERY ONLY	LONG LIFE BATTERY ONLY



NOTES:

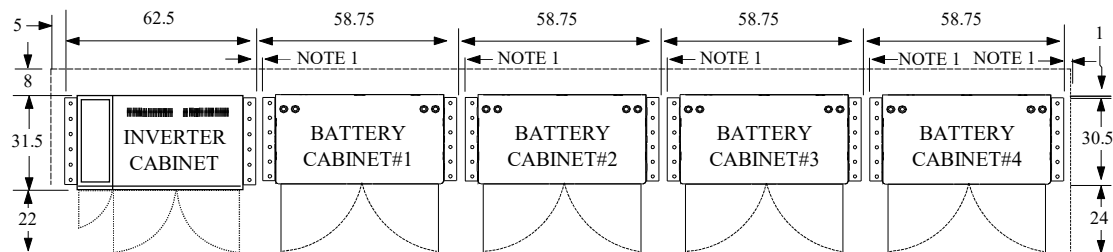
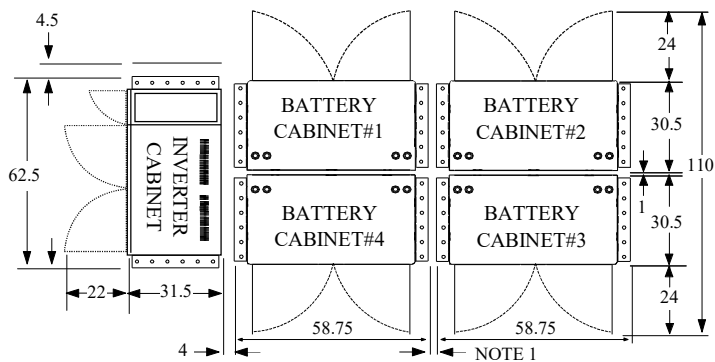
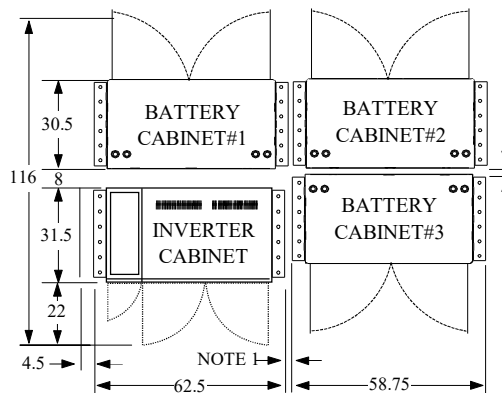
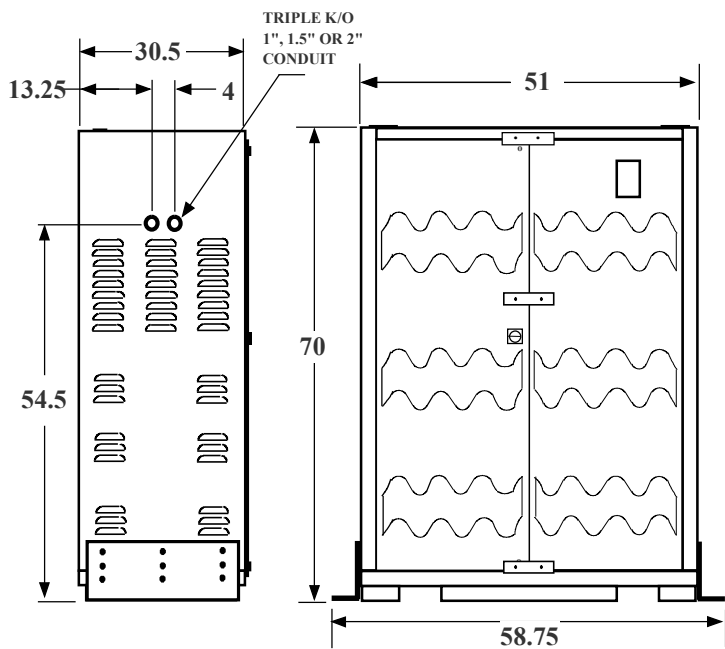
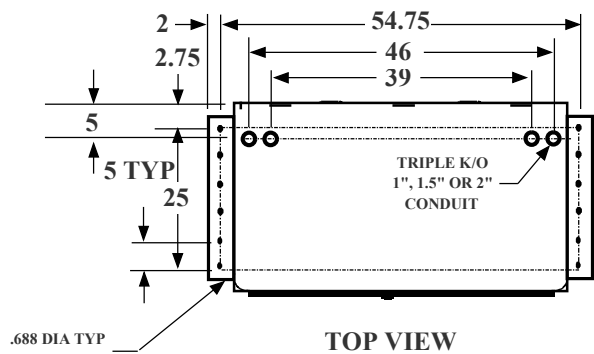
- 1) SPACING IS OPTIONAL NOT REQUIRED BY MFR.
- 2) CONSTRUCTION: NEMA1 INDOOR.
- 3) DIMENSIONS ARE IN INCHES.

