SCOPE OF WORK

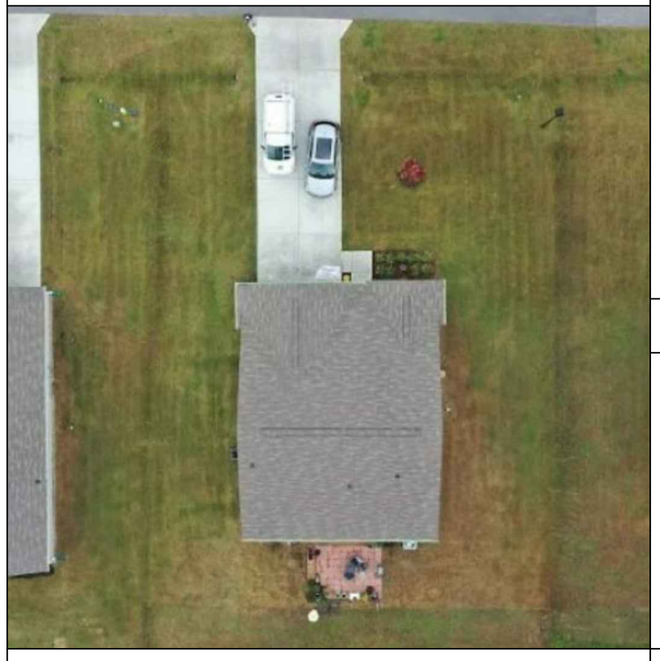
INSTALL A ROOF-MOUNTED PV SYSTEM:

- (17) CERTAINTEED CT370HC11-06 MODULES
- (17) ENPHASE IQ8PLUS-72-2-US (240V) MICROINVERTERS
- (01) ENPHASE COMBINER BOX 4
- (01) NON-FUSED AC DISCONNECT

TOTAL PV SIZE: 6.290KW DC, 5.701KW CEC AC

TABLE OF CONTENTS

AERIAL PHOTO



GOVERNING CODES

ALL WORK TO COMPLY WITH:

- 2018 INTERNATIONAL BUILDING CODE
- 2018 INTERNATIONAL RESIDENTIAL CODE
- 2017 NATIONAL ELECTRICAL CODE
- 2013 INTERNATIONAL FIRE CODE

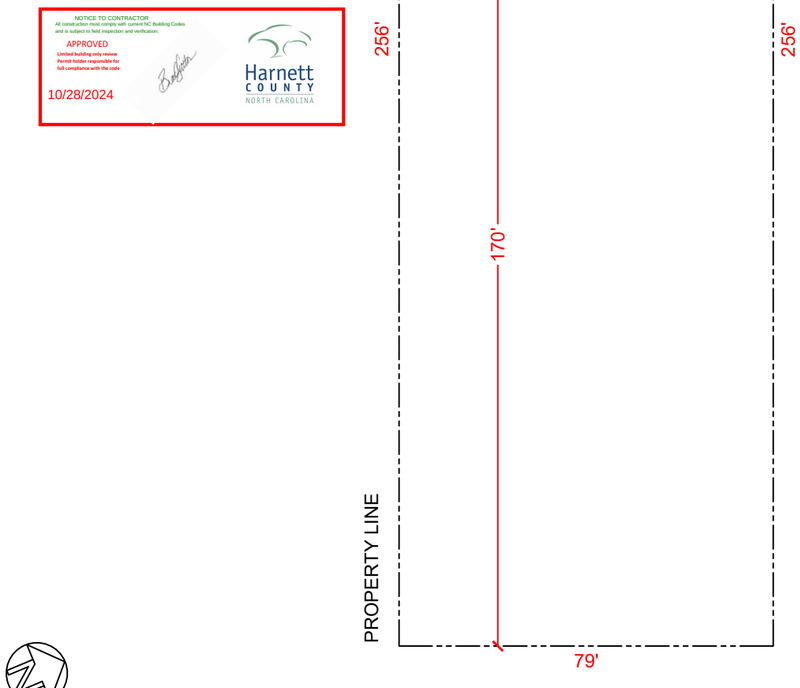
GENERAL NOTES

- ALL WORK SHALL CONFORM TO APPLICABLE BUILDING, ELECTRICAL CODE AND ANY LOCALLY ADOPTED ORDINANCES.
- DRAWINGS ARE DIAGRAMMATIC, SITE CONDITIONS SHALL PREVAIL. IF NO SCALE IS GIVEN, DRAWINGS ARE NOT TO SCALE. ALL DIMENSIONS SHALL BE VERIFIED BY THE CONTRACTOR IN THE FIELD UPON COMMENCEMENT OF CONSTRUCTION.
- ALL CONDUIT AND WIRE RUNS ARE DIAGRAMMATIC, SUBJECT TO FIELD CONDITIONS ROUTING OF RACEWAYS SHALL BE FINALIZED BY THE CONTRACTOR. IF THE DISTANCES FOR WIRE RUNS ARE DIFFERENT THAN AS SHOWN, THE CONTRACTOR SHALL NOTIFY THE DESIGN TEAM TO VALIDATE THE WIRE SIZE.
- ALL EQUIPMENT SHALL BE LISTED AND LABELED BY A RECOGNIZED TESTING LABORATORY AND INSTALLED PER THE LISTING AND MANUFACTURER'S REQUIREMENTS.
- ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH REQUIRED ACCESS AND WORKING CLEARANCES PER CEC ARTICLE 110.
- ALL NEW MAIN SERVICE PANELS AND SUBPANELS WILL HAVE APPROPRIATE FIELD IDENTIFICATION PER CEC 408.4.
- ALL EQUIPMENT WILL BE INSTALLED WHERE IT IS NOT EXPOSED TO PHYSICAL DAMAGE PER CEC110.27(B).

