TIM POWER - 10.560kW DC, 8.376kW AC





| SHEET | REVISION | DESCRIPTION |
|--------|----------|-------------------------|
| CS-01 | A | COVER SHEET |
| CS-02 | A | GENERAL NOTES |
| E-01 | А | SITE PLAN |
| Ė-01.1 | А | SATELLITE VIEW |
| S-01 | А | MOUNTING DETAILS |
| S-02 | А | STRUCTURAL DETAILS |
| E-02 | A | SINGLE LINE DIAGRAM |
| E-03 | А | ELECTRICAL CALCULATIONS |
| PL-01 | А | PLACARDS |
| SS | A | SPEC SHEET(S) |

ROOF AREA CALCULATION

TOTAL ARRAY AREA TOTAL ROOF AREA

= 503.98 sq.ft = 2189 sq.ft

% ARRAY AREA IN ROOF = 23.03 % **DESIGN CRITERIA**

BASIC WIND SPEED = 130 MPH @ 3-SEC GUST GROUND SNOW LOAD = 35 PSF RISK CATEGORY- II

PROJECT WINDSPEED DETERMINED USING THE ASCE 7 STANDARD UNLESS DIRECTED OTHERWISE BY LOCAL JURISDICTION AMENDMENTS

SCOPE OF WORK

SYSTEM SIZE:

10560W DC, 8376W AC MODULE:

(24)SILFAB SIL-440 QD (440W)

INVERTER:

(24)ENPHASE IQ8AC-72-M-US (240V)

BRANCH DETAILS:

1X8, 1X8, 1X8 ENPHASE BRANCHES

ENGINEERING SCOPE OF WORK

- ILLUMINE INTERNATIONAL INC. HAS ONLY PROVIDED DRAFTING SERVICES FOR THE PERMIT DRAWINGS. NO ACTUAL ENGINEERING WORK, ENGINEERING REVIEW OR ENGINEERING APPROVAL HAS BEEN CONDUCTED BY ILLUMINE INTERNATIONAL INC. UNLESS NOTED OTHERWISE.
- WHEN A PROFESSIONAL ENGINEER APPROVES AND SEALS THE DESIGN FOR COMPONENTS OF THEIR RESPECTIVE DISCIPLINE (STRUCTURAL/ELECTRICAL) SHOWN ON THESE PERMIT DRAWINGS, THE PROFESSIONAL ENGINEER a. TAKES FULL DIRECT CONTROL OF THE ENGINEERED DESIGN
- b. IS GIVEN ACCESS TO PERSONALLY SUPERVISE AND RECTIFY ANY ASPECT OF THE ENGINEERED DESIGN
 c. HAS FULLY ACCEPTED RESPONSIBILITY FOR THE ENGINEERED DESIGN

GENERAL NOTES

- MODULES ARE LISTED UNDER UL 1703 / 61730 AND CONFORM TO THE STANDARDS.
- INVERTERS ARE LISTED UNDER UL 1741 AND CONFORM TO THE STANDARDS.
- DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT OF THE PV SYSTEM AND THE ACTUAL SITE CONDITION MIGHT VARY.
- WORKING CLEARANCES AROUND THE NEW PV ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH
- 5. ALL GROUND WIRING CONNECTED TO THE MAIN SERVICE GROUNDING IN MAIN SERVICE PANEL/ SERVICE EQUIPMENT.
- ALL CONDUCTORS SHALL BE 600V, 90°C STANDARD COPPER UNLESS OTHERWISE NOTED.
- WHEN REQUIRED, A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
- B. THE SYSTEM WILL NOT BE INTERCONNECTED BY THE CONTRACTOR UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND/OR THE UTILITY.
- 9. ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREES, WIRES OR SIGNS. 10. PV ARRAY COMBINER/JUNCTION BOX PROVIDES TRANSITION FROM ARRAY WIRING TO CONDUIT WIRING.

Richard Pantel

Digitally signed by Richard Pantel Date: 2025.10.10 04:03:49 -04000

APPLICABLE CODES

- ELECTRIC CODE: NEC 2020
- VIRGINIA STATEWIDE FIRE PREVENTION CODE: 2021 VSFPC
- VIRGINIA CONSTRUCTION CODE: 2021 VCC
- VIRGINIA RESIDENTIAL CODE: 2021 VRC WITH LOCAL AMENDMENTS

CUSTOMER INFORMATION | CONTRACTOR INFORMATION

NAME: TIM POWER ADDRESS: 119A PARK ST NE, VIENNA, VA 22180

38.904714, -77.262950 APN: 0382710007 UTILITY: DOMINION ENERGY

AHJ: VA - COUNTY FAIRFAX

CONVERT SOLAR

DRAWING INFORMATION

PRN NUMBER: COS-1017707 REV: A DRAFTED BY: WALEED QC'ED BY: PARTHA S SCALE: AS NOTED PAPER SIZE: 17"X11"

COVER SHEET

SHEET: CS-01

INSTALLATION NOTES:

- 1. STRUCTURAL ROOF MEMBER LOCATIONS ARE ESTIMATED AND SHOULD BE LOCATED AND VERIFIED BY THE CONTRACTOR WHEN LAG BOLT PENETRATION OR MECHANICAL ATTACHMENT TO THE STRUCTURE IS REQUIRED.
- 2. ROOFTOP PENETRATIONS FOR SOLAR RACKING WILL BE COMPLETED AND SEALED WITH APPROVED SEALANT PER CODE BY A LICENSED CONTRACTOR.
- 3. LAGS MUST HAVE A MINIMUM 2.5" THREAD EMBEDMENT INTO THE STRUCTURAL MEMBER.
- 4. ALL PV RACKING ATTACHMENTS SHALL BE STAGGERED BY ROW BETWEEN THE ROOF FRAMING MEMBERS AS NECESSARY.
- 5. ROOF MOUNTED STANDARD RAIL REQUIRES ONE THERMAL EXPANSION GAP FOR EVERY RUN OF RAIL GREATER THAN 40°.
- 6. ALL CONDUCTORS AND CONDUITS ON THE ROOF SHALL BE MINIMUM 7/8" ABOVE THE ROOF SURFACE (INCLUDING CABLES UNDERNEATH MODULES AND RACKING).
- 7. ALL SOLAR PANEL ARRAY COMPONENTS SHALL BE INSTALLED PER THE MANUFACTURER'S APPROVED INSTALLATION SPECIFICATIONS.
- 8. THE EXISTING BUILDINGS STRUCTURE SHALL BE VERIFIED AS PROPERLY CONSTRUCTED AND MAINTAINED IN GOOD CONDITION. NO ALLOWANCE HAS BEEN MADE IN THESE DRAWINGS FOR ANY EXISTING DEFICIENCY IN DESIGN. MATERIAL. CONSTRUCTION, OR LACK OF MAINTENANCE FOR THE EXISTING STRUCTURE OR PROPOSED EQUIPMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING EXISTING CONDITIONS, PROPER FIT, AND CLEARANCES IN THE FIELD. 9. WATERPROOFING AROUND THE ROOF PENETRATIONS IS THE RESPONSIBILITY OF CONTRACTOR/INSTALLER.
- 10. MISCELLANEOUS ITEMS NOT EXPLICITLY LISTED OR IDENTIFIED IN THESE DRAWINGS HAVE NOT BEEN DESIGNED. IT IS RECOMMENDED THAT MATERIAL OF SUITABLE SIZE STRENGTH TO BE OBTAINED FROM A REPUTABLE MANUFACTURER FOR MISCELLANEOUS ITEMS.
- 11. IF PROJECT IS STAMPED AND SEALED BY AN ILLUMINE-I STRUCTURAL ENGINEER, SEE ASSOCIATED ILLUMINE-I STRUCTURAL REPORT FOR FULL COMPREHENSIVE SCOPE OF STRUCTURAL ENGINEERING INVESTIGATION AND APPROVAL
- 12. IF ANY CONDITION THROUGHOUT THE ASSOCIATED REPORT OR PERMIT DRAWINGS IS NOT ALSO REPRESENTED ON-SITE, CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD OF ANY DISCREPANCIES AND RECEIVE WRITTEN APPROVAL FROM THE ENGINEER OF RECORD BEFORE PROCEEDING WITH INSTALLATION.
- 13. CONTRACTOR TO PROVIDE MINIMUM 1/4" GAP BETWEEN ALL SOLAR PANELS.

ROOF ACCESS PATHWAYS AND SETBACKS:

1205.2.1 SOLAR PHOTOVOLTAIC SYSTEMS FOR GROUP R-3 BUILDINGS:

SOLAR PHOTOVOLTAIC SYSTEMS FOR GROUP R-3 BUILDINGS SHALL COMPLY WITH SECTIONS 1205.2.1.1 THROUGH 1205.2.1.3.

- 1. THESE REQUIREMENTS SHALL NOT APPLY TO STRUCTURES DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE INTERNATIONAL RESIDENTIAL CODE.
- 2. THESE REQUIREMENTS SHALL NOT APPLY TO ROOFS WITH SLOPES OF 2 UNITS VERTICAL IN 12 UNITS HORIZONTAL (16,7-PERCENT) OR LESS.

NOT FEWER THAN TWO 36-INCH-WIDE (914 MM) PATHWAYS ON SEPARATE ROOF PLANES, FROM LOWEST ROOF EDGE TO RIDGE, SHALL BE PROVIDED ON ALL BUILDINGS. NOT FEWER THAN ONE PATHWAY SHALL BE PROVIDED ON THE STREET OR DRIVEWAY SIDE OF THE ROOF, FOR EACH ROOF PLANE WITH A PHOTOVOLTAIC ARRAY, NOT FEWER THAN ONE 36-INCH-WIDE (914 MM) PATHWAY FROM LOWEST ROOF EDGE TO RIDGE SHALL BE PROVIDED ON THE SAME ROOF PLANE AS THE PHOTOVOLTAIC ARRAY, ON AN ADJACENT ROOF PLANE OR STRADDLING THE SAME AND ADJACENT ROOF PLANES

1205.2.1.2 SETBACKS AT RIDGE:

FOR PHOTOVOLTAIC ARRAYS OCCUPYING 33 PERCENT OR LESS OF THE PLAN VIEW TOTAL ROOF AREA,

A SETBACK OF NOT LESS THAN 18 INCHES (457 MM)WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE. FOR PHOTOVOLTAIC ARRAYS OCCUPYING MORE THAN 33 PERCENT OF THE PLAN VIEW TOTAL ROOF AREA, A SETBACK OF NOT LESS THAN 36 INCHES (457 MM) WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.

1205.2.1.3 ALTERNATIVE SETBACKS AT RIDGE:

WHERE AN AUTOMATIC SPRINKLER SYSTEM IS INSTALLED WITHIN THE DWELLING IN ACCORDANCE WITH SECTION 903.3.1.3, SETBACKS AT THE RIDGE SHALL CONFORM TO ONE OF THE FOLLOWING:

1. FOR PHOTOVOLTAIC ARRAYS OCCUPYING 66 PERCENT OR LESS OF THE PLAN VIEW TOTAL ROOF AREA, A SETBACK OF NOT LESS THAN 18 INCHES (457 MM) WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.

2. FOR PHOTOVOLTAIC ARRAYS OCCUPYING MORE THAN 66 PERCENT OF THE PLAN VIEW TOTAL ROOF AREA, A SETBACK OF NOT LESS THAN 36 INCHES (914 MM) WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.

1205.2.2 EMERGENCY ESCAPE AND RESCUE OPENINGS. PANELS AND MODULES INSTALLED ON GROUP R-3 BUILDINGS SHALL NOT BE PLACED ON THE PORTION OF A ROOF THAT IS BELOW AN EMERGENCY ESCAPE AND RESCUE OPENING. A PATHWAY OF NOT LESS THAN 36 INCHES (914 MM) WIDE SHALL BE PROVIDED TO THE EMERGENCY ESCAPE AND RESCUE OPENING.

