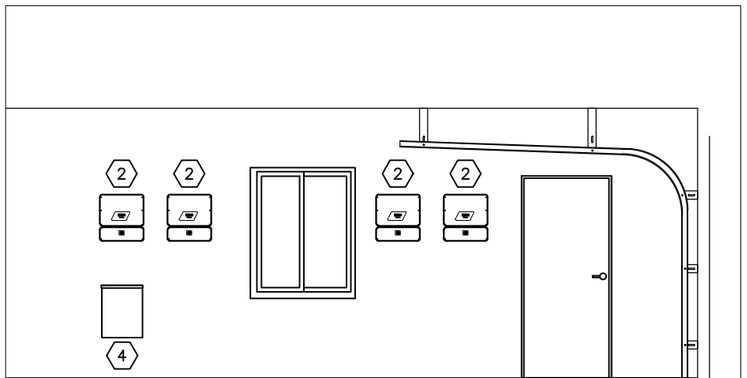
UTILITY METER/DISCONNECT LOCATED
BEHIND EXISTING SCREEN WALL
ALL OTHER EQUIPMENT TO BE
LOCATED INSIDE GARAGE

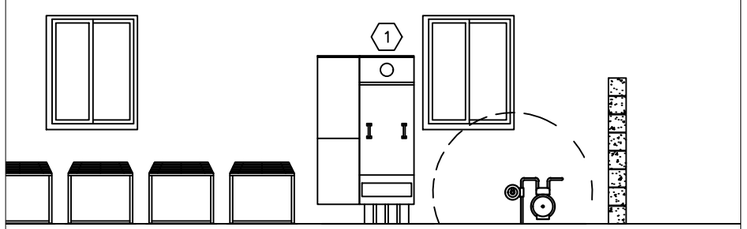
SITE LOCATION



NOTE: EQUIPMENT LOCATIONS ARE APPROXIMATE AND SUBJECT TO CHANGE

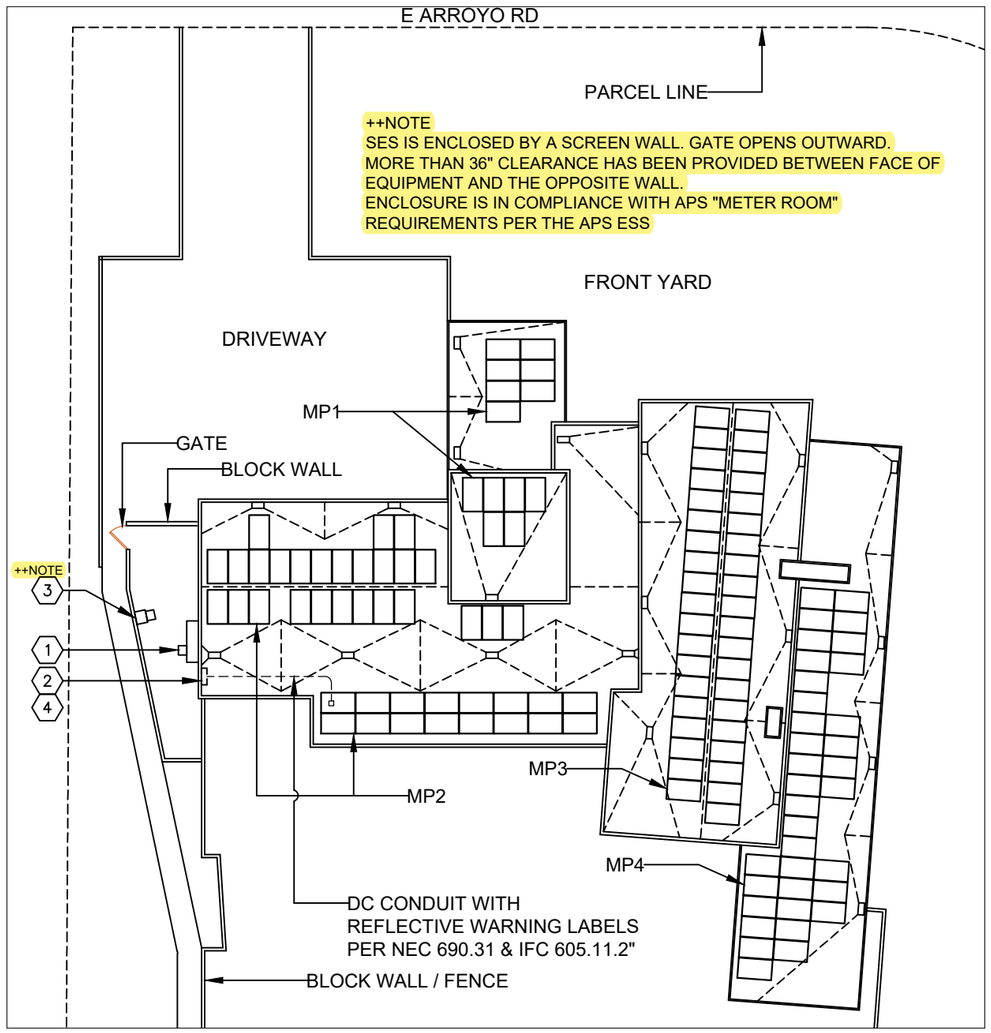
GARAGE (INTERIOR)

EXTERIOR HOME WALL LRV = ~80%
EXTERIOR EXPOSED CONDUIT LRV = ~80% (PAINTED TO MATCH EXTERIOR WALL)
UTILITY METER/DISCONNECT LRV = ~50%
NOTE: UTILITY METER DISCONNECT CANNOT BE PAINTED PER UTILITY REQUIREMENTS. ALL EXTERIOR EQUIPMENT IS LOCATED BEHIND EXISTING SCREEN WALL AND IS NOT VISIBLE FROM SURROUNDING AREA.



NOTE: EQUIPMENT LOCATIONS ARE APPROXIMATE AND SUBJECT TO CHANGE

EQUIPMENT WALL (EXTERIOR)



SITE PLAN

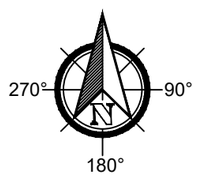
MP1	PITCH: 0 AZIMUTH: 180 MATERIAL: Foam MOUNTING: Flush Mounted
MP2	PITCH: 0 AZIMUTH: 180 MATERIAL: Foam MOUNTING: Flush Mounted
MP3	PITCH: 0 AZIMUTH: 94 MATERIAL: Foam MOUNTING: Flush Mounted
MP4	PITCH: 0 AZIMUTH: 94 MATERIAL: Foam MOUNTING: Flush Mounted

ROOF LEGEND
- GAS VENT
- T-TOP VENT
- DORMER VENT

Project Manager:
Rachel Napier

Sales Person:
Bobby Burnett

PARCEL INFO
PARCEL #: 169-29-021
SQUARE FOOTAGE: 9,950
CONST. YEAR: 2017



SCALE: NTS

NOTE:
1. UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.
2. WORKSPACE IN FRONT OF THE AC ELECTRICAL SYSTEM COMPONENTS SHALL BE IN ACCORDANCE WITH APS & NEC REQUIREMENTS. FOR APS REQUIREMENTS, REFERENCE SECTION 300 OF THE APS ESRM & SECTION 8.2 OF THE APS INTERCONNECTION REQUIREMENTS.
3. REFERENCE SECTION 301.15 OF THE APS ESRM FOR ELECTRIC METER SEPARATION BETWEEN WATER & GAS.

SCOPE OF WORK

TO INSTALL A PHOTOVOLTAIC (PV) SYSTEM AT THE
Folz, Michael Residence
LOCATED AT
5211 E Arroyo Rd
Paradise Valley , AZ 85253

THE POWER GENERATED BY THE PV SYSTEM WILL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ELECTRICAL SERVICE EQUIPMENT.

SHEET INDEX

GOVERNING CODES

LOCAL JURISDICTION - Paradise Valley
UTILITY - APS
2014 NATIONAL ELECTRICAL CODE
2015 INTERNATIONAL BUILDING CODE
2015 INTERNATIONAL RESIDENTIAL CODE
2015 INTERNATIONAL FIRE CODE
CITY AMENDMENTS

SITE PLAN NOTES

1. (EXISTING) ELECTRICAL SERVICE ENTRANCE 800A RATED 200A PULL OUT FUSES and UTILITY REVENUE METER
2. (NEW) INVERTER WITH INTEGRATED DC DISCONNECT
3. (NEW) DEDICATED PV SYSTEM KWH METER and UTILITY DISCONNECT SWITCH (++SEE NOTE)
4. (NEW) AC COMBINER PANEL

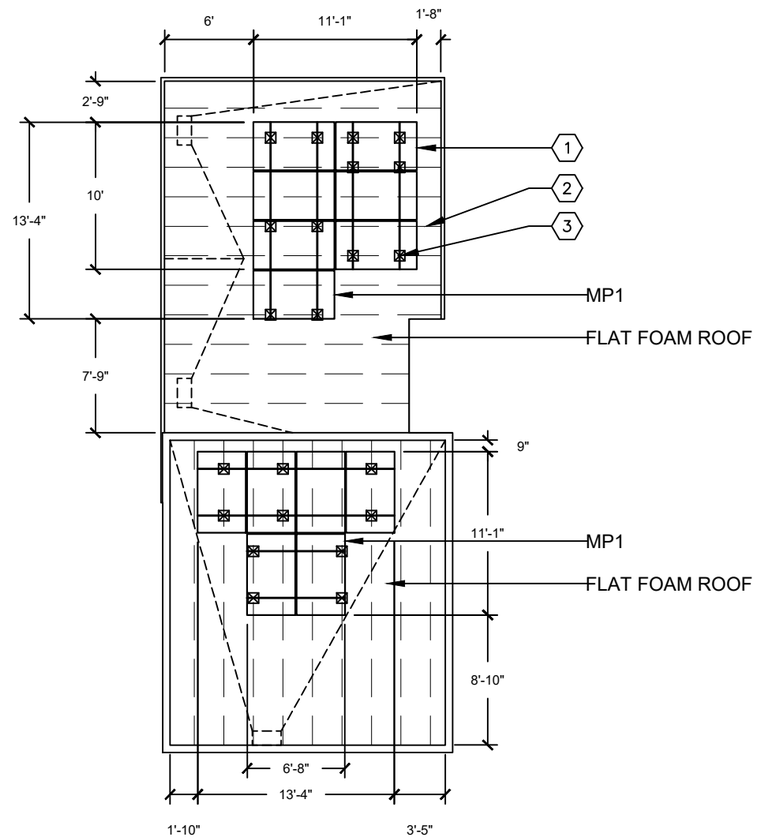
EQUIPMENT SUMMARY

129	REC320NP
129	SolarEdge P320 Optimizers
002	SolarEdge SE11400H–US
002	SolarEdge SE7600H–US
001	Milbank 200A Meter Base
001	BR1224L200R, 200A, COMBINER PANEL
001	DH364URK, 200A, NON–FUSED DISCONNECT

SHEET: PV1
DATE: 5/19/2020
Revision: 0
Designer: Evan Jerpbak
38.000 kW-AC
Residence 41,280 W-DC
Paradise Valley , AZ 85253
TITLE: SITE PLAN
Folz, Michael Residence
5211 E Arroyo Rd, Paradise Valley , AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St. Chandler, AZ 85225
T: (480) 889-5000 / F: (480) 659-3429
www.sunvalleysolar.com

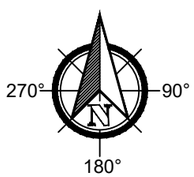
ROOF PLAN



EQUIPMENT APPEARANCE DATA

ITEM	LRV	COLOR
EVEREST CLAMPS	<10%	BLACK
EVEREST CROSSRAIL	<10%	BLACK
EVEREST TILT CONNECTOR	<10%	BLACK
BARREL STANDOFF	35%	DARK SILVER
L FOOT	35%	DARK SILVER
PV MODULE FRAME	<10%	BLACK

NOTE:
ALL PARAPET WALLS ARE 7" OR HIGHER
PANELS WILL BE LAID FLAT ON ROOF WITH MAXIMUM HEIGHT OF ~5"



SCALE: NTS

NOTE: EXPOSED PV ROOFTOP CONDUCTORS THAT ARE NOT LOCATED UNDER THE ARRAY MODULES, SHALL BE INSTALLED IN A LISTED RACEWAY, AND SHALL INCLUDE LISTED JUNCTION BOXES AT BOTH ENDS OF THE RACEWAY TO TRANSITION FROM EXPOSED CONDUCTORS TO THE LISTED RACEWAYS. NEC ARTICLE 690.31(A) AND (B) EXCEPTION

NOTE: SYSTEM DESIGN IN ACCORDANCE WITH THE 2014 N.E.C.

