# ROMMY DAVIS
# NEW GRID-INTERACTIVE PHOTOVOLTAIC SYSTEM
# DC SYSTEM SIZE (5.81KW)

## SYSTEM DETAILS

| | |
|---|---|
| DESCRIPTION | NEW GRID-INTERACTIVE PHOTOVOLTAIC SYSTEM WITH NO BATTERY STORAGE |
| DC RATING OF SYSTEM | SYSTEM SIZE :5.81 KW DC STC |
| AC RATING OF SYSTEM | 5 KW AC |
| AC OUTPUT CURRENT | 21 A |
| NO. OF MODULES | (14) TRINA SOLAR TSM-DE09R.05 (415W) SOLAR MODULE |
| NO. OF INVERTERS | (1) SOLAREDGE SE5000H-US INVERTER |
| POINT OF CONNECTION | BACKFEED BREAKER IN THE MMC |
| ARRAY STRINGING | (1) BRANCH OF 14 MODULES |

## SITE DETAILS

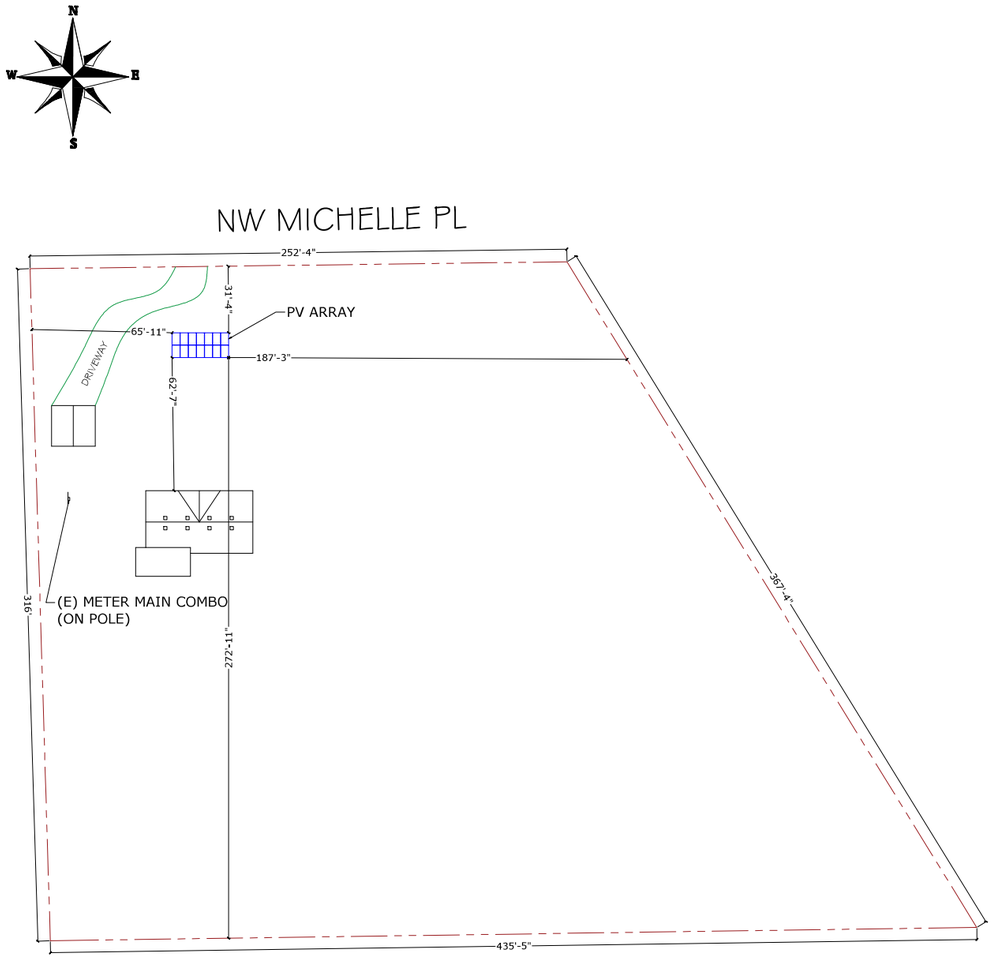
| | |
|---|---|
| ASHRAE EXTREME LOW | -5°C |
| ASHRAE 2% HIGH | 34°C |
| GROUND SNOW LOAD | 0 PSF |
| WIND SPEED | 117MPH (ASCE 7-16) |
| RISK CATEGORY | I |
| WIND EXPOSURE CATEGORY | C |

## GOVERNING CODES

| |
|---|
| FLORIDA RESIDENTIAL CODE, 7TH EDITION 2020 (FRC) |
| FLORIDA BUILDING CODE, 7TH EDITION 2020 (FBC) |
| FLORIDA FIRE PREVENTION CODE, 7TH EDITION 2020 (FFPC) |
| NATIONAL ELECTRICAL CODE, NEC 2017 CODE BOOK, NFPA 70 |

