Pine Mountain Lake Association - Administrative Center Solar Project

19228 PINE MOUNTAIN DR., GROVELAND, CA 95231

PROJECT CONTACTS:

EXCITE ENERGY
VINCE BOWLES
OWNER / EE
(916) 844-6232
VINCE@EXCITEENERGY.COM

EXCITE ENERGY
HEATH KIRIN
OWNER / EE
(916) 400-1197
HEATH@EXCITEENERGY.COM

PINE MOUNTAIN LAKE ASSOCIATION
KEN SPENCER
CONTROLLER
(209) 962-8606
CONTROLLER@PINEMOUNTAINLAKE.COM

SCOPE OF WORK:

THE PROJECT CONSISTS OF INSTALLING A 34.5KW PHOTOVOLTAIC SYSTEM AT THE PINE MOUNTAIN LAKE ASSOCIATION ENTRANCE BUILDING.

DURING DAYLIGHT HOURS THE PHOTOVOLTAIC SYSTEM WILL PROVIDE ELECTRICITY IN PARALLEL WITH THE LOCAL UTILITY.

ALL EQUIPMENT WILL BE INSTALLED AS REQUIRED BY APPLICABLE CODES AND THE LOCAL AUTHORITY HAVING JURISDICTION.

VALUATION: $113,692.00

(72) Q CELLS Q.PEAK DUO XL-G10 480W PHOTOVOLTAIC MODULES (COMPLIANT WITH CA RULE 21, UL62109-1, UL 1761, AND IEEE 1567)

(4) SMA SUNNYBOY 7.7-1SP-US-41 INVERTERS (COMPLIANT WITH CA RULE 21, UL 1741 SA, IEEE 1547, AND RULE 14H)

PG&E METER # 1006418321

SHEET INDEX:

APPLICABLE CODES:

CALIFORNIA ELECTRICAL CODE, 2019
CALIFORNIA BUILDING CODE, 2019
CALIFORNIA FIRE CODE, 2019
CALIFORNIA ENERGY CODE, 2019

VICINITY MAP:

EXCITE ENERGY, LLC
4970 ROBERT J MATHEWS PKWY
SUITE 160
EL DORADO HILLS, CA 95762
(916) 400-1197

CSLB #1018541
C10 CONTRACTOR

REFERENCE DRAWINGS		REVISIONS					
NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
EXCITE ENERGY CLIENT NO: 1018							
(FORMATTED 11"x17") SCALE: NONE		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT
ADMINISTRATIVE CENTER
COVER SHEET

DWG. NO. 1018-01-100
REV 0

GENERAL NOTES:

1. ALL MATERIALS AND INSTALLATIONS SHALL BE DONE IN ACCORDANCE WITH THE 2019 CALIFORNIA ELECTRICAL CODE (CEC) AS WELL AS ANY APPLICABLE CODES AND STANDARDS REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ).
2. COLOR CODING OF POWER CABLES SHALL TO BE AS FOLLOWS :

SINGLE PHASE:	THREE PHASE (120/208V):	THREE PHASE (277/480V):
HOT - BLACK	PHASE A - BLACK	PHASE A - BROWN
NEUTRAL - WHITE	PHASE B - RED	PHASE B - ORANGE
GROUND - GREEN	PHASE C - BLUE	PHASE C - YELLOW
	NEUTRAL - WHITE	NEUTRAL - GRAY
	GROUND - GREEN	GROUND - GREEN

3. LOW VOLTAGE CABLES SHALL HAVE A TEMPERATURE RATING OF 90°C.
4. WIRING FOR LOW VOLTAGE POWER AND CONTROL CIRCUITS SHALL BE TYPE THWN-2 OR XHHW-2.
5. ALL INDIVIDUALLY INSULATED NEUTRAL CONDUCTORS SHALL HAVE WHITE OR GRAY INSULATION AS NOTED ABOVE AND SHALL BE PERMANENTLY IDENTIFIED AS A NEUTRAL CONDUCTOR BY SHRINK-WRAPPING OR TAPING THE EXPOSED INSULATION AT EACH END AND AT EVERY OTHER POINT WHERE THE CONDUCTOR IS ACCESSIBLE AS NOTED IN NEC ARTICLE 200.6. INDIVIDUALLY INSULATED GROUNDING CONDUCTORS SHALL HAVE GREEN INSULATION.
6. ALL WIRING ENTERING FIELD JUNCTION BOXES SHALL BE FORMED, BUNDLED, AND ZIP-TIED IN A NEAT AND ORDERLY FASHION AND LOOPED WHERE POSSIBLE TO ALLOW SUFFICIENT LENGTH FOR RELOCATION FROM ITS DESIGNED TERMINATION POINT TO ANY OTHER TERMINAL WITHIN THE ENCLOSURE.
7. ALL SPARE WIRING NOT DESIGNATED TO TERMINATE ON SPARE TERMINALS SHALL BE FORMED, BUNDLED, AND TAGGED SPARE AND BE OF SUFFICIENT LENGTH TO REACH ANY TERMINAL WITHIN THE ENCLOSURE.
8. ALL WIRING TERMINATIONS SHALL BE IDENTIFIED USING PERMANENT WIRE MARKERS WITH IDENTIFICATION CORRESPONDING TO THAT ON SCHEMATICS, LOOPS, AND WIRING DIAGRAMS.
9. AFTER INSTALLATION, ELECTRICAL CONTRACTOR SHALL PERFORM MEGGER TESTS FOR ALL POWER CABLES AND CONTINUITY TESTS OF ALL CONTROL, AND INSTRUMENTATION CONDUCTORS TO ENSURE CORRECT CABLE CONNECTION. TESTS SHALL BE DOCUMENTED AND PROVIDED TO THE OWNER OR OWNER'S REPRESENTATIVE.
10. LENGTHS OF CABLES SHOWN ON PROJECT DRAWINGS ARE ESTIMATES. ELECTRICAL CONTRACTOR SHALL DETERMINE ACTUAL LENGTHS AND PART NUMBERS PRIOR TO ORDERING AND CUTTING CABLES.
11. ELECTRICAL CONTRACTOR SHALL KEEP WORKING COPIES OF AS-BUILT DRAWINGS FOR SUBMITTAL TO THE OWNER AT THE COMPLETION OF THE PROJECT.

