SCOPE OF WORK:
TO INSTALL A ROOF MOUNTED SOLAR PHOTOVOLTAIC SYSTEM AT THE OWNER RESIDENCE LOCATED AT 81 KNOLL WAY, SANFORD, NC 27332 THE POWER GENERATED BY THE PV SYSTEM WILL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ELECTRICAL SERVICE EQUIPMENT.
THE PV SYSTEM DOES NOT INCLUDE STORAGE BATTERIES

EQUIPMENT SUMMARY
23 MISSION SOLAR MSE410HT0B MODULES
23 SOLAREDGE S500B POWER OPTIMIZERS
01 SOLAREDGE SE7600H-US INVERTER

SYSTEM RATING
9.430 KWDC
7.600 KWAC

GOVERNING CODES
2018 INTERNATIONAL FIRE CODE 2018 INTERNATIONAL BUILDING CODE 2018 INTERNATIONAL RESIDENTIAL CODE 2018 NORTH CAROLINA STATE BUILDING CODE 2017 NATIONAL ELECTRICAL CODE
AUTHORITY HAVING JURISDICTION (AHJ) : HARNETT COUNTY

GENERAL NOTES:
- THESE CONSTRUCTION DOCUMENTS HAVE BEEN BASED ON FIELD INSPECTIONS AND OTHER INFORMATION AVAILABLE AT THE TIME. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS IN CONSTRUCTION DETAILS.
- ARCHITECT HAS NOT BEEN RETAINED TO SUPERVISE ANY CONSTRUCTION OR INSTALLATION OF ANY EQUIPMENT AT SITE.
- CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, EQUIPMENT, TOOLS, OBTAINS ALL PERMITS, LICENSES AND PAY ALL REQUIRED FEES AND COMPLETE INSTALLATION.
- CONTRACTOR HAS THE FULL RESPONSIBILITY TO CHECK AND VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK. ANY WORK STARTED BEFORE CONSULTATION AND ACCEPTANCE BY THE ENGINEER SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE SUBJECT TO CORRECTION BY THEM WITHOUT ADDITIONAL COMPENSATION.
- DAMAGE CAUSED TO THE EXISTING STRUCTURE, PIPES, DUCTS, WINDOWS, WALL, FLOORS, ETC. SHALL BE REPAIRED TO THE ORIGINAL CONDITION OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR THE PROPER INSTALLATION AND COMPLETION OF THE WORK WITH APPROVED MATERIALS.
- NO CHANGES ARE TO BE MADE WITHOUT THE CONSULTATION AND APPROVAL OF THE ARCHITECT.
- CONTRACTOR SHALL OBTAIN BULDING PERMIT. NO WORK TO START UNLESS BUILDING PERMIT IS PROPERLY DISPLAYED.
- ALL WORKMANSHIP AND MATERIALS SHALL BE OF FIRST QUALITY AND IN COMPLIANCE WITH THE REQUIREMENTS OF THE NC BUILDING CODE, THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ALL PERTINENT AGENCIES.
- IT IS ESSENTIAL THAT ALL WORK PROCEED WITH THE MAXIMUM COOPERATION OF ALL PARTIES AND WITH MINIMUM INTERFERENCE TO THE OCCUPANTS WITHIN THE BUILDING. THE OWNER'S DIRECTIONS IN THIS REGARD SHALL BE FULLY COMPLIED WITH.
- ALL EXPOSED PLUMBING, HVAC, ELECTRICAL DUCTWORK, PIPING AND CONDUITS ARE TO BE PAINTED BY GENERAL CONTRACTOR.
- THE CONTRACTOR SHALL PERFORM THE WORK IN STRICT CONFORMANCE WITH THE LOCAL LAWS, REGULATIONS AND THE NATIONAL ELECTRIC CODE.
- THE CONTRACTOR SHALL OBTAIN ALL PERMITS, APPROVALS, AFFIDAVITS, CERTIFICATIONS, ETC. AND PAY ALL FEES AS REQUIRED BY THE LOCAL AUTHORITIES.
- CONTRACTORS SHALL OBTAIN FIRE CERTIF. UPON COMPLETION OF WORK.

WIRING AND CONDUIT NOTES:
- ALL CONDUIT SIZES AND TYPES, SHALL BE LISTED FOR ITS PURPOSE AND APPROVED FOR THE SITE APPLICATIONS.
- ALL PV CABLES AND HOME RUN WIRES BE #10AWG *USE-2, PV WIRE, OR PROPRIETARY SOLAR CABLING SPECIFIED BY MFR, OR EQUIVALENT; ROUTED TO SOURCE CIRCUIT COMBINER BOXES AS REQUIRED.
- ALL CONDUCTORS AND OCPD SIZES AND TYPES SPECIFIED ACCORDING TO [NEC 690.8 (A)(1) & (B)(1)], [NEC 240] [NEC 690.7] FOR MULTIPLE CONDUCTORS.
- ALL PV DC CONDUCTORS IN CONDUIT EXPOSED TO SUNLIGHT SHALL BE DERATED ACCORDING TO [NEC TABLE 310.15 (B)(2)(C)] BLACK ONLY**
- EXPOSED ROOF PV DC CONDUCTORS SHALL BE USE-2, 90°C RATED, WET AND UV RESISTANT, AND UL LISTED RATED FOR 600V, UV RATED SPIRAL WRAP SHALL BE USED TO PROTECT WIRE FROM SHARP EDGES.
- PHASE AND NEUTRAL CONDUCTORS SHALL BE DUAL RATED THHN/THWN-2 INSULATED, 90°C RATED, WET AND UV RESISTANT, RATED FOR 600V PER NEC 2008 OR 1000V PER NEC 2011.
- 4-WIRE DELTA CONNECTED SYSTEMS HAVE THE PHASE WITH THE HIGHER VOLTAGE TO GROUND MARKED ORANGE OR IDENTIFIED BY OTHER EFFECTIVE MEANS.
- ALL SOURCE CIRCUITS SHALL HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION.
- VOLTAGE DROP LIMITED TO 2%
- AC CONDUCTORS >4AWG COLOR CODED OR MARKED: PHASE A OR L1- BLACK, PHASE B OR L2- RED, PHASE C OR L3- BLUE, NEUTRAL- WHITE/GRAY.

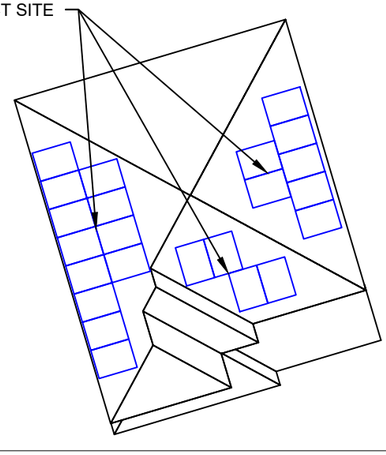
NORTH CAROLINA PROFESSIONAL SEAL 047345 Exp. 12/31/2025 ENGINEER METHODE MANIRAGUHA
STAMPED 05/02/2025

ELECTRICAL NOTES:
- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
- WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- MODULE GROUNDING (UFO) FASTENER TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE (UFO) FASTENER MANUFACTURE'S INSTRUCTION.