## SHEET INDEX

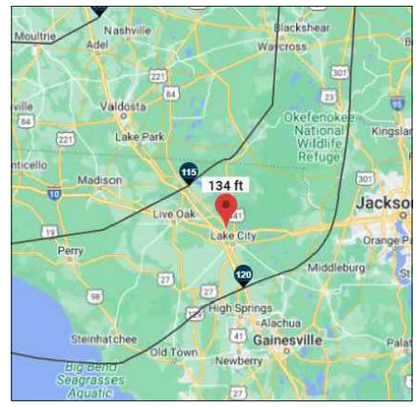





## SITE MAP


## VICINITY MAP


## WIND FLOW MAP





EnLight Energy

978 SW 2ND AVE GAINESVILLE , FL 32601
CONTACT:-(800) 798-0315


ENGINEER OF RECORD

STATE OF FLORIDA PROFESSIONAL ENGINEER
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ROMMY DAVIS

158 NW MICHELLE PL, LAKE CITY, FL 32055, USA

REVISIONS

| REV | ENGGS. | DESCRIPTION | DATE |
|---|---|---|---|
| | | | |

| PERMIT DEVELOPER | |
|---|---|
| DATE | 06/08/2023 |
| DESIGNER | OSB |
| REVIEWER | |

SHEET NAME

SITE MAP & VICINITY MAP

SHEET NUMBER

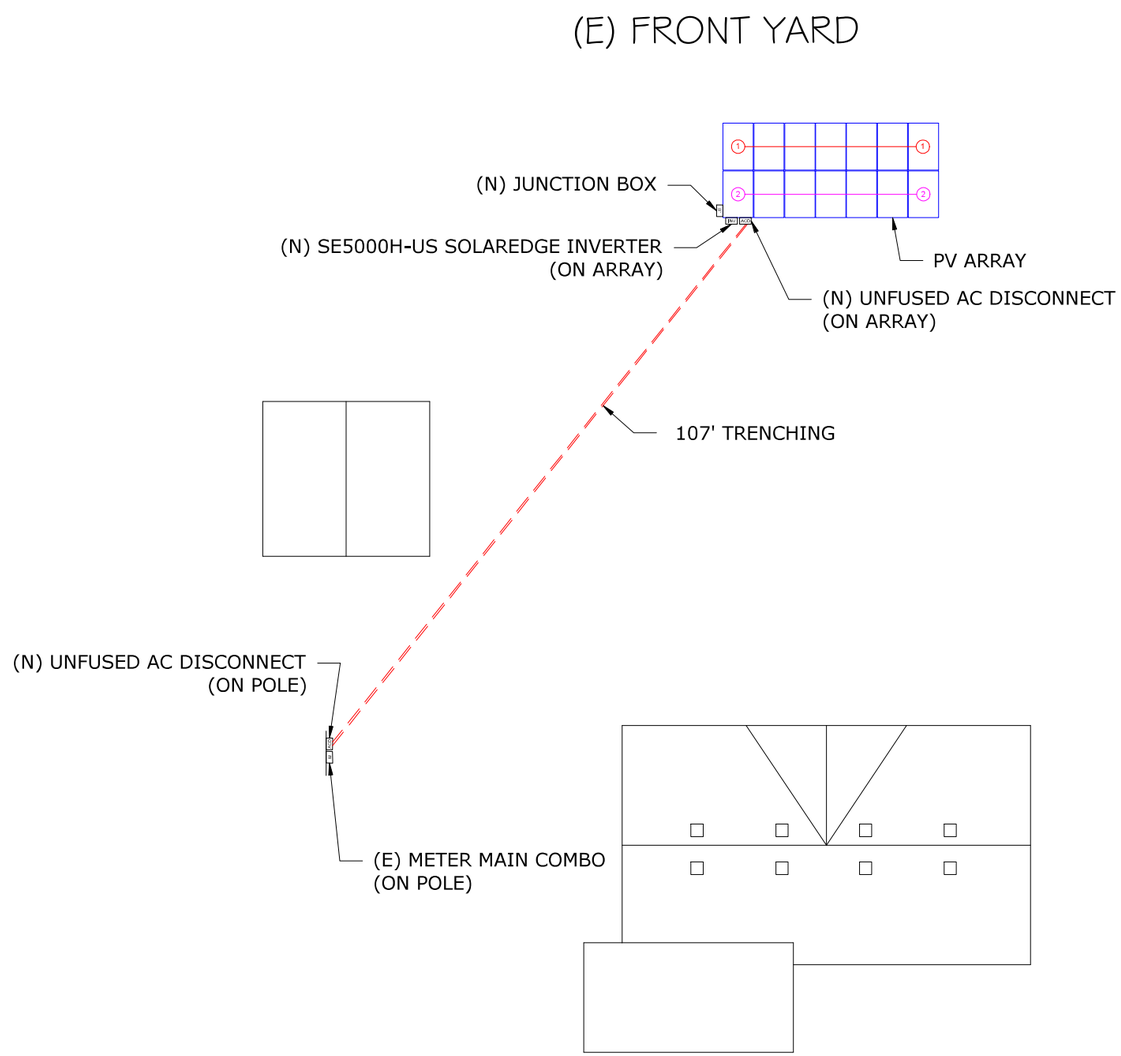
A-00


## MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 14 MODULES
MODULE TYPE = TRINA SOLAR TSM-DE09R.05 (415W) SOLAR MODULE
WEIGHT = 48.06 LBS / 21.8 KG.
MODULE DIMENSIONS = 69.37" X 44.65" = 21.51 SF

NUMBER OF INVERTER = 1 INVERTER
INVERTER TYPE = SOLAREDGE SE5000H-US INVERTER

DC SYSTEM SIZE: 5.81 KW
AC SYSTEM SIZE: 5 KW




1 - MODULE STRING

2 - MODULE STRING

## LEGENDS

- M - METER MAIN COMBO
- JB - JUNCTION BOX
- INV - INVERTER
- ACD - AC DISCONNECT
- FIRE SETBACK
- 1 - STRING TAG
- VENT, ATTIC FAN (ROOF OBSTRUCTION)
- CONDUIT
- TRENCHING

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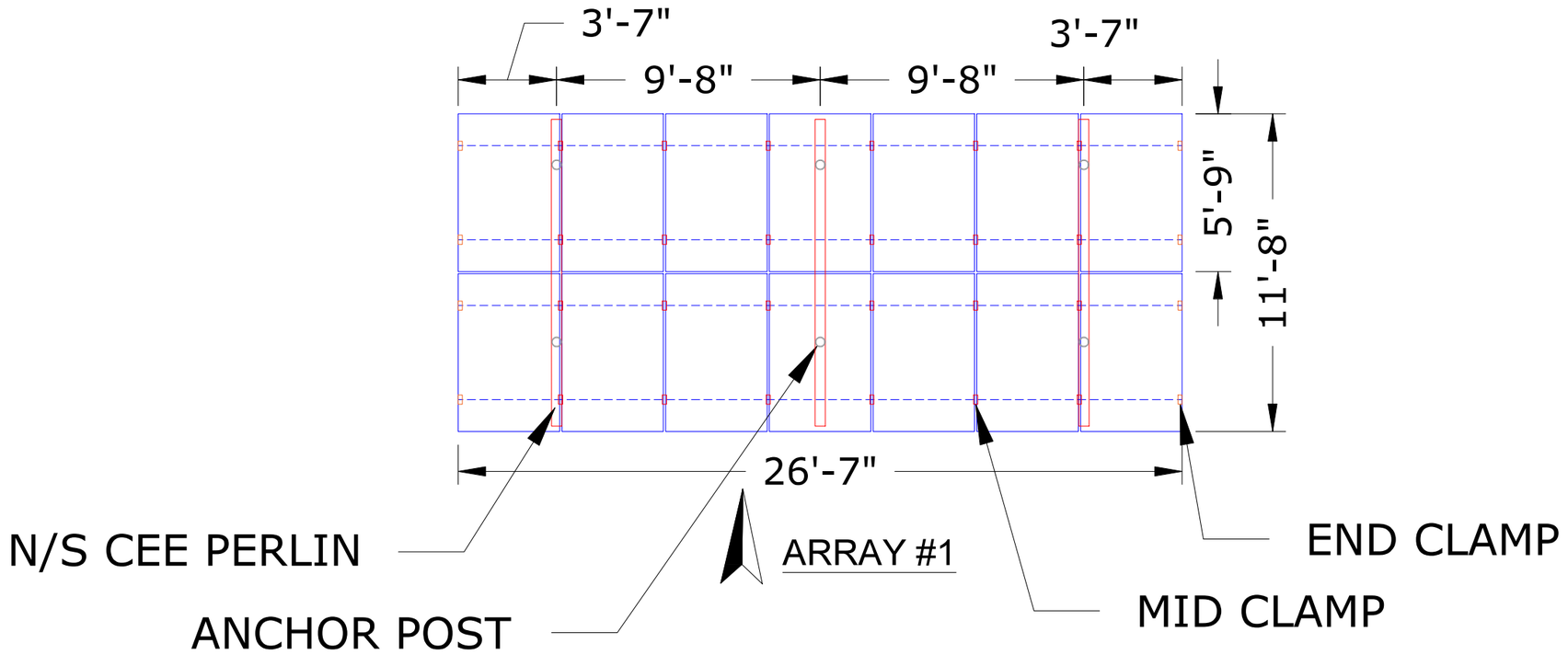
| DESIGNER | OSB |
| REVIEWER | |