MP1	PITCH: 0 AZIMUTH: 180 MATERIAL: Foam MOUNTING: Flush Mounted

ROOF LEGEND
- GAS VENT
- T-TOP VENT
- DORMER VENT

ROOF PLAN NOTES:

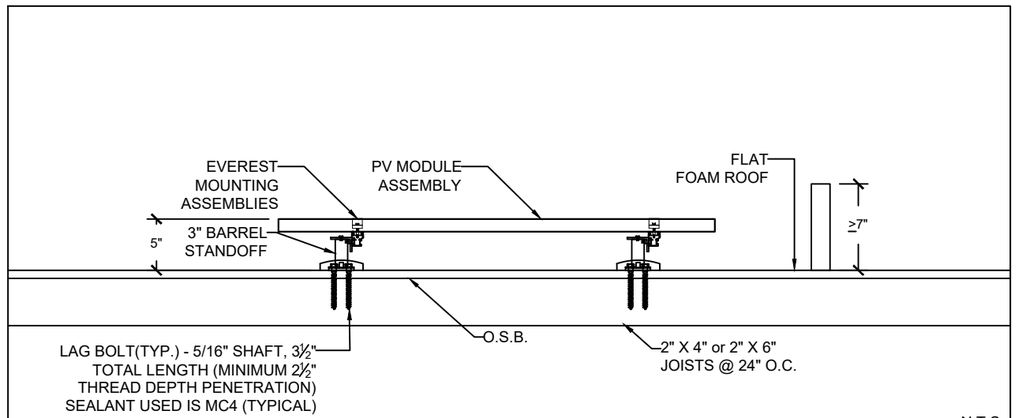
1. (NEW) PHOTOVOLTAIC PANEL ARRAY MOUNTED FLUSH TO ROOF WITH 0DEG PITCH
2. 2" x 4" TRUSS @ 24" O.C.
3. RACKING INFORMATION
   - EVEREST MOUNTING RAIL
   - UNIRAC STANDOFF – 3"
   - TRUSS SPACING = 24" O.C.
   - PENETRATION POINTS = 6' SPACING
   - MOUNTING DETAIL

ROOF 1 CALCULATIONS:

DESIGN PER ASCE 7-10 2.4.1 & IBC 2015
SOLAR MODULE WEIGHT = 40.79 LBS.
EXPOSURE CATEGORY = B
BASIC WIND SPEED = 115 MPH

STRUCTURAL NOTES:
1) TOTAL ASSEMBLY WEIGHT: 617.9 LBS
2) TOTAL AREA COVERED BY MODULES: 245.2 FT2
3) DEAD LOAD = 617.9 / 245.2 = 2.5 LBS/FT2
4) POINT LOAD CALCULATIONS [# OF POINTS (22)] - 28.1 lb/point
5) TOTAL DESIGN LOAD (DOWNFORCE) = 12.1 psf
6) TOTAL DESIGN LOAD (UPFORCE) = -33.4 psf

RAILS TO BE BONDED TO GROUND (EGC) - 690.4 (C)
RAIL SPLICES TO BE ELECTRICALLY BONDED
FLASHING REQUIRED FOR STANDOFF PENETRATIONS
FOLLOW MODULE INSTRUCTION ON FRAME MOUNTING POINT



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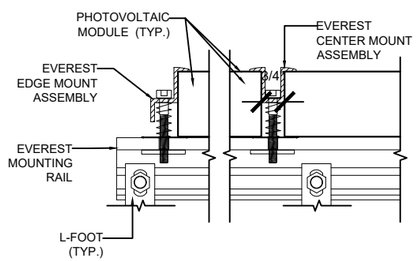


SCALE
N.T.S

SHEET: PV2

DATE: 5/19/2020

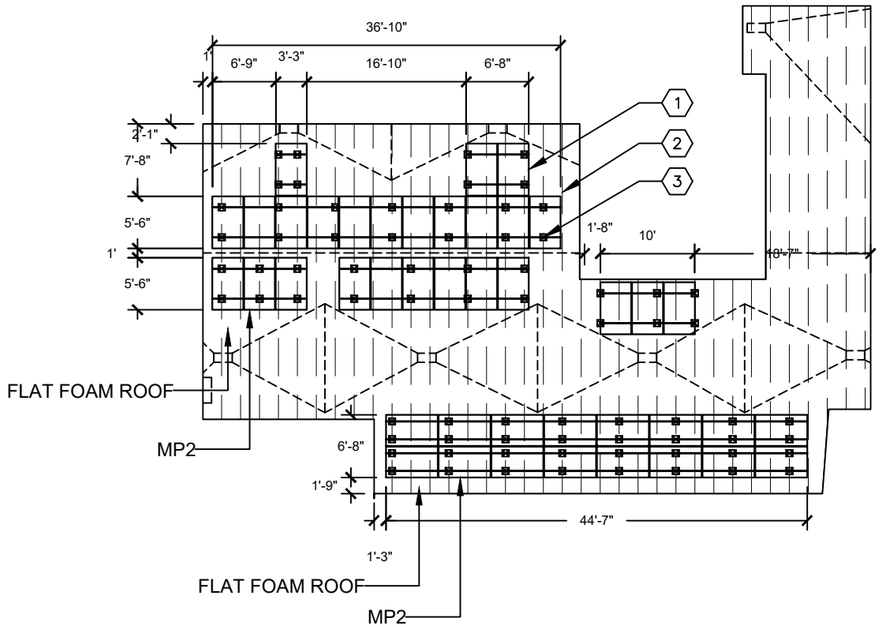
Revision: 0

Designer:

TITLE: ROOF PLAN 38.000 kW-AC
Folz, Michael Residence 41,280 W-DC
5211 E Arroyo Rd, Paradise Valley , AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St. Chandler, AZ 85225
T: (480) 689-5000 / F: (480) 659-3429
www.sunvalleysolar.com

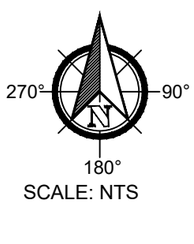
ROOF PLAN



EQUIPMENT APPEARANCE DATA

ITEM	LRV	COLOR
EVEREST CLAMPS	<10%	BLACK
EVEREST CROSSRAIL	<10%	BLACK
EVEREST TILT CONNECTOR	<10%	BLACK
BARREL STANDOFF	35%	DARK SILVER
L FOOT	35%	DARK SILVER
PV MODULE FRAME	<10%	BLACK

NOTE:
ALL PARAPET WALLS ARE 18" OR HIGHER
PV MODULES NOT TO EXTEND ABOVE THE HEIGHT OF THE PARAPET WALL



SCALE: NTS

NOTE: EXPOSED PV ROOFTOP CONDUCTORS THAT ARE NOT LOCATED UNDER THE ARRAY MODULES, SHALL BE INSTALLED IN A LISTED RACEWAY, AND SHALL INCLUDE LISTED JUNCTION BOXES AT BOTH ENDS OF THE RACEWAY TO TRANSITION FROM EXPOSED CONDUCTORS TO THE LISTED RACEWAYS. NEC ARTICLE 690.31(A) AND (B) EXCEPTION

NOTE: SYSTEM DESIGN IN ACCORDANCE WITH THE 2014 N.E.C.

MP2	PITCH: 0 AZIMUTH: 180 MATERIAL: Foam MOUNTING: Flush Mounted

ROOF LEGEND
- ⊗ GAS VENT
- T-TOP VENT
- DORMER VENT

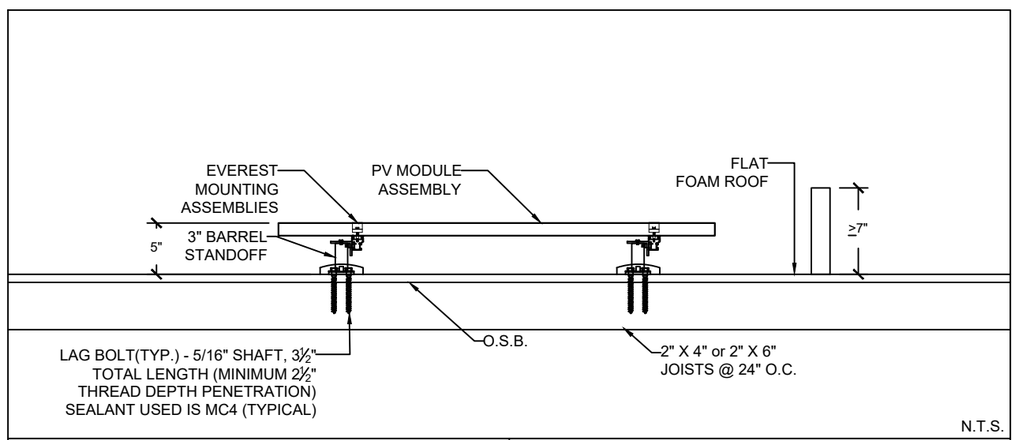
ROOF PLAN NOTES:

1. (NEW) PHOTOVOLTAIC PANEL ARRAY MOUNTED FLUSH TO ROOF WITH 0DEG PITCH
2. 2" x 4" TRUSS @ 24" O.C.
3. RACKING INFORMATION
   - EVEREST MOUNTING RAIL
   - UNIRAC STANDOFF – 3"
   - TRUSS SPACING = 24" O.C.
   - PENETRATION POINTS = 6' SPACING
   - MOUNTING DETAIL

ROOF 2 CALCULATIONS:

DESIGN PER ASCE 7-10 2.4.1 & IBC 2015
SOLAR MODULE WEIGHT = 40.79 LBS.
EXPOSURE CATEGORY = B
BASIC WIND SPEED = 115 MPH
STRUCTURAL NOTES:
1) TOTAL ASSEMBLY WEIGHT: 1996.3 LBS
2) TOTAL AREA COVERED BY MODULES: 792.1 FT2
3) DEAD LOAD = 1996.3 / 792.1 = 2.5 LBS/FT2
4) POINT LOAD CALCULATIONS [# OF POINTS (74)] - 27.0 lb/point
5) TOTAL DESIGN LOAD (DOWNFORCE) = 11.3 psf
6) TOTAL DESIGN LOAD (UPFORCE) = -27.8 psf

RAILS TO BE BONDED TO GROUND (EGC) - 690.4 (C)
RAIL SPLICES TO BE ELECTRICALLY BONDED
FLASHING REQUIRED FOR STANDOFF PENETRATIONS
FOLLOW MODULE INSTRUCTION ON FRAME MOUNTING POINT



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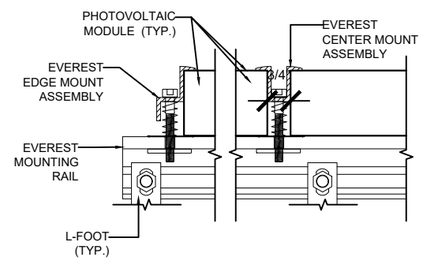

SCALE
N.T.S

SHEET: PV2

DATE: 5/19/2020

Revision: 0

Designer: Evan Jerpbak

TITLE: ROOF PLAN
38.000 kW-AC
41,280 W-DC
Folz, Michael Residence
5211 E Arroyo Rd, Paradise Valley , AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St. Chandler, AZ 85225
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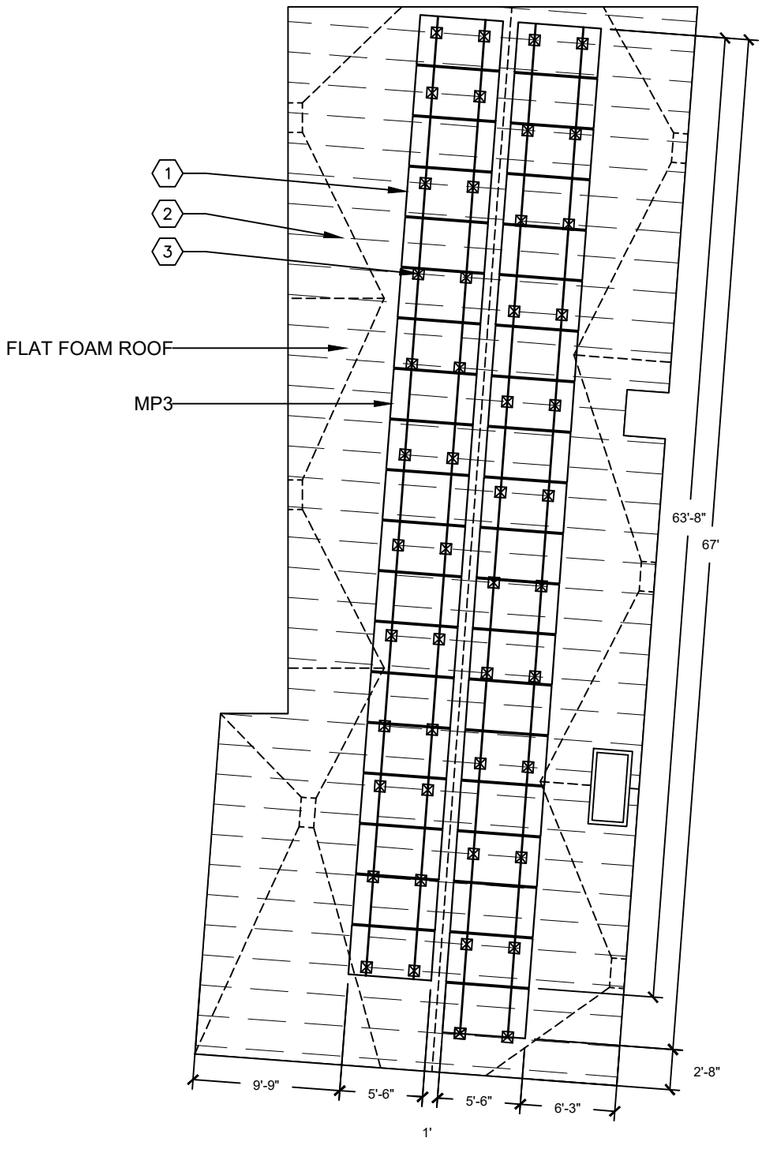
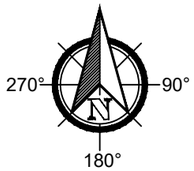
ROOF PLAN





SCALE: NTS

NOTE: EXPOSED PV ROOFTOP CONDUCTORS THAT ARE NOT LOCATED UNDER THE ARRAY MODULES, SHALL BE INSTALLED IN A LISTED RACEWAY, AND SHALL INCLUDE LISTED JUNCTION BOXES AT BOTH ENDS OF THE RACEWAY TO TRANSITION FROM EXPOSED CONDUCTORS TO THE LISTED RACEWAYS. NEC ARTICLE 690.31(A) AND (B) EXCEPTION

NOTE: SYSTEM DESIGN IN ACCORDANCE WITH THE 2014 N.E.C.

