

Building Codes: 2017 NEC, 2018 NORTH CAROLINA RESIDENTIAL CODE, 2018 NORTH CAROLINA FIRE CODE, 2018 NORTH CAROLINA BUILDING CODE and AHJ Amendments

CASILLAS, VICTOR PV SYSTEM
326 PLANTERS LANE .
COATS, NC, 27521
APN: 021507 0005 35
JURISDICTION: HARNETT COUNTY (NC)
GENERAL INFORMATION

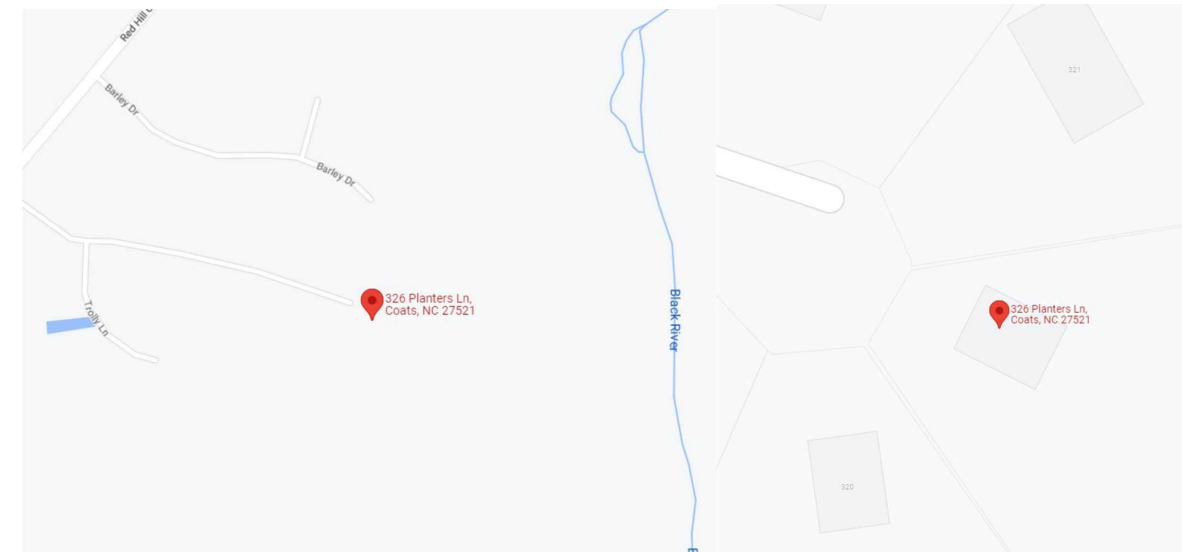
SYSTEM SIZE:	10.000 kW-DC-STC
	7.250 kW-AC
ROOF PITCHED:	40 DEGREES
INVERTER:	(1) ENPHASE IQ8PLUS-72-2-US
MODULES:	(25) HY-DH108P8-400B
STRINGS:	INV 1: (1) x 13 (1) x 12 MODULE SERIES STRINGS
ELECTRICAL SERVICE RATING:	225A
PV SYSTEM OVERCURRENT RATING:	40A
PV SYSTEM DISCONNECT SWITCH:	EATON DG222URB (60A / 2P)
ROOF TYPE:	COMP SHINGLE
ROOF FRAMING:	ENGINEERED TRUSS
RACKING/RAILING:	K2 SYSTEMS / K2RAIL
ATTACHMENT METHOD:	SPLICE FOOT
ROOF ATTACHMENT :	M5 x 60 S.S LAG SCREWS

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VICINITY MAP

SCALE: NTS



AERIAL MAP

SCALE: NTS



Wyssling Consulting, PLLC
 76 N Meadowbrook Drive Alpine UT 84004
 North Carolina CDA # P-2308

Signed 2/13/2023

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NOTES

EQUIPMENT LOCATION

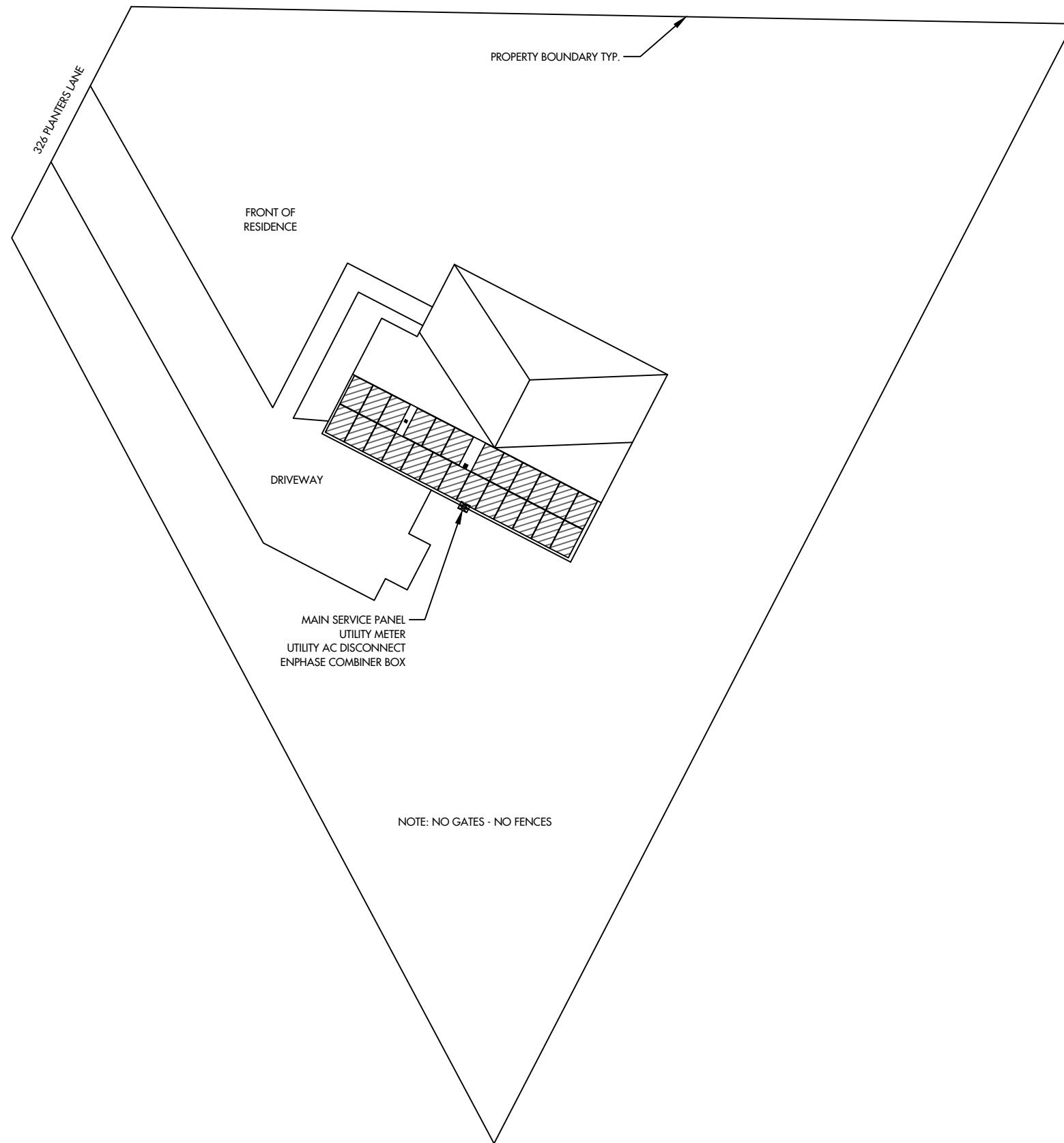
- ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.
- WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31(A),(C) AND NEC TABLES 310.15(B)(2)(A) AND 310.15(B)(3)(C).
- JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.
- ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT.
- ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.
- ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

WIRING & CONDUIT NOTES

- ALL CONDUITS AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
- CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.
- DC WIRING LIMITED TO MODULE FOOTPRINT. MICRO INVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY WITH SUITABLE WIRING CLIPS.
- AC CONDUCTORS COLORED OR MARKED AS FOLLOWS: PHASE A OR L1- BLACK, PHASE B OR L-2 RED, OR OTHER CONVENTION IF THREE PHASE, PHASE C OR L3-BLUE, YELLOW, ORANGE, OR OTHER CONVENTION NEUTRAL- WHITE OR GREY IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH THE HIGHER VOLTAGE TO BE MARKED ORANGE NEC 110.15.