SHEET NAME
ROOF PLAN & MODULES

SHEET NUMBER
A-01

(ARRAY #1)

MODULES - 14
GROUND TILT - 20°
GROUND AZIMUTH - 180°




- ANCHOR POST
- CAPS
- RAILS
- RAFTERS / TRUSSES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| | | | | |

| PERMIT DEVELOPER | |
|---|---|
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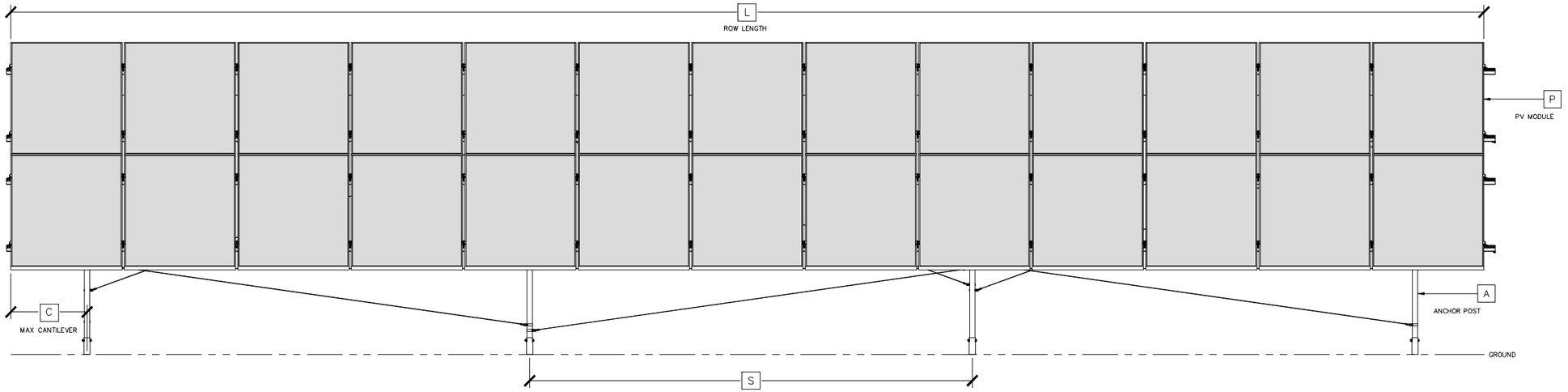
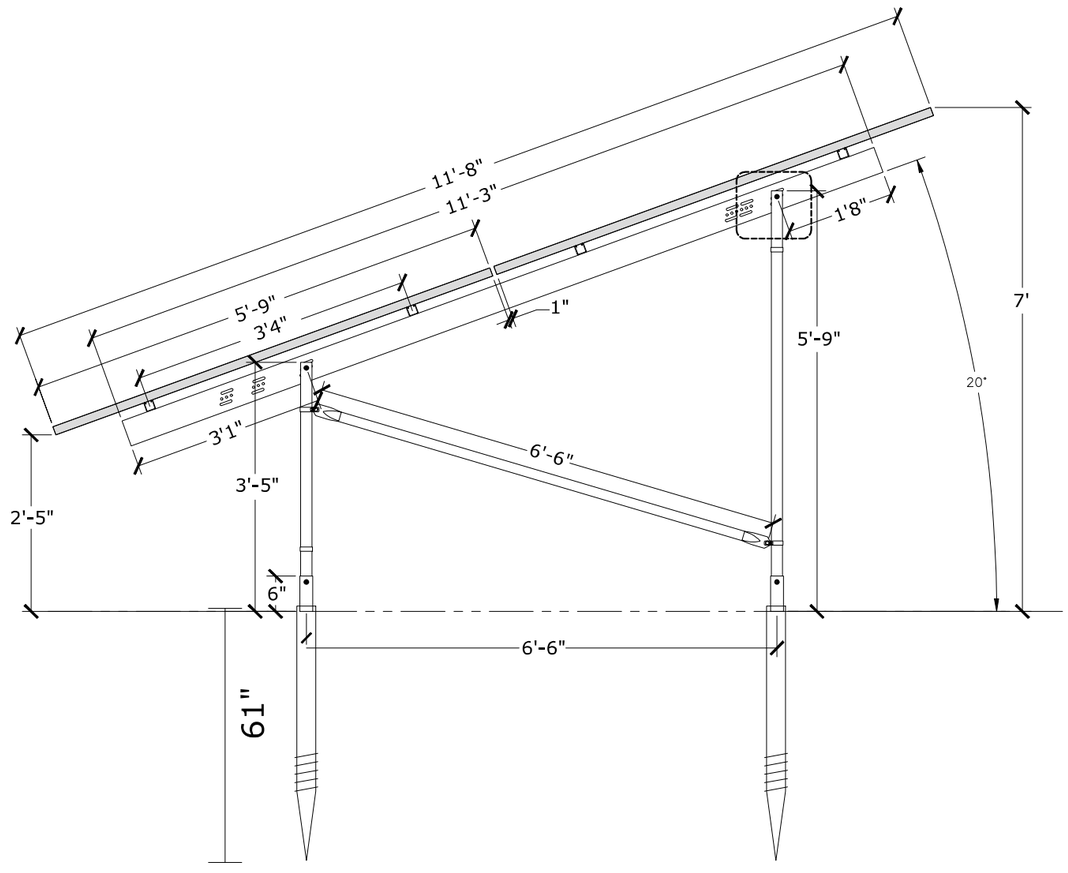
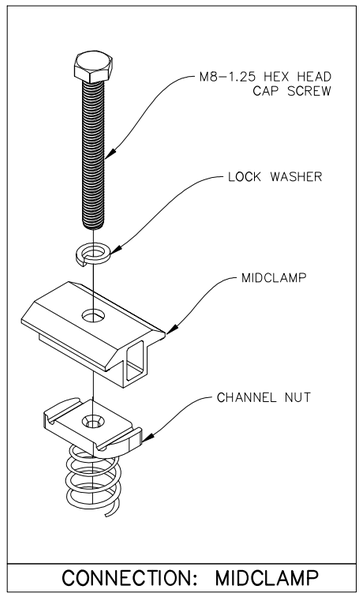
| DESIGNER | OSB |
| REVIEWER | |

SHEET NAME
ARRAY LAYOUT

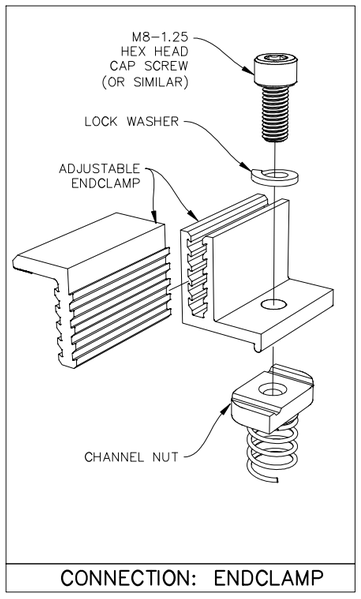
SHEET NUMBER
S-01




CONNECTION: MIDCLAMP




CONNECTION: ENDCLAMP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PERMIT DEVELOPER

| | |
|---|---|
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| REVIEWER | |

SHEET NAME
STRUCTURAL ATTACHMENT DETAILS

SHEET NUMBER
S-02

**NOTE:**
SUBJECT PV SYSTEMS HAS BEEN DESIGNED TO MEET THEREQUIREMENTS OF THE NEC 2017, NFPA 70 AND THOSE SET FORTH BYTHE FLORIDA SOLAR ENERGY CENTER CERTIFICATION, INCLUDINGMAXIMUM NUMBER OF MODULE STRINGS, MAXIMUM NUMBER OFMODULES PER STRING, MAXIMUM OUTPUT, MODULE MANUFACTURERAND MODEL NUMBER, INVERTER MANUFACTURER AND MODEL NUMBER, AS APPLICABLE. 2. PROVIDE TAP BOX IN COMPLIANCE WITH 312.8 IF PANEL GUTTER SPACE IS INADEQUATE.