MP3	PITCH: 0 AZIMUTH: 94 MATERIAL: Foam MOUNTING: Flush Mounted

ROOF LEGEND

- ⊗ GAS VENT
- T-TOP VENT
- DORMER VENT

ROOF PLAN NOTES:

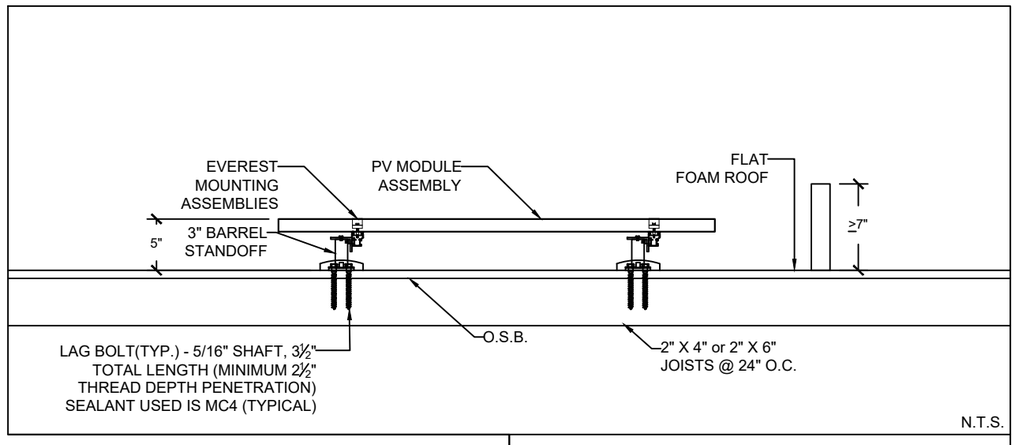
1. (NEW) PHOTOVOLTAIC PANEL ARRAY MOUNTED FLUSH TO ROOF WITH 0DEG PITCH
2. 2" x 4" TRUSS @ 24" O.C.
3. RACKING INFORMATION
   - EVEREST MOUNTING RAIL
   - UNIRAC STANDOFF – 3"
   - TRUSS SPACING = 24" O.C.
   - PENETRATION POINTS = 6' SPACING
   - MOUNTING DETAIL

ROOF 3 CALCULATIONS:

DESIGN PER ASCE 7-10 2.4.1 & IBC 2015
SOLAR MODULE WEIGHT = 40.79 LBS.
EXPOSURE CATEGORY = B
BASIC WIND SPEED = 115 MPH

STRUCTURAL NOTES:
1) TOTAL ASSEMBLY WEIGHT: 1853.7 LBS
2) TOTAL AREA COVERED BY MODULES: 735.5 FT2
3) DEAD LOAD = 1853.7 / 735.5 = 2.5 LBS/FT2
4) POINT LOAD CALCULATIONS [# OF POINTS (48)] - 38.6 lb/point
5) TOTAL DESIGN LOAD (DOWNFORCE) = 10.7 psf
6) TOTAL DESIGN LOAD (UPFORCE) = -23.5 psf

RAILS TO BE BONDED TO GROUND (EGC) - 690.4 (C)
RAIL SPLICES TO BE ELECTRICALLY BONDED
FLASHING REQUIRED FOR STANDOFF PENETRATIONS
FOLLOW MODULE INSTRUCTION ON FRAME MOUNTING POINT

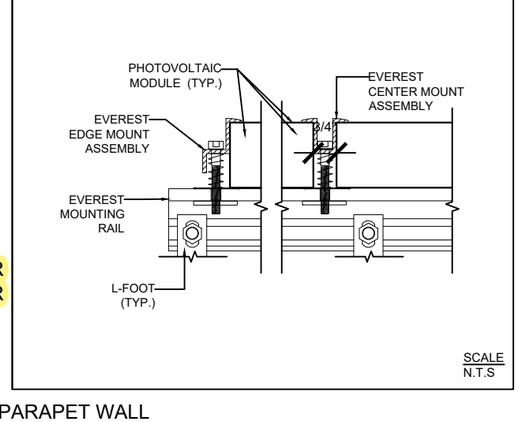


N.T.S.

EQUIPMENT APPEARANCE DATA

ITEM	LRV	COLOR
EVEREST CLAMPS	<10%	BLACK
EVEREST CROSSRAIL	<10%	BLACK
EVEREST TILT CONNECTOR	<10%	BLACK
BARREL STANDOFF	35%	DARK SILVER
L FOOT	35%	DARK SILVER
PV MODULE FRAME	<10%	BLACK

NOTE:
ALL PARAPET WALLS ARE 18" OR HIGHER
PV MODULES NOT TO EXTEND ABOVE THE HEIGHT OF THE PARAPET WALL



SCALE
N.T.S

SHEET: PV2

DATE: 5/19/2020

Revision: 0

Designer:

TITLE: ROOF PLAN 38.000 kW-AC
Folz, Michael Residence 41,280 W-DC
5211 E Arroyo Rd, Paradise Valley , AZ 85253

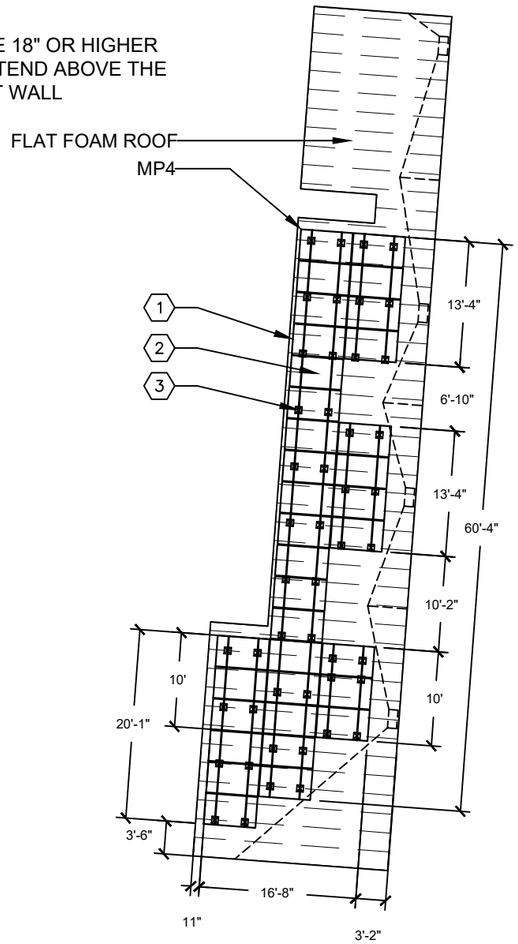
Sun Valley Solar Solutions LLC
3225 N Colorado St. Chandler, AZ 85225
T: (480) 689-5000 / F: (480) 659-3429
www.sunvalleysolar.com

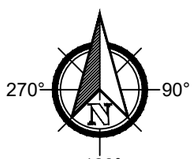
ROOF PLAN

EQUIPMENT APPEARANCE DATA

ITEM	LRV	COLOR
EVEREST CLAMPS	<10%	BLACK
EVEREST CROSSRAIL	<10%	BLACK
EVEREST TILT CONNECTOR	<10%	BLACK
BARREL STANDOFF	35%	DARK SILVER
L FOOT	35%	DARK SILVER
PV MODULE FRAME	<10%	BLACK

NOTE:
ALL PARAPET WALLS ARE 18" OR HIGHER
PV MODULES NOT TO EXTEND ABOVE THE
HEIGHT OF THE PARAPET WALL





SCALE: NTS

NOTE: EXPOSED PV ROOFTOP CONDUCTORS THAT ARE NOT LOCATED UNDER THE ARRAY MODULES, SHALL BE INSTALLED IN A LISTED RACEWAY, AND SHALL INCLUDE LISTED JUNCTION BOXES AT BOTH ENDS OF THE RACEWAY TO TRANSITION FROM EXPOSED CONDUCTORS TO THE LISTED RACEWAYS. NEC ARTICLE 690.31(A) AND (B) EXCEPTION

NOTE: SYSTEM DESIGN IN ACCORDANCE WITH THE 2014 N.E.C.

MP4	PITCH: 0 AZIMUTH: 94 MATERIAL: Foam MOUNTING: Flush Mounted

ROOF LEGEND
- ⊗ GAS VENT
- T-TOP VENT
- DORMER VENT

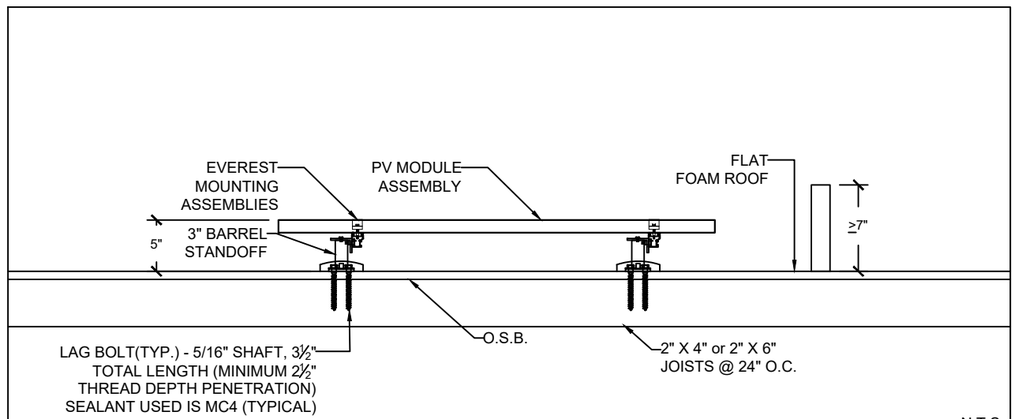
ROOF PLAN NOTES:

1. (NEW) PHOTOVOLTAIC PANEL ARRAY MOUNTED FLUSH TO ROOF WITH 0DEG PITCH
2. 2" x 4" TRUSS @ 24" O.C.
3. RACKING INFORMATION
   - EVEREST MOUNTING RAIL
   - UNIRAC STANDOFF – 3"
   - TRUSS SPACING = 24" O.C.
   - PENETRATION POINTS = 6' SPACING
   - MOUNTING DETAIL

ROOF 4 CALCULATIONS:

DESIGN PER ASCE 7-10 2.4.1 & IBC 2015
SOLAR MODULE WEIGHT = 40.79 LBS.
EXPOSURE CATEGORY = B
BASIC WIND SPEED = 115 MPH
STRUCTURAL NOTES:
1) TOTAL ASSEMBLY WEIGHT: 1663.6 LBS
2) TOTAL AREA COVERED BY MODULES: 660.1 FT2
3) DEAD LOAD = 1663.6 / 660.1 = 2.5 LBS/FT2
4) POINT LOAD CALCULATIONS [# OF POINTS (48)] - 34.7 lb/point
5) TOTAL DESIGN LOAD (DOWNFORCE) = 11.3 psf
6) TOTAL DESIGN LOAD (UPFORCE) = -27.8 psf

RAILS TO BE BONDED TO GROUND (EGC) - 690.4 (C)
RAIL SPLICES TO BE ELECTRICALLY BONDED
FLASHING REQUIRED FOR STANDOFF PENETRATIONS
FOLLOW MODULE INSTRUCTION ON FRAME MOUNTING POINT



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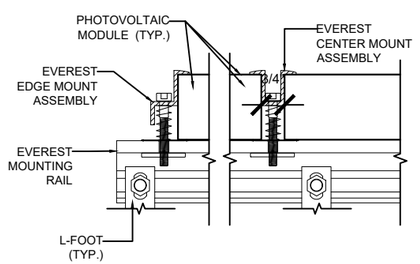

SCALE
N.T.S

SHEET: PV2
DATE: 5/19/2020
Revision: 0
Designer: Evan Jerpbak

TITLE: ROOF PLAN 38.000 kW-AC
Folz, Michael Residence 41.280 W-DC
5211 E Arroyo Rd, Paradise Valley , AZ 85253

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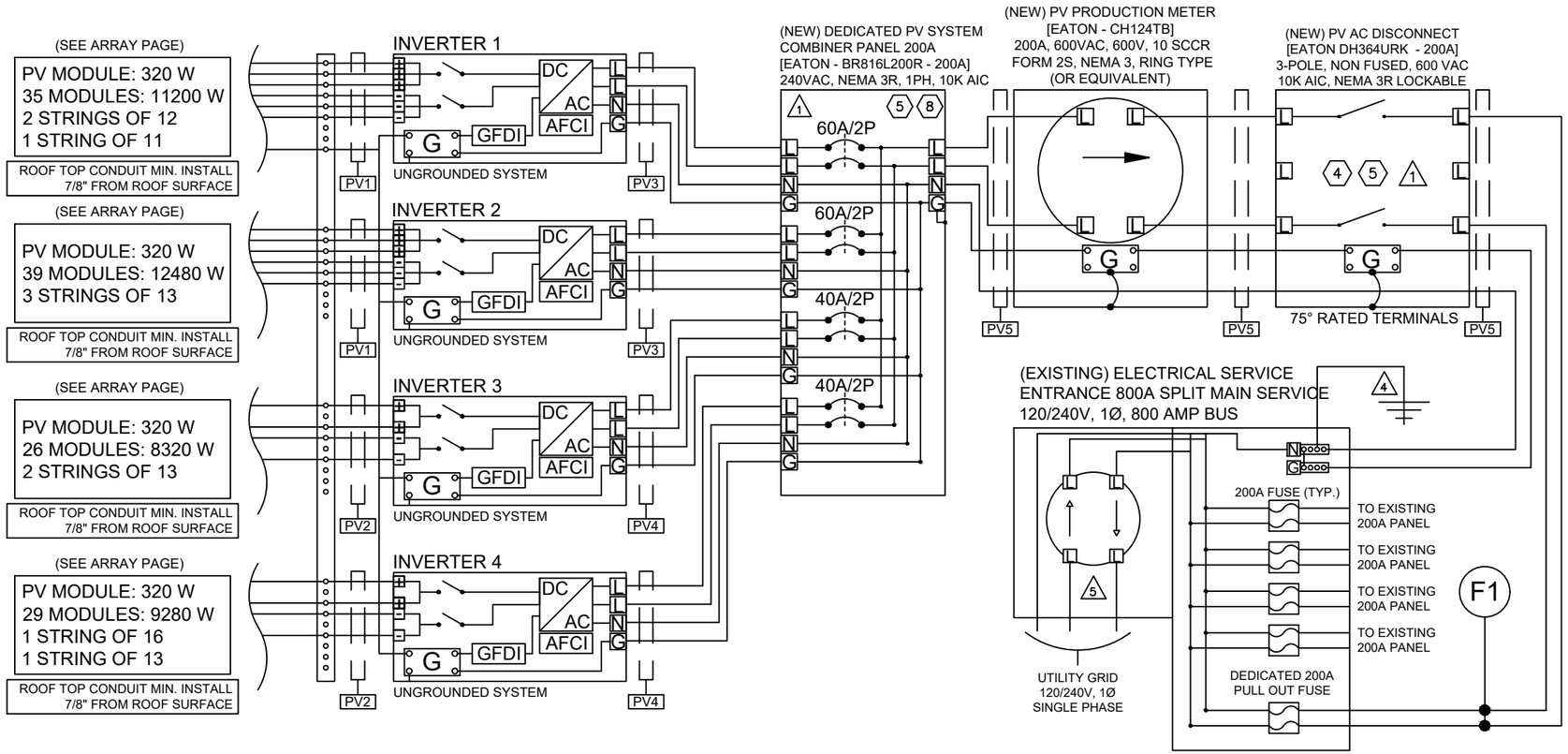


