

ALAMOSA COMMUNITY CENTER ESS

6900 GONZALES RD. SW, ALBUQUERQUE, NM 87121

GENERAL NOTES

1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2017 NEC AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRICAL UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION.
2. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN CHARACTER. LOCATIONS SHOWN FOR ELECTRICAL EQUIPMENT, DEVICES, CONDUIT, ETC. ARE APPROXIMATE.
3. DO NOT SCALE OFF ELECTRICAL PLANS.
4. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 310.0(D)
5. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.8(C)
6. WORKING CLEARANCES AROUND THE EXISTING AND NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH THE NEC 110.26
7. EXACT CONDUIT RUN LOCATIONS SUBJECT TO CHANGE.
8. STRUCTURAL MEMBER LOCATIONS ARE ESTIMATED AND SHOULD BE LOCATED AND VERIFIED AS NECESSARY BY CONTRACTOR.
9. DC CONDUCTORS SHALL BE 1000V, 90C STANDARD COPPER.
10. AC CONDUCTORS IN CONDUIT SHALL BE THWN-2.
11. MAXIMUM DC/AC VOLTAGE DROP SHALL BE NO MORE THAN 2%
12. ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED.
13. METALLIC CONDUIT SHALL BE USED WITHIN BUILDING PER NEC 690.31(E).
14. GEC TO BE INSTALL AS REQUIRED BY MANUFACTURER INSTRUCTIONS AND NEC 690.47

PROJECT DESCRIPTION:

THIS PROJECT SCOPE INCLUDES THE INSTALLATION OF AN ENERGY STORAGE SYSTEM (ESS) TO AN EXISTING GRID-TIED SOLAR ELECTRIC SYSTEM.

THIS SYSTEM CONSISTS OF A CAR PORT PV ARRAY. EXTERIOR MOUNTED PV INVERTERS AND RELATED ELECTRICAL AND SAFETY EQUIPMENT. ALL EQUIPMENT WILL BE INSTALLED AS REQUIRED PER APPLICABLE CODES AND THE LOCAL UTILITY COMPANY.

SYSTEM SPECIFICS		
ITEM	DETAIL	QTY
ESS SYSTEM SIZE	55 kW / 110 KWH	
ESS INVERTER	DELTA PCS125, 55 kW	1
CONTROL	ENERGY TOOLBASE iEMS	1
MONITORING	EGAUGE	1
OPERATING MODE	PEAK SHAVING AND DEMAND CHARGE MANAGEMENT, NO EMERGENCY BACKUP	

SHEET INDEX

PV-1.0	COVER SHEET
PV-2.0	SITE PLAN
PV-2.1	EQUIPMENT LAYOUT
PV-4.0 - 4.1	ONE-LINE DIAGRAMS
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PV-4.3	CONTROL & MONITORING DIAGRAM
PV-4.4	AUX PWR / CONTROL WIRING DIAGRAM
PV-4.5	ESS EQUIPMENT GROUNDING DETAIL
PV-5.0	CALCULATIONS
PV-6.0	PLACARDS
PV-7.0	ESS DATA SHEET
PV-7.1	PASON POWER DATA SHEET
PV-7.2	EGAUGE MONITORING DATA SHEET

GOVERNING CODES

APPLICABLE CODES & STANDARDS
 BUILDING: IBC 2015
 ELECTRICAL: NEC 2017
 FIRE: IFC 2015

DESIGN SPECIFICATIONS
 OCCUPANCY: B
 GROUND SNOW LOAD: 20 PSF
 WIND SPEED: 115 MPH (3 SEC GUST)
 WIND EXPOSURE: B

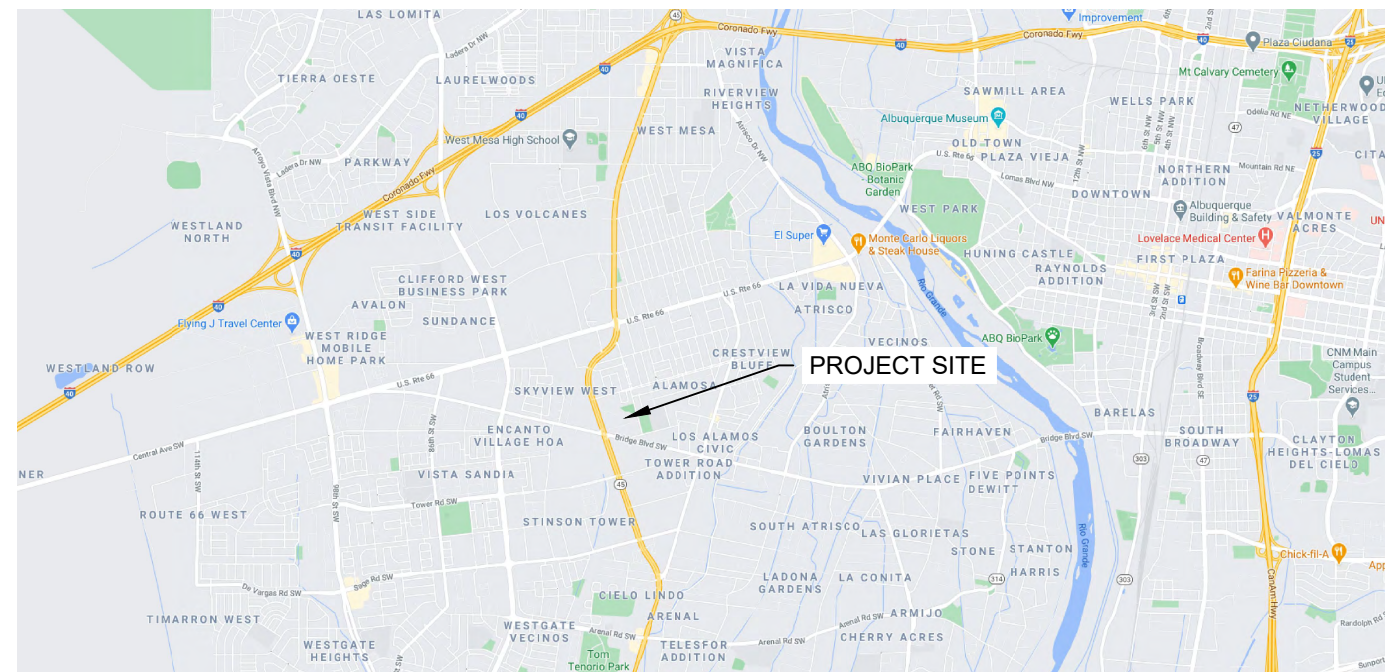
AUTHORITIES HAVING JURISDICTION
 BUILDING: CITY OF ALBUQUERQUE
 ZONING: CITY OF ALBUQUERQUE
 UTILITY: PNM

REVISIONS		
DESCRIPTION	DATE	REV
CONSTRUCTION DRAWINGS	1-21-2021	0

Signature with Seal

PROJECT NAME

ALAMOSA COMMUNITY
 CENTER ESS
 6900 GONZALES RD. SW
 ALBUQUERQUE, NM 87121



VICINITY MAP

SHEET NAME

COVER SHEET

SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-1.0



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REVISIONS

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SHEET NAME

SITE PLAN

SHEET SIZE

ANSI B
 11" X 17"

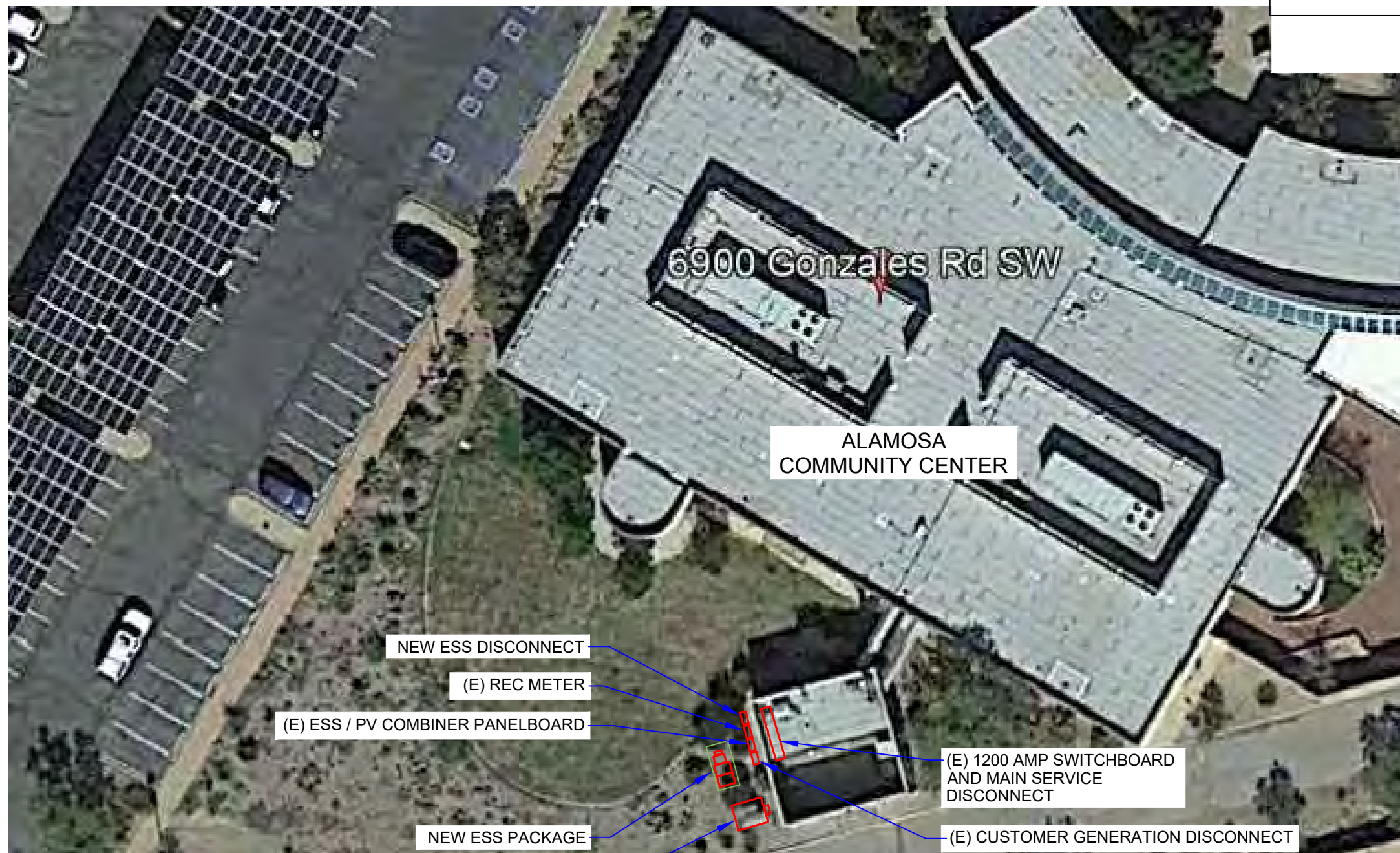
SHEET NUMBER

PV-2.0

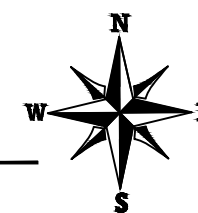
NOTES

1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC AND ALL AUTHORITIES HAVING JURISDICTION.
2. EXACT LOCATION OF ESS PACKAGE SHALL BE FIELD VERIFIED.