SOLAR ARRAY (5.81 KW-DC STC)
AC SYSTEM SIZE 5 KW AC
(14) TRINA SOLAR TSM-DE09R.05 (415W) SOLAR MODULE
(1) SE5000H-US SOLAREDGE INVERTER
(1) BRANCH OF 14 MODULES

PV WIRE

S440 SOLAREDGE POWER OPTIMIZER

PV MODULES

(N)JUNCTION BOX
600 V, NEMA 3R
UL LISTED

EQUIPPED WITH RAPID SHUTDOWN

SOLAREDGE SE5000H-US
INVERTER
5000W ,99% CEC 240VAC,21A

(1) 12/2 NM-b RUN IN ATTIC OR
(1) #10 AWG THHN- RED
(1) #10 AWG THHN - BLACK
(1) #10 AWG THHN GND
IN 3/4" IMC, RMC, FMC, LFMC, PVC, HDPE, NUCC, RTRC, LFNC, FMT, ENT OR EMT CONDUIT RUN

(N) AC DISCONNECT:
240V, 60AMP, UNFUSED
NEMA 3R, UL LISTED

107' TRENCHING

(N) AC DISCONNECT:
240V, 60AMP, UNFUSED
NEMA 3R, UL LISTED

INTERCONNECTION
120% RULE - NEC 705.12(B)(2)(3)(b)

| UTILITY FEED + SOLAR BACKFEED |
|---|
| 200A + 30A = 230 A |
| BUSS RATING x 120% |
| 200A x 120% = 240A |

(3) #10 AWG THWN-2
(1) #10 AWG THWN-2 GND
IN 3/4" IMC, RMC, FMC, LFMC, PVC, HDPE, NUCC, RTRC, LFNC, FMT, ENT OR EMT CONDUIT RUN

(3) #8 AWG THHN
(1) #10 AWG THHN GND
IN 3/4" IMC, RMC, FMC, LFMC, PVC, HDPE, NUCC, RTRC, LFNC, FMT, ENT OR EMT CONDUIT RUN

(3) #10 AWG THWN-2
(1) #10 AWG THWN-2 GND
IN 3/4" IMC, RMC, FMC, LFMC, PVC, HDPE, NUCC, RTRC, LFNC, FMT, ENT OR EMT CONDUIT RUN

TO UTILITY GRID

BI-DIRECTIONAL
UTILITY METER
1-PHASE, 240V
(OUTSIDE HOUSE)

(E) METER MAIN COMBO
240V.
(ON POLE)

200A/2P

(N) MAIN BREAKER
200A/2P, 240V

30A/2P

EXISTING GROUNDING


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| REVIEWER | |

SHEET NAME
ELECTRICAL LINE DIAGRAM

SHEET NUMBER
E-01

## ELECTRICAL CALCULATIONS:

### 1. CURRENT CARRYING CONDUCTOR

(A) BEFORE INVERTER

AMBIENT TEMPERATURE = 34°C
CONDUIT INSTALLED AT DISTANCE OF 7/8 INCHES ABOVE ROOF .....NEC 310.15(B)(3)(c)
TEMPERATURE DERATE FACTOR - 0.96 ...NEC 310.15(B)(2)(a)
GROUPING FACTOR - 0.8...NEC 310.15(B)(3)(a)

CONDUCTOR AMPACITY
= (OPT O/P CURRENT ) x 1.56 / A.T.F / G.F ...NEC 690.8(B)
= [(15 x 1.56) x 1.25] / 0.96 / 0.8
= 38.09 A
SELECTED CONDUCTOR - #10 THHN ...NEC 310.15(B)(16)

AFTER INVERTER
TEMPERATURE DERATE FACTOR - 0.96
GROUPING FACTOR - 1

CONDUCTOR AMPACITY
=(TOTAL INV O/P CURRENT) x 1.25 / 0.96 / 1 ...NEC 690.8(B)
=[21 x 1.25] /0.96 / 1
=27.34 A
SELECTED CONDUCTOR - #10 THHN...NEC 310.15(B)(16)

### 2. PV OVER CURRENT PROTECTION ..NEC 690.9(B)

=TOTAL INVERTER O/P CURRENT x 1.25
=(21 x 1.25) = 26.25 A
SELECTED OCPD = 30A

SELECTED EQUIPMENT GROUND CONDUCTOR (EGC) = #10 THHN... NEC 250.122(A)

| MODULE SPECIFICATION | |
|---|---|
| MODEL NO. | TRINA SOLAR TSM-DE09R.05(415W) |
| PEAK POWER | 415W |
| RATED VOLTAGE (Vmpp) | 41.7 V |
| RATED CURRENT (Impp) | 9.94 A |
| OPEN CIRCUIT VOLTAGE (Voc) | 50.0 V |
| SHORT CIRCUIT CURRENT (Isc) | 10.55 A |

| OPTIMIZER SPECIFICATIONS | |
|---|---|
| MANUFACTURER | SOLAREDGE OPTIMIZER |
| MODEL NO. | S440 |
| MAX.OPEN CIRCUIT VOLTAGE (Voc) | 60 V |
| MAX. AC OUTPUT CURRENT | 15 A |

MAX VOLTAGE DROP CALCULATION

| CABLE SIZE | CABLE DESCRIPTION | ONE WAY DISTANCE IN FEET (D) | BRANCH CURRENT (I) | RESISTANCE OF CONDUCTOR(R) | VOLTAGE (V) | % VOLTAGE DROP=(0.2*D*I*R)/V |
|---|---|---|---|---|---|---|
| #8 THWN-2 | UNFUSED AC DISCONNECT TO UNFUSED AC DISCONNECT | 107 | 21 | 0.778 | 240 | 1.45 |

