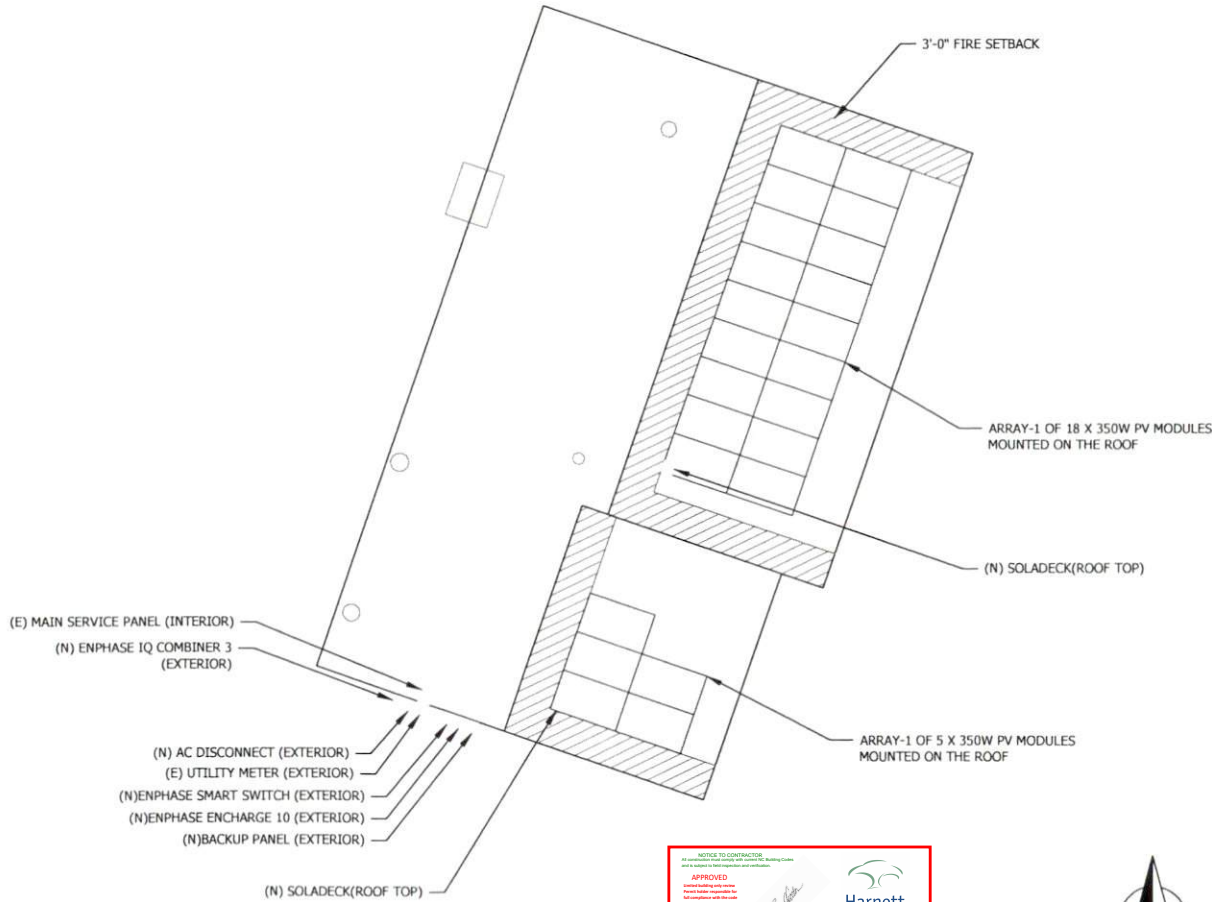


THOMAS LAFOUNTAIN - 8.050kW DC, 5.520kW AC, 10.5kWh SYSTEM STORAGE

SITE PLAN-1

NOTE:
1. CONDUIT RUN IS IN ATTIC



A1 AERIAL MAP
S-001 SCALE: NTS

GENERAL INFORMATION

ELECTRIC CODE	NEC 2017
FIRE CODE	NCFC 2018
RESIDENTIAL CODE	NCRC 2018
BUILDING CODE	NCBC 2018
WIND SPEED	119 MPH
SNOW LOAD	10 PSF

INDEX

INDEX NO.	DESCRIPTION
S-001	SITE PLAN-1
S-002	SITE PLAN-2
G-001	GENERAL NOTES
S-003	MOUNTING DETAILS
S-004	STRUCTURAL DETAILS
E-001	SINGLE LINE DIAGRAM
E-002	WARNING PLACARDS
SS	SPEC SHEET(S)



A SITE PLAN-1
S-001 SCALE: 1"=10'-0"



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SYSTEM INFORMATION

DC SYSTEM SIZE: 8050W
AC SYSTEM SIZE: 5520W
ANNUAL SOLAR OUTPUT: 9528 kWh/an
MODULES:
(23) HANWHA Q CELL Q.PEAK DUO-G6+ 350W
INVERTER:
(23) ENPHASE IQ7-60-2-US
BRANCH DETAILS:
1 BRANCH OF 12 MICRO-INVERTERS(12 MODULES)
1 BRANCH OF 11 MICRO-INVERTERS(11 MODULES)
STORAGE:
(1) ENPHASE ENCHARGE 10, 10.5kWh

ENGINEER OF RECORD

CUSTOMER INFORMATION

NAME & ADDRESS:
THOMAS LAFOUNTAIN
71 SPIRAL BRANCH, COURT LINDEN, NC 28356
35°16'07.4"N 78°52'48.4"W
APN: 053-552-773-8

AHJ: NC - COUNTY HARNETT

UTILITY: SOUTH RIVER EMC

PROJECT NUMBER: SELS-018

SITE PLAN-1

DESIGNER/CHECKED BY:
GP/GP

SCALE: AS NOTED

PAPER SIZE: 17"x11"

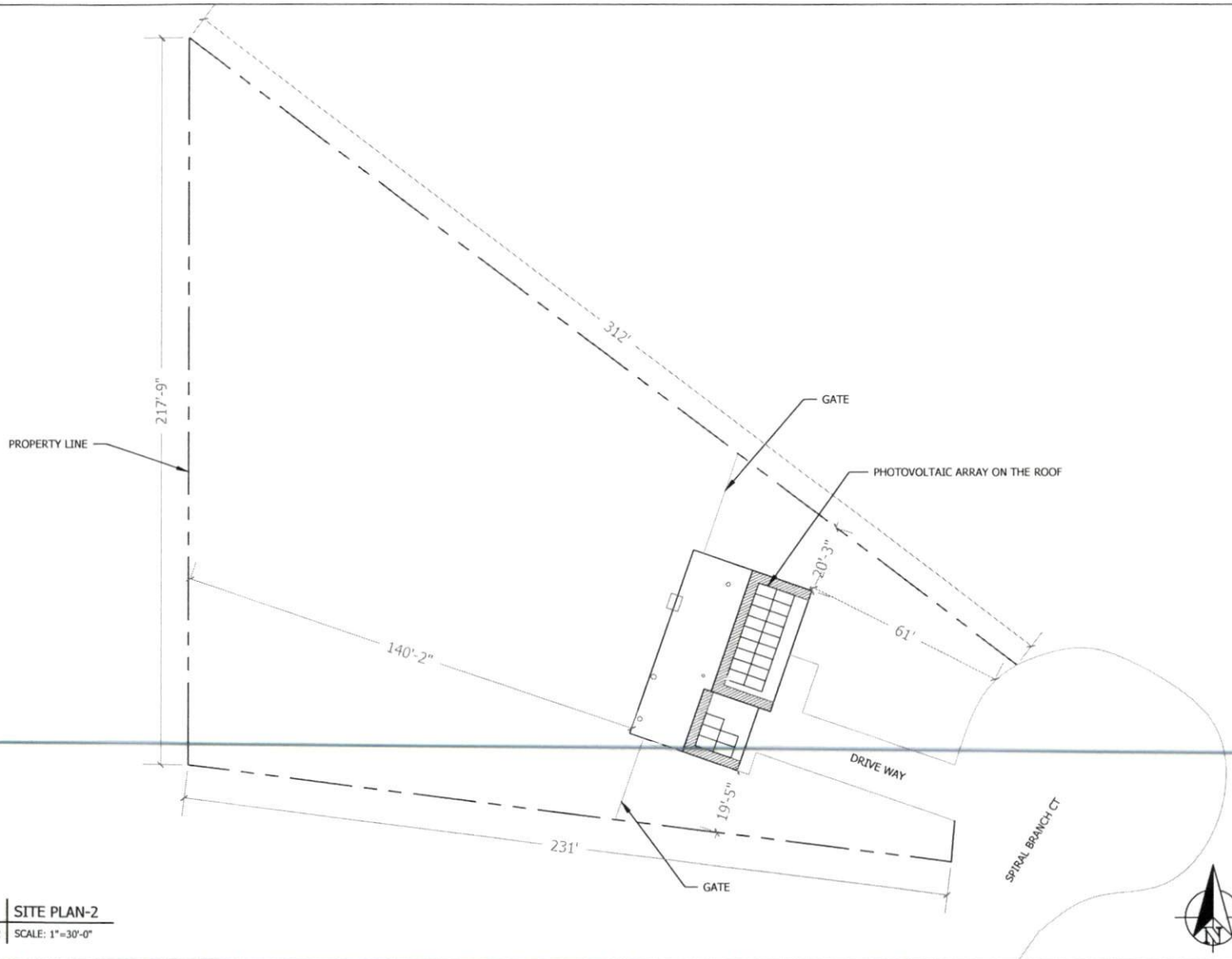
DATE: 6/24/21

REV: A

S-001

THOMAS LAFOUNTAIN - 8.050kW DC, 5.520kW AC, 10.5kWh SYSTEM STORAGE

SITE PLAN-2



Sustainable Energy & Lighting Solutions
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SYSTEM INFORMATION

