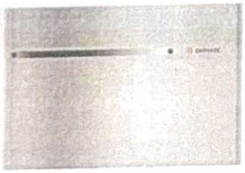
ENPHASE.

DATA SHEET



IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application-specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has super-fast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.



Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the Enphase IQ Battery, Enphase IQ Gateway, and the Enphase App monitoring and analysis software.

Enphase 25 year limited warranty

IQ8 Series Microinverters redefine reliability standards with more than one million cumulative hours of power-on testing, enabling an industry-leading limited warranty of up to 25 years.



Connect PV modules quickly and easily to IQ8 Series Microinverters using the included Q-DCC-2 adapter cable with plug-n-play MC4 connectors.

UL CERTIFIED SAFETY

IQ8 Series Microinverters are UL Listed as PV Rapid Shut Down Equipment and conform with various regulations, when installed according to manufacturer's instructions.

Easy to install

- Lightweight and compact with plug-n-play connectors
- Power Line Communication (PLC) between components
- Faster installation with simple two-wire cabling

High productivity and reliability

- Produce power even when the grid is down
- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Microgrid-forming

- Complies with the latest advanced grid 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) requirements

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IQ8SP-DS-0002-01-EN-US-2021-10-19

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)		IQ8-60-2-US	IQ8PLUS-72-2-US
Commonly used module pairings[1]	W	235 – 350	235 – 440
Module compatibility		60-cell/120 half-cell	60-cell/120 half-cell and 72-cell/144 half-cell
MPPT voltage range	V	27 – 37	29 – 45
Operating range	V	25 – 48	25 – 58
Min/max start voltage	V	30 / 48	30 / 58
Max input DC voltage	V	50	60
Max DC current[2] [module Isc]	A	15	
Overvoltage class DC port		II	
DC port backfeed current	mA	0	
PV array configuration		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	

OUTPUT DATA (AC)		IQ8-60-2-US	IQ8PLUS-72-2-US
Peak output power	VA	245	300
Max continuous output power	VA	240	290
Nominal (L-L) voltage/range[3]	V	240 / 211 – 264	
Max continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	50 – 68	
Max units per 20 A (L-L) branch circuit[4]		16	13
Total harmonic distortion		<5%	
Overvoltage class AC port		III	
AC port backfeed current	mA	30	
Power factor setting		1.0	
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging	
Peak efficiency	%	97.5	97.6
CEC weighted efficiency	%	97	97
Night-time power consumption	mW	60	

MECHANICAL DATA	
Ambient temperature range	-40°C to +60°C (-40°F to +140°F)
Relative humidity range	4% to 100% (condensing)
DC Connector type	MC4
Dimensions (HxWxD)	212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection – no fans
Approved for wet locations	Yes
Acoustic noise at 1 m	<60 dBA
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environ. category / UV exposure rating	NEMA Type 6 / outdoor

COMPLIANCE	
Certifications	CA Rule 21 (UL 1741-SA), UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.

(1) No enforced DC/AC ratio. See the compatibility calculator at https://link.enphase.com/module-compatibility (2) Maximum continuous input DC current is 10.6A (3) Nominal voltage range can be extended beyond nominal if required by the utility. (4) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

Sunlight Solar Inc.

WARRANTY

Sunlight Solar Warranties

Sunlight Solar provides a full Warranty for all products sold from the date of purchase.

30 Year Parts & Labor Warranty on All Solar Panels

30 Year Parts & Labor Warranty on Inverters

25 Year Limited Warranty on Power Output
(All panels sold will retain power output of at least 93% after 10 years and 85% by the 25th year)

20 Year Warranty Against Roof Leaks
(Against any leaks caused by the installation of your solar panels)

10 Year Workmanship Warranty

5 Year Warranty on Monitoring Systems

This warranty provides for no-cost repair or replacement of the system or system components, including any associated labor during the warranty periods and covers all components of the system against breakdown and degradation in electrical output.

This Warranty Is Transferable to a New Owner for $250.00



The Sunlight Solar limited warranty ("Limited Warranty") covers defects of the solar system from the date of original purchase: according to the following:

30 Year Parts & Labor Warranty on Solar Panels - 30 Year Parts & Labor Warranty on Inverters -

25 Year Limited Warranty on Power Output. (All panels will retain power output of at least 93% after 10 years and 85% by the 25th year)

20 Year Warranty Against Roof Leaks - 10 Year Overall Workmanship Warranty - 5 Year Warranty on Monitoring Systems

During the Warranty Period, the Limited Warranty is transferable to a different owner ("Transferee") as long as the materials remain installed at the originally installed end user location ("Original Location") and the Transferee submits to Sunlight Solar a "Change of PV Ownership Form" and applicable Transfer Fee within 30 days from the date of transfer to the Transferee. This submission is a requirement for continued Limited Warranty coverage. The Transfer Fee is set forth in the Change of PV Ownership Form and is subject to reasonable adjustment from time to time (as determined at Sunlight Solar's discretion).

Sunlight Solar reserves the right to provide separate warranties that shall govern with respect to materials installed in specific regions. During the Warranty Period, if Sunlight Solar establishes, through inspection, the existence of a defect that is covered by the Limited Warranty, Sunlight Solar will at its option, either (1) repair or replace the Defective Product free of charge, or (2) issue a credit or refund for the Defective Product to the Warranty Holder in an amount up to its actual value at the time the Warranty Holder notifies Sunlight Solar of the defect, as determined by Sunlight Solar.

If Sunlight Solar elects to repair or replace the Defective Product, Sunlight Solar reserves the right to use parts or products of original or improved design in the repair or replacement of Defective Product. If Sunlight Solar repairs or replaces a Defective Product, the Limited Warranty continues the repaired or replacement product for the remainder of the original Warranty Period or ninety (90) days from the date of Sunlight Solar's return shipment of the repaired or replacement product, whichever is later. The Limited Warranty covers a replacement unit to replace the Defective Product, but does not include labor costs related to (1) un-installing the Defective Product or (2) if applicable, re-installing a repaired or replacement product. To the extent applicable, the Limited Warranty also covers the costs of shipping a repaired or replacement product from Sunlight Solar, via a non-expedited freight carrier selected by Sunlight Solar, to locations in North America where we have approved our materials for installation. The Limited Warranty does not cover, and Sunlight Solar will not be responsible for, shipping damage or damage caused by mishandling by the freight carrier and any such damage is the responsibility of the freight carrier.

Sunlight Solar materials are designed to withstand normal operating conditions and typical wear and tear when used for their original intent and in compliance with the installation and operating instructions supplied with the original equipment. The Limited Warranty does not apply to, and Sunlight Solar will not be responsible for, any defect in or damage to any Sunlight Solar materials: (1) that have been misused, neglected, tampered with, altered, or otherwise damaged, either internally or externally; (2) that has been improperly installed, operated, handled or used, including use under conditions for which the product was not designed, use in an unsuitable environment or applicable laws or regulations; (3) that has been subjected to fire, water, generalized corrosion, biological infestations, acts of God, or input voltage that creates operating conditions beyond the maximum or minimum limits listed in the specifications, including high in put voltage from generators or lightning strikes; (4) that has been subjected to incidental or consequential damage caused by defects of other components of the solar system; or (5) if the original identification markings (including trademark or serial number) of such materials have been defaced, altered, or removed. This Limited Warranty does not cover cosmetic, technical or design defects, or shortcomings which do not materially influence or affect the energy production or degrade form, fit, or function of the products sold. The Limited Warranty does not cover costs related to the removal, installation or troubleshooting of the Warranty Holder's electrical systems. The Limited Warranty does not extend beyond the original cost of the materials .

Sunlight Solar expressly reserves the right to novate or assign its rights and obligations under this warranty agreement to a third party with the demonstrated expertise and requisite resources needed to effectively discharge the obligations hereunder.

> THE LIMITED WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY SUNLIGHT SOLAR AND, WHERE PERMITTED BY LAW, IS MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES,EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION,WARRANTIES OF TITLE, QUALITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OR WARRANTIES AS TO THE ACCURACY, SUFFICIENCY OR SUITABILITY OF ANY TECHNICAL OR OTHER INFORMATION PROVIDED IN MANUALS OR OTHER DOCUMENTATION. IN NO EVENT WILL ENPHASE BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES, COSTS OR EXPENSES HOWEVER ARISING, WHETHER IN CONTRACT OR TORT, INCLUDING WITHOUT LIMITATION ANY ECONOMIC LOSSES OF ANY KIND, ANY LOSS OR DAMAGE TO PROPERTY, OR ANY PERSONAL INJURY.