ENERGY STORAGE SYSTEM: 1 * DELTA P125
 55 kW PCS = 55 kW (AC)



1 | SITE PLAN
 SCALE: 1" = 30'



GENERAL NOTES

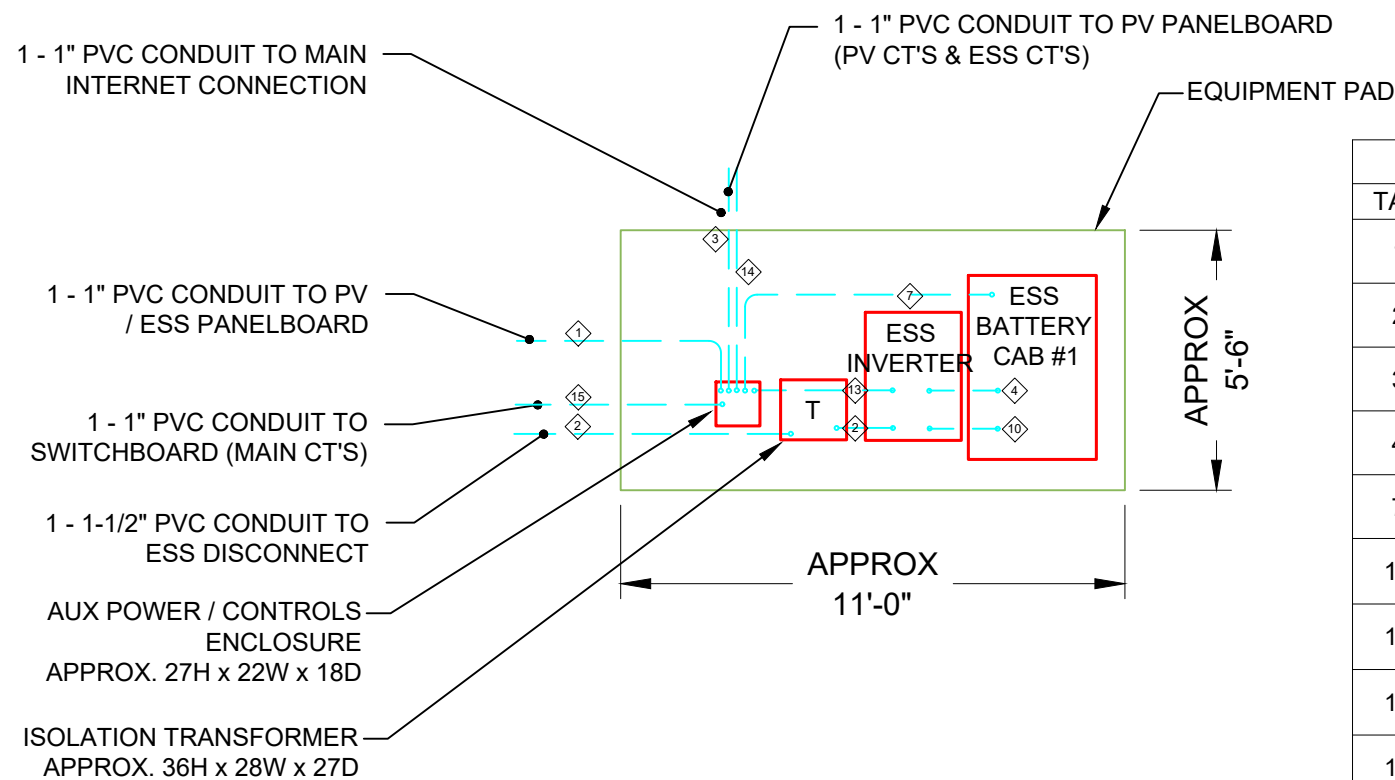
- EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC AND ALL AUTHORITY HAVING JURISDICTION.
- REFER TO DELTA SITE DESIGN MANUAL FOR ESS CONDUIT AND PAD INSTALLATION DETAILS.
- FOLLOW MANUFACTURES SUGGESTED INSTALLATION INSTRUCTIONS AND WIRING SPECIFICATIONS.
- REFER TO MANUFACTURES INSTALLATION INSTRUCTIONS FOR REQUIRED EQUIPMENT CLEARANCES.

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ESS UNDERGROUND WIRING / CONDUIT SCHEDULE				
TAG	CKT DESCRIPTION	WIRING SCHEDULE	EGC	CONDUIT SIZE
1	AUX POWER FEED AND EGAUGE PWR	(2) #12 AWG THWN	#12 AWG	1" PVC
2	MAIN POWER FEED	(3) #1 AWG THWN	#8 AWG	1-1/2" PVC
3	INTERNET CONNECTION	(1) CAT5/6 OR EQ	-	1" PVC
4	DC BUS ESS-M TO PCS	(2) #1/0 AWG RHW-2 1KV	#6 AWG	1-1/2" PVC
7	ESS-M AUX 1 AND AUX 2 POWER	(4) #12 AWG THWN	#12 AWG	1" PVC
10	DI+BBMS ESS-M TO PCS	DUAL CABLE ASSY (BY DELTA)	-	1-1/4" PVC
13	iEMS TO PCS CONTROL	(2) RS485 BELDEN 3106A	-	1" PVC
14	PV AND ESS CT'S	EGAUGE CT WIRES	-	1" PVC
15	MAIN SWITCHBOARD CT'S	EGAUGE CT WIRES	-	1" PVC

1 | **ESS PAD AND EQUIPMENT LAYOUT**
 PV-2.1 (PLAN VIEW) SCALE: NTS

[Handwritten Signature]

SHEET NAME	EQUIPMENT LAYOUT
SHEET SIZE	ANSI B 11" X 17"
SHEET NUMBER	PV-2.1



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ALAMOSA COMMUNITY CENTER – NEW SYSTEM
 INVERTERS: (2) 60KTL-DO/US = 120.0 KW (AC)
 PANELS: (360) * 365W = 131.4 KW (STC-DC)

ALAMOSA COMMUNITY CENTER – EXISTING SYSTEM
 INVERTERS: TOTAL EXISTING SYSTEM 40KW (AC)
 (5) 7KW SB-7000US AND (1) 5KW SB-5000US
 PANELS: (228) * 191 = 43.5 KW (STC-DC)

TOTAL SYSTEM (EXISTING PLUS NEW)
 160KW (AC) 174.9 KW (STC-DC)