## ELECTRICAL NOTES

1. ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL AND LABELED FOR ITS APPLICATION.
2. COPPER CONDUCTORS SHALL BE RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.THE TERMINALS ARE RATED FOR 75 DEGREE C ROMEX/NM-B (NONMETALLIC-SHEATHED) CABLE MAY BE USED FOR BOTH EXPOSED AND CONCEALED WORK IN NORMALLY DRY LOCATIONS AT TEMPERATURES NOT TO EXCEED 90°C (WITH AMPACITY LIMITED TO THAT FOR 60°C CONDUCTORS) AS SPECIFIED IN THE NATIONAL ELECTRICAL CODE. VOLTAGE RATING FOR NM-B CABLE IS 600 VOLTS.
3. WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.265. WORKING CLEARANCES AROUND ALL NEW AND EXISTING
4. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
5. WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
6. ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
7. MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
8. MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
9. THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE.
10. UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.
11. MODULES CONFORM TO AND ARE LISTED UNDER UL 1703.
12. RACKING CONFORMS TO AND IS LISTED UNDER UL 2703.
13. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C) (1) AND ARTICLE 310.10 (D).
14. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.10 (C).

| INVERTER SPECIFICATIONS | |
|---|---|
| MANUFACTURER | SOLAREDGE |
| MODEL NO. | SE5000H-US |
| MAX.OUTPUT POWER | 5000 V |
| MAX. AC OUTPUT VOLTAGE | 240 V |
| MAX. AC OUTPUT CURRENT | 21 A |

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|---|---|
| DATE | 06/08/2023 |
| DESIGNER | OSB |
| REVIEWER | |

SHEET NAME: WIRING CALCULATIONS

SHEET NUMBER: E-02

**⚠ WARNING**

**ELECTRIC SHOCK HAZARD**
**DO NOT TOUCH TERMINALS**
**TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION**

LABEL LOCATION:
AC DISCONNECT, POINT OF INTERCONNECTION, COMBINER PANEL
(PER CODE: NEC 690.13(B))

**WARNING PHOTOVOLTAIC POWER SOURCE**

LABEL LOCATION:
CONDUIT RUNWAY
(PER CODE: NEC690.31(G)(3)(4))

⚠ WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
MAIN SERVICE DISCONNECT
(NEC 705.12(B)(3-4) & NEC 690.59)

ADHESIVE FASTENED SIGNS:

·ANSI Z535.4-2011 PRODUCT SAFETY SIGNS AND LABELS, PROVIDES GUIDELINES FOR SUITABLE FONT SIZES, WORDS, COLORS, SYMBOLS, AND LOCATION REQUIREMENTS FOR LABELS. NEC 110.21(B)(1)
·THE LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED. NEC 110.21(B)(3)
·ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL SIGNS SHALL BE WEATHER RESISTANT. IFC 605.11.1.3

**PHOTOVOLTAIC SYSTEM AC DISCONNECT**
RATED AC OPERATING CURRENT 21 AMPS
AC NOMINAL OPERATING VOLTAGE 240 VOLTS

LABEL LOCATION:
AC DISCONNECT, INVERTER
(PER CODE: NEC 690.54)

**WARNING**
INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION:
POINT OF INTERCONNECTION, MAIN SERVICE DISCONNECT
(PER CODE: NEC 705.12 (B)(2)(c))
[Not required if panelboard is rated not less than sum of ampere ratings of all overcurrent devices supplying it]

DATA PER PANEL

**PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN**

LABEL LOCATION:
AC DISCONNECT, DC DISCONNECT, POINT OF INTERCONNECTION
(PER CODE: NEC 690.56(C)(3))

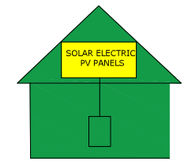
**⚠ WARNING**
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS
OVERCURRENT DEVICE

**EMERGENCY CONTACT**
727-571-4141

**⚠ WARNING**
DEDICATED SOLAR PANELS DO NOT CONNECT ANY OTHER LOADS

EMERGENCY RESPONDER THIS SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM.




NEC690.56(C)(1) AND NFPA 111.12.2.1.1.1.1, 11.12.2.1.4

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| DATE | 06/08/2023 |
| DESIGNER | OSB |
| REVIEWER | |

SHEET NAME
SYSTEM LABELING

SHEET NUMBER
E-03

Mono Multi Solutions

# Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE09R.05

PRODUCT RANGE: 405-425W

**425W**
MAXIMUM POWER OUTPUT

**0~+5W**
POSITIVE POWER TOLERANCE

**21.3%**
MAXIMUM EFFICIENCY

reddot winner 2022

## Outstanding Visual Appearance

- Designed with aesthetics in mind
- Excellent cell color control by dedicated cell blackening treatment and machine selection.
- Thinner wires that appear all black at a distance

## Small in size, big on power

- Small form factor. Generate a huge amount of energy even in limited space.
- Up to 425W, 21.3% module efficiency with high density interconnect technology
- Multi-busbar technology for better light :rapping effect, lower series resistance and improved current collection
- Reduce installation cost with higher power bin and efficieny
- Boost performance in warm weather lower temperature coefficient (-0.34%) and operating temperature

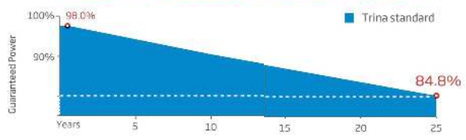
## Universal solution for residential and C&I rooftops

- Designed for compatibility with existing mainstream optimizers, inverters and mounting systems
- Perfect size and low weight. Easy for handling. Economy for transporting
- Diverse installation solutions. Flexible for system deployment

## High Reliability

- 15 year product warranty
- 25 year performance warranty with lowest degradation;
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Mechanical performance up to 6000 Pa positive load and 4000 Pa negative load

### Trina Solar's Backsheet Performance Warranty



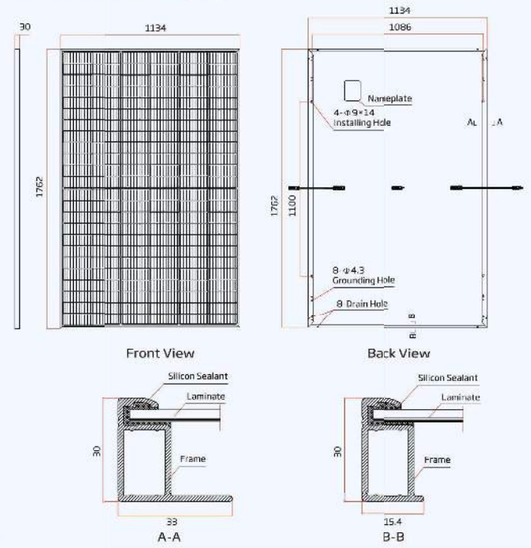

### Comprehensive Products and System Certificates

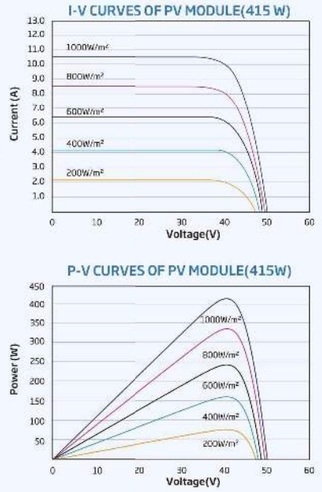
IEC61215/IEC61730/IEC61701/IEC62716
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Verification
ISO45001: Occupational Health and Safety Management System

Trinasolar

# Vertex S BACKSHEET MONOCRYSTALLINE MODULE

## DIMENSIONS OF PV MODULE(mm)







### ELECTRICAL DATA (STC)

| | | | | | |
|---|---|---|---|---|---|
| Peak Power Watts-PMAX (Wp)* | 405 | 410 | 415 | 420 | 425 |
| Power Tolerance-PMAX (W) | | | 0 ~ +5 | | |
| Maximum Power Voltage-VMPP (V) | 41.3 | 41.5 | 41.7 | 42.0 | 42.2 |
| Maximum Power Current-IMPP (A) | 9.82 | 9.87 | 9.94 | 10.01 | 10.08 |
| Open Circuit Voltage-VOC (V) | 49.7 | 49.8 | 50.0 | 50.1 | 50.2 |
| Short Circuit Current-ISC (A) | 10.50 | 10.53 | 10.55 | 10.58 | 10.61 |
| Module Efficiency-η (%) | 20.3 | 20.5 | 20.8 | 21.0 | 21.3 |

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. *Measuring tolerance: ±3%.

