

PROJECT NAME	DIPOCSG 17 LLC
CASE NUMBER	04218616
DRAWN BY	DES LITTLES
DRAWING TITLE	SITE PLAN
SCALE <sup>1</sup>	<div>01"2"</div> <div>1" = 70'</div>
SHEET	PV1



## Equipment Specifications

The 1.000MW solar PV project is rated to 1.000 MW AC/ 1.497 MW DC.

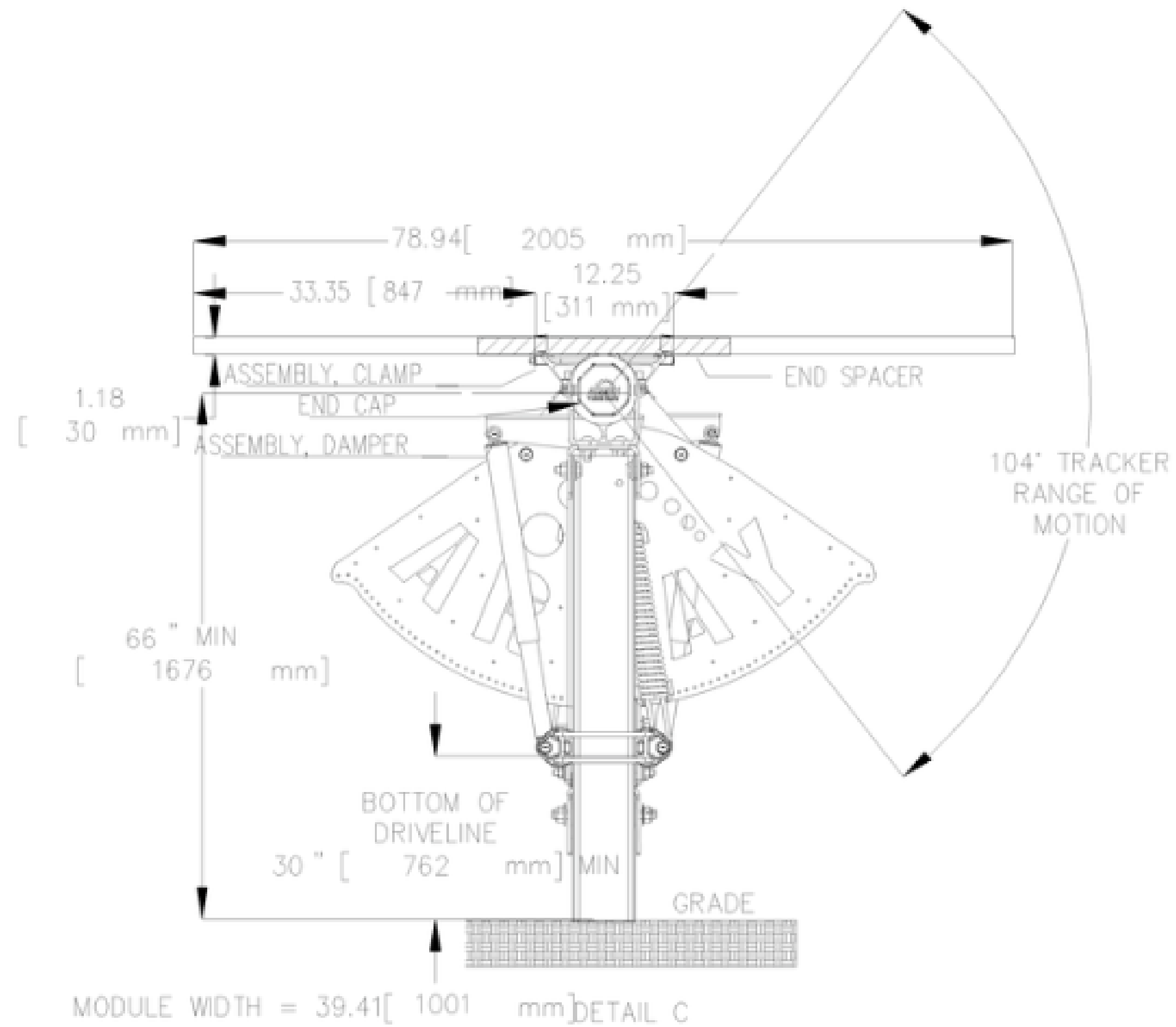
The system consists of the following:

- A. 3744 modules (REC Solar REC400TP 72, 400W, 1500V modules) feed into inverters.
- B. 8 inverters (CHINT SCA125KTL-DO/US, 600 inverter W/integrated DC and AC disconnects) which feed into Low Voltage Switchgear
- C. Low voltage switchgear- 1600A, 480V, 3 phase, 4 wire, 3R which is connected to the 480V side of the step-up transformer.
- D. Step up three phase pad mounted transformer- 1.5MVA, 12.47kV:480V, 5.32%
- E. Zig-zag grounding transformer on the 480V side

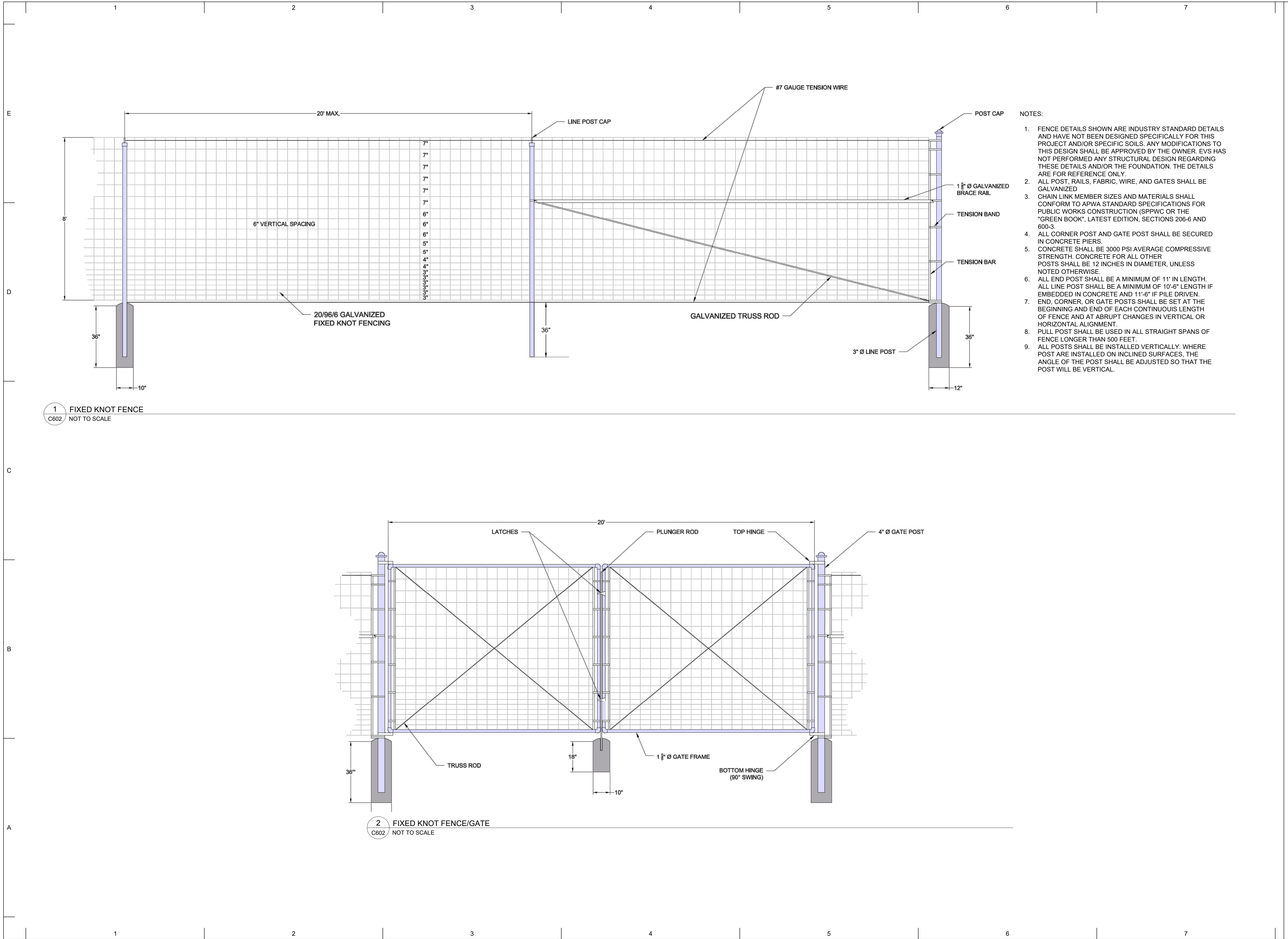
The 3744 modules are divided into strings and each string has 25 modules.

· Each inverter has up to 20 string input of 25 modules each.

The following attachments are the single line electrical drawings and equipment specs as well as the data sheets for the manufacturers.