GROUNDING NOTES:

1. ALL GROUNDING MATERIALS SHALL BE UL LISTED AND INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.
2. ALL GROUNDING MATERIALS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED ON DRAWINGS.
3. THE LOCATION OF GROUND CABLES AND EQUIPMENT SHOWN ON DRAWINGS IS APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED BY THE CONSTRUCTION CONTRACTOR IN COORDINATION WITH THE OWNER OR OWNER'S REPRESENTATIVE.
4. ONLY MAJOR GROUNDING IS SHOWN ON GROUNDING PLANS. OTHER GROUNDING (E.G. CONDUIT GROUNDING BUSHINGS, LUGS, ETC.) ARE NOT SHOWN ON PLANS BUT ARE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
5. GROUND RODS SHALL BE COPPER-COATED STEEL AND AT LEAST 5/8" IN DIAMETER AND 8' LONG.
6. GROUND RODS SHALL NOT BE INSTALLED CLOSER THAN TWICE THE ROD'S LENGTHS FROM ONE ANOTHER.
7. GROUND RODS SHALL BE INSTALLED WITH THE TOPS OF RODS AT A MINIMUM OF 6" BELOW FINISHED GRADE.
8. NEW GROUNDING INSTALLED FOR THE SCOPE OF THIS PROJECT SHALL BE CONNECTED TO THE EXISTING BUILDING GROUND SYSTEM.
9. ALL SURFACES REQUIRING GROUNDING SHALL BE THOROUGHLY CLEANED TO BARE METAL BEFORE ATTACHING GROUNDING DEVICES TO ENSURE GOOD ELECTRICAL CONTACT. WHERE PAINTED SURFACES ARE CLEANED, A TOUCH-UP COATING MATCHING THE ORIGINAL FINISH SHALL BE APPLIED AFTER GROUND CONNECTION IS COMPLETE.
10. CABLE-TO-CABLE CONNECTIONS SHALL BE IRREVERSIBLE COMPRESSION TYPE OR EXOTHERMIC.
11. CABLE-TO-EQUIPMENT CONNECTIONS SHALL BE BOLTED OR SERVIT POST.

CONDUIT NOTES:

1. ALL CONDUIT AND FITTINGS SHALL BE UL LISTED FOR THE INTENDED USE.
2. ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL RACEWAYS AND BULK MATERIALS.
3. ALL ABOVEGROUND CONDUIT SHALL BE EMT. ALL BELOWGROUND CONDUIT SHALL BE SCHEDULE 40 RIGID PVC UNLESS OTHERWISE NOTED ON PROJECT DRAWINGS.
4. REFER TO PLAN DRAWINGS AND ONE LINES FOR CONDUIT SIZES. THE MINIMUM SIZE FOR ALL CONDUIT SYSTEMS SHALL BE 3/4".
5. CONDUIT DRAINS SHALL BE INSTALLED AT ALL LOW POINTS IN CONDUIT SYSTEMS.
6. CRC ZINC-IT (OR APPROVED EQUIVALENT) SHALL BE APPLIED TO COVER ALL WRENCH MARKS AND BREAKS IN GALVANIZED COATINGS TO INHIBIT OXIDATION.
7. ALL SPARE CONDUITS SHALL BE CAPPED OR SEALED TO PREVENT INGRESS OF WATER AND DEBRIS.
8. ALL CONDUIT SUPPORT COMPONENTS SUCH AS BOLTS, NUTS, WASHERS, CLAMPS, THREADED RODS ETC., SHALL BE HOT-DIPPED GALVANIZED STEEL OR CADMIUM PLATED.
9. CONDUIT AND CABLE ROUTING SHOWN ON PLAN DRAWINGS ARE APPROXIMATE. MINOR DEVIATIONS FROM PLAN DRAWINGS, AS REQUIRED BY FIELD CONDITIONS, SHALL BE PERMISSIBLE. COORDINATION WITH THE OWNER'S REPRESENTATIVE OR ENGINEER IS REQUIRED FOR MAJOR DEVIATIONS.
10. ALL WIRE AND CABLES SHALL BE PULLED INTO THEIR RESPECTIVE CONDUITS USING A WIRE PULLING LUBRICANT.
11. SUFFICIENT WIRE SHALL BE LEFT AT ALL OUTLETS FOR CONNECTING FIXTURES AND DEVICES.
12. UNLESS OTHERWISE NOTED ON PROJECT DRAWINGS, UNDERGROUND CONDUIT SHALL BE BURIED TO A MINIMUM OF 18" DEEP TO THE TOP OF CONDUIT WITH 2" OF SAND ABOVE AND BELOW. A WARNING TAPE SHALL BE INSTALLED 12" ABOVE THE CONDUIT FOR THE FULL LENGTH.
13. CONDUIT USED FOR TRANSITION FROM BELOW-GRADE TO ABOVE SHALL EXTEND A MINIMUM OF 6" CONDUIT ABOVE FINAL GRADE.
14. NO INACCESSIBLE BOXES, ENCLOSURES, OR SPLICES SHALL BE INSTALLED.