DC SYSTEM SIZE: 8050W
 AC SYSTEM SIZE: 5520W
 ANNUAL SOLAR OUTPUT: 9528 kWh/an
 MODULES:
 (23) HANWHA Q CELL Q.PEAK DUO-G6+ 350W
 INVERTER:
 (23) ENPHASE IQ7-60-2-US
 BRANCH DETAILS:
 1 BRANCH OF 12 MICRO-INVERTERS(12 MODULES)
 1 BRANCH OF 11 MICRO-INVERTERS(11 MODULES)
 STORAGE:
 (1) ENPHASE ENCHARGE 10, 10.5kWh

ENGINEER OF RECORD

CUSTOMER INFORMATION

NAME & ADDRESS:
 THOMAS LAFOUNTAIN
 71 SPIRAL BRANCH, COURT LINDEN, NC 28356

35°16'07.4"N 78°52'48.4"W
 APN:053-552-773-8

AHD:NC- COUNTY HARNETT

UTILITY:SOUTH RIVER EMC

PROJECT NUMBER:SELS-018

SITE PLAN-2

DESIGNER/CHECKED BY:
 GP/GP

SCALE:AS NOTED

PAPER SIZE:17"x11"

DATE:6/24/21

REV:A

S-002

A | SITE PLAN-2

5-002 | SCALE: 1"=30'-0"

GENERAL NOTES

GENERAL NOTES

1. MODULES ARE LISTED UNDER UL 1703 AND CONFORM TO THE STANDARDS.
2. INVERTERS ARE LISTED UNDER UL 1741 AND CONFORM TO THE STANDARDS.
3. DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT OF THE PV SYSTEM AND THE ACTUAL SITE CONDITION MIGHT VARY.
4. WORKING CLEARANCES AROUND THE NEW PV ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC 110.26(A)(1).
5. ALL GROUND WIRING CONNECTED TO THE MAIN SERVICE GROUNDING IN MAIN SERVICE PANEL/ SERVICE EQUIPMENT.
6. ALL CONDUCTORS SHALL BE 600V, 75°C STANDARD COPPER UNLESS OTHERWISE NOTED.
7. WHEN REQUIRED, A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
8. THE SYSTEM WILL NOT BE INTERCONNECTED BY THE CONTRACTOR UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND/OR THE UTILITY.
9. ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREES, WIRES OR SIGNS.
10. PV ARRAY COMBINER/JUNCTION BOX PROVIDES TRANSITION FROM ARRAY WIRING TO CONDUIT WIRING

EQUIPMENT LOCATION:

11. ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26(A)(1).
12. 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).
13. JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.
14. ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT.
15. ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.
16. ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE

STRUCTURAL NOTES:

17. RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAIL MANUFACTURER'S INSTRUCTIONS.
18. JUNCTION BOX WILL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
19. ROOFTOP PENETRATIONS FOR PV RACEWAY WILL BE COMPLETED AND SEALED WITH APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
20. ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER.
21. WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

WIRING & CONDUIT NOTES:

22. ALL CONDUIT 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.
23. CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.
24. DC WIRING LIMITED TO MODULE FOOTPRINT. MICRO INVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY WITH SUITABLE WIRING CLIPS.
25. AC CONDUCTORS COLORED OR MARKED AS FOLLOWS: PHASE A OR L1- BLACK PHASE B OR L2- 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 HIGHER VOLTAGE TO BE MARKED ORANGE [NEC 110.15].

INTERCONNECTION NOTES:

26. LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 690.64(B)]
27. THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS INPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(D)(2)(3)].
28. WHEN SUM OF THE PV SOURCES EQUALS >100% OF BUSBAR RATING, PV DEDICATED BACKFFED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(D)(2)(3)].
29. AT MULTIPLE PV OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVER CURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVER CURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12(D)(2)(3)(C).
30. FEEDER TAP INTER CONNECTION (LOAD SIDE) ACCORDING TO NEC 705.12(D)(2)(1) SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12(A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42 BACK FEEDING BREAKER FOR UTILITY-INTERACTIVE INVERTER OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12(D)(5)].

GROUNDING NOTES:

31. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.
32. PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC 250.122.
33. METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).
34. EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC 690.45 AND MICRO INVERTER MANUFACTURER'S INSTRUCTIONS.
35. EACH MODULE WILL BE GROUNDED USING WEEB GROUNDING CLIPS AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.
36. THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.
37. GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119]
38. THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47 AND AHJ.
39. GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.5 IN GENERAL AND NEC 690.5(A)(1) SPECIFICALLY.
40. DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:
41. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).
42. DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
43. RAPID SHUTDOWN OF ENERGIZED CONDUCTORS BEYOND 10 FT OF PV ARRAY OR 5 FT INSIDE A BUILDING WITHIN 10 SECONDS. CONTROLLED CONDUCTORS ≤30V AND ≤240VA [NEC 690.12]. LOCATION OF LABEL ACCORDING TO AHJ.
44. ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9 AND 240.
45. MICRO INVERTER BRANCHES CONNECTED TO A SINGLE BREAKER OR GROUPED FUSES IN ACCORDANCE WITH NEC 110.3(B). 2.6.7 IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL1699B.



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SYSTEM INFORMATION

DC SYSTEM SIZE: 8050W
AC SYSTEM SIZE: 5520W
ANNUAL SOLAR OUTPUT: 9528 kWh/an
MODULES:
(23)HANWHA Q CELL Q.PEAK DUO-G6+ 350W
INVERTER:
(23)ENPHASE IQ7-60-2-US
BRANCH DETAILS:
1 BRANCH OF 12 MICRO-INVERTERS(12 MODULES)
1 BRANCH OF 11 MICRO-INVERTERS(11 MODULES)
STORAGE:
(1) ENPHASE ENCHARGE 10, 10.5kWh

ENGINEER OF RECORD

CUSTOMER INFORMATION

NAME & ADDRESS:
THOMAS LAFOUNTAIN
71 SPIRAL BRANCH, COURT LINDEN, NC 28356

35°16'07.4"N 78°52'48.4"W
APN:053-552-773-8

AHJ: NC - COUNTY HARNETT

UTILITY: SOUTH RIVER EMC

PROJECT NUMBER: SELS-018

GENERAL NOTES

DESIGNER/CHECKED BY:
GP/GP

SCALE: AS NOTED

PAPER SIZE: 17"x11"

DATE: 6/24/21

REV: A

G-001

DEAD LOAD CALCULATIONS			
BOM	QUANTITY	LBS/UNIT	TOTAL WEIGHT (LBS)
MODULES	23	43.88	1009.24
MID-CLAMP	28	0.050	1.40
END-CLAMP	16	0.050	0.80
RAIL LENGTH	172	0.680	116.96
SPLICE BAR	8	0.360	2.88
SNAPNRACK ULTRA RAIL COMP KIT	44	1.8	79.20
MICRO-INVERTER	23	2.38	54.74
TOTAL WEIGHT OF THE SYSTEM (LBS)			1265.22
TOTAL ARRAY AREA ON THE ROOF (SQ. FT.)			444.20
WEIGHT PER SQ. FT.(LBS)			2.85
WEIGHT PER PENETRATION (LBS)			28.76