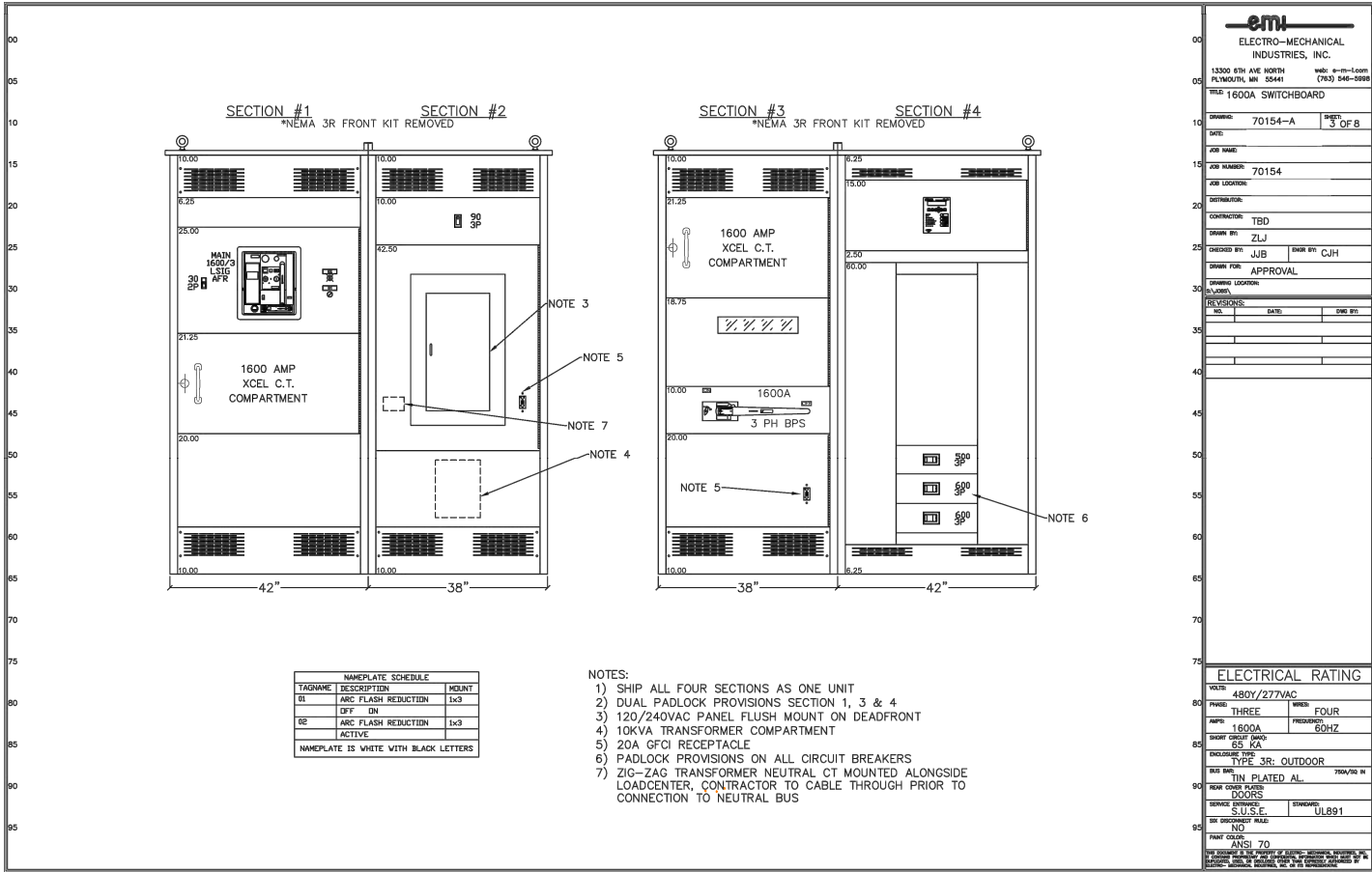
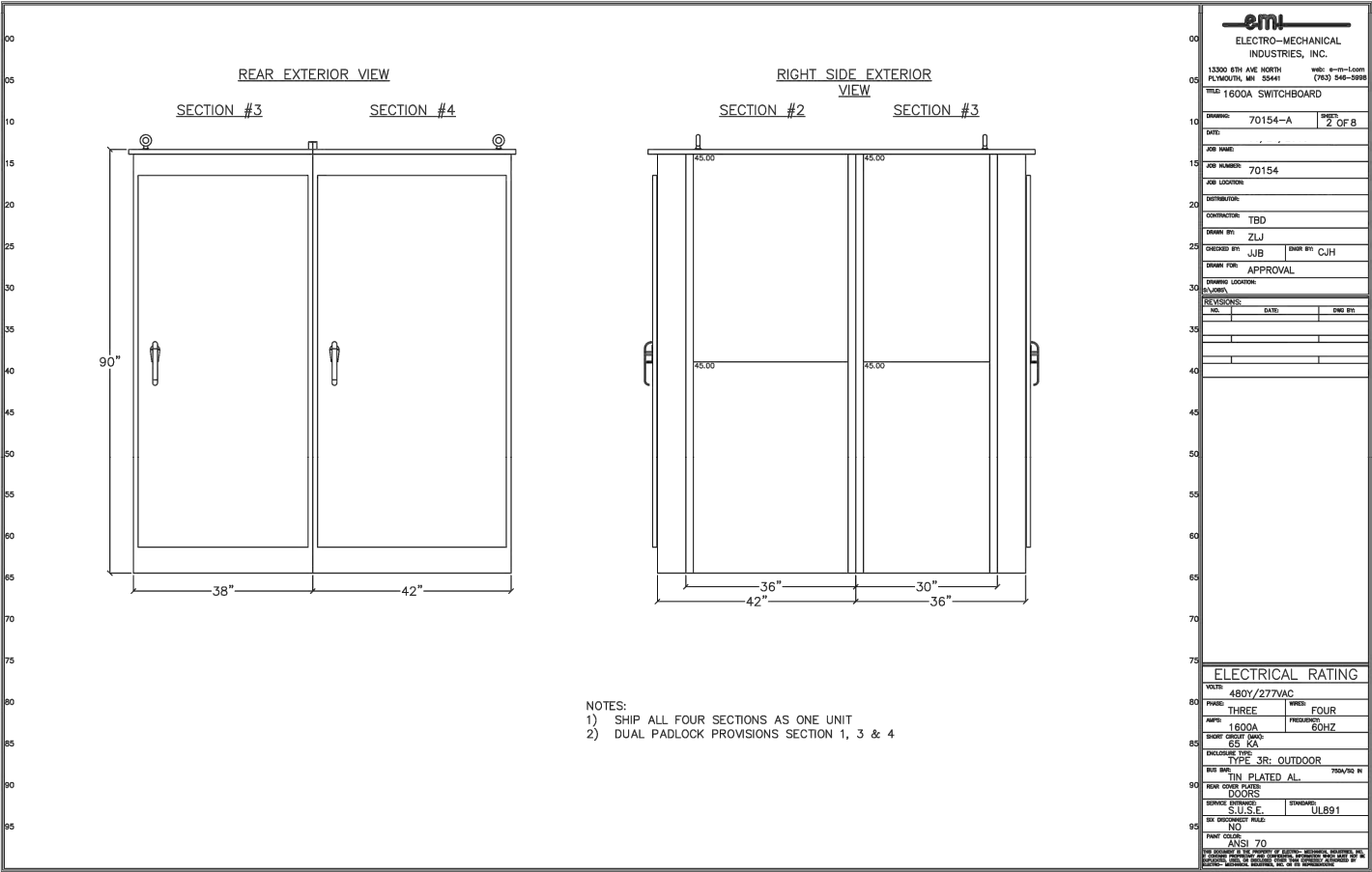


H:\2020\2020-157-1 Cordian T. Luhman\dwg\Civil\03-Production Sheets\2020-157-1 C6-DETAILS.dwg  
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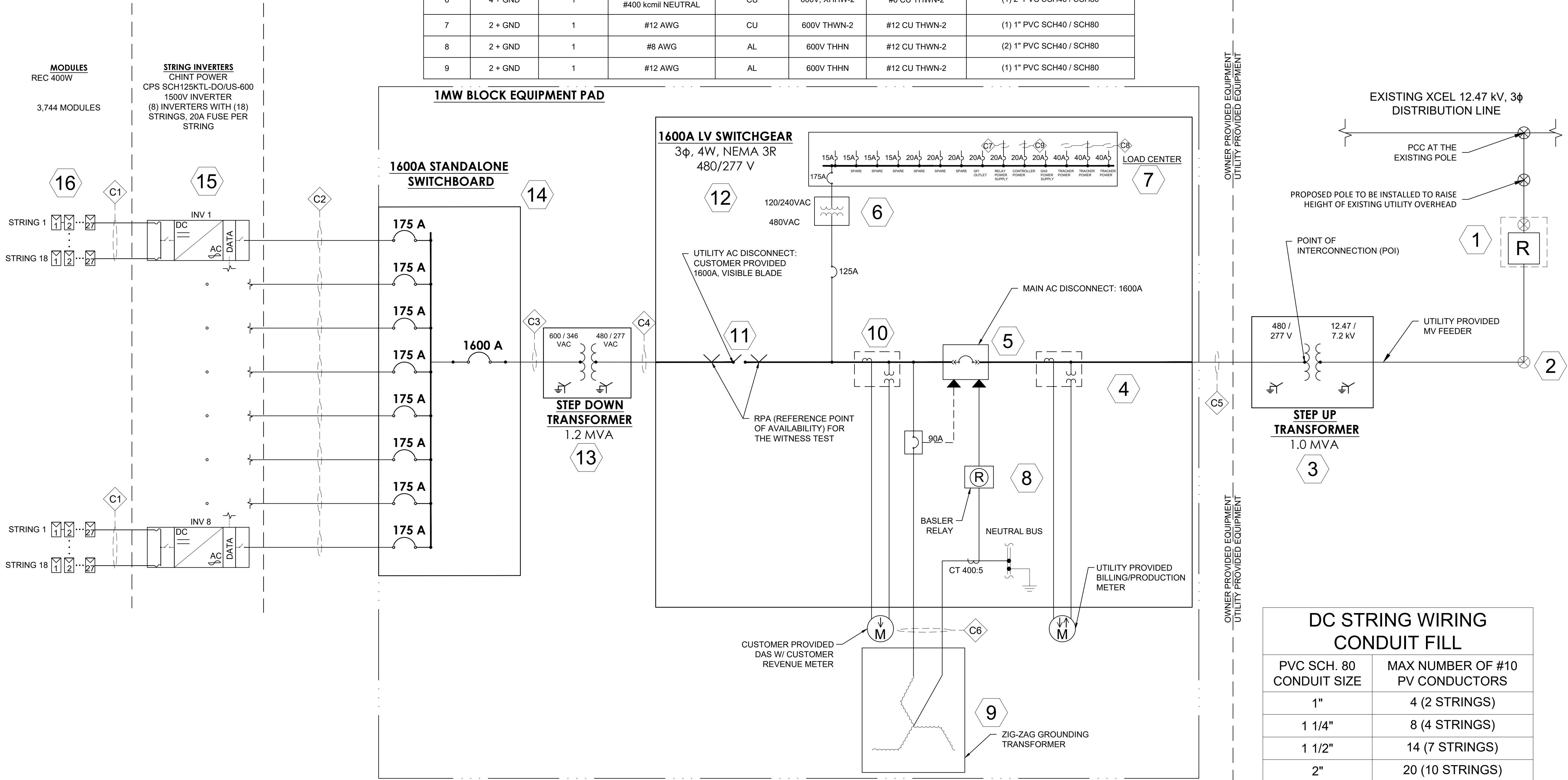
SHEET NAME  
SITE DETAILS





CABLE LIST							
C#	WIRE QTY.	PARALLEL RUNS	WIRE SIZE	CONDUCTOR MATERIAL	INSULATION	GROUND SIZE & TYPE	CONDUIT TYPE (QUANTITY)
1	2 + GND	1	#10 AWG	CU	2kV, PV-WIRE	UL 2703 RACK OR #6 CU THWN-2	OPEN AIR OR PVC SCH 80 SEE TABLE FOR DC STRING WIRING CONDUIT FILL
2	3 + GND	1	4/0 AWG (SEE NOTE 4)	AL	600V, XHHW-2	#6 CU THWN-2	2-1/2" PVC SCH40 / SCH80
3	4 + GND	4	500 KCMIL	CU	600V, XHHW-2	#4/0 CU THWN-2	(4) 4" PVC SCH40 / SCH80
4	4 + GND	4	500 KCMIL	CU	600V, XHHW-2	#4/0 CU THWN-2	(4) 4" PVC SCH40 / SCH80
5	4	4	500 KCMIL	CU	600V, XHHW-2	-	(4) 4" PVC SCH40 / SCH80
6	4 + GND	1	#2 AWG PER PHASE #400 kcmil NEUTRAL	CU	600V, XHHW-2	#6 CU THWN-2	(1) 2" PVC SCH40 / SCH80
7	2 + GND	1	#12 AWG	CU	600V THWN-2	#12 CU THWN-2	(1) 1" PVC SCH40 / SCH80
8	2 + GND	1	#8 AWG	AL	600V THHN	#12 CU THWN-2	(2) 1" PVC SCH40 / SCH80
9	2 + GND	1	#12 AWG	AL	600V THHN	#12 CU THWN-2	(1) 1" PVC SCH40 / SCH80

- NOTES:
- REFER TO EQUIPMENT SCHEDULE (SHEET E-201-03) FOR HEXAGONAL EQUIPMENT CALLOUTS.
  - SCHEDULE 40 TO BE USED FOR ALL UNDERGROUND EXCEPT WHERE SCHEDULE 80 ELBOWS TRANSITION TO ABOVE GROUND.SCHEDULE 80 TO BE USED STARTING AT THE 90° ELBOW AND UP TO AT LEAST 24" ABOVE GROUND.
  - GROUNDING TRANSFORMER CALCULATIONS NEED TO BE REVIEWED AND APPROVED BY XCEL PRIOR TO PROCUREMENT.
  - CONTRACTOR IS RESPONSIBLE FOR USING PIGTAILS TO ENSURE APPROPRIATE INVERTER CABLE INSTALLATIONS.



