PHOTOVOLTAIC ROOF MOUNT & ENERGY SYSTEM

12 MODULES - SYSTEM SIZE STC (5.52 kW DC / 4.56 kW AC)

4227 OVERHILLS RD, SPRING LAKE, NC 28390, USA (35.2705155, -78.9290304)

SYSTEM SUMMARY STC (5.52 kW DC / 4.56 kW AC)

STC DC: (12) 460W = 5.52 kW
STC AC: (12) 380W = 4.56 kW
STORAGE: (2) 3.84kW 5.0kWh = 7.68kW 10.0kWh

- (12) REC SOLAR REC460AA PURE-RX MODULES
- (12) ENPHASE ENERGY INC. IQ8X-80-M-US [240V] MICROINVERTERS
- (2) ENPHASE ENERGY INC. IQBATTERY-5P-1P-NA BATTERIES
- (1) ENPHASE IQ SYSTEM CONTROLLER 3
- 2x BRANCHES OF 6 CONNECTED IN PARALLEL

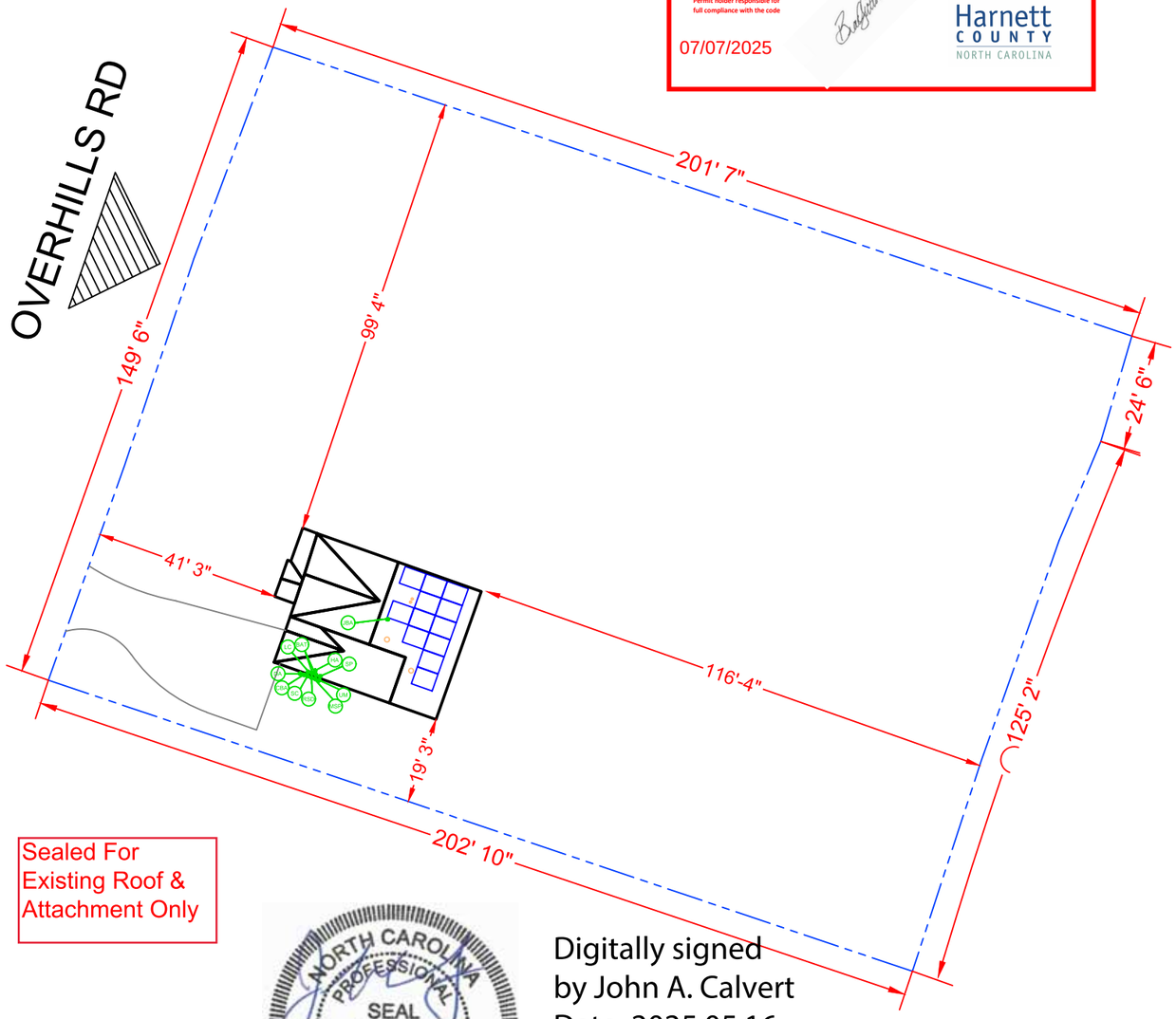
GOVERNING CODES

- 2018 NORTH CAROLINA STATE BUILDING CODE: FIRE PREVENTION CODE
- 2018 NORTH CAROLINA STATE BUILDING CODE
- 2018 NORTH CAROLINA STATE BUILDING CODE: RESIDENTIAL CODE
- 2020 NORTH CAROLINA STATE ELECTRICAL CODE

GENERAL NOTES

1) ALL PANELS, SWITCHES, ETC. SHALL HAVE SUFFICIENT GUTTER SPACE AND LUGS IN COMPLIANCE WITH UL REQUIREMENTS TO ACCOMMODATE CONDUCTORS SHOWN.
2) THIS SYSTEM WILL NOT BE INTERCONNECTED UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND UTILITY IS OBTAINED.
3) ALL EXTERIOR ELECTRICAL DEVICES AND EQUIPMENT INCLUDING THOSE THAT ARE EXPOSED TO OUTSIDE ENVIRONMENT SHALL BE WEATHERPROOF AND SHALL BE LISTED BY 'UL' FOR THE TYPE OF APPLICATION AND 'UL' LABEL SHALL APPEAR ON ALL ELECTRICAL EQUIPMENT.
4) WIRING METHOD SHALL BE EMT ABOVE GROUND MOUNTED IN CONCEALED SPACES (UNLESS APPROVED OTHERWISE) AND SCHEDULE-40 PVC FOR BELOW GROUND INSTALLATIONS UNLESS NOTED OTHERWISE.
5) AN OSHA APPROVED LADDER PROVIDING ACCESS TO ALL PORTIONS OF THE ARRAY SHALL BE SECURED IN PRIOR TO REQUESTING INSPECTION.
6) IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE CONDUCTOR IF NECESSARY.
7) ENPHASE DEVICES ARE WITHIN MANUFACTURER'S REQUIRED GUIDELINE, PV ARRAY DOES NOT EXCEED MAX DISTANCE OF 150'.
8) IF THERE ARE COMMUNICATION ISSUES WITH GATEWAY, UB EXTENDER CAN BE USED TO RELOCATE COMMS KIT NEAR IQ SYSTEM CONTROLLER & BATTERY.
9) IQ BATTERY UNITS SHOULD NOT BE INSTALLED IN DIRECT SUNLIGHT.

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
07/07/2025
Harnett COUNTY NORTH CAROLINA



Sealed For Existing Roof & Attachment Only

LEGEND

- NEW PV MODULE
- FRONT OF HOUSE
- DIMENSIONS
- PROPERTY LINE
- OBSTRUCTION
- FENCE
- GATE
- DRIVEWAY
- POOL
- JBA — AC JUNCTION BOX (NEW)
- CBA — IQ COMBINER 5 (NEW)
- DA — ESS DISCONNECT UNFUSED (NEW)
- SP — SUBPANEL (EXISTING)
- MSP — MAIN SERVICE PANEL (NEW, 200A)
- LC — LOAD CENTER (NEW)
- UM — UTILITY METER (EXISTING)
- SC — IQ SYSTEM CONTROLLER 3 (NEW)
- BAT — BATTERIES (NEW)
- RSD — RAPID SHUTDOWN (NEW)
- HA — HEAT ALARM (NEW)

NORTH CAROLINA PROFESSIONAL SEAL 035433 ENGINEER JOHN A. CALVERT

Digitally signed by John A. Calvert
Date: 2025.05.16 12:22:55 -06'00'

5/16/2025
Firm No. : D-0449

SITE PLAN
SCALE: 1/32" = 1'-0"

SHEET INDEX

AHJ: HARNETT (COUNTY OF), NORTH CAROLINA
UTILITY: SOUTH RIVER EMC

HOUSE PHOTO
SCALE: NTS

VICINITY MAP
SCALE: NTS

BLUE RAVEN SOLAR

CONTRACTOR: BLUE RAVEN SOLAR
ADDRESS: 1403 N 630 E, OREM, UTAH 84097
PHONE: 8003774480
EMAIL: design@blueravensolar.com
LICENSE #: 961988 (C-10) & (C-46)
ELECTRICAL LICENSE #: N/A

REVISIONS

DESCRIPTION	DATE	REV
REVISION	05.13.25	01

SIGNATURE & SEAL

HOMEOWNER INFO

THOMAS FISHER
4227 OVERHILLS RD,
SPRING LAKE, NC 28390, USA
APN: 7950253
PHONE: +15045179690
EMAIL: TFISH25@OUTLOOK.COM

SHEET NAME
COVER PAGE

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

MODULE AREA & WEIGHT CALCULATIONS

PV PANELS (COUNT, AREA, WEIGHT):
- (12x) REC SOLAR REC460AA PURE-RX (68.0" x 47.4", 51.6 LB)

MICRO-INVERTERS (COUNT, WEIGHT):
- (12x) ENPHASE ENERGY INC. IQ8X-80-M-US [240V] (2.43 LB)

ROOF PLANE #1:
- ATTACHMENT COUNT: 31
- MOUNTING SYSTEM WEIGHT / MODULE: 1.5 LB
- MOUNTING SYSTEM WEIGHT: (12) 1.5 LB = 18 LB

NEW PANELS:
- PANEL AREA: (12) 68.0" x 47.4" = 269 SF
- PANEL WEIGHT: (12) 51.6 = 619 LB
- MICRO-INVERTER WEIGHT: (12) 2.4 = 29 LB
- TOTAL SYSTEM WEIGHT: 619 + 29 + 18 = 666 LB
- WEIGHT PER CONNECTION: 666 LB / 31 = 21.48 LB
- DISTRIBUTED LOAD: 666 LB / 269 SF = 2.48 PSF
- ROOF AREA COVERAGE: 269 SF / 1394 SF = 19.3%

BILL OF MATERIALS

EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULES	12	REC SOLAR REC460AA PURE-RX
MICRO INVERTERS	12	ENPHASE ENERGY INC. IQ8X-80-M-US [240V]
BATTERIES	2	ENPHASE ENERGY INC. IQBATTERY-5P-1P-NA
SMART SWITCH	1	ENPHASE IQ SYSTEM CONTROLLER 3
HEAT ALARM	1	HEAT ALARM BRK HD6135FB
JUNCTION BOX (AC)	1	JUNCTION BOX 600V, NEMA 3R UL LISTED
LOAD CENTER (AC)	1	ENPHASE IQ COMBINER 5
ESS DISCONNECT	1	UNFUSED ESS DISCO (MIN 60A 240VAC 1PH)
LOAD CENTER	1	LOAD CENTER EATON, BR2L125RP, 2-SPACE PANEL
PSR-M84	14	PEGASUS RAIL - MILL 84"
PSR-SPLS	10	PEGASUS - BONDED STRUCTURAL SPLICE
PSR-MCB	32	PEGASUS - MULTI-CLAMP - MID/END 30-40MM - FULL BLACK
PSR-MLP	12	PEGASUS - MLPE MOUNT
PSR-LUG	1	PEGASUS - GROUND LUG
PSR-NSJ	3	PEGASUS - NORTH-SOUTH BONDING JUMPER
PSR-WMC	18	PEGASUS - WIRE MANAGEMENT CLIP
PSR-CBG	2	PEGASUS - CABLE GRIP
PSR-CAP	16	PEGASUS - END CAP
PIF2-BDT	31	INSTAFLASH2 - DECK OR RAFTER ATTACH - WITH DOVETAIL T-BOLT
PF-DRW85	93	PEGASUS FASTENER - DECK-RAFTER 85MM

ROOF DESCRIPTION TABLE

ROOF PLANE	ROOF PITCH	ROOF AZIMUTH	ROOF MATERIAL	TRUSS SIZE	TRUSS SPACING	ATTACHMENT SPACING	MODULES (PITCH)
#1	30°	109°	ASPHALT SHINGLE	2" x 6"	24" O.C.	48" O.C.	12 (30°)

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 IN LOCATIONS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES OR SIGNS.