GENERAL NOTES

- MODULES ARE LISTED UNDER UL 1703 AND CONFORM TO THE STANDARDS.
- INVERTERS ARE LISTED UNDER UL 1741 AND CONFORM TO THE STANDARDS.
- DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT OF THE PV SYSTEM AND THE ACTUAL SITE CONDITION MIGHT VARY.
- WORKING CLEARANCES AROUND THE NEW PV ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC 110.26.
- ALL GROUND WIRING CONNECTED TO THE MAIN SERVICE GROUNDING IN MAIN SERVICE PANEL/SERVICE COMPONENT.
- ALL CONDUCTORS SHALL BE 600V, 75° C STANDARD COPPER UNLESS OTHERWISE NOTED.
- WHEN REQUIRED, A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
- THE SYSTEM WILL NOT BE INTERCONNECTED BY THE CONTRACTOR UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND/OR THE UTILITY.
- ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREES, WIRES OR SIGNS.
- PV ARRAY COMBINER/JUNCTION BOX PROVIDES TRANSITION FROM ARRAY WIRING TO CONDUIT WIRING.



PROJECT NOTES

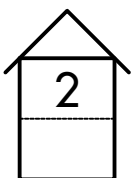
1. UTILITY SHALL HAVE 24HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC COMPONENTS LOCATED AT SES EQUIPMENT
2. NO LOCKED GATES, DOGS, ETC SHALL IMPEDE ACCESS TO SES EQUIPMENT
3. WORKSPACE IN FRONT OF AC ELECTRICAL SYSTEM COMPONENTS SHALL BE IN ACCORDANCE WITH DUKE ENERGY PROGRESS (NC) AND NEC REQUIREMENTS.



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TITAN
SOLAR POWER
525 W BASELINE RD., MESA AZ, 85210
CONTRACTOR LIC# U.34445

CASILLAS, VICTOR RESIDENCE
326 PLANTERS LANE , COATS, NC, 27521
LAT:35.374265, LON:-78.619503
TSP152443

(25) HY-DH108P8-400B
(1) ENPHASE IQ8PLUS-72-2-US
10.000 kW DC SYSTEM SIZE
7.250 kW AC SYSTEM SIZE

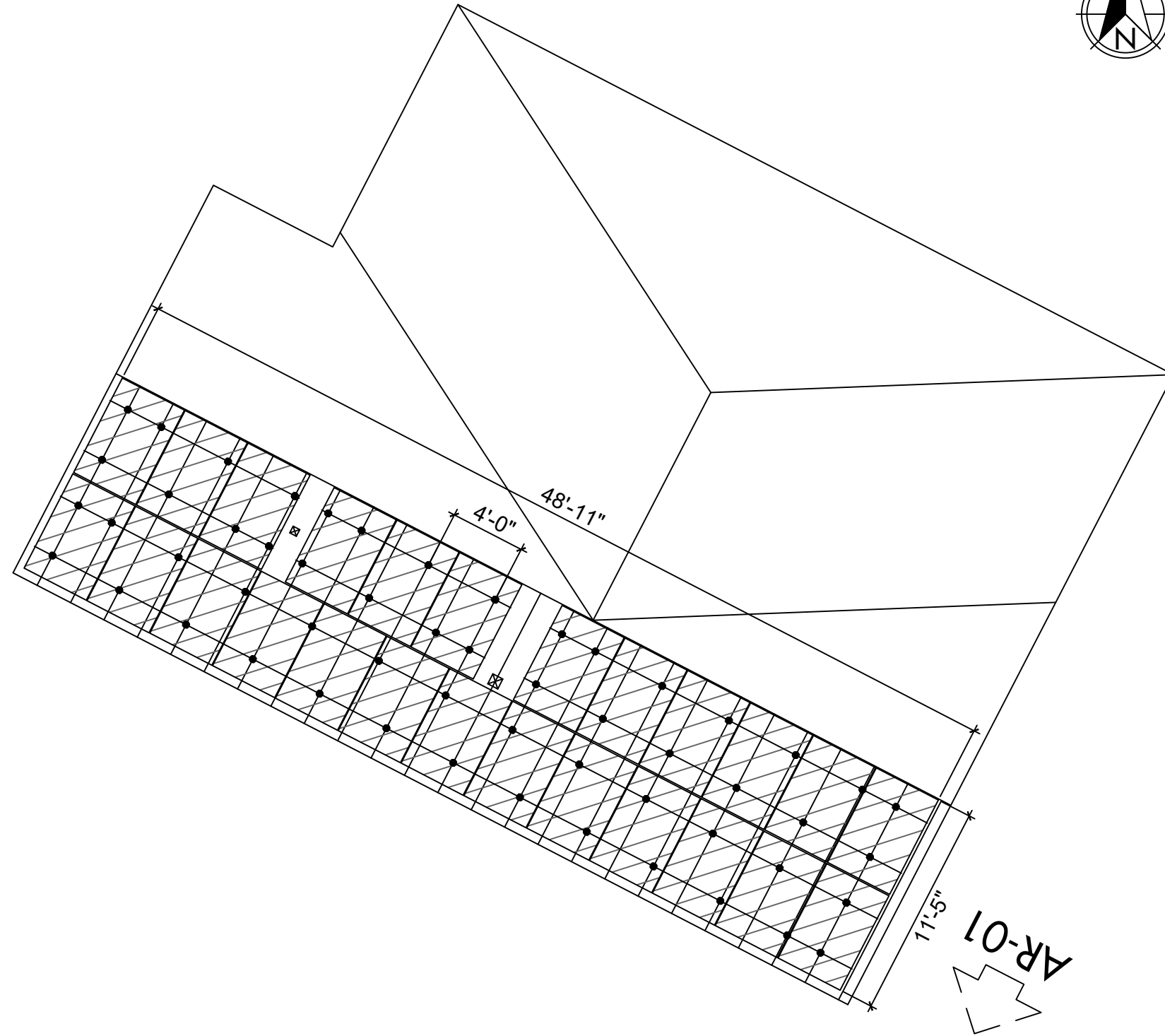
SCALE: 11/256" = 1'-0"
DATE: 2/9/2023
REV: A
DRAWN BY: CA

SEAL:

SITE PLAN
PV 2

ARRAY INFORMATION

AR-01
QUANTITY: 25
MOUNTING TYPE: FLUSH
ARRAY TILT: 40°
AZIMUTH: 210°
ATTACHMENT SPACING: 4'
ROOF TYPE: COMP SHINGLE



NOTES

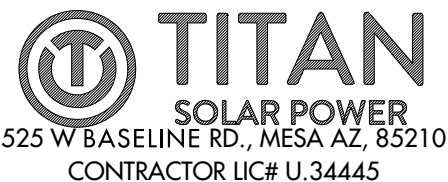
- ROOF VENTS, SKYLIGHTS, WILL NOT BE COVERED UPON PV INSTALLATION
- TOTAL ROOF AREA = 1749 SQ-FT
- TOTAL ARRAY AREA = 525.57 SQ-FT
- ARRAY COVERAGE = 30.05%
-
-



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10.000 kW DC SYSTEM SIZE
7.250 kW AC SYSTEM SIZE

SCALE: 35/256" = 1'-0"
DATE: 2/9/2023
REV:A
DRAWN BY: CA

SEAL:

PV LAYOUT
PV 3

MODULE & RACKING INFORMATION

MODULE: HY-DH108P8-400B
MODULE WEIGHT: 49.80 LBS
MODULE DIMENSIONS: 67.8" x 44.65" x 1.5"
RACKING/RAIL: K2 SYSTEMS / K2RAIL
ROOF ATTACHMENT : M5 x 60 S.S LAG SCREWS