OWNER PROVIDED EQUIPMENT  
UTILITY PROVIDED EQUIPMENT

SHEET  
ONE LINE &  
CABLE LIST

INVERTER SPECIFICATIONS	
CHINT POWER CPS SCH125KTL-DO/US-600 (UL 1741 CERTIFIED)	125kW, 125KVA, 3 $\phi$ , 3W, 600V, 120.3A MAX OUTPUT

SYSTEM SUMMARY	
CSG QTY.	1
SITE CSG SIZE (AC)	1.000 MW
SITE CSG SIZE (DC)	1.445 MW
DC/AC RATIO	1.445
ASHRAE SITE EXTREME MIN. TEMPERATURE (°C)	-29.2
ASHRAE SITE 2% AVG. HIGH TEMPERATURE (°C)	28.8

GROUNDING TRANSFORMER CALCULATIONS - 1MW	
X0	0.13133 $\Omega$
R0	$\leq$ 0.02955 $\Omega$
Z	0.1346 $\Omega$
CONTINUOUS NEUTRAL CURRENT	254.5A
5 SECOND WITHSTAND RATING	> 2913.5A
*SEE SEPARATE CALCULATIONS PAGE FOR FORMULAS	

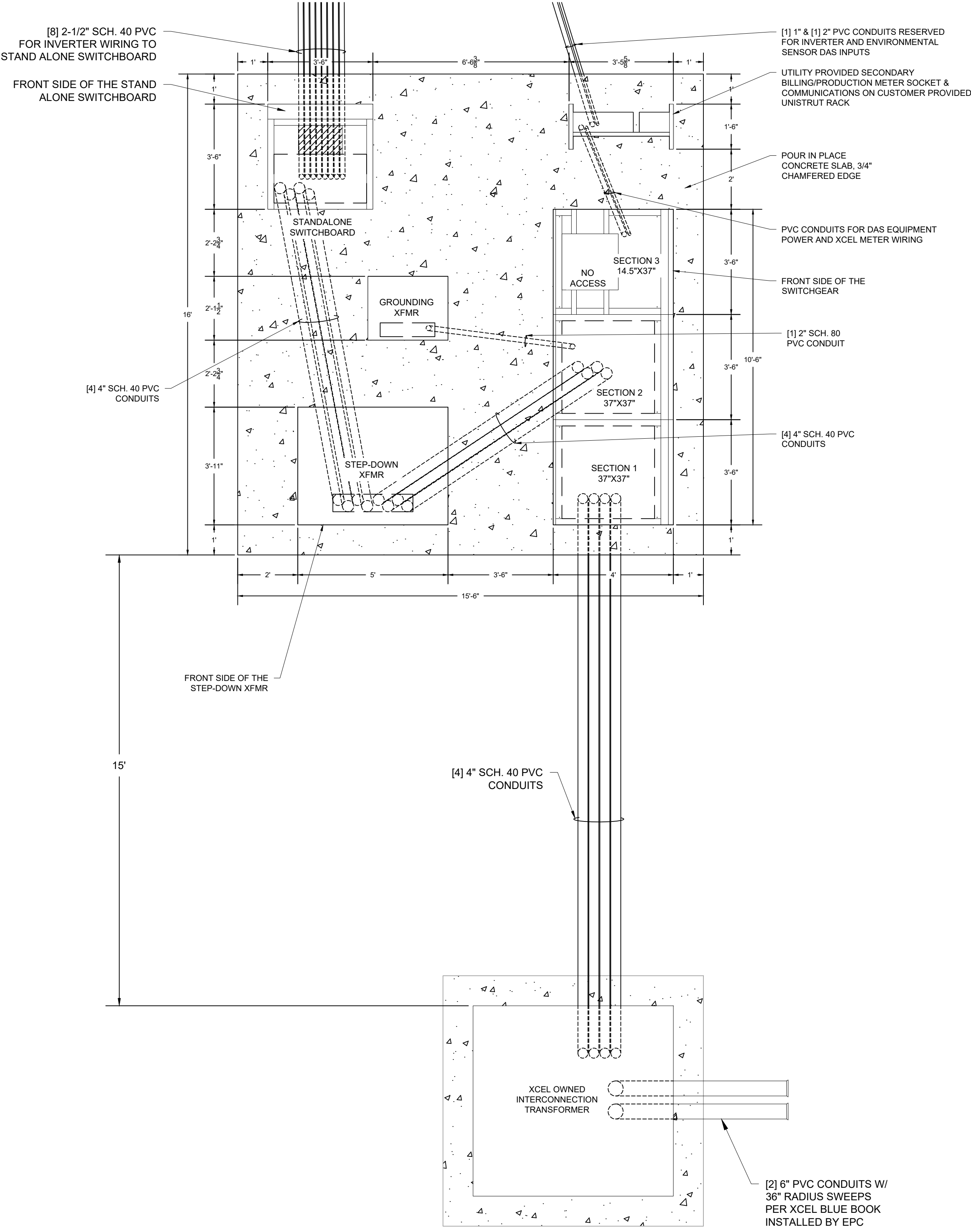
DC STRING WIRING CONDUIT FILL	
PVC SCH. 80 CONDUIT SIZE	MAX NUMBER OF #10 PV CONDUCTORS
1"	4 (2 STRINGS)
1 1/4"	8 (4 STRINGS)
1 1/2"	14 (7 STRINGS)
2"	20 (10 STRINGS)

1. DO NOT EXCEED 20 CONDUCTORS IN ONE CONDUIT. THIS WILL DERATE THE CONDUCTOR AMPACITY AND REQUIRE UPSIZING OF THE WIRE. CONDUCTOR AMPACITY CALCULATED USING NEC TABLE 310.15(B)(16) ASSUMING <15A CIRCUIT AMPACITY.

2. CONDUIT FILL IS FOR #10 AWG XHHW-2 PV WIRE CONDUCTORS (OD = 0.18") INCLUDING [1] #6 AWG INSULATED COPPER GROUND WIRE.



- NOTES:
1. POSSIBLE EXTRA CONTROL CONDUITS WILL BE REQUIRED IN THE CONCRETE DEPENDANT ON THE FINAL LOCATION OF THE XCEL REQUIRED COMMUNICATION EQUIPMENT.
  2. CONDUIT RUNS SHOWN FOR DIAGRAMMATIC PURPOSES ONLY. ACTUAL RUNS WILL VARY WITH SITE CONDITIONS AND EQUIPMENT LAYOUT.
  3. MV TRANSFORMER LOCATION TO BE DETERMINED BY XCEL.



SHEET  
EQUIPMENT PAD  
LAYOUT

1

PRODUCTION/BILLING  
METER

8

DO NOT DISCONNECT UNDER  
LOAD

14



CAUTION

3/8" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
SAFETY YELLOW BACKGROUND

NOMINAL OPERATING AC VOLTAGE  
NOMINAL OPERATING AC FREQUENCY  
MAXIMUM AC POWER  
MAXIMUM AC CURRENT  
OVERCURRENT PROTECTION RATING

600 V  
60 Hz  
1.0 MW  
1203 A  
1600 A

0.12" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
WHITE BACKGROUND

3



WARNING

ELECTRIC SHOCK HAZARD

THE DC CONDUCTORS OF THIS  
PHOTOVOLTAIC SYSTEM ARE  
UNGROUNDING AND MAY BE ENERGIZED

3/8" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
SAFETY ORANGE BACKGROUND

9

MAIN AC DISCONNECT

10

UTILITY AC DISCONNECT

15



CAUTION

3/8" MIN TEXT HEIGHT, SANS  
SERIFF BOLD SAFETY BLACK  
LETTERING ON SAFETY  
YELLOW BACKGROUND

480V SECONDARY FAULT  
CURRENT = 22,609 AMPS

0.12" MIN TEXT HEIGHT, SANS  
SERIFF BOLD SAFETY BLACK  
LETTERING ON WHITE  
BACKGROUND

4



WARNING

ELECTRIC SHOCK HAZARD

DO NOT TOUCH THESE TERMINALS,  
TERMINALS ON BOTH LINE AND LOAD  
SIDES MAY BE ENERGIZED IN THE OPEN  
POSITION

3/8" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
SAFETY ORANGE BACKGROUND

11



CAUTION

PHOTOVOLTAIC  
GENERATION SYSTEM  
CONNECTED

3/8" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
SAFETY YELLOW BACKGROUND

0.12" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
WHITE BACKGROUND

12



WARNING

DUAL POWER SOURCE.  
SECOND SOURCE IS A PV  
SYSTEM

3/8" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
SAFETY YELLOW BACKGROUND

0.12" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
WHITE BACKGROUND

5



WARNING

ELECTRIC SHOCK HAZARD

WHEN A *GROUND FAULT* IS ACTIVE  
CONDUCTORS THAT ARE NORMALLY  
GROUNDED MAY BE UNGROUNDED AND  
ENERGIZED

3/8" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
SAFETY ORANGE BACKGROUND

0.12" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
WHITE BACKGROUND

13



CAUTION

MAXIMUM OPERATING CURRENT 1203 A

MAXIMUM OPERATING VOLTAGE 480 V

3/8" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
SAFETY YELLOW BACKGROUND

0.12" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
WHITE BACKGROUND

6



CAUTION

PHOTOVOLTAIC SYSTEM  
CIRCUIT IS BACKFED

3/8" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
SAFETY YELLOW BACKGROUND

0.12" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
WHITE BACKGROUND

7



WARNING

TURN OFF DISCONNECT  
PRIOR TO WORKING  
INSIDE PANEL

3/8" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
SAFETY ORANGE BACKGROUND

0.12" MIN TEXT HEIGHT, SANS SERIFF  
BOLD SAFETY BLACK LETTERING ON  
WHITE BACKGROUND

2

PHOTOVOLTAIC POWER SOURCE

**LABEL NOTES:**

1. PLACARDS SHALL BE PROVIDED TO CLEARLY SHOW THE MAIN SERVICE METER AND PRODUCTION METER PAIRS
2. ALL LABELS TO BE WEATHERPROOF, DURABLE AND PERMANENTLY MOUNTED
3. ALL LABELS TO BE NEC COMPLIANT

## LABEL LOCATIONS/DETAILS

1	PRODUCTION / BILLING METER
2	PV SYSTEM UTILITY AC DISCONNECT, MSD
3	DC DISCONNECTS, INVERTERS
4	PV SYSTEM UTILITY AC DISCONNECT, MAIN SERVICE DISCONNECT (MSD)
5	DC DISCONNECTS, INVERTERS
6	PV SYSTEM UTILITY AC DISCONNECT LOAD SIDE AND LINE SIDE
7	LV SWITCHGEAR, 1600A STANDALONE SWITCHBOARD
8	PV SYSTEM UTILITY AC DISCONNECT, MAIN SERVICE DISCONNECT
9	MAIN AC DISCONNECT
10	PV SYSTEM UTILITY AC DISCONNECT
11	LV SWITCHGEARS, PRODUCTION / BILLING METER
12	LV SWITCHGEARS, PRODUCTION / BILLING METER
13	PV SYSTEM UTILITY AC DISCONNECT, LV SWITCHGEAR, PRODUCTION METER & MSD
14	1600A STANDALONE SWITCHBOARD (8 INVERTER INPUTS)
15	LV SWITCHGEAR