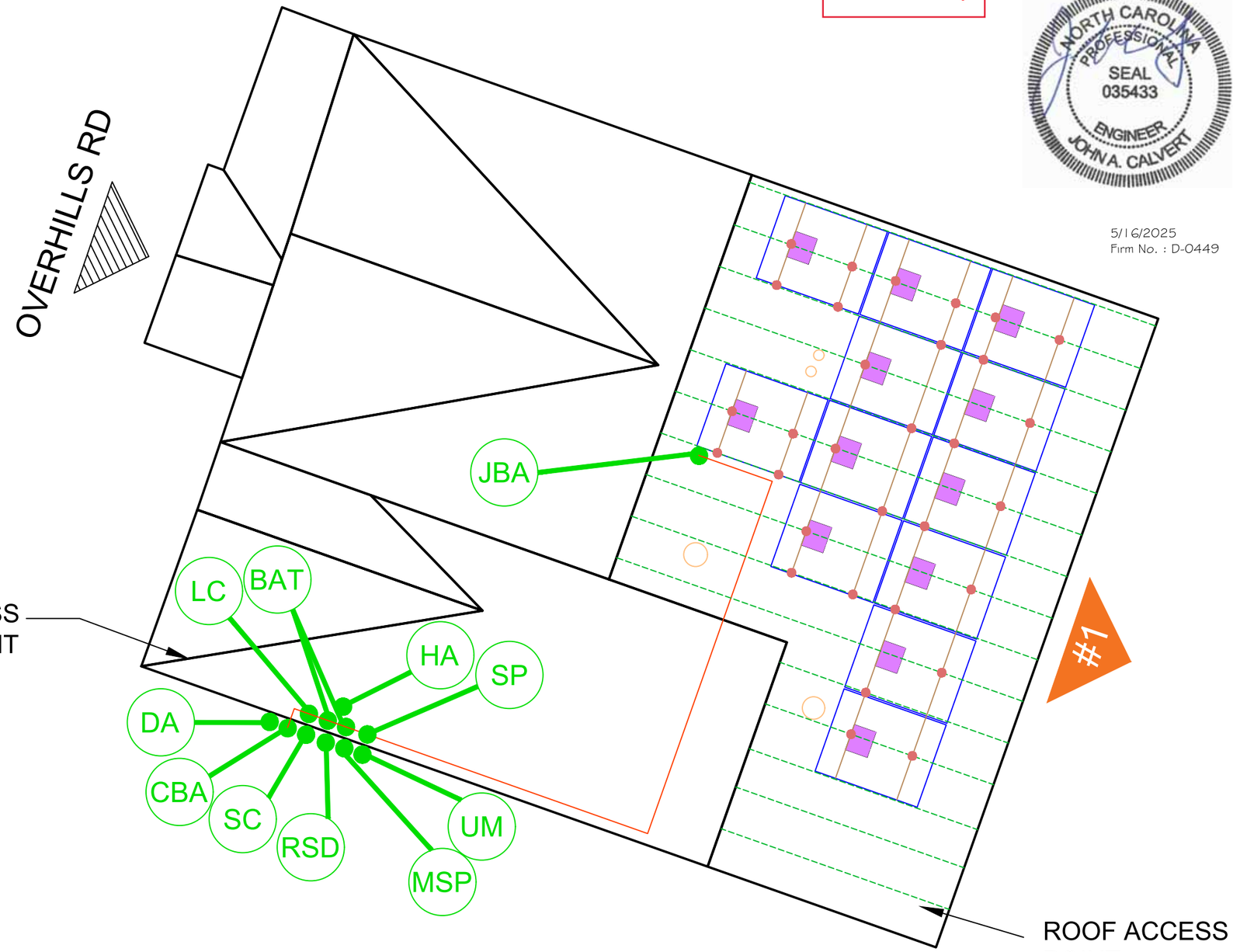
DESIGN CRITERIA

- EXPOSURE CATEGORY = C
- WIND SPEED = 118 MPH
- SNOW LOAD = 10 PSF

Sealed For Existing Roof & Attachment Only

NORTH CAROLINA PROFESSIONAL SEAL 035433 ENGINEER JOHN A. CALVERT

5/16/2025
Firm No. : D-0449



LEGEND

- NEW PV MODULE
- OPTIMIZER
- MICRO-INVERTER
- ROOF ATTACHMENT
- FRONT OF HOUSE
- OBSTRUCTION
- RAFTER/TRUSS
- RAIL
- CONDUIT

- LC — LOAD CENTER (NEW)
- JBA — AC JUNCTION BOX (NEW)
- UM — UTILITY METER (EXISTING)
- CBA — IQ COMBINER 5 (NEW)
- SC — IQ SYSTEM CONTROLLER 3 (NEW)
- DA — ESS DISCONNECT UNFUSED (NEW)
- BAT — BATTERIES (NEW)
- SP — SUBPANEL (EXISTING)
- RSD — RAPID SHUTDOWN (NEW)
- MSP — MAIN SERVICE PANEL (NEW, 200A)
- HA — HEAT ALARM (NEW)

SITE PLAN WITH MODULES

SCALE: 3/16" = 1'-0"

BLUE RAVEN SOLAR

CONTRACTOR: BLUE RAVEN SOLAR
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REVISIONS

DESCRIPTION	DATE	REV
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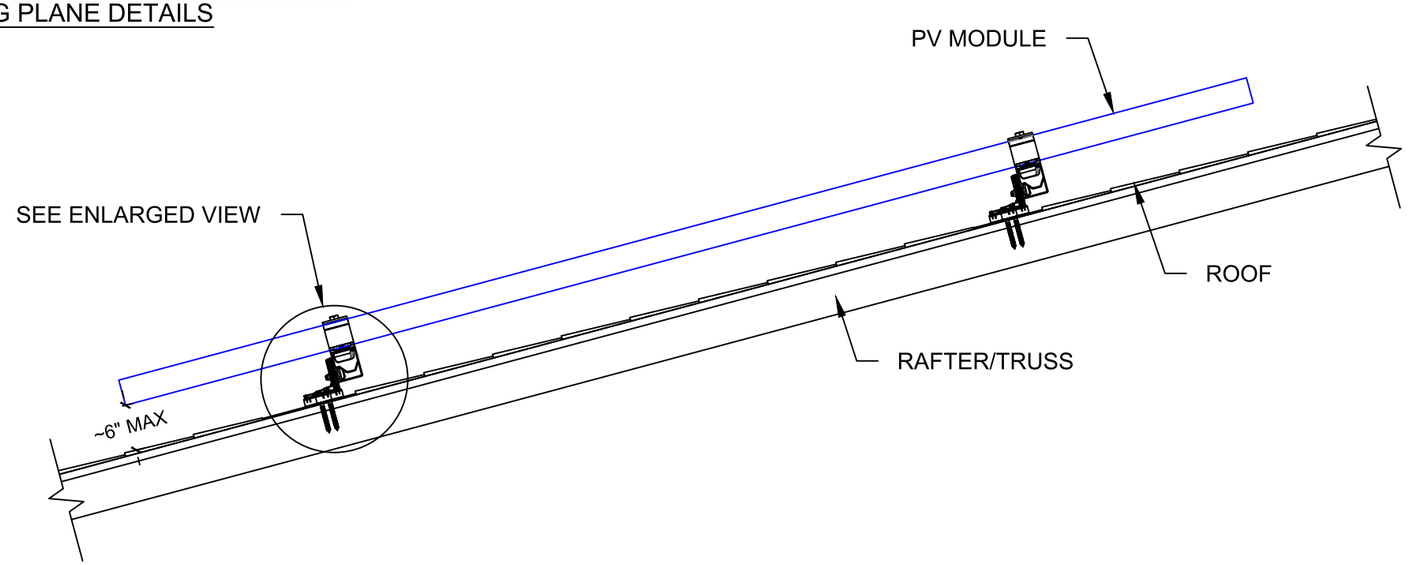
SHEET NAME
SITE PLAN WITH MODULES

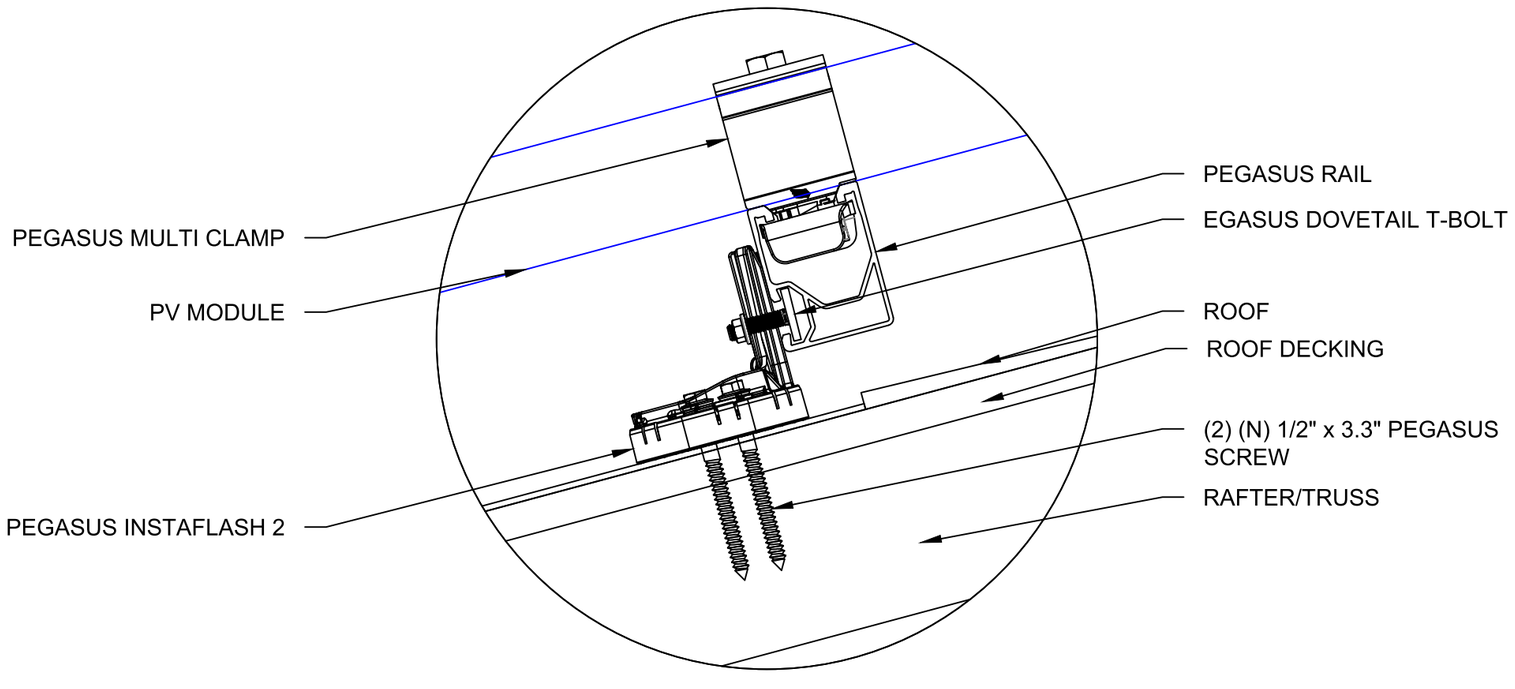
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2

REFER TO ROOF DESCRIPTION TABLE IN PV-2
FOR MOUNTING PLANE DETAILS



ATTACHMENT DETAIL
SCALE: NTS



ATTACHMENT DETAIL (ENLARGED SECTION VIEW)
SCALE: NTS

Sealed For
Existing Roof &
Attachment Only

NORTH CAROLINA PROFESSIONAL SEAL 035433 ENGINEER JOHN A. CALVERT

5/16/2025
Firm No. : D-0449

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SHEET NAME
ATTACHMENT DETAIL

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3

SYSTEM SUMMARY STC (5.52 kW DC / 4.56 kW AC)

STC DC: (12) 460W = 5.52 kW
STC AC: (12) 380W = 4.56 kW
STORAGE: (2) 3.84kW 5.0kWh = 7.68kW 10.0kWh

- (12) REC SOLAR REC460AA PURE-RX MODULES
- (12) ENPHASE ENERGY INC. IQ8X-80-M-US [240V] MICROINVERTERS
- (2) ENPHASE ENERGY INC. IQBATTERY-5P-1P-NA BATTERIES
- (1) ENPHASE IQ SYSTEM CONTROLLER 3
- 2x BRANCHES OF 6 CONNECTED IN PARALLEL

INTERCONNECTION 120% RULE (MAIN PANEL)

