**PROJECT NAME:**

**BONNIE CREELEY**

**94 DONNIBROOK RUN**

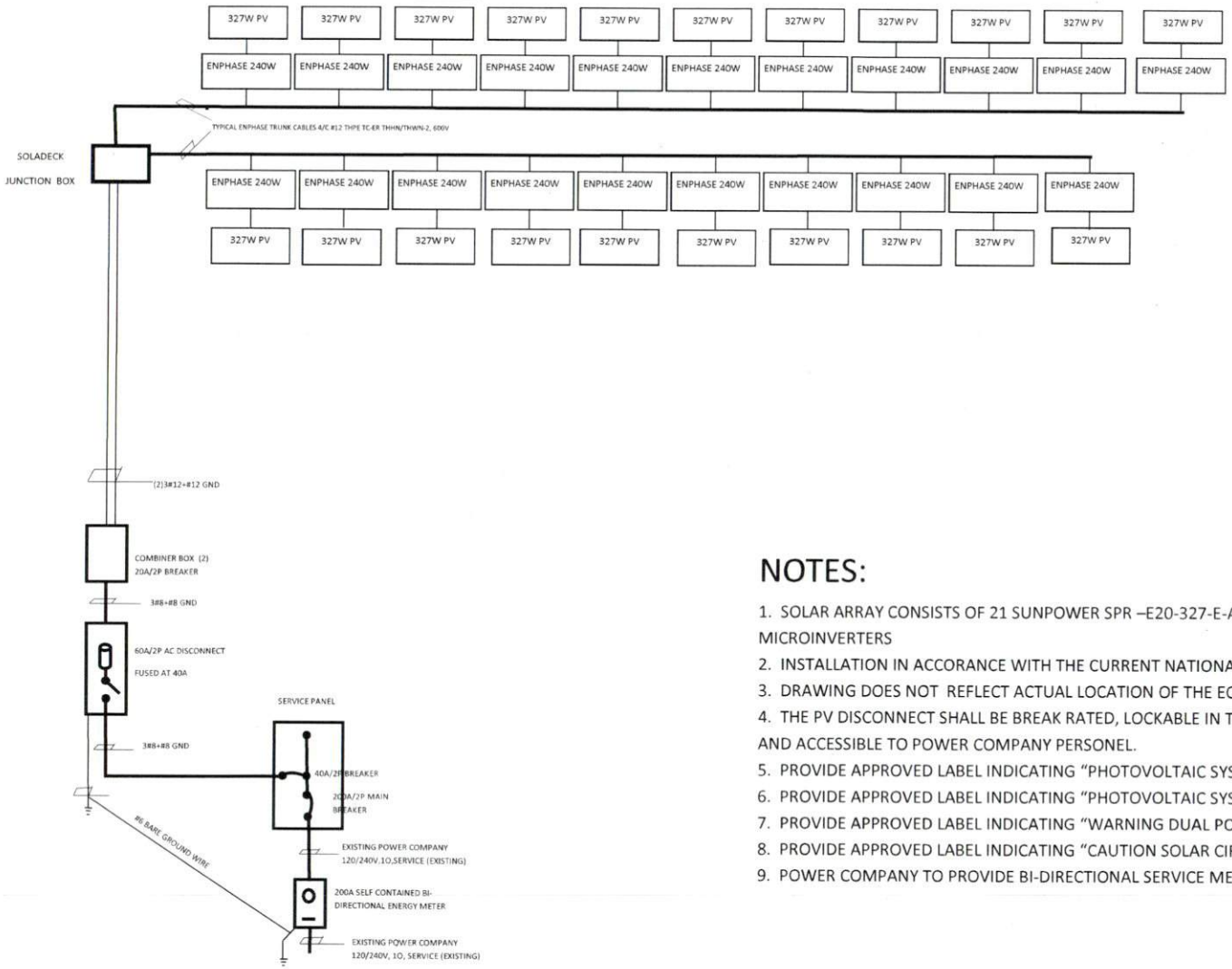
**FUQUAY-VARINA NC 27526**

| | |
|---|---|
| POWER CO: | DUKE PROGRESS |
| DRAWN BY: | J. Powell |
| DATE: | 10/16/19 |

System Size 6.2kW AC

Thompson & Son
Energy Solutions

852 TURNING POINT LN.
CONCORD, NC 28027
(704) 526-9303

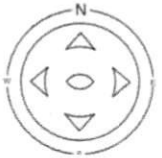


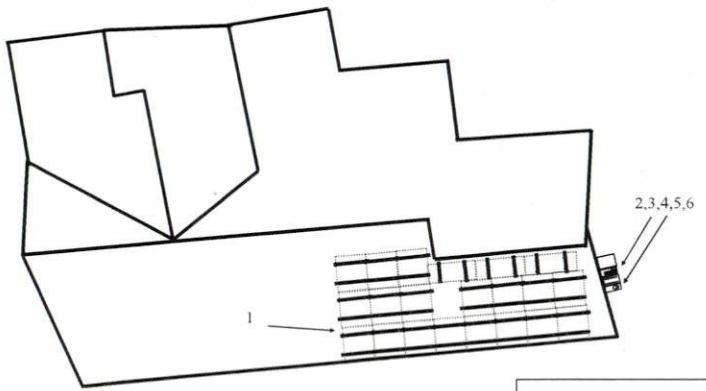

## NOTES:

1. SOLAR ARRAY CONSISTS OF 21 SUNPOWER SPR –E20-327-E-AC 327W PV MODULES WITH INTEGRATED ENPHASE IQ7X-96-2-US MICROINVERTERS
2. INSTALLATION IN ACCORANCE WITH THE CURRENT NATIONAL ELECTRICAL CODE (NEC) AND NFPA 70
3. DRAWING DOES NOT REFLECT ACTUAL LOCATION OF THE EQUIPMENT
4. THE PV DISCONNECT SHALL BE BREAK RATED, LOCKABLE IN THE OPEN POSITION, LOCATED ADJACENT TO THE SERVICE METER, AND ACCESSIBLE TO POWER COMPANY PERSONEL.
5. PROVIDE APPROVED LABEL INDICATING "PHOTOVOLTAIC SYSTEM AC DISCONNECT" ON PV DISCONNECT.
6. PROVIDE APPROVED LABEL INDICATING "PHOTOVOLTAIC SYSTEM Kwh METER" ON CUSTOMER GENERATION METER