UPLIFT CALCULATIONS		
UPLIFT	13326.1	LBS
PULL OUT STRENGTH	27060	LBS
POINT LOADING	23	LBS

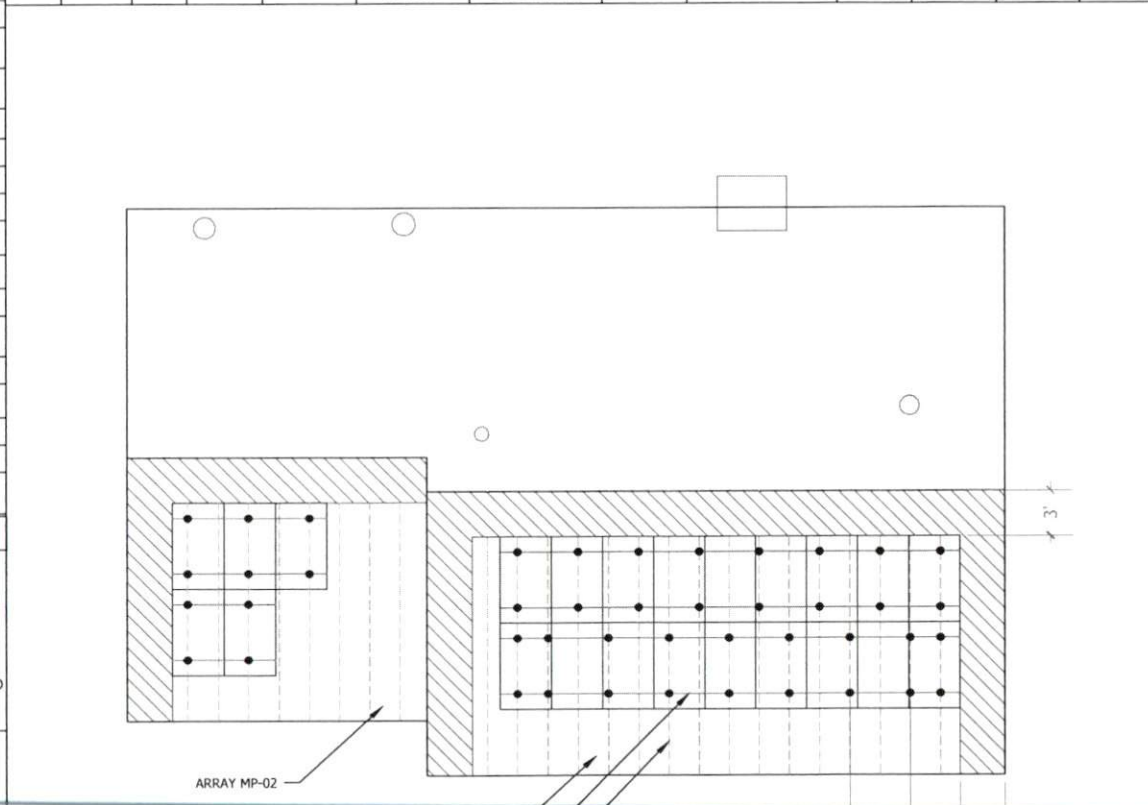
MODULES DATA	
HANWHA Q CELL Q,PEAK DUO-G6+ 350W	
MODULE DIMS	68.5"x40.6"x1.26"
LAG SCREWS	5/16" X 3.5":2.5"MIN EMBEDMENT

FIRE SETBACK

MINIMUM FIRE ACCESS PATHWAYS PER NCF 2018
 RIDGE TO ARRAY: 3'-0"
 EAVE TO ARRAY : 3'-0"
 HIP/VALLEY W/ ADJACENT ARRAY: 1'-6"
 EACH SIDE HIP/VALLEY W/O ADJACENT ARRAY: 0'-0"

NOTE: INSTALLER TO VERIFY RAFTER SIZE, SPACING AND SLOPED SPANS, AND NOTIFY ANY DISCREPANCIES BEFORE PROCEEDING.

SITE INFORMATION													
SR.NO	AZIMUTH	PITCH	NO. OF MODULES	ARRAY AREA (SQ. FT.)	ROOF TYPE	ATTACHMENT	ROOF EXPOSURE	FRAME TYPE	FRAME SIZE	FRAME SPACING	MAX RAIL SPAN	OVER HANG	
MP-01	109°	30°	18	347.6	COMPOSITION SHINGLE	SNAPNRACK ULTRA RAIL COMP KIT	ATTIC	RAFTERS	2 X 4	2'-0"	4'-0"	2'-0"	
MP-02	109°	30°	5	96.6	COMPOSITION SHINGLE	SNAPNRACK ULTRA RAIL COMP KIT	ATTIC	RAFTERS	2 X 4	2'-0"	4'-0"	2'-0"	



MOUNTING DETAILS	
DESIGNER/CHECKED BY:	GP/GP
SCALE: AS NOTED	PAPER SIZE: 17"x11"
DATE: 6/24/21	REV: A
	S-003



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SYSTEM INFORMATION

DC SYSTEM SIZE: 8050W
 AC SYSTEM SIZE: 5520W
 ANNUAL SOLAR OUTPUT: 9528 kWh/an
 MODULES:
 (23) HANWHA Q CELL Q,PEAK DUO-G6+ 350W
 INVERTER:
 (23) ENPHASE IQ7-60-2-US
 BRANCH DETAILS:
 1 BRANCH OF 12 MICRO-INVERTERS(12 MODULES)
 1 BRANCH OF 11 MICRO-INVERTERS(11 MODULES)
 STORAGE:
 (1) ENPHASE ENCHARGE 10, 10.5kWh

ENGINEER OF RECORD

CUSTOMER INFORMATION

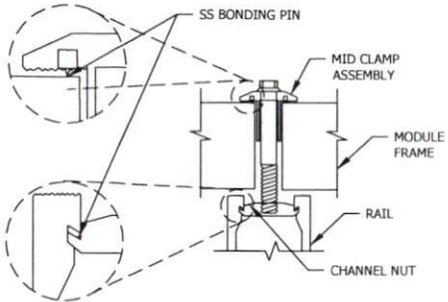
NAME & ADDRESS:
 THOMAS LAFOUNTAIN
 71 SPIRAL BRANCH, COURT LINDEN, NC 28356
 35°16'07.4"N 78°52'48.4"W
 APN: 053-552-773-8
 AHJ: NC- COUNTY HARNETT
 UTILITY: SOUTH RIVER EMC
 PROJECT NUMBER: SELS-018

MOUNTING DETAILS

DESIGNER/CHECKED BY:
 GP/GP
 SCALE: AS NOTED
 PAPER SIZE: 17"x11"
 DATE: 6/24/21
 REV: A
 S-003

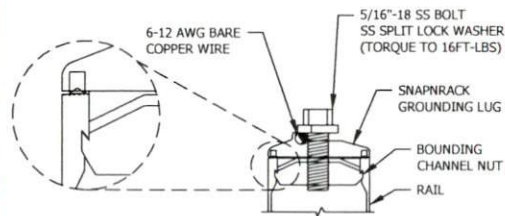
GROUNDING DETAILS

MODULE TO MODULE & MODULE TO RAIL



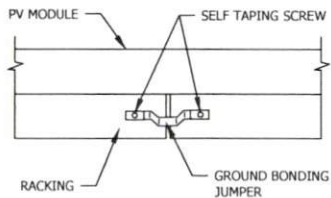
SNAPNRACK GROUNDING MID-CLAMP
SCALE: NTS

SNAPNRACK GROUNDING



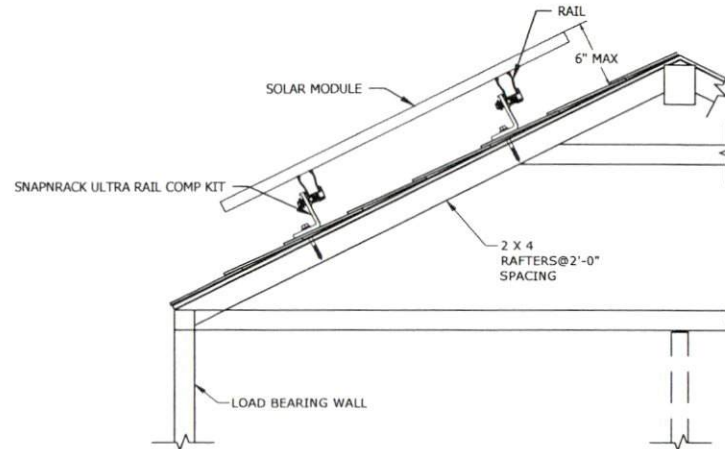
- NOTES:
- ALL HARDWARE IS INCLUDED FROM MANUFACTURER
 - A MINIMUM OF ONE GROUND LUG IS TO BE INSTALLED ON EVERY CONTINUOUS ROW OF MODULES
 - GROUNDING LUG MAY BE INSTALLED IN EITHER RAIL CHANNEL
 - GROUNDING LUG MAY BE INSTALLED SO GROUND WIRE IS PARALLEL OR PERPENDICULAR TO RAIL
 - ENSURE SPLIT LOCK WASHER IS INSTALLED ON TOP OF COPPER WIRE.
- SCALE:NTS