EXCITE ENERGY, LLC
4970 ROBERT J MATHEWS PKWY
SUITE 160
EL DORADO HILLS, CA 95762
(916) 400-1197

CSLB #1018541
C10 CONTRACTOR

REFERENCE DRAWINGS		REVISIONS					
NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
EXCITE ENERGY CLIENT NO: 1018							
(FORMATTED 11"x17") SCALE: NONE		0	02/16/2021	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT

ELECTRICAL NOTES

DWG. NO. 1018-01-104

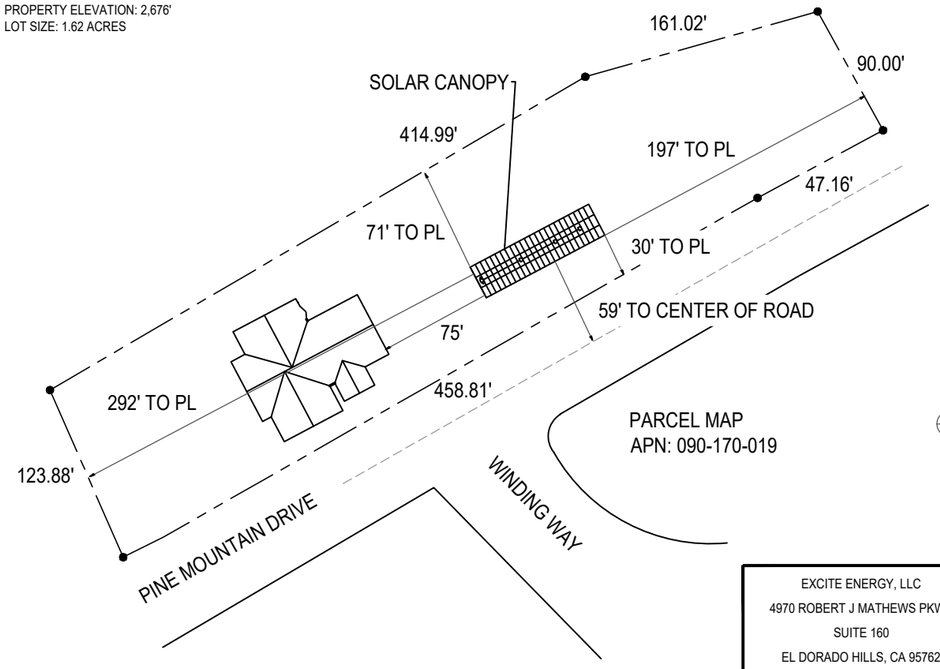
REV 0

NOTES:

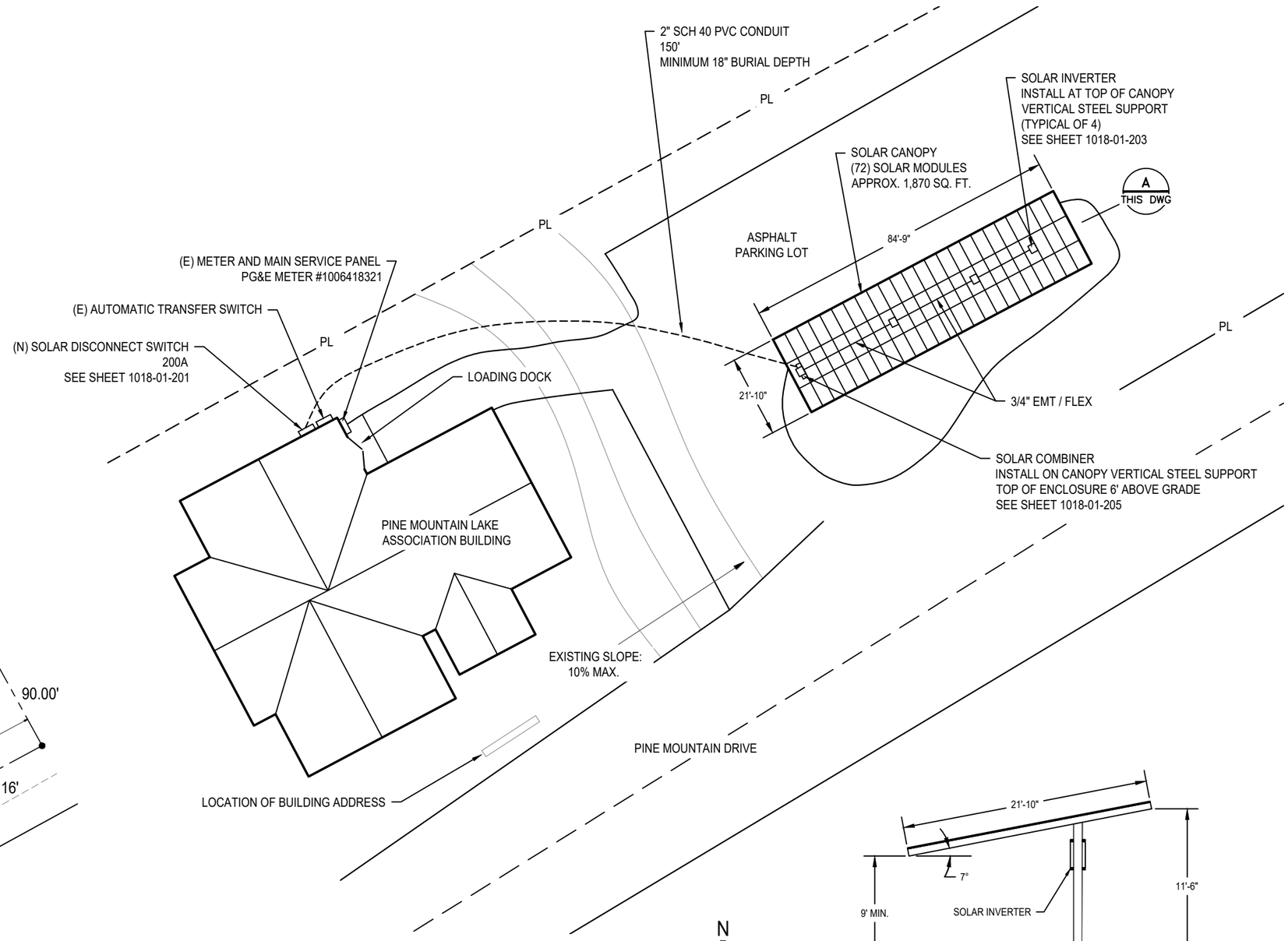
1. THERE SHALL BE NO CHANGES TO THE EXISTING GRADE OR NEW GRADING
2. APPROXIMATELY 6 CUBIC YARDS OF SOIL WILL BE REMOVED FOR THE INSTALLATION OF THE SOLAR CANOPY FOOTINGS

