

SYSTEM INFORMATION	
MODULE	CERTAINTEED CTTC440HC12-08
INVERTER	ENPHASE IQ8PLUS-72-2-US
RACKING	SNAPNRACK ULTRA RAIL & ULTRAFOOT
SYSTEM SIZE (DC)	6.16 KW
LOCATION	30.1613261,-82.6918474

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

PLAN KEY	
PV-1	COVER PAGE
PV-1.1	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

FBC, RESIDENTIAL 2023 TABLE R301.2.1.3 WIND SPEED CONVERSIONS ^a											
V _{ult}	110	115	120	130	140	150	160	170	180	190	200
V _{asd}	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.



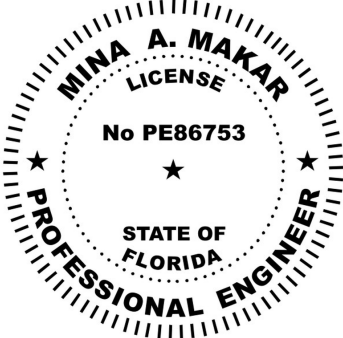
CERTAINTEED CTTC440HC12-08
440 WATT MODULE
67.8" X 44.6" X 1.18"
(SEE DATASHEET)

BILL OF MATERIALS	
MODULES	14
INVERTERS	14
L-FOOT ATTACHMENT W/ ULTRAFOOT	36
168 RAILS	6
SKIRTS	
ENPHASE COMBINER BOX	1
EATON 60A FUSIBLE AC DISCONNECT	1
40A FUSES	2
40A BACKFEED BREAKER	1



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

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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		
GEORGE SMITH - MS187944 559 SOUTHWEST MAYFAIR LANE LAKE CITY , FL 32024 2245428310		
PV SYSTEM INFORMATION		
SYSTEM SIZE (DC): 6.16 KW 14 MODULES: CERTAINTEED CTTC440HC12-08 14 INVERTERS: ENPHASE IQ8PLUS-72-2-US		
PROJECT INFORMATION		
INITIAL	DATE: 7/10/2026	DESIGNER: KJL
REV:	DATE:	DESIGNER:
REV:	DATE:	DESIGNER:

COVER PAGE

PV-1

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

DESCRIPTION:
SNAPNRACK, TDS, UR-45 RAIL (USA)

DOC NUMBER:
SNR-DC-01451

SnapNrack®

PART NUMBER(S):
232-10095-USA, 232-10096-USA, 232-10097-USA,
232-10130-USA

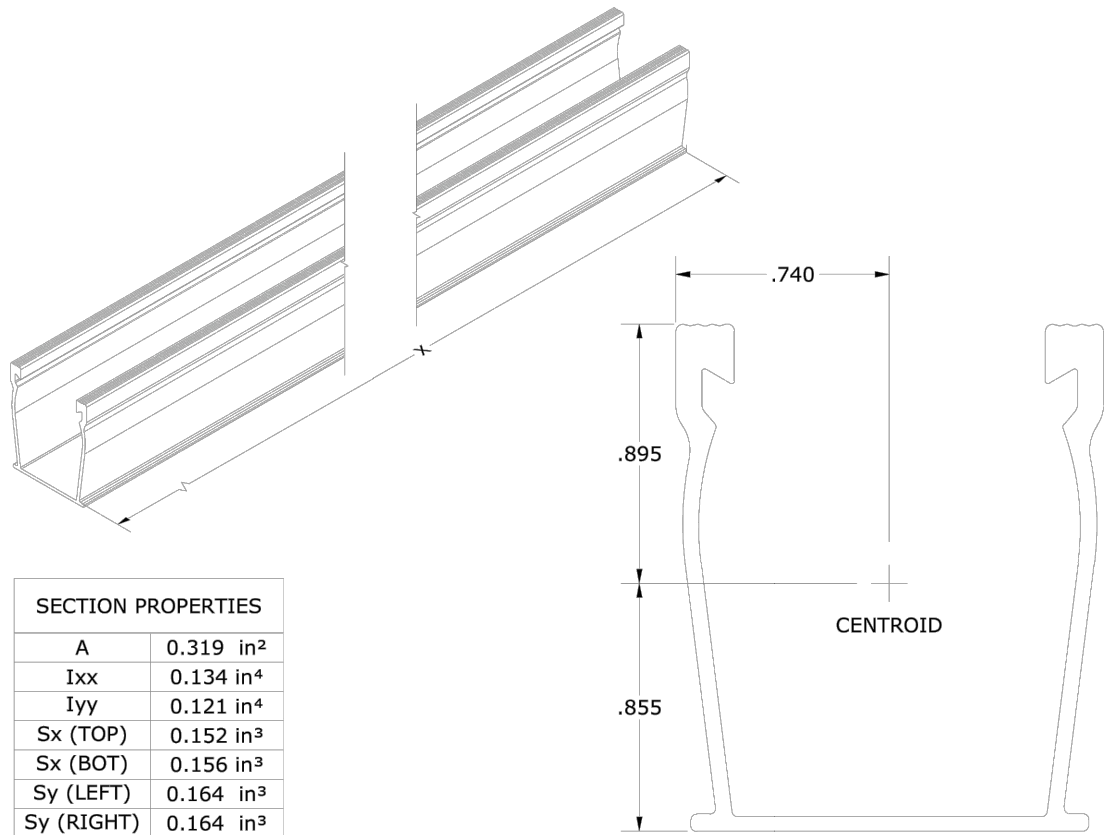
DRAWN BY:
H.WULFEKOETTER

SNR SOLAR LLC
775 FIERO LANE, SUITE 200
SAN LUIS OBISPO, CA 93401 USA
EMAIL: CONTACT@SNAPNRACK.COM
THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY
REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE
WRITTEN CONSENT OF SNR SOLAR LLC.