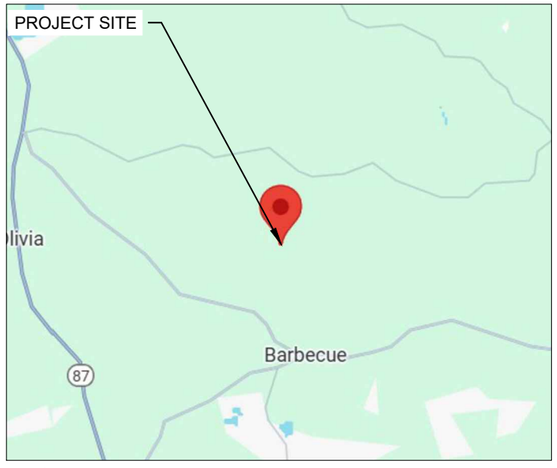
SHEET INDEX

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
05/12/2025
Harnett COUNTY NORTH CAROLINA

PROJECT SITE



1 PV-0 HOUSE PHOTO SCALE: NTS



1 PV-0 VICINITY MAP SCALE: NTS

CAROLINA CONNECTIONS Est. 1999
CAROLINA CONNECTIONS
422 HUFFMAN MILL ROAD, SUITE 105, BURLINGTON, NC 27215, UNITED STATES
PHONE: (336) 585-1314

SYSTEM INFO.
(23) MISSION SOLAR MSE410HT0B
(01) SOLAREDGE SE7600H-US
DC SYSTEM SIZE: 9.430 KWDC
AC SYSTEM SIZE: 7.600 KWAC

REVISIONS

DESCRIPTION	DATE	REV
REVISION	04/18/2025	A
REVISION	04/29/2025	B

Signature with Seal

PROJECT NAME & ADDRESS
STEVEN RICHARDSON RESIDENCE
81 KNOLL WAY,
SANFORD, NC 27332
PH.# : (864) 908-1367
Email: Stever1001@gmail.com

DATE: 04/29/2025

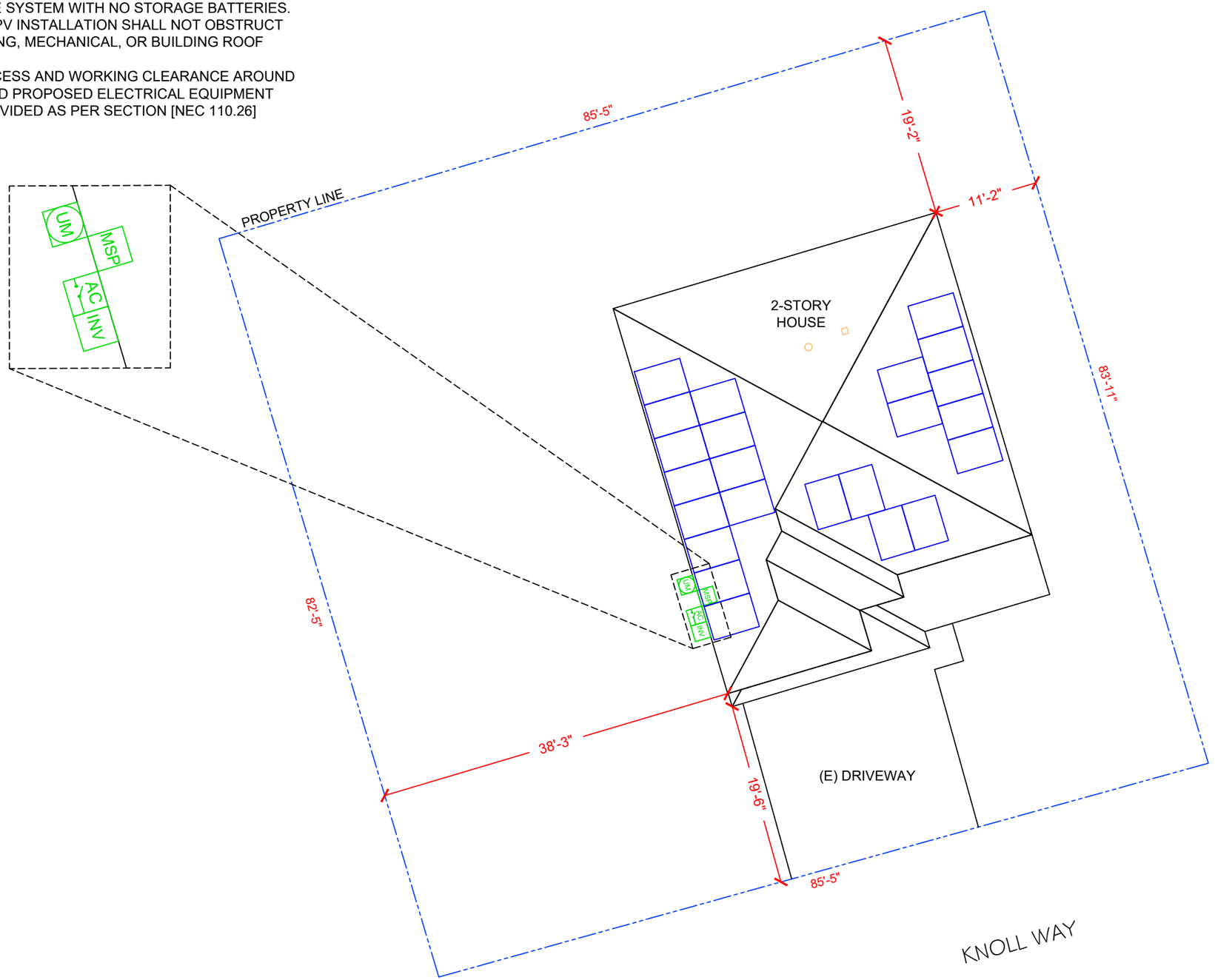
SHEET NAME
COVER PAGE

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-0

SITE NOTES:

- A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
- THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS AN UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.
- THE SOLAR PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION [NEC 110.26]



1 PLOT PLAN WITH ROOF PLAN

PV-1 SCALE: 1/12" = 1'-0"

LEGEND

- JB (N) JUNCTION BOX
- UM (E) UTILITY METER
- MSP (E) MAIN SERVICE PANEL
- INV (N) SOLAREDGE SE7600H-US INVERTER
- AC (N) NON-FUSED AC DISCONNECT
- VENT, ATTIC FAN (ROOF OBSTRUCTION)
- ROOF ATTACHMENT
- CONDUIT
- SOLAREDGE S500B POWER OPTIMIZERS
- MISSION SOLAR MSE410HT0B MODULE
- IRON RIDGE XR-10 168" MILL

METER NO : 343 840 404

CAROLINA CONNECTIONS
422 HUFFMAN MILL ROAD, SUITE 105, BURLINGTON, NC 27215, UNITED STATES
PHONE: (336) 585-1314

SYSTEM INFO.
(23) MISSION SOLAR MSE410HT0B
(01) SOLAREDGE SE7600H-US
DC SYSTEM SIZE: 9.430 KWDC
AC SYSTEM SIZE: 7.600 KWAC

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REVISION	04/29/2025	B

Signature with Seal

PROJECT NAME & ADDRESS

STEVEN RICHARDSON
RESIDENCE
81 KNOLL WAY,
SANFORD, NC 27332
PH.# : (864) 908-1367
Email: Stever1001@gmail.com

DATE: 04/29/2025

SHEET NAME
SITE PLAN

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL	SOLAREDGE SE7600H-US
MAX DC SHORT CIRCUIT CURRENT	45A
CONTINUOUS OUTPUT CURRENT	32.0A (240V)

MODULE TYPE, DIMENSIONS & WEIGHT	
NUMBER OF MODULES:	23 MODULES
MODULE TYPE:	MISSION SOLAR MSE410HT0B
MODULE WEIGHT:	42.0 LBS/19.1 KG
MODULE DIMENSIONS:	67.83" x 44.68" = 21.04SF
UNIT WEIGHT OF ARRAY:	2.00 PSF