RAIL TO RAIL

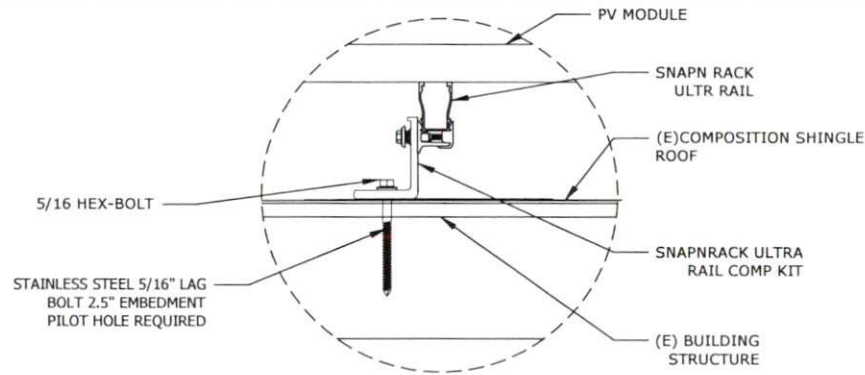


NTS REMOVAL OF ONE PIECE OF EQUIPMENT SHALL NOT DISCONNECT THE BONDING CONNECTION BETWEEN ANY OTHER PIECES.
SCALE:NTS

ROOF FRAMING DETAIL

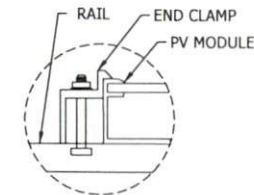
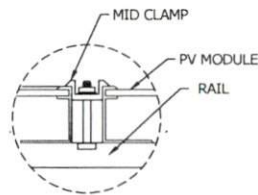


ATTACHMENT DETAIL-SNAPNRACK ULTRA RAIL COMP KIT



SCALE: NTS

MID-CLAMP & END CLAMP DETAIL



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ENGINEER OF RECORD

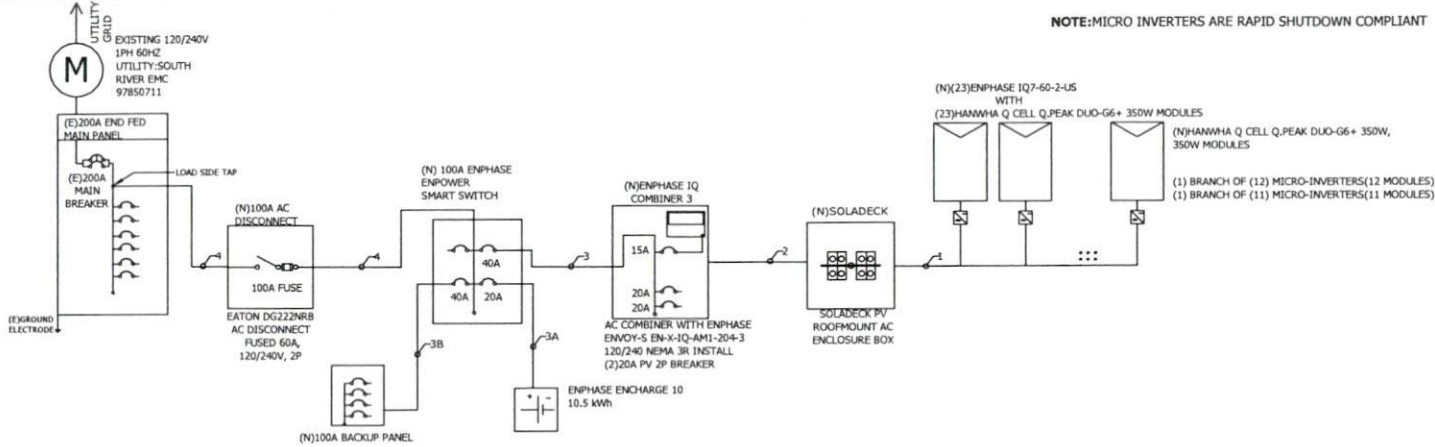
CUSTOMER INFORMATION

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PROJECT NUMBER:SELS-018

STRUCTURAL DETAILS

DESIGNER/CHECKED BY:
GP/GP
SCALE:AS NOTED PAPER SIZE:17"x11"
DATE:6/24/21 REV:A S-004

SINGLE LINE DIAGRAM: DC SYSTEM SIZE - 8050W, AC SYSTEM SIZE - 5520W, SYSTEM STORAGE - 10500Wh



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SYSTEM INFORMATION

DC SYSTEM SIZE: 8050W
AC SYSTEM SIZE: 5520W
ANNUAL SOLAR OUTPUT: 9528 kWh/an
MODULES:
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1 BRANCH OF 11 MICRO-INVERTERS(11 MODULES)
STORAGE:
(1) ENPHASE ENCHARGE 10, 10.5kWh

ENGINEER OF RECORD

MODULE-1 SPECIFICATION	
MODEL	HANWHHA Q CELL Q.PEAK DUO-G6+ 350W
MODULE POWER @ STC	350W
OPEN CIRCUIT VOLTAGE:V _{oc}	40.73V
MAX POWER VOLTAGE:V _{mp}	34.07V
SHORT CIRCUIT VOLTAGE:I _{sc}	10.79A
MAX POWER CURRENT:I _{mp}	10.27A

MICRO INVERTER SPECIFICATIONS	
MODEL	ENPHASE IQ7-60-2-US
POWER RATING	240W
MAX OUTPUT CURRENT	1A
CEC WEIGHTED EFFICIENCY	97%
MAX NO OF MICRO INVERTERS/BRANCH	13
MAX DC VOLTAGE	48V

OCPD CALCULATIONS:
MAIN PANEL RATING:200A,
MAIN BREAKER RATING:200A
LOAD SIDE TAP:100% ALLOWABLE BACKFEED IS 200A
INVERTER OVERCURRENT PROTECTION=
INVERTER O/P I X CONTINUOUS LOAD(1.25)X
#OF INVERTERS = 1x1.25x23=28.75 A =>PV BREAKER = 40A

CONDUIT SCHEDULE				
TAG ID	CONDUIT SIZE	CONDUCTOR	NEUTRAL	GROUND
1	NONE	(4) 12 ENPHASE Q CABLE PER BRANCH CIRCUIT	NONE	(1) 6 AWG BARE COPPER
2	3/4" EMT OR EQUIV	(4) 10 AWG THHN/THWN-2	NONE	(1) 10 AWG THHN/THWN-2
3	3/4" EMT OR EQUIV	(2) 8 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2	(1) 10 AWG THHN/THWN-2
3A	3/4" EMT OR EQUIV	(2) 10 AWG THHN/THWN-2	(1) 10 AWG THHN/THWN-2	(1) 10 AWG THHN/THWN-2
3B	3/4" EMT OR EQUIV	(2) 8 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2	(1) 10 AWG THHN/THWN-2
4	1-1/2" EMT OR EQUIV	(2) 1 AWG THHN/THWN-2	(1) 1 AWG THHN/THWN-2	(1) 6 AWG THHN/THWN-2

ELECTRICAL NOTES:
1. MAXIMUM DC/AC VOLTAGE DROP SHALL BE NO MORE THAN 2%.
2. BREAKER/FUSE SIZES CONFORMS TO NEC 240.6 CODE SECTION.
3. AC GROUNDING ELECTRODE CONDUCTOR SIZED PER NEC 250.66.
4. AMBIENT TEMPERATURE CORRECTION FACTOR IS BASED ON NEC 690.31(A).
5. AMBIENT TEMPERATURE ADJUSTMENT FACTOR IS BASED ON NEC 310.15(B)(2)(C) AND 310.15(B)(2)(B)
6. AC SYSTEM VOLTAGE CORRECTION IS PER NEC 690.7(A)
7. CONDUCTORS ARE SIZED PER WIRE AMPACITY TABLE NEC 310.15(B)(16).
8. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 310.10(D).
9. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.10(C).