CUSTOMER AND LOT INFORMATION:

CUSTOMER NAME: PINE MOUNTAIN LAKE ASSOCIATION
ADDRESS: 19228 PINE MOUNTAIN DRIVE, GROVELAND, CA 95231
OWNER PHONE #: KEN SPENCER, (209) 962-8606
APPLICANT PHONE NUMBER: PHILIP HUTH, (916) 807-4259
APN: 090-170-019-000
PROPERTY ELEVATION: 2,676'
LOT SIZE: 1.62 ACRES



2 PARCEL MAP
SCALE: 1" = 100'



1 PLOT PLAN
SCALE: 1/32" = 1'-0"

DETAIL A SECTION VIEW

EXCITE ENERGY, LLC 4970 ROBERT J MATHEWS PKWY SUITE 160 EL DORADO HILLS, CA 95762 (916) 400-1197 CSLB #1018541 C10 CONTRACTOR	REFERENCE DRAWINGS		REVISIONS					
	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
	1018-01-110	ONE LINE DIAGRAM						
	EXCITE ENERGY CLIENT NO: 1018							
	(FORMATTED 11"x17") SCALE: AS NOTED		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

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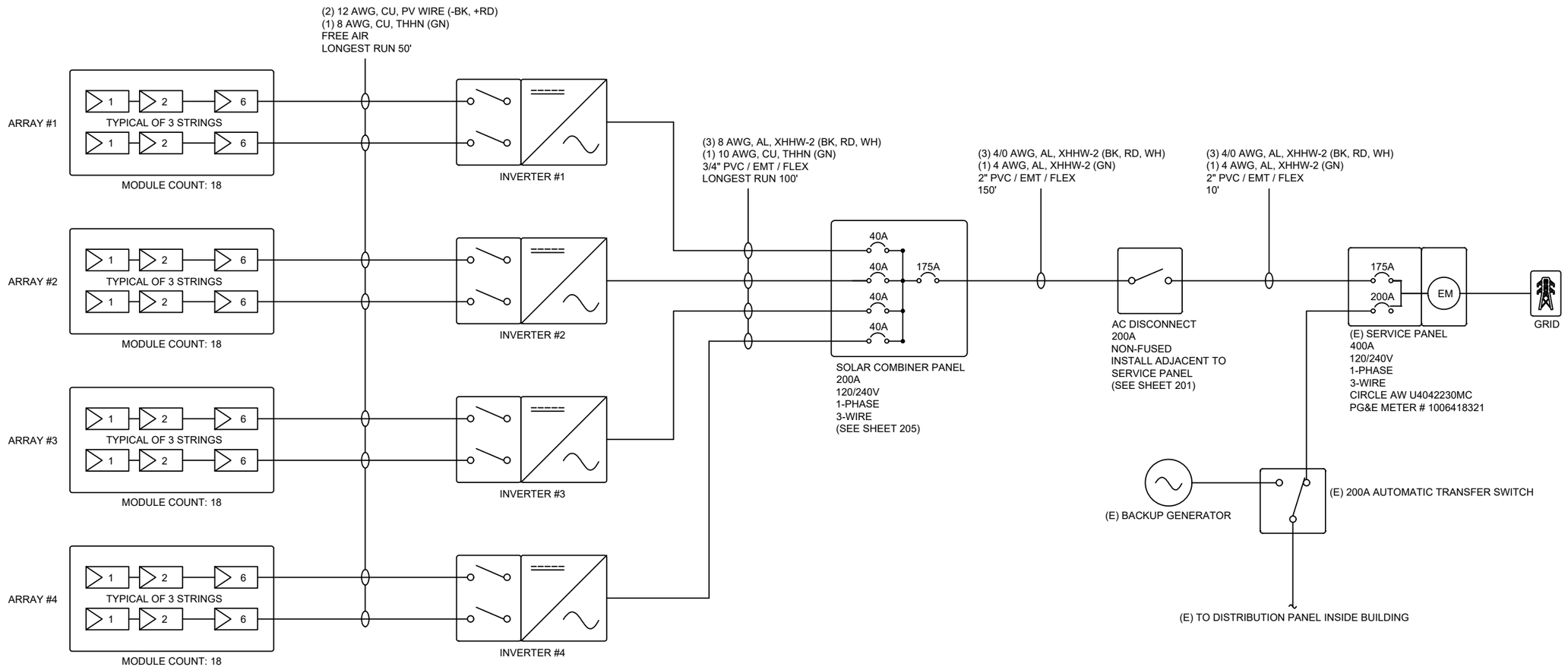
PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT
ADMINISTRATIVE CENTER
PLOT PLAN

DWG. NO. 1018-01-105
REV 0



(SEE SHEET 202)

MODULE SPECIFICATIONS	
(72) Q CELLS Q.PEAK DUO XL-G10 480W	
STC RATING	480 W
PTC RATING	447.1 W
VOLTAGE AT MPP	44.54 V
CURRENT AT MPP	10.66 A
OPEN CIRCUIT VOLTAGE	53.61 V
SHORT CIRCUIT CURRENT	11.26 A

(SEE SHEET 203)

INVERTER SPECIFICATIONS	
(4) SMA SUNNY BOY SB7.7-1TP-US-41	
MAX DC INPUT POWER (STC)	10.9 KW
MAX INPUT VOLTAGE	600 V
MAX AC OUTPUT POWER	7.7 KW
AC OUTPUT VOLTAGE (NOMINAL)	240 V
MAX CONTINUOUS OUTPUT CURRENT	32 A