SITE DETAILS

ASHRAE MIN TEMP	-12°C
ASHRAE 2% HIGH TEMP	34°C
BUILDING OCCUPANCY	R-3
TYPE OF CONSTRUCTION	V-B
SPRINKLERS SYSTEM PER NFPA 13D	NO
# OF STORIES	2
WIND SPEED (ASCE 7-10)	120 MPH
WIND EXPOSURE	B
RISK CATEGORY	II
GROUND SNOW LOAD	15 PSF
SQUARE FOOTAGE	1173 SQ FT
UTILITY PROVIDER	DUKE ENERGY

SITE PLAN



NOTICE TO CONTRACTOR
All construction must comply with current NC Building Codes and is subject to field inspection and verification.
APPROVED
Limited building only review
Permit holder responsible for full compliance with the code
10/28/2024
Harnett COUNTY NORTH CAROLINA

RENU ENERGY SOLUTIONS, LLC
801 PRESSLEY ROAD, SUITE 100
CHARLOTTE, NORTH CAROLINA, 28217
704-525-6767 | RENUENERGYSOLUTIONS.COM

NC GC #76615
NC ELE #U.34519

PREPARED BY:
HIGH LINE DESIGNS
SCOTT TOYAMA

SCALE: 1/32" = 1'-0"	AHJ: HARNETT COUNTY
SHEET SIZE: 11" x 17"	APN: 0662369486000
TEMPLATE V2.0	DATE: 10/11/2024

EDWARD BISHOP
232 BARNSLEY RD
ANGIER, NC 27501

PV-1
COVER SHEET

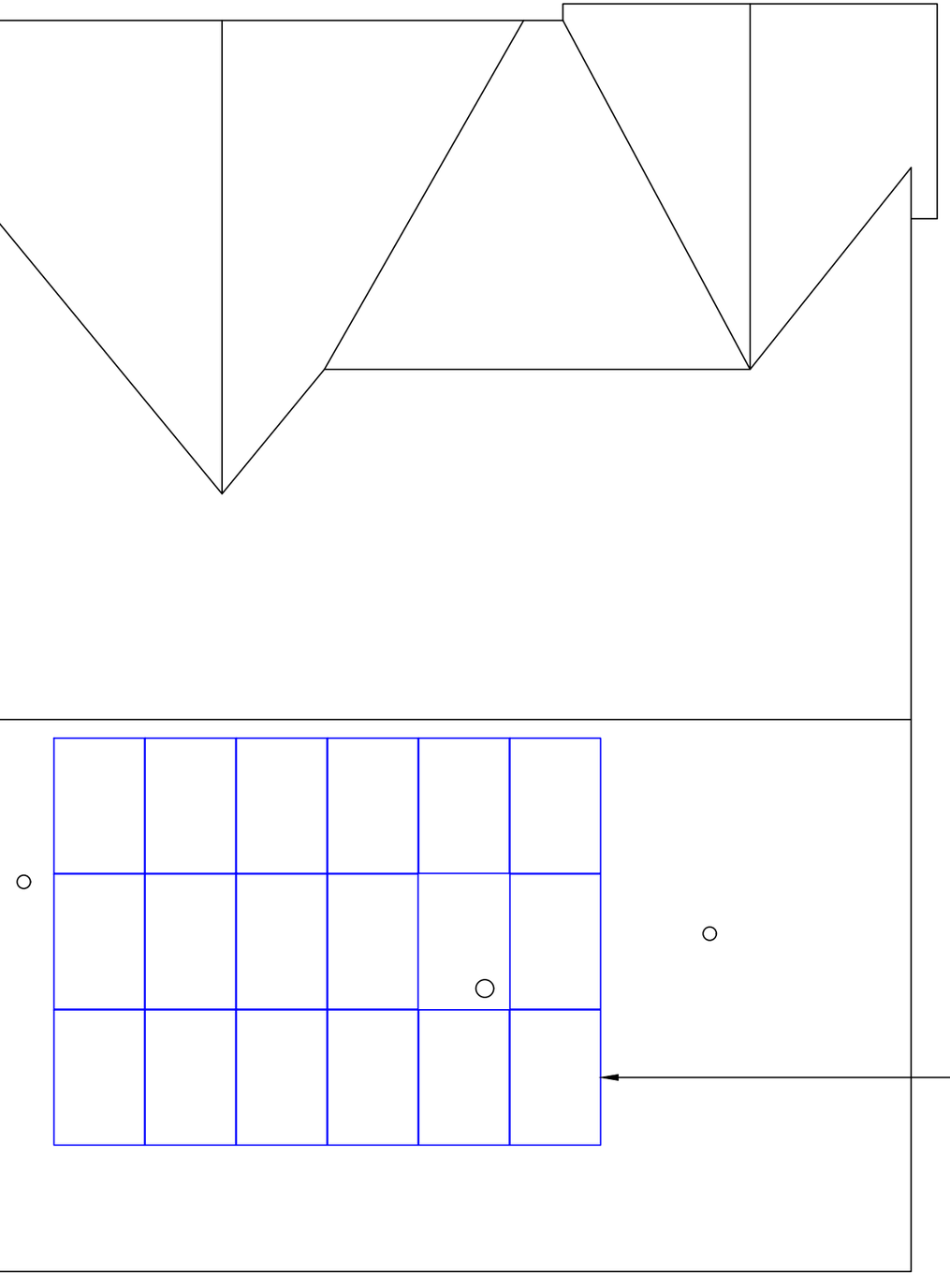
BARNSLEY RD

PV ROOF COVERAGE				
(E) PV AREA [SQ FT]	(N) PV AREA [SQ FT]	TOTAL PV AREA [SQ FT]	TOTAL ROOF AREA [SQ FT]	PERCENTAGE COVERED BY PV
0	296.77	296.77	1709.07	17%

LEGEND

○ □ - ROOF OBSTRUCTION

(N) ENPHASE COMBINER BOX 4
(N) NON-FUSED AC DISCONNECT
(E) UTILITY METER
(E) MAIN HOUSE PANEL



(17) CERTAINTEED CT370HC11-06 MODULES WITH
(17) ENPHASE IQ8PLUS-72-2-US MICROINVERTERS

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NC GC #76615
NC ELE #U.34519

