

SYSTEM INFORMATION	
MODULE	HANWHA Q.PEAK DUO BLK ML-G10+ 410
INVERTER	ENPHASE IQ7PLUS-72-2-US
RACKING	UNIRAC HORIZON 2-RAIL RACKING SYSTEM W/ SUNMODO EZ GRIP
SYSTEM SIZE (DC)	6.56 KW
LOCATION	30.2234941,-82.6308080

**GENERAL NOTES:**

THIS PV SYSTEM HAS BEEN DESIGNED TO MEET THE MINIMUM DESIGN STANDARDS FOR BUILDING AND OTHER STRUCTURES OF THE ASCE 7-22, 8TH EDITION 2023 FLORIDA RESIDENTIAL CODE, 8TH EDITION 2023 FLORIDA BUILDING CODE, 8TH EDITION 2023 FLORIDA FIRE PREVENTION CODE, NEC 2020 AND ALL LOCAL CODES & ORDINANCES.

ROOF SHALL HAVE NO MORE THAN TWO LAYERS OF COVERING IN ADDITION TO THE SOLAR EQUIPMENT.

INSTALLATION OF SOLAR EQUIPMENT SHALL BE FLUSH MOUNTED, PARALLEL TO AND NO MORE THAN 6-INCHES ABOVE THE SURFACE OF THE ROOF.

ANY PLUMBING VENTS ARE NOT TO BE CUT OR COVERED FOR SOLAR EQUIPMENT INSTALLATION. ANY RELOCATION OR MODIFICATION OF THE VENT REQUIRES A PLUMBING PERMIT AND INSPECTION.

ALL DESIGN, CALCULATIONS ARE PERFORMED BY MICHAEL S. REZK, P.E. PROFESSIONAL ENGINEER, WITH LICENCE No. 95844.

**INVERTER PLACEMENT:**

SYSTEM UTILIZES "ENPHASE" MICRO-INVERTERS WITH RAPID SHUTDOWN CONTROL LOCATED ON THE BACK SIDE OF EACH MODULE.

**STRUCTURAL STATEMENT:**

THE EXISTING STRUCTURE IS ADEQUATE TO SUPPORT THE NEW LOADS IMPOSED BY THE PHOTOVOLTAIC MODULE SYSTEM INCLUDING UPLIFT & SHEAR. EXISTING RAFTER SIZES & DIMENSIONS CONFORM TO 8TH EDITION 2023 FLORIDA RESIDENTIAL CODE

MOUNTING BRACKETS AND HARDWARE MEET OR EXCEED FLORIDA CODE REQUIREMENTS FOR THE DESIGN CRITERIA OF THE TOWN.

**FSEC CERTIFICATION STATEMENT:**

PER FL. STATUE 377.705 , I, MINA A. MAKAR PE# 86753, CERTIFICATE OF AUTHORIZATION #33404, AN ENGINEER LICENSED PURSUANT TO CHAPTER 471, CERTIFY THAT THE PV ELECTRICAL SYSTEM AND ELECTRICAL COMPONENTS ARE DESIGNED AND APPROVED USING THE STANDARDS CONTAINED IN THE MOST RECENT VERSION OF THE FLORIDA BUILDING CODE. FBC 2023

CLIMATIC & GEOGRAPHIC DESIGN CRITERIA TABLE R301.2(1)	
SPEED (MPH)	120
TOPOGRAPHIC EFFECTS	B
SPECIAL WIND REGION	NO
WIND BORNE DEBRIS ZONE	2
SEISMIC DESIGN CATEGORY	C
CLIMATE ZONE	2A
WIND EXPOSURE CATETORY	B

FBC, RESIDENTIAL 2023

TABLE R301.2.1.3 WIND SPEED CONVERSIONS <sup>a</sup>											
V <sub>ult</sub>	110	115	120	130	140	150	160	170	180	190	200
V <sub>asd</sub>	85	89	93	101	108	116	124	132	139	147	155

For SI: 1 mile per hour = 0.447 m/s.

a. Linear interpolation is permitted.


<p>HANWHA Q.PEAK DUO BLK ML-G10+ 410 410 WATT MODULE 74" X 41.1" X 1.26" (SEE DATASHEET)</p>

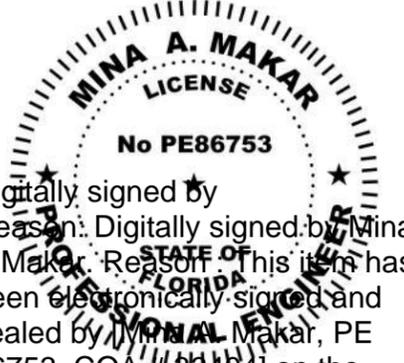
PLAN KEY	
PV-1	COVER PAGE
PV-1.1	ATTACHMENT DETAIL
PV-1.1(2)	ATTACHMENT DETAIL
PV-1.2	INVERTER SPECS
PV-1.3	COMBINER SPECS
PV-1.4	PANEL SPECS
PV-2	PANEL LAYOUT
PV-3	ELETRICAL
PV-3.1	ELECTRICAL CONT.
PV-3.2	EQUIPMENT LABELS

BILL OF MATERIALS	
MODULES	16
INVERTERS	16
L-FOOT ATTACHMENT W/ SUNMODO EZ GRIP	36
171" RAILS	7
ENPHASE COMBINER BOX	1
EATON 60A FUSIBLE AC DISCONNECT	1
35A FUSES	2
125A LINE TAPS	2



