MATTHEW HACKWORTH

AHJ
RIVERSIDE COUNTY

UTILITY
SOUTHERN CALIFORNIA EDISON CO

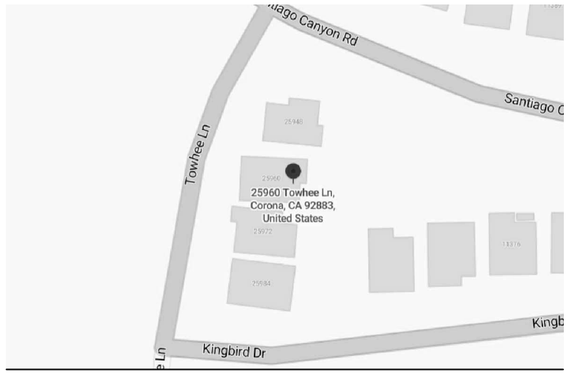
APPLICABLE CODES & STANDARDS
CBC 2022, CRC 2022 CMC 2022 IECC 2018
CPC 2022 CEBC 2022 CGBSC 2022
CEC 2022 (BASED ON 2020 NEC)
CFC 2022
LOCAL AMENDMENTS TO CA CODES

ENVIRONMENTAL
WIND SPEED: 90 MPH
SNOW LOAD: 0 PSF
EXPOSURE CATEGORY: B

SCOPE OF WORK

(N) 10.13KW DC/8.13KW AC ROOF MOUNTED PV SYSTEM
(25) HANWHA QCELLS Q.PEAK DUO BLK ML-G10+ 405 MODULES
(25) ENPHASE IQ8M-72-2-US INVERTERS
(01) ENPHASE IQ COMBINER 4/4C PANEL

VICINITY MAP



GENERAL NOTES

PROJECT NOTES:
- THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE CALIFORNIA ELECTRIC CODE (CEC) ARTICLE 690, ALL MANUFACTURER'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.
- THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION
- GROUND FAULT DETECTION AND INTERRUPTION (GFDI) DEVICE IS INTEGRATED WITH THE MICRO INVERTER IN ACCORDANCE WITH CEC 690.41(B)
- ALL PV SYSTEM COMPONENTS; MODULES, UTILITY - INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY CEC 690.4: PV MODULES: UL1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE INVERTERS: UL 1741 CERTIFIED, IEEE 1547, 929, 519 COMBINER BOX(ES): UL 1703 OR UL 1741 ACCESSORY
- MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO CEC 690.7.
- ALL INVERTERS, PHOTOVOLTAIC MODULES,PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4. SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING [CEC 110.3].
- ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE CEC AND AHJ.

APN- 290730020

SHEET INDEX

CONTRACTOR

New Day Solar
Installing Solar Electric Systems Since 1988

CORY JOHNSON
30770 Wealth St Murrieta,
MURRIETA, CA 92563
8554446329
LIC TYPE- C-10
LIC NO - 812958

PROJECT INFO & ADDRESS

MATTHEW HACKWORTH

25960 TOWHEE LN,
CORONA, CA 92883

SYSTEM SIZE
DC SIZE: 10.125 KW DC-(STC)
AC SIZE: 8.125 KW AC

DRAWN BY	AV
DATE	4/7/2023
REVISION	

SIGNATURE

PV-1

COVER SHEET

NOTE:

1.NO ROOF, PLUMBING, OR HEAT VENT TO BE OBSTRUCTED BY THE ARRAY.

2.WORKING CLEARANCES AROUND EXISTING ELECTRICAL EQUIPMENT AS WELL AS THE NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH CEC 110.26

3.THE PHOTOVOLTAIC INVERTER WILL BE LISTED AS UL 1741 COMPLIANT IN ACCORDANCE WITH CEC 690.4(B)

4.THE 2022 CALIFORNIA RESIDENTIAL CODE (CRC) REQUIRES THAT SMOKE ALARMS AND CARBON MONOXIDE ALARMS ARE RETROFITTED INTO THE EXISTING DWELLING. THE REQUIRED SMOKE ALARMS AND CARBON MONOXIDE DETECTORS SHALL BE LOCATED AS REQUIRED PER SECTIONS R314 & R315 CALIFORNIA RESIDENTIAL CODE (CRC).

5.SOLAR MODULES WILL BE INSTALLED PARALLEL WITH THE EXISTING ROOF SLOPE AND NO MORE THAN 6" ABOVE THE ROOF SURFACE.

6.STRUCTURES, PATIO COVERS, AND/OR ADDITIONS BUILT WITHOUT PERMITS TO BE RESOLVED BY A SEPARATE PERMIT.

7.TO AVOID EXTRA TEMP. CORRECTIONS CONDUIT MUST BE 7/8” MINIMUM HEIGHT OFF ROOFTOP (EXTERIOR) OR 18” BELOW ROOF THROUGH ATTIC (INTERIOR).

TOTAL ROOF AREA:2542.22 SQ. FT
TOTAL ARRAY AREA: 528.25 SQ. FT
ARRAY COVERAGE: 20.78%

SCOPE OF WORK

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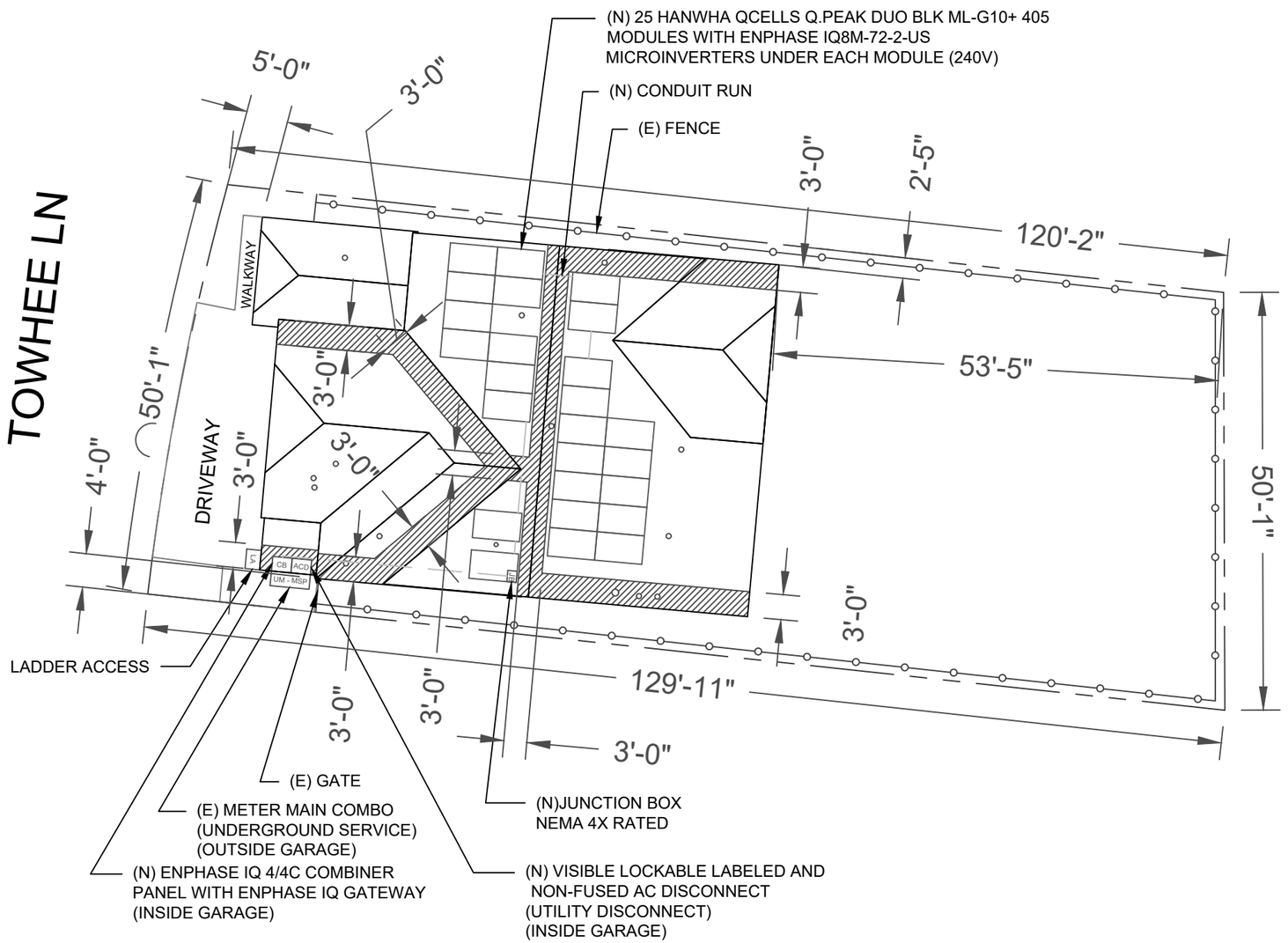
(01) ENPHASE IQ COMBINER 4/4C PANEL