VOLTAGE DROP CALCULATIONS					
CIRCUIT	LENGTH	AMPS	VOLTAGE	V DROP	% DROP
INVERTER TO COMBINER	100'	32 A	240 VAC	5.0 VAC	2.1 %
COMBINER TO DISCONNECT SWITCH	150'	128 A	240 VAC	2.4 VAC	1.0 %
DISCONNECT SWITCH TO SERVICE PANEL	10'	128 A	240 VAC	0.2 VAC	0.1 %

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REFERENCE DRAWINGS

NO.	TITLE
1018-01-105	PLOT PLAN
EXCITE ENERGY CLIENT NO: 1018	
(FORMATTED 11"x17") SCALE: NONE	

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK.	APP.
0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT
ADMINISTRATIVE CENTER
ONE LINE DIAGRAM

DWG. NO. 1018-01-110

REV 0

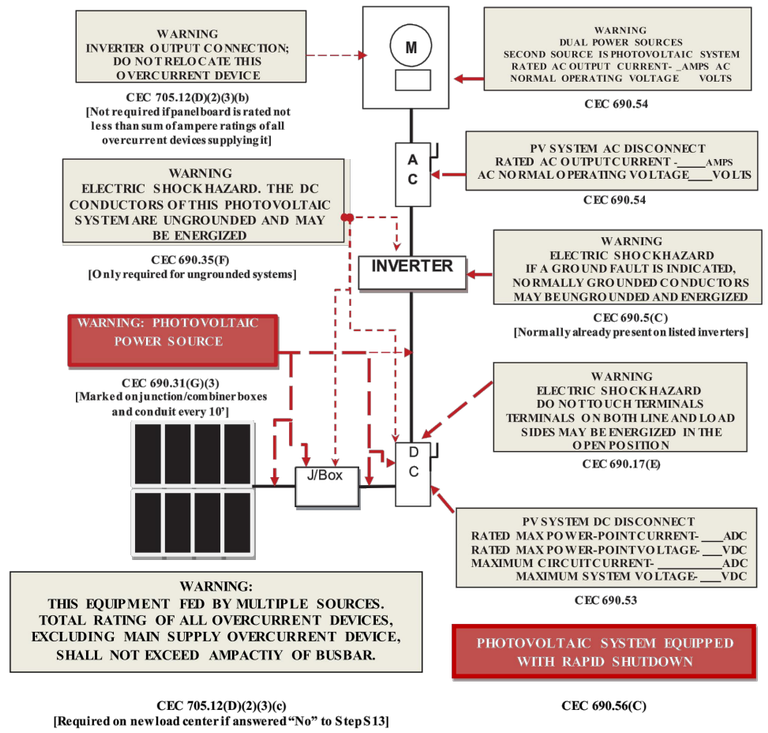
PV LABEL SIGNAGE

* RED BACKGROUND
* WHITE LETTERS
* MINIMUM 3/8" LETTER HEIGHT
* ALL CAPITAL LETTERS
* ARIAL OR SIMILAR FONT, NON-BOLD
* MATERIAL SUITABLE FOR THE ENVIRONMENT (A DURABLE ADHESIVE IS ACCEPTABLE)

Solar PV Standard Plan — Simplified
Central/String Inverter Systems for One- and Two-Family Dwellings

Markings

CEC Articles 690 and 705 and CA Residential Code Section R324 require the following labels or markings be installed at these components of the photovoltaic system:



Informational note: ANSI Z535.4-2011 provides guidelines for the design of safety signs and labels for application to products. A phenolic plaque with contrasting colors between the text and background would meet the intent of the code for permanency. No type size is specified, but 20 point (3/8") should be considered the minimum.

CEC 705.12 requires a permanent plaque or directory denoting all electric power sources on or in the premises or rapid fire shutdown equipment.

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SUITE 160
EL DORADO HILLS, CA 95762
(916) 400-1197

CSLB #1018541
C10 CONTRACTOR

REFERENCE DRAWINGS		REVISIONS					
NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
EXCITE ENERGY CLIENT NO: 1018							
(FORMATTED 11"x17") SCALE: NONE		0	02/16/2021	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT

LABELS

DWG. NO. 1018-01-115

REV 0

1

DG321NRB

120/240 Vac General-Duty, Fusible, Single-Throw, continued

System	Ampere Rating	Fuse Type Provision	Maximum Horsepower Ratings ① Single-Phase AC 120V	Single-Phase AC 240V	Three-Phase AC 240V	DC 250V	NEMA 1 Enclosure Indoor Catalog Number	NEMA 3R Enclosure Rainproof Catalog Number
Cartridge Type—Three-Pole, Three-Wire (Three Blades, Three Fuses)—240 Vac								
	30	—	—	—	—	—	②	②
	60	—	—	—	—	—	②	②
	100	—	—	—	—	—	②	②
	200	H	—	15	25–60	—	**DG324FGK** ③④	②
	400	H	—	—	50–125	—	**DG325FGK** ③④	**DG325FRK** ③④
	600	H	—	—	75–200	—	**DG326FGK** ③④	**DG326FRK** ③④
Cartridge Type—Four-Wire (Three Blades, Three Fuses, S/N)—120/240 Vac								
	30	H	—	1-1/2–3	3–7-1/2	—	**DG321NGB** ⑤	**DG321NRB** ⑤
	60	H	—	3–10	7-1/2–15	—	**DG322NGB** ⑤	**DG322NRB** ⑤
	100	H	—	7-1/2–15	15–30	—	**DG323NGB** ⑤	**DG323NRB** ⑤
	200	H	—	15	25–60	—	**DG324NGK**	**DG324NRK**
	400	H	—	—	50–125	—	**DG325NGK**	**DG325NRK**
	600	H	—	—	75–200	—	**DG326NGK**	**DG326NRK**