INTERCONNECTION 120 % RULE NOT REQUIRED

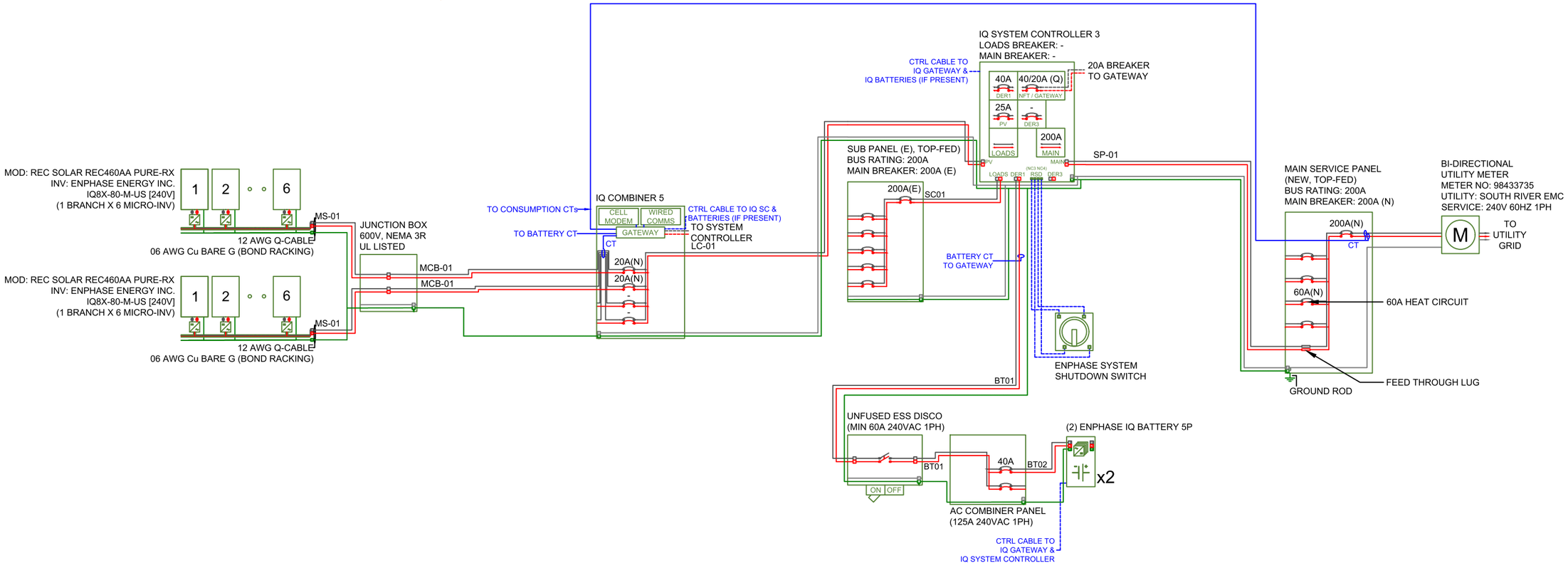
BUSBAR PCS ENABLED

EXTREME CASE MODULE OUTPUT (REC SOLAR REC460AA PURE-RX)

Isc(25°C) = 8.88A, Tisc = 0.040%/°C
Isc(T) = Isc(25°C) x [1 + Tisc x (T-25°C)]
Isc(-11°C) = 8.75A, Isc(35°C) = 8.92A

Voc(25°C) = 65.30V, Tvoc = -0.240%/°C
Voc(T) = Voc(25°C) x [1 + Tvoc x (T-25°C)]
Voc(-11°C) = 70.94V, Voc(35°C) = 63.73V

RELOCATE THE 60A HEAT CIRCUIT FROM THE MSP TO THE NEW 200A NON BACKUP PANEL.



ELECTRICAL NOTES

1) ALL GROUNDING TO COMPLY WITH NEC 690.47.
2) ROOFTOP CONDUIT SHALL BE LOCATED MIN. 7/8" ABOVE ROOF SURFACE.
3) ALL TERMINALS SHALL BE MIN. 75°C RATED.
4) IQ GATEWAY BREAKER DETERMINED AT FACTORY BY MANUFACTURER (20A).
5) FOR IQ GATEWAY: USE SINGLE CT FOR PV PRODUCTION (L1 FROM ALL PV BRANCH CIRCUITS). USE SINGLE CT FOR BATTERIES (L2 FROM ALL BATTERY BRANCHES LANDING IN SYSTEM CONTROLLER). USE DOUBLE CTs FOR CONSUMPTION (L1 AND L2 FEEDING MSP MAIN BREAKER, SERVICE SIDE).
6) IQ COMBINER 5 REQUIRES ENPHASE HOLD DOWN KIT X-IQ-NA-HD-125A.
7) WHEN IQ SYSTEM CONTROLLER 3 NOT AT SERVICE ENTRANCE, REMOVE N-G JUMPER WIRE FROM CONTROLLER.
8) SINGLE LARGEST BREAKER, BASELINE LOAD, AND LRA OF LARGEST LOAD IN BACKUP LOAD PANEL CANNOT EXCEED STORAGE (ESS) OUTPUT CAPACITY, PER NEC 710.15.
9) IQ SYSTEM CONTROLLER 3 MAIN OUTPUT LUGS RATED FOR #6-300 KCMIL, FOR WIRES SMALLER THAN #6 REMOVE LUG AND USE AN APPROVED UL RING TERMINAL.
10) IQ SYSTEM CONTROLLER 3 COMES WITH FACTORY-INSTALLED HOLD DOWN KIT ARM, ADDITIONAL KIT NOT REQUIRED.

PCS CONTROLLED CURRENT : 50.96A
BUS BAR OVERLOAD PROTECTION USED TO LIMIT CONTINUOUS CURRENT ON BUS BAR TO 160A

THE MAXIMUM OUTPUT CURRENT FROM THIS SYSTEM TOWARDS THE MAIN PANEL IS CONTROLLED ELECTRONICALLY, TO LIMIT CONTINUOUS BUSBAR CURRENT TO NOT EXCEED THE LIMIT

AC wire details

Wire	Min Ampacity	Live	Neutral	Ground	Min EMT	Min PVC	Min RMC	Min FMC
MS-01	11.85A	12 AWG (Q-Cable)	-	06 AWG BARE (NOT IN CONDUIT)	-	-	-	-
MCB-01	11.85A	(2) 10 AWG THWN-2	-	10 AWG THWN-2	1/2 in	1/2 in	1/2 in	1/2 in
LC-01	23.70A	(2) 10 AWG THWN-2	10 AWG THWN-2	10 AWG THWN-2	3/4 in	3/4 in	3/4 in	3/4 in
SP-01	200A(OCPD)	(2) 4/0 AWG THWN-2	4/0 AWG THWN-2	06 AWG THWN-2	2 in	2 in	2 in	2 in
BT01	40A (OCPD)	(2) 06 AWG THWN-2	-	10 AWG THWN-2	1 in	1 in	1 in	1 in
BT02	40A (OCPD)	(2) 06 AWG THWN-2	-	10 AWG THWN-2	1 in	1 in	1 in	1 in
SP-01	200A(OCPD)	(2) 4/0 AWG THWN-2	4/0 AWG THWN-2	06 AWG THWN-2	2 in	2 in	2 in	2 in

ELECTRICAL THREE LINE DIAGRAM

SCALE: NTS

BLUE RAVEN SOLAR

CONTRACTOR: BLUE RAVEN SOLAR
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SHEET NAME
THREE LINE DIAGRAM

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-4

SYSTEM SUMMARY STC (5.52 kW DC / 4.56 kW AC)

STC DC: (12) 460W = 5.52 kW
STC AC: (12) 380W = 4.56 kW
STORAGE: (2) 3.84kW 5.0kWh = 7.68kW 10.0kWh

- (12) REC SOLAR REC460AA PURE-RX MODULES
- (12) ENPHASE ENERGY INC. IQ8X-80-M-US [240V] MICROINVERTERS
- (2) ENPHASE ENERGY INC. IQBATTERY-5P-1P-NA BATTERIES
- (1) ENPHASE IQ SYSTEM CONTROLLER 3
- 2x BRANCHES OF 6 CONNECTED IN PARALLEL

INTERCONNECTION 120% RULE (MAIN PANEL)

INTERCONNECTION
120 % RULE
NOT REQUIRED

BUSBAR PCS ENABLED

EXTREME CASE MODULE OUTPUT (REC SOLAR REC460AA PURE-RX)

Isc(25°C) = 8.88A, Tisc = 0.040%/°C
Isc(T) = Isc(25°C) x [1 + Tisc x (T-25°C)]
Isc(-11°C) = 8.75A, Isc(35°C) = 8.92A

Voc(25°C) = 65.30V, Tvoc = -0.240%/°C
Voc(T) = Voc(25°C) x [1 + Tvoc x (T-25°C)]
Voc(-11°C) = 70.94V, Voc(35°C) = 63.73V

AC wire details

WireID	#Modules	Nominal Voltage	Backfeed *1.25 /cond. set	Min OCPD	Conductor sets	ccConductors /conduit	Expected max temp	Adjusted ampacity (ampacity x temp derate x conduit fill derate)	Conductor & neutral size	EGC size (Cu)	Conductor metal	Max length	V drop	Min EMT size	Min PVC size	Min RMC size	Min FMC size
MS-01	6	240 V	11.85 A	20 A	1	2	35	25 x 0.94 x - = 23.50 A	12 AWG (Q-Cable)	06 AWG BARE (NOT IN CONDUIT)	Cu	50 ft	0.69 %	-	-	-	-
MCB-01	6	240 V	11.85 A	20 A	1	2	35	35 x 0.94 x 1.00 = 32.90 A	(NO NEUTRAL)	10 AWG THWN-2	Cu	50 ft	0.41 %	1/2 in	1/2 in	1/2 in	1/2 in
LC-01	12	240 V	23.70 A	25 A	1	2	35	35 x 0.94 x 1.00 = 32.90 A	10 AWG THWN-2	10 AWG THWN-2	Cu	10 ft	0.17 %	1/2 in	1/2 in	1/2 in	1/2 in
SP-01	12	240 V	200A(OCPD)	200 A	1	2	35	230 x 0.94 x 1.00 = 216.2 A	4/0 AWG THWN-2	06 AWG THWN-2	Cu	10 ft	0.05 %	2 in	2 in	2 in	2 in
SC01	12	240 V	200A(OCPD)	200 A	1	2	35	230 x 0.94 x 1.00 = 216.2 A	4/0 AWG THWN-2	06 AWG THWN-2	Cu	10 ft	0.05 %	2 in	2 in	2 in	2 in
BT01	12	240 V	40A(OCPD)	40 A	1	2	35	65 x 0.94 x 1.00 = 61.10 A	06 AWG THWN-2	10 AWG THWN-2	Cu	10 ft	0.05 %	1 in	1 in	1 in	1 in

ELECTRICAL NOTES

1) ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
2) ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600V AND 90°C WET ENVIRONMENT.
3) 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.
4) WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
5) DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
6) WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
7) ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
8) MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
9) MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C.VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
10) PV EQUIPMENT SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NEC 690.
11) EXACT LOCATION OF AUXILIARY GROUNDING TO BE DETERMINED AT TIME OF INSTALL.
12) EXISTING WIRES MUST BE REPLACED IF SMALLER THAN LISTED MINIMUM SIZES PER NEC 310.15(B)(16).
13) IQ GATEWAY BREAKER DETERMINED AT FACTORY BY MANUFACTURER (20A).
14) FOR IQ GATEWAY: USE SINGLE CT FOR PV PRODUCTION (L1 FROM ALL PV BRANCH CIRCUITS). USE SINGLE CT FOR BATTERIES (L2 FROM ALL BATTERY BRANCHES LANDING IN SYSTEM CONTROLLER). USE DOUBLE CTs FOR CONSUMPTION (L1 AND L2 FEEDING MSP MAIN BREAKER, SERVICE SIDE).
15) IQ COMBINER 5 REQUIRES ENPHASE HOLD DOWN KIT X-IQ-NA-HD-125A.
16) WHEN IQ SYSTEM CONTROLLER 3 NOT AT SERVICE ENTRANCE, REMOVE N-G JUMPER WIRE FROM CONTROLLER.
17) SINGLE LARGEST BREAKER, BASELINE LOAD, AND LRA OF LARGEST LOAD IN BACKUP LOAD PANEL CANNOT EXCEED STORAGE (ESS) OUTPUT CAPACITY, PER NEC 710.15.
18) IQ SYSTEM CONTROLLER 3 MAIN OUTPUT LUGS RATED FOR #6-300 KCMIL, FOR WIRES SMALLER THAN #6 REMOVE LUG AND USE AN APPROVED UL RING TERMINAL.
19) IQ SYSTEM CONTROLLER 3 COMES WITH FACTORY-INSTALLED HOLD DOWN KIT ARM, ADDITIONAL KIT NOT REQUIRED.