REVISIONS		
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PROJECT NAME

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SHEET NAME

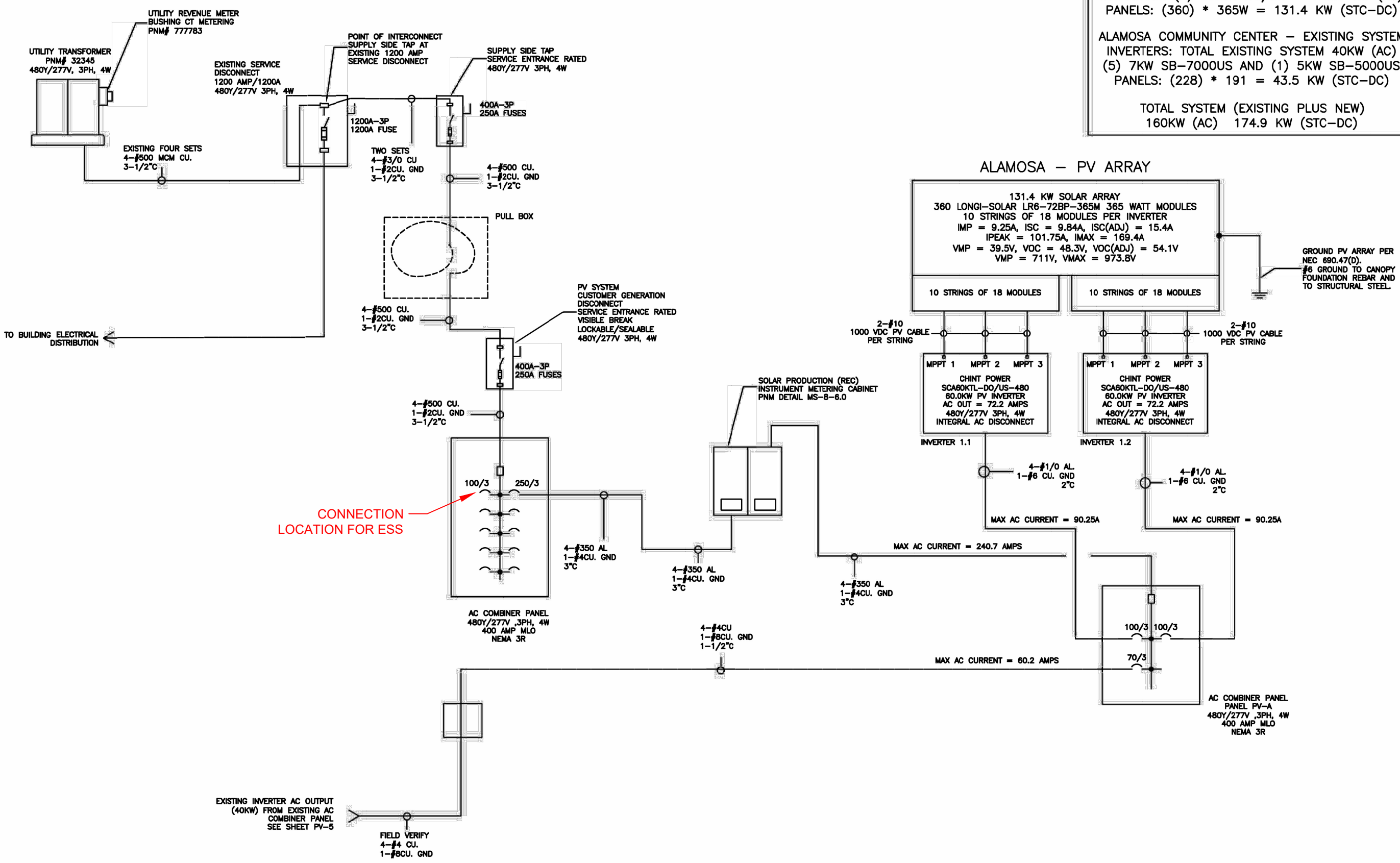
**EXISTING
 ONE-LINE**

SHEET SIZE

**ANSI B
 11" X 17"**

SHEET NUMBER

PV-4.0



EXISTING ONE-LINE DIAGRAM - FOR REFERENCE



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SHEET NAME

ONE-LINE
 DIAGRAM

SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-4.1

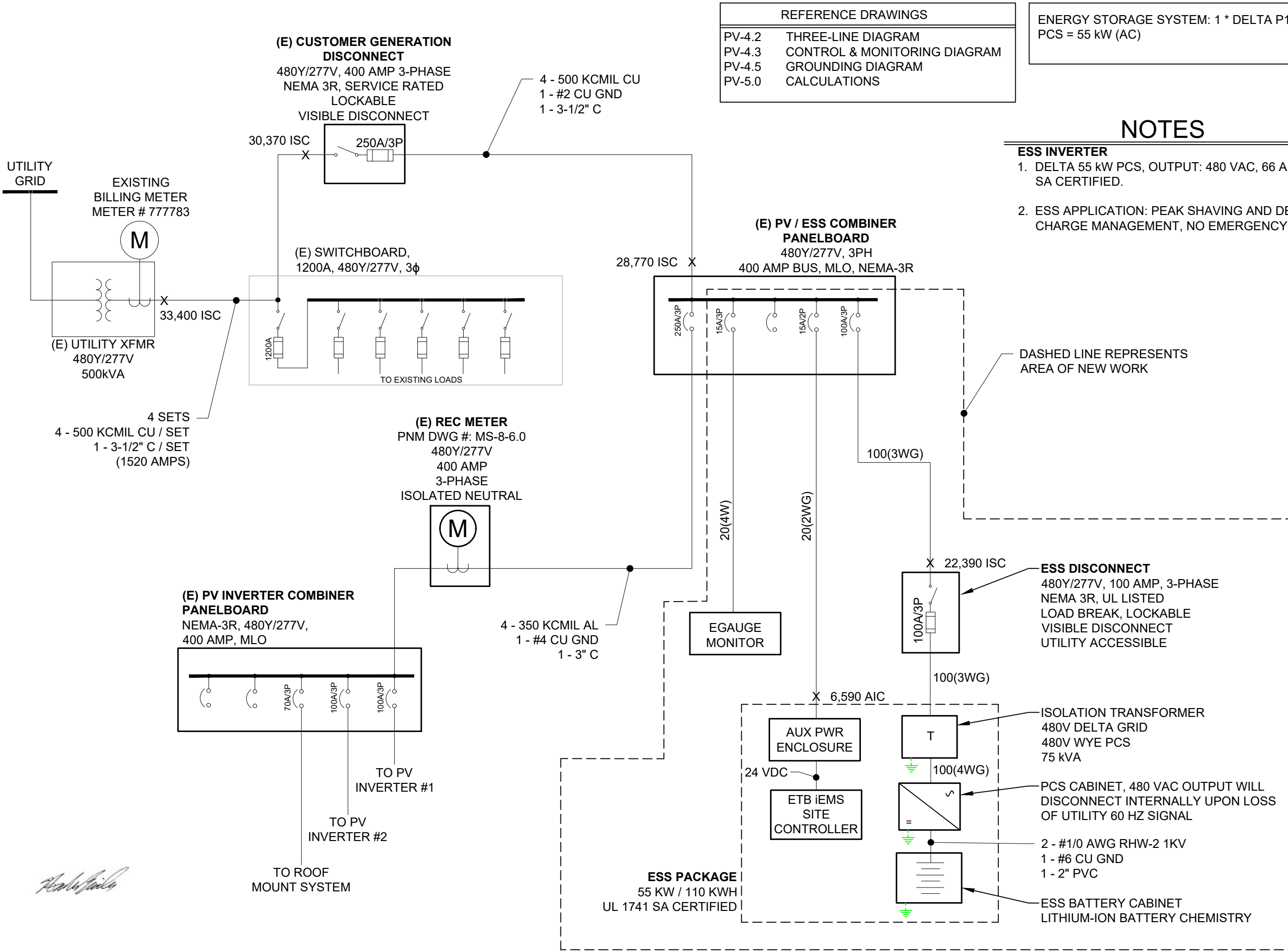
REFERENCE DRAWINGS	
PV-4.2	THREE-LINE DIAGRAM
PV-4.3	CONTROL & MONITORING DIAGRAM
PV-4.5	GROUNDING DIAGRAM
PV-5.0	CALCULATIONS

ENERGY STORAGE SYSTEM: 1 * DELTA P125 55 kW
 PCS = 55 kW (AC)

NOTES

ESS INVERTER

- DELTA 55 kW PCS, OUTPUT: 480 VAC, 66 A, UL 1741 SA CERTIFIED.
- ESS APPLICATION: PEAK SHAVING AND DEMAND CHARGE MANAGEMENT, NO EMERGENCY BACKUP.



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SHEET NAME

3-LINE
 DIAGRAM

SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-4.2

ENERGY STORAGE SYSTEM: 1 * DELTA P125 55 KW
 PCS = 55 KW (AC)

REFERENCE DRAWINGS

PV-4.2	THREE-LINE DIAGRAM
PV-4.3	CONTROL & MONITORING DIAGRAM
PV-4.5	GROUNDING DIAGRAM
PV-5.0	CALCULATIONS

NOTES

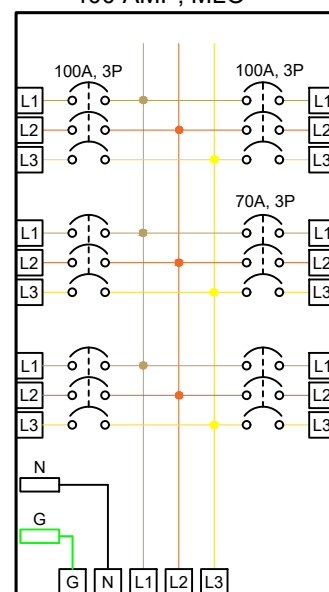
ESS INVERTER

- DELTA 55 KW PCS, OUTPUT: 480 VAC, 66 A, UL 1741 SA CERTIFIED.
- ESS APPLICATION: PEAK SHAVING AND DEMAND CHARGE MANAGEMENT, NO EMERGENCY BACKUP.

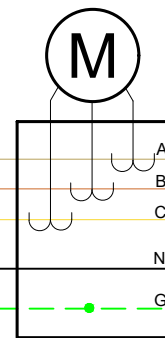
DASHED LINE REPRESENTS
 AREA OF NEW WORK

(E) PV INVERTER COMBINER
 PANELBOARD

NEMA-3R, 480Y/277V,
 400 AMP, MLO



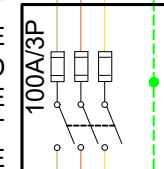
(E) REC METER
 PNM DWG #: MS-8-6.0
 480Y/277V
 400 AMP
 3-PHASE
 ISOLATED NEUTRAL



2 - #1/0 AWG RHW-2 1KV
 1 - #6 CU GND
 1 - 2" PVC

ESS PACKAGE
 55 KW / 110 KWH
 UL 1741 SA CERTIFIED
 MAX FAULT CURRENT
 CONTRIBUTION: 451 A (AC)

ESS DISCONNECT
 480Y/277V, 100 AMP, 3-PHASE
 NEMA 3R, UL LISTED
 LOAD BREAK, LOCKABLE
 VISIBLE DISCONNECT
 UTILITY ACCESSIBLE



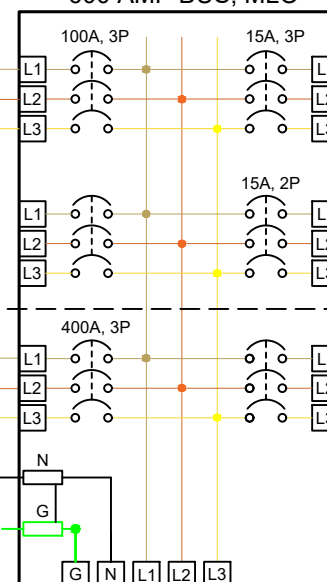
ESS BATTERY CABINET
 LITHIUM-ION BATTERY CHEMISTRY

PCS CABINET, 480 VAC OUTPUT WILL
 DISCONNECT INTERNALLY UPON LOSS
 OF UTILITY 60 HZ SIGNAL

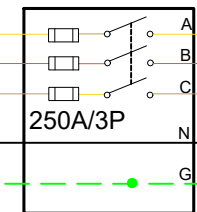
ISOLATION TRANSFORMER
 480V DELTA GRID
 480V WYE PCS
 75 kVA

(E) PV / ESS COMBINER
 PANELBOARD

NEMA-3R, 480Y/277V,
 600 AMP BUS, MLO



(E) CUSTOMER
 GENERATION DISCONNECT
 480Y/277V, 400AMP, FUSED,
 3-PHASE, NEMA 3R
 LOAD BREAK
 LOCKABLE
 VISIBLE DISCONNECT
 UTILITY ACCESSIBLE