DG322URB

120/240 Vac General-Duty, Non-Fusible, Single-Throw

System	Ampere Rating	Maximum Horsepower Ratings Single-Phase AC 120V	Single-Phase AC 240V	Three-Phase AC 240V	DC 250V	NEMA 1 Enclosure Indoor Catalog Number	NEMA 3R Enclosure Rainproof Catalog Number
Two-Pole, Two-Wire (Two Blades)—240 Vac							
	30	2	3	—	—	**DG221UGB** ④⑤	**DG221URB** ④⑤
	60	3	10	—	—	**DG222UGB** ④⑤	**DG222URB** ④⑤
	100	—	15	—	—	**DG223UGB** ④⑤	**DG223URB** ④⑤
	200	—	15	—	—	④⑨	**DG224URK** ④
Three-Pole, Three-Wire (Three Blades)—240 Vac							
	30	2	3	7-1/2	—	**DG321UGB** ④⑤	**DG321URB** ④⑤
	60	3	10	15	—	**DG322UGB** ④⑤	**DG322URB** ④⑤
	100	—	15	30	—	**DG323UGB** ④⑤	**DG323URB** ④⑤
	200	—	15	60	—	**DG324UGK** ④	**DG324URK** ④
	400	—	—	125	—	**DG325UGK** ⑦	**DG325URK** ⑦
	600	—	—	200	—	**DG326UGK** ⑦	**DG326URK** ⑦

Notes

① Maximum hp ratings apply only when dual element time delay fuses are used.
② Use four-wire catalog numbers below.
③ Solid neutral bars are not included. Order separately from table on **Page V2-T1-14**.
④ **WARNING!** Switch is not approved for service entrance unless a neutral kit is installed.
⑤ These switches do not have an interlock that prevents door from being opened when switch is in the ON position.
⑥ Use three-wire catalog numbers below.
⑦ Drilled to accept field installed neutral kits.

All general-duty safety switches are individually packaged.

Accessories are limited in scope on general-duty safety switches. See **Page V2-T1-14** for availability. In addition, clear line shields are available as an accessory on 200–600A general-duty switches. Catalog Numbers: 200A = 70-7759-11, 400A = 70-8063-8, 600A = 70-8064-8.

EXCITE ENERGY, LLC 4970 ROBERT J MATHEWS PKWY SUITE 160 EL DORADO HILLS, CA 95762 (916) 400-1197 CSLB #1018541 C10 CONTRACTOR	REFERENCE DRAWINGS		REVISIONS						ExciteEnergy PINE MOUNTAIN LAKE ASSOCIATION SOLAR PROJECT 200A DISCONNECT DATASHEET
	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.	
	SOLARNORCAL CLIENT NO: 1018								DWG. NO. 1018-01-201 REV 0
	(FORMATTED 11"x17") SCALE: NONE		0	02/16/2021	ISSUED FOR PERMIT	JVB	HRK	JVB	

Q.PEAK DUO XL-G10.d

475-495

ENDURING HIGH PERFORMANCE

EUPD RESEARCH TOP BRAND PV MODULES 2021

Q CELLS Yield Security

BREAKING THE 21% EFFICIENCY BARRIER
Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 21.6%.

LOW ELECTRICITY GENERATION COSTS
Higher yield per surface area, lower BOS costs and up to 80 watts more module power than standard 144 half-cell modules.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID Technology, Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING
High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (3000 Pa).

A RELIABLE INVESTMENT
Inclusive 12-year product warranty and 25-year linear performance warranty[2]

STATE OF THE ART MODULE TECHNOLOGY
Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology

[1] APT test conditions according to IEC/TS 62804-1:2015, method A (−1500 V, 96 h)
[2] See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:

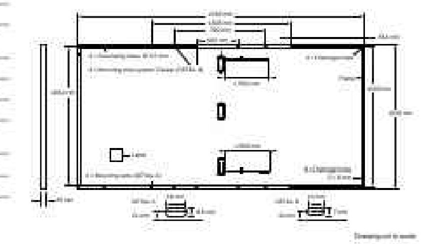
Ground-mounted solar power plants

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	2216 mm × 1045 mm × 35 mm (including frame)
Weight	26.0 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Anodised aluminium
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥700 mm, (−) ≥350 mm*
Connector	Stäubli MC4-Evo2, Hanwha Q CELLS HQC4, IP68
	*Long cables (+) ≥1450 mm, (−) ≥1450 mm for landscape installation are available upon request.

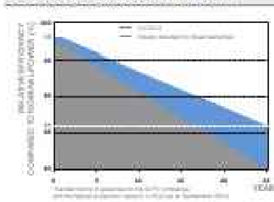


ELECTRICAL CHARACTERISTICS

POWER CLASS			475	480	485	490	495
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)							
Minimum — Power at MPP[1]	P_{MPP}	[W]	475	480	485	490	495
Minimum — Short Circuit Current[1]	I_{SC}	[A]	11.24	11.26	11.29	11.31	11.34
Minimum — Open Circuit Voltage[1]	V_{OC}	[V]	53.58	53.61	53.64	53.68	53.71
Minimum — Current at MPP	I_{MPP}	[A]	10.66	10.71	10.76	10.81	10.86
Minimum — Voltage at MPP	V_{MPP}	[V]	44.54	44.81	45.07	45.33	45.59
Minimum — Efficiency[1]	η	[%]	≥20.5	≥20.7	≥20.9	≥21.2	≥21.4
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum — Power at MPP	P_{MPP}	[W]	356.4	360.1	363.9	367.6	371.4
Minimum — Short Circuit Current	I_{SC}	[A]	9.05	9.07	9.09	9.12	9.14
Minimum — Open Circuit Voltage	V_{OC}	[V]	50.53	50.56	50.59	50.62	50.65
Minimum — Current at MPP	I_{MPP}	[A]	8.39	8.43	8.47	8.52	8.56
Minimum — Voltage at MPP	V_{MPP}	[V]	42.49	42.72	42.94	43.17	43.39

[1]Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

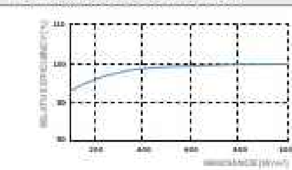
Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²)

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°C]	43±3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V_{SYS}	[V]	1500	PV module classification	Class II
Maximum Reverse Current	I_R	[A]	20	Fire Rating based on ANSI / UL 61730	C / TYPE 1
Max. Design Load, Push / Pull		[Pa]	3600 / 2000	Permitted Module Temperature on Continuous Duty	−40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 3000		

QUALIFICATIONS AND CERTIFICATES

IEC 61215:2016; IEC 61730:2016; This data sheet complies with DIN EN 50380.