PRO CUSTOM SOLAR LLC D.B.A. MOMENTUM SOLAR  
325 HIGH STREET, METUCHEN, NJ 08840  
(732) 902-6224  
MOMENTUMSOLAR.COM

**PROFESSIONAL ENGINEERING**



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**SOLAR CONTRACTOR**  
CAMERON CHRISTENSEN  
CERTIFIED SOLAR CONTRACTOR LICENSE NUMBER: CVC57036  
MOMENTUM SOLAR  
5728 MAJOR BLVD. SUITE 307, ORLANDO FL. 32819

**CUSTOMER INFORMATION**  
LINDA MCCOMBS - MS148424  
502 NE REBECCA TERRACE  
LAKE CITY, FL 32055  
3863442764

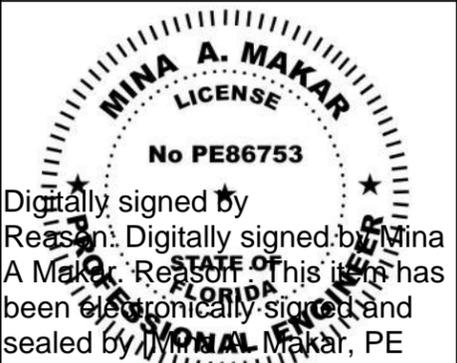
**PV SYSTEM INFORMATION**  
SYSTEM SIZE (DC ): 6.56 KW  
16 MODULES: HANWHA Q.PEAK DUO BLK ML-G10+ 410  
16 INVERTERS: ENPHASE IQ7PLUS-72-2-US

PROJECT INFORMATION		
INITIAL	DATE: 3/21/2024	DESIGNER: AKL
REV:	DATE:	DESIGNER:
REV:	DATE:	DESIGNER:

**COVER PAGE**

**PV-1**

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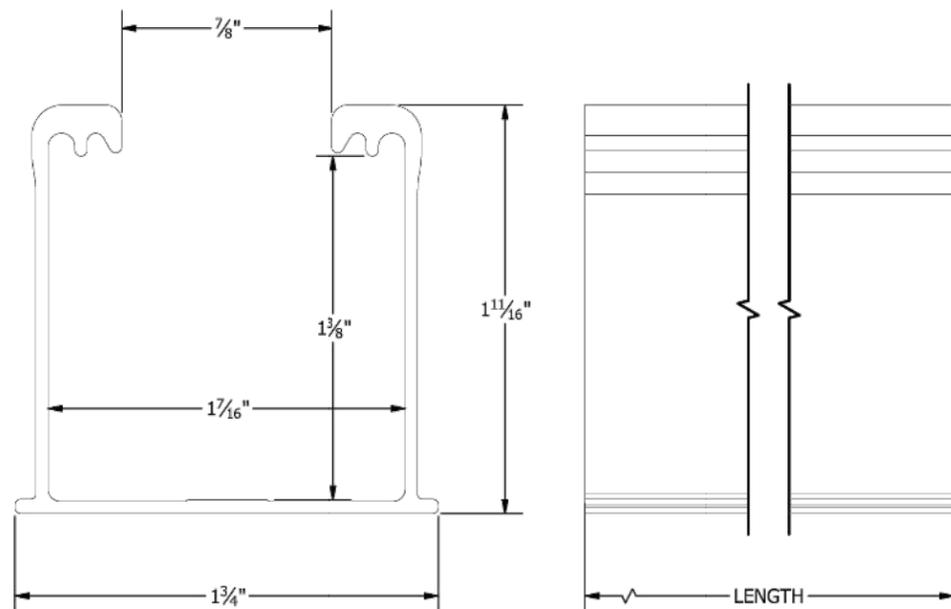
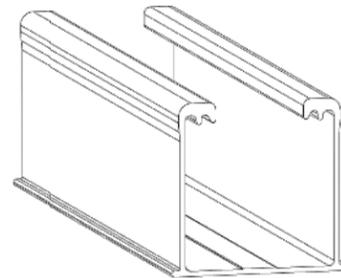
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**ATTACHMENT DETAIL**

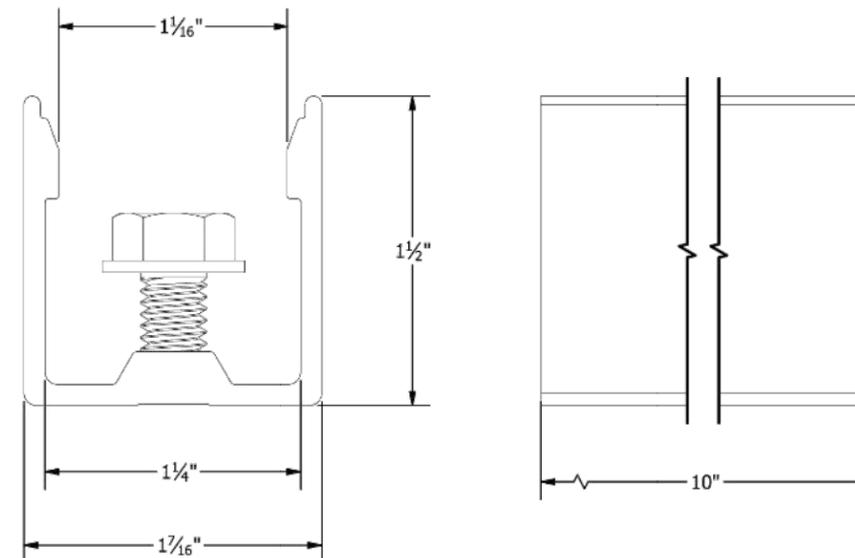
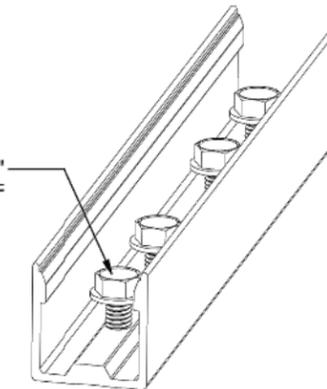
**PV-1.1**