4 - 500 KCMIL CU
 1 - #2 CU GND
 1 - 3-1/2" EMT

EGAUGE
 MONITORING

AUX PWR
 ENCLOSURE

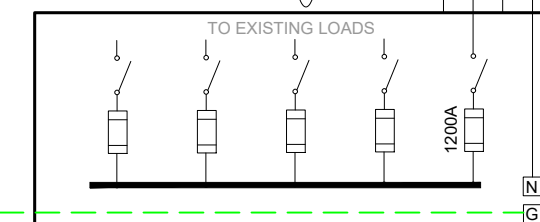
TO UTILITY
 GRID

UTILITY XFMR
 1500 kVA
 480Y/277V, 3φ

BILLING METER
 METER # 777783



4 - 500 KCMIL CU
 1 - #2 CU GND
 1 - 3-1/2" EMT



(E) SWITCHBOARD,
 1200A, 480Y/277V,
 65,000 AIC



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SHEET NAME

CONTROL
 DIAGRAM

SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-4.3

LEGEND

- - - - - ETHERNET, CAT 5e
- - ○ - ○ - ○ - ○ RS 485, BELDEN 3106A OR EQUAL
- EGAUGE CT WIRING

SEQUENCE OF OPERATION

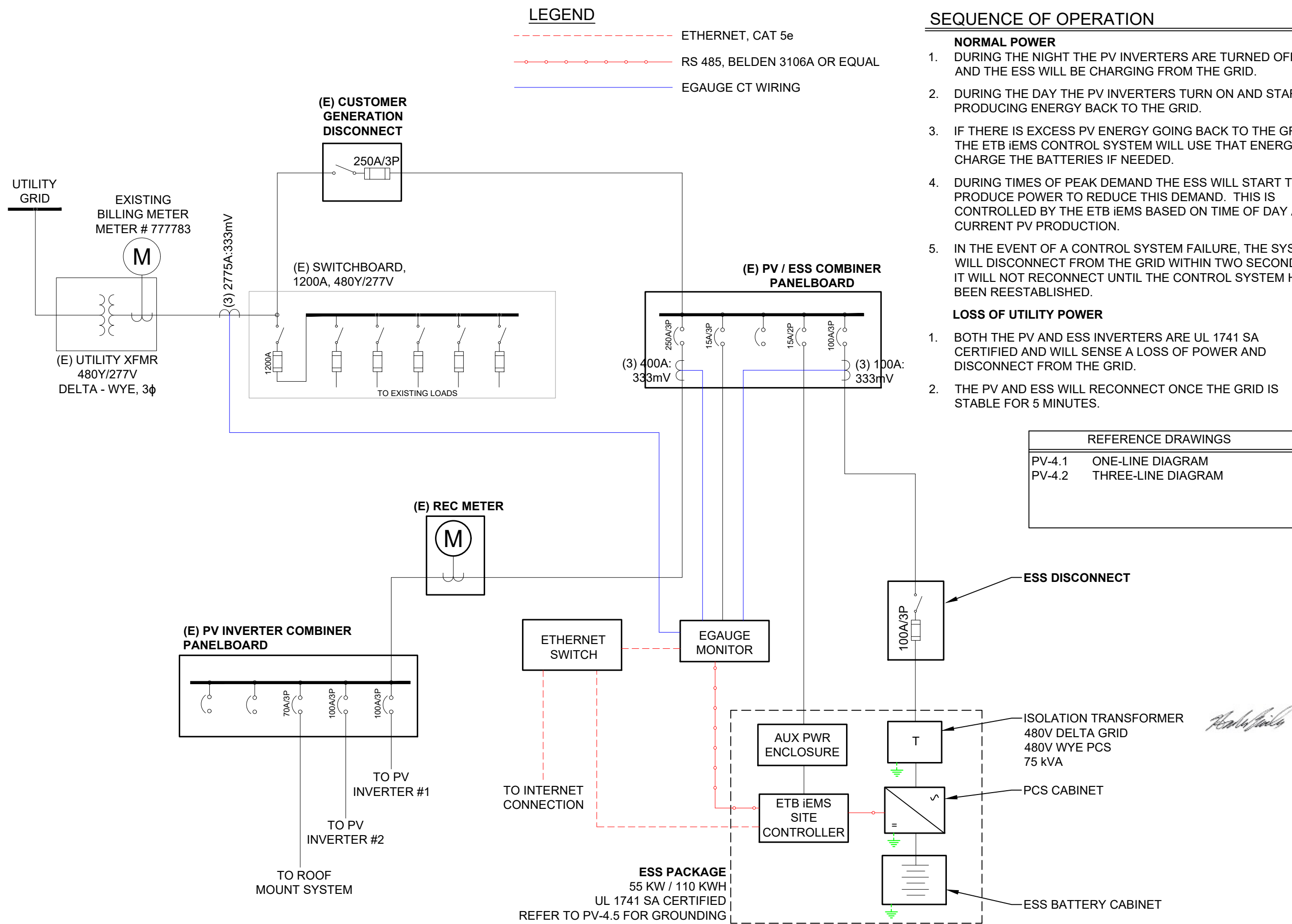
NORMAL POWER

1. DURING THE NIGHT THE PV INVERTERS ARE TURNED OFF AND THE ESS WILL BE CHARGING FROM THE GRID.
2. DURING THE DAY THE PV INVERTERS TURN ON AND START PRODUCING ENERGY BACK TO THE GRID.
3. IF THERE IS EXCESS PV ENERGY GOING BACK TO THE GRID, THE ETB iEMS CONTROL SYSTEM WILL USE THAT ENERGY TO CHARGE THE BATTERIES IF NEEDED.
4. DURING TIMES OF PEAK DEMAND THE ESS WILL START TO PRODUCE POWER TO REDUCE THIS DEMAND. THIS IS CONTROLLED BY THE ETB iEMS BASED ON TIME OF DAY AND CURRENT PV PRODUCTION.
5. IN THE EVENT OF A CONTROL SYSTEM FAILURE, THE SYSTEM WILL DISCONNECT FROM THE GRID WITHIN TWO SECONDS. IT WILL NOT RECONNECT UNTIL THE CONTROL SYSTEM HAS BEEN REESTABLISHED.

LOSS OF UTILITY POWER

1. BOTH THE PV AND ESS INVERTERS ARE UL 1741 SA CERTIFIED AND WILL SENSE A LOSS OF POWER AND DISCONNECT FROM THE GRID.
2. THE PV AND ESS WILL RECONNECT ONCE THE GRID IS STABLE FOR 5 MINUTES.

REFERENCE DRAWINGS	
PV-4.1	ONE-LINE DIAGRAM
PV-4.2	THREE-LINE DIAGRAM



ESS PACKAGE
 55 KW / 110 KWH
 UL 1741 SA CERTIFIED
 REFER TO PV-4.5 FOR GROUNDING

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SHEET NAME

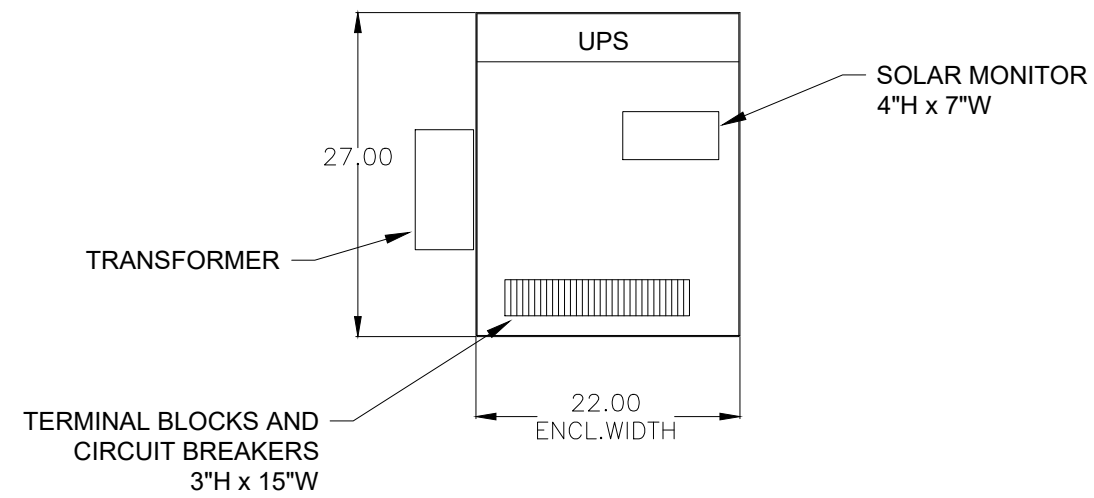
AUX POWER
 WIRING DIAGRAM

SHEET SIZE

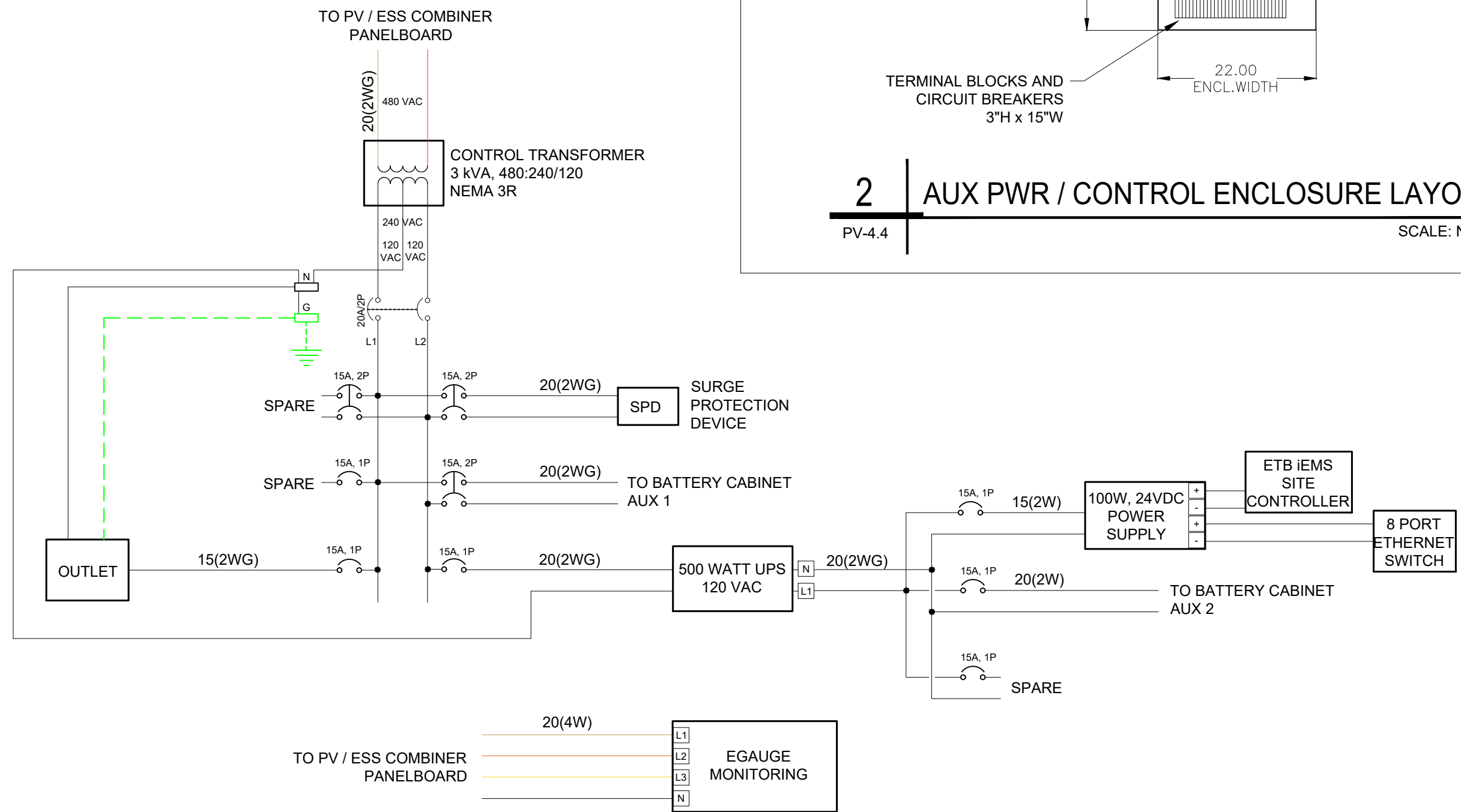
ANSI B
 11" X 17"