ROOF & FRAMING INFORMATION

MATERIAL: COMP SHINGLE
RAFTER/TRUSS SIZE: 2" x 6"
RAFTER/TRUSS SPACING: 2'

ARRAY 01: 25 MODULES

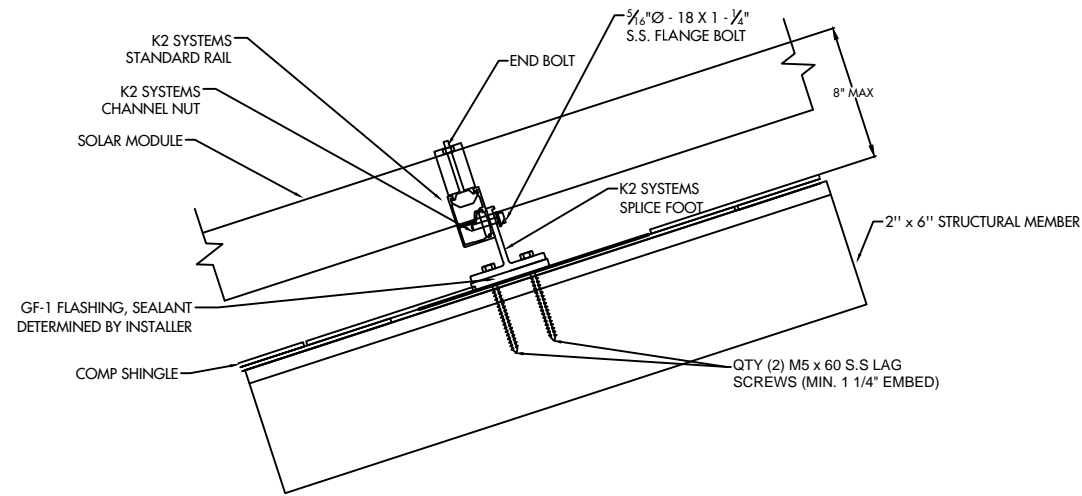
UPLIFT = 15767.03 LBS.

POINT LOAD = 26.65 LBS. PER MOUNTING POINT

PULLOUT STRENGTH = 26250.00 LBS.

DISTRIBUTED LOAD = 2.54 PSF

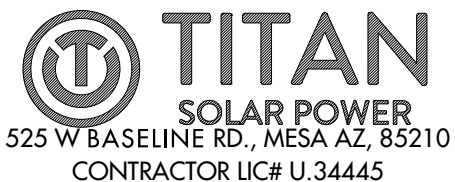
MODULE & RACKING WEIGHT = 1332.50 LBS



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(1) ENPHASE IQ8PLUS-72-2-US
10.000 kW DC SYSTEM SIZE
7.250 kW AC SYSTEM SIZE

DATE: 2/9/2023
REV:A
DRAWN BY: CA

SEAL:

DETAILS
PV 4

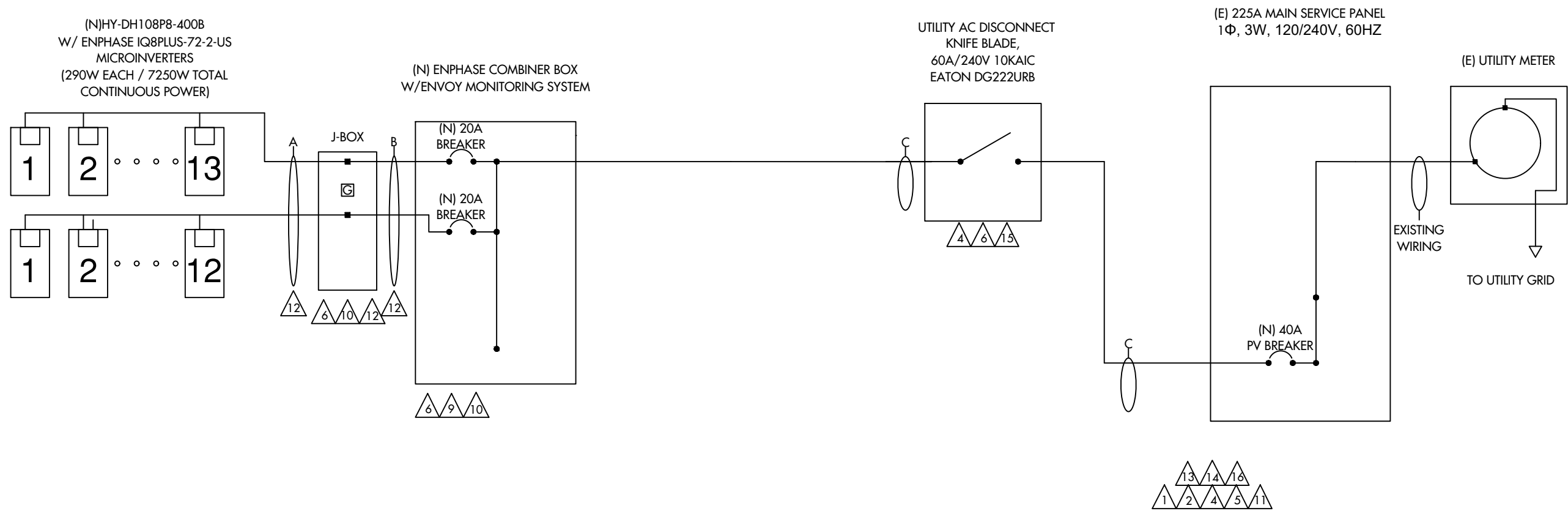
PV MODULE

HY-DH108P8-400B
 W = 400 W
 ISC = 13.79 ADC
 VOC = 37.07 VDC
 IMP = 12.90 ADC
 VMP = 31.21 VDC
 TVOC = -0.304% / °C

WIRE SCHEDULE

A - (4) #12 AWG-CU ENPHASE Q-CABLE (HR)
 (1) #10 AWG-CU BARE COPPER WIRE (GND)
 IN FREE AIR
 B - (4) #10 AWG-CU THWN-2 WIRE (HR)
 (1) #10 AWG-CU THWN-2 WIRE (GND)
 3/4" EMT

C - (3) #8 AWG-CU THWN-2 WIRE (HR)
 (1) #8 AWG-CU THWN-2 WIRE (GND)
 3/4" EMT



WIRE SIZE CALCULATIONS

TEMP CORRECTION FACTOR: 0.87 (43° AMBIENT)
 ROOFTOP TEMP CORRECTION FACTOR: 1.00 (43° ADJUSTED)
 (2" ABOVE ROOFTOP / 0° TEMP ADDERS - AS OCCURS)
 (TEMP DATA TAKEN FROM ASHRAE 2% AVG HIGH TEMP)

DC WIRING
 CONDUIT FILL FACTOR = 0.80
 OPTIMIZER MAX. CURRENT = 18.75A DC (15.00A X 1 X 1.25)
 #10- AWG CU. AMPACITY = 47.85A (55A X 0.87)
 FREE AIR
 #10 - AWG CU. AMPACITY = 27.84A (40A X 0.87 X 0.80)
 ROOFTOP CONDUIT

AC WIRING
 CONDUIT FILL FACTOR = 1 (3) CONDUCTORS
 MAX. INVERTER CURRENT = 30.25A (PER INVERTER SPECS)
 MIN. INVERTER OCP = 37.8125A (30.25A X 1.25)
 INVERTER OCP = 40A
 #8 - AWG CU AMPACITY = 47.85A (55A X 1 X 0.87)



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(25) HY-DH108P8-400B
 (1) ENPHASE IQ8PLUS-72-2-US
 10.000 kW DC SYSTEM SIZE
 7.250 kW AC SYSTEM SIZE

DATE: 2/9/2023
 REV:A
 DRAWN BY: CA

SEAL:

ONE LINE
PV 5

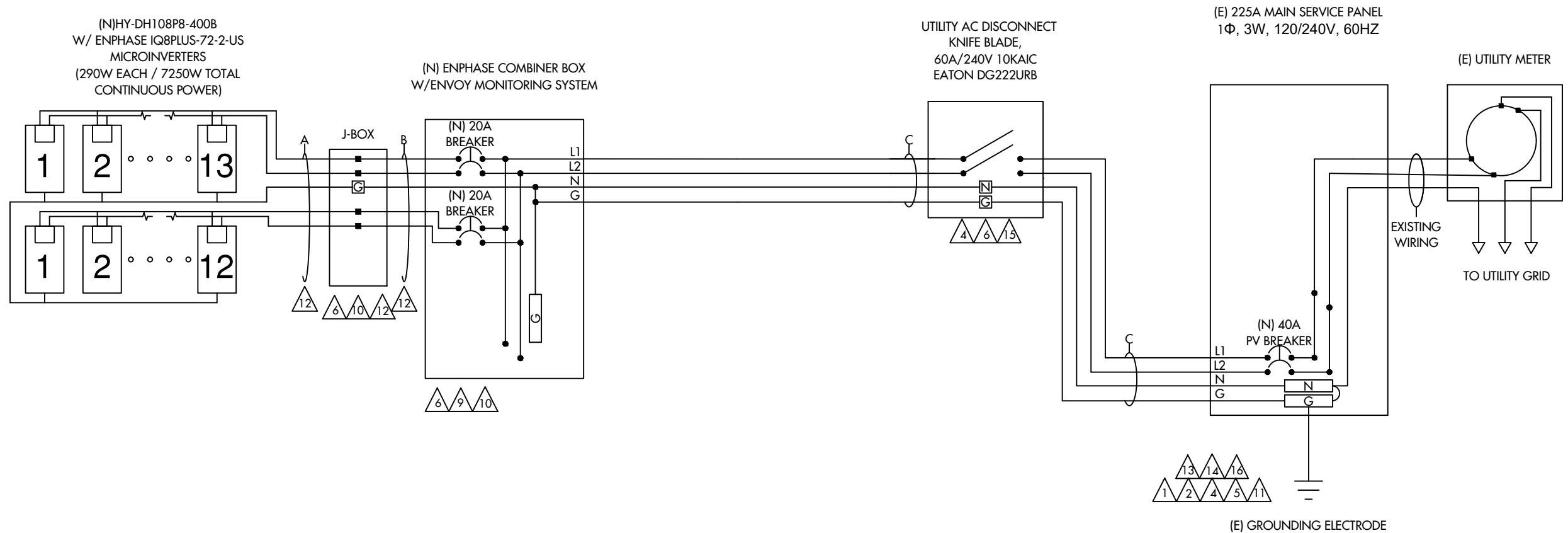
PV MODULE

HY-DH108P8-400B
 W = 400 W
 ISC = 13.79 ADC
 VOC = 37.07 VDC
 IMP = 12.90 ADC
 VMP = 31.21 VDC
 TVOC = -0.304% / °C

WIRE SCHEDULE

A - (4) #12 AWG-CU ENPHASE Q-CABLE (HR)
 (1) #10 AWG-CU BARE COPPER WIRE (GND)
 IN FREE AIR
 B - (4) #10 AWG-CU THWN-2 WIRE (HR)
 (1) #10 AWG-CU THWN-2 WIRE (GND)
 3/4" EMT

C - (3) #8 AWG-CU THWN-2 WIRE (HR)
 (1) #8 AWG-CU THWN-2 WIRE (GND)
 3/4" EMT



WIRE SIZE CALCULATIONS

TEMP CORRECTION FACTOR: 0.87 (43° AMBIENT)
 ROOFTOP TEMP CORRECTION FACTOR: 1.00 (43° ADJUSTED)
 (2" ABOVE ROOFTOP / 0° TEMP ADDERS - AS OCCURS)
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 ROOFTOP CONDUIT

AC WIRING
 CONDUIT FILL FACTOR = 1 (3) CONDUCTORS
 MAX. INVERTER CURRENT = 30.25A (PER INVERTER SPECS)
 MIN. INVERTER OCP = 37.8125A (30.25A X 1.25)
 INVERTER OCP = 40A
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 (1) ENPHASE IQ8PLUS-72-2-US
 10.000 kW DC SYSTEM SIZE
 7.250 kW AC SYSTEM SIZE

DATE: 2/9/2023
 REV:A
 DRAWN BY: CA

SEAL:

THREE LINE
PV 6

1

CAUTION
PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

LOCATION: BACKFED BREAKER
CODE REF: NEC 705.12(4)

2

WARNING
INVERTER OUTPUT CONNECTION:
DO NOT RELOCATE THIS
OVERCURRENT DEVICE

LOCATION: BACKFED BREAKER
CODE REF: 2017 NEC 705.12(2)(3)(b)

3

WARNING
A GENERATION SOURCE IS CONNECTED TO THE SUPPLY
(UTILITY) SIDE OF THE MAIN SERVICE DISCONNECT. FOLLOW
THE PROPER LOCK-OUT/TAG-OUT PROCEDURES TO ENSURE
THE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH IS
OPENED PRIOR TO PERFORMING WORK ON THIS DEVICE

LOCATION: (IF APPLICABLE)
SUPPLY SIDE TAP
LOAD PANEL
CODE REF: UTILITY

4

PHOTOVOLTAIC AC DISCONNECT
RATED AC OPERATING CURRENT: 30.25A
NOMINAL OPERATING AC VOLTAGE: 240VAC

LOCATION: MAIN PANEL
AC DISCONNECT(S)
CODE REF: NEC 690.54

5

**RAPID SHUTDOWN
SWITCH FOR
SOLAR PV SYSTEM**

LOCATION: MAIN PANEL (EXTERIOR)
PV BREAKER (INTERIOR)
CODE REF: NEC 690.56(C)(3)

6

WARNING
ELECTRICAL SHOCK HAZARD
TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

LOCATION: COMBINER PANEL
AC DISCONNECT
JUNCTION BOX
INVERTER(S)
CODE REF: NEC 690.13(B)

7

**PHOTOVOLTAIC
SYSTEM METER**

LOCATION: DEDICATED KWH METER
CODE REF: NEC 690.4(B) UTILITY

8

WARNING
PHOTOVOLTAIC SYSTEM
COMBINER PANEL
DO NOT ADD LOADS

LOCATION: AC COMBINER PANEL
CODE REF: NEC 690.13(B)

9

PHOTOVOLTAIC SYSTEM DC DISCONNECT
MAXIMUM VOLTAGE: 480VDC
MAXIMUM CIRCUIT CURRENT: 15.0ADC
MAX. RATED OUTPUT CURRENT OF
THE CHARGE CONTROLLER OR DC-
TO-DC- CONVERTER (IF INSTALLED) 15.0ADC

LOCATION: DC DISCONNECT
INVERTER
CODE REF: UTILITY

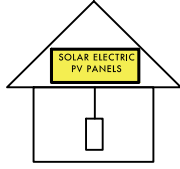
10

WARNING
ELECTRICAL SHOCK HAZARD
TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION
DC VOLTAGE IS ALWAYS PRESENT
WHEN SOLAR MODULES ARE
EXPOSED TO SUNLIGHT

LOCATION: DC DISCONNECT, COMBINE BOX
CODE REF: NEC 690.13(B)

11

**SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN**
TURN RAPID SHUTDOWN
SWITCH TO THE "OFF"
POSITION TO SHUT DOWN
PV SYSTEM AND REDUCE
SHOCK HAZARD IN THE
ARRAY.



LOCATION: MAIN SERVICE (OUTSIDE COVER)
CODE REF: NEC 690.12
NEC 690.56(C)(1)(a)
YELLOW STICKER

12

WARNING PHOTOVOLTAIC POWER SOURCE

LOCATION: DC CONDUIT
JUNCTION BOX
NO MORE THAN 10FT
CODE REF: NEC 690.31(G)(3)
NEC 690.31(G)(4)
REFLECTIVE AND WEATHER RESISTANT

LABEL REQUIRES CAPITALIZED LETTERS WITH A MINIMUM HEIGHT OF 3/8 INCH, WHITE LETTERS ON RED BACKGROUND
LABELS SHALL BE PLACED ON INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES, AND CABLE ASSEMBLIES
EVERY 10 FEET, WITHIN 1 FOOT OF TURNS OR BENDS AND WITHIN 1 FOOT ABOVE AND BELOW PENETRATIONS OF
ROOF/CEILING ASSEMBLIES, WALLS OR BARRIERS.