SHEET  
**XCEL LABELS &  
SIGNS**

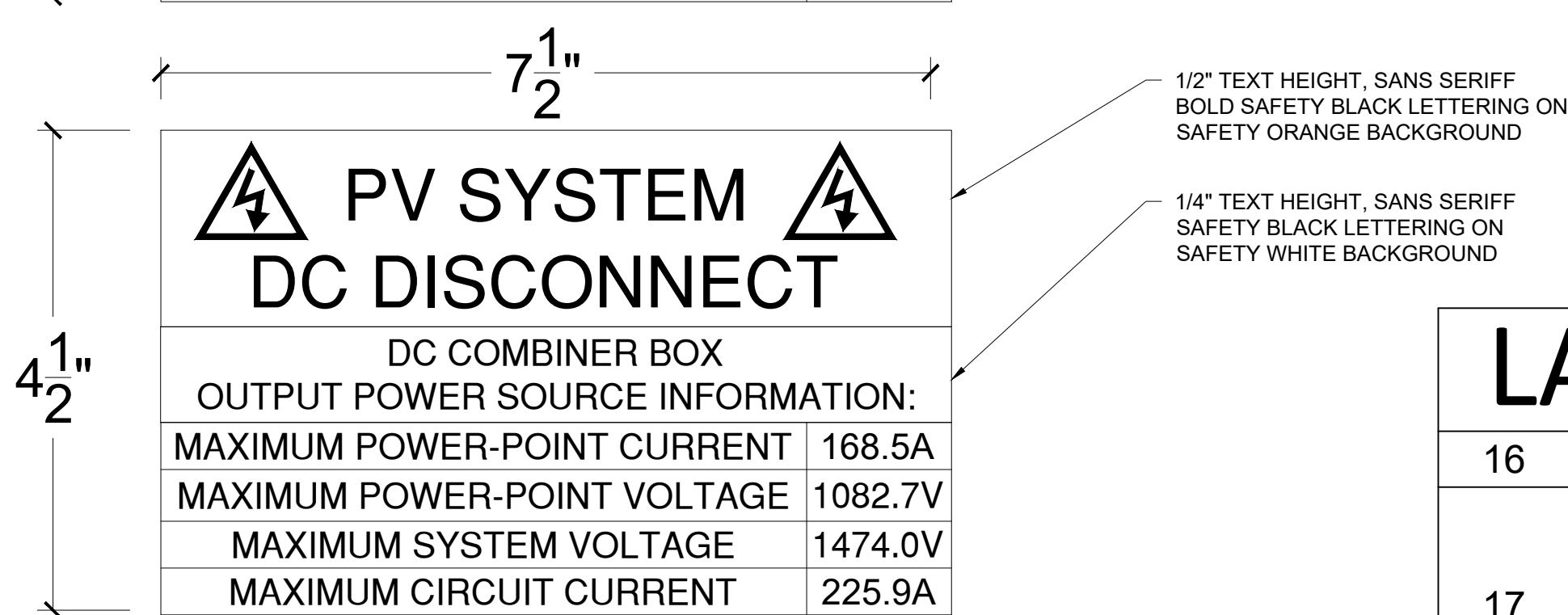
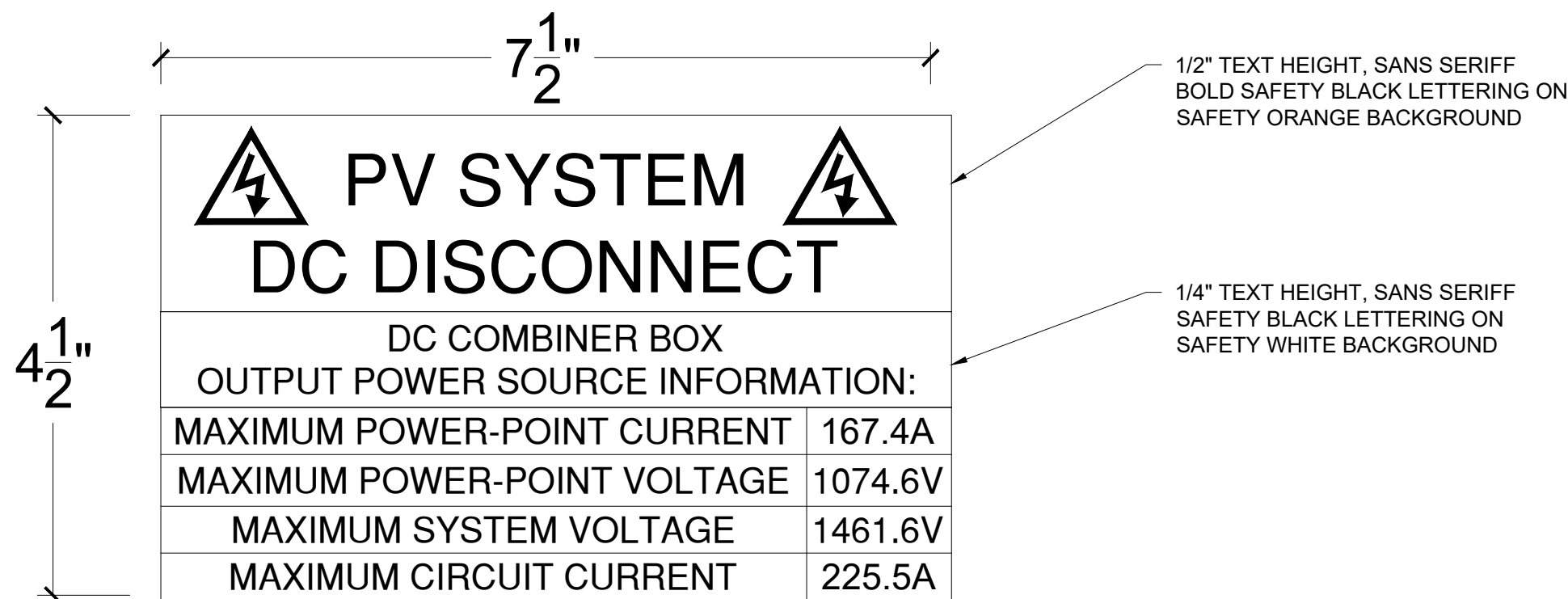
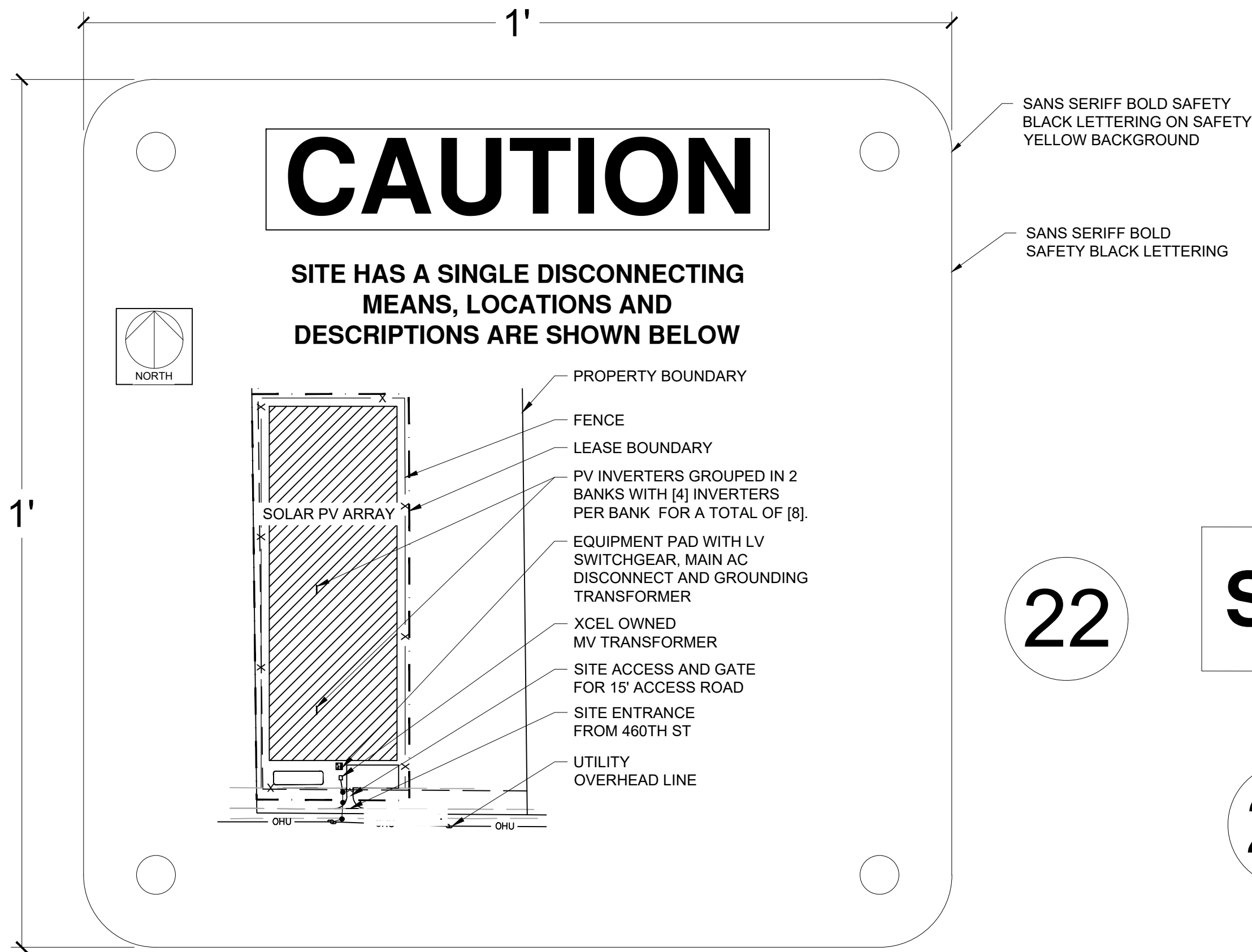


16

18

19

23



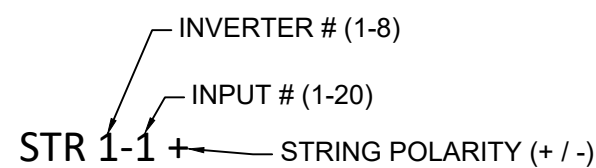
- NOTES:
1. AT A MINIMUM, SIGNS SHALL BE 10 INCHES WIDE BY 7 INCHES HIGH.
  2. TOP OF SIGN SHALL BE PLACED AT 5 FEET HIGH.
  3. SIGNS SHALL BE SPACED AT NO MORE THAN 100 FOOT INTERVALS ON THE PERIMETER.
  4. SIGNS SHALL BE MOUNTED TO FENCE THROUGH PRE-PUNCHED HOLES USING FENCE TIES.

17

STR 1-1 +

STRING NAMING NOTES:

1. STRING NAME:
2. SEE SHEET E-302-01 FOR MODULE STRING WIRING DETAILS.



22

SERVICE DISCONNECT

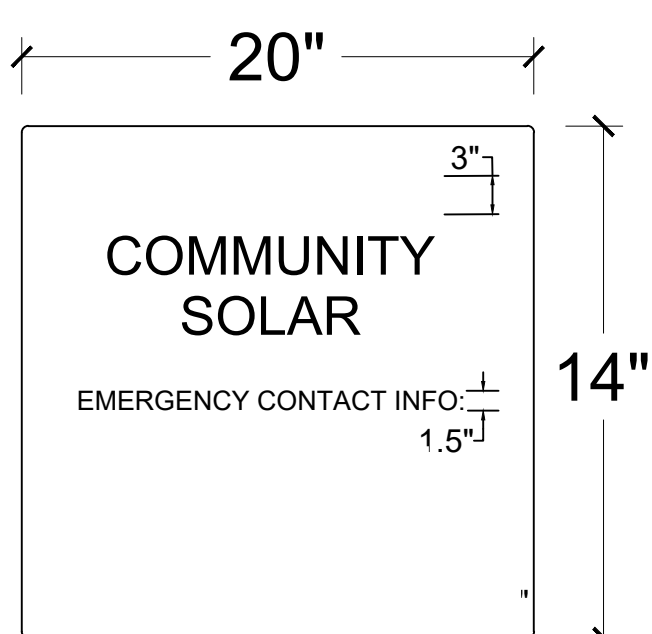
20

INV 1

21

DAS

24



LABEL LOCATIONS/DETAILS

16	SITE ENTRANCE, [1] TOTAL
17	ALL STRINGS TO BE MARKED WITH STRING IDENTIFICATION LABELS WITHIN 6" OF HOME RUN WIRE TERMINATIONS. THIS INCLUDES ONE LABEL AT HOME RUN TERMINATION IN DC COMBINER/INVERTER AND ONE IDENTIFICATION LABEL LOCATED WHERE HOME RUN CONNECTS TO FIRST MODULE LEAD.
18	INVERTER WITH INTEGRATED COMBINER BOX,[18 STRINGS] [6] TOTAL
19	INVERTER WITH INTEGRATED COMBINER BOX,[18 STRINGS] [3] TOTAL
20	INVERTER IDENTIFIER LABELS [8] TOTAL
21	DATA ACQUISITION SYSTEM IDENTIFIER LABEL, [1] TOTAL
22	SERVICE DISCONNECT
23	DANGER SIGN: ONE TO BE PLACED ON EACH GATE AND ONE ON THE NORTH, SOUTH, EAST AND WEST FACING FENCE SECTIONS
24	EMERGENCY CONTACT SIGN: ONE TO BE PLACED ON ENTRANCE GATE

LABEL NOTES:

- 1.[2017 NEC 110.16(A)] ELECTRICAL EQUIPMENT, SUCH AS SWITCHBOARDS, SWITCHGEAR, PANELBOARDS, INDUSTRIAL CONTROL PANELS, METER SOCKET ENCLOSURES, AND MOTOR CONTROL CENTERS, THAT IS IN OTHER THAN DWELLING UNITS, AND IS LIKELY TO REQUIRE EXAMINATION, ADJUSTMENT, SERVICING, OR MAINTENANCE WHILE ENERGIZED, SHALL BE FIELD OR FACTORY MARKED TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS. THE MARKING SHALL MEET THE REQUIREMENTS IN 110.21(B) AND SHALL BE LOCATED SO AS TO BE CLEARLY VISIBLE TO QUALIFIED PERSONS BEFORE EXAMINATION, ADJUSTMENT, SERVICING, OR MAINTENANCE OF THE EQUIPMENT.
- 2.[2017 NEC 110.21(B)] WHERE CAUTION, WARNING, OR DANGER SIGNS OR LABELS ARE REQUIRED BY THIS (NEC 2017) CODE, THE LABELS SHALL MEET THE FOLLOWING REQUIREMENTS:

- 1)THE MARKING SHALL WARN OF THE HAZARDS USING EFFECTIVE WORDS, COLORS, SYMBOLS OR ANY COMBINATION THEREOF
- 2)THE LABEL SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN.