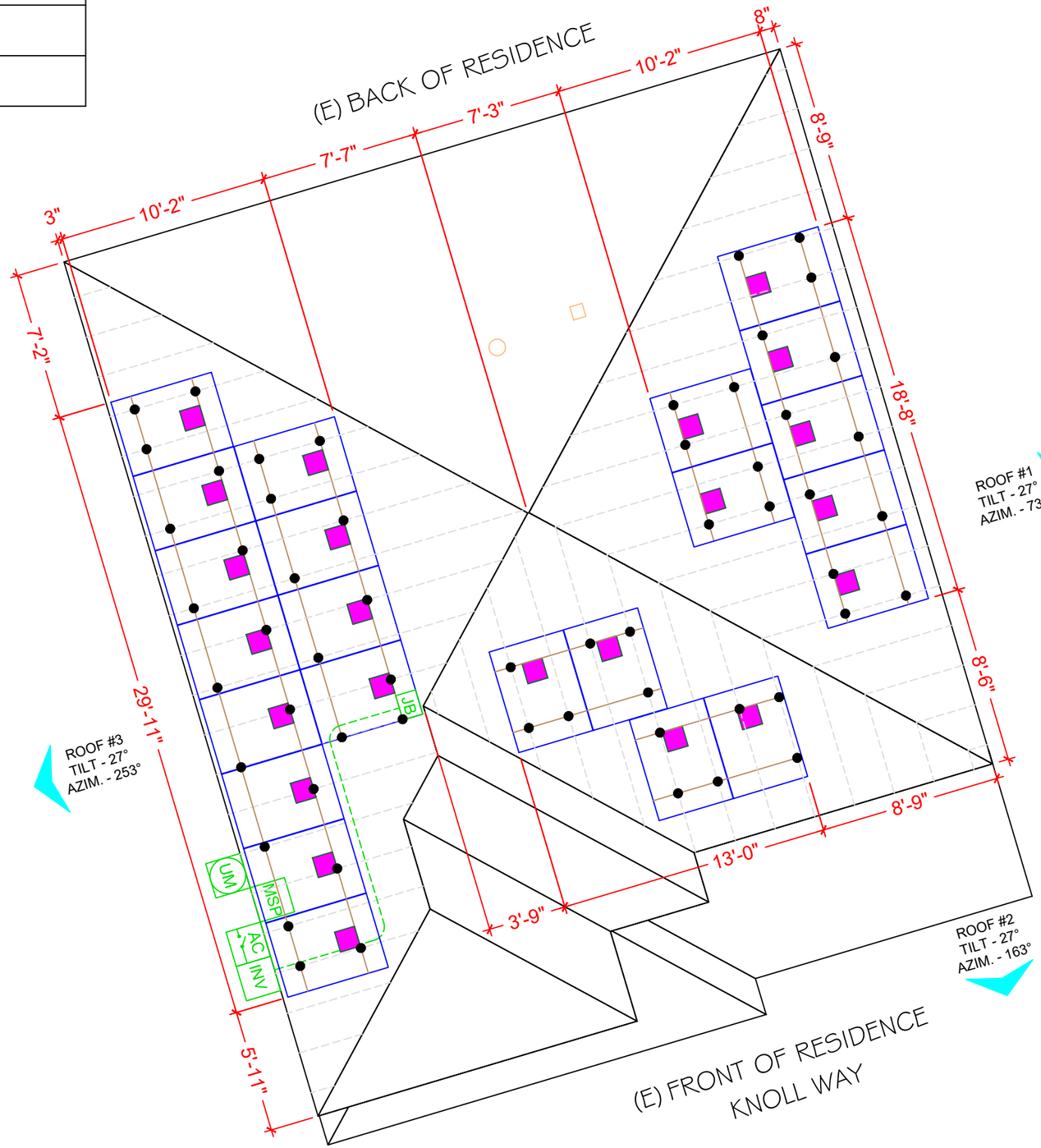
ROOF DESCRIPTION

ROOF	ROOF TILT	AZIMUTH	TRUSS SIZE	TRUSS SPACING	ROOF MATERIAL
#1	27°	73°	2" X 4"	24" O.C.	COMP. SHINGLE
#2	27°	163°	2" X 4"	24" O.C.	COMP. SHINGLE
#3	27°	253°	2" X 4"	24" O.C.	COMP. SHINGLE

ARRAY AREA & ROOF AREA CALC'S

ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)
#1	7	132.41
#2	4	75.52
#3	12	227.18
(TOTAL ARRAY AREA/TOTAL ROOF AREA) X 100%		
(435.10/1575.61) X 100% = 27.61%		

DESIGN SPECIFICATION	
RISK CATEGORY:	II
CONSTRUCTION:	SFD
ZONING:	RESIDENTIAL
SNOW LOAD (ASCE 7-10):	10 PSF
EXPOSURE CATEGORY:	B
WIND SPEED (ASCE 7-10):	116 MPH



LEGEND

- JB (N) JUNCTION BOX
- UM (E) UTILITY METER
- MSP (E) MAIN SERVICE PANEL
- INV (N) SOLAREDGE SE7600H-US INVERTER
- AC (N) NON-FUSED AC DISCONNECT
- VENT, ATTIC FAN (ROOF OBSTRUCTION)
- ROOF ATTACHMENT
- CONDUIT
- SOLAREDGE S500B POWER OPTIMIZERS
- MISSION SOLAR MSE410HT0B MODULE
- IRON RIDGE XR-10 168" MILL

PANEL HEIGHT OFF ROOF	6"

NORTH CAROLINA PROFESSIONAL SEAL 050296 ENGINEER ARASH ZANDIEH

EXP. 12/31/2025

Stamped on 5/2/2025

CAROLINA CONNECTIONS
422 HUFFMAN MILL ROAD,
SUITE 105, BURLINGTON,
NC 27215, UNITED STATES
PHONE: (336) 585-1314

SYSTEM INFO.
(23) MISSION SOLAR MSE410HT0B
(01) SOLAREDGE SE7600H-US
DC SYSTEM SIZE: 9.430 KWDC
AC SYSTEM SIZE: 7.600 KWAC

REVISIONS

DESCRIPTION	DATE	REV
REVISION	04/18/2025	A
REVISION	04/29/2025	B

Signature with Seal

PROJECT NAME & ADDRESS

STEVEN RICHARDSON
RESIDENCE
81 KNOLL WAY,
SANFORD, NC 27332
PH.# : (864) 908-1367
Email: Stever1001@gmail.com