PART # TABLE		
P/N	DESCRIPTION	LENGTH
084RLM1	NXT HORIZON RAIL 84" MILL	84"
084RLD1	NXT HORIZON RAIL 84" DARK	84"
168RLM1	NXT HORIZON RAIL 168" MILL	168"
168RLD1	NXT HORIZON RAIL 168" DARK	168"
208RLM1	NXT HORIZON RAIL 208" MILL	208"
208RLD1	NXT HORIZON RAIL 208" DARK	208"
246RLM1	NXT HORIZON RAIL 246" MILL	246"
246RLD1	NXT HORIZON RAIL 246" DARK	246"



PART # TABLE		
P/N	DESCRIPTION	LENGTH
RLSPLCM1	NXT HORIZON RAIL SPLICE	10"

4X - 5/16"-18 x 5/8"  
HEX FLANGE SCREW - TYPE F



**UNIRAC**  
1411 BROADWAY BLVD. NE  
ALBUQUERQUE, NM 87102 USA  
PHONE: 505.242.6411  
WWW.UNIRAC.COM

PRODUCT LINE: NXT HORIZON  
DRAWING TYPE: PART DETAIL  
DESCRIPTION: RAIL  
REVISION DATE: 9/13/2021

DRAWING NOT TO SCALE  
ALL DIMENSIONS ARE  
NOMINAL  
PRODUCT PROTECTED BY  
ONE OR MORE US PATENTS  
LEGAL NOTICE

NH-P01

SHEET

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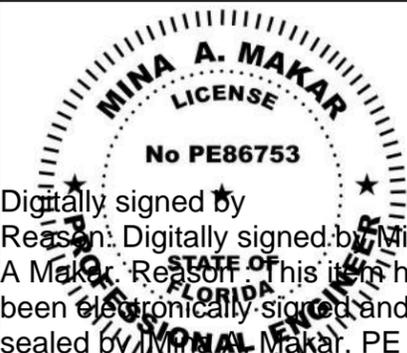
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DESCRIPTION: RAIL SPLICE  
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NH-P02

SHEET

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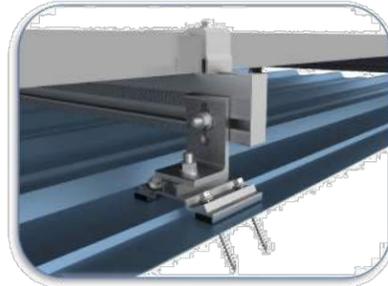
**ATTACHMENT DETAIL**

**PV-1.1 (2)**



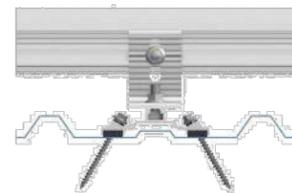
**EZ GRIP METAL DECK MOUNT**

**Make your next metal roof attachment without the daunting task of locating the truss.** SunModo's EZ Grip Metal Deck Mount installs into 26 gauge sheet metal, 1/2 plywood or 7/16 OSB roof decking material.



SunModo's EZ Grip Metal Deck Mount installs in just minutes into sheet metal, plywood or OSB roof decking. The four included 1/4 x 3" Hex Washer Head Self-tapping Screws have the length to penetrate through 1-1/2 inches of insulation while still piercing completely through the roof decking. And since the four screws are guided by the aluminum extruded base to penetrate at a 30-degree angle, the Metal Roof Deck Mount Kit offers superior attachment performance. 1/4-20 Self-drilling screws can be used for attachments into 26 gauge minimum thickness metal roofs.

The EZ Grip Metal Deck Mount is designed to fit on the most popular R-Panel and U-Panel trapezoidal types of metal roofs. The aluminum extruded base easily clears roof profiles 7/16" tall by 1-1/2" wide. The EPDM gaskets on the washers and on the aluminum extruded base combine to provide a water tight seal at the roof penetration site.



**Features and Benefits**

- Attaches into 1/2 plywood or 7/16 OSB roof decking material using four 1/4 x 3" Hex Washer Head Self-tapping Screws
- Attaches into 26 gauge minimum thickness sheet metal using four 1/4 x 2" Hex Washer Head Self-drilling Screws
- Angled penetrations provide superior attachment performance
- A wide variety of L-feet and attachment options are available
- Passed the High-Velocity Hurricane Zone (HVHZ) -TAS 100(a) Wind-Driven Rain Test

SunModo Corp | Vancouver, WA | 360-844-0048  
Document Number D10153-V003 | ©2019 - SunModo Corp.