\*EXCEPTION TO (2): PORTIONS OF LABELS OR MARKINGS THAT ARE VARIABLE, OR THAT COULD BE SUBJECT TO CHANGES, SHALL BE PERMITTED TO BE HAND WRITTEN AND SHALL BE LEGIBLE.

- 3)THE LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.

\*INFORMATION NOTE; ANSI Z535.4-2011, *PRODUCT SAFETY SIGNS AND LABELS*, PROVIDES GUIDELINES FOR SUITABLE FONT SIZES, WORDS, COLORS, SYMBOLS, AND LOCATION REQUIREMENTS FOR LABELS AS WELL AS GUIDELINES FOR THE DESIGN AND DURABILITY OF SAFETY SIGNS AND LABELS FOR APPLICATION TO ELECTRICAL EQUIPMENT.

- 3.[2017 NEC 690.13(B)] EACH PV SYSTEM DISCONNECTING MEANS SHALL PLAINLY INDICATE WHETHER IN THE OPEN (OFF) OR CLOSED (ON) POSITION AND BE PERMANENTLY MARKED "PV SYSTEM DISCONNECT" OR EQUIVALENT. ADDITIONAL MARKINGS SHALL BE PERMITTED BASED UPON THE SPECIFIC SYSTEM CONFIGURATION. FOR PV SYSTEM DISCONNECTING MEANS WHERE THE LINE AND LOAD TERMINALS MAY BE ENERGIZED IN THE OPEN POSITION, THE DEVICE SHALL BE MARKED WITH THE FOLLOWING WORDS OR EQUIVALENT:

**WARNING**

ELECTRIC SHOCK HAZARD

TERMINAL ON THE LINE AND LOAD SIDES

MAY BE ENERGIZED IN THE OPEN POSITION

THE WARNING SIGN(S) OR LABEL(S) SHALL COMPLY WITH 110.21(B).

- 4.[2017 NEC 690.53] A PERMANENT LABEL FOR THE DC PV POWER SOURCE INDICATING THE INFORMATION SPECIFIED IN (1) THROUGH (3) SHALL BE PROVIDED BY THE INSTALLER AT DC PV SYSTEM DISCONNECTION MEANS AND AT EACH DC EQUIPMENT DISCONNECTING MEANS REQUIRED BY 690.15. WHERE A DISCONNECTING MEANS HAS MORE THAN ONE DC PV POWER SOURCE, THE VALUES IN 690.53(1) THROUGH (3) SHALL BE SPECIFIED FOR EACH SOURCE.

- (1) MAXIMUM VOLTAGE
- \*INFORMATION NOTE TO (1): SEE 690.7 FOR VOLTAGE.
- (2) MAXIMUM CIRCUIT CURRENT
- \*INFORMATION NOTE TO (2): SEE 690.8(A) FOR CALCULATION OF MAXIMUM CIRCUIT CURRENT.
- (3) MAXIMUM RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED)

- 5.[2017 NEC 690.54] ALL INTERACTIVE SYSTEM(S) POINTS OF INTERCONNECTION WITH OTHER SOURCES SHALL BE MARKED AT AN ACCESSIBLE LOCATION AT THE DISCONNECTING MEANS AS A POWER SOURCE AND WITH THE RATED AC OUTPUT CURRENT AND THE NOMINAL OPERATING AC VOLTAGE.

- 6.[2017 NEC 690.56(B)] PLAQUES AND DIRECTORIES SHALL BE INSTALLED IN ACCORDANCE WITH 705.10.

- 7.[2017 NEC 705.10] A PERMANENT PLAQUE OR DIRECTORY DENOTING THE LOCATION OF ALL ELECTRIC POWER SOURCE DISCONNECTING MEANS ON OR IN THE PREMISES SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION AND AT THE LOCATIONS(S) OF THE SYSTEM DISCONNECT(S) FOR ALL ELECTRIC POWER PRODUCTION SOURCES CAPABLE OF BEING INTERCONNECTED. THE MARKING SHALL COMPLY WITH 110.21(B).

\*EXCEPTION: INSTALLATION WITH LARGE NUMBERS OF POWER PRODUCTION SOURCES SHALL BE PERMITTED TO BE DESIGNATED BY GROUPS.

- 8.[2017 NEC 705.12(B)(2)(3)(C)] THE SUM OF THE AMPERE RATINGS OF ALL OVERCURRENT DEVICES ON PANELBOARDS, BOTH LOAD AND SUPPLY DEVICES, EXCLUDING THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR, SHALL NOT EXCEED THE AMPACITY OF THE BUSBAR. THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED THE RATING OF THE BUSBAR. PERMANENT WARNING LABELS SHALL BE APPLIED TO DISTRIBUTION EQUIPMENT DISPLAYING THE FOLLOWING OR EQUIVALENT WORDING:

**WARNING:**

THIS EQUIPMENT FED BY MULTIPLE SOURCES.

TOTAL RATING OF ALL OVERCURRENT DEVICES

EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE

SHALL NOT EXCEED AMPACITY OF BUSBAR.

THE WARNING SIGN(S) OR LABELS(S) SHALL COMPLY WITH 110.21(B).

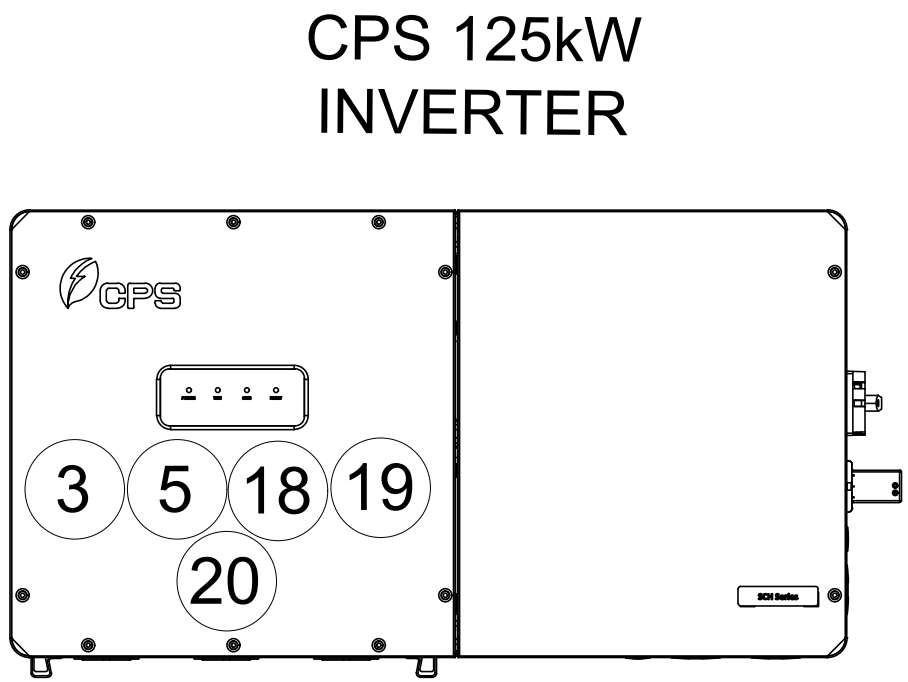
- 9.[2017 NEC 705.12(B)(3)] EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUSBAR OR CONDUCTOR SUPPLIED FROM MULTIPLE SOURCES SHALL BE MARKED TO INDICATE THE PRESENCE OF ALL SOURCES.

10. SAFETY SIGNS SHALL BE UV RESISTANT.

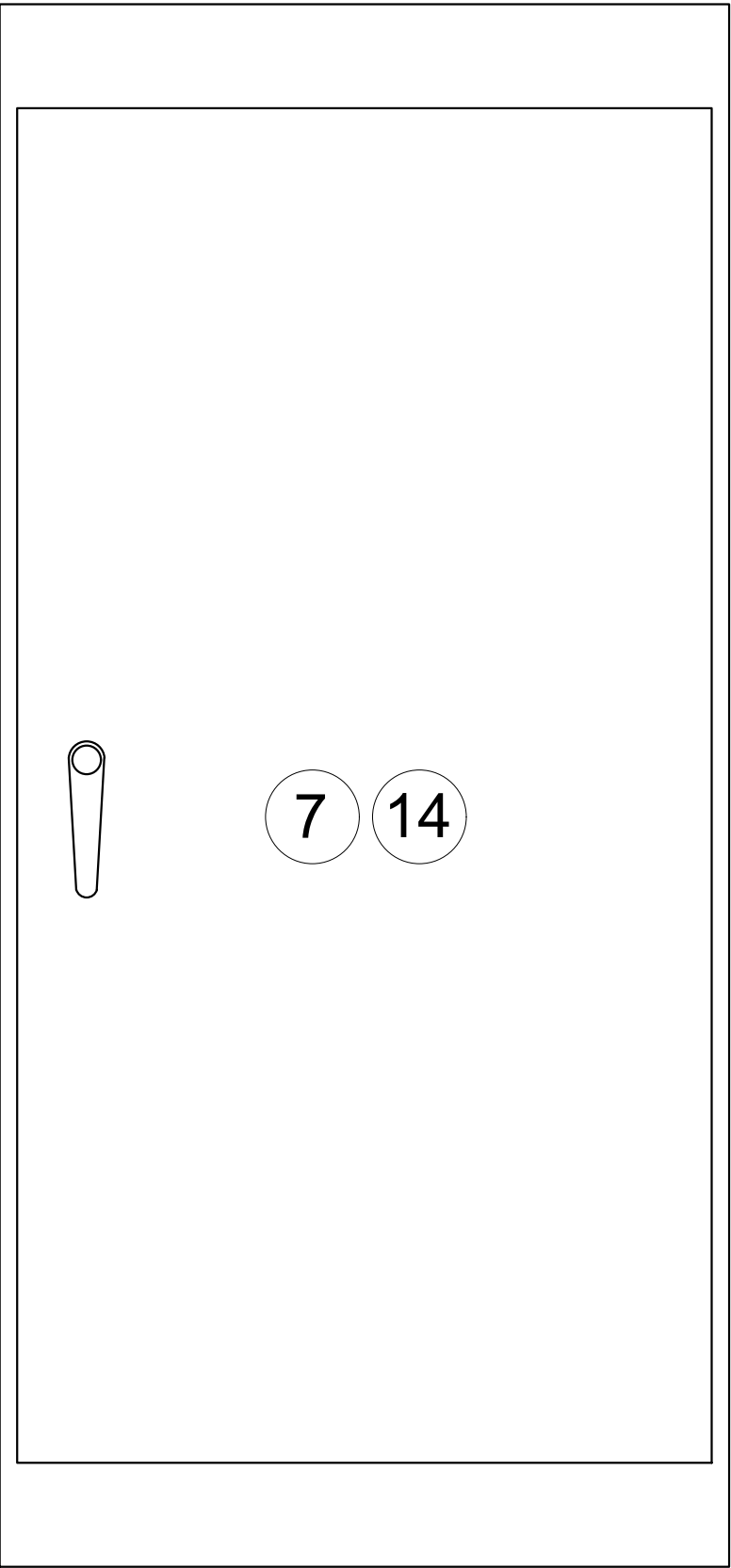
11. IDENTIFIER LABELS SHALL BE AFFIXED TO INVERTERS, COMBINER BOXES, STEP-UP TRANSFORMERS, AND DEAD BREAK JUNCTION BOXES, AS PER NUMBERS INDICATED ON THE PLANS USING THE SIGNS ON THIS PAGE AS REFERENCE.