DATE: 04/29/2025

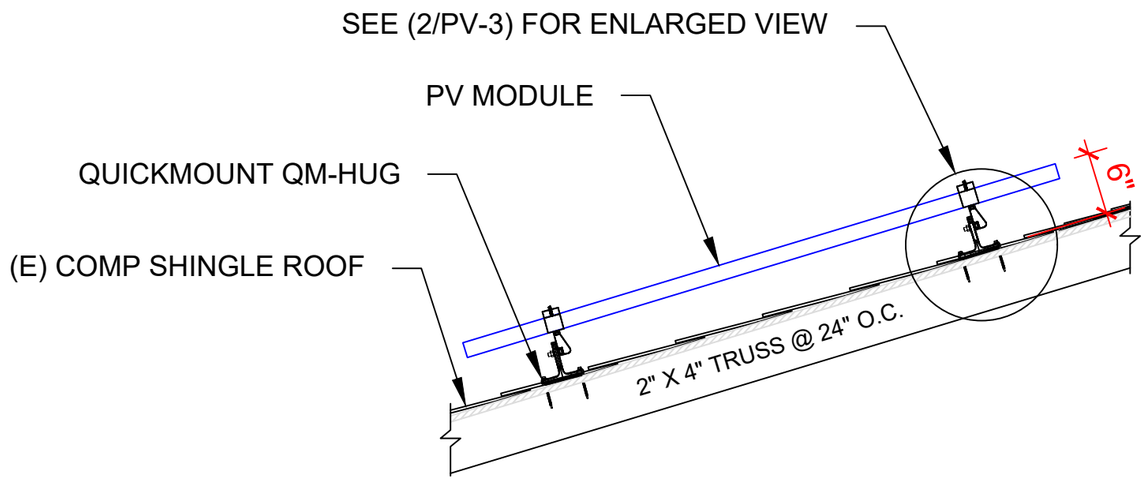
SHEET NAME
ROOF PLAN & MODULES

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2

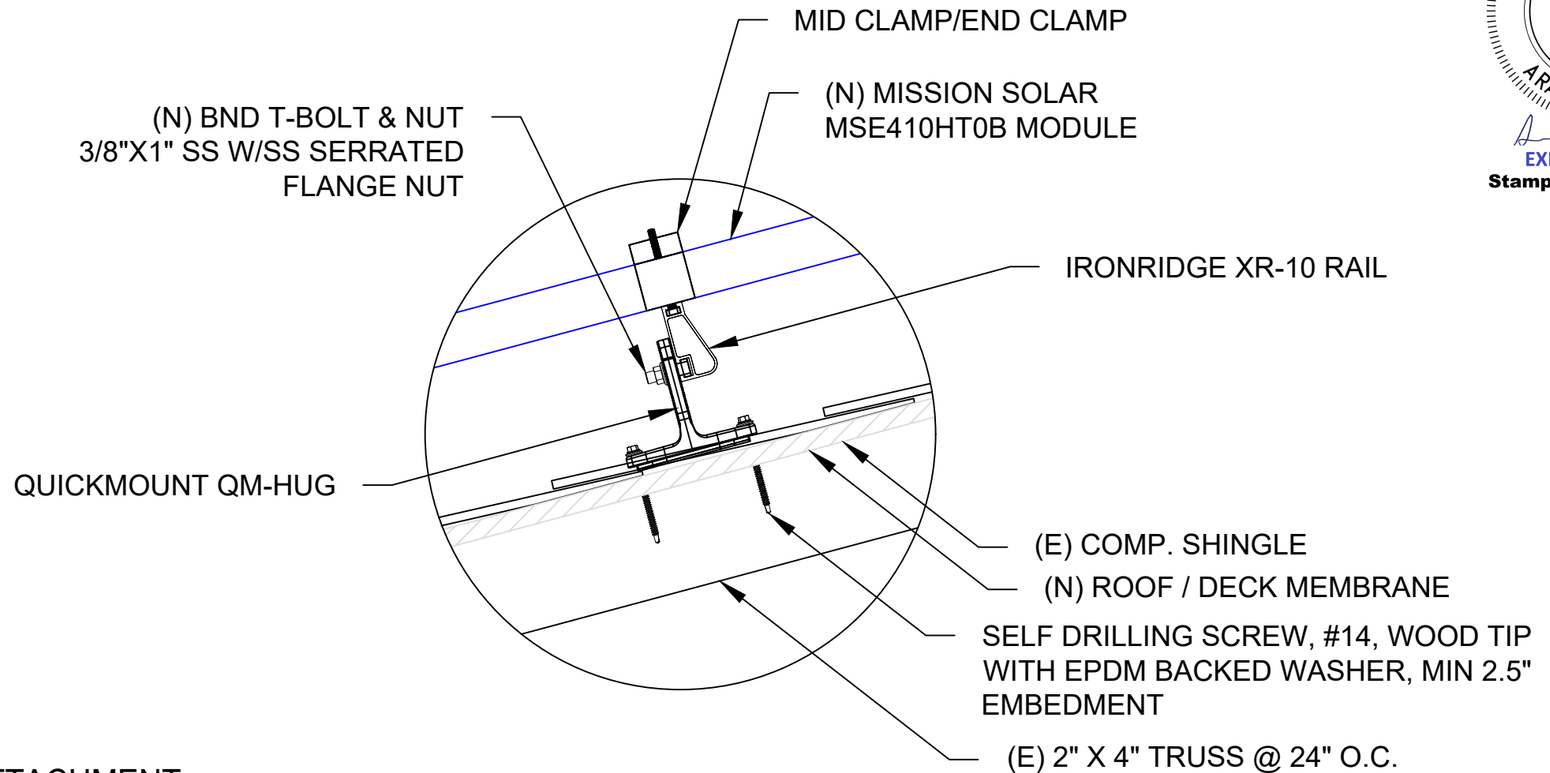
1 ROOF PLAN & MODULES
PV-2
SCALE: 1/6" = 1'-0"

METER NO : 343 840 404



1 ATTACHMENT DETAILS

PV-3



2 ENLARGED VIEW OF ATTACHMENT

PV-3

SCALE: NTS

NORTH CAROLINA PROFESSIONAL SEAL 050296 ENGINEER ARASH ZANDIEH

EXP. 12/31/2025

Stamped on 5/2/2025

CAROLINA CONNECTIONS
422 HUFFMAN MILL ROAD,
SUITE 105, BURLINGTON,
NC 27215, UNITED STATES
PHONE: (336) 585-1314

SYSTEM INFO.
(23) MISSION SOLAR MSE410HT0B
(01) SOLAREDGE SE7600H-US
DC SYSTEM SIZE: 9.430 KWDC
AC SYSTEM SIZE: 7.600 KWAC

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REVISION	04/29/2025	B

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STEVEN RICHARDSON
RESIDENCE
81 KNOLL WAY,
SANFORD, NC 27332
PH.# : (864) 908-1367
Email: Stever1001@gmail.com

DATE: 04/29/2025

SHEET NAME
ATTACHMENT DETAIL

SHEET SIZE
ANSI B
11" X 17"

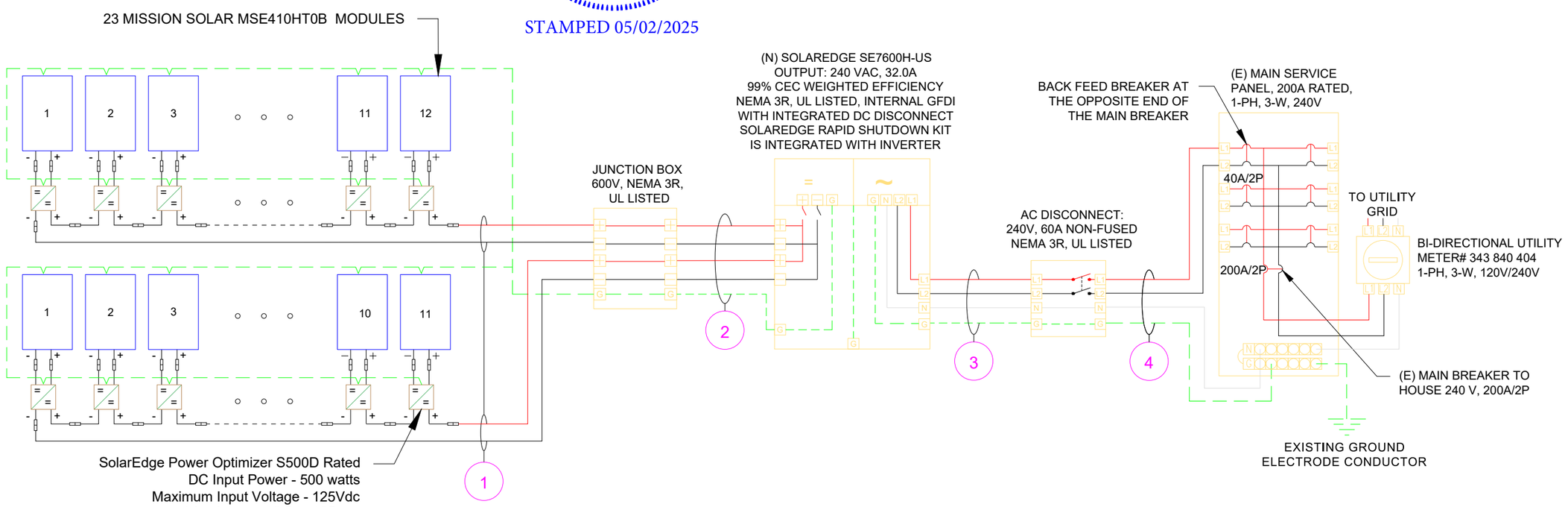
SHEET NUMBER
PV-3

ID	TYPICAL	INITIAL CONDUCTOR LOCATION	FINAL CONDUCTOR LOCATION	CONDUCTOR			CONDUIT	# OF PARALLEL CIRCUITS	CURRENT-CARRYING CONDUCTORS IN CONDUIT	CONDUIT FILL PERCENT	OCPD	EGC		TEMP. CORR. FACTOR		CONDUIT FILL FACTOR	CONT. CURRENT	MAX. CURRENT	BASE AMP.	DERATED AMP.	TERM. TEMP. RATING	LENGTH	VOLTAGE DROP
1	2	ARRAY	JUNCTION BOX	10 AWG	PV WIRE	-	-	1	2	N/A	N/A	6 AWG	BARE COPPER	0.71	(56°C)	N/A	13.07A	16.33A	N/A	N/A	90°C	51FT	0.43%
2	1	JUNCTION BOX	INVERTER	10 AWG	THWN-2	COPPER	MIN 0.75" Dia	2	4	19.09%	N/A	10 AWG	THWN-2, COPPER	0.96	(34°C)	0.8	13.07A	16.33A	40A	30.7A	75°C	39FT	0.33%
3	1	INVERTER	NON-FUSED AC DISCONNECT	8 AWG	THWN-2	COPPER	MIN 0.75" Dia	1	3	23.86%	N/A	10 AWG	THWN-2, COPPER	0.96	(34°C)	1	32.00A	40.00A	55A	52.8A	75°C	5FT	0.10%
4	1	NON-FUSED AC DISCONNECT	MAIN SERVICE PANEL	8 AWG	THWN-2	COPPER	MIN 0.75" Dia	1	3	23.86%	40A	10 AWG	THWN-2, COPPER	0.96	(34°C)	1	32.00A	40.00A	55A	52.8A	75°C	5FT	0.10%