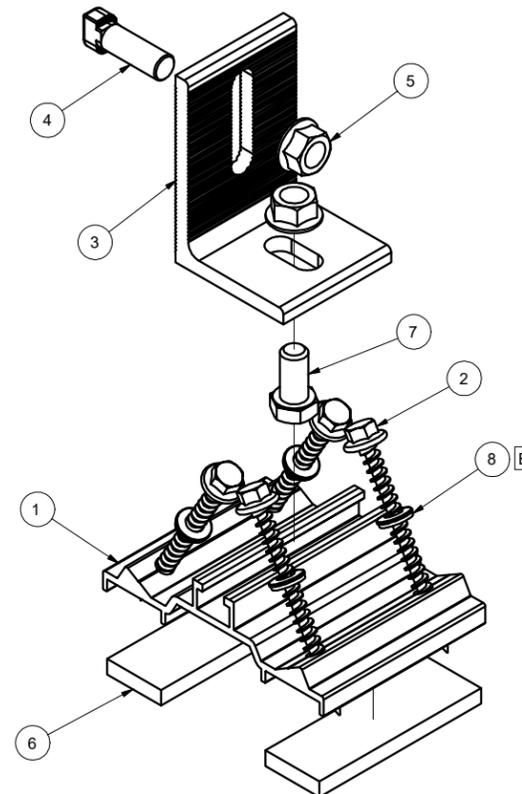
REVISIONS			
REV	DESCRIPTION	BY	DATE
A	INITIAL RELEASE	LWF	10/16/2018
B	ADD B15019-001	LWF	10/24/2018

IN 1/2" PLYWOOD		
LOAD DIRECTION	FOS=2	FOS=3
UPLIFT	345	230
LATERAL.PERP. TO SLOT	140	95
LATERAL.PARALLEL TO SLOT	265	175

IN 7/16" OSB		
LOAD DIRECTION	FOS=2	FOS=3
UPLIFT	190	125
LATERAL.PERP. TO SLOT	125	85
LATERAL.PARALLEL TO SLOT	135	90

**NOTES**

- Factor of Safety as shown
- Torque at 3/8" T-Bolt = 15ft.lbs (20 N.m)
- All loads in pounds force
- Values valid only for conditions equal or better than test conditions
- Values valid only when product is used in accordance with SunModo installation instruction and other technical documentation
- The kit as shown in the BOM. For alternative configurations, contact SunModo
- 4 1/4" Deck Screws in Min 7/16" OSB



ITEM	PART NUMBER	DESCRIPTION	QTY
B	8	B15019-001 SEALING WASHER .26 ID X .50 X .125	4
	7	B15018-001 HEX CAP SCREW 3/8-16 X 3/4	1
	6	C50001-001 GASKET, EPDM, WITH ADHESIVE	2
	5	B15003-001 FLANGE NUT 3/8-16	2
	4	B20007-002 T-BOLT 3/8-16X1.0", 304 SS	1
	3	A20062-001 L FOOT	1
	2	B15039-001 HEX WASHER HEAD LAG BOLT 1/4X3	4
	1	A50224-001 METAL ROOF DECK MOUNT	1

MATERIAL		SEE NOTES	
Third Angle Projection:			
GENERAL SPECIFICATIONS All Dimensions in inches (millimeters)			
Tolerances X.XXX ±0.01 (0.25mm) X.XX ±0.02 (0.50mm) X.X ±0.039 (1.0mm) Unless otherwise spec'd			
DRAWN BY LWF		DATE 10/16/2018	
CHECKED BY		B	
APPROVALS		SCALE: NONE SHEET 1 of 1	

**SunModo Corp.**  
14800 NE 65TH STREET, VANCOUVER WA 98682

METAL ROOF DECK MOUNT KIT

DRAWING NUMBER  
K50532-001 STRUCTURE

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ATTACHMENT DETAIL FOR CORRUGATED METAL ROOF



## IQ Combiner 4/4C



The **IQ Combiner 4/4C** with IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure. It 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 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
- Supports Wi-Fi, Ethernet, or cellular connectivity
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

### Simple

- Mounts on single stud with centered brackets
- Supports bottom, back and side conduit entry
- Allows up to four 2-pole branch circuits for 240VAC 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
- X2-IQ-AM1-240-4 and X2-IQ-AM1-240-4C comply with IEEE 1547:2018 (UL 1741-SB, 3<sup>rd</sup> Ed.)

## IQ Combiner 4/4C

MODEL NUMBER	
IQ Combiner 4 X-IQ-AM1-240-4 X2-IQ-AM1-240-4 (IEEE 1547:2018)	IQ Combiner 4 with 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 and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C X-IQ-AM1-240-4C X2-IQ-AM1-240-4C (IEEE 1547:2018)	IQ Combiner 4C with IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 ± 0.5%) and consumption monitoring (± 2.5%). Includes 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)	
Supported microinverters	IQ6, IQ7, and IQE. (Do not mix IQ6/7 Microinverters with IQ8)
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 - 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
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)
X-IQ-NA-HD-125A	Hold-down kit for Eaton circuit breaker with screws
Consumption monitoring CT (CT-200-SPLIT/CT-200-CLAMP)	A pair of 200A split core current transformers
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240VAC, 60 Hz
Eaton BR series busbar rating	125A
Max. continuous current rating	65A
Max. continuous current rating (input from PV/storage)	64A
Max. fuse/circuit rating (output)	90A
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
IQ Gateway breaker	10A or 15A rating GE/Siemens/Eaton included
Production metering CT	200A solid core pre-installed and wired to IQ Gateway
MECHANICAL DATA	
Dimensions (WxHxD)	37.5 cm x 49.5 cm x 16.8 cm (14.75 in x 19.5 in x 6.63 in). Height is 53.5 cm (21.06 in) with mounting brackets.
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40°C to +46°C (-40°F to 115°F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	<ul style="list-style-type: none"> <li>20A to 50A breaker inputs: 14 to 4 AWG copper conductors</li> <li>60A breaker branch input: 4 to 1/0 AWG copper conductors</li> <li>Main lug combined output: 10 to 2/0 AWG copper conductors</li> <li>Neutral and ground: 14 to 1/0 copper conductors</li> <li>Always follow local code requirements for conductor sizing.</li> </ul>
Altitude	Up to 3,000 meters (9,842 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	IEEE 802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Mobile Connect cellular modem is required for all Enphase Energy System installations.
Ethernet	Optional, IEEE 802.3, Cat5E (or Cat6) UTP Ethernet cable (not included)
COMPLIANCE	
Compliance, IQ Combiner	CA Rule 21 (UL 1741-SA) IEEE 1547:2018 -UL 1741-SB, 3 <sup>rd</sup> Ed. (X2-IQ-AM1-240-4 and X2-IQ-AM1-240-4C) CAN/CSA C22.2 No. 107.1, Title 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