MODULE INFO
Module: REC REC320NP
Pmax: 320 W
Voc: 40.8 VDC
Vmp: 34.4 VDC
Imp: 9.46 A
Isc: 10.27 A
Low Amb Temp (C): -9
Avg High Temp (C): 42

INVERTER 1-2 INFO
SolarEdge SE11400H-US
Max PV Power: 15390 Watt
DC Max Voltage: 600 VDC
AC Nom Power: 11400 Watt
AC Max Output Current: 47.5 Amp
AC OCPD Required: 60A

INVERTER 3-4 INFO
SolarEdge SE7600H-US
Max PV Power: 10260 Watt
DC Max Voltage: 600 VDC
AC Nom Power: 7600 Watt
AC Max Output Current: 32 Amp
AC OCPD Required: 40A

CONDUCTOR SCHEDULE

PV1 6 #10 CU THWN-2
1 #10 CU EGC
in 3/4" EMT CONDUIT

PV2 4 #10 CU THWN-2
1 #10 CU EGC
in 3/4" EMT CONDUIT

ALTERNATE CONDUIT OPTIONS FOR PV1 AND PV2 (CREW TO DECIDE)

CONDUIT 1
10 #10 CU THWN-2
1 #10 CU EGC
in 3/4" EMT CONDUIT

CONDUIT 2
10 #10 CU THWN-2
1 #10 CU EGC
in 3/4" EMT

PV3 2 #6 CU THWN-2
1 #8 CU THWN-2 NEU
1 #8 CU EGC
in 3/4" EMT CONDUIT

PV5 2 #3/0 CU THWN-2
1 #4 CU THWN-2 NEU
1 #4 CU EGC
in 1-1/2" EMT CONDUIT

PV4 3 #8 CU THWN-2
1 #8 CU EGC
in 3/4" EMT CONDUIT

LABEL REQUIREMENTS

1. -LABEL "PHOTOVOLTAIC ARRAY DC DISCONNECT SWITCH" PER NEC 690.14(C)(2). LABEL WITH OPERATING CURRENT, OPERATING VOLTAGE, MAX SYSTEM VOLTAGE AND SHORT CIRCUIT CURRENT PER NEC 690.53.
2. -LABEL WARNING SIGN PER NEC 690.35 READING "WARNING - ELECTRIC SHOCK HAZARD - THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED"
3. -LABEL "PHOTOVOLTAIC POWER SYSTEM DEDICATED KWH METER"
4. -LABEL "PHOTOVOLTAIC SYSTEM AC UTILITY DISCONNECT SWITCH". SWITCH COVER TO BE LOCKABLE. SWITCH TO BE VISIBLE BLADE AND ACCESSIBLE PER UTILITY REQUIREMENTS AND CONFORM TO NEC 705.22.
5. -LABEL WARNING SIGN PER NEC 690.17 READING "WARNING - ELECTRIC SHOCK HAZARD - DO NOT TOUCH TERMINALS. TERMINAL ON BOTH THE LINE AND LOAD SIDE MAY BE ENERGIZED IN THE OPEN POSITION".
6. -LABEL WARNING SIGN PER NEC 705.12(D)(7) READING "WARNING INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCORRECT PROTECTION DEVICE". LOCATE AT OPPOSITE END OF BUS FROM MAIN BREAKER LOCATION
7. -LABEL BREAKER "PHOTOVOLTAIC ELECTRIC POWER SOURCE" PER NEC 705.10, AND "BREAKERS ARE BACKFED" PER NEC 705.12 (D)(5). LABELED WITH THE MAX AC OUTPUT OPERATION CURRENT AND THE OPERATING VOLTAGE PER NEC 690.54.
8. -LABEL COMBINER PANEL "DEDICATED PHOTOVOLATIC SYSTEM COMBINER PANEL" AND "LOADS NOT TO BE ADDED TO THIS PANEL"
9. -LABEL "BREAKER HAS BEEN DE-RATED PER NEC 705.12 (D)(2)"

SYSTEM REQUIREMENTS

1. -EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC 690 AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRIC UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION
2. -LISTING AGENCY NAME AND NUMBERS TO BE INDICATED ON POWER INVERTER AND SOLAR MODULES PER NEC 110.3(B).
3. -METALLIC CONDUIT SHALL BE USED WITHIN BUILDINGS PER NEC 690.31(E). EMT BONDED PER NEC 110.3(B).
4. -GEC TO BE INSTALLED AS REQUIRED BY MANUFACTURER AND NEC 690.47
5. -BI-DIRECTIONAL UTILITY METER TO BE INSTALLED BY UTILITY COMPANY

NOTE: SYSTEM DESIGN IN ACCORDANCE WITH THE 2014 N.E.C.

NEUTRAL IS USED EXCLUSIVELY FOR PHASE AND VOLTAGE DETECTION PER NEC 705.95 (B)

SOLAREDGE OPTIMIZERS FUNCTION AS DISCONNECTING CONDUCTORS TO DE-ENERGIZE PV SOURCE CIRCUITS IN COMPLIENCE WITH NEC SECTION 690.12 (RAPID SHUTDOWN)

FAULT CALCULATIONS

F1
AVAILABLE = 29,294 AIC*
D = 15'
F = 0.386
M = 0.721
Isc = 36,451 AIC
#3/0 AWG CU CONDUCTORS

CALCULATIONS IN ACCORDANCE WITH NEC 110.9 & 110.10

*NOTE: PASS THRU CURRENT LIMITED BY PULL OUT FUSES

SHEET: E1

DATE: 4/15/2020

Revision: 0

Designer: Evan Jerpbak

TITLE: 3-LINE
Folz, Michael Residence 38.000 kW-AC
5211 E Arroyo Rd, Paradise Valley , AZ 85253 41,280 W-DC

Sun Valley Solar Solutions LLC
3225 N Colorado St. Chandler, AZ 85225
T: (480) 689-5000 / F: (480) 659-3429
www.sunvalleysolar.com

INVERTER 1

PV Module = 320 Watts
35 Modules = 11200 Watts
2 Strings of 12 PV Modules
1 String of 11 PV Modules

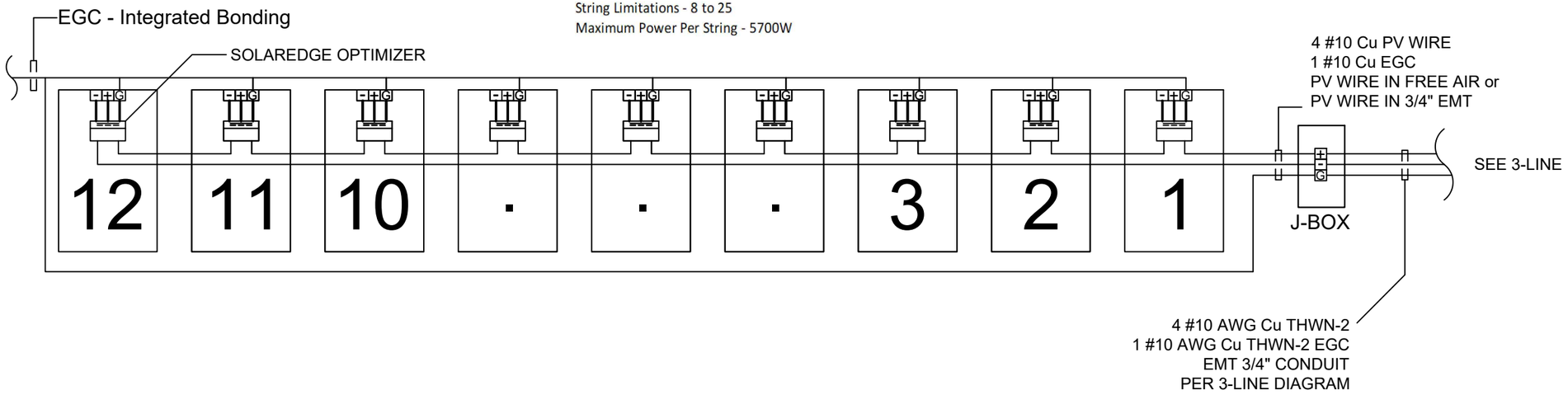
MODULE INFO
Module: REC REC320NP
Pmax: 320 W
Voc: 40.8 VDC
Vmp: 34.4 VDC
Imp: 9.46 A
Isc: 10.27 A
Low Amb Temp (C): -9
Avg High Temp (C): 42

INVERTER 1 INFO
SolarEdge SE11400H-US
Max PV Power: 15390 Watt
DC Max Voltage: 600 VDC
AC Nom Power: 11400 Watt
AC Max Output Current: 47.5 Amp
AC OCPD Required: 60A

NOTE: SYSTEM DESIGN
IN ACCORDANCE WITH
THE 2017 N.E.C.

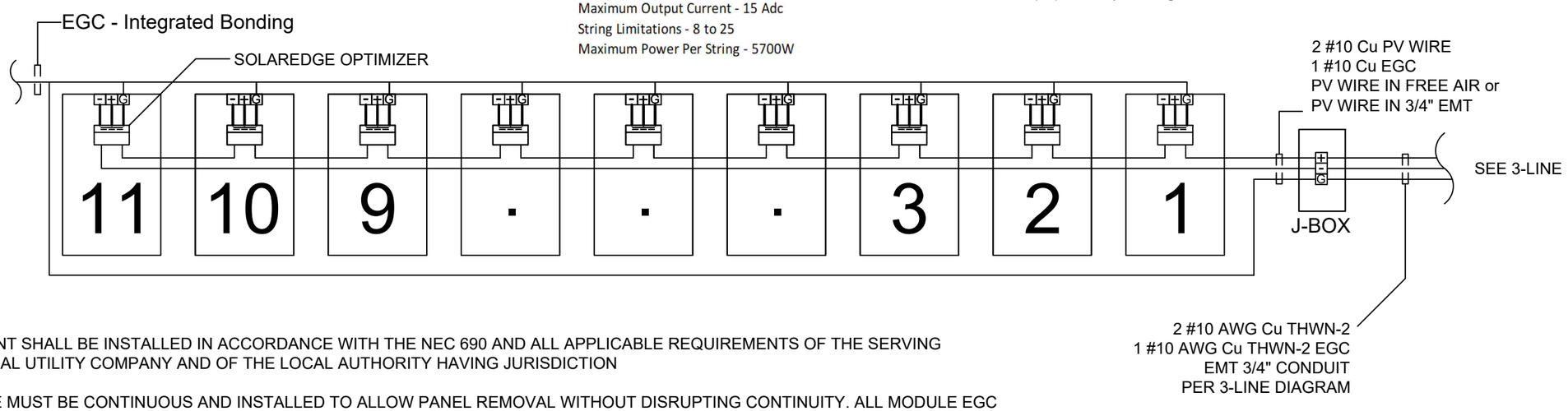
SolarEdge Optimizer P320
Rated DC Input Power - 320W
Maximum Input Voltage - 48 Vdc
MPPT Range - 8 to 48 Vdc
Maximum Input Current - 11 Adc
Maximum Output Current - 15 Adc
String Limitations - 8 to 25
Maximum Power Per String - 5700W

SYSTEM LABEL 690.53 - [ARRAY 1]
RATED MAX. POWER-POINT CURRENT (Imp): 9.60 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 500 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String



SolarEdge Optimizer P320
Rated DC Input Power - 320W
Maximum Input Voltage - 48 Vdc
MPPT Range - 8 to 48 Vdc
Maximum Input Current - 11 Adc
Maximum Output Current - 15 Adc
String Limitations - 8 to 25
Maximum Power Per String - 5700W

SYSTEM LABEL 690.53 - [ARRAY 2]
RATED MAX. POWER-POINT CURRENT (Imp): 8.80 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 500 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String



NOTES

1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC 690 AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRICAL UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION
2. EGC WIRE MUST BE CONTINUOUS AND INSTALLED TO ALLOW PANEL REMOVAL WITHOUT DISRUPTING CONTINUITY. ALL MODULE EGC CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC 690.4(C)
3. FOLLOW MANUFACTURER'S SUGGESTED INSTALLATION PRACTICES AND WIRING SPECIFICATIONS.
4. CONDUCTORS SHALL BE RATED AND LABELED
5. LISTING AGENCY NAME AND NUMBERS TO BE INDICATED ON POWER INVERTER AND SOLAR MODULES PER NEC 110.3(B)
6. METALLIC CONDUIT TO BE USED WITHIN BUILDINGS PER NEC 690.31(E). EMT BONDED PER NEC 250.97

SHEET: E2

DATE: 4/15/2020

Revision: 0

Designer: Evan Jerpbak

TITLE: ARRAY 38.000 kW-AC
Folz, Michael Residence 41,280 W-DC
5211 E Arroyo Rd, Paradise Valley , AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St. Chandler, AZ 85225
T: (480) 689-5000 / F: (480) 659-3429
www.sunvalleysolar.com

INVERTER 2

PV Module = 320 Watts
39 Modules = 12480 Watts
3 Strings of 13 PV Modules

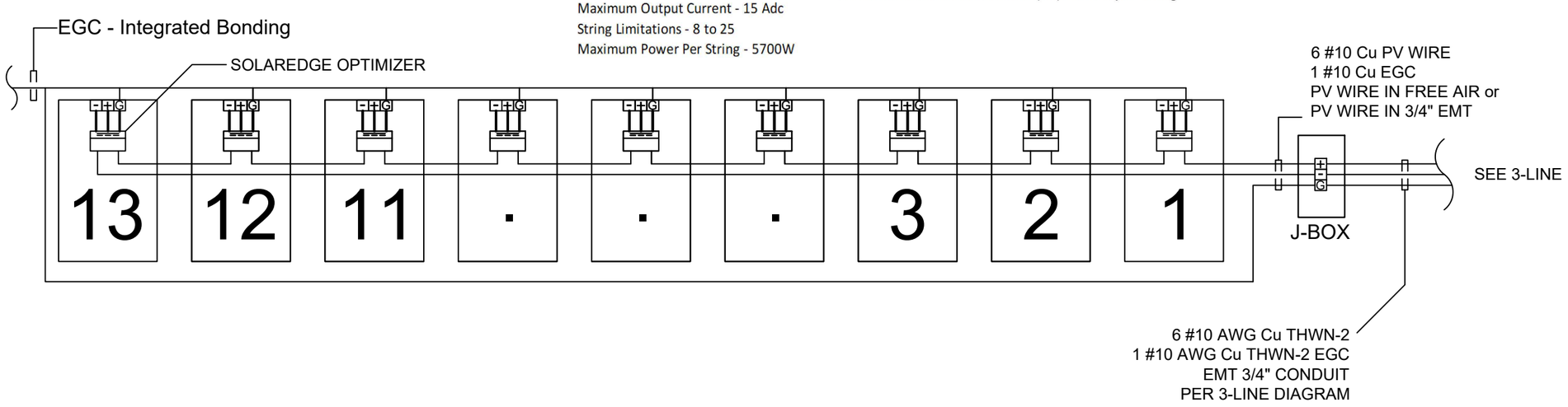
MODULE INFO
Module: REC REC320NP
Pmax: 320 W
Voc: 40.8 VDC
Vmp: 34.4 VDC
Imp: 9.46 A
Isc: 10.27 A
Low Amb Temp (C): -9
Avg High Temp (C): 42

INVERTER 2 INFO
SolarEdge SE11400H-US
Max PV Power: 15390 Watt
DC Max Voltage: 600 VDC
AC Nom Power: 11400 Watt
AC Max Output Current: 47.5 Amp
AC OCPD Required: 60A

NOTE: SYSTEM DESIGN
IN ACCORDANCE WITH
THE 2017 N.E.C.