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL	SOLAREDGE SE7600H-US
MAX DC SHORT CIRCUIT CURRENT	45 A
CONTINUOUS OUTPUT CURRENT	32.0A (240V)
MAX CONTINUOUS OUTPUT POWER	7600 W

NORTH CAROLINA PROFESSIONAL SEAL 047345 Exp. 12/31/2025 ENGINEER METHODE MANIRAGUHA

STAMPED 05/02/2025



INTERCONNECTION
120% RULE - NEC 705.12(B)(2)(3)(b)
UTILITY FEED + SOLAR BACKFEED 200A + 40A = 240A
BUS RATING X 120% 200A x 120% = 240A

SERVICE INFO	
UTILITY PROVIDER:	DUKE ENERGY
AHJ NAME:	HARNETT COUNTY
MAIN PANEL BRAND:	EATON
MAIN SERVICE PANEL:	200A
MAIN PANEL LOCATION:	SOUTH-WEST
SERVICE FEED SOURCE:	UNDERGROUND

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL	MISSION SOLAR MSE410HT0B
VMP	31.38 V
IMP	13.07 A
VOC	37.41 V
ISC	13.90 A
TEMP. COEFF. VOC	-0.254 %/C
MODULE DIMENSION	67.83" (L) x 44.68" (W)
PANEL WATTAGE	410W

1 ELECTRICAL LINE DIAGRAM

PV-4 SCALE: NTS

CAROLINA CONNECTIONS

CAROLINA CONNECTIONS
422 HUFFMAN MILL ROAD,
SUITE 105, BURLINGTON,
NC 27215, UNITED STATES
PHONE: (336) 585-1314

SYSTEM INFO.
(23) MISSION SOLAR MSE410HT0B
(01) SOLAREDGE SE7600H-US
DC SYSTEM SIZE: 9.430 KWDC
AC SYSTEM SIZE: 7.600 KWAC

REVISIONS		
DESCRIPTION	DATE	REV
REVISION	04/18/2025	A
REVISION	04/29/2025	B

Signature with Seal

PROJECT NAME & ADDRESS

STEVEN RICHARDSON
RESIDENCE
81 KNOLL WAY,
SANFORD, NC 27332
PH.# : (864) 908-1367
Email: Stever1001@gmail.com

DATE: 04/29/2025

SHEET NAME
ELECTRICAL LINE & CALCS.

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-4

NORTH CAROLINA PROFESSIONAL SEAL 047345 Exp. 12/31/2025 ENGINEER METHODE MANIRAGUHA

STAMPED 05/02/2025

CAROLINA CONNECTIONS
422 HUFFMAN MILL ROAD,
SUITE 105, BURLINGTON,
NC 27215, UNITED STATES
PHONE: (336) 585-1314

SYSTEM INFO.
(23) MISSION SOLAR MSE410HT0B
(01) SOLAREDGE SE7600H-US
DC SYSTEM SIZE: 9.430 KWDC
AC SYSTEM SIZE: 7.600 KWAC

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REVISION	04/29/2025	B

Signature with Seal

PROJECT NAME & ADDRESS

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RESIDENCE
81 KNOLL WAY,
SANFORD, NC 27332
PH.# : (864) 908-1367
Email: Stever1001@gmail.com

DATE: 04/29/2025

SHEET NAME
ELECTRICAL PHOTOS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL	MISSION SOLAR MSE410HT0B
VMP	31.38 V
IMP	13.07 A
VOC	37.41 V
ISC	13.90 A
TEMP. COEFF. VOC	-0.254 %/C
MODULE DIMENSION	67.83" (L) x 44.68" (W)
PANEL WATTAGE	410W

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL	SOLAREDGE SE7600H-US
MAX DC SHORT CIRCUIT CURRENT	45 A
CONTINUOUS OUTPUT CURRENT	32.0A (240V)

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-13°C
AMBIENT TEMP (HIGH TEMP 2%)	34°C
CONDUIT HEIGHT	7/8"
ROOF TOP TEMP	90°C
CONDUCTOR TEMPERATURE RATE	56°C
MODULE TEMPERATURE COEFFICIENT OF VOC	-0.254 %/C

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
0.80	4-6
0.70	7-9
0.50	10-20

STAMPED 05/02/2025

CAROLINA CONNECTIONS
422 HUFFMAN MILL ROAD,
SUITE 105, BURLINGTON,
NC 27215, UNITED STATES
PHONE: (336) 585-1314

SYSTEM INFO.
(23) MISSION SOLAR MSE410HT0B
(01) SOLAREDGE SE7600H-US
DC SYSTEM SIZE: 9.430 KWDC
AC SYSTEM SIZE: 7.600 KWAC

REVISIONS

DESCRIPTION	DATE	REV
REVISION	04/18/2025	A
REVISION	04/29/2025	B

Signature with Seal

PROJECT NAME & ADDRESS

STEVEN RICHARDSON
RESIDENCE
81 KNOLL WAY,
SANFORD, NC 27332
PH.# : (864) 908-1367
Email: Stever1001@gmail.com

DATE: 04/29/2025

SHEET NAME
SPECIFICATIONS & CALC.

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-6

1

⚠ WARNING

ELECTRIC SHOCK HAZARD

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

LABEL LOCATION:
MAIN SERVICE PANEL/AC DISCONNECT/AC COMBINER
(PER CODE: NEC 2017 690.13(B))

2

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION:
DC CONDUIT
EVERY 10' AND ON CONDUIT BODIES WHEN EXPOSED
(PER CODE: NEC2017 690.31(G)(3)(4))

3

PHOTOVOLTAIC SYSTEM AC DISCONNECT
RATED AC OUTPUT CURRENT 32.00 AMPS
NOMINAL OPERATING AC VOLTAGE 240 VOLTS

LABEL LOCATION:
MAIN SERVICE PANEL/AC DISCONNECT
NEC2017, 690.53

4

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION:
INVERTER
AT OR WITHIN 3' OF THE AC/DC COMBINER SWITCH
PER CODE: NEC 690.58(C)(3)

5

⚠ CAUTION

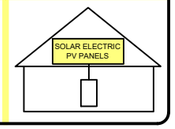
DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
MAIN SERVICE PANEL/AC DISCONNECT/AC COMBINER/REVENUE METER
2017 NEC 705.12(B)(3)

6

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



MAIN SERVICE PANEL
IF MSD IS OUTSIDE PLACE IT THERE / IF MSD IS INSIDE PLACE ON THE AC DISCONNECT
PER CODE: NEC 690.56(C)(1)

7

PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH

LABEL LOCATION:
AC DISCONNECT
2017 NEC 690.56(C)(3)

8

PV SOLAR BREAKER

DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION:
MAIN SERVICE PANEL
2017 NEC 705.12(B)(2)(3)(B)