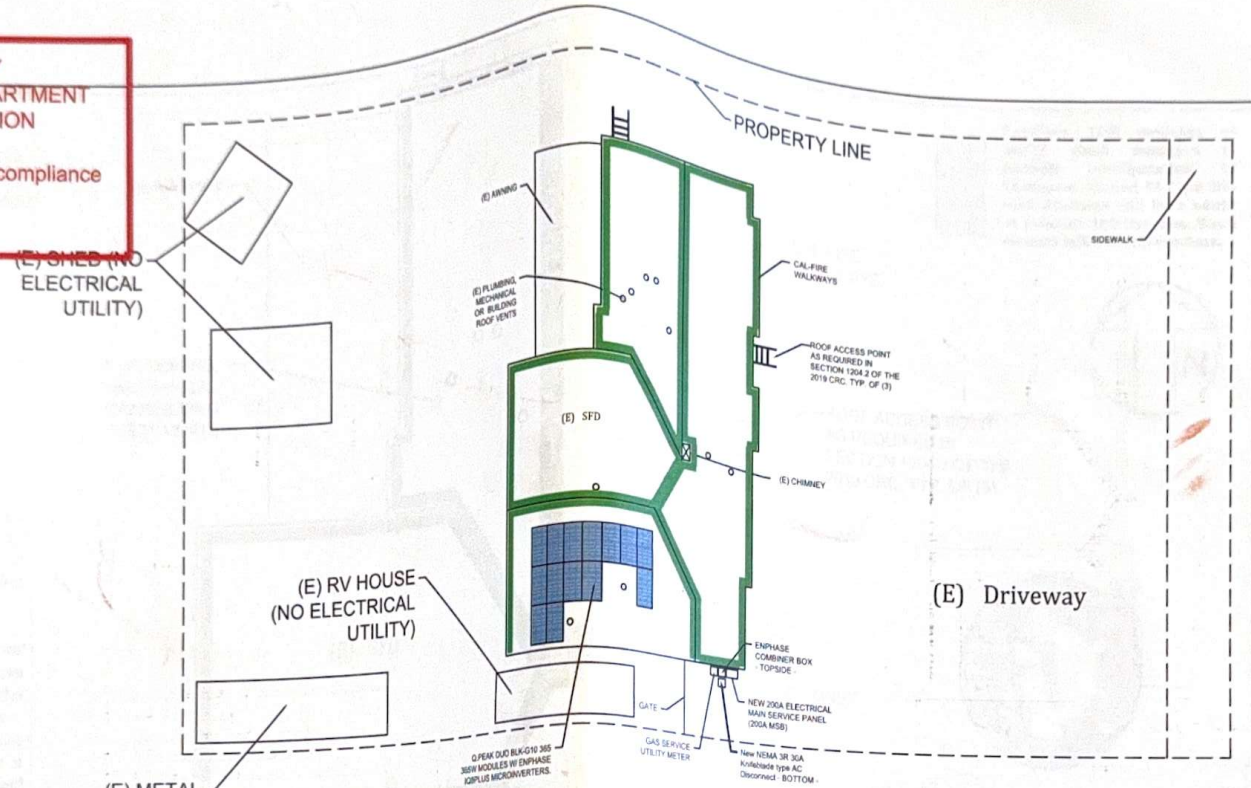
To the extent any implied warranties are required under applicable law to apply to such materials sold, such implied warranties shall be limited in duration to the Warranty Period, to the extent permitted by applicable law. Some regions do not allow limitations or exclusions on implied warranties or on the duration of an implied warranty or on the limitation or exclusion of incidental or con sequential damages, so the above limitation(s) or exclusion(s) may not apply. This Limited Warranty gives the Warranty Holder specific legal rights, and the Warranty Holder may have other rights that may vary from region to region. The grant of this Limited Warranty by Sunlight Solar is conditioned upon agreement by the Warranty Holder and any permitted Transferee to the terms, conditions, and requirements herein.

CITY OF MORENO VALLEY
COMMUNITY DEVELOPMENT DEPARTMENT
BUILDING AND SAFETY DIVISION
APPROVED
Reviewed for applicable building code compliance
BCN22-1207

SITE MAP:

12471 Sage Grouse Ave,
Moreno Valley, CA 92555
A.P.N. 487 - 180 - 013





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- **Solar Panels**
- **Enphase IQ Combiner+ with Envoy**
- **Microinverters**
- **Photovoltaic Rapid Shutdov Equipment**
- **Roof mount system**
- **Grounding method**
- **Module compatibility**
- **Roof tile replacement detail**

Structural Only
REGISTERED PROFESSIONAL ENGINEER
EUGENE MUNYANZILA
C 88783
CIVIL
STATE OF CALIFORNIA

SCOPE OF WORK:

1. **Fourteen (14) QCell Q.PEAK DUO BLK-G10+ 365 365W**
2. **System total of 5.1 kW DC // 4.1 kW AC**
3. **Fourteen (14) Enphase IQ8PLUS-72-2-US Microinverters**
4. **One (1) Enphase IQ Combiner 4 (X-IQ-AM1-240-4)**
5. **Lot size: 0.46 Acres / House Size: 2,010 Sq. Ft.**
6. **Valuation: $29,886.00**

APLICABLE CODES

ALL MATERIALS, EQUIPMENT, INSTALLATION AND WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

a. **2019 CA BUILDING CODES**
b. **2019 CA RESIDENTIAL CODES**
c. **2019 CA MECHANICAL CODES**
d. **2019 CA PLUMBING CODES**
e. **2019 CA ELECTRICAL CODES**
f. **2019 CA FIRE CODES**
g. **2019 BUILDING ENERGY EFFICIENCY STANDARDS**
h. **2017 NATIONAL ELECTRICAL**

GENERAL NOTES:

1.- **Solar photovoltaic system to be installed on Residential Structure.**

2.- **Design Complying with the 2019 edition of California Electrical Code, NEC, the County Of Riverside and City of Moreno Valley ordinances and policies.**

3.- **This project has been designed in compliance with the CBC Section 1609 to Withstand a minimum 110 mph wind load.**

4.- **The house is one story tall.**

5.- **The rafters are 2" x 4" and 24" on center.**

6.- **The system will not be interconnected until approval from the local jurisdiction and the utility is obtained.**

7.- **This system is a utility grid interactive system with no storage batteries.**

8.- **The solar photovoltaic installation shall not obstruct any plumbing, mechanical or building roof vents.**

9.- **If the existing main service panel does not have verifiable grounding electrode, it is the contractor's responsibility to install a supplemental grounding electrode.**

10.- **Each module will be grounded using the supplied connections points identified on the module and the manufacturer's installation instruction.**

11.- **A ladder should be in place for inspection in compliance with CAL-OSHA regulations.**

12.- **Proper access and working clearance will be provided as per section 110.26 CEC.**

CONTRACTOR INF.

Sunlight Solar Inc.

WARREN B. LAMB

1300 NORTH JOHNSON AVE.
SUITE 104, EL CAJON CA 92020
(858) - 564 - 8032
LICENSE: #997589
TYPE: C-46

CUSTOMER INF.

JOSEPH PEREZ
12471 SAGE GROUSE AVE,
MORENO VALLEY, CA 92555
(951) 213-5355

APN 487 - 180 - 013

PV SYSTEM

5.1 kW

DRAWING

DATE: September 29th, 2022

DRAWN BY: EQ

TITLE: SITE MAP & SCOPE OF WORK

SHEET: PV-01

CITY OF MORENO VALLEY
COMMUNITY DEVELOPMENT DEPARTMENT
BUILDING AND SAFETY DIVISION
APPROVED
Reviewed for applicable building code compliance
BON22-1907

CALIFORNIA FIRE CODE 2019

1204.1 General. Solar photovoltaic systems shall be installed in accordance with Sections 1204.2 through 1204.5 and the *California Building Code* or *California Residential Code*. The electrical portion shall be installed in accordance with the *California Electrical Code*.

1204.2 Access and pathways. Roof access, pathways, and spacing requirements shall be provided in accordance with Section 1204.1 through 1204.3. Pathways shall be over areas capable of supporting fire fighter accessing the roof. Pathways shall be located in areas with minimal obstructions, such as vent pipes, conduit or mechanical equipment.

1204.2.3 Conduit wiring systems, and raceways for photovoltaic circuits shall be located as close as possible to the ridge or hip or valley and from the hip or valley as directly as possible to an outside wall to reduce trip hazards and maximize ventilation opportunities.

Conduit runs between sub arrays and to DC combiner boxes shall be installed in a manner that minimizes the total amount of conduit on the roof by taking the shortest path from the array to the DC combiner box. DC wiring shall be installed in metallic conduit raceways when located within enclosed spaces in a building. Conduit shall run along the bottom of load bearing members.