WAVE RIDER 4 SHAKER TABLE TESTED BATTERY CABINET (51" WIDE)		SHT 1 OF 1
SUBJECT TO CHANGE WITHOUT NOTICE		
DRAWN : SHERRIS.	4/17/24	420-SV-TD-015
APPVD : HN	4/17/24	
		REV A

BATTERY CABINET (80 KVA THRU 160 KVA) LONG LIFE BATTERY

SHAKER TABLE TEST CERTIFIED BY (HCAI)

RECOMMENDED SYSTEM LAYOUT



LONG LIFE BATTERY		
BATTERY	BATTERY CABINET QTY 90 MIN.	BATTERY CABINET QTY 120 MIN.
80KVA/64KW	2	3
100KVA/80KW	3	3
120KVA/96KW	3	4
160KVA/128KW	4	5

NOTES:

- 1) SPACING IS OPTIONAL NOT REQUIRED BY MFR.
- 2) CONSTRUCTION: NEMA1 INDOOR.
- 3) DIMENSIONS ARE IN INCHES.

WAVE RIDER 4 SHAKER TABLE TESTED BATTERY CABINET (51" WIDE)		SHT 1 OF 1	
CRUCIAL POWER PRODUCTS SUBJECT TO CHANGE WITHOUT NOTICE			
DRAWN : SHERRIS.	4/17/24	420-SV-TD-016	REV A
APPVD : HN	4/17/24		

REMOTE STATUS PANEL

SIDE MOUNT PROVISION

BACK MOUNT PROVISION

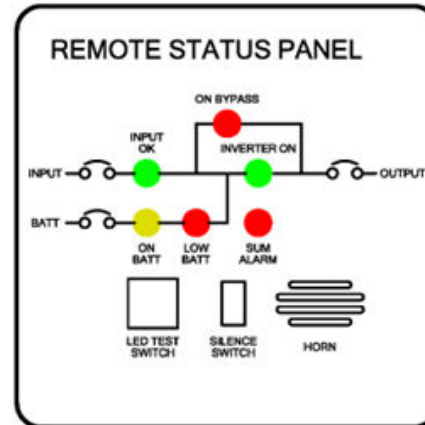


**TO UPS P100 TERMINAL BLOCK
SEE INSTALLATION INSTRUCTION SHIPPED WITH THE ASSEMBLY**

USE BUMPERS FOR CONSOLE INSTALL

Remote Status Panel displays the following:

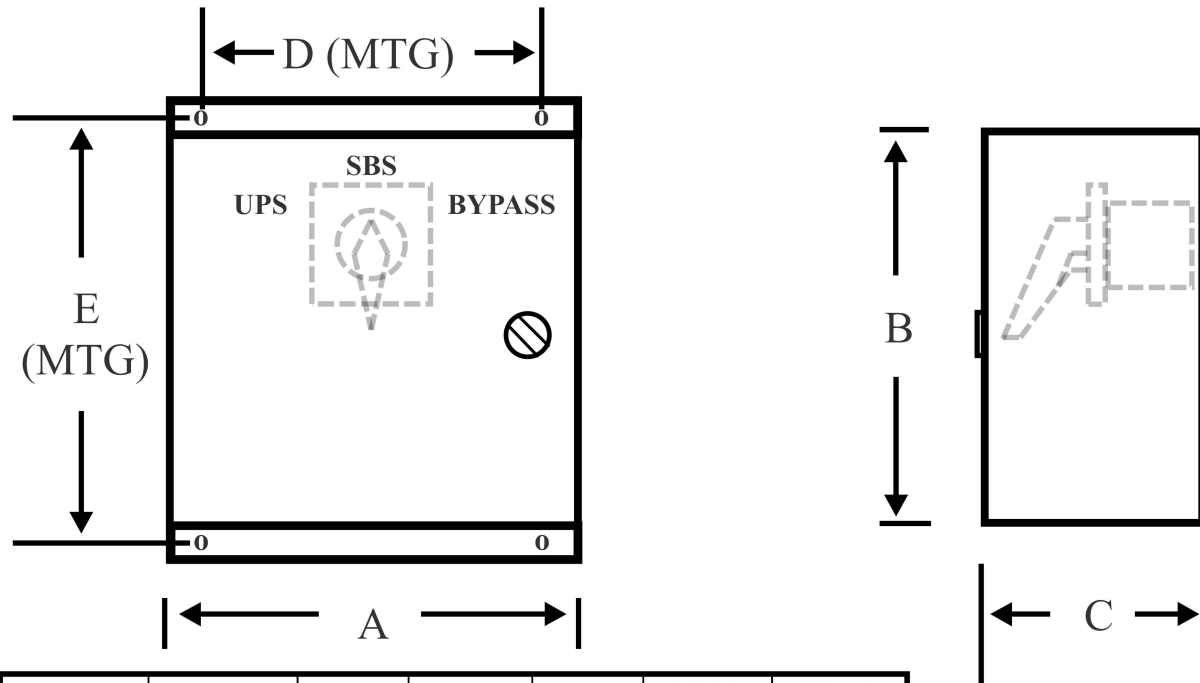
INPUT OK:	Input power is within acceptable range
INVERTER ON:	Inverter is on
ON BYPASS:	Unit is on Bypass Mode
ON BATT:	Unit is running from Battery
LOW BATT:	Battery voltage is at low voltage before shutdown
SUM ALARM:	Unit is on critical alarm such as: Over temperature, DC OV/UV
HORN:	Audible warning for alarm condition
SILENCE WATCH:	Silences the audible warning
LED TEST:	Tests the LED's by push in



NOTES:
 1. ALL DIMENSIONS ARE IN INCHES.
 2. 7.5KW CAN BE IN 39" OR 51" WIDE CABINET DEPENDING ON THE BATTERY TYPE.

REMOTE STATUS PANEL ASSEMBLY		SHT 1 OF 1
CRUCIAL POWER PRODUCTS SUBJECT TO CHANGE WITHOUT NOTICE		
DRAWN : M.TANG	12/07/22	410-SV-TD-014
APPVD : H.N	12/07/22	
		REV A

MAKE BEFORE BREAK EXTERNAL WRAP AROUND BY-PASS SWITCH



RATING	VOLTAGE	DIM A	DIM B	DIM C	DIM D (MTG)	DIM E (MTG)
350 AMPS	600V	30	36	16	28.5	34.5
240 AMPS	600V	30	30	12	28.5	28.5
175 AMPS	600V	20	20	12	18.5	18.5
110 AMPS	600V	14	16	10	12	16.75
55 AMPS	600V	14	16	8	12	16.75

NOTES:

- 1) SWITCH CONTACTS ARE THREE PHASE L-NEUTRAL "MAKE BEFORE-BREAK"
- 2) CONTACTS MARKED "UPS" ARE CLOSED IN THE "UPS" POSITION
- 3) CONTACTS MARKED "BYPASS" ARE CLOSED IN THE "BYPASS" POSITION
- 4) CONTACTS MARKED "SBS" ARE CLOSED IN THE "SBS" POSITION
- 5) WRAP AROUND BY-PASS SWITCH IS FOR SAME INPUT/OUTPUT VOLTAGES ONLY
- 6) WRAP AROUND BY-PASS SWITCH CAN ONLY BE USED WITHOUT ANY BUILT-IN SECONDARY DISTRIBUTION CIRCUIT BREAKERS IN UPS