STAMPED 05/02/2025

9

SERVICE DISCONNECT

SECTIONNEUR PRINCIPALE

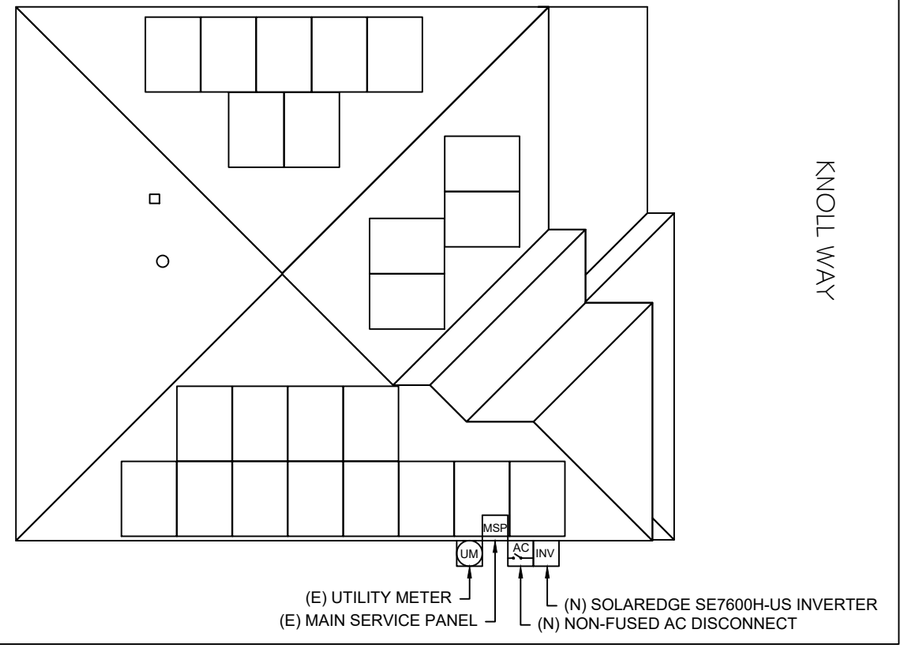
SERVICIO DE DESCONEXION

LABEL LOCATION:
AC DISCONNECT
2017 NEC 230.66

ADHESIVE FASTENED SIGNS:
- ANSI Z535.4-2011 PRODUCT SAFETY SIGNS AND LABELS, PROVIDES GUIDELINES FOR SUITABLE FONT SIZES, WORDS, COLORS, SYMBOLS, AND LOCATION REQUIREMENTS FOR LABELS. NEC 110.21(B)(1).
- THE LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED. NEC 110.21(B)(3).
- ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL SIGNS SHALL BE WEATHER RESISTANT.

CAUTION

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



CAROLINA CONNECTIONS
422 HUFFMAN MILL ROAD, SUITE 105, BURLINGTON, NC 27215, UNITED STATES
PHONE: (336) 585-1314

SYSTEM INFO.
(23) MISSION SOLAR MSE410HT0B
(01) SOLAREDGE SE7600H-US
DC SYSTEM SIZE: 9.430 KWDC
AC SYSTEM SIZE: 7.600 KWAC

REVISIONS

DESCRIPTION	DATE	REV
REVISION	04/18/2025	A
REVISION	04/29/2025	B

Signature with Seal

PROJECT NAME & ADDRESS

STEVEN RICHARDSON RESIDENCE
81 KNOLL WAY,
SANFORD, NC 27332
PH.# : (864) 908-1367
Email: Stever1001@gmail.com

DATE: 04/29/2025

SHEET NAME
SIGNAGE

SHEET SIZE
ANSI B
11" X 17"

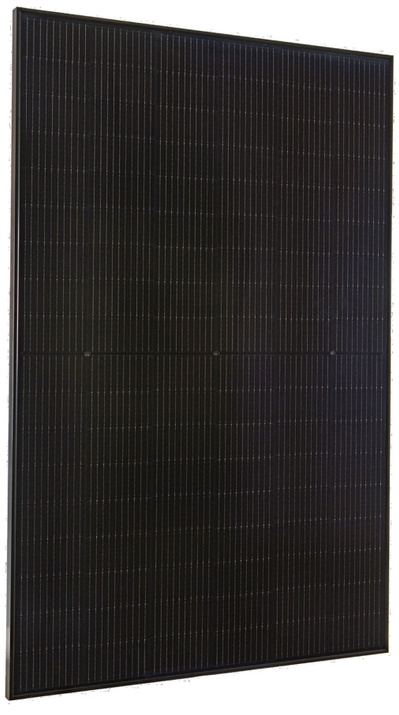
SHEET NUMBER
PV-7

MSE PERC 108HC

MISSION SOLAR ENERGY

410W Positive Power Tolerance

Class leading power output **-0 to +3%**



FRAME-TO-FRAME WARRANTY

Degradation guaranteed not to exceed 2% in year 1 and 0.055% annually from years 2 to 25 with 84.8% capacity guaranteed in year 25.
For more information, visit www.missionsolar.com/warranty

CERTIFICATIONS

CEC · TÜV SÜD · c UL us LISTED

If you have questions or concerns about certification of our products in your area, please contact Mission Solar Energy.

True American Quality
True American Brand

Mission Solar Energy is headquartered in San Antonio, Texas where we manufacture our modules. We produce American, high-quality solar modules ensuring the highest-in-class power output and best-in-class reliability. This product is tailored for residential and commercial applications. Every Mission Solar Energy solar module is certified and surpasses industry standard regulations, providing excellent performance over the long term.

Demand the best. Demand Mission Solar Energy.

Certified Reliability
- Tested to UL 61730 & IEC Standards
- PID resistant
- Resistance to salt mist corrosion

Advanced Technology
- M10 half-cut cell with 10 busbars
- Passivated Emitter Rear Contact
- Engineered for residential and commercial applications

Extreme Weather Resilience
- Up to 5,400 Pa snow and wind load
- In-house hail tests exceeded 35 mm at 23 m/s

BAA Compliant for Government Projects
- Buy American Act
- American Recovery & Reinvestment Act

MODULES ASSEMBLED DESIGNED & ENGINEERED IN THE USA OF U.S. AND NON-U.S. PARTS

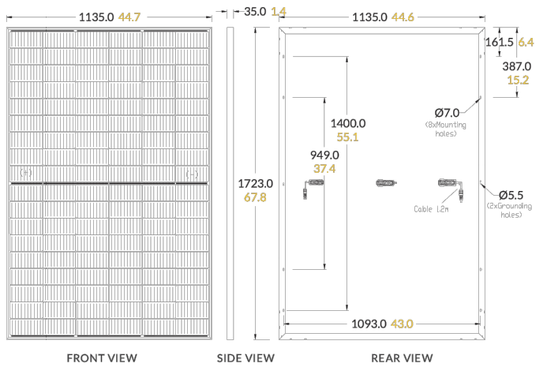
FRAME-TO-FRAME 25 YEAR WARRANTY

Class Leading
400-410W

MSE PERC 108HC

BASIC DIMENSIONS

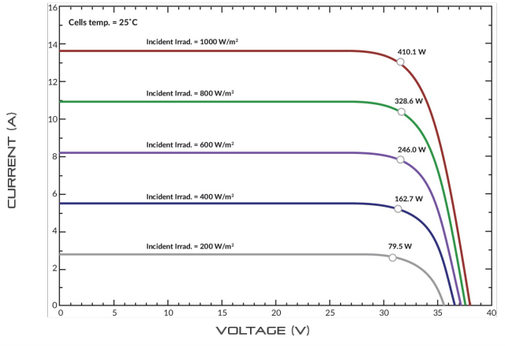
[UNITS: MM/IN]



CURRENT-VOLTAGE CURVE

MSE410HT0B: 410W, 108 HALF-CUT CELL SOLAR MODULE

Current-voltage characteristics with dependence on irradiance and module temperature



CERTIFICATIONS AND TESTS

IEC	61215, 61730, 61701
UL	61730

TÜV SÜD · CEC · c UL us LISTED

Mission Solar Energy
8303 S. New Braunfels Ave., San Antonio, Texas 78235
www.missionsolar.com | info@missionsolar.com

Mission Solar Energy reserves the right to make specification changes without notice.