7. PROVIDE APPROVED LABEL INDICATING "WARNING DUAL POWER SOURCES: UTILITY GRID AND PV ELECTRIC SYSTEM"
8. PROVIDE APPROVED LABEL INDICATING "CAUTION SOLAR CIRCUIT" AT SYSTEM BRANCH BREAKER IN PANELBOARD.
9. POWER COMPANY TO PROVIDE BI-DIRECTIONAL SERVICE METER AFTER FINAL INSPECTION.

AZIMUTH AND TILT ANGLE

| | A | B | C | D |
|---|---|---|---|---|
| AZIMUTH | 170 | | | |
| TILT | 34 | | | |
| MODULE COUNT | 21 | | | |
| MODULE | SUNPOWER SPR-E20-327-E-AC | | | |
| INVERTER | ENPHASE IQ7X-96-2-US | | | |
| PANELS AND OTHER INSTALLED FIXTURES ARE COMPLIANT TO THE 2015 IFC, 2015 IRC & 2014 NEC | | | | |
| DESIGN DATA | | | | |
| 1 | SOLAR PV ARRAY-21 SUNPOWER SPR-E20-327-E-AC 327W MODULES W/INTEGRATED ENPHASE MICROINVERTERS IQ7XS-96-2-US W/ AUTOMATIC SHUTDOWN. | | | |
| 2 | PV COMBINER BOX, UL50 TYPE3R | | | |
| 3 | EXISTING ELECTRICAL PANEL (OUTSIDE) | | | |
| 4 | METER BASE | | | |
| 5 | AC DISCONNECT (OUTSIDE) | | | |
| 6 | CONDUIT RUN (DETERMINED IN FIELD) | | | |