Certification in process.

CE

PACKAGING INFORMATION

Horizontal packaging	2270 mm	1100 mm	1210 mm	807 kg	22 pallets	20 pallets	29 modules

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS GmbH
Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | TEL +49 (0)3494 66 99-23444 | FAX +49 (0)3494 66 99-23000 | EMAIL sales@q-cells.com | WEB www.q-cells.com

Engineered in Germany

Q CELLS

EXCITE ENERGY, LLC 4970 ROBERT J MATHEWS PKWY SUITE 160 EL DORADO HILLS, CA 95762 (916) 400-1197 CSLB #1018541 C10 CONTRACTOR	REFERENCE DRAWINGS		REVISIONS						ExciteEnergy
	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.	PINE MOUNTAIN LAKE ASSOCIATION SOLAR PROJECT MODULE DATASHEET
	EXCITE ENERGY CLIENT NO: 1018								
	(FORMATTED 11"x17") SCALE: NONE		0	02/16/2021	ISSUED FOR PERMIT	JVB	HRK	JVB	DWG. NO. 1018-01-202 REV 0

SUNNY BOY
3.0-US / 3.8-US / 5.0-US / 6.0-US / 7.0-US / 7.7-US

Value-Added Improvements

- Superior integration with SMA's MLPE Power+ Solution
- World's first Secure Power Supply* now offers up to 2,000 W
- Full grid management capabilities ensure a utility-compliant solution for any market

Reduced Labor

- New Installation Assistant with direct access via smartphone minimizes time in the field
- Advanced communication interface with fewer components creates 50% faster setup and commissioning

Unmatched Flexibility

- SMA's proprietary OptiTrac™ Global Peak technology mitigates shade with ease
- Multiple independent MPPTs accommodate hundreds of stringing possibilities

Trouble-Free Servicing

- Two-part enclosure concept allows for simple, expedited servicing
- Equipped with SMA Smart Connected, a proactive service solution that is integrated into Sunny Portal

SUNNY BOY 3.0-US / 3.8-US / 5.0-US / 6.0-US / 7.0-US / 7.7-US

Reduce costs across your entire residential business model

The residential PV market is changing rapidly. Your bottom line matters more than ever–so we've designed a superior residential solution to help you decrease costs at every stage of your business operations. The Sunny Boy 3.0-US/3.8-US/5.0-US/6.0-US/7.0-US/7.7-US join the SMA lineup of field-proven solar technology backed by the world's #1 service team, along with a wealth of improvements. Simple design, improved stocking and ordering, value-driven sales support and streamlined installation are just some of the ways that SMA helps your business operate more efficiently. And, Sunny Boy's superior integration with the innovative Power+ Solution means installers have even more flexibility in addressing their toughest challenges. Finally, SMA Smart Connected will automatically detect errors and initiate the repair and replacement process so that installers can reduce service calls and save time and money.

www.SMA-America.com

Technical data	Sunny Boy 6.0-US		Sunny Boy 7.0-US		Sunny Boy 7.7-US	
	208 V	240 V	208 V	240 V	208 V	240 V
Input (DC)						
Max. PV power	9600 Wp		9940 Wp		10905 Wp	
Max. DC Voltage	600 V					
Rated MPP Voltage range	220 – 480 V		245 - 480 V		270 - 480 V	
MPPT operating voltage range	100 – 550 V					
Min. DC voltage / start voltage	100 V / 125 V					
Max. operating input current per MPPT	10 A					
Max. short circuit current per MPPT	18 A					
Number of MPPT tracker / string per MPPT tracker	3 / 1					
Output (AC)						
AC nominal power	5200 W	6000 W	6660 W	7000 W	6660 W	7680 W
Max. AC apparent power	5200 VA	6000 VA	6660 VA	7000 VA	6660 VA	7680 VA
Nominal voltage / adjustable	208 V / ●	240 V / ●	208 V / ●	240 V / ●	208 V / ●	240 V / ●
AC voltage range	183 – 229 V	211 – 264 V	183 – 229 V	211 – 264 V	183 – 229 V	211 – 264 V
AC grid frequency	60 Hz / 50 Hz					
Max. output current	25.0 A	25.0 A	32.0 A	29.2 A	32.0 A	32.0 A
Power factor (cos ϕ)	1					
Output phases / line connections	1 / 2					
Harmonics	< 4 %					
Efficiency						
Max. efficiency	97.3 %	97.7 %	97.3 %	97.9 %	97.3 %	97.5 %
CEC efficiency	96.7 %	96.9 %	96.4 %	96.8 %	96.4 %	96.8 %
Protection devices						
DC disconnect device / DC reverse polarity protection	● / ●					
Ground fault monitoring / Grid monitoring	●					
AC short circuit protection	●					
All-pole sensitive residual current monitoring unit (RCMU)	●					
Arc fault circuit interrupter (AFCI)	●					
Protection class / overvoltage category	I / IV					
General data						
Dimensions (W / H / D) in mm (in)	535 x 730 x 198 (21.1 x 28.5 x 7.8)					
Packaging Dimensions (W / H / D) in mm (in)	600 x 800 x 300 (23.6 x 31.5 x 11.8)					
Weight / packaging weight	26 kg (57 lb) / 30 kg (66 lb)					
Temperature range: operating / non-operating	-25°C ...+60°C / -40°C ...+60°C					
Environmental protection rating	NEMA 3R					
Noise emission (typical)	39 dB(A)		45 dB(A)			
Internal power consumption at night	< 5 W					
Topology / Cooling concept	Transformerless / Convection		Transformerless / Fan			
Features						
Ethernet ports	2					
Secure Power Supply	●*					
Display (2 x 16 characters)	●					
2.4 GHz WLAN / External WLAN antenna	●/○					
Cellular (4G / 3G) / Revenue Grade Meter	○/○**					
Warranty: 10 / 15 / 20 years	●/○/○					
Certificates and approvals	UL 1741, UL 1741 SA incl. CA Rule 21 RSD, UL 1998, UL 1699B Ed. 1, IEEE1547, FCC Part 15 (Class A & B), CAN/CSA V22.2 107.1-1, HECO Rule 14H, PV Rapid Shutdown System Equipment					
● Standard features ○ Optional features – Not available						
NOTE: US inverters ship with gray lids. Data at nominal conditions * Not compatible with the SunSpec Rapid Shutdown functionality **Standard in SBX.X-1TP-US-41						
Type designation	SB6.0-1SP-US-41 / SB6.0-1TP-US-41		SB7.0-1SP-US-41 / SB7.0-1TP-US-41		SB7.7-1SP-US-41 / SB7.7-1TP-US-41	