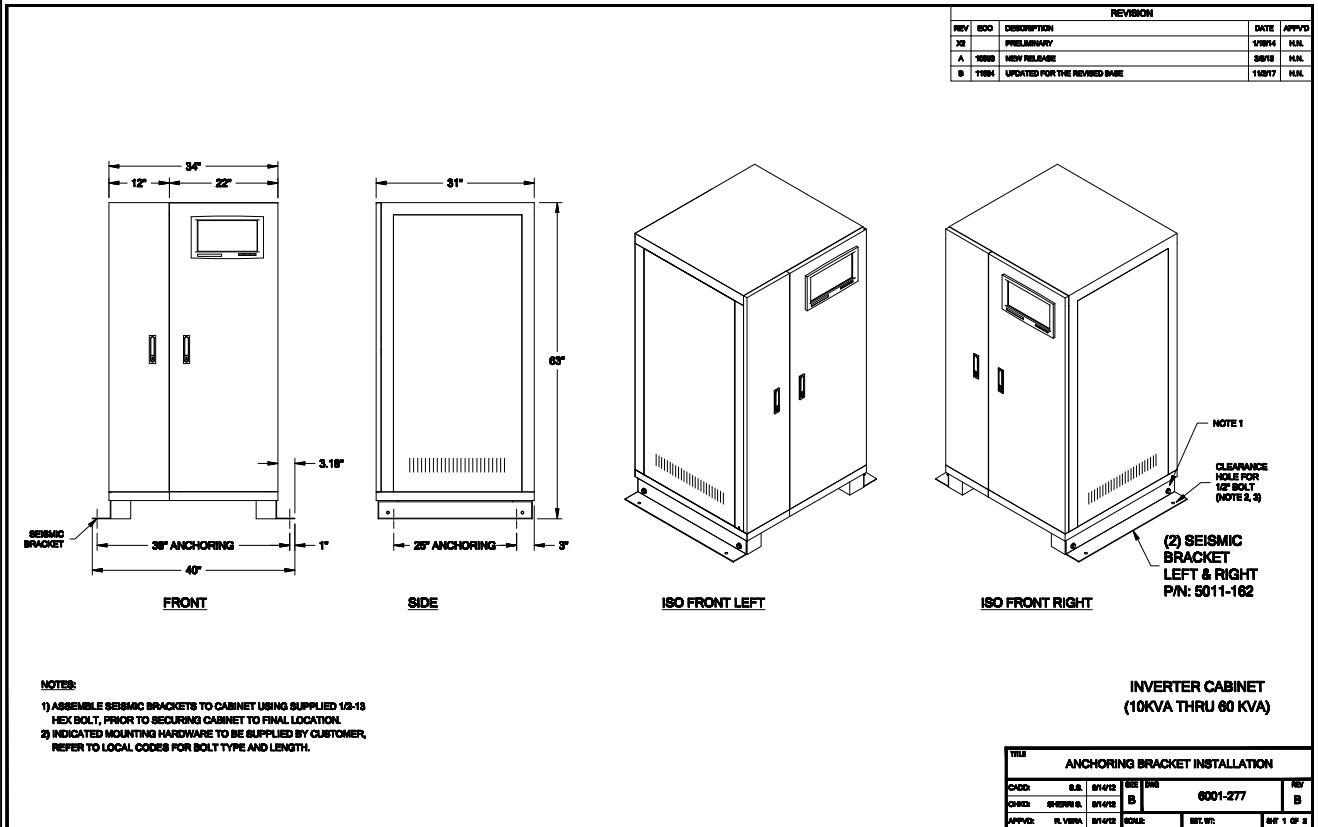
WAVE RIDER 3 / 4
EXTERNAL WRAP AROUND BY-PASS SWITCH

SHT
1 OF 1

PP CRUCIAL POWER PRODUCTS
SUBJECT TO CHANGE WITHOUT NOTICE

DRAWN : SS	4/17/24	415-TD-016	REV
APPVD: HN	4/17/24		A

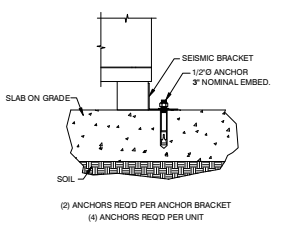
REVISION					
REV	ISS	DESCRIPTION	DATE	APPROV	
3D		PRELIMINARY	1/18/14	HAL	
A	10000	NEW RELEASE	06/18	HAL	
B	11004	UPDATED FOR THE REVISED SHAE	11/21/17	HAL	



REV	ISS	DESCRIPTION	DATE	APPROV
3D		PRELIMINARY	1/18/14	HAL
A	10000	NEW RELEASE	06/18	HAL
B	11004	UPDATED FOR THE REVISED SHAE	11/21/17	HAL

NOTES:
 1) ASSEMBLE SEISMIC BRACKETS TO CABINET USING SUPPLIED 1/2-18 HEX BOLT, PRIOR TO SECURING CABINET TO FINAL LOCATION.
 2) INDICATED MOUNTING HARDWARE TO BE SUPPLIED BY CUSTOMER. REFER TO LOCAL CODES FOR BOLT TYPE AND LENGTH.