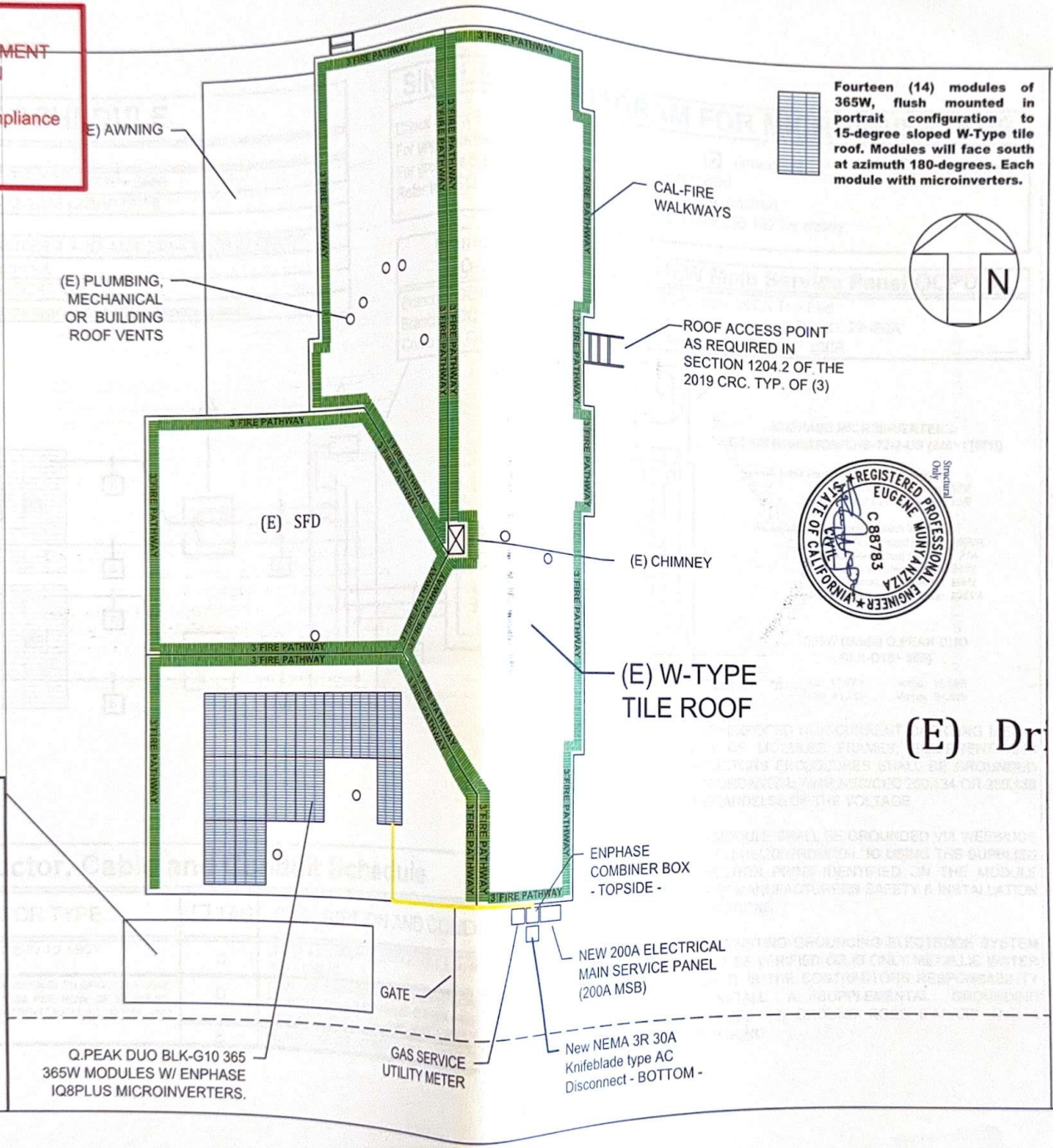
1204.2.1.1 Not fewer than two 36" wide pathways on separate roof planes, from lowest roof edge to ridge.

○ INDICATES PLUMBING, BUILDING OR MECHANICAL ROOF VENTS AND SHALL NOT BE OBSTRUCTED BY THE SOLAR PHOTOVOLTAIC INSTALLATION.

CONDUIT RUNS ARE APPROXIMATE. THE CONDITIONS MAY CHANGE IN THE FIELD AND DICTATE ALTERNATE PATHS.

A. New NEMA 3/4" EMT Conduit with (2) #10 AWG THWN-2 conductors & (1) #8 AWG THWN-2 EGC wire run from rooftop J-box to 20A breaker in Enphase AC Combiner Box.

B. New NEMA 3/4" EMT Conduit with (3) #8 AWG THWN-2 conductors & (1) #6 AWG THWN-2 EGC wire run from Enphase AC Combiner Box to 30A knifeblade and then to a 2P-20A breaker in MSP.



Fourteen (14) modules of 365W, flush mounted in portrait configuration to 15-degree sloped W-Type tile roof. Modules will face south at azimuth 180-degrees. Each module with microinverters.

REGISTERED PROFESSIONAL ENGINEER EUGENE MUNYAZIZA C 88783 STATE OF CALIFORNIA CIVIL Structural Only

(E) Dri

CONTRACTOR INF.

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LICENSE: #997589
TYPE: C-46

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APN 487 - 180 - 013

PV SYSTEM

5.1 kW

DRAWING

DATE: September 29th, 2022

DRAWN BY: EQ

TITLE: CONDUIT RUN DETAIL

SHEET: PV-02

CITY OF MORENO VALLEY
COMMUNITY DEVELOPMENT DEPARTMENT
BUILDING AND SAFETY DIVISION
APPROVED
Reviewed for applicable building code compliance
BLDR-2022-1907

EQUIPMENT SCHEDULE

TAG	DESCRIPTION:
1	Solar PV Module: 365W (Model Q.PEAK DUO BLK-G10+ 365)
2	Microinverter: 0.3 kW (Model IQ8PLUS-72-2-US (240V) [SI1])
3	Junction Boxes: NEMA 3R
4	Solar Load Center: ENPHASE IQ COMBINER 4 X-IQ-AM1-240-4 WITH IQ ENVOY
5	Nema 3R 30A Knifeblade type AC Disconnect.
6	NEW Main Service Panel: 200A MAX; 120/240 VOLTS;
7	Existing breakers 1P and 2P different amperage in the main service panel.

SINGLE-LINE DIAGRAM FOR MICROINVERTERS

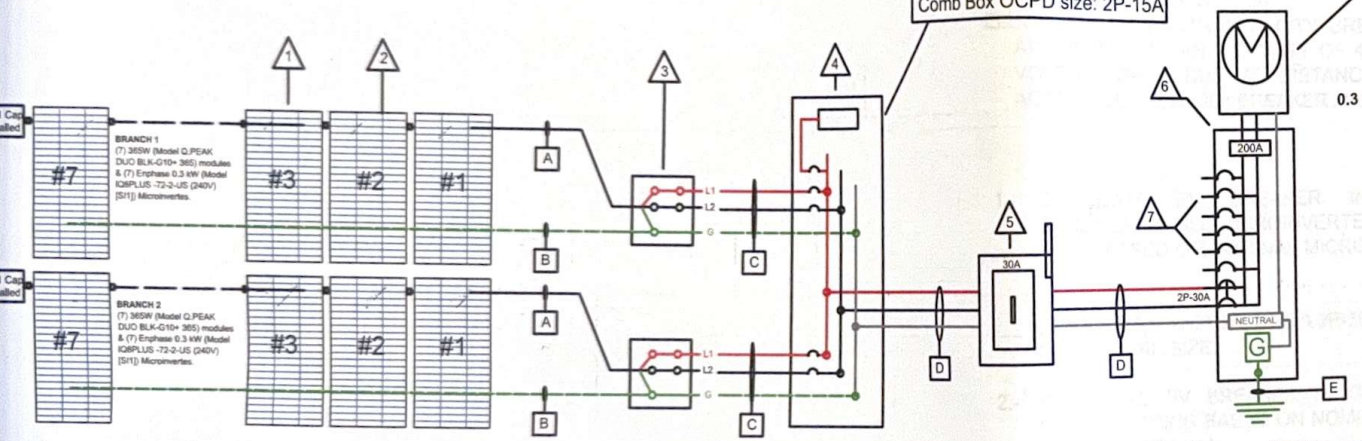
Check a box for DC system grounding: ☒ Grounded ☐ Ungrounded
For ungrounded DC power systems, EGC is required.
For grounded DC power systems, GEC & EGC are required.
Refer to CEC 250.120 for EGC installation & Table 250.122 for sizing.

Branch Circuit OCPD`s

Branch 1 OCPD size: 2P-20A
Branch 2 OCPD size: 2P-20A
Comb Box OCPD size: 2P-15A

NEW Main Service Panel OCPD`s

Main OCPD size: 200A Top Fed
Combined inverter Output OCPD: 2P-30A
Main Service Panel Busbar: 200A



ENPHASE MICROINVERTERS:
0.3 kW (Model IQ8PLUS-72-2-US (240V) [SI1])

DC Input Data Specs for each inverter
Max DC Input Voltage: 60V
Max DC Short Circuit Current: 15A

AC Output Data Specs for each inverter
Peak output power: 300VA
Nominal output current: 1.21A
Nominal voltage range: 240V
Nominal frequency: 60Hz
Max Continuous Output Power: 290VA

365W (Model Q.PEAK DUO BLK-G10+ 365)

Isc: 11.07A Impp: 10.56A
Voc: 41.21V Vmpp: 34.58V

NOTES: EXPOSED NON-CURRENT CARRYING METAL PARTS OF MODULES FRAMES, EQUIPMENT AND CONDUCTORS ENCLOSURES SHALL BE GROUNDED IN ACCORDANCDE WITH NEC/CEC 250.134 OR 250.136 (A) REGARDELSS OF THE VOLTAGE.

EACH MODULE SHALL BE GROUNDED VIA WEEB/UGS CLIPS OR HELIO GROUND LUG USING THE SUPPLIED CONNECTION POINT IDENTIFIED ON THE MODULE PER THE MANUFACTURERS SAFETY & INSTALLATION INSTRUCTIONS.

IF THE EXISTING GROUNDING ELECTRODE SYSTEM CANNOT BE VERIFIED OR IS ONLY METALLIC WATER PIPING, IT IS THE CONTRACTORS RESPONSABILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE. (2) GROUND RODS 6`APART AND A WATER BOND.