| | CONSTRUCTION NOTES |
|---|---|
| A. | A LADDER SHALL BE IN PLACE FOR ANY INSPECTIONS IN COMPLIANCE WITH OSHA REGULATIONS |
| B. | PV MODULES ARE NON-COMBISTIBLE IN NATURE. |
| C. | THIS SYSTEM IS A UTILITY INTERACTIVE (GRID CONNECTED) SYSTEM AND DOES NOT HAVE STORAGE BATTERIES. |
| D. | A GROUND ELECTRODE WILL BE USED IN ACCORDANCE WITH NEC 690.47 & 250.50-250.166. GROUNDING ELECTRODE SYSTOM OF EXISTING BUILDING MAY BE USED WHEN BONDED AT THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE, OR IS ONLY METALLICE WATER PIPING, A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8FT GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO GREATER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE GROUNDING SYSTEM. |
| E. | EACH MODULE WILL BE GROUNDED USING THE SUPPLIED CONECTION POINT IDENTIFIED IN THE MAUFACTURER'S INSTALLATION INSTRUCTIONS. |
| F. | THE EXPOSED METALLIC TABS OF THE ENPHASE M250 MICROINVERTERS SHALL BE BONDED AND/OR GROUNDED PER THE NEC 690.43(A) AND THE MANUFACTURER'S INSTRUCTIONS. |
| G. | PROPER ACCESS AND WORKING CLEARNCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER NEC 110.26 |
| H. | ALTERNATE POWER SOURCE PLACARD SHALL BE PLASTIC, ENGRAVED IN A CONTRASTING COLOR(WHITE). THIS PLAQUE WILL BE PERMANATELY ATTACHED AND UV RESISTANT. |
| I. | ALL PLAQUES AND SIGNS WILL BE INSALLED AS REQUIRED BY 2014 NEC. |
| J. | A SMOKE DETECTOR, APPROVED AND LISTED BY THE STATE FIRE MARSHALL, SHALL BE INSTALLED IN EACH DWELLING WHEN A PERMIT FOR ALTERATIONS, REPAIRS OR ADDITIONS EXCEEDS $1,000.00. A BATTERY POWERED SMOKE DETECTOR SATISFIES THE REQUIREMENTS FOR A SMOKE DETECTOR, APPROVED COMBINED SMOKE ALARMS AND CARBON DIOXIDE ALARMS SHALL BE ACCEPTABLE. A CARBON MONOXIDE DETECTOR SHALL BE INSTALLED IN THE SPECIFIC EXISTING DWELLING UNIT THAT HAVE ATTACHED GRAGES OR FUEL-BURNING APPLICANCES FOR WHICH A PERMIT IS ISSUED FOR ALTERATIONS, REPAIRS OR ADDITIONS EXCEEDING $1,00.00. LISTED SINGLE- OR MULTI-STATION CARBON MONOXIDE ALARMS SHALL BE INSTALLED OUTSIDE OF EACH SEPARATE SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS AND ON ENTRY LEVEL OF A DWELLING UNIT INCLUDING BASEMENTS. COMBINED SMOKE/CARBON MONOXIDE ALARMS MAY BE USED. THE ALARM SHALL RECEIVE ITS PRIMARY POWER FROM THE BUILDING WIRING EXCEPT IT IS PERMITTED TO BE SOLELY BATTERY OPERATED WHERE REPAIRS OR ALTERATIONS DO NOT RESULT IN THE REMOVAL OF WALL AND CEILING FINISHES OR THERE IS NO ACCESS BY MEANS OF AN ATTIC. |
| K. | THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE BETWEEN THE GROUNDING ELECTRODE AND THE PANEL (OR INVERTER) IF SMALLER THAN #6AWG COPPER WIRE AS PER NEC 250-64B. THE GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AS BUS-BARS WITHIN LISTED EQUIPMENT AS PER NEC 250.64C |
| L. | ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THE BUILDING CODE OF THE LOCAL JURISDICTION |
| M. | PV SYSTEMS CONNECTION IN THE SWITCH GEAR (PANEL) SHALL BE POSITIONED AT THE OPPOSITE AT THE OPPOSITE END FROM THE INPUT FEEDER LOCATION OR MAIN CIRCUIT LOCATION AS PER NEC 705.12(D)(7). |
| N. | ALL EQUIPMENT SUPPLIED SHALL BE UL LISTED OR LISTED BY A LISTING AGENCY RECOGNIZED BY THE STATE IN WHICH THE SYSTEM IS CONSTRUCTED. |
| O. | AC DISCONNECTS SHALL BE IN COMPLIANCE WITH NEC 690.17. |
| P. | ALL DC CONDUCTORS SHALL BE 90 RATED THHW, THWN-2, USE-2 OR PV WIRE. ALL AC CONDUCTORS SHALL BE 75 RATED THWN WIRE. |
| Q. | THE UTILITY DISCONNECT HAS VISIBLE BLADES, IS LOCKABLE AND IS ACCESSIBLE TO THE UTILITY 24/7. |
| R. | ALL BREAKERS SHALL BE SUITABLE FOR BACKFEED. WHEN THE BACKFED BREAKER IS THE METHOD OF UTILITY INTERCONNECTION BREAKER SHALL NOT READ "LINE AND LOAD". |
| S. | COORDINATE ANY POWER OUTAGE WITH LOCAL UTILITY AND PROPERTY OWER. NOTIFY UTILITY BEFORE ACTIVATION OF PV SYSTEM. |
| T. | CITY BUILDING INSPECTOR SHALL INSPECT ACCESSIBLE STRUCTURAL CONNECTIONS AND THE HOUSE CURRENT SIDE OF THE SYSTEM, ALL OTHER EQUIPMENT SHALL BE UL LISTED AND APPROVED. |
| U. | PHOTOVOLTAIC MODULES SHALL NOT BE INSTALLED OVER ANY ATTIC, PLUMBING OR MECHANICAL VENTS TO EXTEND A MIN OF 6" ABOVE ROOF OR MODULE. NO BLDG, PLBG OR MECH VENTS TO BE COVERED , OBSTRUCTED OR ROUTED AROUND MODULES |
| V. | ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER THE OPENINGS SUCH AS WINDOWS OR DOORS, AD LOCATED AT A STRONG POINT OF BUILDING CONSTRUCTION. FIELD VERIFY EXACT LOCATION. |
| W. | THE DISCHARGE OF POLLUTANTS TO ANY STOR DRAINAGE SYSTEM IS PROHIBITED. NO SOLID WAST, PETROLEUM BYPRODUCTS, SOIL PARTICULATE, CONSTRUCTION WASTE MATERIAL OR WASTEWATER GENERATED ON CONSTRUCTION SITE OR BY CNSTRUCTION ACTIVITES SHALL BE PLACED, CONVEYED OR DISCHARGED INTO THE STREET, GUTTER OR DRAIN SYSTEM. |
| X. | ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVIES OR MECHANICAL MEANS DESIGNED ND LISTED FOR SUCH USE AND WIRING MUST BE PERMANETLY AND COM-PLETELY HELD OFF THE ROOF SURFACE. |