LEGEND

- FIRE PATHWAYS
- PROPERTY LINE
- FENCE
- SKYLIGHT/CHIMNEY
- VENT/OBSTRUCTION

N

SITE PLAN

SCALE:1/16" = 1'-0"

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PV-2

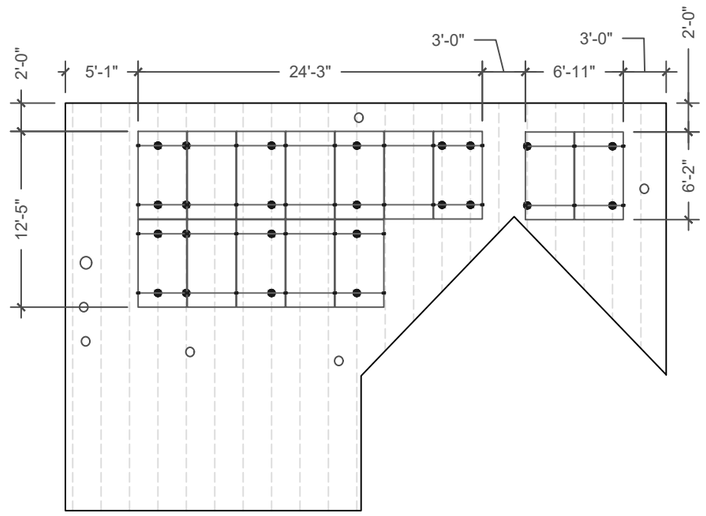
SITE PLAN

ROOF SECTION(S)

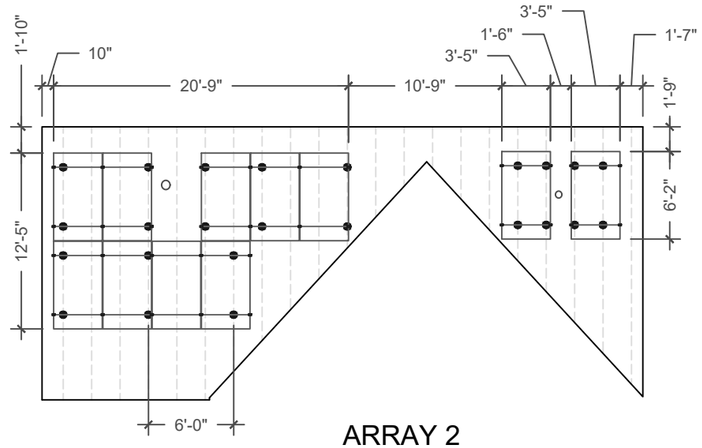
ROOF 1	ROOF MATERIAL - FLAT TILE CONCRETE RAFTER SIZE - 2"X4" O.C. SPACING - 24" MODULES - 14
ROOF 2	ROOF MATERIAL - FLAT TILE CONCRETE RAFTER SIZE - 2"X4" O.C. SPACING - 24" MODULES - 11

- CLAMP
- PROSOLAR TILETRAC
- PROSOLAR RAIL
- RAFTER

48 - TOTAL MOUNT



ARRAY 1
TILT- 23 DEG
AZIMUTH - 95 DEG



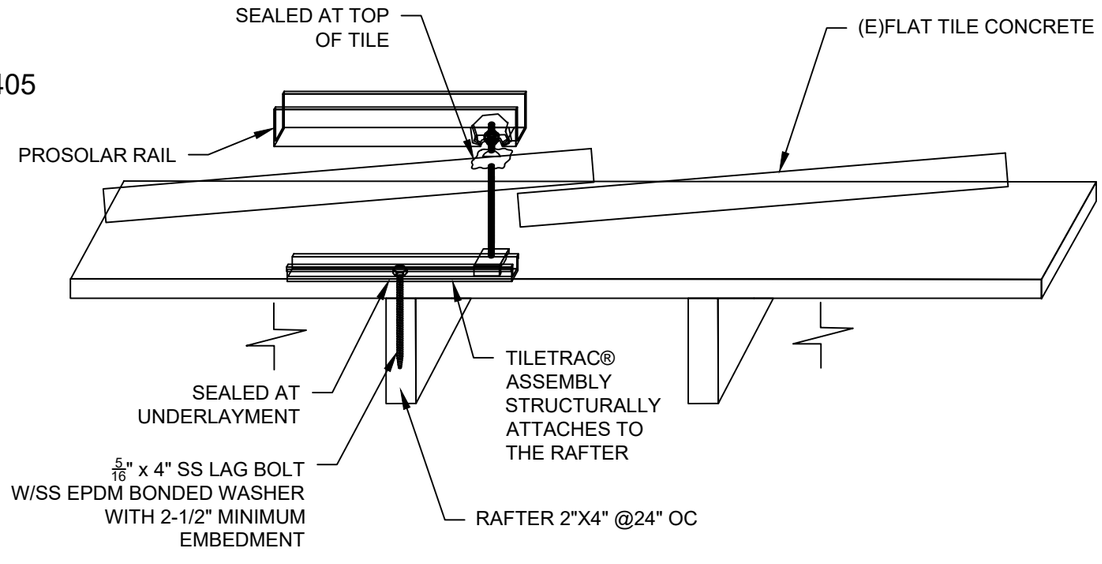
ARRAY 2
TILT- 23 DEG
AZIMUTH - 275 DEG

1 ATTACHMENT PLAN

SCALE:3/32" = 1'-0"

LOAD CALCULATIONS:

NUMBER OF PANELS IN ARRAY = 25 MODULES
MODULE TYPE = HANWHA QCELLS Q.PEAK DUO BLK ML-G10+ 405 (405W) MODULES
NUMBER OF CONNECTIONS TO ROOF = 48
WEIGHT OF INDIVIDUAL PANEL = 48.50 LBS / 22 KG.
TOTAL WEIGHT OF ARRAY: 1212.50 LBS.
WEIGHT AT EACH CONNECTION : 1212.50 LBS / 48 = 25.26 LBS
SOLAR PANEL AREA = 74"X 41.14" = 21.14 SF
TOTAL ARRAY AREA = 25 X 21.14 = 528.53 SF
DISTRIBUTED LOAD = 1212.50/528.53 = 2.2941 PSF



1 STRUCTURAL PLAN

SCALE:NTS

CONTRACTOR

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30770 Wealth St Murrieta,
MURRIETA, CA 92563
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LIC NO - 812958