WIRING CALCULATIONS

SCALE: NTS

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REVISIONS

DESCRIPTION	DATE	REV
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SHEET NAME
WIRING CALCULATIONS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5

⚠WARNING

ELECTRICAL SHOCK HAZARD

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

LABEL LOCATION: INVERTERS, DC & AC DISCONNECTS, DC & AC COMBINER PANELS (IF APPLICABLE)
CODE REF: NEC 2020 - 690.13(B)

⚠WARNING

THIS EQUIPMENT FED BY MULTIPLE SOURCES.TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE SHALL NOT EXCEED AMPACITY OF BUSBAR

LABEL LOCATION: MSP
CODE REF: NEC 2020 - 750.12(B)(3)(C), NEC 2020 - 110.21(B)

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION: UTILITY INTERCONNECTION DISCONNECT (MSP OR AC DISCONNECT), AND WHEREVER REQUIRED BY AHJ (DC DISCONNECTS, INVERTERS)
CODE REF: NEC 2020 - 690.56(C)(2)

PV SYSTEM DISCONNECT

MAXIMUM AC OPERATING CURRENT: 50.96 AMPS
NOMINAL OPERATING AC VOLTAGE: 240 VAC

LABEL LOCATION: AC DISCONNECTS, PV POINT OF INTERCONNECTION
CODE REF: NEC 2020 - 690.54

PHOTOVOLTAIC

AC DISCONNECT

LABEL LOCATION: AC DISCONNECT, PV BACKFEED BREAKER/POINT OF INTERCONNECTION
CODE REF: NEC 2020 - 690.13(B)

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

LABEL LOCATION: INTERCONNECTION DISCONNECT FOR UTILITY ACCESS
CODE REF: NEC 2020 - 690.13(B) OR UTILITY

⚠WARNING

POWER SOURCE OUTPUT CONNECTION

DO NOT RELOCATE THIS OVERCURRENT DEVICE

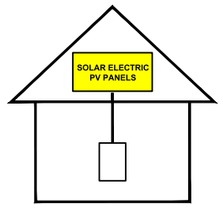
LABEL LOCATION: ADJACENT TO PV BACKFEED BREAKER AND ESS OCPD (IF APPLICABLE)
CODE REF: NEC 2020 - 705.12(B)(3)(2)

CAUTION: MULTIPLE POWER SOURCES

LABEL LOCATION: MSP & UTILITY METER (IF SEPARATE)
CODE REF: NEC 2020 - 705.10

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: INTERCONNECTION POINT (MSP OR AC DISCONNECT IF LINE SIDE TAP)
CODE REF: NEC 2020 - 690.56(C)

⚠ WARNING

TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

LABEL LOCATION: MSP
CODE REF: N/A

ENERGY STORAGE SYSTEM DISCONNECT

LABEL LOCATION: ESS DISCONNECT (IF INSTALLED)
CODE REF: NEC 2020 - 706.15(C)

FOR ESS DISCONNECT

NOMINAL ESS VOLTAGE : 240 VAC
MAXIMUM AVAILABLE SHORT-CIRCUIT CURRENT DERIVED FROM THE ESS : 51.2 AAC
THE ASSOCIATED CLEARING TIME OR ARC DURATION BASED ON THE AVAILABLE SHORT-CIRCUIT CURRENT FROM THE ESS AND ASSOCIATED OVERCURRENT PROTECTIVE DEVICES : 10 s
DATE OF THE CALCULATION PERFORMED : 09-MAY-2025

LABEL LOCATION: ESS DISCONNECT (IF INSTALLED), PROJECT SHALL COMPLY WITH CURRENT VERSION OF DEPARTMENT ELECTRICAL POWER SOURCE DISCONNECT PLACARDING SYSTEM
CODE REF: NEC 2020 - 706.15(C)

PCS CONTROLLED CURRENT : 50.96A
THE MAXIMUM OUTPUT CURRENT FROM THIS SYSTEM TOWARDS THE MAIN PANEL IS CONTROLLED ELECTRONICALLY

LABEL LOCATION: MAIN SERVICE PANEL
CODE REF: NEC 2020 - 705.13

BUS BAR OVERLOAD PROTECTION USED TO LIMIT CONTINUOUS CURRENT ON BUS BAR TO 160A THE MAXIMUM OUTPUT CURRENT FROM THIS SYSTEM TOWARDS THE MAIN PANEL IS CONTROLLED ELECTRONICALLY

LABEL LOCATION: MAIN SERVICE PANEL
CODE REF: NEC 2020 - 705.13

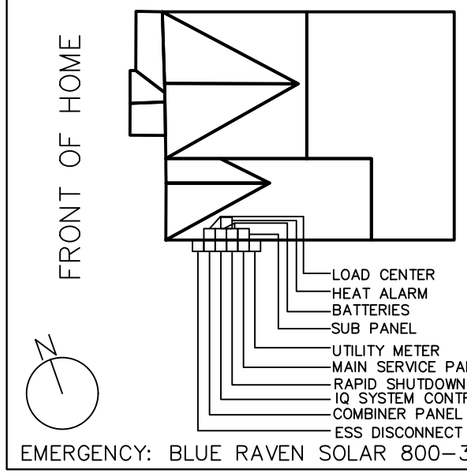
THIS SENSOR IS PART OF A POWER CONTROL SYSTEM. DO NOT REMOVE OR DISABLE. REPLACE WITH SAME TYPE AND RATING

LABEL LOCATION: MAIN SERVICE PANEL
CODE REF: NEC 2020 - 705.13

NOTES AND SPECIFICATIONS

1) SIGNS AND LABELS SHALL MEET THE REQUIREMENTS OF NEC 110.21(B), UNLESS SPECIFIC INSTRUCTIONS ARE REQUIRED BY SECTION 690, OR IF REQUESTED BY THE LOCAL AHJ.
2) SIGNS AND LABELS SHALL ADEQUATELY WARN OF HAZARDS USING EFFECTIVE WORDS, COLORS AND SYMBOLS.
3) LABELS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN.
4) LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
5) SIGNS AND LABELS SHALL COMPLY WITH ANSI Z535.4 - 2011, PRODUCT SAFETY SIGNS AND LABELS, UNLESS OTHERWISE SPECIFIED.
6) DO NOT COVER EXISTING MANUFACTURER LABELS.

CAUTION:
MULTIPLE SOURCES OF POWER



LABEL LOCATION: MSP
CODE REF: NEC 2020 - 705.10, NEC 2020 - 710.10

BLUE RAVEN SOLAR

CONTRACTOR: BLUE RAVEN SOLAR
ADDRESS: 1403 N 630 E, OREM, UTAH 84097
PHONE: 8003774480
EMAIL: design@blueravensolar.com
LICENSE #: 961988 (C-10) & (C-46)
ELECTRICAL LICENSE #: N/A

REVISIONS

DESCRIPTION	DATE	REV
REVISION	05.13.25	01

SIGNATURE & SEAL

HOMEOWNER INFO

THOMAS FISHER
4227 OVERHILLS RD,
SPRING LAKE, NC 28390, USA
APN: 7950253
PHONE: +15045179690
EMAIL: TFISH25@OUTLOOK.COM

SHEET NAME

PLACARDS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-6

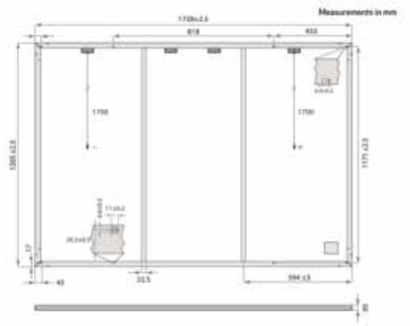
REC ALPHα® PURE-RX SERIES

DATASHEET

REC
SOLAR'S MOST TRUSTED

GENERAL DATA

Cell Type	88 half-cut bifacial REC heterojunction cells, with lead-free, gapless technology
Glass	3.2 mm solar glass with anti-reflective surface treatment in accordance with EN12150
Backsheet	Highly resistant polymer (Black)
Frame	Anodized aluminum (Black)
Junction Box	4-part, 4 bypass diodes, lead-free IP68 rated, in accordance with IEC 62790
Connectors	Stäubli MC4 PV-KBT4/KST4 (4 mm²) in accordance with IEC 62852, IP68 only when connected
Cable	4 mm² solar cable, 1.7 m + 1.7 m in accordance with EN50618
Dimensions	1728 x 1205 x 30 mm (2.08 m²)
Weight	23.4 kg
Origin	Made in Singapore



ELECTRICAL DATA

PRODUCT CODE*: RECxxxAA Pure-RX

STC Power Output - P_{MAX} (W_p)	450	455	460	465	470
Watt Class Sorting - (W)	0/+5W	0/+5W	0/+5W	0/+5W	0/+5W
Nominal Power Voltage - V_{MPP} (V)	54.3	54.6	54.9	55.2	55.4
Nominal Power Current - I_{MPP} (A)	8.29	8.34	8.38	8.43	8.49
Open Circuit Voltage - V_{OC} (V)	65.1	65.2	65.3	65.5	65.6
Short Circuit Current - I_{SC} (A)	8.81	8.84	8.88	8.91	8.95
Power Density (W/m²)	216	219	221	224	226
Panel Efficiency (%)	21.6	21.9	22.1	22.3	22.6
NMOT Power Output - Pmax (W_p)	343	346	350	354	358
Nominal Power Voltage - V_{MPP} (V)	51.2	51.4	51.7	52.0	52.2
Nominal Power Current - I_{MPP} (A)	6.70	6.73	6.77	6.81	6.86
Open Circuit Voltage - V_{OC} (V)	61.3	61.5	61.6	61.7	61.8
Short Circuit Current - I_{SC} (A)	7.11	7.14	7.17	7.2	7.23

Values at standard test conditions (STC: air mass AM 1.5, irradiance 1000 W/m², temperature 25°C), based on a production spread with a tolerance of P_{MPP}, V_{OC} & I_{SC} ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM 1.5, irradiance 800 W/m², temperature 20°C, windspeed 1 m/s). * Where xxx indicates the nominal power class (P_{MPP}) at STC above.

CERTIFICATIONS

IEC 61215:2021; IEC 61730:2016; UL 61730	
ISO 11925-2	Ignitability (EN 13501-1 Class E)
IEC 62716	Ammonia Resistance
IEC 61701	Salt Mist (SM6)
IEC 61215:2016	Hailstone (35 mm)
UL 61730	Fire Type 2
IEC 62321	Lead-free acc. to RoHS EU 863/2015
ISO 14001; ISO9001; IEC45001; IEC62941	

Declare.

Specifications subject to change without notice.

MAXIMUM RATINGS

Operational Temperature	-40 °C - 85 °C
System Voltage	1000 V
Maximum Test Load (front)	+7000 Pa (713 kg/m²)
Maximum Test Load (rear)	-4000 Pa (407 kg/m²)
Max Series Fuse Rating	25 A
Max Reverse Current	25 A

* See installation manual for mounting instructions. Design load = Test load / 1.5 (safety factor)

TEMPERATURE RATINGS*

Nominal Module Operating Temperature	44 °C ± 2°C
Temperature coefficient of P_{MAX}	-0.24% / °C
Temperature coefficient of V_{OC}	-0.24% / °C
Temperature coefficient of I_{SC}	0.04% / °C

*The temperature coefficients stated are linear values

DELIVERY INFORMATION

Panels per Pallet	33
Panels per 40 ft GP/high cube container	594 (18 Pallets)
Panels per 13.6 m truck	660 (20 Pallets)

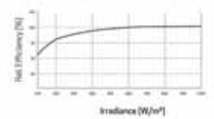
WARRANTY

	Standard	REC ProTrust	
Installed by an REC Certified Professional	No	Yes	Yes
System Size	All	<25 kW	25-500 kW
Product Warranty (yrs)	20	25	25
Power Warranty (yrs)	25	25	25
Labor Warranty (yrs)	0	25	10
Power in Year 1	98%	98%	98%
Annual Degradation	0.25%	0.25%	0.25%
Power in Year 25	92%	92%	92%

The REC ProTrust Warranty is only available on panels purchased through an REC Certified Solar Professional installer. Warranty conditions apply. See www.recgroup.com for more details.

LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



Available from:

Founded in 1996, REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power. As Solar's Most Trusted, REC is committed to high quality, innovation, and a low carbon footprint in the solar materials and solar panels it manufactures. Headquartered in Norway with operational headquarters in Singapore, REC also has regional hubs in North America, Europe, and Asia-Pacific.

REC Solar PTE. LTD.
20 Tuas South Ave. 14
Singapore 637312
post@recgroup.com
www.recgroup.com

REC

Ref: PM-DS-12-06-Rev-4.2 3.2024

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SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-7

ENPHASE.

UNITED STATES | DATA SHEET

IQ8X Microinverter

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

IQ8X Microinverter is the latest addition to this family, designed to support PV modules with high output DC voltage and cell counts, such as 80-half-cut cells, 88-half-cut cells, and 96-cells.