Thompson & Son
Energy Solutions

| | | | | | |
|---|---|---|---|---|---|
| | PROJECT# | TSE-CREELEY | PROJECT LOCATION | PAGE | NOTES |
| | SYSTEM SIZE | 6.20kw AC | 94 DONNIBROOK RUN | | |
| | DATE | 10/14/19 | FUQUAY-VARINA NC | | |
| 2000 MBA CT APT 2305<br>CONCORD, NC 28027 | | | 27526 | | |
| 704-526-9303 | DESIGNER | D. STEELE | | PV1 | BONNIE CREELEY 607-205-0759 |

1 LOCATION: J-BOX

**CAUTION**

**AUTHORIZED SOLAR PERSONNEL ONLY!**

2 LOCATION: PV SUB-PANEL(IF USED)

**PV SUB-PANEL ONLY**

**(TO BE LOCATED ON SUB-PANEL ONLY WHEN SUB-PANEL IS DEDICATED FOR PV ONLY)**

3 LOCATION: AC DISCONNECT

**AC DISCONNECT**

| AC PHOTOVOLTAIC POWER SOURCE | |
|---|---|
| AC OUTPUT CURRENT | 30 A |
| NOMINAL AC VOLTAGE | 240 V |

4 LOCATION: MAIN SERVICE PANEL

**THIS PANEL IS FED BY MULTIPLE SOURCES (UTILITY & SOLAR)**

5 LOCATION: MAIN SERVICE PANEL

**SOLAR**

**(STICKER LOCATED INSIDE PANEL NEXT TO PV BREAKER)**

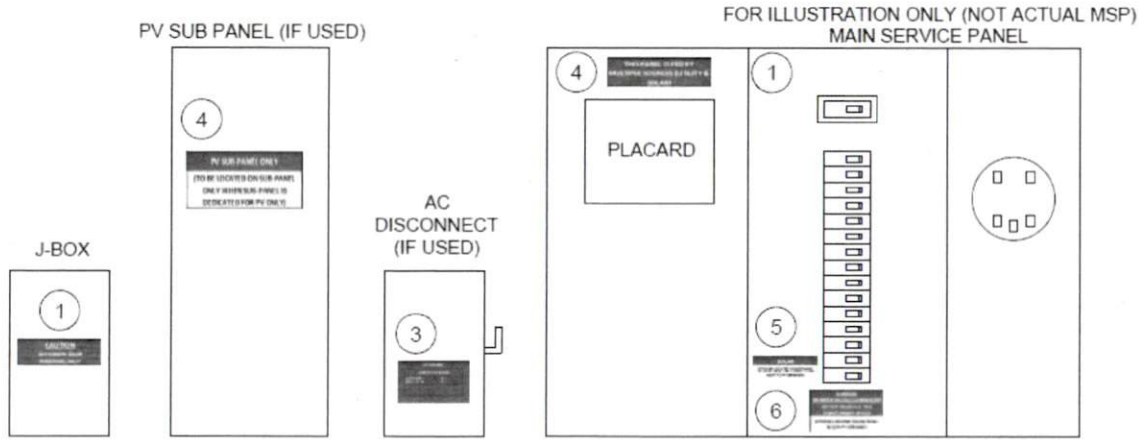
6 LOCATION: MAIN SERVICE PANEL

**WARNING**

**INVERTER OUTPUT CONNECTION**

**DO NOT RELOCATE THIS OVERCURRENT DEVICE**

**(STICKER LOCATED INSIDE PANEL BELOW PV BREAKER)**



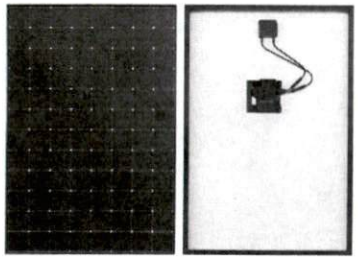

Thompson & Son Energy Solutions

2000 MBA Ct APT 2305
CONCORD, NC 28027

704-239-9098

| | | | | |
|---|---|---|---|---|
| PROJECT# | TSE-CREELEY | PROJECT LOCATION | PAGE | NOTES |
| SYSTEM SIZE | 6.2kW AC | | | |
| DATE | 10/14/2019 | 94DONNIBROOK RUN FUQUAY-VARINA NC 27526 | | |
| DESIGNER | D.STEELE | | PV3 | BONNIE CREELEY 607-205-0759 |

SUNPOWER®



## SunPower® E-Series: E20-327 | E19-320

# SunPower® Residential AC Module

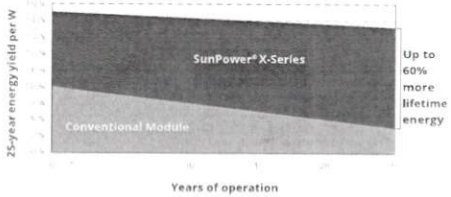
Built specifically for use with the SunPower Equinox™ system, the only fully integrated solution designed, engineered, and warranted by one manufacturer.

### Maximum Power. Minimalist Design.

Industry-leading efficiency means more power and savings per available space. With fewer modules required and hidden microinverters, less is truly more.

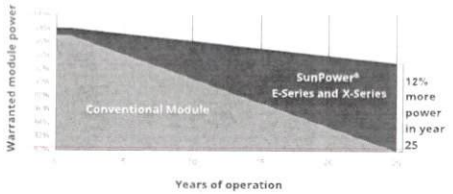