REV: C DATE: 4/1/2025

UNITS: IN, LB, DEG [MM, KG, DEG] SHEET: 1:1

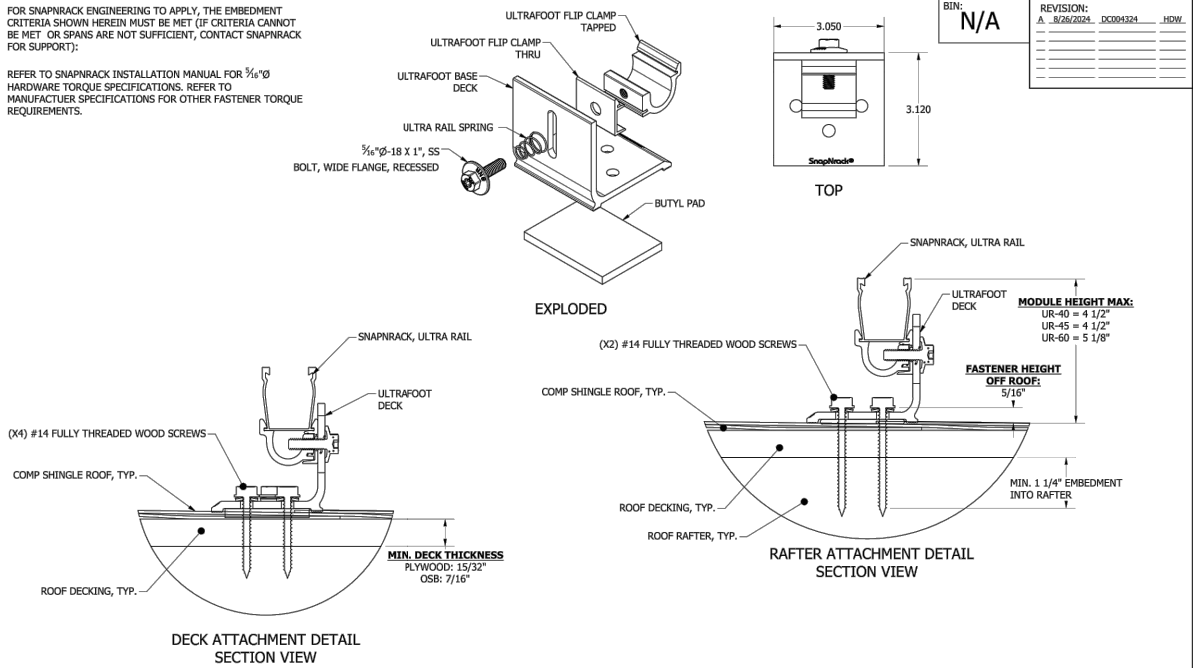
UR-45 RAIL PROPERTIES			
SKU	FINISH	RAIL LENGTH (X)	WEIGHT (lb)
232-10095-USA	MILL	172 in	5.55
232-10096-USA	BLACK	172 in	5.55
232-10097-USA	MILL	94 in	3.03
232-10130-USA	MILL	186 in	6.00



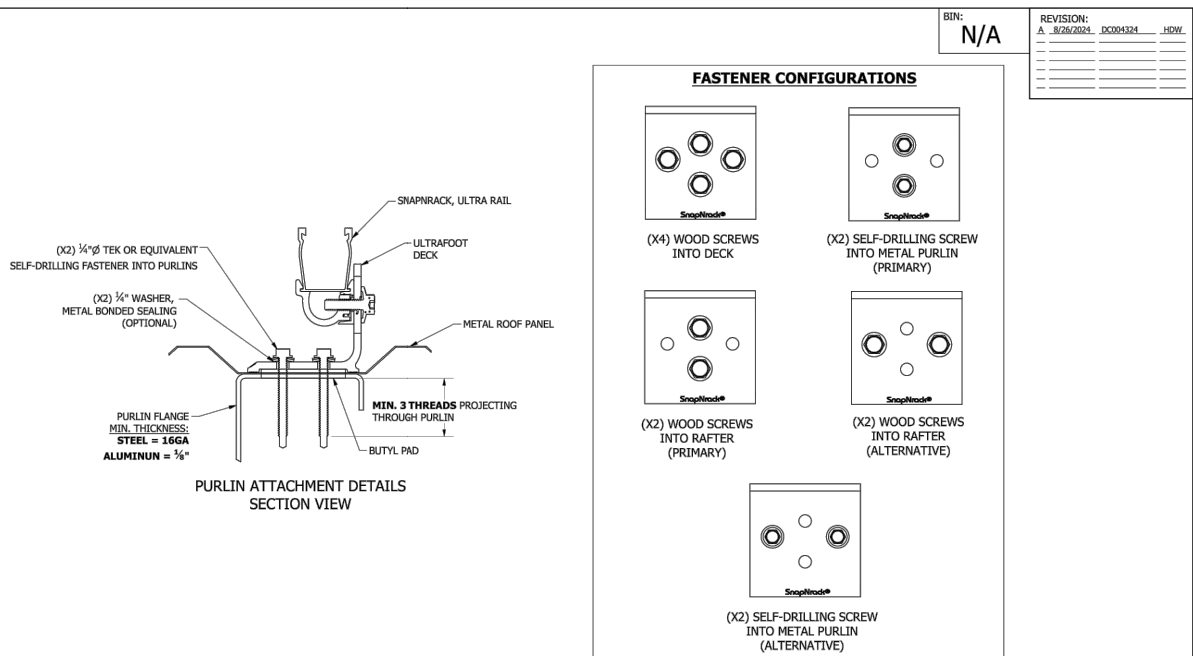
MATERIALS: 6005-T5 ALUMINUM
DESIGN LOAD (LBS): N/A
ULTIMATE LOAD (LBS): N/A
TORQUE SPECIFICATION: N/A FT-LBS
CERTIFICATION: UL 2703, FILE E359313
WEIGHT (LBS): VARIES, SEE PROPERTIES TABLE

FOR SNAPNRACK ENGINEERING TO APPLY, THE EMBEDMENT CRITERIA SHOWN HEREIN MUST BE MET (IF CRITERIA CANNOT BE MET OR SPANS ARE NOT SUFFICIENT, CONTACT SNAPNRACK FOR SUPPORT).

REFER TO SNAPNRACK INSTALLATION MANUAL FOR 3/16" Ø HARDWARE TORQUE SPECIFICATIONS. REFER TO MANUFACTURER SPECIFICATIONS FOR OTHER FASTENER TORQUE REQUIREMENTS.