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IQ-C-4-4C-DS-0103-EN-US-12-29-2022

PRO CUSTOM SOLAR LLC D.B.A. MOMENTUM SOLAR  
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(732) 902-6224  
MOMENTUMSOLAR.COM

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	3/21/2024	AKL
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## COMBINER DETAIL

# PV-1.3



To learn more about Enphase offerings, visit [enphase.com](https://enphase.com)  
IQ-C-4-4C-DS-0103-EN-US-12-29-2022



# Q.PEAK DUO BLK ML-G10+ SERIES



385-410Wp | 132 Cells  
20.9% Maximum Module Efficiency

MODEL Q.PEAK DUO BLK ML-G10+



### Breaking the 20% efficiency barrier

Q.QUANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.



### A reliable investment

Inclusive 25-year product warranty and 25-year linear performance warranty<sup>1</sup>.



### Enduring high performance

Long-term yield security with Anil LeTID Technology, Anti PID Technology<sup>2</sup> and Hot-Spot Protect.



### Extreme weather rating

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



### Innovative all-weather technology

Optimal yields, whatever the weather with excellent low-light and temperature behaviour.



### The most thorough testing programme in the industry

Qcells 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.

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

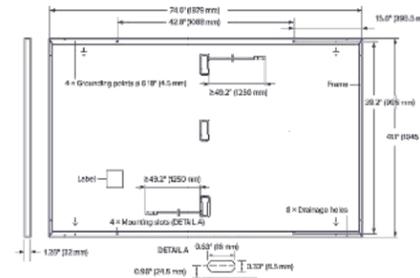
The ideal solution for:



## Q.PEAK DUO BLK ML-G10+ SERIES

### 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 anodised aluminium
Cell	6 × 22 monocrystalline Q.QUANTUM 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 mm <sup>2</sup> Solar cable; (+) > 49.2 in (1250 mm), (-) > 49.2 in (1250 mm)
Connector	Stäubli MC4; IP68



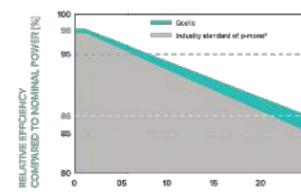
### Electrical Characteristics

POWER CLASS	385	390	395	400	405	410	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC <sup>1</sup> (POWER TOLERANCE ±5W/-0W)							
Power at MPP <sup>1</sup>	$P_{MPP}$ [W]	385	390	395	400	405	410
Short Circuit Current <sup>1</sup>	$I_{SC}$ [A]	11.04	11.07	11.10	11.14	11.17	11.20
Open Circuit Voltage <sup>1</sup>	$V_{OC}$ [V]	45.19	45.23	45.27	45.30	45.34	45.37
Current at MPP	$I_{MPP}$ [A]	10.59	10.65	10.71	10.77	10.83	10.89
Voltage at MPP	$V_{MPP}$ [V]	36.36	36.62	36.88	37.13	37.39	37.64
Efficiency <sup>1</sup>	$\eta$ [%]	≥ 21.6	≥ 21.9	≥ 22.1	≥ 22.4	≥ 22.6	≥ 22.9

MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT <sup>2</sup>							
Power at MPP	$P_{MPP}$ [W]	288.8	292.6	296.3	300.1	303.8	307.6
Short Circuit Current	$I_{SC}$ [A]	8.90	8.92	8.95	8.97	9.00	9.03
Open Circuit Voltage	$V_{OC}$ [V]	42.62	42.65	42.69	42.72	42.76	42.79
Current at MPP	$I_{MPP}$ [A]	8.35	8.41	8.46	8.51	8.57	8.62
Voltage at MPP	$V_{MPP}$ [V]	34.59	34.81	35.03	35.25	35.46	35.68

<sup>1</sup> Measurement tolerances  $P_{MPP} \pm 3\%$ ;  $I_{SC} \pm 5\%$  at STC: 1000 W/m<sup>2</sup>, 25 ± 2 °C, AM 1.5 according to IEC 60904-3 • <sup>2</sup> 800 W/m<sup>2</sup>, NMOT, spectrum AM 1.5

### Qcells 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 Qcells sales organisation of your respective country.

### TEMPERATURE COEFFICIENTS

Temperature Coefficient of $I_{SC}$	$\alpha$ [%/K]	+0.04	Temperature Coefficient of $V_{OC}$	$\beta$ [%/K]	-0.27
Temperature Coefficient of $P_{MPP}$	$\gamma$ [%/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 <sup>3</sup>	[lbs/ft <sup>2</sup> ]	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 <sup>3</sup>	[lbs/ft <sup>2</sup> ]	113 (5400 Pa)/84 (4000 Pa)		

<sup>3</sup> 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),



Qcells pursues minimizing paper output in consideration of the global environment.

