

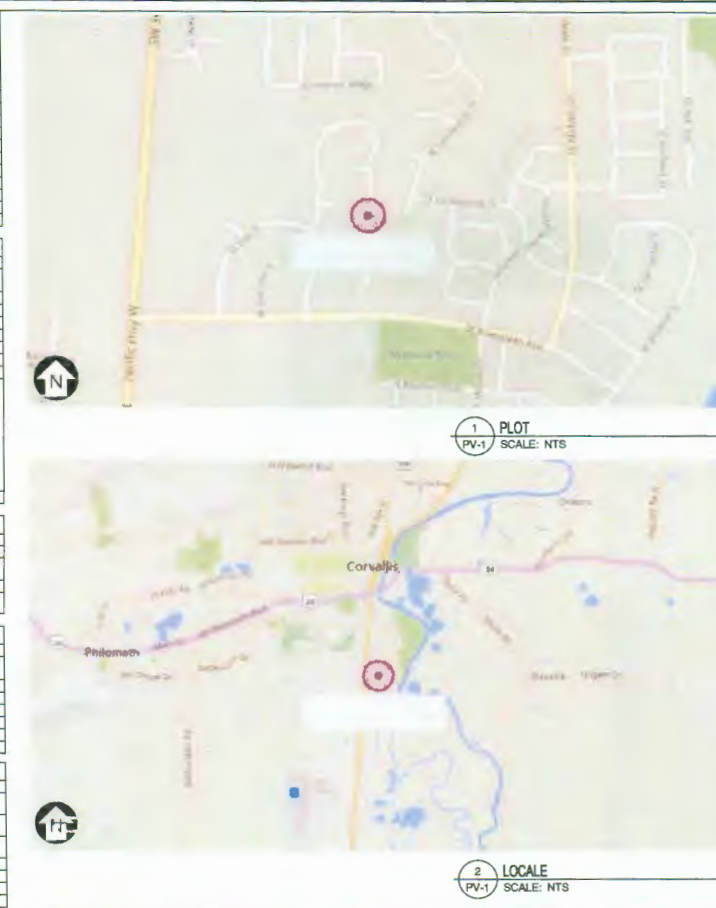
DIRECTORY OF PLAN PAGES	
PV1	PROJECT INFORMATION
PV2	SYSTEM LAYOUT
PV3	SINGLE-LINE DIAGRAM
PV4	WIRE & CONDUCTOR SCHEDULE
PV5	PLACARDS
PV6	ATTACHMENT PLAN
PV7	MOUNTING & RACKING METHOD
PV8	BUILDING ELEVATION
PV9	RACKING DATASHEET
PV10	PV MODULE DATASHEET
PV11	POWERWIRE ONE FOR DATASHEET
PV12	INVERTER / CHARGER DATASHEET
PV13	CHARGE CONTROLLER DATASHEET
PV14	COMBINER BOX DATASHEET
PV15	SOLARDECK BOX DATASHEET
PV16	BATTERY DATASHEET

PROJECT DETAILS	
PROPERTY OWNER	JOHN HOMEOWNER
PROPERTY ADDRESS	1234 HAWTHORNE AVENUE CORVALLIS, OR 97333
ZONING	RESIDENTIAL
ACCOUNT NUMBER	951753
CONST. TYPE	SINGLE FAMILY DWELLING
BUILDING HCU	CITY OF CORVALLIS
UTILITY COMPANY	PACIFIC POWER
NEC VERSION	2014 NEC
FIRE CODE	2014 OREGON FIRE CODE
STATE CODES	2014 OREGON STRUCTURAL SPECIALTY CODE 2014 OREGON RESIDENTIAL SPECIALTY CODE 2014 OREGON ELECTRICAL SPECIALTY CODE 2014 OREGON PLUMBING SPECIALTY CODE 2014 OREGON MECHANICAL SPECIALTY CODE 2014 OREGON ENERGY EFF. SPECIALTY CODE 2011 OREGON REACH CODE CSBA 29 CFR 1910.269 UNDERWRITERS LABORATORIES (UL) STANDARDS
STRUCT. METHOD	ASCE7-10

CONTRACTOR INFORMATION	
COMPANY	YOUR COMPANY HERE, LLC
LICENSE NO.	000000 (OREGON)
ADDRESS	8708 SE 8TH AVENUE PORTLAND, OR 97202
PHONE	(503) 802-5743
CONTRACTOR SIGNATURE	

SYSTEM DETAILS	
DC RATING OF SYSTEM	3.24kW
AC OUTPUT CURRENT	60A (RMS)
INVERTER / CHARGER	OUTBACK VF03648A
CHARGE CONTROLLER	OUTBACK FLEXMAX 80
BATTERY	(8) ENERGYCELL 200AH
MODULE	155 PERMA SOL210P
STRING CONFIGURATION	4 STRINGS OF 3 MODULES
INTERCONNECTION	LOAD-SIDE

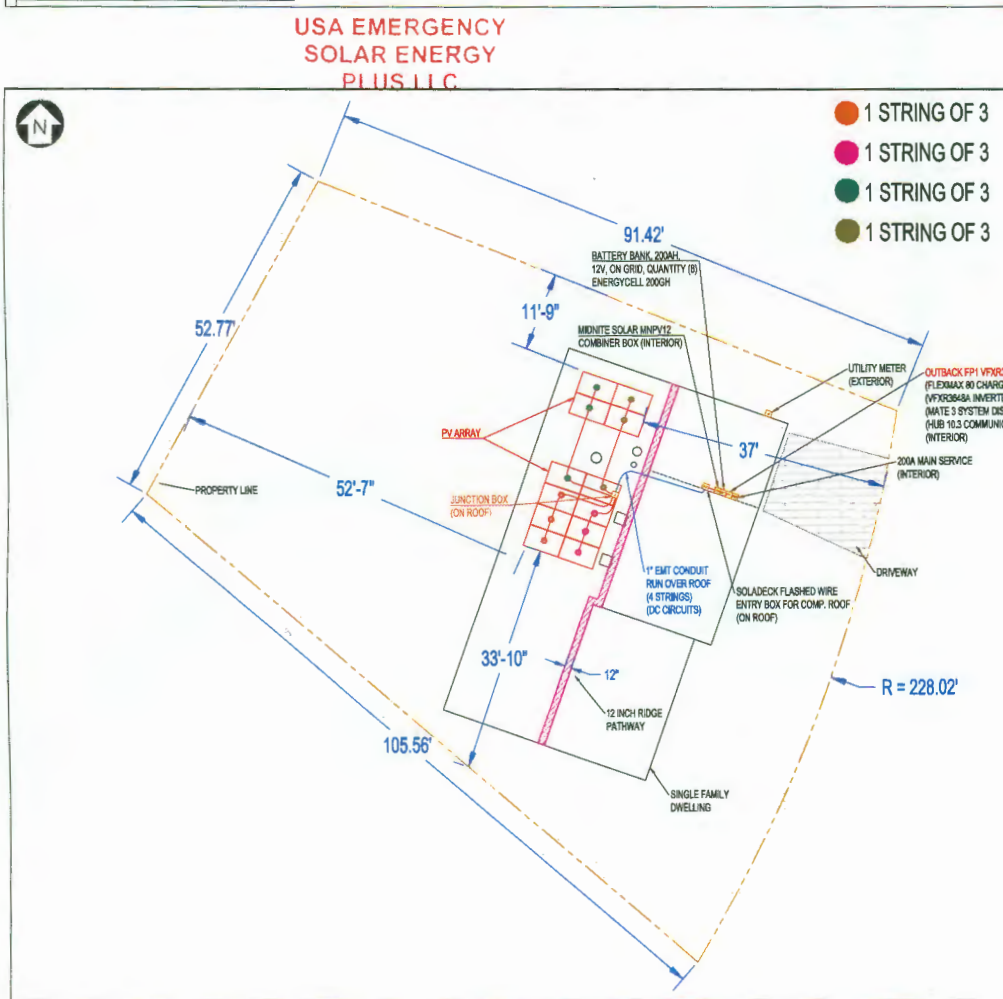
SITE SPECIFICATIONS	
UTILITY SERVICE	120/208V SPLIT PHASE
MAIN SERVICE PANEL	200A RATED BUSBAR 200A MAIN BREAKER
ASHRAE EXTREME ANNUAL MEAN MINIMUM DENSITY DRY BULB TEMP.	4°C
ASHRAE 2% ANNUAL DRY DENSITY	33°C
SUBS. TEMP.	
BASIC WIND SPEED (3-SECOND GUST)	120 MPH
SNOW LOADING	25 PSF
EXPOSURE CATEGORY	B
RISK CATEGORY	I



