



MODULES										
REF.	QTY.	MAKE AND MODEL	PMAX	PTC	ISC	IMP	VOC	VMP	TEMP. COEFF. OF VOC	FUSE RATING
PM1-12	12	Q-CELLS Q.PEAK DUO XL-G10.2 480	480W	447W	11.24A	10.66A	53.6V	44.5V	-0.145V/°C (-0.27%/°C)	20A

INVERTERS										
REF.	QTY.	MAKE AND MODEL	AC VOLTAGE	GROUND	RATED POWER	MAX OUTPUT CURRENT	MAX INPUT CURRENT	MAX ESS CHARGING/DISCHARGING CURRENT	MAX INPUT VOLTAGE	WEIGHTED EFFICIENCY
I1	1	SOL-ARK 15K-48-ST	240V	NOT SOLIDLY GROUNDED	12,000W (BATTERY TO LOADS)	62.5A AC	78A	275.0A (ADJUSTED)	500V	96.5%

ENERGY STORAGE SYSTEMS						
REF.	QTY.	MAKE AND MODEL	CHEMISTRY	CONTINUOUS POWER OUTPUT	CONTINUOUS CURRENT	VOLTAGE RANGE
ESS1	5	POWERSYNC LFP 51.2v	LIFEPO4	12,000W	230A	44.0 VDC - 56.8 VDC

OCPDS			
REF.	QTY.	RATED CURRENT	MAX VOLTAGE
CB2	1	200A	240VAC
CB3	1	200A	240VAC

SYSTEM SUMMARY		
	MPPT 1	MPPT 2
MODULES IN SERIES	6	6
ARRAY VMP	267.2V	267.2V
ARRAY IMP	10.7A	10.7A
ARRAY MAX VOC	335V	335V
ARRAY ISC	11.2A	11.2A
ARRAY STC POWER	5,760W	
ARRAY PTC POWER	4,608W	
MAX AC CURRENT	62.5A	
MAX AC POWER OUTPUT	15,000W	
DERATED AC POWER OUTPUT	12,000W	

NOTES

⚠️ DC PV CONDUCTORS ARE NOT SOLIDLY-GROUNDED. NO DC PV CONDUCTOR SHALL BE WHITE- OR GRAY-COLORED

⚠️ ALL METAL ENCLOSURES, RACEWAYS, CABLES AND EXPOSED NONCURRENT-CARRYING METAL PARTS OF EQUIPMENT SHALL BE GROUNDED TO EARTH AS REQUIRED BY NEC 250.4(A) AND PART III OF ARTICLE 250 AND EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC 690.45. THE GROUNDING ELECTRODE SYSTEM SHALL ADHERE TO NEC 690.47(A) AND NEC 250.169. THE DC GROUNDING ELECTRODE SHALL BE SIZED ACCORDING TO NEC 250.166 AND INSTALLED IN COMPLIANCE WITH NEC 250.64.

⚠️ MAX DC VOLTAGE OF ARRAY IS 335.0V AT -25°C ((-25°C - 25°C) X -0.145V/°C + 67V) X 5 MODULES = 335.0V).

⚠️ INSTALLER SHALL SET SOL-ARK 15K-48-ST MAX DISCHARGE/CHARGE CURRENT TO 275A.

⚠️ (E) 200A MAIN BREAKER DERATED TO (N) 125A

CONDUCTOR AND CONDUIT SCHEDULE W/ELECTRICAL CALCULATIONS																
ID	TYPICAL	CONDUCTOR	CONDUIT / CABLE	CURRENT-CARRYING CONDUCTORS IN CONDUIT / CABLE	OCPD	EGC	TEMP. CORR. FACTOR	FILL FACTOR	CONT. CURRENT	MAX. CURRENT (125%)	BASE AMP.	DERATED AMP.	TERM. TEMP. RATING	AMP. @ TERM. TEMP. RATING	LENGTH	VOLTAGE DROP
1		10 AWG PV WIRE, COPPER	FREE AIR	N/A	N/A	6 AWG BARE, COPPER	0.76 (52°C)	1.0	14.05A	17.56A	55A	41.8A	75°C	50A	12FT	0.04%
2		10 AWG THWN-2, COPPER	2" DIA. PVC	4	N/A	10 AWG THWN-2, COPPER	1.0 (30°C)	0.2	14.05A	17.56A	40A	35A	90°C	40A	115FT	1.19%
3		4/0 AWG THW, COPPER	2" FMC	4	200A	6 AWG THWN-2, COPPER	1.0 (30°C)	1.0	184A	230A	360A	360A	75°C	360A	10 FT	0.55%
4		6 AWG THWN-2, COPPER	2" SCH40 PVC	3	50A	10 AWG THWN-2, COPPER	1.0 (30°C)	1.0	50A (GEN)	40A(GEN)	55A	55A	75°C	50A	16FT	0.42%
5		4/0 XHHW	SER	3	200A	6 AWG XHHW	1.0 (30°C)	1.0	62.5A	80A	55A	55A	75°C	50A	25FT	0.33%

GENERAL ELECTRICAL NOTES

1 OFF-GRID POWER SYSTEM, NO UTILITY GRID PRESENT

2 CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C) (1) AND ARTICLE 310.10 (D).

3 CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.10 (C).

GROUNDING NOTES

1 ALL EQUIPMENT SHALL BE PROPERLY GROUNDED PER THE REQUIREMENTS OF NEC ARTICLES 250 & 690

2 PV MODULES SHALL BE GROUNDED TO MOUNTING RAILS USING MODULE LUGS OR RACKING INTEGRATED GROUNDING CLAMPS AS ALLOWED BY LOCAL JURISDICTION. ALL OTHER EXPOSED METAL PARTS SHALL BE GROUNDED USING UL-LISTED LAY-IN LUGS.

3 INSTALLER SHALL CONFIRM THAT MOUNTING SYSTEM HAS BEEN EVALUATED FOR COMPLIANCE WITH UL 2703 "GROUNDING AND BONDING" WHEN USED WITH PROPOSED PV MODULE.

4 IF THE EXISTING MAIN SERVICE PANEL DOES NOT HAVE A VERIFIABLE GROUNDING ELECTRODE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE.

5 AC SYSTEM GROUNDING ELECTRODE CONDUCTOR (GEC) SHALL BE A MINIMUM SIZE #8AWG WHEN INSULATED, #6AWG IF BARE WIRE.

6 EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC ARTICLE 690.45, AND BE A MINIMUM OF #10AWG WHEN NOT EXPOSED TO DAMAGE, AND #6AWG SHALL BE USED WHEN EXPOSED TO DAMAGE

7 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLOR CODED GREEN, OR MARKED GREEN IF #4AWG OR LARGER

1 SINGLE-LINE DIAGRAM
PV-2 SCALE: NTS

P-01122

GRID-TIED SOLAR POWER SYSTEM

21498 MOUNTAIN TOP DRIVE, OAK CREEK, CO 80467

SINGLE-LINE DIAGRAM

DATE: 7/1/2022

CREATED BY: C.M.

CHECKED BY:

REVISIONS	

PV-2