Note: Installation instructions must be followed. Contact our technical service for further information on approved installation 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@qcells.com](mailto:inquiry@qcells.com) | WEB: [www.qcells.com](http://www.qcells.com)

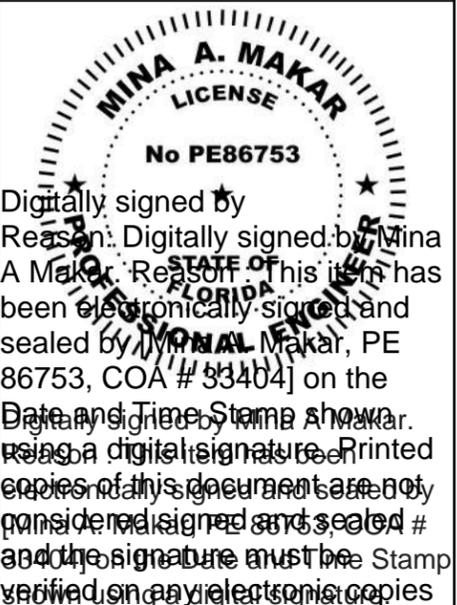


Specifications subject to technical changes © Qcells Q.PEAK DUO BLK ML-G10+ Series\_2023-03\_Rev01.USA



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## PROFESSIONAL ENGINEERING



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### SOLAR CONTRACTOR

CAMERON CHRISTENSEN  
CERTIFIED SOLAR CONTRACTOR LICENSE NUMBER: CVC57036  
MOMENTUM SOLAR  
5728 MAJOR BLVD., SUITE 307, ORLANDO FL. 32819

### CUSTOMER INFORMATION

LINDA MCCOMBS - MS148424  
502 NE REBECCA TERRACE  
LAKE CITY, FL 32055  
3863442764

### PV SYSTEM INFORMATION

SYSTEM SIZE (DC) : 6.56 KW  
16 MODULES: HANWHA Q.PEAK DUO BLK ML-G10+ 410  
16 INVERTERS: ENPHASE IQ7PLUS-72-2-US

### PROJECT INFORMATION

INITIAL	DATE: 3/21/2024	DESIGNER: AKL
REV:	DATE:	DESIGNER:
REV:	DATE:	DESIGNER:

## PANEL DETAIL

# PV-1.4

SCALE: 1/8" = 1'-0"

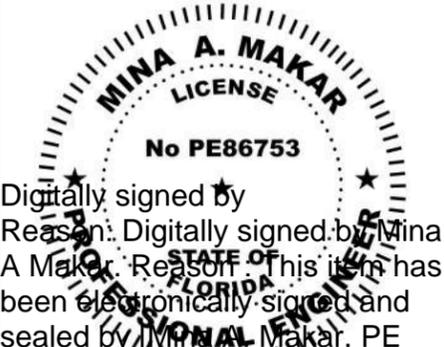


ROOF	PANEL COUNT	TILT	AZIMUTH	SHADING	LANDSCAPE MAX SPAN (ROOF AREA 1/2/3)	PORTRAIT MAX SPAN (ROOF AREA 1/2/3)	LANDSCAPE MAX CANTILEVER	PORTRAIT MAX CANTILEVER
R1	16	20°	90°	80%	48 /48 /48	48 /48 /48	16 /10 /10	16 /10 /10



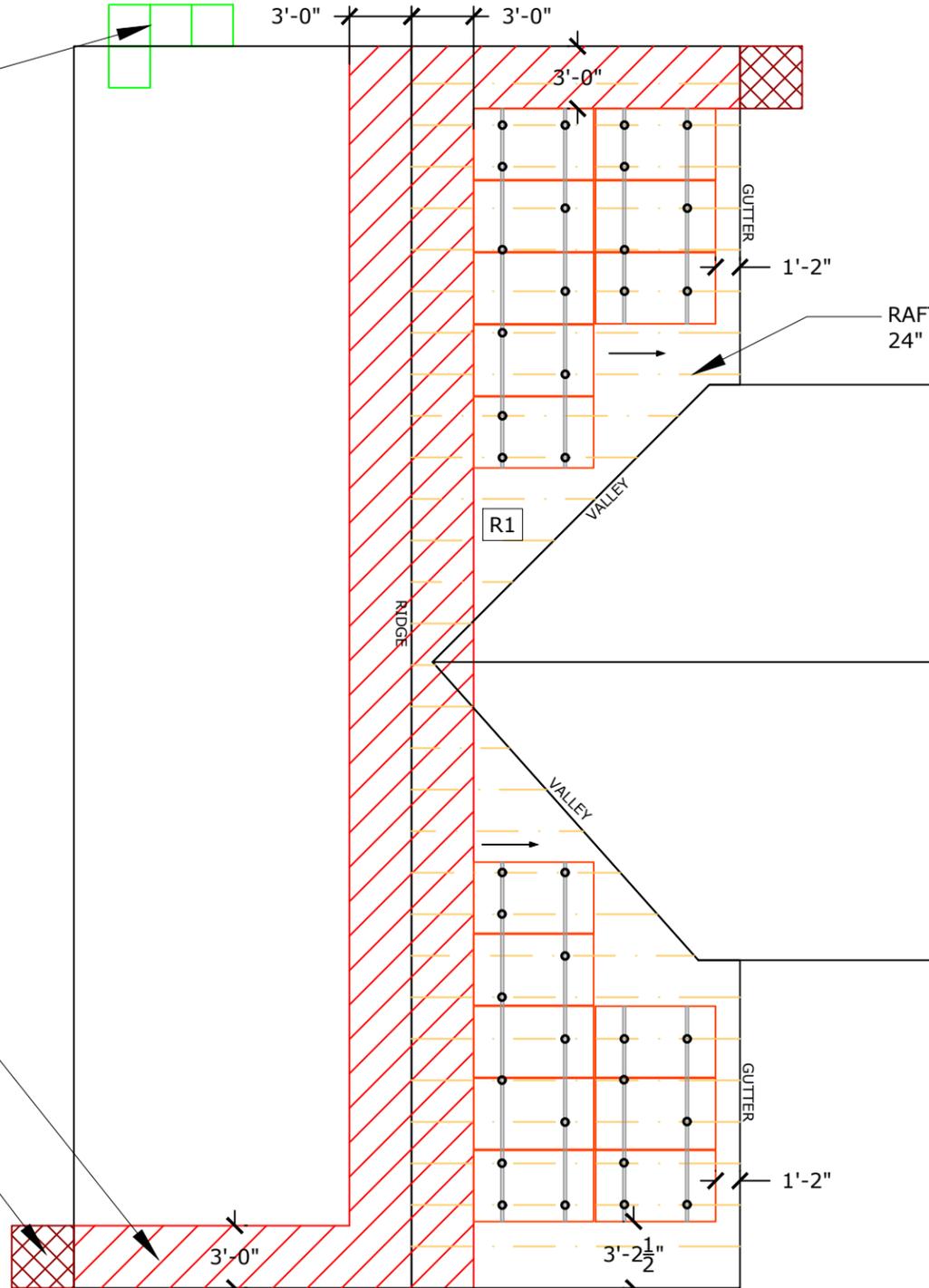
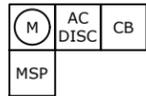
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ELECTRICAL EQUIPMENT