CUSTOMER INFORMATION

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PROJECT NUMBER: SELS-018

ELECTRICAL CALCULATION

AC WIRE CALCULATIONS:- MATERIAL: COPPER & TEMPERATURE RATING: 90°C

TAG ID	REQUIRED CONDUCTOR AMPACITY				CORRECTED AMPACITY CALCULATION				TERMINAL RATING CHECK				DERATED CONDUCTOR AMPACITY CHECK						
1	1	X	12	= 12.00	X	1.25	= 15.00A	30	X	0.91	X	1	= 27.30A	15.00A	<	30A	15.00A	<	27.30A
2	1	X	12	= 12.00	X	1.25	= 15.00A	40	X	0.91	X	0.8	= 29.12A	15.00A	<	30A	15.00A	<	29.12A
3	1	X	23	= 23.00	X	1.25	= 28.75A	55	X	0.91	X	1	= 50.05A	28.75A	<	40A	28.75A	<	50.05A
3A	16	X	1	= 16.00	X	1.25	= 20.00A	40	X	0.91	X	1	= 36.40A	20.00A	<	30A	20.00A	<	36.40A
4	60	X	1	= 60.00	X	1.00	= 60.00A	110	X	0.91	X	1	= 100.01A	60.00A	<	110A	60A	<	100.001A

SINGLE LINE DIAGRAM

DESIGNER/CHECKED BY:
GP/GP
SCALE: AS NOTED
DATE: 6/24/21
PAPER SIZE: 17"x11"
REV: A
E-001

WARNING PLACARDS

WARNING

ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

LABEL LOCATION
DC DISCONNECT, INVERTER
[PER CODE: NEC 690.41]
[To be used when inverter is ungrounded]

WARNING

ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
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

LABEL LOCATION
AC DISCONNECT, POINT OF INTERCONNECTION
[PER CODE: NEC 690.13(B)]

WARNING

ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL LOCATION
AC DISCONNECT, POINT OF INTERCONNECTION
[PER CODE: NEC 690.13(B)]

WARNING-Electric Shock Hazard
No User Serviceable Parts Inside
Contact authorized service provide for assistance

LABEL LOCATION
INVERTER, JUNCTION BOXES(ROOF),
AC DISCONNECT
[PER CODE: NEC 690.13]

WARNING:PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION
CONDUIT, COMBINER BOX
[PER CODE: NEC690.31(G)(3)]

WARNING

TRI POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM THIRD POWER SOURCE IS BATTERY

LABEL LOCATION
POINT OF INTERCONNECTION
[PER CODE: NEC705.12(D)(4)]

CAUTION

SOLAR PV SYSTEM AND BATTERY BACKUP INSTALLED. WHEN POWER DISCONNECT, SOLAR PANELS AND BATTERY POWER WIRING MAY REMAIN ENERGIZED

LABEL LOCATION
POINT OF INTERCONNECTION

PHOTOVOLTAIC SYSTEM AC DISCONNECT SWITCH
RATED AC OPERATING CURRENT **27.83** AMPS AC
AC NOMINAL OPERATING VOLTAGE **240** VAC

LABEL LOCATION
AC DISCONNECT, POINT OF INTERCONNECTION
[PER CODE: NEC 690.54]

WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS OVER-CURRENT DEVICE

LABEL LOCATION
POINT OF INTERCONNECTION
[PER CODE: NEC 705.12(2)(b)]
[Not Required if Panel board is rated not less than sum of ampere ratings of all overcurrent devices supplied.]

CAUTION: SOLAR CIRCUIT

LABEL LOCATION
MARKINGS PLACED ON ALL INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES AND CABLE ASSEMBLES AT LEAST EVERY 10 FT, AT TURNS AND ABOVE/BELOW PENETRATIONS AND ALL COMBINER/JUNCTION BOXES.
[PER CODE: IFC605.11.1.4]

SOLAR DISCONNECT

LABEL LOCATION
DISCONNECT, POINT OF INTERCONNECTION
[PER CODE: NEC690.13(B)]

CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED

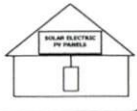
LABEL LOCATION
WEATHER RESISTANT MATERIAL, DURABLE ADHESIVE, UL969 AS STANDARD TO WEATHER RATING (UL LISTING OF MARKINGS NOT REQUIRED), MIN 3/8" LETTER HEIGHT ARIAL OR SIMILAR FONT NON-BOLD, PLACED WITHIN THE MAIN SERVICE DISCONNECT, PLACED ON THE OUTSIDE OF THE COVER WHEN DISCONNECT IS OPERATED WITH THE SERVICE PANEL CLOSED.
[PWER CODE: NEC690.15 ,690.13(B)]

RAPID SHUTDOWN SWITCH FOR SOLAR SYSTEM

LABEL LOCATION
INVERTER, POINT OF INTERCONNECTION
[PER CODE: 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 THE ARRAY

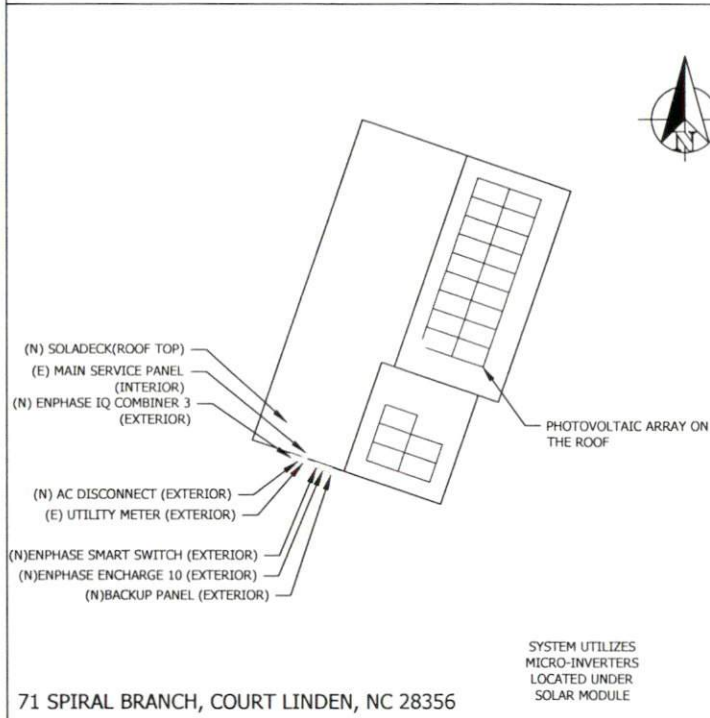


LABEL LOCATION
POINT OF INTERCONNECTION
[PER CODE: NEC690.56(C)]

ALL PLACARDS SHALL BE OF WEATHER PROOF CONSTRUCTION, BACKGROUND ON ALL PLACARDS SHALL BE RED WITH WHITE LETTERING U.O.N. PLACARD SHALL BE MOUNTED DIRECTLY ON THE EXISTING UTILITY ELECTRICAL SERVICE. FASTENERS APPROVED BY THE LOCAL JURISDICTION

NOTE: ALL SIGNAGE CANNOT BE HAND WRITTEN NEC 110.21

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



71 SPIRAL BRANCH, COURT LINDEN, NC 28356

SYSTEM UTILIZES MICRO-INVERTERS LOCATED UNDER SOLAR MODULE

WARNING

ARC FLASH HAZARD APPROPRIATE REQUIRED DO NOT OPERATE CONTROLS OR OPEN COVER WITHOUT APPROPRIATE PERSONAL PROTECTION EQUIPMENT. FAILURE TO COMPLY MAY RESULT IN INJURY OR DEATH. REFER TO NFPA 70A FOR MINIMUM PPE REQUIREMENTS.

LABEL LOCATION
POINT OF INTERCONNECTION



Sustainable Energy & Lighting Solutions
Your future is brighter with us!

SYSTEM INFORMATION

DC SYSTEM SIZE: 8050W
AC SYSTEM SIZE: 5520W
ANNUAL SOLAR OUTPUT: 9528 kWh/an
MODULES:
(23) HANWHA Q CELL Q-PEAK DUO-G6+ 350W
INVERTER:
(23) ENPHASE IQ7-60-2-US
BRANCH DETAILS:
1 BRANCH OF 12 MICRO-INVERTERS (12 MODULES)
1 BRANCH OF 11 MICRO-INVERTERS (11 MODULES)
STORAGE:
(1) ENPHASE ENCHARGE 10, 10.5kWh

ENGINEER OF RECORD

CUSTOMER INFORMATION

NAME & ADDRESS:
THOMAS LAFOUNTAIN
71 SPIRAL BRANCH, COURT LINDEN, NC 28356

35°16'07.4"N 78°52'48.4"W
APN: 053-552-773-8

AHJ: NC - COUNTY HARNETT

UTILITY: SOUTH RIVER EMC

PROJECT NUMBER: SELS-018

WARNING PLACARDS

DESIGNER/CHECKED BY:
GP/GP

SCALE: AS NOTED

PAPER SIZE: 17"x11"

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REV: A

E-002



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MOODULE SPECSHEET

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**Q.PEAK DUO-G6+
345-355**
ENDURING HIGH PERFORMANCE



- Q ANTUM TECHNOLOGY: LOW LEVELLED COST OF ELECTRICITY**
Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 20.1%.
- INNOVATIVE ALL-WEATHER TECHNOLOGY**
Optimal yields, whatever the weather with excellent low-light and temperature behaviour.
- ENDURING HIGH PERFORMANCE**
Long-term yield security with Anti-LID Technology, Anti-PID Technology, Hot-Spot Protect and Traceable Quality-Tra Q™.
- EXTREME WEATHER RATING**
High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).
- A RELIABLE INVESTMENT**
Inclusive 25-year product warranty and 25-year linear performance warranty*.
- STATE OF THE ART MODULE TECHNOLOGY**
Q ANTUM DUO combines cutting edge cell separation and innovative wiring with Q ANTUM Technology.