CUSTOMER INFORMATION | CONTRACTOR INFORMATION

NAME: TIM POWER

ADDRESS: 119A PARK ST NE, VIENNA, VA 22180

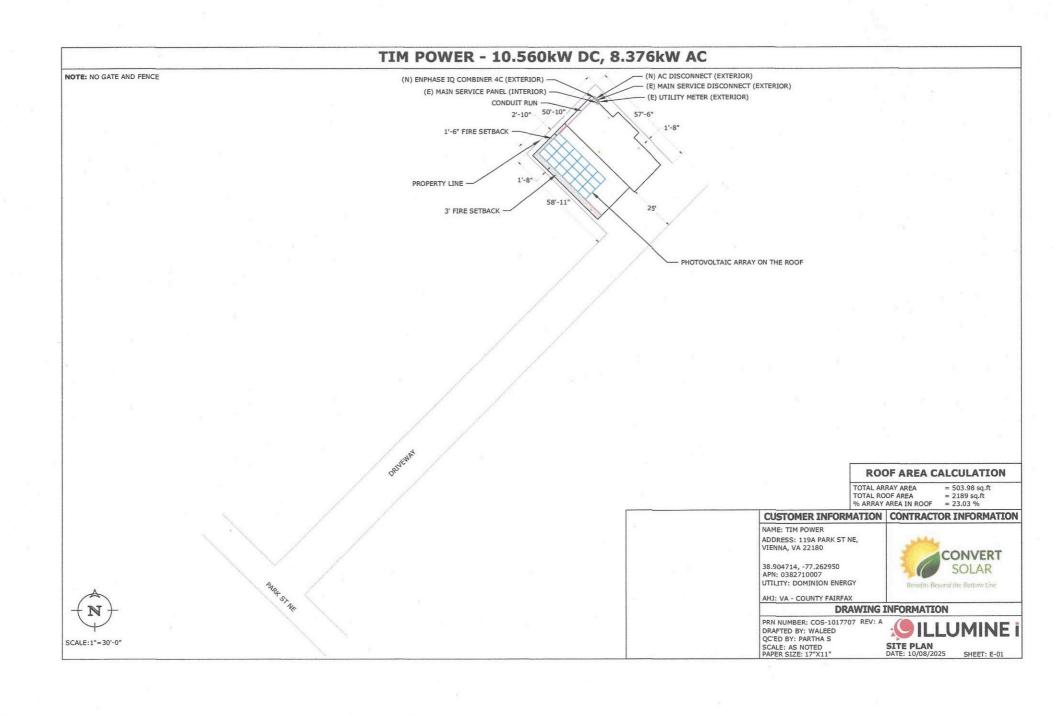
38.904714, -77.262950 APN: 0382710007 UTILITY: DOMINION ENERGY



AHJ: VA - COUNTY FAIRFAX DRAWING INFORMATION

PRN NUMBER: COS-1017707 REV: A DRAFTED BY: WALEED QC'ED BY: PARTHA S SCALE: AS NOTED PAPER SIZE: 17"X11"

GENERAL NOTES DATE: 10/08/2025 SHEET: CS-02



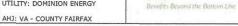




CUSTOMER INFORMATION | CONTRACTOR INFORMATION

NAME: TIM POWER ADDRESS: 119A PARK ST NE, VIENNA, VA 22180

38.904714, -77.262950 APN: 0382710007 UTILITY: DOMINION ENERGY



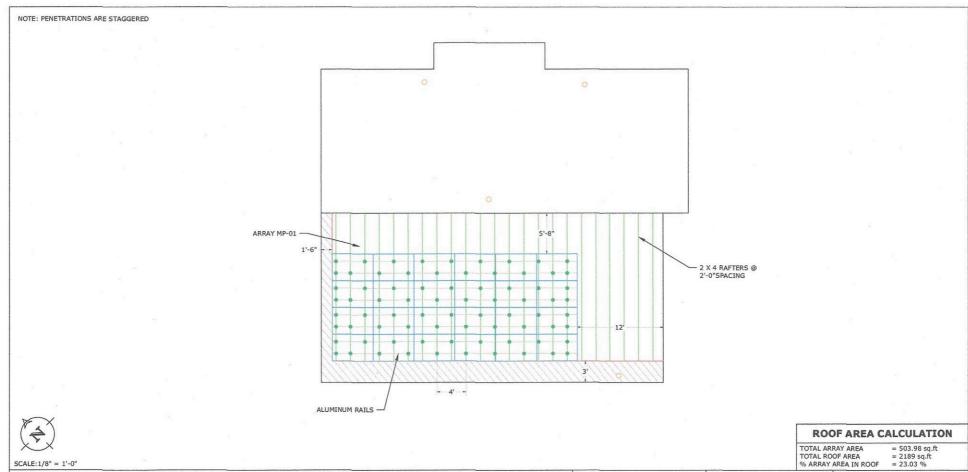
DRAWING INFORMATION

PRN NUMBER: COS-1017707 REV: A DRAFTED BY: WALEED QC'ED BY: PARTHA S SCALE: AS NOTED PAPER SIZE: 17"X11"



CONVERT

SOLAR



SITE INFORMATION NO. OF ARRAY AREA (SQ. FT.) ROOF FRAME FRAME MAX RAIL OVER SPACING SPAN HANG AZIMUTH PITCH ROOF TYPE S.NO ATTACHMENT FRAME TYPE QUICKMOUNT HALO ULTRAGRIP (FRAMING MOUNT) MP-01 225° 00 503.98 EPDM MEMBRANE ATTIC RAFTERS 2 X 4 2'-0" 4'-0" 1'-6"

CUSTOMER INFORMATION | CONTRACTOR INFORMATION

NAME: TIM POWER ADDRESS: 119A PARK ST NE, VIENNA, VA 22180

38.904714, -77.262950 APN: 0382710007 UTILITY: DOMINION ENERGY CONVERT SOLAR Benefits Beyond the Bottom Line