PREPARED BY:
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SCOTT TOYAMA

SCALE: 3/16" = 1'-0"	AHJ: HARNETT COUNTY
SHEET SIZE: 11" x 17"	APN: 0662369486000
TEMPLATE V2.0	DATE: 10/11/2024

EDWARD BISHOP

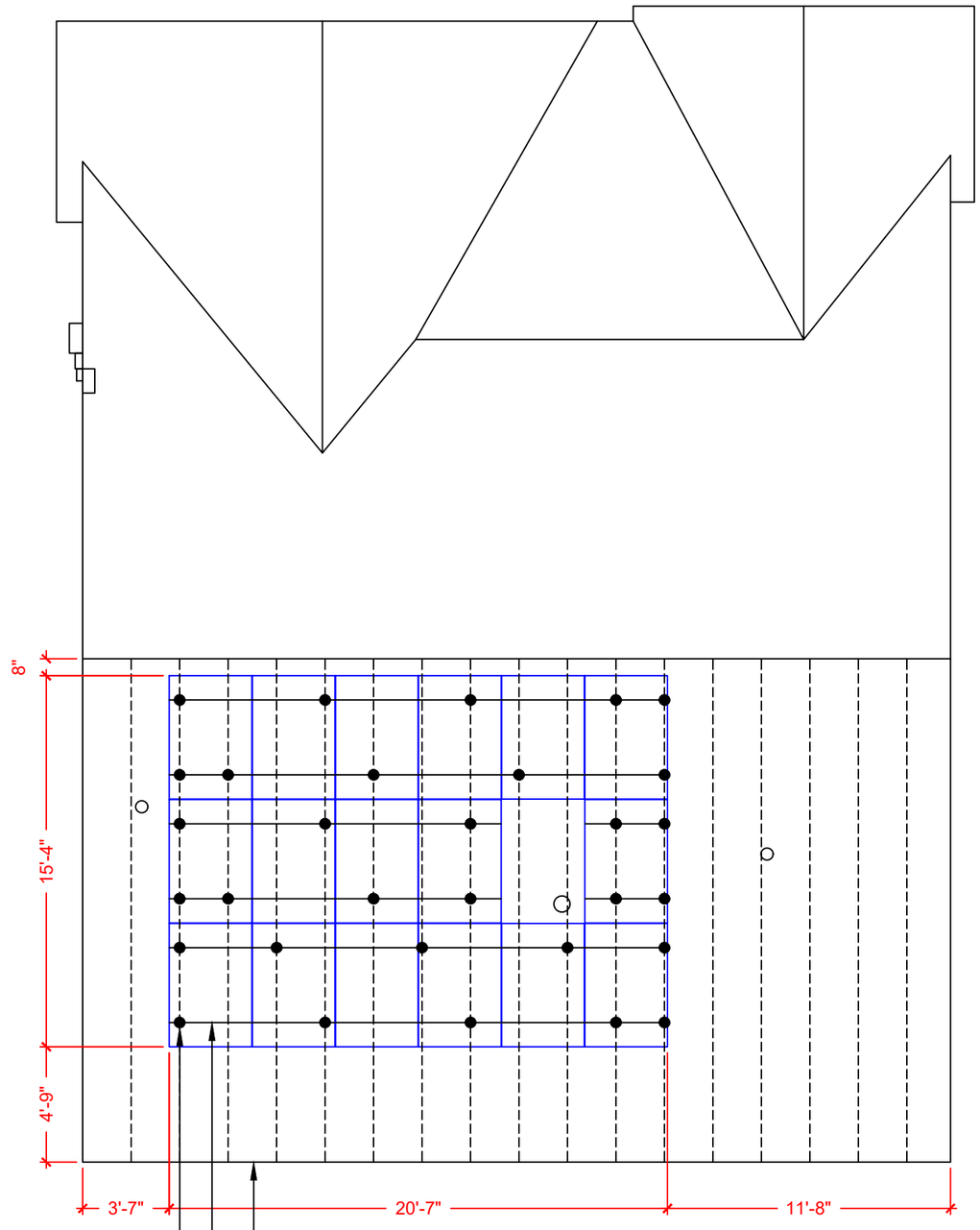
232 BARNSLEY RD
ANGIER, NC 27501

PV-2
ROOF PLAN & MODULES

LEGEND

- - - - RAFTER OR TRUSS
● - ROOF ATTACHMENT
○ □ - ROOF OBSTRUCTION

BARNSLEY RD

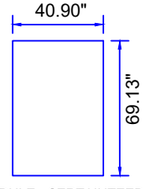


ROOF DESCRIPTION

ROOF	ROOF TILT	AZIMUTH	ROOF MATERIAL	TRUSS SIZE	TRUSS SPACING	MAX SPAN
#1	28°	113°	COMP SHINGLE	2" X 4"	24" O.C.	9'-2"

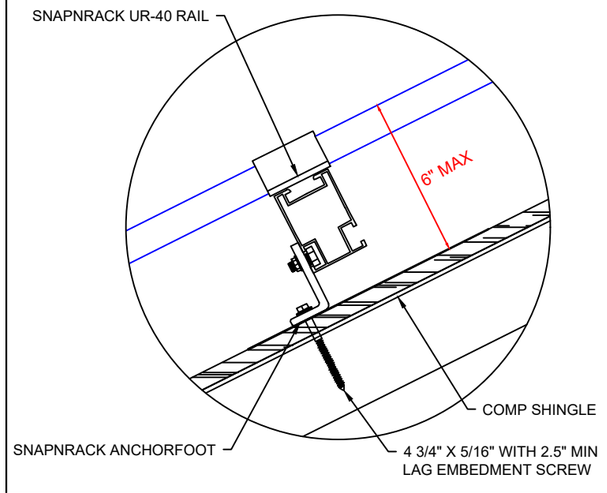
STRUCTURAL INFORMATION

NUMBER OF MODULES	17	--
MODULE WEIGHT	45.19	LBS
TOTAL MODULE (ARRAY) WEIGHT	768.23	LBS
NUMBER OF ATTACHMENT POINT	31	--
MOUNTING SYSTEM WEIGHT (PER MODULE)	0.55	LBS
MOUNTING SYSTEM WEIGHT	17.05	LBS
TOTAL SYSTEM WEIGHT	785.28	LBS
WEIGHT AT EACH ATTACHMENT POINT	24.78	LBS
MODULE AREA (69.13"X40.90")	19.63	SQFT
TOTAL ARRAY AREA	296.77	SQFT
DISTRIBUTED LOAD	2.65	PER SQFT