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

Enphase 25 year limited warranty

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

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

UL CERTIFIED

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

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

Easy to install

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

High productivity and reliability

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

Microgrid-forming

- Complies with the latest advanced grid support
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) and IEEE 1547:2018 (UL 1741-SB)

NOTE:

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

IQ8X Microinverter

INPUT DATA (DC)	UNIT	IQ8X-80-M-US/IQ8X-80-M-DOM-US[1]	
Commonly used module pairings [2]	W	320–540	
Module compatibility	—	To meet compatibility, PV modules must be within the following maximum input DC voltage and maximum module I_{sc}. Module compatibility can be checked at https://enphase.com/installers/microinverters/calculator	
MPPT voltage range	V	43–60	
Operating range	V	25–79.5	
Minimum and maximum start voltage	V	30–79.5	
Maximum input DC voltage	V	79.5	
Maximum continuous operating DC current	A	10	
Maximum input DC short-circuit current	A	16	
Maximum module I_{sc}	A	13	
Overvoltage class DC port	—	II	
DC port backfeed current	mA	0	
PV array configuration	—	Ungrounded array; no additional DC side protection required; AC side protection requires a maximum of 20 A per branch circuit	
OUTPUT DATA (AC)	**UNIT**	**IQ8X-80-M-US/IQ8X-80-M-DOM-US @240 V**	**IQ8X-80-M-US/IQ8X-80-M-DOM-US @208 V**
Peak output power	VA	384	366
Maximum continuous output power	VA	380	360
Nominal grid voltage (L-L)	V	240, split-phase (L-L), 180°	208, single-phase (L-L), 120°[3]
Minimum and maximum grid voltage[4]	V	211–264	183–229
Maximum continuous output current	A	1.58	1.73
Nominal frequency	Hz	60	
Extended frequency range	Hz	47–68	
AC short circuit fault current over three cycles	A_{rms}	2.70	
Maximum units per 20 A (L-L) branch circuit[5]	—	10	9
Total harmonic distortion	%	<5	
Overvoltage class AC port	—	III	
AC port backfeed current	mA	18	
Power factor setting	—	1.0	
Grid-tied power factor (adjustable)	—	0.85 leading ... 0.85 lagging	
Peak efficiency	%	97.3	97.0
CEC weighted efficiency	%	96.5	96.5
Nighttime power consumption	mW	26	12
MECHANICAL DATA			
Ambient temperature range		-40°C to 65°C (-40°F to 149°F)	
Relative humidity range		4% to 100% (condensing)	
DC connector type		Staubli MC4	
Dimensions (H × W × D); Weight		212 mm (8.3") × 175 mm (6.9") × 30.2 mm (1.2"); 1.1 kg (2.43 lb)	
Cooling		Natural convection – no fans	
Approved for wet locations; Pollution degree		Yes; PD3	
Enclosure		Class II double-insulated, corrosion-resistant polymeric enclosure	
Environmental category; UV exposure rating		NEMA Type 6; outdoor	

[1] IQ8X-80-M-DOM-US is undergoing compliance, and the specs are preliminary. This SKU is made in the USA, and the PCBA, electrical parts, and enclosure are domestically manufactured to meet the eligibility requirements to be considered for the ITC domestic content bonus adder.
[2] No enforced DC/AC ratio.
[3] IQ8X is not certified for use with Enphase Three Phase Network Protection Relay (NPR-3P-208-NA) and is, therefore, designed for single-phase operation only. Check with the local utility requirements if you wish to install single-phase inverters across three phases.
[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.

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SHEET NAME
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SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-8

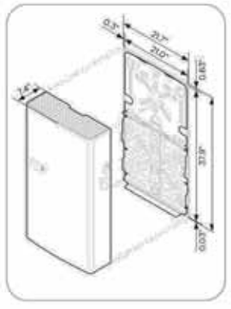
ENPHASE

DATA SHEET

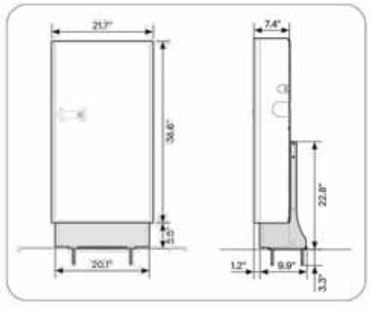
IQ Battery 5P

The IQ Battery 5P all-in-one AC-coupled system is powerful, reliable, simple, and safe. It has a total usable energy capacity of 5.0 kWh and includes six embedded grid-forming microinverters with a 3.84 kVA continuous power rating. It provides backup capability, and installers can quickly design the right system size to meet the customer needs.

Dimensions in inches



Wall mounted



Floor mounted with pedestal (sold separately)

Enphase 15 year limited warranty

LISTED

UL 9540A Certified

Powerful

- Provides 3.84 kVA continuous and 7.68 kVA peak power
- Doubles the available power per kWh of prior generations of IQ Battery
- Includes six embedded IQ8D-BAT (SKU: IQ8D-BAT-240) Microinverters

Reliable

- 15-year limited warranty
- Cools passively with no moving parts or fans
- Uses wired communication for fast and consistent connection
- Updates software and firmware remotely

Simple

- Fully integrated AC battery system
- Installs and commissions easily
- Supports Backup, Self-Consumption, and time-of-use (TOU) modes
- Offers homeowners remote monitoring and control from the Enphase App
- Field replaceable components

Safe

- Evaluated to UL 9540A for large scale fire testing and reduced separation distance as required in 2021 IRC R328.3.1, 2021 IFC 1207.1.5, and 2023 NFPA 855 15.3.1 and 9.1.5.[1]
- Uses lithium iron phosphate (LFP) chemistry for maximum safety and longevity

[1]Follow all installation instructions and local codes and requirements of the Authority Having Jurisdiction (AHJ) when installing Enphase Energy System.

IQ Battery 5P

MODEL NUMBER	
IQBATTERY-5P-1P-NA	The IQ Battery 5P system with integrated IQ Microinverters and battery management system (BMS) with battery controller
WHAT'S IN THE BOX	
IQ Battery 5P unit	IQ Battery 5P unit (B05-T02-US00-1-3)
ID cover and conduit cover	IQ Battery 5P cover with two conduit covers for the left and right sides of the unit
Bottom mounting bracket and top shield	Bottom mounting bracket for mounting the battery on the wall. One top shield is required for UL 9540A
M5 seismic screws	Two M5 seismic screws for securing the battery unit on the bottom mounting bracket
M4 grounding screws	Two M4 grounding screws for securing the top shield on the bottom mounting bracket
M5 ID cover grounding screws	Two M5 ID cover grounding screws for the EMI/EMC requirement
Cable ties	Six cable ties for securing field cables to the unit
Control (CTRL) connector	Spare CTRL connector without resistor for CTRL wiring
Control (CTRL) connector with resistor	Spare CTRL connector with resistor for CTRL wiring
Quick install guide (QIG)	QIG for IQ Battery unit installation instructions
OPTIONAL ACCESSORIES AND REPLACEMENT PARTS	
IQ8D-BAT-RMA	IQ8D-BAT Microinverter for field replacement
B05-T02-US00-1-3-RMA	IQ Battery 5P Battery unit for field replacement
B05-CX-0550-O	IQ Battery 5P cover for field replacement
B05-PI-0550-O	IQ Battery 5P pedestal mount
B05-CP-096-O	IQ Battery 5P conduit plates for field replacement. Includes one left-side and one right-side conduit plate
B05-WB-0543-O	IQ Battery 5P wall bracket for field replacement. Includes one bottom mounting bracket and one top shield
IQBATTERY-HNDL-5	IQ Battery 5P lifting handles. Includes one left-side and one right-side lifting handle
B05-ACFB-080-O	IQ Battery 5P AC filter board for field replacement
B05-BMSNA-0490-O	IQ Battery 5P BMS board for field replacement
B05-CANB-063-O	IQ Battery 5P control communication board for field replacement
B05-NICS-0524-O, B05-NUCS-0524-O	IQ Battery 5P control switch is preinstalled on the wiring cover for field replacement
OUTPUT (AC)	**@240 VAC[2]**
Rated (continuous) output power	3.84 kVA
Peak output power	7.68 kVA (3 seconds), 6.14 kVA (10 seconds)
Nominal voltage/range	240/211–264 VAC
Nominal frequency/range	60/57–63 Hz
Rated output current (@240 VAC)	16 A
Peak output current (@240 VAC)	32 A (3 seconds), 25.6 A (10 seconds)
Power Start capability	Up to 48 A LRA[3]
Power factor (adjustable)	0.85 leading ... 0.85 lagging
Maximum units per 20 A branch circuit	One unit (single-phase)
Maximum conductor size supported	3 AWG
Overcurrent protection device (OCPD) for 3 AWG cable	80 A
Interconnection	Single-phase
AC round-trip efficiency[4]	90%

[2]Supported in both grid-connected and backup/off-grid operations.
[3]Power Start capability may vary.
[4]AC to the battery to AC at 50% power rating.

IQB-5P-DSH-00010-5.0-EN-US-2024-02-16

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SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-9

BATTERY	
Total capacity	5.0 kWh
Usable capacity	5.0 kWh
DC round-trip efficiency	96%
Nominal DC voltage	76.8 V
Maximum DC voltage	86.4 V
Ambient operating temperature range (charging)	-20°C to 50°C (-4°F to 122°F) non-condensing
Ambient operating temperature range (discharging)	-20°C to 55°C (-4°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 (H x W x D)	980 mm × 550 mm × 188 mm (38.6 in × 21.7 in × 7.4 in)
Lifting weight	66.3 kg (146.1 lb)
Total installed weight	78.9 kg (174 lb)
Enclosure	Outdoor-NEMA 3R
IQ8D-BAT Microinverter enclosure	NEMA type 6
Cooling	Natural convection
Altitude	Up to 2,500 meters (8,202 feet)
Mounting	Wall-mount or pedestal-mount (sold separately)
FEATURES AND COMPLIANCE	
Compatibility	Compatible with IQ and M Series Microinverters, IQ System Controller 3/3G, IQ Combiner 5/5C, and IQ Gateway for grid-tied and backup operation
Communication	Wired control communication
Services	Backup, Self-Consumption, TOU, and NEM integrity
Monitoring	Enphase Installer Platform and Enphase App monitoring options; API integration
Compliance	CA Rule 21 (UL 1741-SA), IEEE 1547:2018 (UL 1741-SB, 3rd Ed.) CAN/CSA C22.2 No. 107.1-16 UL 9540[1], UL 9540A, UN 38.3, UL 1998, UL 991, NEMA Type 3R, AC156 EMI: 47 CFR, Part 15, Class B, ICES 003 Cell module: UL 1973, UN 38.3 Inverters: UL 62109-1, IEC 62109-2
LIMITED WARRANTY	
Limited warranty	>60% capacity, up to 15-year or 6,000 cycles[2]

[1] Following local standards, choose a well-ventilated, non-habitable, indoor location (like a 2-car garage) or an outdoor location, which is out of direct sunlight and where the ambient temperature and humidity are within -20°C to 45°C (-4°F to 113°F) and 5% to 95% RH, non-condensing.
[2] Whichever occurs first. Restrictions apply.

Revision history

REVISION	DATE	DESCRIPTION
DSH-00010-5.0	February 2024	Updated the SKU on page 1.
DSH-00010-4.0	November 2023	Updated the "Output (AC)" table.
DSH-00010-3.0	September 2023	• Updated product images. • Editorial updates.
DSH-00010-2.0	July 2023	• Added battery isometric view on the first page. • Editorial updates.
DSH-00010-1.0	May 2023	Initial release.

IQB-5P-DSH-00010-5.0-EN-US-2024-02-16

BLUE RAVEN SOLAR

CONTRACTOR: BLUE RAVEN SOLAR
ADDRESS: 1403 N 630 E, OREM, UTAH 84097
PHONE: 8003774480
EMAIL: design@blueravensolar.com
LICENSE #: 961988 (C-10) & (C-46)
ELECTRICAL LICENSE #: N/A

REVISIONS

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REVISION	05.13.25	01

SIGNATURE & SEAL

HOMEOWNER INFO

THOMAS FISHER
4227 OVERHILLS RD,
SPRING LAKE, NC 28390, USA
APN: 7950253
PHONE: +15045179690
EMAIL: TFISH25@OUTLOOK.COM

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10

ENPHASE

DATA SHEET

X-IQ-AM1-240-5-HDK
X-IQ-AM1-240-5C-HDK
X-IQ-AM1-240-5
X-IQ-AM1-240-5C

IQ Combiner 5/5C

The IQ Combiner 5/5C consolidates interconnection equipment into a single enclosure and streamlines IQ Series Microinverters and IQ Gateway installation by providing a consistent, pre-wired solution for residential applications. IQ Combiner 5/5C uses wired control communication and is compatible with IQ System Controller 3/3G and IQ Battery 5P.

The IQ Combiner 5/5C, IQ Series Microinverters, IQ System Controller 3/3G, and IQ Battery 5P provide a complete grid-agnostic Enphase Energy System.

IQ Series Microinverters
The high-powered smart grid-ready IQ Series Microinverters (IQ6, IQ7, and IQ8 Series) simplify the installation process.

IQ System Controller 3/3G
Provides microgrid interconnection device (MID) functionality by automatically detecting grid failures and seamlessly transitioning the home energy system from grid power to backup power.

IQ Battery 5P
Fully integrated AC battery system. Includes six field-replaceable IQ8D-BAT Microinverters.

IQ Load Controller
Helps prioritize essential appliances during a grid outage to optimize energy consumption and prolong battery life.

Enphase 5 year limited warranty

NOM

UL CERTIFIED SAFETY US-CA SÛRETÉ US-CA E341166

5-year limited warranty

Smart

- Includes IQ Gateway for communication and control
- Includes Enphase Mobile Connect (CELLMODEM-M1-06-SP-05), only with IQ Combiner 5C
- Supports flexible networking: Wi-Fi, Ethernet, or cellular
- Provides production metering (revenue grade) and consumption monitoring

Easy to install

- Mounts to one stud with centered brackets
- Supports bottom, back, and side conduit entries
- Supports up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV branch circuits
- Factory installed hold-down kit
- Bluetooth-based Wi-Fi provisioning for easy Wi-Fi setup

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- 5-year limited warranty
- 2-year labor reimbursement program coverage included for IQ Combiner SKUs*
- UL1741 Listed

*For country-specific warranty information, see the https://enphase.com/installers/resources/warranty page.