* All test conditions according to IEC TS 6204-1:2015, method B; 1500V, 1000h
* See data sheet on rear for further information.

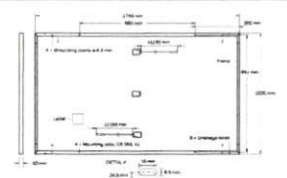
THE IDEAL SOLUTION FOR:
 Rooftop arrays on residential buildings
 Rooftop arrays on commercial/industrial buildings

Engineered in Germany



MECHANICAL SPECIFICATION

Format	1740mm x 1030mm x 32mm (including frame)
Weight	19.9kg
Front Glass	3.2mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 x 20 monocrystalline Q.ANTUM solar half cells
Junction box	53-101, 7mm x 22-80 mm x 15-16 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable, (+) ±1150mm, (-) ±1150mm
Connector	Shuko MCA, IP68



ELECTRICAL CHARACTERISTICS

	345	350	355	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC* (POWER TOLERANCE ±E.W./-0.W)				
Power at MPP	P_{MPP} [W]	345	350	355
Short Circuit Current	I_{sc} [A]	10.75	10.76	10.84
Open Circuit Voltage	V_{oc} [V]	40.40	40.75	40.98
Current at MPP	I_{MPP} [A]	10.27	10.27	10.23
Voltage at MPP	V_{MPP} [V]	33.76	34.07	34.38
Efficiency	η [%]	±19.3	±19.5	±19.8
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT†				
Power at MPP	P_{MPP} [W]	268.2	261.9	266.7
Short Circuit Current	I_{sc} [A]	8.85	8.89	8.74
Open Circuit Voltage	V_{oc} [V]	38.17	38.41	38.65
Current at MPP	I_{MPP} [A]	8.04	8.09	8.13
Voltage at MPP	V_{MPP} [V]	32.13	32.40	32.64

* Measurement tolerances P_{MPP} ±3%, I_{sc} , V_{oc} ±5% at STC, 1000W/m², 25 ±2°C, AM 1.5 according to IEC 60904-3 + 1800W/m², NMOT, spectrum AM 1.5

G CELLS PERFORMANCE WARRANTY

PERFORMANCE AT LOW IRRADIANCE

At least 95% of nominal power during first year. Thereafter max. 0.54% degradation per year. At least 91.1% of nominal power up to 10 years, at least 85% of nominal power up to 25 years.

At date within measurement tolerances, full warranty is in accordance with the warranty terms of the Q CELLS bank organisation of your respect of country.

Typical module performance under low irradiance conditions in comparison to STC conditions (25°C, 1000W/m²)

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{sc}	α [1/K]	+0.04	Temperature Coefficient of V_{oc}	β [1/K]	-0.27
Temperature Coefficient of P_{MPP}	γ [1/K]	-0.36	Normal Module Operating Temperature	NMOT [°C]	43 ± 3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V_{sys} [V]	1000	PV module classification	Class B
Maximum Reverse Current	I_r [A]	20	Fire Rating based on ANSI/UL 1703	C/T/PE 2
Max. Design Load, Push/Pull	[Pa]	3000/2967	Permitted Module Temperature in Continuous Duty	-40°C - +85°C
Max. Test Load, Push/Pull	[Pa]	5400/4500		

QUALIFICATIONS AND CERTIFICATES	PACKAGING INFORMATION	
VDE Quality Tested, IEC 61215:2016, IEC 61700:2016 This data sheet complies with DIN EN 50338	Number of Modules per Pallet	32
	Number of Pallets per Trailer (24t)	28
	Number of Pallets per 40' HC-Container (24t)	24
	Pallet Dimensions (L x W x H)	1815 x 1150 x 1220mm
	Pallet Weight	680kg

Note: Installation instructions must be followed. See the installation and cabling manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS GmbH
Domänenstr. 17-21, 96168 Bitterfeld-Wolfen, Germany | TEL: +49 (0)3494 66 99-22444 | FAX: +49 (0)3494 66 99-22000 | EMAIL: sales@q-cells.com | WEB: www.q-cells.com

Engineered in Germany



Data Sheet
 Enphase Microinverters
 Region: AMERICAS

Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready Enphase IQ 7 Micro™ and Enphase IQ 7+ Micro™ dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power on testing, enabling Enphase to provide an industry leading warranty of up to 25 years.

Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

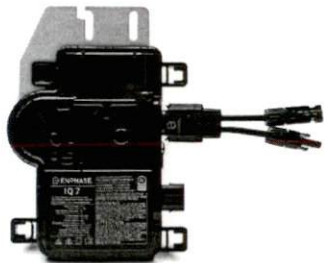
Productive and Reliable

- Optimized for high powered 60-cell/120 half-cell and 72-cell/144 half-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

*The IQ 7+ Micro is required to support 72-cell/144 half-cell modules.



To learn more about Enphase offerings, visit enphase.com



Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US	IQ7PLUS-72-2-US
Commonly used module pairings ¹	235 W - 350 W +	235 W - 440 W +
Module compatibility	60-cell/120 half-cell PV modules only	60-cell/120 half-cell and 72-cell/144 half-cell PV modules
Maximum input DC voltage	40 V	60 V
Peak power tracking voltage	27 V - 37 V	27 V - 45 V
Operating range	16 V - 48 V	16 V - 60 V
Min/Max start voltage	22 V / 48 V	22 V / 60 V
Max DC short circuit current (module Isc)	15 A	15 A
Overvoltage class DC port	II	II
DC port backfeed current	0 A	0 A
PV array configuration	1 x 1 ungrounded array. No additional DC side protection required. AC side protection requires max 20A per branch circuit.	
OUTPUT DATA (AC)	IQ 7 Microinverter	IQ 7+ Microinverter
Peak output power	250 VA	295 VA
Maximum continuous output power	240 VA	290 VA
Nominal (L-L) voltage/range ²	240 V / 211-264 V	208 V / 189-229 V
Maximum continuous output current	11.0 A (240 V)	1.21 A (240 V) 1.39 A (208 V)
Nominal frequency	60 Hz	60 Hz
Extended frequency range	47 - 68 Hz	47 - 68 Hz
AC short circuit fault current over 3 cycles	5.8 Arms	5.8 Arms
Maximum units per 20 A (L-L) branch circuit ³	16 (240 VAC)	13 (208 VAC) 11 (208 VAC)
Overvoltage class AC port	III	III
AC port backfeed current	18 mA	18 mA
Power factor setting	1.0	1.0
Power factor (adjustable)	0.85 leading - 0.85 lagging	0.85 leading - 0.85 lagging
EFFICIENCY	@240 V	@208 V
Peak efficiency	97.6 %	97.5 %
CEC weighted efficiency	97.0 %	97.0 %
MECHANICAL DATA		
Ambient temperature range	-40°C to +65°C	
Relative humidity range	4% to 100% (condensing)	
Connector type	MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)	
Dimensions (HxWxD)	212 mm x 175 mm x 30.2 mm (without bracket)	
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	
FEATURES		
Communication	Power Line Communication (PLC)	
Monitoring	Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.	
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.	
Compliance	CA Rule 21 (UL 1741-SA) UL 62109-1, UL 1741/IEE 1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA C22.2 NO. 107.1 E1 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 C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.	

¹ No unforced DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>
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.