MODULE : CERTAINTEED
CT370HC11-06

ROOF ATTACHMENT DETAIL



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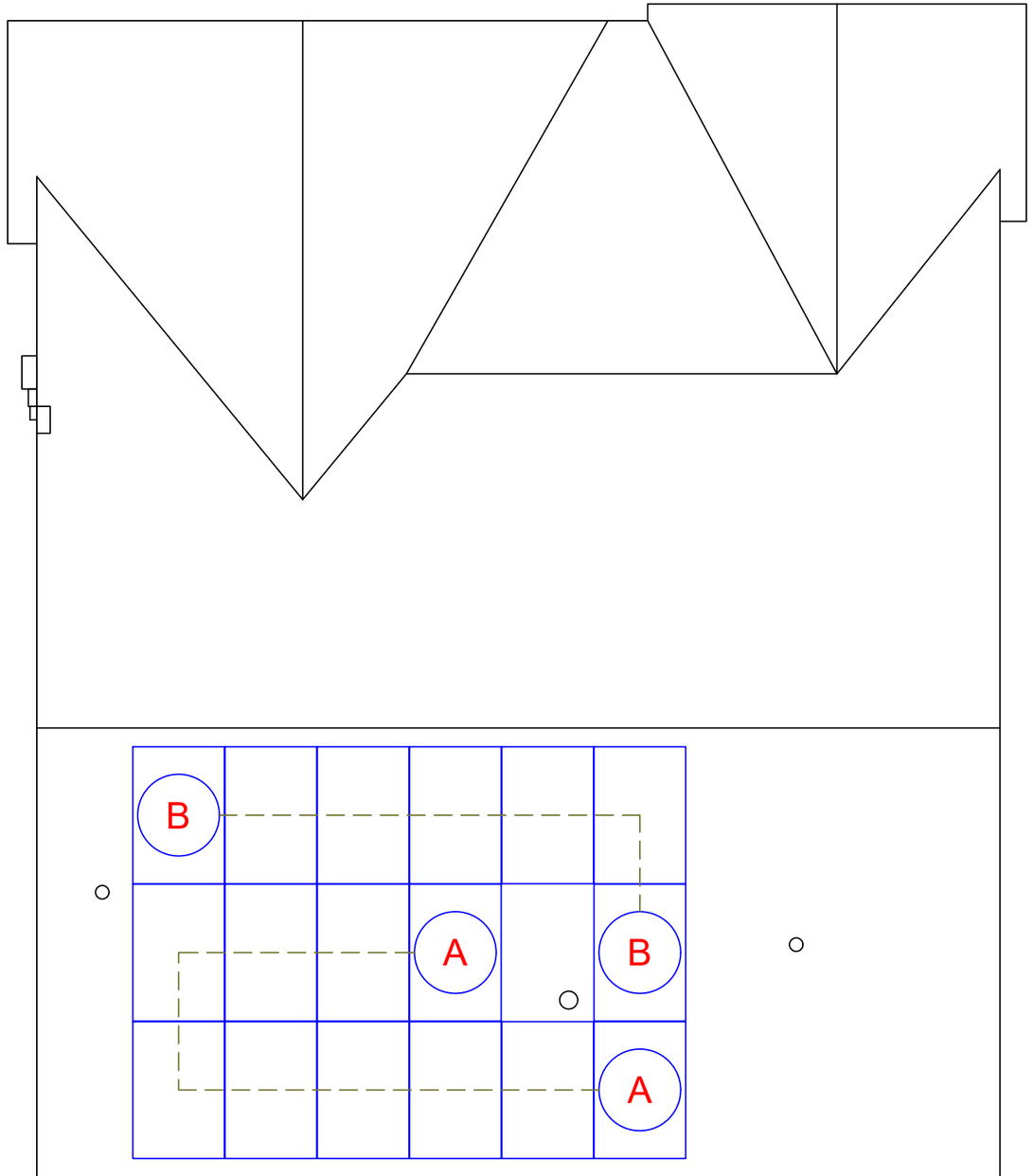
ANGIER, NC 27501

PV-2A
ROOF, MODULES & ATTACHMENT DETAILS

BARNSLEY RD



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EDWARD BISHOP

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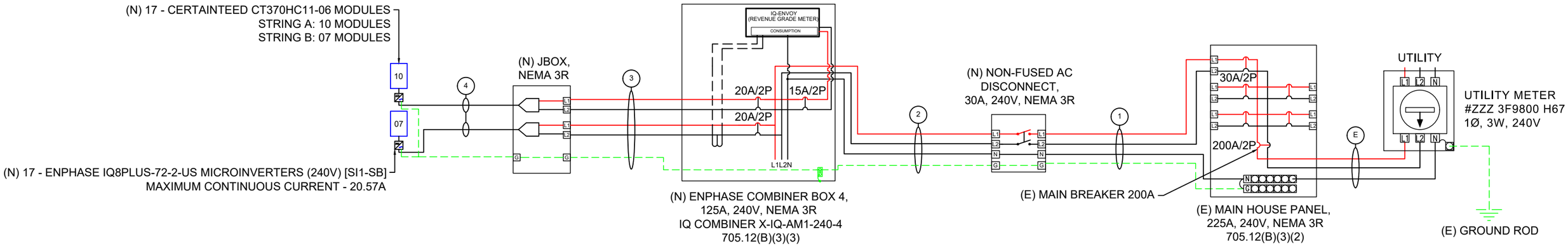
ANGIER, NC 27501

PV-3
STRINGING PAGE

ID	TYPICAL	CONDUCTOR	NEUTRAL	EGC	CONDUIT	CURRENT-CARRYING CONDUCTORS IN CONDUIT	OCPD	TEMP. CORR. FACTOR	CONDUIT FILL FACTOR	CONT. CURRENT	MAX CURRENT (125%)	BASE AMP.	DERATED AMP.	TERM TEMP. RATING	AMP. @ TERMINAL
1	1	10 AWG THHN, COPPER	10 AWG THHN, COPPER	10 AWG THHN, COPPER	0.75" DIA	2	30A	0.96 (34°C)	1	20.6A	25.7A	40A	38.4A	75°C	35A
2	1	10 AWG THHN, COPPER	10 AWG THHN, COPPER	10 AWG THHN, COPPER	0.75" DIA	2	N/A	0.96 (34°C)	1	20.6A	25.7A	40A	38.4A	75°C	35A
3	1	10 AWG THHN, COPPER	N/A	10 AWG THHN, COPPER	0.75" DIA	4	20A	0.96 (34°C)	0.8	12.1A	15.1A	40A	30.7A	75°C	35A
4	2	12 AWG Q CABLE, COPPER	N/A	6 AWG SOLID BARE COPPER	FREE AIR	2	N/A	0.96 (34°C)	1	12.1A	15.1A	N/A	N/A	75°C	20A

NEW SOLAR PROJECT
6.29 KW DC, 4.93 KW AC



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NC GC #76615
NC ELE #U.34519

PREPARED BY:
HIGH LINE DESIGNS
SCOTT TOYAMA

SCALE: NTS
SHEET SIZE: 11" x 17"
TEMPLATE V2.0

AHJ: HARNETT COUNTY
APN: 0662369486000
DATE: 10/11/2024

EDWARD BISHOP
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ANGIER, NC 27501

PV-4
THREE-LINE DIAGRAM

MODULES										
REF.	QTY.	MAKE AND MODEL	PMAX	PTC	ISC	IMP	VOC	VMP	TEMP. COFF. OF VOC	FUSE RATING
(N) PV MODULES	17	CERTAINTEED CT370HC11-06	370W	345.72W	11.51A	10.87A	40.8V	34.06V	-0.29%/°C	20A

INVERTERS									
REF.	QTY.	MAKE AND MODEL	AC VOLTAGE	GROUND	OCPD RATING	RATED POWER	MAX OUTPUT CURRENT	MAX INPUT CURRENT	MAX INPUT VOLTAGE	CEC WEIGHTED EFFICIENCY
(N) MICROINVERTERS	17	ENPHASE IQ8PLUS-72-2-US	240V	FLOATING	20A	290W	1.21A	15A	60V	97.0%