SHEET

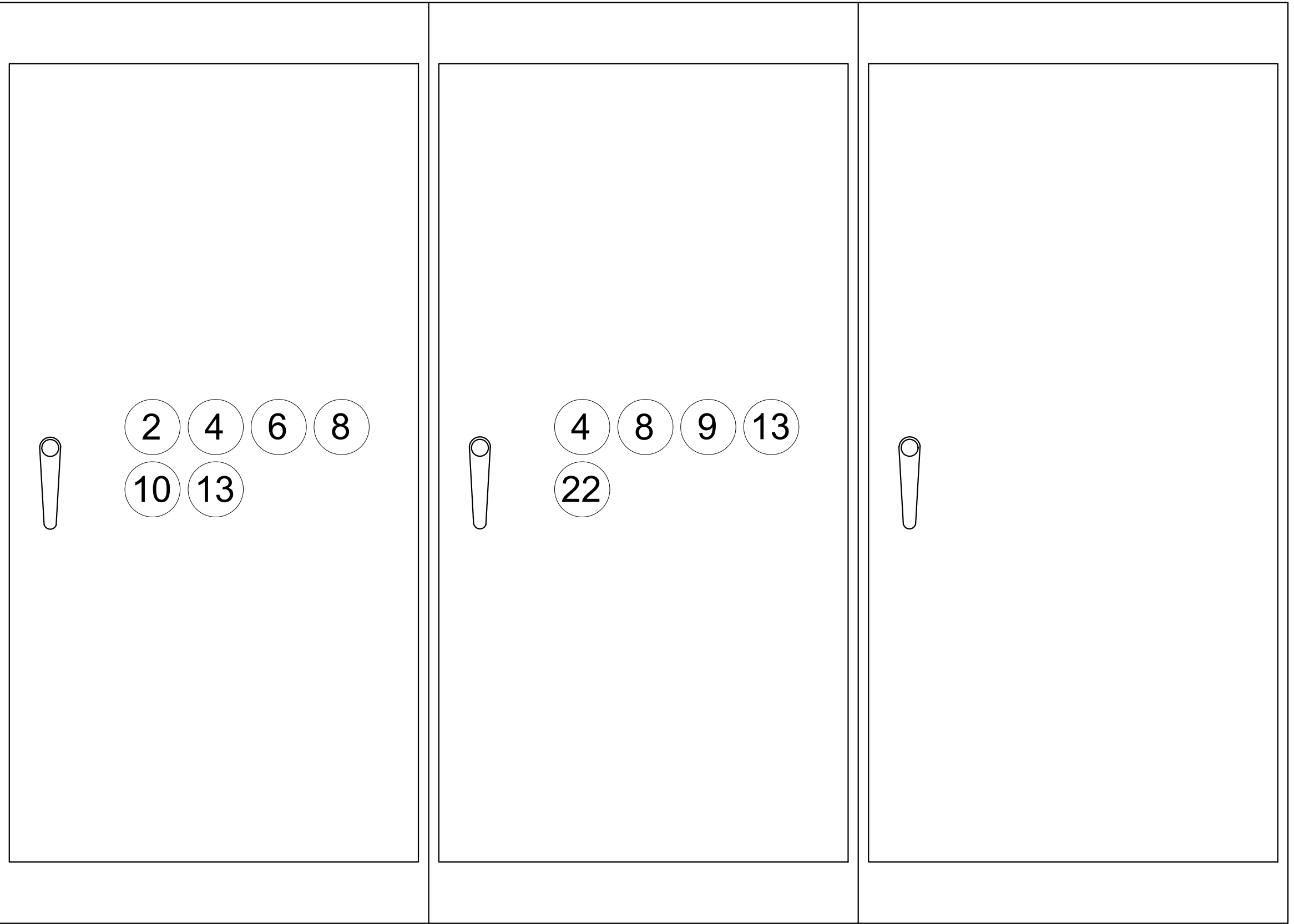
**NEC 2017 LABELS & SIGNS**



1600A  
STANDALONE  
SWITCHBOARD



LV SWITCHGEAR  
7 11 12 13 15





SOLAR'S MOST TRUSTED



# REC TWINPEAK 25 MONO 72 SERIES

PREMIUM SOLAR PANELS  
100% MADE IN SINGAPORE

REC TwinPeak 25 Mono 72 Series solar panels feature an innovative design with high efficiency and an industry-leading lightweight, yet robust construction, enabling customers to get the most out of the installation area.

Combined with the product quality and reliability of a strong and established European brand, REC TwinPeak 25 Mono 72 Series panels are ideal for all types of commercial rooftop and utility installations worldwide.



REDUCES BALANCE OF  
SYSTEM COSTS



IMPROVED PERFORMANCE  
IN SHADED CONDITIONS

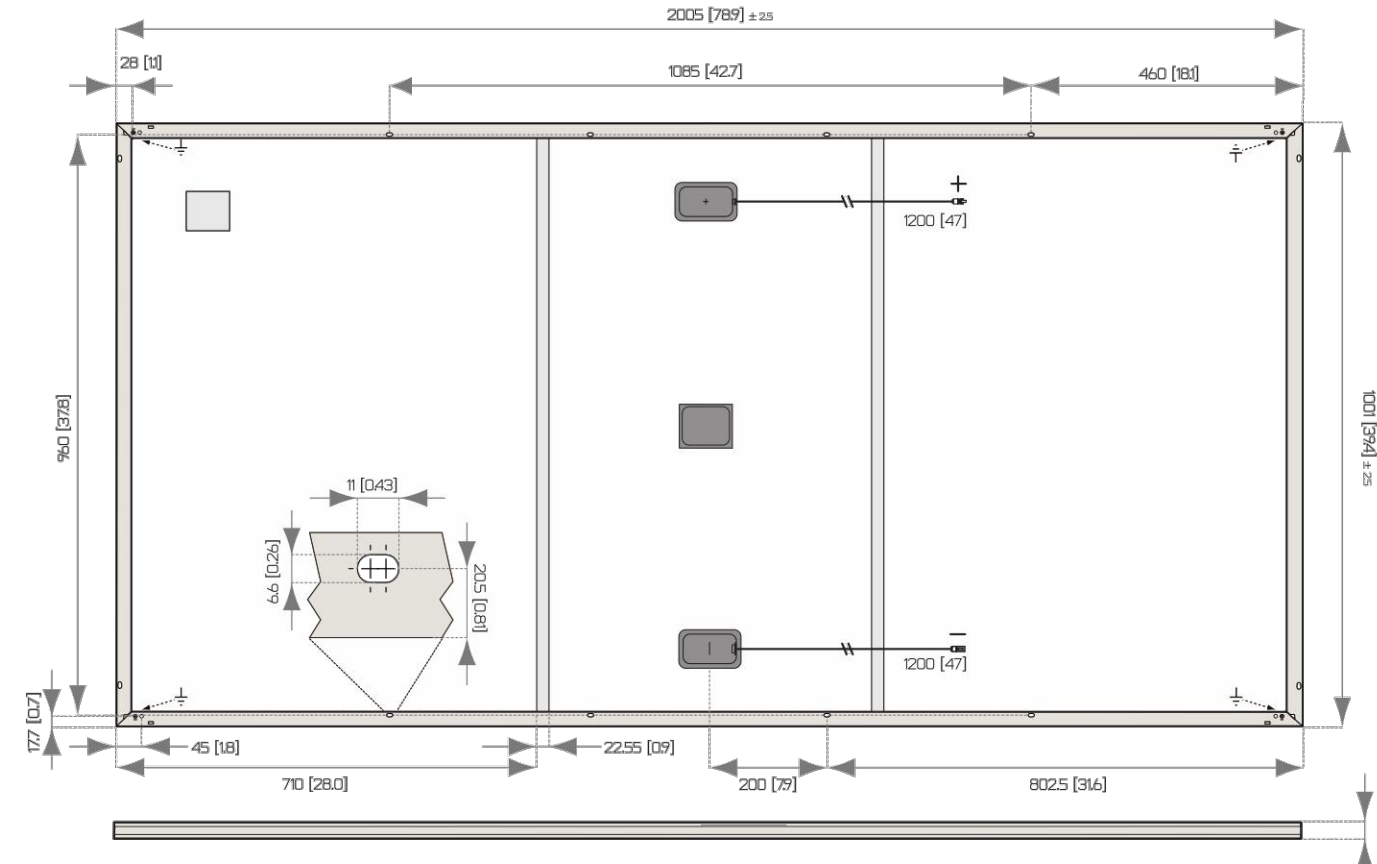


INDUSTRY-LEADING  
LIGHTWEIGHT 72-CELL PANEL



100%  
PID FREE

# REC TWINPEAK 25 MONO 72 SERIES



All measurements in mm [in]

ELECTRICAL DATA @ STC		Product code*: RECxxxTP2SM 72						
Nominal Power - P <sub>MPP</sub> (Wp)	370	375	380	385	390	395	400	
Watt Class Sorting - (W)	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5	
Nominal Power Voltage - V <sub>MPP</sub> (V)	39.8	40.1	40.3	40.5	40.7	40.9	41.1	
Nominal Power Current - I <sub>MPP</sub> (A)	9.30	9.36	9.43	9.51	9.58	9.66	9.73	
Open Circuit Voltage - V <sub>OC</sub> (V)	47.0	47.4	48.0	48.6	49.2	49.8	50.4	
Short Circuit Current - I <sub>SC</sub> (A)	10.02	10.04	10.05	10.07	10.08	10.09	10.1	
Panel Efficiency (%)	18.4	18.7	18.9	19.2	19.4	19.7	20.0	

Values at standard test conditions (STC: air mass AM1.5, irradiance 1000 W/m<sup>2</sup>, temperature 25°C), based on a production spread with a tolerance of V<sub>OC</sub> & I<sub>SC</sub> ±3% within one watt class. At low irradiance of 200 W/m<sup>2</sup> at least 95% of the STC module efficiency will be achieved.  
\*Where xxx indicates the nominal power class (P<sub>MPP</sub>) at STC indicated above, and can be followed by the suffix XV for 1500 V rated modules.

ELECTRICAL DATA @ NMOT		Product code*: RECxxxTP2SM 72						
Nominal Power - P <sub>MPP</sub> (Wp)	276	280	283	287	290	295	298	
Nominal Power Voltage - V <sub>MPP</sub> (V)	37.1	37.3	37.5	37.7	37.9	38.1	38.3	
Nominal Power Current - I <sub>MPP</sub> (A)	7.44	7.49	7.54	7.60	7.66	7.73	7.78	
Open Circuit Voltage - V <sub>OC</sub> (V)	43.7	44.1	44.7	45.3	45.8	46.4	46.9	
Short Circuit Current - I <sub>SC</sub> (A)	8.02	8.03	8.04	8.06	8.06	8.07	8.08	

Nominal module operating temperature (NMOT: air mass AM1.5, irradiance 800 W/m<sup>2</sup>, temperature 20°C, windspeed 1 m/s).  
\*Where xxx indicates the nominal power class (P<sub>MPP</sub>) at STC indicated above, and can be followed by the suffix XV for 1500 V rated modules.