POWER+ SOLUTION

The SMA Power+ Solution combines legendary SMA inverter performance and intelligent DC module-level electronics in one cost-effective, comprehensive package. This means that you can achieve maximum solar power production for your customers while also realizing significant installation savings.

NEW! This rapid shutdown solution fulfills UL 1741, NEC 2014, and NEC 2017 requirements and is compatible with the power line-based SunSpec Rapid Shutdown communication signal over DC wires, making it the most simple and cost-effective rapid shutdown solution on the market.

Visit www.SMA-America.com for more information.

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	EXCITE ENERGY CLIENT NO: 1018							
	(FORMATTED 11"x17") SCALE: NONE		0	02/16/2021	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT

INVERTER DATASHEET

DWG. NO. 1018-01-203

REV 0

Product Selection

1

Single-Phase—Plug-on Neutral—Main Circuit Breaker Loadcenters—10/25 kAIC

Single-Phase Three-Wire—120/240 Vac—Insulated/Bondable Split Neutral

BRP10B100

Main Breaker Type	Main Amp Rating	Maximum Number 1-Inch (25.4 mm) Spaces	Maximum Number 1-Inch (25.4 mm) Poles	Enclosure Type	Box Size	Wire Size Range Cu/Al 60 °C or 75 °C for Main Breaker	Loadcenter Catalog Number with Combination 1 or NEMA Type 3R Cover ①②
BR 10 kAIC	100	10	20	Indoor	X0	#4–1/0 2	**BRP10B100**
		10	20	Outdoor	B2R		**BR1020B100RF** ③④⑦
		12	24	Indoor	X1		**BRP12B100**
		12	24	Outdoor	B2R		**BR1224B100R** ④⑦
		16	32	Indoor	X2		**BRP16B100**
		16	24	Outdoor	C1R		**BR1624B100R** ④⑦
		20	24	Outdoor	C3R		**BR2024B100R** ④⑦
		20	40	Indoor	X3		**BRP20B100**
		30	60	Indoor	X5		**BRP30B100**
	125	16	32	Indoor	X2	#4–2/0	**BRP16B125**
		20	40	Indoor	X3		**BRP20B125**
		20	24	Outdoor	C3R		**BR2024B125R** ④⑦
		30	60	Indoor	X5		**BRP30B125**
BRH ⑤ 22 kAIC	100	12	24	Indoor	X1	#4–1/0	**BRP12H100**
		20	40	Indoor	X3		**BRP20H100**
CSR ⑥ 25 kAIC	150	8	16	Outdoor	C3R	#2–300 kcmil	**BR816B150RF** ③④⑦
		16	32	Indoor	X4		**BRP12B150**
		20	40	Indoor	X4		**BRP20B150**
		20	30	Outdoor	D1R		**BR2030B150R** ④⑦
		24	48	Indoor	X6		**BRP24B150**
		20	40	Outdoor	D1R		**BR2040B150R** ④⑦
		30	60	Indoor	X6		**BRP30B150**
	200	8	16	Outdoor	C3R		**BR816B200RF** ③④⑦
		16	32	Indoor	X4		**BRP16B200**
		20	40	Outdoor	D1R		**BR2040B200R** ④⑦
		20	40	Indoor	X5		**BRP20B200**
		24	48	Indoor	X6		**BRP24B200**
		30	60	Indoor	X6		**BRP30B200**
		30	60	Indoor	X6		**BRP30B200G**
		30	40	Outdoor	G1R		**BR3040B200R** ④⑦
		40	80	Indoor	X8		**BRP40B200**
		40	40	Outdoor	L1R		**BR4040B200R** ④⑦
		60	120	Indoor	X10		**BRP60B200**
		60	120	Outdoor	L3R		**BR60120B200R** ④⑦

Notes

① Combination style covers may be used in surface or flush applications.
② All main circuit breaker loadcenters are listed for use as service entrance equipment and are shipped with neutral bonding screw preattached. The maximum rating of the panel is the main circuit breaker rating when used as service entrance equipment. Ground bar kits priced separately. See **Page V1-T1-72**.
③ Includes through-feed lugs for both phase and neutral conductors.
④ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page V1-T1-71**.
⑤ 22 kAIC series combination rating is obtained when Types BD, BR, BQ, BQC and ETN01 10 kAIC branch breakers are used in series with Type BRH main breaker.
⑥ 25 kAIC series combination rating is obtained when Types BD, BR, BQ, BQC and ETN01 10 kAIC branch circuit breakers are used in series with Type CSR main breaker.
⑦ These styles will be replaced in 2019 with new plug-on neutral style loadcenter.

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	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.	
	EXCITE ENERGY CLIENT NO: 1018								
	(FORMATTED 11"x17") SCALE: NONE		0	02/16/2021	ISSUED FOR PERMIT	JVB	HRK	JVB	DWG. NO. 1018-01-205 REV 0