Conductor, Cable and Conduit Schedule

TAG	DESCRIPTION AND CONDUCTOR TYPE:	TAG	DESCRIPTION AND CONDUCTOR TYPE:
A	5´ FEMALE TRANSITION Q CABLE (4) #10 THWN-2 600V TO J-BOX W / STRAIN RELIEF CONNECTOR	C	(4) #10 AWG THWN-2 CONDUCTORS & (1) #6 AWG THWN-2 EGC WIRE IN 3/4" EMT CONDUIT.
B	USE IRON RIDGE MANUFACTURES GROUNDING COMPONENTS TO GROUND ARRAY, ATTACH (1) ILSCO GBL-4DBT LAY-IN GROUNDING LUG PER ROW OF MODULES, CONNECT WITH #6 BARE SOLID COPPER CONTINUES FROM MODULES TO RAIL AND #6 AWG THWN-2 WIRE FROM RAIL TO SERVICE PANEL.	D	(2) #8 AWG THWN-2 STRANDED COPPER WIRE CONDUCTORS & (1) #8 AWG THWN-2 STRANDED COPPER WIRE NEUTRAL & (1) #6 AWG THWN-2 EGC BARE SOLID COPPER WIRE IN 3/4" EMT CONDUIT.
		E	(E) SERVICE GEC UFER OR 5/8 " X 8" BSC GEC.

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TYPE: C-46

CUSTOMER INF.
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12471 SAGE GROUSE AVE,
MORENO VALLEY, CA 92555
(951) 213-5355

APN 487 - 180 - 013

PV SYSTEM
5.1 kW

DRAWING
DATE: *September 29th, 2022*
DRAWN BY: EQ
TITLE: *SINGLE LINE DIAGRAM (SLD)*
SHEET:
PV-03

CITY OF MORENO VALLEY
COMMUNITY DEVELOPMENT DEPARTMENT
BUILDING AND SAFETY DIVISION
APPROVED
Reviewed for applicable building code compliance
BON22-1907

Conduit on the roof between array junction boxes

XPOSE TEMPERATURE = 29º
EMPERATURE ADDER FOR CONDUIT OFFSET FROM ROOF = 33ºC
ÁDJUSTMENT FACTOR PER TABLE 310.16 FOR 90º C INSULATED CONDUCTOR AT 29ºC + 33ºC = 66ºC = 0.58
ELECT WIRE SIZE WITH AMPACITY GREATER THAN 28A AND ACCOUNT FOR VOLTAGE DROP FOR LENGTH OF CONDUIT RUN: USE 10AWG COPPER WIRE WITH AN AMPACITY OF 40A.

Conduit from AC disconnect to under eave to main panel.

XPOSE TEMPERATURE = 29ºC
ÁDJUSTMENT FACTOR PER TABLE 310.16 FOR 90ºC INSULATED CONDUCTOR AT 29ºC = 1.00
ELECT WIRE SIZE WITH AMPACITY GREATER THAN 30A, USE A 8 AWG WIRE WITH AN AMPACITY OF 40A TO ACCOUNT FOR ANY VOLTAGE DROP DUE TO DISTANCE WIRE IS RUN AND TO ACCOMMODATE 2P-30A BREAKER MAIN SERVICE PANEL.

1.- CALCULATE PV BREAKER IN MAIN SERVICE PANEL CONSIDERING ALL MICROINVERTERS OUTPUT FOR 14 MODULE TOTAL BASED ON NOMINAL MICROINVERTER OUTPUT CURRENT OF 1.21A:

(1.21A)(1.25)(14)=21.2A, USE A 2P-30A BREAKER FOR ARRAY AS IT IS STANDARD SIZE.

2.- CALCULATE PV BREAKER IN COMBINER BOX FOR TWO 7 MODULE STRING BASED ON NOMINAL MICROINVERTER OUTPUT CURRENT OF 1.21A:

COMBINER BOX, STRINGS 1 & 2:
(1.21A)(1.25)(7)= 10.6A, USE A 20A BREAKER FOR EACH ARRAY AS IT IS STANDARD SIZE.

3.- ENSURE MAIN SERVICE PANEL BUSBAR AND MAIN BREAKER COMBINATION ARE COMPATIBLE:

SERVICE MAIN BUSBAR RATING = 200A
SERVICE PANEL MAIN OCPD = 200A
200A + PV OCPD = 230A
230A = 115% MSP; OK 120 RULE

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(951) 213-5355

APN 487 - 180 - 013

PV SYSTEM

5.1 kW

DRAWING

DATE: September 29th, 2022

DRAWN BY: EQ

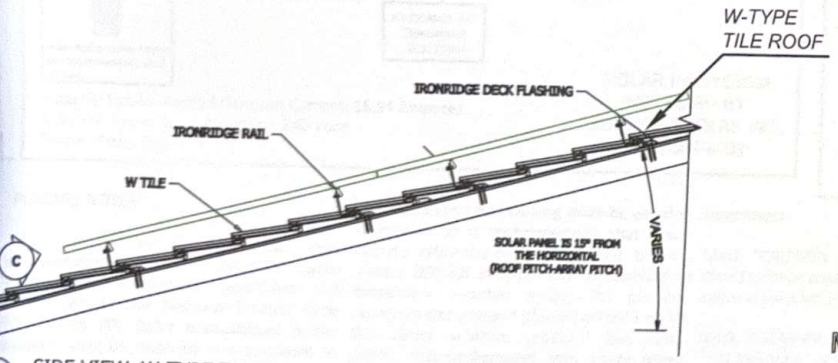
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SHEET: PV-04

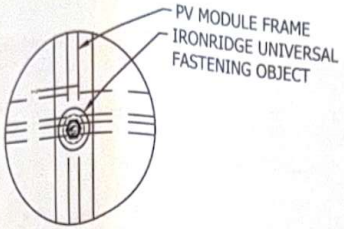
CITY OF MORENO VALLEY
COMMUNITY DEVELOPMENT DEPARTMENT
BUILDING AND SAFETY DIVISION
APPROVED
Reviewed for applicable building code compliance
BON22-1907



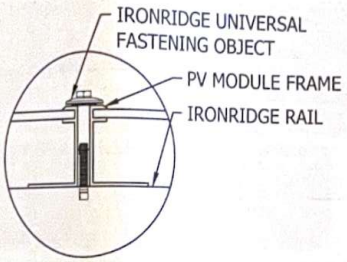
A PLAN VIEW, W-TYPE TILE ROOF. PORTRAIT MODULE



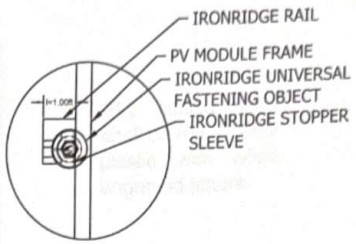
B SIDE VIEW, W-TYPE TILE ROOF, PORTRAIT MODULE



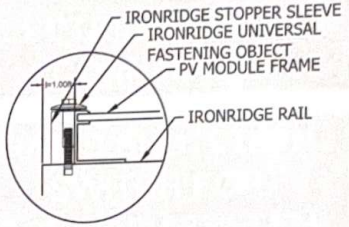
D.1 DETAIL, MID CLAMP PLAN



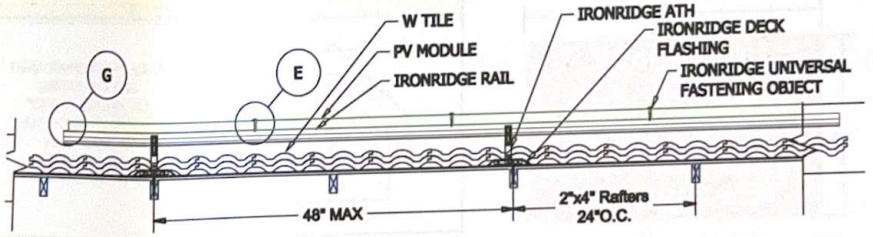
D.2 DETAIL, MID CLAMP FRONT



E.1 DETAIL, END CLAMP PLAN



E.2 DETAIL, END CLAMP FRONT



C FRONT VIEW, W-TYPE TILE ROOF. PORTRAIT MODULE

MECHANICAL SPECIFICATION
Q.PEAK DUO BLK-G10+ 365 365W

Each module area:	21.7 Sq. Ft.
Array Sq. Ft.:	303.8 Sq. Ft.
Solar Modules weight:	2.27 lbs/sq. ft.
Mounting/Racking weight:	0.6 lbs/sq. ft.
System Total:	2.87 lbs/sq. ft.

LAG SCREW: $\frac{5}{16}$" - 4 $\frac{1}{2}$" 18.8
STAINLESS STEEL EMBEDDED
2-$\frac{1}{2}$" IN CENTER OF RAFTER.