## CERTIFICATION



UL 1703, Fire classification: Type 1 (1500 V XV); Type 2 (1000 V);  
IEC 61215, IEC 61730, IEC 62804 (PID), IEC 62716 (Ammonia),  
IEC 61701 (Salt Mist level 6),  
ISO 9001: 2015, ISO 14001: 2004, OHSAS 18001: 2007

## WARRANTY

20 year product warranty  
25 year linear power output warranty  
Max. performance degradation of 0.5% p.a. from 97.5% in year 1  
See warranty conditions for further details.

20,0% EFFICIENCY

20 YEAR PRODUCT WARRANTY

25 YEAR LINEAR POWER  
OUTPUT WARRANTY

## GENERAL DATA

Cell type: 144 half-cut monocrystalline PERC cells  
6 strings of 24 cells in series  
Glass: 3.2 mm solar glass with  
anti-reflection surface treatment  
Backsheet: Highly resistant polymeric construction  
Frame: Anodized aluminum  
Support bars: Anodized aluminum  
Junction box: 3-part, 3 bypass diodes, IP67 rated  
in accordance with IEC 62790  
Cable: 4 mm<sup>2</sup> solar cable, 1.2 m + 1.2 m  
in accordance with EN 50618  
Connectors: Stäubli MC4-Evo2  
PV-KBT4-EVO/PV-KST4-EVO (4 mm<sup>2</sup>)  
in accordance with IEC 62852, IP68 only when connected  
Origin: Made in Singapore

## MAXIMUM RATINGS

Operational temperature: -40 ... +85°C  
Maximum system voltage: 1000 V/1500 V  
Design load (+): snow 367 kg/m<sup>2</sup> (3600 Pa)\*  
Maximum test load (+): 550 kg/m<sup>2</sup> (5400 Pa)  
Design load (-): wind 163 kg/m<sup>2</sup> (1600 Pa)\*  
Maximum test load (-): 244 kg/m<sup>2</sup> (2400 Pa)  
Max series fuse rating: 25 A  
Max reverse current: 25 A  
\* Calculated using a safety factor of 1.5  
\* See installation manual for mounting instructions

## TEMPERATURE RATINGS

Nominal Module Operating Temperature: 44.6°C (±2°C)  
Temperature coefficient of P<sub>MPP</sub>: -0.37 %/°C  
Temperature coefficient of V<sub>OC</sub>: -0.28 %/°C  
Temperature coefficient of I<sub>SC</sub>: 0.04 %/°C  
\*The temperature coefficients stated are linear values

## MECHANICAL DATA

Dimensions: 78.9" x 39.4" x 1.2" (2005 x 1001 x 30 mm)  
Area: 21.6 ft<sup>2</sup> (2.01 m<sup>2</sup>)  
Weight: 48.5 lbs (22 kg)



www.recgroup.com

Ref: PM-D5-07-23 Rev. B-08-19

Specifications subject to change without notice.

SHEET  
MODULE  
DATASHEET





Datasheet

## 100/125kW, 1500Vdc String Inverters for North America

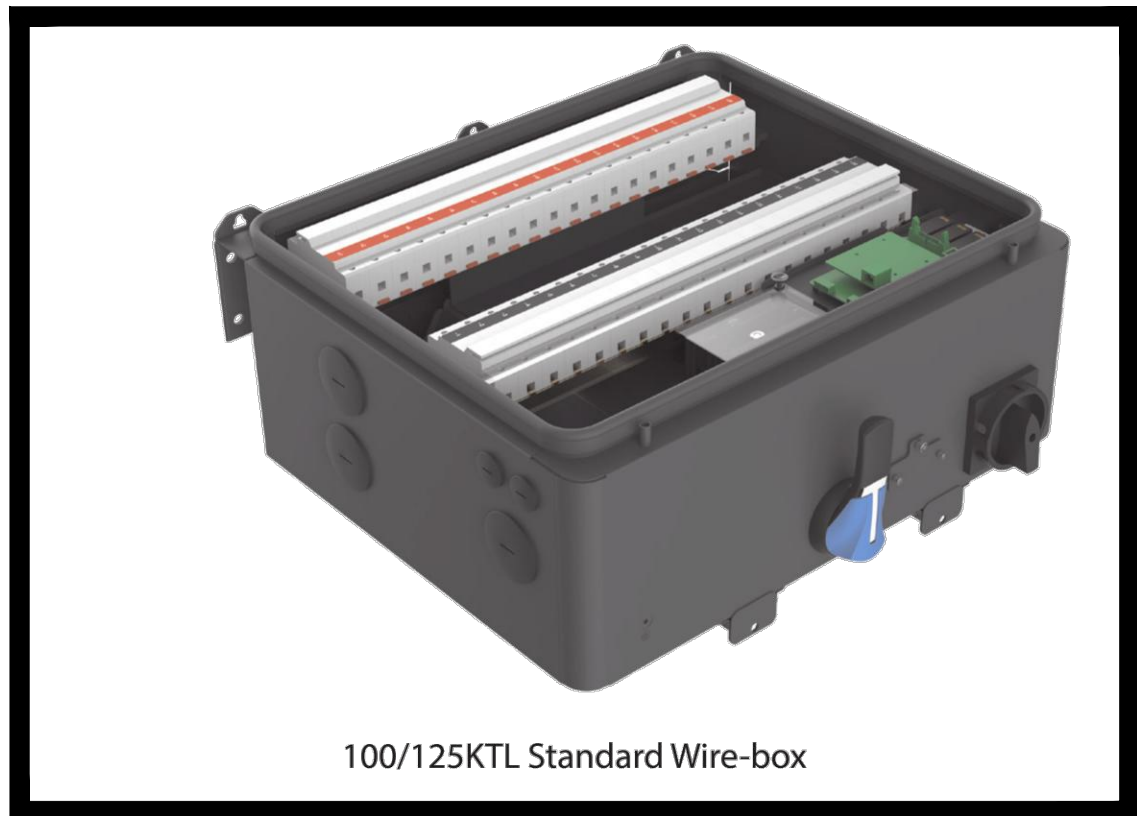


CPS SCH100/125KTL-DO/US-600

The 100 & 125kW high power CPS three phase string inverters are designed for ground mount applications. The units are high performance, advanced and reliable inverters designed specifically for the North American environment and grid. High efficiency at 99.1% peak and 98.5% CEC, wide operating voltages, broad temperature ranges and a NEMA Type 4X enclosure enable this inverter platform to operate at high performance across many applications. The CPS 100/125kW products ship with the Standard or Centralized Wire-box, each fully integrated and separable with AC and DC disconnect switches. The Standard Wire-box includes touch safe fusing for up to 20 strings. The CPS Flex Gateway enables communication, controls and remote product upgrades.

### Key Features

- NFPA 70, NEC 2014 and 2017 compliant
- Touch safe DC Fuse holders adds convenience and safety
- CPS Flex Gateway enables remote FW upgrades
- Integrated AC & DC disconnect switches
- 1 MPPT with 20 fused inputs for maximum flexibility
- Copper and Aluminum compatible AC connections
- NEMA Type 4X outdoor rated, tough tested enclosure
- Advanced Smart-Grid features (CA Rule 21 certified)
- kVA Headroom yields 100kW @ 0.9PF and 125kW @ 0.95PF
- Generous 1.5 DC/AC Inverter Load Ratio
- Separable wire-box design for fast service
- Standard 5 year warranty with extensions to 20 years



100/125KTL Standard Wire-box



100/125KTL Centralized Wire-box



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Chint Power Systems America  
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Tel: 855-584-7168 Mail: AmericaSales@chintpower.com Web: www.chintpowersystems.com

SELECTED WIRE-BOX



Technical Data

Model Name	CPS SCH100KTL-DO/US-600	CPS SCH125KTL-DO/US-600
<b>DC Input</b>		
Max. PV Power	150kW	187.5kW
Max. DC Input Voltage	1500V	
Operating DC Input Voltage Range	860-1450Vdc	
Start-up DC Input Voltage / Power	900V / 250W	
Number of MPP Trackers	1	
MPPT Voltage Range <sup>1</sup>	870-1300Vdc	
Max. PV Input Current (Isc x1.25)	220A	275A
Number of DC Inputs	20 PV source circuits, pos. & neg. fused (Standard Wire-box) 1 PV output circuit, 1-2 terminations per pole, non-fused (Centralized Wire-box)	
DC Disconnection Type	Load-break rated DC switch	
DC Surge Protection	Type II MOV (with indicator/remote signaling), Up=2.5kV, In=20kA (8/20uS)	
<b>AC Output</b>		
Rated AC Output Power	100kW	125kW
Max. AC Output Power <sup>2</sup>	100kVA (111kVA @ PF>0.9)	125kVA (132kVA @ PF>0.95)
Rated Output Voltage	600Vac	
Output Voltage Range <sup>3</sup>	528-660Vac	
Grid Connection Type <sup>4</sup>	3Φ / PE / N (Neutral optional)	
Max. AC Output Current @600Vac	96.2/106.8A	120.3/127.2A
Rated Output Frequency	60Hz	
Output Frequency Range <sup>3</sup>	57-63Hz	
Power Factor	>0.99 (±0.8 adjustable)	>0.99 (±0.8 adjustable)
Current THD	<3%	
Max. Fault Current Contribution (1-cycle RMS)	41.47A	
Max. OCPD Rating	150A	175A
AC Disconnection Type	AC Maintenance switch	
AC Surge Protection	Type II MOV (with indicator/remote signaling), Up=2.5kV, In=20kA (8/20uS)	
<b>System</b>		
Topology	Transformerless	
Max. Efficiency	99.1%	
CEC Efficiency	98.5%	
Stand-by / Night Consumption	<4W	
<b>Environment</b>		
Enclosure Protection Degree	NEMA Type 4X	
Cooling Method	Variable speed cooling fans	
Operating Temperature Range	-22°F to +140°F / -30°C to +60°C (derating from +113°F / +45°C)	
Non-Operating Temperature Range <sup>5</sup>	-40°F to +158°F / -40°C to +70°C maximum	
Operating Humidity	0-100%	
Operating Altitude	8202ft / 2500m (no derating)	
Audible Noise	<65dBA@1m and 25°C	
<b>Display and Communication</b>		
User Interface and Display	LED Indicators, WiFi + APP	
Inverter Monitoring	Modbus RS485	
Site Level Monitoring	CPS Flex Gateway (1 per 32 inverters)	
Modbus Data Mapping	SunSpec/CPS	
Remote Diagnostics / FW Upgrade Functions	Standard / (with Flex Gateway)	
<b>Mechanical</b>		
Dimensions (WxHxD)	45.28x24.25x9.84in (1150x616x250mm) with Standard Wire-box 39.37x24.25x9.84in (1000x616x250mm) with Centralized Wire-box	
Weight	Inverter: 121lbs / 55kg; Wire-box: 55lbs / 25kg (Standard Wire-box); 33lbs / 15kg (Centralized Wire-box)	
Mounting / Installation Angle	15 - 90 degrees from horizontal (vertical or angled)	
AC Termination	M8 Stud Type Terminal Block (Wire range: #6 - 3/0AWG CU/AL, Lugs not supplied)	
DC Termination	Screw Clamp Fuse Holder (Wire range: #12 - #6AWG CU) - Standard Wire-box Busbar, M8 PEMserts (Wire range: #1AWG - 250kcmil CU/AL, Lugs not supplied) - Centralized Wire-box	
Fused String Inputs	15A fuses provided (Fuse values of 15 or 20A allowed)	
<b>Safety</b>		
Safety and EMC Standard	UL1741-SA-2016, CSA-C22.2 NO.107.1-01, IEEE1547a-2014; FCC PART15	
Selectable Grid Standard	IEEE 1547a-2014, CA Rule 21, ISO-NE	
Smart-Grid Features	Volt-RideThru, Freq-RideThru, Ramp-Rate, Specified-PF, Volt-VAR, Freq-Watt, Volt-Watt	
<b>Warranty</b>		
Standard <sup>6</sup>	5 years	
Extended Terms	10, 15 and 20 years	

1) See user manual for further information regarding MPPT Voltage Range when operating at non-unity PF  
2) "Max. AC Apparent Power" rating valid within MPPT voltage range and temperature range of -30°C to +40°C (-22°F to +104°F) for 100KW PF ≥0.9 and 125KW PF ≥0.95  
3) The "Output Voltage Range" and "Output Frequency Range" may differ according to the specific grid standard.  
4) Wye neutral-grounded, Delta may not be corner-grounded.  
5) See user manual for further requirements regarding non-operating conditions.  
6) 5 year warranty effective for units purchased after October 1st, 2019.