AHJ: VA - COUNTY FAIRFAX

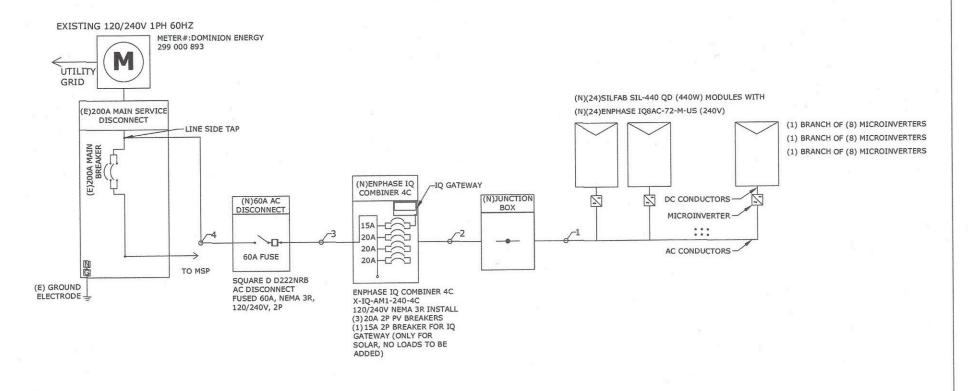
DRAWING INFORMATION

PRN NUMBER: COS-1017707 REV: A DRAFTED BY: WALEED QC'ED BY: PARTHA S SCALE: AS NOTED PAPER SIZE: 17"X11"



DC SYSTEM SIZE- 10560W, AC SYSTEM SIZE - 8376W

EACH MICROINVERTER IS RAPID SHUTDOWN COMPLIANT



| | | CONDUCTOR AND | CONDUIT SCHEDULE | | |
|--------|------------------|--|-----------------------|-----------------------|--|
| rag ID | CONDUIT SIZE | CONDUCTOR | NEUTRAL | GROUND | |
| 1 | NONE | (2) 12 AWG ENPHASE Q CABLE PER BRANCH CIRCUIT | NONE | (1) 6 AWG BARE COPPER | |
| 2 | METALLIC CONDUIT | (6) 10 AWG THHN/THWN-2 | NONE | (1) 8 AWG THHN/THWN-2 | |
| 3 | CONDUIT | (2) 6 AWG THHN/THWN-2 | (1) 6 AWG THHN/THWN-2 | (1) 8 AWG THHN/THWN-2 | |
| 4 | CONDUIT | (2) 6 AWG THHN/THWN-2 | (1) 6 AWG THHN/THWN-2 | (1) 6 AWG THHN/THWN-2 | |

CUSTOMER INFORMATION | CONTRACTOR INFORMATION

NAME: TIM POWER

ADDRESS: 119A PARK ST NE, VIENNA, VA 22180

38.904714, -77.262950 APN: 0382710007 UTILITY: DOMINION ENERGY

AHJ: VA - COUNTY FAIRFAX



DRAWING INFORMATION

PRN NUMBER: COS-1017707 REV: A DRAFTED BY: WALEED QC'ED BY: PARTHA S SCALE: AS NOTED PAPER SIZE: 17"X11"



| DO CVCTEM CITE | 10ECOM A | CCVCTEM | CT7E _ Q276W |
|-----------------|------------|----------|---------------|
| DC SYSTEM SIZE- | TODOOAA' W | COLDICIA | 217F - 0310AA |

| MODULE SPECI | FICATION |
|-----------------------------------|------------------------------|
| MODEL | SILFAB SIL-440 QD (440W) |
| MODULE POWER @ STC | 440 W |
| OPEN CIRCUIT VOLTAGE: Voc | 38.97 V |
| MAX POWER VOLTAGE: Vmp | 33.41 V |
| SHORT CIRCUIT CURRENT: Isc | 14.22 A |
| MAX POWER CURRENT: Imp | 13.17 A |
| MICROINVERTER SF | ECIFICATIONS |
| MODEL | ENPHASE IQ8AC-72-M-US (240V) |
| POWER RATING | 349W |
| MAX. CONTINUOUS OUTPUT CURRENT | . 1.45A |
| CEC WEIGHTED EFFICIENCY | 97% |
| MAX NO OF MICROINVERTERS / BRANCH | 11 |
| MAX DC VOLTAGE | 60V |

| = 14.5 A = 27.3 A | |
|----------------------|-----------------------------------|
| | |
| = 27.3 A | |
| | |
| Li-1/2/2012 31 | |
| = 14.5 A | |
| = 29.12 A | |
| | |
| = 43.5 A | |
| = 68.25 A | |
| | |
| = 43.5 A | |
| = 68.25 A | |
| | = 43.5 A = 68.25 A = 43.5 A |

AC WIRE SIZING CALCULATIONS BASED ON FOLLOWING EQUATIONS

REQUIRED CONDUCTOR AMPACITY:

INVERTER OUTPUT CURRENT * #OF INVERTERS = MAX CURRENT PER 690.8(A)(1)(e) * 125%

= MAX CURRENT PER 690.8(B)(1)

CORRECTED AMPACITY CALCULATIONS:

DERATED CONDUCTOR AMPACITY PER 690.8(B)(2) = AMPACITY * TEMPERATURE DERATE FACTOR *

CONDUIT FILL DERATE

DERATED CONDUCTOR AMPACITY CHECK: MAX CURRENT PER 690.8(B)(1) < DERATED CONDUCTOR AMPACITY

ELECTRICAL NOTES

- 1. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.10(C). CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS
- SUNLIGHT RESISTANT PER NEC 310.10(D). 3. MAXIMUM DC/AC VOLTAGE DROP SHALL BE NO MORE THAN 2%.
- 4. ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED.
- 5. BREAKER/FUSES SIZED ACCORDING PER NEC ARTICLE 240.
- AC GROUNDING ELECTRODE CONDUCTOR (GEC) SIZED PER NEC 250.66.
- EQUIPMENT GROUNDING CONDUCTOR (EGC) SIZED PER NEC
- 8. AMBIENT TEMPERATURE ADJUSTMENT FACTOR IS BASED ON TABLE NEC 310.15(B)(1).
- . CURRENT CARRYING CONDUCTOR ADJUSTMENT FACTOR IS BASED ON NEC 310.15(C)(1).