CONSTRUCTION NOTES	
1	CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO INITIATING CONSTRUCTION.
2	CONTRACTOR SHALL REVIEW ALL MANUFACTURER INSTALLATION DOCUMENTS PRIOR TO INITIATING CONSTRUCTION.
3	ALL EQUIPMENT SHALL BE LISTED BY THE UL OR ETL AND LISTED FOR ITS SPECIFIC APPLICATION.
4	ALL EQUIPMENT SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED.
5	ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6	ACCESS TO ELECTRICAL COMPONENTS OVER 10' VOLTS TO GROUND SHALL BE RESTRICTED TO QUALIFIED PERSONNEL.
7	ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 VOLTS AND 90°C WET ENVIRONMENT, UNLESS OTHERWISE NOTED.
8	WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, CONTRACTOR SHALL SIZE THEM ACCORDING TO APPLICABLE CODES.
9	PV MODULES FRAMES SHALL BE BONDED TO RACKING RAIL OR BARE COPPER G.E.C. PER THE MODULE MANUFACTURER'S LISTED INSTRUCTION SHEET.
10	PV MODULES RACKING RAIL SHALL BE BONDED TO BARE COPPER G.E.C. VIA WEBB LUG, LSC0 GBL-48BT LAY-IN LUG, OR EQUIVALENT LISTED LUG.
11	GROUNDING ELECTRODE CONDUCTOR (G.E.C.) SHALL BE CONTINUOUS AND/OR IRREVERSIBLY SPLICED.
12	ALL JUNCTION BOXES, COMBINER BOXES, AND DISCONNECTS SHALL BE INSTALLED IN AN ACCESSIBLE LOCATION.
13	WORKING SPACE AROUND ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC SECTION 110.26.

PROJECT DESCRIPTION	
THIS ROOF MOUNTED PHOTOVOLTAIC (PV) SYSTEM IS TO BE INSTALLED AT THE SINGLE FAMILY DWELLING IN CORVALLIS, OREGON. THE ENERGY PRODUCED BY THE PV SYSTEM SHALL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ON-SITE ELECTRICAL EQUIPMENT VIA A LOAD-SIDE CONNECTION. THIS PROJECT WILL INCLUDE STORAGE BATTERIES.	

USA EMERGENCY SOLAR PLUS LLC NEW GRID-TIED SYSTEM 3.24kW HOMEOWNER RESIDENCE 1234 HAWTHORNE AVENUE CORVALLIS, OR 97333 USA EMERGENCY SOLAR PLUS LLC	
CONTRACTOR OF RECORD	
NAME: _____	
LICENSE NO. _____	
PROJECT INFO	
PROJECT NO. GSD-20160707-42155	
DRAWN BY: SCM	
DATE: 7/7/2016	
PV-1	

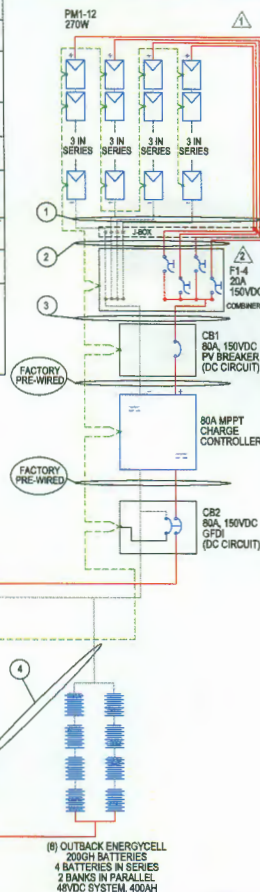


EQUIPMENT LOCATION NOTES	
1	CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE UL LISTED AND UL 486B COMPLIANT RESISTANT PER NEC 310.10(C).
2	CONDUCTORS EXPOSED TO WEATHER LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.10(C).
3	CONDUIT NOT TO BE INSTALLED CLOSER THAN 1/2" TO SURFACE OF ANY ROOF.
4	DC CONDUCTORS EITHER DO NOT ENTER BUILDING OR ARE RUN IN METALLIC RACEWAYS OR ENCLOSURES TO THE FIRST ACCESSIBLE DC DISCONNECTING MEANS PER NEC ARTICLE 480.
5	ARRAYS SHALL BE INSTALLED IN A WAY THAT ENSURES THE SOURCE OF CONDUCTORS SHALL NOT BE READILY ACCESSIBLE.

SYSTEM LAYOUT	
PV-2 SCALE: 1" = 16'-0"	

USA EMERGENCY SOLAR PLUS LLC NEW GRID-TIED SYSTEM 3.24kW HOMEOWNER RESIDENCE 1234 HAWTHORNE AVENUE CORVALLIS, OR 97333 USA EMERGENCY SOLAR PLUS LLC	
CONTRACTOR OF RECORD	
NAME: _____	
LICENSE NO. _____	
SYSTEM LAYOUT	
PROJECT NO. GSD-20160707-42155	
DRAWN BY: SCM	
DATE: 7/7/2016	
PV-2	

1	INSTALLATION SHALL COMPLY WITH ALL REQUIREMENTS OF NEC 2014 AND ANY APPLICABLE LOCAL AMENDMENTS.
2	MODULE INTERCONNECTION CONNECTORS SHALL BE IN COMPLIANCE WITH NEC 690.33(A) AND SHALL BE POLARIZED AND NON INTERCHANGEABLE WITH RECEPTABLES IN OTHER ELECTRICAL SYSTEMS ON THE PREMISES.
3	MODULE INTERCONNECTION CONNECTORS SHALL BE OF THE LOCKING TYPE REQUIRING A TOOL FOR OPENING IN ACCORDANCE WITH NEC 690.33(C)
4	MODULE INTERCONNECTION CONNECTORS SHALL BE MARKED "DO NOT OPEN UNDER LOAD" IN ACCORDANCE WITH NEC 690.33(E).
5	THE CONNECTION OF ALL MODULES SHALL BE ARRANGED SO THAT THE REMOVAL OF ANY PANEL OR MODULE SHALL NOT INTERRUPT A GROUNDED CONDUCTOR TO ANOTHER PHOTOVOLTAIC SOURCE CIRCUIT IN ACCORDANCE WITH NEC 690.4(C)
6	ALL EQUIPMENT IN PHOTOVOLTAIC SYSTEM SHALL BE LISTED BY AN INDEPENDENT TESTING AGENCY.
7	THE GROUNDING ELECTRODE CONDUCTORS SHALL BE CONTINUOUS IN COMPLIANCE WITH NEC 250.64(C) AND 250.160.
8	THIS SYSTEM CONFORMS TO NEC 2014, CODE 690.11, WHICH REQUIRES THAT PV SYSTEMS WITH DC SOURCE CIRCUITS, DC OUTPUT CIRCUITS, OR BOTH OPERATING AT A PV SYSTEM MAXIMUM SYSTEM VOLTAGE OF 80 VOLTS OR GREATER, SHALL BE PROTECTED BY A LISTED (DC) ARC-FAULT CIRCUIT INTERRUPTER, OR OTHER LISTED COMPONENTS TO PROVIDE EQUIVALENT PROTECTION.



PHOTOVOLTAIC MODULE SPECIFICATIONS											
REF.	TYP.	MODULE MANUFACTURER	MODULE MODEL	STC POWER	PTC POWER	ISC	IMP	VOC	VMP	FUSE RATING	
PM1	12	PEIMAR		52070P	275W	246.21W	9.82A	8.77A	37.2V	30.9V	15A

INVERTER										
REF.	TYP.	INVERTER MANUFACTURER	INVERTER MODEL	NOMINAL OUTPUT VOLTAGE	NOMINAL OUTPUT FREQUENCY	MAX OUTPUT POWER	CONTINUOUS AC CURRENT	MAX INPUT VOLTAGE	PEAK EFFICIENCY	
I1	1	OUTBACK	VFXR3448A	120VAC	60HZ	3.600W	35A @ 25°C	48VDC	96%	

SYSTEM SPECIFICATIONS										
ARRAY STC POWER				3.240W						
ARRAY PTC POWER				2.955W						
ARRAY ISC				35.28A						
ARRAY IMP				35.08A						
MODULES IN SERIES				3						
ARRAY VOC				112V						
ARRAY VMP				92V						

ELECTRICAL NOTES										
MAXIMUM OPEN CIRCUIT VOLTAGE OF ARRAY AT DESIGN LOW TEMPERATURE OF -8°C WOULD BE 112V.										
PHOTOVOLTAIC OUTPUT STRINGS ARE FUSED AND COMBINED INSIDE THE PV COMBINER BOX WITH FUSES RATED FOR 150VDC.										