SHEET  
INVERTER  
DATASHEET



This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

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**Applicant:** SHANGHAI CHINT POWER SYSTEMS CO., LTD  
**Manufacturer:** SHANGHAI CHINT POWER SYSTEMS CO., LTD  
**Address:** No. 3255 Si Xian Rd, Songjiang District, Shanghai, 201614  
**Country:** P.R.China  
**Contact:** Danson Chen  
**Phone:** (86)21 3779 1222 ext:6303  
**FAX:** (86)21 3779 1222 ext:6001  
**Email:** Danson.chen@chint.com

**Party Authorized To Apply Mark:** Same as Manufacturer  
**Report Issuing Office:** Intertek Testing Services Shanghai Limited  
**Control Number:** 4004522  
**Authorized by:** Thomas J. Patterson, Certification Manager



This document supersedes all previous Authorizations to Mark for the noted Report Number.

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Intertek Testing Services NA Inc.  
545 East Algonquin Road, Arlington Heights, IL 60005  
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

**Standard(s):** UL Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741, Second Edition, January 28, 2010 & General Use Power Supplies, CSA C22.2 No.107.1-01 dated September, 2001, Reaffirmed 2006 with Interim Certification Requirements for Utility-Interconnected Inverters - Technical Information Letter (T.I.L.) No. I-43, dated January 21, 2011  
**Product:** Grid-Tie PV Inverter  
**Brand Name:** CHINT POWER or CPS  
**Models:** CPS SC14KTL-DO/US-208, CPS SC14KTL-DO/CA-208

Table 4-3 Protection Parameters (IEEE1547 and Rule21)

Grid Voltage Protection		IEEE1547	Rule21
Parameter name	Description	Setting Range (Min, Default, Max)	Setting Range (Min, Default, Max)
GridVoltMax1	Threshold value of Level 1 Max. grid voltage	{100.00%, <b>110.00%</b> , 135.00%}	{100.00%, <b>110.00%</b> , 135.00%}
VoltMaxTripTime1(S)	Threshold value of Level 1 Max. grid trip voltage	{0, <b>1.00</b> , 655}	{0, <b>12.50</b> , 655}
GridVoltMax2	Threshold value of Level 2 Max. grid voltage	{100.00%, <b>120.00%</b> , 135.00%}	{100.00%, <b>120.00%</b> , 135.00%}
VoltMaxTripTime2(S)	Threshold value of Level 2 Max. grid trip voltage	{0, <b>0.16</b> , 655}	{0, <b>0.16</b> , 655}
GridVoltMax3	Threshold value of Level 3 Max. grid voltage	{100.00%, <b>120.00%</b> , 135.00%}	{100.00%, <b>120.00%</b> , 135.00%}
VoltMaxTripTime3(S)	Threshold value of Level 3 Max. grid trip voltage	{0, <b>0.16</b> , 655}	{0, <b>0.16</b> , 655}
GridVoltMin1	Threshold value of Level 1 Min. grid voltage	{30.00%, <b>88.00%</b> , 100.00%}	{30.00%, <b>88.00%</b> , 100.00%}
VoltMinTripTime1(S)	Threshold value of Level 1 Min. grid trip voltage	{0, <b>2.0</b> , 655}	{0, <b>20.50</b> , 655}
GridVoltMin2	Threshold value of Level 2 Min. grid voltage	{30.00%, <b>60.00%</b> , 100.00%}	{30.00%, <b>70.00%</b> , 100.00%}
VoltMinTripTime2(S)	Threshold value of Level 2 Min. grid trip voltage	{0, <b>1.00</b> , 655}	{0, <b>10.50</b> , 655}
GridVoltMin3	Threshold value of Level 3 Min. grid voltage	{30.00%, <b>45.00%</b> , 100.00%}	{30.00%, <b>50.00%</b> , 100.00%}
VoltMinTripTime3(S)	Threshold value of Level 3 Min. grid trip voltage	{0, <b>0.16</b> , 655}	{0, <b>1.5</b> , 655}

Table 4-3 Protection Parameters (IEEE1547 and Rule21) cont'd

Grid Frequency Protection		IEEE1547	Rule21
Parameter name	Description	Setting Range (Min, Default, Max)	Setting Range (Min, Default, Max)
GridFrqMin1	Protection threshold value of Level 1 Min. grid frequency	{54, <b>59.5</b> , 60}	{45, <b>58.5</b> , 60}
FrqMinTripT1 (S)	Trip time of Level 1 Min. grid frequency	{0, <b>2</b> , 655}	{0, <b>299.50</b> , 655.00}
GridFrqMin2	Protection threshold value of Level 2 Min. grid frequency	{54, <b>57</b> , 60}	{45, <b>57</b> , 60}
FrqMinTripT2 (S)	Trip time of Level 2 Min. grid frequency	{0, <b>0.16</b> , 655}	{0, <b>0.16</b> , 655}
GridFrqMin3	Protection threshold value of Level 3 Min. grid frequency	{54, <b>57</b> , 60}	{54, <b>57</b> , 60}
FrqMinTripT3 (S)	Trip time of Level 3 Min. grid frequency	{0, <b>0.16</b> , 655}	{0, <b>0.16</b> , 655}
GridFrqMax1	Protection threshold value of Level 1 Max. grid frequency	{60, <b>60.5</b> , 65}	{50, <b>60.5</b> , 65}
FrqMaxTripT1(S)	Trip time of Level 1 Max. grid frequency	{0, <b>2</b> , 655}	{0, <b>299.50</b> , 655}
GridFrqMax2	Protection threshold value of Level 2 Max. grid frequency	{50, <b>62</b> , 65}	{50, <b>62</b> , 65}
FrqMaxTripT2(S)	Trip time of Level 2 Max. grid frequency	{0, <b>0.16</b> , 655}	{0, <b>0.16</b> , 655}
GridFrqMax3	Protection threshold value of Level 3 Max. grid frequency	{60, <b>62</b> , 65}	{50, <b>62</b> , 65}
FrqMaxTripT3(S)	Trip time of Level 3 Max. grid frequency	{0, <b>0.16</b> , 655}	{0, <b>0.16</b> , 655}

Table 4-3 Protection Parameters (IEEE1547 and Rule21) cont'd

Grid Recovery		IEEE1547	Rule21
Parameter name	Description	Setting Range (Min, Default, Max)	Setting Range (Min, Default, Max)
VolMax (V)	Recovery Max threshold of grid voltage protection	{80.00%, <b>107.92%</b> , 135.00%}	{80.00%, <b>107.99%</b> , 135.00%}
VolMin (V)	Recovery Min threshold of grid voltage protection	{20.00%, <b>90.08%</b> , 100.00%}	{20.00%, <b>90.00%</b> , 100.00%}
VolRecoveryT(S)	Recovery time of grid voltage protection	{0, <b>300</b> , 655}	{0, <b>300</b> , 655}
FrqMax (Hz)	Recovery Max threshold of grid Frequency protection	{54, <b>60.3</b> , 66}	{54, <b>60.4</b> , 65}
FrqMin (Hz)	Recovery Min threshold of grid Frequency protection	{54, <b>59.8</b> , 60}	{48, <b>58.6</b> , 60}
FrqRecoveryT (S)	Recovery time of grid frequency protection	{0, <b>300</b> , 655}	{0, <b>300</b> , 655}
Grid Voltage Balance		IEEE1547	Rule21
Parameter name	Description	Setting Range (Min, Default, Max)	Setting Range (Min, Default, Max)
GridVolBalance	Threshold value of grid voltage imbalance	{0.01%, <b>10%</b> , 10%}	{0.01%, <b>10%</b> , 10%}



## Certificate of Compliance

**Certificate:** 2706862  
**Project:** 70192962  
**Issued to:** REC Solar PTE. LTD.  
20 Tuas South Avenue 14  
Singapore, Singapore 637312  
SINGAPORE

**Master Contract:** 260407  
**Date Issued:** 2018-07-30

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.



Issued by: Sean Jiang  
Sean Jiang

### PRODUCTS

CLASS - C531110 - POWER SUPPLIES-Photovoltaic Modules and Panels  
CLASS - C531190 - POWER SUPPLIES-Photovoltaic Modules and Panels - Certified to US Standards

Photovoltaic Modules with maximum system voltage of 600 V dc or 1000 V dc or 1500 V dc, and Type 1 or Type 2 module fire performance. Model series as below:  
RECOxx (xxx = 214 to 285 W), followed by PE, PE BLK or PE Z-LINK;  
RECOxx (xxx = 245 to 269 W), followed by PE BLK2;  
RECOxx (xxx = 245 to 270 W), followed by PE Z-LINK-S;  
RECOxx (xxx = 285 to 325 W), followed by PE 72, PE 72 BLK, PE 72 BLK2, PE 72 XV;  
RECOxx (xxx = 260 to 300 W), followed by TP, TP BLK, TP IQ, TP BLK IQ;  
RECOxx (xxx = 260 to 330 W), followed by TP2, TP2 BLK, TP2 IQ, TP2 BLK IQ, TP2S, TP2S BLK, TP2S IQ, TP2S BLK IQ;  
RECOxx (xxx = 265 to 290 W), followed by TP2 BLK2, TP BLK2, TP2S BLK2;  
RECOxx (xxx = 280 to 295 W), followed by TP2L, TP2L BLK, TP2L BLK2, TP2SL, TP2SL BLK, TP2SL BLK2;  
RECOxx (xxx = 275 to 320 W), followed by TP2M, TP2M BLK, TP2SM, TP2SM BLK;  
RECOxx (xxx = 270 to 320 W), followed by TP2M BLK2, TP2SM BLK2;  
RECOxx (xxx = 320 to 370 W), followed by PEM 72, PEM 72 BLK;  
RECOxx (xxx = 310 to 370 W), followed by TP 72, TP 72 BLK, TP 72 BLK2, TP2S 72, TP2S 72 BLK, TP2S 72 BLK2;  
RECOxx (xxx = 260 to 295 W), followed by PEM, PEM BLK, PE Z-Link-M;  
RECOxx (xxx = 260 to 290 W), followed by PEM BLK2;  
RECOxx (xxx = 350 to 380 W), followed by TP2M 72, TP2M 72 BLK, TP2M 72 BLK2, TP2SM 72, TP2SM 72 BLK, TP2SM 72 BLK2;  
RECOxx (xxx = 315 to 340 W), followed by TP2SB 72 XV;  
RECOxxNP (where xxx is the power output from 295 W to 330 W)

Note: 1. Model numbers may be followed by suffixes US, ECO, EVO, BLK, BLK2, Q2, Q3, XV, Z-LINK, Z-LINK-M, IQ, 2, S and 2L or a combination of these.  
2. Details such as ratings, size, configuration, etc. reference should be made to the Certification Record or the Descriptive Report.

### APPLICABLE REQUIREMENTS

ULC(ORD)-C1703-01 - Flat-Plate Photovoltaic Modules and Panels  
UL 1703-3rd Edition - Flat-Plate Photovoltaic Modules and Panels