SnapNrack® Solar Mounting Solutions Sunrun South LLC DESIGNER: M.AFFENTRANGER DRAFTER: H.WULFEKOETTER APPROVED BY: M.AFFENTRANGER SHEET: 1:2 DRAWING NUMBER: SNR-DC-01508 DESCRIPTION: ULTRA RAIL, ATTACHMENT DETAIL, ULTRAFOOT DECK REV: A

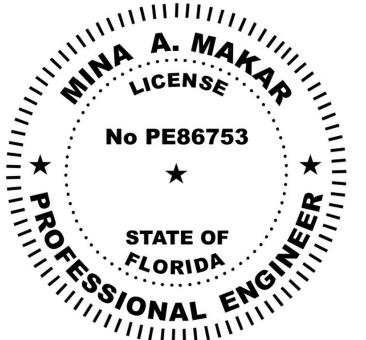


SnapNrack® Solar Mounting Solutions Sunrun South LLC DESIGNER: M.AFFENTRANGER DRAFTER: H.WULFEKOETTER APPROVED BY: M.AFFENTRANGER SHEET: 2:2 DRAWING NUMBER: SNR-DC-01508 DESCRIPTION: ULTRA RAIL, ATTACHMENT DETAIL, ULTRAFOOT DECK REV: A



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ATTACHMENT DETAIL

PV-1.1



DATA SHEET



IQ8HC Microinverter

Our newest IQ8 Series 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 55-nm technology with high-speed digital logic and has superfast 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 IQ Battery, IQ Gateway, and the Enphase App monitoring and analysis software.



Connect PV modules quickly and easily to the IQ8 Series Microinverters that have integrated MC4 connectors.



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.



IQ8 Series Microinverters are UL Listed as PV rapid shutdown equipment and conform with various regulations when installed according to the manufacturer's instructions.

*Meets UL 1741 only when installed with IQ System Controller 2 or 3.

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DSH-00047-6.0-EN-US-2024-10-08

Easy to install

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

High productivity and reliability

- Produces 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) and IEEE 1547:2018 (UL 1741-SB)

NOTE:

- IQ8 Series Microinverters cannot be mixed together with previous generations of Enphase microinverters (IQ7 Series, IQ6 Series, and so on) in the same system.
- IQ Microinverters ship with default settings that meet North America's IEEE 1547 interconnection standard requirements. Region-specific adjustments may be requested by an Authority Having Jurisdiction (AHJ) or utility representative, according to the IEEE 1547 interconnection standard. An IQ Gateway is required to make these changes during installation.

IQ8HC Microinverter

INPUT DATA (DC)		UNITS	IQ8HC-72-M-US/IQ8HC-72-M-DOM-US ¹	
Commonly used module pairings ²		W	320–540	
Module compatibility	—		To meet compatibility, PV modules must be within the maximum input DC voltage and maximum module I_{sc} listed below. Module compatibility can be checked at https://enphase.com/installers/microinverters/calculator .	
MPPT voltage range	V		29.5–45	
Operating range	V		18–58	
Minimum/Maximum start voltage	V		22/58	
Maximum input DC voltage	V		60	
Maximum continuous operating DC current	A		14	
Maximum input DC short-circuit current	A		25	
Maximum module I_{sc}	A		20	
Overtoltage class DC port	—		II	
DC port backfeed current	mA		0	
PV array configuration	—		Ungrounded array; no additional DC side protection required; AC side protection requires max. 20 A per branch circuit	
OUTPUT DATA (AC)			IQ8HC-72-M-US @240 VAC IQ8HC-72-M-DOM-US @240 VAC	IQ8HC-72-M-US @208 VAC IQ8HC-72-M-DOM-US @ 208 VAC
Peak output power	VA		384	366
Maximum continuous output power	VA		380	360
Nominal grid voltage (L-L)	V		240, split-phase (L-L), 180°	208, single-phase (L-L), 120°
Minimum and maximum grid voltage ³	V		211-264	183-229
Maximum continuous output current	A		1.58	1.73
Nominal frequency	Hz		60	
Extended frequency range	Hz		47–68	
AC short-circuit fault current over three cycles	A _{rms}		2.70	
Maximum units per 20 A (L-L) branch circuit ⁴	—		10	9
Total harmonic distortion	%		<5	
Overtoltage class AC port	—		III	
AC port backfeed current	mA		18	
Power factor setting	—		1.0	
Grid-tied power factor (adjustable)	—		0.85 leading ... 0.85 lagging	
Peak efficiency	%		97.3	97.2
CEC weighted efficiency	%		97.0	96.5
Nighttime power consumption	mW		22	26
MECHANICAL DATA				
Ambient temperature range			–40°C to 65°C (–40°F to 149°F)	
Relative humidity range			4% to 100% (condensing)	
DC connector type			Stäubli MC4	
Dimensions (H × W × D); Weight			212 mm (8.3") × 175 mm (6.9") × 30.2 mm (1.2"); 1.1 kg (2.43 lb)	
Cooling			Natural convection – no fans	
Approved for wet locations; Pollution degree			Yes; PD3	
Enclosure			Class II double-insulated, corrosion-resistant polymeric enclosure	
Environmental category; UV exposure rating			NEMA Type 6; outdoor	

¹IQ8HC-72-M-DOM-US is made in the USA, and the PCBA, electrical parts, and enclosure are domestically manufactured to meet the requirements of eligibility to be considered for the ITC domestic content bonus adder.

²No enforced DC/AC ratio.

³Nominal voltage range can be extended beyond nominal if required by the utility.