OVER CURRENT PROTECTION DEVICES										
REF.	TYP.	CURRENT RATING	MAX. VOLTAGE							
F1-4	4	29A	150VDC							
CB1	1	80A	150VDC							
CB2	1	80A QFID	150VDC							
CB3	1	175A	125VDC							

BATTERY MAKE MODEL				OUTBACK
BATTERY VOLTAGE				80VDC CELL 2000H
BATTERY AMP HOURS				48VDC
QUANTITY OF BATTERIES				400AH
BATTERIES IN SERIES				8
BATTERIES IN PARALLEL				2

MAXIMUM OPEN CIRCUIT VOLTAGE OF ARRAY
AT DESIGN LOW TEMPERATURE OF -8°C WOULD
BE 112V.

PHOTOVOLTAIC OUTPUT STRINGS ARE FUSED
AND COMBINED INSIDE THE PV COMBINER BOX
WITH FUSES RATED FOR 150VDC.

(PV-3) SCALE: NTS

LICENSE NO. XXXXXX (0-200)

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HOMEOWNER RESIDENCE

CONTRACTOR OF RECORD

NAME: _____
 LICENSE No. _____
 SINGLE-LINE DIAGRAM

PROJECT NO: GSD-20160707-42155
DRAWN BY: SCM
DATE: 7/7/2016

PV-3

ID	TYPE	DESCRIPTION	CONDUCTOR	CONDUIT	NO. CONDRS. IN CNDT.	FILL %	RATED AMPS	OCPP	EGC	TEMP. CORR. FACTOR	FILL ADJ. FACTOR	CONT. CURRENT	MAX. CURRENT	BASE AMPACITY	DERATED AMPACITY	ESTIMATED DISTANCE	VOLTAGE DROP
1	4	PV SOURCE CIRCUIT: SERIES STRING OUTPUT TO JUNCTION BOX	10 AWG PV WIRE COPPER	FREE AIR	N/A	N/A	9.62A	N/A	8 AWG BARE COPPER	0.76 (55°C)	1.0	12.27A	15.34A	55A	41.8A	30 FT	0.79%
2	1	PV SOURCE CIRCUIT: JUNCTION BOX TO COMBINER BOX	10 AWG THWN-2 COPPER	1.00" DIA. EMT	8	29.3%	9.62A	20A X 4 (FUSES)	10 AWG THWN-2 COPPER	0.76 (56°C)	0.7	12.27A	15.34A	40A	21.28A	30 FT	0.79%
3	1	STRING COMBINER OUTPUT: STRING COMBINER TO FLEXPPOWER ONE VFXR3484A	2 AWG THWN-2 COPPER	1.00" DIA. EMT	2	31.0%	39.28A	80A X 1	8 AWG THWN-2 COPPER	0.96 (33°C)	1.0	49.1A	61.37A	130A	124.8A	10 FT	0.17%
4	1	BATTERY BANK OUTPUT: BATTERY BANK TO FLEXPPOWER ONE VFXR3484A	20 AWG THWN-2 COPPER	1.25" DIA. EMT	2	35.9%	76.4A	175A X 1	4 AWG THWN-2 COPPER	0.96 (33°C)	1.0	95.5A	119.4A	195A	187.2A	10 FT	0.08%
5	1	FLEXPPOWER ONE VFXR3484A AC CIRCUIT OUTPUTS: OUTPUT TO CRITICAL LOADS PANEL & INPUT FROM MAIN SERVICE PANEL	8 AWG THWN-2 COPPER	1.00" DIA. EMT	3	20.2%	30A CONT. @ 120VAC	80A MAX 120VAC	8 AWG THWN-2 COPPER	0.96 (33°C)	1.0	30A CONT. @ 120VAC	37.50A	75A	72A	10 FT	0.12%

ALL CONDUCTORS, OCPD SIZES AND TYPES SPECIFIED ACCORDING TO NEC ARTICLES 690.8(AV1), NEC ARTICLE 240, AND NEC ARTICLE 690.7