ELECTRICAL SPECIFICATION

PRODUCT TYPE			MSExxxHT0B (xxx = P_{max})		
Power Output	P_{max}	W_p	400	405	410
Module Efficiency		%	20.5	20.7	21.0
Tolerance		%	0/+3	0/+3	0/+3
Short Circuit Current	I_{sc}	A	13.75	13.82	13.90
Open Circuit Voltage	V_{oc}	V	37.09	37.27	37.41
Rated Current	I_{mp}	A	12.92	13.00	13.07
Rated Voltage	V_{mp}	V	30.96	31.16	31.38
Fuse Rating		A	25A	25A	25A
System Voltage		V	1,000	1,000	1,000

TEMPERATURE COEFFICIENTS

Normal Operating Cell Temperature (NOCT)	45.52°C (±3.7%)
Temperature Coefficient of Pmax	-0.343%/°C
Temperature Coefficient of Voc	-0.254%/°C
Temperature Coefficient of Isc	-0.257%/°C

OPERATING CONDITIONS

Maximum System Voltage	1,000Vdc
Operating Temperature Range	-40°F to 185°F (-40°C to +85°C)
Maximum Series Fuse Rating	25A
Fire Safety Classification	Type 1*
Front & Back Load (UL Standard)	Up to 5,400 Pa front and 5,400 Pa back load. Tested to UL 61730
Hail Safety Impact Velocity	25mm at 23 m/s

**Mission Solar Energy uses quality sourced materials that result in a Type 1 fire rating. Please note, the 'Fire Class' Rating is designated for the fully-installed PV system, which includes, but is not limited to, the module, the type of mounting used, pitch and roof composition.*

MECHANICAL DATA

Solar Cells	P-PERC 182mm x 182mm
Cell Orientation	108 half-cut cells
Module Dimension	1723mm x 1135mm x 35mm
Weight	42 lbs. (19kg)
Front Glass	3.2mm tempered, low-iron, anti-reflective
Frame	35mm anodized interlocking
Encapsulant	Ethylene vinyl acetate (EVA)
Junction Box	Protection class IP68 with 3 bypass-diodes
Cable	1.2m, Wire 4mm² (12AWG)
Connector	MC4 Staubli PV-KBT4/6II-UR and PV-KST4/6II-UR

SHIPPING INFORMATION

Container Feet	Ship To	Pallets	Panels	410W Bin
53'	Most States	26	806	330.46 kW

Double Stack: (Horizontal Orientation): 31 panels per pallet

PALLET [31 PANELS]

Weight	Height	Width	Length
1,610 lbs. (730 kg)	51 in (129.5 cm)	47 in (119.4 cm)	70 in (119.4 cm)

www.missionsolar.com | info@missionsolar.com

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SYSTEM INFO.

(23) MISSION SOLAR MSE410HT0B

(01) SOLAREDGE SE7600H-US

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AC SYSTEM SIZE: 7.600 KWAC

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SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-8

Power Optimizer

For Residential Installations

S440 / S500 / S500B / S650B

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

solaredge

Power Optimizer

For Residential Installations

S440 / S500 / S500B / S650B

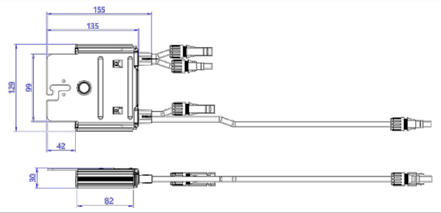
	S440	S500	S500B	S650B	UNIT
INPUT					
Rated Input DC Power(1)	440	500		650	W
Absolute Maximum Input Voltage (Voc)	60		125	85	Vdc
MPPT Operating Range	8 – 60		12.5 – 105	12.5 - 85	Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5	15			Adc
Maximum Efficiency	99.5				%
Weighted Efficiency	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 165 x 45		mm
Weight	720		790		gr
Input Connector	MC4(3)				
Input Wire Length	0.1				m
Output Connector	MC4				
Output Wire Length	(+) 2.3, (-) 0.10				m
Operating Temperature Range(4)	-40 to +85				°C
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) Power de-rating is applied for ambient temperatures above +85°C for S440 and S500, and for ambient temperatures above +75°C for S500B. Refer to the Power Optimizers Temperature De-Rating Technical Note for details.

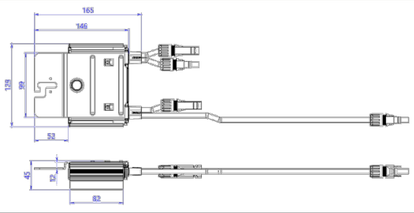
PV System Design Using a SolarEdge Inverter(5)		SolarEdge Home Wave Inverter Single Phase	SolarEdge Home Short String Inverter Three Phase	Three Phase for 230/400V Grid	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440, S500	8	9	16	18	
	S500B, S650B	6	8	14		
Maximum String Length (Power Optimizers)		25	20	50		
Maximum Continuous Power per String		5700	5625	11,250	12,750	W
Maximum Allowed Connected Power per String(6) (In multiple string designs, the maximum is permitted only when the difference in connected power between strings is 2,000W or less)		6800(7)	See(6)	13,500	15,000	W
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 in the same string.
(6) If the inverter's rated AC power ≤ maximum continuous power per string, then the maximum connected power per string will be able to reach up to the inverters maximum input DC power. Refer to the Single String Design Guidelines application note.
(7) For inverters with a rated AC power ≥ 8000W that are connected to at least two strings.

S440, S500 (Flat Bracket)



S500B, S650B (Bent Bracket)



CE RoHS

CAROLINA CONNECTIONS
422 HUFFMAN MILL ROAD, SUITE 105, BURLINGTON, NC 27215, UNITED STATES
PHONE: (336) 585-1314

SYSTEM INFO.

(23) MISSION SOLAR MSE410HT0B

(01) SOLAREDGE SE7600H-US

DC SYSTEM SIZE: 9.430 KWDC

AC SYSTEM SIZE: 7.600 KWAC

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Signature with Seal

PROJECT NAME & ADDRESS

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SANFORD, NC 27332
PH.# : (864) 908-1367
Email: Stever1001@gmail.com

DATE: 04/29/2025

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-9

SolarEdge Home Wave Inverter

For North America

SE3000H-US / SE3800H-US / SE5000H-US / SE5700H-US /
SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US

INVERTERS

12-25 YEAR WARRANTY

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking 99% weighted efficiency
- Quick and easy inverter commissioning directly from a smartphone using SolarEdge SetApp
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014-2023 per articles 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Small, lightweight, and easy to install both outdoors or indoors
- Built-in module-level monitoring
- Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)

solaredge.com

solaredge

SolarEdge Home Wave Inverter

For North America

SE3000H-US / SE3800H-US / SE5000H-US / SE5700H-US / SE6000H-US/ SE7600H-US

Applicable to inverters with part number	SEXXXXH-XXXXXBXX4						Units
	SE3000H-US	SE3800H-US	SE5000H-US	SE5700H-US	SE6000H-US	SE7600H-US	
OUTPUT							
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	5760 @ 240V 5000 @ 208V	6000 @ 240V 5000 @ 208V	7600	VA
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	5760 @ 240V 5000 @ 208V	6000 @ 240V 5000 @ 208V	7600	VA
AC Output Voltage Min. – Nom. – Max. (211 – 240 – 264)	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min. – Nom. – Max. (183 – 208 – 229)	-	✓	-	✓	✓	-	Vac
AC Frequency (Nominal)	59.3 – 60 – 60.5(1)						Hz
Maximum Continuous Output Current @240V	12.5	16	21	24	25	32	A
Maximum Continuous Output Current @208V	-	16	-	24	24	-	A
Power Factor	1, Adjustable – 0.85 to 0.85						
GFDI Threshold	1						A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes						
INPUT							
Maximum DC Power @240V	4650	5900	7750	8900	9300	11800	W
Maximum DC Power @208V	-	5100	-	7750	7750	-	W
Transformer-less, Ungrounded	Yes						
Maximum Input Voltage	480						Vdc
Nominal DC Input Voltage	380						Vdc
Maximum Input Current @240V(2)	8.5	10.5	13.5	16	16.5	20	Adc
Maximum Input Current @208V(2)	-	9	-	13.5	13.5	-	Adc
Max. Input Short Circuit Current	45						Adc
Reverse-Polarity Protection	Yes						
Ground-Fault Isolation Detection	600k Sensitivity						
Maximum Inverter Efficiency	99	99.2					%
CEC Weighted Efficiency	99						%
Nighttime Power Consumption	< 2.5						W
ADDITIONAL FEATURES							
Supported Communication Interfaces	RS485, Ethernet, wireless SolarEdge Home Network (optional)(3), Wi-Fi (optional), Cellular (optional)						
Revenue Grade Metering, ANSI C12.20	Optional(4)						
Consumption Metering	Optional(4)						
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection						
Rapid Shutdown - NEC 2014-2023 per articles 690.11 and 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect						
STANDARD COMPLIANCE							
Safety	Conforms to UL 1741, UL 1741SA, UL 1741SB, UL 1699B Certified by CSA 22.2#107.1, C22.2#330, C22.3#9, ANSI/CAN/UL 9540						
Grid Connection Standards	IEEE1547 and IEEE-1547.1, Rule 21, Rule 14H						
Emissions	FCC Part 15 Class B						
INSTALLATION SPECIFICATIONS							
AC Output Conduit Size / AWG Range	1" Maximum / 14 – 6 AWG						
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1 – 2 strings / 14 – 6 AWG						
Dimensions with Safety Switch (H x W x D)	17.7 x 14.6 x 6.8 / 450 x 370 x 174						in / mm
Weight with Safety Switch	22 / 10		25.1 / 11.4	27.5 / 12.5	26.2 / 11.9		lb / kg
Noise	< 25					< 50	dBA
Cooling	Natural Convection						
Operating Temperature Range	-40 to +140 / -40 to +60(5)						°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)						