 10. MAX, SYSTEM VOLTAGE CORRECTION IS PER NEC 690.7.
- 11. CONDUCTORS ARE SIZED PER NEC 310.16.

OCPD CALCULATION

ALLOWABLE BACKFEED:

MAIN SERVICE DISCONNECT RATING = 200 A MAIN SERVICE DISCONNECT BREAKER RATING

LINE SIDE TAP 100% OF ALLOWABLE BACKFEED = 200 A

INVERTER OVERCURRENT PROTECTION:

INVERTER OVERCURRENT PROTECTION = (MICROINVERTER O/P CURRENT * # OF MICROINVERTERS * CONTINUOUS LOAD(1.25))

= (1.45 * 24 *1.25)

= 43.5 A

PV BREAKER SIZE / FUSE SIZE

= 60 A ≥ 43.5 A

TOTAL REQUIRED PV BREAKER SIZE / FUSE SIZE = 60 A PV BREAKER / FUSE SIZE

CUSTOMER INFORMATION | CONTRACTOR INFORMATION

ADDRESS: 119A PARK ST NE, VIENNA, VA 22180

38.904714, -77.262950

APN: 0382710007 UTILITY: DOMINION ENERGY

AHJ: VA - COUNTY FAIRFAX

CONVERT Benefits Beyond the Bottom Line

DRAWING INFORMATION

PRN NUMBER: COS-1017707 REV: A DRAFTED BY: WALEED QC'ED BY: PARTHA S SCALE: AS NOTED PAPER SIZE: 17"X11"

ELECTRICAL CALCULATIONS DATE: 10/08/2025 SHEET: E-03

| AC RA | CEWAYS | |
|----------------|---------------------------|----------|
| 1 | \rangle | |
| SW-1 (SQUAR | DISCONNEC E D D222NRB) | Т |
| 1 | $\langle 3 \rangle$ | |
| MSP - | MAIN SERVI | CE PANEL |
| 1 | $\langle 2 \rangle$ | |
| UTILIT | Y METER | |
| 2 | > | |



WARNING: PHOTOVOLTAIC POWER SOURCE

A CAUTION

SOLAR ELECTRIC SYSTEM CONNECTED

3

SOLAR AC DISCONNECT

ALL PLAQUES AND SIGNAGE REQUIRED BY 2020 NEC AND 2021 VSFPC WILL BE INSTALLED AS REQUIRED LABELS, WARNING(S) AND MARKING SHALL COMPLY WITH ANSI 2535.4, WHICH REQUIRES THAT DANGER WARNING, AND CAUTION SIGNS USED THE STANDARD HEADER COLORS, HEADER TEXT AND SAFETY ALERT SYMBOL ON EACH LABEL. THE ANSI STANDARD REQUIRES A HEADING THAT IS AT LEAST 50% TALLER THAN THE BODY TEXT, IN ACCORDANCE WITH NEC 110.21(B). A PERMANENT PLAQUE OR DIRECTORY SHALL BE INSTALLED PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS IF NOT IN THE SAME LOCATION IN ACCORDANCE WITH NEC LABEL(S) WITH MARKING, "WARNING PHOTOVOLTAIC POWER SOURCE, "SHALL BE LOCATED AT EVERY 10 FEET OF EACH DC RACEWAY AND WITH IN ONE FOOT OF EVERY TURN OR BEND AND WITH IN ONE FOOT OF EVERY TURN OR BEND AND WITH IN ONE FOOT ABOVE AND BELOW ALL PENETRATIONS OF ROOF/CEILING ASSEMBLIES, WALLS AND BARRIERS. THE LABEL SHALL HAVE 3/8" TALL LETTERS AND BE REFLECTIVE WITH WHITE TEXT ON A RED BACKGROUND

LABELING NOTES

CUSTOMER INFORMATION CONTRACTOR INFORMATION

NAME: TIM POWER ADDRESS: 119A PARK ST NE, VIENNA, VA 22180

38.904714, -77.262950 APN: 0382710007 UTILITY: DOMINION ENERGY

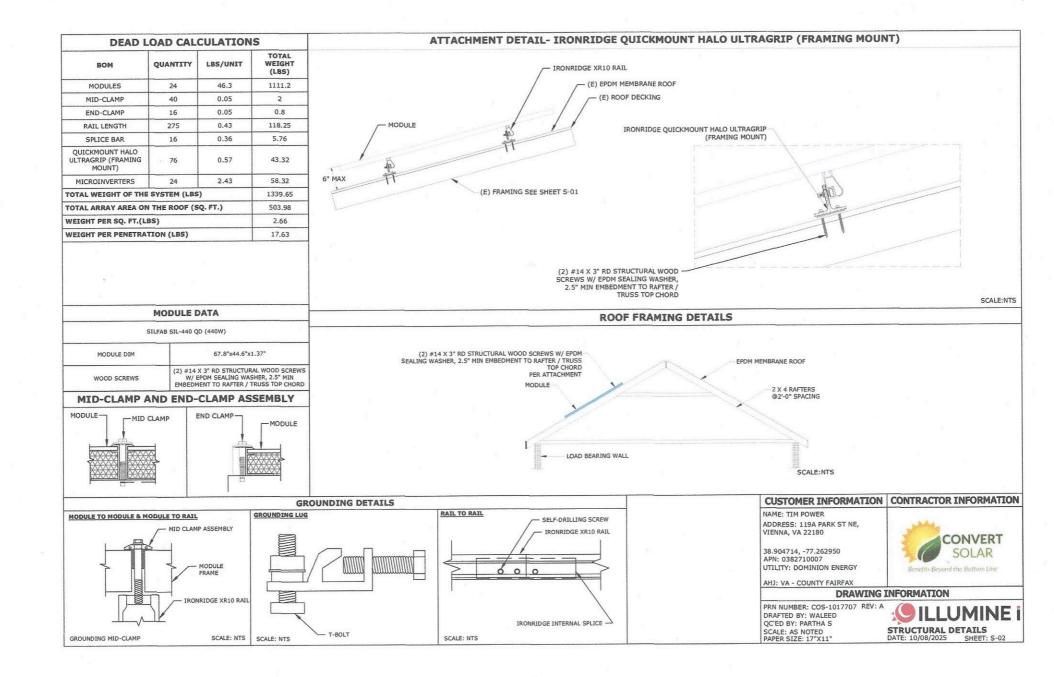


AHJ: VA - COUNTY FAIRFAX

DRAWING INFORMATION

PRN NUMBER: COS-1017707 REV: A DRAFTED BY: WALEED QC'ED BY: PARTHA S SCALE: AS NOTED PAPER SIZE: 17"X11"