DISCONNECTS					
REF.	QTY.	MAKE AND MODEL	FUSES	RATED CURRENT	MAX RATED VOLTAGE
(N) DISCONNECT	1	EATON OR EQUIVALENT	N/A	30A	240V

OCPDS				
REF.	QTY.	MAKE AND MODEL	RATED CURRENT	MAX VOLTAGE
MAIN HOUSE PANEL	1	CUTLER HAMMER CH230	30A	240V
IQ COMBINER	2	EATON BR220	20A	240V

DESIGN TEMPERATURES	
ASHRAE EXTREME LOW	-12°C (10.4°F), SOURCE: RALEIGH DURHAM INTERNATIONAL
ASHRAE 2% HIGH	34°C (93.2°F), SOURCE: RALEIGH DURHAM INTERNATIONAL

SYSTEM SUMMARY		
	BRANCH #A	BRANCH #B
INVERTERS PER BRANCH	10	07
MAX AC CURRENT	12.1A	8.5A
INVERTERS PER BRANCH	2900W	2030W
MAX AC CURRENT	20.57A	
MAX AC POWER	4930W	

INVERTER OUTPUT CALCULATIONS & 705.12 COMPLIANCE

INVERTER OUTPUT CIRCUIT	INVERTER OR ESS	# OF INVERTERS / ESS	CONTINUOUS OUTPUT	125% SAFETY FACTOR	TOTAL BACKFEED	MINIMUM BREAKER SIZE
#1	IQ8PLUS	10	1.21A	125%	15.13A	20A
#2	IQ8PLUS	7	1.21A	125%	10.59A	20A
TOTAL					25.71A	30A

PANEL	705.12 COMPLIANCE	BUSBAR	OCPD PROTECTING PANEL	BUSBAR X 120%	MAX GENERATION BACKFEED
MSP	705.12(B)(3)(2)	225A	200A	270A	70A
IQ COMBINER	705.12(B)(3)(3)	125A	N/A	N/A	N/A

ELECTRICAL NOTES (APPLICABILITY BASED ON SCOPE OF WORK)

AS-BUILT CHANGES TO THE ABOVE WIRING ARE PERMISSIBLE AS LONG AS SUBSITUTIONS ARE CODE COMPLIANT. FOR EXAMPLE, APPROPRIATELY SIZED NM-B MAY BE USED FOR MICROINVERTER OUTPUT CIRCUITS IF INSTALLED IN ACCORDANCE WITH NEC ARTICLE 334, OR MC CABLE MAY BE USED FOR DC SOLAR STRINGS IF INSTALLED IN ACCORDANCE WITH NEC ARTICLE 330.

ALL OUTDOOR EQUIPMENT SHALL BE RAINTIGHT & HOLD A MINIMUM NEMA 3R RATING, INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES. CONDUCTORS EXPOSED TO WET CONDITIONS SHALL BE SUITABLE FOR USE IN WET CONDITIONS PER NEC 310.10(C).

ALL TERMINAL TEMPERATURES OF EQUIPMENT WILL BE VERIFIED TO BE RATED FOR 75°C, OR THE WIRE WILL NEED TO BE RESIZED USING THE 60°C TERMINAL TEMPERATURE RATINGS FOR 100A OR LESS.

ALL NM-B SHALL BE INSTALLED AND PROTECTED PER NEC 334, AND ALL SER CABLE SHALL BE INSTALLED AND PROTECTED PER NEC 338.

ALL ROOFTOP RACEWAYS AND CABLES EXPOSED TO DIRECT SUNLIGHT WILL BE INSTALLED >7/8" ABOVE THE ROOF.

ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250. A SUPPLEMENTAL GROUND ROD WILL BE DRIVEN IN ACCORDANCE WITH NEC 250.53(A)(3) IF THE EXISTING GROUND ROD HAS A RESISTANCE TO EARTH THAT IS GREATER THAN 25 OHMS.

IF ANY EXISTING LOAD CONDUCTORS ARE EXTENDED BY MORE THAN 6', AFCI PROTECTION WILL BE PROVIDED PER NEC 210.12(D).

PER NEC 690.47(A) PV SYSTEMS THAT ARE NOT SOLIDLY GROUNDED, THE EQUIPMENT GROUNDING CONDUCTOR FOR THE OUTPUT OF THE PV SYSTEMS SHALL BE PERMITTED TO BE THE CONNECTION TO GROUND FOR GROUND-FAULT PROTECTION AND EQUIPMENT GROUNDING OF THE PV ARRAY.

THE ESS CIRCUIT BREAKER SHALL BE SECURED IN PLACE BY AN ADDITIONAL FASTENER PER NEC 408.36(D).

NO SINGLE BACK-UP LOAD WILL BE LARGER THAN THE MAXIMUM CONTINUOUS OUTPUT OF THE ESS PER NEC 710.15(A).

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NC GC #76615
NC ELE #U.34519

PREPARED BY:
HIGH LINE DESIGNS
SCOTT TOYAMA

SCALE: NTS
SHEET SIZE: 11" x 17"
TEMPLATE V2.0

AHJ: HARNETT COUNTY
APN: 0662369486000
DATE: 10/11/2024

EDWARD BISHOP
232 BARNSLEY RD
ANGIER, NC 27501

PV-4A
DESIGN TABLES

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

LABEL 1
AT EACH DISCONNECTING MEANS FOR PHOTOVOLTAIC EQUIPMENT (2" X 4").
[NEC 690.13(B)].

⚠ WARNING

POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL 2
AT POINT OF INTERCONNECTION OVERCURRENT DEVICE (2" X 4").
[NEC 705.12(B)(3)(2)].

PHOTOVOLTAIC SYSTEM
⚠ AC DISCONNECT ⚠

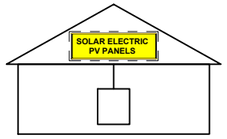
RATED AC OUTPUT CURRENT	20.57	A
NOMINAL OPERATING AC VOLTAGE	240	V

LABEL 3
AT POINT OF INTERCONNECTION, MARKED AT DISCONNECTING MEANS (4" X 2").
[NEC 690.54]

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL 4
AT RAPID SHUTDOWN DISCONNECT SWITCH (5 1/4" X 2").
[NEC 690.56(C)(3)].

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN



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

LABEL 5
AT RAPID SHUTDOWN SYSTEM (3 3/4" X 5 1/4"). [NEC 690.56(C)(1)(A)].

⚠ WARNING

TRI POWER SUPPLY

SOURCES: UTILITY GRID, PV SOLAR & BATTERY ELECTRIC SYSTEM

LABEL 6
AT POINT OF INTERCONNECTION (2 3/4" X 1 5/8").