FIRE SETBACK (36" VENTILATION, 36" ROOF ACCESS) (TYP)

GROUND ACCESS (TYP)

CLAMPING MAX SPACING IN ZONE 1 48" O.C AND IN ZONE 2 AND ZONE 3 48" O.C

**NOTE:**

1. ROOF COVERING MATERIAL IS COMPOSED OF CORRUGATED METAL.
2. EXACT ATTACHMENT LOCATION AND QUANTITY OF ATTACHMENTS ARE BASED ON EXISTING RAFTER LOCATIONS OBTAINED FROM FIELD MEASUREMENTS. THE LOCATION AND QUANTITY OF ATTACHMENTS MAY VARY BASED ON RAFTER LAYOUT START POINT, SPACING VARIATIONS AND ROOFING TYPE. VERIFY IN THE FIELD ALL RAFTER LOCATIONS AND ADJUST LAYOUT AS REQUIRED. A TILE ROOF WILL PRODUCE A STAGGERED ATTACHMENT LAYOUT BECAUSE OF EXISTING STAGGERED TILE JOINT LOCATIONS.

FRONT OF RESIDENCE  
NE REBECCA TERRACE

TOTAL SQUARE FOOTAGE OF ROOF: 2326 SQFT  
SQUARE FOOTAGE OF SOLAR ARRAY: 337.94 SQFT  
PERCENTAGE OF SOLAR ROOF COVERAGE: 14.53%  
18" RIDGE SETBACK SHALL BE REQUIRED

**SYMBOL LEGEND**

MSP	MAIN SERVICE PANEL		CHIMNEY
SP	SUB-PANEL		SKYLIGHT
M	UTILITY METER		VENT
AC DISC	AC DISCONNECT		PIPE VENT
UDC	UTILITY DISCONNECT		FAN
LC	LOAD CENTER		SATELLITE DISH
N3R	NEMA 3R BOX W/ ENVOY-S		FIRE SETBACKS
CB	COMBINER BOX		MIN 3'x3' GROUND ACCESS POINT
	MODULE		PITCH DIRECTION
	WIND PRESSURE ZONE LINES. REFER TO PV-2.2 FOR ADDITIONAL INFO		

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**PROJECT INFORMATION**

INITIAL	DATE:	DESIGNER:
	3/21/2024	AKL
REV:	DATE:	DESIGNER:
REV:	DATE:	DESIGNER:

**ROOF LAYOUT**

**PV-2**

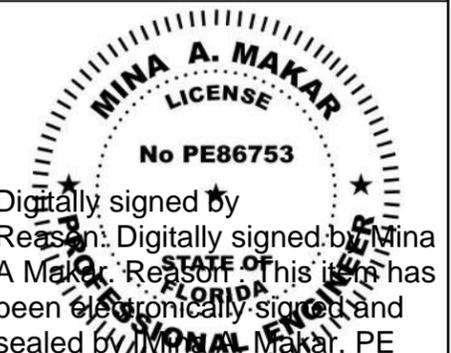
PV MODULE RATINGS		INVERTER RATINGS	
MODULE MAKE	HANWHA	INVERTER MAKE	ENPHASE
MODEL	HANWHA Q.PEAK DUO BLK ML-G10+ 410	MODEL	IQ7PLUS-72-2-US
MAX POWER	410W	MAX OUTPUT POWER	290W
OPEN CIRCUIT VOLTAGE	45.37V	OPEN DC VOLTAGE	60V
MPP VOLTAGE	37.64V	NOMINAL AC VOLTAGE	240V
SHORT CIRCUIT CURRENT	11.2A	MAX AC CURRENT	1.21A
MPP CURRENT	10.89A	CEC INVERTER EFFICIENCY	97%
NUMBER OF MODULES	16	NUMBER OF INVERTERS	16
UL1703 COMPLIANT	YES	UL1703 COMPLIANT	YES