MODULE SPEC SHEET





SIL-440 QD



NEXT-GENERATION N-TYPE CELL TECHNOLOGY

- Improved Shade Tolerance
- Enhanced Durability
- Improved Low-Light Performance Reduced Degradation Rate
- Increased Performance in
- 25-Year Product Warranty/
- 30-Year Performance Warranty
- High Temperatures















Measurement conditions: STC 1000 W/m² - AM 1.5 - Temperature 25 °C - NOCT 800 W/m² - AM 1.5 - Measurement uncertainty-3 3% Sun simulator calibration reference modules from Fraunholer Institute. Electrical characteristics may vary by a5% and power by 0 to +10 W.

| MECHANICAL PROPERTIES / C | OMPONENTS | METRIC | | IMPERIAL | | |
|---|------------|---|--|---------------------------------|---|--|
| Module weight | | 21 kg ± 0.2 kg | | 46.3 lbs ± 0.4 lbs | | |
| Dimensions (H x L x D) | | 1721 mm x 1133 mm x 3 | 1721 mm x 1133 mm x 35 mm | | 1,37 in | |
| Maximum surface load (wind/snow)* | | 4000 Parcar load / 5400 Pa front load | | 83.5 lb/ft ² rear lo | ad / 112.8 lb/ft ² front load | |
| Hail impact resistance | | p 25 mm at 83 km/h | p 25 mm at 83 km/h | | h | |
| | | 103 Haif cells - N-Type S 182 mm x 91 mm | 103 Half cells - N-Type Silicon solar cell 182 mm x 91 mm | | Type Silicon solar cell | |
| Glass | | 3.2 mm high transmittance, tempered, antireflective coating | | | 126 in high transmittance, tempered, antireflective coating | |
| Cables and connectors (refer to installation manual) Bockshect Frame Junction Box | | 1350 mm, o 5.7 mm, MC4 from Staubli 53 | | 53.1 in, a 0.22 in | 3.1 in, a 0.22 in (12 AWG), MC4 from Staubli | |
| | | High durability, superior hydrolysis and UV resistance, multi-layer dielectric film, fluorine-free PV backsheet | | | | |
| | | Anodized aluminum (Black) UL 3730 Certified, IEC 62790 Certified, IP68 rated, 3 diodes | | | | |
| | | | | | | |
| Temperature Coefficient Isc | 6.04 %/°C | | Module product wo | rkmanship warranty | 25 years** | |
| Temperature Coefficient Voc | 0.24 %/°C | 0.24 %/°C | | mance guarantee | 30 years | |
| Temperature Coefficient Pmax | -0.29 %/°C | | | | ≥ 98% end 1st yr | |
| NOCT (± 2 °C) | 45 °C | | | | ≥ 94.7% end 12th yr ≥ 90.8% end 25th yr | |
| Operating temperature | 40.485°C | | | | 2 30.075 Chd 25th yr | |

| CERTIFICATIONS | |
|----------------|--|
| Product | UL 61215, UL 61730, CSA C22 2#61730, IEC 61215, IEC 61730, IEC 61701 (Salt Mist Corrosion), IEC 62716 (Ammonia Corrosion), CEC Listed, UL Fire Rating: Type 2 |

SHIPPING SPECS Modules Per Pallet: 26 or 26 (California)

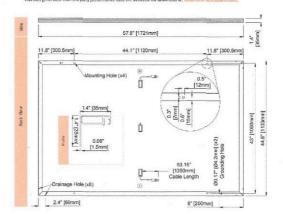
Pallets Per Truck 32 or 30 (California) Modules Per Truck 832 or 780 (California)

A Warning, Read the Safety and installation Manual for mounting specifications and before handling, installating and operating modules.

12 year extendable to 25 years tubject to registration and conditions outlined under "Warranty" at sitlabsoian.com.

ISQ9001:2015 PAN files engrated from 3rd party performance data are available for download at: sitisfassis

Factory



SILFAB SOLAR INC.

1770 Port Drive Burlington WA 98233 USA T+1 360.569.4733 info@silfabsolar.com

7149 Logistics Lane Fort Mill SC 29715 USA

T +1 839,400,4338 240 Courtneypark Drive East Mississauga ON LST 2Y3 Canada T +1 905.255.2501

F +1 905.696.0267

Silfab - SIL-440-QD-20240829

INVERTER SPEC SHEET



WORTH AMERICA BATA SHEET

IQ8AC Microinverter

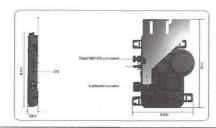
Our newest IQ8 Series Microinverters 12.3 are the industry's first microgrid-forming*, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently.







| Key specifications | IQ8AC-72-M-US @240 VAC | IQ8AC-72-M-US @208 VAC |
|--------------------------------|----------------------------------|-----------------------------------|
| Peak output power | 366 VA | 350 VA |
| Nominal grid voltage (L-L) | 240 V split-phase (L-L), 180° | 208 V single-phase (L-L), 120° |
| Nominal frequency | 60 Hz | 60 Hz |
| CEC weighted efficiency | 97.0% | 96.5% |
| Maximum input DC voltage | 60 V | 60 V |
| MPPT voltage range | 28-45 V | 28-45 V |
| Maximum module I _{sc} | 20 A | 20 A |
| Ambient temperature range | -40°C to 65°C | (-40°F to 149°F) |



- TOE See Microbracties can be saided to eating, OZ systems on the assets. Districting only in the following addition of configurations: Soft only or data in Selective OE seekers (Fig. 1987) and the object of the Company of the Compa

© 2024 Emphase Energy, All rights received, Emphase, the e and CG logos, IC, and contain other marks listed at

| 10 | P | |
|-----|--------|--|
| SI. | Simple | |

- · Lightweight and compact with plug-and-play connectors
- Power line communication (PLC) between components
- · Faster installation with simple twowire cabling

- Produces power even when the grid is down4
- More than one million cumulative hours of testing
- · Industry-leading limited warranty of up to 25 years
- · Class II double-insulated enclosure · Optimized for the latest highpowered PV modules

Microgrid-forming

- · Complies with the latest advanced grld support
- Remote automatic updates for the latest grid requirements
- · Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) and IEEE 1547:2018 (UL 1741-SB 3rd Ed.)