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W GRID-TIED SYSTEM 3.24kW

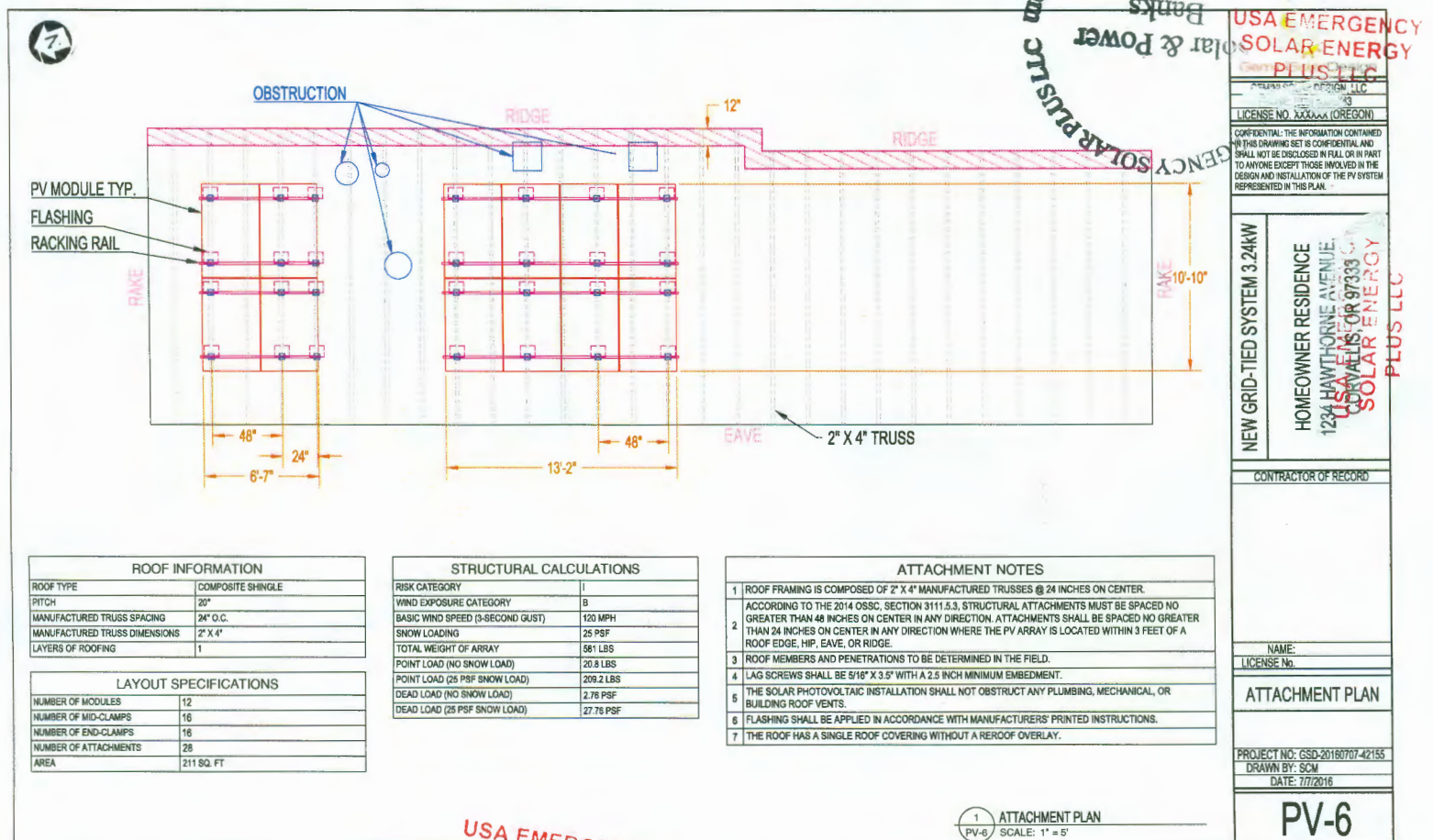
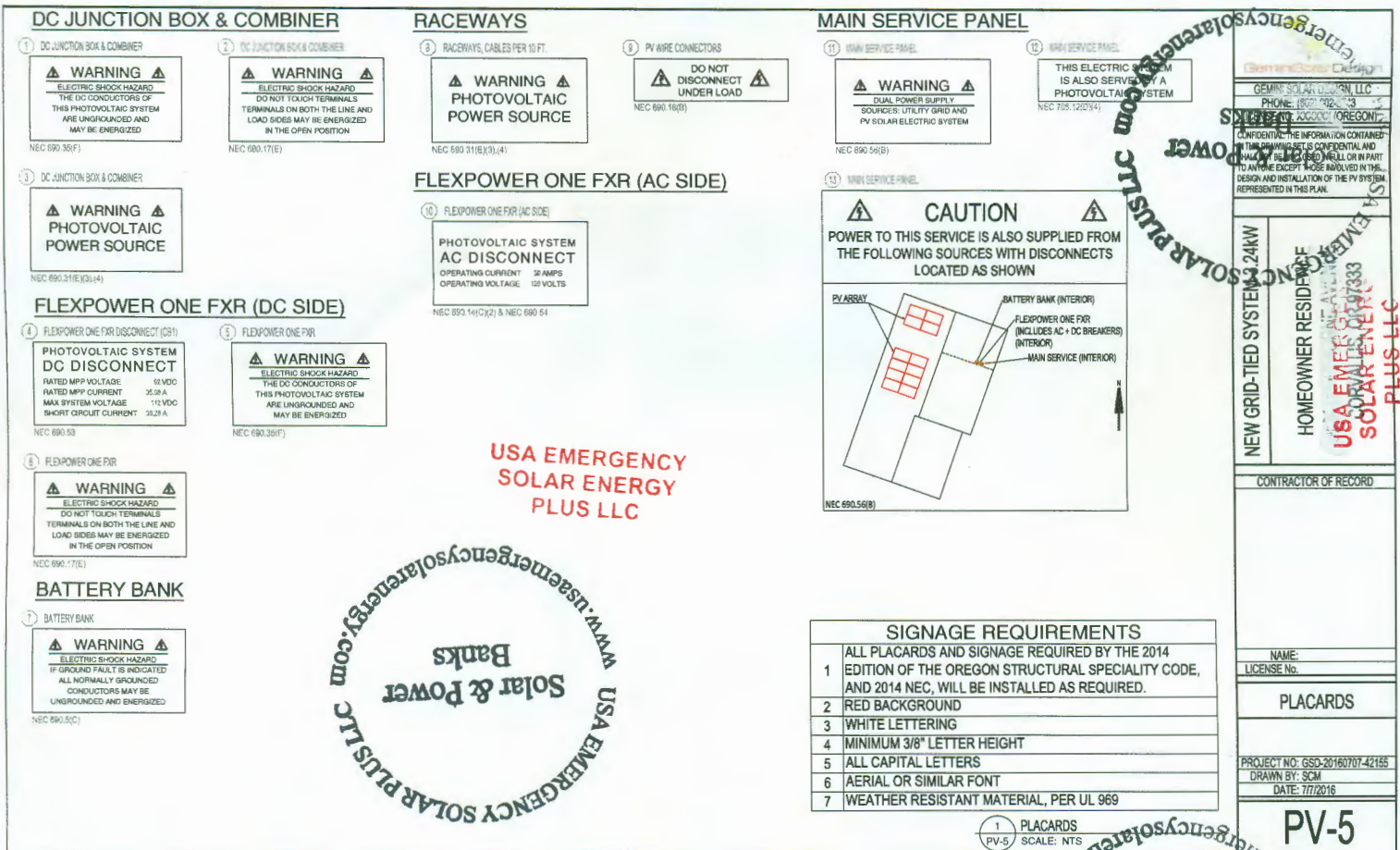
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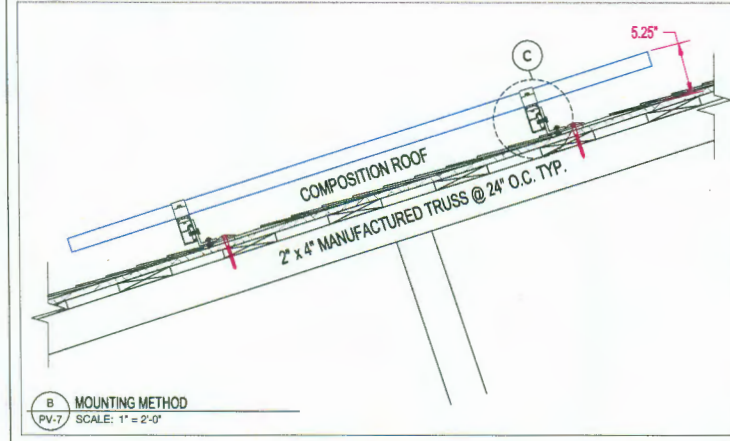
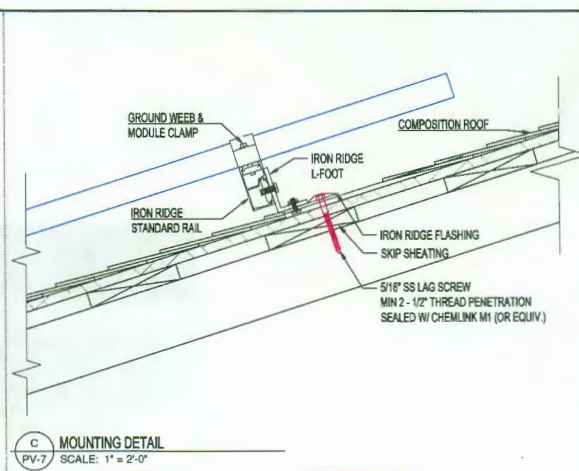
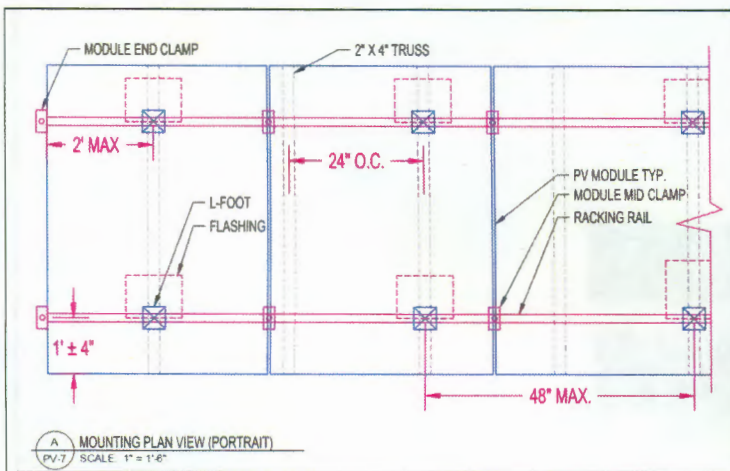
NAME:
LICENSE No.
CNDR. SCHEDULE

PROJECT NO: GSD-20160707-4215
DRAWN BY: SCM
DATE: 7/7/2016

PV-4

PV-4 SCALE: NTS





USA EMERGENCY
SOLAR ENERGY
PLUS LLC

USA EMERGENCY
SOLAR ENERGY
PLUS LLC
PHONE: (503) 802-2777
LICENSE NO. XXXXXXX (OREGON)

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NEW GRID-TIED SYSTEM 3.24kW
HOMEOWNER RESIDENCE
1495 S CORVALLIS, OR 97333
S CORVALLIS, OR 97333
PLUS LLC