13

CAUTION
DUAL POWER SOURCE
SECOND SOURCE IS
PHOTOVOLTAIC

LOCATION: SERVICE METER
MAIN PANEL

14

WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS
OVERCURRENT DEVICE

LOCATION: (IF APPLICABLE)
SERVICE PANEL
CODE REF: NEC 705.12(7)

15

**PHOTOVOLTAIC SYSTEM
UTILITY DISCONNECT SYSTEM**

LOCATION: AC DISCONNECT
CODE REF: UTILITY

16

PV SOLAR BREAKER
DO NOT RELOCATE THIS
OVERCURRENT DEVICE

LOCATION: MAIN PANEL (EXTERIOR)
PV BREAKER (INTERIOR)
CODE REF: NEC 705.12(B)(2)(3)(B)



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(1) ENPHASE IQ8PLUS-72-2-US
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7.250 kW AC SYSTEM SIZE

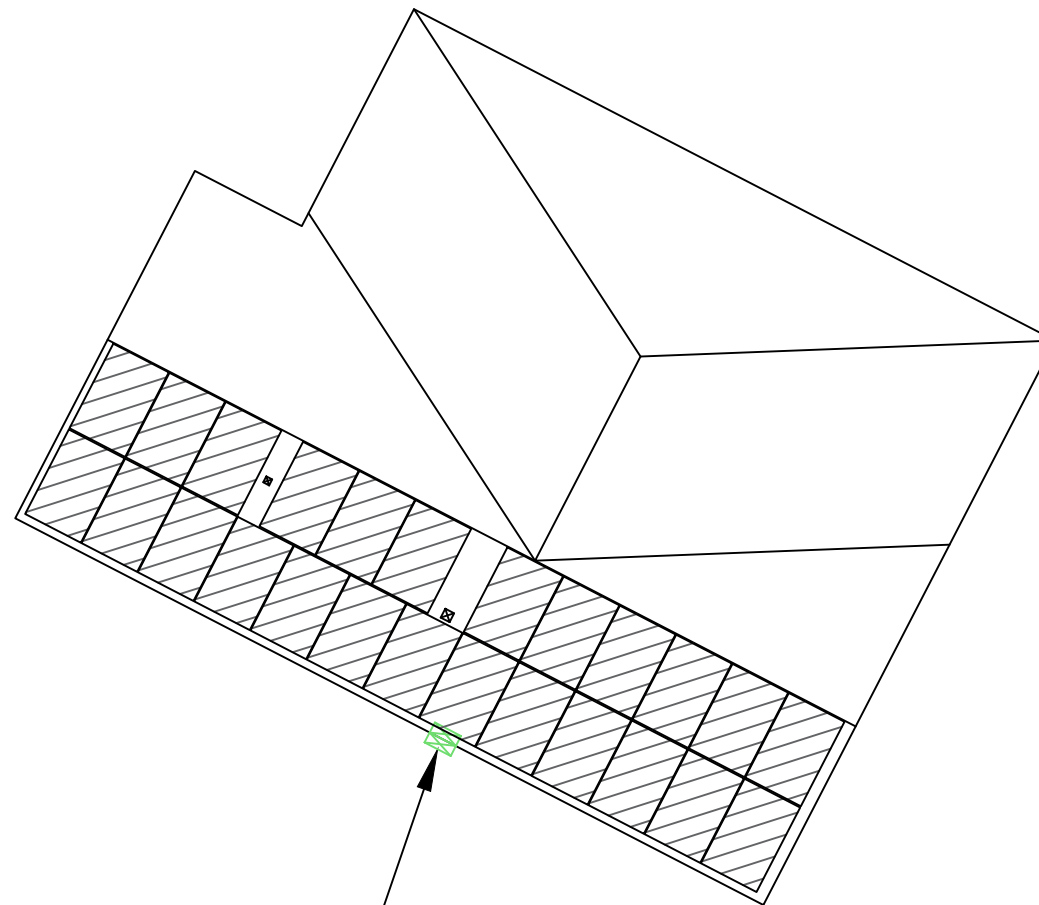
DATE: 2/9/2023
REV: A
DRAWN BY: CA

SEAL:

LABELS
PV 7

CAUTION

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



MAIN SERVICE PANEL
UTILITY METER
UTILITY AC DISCONNECT
ENPHASE COMBINER BOX

DIRECTORY PLAQUE IN
ACCORDANCE WITH
NEC690.56(A)(B), 705.10



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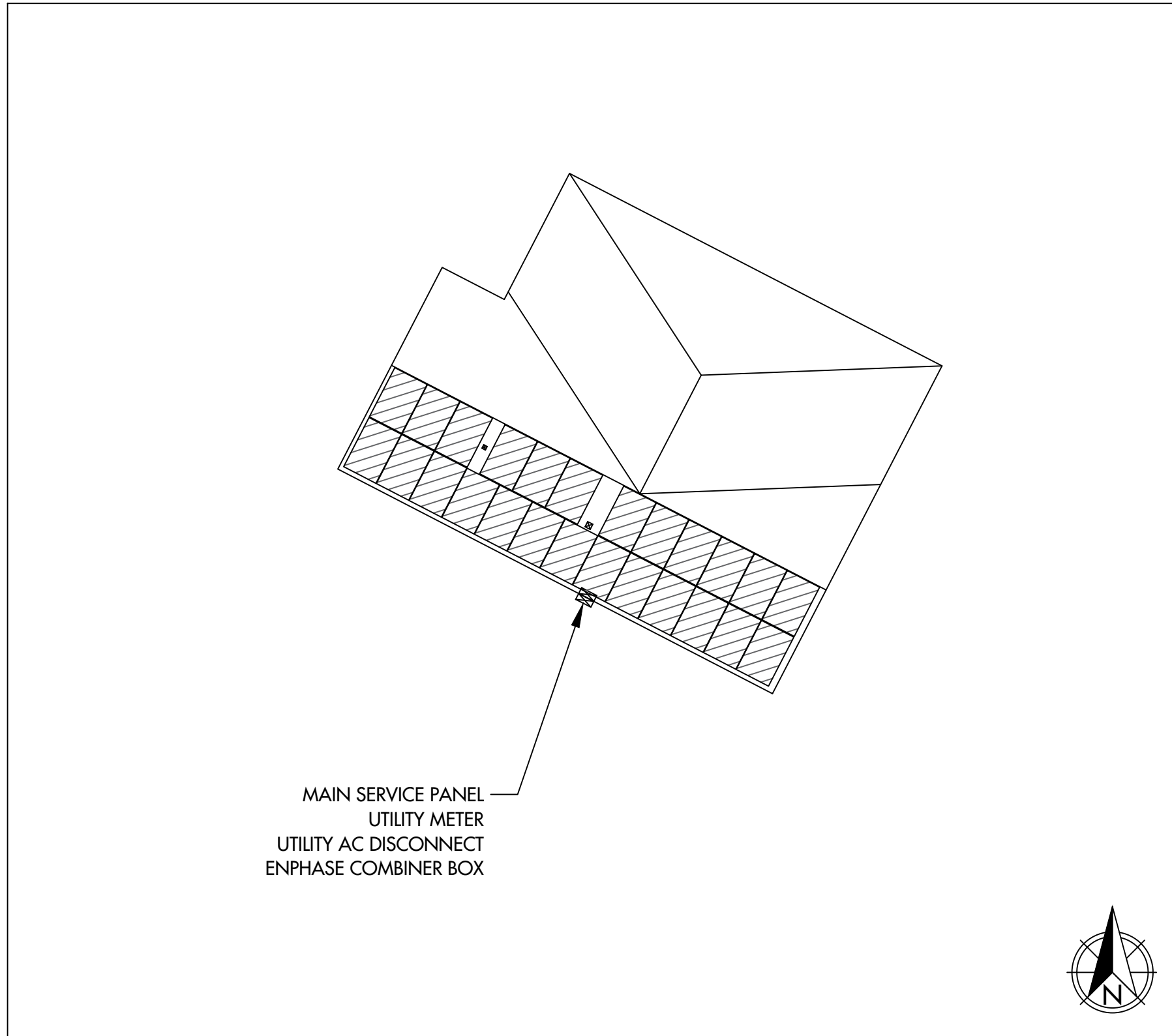