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SIGNATURE	

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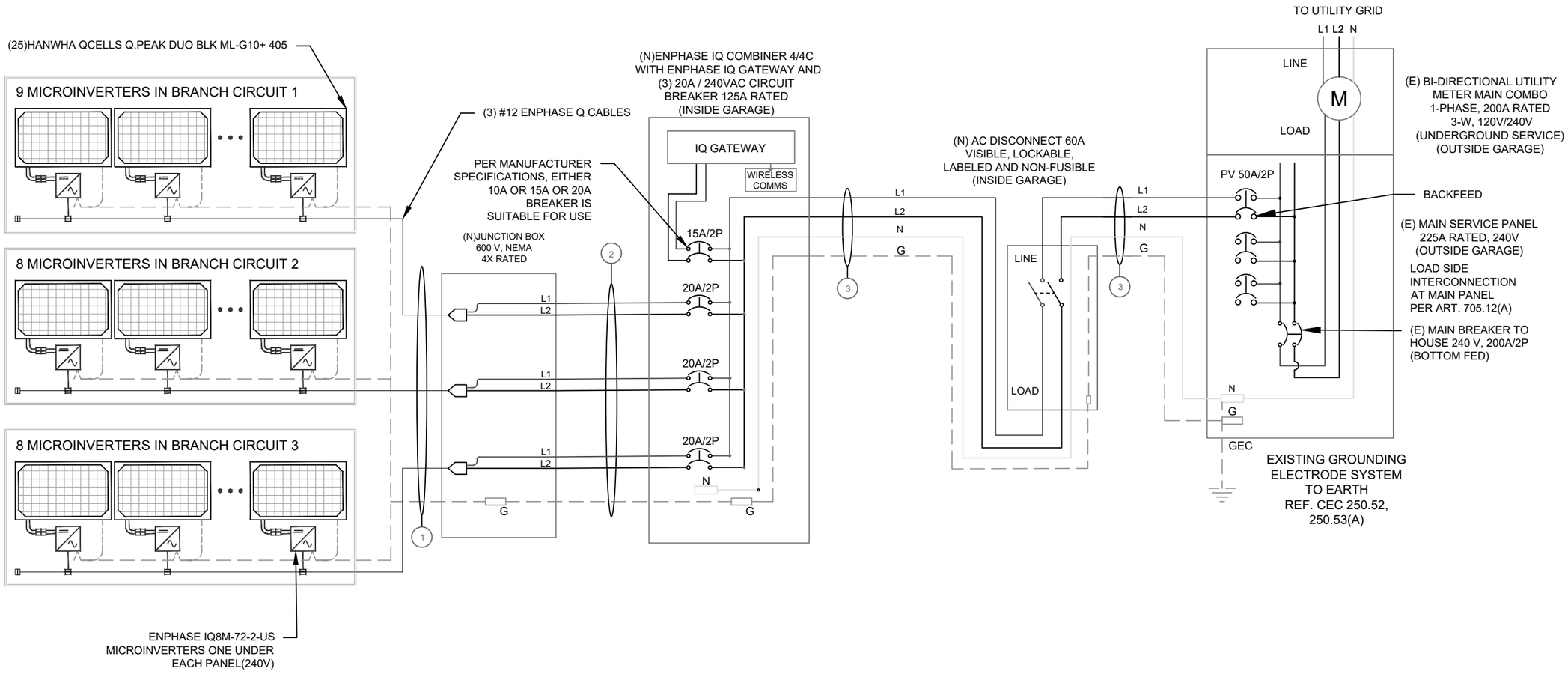
ATTACHMENT AND STRUCTURAL PLAN

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	HANWHA QCELLS Q.PEAK DUO BLK ML-G10+ 405
VMP	37.39V
IMP	10.83A
VOC	45.34V
ISC	11.17A
TEMP. COEFF. VOC	-0.27%/K
MODULE DIMENSION	74.0"L x 41.14"W x 1.26"D (In Inch)

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	ENPHASE IQ8M-72-2-US MICROINVERTER
MIN/MAX DC VOLT RATING	30V MIN/ 58V MAX
MAX INPUT POWER	460W
NOMINAL AC VOLTAGE RATING	240V/ 211-264V
MAX AC CURRENT	1.35A
MAX MODULES PER STRING	11 (SINGLE PHASE)
MAX OUTPUT POWER	325 VA

NOTE:
- ALL CONDUCTORS ARE COPPER UNLESS OTHERWISE NOTED.
- SOLAR BREAKER LOCATED AT THE FURTHEST END OF BUSBAR FROM THE MAIN BREAKER OR FEEDER UNIT.



	PHASE CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			NEUTRAL QTY, SIZE AND TYPE PER CONDUIT			GROUND CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			CONDUIT SIZE	CONDUIT TYPE
1	3	AWG #12	Q-CABLE	NA	NA	NA	1	AWG #10	BARE,COPPER EGC	N/A	FREE AIR
2	6	AWG #10	THWN-2,COPPER	NA	NA	NA	1	AWG #10	THWN-2,COPPER EGC	3/4"	EMT
3	2	AWG #8	THWN-2,COPPER	1	AWG #8	THWN-2,COPPER	1	AWG #10	THWN-2,COPPER EGC	3/4"	EMT

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ELECTRICAL

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-1°
AMBIENT TEMP (HIGH TEMP 2%)	36°
CONDUIT HEIGHT	7/8"
ROOF TOP TEMP	58°
CONDUCTOR TEMPERATURE RATE	90°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.27% /K

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN CONDUIT
.80	4-6
.70	7-9
.50	10-20

CALCULATIONS:

1. CURRENT CARRYING CONDUCTOR

(A) BEFORE IQ COMBINER PANEL

AMBIENT TEMPERATURE - (36)°C ...CEC 310.15(B)(1)
TEMPERATURE DERATE FACTOR - 0.88 ...CEC 310.15(B)(1)
GROUPING FACTOR - 0.8...CEC 310.15(C)(1)

CONDUCTOR AMPACITY
= (INV O/P CURRENT) x 1.25 / A.T.F / G.F ...CEC 690.8(B)
= [(9 x 1.35) x 1.25] / [0.88 x 0.8]
= 21.57A
SELECTED CONDUCTOR - #10 THWN-2 ...CEC 310.16

(B) AFTER IQ COMBINER PANEL

TEMPERATURE DERATE FACTOR - 0.88
GROUPING FACTOR - 1

CONDUCTOR AMPACITY
= (TOTAL INV O/P CURRENT) x 1.25 / 0.88/ 1 ...CEC 690.8(B)
= [(25 x 1.35) x 1.25] / [0.88 x 1]
= 47.94 A
SELECTED CONDUCTOR - # 8 THWN-2 ...CEC 310.16

2. PV OVER CURRENT PROTECTION

...CEC 690.9(B)

= TOTAL INVERTER O/P CURRENT x 1.25
= (25 x 1.35) x 1.25 = 42.19 A
SELECTED OCPD = 50 A ...CEC 240.6

3. 120% RULE FOR BACKFEED

...CEC 705.12(B)(3)(2)

MCB RATING + PV BREAKER RATING <= (1.2 x BUS BAR RATING)
(200 + 50) <= 1.2 x 225A
250.00 <= 270.00 HENCE OK

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PV-4.1

ELECTRICAL CALCULATIONS

Applicable Codes:

Photovoltaic equipment, all associated wiring, and interconntions shall be installed by qualified personnel as well as Current (2022) California Building Code (CBC), California Electrical Code (CEC) California Residential Code (CRC), California Plumbing Code (CPC), Green Building Code, California Energy Code, California Existing Building Code, California Fire Code (CFC), California Business and Professional Code, California Mechanical Code (CMC), and Calfornia Green Code.

Notations:

A. Roofing and weatherproofing. All roofing and weatherproofing installation shall comply with the following methods and requirements:

1. Any arrays integrated with the roofing material shall be Class "A" rated.
2. All roof penetrations shall be secure and weather-tight. (CRC 903.2)
3. Module installations shall not cover or block any roof vent locations. (CPC 904, CPC 906, CMC 802.6, CMC 510.8)
4. Existing DWV plumbing vent terminations that are horizontally located closer than 12” from the proposedmodules, must be rerouted, or must be extended a minimum of 6” above the surface of the modules, (CPC 906.1)
5. Existing gas B-vent terminations, for fuel burning appliances, where adjacent to the proposed modules, must be extended 12” above the modules’ top surface, CMC 802.6.1(1) & CPC 509.6.1(1).”

B. Firefighter access requirements. All roof-mounted solar photovoltaic systems shall comply with the following:

1. Roof Access points shall not be located in areas not requiring placement of ground ladders over openings such as doors/windows.
2. Roof Access points shall be located at strong points of building construction it does not conflict with overhead obstructions.