SolarEdge Optimizer P320
Rated DC Input Power - 320W
Maximum Input Voltage - 48 Vdc
MPPT Range - 8 to 48 Vdc
Maximum Input Current - 11 Adc
Maximum Output Current - 15 Adc
String Limitations - 8 to 25
Maximum Power Per String - 5700W

SYSTEM LABEL 690.53 - [ARRAY 1]
RATED MAX. POWER-POINT CURRENT (Imp): 10.40 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 500 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String



NOTES

1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC 690 AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRICAL UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION
2. EGC WIRE MUST BE CONTINUOUS AND INSTALLED TO ALLOW PANEL REMOVAL WITHOUT DISRUPTING CONTINUITY. ALL MODULE EGC CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC 690.4(C)
3. FOLLOW MANUFACTURER'S SUGGESTED INSTALLATION PRACTICES AND WIRING SPECIFICATIONS.
4. CONDUCTORS SHALL BE RATED AND LABELED
5. LISTING AGENCY NAME AND NUMBERS TO BE INDICATED ON POWER INVERTER AND SOLAR MODULES PER NEC 110.3(B)
6. METALLIC CONDUIT TO BE USED WITHIN BUILDINGS PER NEC 690.31(E). EMT BONDED PER NEC 250.97

SHEET: E2
DATE: 4/15/2020
Revision: 0
Designer: Evan Jerpbak
TITLE: ARRAY 38.000 kW-AC
Folz, Michael Residence 41,280 W-DC
5211 E Arroyo Rd, Paradise Valley , AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St. Chandler, AZ 85225
T: (480) 689-5000 / F: (480) 659-3429
www.sunvalleysolar.com

INVERTER 3

PV Module = 320 Watts
26 Modules = 8320 Watts
2 Strings of 13 PV Modules

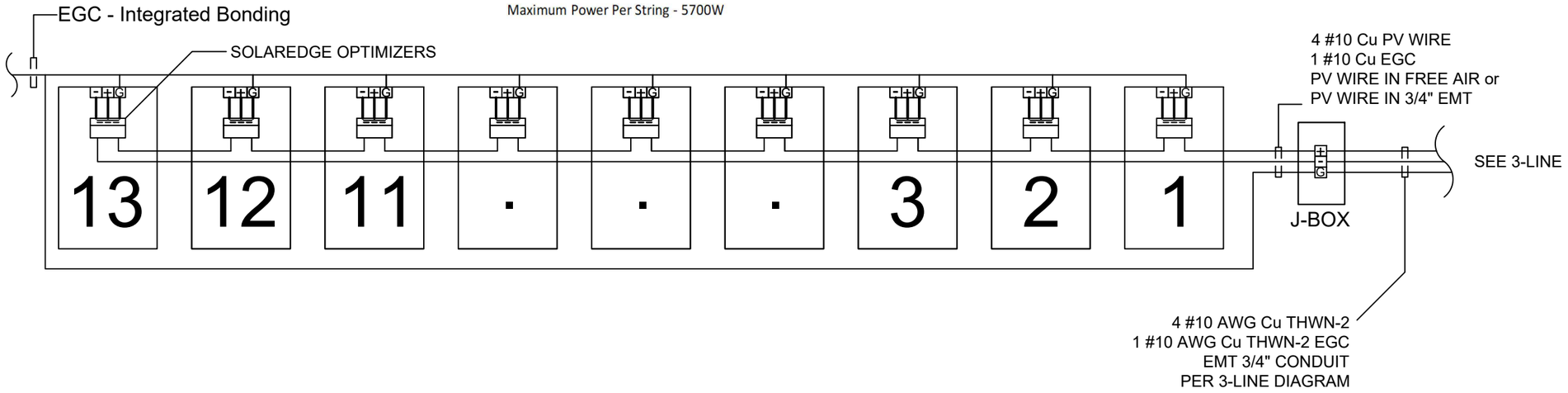
MODULE INFO
Module: REC REC320NP
Pmax: 320 W
Voc: 40.8 VDC
Vmp: 34.4 VDC
Imp: 9.46 A
Isc: 10.27 A
Low Amb Temp (C): -9
Avg High Temp (C): 42

INVERTER INFO
SolarEdge SE7600H-US
Max PV Power: 10260 Watt
DC Max Voltage: 600 VDC
AC Nom Power: 7600 Watt
AC Max Output Current: 32 Amp
AC OCPD Required: 40A

NOTE: SYSTEM DESIGN
IN ACCORDANCE WITH
THE 2017 N.E.C.

SolarEdge Optimizer P320
Rated DC Input Power - 320W
Maximum Input Voltage - 48 Vdc
MPPT Range - 8 to 48 Vdc
Maximum Input Current - 11 Adc
Maximum Output Current - 15 Adc
String Limitations - 8 to 25
Maximum Power Per String - 5700W

SYSTEM LABEL 690.53 - [ARRAY 1]
RATED MAX. POWER-POINT CURRENT (Imp): 10.40 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 500 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String



NOTES

1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC 690 AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRICAL UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION
2. EGC WIRE MUST BE CONTINUOUS AND INSTALLED TO ALLOW PANEL REMOVAL WITHOUT DISRUPTING CONTINUITY. ALL MODULE EGC CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC 690.4(C)
3. FOLLOW MANUFACTURER'S SUGGESTED INSTALLATION PRACTICES AND WIRING SPECIFICATIONS.
4. CONDUCTORS SHALL BE RATED AND LABELED
5. LISTING AGENCY NAME AND NUMBERS TO BE INDICATED ON POWER INVERTER AND SOLAR MODULES PER NEC 110.3(B)
6. METALLIC CONDUIT TO BE USED WITHIN BUILDINGS PER NEC 690.31(E). EMT BONDED PER NEC 250.97

SHEET: E2

DATE: 4/15/2020

Revision: 0

Designer: Evan Jerpbak

TITLE: ARRAY
38.000 kW-AC
Folz, Michael Residence 41,280 W-DC
5211 E Arroyo Rd, Paradise Valley , AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St. Chandler, AZ 85225
T: (480) 689-5000 / F: (480) 659-3429
www.sunvalleysolar.com

INVERTER 4

PV Module = 320 Watts
29 Modules = 9280 Watts
1 String of 16 PV Modules
1 String of 13 PV Modules

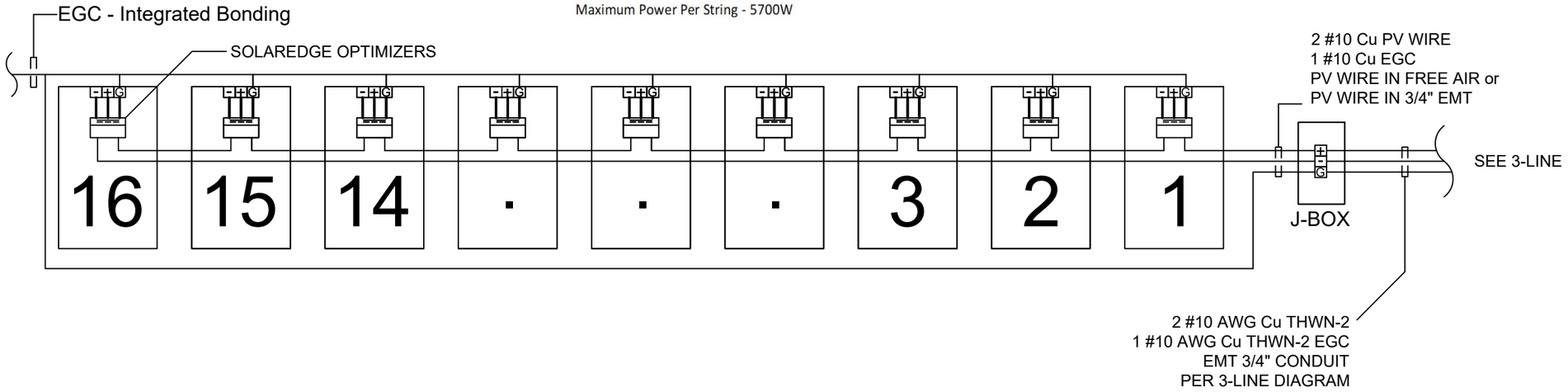
MODULE INFO
Module: REC REC320NP
Pmax: 320 W
Voc: 40.8 VDC
Vmp: 34.4 VDC
Imp: 9.46 A
Isc: 10.27 A
Low Amb Temp (C): -9
Avg High Temp (C): 42

INVERTER INFO
SolarEdge SE7600H-US
Max PV Power: 10260 Watt
DC Max Voltage: 600 VDC
AC Nom Power: 7600 Watt
AC Max Output Current: 32 Amp
AC OCPD Required: 40A

NOTE: SYSTEM DESIGN
IN ACCORDANCE WITH
THE 2017 N.E.C.

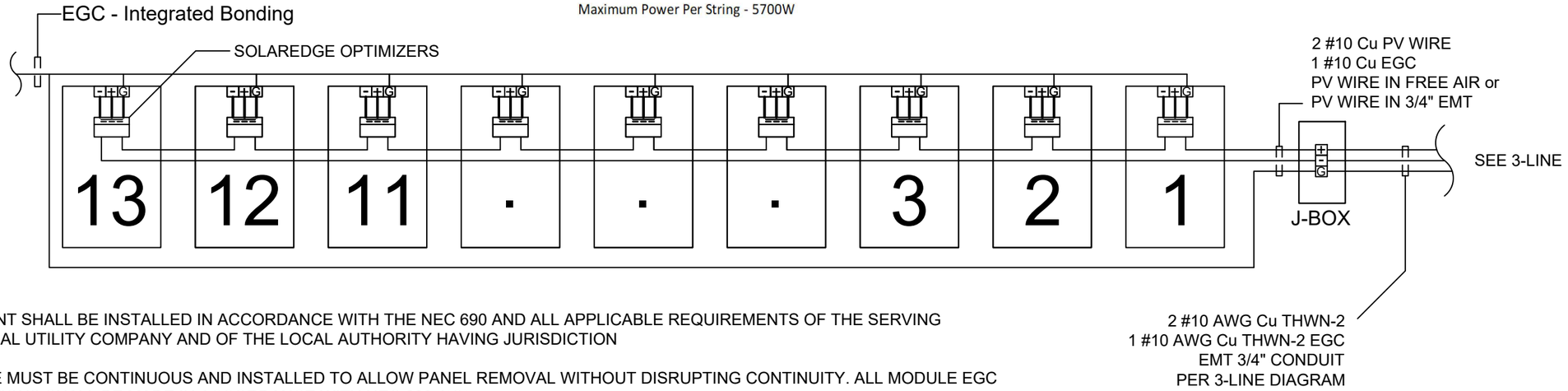
SolarEdge Optimizer P320
Rated DC Input Power - 320W
Maximum Input Voltage - 48 Vdc
MPPT Range - 8 to 48 Vdc
Maximum Input Current - 11 Adc
Maximum Output Current - 15 Adc
String Limitations - 8 to 25
Maximum Power Per String - 5700W

SYSTEM LABEL 690.53 - [ARRAY 1]
RATED MAX. POWER-POINT CURRENT (Imp): 12.80 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String



SolarEdge Optimizer P320
Rated DC Input Power - 320W
Maximum Input Voltage - 48 Vdc
MPPT Range - 8 to 48 Vdc
Maximum Input Current - 11 Adc
Maximum Output Current - 15 Adc
String Limitations - 8 to 25
Maximum Power Per String - 5700W

SYSTEM LABEL 690.53 - [ARRAY 2]
RATED MAX. POWER-POINT CURRENT (Imp): 10.40 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String



NOTES

1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC 690 AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRICAL UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION
2. EGC WIRE MUST BE CONTINUOUS AND INSTALLED TO ALLOW PANEL REMOVAL WITHOUT DISRUPTING CONTINUITY. ALL MODULE EGC CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC 690.4(C)
3. FOLLOW MANUFACTURER'S SUGGESTED INSTALLATION PRACTICES AND WIRING SPECIFICATIONS.
4. CONDUCTORS SHALL BE RATED AND LABELED
5. LISTING AGENCY NAME AND NUMBERS TO BE INDICATED ON POWER INVERTER AND SOLAR MODULES PER NEC 110.3(B)
6. METALLIC CONDUIT TO BE USED WITHIN BUILDINGS PER NEC 690.31(E). EMT BONDED PER NEC 250.97