TITLE ANCHORING BRACKET INSTALLATION					
CHGR	DR	DATE	REV	BY	CHK
CHGR1	DR1000 R	01/17/12	B	6001-277	B
APPROV:	KL VERA	01/17/12	SCALE	DATE:	SHEET 1 OF 3



1 ANCHOR DETAIL

LOADS & DISTRIBUTION: INVERTER CABINET
 ANALYSIS BASED ON SECTION 18.3.3 OF THE ACI 318 SPECIFICATION REFERENCED IN CHAPTER 16 OF THE 2021 IBC/2022 CBC/2023 LABC

Fp (13-3-1) 0.4 x ea x 50_s x Wp (Wp/4) 0.25 x Wp
 Fp (13-3-2) 1.6 x 50_s x 15 x Wp 2.38 x Wp SHALL NOT BE GREATER THAN
 Fp (13-3-3) 0.2 x 50_s x 15 x Wp 0.438 x Wp SHALL NOT BE LESS THAN

SITE CLASS = D
 Fe = 1.2
 Ss = 1.89
 Scp = 1.45
 I_p = 1.00
 Rp = 2.5 ASCE 7-16 Table 13.5-1
 ap = 1 ASCE 7-16 Table 13.5-1

Wp = 2500 LB
 0.7Fp = 0.7*0.438*Wp = 0.31*2500 LB = 767 LB

OVERTURNING ANALYSIS:
 CABINET HEIGHT, Hc = 63.0 IN
 ANCHORS SPACING, d = 25.0 IN

Mot = Vtotal*(1/2 H)
 = 767 LB * 63 IN * 1/2 = 24,345 IN-LB

Mst = Wp*d/2 = 2500 LB * 25 IN/2 = 31,250 IN-LB

PullOut = (Mot - 0.8*Mst)/d = (24,345 IN-LB - 0.8 * 31,250 IN-LB)/25 IN = 236 LB < UPLIFT

ANCHORS
 ALLOWABLE CAPACITY PER ICC REPORT AND ACI 318-14 CHAPTER 17
 PULLOUT: 1170 LB T_{anchors, acc}
 SHEAR: 2390 LB V_{anchors, acc}

COMBINED STRESS = (216 LB/2340 LB) + (767 LB/9560 LB) = 0.17 < 1.7 OK

USE 1/2"Ø x 3"MIN. EMBED. HILTI KB-T2 (ICC ESR-4266) OR APPROVED EQUAL (4) PER CABINET

NOTES:
 1. DESIGNED PER THE 2021 IBC / 2022 CBC / 2023 LABC.
 Fa = 1.2 & Ss = 1.82
 2. STORAGE CAPACITY: 2,500# MAX. WEIGHT.
 3. ANCHORS: HILTI KWIK-BOLT T-22.
 ICC #ESR-4266 W/LABC SUPPLEMENT
 4. CONCRETE: 6" THICK x 2,500 PSI.
 5. SOIL BEARING PRESSURE: 600 PSF. (MIN. REQ'D).
 6. EVALUATION BASED ON NORTHRIDGE LOCATION (ONE OF THE HIGHEST LA FAULT AREAS) WITH THE FOLLOWING CALCULATION AS A TYPICAL EXAMPLE. (ASSUMED GROUND FLOOR INSTALLATION)

POWER COMPANY
 NORTHRIDGE, CA 91324

NO.	DATE	BY	DESCRIPTION

NO.	DATE	BY	DESCRIPTION

SEIZMIC ENGINEERING, INC.
 EST. 1993
 1130 E. Cypress St.
 Covina, California 91724
 Tel. (909) 869-0989

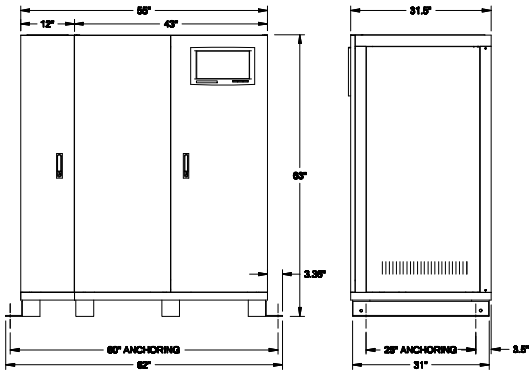
DRAWN BY: M.V. / T.C.
 DATE: 01/25/24
 DESIGNED BY:
 REV. DATE:
 TYPE:
 SCALE: N.T.S.
 APPROV BY: DALE PATERN