DATE: 2/9/2023
REV: A
DRAWN BY: CA

SEAL:

PLACARD
PV 8

JOB SAFETY PLAN



LOCATION OF NEAREST URGENT CARE FACILITY

NAME:

ADDRESS:

PHONE NUMBER:

NOTES:

- INSTALLER SHALL DRAW IN DESIGNATED SAFETY AREA AROUND HOME
- INSTALLER SHALL UPDATE NAME, ADDRESS, AND PHONE NUMBER OF NEAREST URGENT CARE FACILITY RELATIVE TO THE JOB SITE BEFORE STARTING WORK.

PRINT NAME	INITIAL	YES	NO



DATA SHEET



IQ8 Series Microinverters

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



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



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



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



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

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IQ8SE-DS-0001-01-EN-US-2022-03-17

Easy to install

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

High productivity and reliability

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

Microgrid-forming

- Complies with the latest advanced grid support**
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) requirements

* Only when installed with IQ System Controller 2, meets UL 1741. IQ8H-208V operates only in grid-tied mode.
** IQ8 Series Microinverters supports split phase, 240V. IQ8H-208 supports split phase, 208V only.

IQ8 Series Microinverters

INPUT DATA (DC)		IQ8-60-2-US	IQ8PLUS-72-2-US	IQ8M-72-2-US	IQ8A-72-2-US	IQ8H-240-72-2-US	IQ8H-208-72-2-US ⁽¹⁾
Commonly used module pairings ²	W	235 – 350	235 – 440	260 – 460	295 – 500	320 – 540+	295 – 500+
Module compatibility		60-cell/120 half-cell, 60-cell/120 half-cell, 66-cell/132 half-cell and 72-cell/144 half-cell					
MPPT voltage range	V	27 – 37	29 – 45	33 – 45	36 – 45	38 – 45	38 – 45
Operating range	V	25 – 48	25 – 58				
Min/max start voltage	V	30 / 48	30 / 58				
Max input DC voltage	V	50	60				
Max DC current ³ [module Isc]	A	15					
Over voltage class DC port		II					
DC port backfeed current	mA	0					
PV array configuration		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit					
OUTPUT DATA (AC)		IQ8-60-2-US	IQ8PLUS-72-2-US	IQ8M-72-2-US	IQ8A-72-2-US	IQ8H-240-72-2-US	IQ8H-208-72-2-US ⁽¹⁾
Peak output power	VA	245	300	330	366	384	366
Max continuous output power	VA	240	290	325	349	380	360
Nominal (L-L) voltage/range ⁴	V	240 / 211 – 264					208 / 183 – 250
Max continuous output current	A	1.0	1.21	1.35	1.45	1.58	1.73
Nominal frequency	Hz	60					
Extended frequency range	Hz	50 – 68					
AC short circuit fault current over 3 cycles	Arms	2					4.4
Max units per 20 A (L-L) branch circuit ⁵		16	13	11	11	10	9
Total harmonic distortion		<5%					
Overvoltage class AC port		III					
AC port backfeed current	mA	30					
Power factor setting		1.0					
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging					
Peak efficiency	%	97.5	97.6	97.6	97.6	97.6	97.4
CEC weighted efficiency	%	97	97	97	97.5	97	97
Night-time power consumption	mW	60					
MECHANICAL DATA							
Ambient temperature range		-40°C to +60°C (-40°F to +140°F)					
Relative humidity range		4% to 100% (condensing)					
DC Connector type		MC4					
Dimensions (HxWxD)		212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")					
Weight		1.08 kg (2.38 lbs)					
Cooling		Natural convection – no fans					
Approved for wet locations		Yes					
Pollution degree		PD3					
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure					
Environ. category / UV exposure rating		NEMA Type 6 / outdoor					
COMPLIANCE							
Certifications		CA Rule 21 (UL 1741-SA), UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 1071-01					
		This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.					

(1) The IQ8H-208 variant will be operating in grid-tied mode only at 208V AC. (2) No enforced DC/AC ratio. See the compatibility calculator at <https://link.enphase.com/module-compatibility> (3) Maximum continuous input DC current is 10.6A (4) Nominal voltage range can be extended beyond nominal if required by the utility. (5) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ8SE-DS-0001-01-EN-US-2022-03-17

Enphase IQ Combiner 4/4C

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



To learn more about Enphase offerings, visit enphase.com

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



Enphase IQ Combiner 4/4C

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

To learn more about Enphase offerings, visit enphase.com

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Power Optimizer For Residential Installations

S440 / S500 / S500B



POWER OPTIMIZER

Enabling PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detects abnormal PV connector behavior, preventing potential safety issues*
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified cable management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules

*Functionality subject to inverter model and firmware version

solaredge.com



/ Power Optimizer For Residential Installations S440 / S500 / S500B

	S440	S500	S500B	UNIT
INPUT				
Rated Input DC Power ⁽¹⁾	440	500		W
Absolute Maximum Input Voltage (Voc)	60	125		Vdc
MPPT Operating Range	8 – 60	12.5 – 105		Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5	15		Adc
Maximum Efficiency		99.5		%
Weighted Efficiency		98.6		%
Overvoltage Category		II		
OUTPUT DURING OPERATION				
Maximum Output Current		15		Adc
Maximum Output Voltage	60	80		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)				
Safety Output Voltage per Power Optimizer		1 ± 0.1		Vdc
STANDARD COMPLIANCE⁽²⁾				
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011			
Safety	IEC62109-1 (class II safety), UL1741			
Material	UL94 V-0, UV Resistant			
RoHS	Yes			
Fire Safety	VDE-AR-E 2100-712:2018-12			
INSTALLATION SPECIFICATIONS				
Maximum Allowed System Voltage		1000		Vdc
Dimensions (W x L x H)	129 x 155 x 30		129 x 155 x 45	mm
Weight (including cables)		655		gf
Input Connector	MC4 ⁽³⁾			
Input Wire Length	0.1			
Output Connector	MC4			
Output Wire Length	(+/-) 2.3, (-) 0.10			
Operating Temperature Range ⁽⁴⁾	-40 to +85			
Protection Rating	IP68			
Relative Humidity	0 – 100			

⁽¹⁾ Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.

⁽²⁾ For details about CE compliance, see [Declaration of Conformity – CE](#).

⁽³⁾ For other connector types please contact SolarEdge.

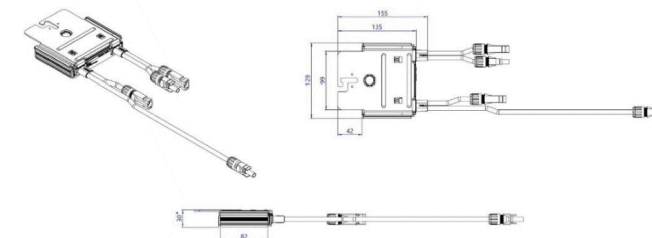
⁽⁴⁾ For ambient temperatures above +70°C power de-rating is applied. Refer to [Power Optimizers Temperature De-Rating Technical Note](#) for details.