IRONRIDGE
1495 ZEPHYR AVE, HAYWARD, CA 94544
800.227.9523 IRONRIDGE.COM

Structural Only
REGISTERED PROFESSIONAL ENGINEER
EUGENE MUNYANZIZA
C 88783
CIVIL
STATE OF CALIFORNIA

CONTRACTOR INF.
Sunlight Solar Inc.
WARREN B. LAMB
1300 NORTH JOHNSON AVE.
SUITE 104, EL CAJON CA 92020
(858) - 564 - 8032
LICENSE: #997589
TYPE: C-46

CUSTOMER INF.
JOSEPH PEREZ
12471 SAGE GROUSE AVE,
MORENO VALLEY, CA 92555
(951) 213-5355

APN 487 - 180 - 013

PV SYSTEM
5.1 kW

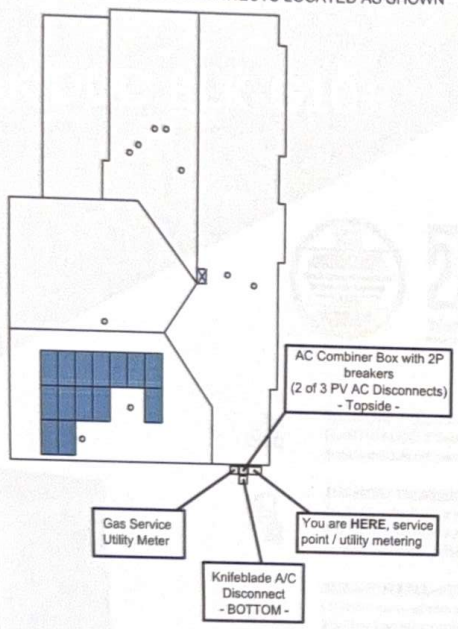
DRAWING
DATE: September 29th, 2022
DRAWN BY: EQ
TITLE: RACKING & ROOF DETAILS
SHEET: PV-05

CITY OF MORENO VALLEY
COMMUNITY DEVELOPMENT DEPARTMENT
BUILDING AND SAFETY DIVISION
APPROVED
Reviewed for applicable building code compliance
BON22-1934

6"

CAUTION

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN



Solar PV System Rated AC Output Current: 16.94 Amperes
Solar PV System Output Voltage: 240 Volts
Power Phase: Single

SOLAR PV SYSTEM INSTALLED BY:
SUNLIGHT SOLAR INC.
(858)-564-8032

6"

4"

WARNING:
ELECTRIC SHOCK HAZARD

TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.

DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT

2"

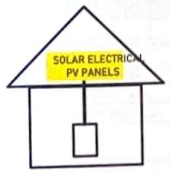
ALL plastic signs shall be red exterior plastic with white engraved letters.

PV SYSTEM DISCONNECT

CAUTION SOLAR CIRCUIT

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY



CAUTION: SOLAR ELECTRICAL SYSTEM CONNECTED

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

Rapid Shutdown switch shall have a label located on or not more than 3 ft from the switch.

2"

WARNING!

SOLAR PV SYSTEM DO NOT RELOCATE THIS BREAKER.

1"

PLACARD NOTES:

This system is designed to meet requirements of the CAL-FIRE Solar Photovoltaic Installation Guidelines and Article 690 of the National Electric Code (NEC NFPA 70). Solar photovoltaic power systems shall be installed in accordance to CA Fire Code Sections 605.11.1 through 605.11.4.

Markings will be provided in accordance with the Cal-Fire Solar Photovoltaic Installation Guideline.

Materials used for marking must be weather resistance. It is recommended that under writers laboratories marking and labeling system 969 (UL 969) be used as standard to determine weather rating. All placards except meter placard placard printed on UL 969 rated weather resistant two color plastic, red background with white letter, 1/4" Arial Non-Bold Font.

Meter placard riveted using 1/8" aluminum pop rivets.

Plans will show:
Mark "CAUTION SOLAR ELECTRICAL SYSTEM CONNECTED" at the main service disconnect.

Mark "CAUTION SOLAR CIRCUIT" for the direct current conduit, raceways, enclosures, cable assembles and junction boxes.

Mark "SOLAR PV SYSTEM DO NOT RELOCATE THIS BREAKER" at PV breaker in main service panel.

Mark "WARNING, ELECTRIC SHOCK HAZARD, TERMINAL ON LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION." at rooftop J-Boxes. (CEC 690.13)(B)

Mark "PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN" on load center (circuit breaker cover) at utility service point. (CEC 690.56)(C)(1)(A). The rapid shutdown label in 690.56(C)(3) shall be located on or no more than 3 ft. from the service disconnecting means to which the PV systems are connected and shall indicate the location of all identified rapid shutdown switches if not at the same location".

Details about marking; red background, white lettering, minimum 3/8" height, all capital letters arial or similar font, Non-Bold reflective, weather resistant material suitable for the environment (Durable adhesive materials may meet this requirement)

Marking is required on all interior and exterior DC conduit, raceways, enclosures, cable assemblies and junction boxes to alert the fire service to avoid cutting them. Shall be every 10´, at turns and above and/or below penetrations and all DC Combiner and Junction boxes.

CONTRACTOR INF.
Sunlight Solar Inc.
WARREN B. LAMB
1300 NORTH JOHNSON AVE.
SUITE 104, EL CAJON CA 92020
(858) - 564 - 8032
LICENSE: #997589
TYPE: C-46

CUSTOMER INF.
JOSEPH PEREZ
12471 SAGE GROUSE AVE,
MORENO VALLEY, CA 92555
(951) 213-5355

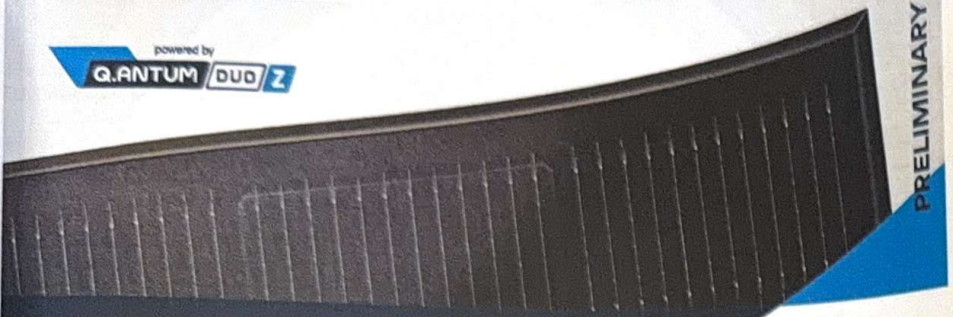
APN 487 - 180 - 013

PV SYSTEM
5.1 kW

DRAWING
DATE: September 29th, 2022
DRAWN BY: EQ
TITLE: NEC SAFETY SIGNAGE
SHEET: PV-06

powered by Q.ANTUM DUO Z

PRELIMINARY



Q.PEAK DUO BLK-G10+
350-370

ENDURING HIGH PERFORMANCE

Quality Controlled PV
TÜVRheinland CERTIFIED
www.tuv.com ID 1111232615

GERMANY'S MOST POPULAR PROVIDER

25 YR Warranty
Product & Performance

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2021

Q CELLS Yield Security



BREAKING THE 20% EFFICIENCY BARRIER
Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.

THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY
Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.

INNOVATIVE ALL-WEATHER TECHNOLOGY
Optimal yields, whatever the weather with excellent low-light and temperature behaviour.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID Technology, Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING
High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).

A RELIABLE INVESTMENT
Inclusive 25-year product warranty and 25-year linear performance warranty[2].

[1] APT test conditions according to IEC/TS 62804-1:2015, method A (-1500 V, 96 h)
[2] See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:

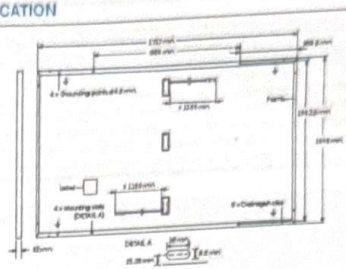
Rooftop arrays on residential buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	1717 mm × 1045 mm × 32 mm (including frame)
Weight	19.9 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 20 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 1150 mm, (-) ≥ 1150 mm
Connector	Stäubli MC4; IP68

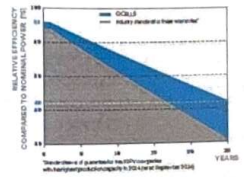


ELECTRICAL CHARACTERISTICS

POWER CLASS			350	355	360	365	370
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)							
Minimum	Power at MPP[1]	P_{MPP} [W]	350	355	360	365	370
	Short Circuit Current[1]	I_{SC} [A]	10.97	11.00	11.04	11.07	11.10
	Open Circuit Voltage[1]	V_{OC} [V]	41.11	41.14	41.18	41.21	41.24
	Current at MPP	I_{MPP} [A]	10.37	10.43	10.49	10.56	10.62
	Voltage at MPP	V_{MPP} [V]	33.76	34.03	34.31	34.58	34.84
	Efficiency[1]	η [%]	≥19.5	≥19.8	≥20.1	≥20.3	≥20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	Power at MPP	P_{MPP} [W]	262.6	266.3	270.1	273.8	277.6
	Short Circuit Current	I_{SC} [A]	8.84	8.87	8.89	8.92	8.95
	Open Circuit Voltage	V_{OC} [V]	38.77	38.80	38.83	38.86	38.90
	Current at MPP	I_{MPP} [A]	8.14	8.20	8.26	8.31	8.37
	Voltage at MPP	V_{MPP} [V]	32.24	32.48	32.71	32.94	33.17

[1] Measurement tolerances P_{MPP} ± 3%; I_{SC}; V_{OC} ± 5% at STC: 1000 W/m², 25 ± 2 °C, AM 1.5 according to IEC 60904-3 • [2] 800 W/m², NMOT, spectrum AM 1.5

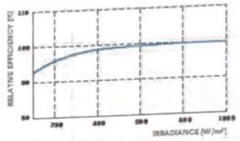
Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS							
Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°C]	43 ± 3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V_{SYS}	[V]	1000	PV module classification	Class II
Maximum Reverse Current	I_R	[A]	20	Fire Rating based on ANSI / UL 61730	C / TYPE 2
Max. Design Load, Push / Pull		[Pa]	3600 / 2660	Permitted Module Temperature on Continuous Duty	−40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 4000		

QUALIFICATIONS AND CERTIFICATES

Quality Controlled PV - TÜV Rheinland, IEC 61215:2016, IEC 61730:2016. This data sheet complies with DIN EN 50380. QCPV Certification ongoing.