12-31-2025

CABINET DETAILS

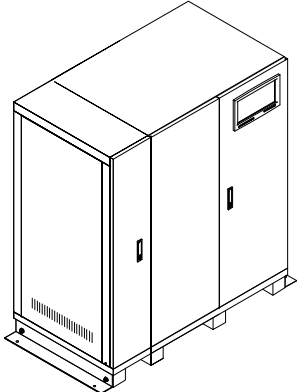
DRAWING NUMBER: **24-0186-C**

CALCULATIONS

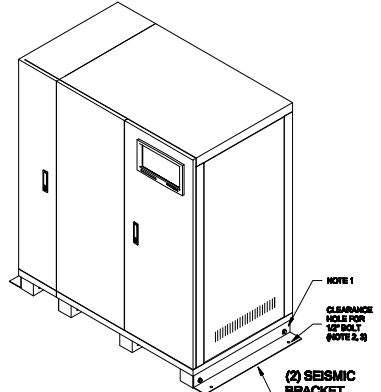


FRONT

SIDE



ISO FRONT LEFT

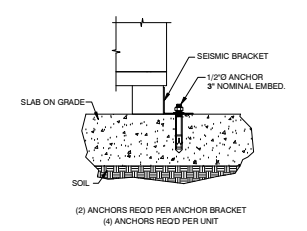


ISO FRONT RIGHT

(80KVA THRU 160 KVA)

- NOTES:**
- 1) ASSEMBLE SEISMIC BRACKETS TO CABINET USING SUPPLIED 1/2-13 HEX BOLT, PRIOR TO RELOCATING CABINET TO FINAL LOCATION.
 - 2) INDICATED MOUNTING HARDWARE TO BE SUPPLIED BY CUSTOMER. REFER TO LOCAL CODES FOR BOLT TYPE AND LENGTH.

REV	DATE	DESCRIPTION
B	0601-277	B
SCALE	DR. WTS.	SH. 1 OF 2



1 ANCHOR DETAIL

- NOTES:**
1. DESIGNED PER THE 9021 IBC / 2022 CBC / 2023 IABC. $F_a = 1.2$ & $S_s = 1.82$.
 2. STORAGE CAPACITY: 4,000# MAX. WEIGHT.
 3. ANCHORS: MULTI-ROW BOLT T22, ICC #ESR-4266 W/ LABC SUPPLEMENT
 4. CONCRETE: 6" THICK x 2,800 PSI.
 5. SOIL BEARING PRESSURE: 800 PSF. (MIN. REQ'D)
 6. EVALUATION BASED ON NORTHRIDGE LOCATION (ONE OF THE HIGHEST LA FAULT AREAS) WITH THE FOLLOWING CALCULATION AS A TYPICAL EXAMPLE. (ASSUMED GROUND FLOOR INSTALLATION)

LOADS & DISTRIBUTION: INVERTER CABINET

ANALYSIS BASED ON SECTION 13.3 OF THE ASCE 7-16 SPECIFICATION REFERENCED IN CHAPTER 16 OF THE 2021 IBC/2022 CBC/2023 IABC

$F_p (13.3-1) = 0.4 \times \text{top} \times S_{ps} \times W_p / R_p / I_p$	$0.234 \times W_p$	
$F_p (13.3-2) = 1.6 \times S_{ps} \times I_p \times W_p$	$2.336 \times W_p$	SHALL NOT BE GREATER THAN
$F_p (13.3-3) = 0.3 \times S_{ps} \times I_p \times W_p$	$0.438 \times W_p$	SHALL NOT BE LESS THAN

SITE CLASS = D
 $F_a = 1.2$
 $S_s = 1.83$
 $S_{ps} = 1.46$
 $I_p = 1.00$
 $R_p = 2.5$ ASCE 7-16 Table 13.5-1
 $q_p = 1$ ASCE 7-16 Table 13.5-1

$W_p = 4000 \text{ LB}$
 $0.7F_p = 0.7 \times 0.438 \times W_p = 0.317 \times 4000 \text{ LB} = 1,228 \text{ LB}$

OVERTURNING ANALYSIS:

CABINET HEIGHT, H = 63.0 IN
 ANCHORS SPACING, D = 25.0 IN

$M_{ot} = V_{ot} \times (1/2 H)$
 $= 1228 \text{ LB} \times 63 \text{ IN} \times 1/2$
 $= 38,632 \text{ IN-LB}$