### Highest Lifetime Energy and Savings.

Designed to deliver 60% more energy over 25 years in real-world conditions like partial shade and high temperatures.




### Best Reliability. Best Warranty.

With more than 25 million modules deployed around the world, SunPower technology is proven to last. That's why we stand behind our module and microinverter with the industry's best 25-year Combined Power and Product Warranty, including the highest Power Warranty in solar.




### Fundamentally Different. And Better.

The SunPower® Maxeon® Solar Cell

- Enables highest-efficiency modules available [1]
- Unmatched reliability [3]
- Patented solid metal foundation prevents breakage and corrosion

Factory-integrated Microinverter

- Simpler, faster installation
- Integrated wire management, rapid shutdown
- Engineered and calibrated by SunPower for SunPower modules

## E-Series: E20-327 | E19-320 SunPower® Residential AC Module

| AC Electrical Data | | |
|---|---|---|
| Inverter Model: Enphase IQ 7XS (IQ7XS-96-ACM-US) | @240 VAC | @208 VAC |
| Peak Output Power | 320 VA | 320 VA |
| Max. Continuous Output Power | 315 VA | 315 VA |
| Nom. (L-L) Voltage/Range [4] | 240 / 211–264 | 208 / 183–229 |
| Max. Continuous Output Current (A) | 1.31 | 1.51 |
| Max. Units per 20 A (LL) Branch Circuit [5] | 12 (single phase) | 10 (two pole) |
| CEC Weighted Efficiency | 97.5% | 97.0% |
| Nom. Frequency | 60 Hz | |
| Extended Frequency Range | 47–68 Hz | |
| AC Short Circuit Fault Current Over 3 Cycles | 5.8 Arms | |
| Overvoltage Class AC Port | III | |
| AC Port Backfeed Current | 18 mA | |
| Power Factor Setting | 1.0 | |
| Power Factor (adjustable) | 0.7 lead / 0.7 lag | |
| | No active phase balancing for three-phase installations | |

| DC Power Data | | |
|---|---|---|
| | SPR-E20-327-E-AC | SPR-E19-320-E-AC |
| Nom. Power (Pnom) | 327 W | 320 W |
| Power Tol. | +5/-0% | +5/-0% |
| Module Efficiency | 20.4% | 19.9% |
| Temp. Coef. (Power) | -0.25%/°C | -0.35%/°C |
| Shade Tol. | • Three bypass diodes<br>• Integrated module-level maximum power point tracking | |