C. Wiring methods. All wiring installation shall comply with the following methods and requirements:

1. All supplied electrical equipment is UL, ETL or CSA listed. Modules are 1703 UL, with a Class A Fire Rating when grouped with the proposed racking, while Inverters carry a 1741 UL Listing.
2. All equipment will be installed and grounded in accordance with current code and manufacture's installation instructions.
3. Utility will be notified and grant permission before full activation of the PV system.
4. Backfed breaker used as the method of the interconnection shall not read, "Line and Load".
5. All metallic raceways and equipment shall be bonded and electrically continuous per CEC 250.90 and 250.96.
6. Grounding electrode conductor will be continuous, except for splices or joints at busbars within listed equipment per CEC 250.64 C.
7. All exterior equipment, conduit, and fittings, shall be rain-tight, sunlight resistant, and approved for use in wet locations with proper NEMA 3 ratings or above. (CEC 690.31, CEC 310.8, CEC 314.15).
8. Working clearances around existing and new electrical equipment will be maintained in accordance with CEC 110.26.
9. All equipment shall be identified on a warning placard clearly showing location of all pertinent equipment and disconnects. The placard shall be metal or plastic, with engraved letters in contrasting color to the placard.
10. All exterior conduit placement and sizing shall have ambient temperature adjustments in conformance with table 310.15(b)(16).
11. Photovoltaic system conductors shall be identified and grouped. The means of identification shall be permitted by separate color coding, marking tape, tagging, or other approved means.

D. Grounding Methods. All grounding installations shall comply with the following grounding methods/requirements:

1. All modules shall be grounded in accordance with the CEC and the manufacturer's installation instructions.
2. Electric service panels shall be grounded with the a grounding electrode(s) that complies with CEC Article 250. Grounding-rods shall be supplemented by a second grounding-rod installed at least 6 feet apart. (CEC 690.47)
3. If the existing main service panel does not have verifiable grounding electrode, it shall be the contractor's responsibility to install a supplemental grounding electrode. Service grounding electrode must be verified at the time of inspection for all buildings. Buildings with a metallic water pipe system as the sole grounding electrode shall have a supplemental electrode installed. (CEC 690.47)

E. Dig Alert

Statement: Dig Alert (811) shall be contacted before any excavation work is to take place. Work shall be in compliance with excavation safety in accordance with Government

Cory Johnson

Cory Johnson (Contractor) CSLB #812958

Labels shall be outdoor rated and made from vinyl and polyester film lamination.
ANSI and UL 969 Recognized: UL File #PGGU2.MH10170

⚠ WARNING
THIS EQUIPMENT FED BY MULTIPLE SOURCES
SOURCES: UTILITY GRID / PHOTOVOLTAIC SYSTEM
RATED AC OUTPUT CURRENT: 33.75 AMPS
NORMAL OPERATING VOLTAGE: 240 VOLTS

Location: Additional Utility Disconnect App. by request of either utility or AHJ.

⚠ WARNING
THIS EQUIPMENT FED BY MULTIPLE SOURCES
AC COMBINING PANELBOARD FOR PV SYSTEM
DO NOT ADD ADDITIONAL LOADS

Location: Dedicated Sub-Panel when applicable.

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

Location: Main Breaker
AHJ Preference:(CEC 690.56(C)(3))

⚠ WARNING
THIS EQUIPMENT FED BY MULTIPLE SOURCES
POWER SOURCE OUTPUT CONNECTION
DO NOT RELOCATE THIS OVERCURRENT DEVICE

Location: Inverter Output Connection (CEC 690.54)(CEC 705.12(B)(2)(3)(b))

⚠ WARNING
PV SYSTEM AC DISCONNECTING MEANS
-DUAL POWER SUPPLY-
SOURCES: UTILITY GRID / PHOTOVOLTAIC SYSTEM
RATED AC OUTPUT CURRENT: 33.75 AMPS
NORMAL OPERATING VOLTAGE: 240 VOLTS

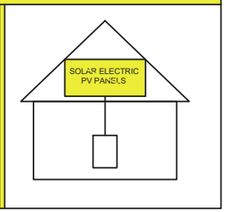
Location: Service Panelboard Cover (AHJ Preference)

Battery Disconnecting Means
Nominal battery voltage:_____
Nominal available short-circuit current derived from the stationary battery system: _____
Date of calculation: _____

Location: Energy Storage System (ESS) (CEC 706.7(D))

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

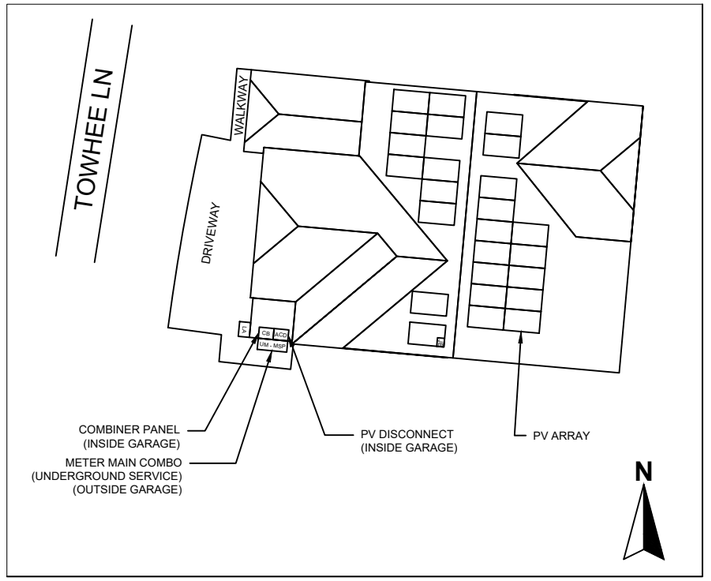
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY



CAUTION

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

RAPID SHUTDOWN / PV SYSTEM AC DISCONNECTING MEANS
PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN.
TURN PANEL BOARD MAIN BREAKER SWITCH "OFF" TO INITIATE.



PHOTOVOLTAIC SYSTEM SPECIFICATIONS	
RATED AC OUTPUT CURRENT:	33.75 Amps
NOMINAL OPERATING AC VOLTAGE:	240 Volts

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1(855) 444-6329 www.newdaysolar.com

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PV-5

LABELS

powered by Q.ANTUM DUO Z

Q.PEAK DUO BLK ML-G10+

385-405

ENDURING HIGH PERFORMANCE

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

ASSEMBLED IN THE USA

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 behavior.

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 aluminum 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.

6 BUSBAR CELL TECHNOLOGY — 12 BUSBAR CELL TECHNOLOGY

THE IDEAL SOLUTION FOR:

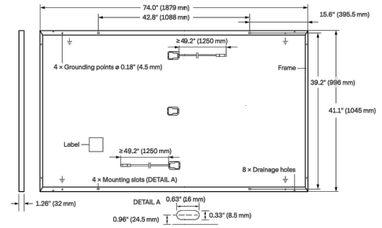
Rooftop arrays on residential buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	74.0 in × 41.1 in × 1.26 in (including frame) (1879 mm × 1045 mm × 32 mm)
Weight	48.5 lbs (22.0 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 22 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 49.2 in (1250 mm), (–) ≥ 49.2 in (1250 mm)
Connector	Stäubli MC4; IP68

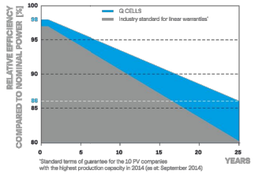


ELECTRICAL CHARACTERISTICS

POWER CLASS				385	390	395	400	405
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / –0 W)								
Minimum	Power at MPP[1]	P_{MPP}	[W]	385	390	395	400	405
	Short Circuit Current[1]	I_{SC}	[A]	11.04	11.07	11.10	11.14	11.17
	Open Circuit Voltage[1]	V_{OC}	[V]	45.19	45.23	45.27	45.30	45.34
	Current at MPP	I_{MPP}	[A]	10.59	10.65	10.71	10.77	10.83
	Voltage at MPP	V_{MPP}	[V]	36.36	36.62	36.88	37.13	37.39
	Efficiency[1]	η	[%]	≥19.6	≥19.9	≥20.1	≥20.4	≥20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]								
Minimum	Power at MPP	P_{MPP}	[W]	288.8	292.6	296.3	300.1	303.8
	Short Circuit Current	I_{SC}	[A]	8.90	8.92	8.95	8.97	9.00
	Open Circuit Voltage	V_{OC}	[V]	42.62	42.65	42.69	42.72	42.76
	Current at MPP	I_{MPP}	[A]	8.35	8.41	8.46	8.51	8.57
	Voltage at MPP	V_{MPP}	[V]	34.59	34.81	35.03	35.25	35.46