SHEET NUMBER

PV-4.4



2 | AUX PWR / CONTROL ENCLOSURE LAYOUT
 PV-4.4 | SCALE: NTS



1 | AUX PWR / CONTROL ENCLOSURE WIRING
 PV-4.4 | SCALE: NTS

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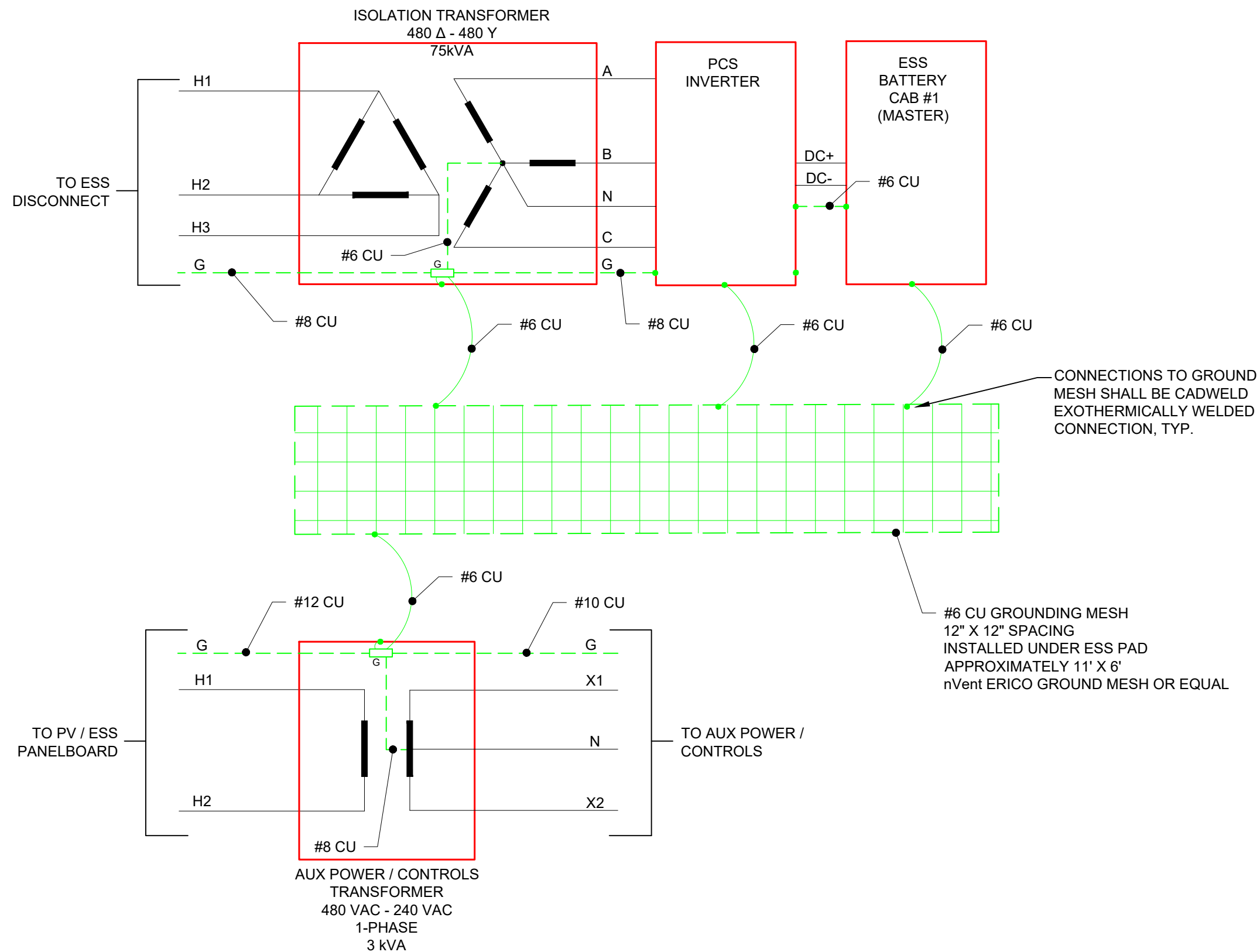
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SHEET NAME
**GROUNDING
 DIAGRAM**

SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER
PV-4.5



1 | ESS EQUIPMENT GROUNDING

PV-4.5

SCALE: NTS

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WIRING SCHEDULE - COPPER

WIRING SCHEDULE - ALUMINUM

AMPS	(2WG)	(3WG)	(4W)	(4WG)	AMPS	(3WG)	(4WG)
	1Ø, 2 WIRE, GROUND	1Ø, 3 WIRE, GROUND OR 3Ø, 3 WIRE, GROUND	3Ø, 4 WIRE	3Ø, 4 WIRE, GROUND		1Ø, 3 WIRE, GROUND OR 3Ø, 3 WIRE, GROUND	3Ø, 4 WIRE, GROUND
20	(2#12 & 1#12 G) 3/4"C	(3#12 & 1#12 G) 3/4"C		(4#12 & 1#12 G) 3/4"C	20		
30	(2#10 & 1#10 G) 3/4"C	(3#10 & 1#10 G) 3/4"C		(4#10 & 1#10 G) 3/4"C	30		
40	(2#8 & 1#10 G) 3/4"C	(3#8 & 1#10 G) 3/4"C		(4#8 & 1#10 G) 1"C	40		
50	(2#6 & 1#10 G) 3/4"C	(3#6 & 1#10 G) 1"C		(4#6 & 1#10 G) 1"C	50		
60	(2#6 & 1#10 G) 3/4"C	(3#6 & 1#10 G) 1"C		(4#6 & 1#10 G) 1"C	60	(3#4 & 1#8 G) 1 1/4"C	(4#4 & 1#8 G) 1 1/4"C
70	(2#4 & 1#8 G) 1"C	(3#4 & 1#8 G) 1 1/4"C		(4#4 & 1#8 G) 1 1/4"C	70	(3#2 & 1#6 G) 1 1/4"C	(4#2 & 1#6 G) 1 1/2"C
80	(2#2 & 1#8 G) 1"C	(3#2 & 1#8 G) 1 1/4"C		(4#2 & 1#8 G) 1 1/2"C	80	(3#2 & 1#6 G) 1 1/4"C	(4#2 & 1#6 G) 1 1/2"C
90	(2#2 & 1#8 G) 1"C	(3#2 & 1#8 G) 1 1/4"C		(4#2 & 1#8 G) 1 1/2"C	90	(3#2 & 1#6 G) 1 1/4"C	(4#2 & 1#6 G) 1 1/2"C
100	(2#1 & 1#8 G) 1 1/4"C	(3#1 & 1#8 G) 1 1/2"C	(4#1) 1 1/2"C	(4#1 & 1#8 G) 1 1/2"C	100	(3#1 & 1#6 G) 1 1/2"C	(4#1 & 1#6 G) 1 1/2"C
110	(2#1 & 1#6 G) 1 1/4"C	(3#1 & 1#6 G) 1 1/2"C	(4#1) 1 1/2"C	(4#1 & 1#6 G) 1 1/2"C	110	(3#1/0 & 1#4 G) 1 1/2"C	(4#1/0 & 1#4 G) 2"C
125	(2#1 & 1#6 G) 1 1/4"C	(3#1 & 1#6 G) 1 1/2"C	(4#1) 1 1/2"C	(4#1 & 1#6 G) 1 1/2"C	125	(3#2/0 & 1#4 G) 2"C	(4#2/0 & 1#4 G) 2"C
150	(2#1/0 & 1#6 G) 1 1/4"C	(3#1/0 & 1#6 G) 1 1/2"C	(4#1/0) 2"C	(4#1/0 & 1#6 G) 2"C	150	(3#3/0 & 1#4 G) 2"C	(4#3/0 & 1#4 G) 2 1/2"C
175	(2#2/0 & 1#6 G) 1 1/2"C	(3#2/0 & 1#6 G) 2"C	(4#2/0) 2"C	(4#2/0 & 1#6 G) 2"C	175	(3#4/0 & 1#4 G) 2"C	(4#4/0 & 1#4 G) 2 1/2"C
200	(2#3/0 & 1#6 G) 1 1/2"C	(3#3/0 & 1#6 G) 2"C	(4#3/0) 2"C	(4#3/0 & 1#6 G) 2"C	200	(3-250 KCMIL & 1#4 G) 2 1/2"C	(4-250 KCMIL & 1#4 G) 3"C
225	(2#4/0 & 1#4 G) 2"C	(3#4/0 & 1#4 G) 2"C	(4#4/0) 2 1/2"C	(4#4/0 & 1#4 G) 2 1/2"C	225	(3-300 KCMIL & 1#2 G) 2 1/2"C	(4-300 KCMIL & 1#2 G) 3"C
250	(2-250 KCMIL & 1#4 G) 2"C	(3-250 KCMIL & 1#4 G) 2 1/2"C	(4-250 KCMIL) 2 1/2"C	(4-250 KCMIL & 1#4 G) 3"C	250	(3-350 KCMIL & 1#2 G) 3"C	(4-350 KCMIL & 1#2 G) 3"C
300	(2-350 KCMIL & 1#4 G) 2"C	(3-350 KCMIL & 1#4 G) 3"C	(4-350 KCMIL) 3"C	(4-350 KCMIL & 1#4 G) 3"C	300	(3-500 KCMIL & 1#2 G) 3"C	(4-500 KCMIL & 1#2 G) 3 1/2"C
380	(2-500 KCMIL & 1#3 G) 2 1/2"C	(3-500 KCMIL & 1#3 G) 3"C	(4-500 KCMIL) 3 1/2"C	(4-500 KCMIL & 1#3 G) 3 1/2"C	380	(3-750 KCMIL & 1#1 G) 3 1/2"	(4-750 KCMIL & 1#1 G) 4"
400	2[(2#3/0 & 1#3 G) 1 1/2"C]	2[(3#3/0 & 1#3 G) 2"C]	2[(4#3/0) 2"C]	2[(4#3/0 & 1#3 G) 2 1/2"C]	400	2[(3-250 KCMIL & 1#1 G) 2 1/2"C]	2[(4-250 KCMIL & 1#1 G) 3"C]
450	2[(2#4/0 & 1#2 G) 2"C]	2[(3#4/0 & 1#2 G) 2"C]	2[(4#4/0) 2 1/2"C]	2[(4#4/0 & 1#2 G) 2 1/2"C]	450	2[(3-300 KCMIL & 1#1/0 G) 2 1/2"C]	2[(4-300 KCMIL & 1#1/0 G) 3"C]
500	2[(2-250 KCMIL & 1#2 G) 2"C]	2[(3-250 KCMIL & 1#2 G) 2 1/2"C]	2[(4-250 KCMIL) 2 1/2"C]	2[(4-250 KCMIL & 1#2 G) 3"C]	500	2[(3-350 KCMIL & 1#1/0 G) 3"C]	2[(4-350 KCMIL & 1#1/0 G) 3"C]
600	2[(2-350 KCMIL & 1#1 G) 2 1/2"C]	2[(3-350 KCMIL & 1#1 G) 3"C]	2[(4-350 KCMIL) 3"C]	2[(4-350 KCMIL & 1#1 G) 3"C]	600	2[(3-500 KCMIL & 1#2/0 G) 3"C]	2[(4-500 KCMIL & 1#2/0 G) 3 1/2"C]