| Input data (DC) | | IQ8AC-72-M-US |
|--|----|---|
| Commonly used module pairings ⁵ | W | 295-500 |
| Module compatibility | - | To meet compatibility. PV modules must be within the following maximum input DC voltage and maximum module l _{sc} . Module compatibility can be checked at https://enphase.com/installers/microinverters/calculator . |
| MPPT voltage range | ٧ | 28-45 |
| Operating range | V | 18-58 |
| Minimum/Maximum start voltage | ٧ | 22/58 |
| Maximum input DC voltage | V | 60 |
| Maximum continuous input DC current | А | 14 |
| Maximum input DC short-circuit current | A | 25 |
| Maximum module I _{sc} | Α | 20 |
| Overvoltage class DC port | - | II . |
| DC port backfeed current | mA | 0 |
| PV array configuration | - | Ungrounded array; no additional DC side protection required; AC side protection requires a maximum of 20 A per branch circuit |

| Output data (AC) | Units | IQ8AC-72-M-US @240 VAC | IQ8AC-72-M-US @208 VAC |
|--|------------------|------------------------------|------------------------------|
| Peak output power | VA | 366 | 350 |
| Maximum continuous output power | VA | 349 | 345 |
| Nominal grid voltage (L-L) | ٧ | 240, split-phase (L-L), 180° | 208,single-phase (L-L), 120° |
| Minimum and maximum grid voltage ⁶ | v | 211-264 | 183-229 |
| Maximum continuous output current | Α | 1.45 | 1.66 |
| Nominal frequency | Hz | 6 | 0 |
| Extended frequency range | Hz | 47- | -68 |
| AC short-circuit fault current over three cycles | A _{rms} | 2. | 70 |
| Maximum units per 20 A (L-L) branch circuit 7 | - | 11 | 9 |
| Total harmonic distortion | % | < | 5 |
| Overvoltage class AC port | - | i i | U . |
| AC port backfeed current | mA | 1 | 8 |
| Power factor setting | - | 1. | 0 |
| Grid-tied power factor (adjustable) | - | 0.85 leading | 0.85 lagging |
| Peak efficiency | % | 97.3 | 97.2 |
| CEC weighted efficiency | % | 97.0 | 96.5 |
| Nighttime power consumption | mW | 30 | 22 |

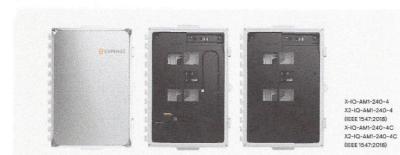
| Mechanical data | IQ8AC-72-M-US | | | |
|---------------------------|--------------------------------|--|--|--|
| Ambient temperature range | -40°C to 65°C (-40°F to 149°F) | | | |
| Relative humidity range | 4% to 100% (condensing) | | | |
| DC connector type | Stäubli MC4 | | | |

DSH-00046-5.0 FN-2024-12-10

COMBINER SPEC SHEET







IQ System Controller 2

IQ Load Controller

and prolong battery life.

Provides microgrid interconnection device

(MID) functionality by automatically detecting grid failures and seamlessly transitioning the

home energy system from grid power to backup

Helps prioritize essential appliances during a

grid outage to optimize energy consumption

IQ Combiner 4/4C

The Enphase IQ Combiner 4/4C with IQ Gateway and integrated LTE-M1 cell modem (Included only with 10 Combiner 40) consolidates interconnection equipment into a single onclosure and streamlines (I Microinverters and strang installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and an Eaton BR series busbar assembly.



IQ Series Microinverters The high-powered smart grid-ready IQ Series Microinverters (IQ6, IQ7, and IQ8 Series) dramatically simplify the installation process.



IQ Battery

All-in-one AC coupled storage system that is reliable, smart, simple, and safe. It provides backup capability, and installers can quickly design the right system size to meet the needs of both new and retrofit solar customers.











- · IncludesIQ Gateway for communication and control
- · Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), included only with IQ Combiner 4C
- Includes solar shield to match IQ Battery aesthetics and deflect heat
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

- · Centered mounting brackets support single stud mounting
- Supports bottom, back and side condult
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- · 80 A total PV or storage branch circuits

- · Durable NRTL-certified NEMA type 3R
- · Five-year limited warranty
- Two-years labor reimbursement program coverage included for both the IQ Combiner SKU's
- · UL Listed X2-IQ-AMI-240-4 and X2-IQ-AMI-240-4C comply with IEEE 1547:2018 (UL 1741-SB, 3rd Ed.)

Refer to the https://enphasa.com/installers/resources/warranty page for country-specific warranty information.

© 2024 Enphase Energy. All rights reserved. Enphase, the e and CC legos, ICL and certain other marks lasted at https://enphase.com/trademark-usage-guidelines are trademarks of Enphase Energy, Inc. in the U.S. and other countries. Data subject to change.