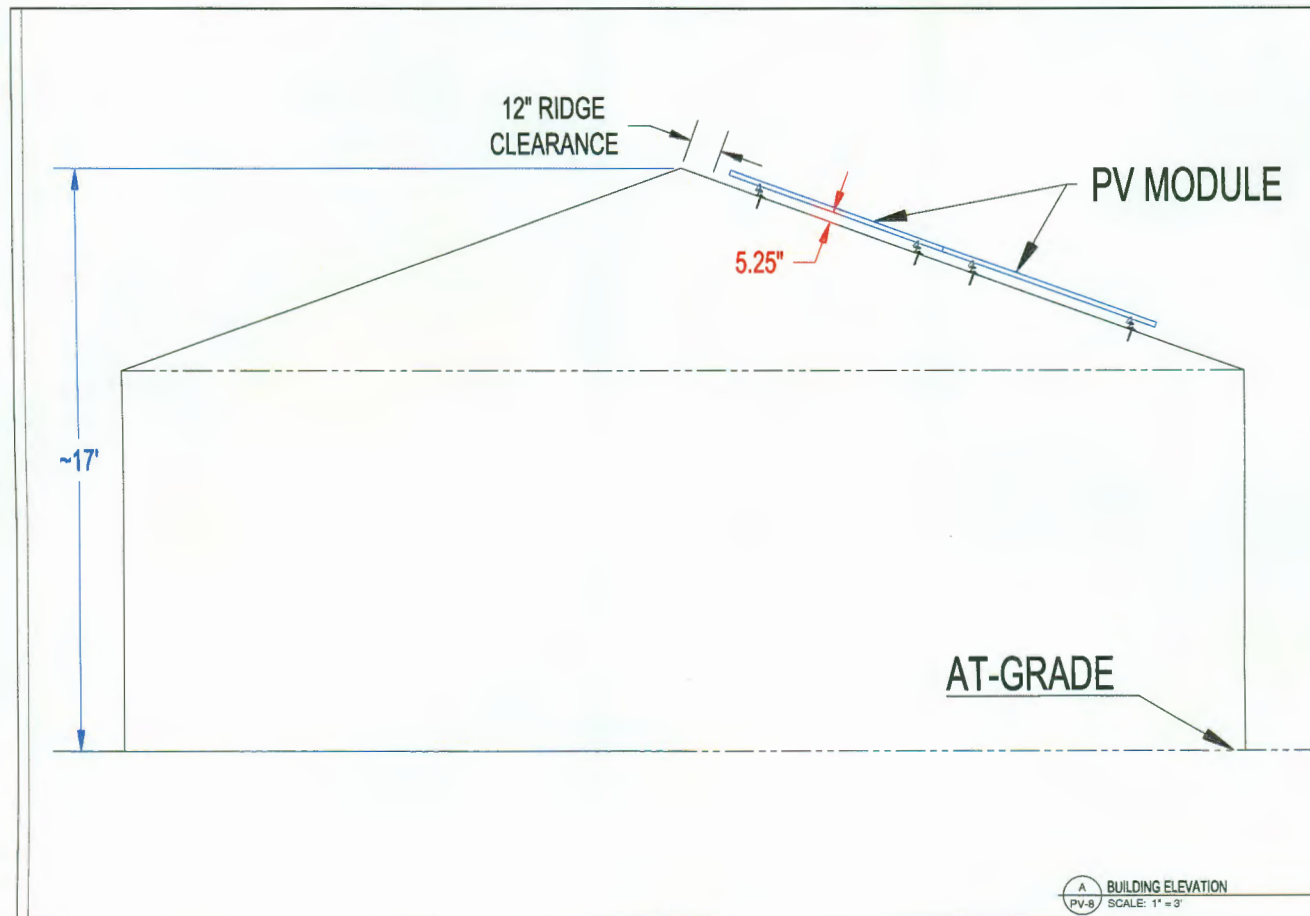
CONTRACTOR OF RECORD

NAME:
LICENSE No.:

MOUNTING & RACKING

PROJECT NO: GSD-20160707-42155
DRAWN BY: SCM
DATE: 7/7/2016

PV-7



USA EMERGENCY
SOLAR ENERGY
PLUS LLC
PHONE: (503) 802-2777
LICENSE NO. XXXXXXX (OREGON)

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NEW GRID-TIED SYSTEM 3.24kW
HOMEOWNER RESIDENCE
1495 S CORVALLIS, OR 97333
S CORVALLIS, OR 97333
PLUS LLC

CONTRACTOR OF RECORD

NAME:
LICENSE No.:

BUILDING ELEVATION

PROJECT NO: GSD-20160707-42155
DRAWN BY: SCM
DATE: 7/7/2016

PV-8

IRONRIDGE

Flush Mount System



Built for solar's toughest roofs.

Ironridge builds the strongest mounting system for pitched roofs in solar. Every component has been tested to the best and proven in extreme environments.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 20-year warranty.



Strength Tested

All components evaluated for superior structural performance.



Class A Fire Rating

Certified to maintain the fire resistance rating of the existing roof.



Integrated Grounding

UL 2703 system eliminates separate module grounding components.



PE Certified

Pre-stamped engineering letters available in most states.



Design Assistant

Online software makes it simple to create, share, and price projects.



20 Year Warranty

Twice the protection offered by competitors.

XPR Rails

XPR10 Rail



A low-profile mounting rail for regions with light snow.

- 6" spanning capability
- Moderate load capability
- Clear & black anod. finish

XPR100 Rail



The ultimate residential solar mounting rail.

- 8" spanning capability
- Heavy load capability
- Clear & black anod. finish

XPR1000 Rail



A heavyweight mounting rail for commercial projects.

- 12" spanning capability
- Extreme load capability
- Clear anodized finish

Internal Splices



All rails use internal splices for seamless connections.

- Self-tapping screws
- Varying versions for rails
- Grounding Straps offered

Attachments

FlashFoot



Anchor, flash, and mount with all-in-one attachment.

- Ships with all hardware
- IDC & PNC compliant
- Certified with XPR Rails

Bolted L-Foot



Drop-in design for rapid rail attachment.

- High-friction serrated base
- Heavy-duty profile shape
- Clear & black anod. finish

Standoffs



Raises flush mount system to various heights.

- Works with vent flashing
- Ships assembled
- 4" and 7" Lengths

Clamps & Mounting

End Clamps



Slide in clamps and secure modules at ends of rails.

- Mill finish & black anod.
- Sizes from 1.25" to 2.5"
- Optional Under Clamps

Grounding L-Foot



Attach and ground modules in the middle of the rail.

- Bonding T-bolt
- Resizable up to 10 times
- Mill & black stainless

T-Bolt Grounding Legs



Ground system using the rail's top slot.

- Easy top-slot mounting
- Eliminates drilling
- Rotate in any direction

Accessories



Provides a finished and organized look for rails.

- Snap-in Vette Clips
- Snap-in End Caps
- UV-stabilized polymer

Free Resources



Design Assistant
Go from rough layout to fully engineered system. For free.
[Go to ironridge.com/design](http://go.to/ironridge.com/design)

NABCEP Certified Training
Earn free continuing education credits, while learning more about our systems.
[Go to ironridge.com/training](http://go.to/ironridge.com/training)

1 RACKING DATASHEET
PV-9 SCALE: NTS

USA EMERGENCY
SOLAR ENERGY
PLUS LLC

USA EMERGENCY SOLAR ENERGY PLUS LLC
NEW GRID-TIED SYSTEM 3.24kW
HOMESOWNER RESIDENCE
1234 HAWTHORNE AVENUE
CORVALLIS, OR 97333
CONTRACTOR OF RECORD
NAME:
LICENSE NO.:
RACKING DATASHEET
PROJECT NO: GSD-20160707-42155
DRAWN BY: SCM
DATE: 7/7/2016
PV-9

PEIMAR
EU S-GREEN LINE
SG250P / SG260P / SG270P
POLY-CRYSTALLINE SOLAR MODULE EU
60 CELLS 156x156mm
The PEIMAR polycrystalline solar panels are a perfect combination of high-efficiency and versatility. Flexible, unbreakable and solid, our panels are ideal for commercial and residential applications, as well as for large solar systems.
Thanks to the use of high-quality solar cells, our panels achieve outstanding performance and ensure the maximum production output even under low lighting conditions.
Last but not least, the silver-edges and consistently robust frame make it easy to install the panels, while setting up the solar system.