IQ Combiner 5/5C

MODEL NUMBER	
IQ Combiner 5 (X-IQ-AM1-240-5/ X-IQ-AM1-240-5-HDK)	IQ Combiner 5 with IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSI C12.20 ±0.5%), consumption monitoring (±2.5%), and IQ Battery monitoring (±2.5%). Includes a silver solar shield to deflect heat. IQ-AM1-240-5-HDK includes a factory installed hold-down kit compatible with all the circuit breakers mentioned in the **Accessories and Replacement Parts** section.
IQ Combiner 5C (X-IQ-AM1-240-5C / X-IQ-AM1-240-5C-HDK)	IQ Combiner 5C with IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSI C12.20 ±0.5%), consumption monitoring (±2.5%), and IQ Battery monitoring (±2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05)[1]. Includes a silver solar shield to deflect heat. IQ-AM1-240-5C-HDK includes a factory installed hold-down kit compatible with all the circuit breakers mentioned in the **Accessories and Replacement Parts** section.
WHAT'S IN THE BOX	
IQ Gateway printed circuit board	IQ Gateway is the platform for total energy management for comprehensive, remote maintenance, and management of the Enphase Energy System
Busbar	80 A busbar with support for one IQ Gateway breaker and four 20 A breakers for installing IQ Series Microinverters and IQ Battery 5P
IQ Gateway breaker	Circuit breaker, 2-pole, 10 A/15 A
Production CT	Pre-wired revenue-grade solid-core CT, accurate up to ±0.5%
Consumption CT	Two consumption metering clamp CTs, shipped with the box, accurate up to ±2.5%
IQ Battery CT	One battery metering clamp CT, shipped with the box, accurate up to ±2.5%
CTRL board	Control board for wired communication with IQ System Controller 3/3G and the IQ Battery 5P
Enphase Mobile Connect (only with IQ Combiner 5C)	4G-based LTE-M1 cellular modem (CELLMODEM-M1-06-SP-05) with a 5-year T-Mobile data plan
Accessories kit	Spare control headers for the COMMS-KIT-2 board
ACCESSORIES AND REPLACEMENT PARTS (NOT INCLUDED, ORDER SEPARATELY)	
CELLMODEM-M1-06-SP-05	4G-based LTE-M1 cellular modem with a 5-year T-Mobile data plan
CELLMODEM-M1-06-AT-05	4G-based LTE-M1 cellular modem with a 5-year AT&T data plan
Circuit breakers (off-the-shelf)	Supports Eaton BR2XX, Siemens Q2XX, and GE/ABB THQL21XX Series circuit breakers (XX represents 10, 15, 20, 30, 40, 50, or 60). Also supports Eaton BR220B, BR230B, and BR240B circuit breakers compatible with the hold-down kit.
Circuit breakers (provided by Enphase)	BRK-10A-2-240V, BRK-15A-2-240V, BRK-20A-2P-240V, BRK-15A-2P-240V-B, and BRK-20A-2P-240V-B (more details in the "Accessories" section)
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 5/5C
XA-ENV2-PCBA-5	IQ Gateway replacement printed circuit board (PCB) for IQ Combiner 5/5C
X-IQ-NA-HD-125A	Hold-down kit compatible with Eaton BR-B Series circuit breakers (with screws). Not required for X-IQ-AM1-240-5-HDK/X-IQ-AM1-240-5C-HDK.
XA-COMMS2-PCBA-5	Replacement COMMS-KIT-2 printed circuit board (PCB) for IQ Combiner 5/5C
ELECTRICAL SPECIFICATIONS	
Rating	80 A
System voltage and frequency	120/240 VAC or 120/208 VAC, 60 Hz
Busbar rating	125 A
Fault current rating	10 kAIC
Maximum continuous current rating (input from PV/storage)	64 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR, Siemens Q, or GE/ABB THQL Series distributed generation (DG) breakers only (not included)
Maximum total branch circuit breaker rating (input)	80 A of distributed generation/95 A with IQ Gateway breaker included
IQ Gateway breaker	10 A or 15 A rating GE/Siemens/Eaton included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway

[1] A plug-and-play industrial-grade cell modem for systems of up to 60 microinverters. Available in the United States, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.

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SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-11

ACCESSORIES AND REPLACEMENT PARTS (NOT INCLUDED, ORDER SEPARATELY)	
Consumption monitoring CT (CT-200-CLAMP)	A pair of 200 A clamp-style current transformers is included with the box
IQ Battery metering CT	200 A clamp-style current transformer for IQ Battery metering, included with the box
MECHANICAL DATA	
Dimensions (W × H × D)	37.5 cm × 49.5 cm × 16.8 cm (14.75" × 19.5" × 6.63"). Height is 53.5 cm (21.06") with mounting brackets.
Weight	7.5 kg (16.5 lb)
Ambient temperature range	-40°C to 46°C (-40°F to 115°F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 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
Communication (in-premise connectivity)	Built-in CTRL board for wired communication with the IQ Battery 5P and the IQ System Controller 3/3G. Integrated power line communication for IQ Series Microinverters.
Altitude	Up to 2,600 meters (8,530 feet)
COMMUNICATION INTERFACES	
Integrated Wi-Fi	802.11b/g/n (dual band 2.4 GHz/5 GHz) for connecting the Enphase Cloud through the internet.
Wi-Fi range (recommended)	10 m (32.8 feet)
Bluetooth	BLE4.2, 10 m range to configure Wi-Fi SSID
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included) for connecting to the Enphase Cloud through the internet.
Cellular/Mobile Connect	CELLMODEM-M1-06-SP-05 or CELLMODEM-M1-06-AT-05 (included with the IQ Combiner 5C)
Digital I/O	Digital input/output for grid operator control
USB 2.0	Mobile Connect, COMMS-KIT-01 for IQ Battery 3/3T/10/10T, COMMS-KIT-02 for IQ Battery 5P
Access point (AP) mode	For connection between the IQ Gateway and a mobile device running the Enphase Installer App
Metering ports	Up to two Consumption CTs, one IQ Battery CT, and one Production CT
Power line communication	90–110 kHz
Web API	See https://developer-v4.enphase.com
Local API	See Guide for local API
COMPLIANCE	
IQ Combiner with IQ Gateway	UL 1741, CAN/CSA C22.2 No. 107.1, Title 47 CFR, Part 15, Class B, ICES 003, NOM-208-SCFI-2016, UL 61010-1, CAN/CSA 22.2 No. 61010-1, IEEE 1547: 2018 (UL 1741-SB, 3rd Ed.), IEEE 2030.5/CSIP Compliant, Production metering: ANSI C12.20 accuracy class 0.5 (PV production)

COMPATIBILITY		
PV	Microinverters	IQ6, IQ7, and IQ8 Series Microinverters
COMMS-KIT-01[2]	IQ System Controller	EP200G101-M240US00
	IQ System Controller 2	EP200G101-M240US01
	IQ Battery	ENCHARGE-3-1P-NA, ENCHARGE-10-1P-NA, ENCHARGE-3T-1P-NA, ENCHARGE-10T-1P-NA
COMMS-KIT-02[3]	IQ System Controller 3	SC200D111C240US01, SC200G111C240US01
	IQ Battery	IQBATTERY-5P-1P-NA

[1] For information about IQ Combiner 5/5C compatibility with the 2nd-generation batteries, refer to the compatibility matrix.
[2] IQ Combiner 5/5C comes pre-equipped with COMMS-KIT-02.

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ANSI B
11" X 17"

SHEET NUMBER
PV-12

ENPHASE

DATA SHEET

IQ System Controller 3/3G

The Enphase IQ System Controller 3/3G connects the home to grid power, the IQ Battery system, and solar PV. It provides microgrid interconnect 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.

IQ Series Microinverters
The high-powered smart grid-ready IQ Series Microinverters (M Series, IQ6, IQ7, and IQ8 Series) dramatically simplify the installation process.

IQ Battery 5P
Fully integrated AC battery system. Includes six field-replaceable IQ8D-BAT microinverters.

IQ Combiner 5/5C
Consolidates PV interconnection equipment into a single enclosure and streamlines IQ Series Microinverters and IQ Gateway installation by providing a consistent, pre-wired solution for residential applications.

IQ Load Controller
Helps prioritize essential appliances during a grid outage to optimize energy consumption and prolong battery life.

Enphase 10 year limited warranty

IQ System Controller 3

IQ System Controller 3G

Easy to install

- Connects to service entrance[1] or main load center
- Includes neutral-forming transformer
- Mounts on single stud with centered brackets
- Provides conduit entry from the bottom, left, or right
- Includes color-coded wires for ease of wiring the System Shutdown Switch
- Integrates hold-down functionality to eliminate the need for hold-down kits and special breakers

Flexible

- Can be used for Sunlight Backup, Home Essentials Backup, or Full Energy Independence
- IQ System Controller 3 integrates with IQ Battery 5P
- IQ System Controller 3G integrates with select AC standby generators. See the Generator integration tech brief for a list of generators
- Provides a seamless transition to backup

Safe and reliable

- System Shutdown Switch can be used to disconnect PV, battery, and generator systems
- The System Shutdown Switch acts as a rapid shutdown initiator of grid-forming IQ8 PV Microinverters for the safety of maintenance technicians/first responders
- 10-year limited warranty

[1] IQ System Controller 3 is not suitable for use as service equipment in Canada.

IQ System Controller 3/3G

MODEL NUMBERWW	DESCRIPTION
SC200D111C240US01	IQ System Controller 3 streamlines the grid-independent capabilities of PV and storage installations. Integrates hold-down capability. Supports IQ Battery 5P units up to 40 kWh (without PCS*) and 80 kWh (with PCS*). Does not support generator integration
SC200G111C240US01	IQ System Controller 3G streamlines the grid-independent capabilities of PV and storage installations. Integrates hold-down capability. Supports IQ Battery 5P units up to 20 kWh (without PCS*) and 40 kWh (with PCS*). Supports generator integration
WHAT IS IN THE BOX	
IQ System Controller 3/3G	Includes neutral-forming transformer (NFT) and microgrid interconnect device (MID)
System Shutdown Switch	Includes pre-wired red, black, orange, and purple 12 AWG wire (EP200G-NA-02-RSD)
Wall-mounting bracket	Screws provided in the accessories kit for mounting
4-pole circuit breaker	Pre-installed quad breaker (BRK-20A40A-4P-240V), 20 A–40 A, 10 kAIC, Eaton BQC220240[2]
Accessories kit	IQ System Controller 3/3G literature kit, including labels, CTRL headers, screws, filler plates, and quick install guide (QIG) (EP200G-LITKIT)
OPTIONAL ACCESSORIES AND REPLACEMENT PARTS	
CT-200-SPLIT	200 A split-core current transformers for metering (accuracy: ±2.5%)[3]
CT-200-CLAMP	200 A clamp-type current transformers for metering (accuracy: ±2.5%)[3]
Main or load circuit breakers (order separately, as needed)[4]	• BRK-100A-2P-240V : 2-pole, 100A, 25kAIC, CSR2100N or CSR2100 • BRK-125A-2P-240V: 2-pole, 125A, 25kAIC, CSR2125N • BRK-150A-2P-240V: 2-pole, 150A, 25kAIC, CSR2150N • BRK-175A-2P-240V: 2-pole, 175A, 25kAIC, CSR2175N • BRK-200A-2P-240V: 2-pole, 200A, 25kAIC, CSR2200N
Distributed energy resource (DER) circuit breakers (order separately, as needed)[5]	• BRK-20A-2P-240V-B: 2-pole, 20 A, 10 kAIC, BR220B/BR220 • BRK-30A-2P-240V-B: 2-pole, 30 A, 10 kAIC, BR230 • BRK-40A-2P-240V-B: 2-pole, 40 A, 10 kAIC, BR240B/BR240 • BRK-60A-2P-240V: 2-pole, 60 A, 10 kAIC, BR260 • BRK-80A-2P-240V: 2-pole, 80 A, 10 kAIC, BR280
EP200G-HNDL-R1	IQ System Controller 3/3G installation handle kit (order separately)
CTRL-SC3-NA-01	Control cable, 500 ft. spool (order separately)
BRK-20A40A-4P-240V	2-pole 20 A, 2-pole 40 A, 10 kAIC, Quad Breaker BQC220240 [6]
ALTERNATE DER CIRCUIT BREAKERS	
GE/ABB	THQL21xx (20/40/60/80 A)
Siemens	Q2xx (20/40/60/80 A)
Siemens (quad breaker)	Q24020CT2 (20/40 A)
ELECTRICAL SPECIFICATIONS	
Nominal voltage/Range (L-L)	240 V~[7]/±20%
Voltage measurement accuracy	±1% V nominal (±1.2 V L-N and ±2.4 V L-L)
Auxiliary (dry) contact for load control, excess PV control, and generator two-wire control	24 V, 1 A
Nominal frequency/Range	60 Hz/56–63 Hz
Frequency measurement accuracy	±0.1 Hz
Maximum continuous current rating	160 A
Maximum input overcurrent protection device	200 A
Maximum output overcurrent protection device	200 A
Maximum overcurrent protection device rating for generator circuit	80 A (IQ System Controller 3G only - SC200G111C240US01)
Maximum overcurrent protection device rating for storage circuit	2 × 80 A (IQ System Controller 3 - SC200D111C240US01) 1 × 80 A (IQ System Controller 3G - SC200G111C240US01)

[2] Factory-installed quad breaker (Siemens or Eaton). NFT pre-wired to 40 A terminal of the quad breaker.
[3] Two units of CT-200-SPLIT or CT-200-CLAMP must be bought separately for generator integration.
[4] The IQ System Controller 3 is rated at 22 kAIC.
[5] Integrated hold-down kit support breakers (BR230/BR230/BR240) without predrilled hole. The integrated hold-down kit also supports GE/ABB and Siemens as mentioned in the *Alternate DER circuit breakers* section.
[6] Figures 1a and 1b show Siemens or Eaton factory-installed quad breakers with NFT pre-wired to 40 A.
[7] "~" indicates alternating current (AC) supply.
* Power control system.