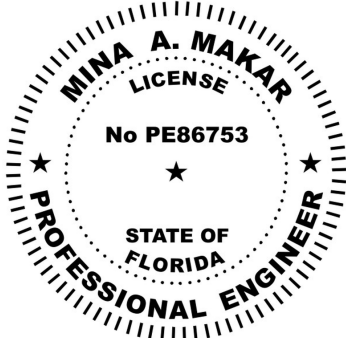
⁴Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

DSH-00047-6.0-EN-US-2024-10-08



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CTTC440HC12-08
14 INVERTERS: ENPHASE
IQ8PLUS-72-US

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INITIAL	DATE: 7/10/2026	DESIGNER: KJL
REV:	DATE:	DESIGNER:
REV:	DATE:	DESIGNER:

INVERTER DETAIL

PV-1.2

IQ Combiner 4/4C



To learn more about Enphase offerings, visit enphase.com
IQ-C-4-4C-DS-0103-EN-US-12-29-2022



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, 3rd 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 IQ8. (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	• 20A to 50A breaker inputs: 14 to 4 AWG copper conductors • 60A 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	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 rd 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

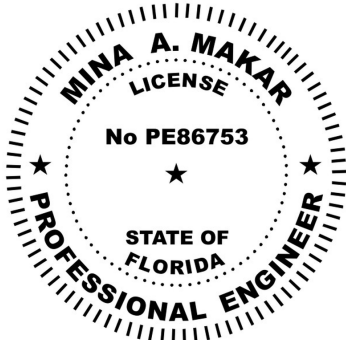
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IQ-C-4-4C-DS-0103-EN-US-12-29-2022



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COMBINER DETAIL

PV-1.3

Solstice® Panel

HALF-CELL 440W
SOLAR MODULE

High performance, half-cell N-Type mono-crystalline TOPCon 16BB 440W bifacial all-black modules produced using state of the art automated production lines and made using the highest quality materials and quality control standards.

HALF-CELL MONOCRYSTALLINE TYPE

• CTTC440HC12-08

FEATURES AND BENEFITS

High Quality / High Power

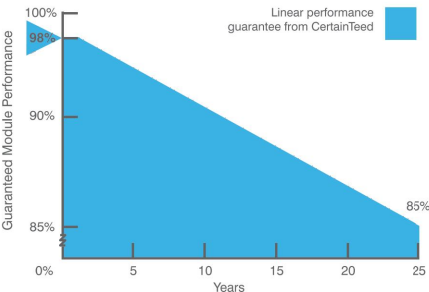
- 440W bifacial with transparent backsheet
- UL listed (61730-1, UL 61730-2)
- Positive power output tolerance

Limited Warranty*

- 25-year linear power output warranty

*See CertainTeed's limited warranty for details

POWER OUTPUT WARRANTY



OPERATING CONDITIONS

Dimensions	1721 x 1133 x 30 mm
Nominal Operating Cell Temperature	45 +/- 2° C
Operating Temperature	-40 to 85° C
Maximum System Voltage	1,500V
Fire Performance	Class C / Type 1
Maximum Wind Load	112 lbs/ft² (5400 Pa)
Maximum Snow Load	112 lbs/ft² (5400 Pa)



ELECTRICAL CHARACTERISTICS

Nominal Output (Pmpp)	W	440
Voltage at Pmax (Vmpp)	V	32.98
Current at Pmax (Impp)	A	13.36
Open Circuit Voltage (Voc)	V	38.63
Short Circuit Current (Isc)	A	14.30
Output Tolerance	W	0~+3%
No. of Cells & Connections		108 half-cells with 3 bypass diodes
Maximum Series Fuse Rating		30A
Cell Type		N-Type Monocrystalline TOPCon
Module Efficiency	%	22.57
Temperature Coefficient of Pmpp	%/C	-0.30
Temperature Coefficient of Voc	%/C	-0.25
Temperature Coefficient of Isc	%/C	+0.046
Bifaciality Ratio	%	80 +/- 5

MECHANICAL CHARACTERISTICS

Glass	Glass: 3.2 high transmission, tempered, anti-reflective
Frame	Anodized aluminum (Black)
Junction Box	IP68
Output Cables	4 mm2 (12AWG) PV Wire, Length 1.2m (47.2")
Connectors	Staubli MC4
Weight	45.2 lbs (20.5 kg)

PACKAGING

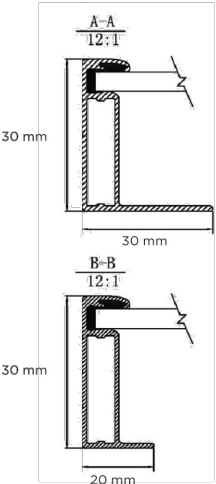
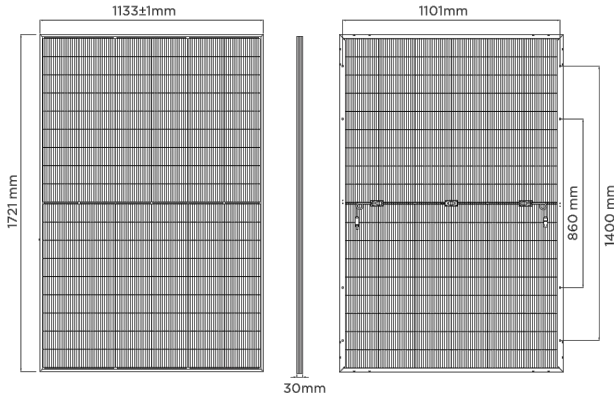
Panels Per Pallet	37
Panels Per Container	962



CertainTeed

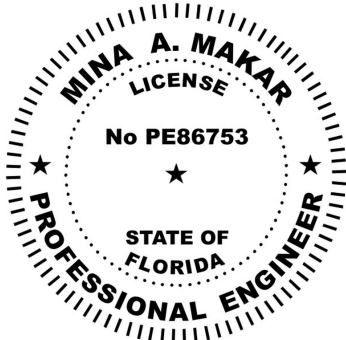
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SOLAR CONTRACTOR

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

CUSTOMER INFORMATION

GEORGE SMITH - MS187944
559 SOUTHWEST MAYFAIR LANE
LAKE CITY , FL 32024
2245428310

PV SYSTEM INFORMATION

SYSTEM SIZE (DC): 6.16 KW
14 MODULES: CERTAINTEED
CTTC440HC12-08
14 INVERTERS: ENPHASE
IQ8PLUS-72-2-US

PROJECT INFORMATION

INITIAL	DATE: 7/10/2026	DESIGNER: KJL
REV:	DATE:	DESIGNER:
REV:	DATE:	DESIGNER:

PANEL DETAIL

PV-1.4

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

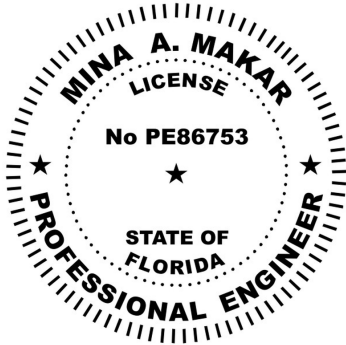


ROOF	PANEL COUNT	TILT	AZIMUTH	SHADING	LANDSCAPE MAX SPAN (ROOF AREA 1/2/3)	PORTRAIT MAX SPAN (ROOF AREA 1/2/3)	LANDSCAPE MAX CANTILEVER	PORTRAIT MAX CANTILEVER
R1	2	25°	180°	99%	48 /48 /48	48 /48 /48	24 /16 /16	24 /16 /16
R2	12	25°	360°	99%	48 /48 /48	48 /48 /48	24 /16 /16	24 /16 /16



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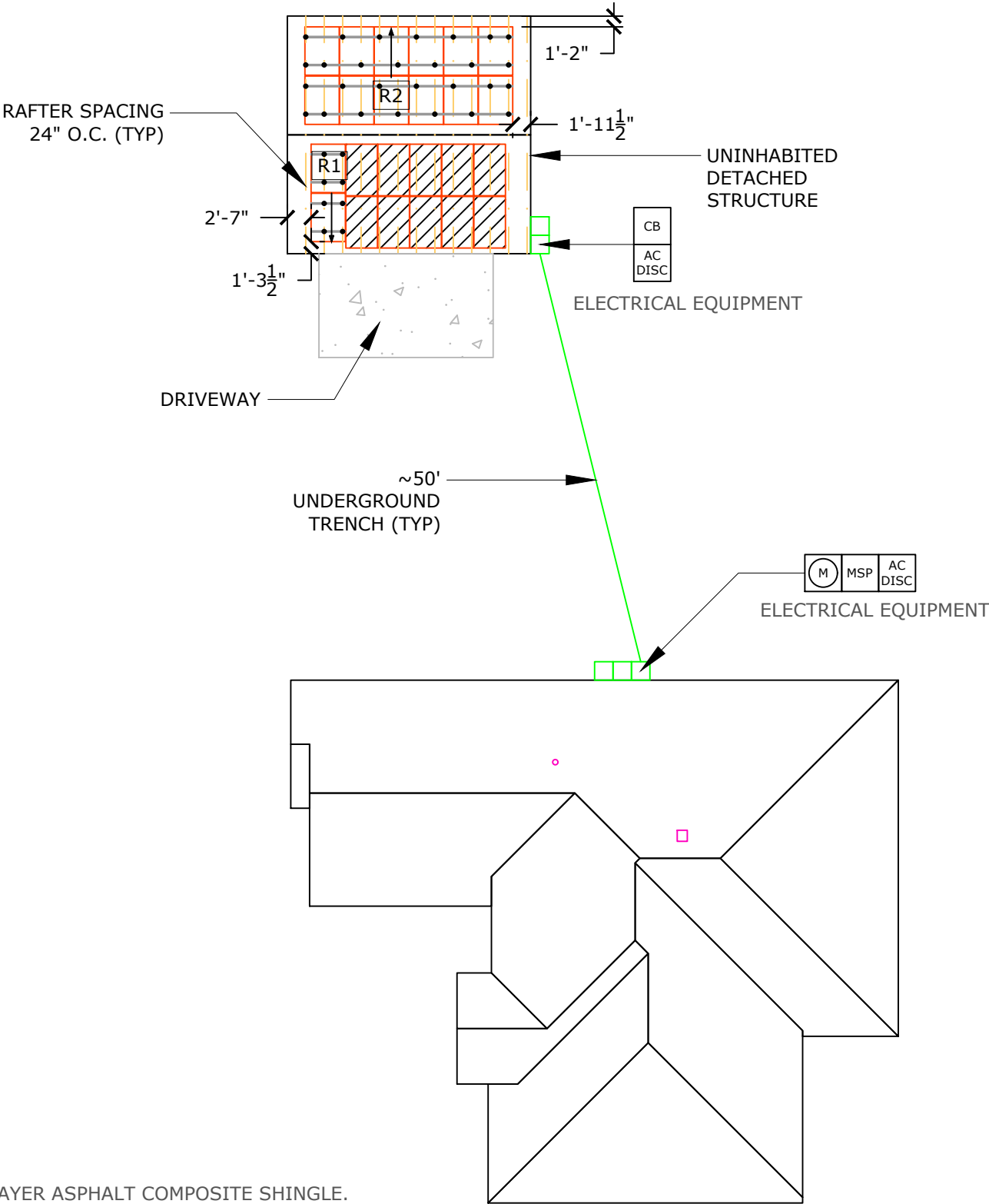
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ROOF LAYOUT