To learn more about Enphase offerings, visit enphase.com

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SYSTEM INFORMATION

DC SYSTEM SIZE: 8050W
 AC SYSTEM SIZE: 5520W
 ANNUAL SOLAR OUTPUT: 9528 kWh/yr
 MODULES:
 (23) HANWHA Q CELL Q.PEAK DUO-G6+ 350W
 INVERTER:
 (23) ENPHASE IQ7-60-2-US
 BRANCH DETAILS:
 1 BRANCH OF 12 MICRO-INVERTERS (12 MODULES)
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 (1) ENPHASE ENCHARGE 10, 10.5kWh

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INVERTER SPECSHEET

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SS-002

Enphase IQ Combiner 3 (X-IQ-AM1-240-3)

The Enphase IQ Combiner 3™ with Enphase IQ Envoy™ consolidates interconnection equipment into a single enclosure and streamlines PV 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

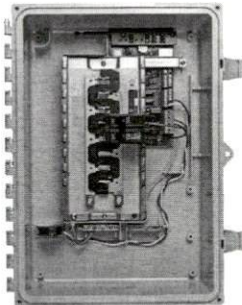
- Includes IQ Envoy for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and optional consumption monitoring

Simple

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

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- UL listed



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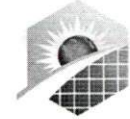


Enphase IQ Combiner 3

MODEL NUMBER	
IQ Combiner 3 X-IQ-AM1-240-3	IQ Combiner 3 with Enphase IQ Envoy™ printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and optional* consumption monitoring (+/- 2.5%).
ACCESSORIES and REPLACEMENT PARTS (not included, order separately)	
Enphase Mobile Connect™ CELLMODEM-03 (4G/12-year data plan) CELLMODEM-01 (3G/5-year data plan) CELLMODEM-M1 (4G based LTE-M/5-year data plan) Consumption Monitoring* CT CT-200-SPLIT	Plug and play industrial grade cellular modem with data plan 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.) Split core current transformers enable whole home consumption metering (+/- 2.5%).
Wireless USB adapter COMMS-KIT-01	Installed at the IQ Envoy. For communications with Enphase Encharge™ storage and Enphase Enpower™ smart switch. Includes USB cable for connection to IQ Envoy or Enphase IQ Combiner™ and allows redundant wireless communication with Encharge and Enpower.
Circuit Breakers BRK-10A-2-240 BRK-15A-2-240 BRK-20A-2P-240	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
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 3 (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Envoy printed circuit board (PCB) for Combiner 3
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating (output to grid)	65 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. continuous current rating (input from PV)	64 A
Max. total branch circuit breaker rating (input)	80A of distributed generation / 90A with IQ Envoy breaker included
Production Metering CT	200 A solid core pre-installed and wired to IQ Envoy
MECHANICAL DATA	
Dimensions (WxHxD)	49.5 x 37.5 x 16.8 cm (19.5" x 14.75" 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. To 2000 meters (6,560 feet)
Altitude	
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
Cellular	Optional, CELLMODEM-01 (3G) or CELLMODEM-03 (4G) or CELLMODEM-M1 (4G based LTE-M) (not included)
COMPLIANCE	
Compliance, 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)
Compliance, IQ Envoy	UL 60601-1/CAN/CSA 22.2 No. 61010-1

To learn more about Enphase offerings, visit enphase.com

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2019-11-04



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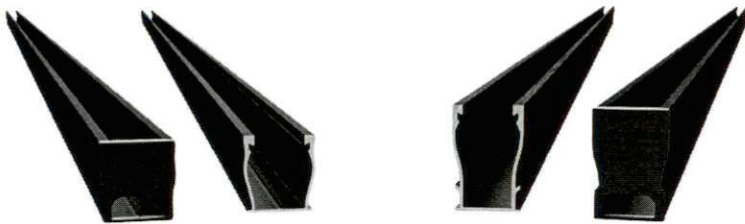
DATE: 6/24/21

REV: A


SS-003


Ultra Rail


UR-40
UR-60




The Ultimate Value in Rooftop Solar

 Industry leading Wire Management Solutions

 Mounts available for all roof types

 Single Tool Installation

 All SnapNrack Module Clamps & Accessories are compatible with both rail profiles

Start Installing Ultra Rail Today

RESOURCES snapnrack.com/resources
DESIGN snapnrack.com/configurator
WHERE TO BUY snapnrack.com/where-to-buy

SnapNrack Ultra Rail System

A sleek, straightforward rail solution for mounting solar modules on all roof types. Ultra Rail features two rail profiles; UR-40 is a lightweight rail profile that is suitable for most geographic regions and maintains all the great features of SnapNrack rail, while UR-60 is a heavier duty rail profile that provides a larger rail channel and increased span capabilities. Both are compatible with all existing mounts, module clamps, and accessories for ease of install.

The Entire System is a Snap to Install

- New Ultra Rail Mounts include snap-in brackets for attaching rail
- Compatible with all the SnapNrack Mid Clamps and End Clamps customers love
- Universal End Clamps and snap-in End Caps provide a clean look to the array edge

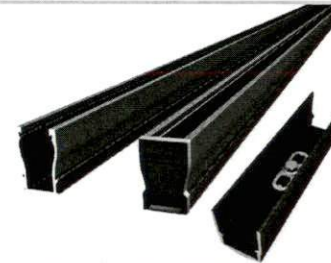


Unparalleled Wire Management

- Open rail channel provides room for running wires resulting in a long-lasting quality install
- Industry best wire management offering includes Junction Boxes, Universal Wire Clamps, MLPE Attachment Kits, and Conduit Clamps
- System is fully bonded and listed to UL 2703 Standard

Heavy Duty UR-60 Rail

- UR-60 rail profile provides increased span capabilities for high wind speeds and snow loads
- Taller, stronger rail profile includes profile-specific rail splice and end cap
- All existing mounts, module clamps, and accessories are retained for the same great install experience



Quality. Innovative. Superior.

SnapNrack Solar Mounting Solutions are engineered to optimize material use and labor resources and improve overall installation quality and safety.

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

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SYSTEM INFORMATION

DC SYSTEM SIZE: 8050W
AC SYSTEM SIZE: 5520W
ANNUAL SOLAR OUTPUT: 9528 kWh/an
MODULES:
(23) HANWHA Q CELL Q.PEAK DUO-G6+ 350W
INVERTER:
(23) ENPHASE IQ7-60-2-US
BRANCH DETAILS:
1 BRANCH OF 12 MICRO-INVERTERS (12 MODULES)
1 BRANCH OF 11 MICRO-INVERTERS (11 MODULES)
STORAGE:
(1) ENPHASE ENCHARGE 10, 10.5kWh

ENGINEER OF RECORD

CUSTOMER INFORMATION

NAME & ADDRESS:
THOMAS LAFOUNTAIN
71 SPIRAL BRANCH, COURT LINDEN, NC 28356

35°16'07.4"N 78°52'48.4"W
APN:053-552-773-8

AHJ: NC- COUNTY HARNETT

UTILITY: SOUTH RIVER EMC

PROJECT NUMBER: SELS-018

RACKING SPECSHEET

DESIGNER/CHECKED BY:
GP/GP

SCALE: AS NOTED

PAPER SIZE: 17"x11"

DATE: 6/24/21

REV: A

SS-004

Enphase Enpower

The Enphase Enpower™ smart switch connects the home to grid power, the Encharge storage system, and solar PV. It provides microgrid interconnection device (MID) functionality by automatically detecting and seamlessly transitioning the home energy system from grid power to backup power in the event of a grid failure. It consolidates interconnection equipment into a single enclosure and streamlines grid independent capabilities of PV and storage installations by providing a consistent, pre-wired solution for residential applications.

Reliable

- Durable NEMA type 3R enclosure
- Ten-year limited warranty

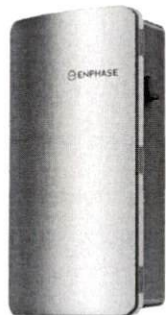
Smart

- Controls safe connectivity to the grid
- Automatically detects grid outages
- Provides seamless transition to backup

Simple

- Connects to the load or service equipment¹ side of the main load panel
- Centered mounting brackets support single stud mounting
- Supports conduit entry from the bottom, bottom left side, and bottom right side
- Supports whole home and partial home backup and subpanel backup
- Up to 200A main breaker support
- Includes neutral-forming transformer for split phase **120/240V backup operation**

¹ Enpower is not suitable for use as service equipment in Canada.