### ELECTRICAL DATA (NOCT)

| | | | | | |
|---|---|---|---|---|---|
| Maximum Power-PMAX (Wp) | 306 | 309 | 312 | 317 | 321 |
| Maximum Power Voltage-VMPP (V) | 38.3 | 38.5 | 38.7 | 39.2 | 39.5 |
| Maximum Power Current-IMPP (A) | 7.99 | 8.03 | 8.07 | 8.10 | 8.13 |
| Open Circuit Voltage-VOC (V) | 46.8 | 46.9 | 47.1 | 47.1 | 47.2 |
| Short Circuit Current-ISC (A) | 8.46 | 8.49 | 8.50 | 8.53 | 8.55 |

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

### MECHANICAL DATA

| | |
|---|---|
| Solar Cells | Monocrystalline |
| No. of cells | 144 cells |
| Module Dimensions | 1762×1134×30 mm (69.37×44.65×1.18 inches) |
| Weight | 21.8 kg (48.1 lb) |
| Glass | 3.2 mm (0.13 inches), High-Transmission, AR Coated Heat Strengthened Glass |
| Encapsulant material | EVA/POE |
| Backsheet | Black-White |
| Frame | 30mm(1.18 inches) Anodized Aluminium Alloy |
| j-Box | IP 68 rated |
| Cables | Photovoltaic Technology Cable 4.0mm² (0.006 inches²), Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized |
| Connector | MC4 EVO2 / TS4* |

*Please refer to regional datasheet for specific connector.

### TEMPERATURE RATINGS

| | |
|---|---|
| NOCT(Nominal Operating Cell Temperature) | 43°C (±2°C) |
| Temperature Coefficient of PMAX | -0.34%/°C |
| Temperature Coefficient of Voc | -0.25%/°C |
| Temperature Coefficient of Isc | 0.04%/°C |

### MAXIMUMRATINGS

| | |
|---|---|
| Operational Temperature | -40~+85°C |
| Maximum System Voltage | 1500V DC (IEC) |
| Max Series Fuse Rating | 20A |

### WARRANTY

15 year Product Workmanship Warranty
25 year Power Warranty
2% first year degradation
0.55% Annual Power Attenuation
(Please refer to product warranty for details)

### PACKAGING CONFIGUREATION

Modules per box: 36 pieces
Modules per 40' container: 936 pieces

Trinasolar


Version number: TSM_EN_2022_A

www.trinasolar.com

EnLightEnergy
978 SW 2ND AVE GAINESVILLE , FL 32601
CONTACT:-(800) 798-0315

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| REV | ENGG. | |

PERMIT DEVELOPER

| | |
|---|---|
| DATE | 06/08/2023 |
| DESIGNER | OSB |
| REVIEWER | |

SHEET NAME
MODULE DATASHEET

SHEET NUMBER
DS-01

# Power Optimizer

## For Residential Installations

S440 / S500 / S500B


POWER OPTIMIZER

## Enabling PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detects abnormal PV connector behavior, preventing potential safety issues*
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified cable management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules

* Functionality subject to inverter model and firmware version

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# Power Optimizer

## For Residential Installations

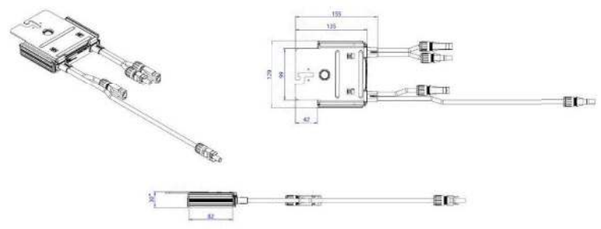
S440 / S500 / S500B


| | S440 | S500 | S500B | UNIT |
|---|---|---|---|---|
| **INPUT** | | | | |
| Rated Input DC Power(3) | 440 | 500 | | W |
| Absolute Maximum Input Voltage (Voc) | 60 | | 125 | Vdc |
| MPPT Operating Range | 8 – 60 | | 12.5 – 105 | Vdc |
| Maximum Short Circuit Current (Isc) of Connected PV Module | 14.5 | 15 | | Adc |
| Maximum Efficiency | 99.5 | | | % |
| Weighted Efficiency | 98.6 | | | % |
| Overvoltage Category | II | | | |
| **OUTPUT DURING OPERTION** | | | | |
| Maximum Output Current | 15 | | | Adc |
| Maximum Output Voltage | 60 | | 80 | Vdc |
| **OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)** | | | | |
| Safety Output Voltage per Power Optimizer | 1 ± 0.1 | | | Vdc |
| **STANDARD COMPLIANCE(2)** | | | | |
| EMC | FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011 | | | |
| Safety | IEC62109-1 (class II safety), UL1741 | | | |
| Material | UL94 V-0, UV Resistant | | | |
| RoHS | Yes | | | |
| Fire Safety | VDE-AR-E 2100-712:2013-05 | | | |
| **INSTALLATION SPECIFICATIONS** | | | | |
| Maximum Allowed System Voltage | 1000 | | | Vdc |
| Dimensions (W x L x H) | 129 x 155 x 30 | | 129 x 155 x 45 | mm |
| Weight (including cables) | 655 | | | gr |
| Input Connector | MC4(5) | | | |
| Input Wire Length | 0.1 | | | m |
| Output Connector | MC4 | | | |
| Output Wire Length | (+) 2.3; (-) 0.10 | | | m |
| Operating Temperature Range(4) | -40 to +85 | | | °C |
| Protection Rating | IP68 | | | |
| Relative Humidity | 0 – 100 | | | % |

(1) Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.
(2) For details about CE compliance, see Declaration of Conformity – CE
(3) For other connector types please contact SolarEdge.
(4) For ambient temperature above +70°C, power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for details.

| PV System Design Using a SolarEdge Inverter(5) | | SolarEdge Home Wave Single Phase | Three Phase SExxK-RWB | Three Phase for 230/400V Grid | Three Phase for 277/480V Grid | |
|---|---|---|---|---|---|---|
| Minimum String Length (Power Optimizers) | S440, S500 | 8 | 9 | 16 | 18 | |
| | S500B | 6 | 8 | 14 | | |
| Maximum String Length (Power Optimizers) | | 25 | 20 | 50 | | |
| Maximum Continuous Power per String | | 5700 | 5625 | 11250 | 12750 | W |
| Maximum Allowed Connected Power per String (Permitted only when the power difference between strings is less than 2,000W) | | See(6) | See(6) | 13500 | 15000 | W |
| Parallel Strings of Different Lengths or Orientations | | Yes | | | | |