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SHEET SIZE
ANSI B
11" X 17"

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PV-13

ELECTRICAL SPECIFICATIONS		
Maximum overcurrent protection device rating for PV combiner unit	80 A	
Internal busbar rating	200 A	
Neutral-forming transformer (NFT)	• Breaker rating (pre-installed): 40 A between L1 and Neutral; 40 A between L2 and Neutral • Continuous rated power: 3,600 VA • Maximum continuous unbalance current: 30 A @ 120 V • Peak unbalanced current: 80 A @ 120 V for two seconds	
MECHANICAL DATA		
Dimensions (W × H × D)	50 cm × 91.6 cm × 24.6 cm (19.7 in × 36 in × 9.7 in)	
Weight	39.4 kg (87 lb)	
Ambient temperature range	-40°C to 50°C (-40°F to 122°F)	
Cooling	Natural convection and a heat shield	
Enclosure environmental rating	Outdoor, NEMA type 3R, polycarbonate construction	
Maximum altitude	2,500 m (8,200 ft)	
WIRE SIZES		
Connections (All lugs are rated to 90°C)	Main lugs and backup load lugs Cu/Al: CSR breaker bottom wiring lugs Cu/Al: AC combiner lugs, IQ Battery lugs, and generator lugs: Neutral (large lugs) Cu/Al:	6 AWG–300 kcmil 2 AWG–300 kcmil 14 AWG–2 AWG 6 AWG–300 kcmil
Neutral and ground bars	Large holes (5/16–24 UNF) Small holes (10–32 UNF)	14 AWG–1/0 AWG 14 AWG–6 AWG
COMPLIANCE		
Compliance	UL 1741, UL 1741 SA, IEEE 1547:2018 (UL 1741-SB, 3rd Ed.), UL 1741 PCS CRD, UL1 998, UL 869A, UL 508[a], UL 50E[a] CSA 22.2 No. 107.1, 47 CFR Part 15 Class B, ICES 003, ICC ES AC156 The IQ System Controller 3/3G is approved for use as service equipment in the United States	
WARRANTY		
Limited warranty (restrictions apply)	Up to 10 years (EP200G-NA-02-RSD has a 5-year warranty)	
COMPATIBILITY[b]		
Battery	IQ Battery 5P (IQBATTERY-5P-1P-NA)	
Microinverters	IQ8, IQ7, IQ6, and M Series Microinverters[c]	
IQ Combiner	IQ Combiner 5/5C (X-IQ-AM1-240-5C and X-IQ-AM1-240-5)	
Communications Kit 2	COMMS-KIT-02	

[a] Sections from these standards were used during the safety evaluation and included in the UL 1741 listing.
[b] For more details, refer to the IQ System Controller 3/3G quick install guide.
[c] M Series Microinverters can only be supported in states that have not yet adopted IEEE 1547:2018. Enphase does not support mixing IQ8 Series Microinverters with other series on the same IQ Gateway.

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SHEET NUMBER
PV-14

PEGASUS SOLAR™
A Better Day on the Job

RAIL SYSTEM

Next-Level Solar Mounting

A complete system for hassle-free rooftop installation, from watertight mounts to lifetime wire management.

Simplicity
1/2" socket for everything.
One clamp for mid or end.
No tool splicing and bonding.
Easy wire management.

Code Compliant
UL 2703 listed
LTR-AE-001-2012 listed
Class A fire rating for any slope
ASCE 7-16 PE Certified

Premium Aesthetics
The narrowest panel gap available. Optional Hidden End Clamps and End Caps provide a flush look on the edge of the array.

Watertight for Life
Secured on industry-leading Pegasus Mounts, for composite shingle and tile roofs. Backed by a 25-year warranty.

Pegasus Solar Inc | 506 West Ohio Avenue, Richmond, CA 94804 | T: 510.210.3797 | **www.pegasussolar.com**

PEGASUS SOLAR

RAIL SYSTEM

Pegasus Rail
Available in 14' and 7' lengths for easy layout and shipping.
Open-channel design holds MC4 connectors, PV wire and trunk cables.
Black and Mill finish

Pegasus Max Rail
Maximum-strength design.
Meets specifications for high snow-load and hurricane zones.
Black and Mill finish

Splice and Max Splice
Installs by hand.
Works over mounts.
Structurally connects and bonds rails automatically; UL2703 listed as reusable.

Dovetail T-bolt
Dovetail shape for extra strength.
Uses ½" socket.

Multi-Clamp
Fits 30-40mm PV frames, as mid- or end-clamp.
Twist-locks into position; doesn't pinch wires in rail.
Bonds modules to rail; UL2703 listed as reusable

Hidden End Clamp
Offers premium edge appearance.
Preinstalled pull-tab grips rail edge, allowing easy, one-hand installation.
Tucks away for reuse.

Ground Lug
Holds 6 or 8 AWG wire.
Mounts on top or side of rail.
Assembled on MLPE Mount.
UL2703 listed as reusable.

N-S Bonding Jumper
Installs by hand, eliminates row-to-row copper wire.
UL2703 listed as reusable only with Pegasus Rail.

MLPE Mount
Secures and bonds most micro-inverters and optimizers to rail.
Connectors and wires easily route underneath after installation.
UL2703 listed as reusable.

Cable Grip
Secures four PV wires or two trunk cables.
Stainless-steel backing provides durable grip.
Eliminates sagging wires.

Wire Clip
Hand operable.
Holds wires in channel.
Won't slip.

End Cap and Max End Cap
Fits flush to PV module and hides raw or angled cuts.
Hidden drain quickly clears water from rail.

Certifications:
- UL 2703, Edition 1
- LTR-AE-001-2012
- ASCE 7-16 PE certified
- Class A fire rating for any slope roof

FREE PEGASUS SOLAR Design Tool
Quickly calculate the most efficient layout, spans and materials needed to suit your job. Visit the Pegasus Customer Portal. **pegasussolar.com/portal**

LOAD		SPAN			
SNOW (PSF)	WIND (MPH)	32"	4'	6'	8'
0	120				
	160				
	190				
15	140				
	160				
	190				
30	160				
	190				
45	190				
70	190				
110	190				

PEGASUS RAIL | PEGASUS MAX RAIL

For reference only. Spans above are calculated using ASCE 7-16 for a Gable Roof, Exposure Category B, 7-20deg roof angle, 30ft mean roof height with non-exposed modules. For PE certified span tables, visit www.pegasusolar.com/spans.

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APN: 7950253
PHONE: +15045179690
EMAIL: TFISH25@OUTLOOK.COM

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-15

PEGASUS

INSTAFLASH® 2

Rafter or Deck Attach!

- No pilot holes
- Pre-installed sealant
- No caulking, no ripping shingles

Pre-installed sealant

Before: Sealant contained by protective cage. No contact with hands or tools.

Instant, watertight seal

After: Non-hardening sealant automatically fills all gaps, overlays and butt joints.

Install in any season

Install in 0 to 170° F weather, including rain and sleet. Watertight for life.

The Ultimate Comp Roof Attachment

Simple to use. Works for rafter or deck attach. No caulking, no ripped shingles, no mess. Pre-installed sealant acts as a chemical flashing and fills all gaps, voids, and butt joints for an instant, watertight seal.

25-Year Warranty
Manufactured with advanced materials and coatings to outlast the roof itself

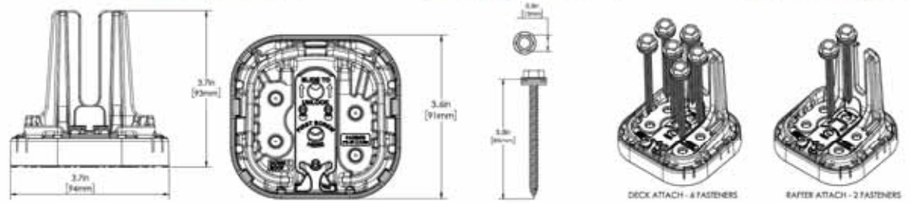
Code Compliant
Fully IBC/CBC code compliant Exceeds ASCE 7-22 standards UL2703 certified

Self-Healing
Proprietary non-hardening sealant will flex and reseal over years of thermal expansion and contraction

Larger Spans
Extra-large L-foot and proprietary screws result in larger spans between mounts

PEGASUS

INSTAFLASH® 2



SPECIFICATIONS	INSTAFLASH KITS			
	PIF2-B0	PIF2-BDT	PIF2-M0	PIF2-MDT
Finish	Black		Mill	
Kit Contents	Black InstaFlash2	Black InstaFlash2, Dovetail T-bolt	Mill InstaFlash2	Mill InstaFlash2, Dovetail T-bolt
Attachment Type	Rafter & Deck Attach			
Roof Fasteners	1/2" Socket Driven; PF-DRW85 (sold separately in boxes of 24)			
Roof Type	Sloped Roof: Composition Shingle, Rolled Asphalt | Flat Roof: Modified Bitumen Roof, Built-Up Roof			
Flashing Type	Factory Installed Non-Drying, Non-Skinning Butyl Based Chemical Flashing			
Installation Temperature	0° F to 170° F			
Cure Time	Instantly Waterproof; Non-Hardening			
Service Temperature	-40° F to 195° F			
Certifications	IBC, ASCE/SEI 7-16 & 7-22, UL2703			
Install Application	Most Railed Systems			
Kit Quantity	24			
Boxes Per Pallet	36			

SCAN FOR INSTALLATION VIDEO

SCAN FOR FREE TRIAL

Pegasus | 506 West Ohio Avenue, Richmond, CA 94804 | **www.pegasussolar.com**

BLUE RAVEN SOLAR

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LICENSE #: 961988 (C-10) & (C-46)
ELECTRICAL LICENSE #: N/A

REVISIONS

DESCRIPTION	DATE	REV
REVISION	05.13.25	01

SIGNATURE & SEAL

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11" X 17"

SHEET NUMBER
PV-16

HEAT ALARM

CAT. **HD6135FB**

135° FIXED & RATE OF RISE

Microprocessor controlled -Features Fixed Rate and Rate of Rise temperature sensing - allows unit to alarm prior to reaching the fixed temperature setting of 135° F.

LATCHING ALARM INDICATOR

Remembers which unit initiated an alarm.

SILENCE FEATURE

Silences nuisance alarms.

TWO LOCKING FEATURES

Pins are provided to lock battery drawer and/or alarm to base. Perfect for apartment, dormitory or hotel applications.

LIMITED 10 YEAR WARRANTY

Listed to UL 539 Standard

BRK®

THE PROFESSIONAL STANDARD

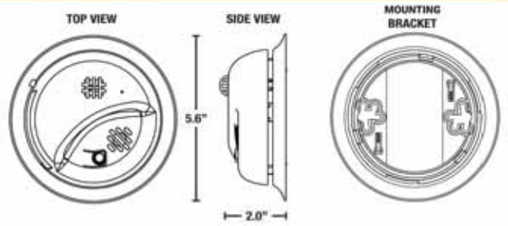
120V AC, 60Hz Wire-in with 9V Battery Backup

Description:

The BRK Brands, Inc. Model Number HD6135FB is a wire-in, 120V AC 60Hz single and/or multiple station heat alarm designed to supplement smoke alarms in residential and institutional applications including sleeping rooms of hospitals, hotels, motels, dormitories and other multi-family dwellings as defined in standard NFPA 101. Models HD6135FB complies with UL539, CSFM, NFPA 72, HUD, FHA and other agencies that model their codes after the above agencies. They meet building codes where AC and AC/DC with Silence heat alarms are required. The alarms are interconnectable with up to 18 devices, of which 12 can be smoke alarms. This heat alarm is not a smoke alarm nor has it been designated a life safety device.

BRK Electronics HD6135FB is designed to give reliable early warning of heat from fire. It is recommended for garages, crawl spaces, bathrooms, kitchens, laundry rooms or other applications not suitable for smoke alarm installations. The unit contains a thermistor that senses heat and will alarm when either the temperature reaches 135°F or when a rate of rise of 15°F/minute is sensed by the microprocessor. This feature enables a more rapid response to a potential fire. The unit has an 85dB horn, a 9V battery backup power supply, an easy access side-load battery drawer. This alarm features Alarm Latch: Easily identifies initiating alarm even after alarm condition has subsided; Low Battery Silence: Temporarily silence the low battery chirp for up to eight hours; Alarm Silence: Silence alarm for several minutes. Two locking features are provided to prevent battery theft and/or theft of the unit. Connection to AC power is made with a Quick-Connect wiring harness. Installation is quick, easy and cost effective.