SHEET: E2

DATE: 4/15/2020

Revision: 0

Designer: Evan Jerpbak

TITLE: ARRAY 38.000 kW-AC
Folz, Michael Residence 41,280 W-DC
5211 E Arroyo Rd, Paradise Valley , AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St. Chandler, AZ 85225
T: (480) 689-5000 / F: (480) 659-3429
www.sunvalleysolar.com

SYSTEM EQUIPMENT TAG LIST

REQ'D BY: NEC 690.5 (C)
APPLY TO: TRANSFORMERLESS INVERTERS / DC J-BOX / DC DISCONNECTS

WARNING
ELECTRIC SHOCK HAZARD.
THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

REQ'D BY: NEC 690.54
APPLY TO: AC PANEL

PHOTOVOLATIC POWER SOURCE
BREAKERS ARE BACKFED
MAX AC CURRENT: 95 A
OPERATING VOLTAGE: 240 VAC

REQ'D BY:
APPLY TO: PV KWH METER

PHOTOVOLTAIC SYSTEM METER

REQ'D BY: NEC 690.14(C)(2)
APPLY TO: AC DISCONNECT

PHOTOVOLTAIC SYSTEM
AC UTILITY DISCONNECT SWITCH

REQ'D BY: NEC 690.17
APPLY TO: DISCONNECT, COMBINER PANELS

WARNING - ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS - TERMINALS ON BOTH THE LINE AND LOAD MAY BE ENERGIZED IN THE OFF POSITION

REQ'D BY:
APPLY TO: DEAD FRONT

PHOTOVOLTAIC
POWER SOURCE
BREAKERS ARE
BACKFEEDING

REQ'D BY: IFC 605.11.1.1 -605.11.1.4
NEC 690.31 (E)(3)

- LABEL WITH CAPITALIZED LETTERS MINIMUM HEIGHT 3/8 INCH WHITE LETTERS ON RED BACKGROUND
- LABEL MUST BE REFLECTIVE AND WEATHER RESISTANT
- LABEL PLACED ON INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES AND CABLE ASSEMBLIES EVERY 10 FEET, WITHIN 1 FOOT OF TURNS OR BENDS AND WITHIN 1 FOOT ABOVE AND BELOW PENETRATIONS OF ROOF/CELINGS ASSEMBLIES, WALL OR BARRIERS.

WARNING: PHOTOVOLTAIC POWER SOURCE

WARNING: PHOTOVOLTAIC POWER SOURCE

WARNING:
PHOTOVOLTAIC
POWER SOURCE

NOTE: SYSTEM DESIGN IN ACCORDANCE WITH THE 2014 N.E.C.

REQ'D BY: NEC 705.12 (D)(2)
APPLY TO: ABOVE MAIN BREAKER

BREAKER HAS BEEN DE-RATED
PER NEC 705.12 (D)(2)

REQ'D BY: UTILITY & NEC 2014 - 705.10
APPLY TO:

WARNING
OTHER POWER SOURCE CONNECTED IS A PHOTOVOLTAIC SYSTEM
UTILITY DISCONNECT SWITCH FOR THIS SOURCE IS LOCATED APPROX.

REQ'D BY:
APPLY TO: FRONT COMBINER PANEL

DEDICATED PHOTOVOLTAIC
SYSTEM COMBINER PANEL
LOADS NOT TO BE ADDED
TO THIS PANEL

REQ'D BY: SUN VALLEY SOLAR
APPLY TO: INVERTERS

QUALITY INSTALLATION BY:
SUN VALLEY SOLAR SOLUTIONS
3225 N Colorado St
Chandler, AZ 85225
PHONE: 1 888 5 SOLAR UP

REQ'D BY: NEC 2014 - 690.12
APPLY TO: RAPID SHUTDOWN DEVICE

PHOTOVOLTAIC SYSTEM
EQUIPPED WITH
RAPID SHUTDOWN

RAPID SHUTDOWN
LOCATED AT

REQ'D BY: NEC 690.53
APPLY TO: DC DISCONNECT

INVERTER
1

PHOTOVOLTAIC ARRAY DC
DISCONNECT SWITCH
Voc: 500 Vdc Vop: 400 Vdc
Isc: 15 A Imp: 9.60 A
Max MPPT Voltage: 500 Vdc
Max System Voltage: 500 Vdc
STRING 1-2

PHOTOVOLTAIC ARRAY DC
DISCONNECT SWITCH
Voc: 500 Vdc Vop: 400 Vdc
Isc: 15 A Imp: 8.80 A
Max MPPT Voltage: 500 Vdc
Max System Voltage: 500 Vdc
STRING 3

INVERTER
2

PHOTOVOLTAIC ARRAY DC
DISCONNECT SWITCH
Voc: 500 Vdc Vop: 400 Vdc
Isc: 15 A Imp: 10.4 A
Max MPPT Voltage: 500 Vdc
Max System Voltage: 500 Vdc
STRING 1-3

INVERTER
3

PHOTOVOLTAIC ARRAY DC
DISCONNECT SWITCH
Voc: 500 Vdc Vop: 400 Vdc
Isc: 15 A Imp: 10.40 A
Max MPPT Voltage: 500 Vdc
Max System Voltage: 500 Vdc
STRING 1-2

INVERTER
4

PHOTOVOLTAIC ARRAY DC
DISCONNECT SWITCH
Voc: 500 Vdc Vop: 400 Vdc
Isc: 15 A Imp: 12.8 A
Max MPPT Voltage: 500 Vdc
Max System Voltage: 500 Vdc
STRING 1

PHOTOVOLTAIC ARRAY DC
DISCONNECT SWITCH
Voc: 500 Vdc Vop: 400 Vdc
Isc: 15 A Imp: 10.4 A
Max MPPT Voltage: 500 Vdc
Max System Voltage: 500 Vdc
STRING 2

SHEET: L1

DATE: 4/15/2020

Revision: 0

Designer: Evan Jerpbak

TITLE: LABELS - SAFETY

38.000 kW-AC
41,280 W-DC

Folz, Michael Residence
5211 E Arroyo Rd, Paradise Valley , AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St, Chandler, AZ 85225
T: (480) 689-5000 / F: (480) 659-3429
www.sunvalleysolar.com

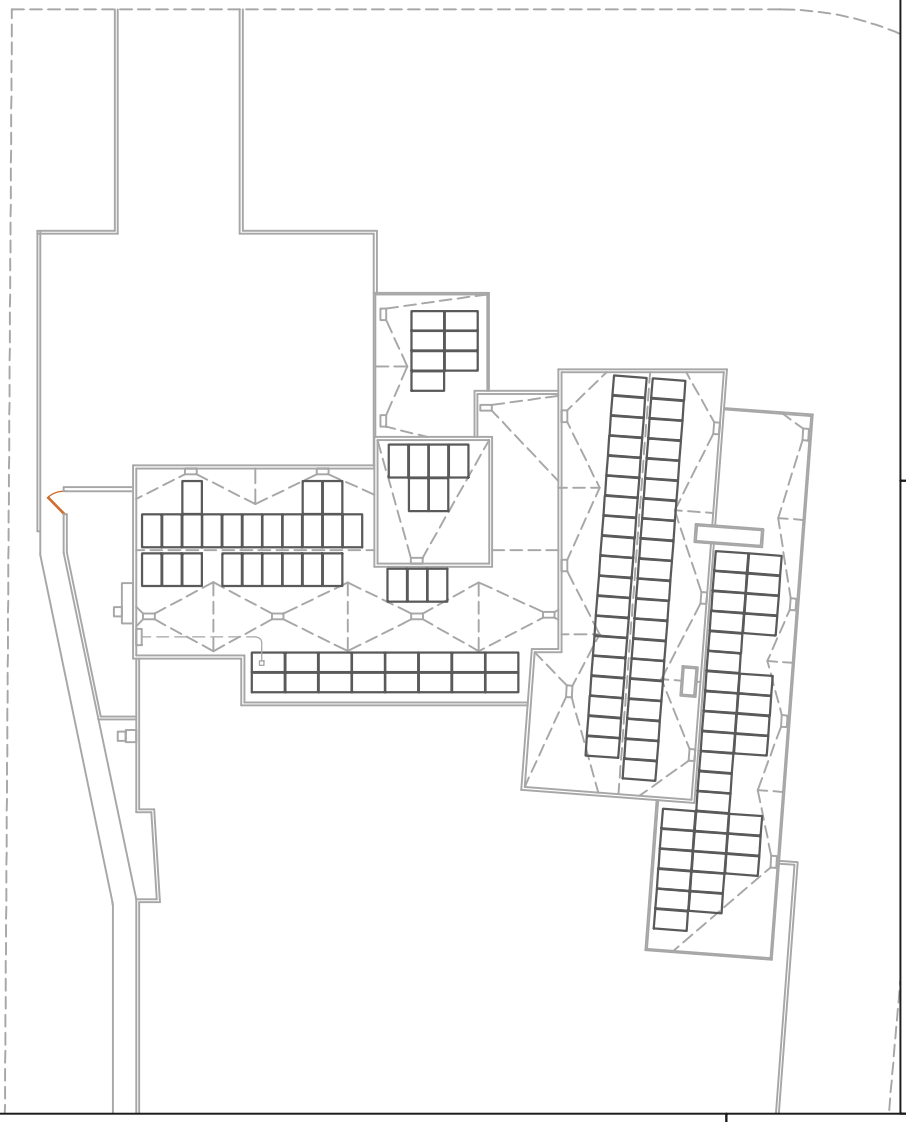
Notes:
-
-
-

Competent Person: _____

Crew Lead: _____

Emergency Center

N



REQUIRED PPE

- ☐ STEEL TOE BOOTS
- ☐ HARD HAT
- ☐ HARNESS/FALL PROTECTION
- ☐ SAFTEY GLASSES
- ☐ GLOVES
- ☐ HIGH VOLTAGE GLOVES

ELECTRICAL PPE CAT

- ☐ -0
- ☐ -1
- ☐ -2
- ☐ -3
- ☐ -4

SPECIALTY

Mark Up Key

- (P) Permanent Anchor
- (T) Temporary Anchor
- (D) Warning Line Delineator
- (G) Guard Rail Stanchon
- [IL] Installer Ladder
- [AL] Auditor Ladder
- [CB] Combiner Box
- [SO] Stubout
- ☒ SkyLight
- No Ladder Access
- ☐ Restricted Area
- Conduit

Installer Signatures:

Print	Signature
1._____	_____
2._____	_____
3._____	_____
4._____	_____
5._____	_____
6._____	_____
7._____	_____
8._____	_____

OSHA SECTIONS PURSUANT TO JOB TASKS:

- ☐ PPE & Life Saving Equip-1926 Subpart E
- ☐ Lifelines & Lanyards-1926.104
- ☐ Tools-Hand and Power-1926-Subpart I
- ☐ Toxic Substances-1926 Subpart Z
- ☐ Steel Erection- 1926 Subpart R
- ☐ Ladders-1926 Subpart X
- ☐ Fall Protection-1926 Subpart M
- ☐ Electrical-1926 Subpart K
- ☐ Excavation-1926 Subpart P
- ☐ First Aid & Medical-1926.23

SHEET: L1

DATE: 4/1/2020

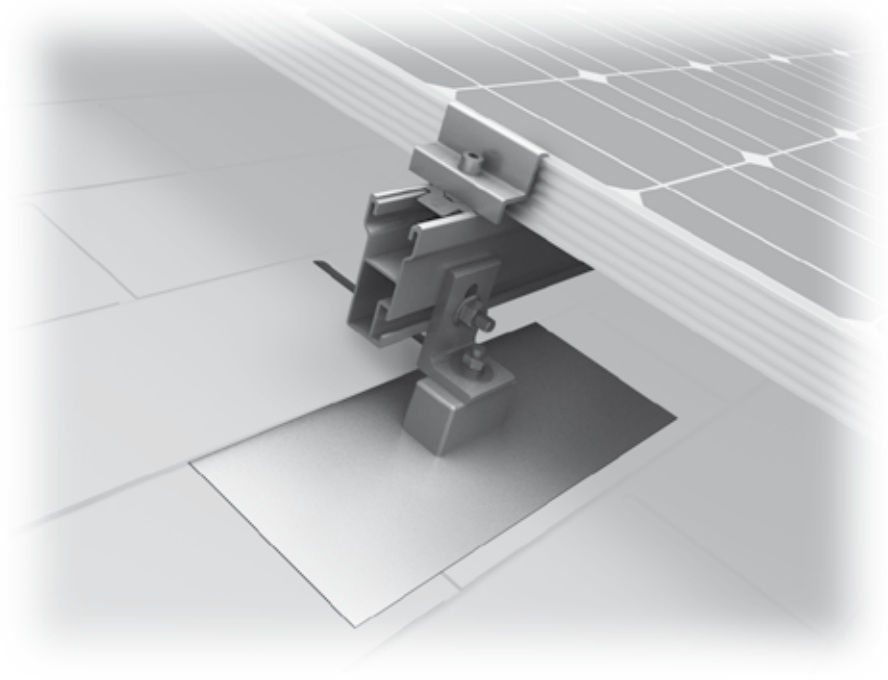
Revision: 0

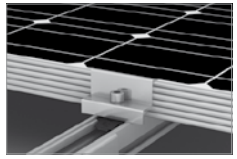
Designer:

TITLE: SAFETY PLAN 38.400 kW-AC
Folz, Michael Residence 41,280 W-DC
5211 E Arroyo Rd, Paradise Valley , AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St. Chandler, AZ 85225
T: (480) 689-5000 / F: (480) 659-3429
www.sunvalleysolar.com

Mounting systems for solar technology





Everest Solar Systems, LLC
3809 Ocean Ranch Blvd., Suite 111
Oceanside, CA 92056
Service-Hotline +1.760.301.5300
info@everest-solarsystems.com
www.everest-solarsystems.com