(1) For other regional settings please contact SolarEdge support.
(2) A higher current source may be used; the inverter will limit its input current to the values stated.
(3) For more information, refer to the SolarEdge Home Network datasheet
(4) Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BEI4. For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box.
(5) Full power up to at least 50°C / 122°F; for power de-rating information refer to the Temperature Derating technical note for North America.

CE

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SHEET NAME
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11" X 17"

SHEET NUMBER
PV-10

Tech Brief

IRONRIDGE

QuickMount® HUG

The Respect Your Roof Deserves

When integrating with a home, solar attachments must be dependable for the lifetime of the rooftop. Due to recent innovations, many asphalt shingles have bonded courses. A mount that protects without the need to pry shingles can really speed things up.

Halo UltraGrip™ (HUG™) is here to respect the roof. Its Halo is a cast-aluminum barrier that encases the UltraGrip, our industrial-grade, foam-and-mastic seal. This allows HUG to accelerate the installation process and provide the utmost in waterproofing protection. Give your roof a HUG.™

Multi-Tiered Waterproofing
HUG utilizes a multi-tiered stack of components to provide revolutionary waterproofing protection. The Halo cast-aluminum, raised-perimeter foundation surrounds the UltraGrip base—a foam-backed mastic seal combination that prevents water intrusion by adhering and sealing with the shingle surface.

Halo UltraGrip™ is part of the QuickMount® product line.

UltraGrip™ Seal Technology
HUG UltraGrip utilizes a state-of-the-art seal design that uses a unique, foam-and-mastic combination. The foam-backed adhesive provides an entirely new flashing system that conforms and adheres to every nook and cranny of composition shingles, filling gaps and shingle step-downs (up to 1/8" in height).

Triple Rated & Certified to Respect the Roof™
UL 2703, 441 (27)
TAS 100(A)-95

Rafter & Deck Mounting Options
Mount HUG to the roof rafters, the roof deck, or both with our custom-engineered RD (rafter-or-deck) Structural Screw. The RD Structural Screw anchors HUG to the roof with an EPDM sealing washer, completing the stack of waterproofing barriers. See backside for more installation information.

Tech Brief

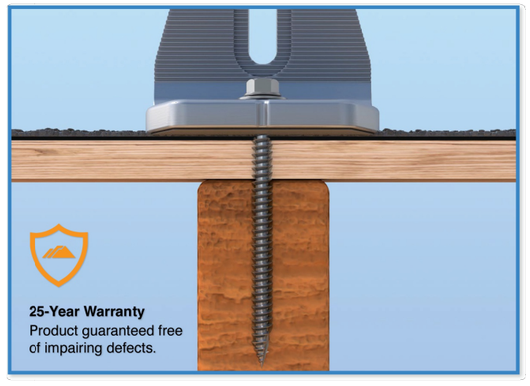
Adaptive, Rafter-Friendly Installation

Hit the rafter? Good to go!
When you find a rafter, you can move on. Only 2 RD Structural Screws are needed.

Miss the rafter? Try it again.
Place another screw to the left or right. If rafter is found, install 3rd and final screw.

Still no luck? Install the rest.
If more than 3 screws miss the rafter, secure six screws to deck mount it.

Trusted Strength & Less Hassle



25-Year Warranty
Product guaranteed free of impairing defects.

Structural capacities of HUG™ were reviewed in many load directions, with racking rail running cross-slope or up-slope in relation to roof pitch.

For further details, see the HUG certification letters for attaching to rafters and decking.

IronRidge designed the HUG, in combination with the RD Structural Screw to streamline installs, which means the following:

- No prying shingles
- No roof nail interference
- No pilot holes necessary
- No sealant (in most cases)
- No butyl shims needed

Attachment Loading
The rafter-mounted HUG has been tested and rated to support 1004 (lbs) of uplift and 368 (lbs) of lateral load.

Structural Design
Parts are designed and certified for compliance with the International Building Code & ASCE/SEI-7.

Water Seal Ratings
HUG passed both the UL 441 Section 27 "Rain Test" and TAS 100(A)-95 "Wind Driven Rain Test" by Intertek.

UL 2703 System
Systems conform to UL 2703 mechanical and bonding requirements. See Flush Mount Manual for more info.

CAROLINA CONNECTIONS

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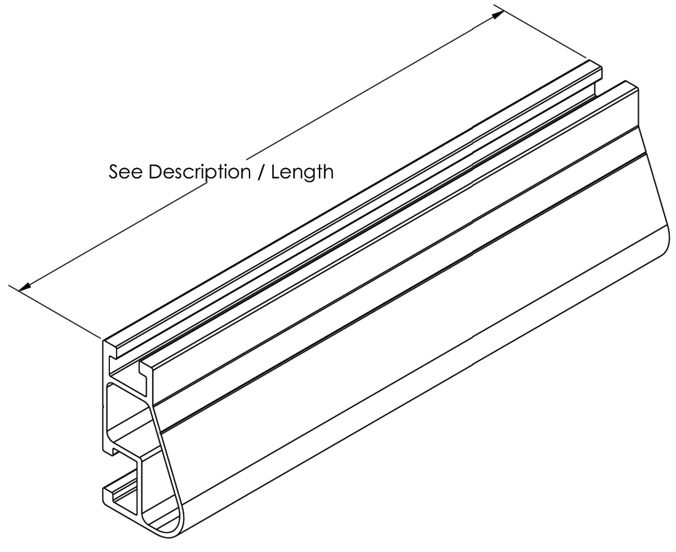
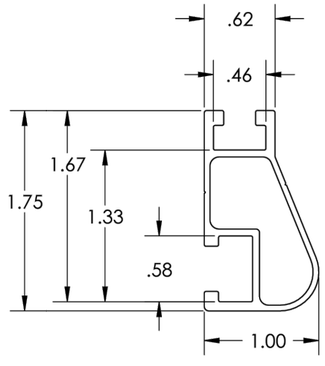
Cut Sheet

IRONRIDGE

XR10® Rail





Rail Section Properties	
Property	Value
Total Cross-Sectional Area	0.363 in^2
Section Modulus (X-axis)	0.136 in^3
Moment of Inertia (X-axis)	0.124 in^4
Moment of Inertia (Y-axis)	0.032 in^4
Torsional Constant	0.076 in^3
Polar Moment of Inertia	0.033 in^4

Clear Part Number	Black Part Number	Description / Length	Material	Weight
XR-10-132A	XR-10-132B	XR10, Rail 132" (11 Feet)	6000-Series Aluminum	4.67 lbs.
XR-10-168A	XR-10-168B	XR10, Rail 168" (14 Feet)		5.95 lbs.
XR-10-204A	XR-10-204B	XR10, Rail 204" (17 Feet)		7.22 lbs.

v1.01

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REVISIONS

DESCRIPTION	DATE	REV
REVISION	04/18/2025	A
REVISION	04/29/2025	B

Signature with Seal

PROJECT NAME & ADDRESS

STEVEN RICHARDSON
RESIDENCE
81 KNOLL WAY,
SANFORD, NC 27332
PH.# : (864) 908-1367
Email: Stever1001@gmail.com

DATE: 04/29/2025

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-12