High efficiency PER technology
60 x 60 mm cells
20 Year limited Power Warranty
12 Year Product Warranty
Advanced performance under different light conditions
IP65
PER 20 Year limited Power Warranty
12 Year Product Warranty
Advanced performance under different light conditions

SG250P / SG260P / SG270P
EU S-GREEN LINE
ELECTRICAL CHARACTERISTICS (STC)¹

	SG250P	SG260P	SG270P
Maximum Output (P _{max}) [W]	260	280	270
Peak Test Power Classification [W]	0 / +6	0 / +6	0 / +6
Voltage at P _{max} (V _{mp}) [V]	30.4	30.8	30.8
Current at P _{max} (I _{mp}) [A]	8.23	8.80	8.77
Open Circuit Voltage (V _{oc}) [V]	36.8	36.8	37.3
Short Circuit Current (I _{sc}) [A]	9.24	9.82	9.82
Maximum System Voltage [V]		1000	
Maximum Series Fuse Rating [A]	15	15	15
Cell Efficiency [%]	17.12	17.81	18.48
Module Efficiency [%]	16.37	16.88	16.89

100W Standard Test Conditions: Irradiance 1000W/m², Module Temperature 25°C, Air Mass 1.5

MECHANICAL CHARACTERISTICS

Module Size: 600x1050 poly - 156x156 mm - 3 or 4 BB
Front Cover: 3.2 mm thick, low iron tempered glass
Back Cover: TPT (Tedlar-PET-Tedlar)
Encapsulant: EVA (Ethylene vinyl acetate)
Frame: Anodized aluminum alloy, double wall
Diodes: 3 Bypass diodes, applicable
Junction Box: IP68 rated
Connectors: MC4 or compatible connector
Cables: Length: 900 mm / Standard: 4.0 mm²
Dimensions: 1940 x 912 x 40 mm
Weight: 16 kg
Max. Load: Certified to 5400 Pa

TEMPERATURE CHARACTERISTICS

NOCT²: 45±2 °C
Temperature Coefficient of P_{max}: -0.45 %/°C
Temperature Coefficient of V_{oc}: -0.32 %/°C
Temperature Coefficient of I_{sc}: 0.047 %/°C
Operating Temperature: -40°C ~ +85°C
25°C³ Standard Question-Cell Temperature Rise Addition: At 25°C Total panel temp

PACKING CONFIGURATION

Pallet dimensions: 1780 x 1160 x 1200 mm
Pieces per pallet: 27 pcs
Weight: 819 kg
² Values are indicated as a min.

CURRENT / VOLTAGE CHARACTERISTICS¹

Dimensions: 1940 x 912 x 40 mm

PEIMAR

1 MODULE DATASHEET
PV-10 SCALE: NTS

USA EMERGENCY SOLAR ENERGY PLUS LLC
NEW GRID-TIED SYSTEM 3.24kW
HOMESOWNER RESIDENCE
1234 HAWTHORNE AVENUE
CORVALLIS, OR 97333
CONTRACTOR OF RECORD
NAME:
LICENSE NO.:
MODULE DATASHEET
PROJECT NO: GSD-20160707-42155
DRAWN BY: SCM
DATE: 7/7/2016
PV-10

FLEXpower ONE FXR

Fully Pre-Wired Single Inverter System



- Factory tested, pre-wired and pre-configured systems
- Fast installation—just hang on the wall with the bracket (included) and make connections
- Off-grid and grid-tied functionality in one flexible system
- Powerful system in a compact, space-saving footprint
- Field-upgradable software
- Ample AC and DC breaker provisions
- GridZero technology effectively lets users "zero out" the utility grid if enough renewables are present, reducing or even eliminating grid dependence
- Advanced Battery Charging (ABC) supports a wide range of battery technologies including lithium-ion
- All components carry necessary ETL certifications

Outback's pre-assembled and pre-wired FLEXpower systems are now developed with the optional FXR Series GridHybrid Inverters/chargers.

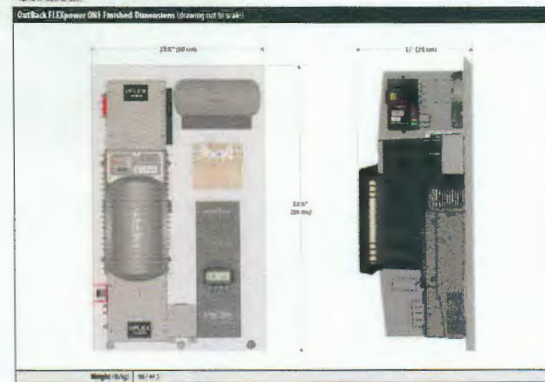
This means that the most advanced GridHybrid inverters features are now available on the industry's most trusted and proven system platform for unmatched flexibility and value. The FLEXpower ONE FXR is available in six models for 120VAC or 240VAC applications ranging from 2000W to 3600W and are field adjustable for 50Hz or 60Hz. Each system is field upgradable to eliminate downtime during critical updates. Features seven programmable operating modes including GridZero and Advanced Battery Charging and offers remote monitoring and control through any internet enabled device with OPTICS RE.

The FLEXpower ONE is ideal for residential and commercial applications including cabins, vacation homes, farm buildings, remote communications sites and back-up power systems, with all necessary components integrated into a compact hang-on-thewall system with a minimal footprint.

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FLEXpower ONE FXR Specifications

For 120VAC, 50/60Hz Applications	Description	Inverter(s)	FW-2340	FW-2340	FW-2340	FW-2340	FW-2340	FW-2340
FPI F1202340	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W
FPI F1202340	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W
FPI F1202340	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W
FPI F1202340	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W	120VAC, 50/60Hz, 2340W



Worldwide Corporate Offices
North America: 1-800-451-0000, 1-800-451-0001, 1-800-451-0002, 1-800-451-0003, 1-800-451-0004, 1-800-451-0005, 1-800-451-0006, 1-800-451-0007, 1-800-451-0008, 1-800-451-0009, 1-800-451-0010, 1-800-451-0011, 1-800-451-0012, 1-800-451-0013, 1-800-451-0014, 1-800-451-0015, 1-800-451-0016, 1-800-451-0017, 1-800-451-0018, 1-800-451-0019, 1-800-451-0020, 1-800-451-0021, 1-800-451-0022, 1-800-451-0023, 1-800-451-0024, 1-800-451-0025, 1-800-451-0026, 1-800-451-0027, 1-800-451-0028, 1-800-451-0029, 1-800-451-0030, 1-800-451-0031, 1-800-451-0032, 1-800-451-0033, 1-800-451-0034, 1-800-451-0035, 1-800-451-0036, 1-800-451-0037, 1-800-451-0038, 1-800-451-0039, 1-800-451-0040, 1-800-451-0041, 1-800-451-0042, 1-800-451-0043, 1-800-451-0044, 1-800-451-0045, 1-800-451-0046, 1-800-451-0047, 1-800-451-0048, 1-800-451-0049, 1-800-451-0050, 1-800-451-0051, 1-800-451-0052, 1-800-451-0053, 1-800-451-0054, 1-800-451-0055, 1-800-451-0056, 1-800-451-0057, 1-800-451-0058, 1-800-451-0059, 1-800-451-0060, 1-800-451-0061, 1-800-451-0062, 1-800-451-0063, 1-800-451-0064, 1-800-451-0065, 1-800-451-0066, 1-800-451-0067, 1-800-451-0068, 1-800-451-0069, 1-800-451-0070, 1-800-451-0071, 1-800-451-0072, 1-800-451-0073, 1-800-451-0074, 1-800-451-0075, 1-800-451-0076, 1-800-451-0077, 1-800-451-0078, 1-800-451-0079, 1-800-451-0080, 1-800-451-0081, 1-800-451-0082, 1-800-451-0083, 1-800-451-0084, 1-800-451-0085, 1-800-451-0086, 1-800-451-0087, 1-800-451-0088, 1-800-451-0089, 1-800-451-0090, 1-800-451-0091, 1-800-451-0092, 1-800-451-0093, 1-800-451-0094, 1-800-451-0095, 1-800-451-0096, 1-800-451-0097, 1-800-451-0098, 1-800-451-0099, 1-800-451-0100, 1-800-451-0101, 1-800-451-0102, 1-800-451-0103, 1-800-451-0104, 1-800-451-0105, 1-800-451-0106, 1-800-451-0107, 1-800-451-0108, 1-800-451-0109, 1-800-451-0110, 1-800-451-0111, 1-800-451-0112, 1-800-451-0113, 1-800-451-0114, 1-800-451-0115, 1-800-451-0116, 1-800-451-0117, 1-800-451-0118, 1-800-451-0119, 1-800-451-0120, 1-800-451-0121, 1-800-451-0122, 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FLEXmax Series

Continuous Maximum Power Point Tracking (MPPT) Charge Controllers



- Increases PV array output by up to 30%
- Advanced continuous maximum power point tracking
- Full power output in ambient temperature up to 104°F (40°C)
- Battery voltages from 12 to 60VDC
- Fully Outback network integrated and programmable
- Programmable auxiliary control output
- Built-in 128 days of data logging
- Standard 5 year warranty
- Greater than 98% peak efficiency

The FLEXmax family of charge controllers is the industry leading innovation in Maximum Power Point (MPPT) charge controllers from Outback Power.