[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

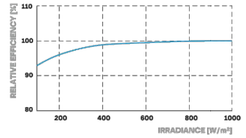
Q CELLS PERFORMANCE WARRANTY



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	[°F]	109±5.4 (43±3 °C)

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{SYS}	[V]	1000 (IEC) / 1000 (UL)	PV module classification	Class II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 2
Max. Design Load, Push / Pull[3]	[lbs/ft²]	75 (3600 Pa) / 55 (2660 Pa)	Permitted Module Temperature on Continuous Duty	–40 °F up to +185 °F (–40 °C up to +85 °C)
Max. Test Load, Push / Pull[3]	[lbs/ft²]	113 (5400 Pa) / 84 (4000 Pa)		

[3] See Installation Manual

QUALIFICATIONS AND CERTIFICATES

UL 61730, CE-compliant, Quality Controlled PV - TÜV Rheinland, IEC 61215:2016, IEC 61730:2016, U.S. Patent No. 9,893,215 (solar cells),

C Certified US UL 61730 — CE — TÜVRheinland CERTIFIED www.tuv.com ID 111120207

PACKAGING INFORMATION

Horizontal packaging	76.4 in 1940 mm	43.3 in 1100 mm	48.0 in 1220 mm	1656 lbs 751 kg	24 pallets	24 pallets	32 modules

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 America Inc.
400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | **TEL** +1 949 748 59 96 | **EMAIL** inquiry@us.q-cells.com | **WEB** www.q-cells.us

CONTRACTOR

New Day Solar
Installing Solar Electric Systems Since 1988

CORY JOHNSON
30770 Wealth St Murrieta,
MURRIETA, CA 92563
8554446329
LIC TYPE- C-10
LIC NO - 812958

PROJECT INFO & ADDRESS

MATTHEW HACKWORTH

25960 TOWHEE LN,
CORONA, CA 92883

SYSTEM SIZE
DC SIZE: 10.125 KW DC-(STC)
AC SIZE: 8.125 KW AC

DRAWN BY	AV
DATE	4/7/2023
REVISION	
SIGNATURE	

PV-6

RESOURCE DOCUMENT

ENPHASE.

DATA SHEET

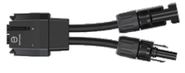
IQ8M and IQ8A Microinverters

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.

IQ8MA-DS-0003-01-EN-US-2021-10-19

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

IQ8M and IQ8A Microinverters

INPUT DATA (DC)		IQ8M-72-2-US	IQ8A-72-2-US
Commonly used module pairings[1]	W	260 – 460	295 – 500
Module compatibility		60-cell/120 half-cell and 72-cell/144 half-cell	
MPPT voltage range	V	33 – 45	36 – 45
Operating range	V	25 – 58	
Min/max start voltage	V	30 / 58	
Max input DC voltage	V	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)		**IQ8M-72-2-US**	**IQ8A-72-2-US**
Peak output power	VA	330	366
Max continuous output power	VA	325	349
Nominal (L-L) voltage/range[3]	V	240 / 211 – 264	
Max continuous output current	A	1.35	1.45
Nominal frequency	Hz	60	
Extended frequency range	Hz	50 – 68	
Max units per 20 A (L-L) branch circuit[4]		11	
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	%	97.6	97.6
CEC weighted efficiency	%	97	97.5
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.

IQ8MA-DS-0003-01-EN-US-2021-10-19

CONTRACTOR

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8554446329
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LIC NO - 812958

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PV-6.1

RESOURCE DOCUMENT

Data Sheet
Enphase Networking

Enphase IQ Combiner 4/4C

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

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.

X-IQ-AM1-240-4C

X-IQ-AM1-240-4

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 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites - 4G based LTE-M1 cellular modem with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V BRK-15A-2-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220 Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support 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**

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MURRIETA, CA 92563
8554446329
LIC TYPE- C-10
LIC NO - 812958

PROJECT INFO & ADDRESS

MATTHEW HACKWORTH

25960 TOWHEE LN,
CORONA, CA 92883

SYSTEM SIZE
DC SIZE: 10.125 KW DC-(STC)
AC SIZE: 8.125 KW AC

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DATE	4/7/2023
REVISION	
SIGNATURE	

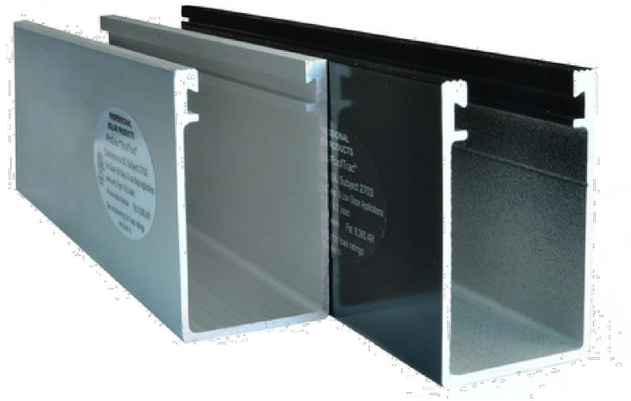
PV-6.2

RESOURCE DOCUMENT

Rail Specs- ProSolar® RoofTrac® Rail Technical Specifications

Standard 1-1/2" Rail:

- Colors: Clear Anodized and Black Finish
- UL 2703 Listed
- Available in 136" and 168" lengths
- 1-1/2" Tall by 1-1/2" Wide
- 4 foot on center span
- Engineered and load tested to 45 lb/sq. ft. , equivalent of 125 mph wind speed per 2013 CBC / 2012 IBC / ASCE 7-10 to ensure safety and quality
- Sold in crates of 24 each or 60 each



Deep 2-1/2" Rail:

- Colors: Clear Anodized and Black Finish
- UL 2703 Listed
- Available in 124", 136", and 168" lengths
- 2-1/2" Tall by 1-1/2" Wide
- 6 foot on center span
- Engineered and load tested to 45 lb/sq. ft. , equivalent of 125 mph wind speed per 2013 CBC / 2012 IBC / ASCE 7-10 to ensure safety and quality
- Sold in crates of 24 each and 60 each

XD 3" Rail:

- Colors: Clear Anodized
- UL 2703 Listed
- Available in 136", 164", and 172" lengths
- 3" Tall by 1-1/2" Wide
- 8 foot on center span with SolarWedge®
- Engineered and load tested to 30 lb/sq. ft, equivalent of 110 mph wind speed per 2013 CBC/2012 IBC / ASCE 7-10
- Sold in crates of 24 each and 60 each

Related Links

PV Mount Systems:

Attachments:

Accessories:

CONTRACTOR

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SIGNATURE	

PV-6.3

RESOURCE DOCUMENT

TileTrac®

Intertek 4007217

MADE IN U.S.A PRODUCT

UL2703*

Concrete Roof Tile Structural Attachment

TileTrac® was mechanically tested to the UL2703 standard and waterproof tested to the ASTM D7349 test method by Nationally Recognized Test Laboratories.

TileTrac® for flat concrete tile (6" Tall Threaded Stud)
Part # TT-18-T6

TileTrac® for flat concrete tile (4" Tall Threaded Stud)
Part # TT-18-T4

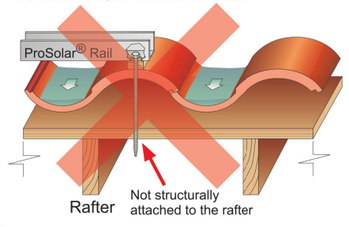
Benefits of TileTrac®

- Easiest and lowest cost waterproof tile roof attachment
- Aluminum and Stainless Steel components for maximum corrosion resistance and strength
- 3rd party lab waterproof and load tested
- Triple seal design at underlayment and top of tile
- Includes Stainless Steel tile flashing and lag bolt
- UL2703 system tested with ProSolar® RoofTrac® rail to 45 psf (3X minimum UL2703 standard)
- Includes aluminum subflashing for double flashing
- Over 20 years of industry preferred single lag bolt design

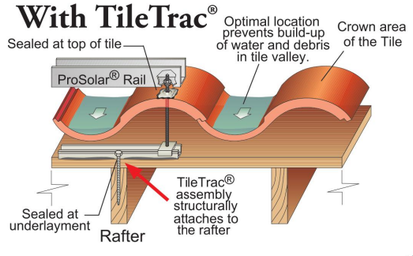
The TileTrac® Design

Structurally attaches to roof rafter and allows the ProSolar® RoofTrac® rail attachment stud to be located at the strongest area of the tile (the crown area) where water does not flow.