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL 7
AT EXPOSED RACEWAYS, CABLE TRAYS, AND OTHER WIRING METHODS; SPACED AT MAXIMUM 10 FT SECTION OR WHERE SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS (5 3/4" X 1 1/8").
[NEC 690.31(G)]
LETTERS AT LEAST 3/8 INCH; WHITE ON RED BACKGROUND; REFLECTIVE
[IFC 605.11.1.1]

LABELING NOTES
1.1 LABELING REQUIREMENTS BASED ON THE 2020 NATIONAL ELECTRICAL CODE, INTERNATIONAL FIRE CODE 605.11, OSHA STANDARD 1910.145, ANSI Z535
1.2 MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
1.3 LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
1.4 LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8" AND PERMANENTLY AFFIXED.
1.5 ALERTING WORDS TO BE COLOR CODED. "DANGER" WILL HAVE RED BACKGROUND; "WARNING" WILL HAVE ORANGE BACKGROUND; "CAUTION" WILL HAVE YELLOW BACKGROUND. [ANSI Z535]

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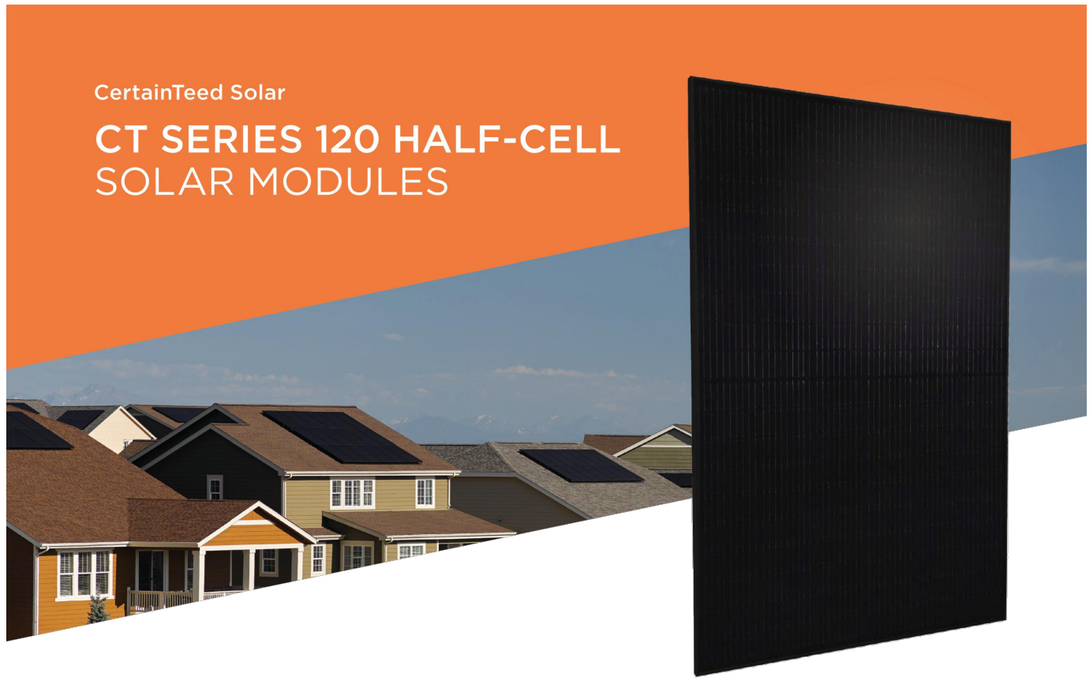
PV-5
LABELS & PLACARDS

CertainTeed Solar

CT SERIES 120 HALF-CELL SOLAR MODULES



Half-Cell Monocrystalline Type

CT360HC11-06
CT365HC11-06
CT370HC11-06

Features and Benefits

High Quality / High Power

- Up to 370W with black backsheet
- UL listed (UL 61730)
- Positive power output tolerance

Limited Warranty*

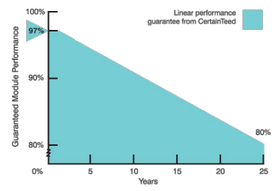
- 25-year linear power output warranty

*See CertainTeed's limited warranty for details

intertek

See reverse for product specifications

Power Output Warranty



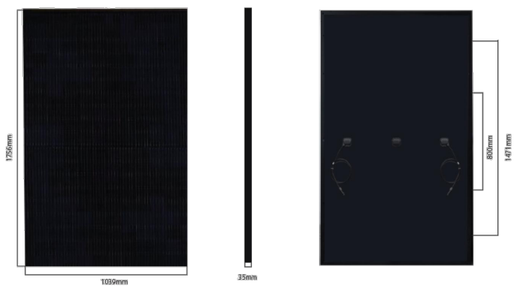
Electrical Characteristics

		360W	365W	370W
Nominal Output (Pmpp)	W	360	365	370
Voltage at Pmax (Vmpp)	V	33.8	33.96	34.06
Current at Pmax (Impp)	A	10.66	10.75	10.87
Open Circuit Voltage (Voc)	V	40.6	40.7	40.8
Short Circuit Current (Isc)	A	11.24	11.36	11.51
Output Tolerance	W	-0 / + 5		
No. of Cells & Connections		120 half-cells with 3 bypass diodes		
Maximum Series Fuse Rating		20A		
Cell Type		Monocrystalline		
Module Efficiency	%	19.73	20.01	20.29
Temperature Coefficient of Pmpp	%/C	-0.36		
Temperature Coefficient of Voc	%/C	-0.29		
Temperature Coefficient of Isc	%/C	0.05		

Mechanical Characteristics

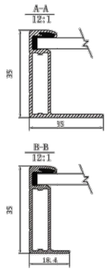
Laminate	Glass: 3.2 high transmission, tempered, anti-reflective Encapsulant: POE Backsheet: Weatherproof film (Black)
Frame	Anodized aluminum (Black)
Junction Box	IP68
Output Cables	4 mm² (12AWG) PV Wire, Length 1.2m (47.2")
Connectors	Polarized MC compatible
Weight	20.5 kg (45.19 lbs)

Dimensions



Operating Conditions

Nominal Operating Cell Temp.	44+/-2° C
Operating Temperature	-40 to 85° C
Maximum System Voltage	1,500V
Fire Performance	Class C / Type 1
Maximum Wind Load	210mph wind speed (5400 Pa)
Maximum Snow Load	112 lbs/ft² (5400 Pa)



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PV-6
EQUIPMENT DATASHEET

ENPHASE.

DATA SHEET

IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application-specific integrated circuit (ASIC), which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built using 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.

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-and-play MC4 connectors.