The innovative FLEXmax MPPT software algorithm is both continuous and active, increasing your photovoltaic array power yield up to 30% compared to non-MPPT controllers. Thanks to active cooling and intelligent thermal management cooling, both FLEXmax charge controllers can operate at their full maximum current rating, 60 Amps or 80 Amps respectively, in ambient temperatures as high as 104°F (40°C).

Included in all the FLEXmax charge controllers are the revolutionary features first developed by Outback Power, including support for a wide range of nominal battery voltages and the ability to step down a higher-voltage solar array to recharge a lower-voltage battery bank. A built-in, backlit 80 character display shows the current status and logging.

systems performance data for the last 128 days at the touch of a button. The Integrated Outback Power network communications allow FLEXmax series charge controllers to be remotely programmed and monitored using the MATE family of system displays and provide unlimited complete system integration.

FLEXmax MPPT charge controllers are the only choice when you demand a high performance, efficient and versatile charge controller for your advanced power system.

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FLEXmax Series Specifications

Model	FLEXmax 60 (150V/60VDC)	FLEXmax 120 (150V/120VDC)
Maximum Battery Voltage	150VDC (150VDC/150VDC)	150VDC (150VDC/150VDC)
Maximum Output Current	60A (60A/60A)	120A (120A/120A)
NEC Recommended Solar Maximum Array DC Voltage	150VDC (150VDC/150VDC)	150VDC (150VDC/150VDC)
PV Open Circuit Voltage (VOC)	150VDC (150VDC/150VDC)	150VDC (150VDC/150VDC)
Standard Power Consumption	1.0W (1.0W/1.0W)	1.0W (1.0W/1.0W)
Power Consumption Efficiency	98.5% (98.5%/98.5%)	98.5% (98.5%/98.5%)
Peak Efficiency	98.5% (98.5%/98.5%)	98.5% (98.5%/98.5%)
Charge Regulation	±0.5% (±0.5%/±0.5%)	±0.5% (±0.5%/±0.5%)
Voltage Regulation Set Point	12.0V (12.0V/12.0V)	12.0V (12.0V/12.0V)
Equalization Charging	14.0V (14.0V/14.0V)	14.0V (14.0V/14.0V)
Battery Temperature Compensation	±0.5% (±0.5%/±0.5%)	±0.5% (±0.5%/±0.5%)
Voltage Step-Down Capability	150VDC (150VDC/150VDC)	150VDC (150VDC/150VDC)
Programmable Auxiliary Control Output	12V (12V/12V)	12V (12V/12V)
Power Display	80 Character (80/80/80)	80 Character (80/80/80)
Network Cabling	12V (12V/12V)	12V (12V/12V)
Data Logging	128 Days (128/128/128)	128 Days (128/128/128)
Operating Temperature Range	-40°C to 104°C (-40/104)	-40°C to 104°C (-40/104)
Environmental Rating	IP67 (IP67/IP67)	IP67 (IP67/IP67)
Conformity Standards	UL 1741 (UL1741/UL1741)	UL 1741 (UL1741/UL1741)
Warranty	5 Years (5/5/5)	5 Years (5/5/5)
Weight (Lbs)	1.0 (1.0/1.0)	1.0 (1.0/1.0)
Dimensions (L x W x H) (in)	1.0 x 1.0 x 1.0 (1.0/1.0/1.0)	1.0 x 1.0 x 1.0 (1.0/1.0/1.0)
Options	12V (12V/12V)	12V (12V/12V)
Certifications	UL 1741 (UL1741/UL1741)	UL 1741 (UL1741/UL1741)

The specifications are subject to change without notice.



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Fax: +1 503 535 6274 Fax: +54 1 4751 7113 Fax: +49 9122 780001 Fax: +65 271 371112

AVAILABLE FROM

CHARGE CONTROLLER DATASHEET
PV-13 SCALE: NTS

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SOLAR ENERGY
PLUS LLC

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EXCEPT THOSE INVOLVED IN THE
DESIGN AND INSTALLATION OF THE PV SYSTEM
REPRESENTED IN THIS PLAN.

NEW GRID-TIED SYSTEM 3.2kW
HOMESOWNER RESIDENCE
1234 HAWTHORNE AVENUE,
CORVALLIS, OR 97333

CONTRACTOR OF RECORD

NAME:
LICENSE NO.:

C.C. DATASHEET

PROJECT NO: GSD-20160707-42155
DRAWN BY: SCM
DATE: 7/7/2016

PV-13



MNPV Combiners

Midnite Solar offers a range of PV Combiners from our MNPV3 to the MNPV16. This range of combiners accommodates PV systems as small as a two string off grid cabin up to 16 strings for a 100kW commercial grid tie inverter. The MNPV series of combiners are the result of 20 years of design and manufacturing experience in the renewable energy industry. Each unit has the same quality features such as:

- Aluminum rainproof type 3FR enclosure
- Internal plastic injection molded dead front covers
- Knock outs that accept waterproof strain reliefs, conduit or panel mount MC type connectors
- Knock outs for lightning arrestors
- Uses 150VDC & 300VDC breakers or 600VDC fuses depending on model number
- ETL listed to UL1741 for use in the US and Canada
- Adaptable for two separate inverters or charge controllers on certain models



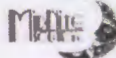
MNPV 12



Configured for 600VDC fuses (Gridtie)



Configured for 150VDC breakers (Offgrid)



Been mooned lately?
www.midnitesolar.com

17722 - 67th Ave NE, Unit C, Arlington WA 98223 - Ph: 360 403 7207 Fax: 360 691 6862

PV Combiner: MNPV12

Model	Max VDC	Max Input Amps	Max Output Amps	Max Input Voltage (VDC)	Max Output Voltage (VDC)	Max Input Current (Amps)	Max Output Current (Amps)	Approved Mounting Orientation	Enclosure Type Material	Listing
MNPV12-120	120	12	12	120V	120V	12	12	120V/120V	3FR/Aluminum	UL1741
MNPV12-150	150	12	12	150V	150V	12	12	150V/150V	3FR/Aluminum	UL1741
MNPV12-200	200	12	12	200V	200V	12	12	200V/200V	3FR/Aluminum	UL1741
MNPV12-250	250	12	12	250V	250V	12	12	250V/250V	3FR/Aluminum	UL1741
MNPV12-300	300	12	12	300V	300V	12	12	300V/300V	3FR/Aluminum	UL1741
MNPV12-350	350	12	12	350V	350V	12	12	350V/350V	3FR/Aluminum	UL1741
MNPV12-400	400	12	12	400V	400V	12	12	400V/400V	3FR/Aluminum	UL1741
MNPV12-450	450	12	12	450V	450V	12	12	450V/450V	3FR/Aluminum	UL1741
MNPV12-500	500	12	12	500V	500V	12	12	500V/500V	3FR/Aluminum	UL1741
MNPV12-550	550	12	12	550V	550V	12	12	550V/550V	3FR/Aluminum	UL1741
MNPV12-600	600	12	12	600V	600V	12	12	600V/600V	3FR/Aluminum	UL1741

NOTE: All of the combiners have a 30 day C rating except the 200V and 250V models. 200V and 250V models are rated for 30 days C rating. 300V and 350V models are rated for 30 days C rating. 400V and 450V models are rated for 30 days C rating. 500V and 550V models are rated for 30 days C rating. 600V and 650V models are rated for 30 days C rating.

MNPV12 (For 150 VDC charge controllers and 600 VDC gridtie inverters) Gray aluminum type 3FR rainproof enclosure with insulating dead front, will accept 12 150VDC breakers or ten 600V/1000VDC fuse holders. Includes 15 position PV negative bus bar, 15 position ground bus bar, and two 200 amp Plus bus bars for breakers or fuses. Plus busbars can be combined or separated to support 2 grid tie inverters or two charge controllers. Charge Controllers and Gridtie Inverters can typically can have a common PV input. The exception is the XW and BlueSky.