CE

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS GmbH
Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | TEL +49 (0)3494 66 99-23444 | FAX +49 (0)3494 66 99-23000 | EMAIL sales@q-cells.com | WEB www.q-cells.com

Specifications subject to technical changes © Q CELLS Q.PEAK DUO BLK-G10+_350-370_2021-06_Rev01_EN

Engineered in Germany

Q CELLS

Data Sheet
Enphase Networking

Enphase IQ Combiner 4/4C

X-IQ-AM1-240-4
X-IQ-AM1-240-4C



X-IQ-AM1-240-4C

X-IQ-AM1-240-4

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

Smart

- Includes IQ 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 Enphase 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

Simple

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

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- Two years labor reimbursement program coverage included for both the IQ Combiner SKU's
- UL listed

UL LISTED

To learn more about Enphase offerings, visit enphase.com

ENPHASE.

Enphase IQ Combiner 4/4C

MODEL NUMBER	
IQ Combiner 4 (X-IQ-AM1-240-4)	IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match the IQ Battery system and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C)	IQ Combiner 4C with Enphase 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 (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.
ACCESSORIES AND REPLACEMENT PARTS	**(not included, order separately)**
Ensemble Communications Kit COMMS-CELLMODEM-M1-06	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites
CELLMODEM-M1-06-SP-05	- 4G based LTE-M1 cellular modem with 5-year Sprint data plan
CELLMODEM-M1-06-AT-05	- 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210
BRK-15A-2-240V	Circuit breaker, 2 pole, 15A, Eaton BR215
BRK-20A-2P-240V	Circuit breaker, 2 pole, 20A, Eaton BR220
BRK-15A-2P-240V-B	Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support
BRK-20A-2P-240V-B	Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 4/4C
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Gateway printed circuit board (PCB) for Combiner 4/4C
X-IQ-NA-HD-125A	Hold down kit for Eaton circuit breaker with screws.
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. total branch circuit breaker rating (input)	80A of distributed generation / 95A with IQ Gateway breaker included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway
Consumption monitoring CT (CT-200-SPLIT)	A pair of 200 A split core current transformers
MECHANICAL DATA	
Dimensions (WxHxD)	37.5 x 49.5 x 16.8 cm (14.75" x 19.5" x 6.63"). Height is 21.06" (53.5 cm) with mounting brackets.
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
COMPLIANCE	
Compliance, IQ Combiner	UL 1741, CAN/CSA C22.2 No. 107.1; 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production) Consumption metering: accuracy class 2.5
Compliance, IQ Gateway	UL 60601-1/CANCSA 22.2 No. 61010-1

To learn more about Enphase offerings, visit enphase.com

ENPHASE.

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Rapid shutdown is built-in

The 2014 edition of the National Electrical Code (NEC 2014) added new rapid shutdown requirements for PV systems installed on buildings. Enphase Microinverters fully meet rapid shutdown requirements in the new code without the need to install any additional electrical equipment.

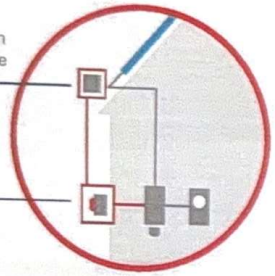
What's new in NEC 2014?
NEC 2014, Section 690.12 applies to PV conductors over 10 feet from the PV array and requires that the conductors power down to 30 volts and 240 volt-amperes within 10 seconds of rapid shutdown initiation.

String inverters require work arounds for rapid shutdown

Work around.
Specialized Rapid Shutdown electrical box installed on the roof within 10 feet of array.

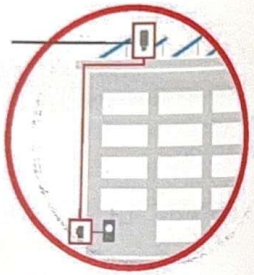
Work around.
Shutoff switch that is easily accessible to first responders on the ground.

Work around.
Extra conduit in installation.



Residential String Inverter

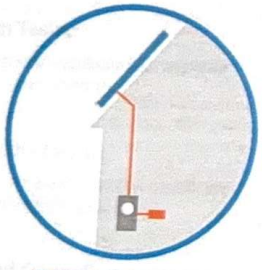
Work around.
String inverter installed on roof, a hostile environment that string inverters are not built to live in.



Commercial String Inverter

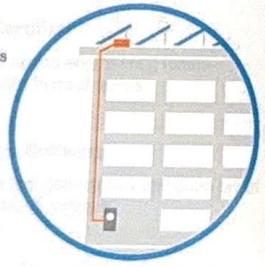
Enphase comes standard with rapid shutdown capability

All Enphase microinverters, even those that were previously installed, inherently meet rapid shutdown requirements, no additional equipment or workarounds needed



Residential Microinverter

Enphase microinverters can safely shut down automatically, leaving only low-voltage DC electricity isolated to the PV module



Commercial Microinverter

To learn more, visit enphase.com

[e] enphase® ENERGY

CERTIFICATE OF COMPLIANCE

Certificate Number 20180626-E341165
Report Reference E341165-20171030
Issue Date 2018-June-26

Issued to: Enphase Energy Inc.
1420 N. McDowell Blvd. Petaluma, CA 94954-6515

This is to certify that representative samples of Photovolic Grid Support Utility Interactive Inverter with Rapid Shutdown Functionality

Models IQ7-60, IQ7PLUS-72, and IQ7X-96, followed by -2, -5, -B, or -ACM, followed by -US.

Models IQ7PD-72-2-US and IQ7PD-84-2-US.

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety:
UL 1741, Standard for Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741, Second Edition, dated January 28, 2010. Including the requirements in UL 1741 Supplement SA, sections as noted in the Technical considerations.
IEEE 1547, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems.
IEEE 1547.1, IEEE Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems.
UL 62109-1, Safety of Converters for Use in Photovoltaic Power Systems - Part 1: General Requirements; IEC 62109-2, Safety of Power Converters for use in Photovoltaic Power Systems - Part 2: Particular Requirements for Inverters.
CSA C22.2 No. 107.1-01, General Use Power Supplies.

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.

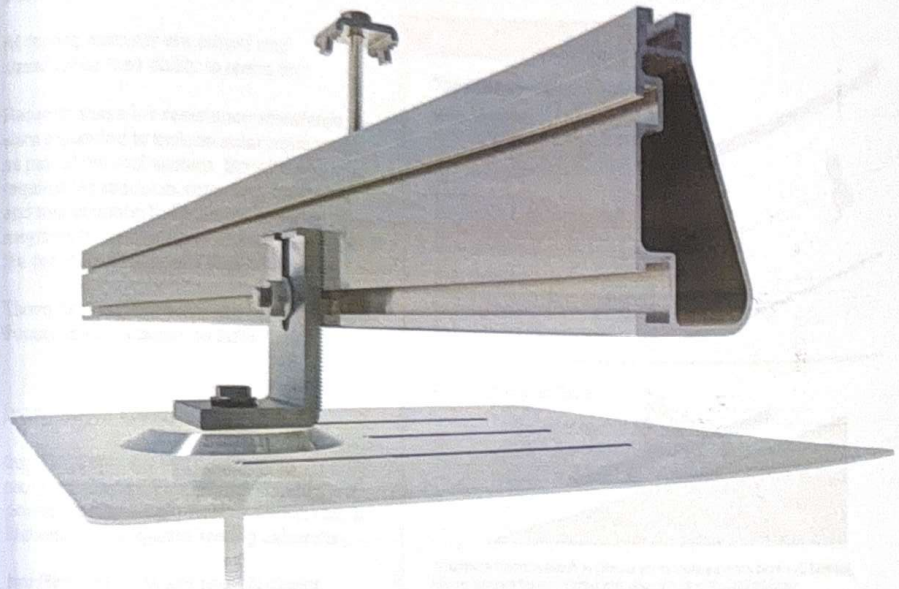
Bruce Mahrenholz, Director North American Certification Program
UL LLC

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Datasheet

IRONRIDGE

Roof Mount System



Built for solar's toughest roofs.

IronRidge builds the strongest roof mounting system in solar. Every component has been tested to the limit and proven in extreme environments.

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

Strength Tested
All components evaluated for superior structural performance.

PE Certified
Pre-stamped engineering letters available in most states.

Class A Fire Rating
Certified to maintain the fire resistance rating of the existing roof.

Design Software
Online tool generates a complete bill of materials in minutes.

Integrated Grounding
UL 2703 system eliminates separate module grounding components.