CONDUCTOR SIZES ARE BASED ON 60° TERMINATIONS LESS THAN 100A AND 75° TERMINATIONS GREATER THAN 100A
 CONDUIT SIZES ARE BASED ON NEC TABLE 4 (RNC) AND TABLE 5 (THHN INSULATION).

FULLY RATED SHORT CIRCUIT CALCULATIONS SUMMARY

EQUIP.	LENGTH	VOLT	WIRE SIZE	CONDUCTOR MATERIAL	CONDUIT	VOLTAGE CLASS (V)	# OF ABLES (S or T)	C VALUE *	# OF PARALLEL RUNS	Isc AVAILABLE UPSTREAM	f *	M *	Isc (FAULT) *
MAIN SWITCHBOARD	30	480	500	C	N	600	S	23,451	4	33,400	0	1	32,160
CUST. GEN. DISC.	10	480	500	C	S	600	S	19,703	1	32,160	0	1	30,370
COMBINER PANEL	10	480	500	C	S	600	S	19,703	1	30,370	0	1	28,770
ESS DISC.	20	480	3X	C	S	600	S	7,292	1	28,770	0	1	22,390
AUX PWR ENCLOSURE	20	480	2	C	S	600	S	617	1	28,770	3	0	6,590

* AUTOMATICALLY CALCULATED
UTILITY TRANSFORMER SIZE: 500 KVA
MAX AVAILABLE (SYMMETRICAL) FAULT AT THE SECONDARY: 33,400 AMPS

SERIES RATING NOTES

- SERIES COMBINATION OF OVERCURRENT DEVICES PER NEC 240.86.
- IDENTIFY THE FUSE CLASS AND THE CIRCUIT BREAKER MANUFACTURER, MODEL DESIGNATION, AND ELECTRICAL RATING USED AS PART OF SERIES RATING.
- SERIES COMBINATION INTERRUPTING RATING SHALL NOT BE USED WHEN THE SECOND DEVICE IN THE SERIES IS SUBJECTED TO A TOTAL CONNECTED FULL LOAD MOTOR CURRENT OF MORE THAN 1% OF IT'S AIC RATING.
- MOTOR CIRCUIT PROTECTORS SHALL NOT BE USED AS PART OF A SERIES COMBINATION INTERRUPTING RATING.
- IF SERIES COMBINATION RATINGS ARE USED, PROVIDE A CAUTIONARY LABEL TO THE SERIES RATED DEVICE COVER STATING "CAUTION - SERIES RATED SYSTEM 16,900 A AVAILABLE. IDENTIFIED REPLACEMENT COMPONENT REQUIRED."
- THE SERIES RATED COMBINATION DEVICES SHALL BE A TESTED COMBINATION FROM THE MANUFACTURE. THE EQUIPMENT SHALL BE LABELED PER NEC 110.22
- SERIES COMBINATION INTERRUPTING RATING SHALL NOT BE USED FOR THE CIRCUITS OF EMERGENCY SYSTEM, HEALTH CARE FACILITIES AND ELEVATOR SYSTEM BECAUSE THESE CIRCUITS ARE REQUIRED TO BE SELECTIVE COORDINATED IN COMPLIANCE WITH 517.17, 700.27 AND 620.62.

AMBIENT TEMPERATURE SPECS

WEATHER STATION - ALBUQUERQUE INTL ARPT	
RECORD LOW TEMP	-15°
AMBIENT TEMP (HIGH TEMP 2%)	35°
CONDUIT HEIGHT	0.5"
CARPORT TOP TEMP	57°
CONDUCTOR TEMPERATURE RATE	75°
MODULE TEMPERATURE COEFFICIENT OF Voc LONGI SOLAR LR6-72BP-365M (365W) MODULES	-0.27%/°C

ESS SPECIFICATIONS

MANUFACTURER / MODEL #	DELTA PCS125
NOMINAL AC POWER	55 KW
NOMINAL OUTPUT VOLTAGE	480 VAC
NOMINAL OUTPUT CURRENT	66 A AC
MAX INPUT VOLTAGE	1000 VDC
MAX CHARGE CURRENT	74 A AC

INVERTER OUTPUT CONDUCTORS - INVERTER #1 TO COMBINER PANEL

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(B), 1.25 X MAX INVERTER OUTPUT CURRENT	82.5 A
CIRCUIT CONDUCTOR SIZE	#1 AWG CU
CIRCUIT CONDUCTOR AMPACITY (60° C)	100 A
AMBIENT TEMPERATURE ADJUSTMENT FOR EXPOSED CONDUIT, PER NEC 310.15(B)(2)	34°
TEMP. CORRECTION PER TABLE 310.15(B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	3
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	1.0
CIRCUIT CONDUCTOR AMPACITY (90° C)	145 A
TEMP. CORRECTION PER TABLE 310.15(B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY	140 A
ESTIMATED CIRCUIT LENGTH	50 FEET
VOLTAGE DROP	0.86 V, 0.18%

PV / ESS PANELBOARD SIZE

NEC 705.12(B)(2)(3)(c)

	MAX OUTPUT CURRENT	125%:	BREAKER SIZE
AUX PWR ENCLOSURE			15 A
ESS OUTPUT CURRENT	66 A	82.5 A	100 A
EGAUGE MONITOR			15 A
PV SYSTEM			250 A
SUBTOTAL			380 A
MIN PANELBOARD BUS SIZE			400 A



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REVISIONS

DESCRIPTION	DATE	REV
CONSTRUCTION DRAWINGS	1-21-2021	0

Signature with Seal

PROJECT NAME

**ALAMOSA COMMUNITY
 CENTER ESS
 6900 GONZALES RD. SW
 ALBUQUERQUE, NM 87121**

SHEET NAME

CALCULATIONS

SHEET SIZE

**ANSI B
 11" X 17"**

SHEET NUMBER

PV-5.0

⚠ WARNING
ELECTRIC SHOCK HAZARD
 TERMINALS ON BOTH LINE AND
 LOAD SIDES MAY BE ENERGIZED
 IN THE OPEN POSITION

LABEL LOCATION:
 ESS DISCONNECT
 PER CODE: NEC 706.15(C)

⚠ WARNING
DUAL POWER SUPPLY
 SOURCES: UTILITY GRID AND PV
 SOLAR ELECTRIC SYSTEM

LABEL LOCATION:
 POINT OF INTERCONNECTION
 PER CODE: NEC 705.12(B)(3)

⚠ WARNING
PANELBOARD FED BY MULTIPLE SOURCES
 TOTAL RATING OF ALL OVERCURRENT
 DEVICES, EXCLUDING MAIN SUPPLY
 OVERCURRENT DEVICE, SHALL NOT
 EXCEED AMPACITY OF BUSBAR

LABEL LOCATION:
 PV COMBINER PANELBOARD
 PER CODE: NEC 705.12(B)(2)(3)(C)

ESS DISCONNECT

LABEL LOCATION:
 ESS DISCONNECT, ESS BREAKER
 (PER CODE: NEC690.13(B))

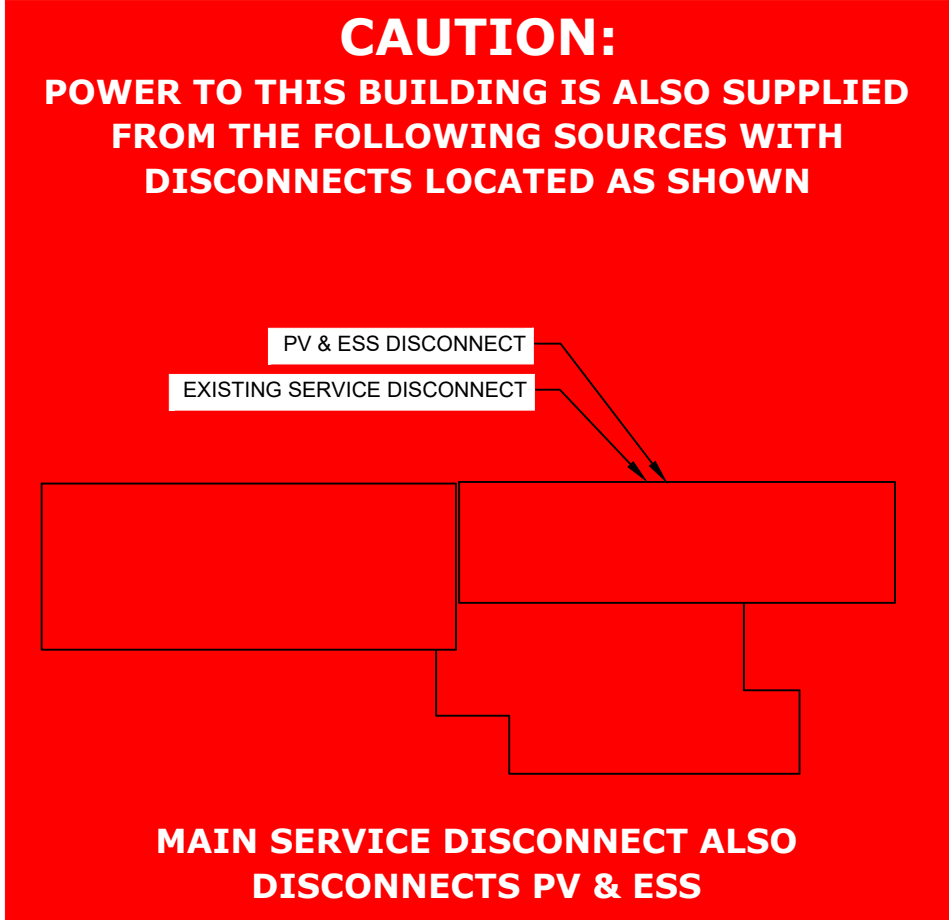
WARNING
ENERGY STORAGE POWER SOURCE
 SYSTEM DESIGNED FOR PEAK SHAVING
 AND DEMAND CHARGE MANAGEMENT.
NO EMERGENCY BACKUP