IQ Combiner 4/4C

| MODEL NUMBER | UNITS | DESCRIPTION | | | |
|--|-------|--|--|--|--|
| IQ Combiner 4 (X-IQ-AM1-240-4, X2-IQ-AM1-240-4) | - | IQ Combiner 4 with an IQ Gateway printed circuit board for integrated revenue-grade PV production metering (AMSI C12.20 ±0.5%) and consumption monitoring (±2.5%), includes a salver solar shield to match the IG Battery and IQ System Controller 2 and to defletch teat. | | | |
| IO Combiner 4C (X-IQ-AMI-240-4C, X2-IQ-AMI-240-4C) | - | IQC combiner 4C with an IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSI C12.20 ±0.5%) and consumption monitoring (±2.5%), Includes Enphase Mobile Connect cellular modem (CELL MODEM-MI) "0-6-\$P-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada. Mexico. Puetro Rioro, and the US Virgin Islands, where there is adequate cellular service in the installation area). Includes a sliver solar shield to match the IQ Battery and IQ System Controller 2 and to deflect heat. | | | |
| WHAT'S IN THE BOX | | | | | |
| IQ Gateway printed circuit board | - | IQ Gateway is the platform for total energy management for comprehensive, remote maintenance, and management of the Enphase Energy System. | | | |
| Busbar | - | 80 A busbar with support for one IQ Gateway breaker and four 20 A breakers for installin IQ Series MicroInverters and IQ Battery | | | |
| IQ Gateway breaker | Α | Circuit breaker, 2-pole, 10/15 | | | |
| Production CT | - | Pre-wired revenue-grade solid-core CT, accurate up to ±0.5% | | | |
| Consumption CT | - | Two consumption metering split core or clamp-type CTs, shipped with the box, accurate up to $\pm 2.5\%$ | | | |
| Emphase Mobile Connect (only with IQ Combiner 4C) | - | 4G-based LTE-M1 cellular modern (CELLMODEM-M1-06-SP-05) with a five-year T-Mot data plan | | | |
| MICROINVERTERS, ACCESSORIES AND REPLACEMENT PARTS (not included; order separately) | UNITS | | | | |
| Supported microinverters | - | IQ6, IQ7, and IQ8. Do not mix IQ6/IQ7 Microinverters with IQ8 | | | |
| Enphase Communications Kit COMMS-CELLMODEM-M1-06 | | - Includes COMMS-KIT-01 and CELLMODEM-MI-06-SP-05 with a 5-year T-Mobile data | | | |
| CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05 | - | plan for Enphase sites - 4G-based LTE-M1 cellular modem with a five-year T-Mobile data plan - 4G-based LTE-M1 cellular modem with a five-year AT&T data plan | | | |
| Circuit breakers (off-the-shelf) | _ | Supports Eaton BR2xx, Siemens Q2xx and GE/ABB THQL2txx Series breakers (xx may be 10, 15, 20, 30, 40, 50, or 60). Supports Eaton BR220B, BR230B, and BR240B circuit breakers compatible with hold-down kit. | | | |
| Circuit breakers (provided by Enphase) | - | BRK-10A-2-240V, BRK-15A-2-240V, BRK-20A-2P-240V, BRK-15A-2P-240V-B, and BRK-20A-2P-240V-B | | | |
| XA-SOLARSHIELD-ES | - | Replacement solar shield for IQ Combiner 4/4C | | | |
| XA-ENV2-PCBA-4 | - | IQ Gateway replacement printed circuit board (PCB) for IQ Combiner 4/4C | | | |
| XA-PLUG-120-3 | - | Accessory receptacle for power line carrier in IQ Combiner 4/4C (required for EPLC-01) | | | |
| X-IQ-NA-HD-125A | - | Hold-down kit for Eaton circuit breaker with screws | | | |
| ELECTRICAL SPECIFICATIONS | UNITS | | | | |
| Rating | A | 80 | | | |
| System voltage and frequency | - | 120/240 VAC, 120/208 VAC, 60 Hz | | | |
| Busbarrating | A | 125 | | | |
| Fault current rating | kAIC | 10 | | | |
| Maximum continuous current rating (input from PV/storage) | A | 64 | | | |
| Maximum fuse/Circuit rating (output) | Α | 90 | | | |
| Branch circuits (solar and storage) | - | Up to four 2-pole Eaton BR, Siemens Q, or GE/ABB THQL Series distributed generation (DG) breakers only (not included) | | | |
| Maximum total branch circuit breaker rating (input) | Α | 80 A of distributed generation/95 A with IQ Gateway breaker included | | | |
| o learn more about Enphase offerings, visit <u>enphase.com</u> . | | IQC-4-4C-D5H-00217-3.0-EN-U5-2024-08-N | | | |
| | | | | | |

IQC-4-4C-DSH-00217-3.0-EN-US-2024-08-16

RACKING SPEC SHEET

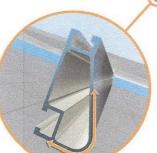
IRONRIDGE

XR Rail® Family

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails® are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails® is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs



XR Rails[®] are compatible with FlashFoot⁹ and other pitched roof



IronRidge® offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails® are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.



XR Rail® Family

The XR Rail® Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail® to match.



XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6' spanning capability
 Moderate load capability
- · Clear & black anodized finish · Internal splices available



XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- · 10' spanning capability
- · Heavy load capability
- · Clear & black anodized finish
- Internal splices available



XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications

- · 12' spanning capability
- · Extreme load capability
- · Internal splices available

Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft, Visit IronRidge.com for detailed certification letters.

| None | 90 | | | | | | | |
|------|-----|------|--|--|--|------------------------|---|--|
| | 120 | | | | | | | |
| | 140 | XR10 | | XR100 | | XR1000 | | |
| | 160 | | | | | | | |
| 20 | 90 | | | | | AND A STREET OF STREET | | |
| | 120 | | | | | | | |
| | 140 | | | | | | | |
| | 160 | | | | | | | |
| 30 | 90 | | | | | | | |
| | 160 | | | | | | | |
| 40 | 90 | | | | | | - | |
| | 160 | | | | | | | |
| 80 | 160 | | | | | | | |
| 120 | 160 | | | Commenter of the Commen | | | | |

Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification latters for actual design guidance

ATTACHMENT SPEC SHEET



Adaptive, Rafter-Friendly Installation







Miss the rafter? Try it again.
Place another screw to the left or right. It rafter is found, install 3rd and final screw.



Still no luck? Install the rest
if more than 3 screws miss the refler,
secure sox screws to peck mount if

Trusted Strength & Less Hassle



Structural capacities of HUG™ were reviewed in many load directions, with racking rail running cross-slope or up-slope in relation to roof pitch.

For further details, see the HUG certification letters for attaching to rafters and decking.

IronRidge designed the HUG, in combination with the RD Structural Screw to streamline installs, which means the following:

- · No prying shingles
- · No roof nail interference
- No pilot holes necessary
- · No sealant (in most cases)
- No butyl shims needed



The rafter-mounted HUG has been tested and rated to support 1004 (lbs) of uplift and 368 (lbs) of lateral load.

Structural Design

Parts are designed and certified for compliance with the International Building Code & ASCE/SEI-7.

Water Seal Ratings

HUG passed both the UL 441 Section 27 "Rain Test" and TAS 100(A)-95 "Wind Driven Rain Test" by Intertek.

UL 2703 System

Systems conform to UL 2703 mechanical and bonding requirements. See Flush Mount Manual for more info.