(5) It is not allowed to mix S-series and P-series Power Optimizers in new installations.
(6) If the inverter's rated AC power is maximum nominal power per string, then the maximum power per string will be able to reach up to the inverter's maximum input DC power. Refer to Application Note: Single String Design Guidelines



* 45mm for S500B



CE RoHS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| | | | |

| PERMIT DEVELOPER | |
|---|---|
| DATE | 06/08/2023 |
| DESIGNER | OSB |
| REVIEWER | |

SHEET NAME: OPTIMIZER DATASHEET

SHEET NUMBER: DS-02

INVERTERS

# Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US


## Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking efficiency
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per artcle 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Extremely small
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

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# Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

| | SE3000H-US | SE3800H-US | SE5000H-US | SE6000H-US | SE7600H-US | SE10000H-US | SE11400H-US | |
|---|---|---|---|---|---|---|---|---|
| APPLICABLE TO INVERTERS WITH PART NUMBER | SE3000H-xxxxBxxx4 | | | | | | | |
| **OUTPUT** | | | | | | | | |
| Rated AC Power Output | 3000 | 3800 @ 240V<br>3300 @ 208V | 5000 | 5000 @ 240V<br>5000 @ 208V | 7600 | 10000 | 11400 @ 240V<br>10000 @ 208V | VA |
| Maximum AC Power Output | 3000 | 3800 @ 240V<br>3300 @ 208V | 5000 | 5000 @ 240V<br>5000 @ 208V | 7600 | 10000 | 11400 @ 240V<br>10000 @ 208V | VA |
| AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Vac |
| AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229) | - | ✓ | - | ✓ | - | - | ✓ | Vac |
| AC Frequency (Nominal) | 59.3 - 60 - 60.5[1] | | | | | | | Hz |
| Maximum Continuous Output Current @240V | 12.5 | 16 | 21 | 25 | 32 | 42 | 47.5 | A |
| Maximum Continuous Output Current @208V | - | 16 | - | 24 | - | - | 48.5 | A |
| Power Factor | 1, adjustable -0.85 to 0.85 | | | | | | | |
| GFDI Threshold | 1 | | | | | | | A |
| Utility Monitoring, Islanding Protection, Country Configurable Thresholds | Yes | | | | | | | |
| **INPUT** | | | | | | | | |
| Maximum DC Power @240V | 4650 | 5900 | 7750 | 9300 | 11800 | 15500 | 17650 | W |
| Maximum DC Power @208V | - | 5100 | - | 7750 | - | - | 15500 | W |
| Transformer-less, Ungrounded | Yes | | | | | | | |
| Maximum Input Voltage | 480 | | | | | | | Vdc |
| Nominal DC Input Voltage | 380 | | | | | 400 | | Vdc |
| Maximum Input Current @240V[2] | 8.5 | 10.5 | 13.2 | 16.5 | 20 | 27 | 30.5 | Adc |
| Maximum Input Current @208V[2] | - | 9 | | 13.5 | | | 27 | Adc |
| Max. Input Short Circuit Current | 45 | | | | | | | Adc |
| Reverse-Polarity Protection | Yes | | | | | | | |
| Ground-Fault Isolation Detection | 600kΩ Sensitivity | | | | | | | |
| Maximum Inverter Efficiency | 99 | 99.2 | | | | | | % |
| CEC Weighted Efficiency | 99 | | | | | | 99 @ 240V<br>98.5 @ 208V | % |
| Nighttime Power Consumption | < 2.5 | | | | | | | W |

[1] For other regional settings please contact SolarEdge support
[2] A higher current source may be used; the inverter will limit its input current to the values given

# Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

| | SE3000H-US | SE3800H-US | SE5000H-US | SE6000H-US | SE7600H-US | SE10000H-US | SE11400H-US | |
|---|---|---|---|---|---|---|---|---|
| **ADDITIONAL FEATURES** | | | | | | | | |
| Supported Communication Interfaces | RS485, Ethernet, ZigBee (optional), Cellular (optional) | | | | | | | |
| Revenue Grade Data, ANSI C12.20 | Optional[3] | | | | | | | |
| Inverter Commissioning | with the SolarEdge mobile application using built-in Wi-Fi station for local connection | | | | | | | |
| Rapid Shutdown - NEC 2014 and 2017 690.12 | Automatic Rapid Shutdown upon AC Grid Disconnect | | | | | | | |
| **STANDARD COMPLIANCE** | | | | | | | | |
| Safety | UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07 | | | | | | | |
| Grid Connection Standards | IEEE1547, Rule 21, Rule 14 (HI) | | | | | | | |
| Emissions | FCC Part 15 Class B | | | | | | | |
| **INSTALLATION SPECIFICATIONS** | | | | | | | | |
| AC Output Conduit Size / AWG Range | 3/4" minimum / 14-6 AWG | | | | | 3/4" minimum / 14-4 AWG | | |
| DC Input Conduit Size / # of Strings / AWG Range | 3/4" minimum / 1-2 strings / 14-6 AWG | | | | | 3/4" minimum / 1-3 strings / 14-6 AWG | | |
| Dimensions with Safety Switch (HxWxD) | 17.7 x 14.6 x 6.8 / 450 x 370 x 174 | | | | | 21.3 x 14.6 x 7.3 / 540 x 370 x 185 | | in / mm |
| Weight with Safety Switch | 22 / 10 | | 22.1 / 10 | | 25.2 / 11.5 | 38.8 / 17.6 | | lb / kg |
| Noise | < 25 | | | | | < 50 | | dBA |
| Cooling | Natural Convection | | | | | | | |
| Operating Temperature Range | -40 to +140 / -40 to +60 [4] | | | | | | | °F / °C |
| Protection Rating | NEMA 4X (Inverter with Safety Switch) | | | | | | | |

[3] Revenue grade inverter P/N: SE3000H-US000BNC4
[4] Full power up to at least 50°C / 122°F, for power derating information refer to: https://www.solaredge.us/sites/default/files/se-temperature-derating-note-us.pdf



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| DESIGNER | OSB |
| REVIEWER | |

SHEET NAME

INVERTER DATASHEET

SHEET NUMBER

DS-03

APA SOLAR RACKING

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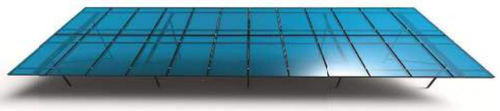
WHERE INNOVATION MEETS AUTOMATION

## STANDARD SPECIFICATIONS

**Engineering:** APA Drawings can be PE stamped for all 50 States and territories
**Grounding:** Materials included
**Foundation:** Helical, Ground Screw or Ballast
**Tilt Angles:** 5°-35° Tilt Options
**Racking Coating:** Galvanized; G90
**Foundation Coating:** HDG
**Wind Loading:** Up to 150mph
**Snow Loading:** Up to 100psf
**Mounting Orientation:** 2-High in Portrait
**Warranty:** 25 Years

## DUAL POST DESIGN

Ready Rack is a dual post design, making it an ideal choice for challenging sites with heavy wind or snow loads, and high topography. It comes standard with shallow micro helicals for soft or saturated soils, deep frost lines, shallow bedrock or high water tables. Ground screw or ballast foundation options are also available for sites with rock or non-penetrative soils.