VOLTAGE DROP CALCULATIONS							
FORMULA USED PER NEC HANDBOOK 215.2(A)(4) WHERE APPLICABLE							
WIRE RUN	$V_{mp}$	$I_{mp}$	R	L (FT)	$V_o$	% $V_o$	WIRE SIZE
BRANCH TO J-BOX	240.00	9.68	1.98	52.67	2.019	0.84%	12 AWG
J-BOX TO LOAD CENTER	240.00	19.36	1.24	50.00	2.401	1.00%	10 AWG
LOAD CENTER TO AC DISCONNECT	240.00	24.2	0.778	3.00	0.113	0.05%	08 AWG
AC DISCONNECT TO INTERCONNECTION	240.00	24.2	0.491	10.00	0.238	0.10%	06 AWG



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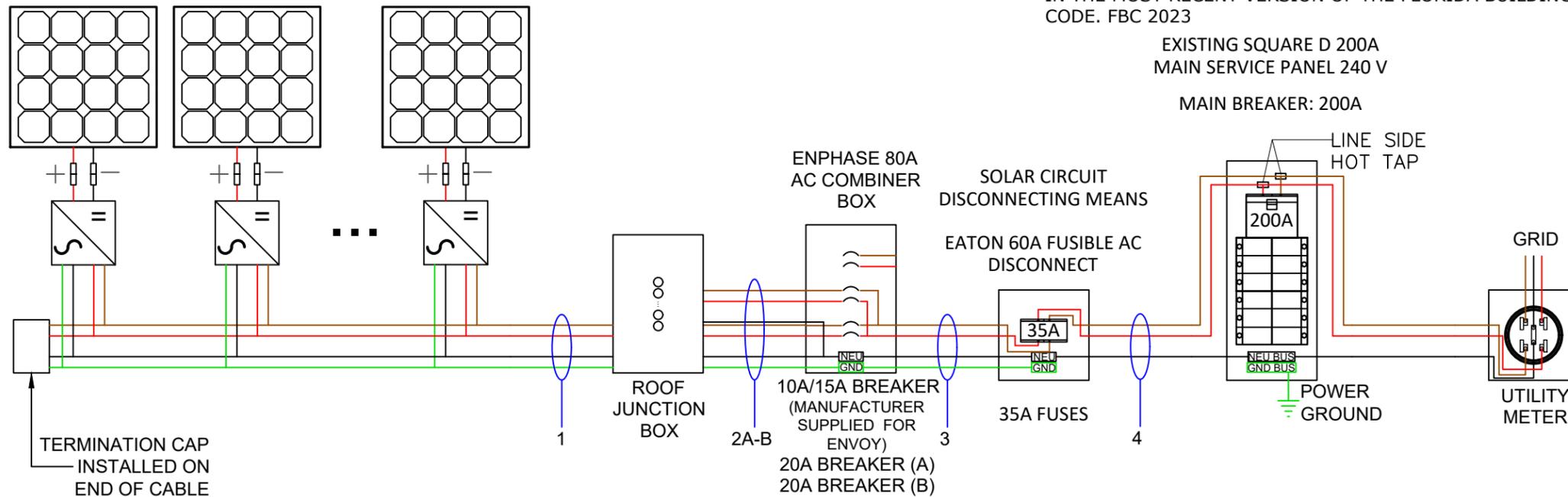
**FSEC CERTIFICATION STATEMENT:**

PER FL. STATUE 377.705 , I, MINA A. MAKAR PE# 86753, CERTIFICATE OF AUTHORIZATION #33404, AN ENGINEER LICENSED PURSUANT TO CHAPTER 471,CERTIFY THAT THE PV ELECTRICAL SYSTEM AND ELECTRICAL COMPONENTS ARE DESIGNED AND APPROVED USING THE STANDARDS CONTAINED IN THE MOST RECENT VERSION OF THE FLORIDA BUILDING CODE. FBC 2023

THIS SOLAR PHOTOVOLTAIC SYSTEM COMPLIES WITH THE 2023 FLORIDA BUILDING CODE AND THE 2020 NATIONAL ELECTRICAL CODE

16 HANWHA Q.PEAK DUO BLK ML-G10+ 410 410W MODULES PAIRED WITH 16 ENPHASE IQ7PLUS-72-2-US MICRO-INVERTERS

BRANCH CIRCUIT A 8 MICRO-INVERTERS  
BRANCH CIRCUIT B 8 MICRO-INVERTERS



Wire Tag	Conduit	Wire Qty	Wire Gauge	Wire Type	Temp. Rating	Wire Ampacity (A)	Temp. Derate	Conduit Fill Derate	Derated Ampacity (A)	Inverter Qty	NOC (A)	NEC Correction	Design Current (A)	Ground Size	Ground Wire Type
1	OPEN AIR	2	12 AWG	Trunk Cable	90°C	30	0.96	1	28.80	8	1.21	1.25	12.10	12 AWG	Trunk Cable
2A	3/4" PVC	4	10 AWG	THWN-2	75°C	35	0.96	0.8	26.88	8	1.21	1.25	12.10	08 AWG	THWN-2
2B			10 AWG	THWN-2	75°C	35	0.96								
3	3/4" PVC	3 + G	08 AWG	THWN-2	75°C	50	0.96	1	48.00	16	1.21	1.25	24.20	08 AWG	THWN-2
4	3/4" PVC	3	06 AWG	THWN-2	75°C	65	0.96	1	62.40	16	1.21	1.25	24.20		THWN-2

NOTE: LETTER "G" IN WIRE QTY TAB STANDS FOR GROUNDING CONDUCTOR.

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**THREE LINE DIAGRAM**

**PV-3**