Produktblatt QuickMount-CrossRail | US3 | 1113

EVEREST SOLAR SYSTEMS
RESIDENTIAL ROOF SOLUTIONS
CROSSRAIL SYSTEM

CROSSRAIL SYSTEM

- High quality, German engineered system optimized for residential installation
- Everest M K2 mounting hardware simplifies module installation – fast, easy, and secure
- Easily integrates with third party roof attachment products, such as QuickMountPV
- L-foot provides adjustability and compatibility with common roof interfaces (Comp, Tile & Metal)
- No shingle cutting, won't void roof manufacturer's warranty
- 100% code-compliant, structural validation for all solar states
- Two rail sizes available to suit all structural conditions
- Fast installation, minimal component count result in low total installed cost
- Simple to design and permit using code compliant "Everest Base" software

Technical data	
Applicable Roof Types	composition shingle, tile, flat tile
Flexibility	modular construction, suitable for any system size, height adjustable
PV-Modules	for all common module types
Module orientation	portrait and landscape
Material	high corrosion resistance, stainless steel and high grade aluminum
Roof attachement	screw connection into rafter
Structural Validity	IBC compliant, stamped engineering letters available for all solar states
Warranty	10 years
System components	CrossRail 36, 48 or 80, L-Foot, mid and end clamp sets, M K2, third-party roof attachment products such as QuickMountPV

Flashing System with CrossRail 48 for asphalt shingle roofs

SOLAR'S MOST TRUSTED

REC

REC N-PEAK SERIES

PREMIUM MONO N-TYPE SOLAR PANELS WITH SUPERIOR PERFORMANCE

MONO N-TYPE: THE MOST EFFICIENT C-SI TECHNOLOGY

NO LIGHT INDUCED DEGRADATION

SUPER-STRONG FRAME UP TO 7000 PA SNOW LOAD

FLEXIBLE INSTALLATION OPTIONS

IMPROVED PERFORMANCE IN SHADED CONDITIONS

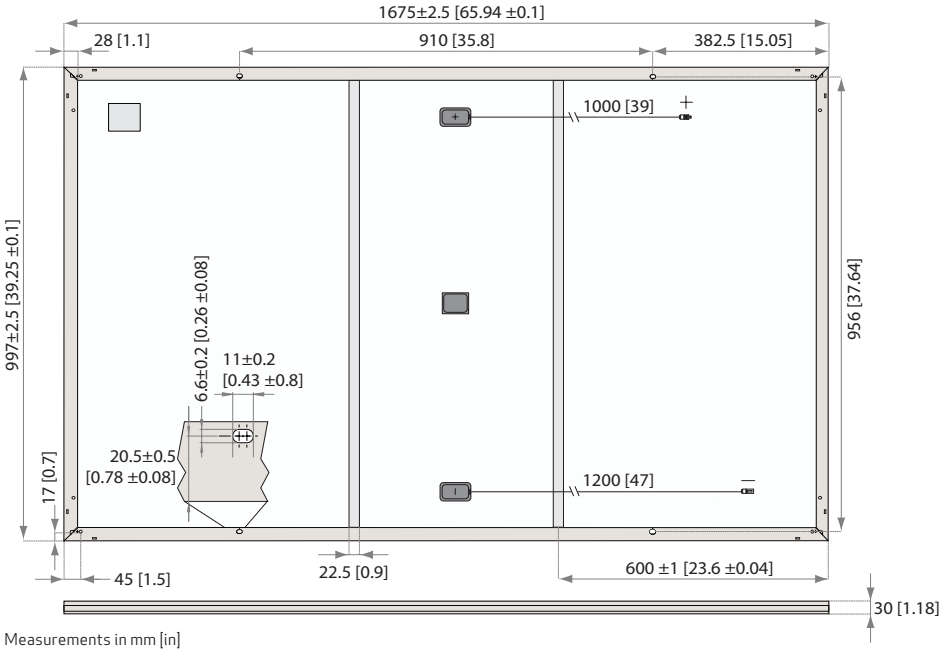
GUARANTEED HIGH POWER OVER LIFETIME

330 Wp POWER

20 YEAR PRODUCT WARRANTY

0.5% ANNUAL DEGRADATION OVER 25-YEAR POWER WARRANTY

REC N-PEAK SERIES



Measurements in mm [in]

GENERAL DATA

Cell type:	120 half-cut n-type mono c-Si cells 6 strings of 20 cells in series
Glass:	0.13" (3.2 mm) solar glass with anti-reflection surface treatment
Backsheet:	Highly resistant polymeric construction
Frame:	Anodized aluminum (black)
Junction box:	3-part, 3 bypass diodes, IP67 rated in accordance with IEC 62790
Cable:	12 AWG (4 mm²) PV wire, 39 + 47" (1 m + 1.2 m) in accordance with EN 50618
Connectors:	Stäubli MC4 PV-KBT4/KST4, 12 AWG(4 mm²) in accordance with IEC 62852 IP68 only when connected
Origin:	Made in Singapore

MECHANICAL DATA

Dimensions:	65.9 x 39.25 x 1.1" (1675 x 997 x 30 mm)
Area:	17.98 ft²(1.67 m²)
Weight:	39.7 lbs (18 kg)

ELECTRICAL DATA @ STC

Product code*: RECxxxNP					
Nominal Power - P_{MPP} (Wp)	310	315	320	325	330
Watt Class Sorting - (W)	-0/+5	-0/+5	-0/+5	-0/+5	-0/+5
Nominal Power Voltage - V_{MPP} (V)	33.6	33.9	34.2	34.4	34.6
Nominal Power Current - I_{MPP} (A)	9.24	9.31	9.37	9.46	9.55
Open Circuit Voltage - V_{OC} (V)	40.2	40.5	40.8	41.0	41.3
Short Circuit Current - I_{SC} (A)	10.01	10.09	10.18	10.27	10.36
Panel Efficiency (%)	18.6	18.9	19.2	19.5	19.8

Values at standard test conditions (STC: air mass AM 1.5, irradiance 1000 W/m², temperature 25°C), based on a production spread with a tolerance of V_{OC} & I_{SC} ±3% within one watt class. * Where xxx indicates the nominal power class (P_{MPP}) at STC above.

ELECTRICAL DATA @ NOCT

Product code*: RECxxxNP					
Nominal Power - P_{MPP} (Wp)	234	238	241	245	249
Nominal Power Voltage - V_{MPP} (V)	31.1	31.4	31.7	31.9	32.1
Nominal Power Current - I_{MPP} (A)	7.51	7.56	7.62	7.69	7.76
Open Circuit Voltage - V_{OC} (V)	37.3	37.5	37.8	38.0	38.3
Short Circuit Current - I_{SC} (A)	8.01	8.07	8.14	8.22	8.29

Nominal operating cell temperature (NOCT: air mass AM 1.5, irradiance 800 W/m², temperature 20°C, windspeed 1 m/s).
* Where xxx indicates the nominal power class (P_{MPP}) at STC above.

MAXIMUM RATINGS

Operational temperature:	-40 ... +85°C
Maximum system voltage:	1000 V
Design load (+): snow	4666 Pa (97.5 lbs/ft²)*
Maximum test load (+):	7000 Pa (146 lbs/ft²)*
Design load (-): wind	1600 Pa (33.4 lbs/ft²)*
Maximum test load (-):	2400 Pa (50 lbs/ft²)*
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 Operating Cell Temperature:	44°C (±2°C)
Temperature coefficient of P_{MPP}:	-0.35 %/°C
Temperature coefficient of V_{OC}:	-0.27 %/°C
Temperature coefficient of I_{SC}:	0.04 %/°C

*The temperature coefficients stated are linear values

CERTIFICATIONS

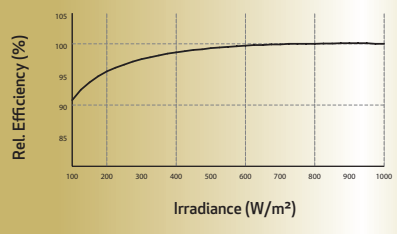
UL 1703 (Fire type 2); IEC 61215, IEC 61730
IEC 62804 (PID), IEC 61701 (Salt Mist), IEC 62716 (Ammonia),
ISO 9001: 2015, ISO 14001: 2004, OHSAS 18001: 2007

WARRANTY

20 year product warranty
25 year linear power output warranty, maximum degression in performance of 0.5% p.a., giving 86% at end of year 25.
See warranty conditions for further details.

LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC.



Specifications subject to change without notice.

Ref: NE-05-11-Rev- B 01.19

Founded in Norway in 1996, REC is a leading vertically integrated solar energy company. Through integrated manufacturing from silicon to wafers, cells, high-quality panels and extending to solar solutions, REC provides the world with a reliable source of clean energy. REC's renowned product quality is supported by the lowest warranty claims rate in the industry. REC is a Bluestar Elkem company with headquarters in Norway and operational headquarters in Singapore. REC employs more than 2,000 people worldwide, producing 1.5 GW of solar panels annually.

REC

www.recgroup.com

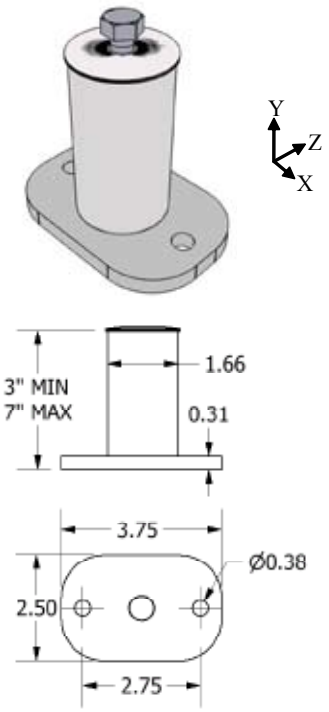
2-Piece Standoff Technical Datasheet

Pub 101026-1td V1.0 October 2010

Standoffs

2-Piece Aluminum Standoffs

Part No. 310503, 310504, 310506, 310507, 310553, 310554, 310556, 310557, 310603, 310604, 310606, 310607, 310653, 310654, 310656, 310657



Dimensions specified in inches unless noted

Standoff and Base Material:

- One of the following extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
- Ultimate tensile: 38 ksi; Yeild: 35 ksi
- Clear or Dark anodized

Weight:

- 3" Standoff (as shown): 0.522 pounds (237 g)
- Add 0.086 pounds per inch (39 g/ inch)

Allowable and design loads are valid for a Unirac 2-piece aluminum standoff

Attach with zinc plated carbon steel or stainless steel fasteners

Resistance and safety factors are determined according to Part 1A section 9 of the 2005 Aluminum Design Manual

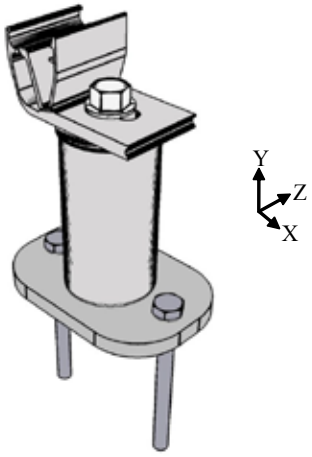
NOTE: Loads are given for the standoff only. Check load limits for lag screw or other attachment method.

Applied Load Direction	Average Ultimate Load lbs (N)	Allowable Load lbs (N)	Safety Factor, W	Design Load lbs (N)	Resistance Factor, F
Tension/ Compression, Y±	3266 (14528)	1089 (4844)	3.00	1633 (7264)	0.500
↻Z Bending, Applied Moment*	559 ft lbs (758 Nm)	250 ft lbs (339 Nm)	2.24	378 ft lbs (512 Nm)	0.676

*Example: If the module is mounted 6" (0.5 ft) from the base of the standoff, the allowable side load is 250 ft*lbs/ 0.5 ft = 500 lbs

2-Piece Aluminum Standoff with SolarMount-I 1-flange connection

Part No. 05013C, 05014C, 05016C, 05017C



Reference the SolarMount-I series datasheet for 1-flange connection specifications.

For the 1-flange connection to standoff:

- Use included 1 ¾" EPDM washer between the 1-flange connection and standoff
- Assemble with included 300 series stainless steel ⅜"-16 flanged hex head screw
- Use anti-seize and tighten to 30 ft-lbs of torque

Allowable and design loads are valid when components are assembled according to authorized Unirac documents.

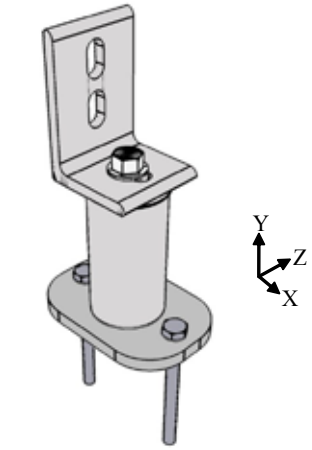
1-Flange connections are compatible with SolarMount-I series beams.

Resistance factors and allowable loads are determined according to part 1A section 9 of the 2005 Aluminum Design Manual.

NOTE: Loads are for the connection and standoff only. Check load limits for the lag screw or other attachment method.

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor, FS	Design Loads lbs (N)	Resistance Factor, Φ
Tension, Y+	1415 (6294)	635 (2825)	2.23	960 (4270)	0.679
Compression, Y-	1949 (8670)	873 (3883)	2.23	1320 (5872)	0.677
Transverse, X-, downhill	635 (2825)	313 (1392)	2.03	473 (2104)	0.745
Transverse, X+, uphill	42 (187)	20 (89)	2.15	30 (133)	0.705
↻Z Bending, Applied Moment	559 ft lbs (758 Nm)	250 ft lbs (339 Nm)	2.24	378 ft lbs (512 Nm)	0.676

2-Piece Aluminum Standoff with L-foot connection



Reference the SolarMount datasheet for L-foot specifications.

For the L- foot to standoff connection:

- Use included 1 ¾" EPDM washer between the L-foot and standoff
- Assemble with included 300 series stainless steel ⅜"-16 flanged hex head screw
- Use anti-seize and tighten to 30 ft-lbs of torque

Allowable and design loads are valid when components are assembled according to authorized Unirac documents.

L-feet are compatible with SolarMount, SolarMount Heavy Duty, and SunFrame rails.

Resistance factors and allowable loads are determined according to part 1A section 9 of the 2005 Aluminum Design Manual.