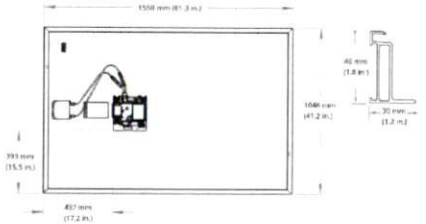
| Tested Operating Conditions | |
|---|---|
| Operating Temp. | -40°F to +185°F (-40°C to +85°C) |
| Max. Ambient Temp. | 122°F (50°C) |
| Max. Load | Wind: 62 psf, 3000 Pa, 305 kg/m² front & back<br>Snow: 125 psf, 6000 Pa, 611 kg/m² front |
| Impact Resistance | 1 inch (25 mm) diameter hail at 52 mph (23 m/s) |

| Mechanical Data | |
|---|---|
| Solar Cells | 96 Monocrystalline Maxeon Gen III |
| Front Glass | High-transmission tempered glass with anti-reflective coating |
| Environmental Rating | Outdoor rated |
| Frame | Class 1 black anodized (highest AA/MA rating) |
| Weight | 42.9 lbs (19.5 kg) |
| Recommended Max. Module Spacing | 1.3 in. (33 mm) |

| Warranties, Certifications, and Compliance | |
|---|---|
| Warranties | • 25-year limited power warranty<br>• 25-year limited product warranty |
| Certifications and Compliance | • UL 1703<br>• UL 1741 / IEEE1547<br>• UL 741 AC Module (Type 2 fire rated)<br>• UL 62109-1 / IEC 62109-2<br>• FCC Part 15 Class B<br>• ICES-0003 Class B<br>• CAN/CSA-C22.2 NO. 107.1-01<br>• CA Rule 21 (UL 1741-SA) (Includes Volt/Var and Reactive Power Priority)<br>• UL Listed PV Rapid Shutdown Equipment<br><br>Enables installation in accordance with:<br>• NEC 690.6 (AC module)<br>• NEC 690.12 Rapid Shutdown inside and outside the array<br>• NEC 690.15 AC Connectors 690.33(A)–(E) 1<br><br>When used with Ironridge Mount racking and Ironridge Mount accessories (UL 2703):<br>• Module grounding and bonding through Ironridge Mount<br>• Class A fire rated<br>When used with AC module Q Cables and accessories (UL 6703 and UL 2238)*<br>• Rated for load break disconnect |
| PID Test | Potential-induced degradation free |

1 SunPower 360 W compared to a conventional module on same-sized arrays (250 W, 15% efficient; approx. 1.6 m²). 4% more energy per watt (based on third-party module characterization and PVSim); 0.75%/yr slower degradation (Campeau, Z. et al. "SunPower Module Degradation Rate." SunPower white paper, 2013).
2 Based on search of datasheet values from websites of top 10 manufacturers per IHS, as of January 2017.
3 #1 rank in "Fraunhofer PV Durability Initiative for Solar Modules: Part 3." PVTech Power Magazine, 2015. Campeau, Z. et al. "SunPower Module Degradation Rate." SunPower white paper, 2013.
4 Factory set to 1547a-2014 default settings. CA Rule 21 default settings profile set during commissioning. See the Equinox Installation Guide #518101 for more information.
5 Standard Test Conditions (1000 W/m² irradiance, AM 1.5, 25°C). NREL calibration standard: SOMS current, LACCS FF, and voltage. All DC voltage is fully contained within the module.
6 This product is UL Listed as PV Rapid Shutdown Equipment and conforms with NEC 2014 and NEC 2017 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.

See www.sunpower.com/facts for more reference information.
For more details, see extended datasheet www.sunpower.com/datasheets.
Specifications included in this datasheet are subject to change without notice.


UL LISTED 8478339 Module Fire Performance: Type 2

SUNPOWER®

Please read the Safety and Installation Instructions for details.

531948 RevA

Data Sheet
Enphase Microinverters
Region: AMERICAS

# Enphase IQ 7X Microinverter

The high-powered smart grid-ready **Enphase IQ 7X Micro™** dramatically simplifies the installation process while achieving the highest system efficiency for systems with 96-cell modules.

Part of the Enphase IQ System, the IQ 7X Micro integrates with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

The IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.


## Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

## Efficient and Reliable

- Optimized for high powered 96-cell* modules
- Highest CEC efficiency of 97.5%
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

## Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7X is required to support 96-cell modules.