$M_{st} = W_p \times D/2$
 $= 4000 \text{ LB} \times 25 \text{ IN} / 2$
 $= 50,000 \text{ IN-LB}$

$P_{uplift} = (M_{st} - 0.6 \times M_{ot}) / D$
 $= (38632 \text{ IN-LB} - 0.6 \times 50000 \text{ IN-LB}) / 25 \text{ IN}$
 $= 345 \text{ LB} \quad \Rightarrow \text{UP/LIFT}$

ANCHORS
 ALLOWABLE CAPACITY PER ICC REPORT AND ACI 318-14 CHAPTER 17
 PULLOUT: 1170 LB $V_{allowable, pull}$
 SHEAR: 2300 LB $V_{allowable, shear}$

COMBINED STRESS = $(345 \text{ LB} / 2340 \text{ LB}) = (1226 \text{ LB} / 9560 \text{ LB}) = 0.28 < 1.2 \text{ OK}$

USE 1/2" DIA x 3" MIN. EMBED. MULTI-KB-T22 (ICC ESR-4266) OR APPROVED EQUIV. (4) PER CABINET

CALCULATIONS

POWER COMPANY
 NORTHBRIDGE, CA 91324

NO.	DATE	DESCRIPTION

REV.	DATE	BY	DESCRIPTION

SEIZMIC
 EST. 1990
 SEIZMIC
 ENGINEERING, INC.
 1100 S. Cypress St.
 Covina, California
 91724
 Tel. (909)869-0999

DRAWN BY: M.V. J.T.C.
 DATE: 01/25/24
 JOB REV. BY:
 REV. DATE:
 TYPE:
 SCALE: N.T.S.
 APPROV BY: SALE PATREY



12-31-2025

DESCRIPTION:
CABINET DETAILS

DRAWING NUMBER:
24-0186-D

HCAI Certification (pg. 1 of 3)



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0499

HCAI Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Crucial Power Products

Manufacturer's Technical Representative: Sherri Shahsavari

Mailing Address: 14000 S Broadway, Los Angeles, CA 90061

Telephone: (323) 721-5017

Email: sherris@onlinepower.com

Product Information

Product Name: UPS and Batteries

Product Type: Lighting Inverter Systems

Product Model Number: See Attachment

General Description: Single phase or three phase emergency lighting inverter with battery backup inside of a carbon steel electrical cabinet enclosure.

Mounting Description: Rigid, Floor Mounted

Tested Seismic Enhancements: Seismic enhancements made to the test units and/or modifications required to address anomalies during the tests shall be incorporated into the production units.

Applicant Information

Applicant Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

Contact Person: Galen Reid

Mailing Address: 5215 Hellyer Ave. Suite 210, San Jose, CA 95138

Telephone: (541) 604-7225

Email: greid@structint.com

Title: Director, TRU Compliance



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

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

Company Name: STRUCTURAL INTEGRITY ASSOCIATES, INC.