20 Year Warranty
Twice the protection offered by competitors.

Datasheet

XR Rails

XR10 Rail



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

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

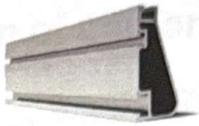
XR100 Rail



The ultimate residential solar mounting rail.

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

XR1000 Rail



A heavyweight mounting rail for commercial projects.

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

Internal Splices



All rails use internal splices for seamless connections.

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

Attachments

FlashFoot



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

- Ships with all hardware
- IBC & IRC compliant
- Certified with XR Rails

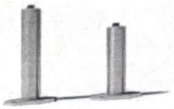
Slotted L-Feet



Drop-in design for rapid rail attachment.

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

Standoffs



Raise flush or tilted systems to various heights.

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

Tilt Legs



Tilt assembly to desired angle, up to 45 degrees.

- Attaches directly to rail
- Ships with all hardware
- Fixed and adjustable

Clamps & Grounding

End Clamps



Slide in clamps and secure modules at ends of rails.

- Mill finish & black anod.
- Sizes from 1.22" to 2.3"
- Optional Under Clamps

Grounding Mid Clamps



Attach and ground modules in the middle of the rail.

- Parallel bonding T-bolt
- Reusable up to 10 times
- Mill & black stainless

T-Bolt Grounding Lugs



Ground system using the rail's top slot.

- Easy top-slot mounting
- Eliminates pre-drilling
- Swivels in any direction

Accessories



Provide a finished and organized look for rails.

- Snap-in Wire Clips
- Perfected End Caps
- UV-protected polymer

Free Resources



Design Assistant
Go from rough layout to fully engineered system. For free.
Go to IronRidge.com/rm

NABCEP Certified Training
Earn free continuing education credits, while learning more about our systems.
Go to IronRidge.com/training

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Tech Brief

IRONRIDGE

Class A Fire Rating

Background

All roofing products are tested and classified for their ability to resist fire.

Recently, these fire resistance standards were expanded to include solar equipment as part of the roof system. Specifically, this requires the modules, mounting hardware and roof covering to be tested together as a system to ensure they achieve the same fire rating as the original roof covering.

These new requirements are being adopted throughout the country in 2016.

IronRidge Certification

IronRidge was the first company to receive a Class A Fire Rating—the highest possible rating—from Intertek Group plc., a Nationally Recognized Testing Laboratory.

IronRidge Flush Mount and Tilt Mount Systems were tested on sloped and flat roofs in accordance with the new UL 1703 & UL 2703 test standards. The testing evaluated the system's ability to resist flame spread, burning material and structural damage to the roof.

Refer to the table below to determine the requirements for achieving a Class A Fire Rating on your next project.

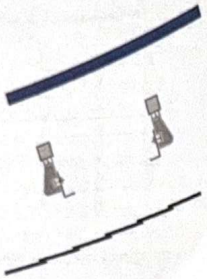
Fire Testing Process

Test Setup

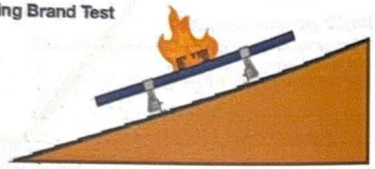
Solar Modules
Solar modules are given a Type classification based on their materials and construction.

Mounting System
Mounting is tested as part of a system that includes type-tested modules and fire-rated roof covering.

Roof Covering
Roof covering products are given a Fire Class Rating of A, B or C based on their tested fire resistance.

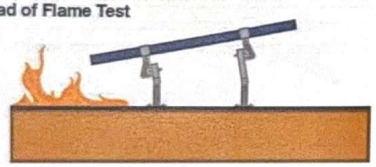


Burning Brand Test



A burning wooden block is placed on module as a fan blows at 12 mph. Flame cannot be seen on underside of roof within 90 minutes.

Spread of Flame Test



Flame at southern edge of roof is aimed up the roof as a fan blows at 12 mph. The flame cannot spread 6 feet or more in 10 minutes.

System	Roof Slope	Module	Fire Rating*
Flush Mount	Any Slope	Type 1, 2, & 3	Class A
Tilt Mount	≤ 6 Degrees	Type 1, 2, & 3	Class A

*Class A rated PV systems can be installed on Class A, B, and C roofs.

Intertek

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Middleton, WI 53562 USA

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Facsimile: 608.831.9279
www.intertek.com

Test Verification of Conformity

In the basis of the tests undertaken, the sample(s) of the below product have been found to comply with the requirements of the referenced specifications at the time the tests were carried out.

Applicant Name & Address:	IronRidge, Inc. 1495 Zephyr Ave. Hayward, CA 94544 USA
Product Description:	Flush Mount System with XR Rails.
Ratings & Principle Characteristics:	Fire Class Resistance Rating: -Flush Mount (Symmetrical). Class A Fire Rated for Low Slope applications when using Type 1, 2 and 3, listed photovoltaic modules. Class A Fire Rated for Steep Slope applications with Type1, 2 and 3, listed photovoltaic modules. Tested with a 5" gap (distance between the bottom the module frame and the roof covering), per the standard this system can be installed at any gap allowed by the manufacturers installation instructions. No perimeter guarding is required. This rating is applicable with any IronRidge or 3'rd party roof anchor.
Models:	IronRidge Flush Mount with XR Rails
Brand Name:	IronRidge Flush Mount
Relevant Standards:	UL 2703 (Section 15.2 and 15.3) Standard for Safety Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels, First Edition dated Jan. 28, 2015 **Referencing** UL1703 Third Edition dated Nov. 18, 2014, (Section 31.2) Standard for Safety for Flat-Plate Photovoltaic Modules and Panels.
Verification Issuing Office:	Intertek Testing Services NA, Inc. 8431 Murphy Drive Middleton, WI 53562
Date of Tests:	08/27/2014 to 03/17/2015
Test Report Number(s):	101769343MID-001r1, 101769343MID-001a, 101915978MID-001 & 101999492MID-001ar1-cr1.

This verification is part of the full test report(s) and should be read in conjunction with them. This report does not automatically imply product certification.

Completed by:	Chris Zimbrich	**Reviewed by:**	Chad Naggs
Title:	Technician II, Fire Resistance	**Title:**	Technician I, Fire Resistance
Signature:		**Signature:**	
Date:	05/25/2016	**Date:**	05/25/2016

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Tech Brief

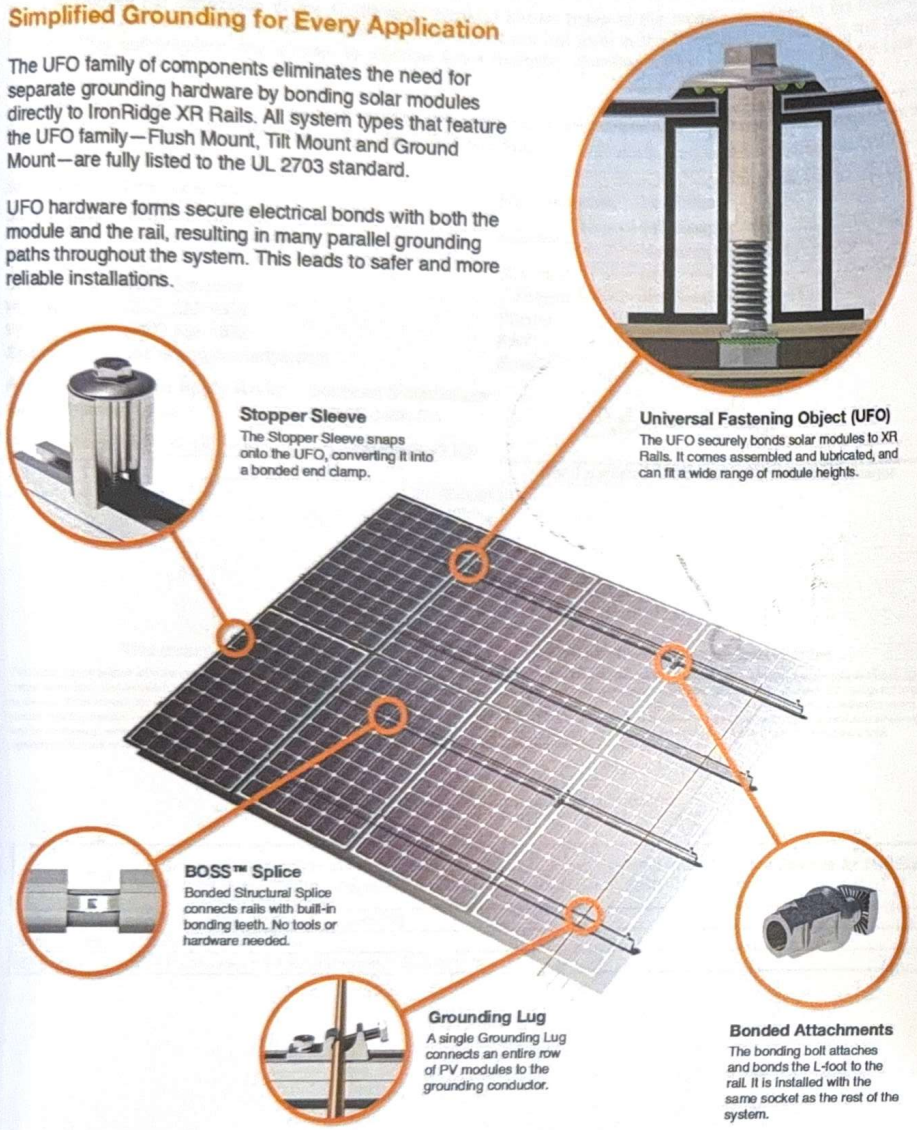
IRONRIDGE

UFO Family of Components

Simplified Grounding for Every Application

The UFO family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge XR Rails. All system types that feature the UFO family—Flush Mount, Tilt Mount and Ground Mount—are fully listed to the UL 2703 standard.