PV System Design Using a SolarEdge Inverter ⁽⁵⁾	SolarEdge Home Wave Inverter Single Phase		SolarEdge Home Short String Inverter Three Phase	Three Phase for 230/400V Grid	Three Phase for 277/480V Grid
	Minimum String Length (Power Optimizers)	S440, S500	8	9	16
Maximum String Length (Power Optimizers)	S500B	6	8	14	50
Maximum String Length (Power Optimizers)		25	20		
Maximum Continuous Power per String		5700	5625	11250	12750
Maximum Allowed Connected Power per String (Permitted only when the power difference between strings is less than 2,000W)		See ⁽⁶⁾	See ⁽⁶⁾	13500	15000
Parallel Strings of Different Lengths or Orientations				Yes	

⁽⁵⁾ It is not allowed to mix S-series and P-series Power Optimizers in new installations.

⁽⁶⁾ If the inverter's rated AC power < maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power.

Refer to [Application Note: Single String Design Guidelines](#).



*45mm for S500B

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CE RoHS

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SOLAR POWER
525 W BASELINE RD., MESA AZ, 85210
CONTRACTOR LIC# U.34445

CASILLAS, VICTOR RESIDENCE
326 PLANTERS LANE, COATS, NC, 27521
LAT:35.374265, LON:-78.619503
TSP152443

(25) HY-DH108P8-400B
(1) ENPHASE IQ8PLUS-72-2-US
10.000 kW DC SYSTEM SIZE
7.250 kW AC SYSTEM SIZE

DATE: 2/9/2023
REV: A
DRAWN BY: CA

SEAL:

EQUIPMENT
SPECIFICATIONS
PV 12



TITAN SOLAR POWER
 525 W BASELINE RD
 MESA, AZ 85210
 TEL 855 SAY-SOLAR
 INFO@TITANSOLARPOWER
 TITANSOLARPOWER.COM

390-410W

HIGH CONVERSION EFFICIENCY
 Module efficiency up to 21.0% through advanced cell technology and manufacturing process

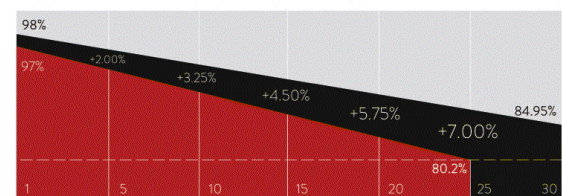
EXCELLENT WEAK LIGHT PERFORMANCE
 More power output in weak light condition, such as cloudy days, morning and sunset

EXTENDED MECHANICAL PERFORMANCE
 Module certified to withstand extreme wind (2400 Pa) and snow loading (5400 Pa)

QUALITY GUARANTEE
 High module quality ensures long-term reliability

INFO@HYPERION-USA.COM
 7/559 MOO.6, MAPYANGPHON SUBDISTRICT,
 PLUAK DAENG DISTRICT, RAYONG PROVINCE,
 21140, THAILAND

HY-DH108P8
 108 HALF-CELL BIFACIAL MODULE



■ Conventional Module ■ Hyperion Performance
 25 Years warranty for materials and workmanship
 30 Years warranty for extra linear power output



IEC61215 / IEC61730 / UL61730
 IEC61701 / IEC62716
 ISO9001: Quality Management System

12/22

BLACK DH108P8

Mechanical Parameters

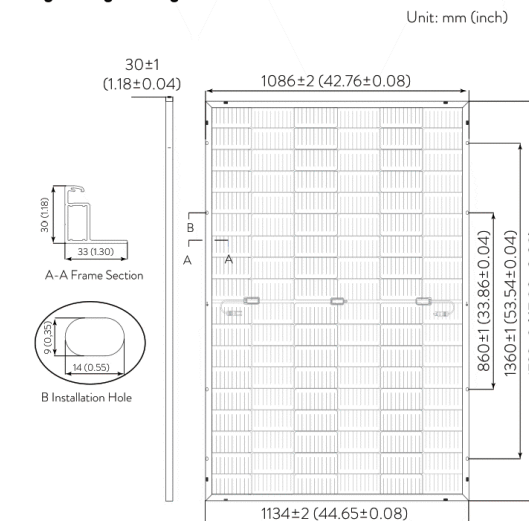
Solar Cell	Mono PERC 182mm
No. of Cells	108 (6 × 18)
Dimensions	1722 × 1134 × 30mm (67.08 × 44.65 × 1.18in.)
Weight	25.2kg (55.55lbs)
Junction Box	IP68 rated (3 bypass diodes)
Output Cables	4mm ² (IEC), 12 AWG (UL) (-/+1200mm (47.24in.) or customized)
Connector	EVO2 or customized
Front Cover	2.0mm (0.079in.) semi-tempered AR glass
Back Cover	2.0mm (0.079in.) semi-tempered glass
Container	36 pcs/Pallet, 792 pcs/40' HC

Operating Parameters

Max. System Voltage	DC 1500V (IEC/UL)
Operating Temperature	-40°C ~ +85°C (-40°F ~ +185°F)
Max. Fuse Rating	30A
Frontside Max. Loading	5400Pa (112lb/ft ²)
Backside Max. Loading	2400Pa (50lb/ft ²)
Bifaciality	70%±10%
Fire Resistance	IEC Class A, UL Type 29

HY-DH108P8-390/410B

Engineering Drawing



Electrical Characteristics - STC

	Irradiance 1000 W/m ² , ambient temperature 25 °C, AM1.5				
Maximum Power at STC (Pmax/W)	410	405	400	395	390
Power Tolerance (W)	0 ~ +5				
Optimum Operating Voltage (Vmp/V)	31.45	31.21	31.01	30.84	30.64
Optimum Operating Current (Imp/A)	13.04	12.98	12.90	12.81	12.73
Open Circuit Voltage (Voc/V)	37.32	37.23	37.07	36.98	36.85
Short Circuit Current (Isc/A)	13.95	13.87	13.79	13.70	13.61
Module Efficiency	21.0%	20.7%	20.5%	20.2%	20.0%

Electrical Characteristics - NMOT

	Irradiance 800 W/m ² , ambient temperature 20 °C, AM1.5, wind speed 1 m/s.				
Maximum Power at NMOT (Pmax/W)	310.2	306.4	302.5	298.8	295.0
Optimum Operating Voltage (Vmp/V)	29.82	29.60	29.41	29.25	29.15
Optimum Operating Current (Imp/A)	10.40	10.35	10.29	10.22	10.15
Open Circuit Voltage (Voc/V)	35.39	35.31	35.15	35.07	34.95
Short Circuit Current (Isc/A)	11.25	11.19	11.13	11.05	10.98

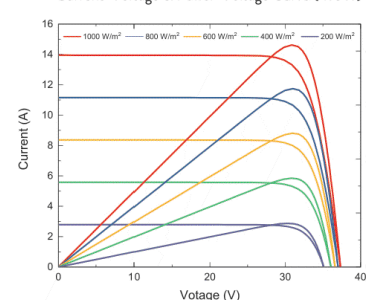
Rearside Power Gain (Reference to 410W Front)

	5%	15%	25%
Rearside Power Gain	5%	15%	25%
Maximum Power (Pmax/W)	431.4	472.3	514.8
Optimum Operating Voltage (Vmp/V)	31.57	31.57	31.65
Optimum Operating Current (Imp/A)	13.66	14.96	16.27
Open Circuit Voltage (Voc/V)	37.46	37.46	37.46
Short Circuit Current (Isc/A)	14.57	15.96	17.35
Module Efficiency	22.1%	24.2%	26.4%

Temperature Characteristics

Nominal Module Operating Temperature	42 ± 2 °C
Nominal Cell Operating Temperature	45 ± 2 °C
Temperature Coefficient of Pmax	-0.35%/°C
Temperature Coefficient of Voc	-0.27%/°C
Temperature Coefficient of Isc	0.05%/°C

Current-Voltage & Power-Voltage Curve (410W)