Without TileTrac®



With TileTrac®



*As load tested with the ProSolar® RoofTrac® Rail and Clamping System

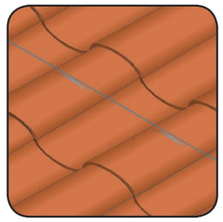
professional SOLAR products inc.

(805) 486-4700
(805) 486-4799-fax
1551 S. Rose Ave.
Oxnard, CA 93033

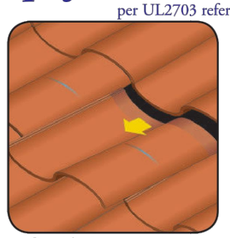
View more info on our website at:
www.prosolar.com

*Installation steps for both s-curve and flat concrete tile**

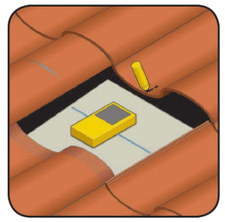
per UL2703 reference installation



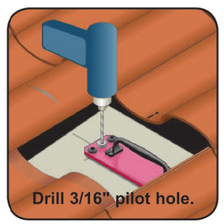
STEP 1: Select a tile in the area of the roof rafter.



STEP 2: Remove the tile by pushing and pulling. It is usually held in place by a small nail.

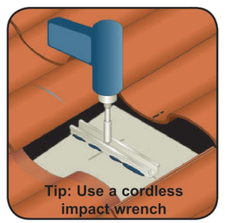


STEP 3: Using an electronic stud finder (recommended), or other means, locate the rafter center. Mark a reference point on the tile above.



Step 4: Seal the initial tile nail hole. Using a 3/16" drill bit and drill guide (FJ-Drill), drill pilot hole along the rafter center.

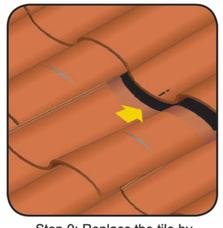
Step 5: Insert the lag bolt and washer through the TileTrac® and apply fresh compatible sealant to the base.



Step 6: Fasten lag screw until seated. Do not overtighten. The sealant should flow outward sealing any holes.

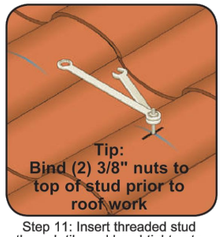
Step 7: After bolting the base to the roof, slide the upper carriage into the correct position under the crown of the tile. For flat tile, slide the upper carriage near the middle of the tile.

Step 8: Install subflashing and seal as needed if double flash is desired.

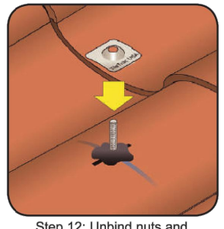


Step 9: Replace the tile by lining up the snap lines and mark the drill location accordingly.

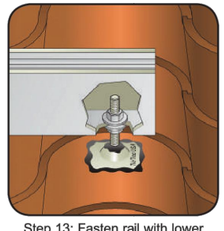
Step 10: Using a 1/2" carbide drill bit and ROTARY HAMMER DRILL in hammer mode, drill through the tile. See online video at *www.prosolar.com* for details.



Step 11: Insert threaded stud through tile and hand-tighten to engage with base. Bind two 3/8" nuts (included) using 9/16" wrenches and tighten.



Step 12: Unbind nuts and remove from stud. Apply sealant around stud at tile opening and compress with Stainless Steel flashing (included) until seated.



Step 13: Fasten rail with lower and upper 3/8" nuts/washers as shown.

*Not recommended for clay or slate tiles. TileTrac® tested and approved for use only with the ProSolar® RoofTrac® rail mounting system.

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CORONA, CA 92883

SYSTEM SIZE
DC SIZE: 10.125 KW DC-(STC)
AC SIZE: 8.125 KW AC

DRAWN BY	AV
DATE	4/7/2023
REVISION	
SIGNATURE	

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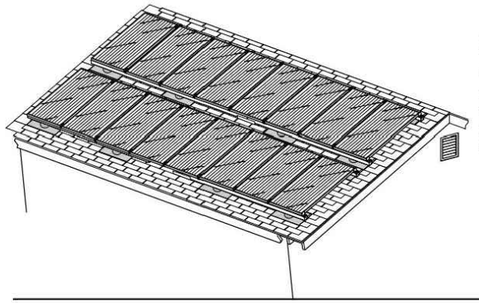
RESOURCE DOCUMENT

RoofTrac®
Installation Manual

professional SOLAR products

Intertek 4007217 UL2703

Class A Fire Rated



APPLICATION:
The RoofTrac® mounting system consists of support rails and top-down clamping hardware which is integrated with either a TileTrac® or FastJack® attachment device. The RoofTrac® mounting system can be utilized on virtually all standard construction residential roof tops, to install UL1703 approved framed solar modules.

WARNING:
All Professional Solar Products (ProSolar®) are engineered and tested to withstand stated specifications (as stated on published specification sheets) when installed properly. Failure to install properly may decrease the performance of installation.

SAFETY:
All regional safety requirements should be followed when installing Professional Solar Products. All tools and equipment located on the roof should be secured to avoid falling object hazards. All equipment/tools should be properly maintained and inspected prior to use. Any exposed studs should be protectively capped to avoid injury. This racking system may be used to ground and/or mount a PV module complying with UL 1703 only when the specific module frame has been evaluated for grounding and/or mounting compliance with the included instructions. This installation manual is intended for use by professional installers with a working knowledge of construction principles.

Symbol Legend

- Explanation or Install Tip
- Important Product Performance Information
- Critical for Safety

Tool List

- Cordless impact wrench
- Cordless drill
- 1/2" Irwin #10 Unibit
- 1/2" deep socket
- Torque wrench
- RoofTrac® rail spreader (optional)
- Reciprocating saw
- Flashing
- 3/8" Nut driver
- 3/16" Carbide drill
- 5/52" Hex L key

professional SOLAR products

RoofTrac®
Installation Manual

Parts List

3"Rail, 2-1/2", 2", 1-1/2" RoofTrac® Rail

Universal Self-Bonding Splice Assembly

Ilsco® SGB-4 Grounding Lug

Decorative Front Skirt & Clamp Set

FastJack® : 3", 4.5", 6", and 7.5"

FastJack® E-Series: 2", 3", 4.5", 6",and 7.5"

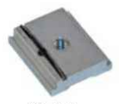
FastJack® E-Series Flashing

Flashing stamped with "TileTrac® USA"

TileTrac® 4"& 6" Stud

Self-Bonding Mid Clamp Assembly

End Clamp Assembly



Module Bonding Mid-Clamp Channel Nut

End Clamp Bonding Channel Nut

Microinverter/ Optimizer Bonding Channel Nut Assembly

Torque Values

Clamps 180 in-lb (15 ft-lb)
Rail to FastJack® 180 in-lb (15 ft-lb)
FastJack® Lag Screw: Fully Seat
TileTrac® Lag Screw: Fully seat
TileTrac® Nut: 180 in-lb (15 ft-lb)

Skirt Clip to Module: 48 in-lb (4 ft-lb)
Clip to Skirt: 84 in-lb (7 ft-lb)
Splice: 180 in-lb (15 ft-lb)
Islco Ground Lug: 35 in-lb (conductor)/75 in-lb (frame)
Pipe Tee Set Screw: 17 ft-lb

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New Day Solar
Installing Solar Electric Systems Since 1988

CORY JOHNSON
30770 Wealth St Murrieta,
MURRIETA, CA 92563
8554446329
LIC TYPE- C-10
LIC NO - 812958

PROJECT INFO & ADDRESS

MATTHEW HACKWORTH

25960 TOWHEE LN,
CORONA, CA 92883

SYSTEM SIZE
DC SIZE: 10.125 KW DC-(STC)
AC SIZE: 8.125 KW AC

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RoofTrac®
Installation Manual

Attachment Method: TileTrac®

STEP 1: Select a tile in the area of the roof rafter and snap a line down the midsection of the tile.

STEP 2: Remove the tile by pushing and pulling. It is usually held in place by a small nail.