UFO hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.



Stopper Sleeve
The Stopper Sleeve snaps onto the UFO, converting it into a bonded end clamp.

Universal Fastening Object (UFO)
The UFO securely bonds solar modules to XR Rails. It comes assembled and lubricated, and can fit a wide range of module heights.

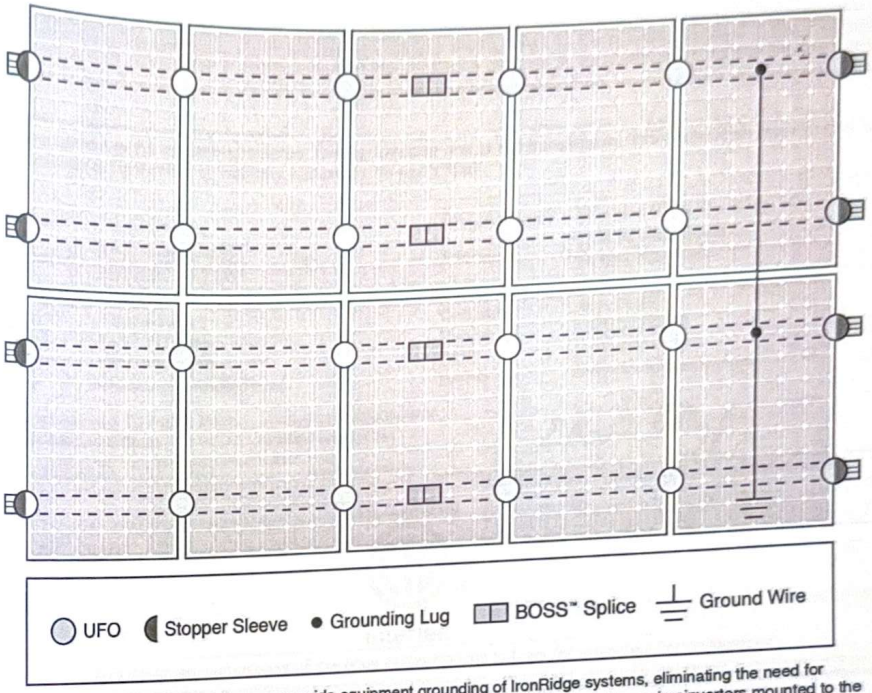
BOSS™ Splice
Bonded Structural Splice connects rails with built-in bonding teeth. No tools or hardware needed.

Grounding Lug
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.

Bonded Attachments
The bonding bolt attaches and bonds the L-foot to the rail. It is installed with the same socket as the rest of the system.

Tech Brief

System Diagram



Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

UL Certification

The IronRidge Flush Mount, Tilt Mount, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

Go to IronRidge.com/UFO

Cross-System Compatibility			
Feature	**Flush Mount**	**Tilt Mount**	**Ground Mount**
XR Rails	✔	✔	XR1000 Only
UFO/Stopper	✔	✔	✔
BOSS™ Splice	✔	✔	N/A
Grounding Lugs	1 per Row	1 per Row	1 per Array
Microinverters & Power Optimizers	Enphase - M250-72, M250-60, M215-60, C250-72 Darfon - MIG240, MIG300, G320, G640 SolarEdge - P300, P320, P400, P405, P600, P700, P730		
Fire Rating	Class A	Class A	N/A
Modules	Tested or Evaluated with over 400 Framed Modules Refer to installation manuals for a detailed list.		

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AUTHORIZATION TO MARK

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Applicant:	IronRidge, Inc.	**Manufacturer:**	IronRidge, Inc.
Address:	1495 Zephyr Ave Hayward, CA 94544	**Address:**	1495 Zephyr Ave Hayward, CA 94544
Country:	USA	**Country:**	USA
Contact:	Yann Schwarz	**Contact:**	Jim Norsworthy Or
Phone:	(800) 227-9523	**Phone:**	(707) 363-3025
FAX:	(707) 459-1833	**FAX:**	(510) 225-0975
Email:	yschwarz@ironridge.com	**Email:**	jnorsworthy@ironridge.com

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Lake Forest, CA

Control Number: 4008377 **Authorized by:** Edward Kelley

for Thomas J. Patterson, Certification Manager

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Intertek Testing Services NA Inc.
545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

Standard(s):	UL Subject 2703 Outline of Investigation for Rack Mounting Systems and Clamping Devices for Flat-Plate Photovoltaic Modules and Panels, Issue Number: 1, October 4, 2010
Product:	XR Rails with Integrated Grounding.
Brand Name:	IronRidge Roof Mount
Models:	IR XR followed by 4 Alphanumeric Characters

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Address:	1495 Zephyr Ave Hayward, CA 94544	**Address:**	1704 W. 10th Street Tempe, AZ 85281
Country:	USA	**Country:**	USA
Contact:	Yann Schwarz	**Contact:**	Andy Frola
Phone:	(800) 227-9523	**Phone:**	(480) 967-2038
FAX:	(707) 459-1833	**FAX:**	(480) 829-0838
Email:	yschwarz@ironridge.com	**Email:**	andy@precisiondie.com

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Lake Forest, CA

Control Number: 4008083 **Authorized by:** Edward Kelley

for Thomas J. Patterson, Certification Manager

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Product:	XR Rails with Integrated Grounding.
Brand Name:	IronRidge Roof Mount
Models:	IR XR followed by 4 Alphanumeric Characters

Tile Replacement Mount

Elevated Water Seal Technology®

For use with Flat, S, & W shaped tiles



Installation Instructions

Quick Mount PV®

RESPECT THE ROOF

Instructions: QMTR - Tile Replacement Mount

Installation Tools Required: stud finder, tape measure, utility knife, drill with ⅛" bit, impact gun with T-30 Torx bit, channel lock pliers, caulking gun, appropriate sealant compatible with EPDM rubber and roofing materials, roofing bar, and hand broom.

NOTE: Installation method is the same for all tile replacement flashing profiles.



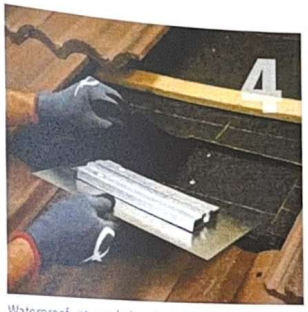
Locate and remove the tile that will be replaced by the tile replacement flashing. Remove tile to the left of and above the mount location. Locate rafter and mark center. Measure 8¾" up from bottom of the adjacent tiles and mark the location with a horizontal line across rafter.



Align the base plate over rafter so the lag holes line up with the rafter line and horizontal line aligns with the post groove. The orientation of the base plate can be flipped east-west for post location versatility of up to 12¼". Mark location of lag holes on the roof.



Drill two pilot holes using ⅛" bit to a depth of 2¾". Be sure lags go into center of rafter for strongest attachment. Pilot holes reduce rafter splitting. Fill pilot holes with appropriate sealant and align lag holes over the pilot holes.



Waterproof at underlayment level according to roofing manufacturer instructions and Tile Roofing Institute Guidelines. Alternative flashing methods may be approved by the AHJ at their discretion.



Use T-30 Torx bit and impact gun to secure mount into rafter with provided hardware.



Insert the grade-8 serrated flange bolt into the bottom of the post. Slide post into base plate channel. Line up post with the hole in the tile replacement flashing. Leave loose for adjustments.



Place the tile replacement flashing over the post and mount, allowing flashing to interlock with surrounding tiles properly. Secure the post by tightening it down using a pair of channel lock pliers. Replace surrounding tiles.



Apply a bead of sealant where the post meets the flashing. Slip the EPDM collar over the post and onto the flashing.

WARNING: Quick Mount PV products are NOT designed and should NOT be used for anchoring fall protection equipment.

CAUTION: Prior to installation, check that proper screw embedment will be achieved for the necessary site load and roofing configurations.

Powering Business Worldwide

pe.eaton.com



General Duty Non-Fusible Safety Switch

DG221URB

UPC:782113120232

Dimensions:

- **Height:** 6.25 IN
- **Length:** 5.73 IN
- **Width:** 6.1 IN

Weight:5 LB

Notes:WARNING! Switch is not approved for service entrance unless a neutral kit is installed.

Warranties:

- Eaton Selling Policy 25-000, one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

Specifications:

- **Type:** General Duty/Non-Fusible
- **Amperage Rating:** 30A
- **Enclosure:** NEMA 3R
- **Enclosure Material:** Painted galvanized steel
- **Fuse Configuration:** Non-fusible
- **Number Of Poles:** Two-pole
- **Number Of Wires:** Two-wire
- **Product Category:** General Duty Safety Switch
- **Voltage Rating:** 240V

Supporting documents:

- Eatons Volume 2-Commercial Distribution
- Eaton Specification Sheet - DG221URB

Certifications:

- UL Listed

Product compliance: No Data