PV-2

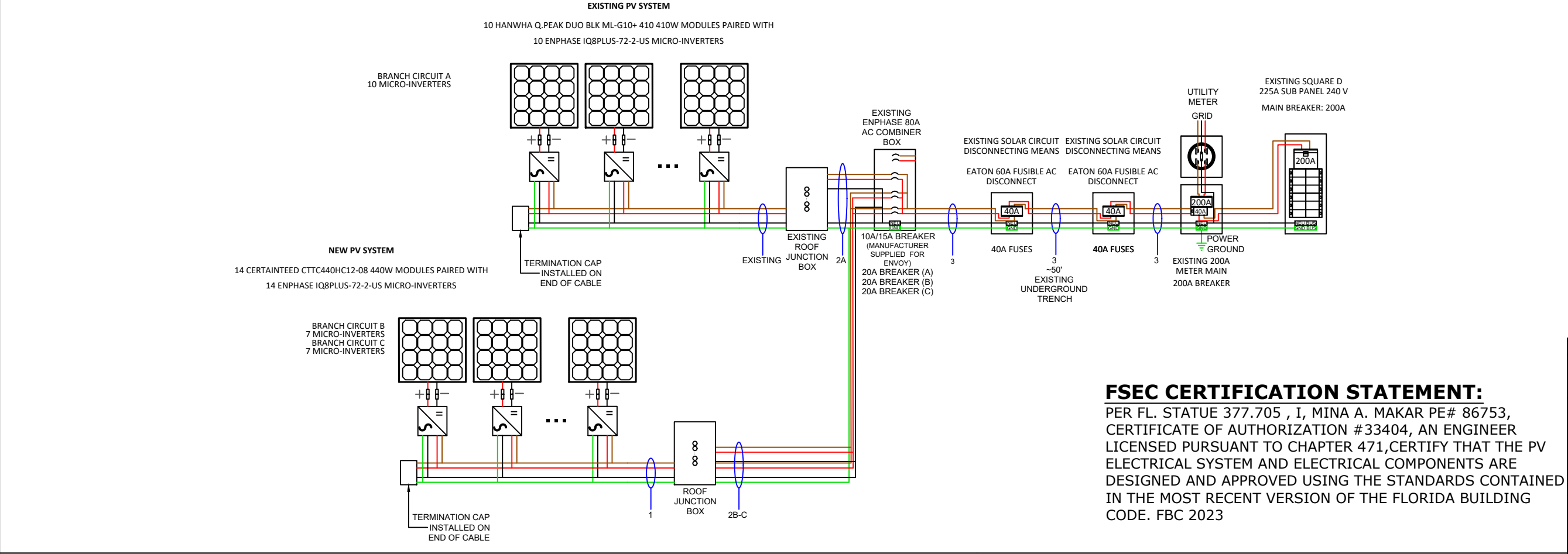


CLAMPING MAX SPACING IN ZONE 1 48" O.C
AND IN ZONE 2 AND ZONE 3 48" O.C

NOTE:
1. ROOF COVERING MATERIAL IS COMPOSED OF SINGLE LAYER ASPHALT COMPOSITE SHINGLE.
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.

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	

PV MODULE RATINGS				INVERTER RATINGS		VOLTAGE DROP CALCULATIONS														
MODULE MAKE		SOLSTICE		INVERTER MAKE		ENPHASE		FORMULA USED PER NEC HANDBOOK 215.2(A)(4) WHERE APPLICABLE												
MODEL		CERTAINTIED CTTC440HC12-08		MODEL		IQ8PLUS-72-2-US		WIRE RUN	V _{mp}	I _{mp}	R	L (FT)	V _o	% V _o	WIRE SIZE					
MAX POWER		440W		MAX OUTPUT POWER		290W		BRANCH TO J-BOX	240.00	12.1	1.98	65.83	3.154	1.31%	12 AWG					
OPEN CIRCUIT VOLTAGE		38.63V		OPEN DC VOLTAGE		60V		J-BOX TO LOAD CENTER	240.00	29.04	1.24	50.00	3.601	1.50%	10 AWG					
MPP VOLTAGE		32.98V		NOMINAL AC VOLTAGE		240V		LOAD CENTER TO AC DISCONNECT	240.00	36.3	0.778	3.00	0.169	0.07%	08 AWG					
SHORT CIRCUIT CURRENT		14.3A		MAX AC CURRENT		1.21A														
MPP CURRENT		13.36A		CEC INVERTER EFFICIENCY		97%		AC DISCONNECT TO INTERCONNECTION	240.00	36.3	0.778	10.00	0.565	0.24%	08 AWG					
NUMBER OF MODULES		14		NUMBER OF INVERTERS		14														
UL1703 COMPLIANT		YES		UL1703 COMPLIANT		YES		NEC 705.12(B)(3)(2) 120% RULE (1.25 x INVERTER OUTPUT) + MAIN OCPD ≤ BUS RATING x 1.20 (1.25 x 29.04) + 200 ≤ 200 x 1.20												
SUB PANEL BREAKER SIZE	# OF MODULES		PV BREAKER PER BRANCH		THIS SOLAR PHOTOVOLTAIC SYSTEM COMPLIES WITH THE 2023 FLORIDA BUILDING CODE AND THE 2020 NATIONAL ELECTRICAL CODE															
	UP TO 16		20A																	



NEC 705.12(B)(3)(2) 120% RULE
(1.25 x INVERTER OUTPUT) + MAIN OCPD ≤ BUS RATING x 1.20
(1.25 x 29.04) + 200 ≤ 200 x 1.20

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

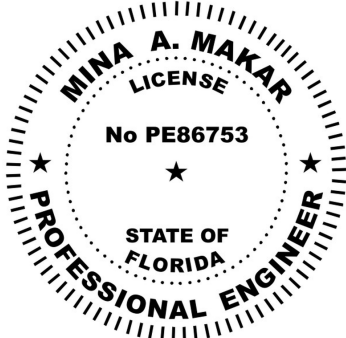
Wire Tag	Conduit	Wire Qty	Wire Gauge	Wire Type	Temp. Rating	Wire Ampacity (A)	Temp. Derate	Conduit Fill Derate	Derated Ampacity (A)	Inverter Qty	NOC (A)	NEC Correction	Design Current (A)	Ground Size	Ground Wire Type
1	OPEN AIR	3	12 AWG	Trunk Cable	90°C	30	0.96	1	28.80	10	1.21	1.25	15.13	12 AWG	Trunk Cable
2A	3/4" PVC	6	10 AWG	THWN-2	75°C	35	0.96	0.8	26.88	10	1.21	1.25	15.13	08 AWG	THWN-2
2B			10 AWG	THWN-2	75°C	35	0.96		26.88	7	1.21	1.25	10.59		
2C			10 AWG	THWN-2	75°C	35	0.96		26.88	7	1.21	1.25	10.59		
3	3/4" PVC	3 + G	08 AWG	THWN-2	75°C	50	0.96	1	48.00	24	1.21	1.25	36.30	08 AWG	THWN-2

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



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GEORGE SMITH - MS187944
559 SOUTHWEST MAYFAIR LANE
LAKE CITY , FL 32024
2245428310

PV SYSTEM INFORMATION
SYSTEM SIZE (DC): 6.16 KW
14 MODULES: CERTAINTIED CTTC440HC12-08
14 INVERTERS: ENPHASE IQ8PLUS-72-2-US

PROJECT INFORMATION

INITIAL	DATE: 7/10/2026	DESIGNER: KJL
REV:	DATE:	DESIGNER:
REV:	DATE:	DESIGNER:

THREE LINE DIAGRAM

PV-3

ELECTRICAL NOTES:

1. ALL CALCULATIONS FOR VOC, VMAX, IMP AND ISC HAVE BEEN CALCULATED USING THE MANUFACTURED STRING CALCULATOR BASED ON ASHRAE 2% HIGH AND EXTREME MINIMUM TEMPERATURE COEFFICIENTS.
2. THE ENTIRE ARRAY IS BONDED ACCORDING TO (NEC 690.43(A) THROUGH (D) WITH 250.134 OR 250.136.
3. THIS SYSTEM COMPLIES WITH NEC 2020
4. BRANCH CIRCUIT CALCULATION FOR WIRE TAG 1 DISPLAYS THE LARGEST BRANCH CIRCUIT IN SYSTEM. OTHER BRANCH CIRCUITS SHALL HAVE LOWER DESIGN CURRENT THAN THE ONE SHOWN. IN ADDITION, VOLTAGE DROP CALCULATIONS FROM PANELS TO THE COMBINER BOX SHALL BE SHOWN IN A SIMILAR FASHION
5. ALL CONDUCTORS ARE SIZED BASED ON NEC 2020 ARTICLE 310
6. ALL EQUIPMENT INSTALLED IS RATED AT 75°C
7. INVERTER NOC (NOMINAL OPEN CURRENT) OBTAINED FROM EQUIPMENT DATASHEET
8. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL LOCAL AND NATIONAL CODE REQUIREMENTS.
9. EACH MODULE MUST BE GROUNDED ACCORDING TO USER INSTRUCTIONS
10. ALL EQUIPMENT SHALL BE LISTED PER NEC 690.4(B)
11. PER NEC 690.13, 690.15, PROVIDE A WARNING SIGN AT ALL LOCATIONS WHERE TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION> SIGN SHALL READ *WARNING - ELECTRIC SHOCK HAZARD - DO NOT TOUCH TERMINALS - OR EQUIVALENT.
12. PER NEC 705.10, PROVIDE A PERMANENT PLAQUE OR DIRECTORY SHOWING ALL ELECTRIC POWER SOURCES ON THE PREMISES AT SERVICE ENTRANCE.
13. INTERCONNECTION METHOD SHALL COMPLY WITH NEC 705.12
14. AND OPTION FOR A SINGLE CIRCUIT BRANCH TO BE SPLIT INTO TWO SUB-CIRCUIT BRANCHES IS ACCEPTABLE.
15. ALL CONDUCTORS MUST BE COPPER.
16. NEUTRAL AND EQUIPMENT GROUNDING CONDUCTOR BONDED AS PER NEC 250.24(C).
17. EQUIPMENT GROUNDING CONDUCTOR IS CONNECTED TO A GROUNDING ELECTRODE SYSTEM PER 250.54(D).
18. FUSES FOR PV DISCONNECT HAVE AIC RATINGS OF 200KA AC AND 20KA DC.
19. SUPPLY SIDE CONNECTION SHALL BE MADE USING ILSKO INSULATION PIERCING CONNECTORS (IPC). MAKE, MODEL, AND RATING OF INTERCONNECTION CAN BE SEEN ON TABLE 1 BELOW.
20. METHOD OF INTERCONNECTION CAN BE SEEN IN FIGURE 1.
21. UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.

22. WORKING CLEARANCES AROUND THE EXISTING AND NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC ARTICLE 110.26.
23. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C)(1) AND ARTICLE 310.8 (D).
24. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.10 (C).
25. TOTAL AREA OF ALL CONDUCTORS, SPLICES, AND TAPS INSTALLED AT ANY CROSS SECTION OF THE WIRING DOES NOT EXCEED 75% OF THE CROSS SECTIONAL AREA OF THE SPACE. NEC 312.8(A)(2).
26. SYSTEM IS CONSIDERED AN AC MODULE SYSTEM. NO DC CONDUCTORS ARE PRESENT IN CONDUIT, COMBINER, JUNCTION BOX, DISCONNECT. AND COMPLIES WITH 690.6 - NO DC DISCONNECT AND ASSOCIATED DC LABELING ARE REQUIRED.
27. SYSTEM COMPLIES WITH 690.12 RAPID SHUTDOWN AND ASSOCIATED LABELING AS PER 690.56(C). AC VOLTAGE AND SYSTEM OPERATING CURRENT SHALL BE PROVIDED 690.51.
28. CONDUCTORS IN CONDUIT ARE AC CONDUCTORS BRANCH CIRCUITS AND NOT PV SOURCE CIRCUITS. 690.6.
29. ALL GROUNDING SHALL COMPLY WITH 690.47(A) IN THAT THE AC MODULES WILL COMPLY WITH 250.64.
30. NO TERMINALS SHALL BE ENERGIZED IN THE OPEN POSITION IN THIS AC MODULE SYSTEM 690.13(B), 690.6.
31. WHERE APPLICABLE: INTERCONNECTION SHALL COMPLY WITH 705.11(A) THROUGH (E) OR 705.12(B) THROUGH (E)
32. ALL WARNING SIGN(S) OR LABEL(S) SHALL COMPLY WITH 2020 NEC ARTICLE 110.21(B). LABEL WARNINGS SHALL ADEQUATELY WARN OF THE HAZARD. LABELS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT, AND LABELS REQUIRED SHALL BE SUITABLE FOR THE ENVIRONMENT.
33. PV POWER CIRCUIT LABELS SHALL APPEAR ON EVERY SECTION OF THE WIRING SYSTEM THAT IS SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.