UL CERTIFIED SAFETY US-CA E341165

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE

## Enphase IQ 7X Microinverter

| INPUT DATA (DC) | IQ7X-96-2-US and IQ7X-96-B-US | |
|---|---|---|
| Commonly used module pairings[1] | 320 W - 460 W + | |
| Module compatibility | 96-cell PV modules | |
| Maximum input DC voltage | 79.5 V | |
| Peak power tracking voltage | 53 V - 64 V | |
| Operating range | 25 V - 79.5 V | |
| Min/Max start voltage | 33 V / 79.5 V | |
| Max DC short circuit current (module Isc) | 10 A | |
| Overvoltage class DC port | II | |
| DC port backfeed current | 0 A | |
| PV array configuration | 1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit | |
| **OUTPUT DATA (AC)** | **@ 240 VAC** | **@ 208 VAC** |
| Peak output power | 320 VA | |
| Maximum continuous output power | 315 VA | |
| Nominal (L-L) voltage/range[2] | 240 V / 211-264 V | 208 V / 183-229 V |
| Maximum continuous output current | 1.31 A (240 VAC) | 1.51 A (208 VAC) |
| Nominal frequency | 60 Hz | |
| Extended frequency range | 47 - 68 Hz | |
| AC short circuit fault current over 3 cycles | 5.8 Arms | |
| Maximum units per 20 A (L-L) branch circuit[3] | 12 (240 VAC) | 10 (208 VAC) |
| Overvoltage class AC port | III | |
| AC port backfeed current | 18 mA | |
| Power factor setting | 1.0 | |
| Power factor (adjustable) | 0.85 leading ... 0.85 lagging | |
| **EFFICIENCY** | **@240 VAC** | **@208 VAC** |
| CEC weighted efficiency | 97.5 % | 97.0 % |
| **MECHANICAL DATA** | | |
| Ambient temperature range | -40°C to +60°C | |
| Relative humidity range | 4% to 100% (condensing) | |
| Connector type (IQ7X-96-2-US) | MC4 (or Amphenol H4 UTX with optional Q-DCC-5 adapter) | |
| Connector type (IQ7X-96-B-US) | Friends PV2, may require adapters for modules with MC4 or UTX connectors:<br>- PV2 to MC4: order ECA-S20-S22<br>- PV2 to UTX: order ECA-S20-S25 | |
| Dimensions (WxHxD) | 212 mm x 175 mm x 30.2 mm (without bracket) | |
| Weight | 1.08 kg (2.38 lbs) | |
| Cooling | Natural convection - No fans | |
| Approved for wet locations | Yes | |
| Pollution degree | PD3 | |
| Enclosure | Class II double-insulated, corrosion resistant polymeric enclosure | |
| Environmental category / UV exposure rating | NEMA Type 6 / outdoor | |
| **FEATURES** | | |
| Communication | Power Line Communication (PLC) | |
| Monitoring | Enlighten Manager and MyEnlighten monitoring options<br>Compatible with Enphase IQ Envoy | |
| Disconnecting means | The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690. | |
| Compliance | CA Rule 21 (UL 1741-SA)<br>UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01<br>This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC-2014 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions. | |

1. No enforced DC/AC ratio. See the compatibility calculator at https://enphase.com/en-us/support/module-compatibility.
2. Nominal voltage range can be extended beyond nominal if required by the utility.
3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE


2018-11-19

# SunPower® InvisiMount™ | Residential Mounting System

## Simple and Fast Installation

- Integrated module-to-rail grounding
- Pre-assembled mid and end clamps
- Levitating mid clamp for easy placement
- Mid clamp width facilitates consistent, even module spacing
- UL 2703 Listed integrated grounding

## Flexible Design

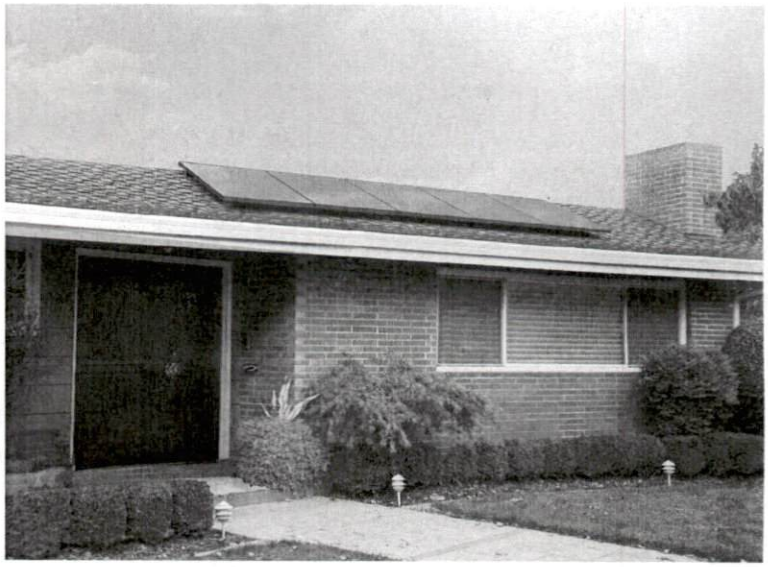
- Addresses nearly all sloped residential roofs
- Design in landscape and portrait with up to 8' rail span
- Pre-drilled rails and rail splice
- Rails enable easy obstacle management