STEP 3: Using an electronic stud finder (recommended), or other means, locate the rafter center. Mark a reference point on the tile above.

Step 4: Using a 3/16" drill bit, drill pilot hole along the rafter center

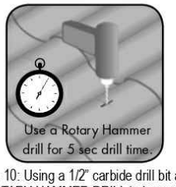
Step 5: Insert the lag bolt and washer through the TileTrac® and apply fresh compatible sealant to the base. Seal tile nail hole.

Step 6: Fasten lag screw until seated. Do not overtighten. The sealant should flow outward sealing any holes.

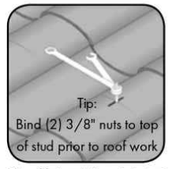
Step 7: Install subflashing and seal as needed if double flash is desired.

Step 8: After bolting the base to the roof, slide the upper carriage under any portion of the crown (high point) of the tile.* For flat tile, slide the upper carriage near the middle of the tile.*

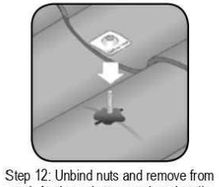
Step 9: Replace the tile by lining up the snap lines and mark the drill location accordingly.



Step 10: Using a 1/2" carbide drill bit and ROTARY HAMMER DRILL in hammer mode, drill through the tile. See online video at www.prosolar.com for details.



Step 11: Insert threaded stud through tile and hand-tighten to engage with base. Bind two 3/8" nuts (included) using 9/16" wrenches and tighten. and tighten to 15 ft-lbs. Tip: Pre-assemble studs and nuts before roofwork



Step 12: Unbind nuts and remove from stud. Apply sealant around stud at tile opening and compress with Stainless Steel flashing (included) until seated.

Step 13: Fasten rail with lower and upper 3/8" nuts/washers to 15 ft-lb as shown.

*Do not locate stud in valley of tile. Not recommended for clay or slate tiles. TileTrac® tested and approved for use only with the ProSolar® RoofTrac® rail mounting system. NOT APPROVED for non-Prosolar® RoofTrac® products.

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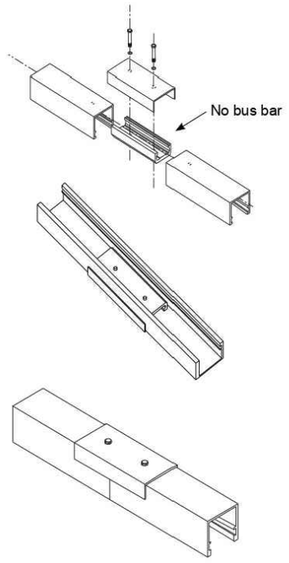
RoofTrac®
Installation Manual

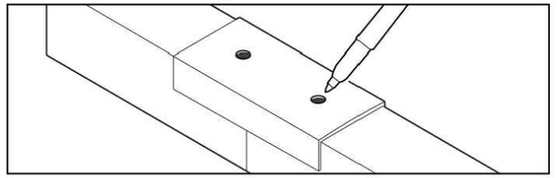
Self-bonding RoofTrac® Rail Splicing Connection



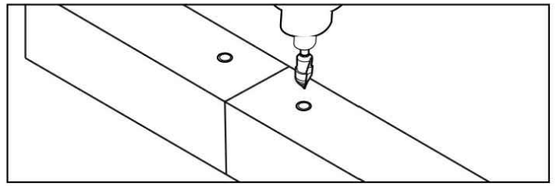
For RoofTrac® Rail Bonding Splice:

- Drill 1/2" holes at bottom of rails with 1/2" #10 Irwin Unibit® using the rail support as a hole location guide.
- Insert 5/16" bolt through support holes and hand thread into threaded splice rail support insert. Fasten to 15 ft-lbs.
- Rail splice should not be further than 1/3 of rail span away from attachment.
- Rail should be supported by an attachment on both sides of a splice.
- Max three 136" rails continuously spliced

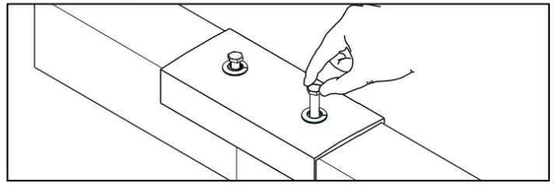
1. Mark with a Sharpie®



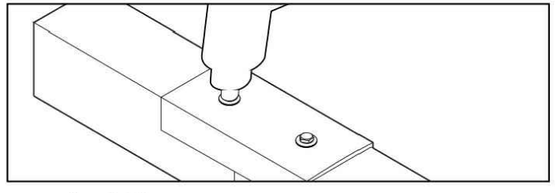
2. Drill



3. Hand-Tighten



4. Fasten to 15 ft lb



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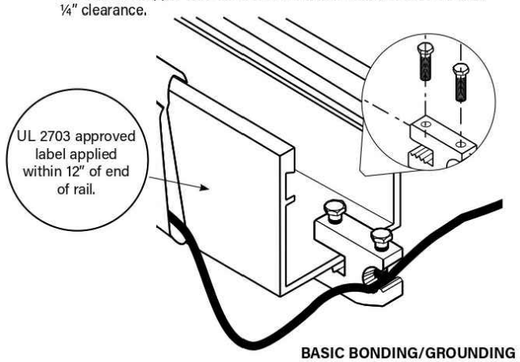
RESOURCE DOCUMENT

Grounding Wire Installation

FOR GROUNDING CONNECTION
- ILSCO SGB-4 rail ground connection
- Fasten both terminals to 35 in-lbs
- Ensure that copper wire does not touch aluminum; Recommended ¼" clearance.

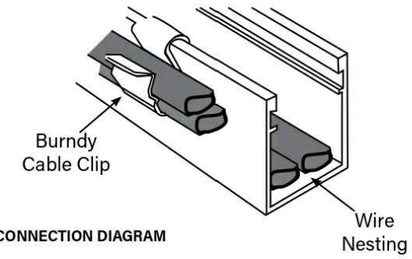


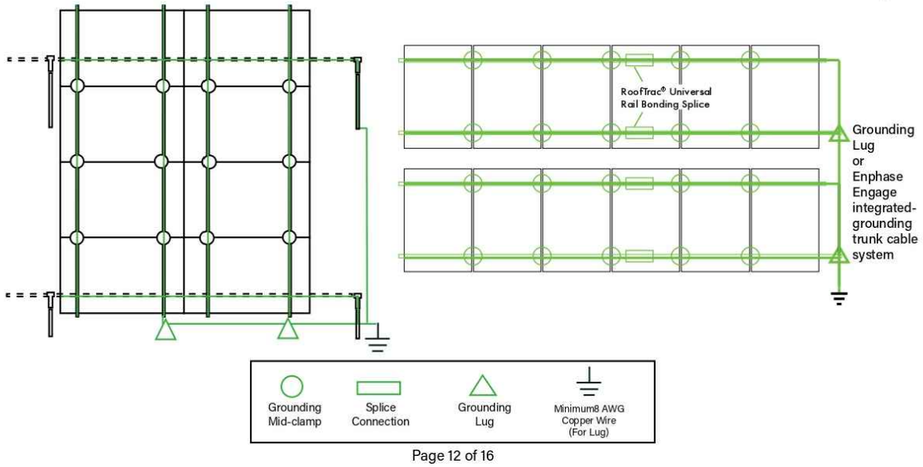
BASIC BONDING/GROUNDING CONNECTION DIAGRAM

Burndy Cable Clip: Cable Management

Outdoor rated, insulated wire, such as quick connect cables, can be nested inside the RoofTrac® support rail or held in place with approved cable clip such as Burndy ACC-R2 (for Microinverter trunk cable) and ACC-R4 (for PV wire) clips.

Uninsulated copper grounding wire must never be placed inside the aluminum rail – it should be kept at a distance of at least ¼" away from the aluminum rail.