## READYRACK

The **Ready Rack™** system is one of our original designs, updated and optimized over the years with innovative features to bring down hardware cost and install time. It is one of the most versatile systems on the market, and is designed to easily accommodate changes with modules, layouts and terrain. The simplistic hardware allows contractors to streamline the install process with adjustable features built in. Helical foundations and quick-install bracing, along with carefully engineered, strong, and lightweight cee channels, are highly configurable and allow infinite solutions to common adjustment issues.

*In business since 2008, APA offers a versatile line of racking and foundation solutions for projects in even the most challenging environments. With projects nationwide, APA is a trusted racking partner.*

20-345 COUNTY ROAD X \\ PO. BOX 224 \\ RIDGEVILLE CORNERS, OH 43555

419.267.5280 // SALES@APASOLAR.COM

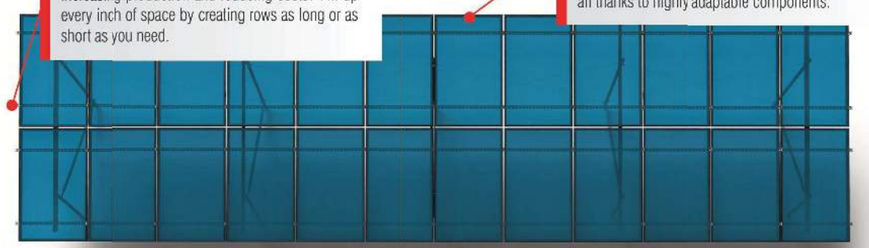
## WHY USE READY RACK™?

### CUSTOMIZABLE ROW LENGTHS

How do you fit more content in an area while increasing production and reducing costs? Fill up every inch of space by creating rows as long or as short as you need.

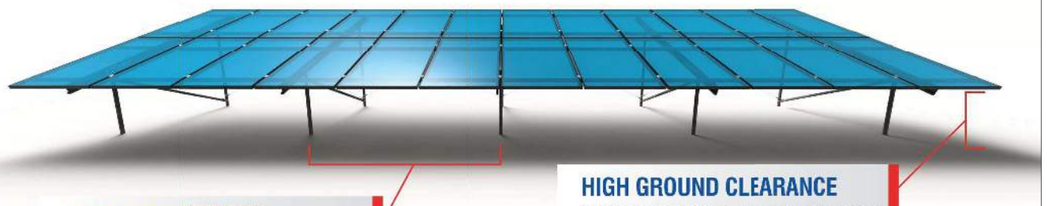
### VERSATILE DESIGN

Design your rack to fit any panel and in any space, all thanks to highly adaptable components.



### HIGH TERRAIN CAPACITY

By easily accommodating slopes over 20%, difficult terrain is no longer a problem.



### INCREASED SPACING

Longer spans means less parts, faster installation, and more money in your pocket.

### HIGH GROUND CLEARANCE

Whether your project needs clearance for snow or room for maintenance, our highly adjustable foundations have got you covered.

### INSTALLER FRIENDLY

Sleek and strong, our cee channel accommodates varying post heights, spans, tilts, and allows for adjustments in the field.

### HIGH STRENGTH PARTS

Engineered for the toughest Northern winters and the harshest Southern hurricanes, Ready Rack has stood the test of time.

APA SOLAR RACKING

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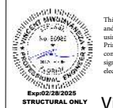


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| REVIEWER | |

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SHEET NUMBER
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APA SOLAR RACKING

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## ROCKY SOIL CONDITIONS

APA's ground screws are designed for sites with rock. The forged tip helps lead the screw straight and plumb. The threads of the screw bite and hold firmly into the soil without getting caught on rocks and cobbles. The heavy walled tube and welded connections allow massive amounts of torque and downward pressure to be applied helping the screw to advance into even the toughest soils.

## SIMPLE INSTALL

Several types of equipment can be used to install APA's ground screws. Skid loaders or mini excavators with an auger attachment are among the most common installation equipment. Many drilling contractors can use a simple adaptor to drive ground screws without buying new equipment. Most pile driving rigs can be converted to rotary heads with little effort.

20-345 COUNTY ROAD X P.O. BOX 326 RIDGEVILLE CORNERS, OH 43555

## GROUND SCREW

APA **Ground Screws** are manufactured for even the most challenging solar sites. Our ground screws use heavy walled tubing for the main shaft of the screw. The tips of the screw are forged, making them extremely hard, this is essential to help it penetrate into or pass by underground obstructions. The threads are welded with a patented automated welding process to provide a consistent and strong weld along the entire length of the thread. Ground screws come with a durable hot dipped galvanized coating that will protect them from corrosion.

*In business since 2008, APA offers the most versatile line of racking and foundation solutions for projects in even the most challenging environments. With projects nationwide, APA is a trusted quality racking partner.*

419.267.5280 SALES@APALTERNATIVES.COM

# WHAT MAKES THE GROUND SCREW FOUNDATION SO CAPABLE?

### HARD SOILS
Hard soils are why ground screws were designed. The forged tip and heavy duty steel tube allow for thousands of pounds of downforce and turning torque to be applied to the screw. This amount of torque and downforce allows rocks and cobbles to be pushed out of the way during installation

### SOLID ROCK
Ground screws can be installed into solid rock. By utilizing the method of drilling a pilot hole and adding some gravel backfill. The ground screws are securely installed into the pilot hole using the threads of the screw and the gravel backfill then locks them into the solid rock

### SANDY SOILS
The granular structure of sand has poor friction value making it hard for driven piles to perform well. However, the shape and threads of a ground screw displace and compact the sand around it when installed. This helps interlock the sand together and provides excellent holding power of the screw threads

### HEIGHT ADJUSTMENT
Posts can be adjusted to the perfect height by simply raising or lowering the top post in or out of the screw. To secure the top post, simply tighten the three set screws

### SHALLOW INSTALL
The ground screws can be installed as shallow as 30" depending on the soil. This allows for less chances of hitting underground obstructions

| Diameter | Overall Length | | | |
|---|---|---|---|---|
| 2.35" | 40" | 61" | 73" | 85" |
| 3.00" | 40" | 61" | 73" | 85" |
| 3.50" | 40" | 61" | 73" | 85" |
| 4.00" | 61" | 73" | 85" | |
| 4.50" | 61" | 73" | 85" | |

Custom sizes are available - contact us for more information

### SET SCREW OR FLANGE CONNECTION
Ground screws can be manufactured with a set of three screw nuts or a flange welded to the top of the post. The set screws and flange options allow the screws to be used with fixed tilt, tracking and other solar mounting applications

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REVISIONS

| REV | ENGG. | DESCRIPTION | DATE |
|---|---|---|---|
| | | | |

| PERMIT DEVELOPER | |
|---|---|
| DATE | 06/08/2023 |
| DESIGNER | OSB |
| REVIEWER | |

SHEET NAME
ATTACHMENT DATASHEET

SHEET NUMBER
DS-05