## Customer-Preferred Aesthetics

- #1 module and #1 mounting aesthetics
- Best-in-class system aesthetics
- Premium, low-profile design
- Black anodized components
- Hidden mid clamps and capped, flush end clamps

## Part of Superior System

- Built for use with SunPower DC and AC modules
- Best-in-class system reliability and aesthetics
- Optional rooftop transition flashing, rail-mounted J-box, and wire management rail clips
- Combine with SunPower modules and SunPower EnergyLink® monitoring app



## Elegant Simplicity

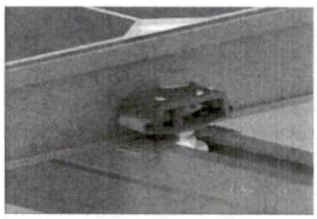
SunPower® InvisiMount™ is a SunPower-designed rail-based mounting system. The InvisiMount system addresses residential sloped roofs and combines faster installation time, design flexibility, and superior aesthetics. The InvisiMount product was specifically envisioned and engineered to pair with SunPower modules. The resulting system-level approach amplifies the aesthetic and installation benefits—for homeowners and for installers.

sunpower.com

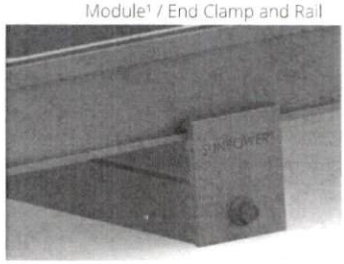
# SunPower® InvisiMount™ | Residential Mounting System

## InvisiMount Components

Module[1] / Mid Clamp and Rail

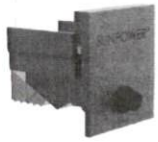


Module[1] / End Clamp and Rail



Ground Lug Assembly

Row-to-Row Spacer



End Clamp

Mid Clamp

Row-to-Row Grounding Clip

Rail and Rail Splice

| InvisiMount Component Details | | |
|---|---|---|
| Mid clamp | Black oxide stainless steel 300 series | 63 g (2.2 oz) |
| End clamp | Black anodized aluminum 6000 series | 110 g (3.88 oz) |
| Rail | Black anodized aluminum 6000 series | 830 g/m (9 oz/ft) |
| Rail splice | Aluminum alloy 6000 series | 830 g/m (9 oz/ft) |
| Rail bolt | M10-1.5 x 25 mm; custom T-head SS304 | 18 g (0.63 oz) |
| Rail nut | M10-1.5; DIN 6923 SS304 | nominal |
| Ground lug assembly | SS304; A2-70 bolt; tin-plated copper lug | 106.5 g (3.75 oz) |
| Row-to-row grounding clip | SS 301 with SS 304 M6 bolts | 75 g (2.6 oz) |
| Row-to-row spacer | Black POM-grade plastic | 5 g (0.18 oz) |

| InvisiMount Operating Conditions | |
|---|---|
| Temperature | −40° C to 90° C (−40° F to 194° F) |
| Max. Load (LRFD) | • 3000 Pa uplift<br>• 6000 Pa downforce |

| Roof Attachment Hardware Supported by Design Tool | |
|---|---|
| Application | • Composition Shingle Rafter Attachment<br>• Composition Shingle Roof Decking Attachment<br>• Curved and Flat Tile Roof Attachment<br>• Universal interface for other roof attachments |

| InvisiMount Component LRFD Capacities[2] | | |
|---|---|---|
| Mid clamp | Uplift | 664 lbf |
| | Shear | 540 lbf |
| End clamp | Uplift | 899 lbf |
| | Shear | 220 lbf |
| Rail | Moment: upward | 548 lbf-ft |
| | Moment: downward | 580 lbf-ft |
| Rail splice | Moment: upward | 548 lbf-ft |
| | Moment: downward | 580 lbf-ft |
| L-foot | Uplift | 1000 lbf |
| | Shear | 390 lbf |

| InvisiMount Warranties And Certifications | |
|---|---|
| Warranties | • 25-year product warranty<br>• 5-year finish warranty |
| Certifications | • UL 2703 Listed<br>• Class A Fire Rated |

| Roof Attachment Hardware Warranties |
|---|
| Refer to roof attachment hardware manufacturer's documentation |

[1] Module frame that is compatible with the InvisiMount system required for hardware interoperability.
[2] SunPower recommends that all Equinox™, InvisiMount™, and AC module systems always be designed using the InvisiMount Span Tables #524734. If a designer decides to instead use the component capacities listed in this document to design a system, note that the capacities shown are Load and Resistance Factor Design (LRFD) design loads, and are NOT to be used for Allowable Stress Design (ASD) calculations; and that a licensed Professional Engineer (PE) must then stamp all calculations. If you have any questions please contact SunPower Technical Support at 1-855-977-7867.



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