Snap in adapters are included for use with fuse holders for a professional fit and finish. Breakers/fuse holders sold separately. Bowed size: 14 x 14 x 5 Weight: 8 Lbs.



Configured for 150VDC breakers (Offgrid)



Configured for 150VDC breakers (Offgrid)



Configured for 150VDC breakers (Offgrid)



ETL Listed for US & Canada



17722 - 67th Ave NE, Unit C, Arlington WA 98223
Ph: 360 403 7207 Fax: 360 691 6862
http://www.midnitesolar.com

COMBINER BOX DATASHEET
PV-14 SCALE: NTS

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PLUS LLC

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EXCEPT THOSE INVOLVED IN THE
DESIGN AND INSTALLATION OF THE PV SYSTEM
REPRESENTED IN THIS PLAN.

NEW GRID-TIED SYSTEM 3.2kW
HOMESOWNER RESIDENCE
1234 HAWTHORNE AVENUE,
CORVALLIS, OR 97333

CONTRACTOR OF RECORD

NAME:
LICENSE NO.:

COMBINER DATASHEET

PROJECT NO: GSD-20160707-42155
DRAWN BY: SCM
DATE: 7/7/2016

PV-14

SolaDeck

PV ROOF-MOUNT ENCLOSURE

INTRODUCED AT
SOLAR POWER 2007



UL50 Type 3R Enclosure - Stamped 16 gauge gal. steel - Powder coated finish - Weather Tight



PV Roof-Mount Combiner/Enclosure

Enclosure Includes:

- Dead ground lug
- Universal DIN rail
- 1/2", 3/4" & 1" knockouts
- Wire strain relief clip
- Complete hardware package

Benefits

- The ability to prep the building is now possible
- Replaces several parts used today
- Provides professional looking install
- Saves time on install
- Allows for easy access
- Guaranteed seal to roof
- Low profile design

For product information contact us at
(866) 367-7782

www.commdeck.com



RSTC Enterprises, Inc.
2219 Hemstead Road
Eau Claire, WI 54703
1 (866) 367-7782



SolaDeck Part # 780

Specifications:

- 18 Gauge Steel Base (1) and Cover (2)
- Pre Punched 7 holes in base (1) for roof deck
- Pre Punched 4 holes in base (1) and cover (2) for match
- Draw Process both parts
- Powder Coated to withstand 1000 hours Salt Spray (Primer Gray)
- High UV resistance
- 15" x 15" flashing dimension
- Cavity dimension 8" W x 9" L x 2.5" D
- Approx. 162 Cubic inch equipment cavity
- Norloked steel base plate (3) to drawn base (2)
- Three knockout locations, .5", .75" and 1"
- 3" DIN rail installed
- Grounding Lug - Installed (in Equipment Cavity)
- Wire Strain Relief Clip - Installed (in Equipment Cavity)
- Hardware pack withstands 500 hours Salt Spray
- 7 - 2" Trusshead Screws
- 4 - .5" 8-32 thread cutting screws
- 4 - #10 Bonded Seal washers
- 1 - Foam closed Cell Seal
- ETL Listed UL50 Type 3R

Total Weight 6.9 pounds each

Packaging:

- Individually bagged and boxed
- Box dimension 15.5" w x 16" L x 3" D
- White Carton labeled with Cut out template
- Print One Color - Black

- Master Cartons of 6 Units each
- Master Carton dimension 18.75" x 18" x 16.375"
- Master Carton Weight - 42 pounds
- 18 Master Cartons per skid Approx 800 pounds with skid

2219 Hemstead Road, Eau Claire, WI 54703
Phone: 715/830-9987 Fax: 715/830-9976 866/FOR-RSTC (367-7782)

1 SOLADECK BOX DATASHEET
PV-15 SCALE: NTS

USA EMERGENCY
SOLAR ENERGY

PLUS LLC

PHONE: (866) 367-7782

LICENSE NO. XXXXXX (OREGON)

CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING SET IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED IN FULL OR IN PART TO ANYONE EXCEPT THOSE INVOLVED IN THE DESIGN AND INSTALLATION OF THE PV SYSTEM REPRESENTED IN THIS PLAN.

NEW GRID-TIED SYSTEM 3.2kW

RESIDENCE

OWNER: [Name]

DATE: 7/1/2016

CONTRACTOR OF RECORD

NAME:

LICENSE NO.

SOLADECK DATASHEET

PROJECT NO: GSD-20160707-42155

DRAWN BY: SCM

DATE: 7/1/2016

PV-15

USA EMERGENCY
SOLAR ENERGY
PLUS LLC

EnergyCell GH Front Terminal Battery

VRLA Battery for Grid/Hybrid Renewable Energy Storage

- EnerSys B2S GDM Technology for Highest Energy Density
- Front Terminal Access for Ease of Installation and Maintenance
- UL-Recognized Component
- Designed for Grid/Hybrid and AC-Coupled Renewable Energy Storage Applications
- Up to 4-Year Full Replacement Warranty
- 18-Month Shelf Life @ 25°C
- Wide Operating Temperature Range



Outback's new EnergyCell Solar Registered Lead Acid (VRLA) 200AH batteries are designed to support 10-year power agreements in Grid/Hybrid systems before even utility users to maximize investment and power. For the power-to-renewable system, Outback's will give maximum during emergencies or outages. EnerSys B2S GDM technology incorporates TPA, AGM (Thin Plate Lead Anticorrosion Glass Mat) which allows for greater shelf life, extended float service life in optimal operating conditions, higher energy density, and superior discharge and charge performance.

The EnergyCell GH battery series is designed for 24V/48V/120V and AC-coupled storage applications; for deep-cycle applications Outback EnergyCell GH batteries are recommended. The EnergyCell GH also features front terminal access with threaded copper sockets, which decreases impedance and increases safety.

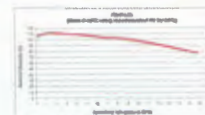
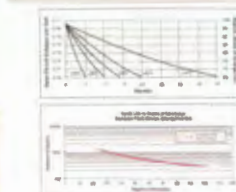
B2S Technology is a trademark of EnerSys.



www.outbackpower.com

EnergyCell GH Front Terminal Battery Specifications

	EnergyCell 200AH	EnergyCell 250AH
Cells Per Unit	10	10
Voltage Per Unit	12 VDC	12 VDC
Operating Temperature Range (with temperature compensation)	-40 to 125°F (-40 to 50°C)	-40 to 125°F (-40 to 50°C)
Optional Operating Temp Range	60°F (15°C)	60°F (15°C)
Float Charging Voltage	13.6V VDC / with average at 77°F (25°C)	13.6V VDC / with average at 77°F (25°C)
Equalization and Cycle Service Charging Limits	14.4 VDC / with average at 77°F (25°C)	14.4 VDC / with average at 77°F (25°C)
Self Discharge	Battery can be stored up to 18 months at 77°F (25°C) before a recharging charge is required. Discharge stored at temperatures greater than 77°F (25°C) will require recharge before that battery is used at lower temperatures.	
Temp Compensation (Recharge/Charge)	-18mV per degree C per volt (18mV)	
Terminal	Throated copper alloy front terminal to accept 1/2" (12.7mm) bolt	
Terminal Hardware Initial Torque	800 in-lb (90.7 Nm)	
Weight	110 lbs (49 kg)	132 lbs (59 kg)
Dimensions (H x D x W)	21.7 x 12.2 x 10.4" (552 x 311 x 264 mm)	22.8 x 12.5 x 10.5" (579 x 318 x 267 mm)



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14140 Cedar Blvd PL
Haltom City, TX 76117 USA
Phone: +1 940 702 0001
Fax: +1 940 702 0001

1 BATTERY DATASHEET
PV-16 SCALE: NTS

USA EMERGENCY
SOLAR ENERGY

PLUS LLC

PHONE: (866) 367-7782

LICENSE NO. XXXXXX (OREGON)

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NEW GRID-TIED SYSTEM 3.2kW

RESIDENCE

OWNER: [Name]

DATE: 7/1/2016

CONTRACTOR OF RECORD

NAME:

LICENSE NO.

BATTERY DATASHEET

PROJECT NO: GSD-20160707-42155

DRAWN BY: SCM

DATE: 7/1/2016

PV-16