CAT. **HD6135FB**



ARCHITECTURAL AND ENGINEERING SPEC

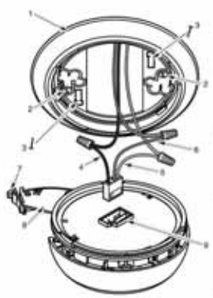
The heat alarm shall be a BRK Model HD6135FB and shall provide at a minimum the following features and functions:

1. A thermistor and microprocessor capable of sensing and alarming at a 135°F fixed temperature level and a 15°F/min. rate of rise temperature change.
2. The unit shall be capable of self restoring.
3. Powered by 120V AC, 60Hz and have a monitored 9V battery backup and a solid state piezo horn rated at 85dB at 10 ft.
4. A visual green LED power-on indicator to confirm unit is receiving power or is in alarm.
5. A full function test button should check all alarm functions by simulating a smoke condition, causing the unit to alarm.
6. Silence feature - Temporarily silence unwanted nuisance alarms.
7. Two Locking features - tamper resistant locking pins that lock battery drawer and/or alarm to mounting bracket.
8. The unit shall be capable of operating between -10°F (-23°C) and 100°F (38°C) and relative humidity between 10% and 90%.
9. The unit shall have a gasketless base for easy installation and be capable of keeping alarm secure over a wide rotation range to allow for true alarm alignment.
10. The unit shall have a plug in connector and be capable of interconnection of up to 18 alarms, 12 of which can be smoke alarms.
11. The unit shall at a minimum meet the requirements of UL539, CSFM, NFPA 72, NFPA 101, ICC.

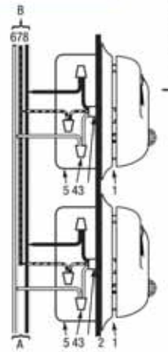
INSTALLATION OF ALARM

Installation of this heat alarm must conform to all local electrical codes and Article 760 of the National Electrical Code (NFPA 70) and NFPA 72. Interconnected units must meet the following requirements: Total length of wire interconnecting units should be less than 1000 feet, be #18 gauge or larger and be rated at least 300V. It is recommended that all units be on the same fuse or circuit breaker. If local codes do not permit, be sure the neutral wire is common to both phases.

THE PARTS OF THIS HEAT ALARM



1. Mounting bracket
2. Mounting Slots
3. Locking Pins
4. Hot (Black) AC Wire
5. Neutral (White) AC Wire
6. Interconnect (Orange) Wire
7. Battery Drawer Latch
8. Battery Drawer - Install 9V battery here
9. Quick-Connect Plug



A. Unswitched 120VAC 60 Hz source
B. To additional units; Maximum = 18 total (Maximum 12 Smoke Alarms)

1. Heat Alarm
2. Ceiling or Wall
3. Power Connector
4. Wire Nut
5. Junction Box
6. Neutral Wire (White)
7. Interconnect Wire (Orange)
8. Hot Wire (Black)

TECHNICAL SPECS

Alarm Dimensions:	5.6"dia. x 2.0"H
Weight:	7.3 oz
Operating Voltage:	120V AC 60Hz w/ 9V alkaline battery backup
Operating Current:	0.05 amps (standby/alarm)
Temperature Range:	-10°F (-23°C) to 100°F (38°C)
Humidity Range:	10% to 95% relative humidity (RH)
Audio Alarm:	85dB at 10 feet
Test/Silence:	Electronically simulates alarm condition, causing the unit to alarm. Press and hold test/silence button.
Alarm Reset:	Automatic when temperature cools below 130°F
Interconnections:	Up to 18 units of First Alert or BRK Smoke, CO and Heat Alarms. Maximum of 12 smoke alarms. See user's manual for details.
Heat Sensor:	Thermistor
Indicator Lights/Sounds:	
AC Power:	Constant Green LED
DC Power:	Intermittent Green LED
Local Alarm:	Red LED flashes rapidly, audio alarm
Remote Alarm:	Red LED out.
Latching Alarm:	Red LED flashes after local alarm
Listing:	Listed to UL539 Standard

SHIPPING SPECS

Individual Carton Dimensions	5.50"L x 2.50"W x 5.63"H
Weight	0.50 lbs.
Cube	0.05 ft3
UPC	0 29054 50810 2
Master Carton Dimensions	16.81"L x 10.31"W x 6.25"H
Master Pack	12
Weight	6.3 lbs.
Cube:	0.63 ft3
I2of5:	100 29054 50810 9
Pallet Information	
Cases per Layer	10
Number of Layers:	7
Cases per Pallet:	70
Units per Pallet:	840
Cube:	54.7 ft3
Weight:	550 lbs.

BRK® THE PROFESSIONAL STANDARD
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BLUE RAVEN SOLAR

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ANSI B
11" X 17"

SHEET NUMBER
PV-17

Result summary

Information in this document is based on reports as defined by ANSI/CAN/UL 9540A, 4th Edition, November 12, 2019. The products were evaluated by UL Solutions.

Test report	Date of issue	Date of revision
Cell-level	2023-02-08	2023-10-19
Module-level	2023-02-23	2023-10-19
Unit-level	2023-02-28	2023-10-19

UL Solutions file numbers

- North America: FTBW.E488100
- Canada: FTBW7.E488100

BESS intended installation

Enphase IQ Battery 5P (Model number: IQBATTERY-5P-1P-NA, SKU: B05-T02-US00-1-3) was evaluated by UL Solutions to Standard ANSI/CAN/UL 9540A for outdoor and indoor non-habitable[1] residential spaces.

- Indoor (such as a two-car garage) wall-mounted and floor-mounted: Spaces including attached, detached, and open garages, which are well-ventilated and non-habitable.
- Outdoor wall-mounted and ground-mounted: Spaces that are out of direct sunlight and where the ambient temperature and humidity are within -4°F to 113°F (-20°C to 45°C) and 5% to 95% RH, non-condensing.

Cell-level information

Cell-level information	
Chemistry of the test item	Lithium iron phosphate ($LiFePO_4$)
Was the cell certified?	Yes
Standard test item certified to	UL 1973
Organization that certified the test item	UL (BBGA2.MH62591)
Average cell surface temperature at gas venting under heater	331°F (166°C)
Average cell surface temperature at thermal runaway under heater	488°F (242°C)

[1] Habitable space is defined in the IRC as a space in a building for living, sleeping, eating, or cooking. Non-habitable space is defined in the IRC as bathrooms, toilet rooms, closets, halls, storage or utility spaces, and similar areas.

ENPHASE. UL 9540A report summary IQ Battery 5P-1P-NA (B05-T02-US00-1-3)

Cell-level gas composition

Cell-level gas composition	Measured %
Carbon monoxide	6.9
Carbon dioxide	17.4
Hydrogen	60.9
Methane	4.5
Ethylene	3.5
Ethane	1.1
Acetylene	0.3
Propene (Propylene)	2.4
Propane	0.3
Propadiene	0.1
C_4	1.1
Pentane	0.6
C_6	0.3
C_7	0.1
Benzene	0.2
Toluene	0.2
Styrene	0.1
Total	**100**

Module-level information

Module-level information	
Ratings	62.4 Ah, 76.8 V
Module cell configuration	24S1P
Module weight (kgs)	35
Module enclosure material	Polycarbonate, SPCC steel sheet, and aluminum
Was the module certified?	Yes
Standard the module was certified to	UL 1973
Organization that certified the test item	UL, File MH62591

Gas composition and volume of each compound

Module-level information		
Gas compound	**Pre-flaming (L)**	**Flaming (L)**
Total hydrocarbons (Propane equivalent)	937	No flaming occurred
Carbon dioxide	543	No flaming occurred
Carbon monoxide	47	No flaming occurred
Hydrogen	163	No flaming occurred

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PV-18

Unit-level information

Unit testing: No external flaming or hazardous debris

- No external flaming or debris hazards were observed.
- No evidence of flying debris was found in the test room after the conclusion of the test.
- The initiating unit was covered with a single layer of cheesecloth used as an ignition indicator. The cheesecloth did not ignite, and no flame was observed.

No thermal runaway and re-ignitions post-test

No additional thermal runaway behavior or re-ignitions were observed during post-test observation, disassembly, and sample disposal.

No unit-to-unit or module-to-module propagation

Unit-to-unit propagation was not observed because the target unit's temperature did not reach or exceed the cell venting temperature. The target unit temperature was 56°C, far below the cell venting temperature. Therefore, unit-to-unit propagation is not possible.

Module-to-module propagation does not apply because only one module is within the initiating unit.

Unit-level testing summary

Unit level information	Description
Model number	IQBATTERY-5P-1P-NA (B05-T02-US00-1-3)
Rated AC input/output power, kVA	3.84
BESS module configuration	1P1S (single module in the unit)
BESS intended installation **Residential** Indoor: Wall-mounted and floor-mounted Outdoor: Wall-mounted and ground-mounted **Non-residential** Indoor: Wall-mounted, floor-mounted, rooftop, open garage Outdoor: Wall-mounted and ground-mounted	**Residential** A well-ventilated, non-habitable indoor location (such as a two-car garage) **Non-residential** An outdoor location that is out of direct sunlight and where the ambient temperature and humidity are within -4°F to 113°F (-20°C to 45°C) and 5% to 95% RH, non-condensing
Residential indoor use: minimum room size	133 m^3
Was the unit certified?	Yes
Standard the unit was certified to	UL 9540
Organization that certified the unit	UL File FTBW.E488100 and FTBW7.E488100
External flaming from BESS	No external flaming
Location(s) of flame venting	No external flaming
Heat flux measurement	A cheesecloth ignition indicator was used in accordance with CRD. No flaming or charring of the cheesecloth ignition indicator was observed.

Maximum target BESS temperature	133°F (56°C)
Maximum wall surface temperature	244°F (198°F rise above the ambient)
Flying debris	No flying debris
Re-ignition	No re-ignition

External surrounding temperatures

Surrounding temperature	Value
Maximum temperature to target	133°F (56°C)
Maximum wall temperature, absolute	244°F (198°F rise above the ambient)
Maximum wall temperature, delta (79°F ambient)	198°F (92°C)

Unit-level gas composition summary and minimum room size

Gas component	Gas type	During pre-flaming (L)	During flaming (L)
Total hydrocarbons (Propane equivalent)	Hydrocarbons	1393.88	No flaming
Carbon dioxide	Carbon containing	0.06	No flaming
Carbon monoxide	Carbon containing	0.41	No flaming
Hydrogen	Hydrogen	251.23	No flaming
Minimum room size based on 25% LFL	133 m^3		

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Minimum separation distances

The following figure shows spacings between the IQ Battery 5P units as evaluated in the UL 9540A report.

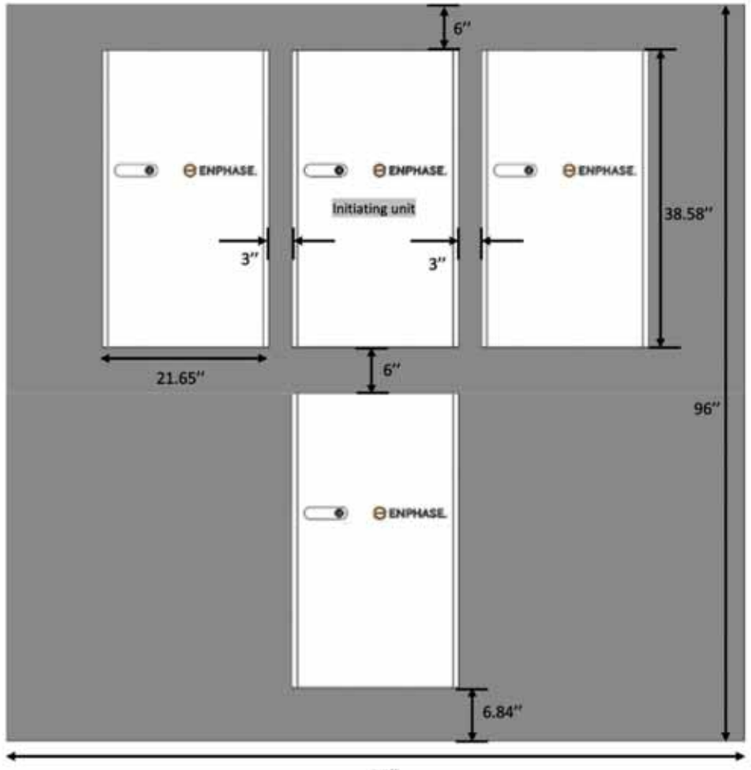

Figure 1: Spacings between the IQ Battery 5P units

The following figure shows the initiating unit in the middle covered with a cheesecloth. Two target units are on the sides, and one is below the initiating unit.

Figure 2: Initiating unit in the middle covered with cheesecloth together with the target units

Conclusion

The IQ Battery 5P product passed the UL 9540A unit-level test. The peak wall surface and target unit temperatures were below the limits, and no ignition events were observed during and after the completion of the test.

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