UL CERTIFIED SAFETY

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.
**IQ8 and IQ8+ support split-phase, 240 V installations only.

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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

- 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

- Compliant 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 Microinverters cannot be mixed 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.

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)	UNITS	IQ8-60-2-US	IQ8PLUS-72-2-US
Commonly used module pairings[1]	W	235–350	235–440
Module compatibility	–	To meet compatibility, PV modules must be within 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	27–37	27–45
Operating range	V	16–48	16–58
Minimum/Maximum start voltage	V	22/48	22/58
Maximum input DC voltage	V	50	60
Maximum continuous input DC current	A	10	12
Maximum input DC short-circuit current	A	25	
Maximum module (I_{sc})	A	20	
Overvoltage class DC port	–	II	
DC port backfeed current	mA	0	
PV array configuration	–	Ungrounded array; no additional DC side protection required; AC side protection requires maximum 20 A per branch circuit.	
OUTPUT DATA (AC)	**UNITS**	**IQ8-60-2-US**	**IQ8PLUS-72-2-US**
Peak output power	VA	245	300
Maximum continuous output power	VA	240	290
Nominal grid voltage (L-L)	V	240, split-phase (L-L), 180°	
Minimum and Maximum grid voltage[2]	V	211-264	
Maximum continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	47–68	
AC short-circuit fault current over three cycles	Arms	2	
Maximum units per 20 A (L-L) branch circuit[3]	–	16	13
Total harmonic distortion	%	<5	
Overvoltage class AC port	–	III	
AC port backfeed current	mA	30	
Power factor setting	–	1.0	
Grid-tied power factor (adjustable)	–	0.85 leading ... 0.85 lagging	
Peak efficiency	%	97.7	
CEC weighted efficiency	%	97	
Nighttime power consumption	mW	23	25
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 (H × W × D)		212 mm (8.3 in) × 175 mm (6.9 in) × 30.2 mm (1.2 in)	
Weight		1.08 kg (2.38 lbs)	
Cooling		Natural convection–no fans	
Approved for wet locations		Yes	
Pollution degree		PD3	
Enclosure		Class II double-insulated, corrosion-resistant polymeric enclosure	
Environmental category/UV exposure rating		NEMA Type 6/Outdoor	

(1) No enforced DC/AC ratio.
(2) Nominal voltage range can be extended beyond nominal if required by the utility.
(3) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ8SP-12A-DSH-00207-3.0-EN-US-2024-02-12

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NC GC #76615
NC ELE #U.34519

PREPARED BY:
HIGH LINE DESIGNS
SCOTT TOYAMA

SCALE: NTS	AHJ: HARNETT COUNTY
SHEET SIZE: 11" x 17"	APN: 0662369486000
TEMPLATE V2.0	DATE: 10/11/2024

EDWARD BISHOP
232 BARNSLEY RD
ANGIER, NC 27501

PV-7
EQUIPMENT DATASHEET

Data Sheet
Enphase Networking

Enphase IQ Combiner 4/4C

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

X-IQ-AM1-240-4C


X-IQ-AM1-240-4

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

Smart

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

Simple

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

Reliable

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

UL LISTED

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE.

Enphase IQ Combiner 4/4C

MODEL NUMBER	
IQ Combiner 4 (X-IQ-AM1-240-4)	IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match the IQ Battery system and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C)	IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.
ACCESSORIES AND REPLACEMENT PARTS	(not included, order separately)
Ensemble Communications Kit COMMS-CELLMODEM-M1-06 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
Envoy breaker	10A or 15A rating GE/Siemens/Eaton 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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NC GC #76615
NC ELE #U.34519

PREPARED BY:
HIGH LINE DESIGNS
SCOTT TOYAMA

SCALE: NTS	AHJ: HARNETT COUNTY
SHEET SIZE: 11" x 17"	APN: 0662369486000
TEMPLATE V2.0	DATE: 10/11/2024

EDWARD BISHOP
232 BARNSLEY RD
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PV-8
EQUIPMENT DATASHEET

SnapNrack®

Ultra Rail

AnchorFoot™

Deck Mounting, *re-imagined.*

- Flexible direct to deck mounting & rafter mounting options
- Pre-installed butyl for easy worry-free sealing
- Compatible with proprietary DeckAnchor™ fasteners cutting the number of deck fasteners in half, from 4 to 2
- Single Tool installation & snap-in features as with all SnapNrack products

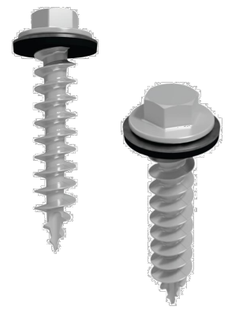
Start Installing AnchorFoot™ Today!

SnapNrack AnchorFoot™ & DeckAnchor™

are the latest innovation designed to reduce the number of roof fasteners when mounting direct to deck and provide maximum flexibility to mount anywhere on the roof. Engineered with butyl, now installers do not have to add sealant to the bottom of the mount, simplifying the installation process and further protecting the roof.

AnchorFoot™

- Pre-installed butyl for easy peel & stick installation allows for no disruption to composition shingles
- Industry-leading .200” thick butyl allows installation over shingles without cutting pieces
- Flexible direct to deck mounting options with (2) DeckAnchors or (4) #14 wood screws
- Flexible rafter mounting options with (1) 5/16” lag or (2) #14 wood screws
- Ships pre-assembled with Ultra Rail Mounting Clamp for easy rail attachment
- Rated for UL2703 Bonding & Grounding with TAS 100A Wind Driven Rain Testing for waterproof certification



DeckAnchor

- Proprietary fastening technology to reduce the number of screws for direct to deck mounting
- Familiar ½” hex head to maintain the SnapNrack tradition of a single tool install
- Wide threads securely grip the wood deck and significantly reduces the potential for over-tightening
- TAS 100A Wind Driven Rain Testing + ASTM D1761 Screw Capacities

Quality. Performance. Innovation.

SnapNrack solutions are focused on simplifying the installation experience through intuitive products and the best wire management in the industry.