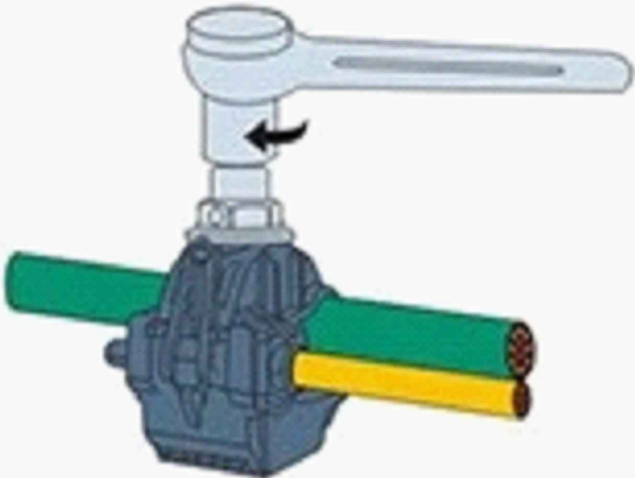
TABLE 1:

MAKE	MODEL	VOLTAGE RATING	CONDUCTOR RANGE MAIN	CONDUCTOR RANGE TAP
ILSCO	IPC 4006	600 V	4/0-4 AWG	6-14 AWG
ILSCO	IPC 4020	600 V	4/0-2 AWG	2/0-6 AWG

INSTRUCTIONS FOR LINE TAPS

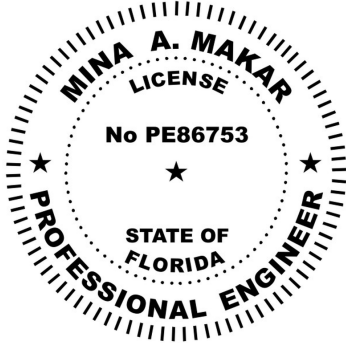
FIGURE 1:

1. ADJUST THE CONNECTOR NUT TO SUITABLE LOCATION
2. PUT THE BRANCH WIRE INTO THE CAP SHEATH FULLY
3. INSERT THE MAIN WIRE, IF THERE ARE TWO LAYS OF INSULATED LAY IN THE MAIN CABLE, SHOULD STRIP A CERTAIN LENGTH OF THE FIRST INSULATED LAY FROM INSERTED END
4. TURN THE NUT BY HAND, AND FIX THE CONNECTOR IN SUITABLE LOCATION.
5. SCREW THE NUT WITH THE SLEEVE SPANNER.
6. SCREW THE NUT CONTINUALLY UNTIL THE TOP PART IS CRACKED AND DROPPED DOWN



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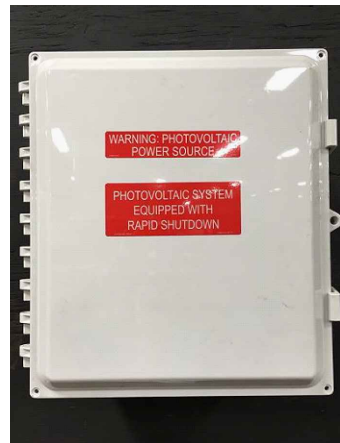
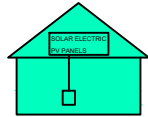
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14 MODULES: CERTAINTED
CTTC440HC12-08
14 INVERTERS: ENPHASE
IQ8PLUS-72-2-US

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REV:	DATE:	DESIGNER:
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ELECTRICAL CONT.

PV-3.1

ALL WARNING SIGN(S) OR LABEL(S) SHALL COMPLY WITH NEC ARTICLE 110.21(B). LABEL WARNINGS SHALL ADEQUATELY WARN OF THE HAZARD. LABELS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT, AND LABELS REQUIRED SHALL BE SUITABLE FOR THE ENVIRONMENT.							
TAG	LABEL		QUANTITY	LOCATION	NOTE	EXAMPLES	
○	⚠ CAUTION AC SOLAR VOLTAGE		12	AC CONDUITS	1 AT EVERY SEPARATION BY ENCLOSURES / WALLS / PARTITIONS / CEILINGS / FLOORS <u>OR</u> NO MORE THAN 10'		
○	WARNING: PHOTOVOLTAIC POWER SOURCE	PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN	1	COMBINER BOX	1 AT ANY COMBINER BOX		
○	⚠ WARNING ELECTRICAL SHOCK HAZARD TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION		1	JUNCTION BOX	1 AT ANY JUNCTION BOX		
○	PHOTOVOLTAIC SYSTEM ⚠ AC DISCONNECT ⚠ RATED AC OUTPUT CURRENT 29.04 A NOMINAL OPERATING AC VOLTAGE 240 V	⚠ WARNING ELECTRICAL SHOCK HAZARD TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION	1	AC DISCONNECT (RSD SWITCH)	1 OF EACH AT FUSED AC DISCONNECT COMPLETE VOLTAGE AND CURRENT VALUES ON DISCONNECT LABEL		
○	⚠ CAUTION POWER TO THIS SERVICE IS ALSO SUPPLIED FROM ON-SITE SOLAR GENERATION AC SYSTEM DISCONNECT	RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM PHOTOVOLTAIC SYSTEM INSTALLED BY MOMENTUM SOLAR 3096 B HAMILTON BLVD S. PLAINFIELD, NJ 07080 PHONE NUMBER: 732-902-6224					
○	⚠ WARNING DUAL POWER SUPPLY SECOND SOURCE IS PHOTOVOLTAIC SYSTEM	REVENUE METER	1	UTILITY METER	1 AT UTILITY METER		
○	EMERGENCY RESPONDER THIS SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN ENTIRE PV SYSTEM SECTIONS OF THE PV SYSTEM THAT ARE SHUT DOWN WHEN THE RAPID SHUTDOWN SWITCH IS OPERATED SECTIONS OF THE PV SYSTEM THAT ARE NOT SHUT DOWN WHEN THE RAPID SHUTDOWN SWITCH IS OPERATED 	⚠ WARNING DUAL POWER SUPPLY SECOND SOURCE IS PHOTOVOLTAIC SYSTEM	1	INTERCONNECTION POINT	1 OF EACH AT BUILDING INTERCONNECTION POINT		
	⚠ WARNING POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE		1	BACKFEED PANEL			
○	NOMINAL OPERATING AC VOLTAGE : 240V NOMINAL OPERATING AC FREQUENCY : 60HZ MAXIMUM AC POWER : VA MAXIMUM AC CURRENT : A MAXIMUM OVERCURRENT DEVICE RATING FOR AC MODULE PROTECTION : 20A		1	AC CURRENT PV MODULES			



momentum
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PROFESSIONAL ENGINEERING

MINA A. MAKAR

LICENSE

No PE86753

STATE OF FLORIDA

PROFESSIONAL ENGINEER

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PV-3.2				