NOTE: Loads are for the connection and standoff only. Check load limits for the lag screw or other attachment method.

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor, FS	Design Loads lbs (N)	Resistance Factor, Φ
Tension, Y+	1859 (8269)	707 (3144)	2.63	1069 (4755)	0.575
Compression, Y-	3258 (14492)	1325 (5893)	2.46	2004 (8913)	0.615
Sliding, Z±	1766 (7856)	755 (3356)	2.34	1141 (5077)	0.646
Transverse, X±	486 (2162)	213 (949)	2.28	323 (1436)	0.664
↻Z Bending, Applied Moment	559 ft lbs (758 Nm)	250 ft lbs (339 Nm)	2.24	378 ft lbs (512 Nm)	0.676

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

Value-Added Improvements

- World's first Secure Power Supply now offers up to 2,000 W
- Full grid management capabilities ensures a utility-compliant solution for any market

Reduced Labor

- New Installation Assistant with direct access via smartphone minimizes time in the field
- Integrated disconnect simplifies equipment stocking and speeds installation

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
- Enhanced AFCI technology reduces false tripping while improving sensitivity in real arcs, greatly reducing unneeded service calls

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

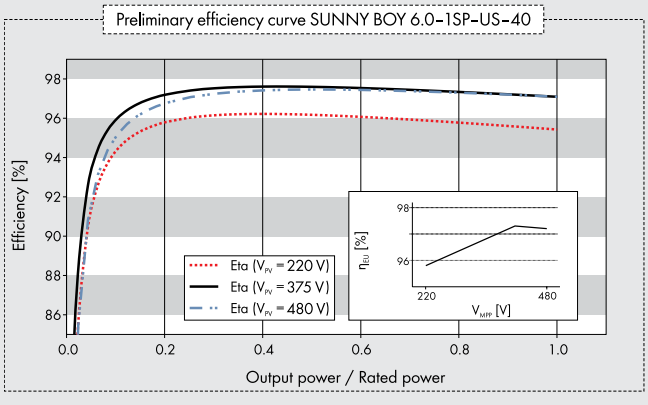
The residential PV market is changing rapidly, and we understand that your bottom line matters more than ever. That's why we've designed a superior residential solution that will help you decrease costs throughout all stages of your business operations. The Sunny Boy 3.0-US/3.8-US/5.0-US/6.0-US/7.0-US/7.7-US 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 is working to help your business operate more efficiently.

Technical data	Sunny Boy 3.0-US *		Sunny Boy 3.8-US *		Sunny Boy 5.0-US	
	208 V	240 V	208 V	240 V	208 V	240 V
Input (DC)						
Max. usable DC power	3100 W	3100 W	3450 W	3900 W	5250 W	5250 W
Max. DC voltage	600 V					
Rated MPP voltage range	155 - 480 V		195 - 480 V		220 – 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	2/1				3 / 1	
Output (AC)						
AC nominal power	3000 W	3000 W	3330 W	3800 W	5000 W	5000 W
Max. AC apparent power	3000 VA	3000 VA	3330 VA	3800 VA	5000 VA	5000 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	14.5 A	12.5 A	16.0 A	16.0 A	24.0 A	24.0 A
Power factor (cos φ)	1					
Output phases / line connections	1 / 2					
Harmonics	< 4 %					
Efficiency						
Max. efficiency	97.2 % *	97.5 % *	97.2 % *	97.5 % *	97.2 %	97.5 %
CEC efficiency	96.5 % *	97.0 % *	96.5 % *	97.0 % *	96.5 %	97 %
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	26 kg (57 lb)					
Packaging weight	30 kg (66 lb)					
Operating temperature range	– 25°C ...+60°C					
Noise emission (typical)	< 25 dB(A)					
Internal power consumption at night	< 5 W					
Topology	Transformerless					
Cooling concept	Convection					
Features						
Secure Power Supply	●					
Display (2 x 16 characters)	●					
Interfaces: Ethernet / WLAN	● / ●					
Sensor module / External WLAN antenna	o / o					
Warranty: 10 / 15 / 20 years	●/o/o					
Certificates and approvals	UL 1741, UL 1998, UL 1699B, IEEE1547, FCC Part 15 (Class A & B), CAN/CSA V22.2 107.1-1					
● Standard features o Optional features – Not available Data at nominal conditions NOTE: US inverters ship with gray lids. * Preliminary data, UL pending						
Type designation	SB3.0-1SP-US-40		SB3.8-1SP-US-40		SB5.0-1SP-US-40	

Accessories

Sensor module
MD.SEN-US-40

External WLAN antenna
EXTANT-US-40



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 usable DC power	5500 W	6300 W	6900 W	7350 W	6950 W	8100 W
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	97.2 %	97.6 %	97.1 % *	97.2 % *	97.1 % *	97.2 % *
CEC efficiency	96.5 %	97 %	96.5 % *	96.5 % *	96.5 % *	96.5 % *
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	26 kg (57 lb)					
Packaging weight	30 kg (66 lb)					
Operating temperature range	– 25°C ...+60°C					
Noise emission (typical)	26 dB(A)		30 dB(A) *			
Internal power consumption at night	< 5 W					
Topology	Transformerless					
Cooling concept	Convection		Fan			
Features						
Secure Power Supply	●					
Display (2 x 16 characters)	●					
Interfaces: Ethernet / WLAN	● / ●					
Sensor module / External WLAN antenna	o / o					
Warranty: 10 / 15 / 20 years	●/o/o					
Certificates and approvals	UL 1741, UL 1998, UL 1699B, IEEE1547, FCC Part 15 (Class A & B), CAN/CSA V22.2 107.1-1					
● Standard features o Optional features – Not available Data at nominal conditions NOTE: US inverters ship with gray lids. * Preliminary data, UL pending						
Type designation	SB6.0-1SP-US-40		SB7.0-1SP-US-40		SB7.7-1SP-US-40	

SAME NAME, NEW GAME

The Sunny Boy 3.0-US through 7.7-US are once again raising the bar by offering improved performance, enhanced features, and most importantly, an economical approach to residential solar. Your business model is a value chain. The new Sunny Boy-US series can help you stay competitive in an increasingly price sensitive residential market by driving down costs across all of your business operations.

SIMPLE, FLEXIBLE DESIGN

Speed the completion of customer proposals and maximize the efficiency of your design team with the Sunny Boy-US series, which provides a new level of flexibility in system design by offering:

» Hundreds of stringing configurations and multiple independent MPPTs

» SMA's proprietary OptiTrac™ Global Peak shade mitigation technology

» Diverse application options including on- and off-grid compatibility

VALUE-DRIVEN SALES ENABLEMENT

SMA wants to enable your sales team by arming them with an abundance of feature/benefit support. Show your customers the value of the Sunny Boy-US series by utilizing:

» Secure Power Supply, now with 2,000 W of opportunity power in the event of a grid outage, as an increased value-add or upsell opportunity

» SMA's 35 year history and status as the #1 global inverter manufacturer instills homeowners with peace of mind and the long-term security they demand from a PV investment

» An economical solution for shade mitigation and the challenges of complex roofs

IMPROVED STOCKING AND ORDERING

Ensure that your back office business operations run smoothly and succinctly while mitigating potential errors. The Sunny Boy-US series can help achieve cost savings in these areas by providing:

» An integrated DC disconnect that simplifies equipment stocking and allows for a single inverter part number

» All communications integrated into the inverter, eliminating the need to order additional equipment

STREAMLINED INSTALLATION AND COMMISSIONING

Expedite your operations in the field by taking advantage of the new Sunny Boy's installer-friendly feature set including:

» Direct access via smartphone and utilization of SMA's Installation Assistant, which minimizes time/labor spent in the field and speeds the path to commissioning

» Improved communication—no need to install additional equipment

» Integrated DC disconnect that simplifies onsite logistics and eliminates the need to install a separate disconnect unit, speeding overall installation time

SUPERIOR SERVICE

SMA understands the factors that contribute to lifetime PV ownership cost, that's why the Sunny Boy-US series was designed for maximum reliability and backstopped by an unmatched service offering. Benefit from:

» The new Sunny Boy's two-part enclosure concept that separates the connection unit from the power unit, which allows for simple, expedited servicing

» The #1 service team in the PV industry, as recognized by IMS research, with experience servicing an installed base of more than 40 GW

TS4-O

Optimization

TS4-O is one of 5 functional covers that pairs with an integrated modular junction box base (TS4-B) or with a retrofit/add-on base (TS4-R).

Features

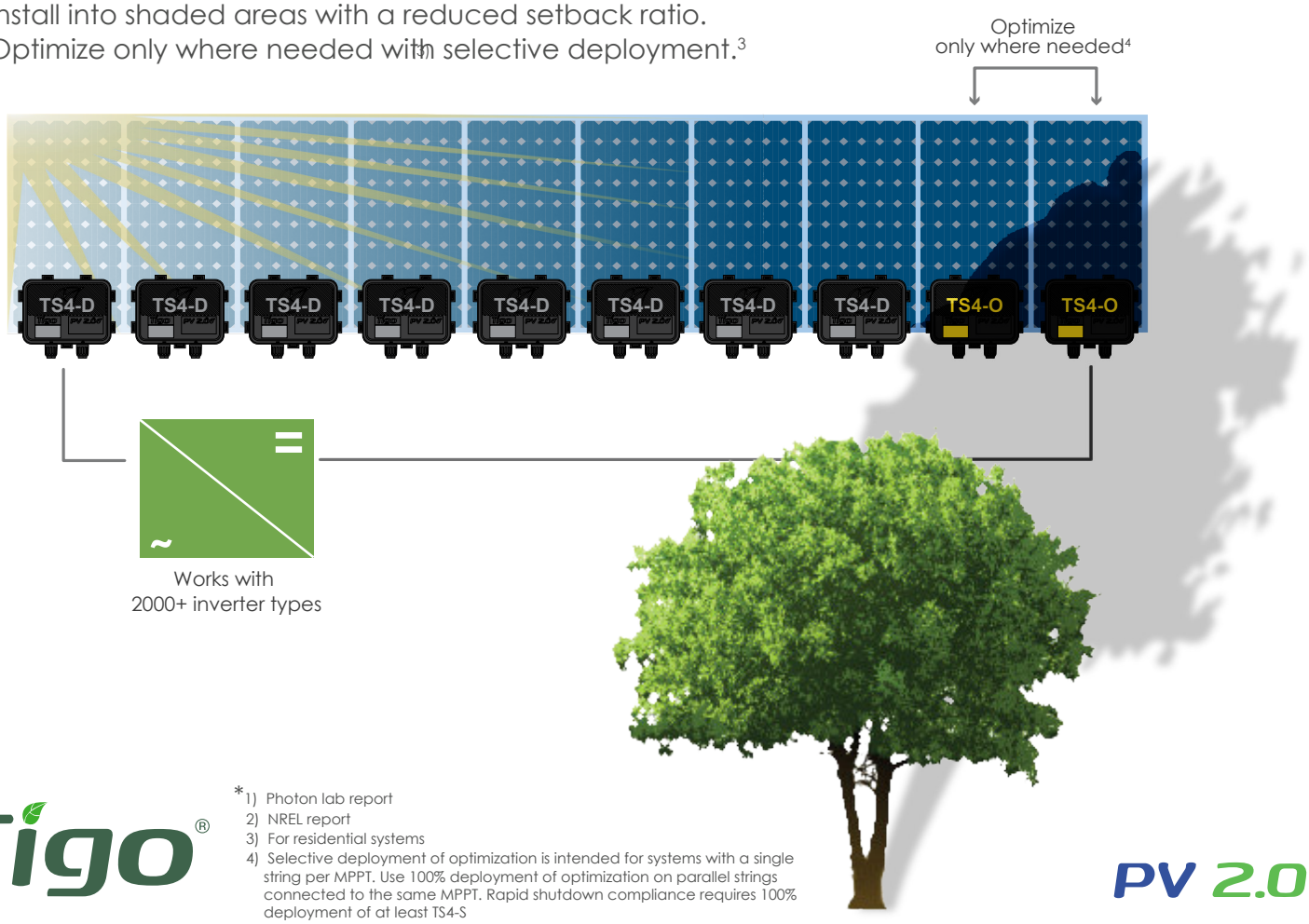
- Increased energy yield
- Greater design flexibility
- Shade and age tolerance
- Maximized roof usage
- Plus all the benefits of rapid shutdown and module-level monitoring

Increase your energy harvest

In an unshaded system, Tigo optimization increased energy harvest by 3%.[1]
In a shaded system, recover 36% of energy that would have been lost due to mismatch.[2]

Design flexibility

Design using unequal string lengths and mixed orientations.
Install into shaded areas with a reduced setback ratio.
Optimize only where needed with selective deployment.[3]



Tigo®

*1) Photon lab report
2) NREL report
3) For residential systems
4) Selective deployment of optimization is intended for systems with a single string per MPPT. Use 100% deployment of optimization on parallel strings connected to the same MPPT. Rapid shutdown compliance requires 100% deployment of at least TS4-S

PV 2.0

04/14/17

Meet any projects' needs with the TS4 covers

Tigo has expanded its smart module platform to provide five levels of customization. TS4 increases your freedom of choice by allowing to select the right features for each project and budget.

ELECTRICAL RATINGS

INPUT	
Rated DC Input Power	475W
Maximum Input Voltage @ Lowest Temperature	90V
Maximum Short Circuit Current (I_{SC})	12A
Maximum V_{OC} @ STC	75V
Minimum V_{MP} @ STC	16V
OUTPUT	
Output Power Range	0 - 475W
Output Voltage Range	0 - V_{OC}
Rapid Shutdown Capability (NEC 2014 690.12)	Yes
Impedance Matching Capability	Yes
Output Voltage Limit	No
Maximum System Voltage	1500V
Maximum Series Fuse Rating	15A

Cloud Connect and Gateway required for rapid shutdown compliance.

OPTIMIZATION
TS4-O

For sales info:
sales@tigoenergy.com or 1.408.402.0802 ext. 1

For product info:
Visit www.tigoenergy.com/products

For technical info:
http://support.tigoenergy.com

For additional info and product selection assistance, use Tigo's online design tool at www.tigoenergy.com/design

Tigo®

PV 2.0

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