SnapNrack®

877-732-2860 www.snapnrack.com contact@snapnrack.com

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EDWARD BISHOP
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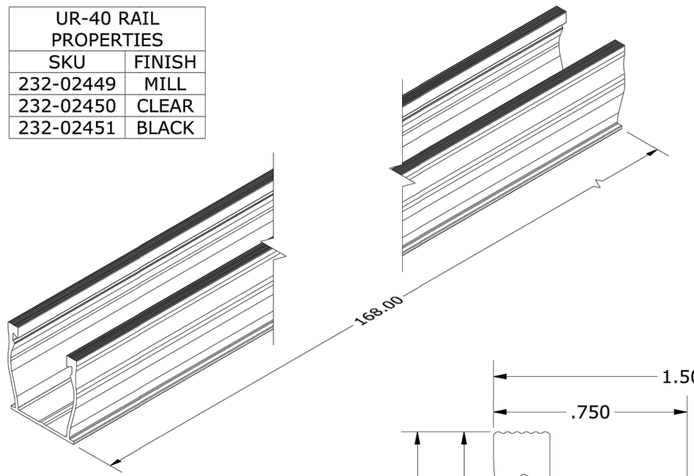
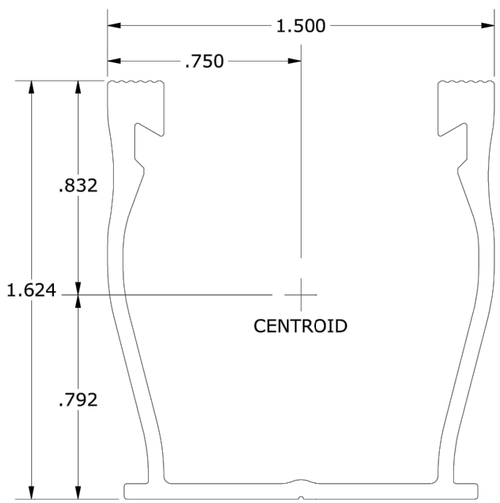
ANGIER, NC 27501

PV-9
EQUIPMENT DATASHEET

DESCRIPTION:	DRAWN BY:	SnapNrack™ Solar Mounting Solutions
SNAPNRACK, UR-40 RAIL	mwatkins	
PART NUMBER(S):	REVISION:	595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902
232-02449, 232-02450, 232-02451	B	THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.

UR-40 RAIL PROPERTIES	
SKU	FINISH
232-02449	MILL
232-02450	CLEAR
232-02451	BLACK





EQUIVALENT PROPERTIES	
A	0.357 in²
Ixx	0.125 in⁴
Iyy	0.132 in⁴
Sx (TOP)	0.150 in³
Sx (BOT)	0.158 in³
Sy (LEFT)	0.175 in³
Sy (RIGHT)	0.175 in³

ALL DIMENSIONS IN INCHES

MATERIALS:	6000 SERIES ALUMINUM	OPTIONS:
DESIGN LOAD (LBS):	N/A	CLEAR / BLACK ANODIZED
ULTIMATE LOAD (LBS):	N/A	MILL FINISH
TORQUE SPECIFICATION:	N/A LB-FT	BUNDLES OF 144
CERTIFICATION:	UL 2703, FILE E359313	BOXES OF 8
WEIGHT (LBS):	5.85	

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EDWARD BISHOP
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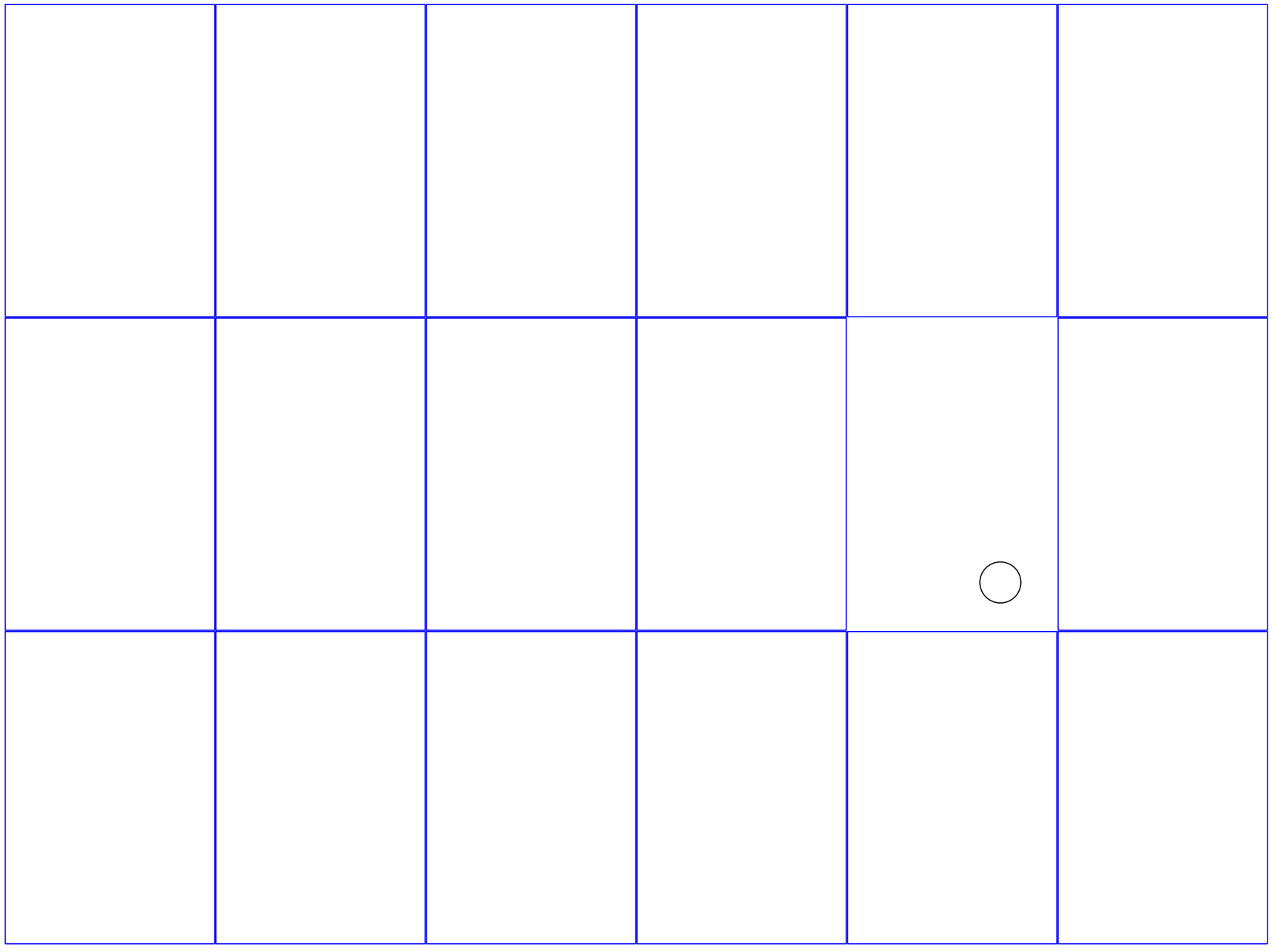
PV-10
EQUIPMENT DATASHEET



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