Name: Andrew Coughlin

California License Number: S6082

Mailing Address: 5215 Hellyer Ave, Suite 101, San Jose, CA 95138-1025

Telephone: (415) 635-8461

Email: acoughlin@structint.com

Certification Method

GR-63-Core

ICC-ES AC156

IEEE 344

IEEE 693

NEBS 3

Other (Please Specify): _____

Testing Laboratory

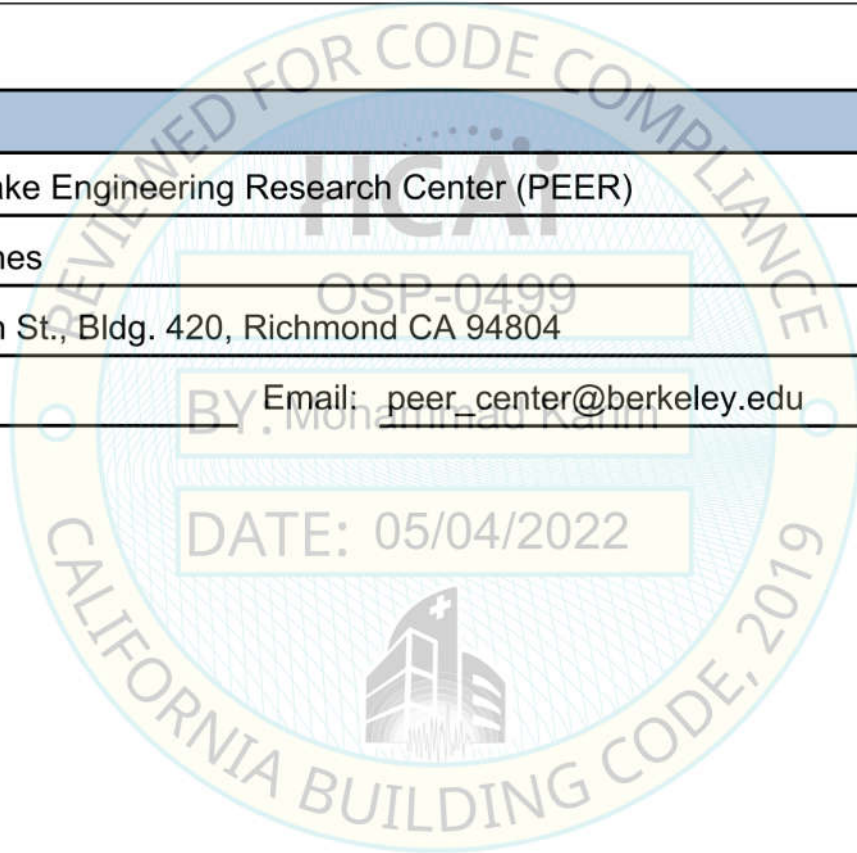
Company Name: Pacific Earthquake Engineering Research Center (PEER)

Contact Person: Clement B Barthes

Mailing Address: 1301 South 46th St., Bldg. 420, Richmond CA 94804

Telephone: (510) 642-3437

Email: peer_center@berkeley.edu





DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.44 (SDS = 2.0g); 1.35 (SDS = 3.0g)

SDS (Design spectral response acceleration at short period, g) = 2.0 (z/h = 1.0); 3.0 (z/h = 0.0)

a_p (Amplification factor) = 1.0

R_p (Response modification factor) = 2.5

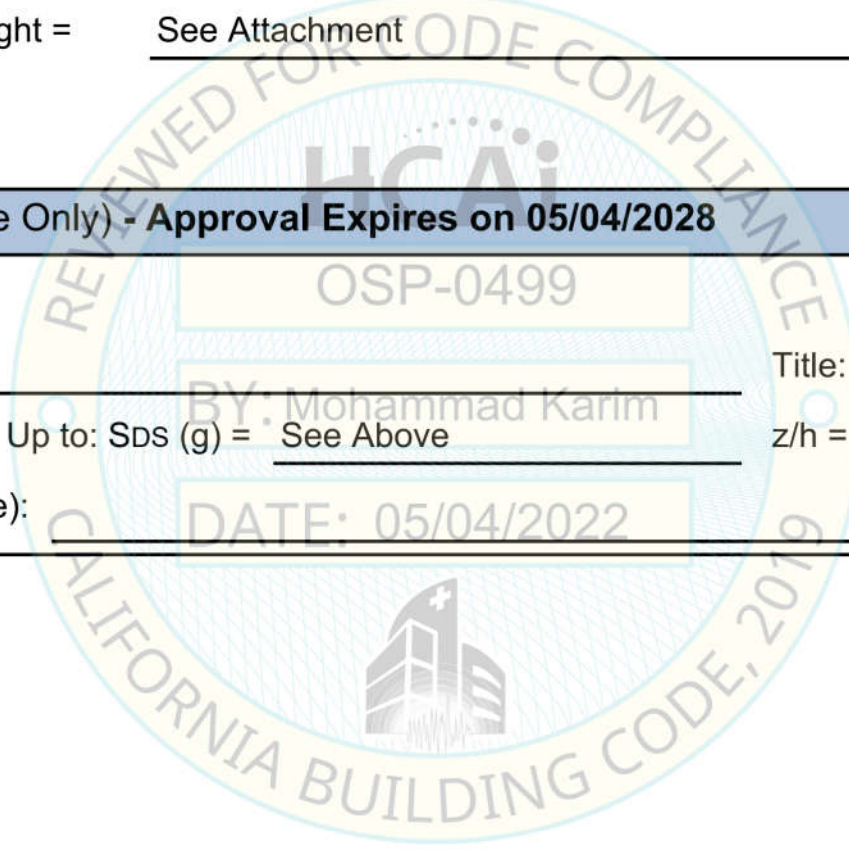
Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1 and 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment



HCAI Approval (For Office Use Only) - Approval Expires on 05/04/2028

Date: 5/4/2022

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: SDS (g) = See Above z/h = See Above

Condition of Approval (if applicable): DATE: 05/04/2022