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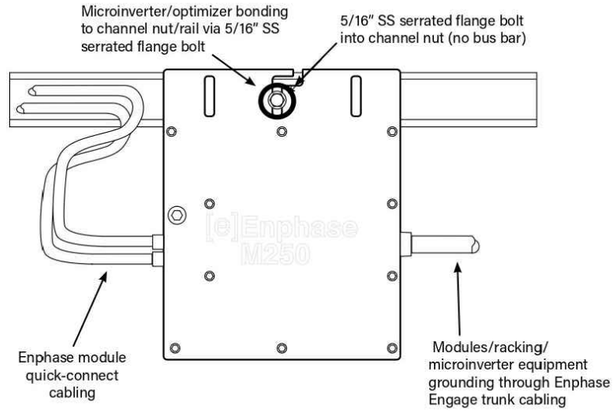
Installation Manual

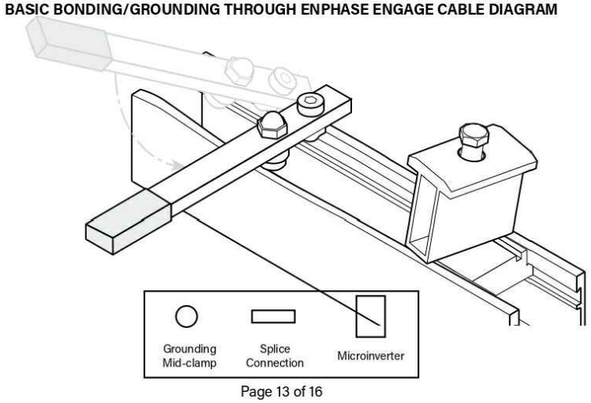
Microinverter and Optimizer (Self-Bonding Connector)

FOR GROUNDING USING ENPHASE ENAGAGE CABLE

- No copper wire or lug required. Equipment grounding conductor (EGC) built into Enphase engage quick-connect cabling.
- Minimum of 2 microinverters to same Enphase engage trunk cable within continuous module row
- Modules in module row must be installed and grounded per install guide requirements and must share the same two rails.



BASIC BONDING/GROUNDING THROUGH ENPHASE ENGAGE CABLE DIAGRAM



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RESOURCE DOCUMENT

CERTIFICATE OF COMPLIANCE

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report.

Applicant:	Professional Solar Products, Inc.	**Manufacturer:**	Professional Solar Products, Inc.
Address:	1551 S. Rose Avenue Oxnard, CA 93033	**Address:**	1551 S. Rose Avenue Oxnard, CA 93033
Country:	USA	**Country:**	USA
Contact:	Stan Ullman	**Contact:**	Stan Ullman
Phone:	(805)-486-4700	**Phone:**	(805)-486-4700
FAX: Email:	(805)-486-4799 s@prosolar.com	**FAX:** **Email:**	(805)-486-4799 s@prosolar.com

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

Control Number: 4007217 **Authorized by:** _____

for Thomas J. Patterson, Director of Certification

ETL CLASSIFIED

Intertek

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 2703 Ed: 1 Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels. Issued: 2015/01/28
Product:	Photovoltaic Racking System
Models:	RoofTrac

Certificate for Report
100779407LAX-003

Certificate Issued:
23-Mar-2015

ED 16.3.15 (1-Jan-13) Mandatory

CONTRACTOR

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30770 Wealth St Murrieta,
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SIGNATURE	

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RESOURCE DOCUMENT

25800 Commercentre Drive
Lake Forest, CA 92630 USA

Telephone: 949.448.4100
Facsimile: 949.448.4111
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:	Professional Solar Products, Inc. 1551 S. Rose Avenue Oxnard, CA 93033
Product Description:	Photovoltaic Racking System, Roof System.
Ratings & Principle Characteristics:	Fire Class Resistance Rating: - Class A for Steep Slope Applications when using Type 1 and Type 2, Listed Photovoltaic Modules.
Models:	RoofTrac
Brand Name:	ProSolar
Relevant Standards:	UL Subject 2703 (Section 15.2 and 15.3) Outline of Investigation for Rack Mounting Systems and Clamping Devices for Flat-Plate Photovoltaic Modules and Panels, Issue Number: 2, Nov 13, 2012 **Referencing** UL1703 (Section 31.2) Standard for Safety for Flat-Plate Photovoltaic Modules and Panels, May 20, 2014
Verification Issuing Office:	Intertek Testing Services NA, Inc. 25800 Commercentre Dr. Lake Forest, CA 92630
Date of Tests:	12/12/2014 through 12/30/2014
Test Report Number(s):	100779407LAX-003

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:	Michael Hoffnagle	**Reviewed by:**	Amar Kacel
Title:	PV Engineer	**Title:**	Reviewer
Signature:		**Signature:**	
Date:	02/23/2015	**Date:**	02/24/2015

8431 Murphy Drive
Middleton, WI 53562 USA

Telephone: 608.836.4400
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:	Professional Solar Products Inc. 1551 S. Rose Avenue Oxnard, CA 93033
Product Description:	Roof Mount Photovoltaic Mounting System.
Ratings & Principle Characteristics:	Fire Class Resistance Rating: -Class A Fire Rated for Low Slope applications with Type 1 or 2 listed photovoltaic modules. This system was evaluated with a 5" gap between the bottom of the module and the roof's surface and a 1° inclination. Per Section 31.2.2.1 of UL 1703 this product can be installed with any gap stated in the manufacturers installation instructions. Per Section 31.2.1.6 of UL 1703 (rev. Oct 2015) the rating obtained for a 1° inclination can be used for any greater inclinations stated in the mounting instructions.
Models:	ProSolar Solar Wedge w/RoofTrac Rails
Brand Name:	ProSolar.
Relevant Standards:	UL 2703 (Section 15.2 and 15.3) Standard for Safety Mounting Systems, Mounting Devices, Clamping/Retention Devices with Flat-Plate Photovoltaic Modules and Panels, First Edition dated Jan. 28, 2015 **Referencing** UL1703 Third Edition revision date Oct, 2015, (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:	04/26/2017
Test Report Number(s):	102966828MID-001

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:	Christopher Zimbrich	**Reviewed by:**	Chad Naggs
Title:	Technician I, Fire Resistance	**Title:**	Technical Team Lead, Fire Resistance
Signature:		**Signature:**	
Date:	04/27/2017	**Date:**	04/27/2017

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GFT-OP-11a (24-MAR-2014)

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RESOURCE DOCUMENT

CERTIFICATE OF COMPLIANCE

Certificate Number	20220223-E341165
Report Reference	E341165-20210317
Issue Date	2022-02-23
Issued to:	Enphase Energy Inc. 1420 N. McDowell Blvd. Petaluma, CA 94954-6515
This is to certify that representative samples of	Grid Support, Utility Interactive Supporting Energy Storage, Multimode, Bi-directional Microinverters Models IQ8-60, IQ8PLUS-72, IQ8M-72, IQ8A-72, IQ8H-208-72, IQ8H-240-72, may be f/b -2, -5, -E, or -M, may be f/b -ACM, f/b -US, may be f/b -NM, may be f/b -RMA, may be f/b -&, where "&" designates additional characters. Has been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	See Page 2
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

This *Certificate of Compliance* is provided as a courtesy to help our customers communicate product compliance information, as documented in our UL Follow-Up Services procedure. This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark shall be considered as being UL Certified and covered under UL's Follow-Up Services. Look for the UL Certification Mark on the product.

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Bruce Mahrenholz, Director North American Certification Program

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number	20220223-E341165
Report Reference	E341165-20210317
Issue Date	2022-02-23

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Standards for Safety:

UL 62109-1, STANDARD FOR SAFETY OF POWER CONVERTERS FOR USE IN PHOTOVOLTAIC POWER SYSTEMS - PART 1: GENERAL REQUIREMENTS, Edition 1, Revision Date 04/30/2019

IEC 62109-2, SAFETY OF POWER CONVERTERS FOR USE IN PHOTOVOLTAIC POWER SYSTEMS - PART 2: PARTICULAR REQUIREMENTS FOR INVERTERS, Edition 1, Issue Date 06/2011

UL 1741, Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Edition 2, Revision Date 06/10/2021, 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.

CSA C22.2 No. 62109-1, Safety of Power Converters for Use in Photovoltaic Power Systems - Part 1: General Requirements, Edition 1, Issue Date 07/2016

CSA C22.2 No. 62109-2, Safety of Power Converters for Use in Photovoltaic Power Systems - Part 2: Particular Requirements for Inverters, Edition 1, Issue Date 07/2016

Bruce Mahrenholz, Director North American Certification Program

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