To learn more about Enphase offerings, visit enphase.com



Enphase Enpower

MODEL NUMBER	EP2000101-M2-K10090	Enphase Enpower smart switch with neutral-forming transformer (NFT), Mid-Range Interconnection Device (MID), breakers, and circuitry. Structures grid-independent capabilities of PV and storage installations.
ACCESSORIES and REPLACEMENT PARTS		
XA-E3-PCBA-ENS	Replacement Enpower controller printed circuit board	
EP2000-AM-HD-20CA	Enphase type EP circuit breaker handle (one 1 screw kit: 864014125)	
ENPHASE HANDLE KIT	Enphase metal handle for kit (for sale separately)	
Circuit breakers (see notes):^{1,2,3}	Not included, must order separately	
BRK-100A-2P-240V	- Main breaker, 2 pole, 100A, 25kAIC, C302100V	
BRK-125A-2P-240V	- Main breaker, 2 pole, 125A, 25kAIC, C302125V	
BRK-150A-2P-240V	- Main breaker, 2 pole, 150A, 25kAIC, C302150V	
BRK-175A-2P-240V	- Main breaker, 2 pole, 175A, 25kAIC, C302175V	
BRK-200A-2P-240V	- Main breaker, 2 pole, 200A, 25kAIC, C302200V	
BRK-20A-2P-240V-B	- Circuit breaker, 2 pole, 20A, 10kAIC, P31200B	
BRK-30A-2P-240V	- Circuit breaker, 2 pole, 30A, 10kAIC, P31200B	
BRK-40A-2P-240V	- Circuit breaker, 2 pole, 40A, 10kAIC, P31200B	
BRK-60A-2P-240V	- Circuit breaker, 2 pole, 60A, 10kAIC, P31200B	
BRK-80A-2P-240V	- Circuit breaker, 2 pole, 80A, 10kAIC, P31200B	
ELECTRICAL SPECIFICATIONS		
Assembly rating	Continuous operation at 100% of its rating	
Rated voltage (range (U_L))	240 VAC / 110V / 120 VAC	
Voltage measurement accuracy	±1% V nominal (±1.0% V _L and ±0.4% V _L)	
Auxiliary contact (load control and access (V_{OC}))	24V, 1A	
Operational frequency range	50 Hz / 50 - 60 Hz	
Frequency measurement accuracy	±0.1 Hz	
Maximum continuous current rating	160A	
Maximum total concurrent protection device	200A	
Maximum single concurrent protection device	200A	
Maximum overcurrent protection device rating for storage branch circuit⁴	60A	
Maximum overcurrent protection device rating for PV output branch circuit⁴	60A	
Neutral Forming Transformer (NFT)		<ul style="list-style-type: none"> • Breaker rating (non-integrated): 40A between L1 and Neutral (0A between L2 and Neutral) • Continuous rated power: 30,000VA • Maximum continuous available current: 30A @ 120V • Peak rating (over 800VA for 30 seconds) • Peak unbalanced current: 300-g, 12-v for 30 seconds
MECHANICAL DATA		
Dimensions (WxDxH)	85cm x 91.6cm x 34.5cm (33.1 in x 36.1 in x 13.6 in)	
Weight	29.5 kg (65 lbs)	
Ambient temperature range	-30°C to 60°C (-20°F to 140°F)	
Coding	Natural convection, plug heat shield	
Enclosure environmental rating	Outdoor, NEMA type 3R, polycarbonate construction	
Altitude	To 2500 meters (8200 feet)	
WIRE SIZES		
Connections (all legs are rated to 90C)	<ul style="list-style-type: none"> • Main legs and backup load legs • CSR breakers • EB breakers (only permitted) • AC combination legs, discharge legs, and generator legs • Neutral (large legs) 	<ul style="list-style-type: none"> • Cu/Al: 1 AWG - 300 KCMIL • Cu/Al: 2 AWG - 300 KCMIL • 6 AWG • 14 AWG - 2 AWG • Cu/Al: 6 AWG - 300 KCMIL
Neutral and ground bars	<ul style="list-style-type: none"> • Large holes (3/16" - 24 UNF) • Small holes (1/8" - 32 UNF) 	<ul style="list-style-type: none"> • 14 AWG - 1/2" AWG • 14 AWG - 6 AWG
COMPLIANCE		
Compliance	UL 1741, IEC 1741 SA, UL 1741 PCS, UL1918, UL6847, UL507, UL508, UL509, CSA 22.2 No. 107.1, IEC 61837, Part 15, Class B, IEEE 928, AC150.	

¹ Compatible with 800VAC 4-wire system. All to comply with 2017 NEC 710.13E for back-fed circuit breakers.
² The Enpower is rated 25 kAIC.
³ Not included. Installer must provide properly rated breakers per circuit breaker list above.
⁴ Sections from these standards were used during the safety evaluation and included in the UL 1741 testing.

To learn more about Enphase offerings, visit enphase.com

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SYSTEM INFORMATION

DC SYSTEM SIZE: 8050W
 AC SYSTEM SIZE: 5520W
 ANNUAL SOLAR OUTPUT: 9528 kWh/yr
 MODULES:
 (23) HANWHA Q CELL Q.PEAK DUO-G6+ 350W
 INVERTER:
 (23) ENPHASE IQ7-60-2-US
 BRANCH DETAILS:
 1 BRANCH OF 12 MICRO-INVERTERS (12 MODULES)
 1 BRANCH OF 11 MICRO-INVERTERS (11 MODULES)
 STORAGE:
 (1) ENPHASE ENCHARGE 10, 10.5kWh

ENGINEER OF RECORD

CUSTOMER INFORMATION

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 APN: 053-552-773-8

AHJ: NC - COUNTY HARNETT

UTILITY: SOUTH RIVER EMC

PROJECT NUMBER: SELS-018

ENPOWER SMART SWITCH

DESIGNER/CHECKED BY:
 GP/GP

SCALE: AS NOTED

PAPER SIZE: 17" x 11"

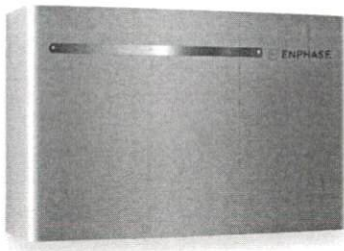
DATE: 6/24/21

REV: A

SS-005

Enphase Encharge 10

The Enphase Encharge 10™ battery is **reliable, smart, simple, and safe**. It provides the lowest lifetime energy costs with backup capability for both new and retrofit solar customers. As an installer, you can quickly design the right system size to meet the needs of the homeowner.



Reliable

- Proven high reliability IQ Series Microinverters
- Ten-year limited warranty
- Extensive testing
- Passive cooling (no moving parts/fans)

Smart

- Utility TOU optimization
- Self consumption
- Remote upgrade
- Mobile app-based monitoring
- Grid-forming capability for backup operation

Simple

- Fully integrated AC battery system
- Quick and easy plug-and-play installation
- Interconnects with standard household AC wiring

Safe

- Cells safety tested
- Lithium iron phosphate (LFP) chemistry for maximum safety and longevity

To learn more about Enphase offerings, visit enphase.com



Enphase Encharge 10

MODEL NUMBER	
ENCHARGE-10-1P-NA	Encharge 10 battery storage system with integrated Enphase Microinverters and BMU. Includes: • Three Encharge 3.36kWh base units (B10-A01-US00-1-3) • One Encharge 10 cover kit with cover, mounting bracket, and watertight conduit hubs (B10-C-1050-0) • Interconnect kit for wiring between batteries (B10-W-AWG08-0700-0)
ACCESSORIES	
B10-W-AWG08-0700-0	Connection cable
OUTPUT (AC)	
	@ 240 VAC ¹
Rated (continuous) output power ²	3.84 kVA
Peak output power	5.7 kVA (10 seconds)
Nominal voltage / range	240 / 211 – 264 VAC
Nominal frequency / range	60 / 57 – 61 Hz
Rated output current	16 A
Power factor (adjustable)	0.85 leading – 0.85 lagging
Maximum units per 20 A branch circuit	1 unit (single phase)
Interconnection	single-phase
Round trip efficiency ³	89%
BATTERY	
Total capacity	10.5 kWh
Usable capacity	10.08 kWh
Round trip efficiency	96%
Maximum DC voltage	73.5 V
Ambient operating temperature range	-15° C to 55° C (5° F to 131° F) non-condensing
Optimum operating temperature range	0° C to 30° C (32° F to 86° F)
Chemistry	Lithium iron phosphate (LFP)
MECHANICAL DATA	
Dimensions (WxHxD)	1070 mm x 664 mm x 319 mm (42.13 in x 26.14 in x 12.56 in)
Weight	Three each 44.2 kg (97.4 lbs) base units plus 24.4 kg (53.8 lbs) cover and mounting bracket; total 156.9 kg (346 lbs)
Enclosure	Outdoor – NEMA 3R
Cooling	Natural convection – No fans
Altitude	Up to 2500 meters (8200 feet)
Mounting	Wall mount
FEATURES AND COMPLIANCE	
Compatibility	Compatible with grid-tied PV systems. Compatible with Enphase IQ Series Micros, Enphase Enpower, and Enphase IQ Envoy for backup operation.
Communication	Wireless 2.4 GHz and 915 MHz
Services	Backup, self-consumption, TOU, Demand Charge, NEM Integrity
Monitoring	Enlighten Manager and MyEnlighten monitoring options. API integration
Compliance	This product will comply with all the required regulatory certifications in the North American markets before launch. Details will be provided in the final data sheet.
LIMITED WARRANTY	
Limited Warranty ³	>70% capacity, up to 10 years or 4000 cycles

- 1 Supported in backup/off grid operations
- 2 AC to Battery to AC
- 3 Whichever occurs first. Restrictions apply.

To learn more about Enphase offerings, visit enphase.com

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ENCHARGE SPECSHEET

DESIGNER/CHECKED BY:
GP/GP

SCALE: AS NOTED

PAPER SIZE: 17"x11"

DATE: 6/24/21

REV: A

SS-006