LABEL LOCATION:
 POINT OF INTERCONNECTION
 ESS INVERTER
 ESS DISCONNECT

**ENERGY STORAGE SYSTEM
 DISCONNECT**

NOMINAL AC VOLTAGE	480	V
MAXIMUM DC VOLTAGE	1000	V
AVAILABLE FAULT CURRENT	451	A

LABEL LOCATION:
 ESS DISCONNECT
 PER CODE: NEC 706.15(C)



LABEL LOCATION:
 POINT OF INTERCONNECTION, PV DISCONNECT
 PER CODE: NEC 690.56(B) & 705.10

NOTES

1. THE LABEL SHALL BE SUITABLE FOR THE ENVIRONMENT WHERE IT IS INSTALLED.
2. FIELD APPLIED LABELS, WARNINGS, AND MARKINGS SHALL COMPLY WITH ANSI Z535.4 [NEC 110.21(B) FIELD MARKING].
3. ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL SIGNS SHALL BE WEATHER RESISTANT [IFC 605.11.1.3]

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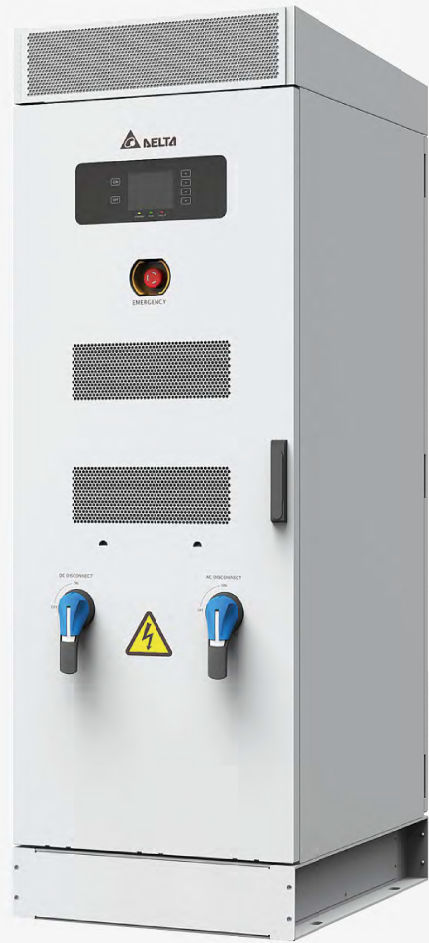
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PROJECT NAME
 ALAMOSA COMMUNITY
 CENTER ESS
 6900 GONZALES RD. SW
 ALBUQUERQUE, NM 87121

SHEET NAME
 PLACARDS

SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER
 PV-6.0

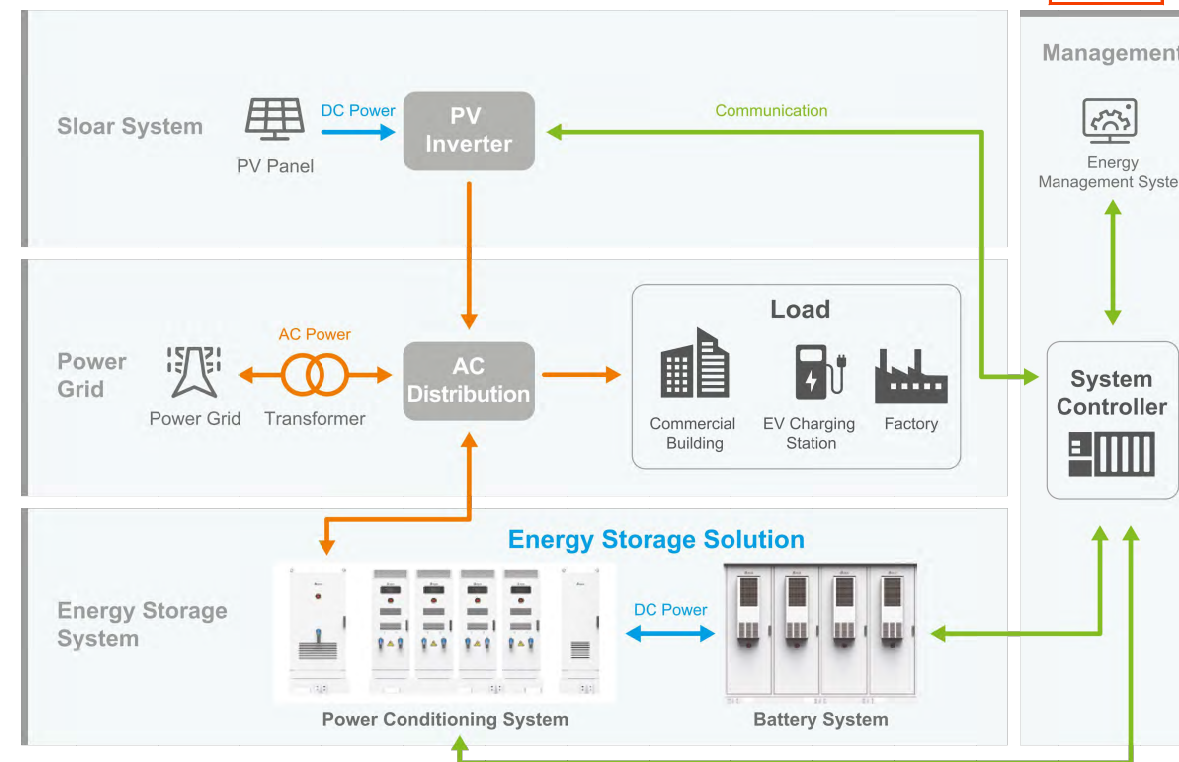


The Leading Power for Energy Storage

Delta Power Conditioning System (PCS) is a bi-directional energy storage inverter for grid-tied and off-grid applications including power backup, peak shaving, load shifting, PV self-consumption, PV smoothing and etc. It demonstrates industry leading power performance with high power efficiency and low stand-by power loss. It is compact for space saving and offers scalability for various system configurations and integration with main-stream branded battery systems.



System Architecture



Applications

- Real and reactive power compensation to improve power quality
- Standalone operation for power backup
- Demand charge management / peak shaving
- Load shifting for time-of-use savings

ENERGY STORAGE SOLUTION

Power Conditioning System / PCS125 55kW

Features

- Power capacity: 55kW, derated from 125 kW; AC voltage: 480 Vac
- High efficiency: peak 97.6%, CEC 97.0%
- High power density: 147 W/l, 403 W/kg
- Quick power transfer time (<40 ms)
- Type 3R enclosure and IP55 for outdoor applications
- Black start capability for power backup and microgrid applications
- Parallel capability: 8 in grid-tied mode and 4 in off-grid mode



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PROJECT NAME

ALAMOSA COMMUNITY
 CENTER ESS
 6900 GONZALES RD. SW
 ALBUQUERQUE, NM 87121

SHEET NAME

ESS
 DATASHEET

SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-7.0A

Specifications

Model Name	PCS125
AC Grid Connection	
Rated Grid Voltage	480 Vac, 3P3W
Grid Voltage Range	422.4 to 528 Vac (-12%, +10%)
Rated Grid Frequency	60 Hz (50 Hz optional)
Frequency Range	59.3 to 60.5 Hz, adjustable
Rated AC Power / Current	55 kVA / 66 A
Max. Continuous AC Current	73.5 Arms
Current THD	< 5% (IEEE 1547 Compliant)
Power Factor	-1 to 1, continuously adjustable
DC Connection	
Voltage Range	750 ~ 1,000 Vdc ¹⁾
Rated Voltage	900 Vdc
Rated Discharge / Charge Power	55 kW
Max. Discharge / Charge Current	74 A
Standalone Operation	
Rated Output Voltage	480 Vac, 3P3W
Rated Output Power	55 kVA / 55 kW (CF ₂) ²⁾
Rated Output Current	66 A
Power Factor	0.8 ~ 1
Output Voltage THD	< 3% @ linear load < 5% @ RCD load (CF ₂)
Performance	
Peak / CEC Efficiency	97.6% / 97.0%
Standby Loss	< 25W @ sleep mode
Environmental	
Max. Altitude	3,000 m, de-rating above 2,000 m
Operating Temperature	-25 ~ 60 °C, de-rating @ > 50°C
Humidity	0 to 95% RH, non-condensing
Acoustic Noise	< 72 dBA @ 1 m @ rated condition
Cooling	Forced air with speed control
Enclosure Rating	Type 3R, IP55
General	
User Interface	4.9" LCD screen
Emergency Stop	EPO button & remote control
Communication	Ethernet / Modbus TCP, RS-485 / Modbus RTU, CAN
Dimension (W x H x D)	23.6" x 69.5" x 31.5"
Net Weight	683 lbs
Certificate	UL1741, UL 1741 SA (Rule 21), IEEE1547, FCC part 15 class A, HECO Listed, CEC Listed
Applicable Battery Chemistry	Lithium-ion, lead-acid, flow battery

1) DC Voltage should be higher than 800V to support HVRT

2) Transformer or motor load, which has large inrush current (CF>2) is not included

* Specifications are subject to change without prior notice



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ALAMOSA COMMUNITY
CENTER ESS
6900 GONZALES RD. SW
ALBUQUERQUE, NM 87121

SHEET NAME

ESS
DATASHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-7.0B

iEMS

(Intelligent Energy Management System)

Energy Storage Controls Software, utilizing AI and advanced machine learning to maximize the value capture of energy storage systems operating in the field.



iEMS lives inside a ruggedized industrial computer

MAXIMIZE THE VALUE OF YOUR ASSET

- ✓ **Experience.** 4+ years of operating history and R&D training our machine learning models.
- ✓ **Optimized.** Capture all available value streams in order of importance to maximize savings.
- ✓ **Re-forecasting.** Ingests real-time data to recreate forecasts every 15 minutes.
- ✓ **Standards.** Supports all industry standard communication protocols.
- ✓ **Compliance.** OEM warranty and incentive program (e.g., ITC, SGIP) compliant operations.
- ✓ **Hardware Agnostic.** Integrated with several leading battery & ESS vendors.
- ✓ **Performance Guarantee.** Backed by an industry leading performance guarantee.