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 TSP152443

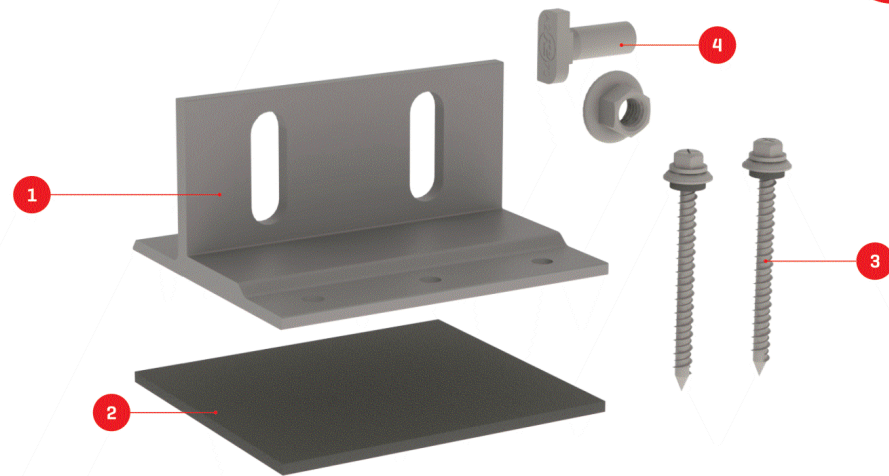
(25) HY-DH108P8-400B
 (1) ENPHASE IQ8PLUS-72-2-US
 10.000 kW DC SYSTEM SIZE
 7.250 kW AC SYSTEM SIZE

DATE: 2/9/2023
 REV: A
 DRAWN BY: CA

SEAL:

EQUIPMENT SPECIFICATIONS
PV 13

We support PV systems
Formerly Everest Solar Systems



Splice Foot X

Patent Pending

TECHNICAL SHEET

Item Number	Description	Part Number
1	Splice Foot X	4000113 Splice Foot X Kit, Mill
2	K2 FlexFlash Butyl	
3	M5 x 60 lag screws	
4	T-Bolt & Hex Nut Set	

Technical Data

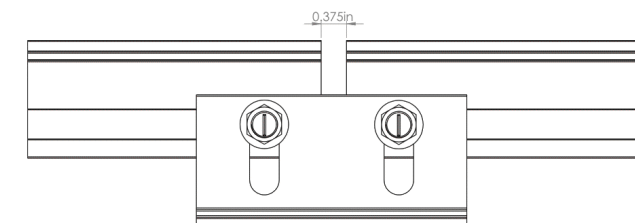
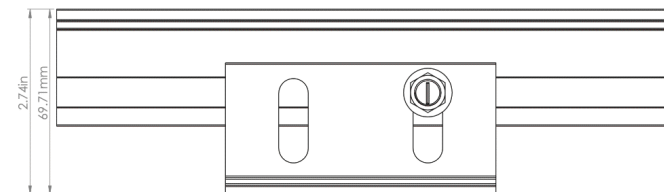
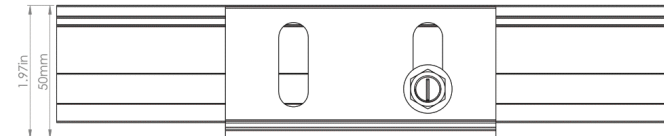
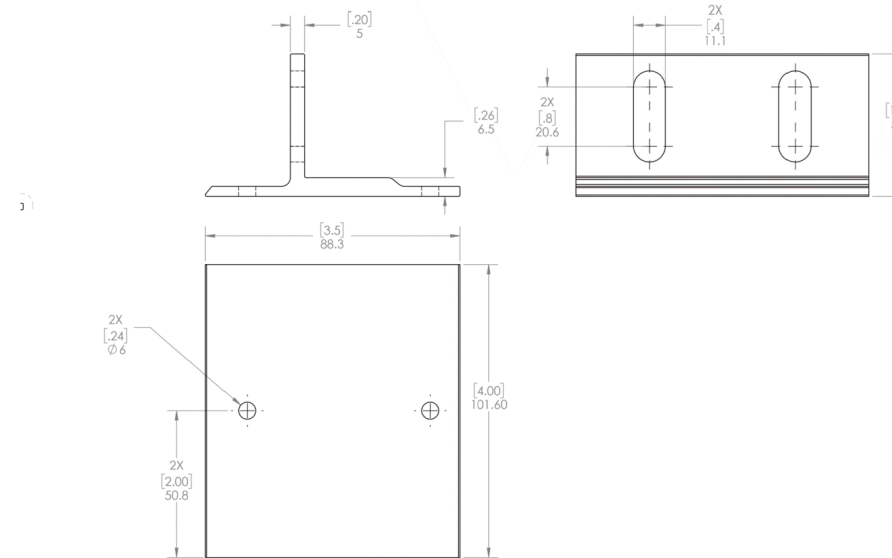
Splice Foot X	
Roof Type	Composition shingle
Material	Aluminum with stainless steel hardware
Finish	Mill
Roof Connection	M5 x 60 lag screws
Code Compliance	UL 2703
Compatibility	CrossRail 44-X, 48-X, 48-XL, 80

k2-systems.com

We support PV systems
Formerly Everest Solar Systems



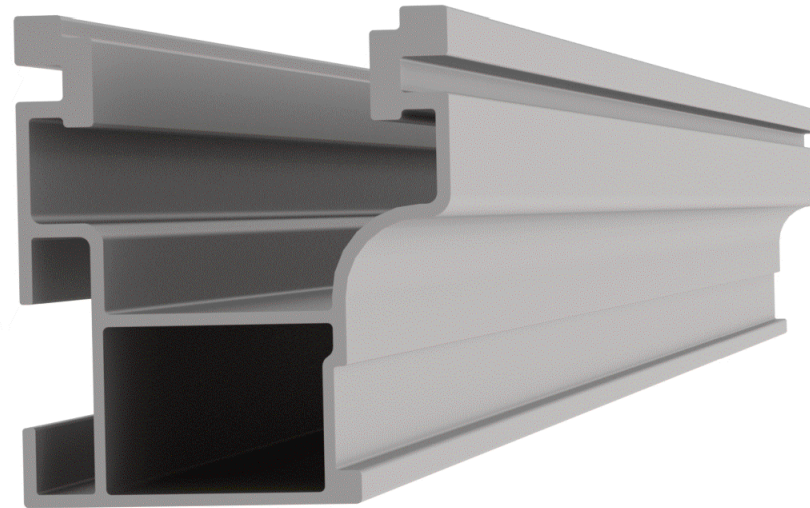
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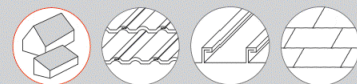
NEW!



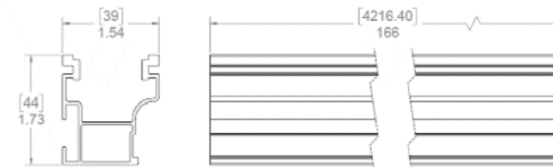
NEW PRODUCT

CrossRail 44-X

- ▶ Optimized rail profile
- ▶ One rail for all markets
- ▶ Built-in wire management
- ▶ Maintains same structural integrity as 48-X
- ▶ Tested up to 200 mph winds
- ▶ Tested up to 100 PSF snow loads



Part Number	Description
4000019	CrossRail 44-X 166", Mill
4000020	CrossRail 44-X 166", Dark
4000021	CrossRail 44-X 180", Mill
4000022	CrossRail 44-X 180", Dark
4000051	RailConn Set, CR 44-X, Mill
4000052	RailConn Set, CR 44-X, Dark
4000067	End Cap, Black, CR 44-X



www.everest-solarsystems.com
 CrossRail 44-X Product Sheet US01 | 0520 · Subject to change · Product illustrations are exemplary and may differ from the original.

Recommended OCPD Size per Grid

Inverter	Maximum Output Current (A)	Minimum Fuse Rating (A)	Maximum Fuse Rating (A)
SE3000H-US	12.5	20	50
SE3800H-US	16	20	50
SE5000H-US	24 @ 208V 21 @ 240V	30	50
SE6000H-US	24 @ 208V 25 @ 240V	30 @ 208V 35 @ 240V	50
SE7600H-US	32	40	50
SE10000H-US	42	60	80
SE11400H-US	48.5 @ 208V 47.5 @ 240V	70 @ 208V 60 @ 240V	80

SolarEdge Single Phase Inverter with HD-Wave Technology Installation MAN-01-00541-1.1