OPERATING MODES

Offers simple and advanced controls for Behind-the-Meter and Front-of-the-Meter assets

Technical Specifications for North America

OPERATING MODES

Demand Charge Management, Time-of-Use Arbitrage, PV Self-Consumption, Critical Load Resiliency, Solar Curtailment, DC Clipping Recapture, Demand Response, Grid Services, Signal Based Dispatching, Microgrid site controller (requires upgrade)

METERING

Integrates with Modbus TCP enabled Revenue Grade Meter
High Accuracy CT's (ANSI .06 or Better)
Data Capture from Solar PV, Storage, Site Main

COMMUNICATIONS

RS-485 or Ethernet/ TCP Networks
Supports Modbus RTU, Modbus TCP, CAN bus, Sunspec/Mesa Modbus API, and DNP3 protocols

COMPATIBILITY

Vendor agnostic, can be easily integrated with any energy storage system
Preexisting integrations with leading brands

CERTIFICATION

CE & FCC Class A
Supports UL 1741 SA
UL Listed Device (Optional)
Sunspec IEEE 2030.5 (Pending)
UL 1741 CRD (Pending)

RESILIENCE

Autonomous operation for limited periods of time with no Internet
Sustained operations during power interruptions

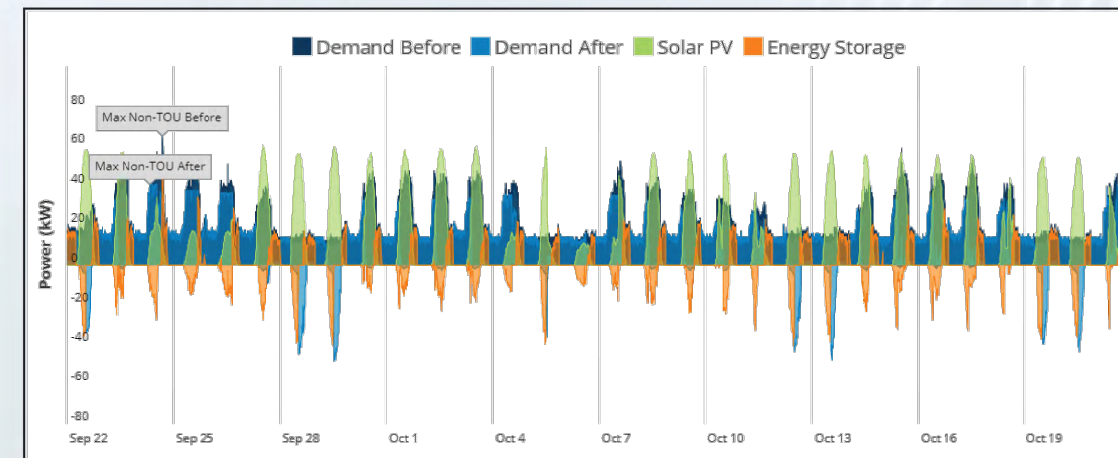
CONNECTIVITY

Wired Ethernet
Embedded LTE or WiFi (Optional)

ENVIRONMENT

Operating Temperature: -25°C to 70°C
Relative Humidity: 10% to 95% (non-condensing)

iEMS ingests real-time data to re-optimize our dispatch forecasts every 15 minutes



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CONSTRUCTION DRAWINGS	1-21-2021	0

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PROJECT NAME
**ALAMOSA COMMUNITY
CENTER ESS
6900 GONZALES RD. SW
ALBUQUERQUE, NM 87121**

SHEET NAME
**SITE CONTROLLER
DATASHEET**

SHEET SIZE
**ANSI B
11" X 17"**

SHEET NUMBER
PV-7.1

eGauge Core Specifications

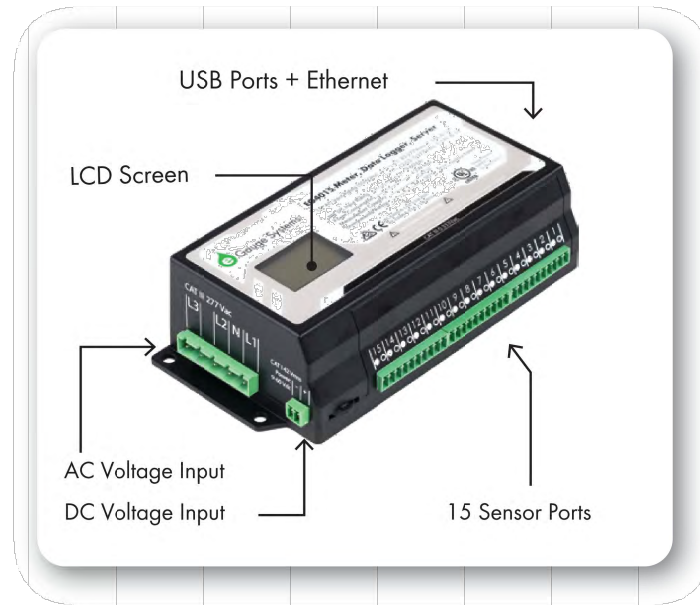
Model: EG4015

Measurement

- AC Voltage:** L1: 85-277 Vrms
(Y: L-N, Δ: L-L)
L2: 0-277 Vrms
L3: 0-277 Vrms
- DC Voltage:** 42 Vrms
Power: 9-60 Vdc
Measurement: -60-60Vdc
- Current:** 15 sensor ports
6900A max
Sensor ports isolated from
USB, Ethernet and voltage inputs
- Frequency:** 50 or 60 Hz
- Logging Values:** V, A, W, Wh, Hz, VA
VAr, THD, deg
- Power Draw:** 12W max, 2W typical
2 5V USB Ports @ 1A max
- Accuracy:** ANSI C12.20 - 0.5% Compliant

Environment Conditions

- Operating Temp:** -30° to 70°C (-22° to 158°F)
- Max Altitude:** 4000m (13,123ft)
- Max Humidity:** 80% up to 31°C
- Meas. Category:** Overvoltage Category III
- Location:** Open type indoor device
- Pollution Degree:** 2



Data Logger Capacity

- Register Count:** 64 (data storage points)
- Granularity:** 1 hr/1 sec
(duration/avg)
1 yr/1 minute
10 yrs/15 minute
Device Lifetime/1 day

Safety and Regulatory

- Safety:** IEC/UL 61010-1 Ed. 3.0 B:2010
- CE:** IEC 61000-6-1 Ed. 3.0 B:2016
IEC 61000-6-3 Ed. 2.1 B:2011
- FCC:** FCC Title 47 CFR Part 15-
Subpart B Class B
ICES-003 Information Technology-
Equipment Class B

eGauge Core Specifications

General

Warranty: 2 years, 5 years

Network Connection

- Powerline:** None
- Ethernet:** IEEE 802.3 - LAN
- WiFi/Cellular:** Optional with USB accessory

Data Communication

- Import:** Modbus RTU*, Modbus TCP
- Export:** Modbus RTU*, Modbus TCP,
BACnet IP, BACnet MS/TP*, XML
- * Requires USB485 converter

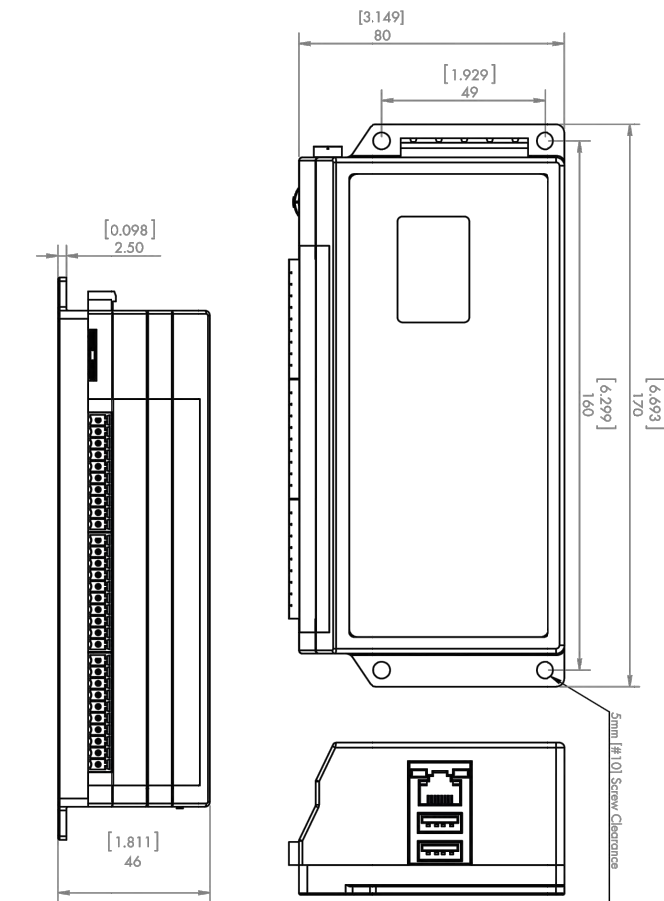
User Interface

- Compatible browsers:** Google Chrome
Firefox
Safari
Microsoft Edge
(Only up-to-date versions supported)
- Apps:** Android & IOS

Enclosure

- Material:** FRABS
- Dimensions:** 17 x 8 x 4.6cm
(6.7 x 3.15 x 1.81in)
- Weight:** 300g (0.66lbs)

Dimensions ([in.] mm)v



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PROJECT NAME

ALAMOSA COMMUNITY
CENTER ESS
6900 GONZALES RD. SW
ALBUQUERQUE, NM 87121

SHEET NAME
MONITORING
DATASHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-7.2