PHOTOVOLTAIC ROOF MOUNT & ENERGY SYSTEM

9 MODULES - SYSTEM SIZE STC (4.445 kW DC /3.190 kW AC)

516 SEILER AVENUE, SAVANNAH, GA 31401, USA (32.0551823, -81.0940812)

SYSTEM SUMMARY STC (4.455 kW DC / 3.190 kW AC)

STC DC: (11) 405W = 4.455 kW
STC AC: (11) 290W = 3.190 kW
STORAGE: (2) 3.84kW 5.0kWh = 7.68kW 10.0kWh

- (11) HANWHA Q CELLS Q.PEAK DUO BLK ML-G10+ 405 MODULES
- (11) ENPHASE ENERGY INC. IQ8PLUS-72-2-US [240V] MICROINVERTERS
- (2) ENPHASE ENERGY INC. IQBATTERY-5P-1P-NA BATTERIES
- (1) ENPHASE IQ SYSTEM CONTROLLER 3

- 1x BRANCH OF 9 CONNECTED IN PARALLEL

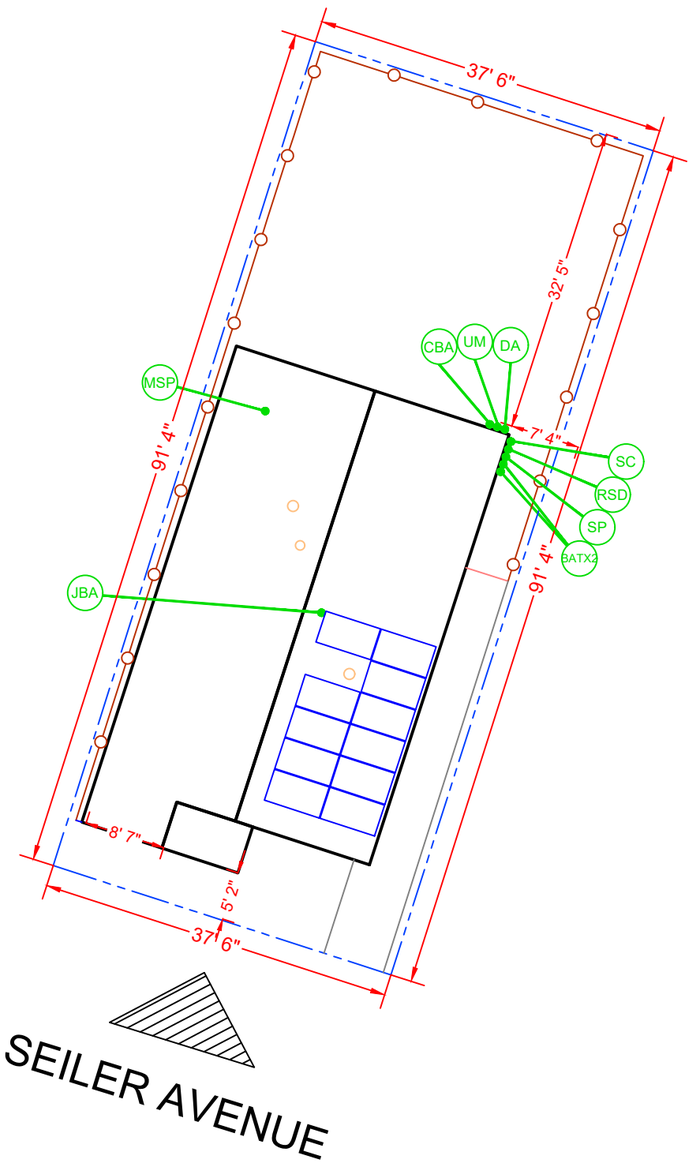
GOVERNING CODES

- 2018 INTERNATIONAL FIRE CODE
- 2018 INTERNATIONAL BUILDING CODE
- 2018 INTERNATIONAL RESIDENTIAL CODE
- 2020 NFPA 70 - NATIONAL 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 250'.
8) ALL ENSEMBLE EQUIPMENT MUST BE WITHIN 50' OF EACH OTHER.
9) IF THERE ARE COMMUNICATION ISSUES WITH GATEWAY, UB EXTENDER CAN BE USED TO RELOCATE COMMS KIT NEAR IQ SYSTEM CONTROLLER & BATTERY.
10) IQ BATTERY UNITS SHOULD NOT BE INSTALLED IN DIRECT SUNLIGHT.

WIRE RUN THROUGH THE ATTIC



SITE PLAN

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

LEGEND

NEW PV MODULE	FENCE
FRONT OF HOUSE	GATE
DIMENSIONS	DRIVEWAY
PROPERTY LINE	POOL

JBA	AC JUNCTION BOX (NEW)	UM	UTILITY METER (EXISTING)
CBA	IQ COMBINER 5/5C (NEW)	SC	IQ SYSTEM CONTROLLER 3 (NEW)
DA	AC DISCONNECT UNFUSED (NEW)	BAT	BATTERIES (NEW)
SP	SUBPANEL (NEW)	RSD	RAPID SHUTDOWN (NEW)
MSP	MAIN SERVICE PANEL (EXISTING, 200A)		

SHEET INDEX

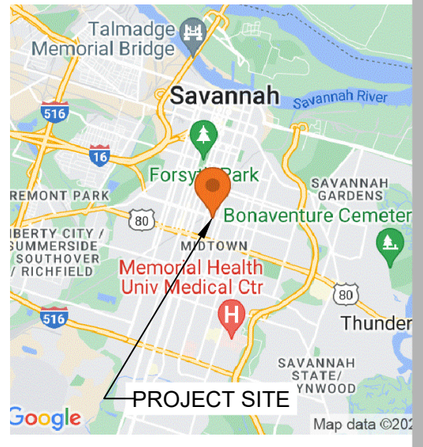
PV-1	COVER PAGE
PV-2	ROOF PLAN WITH MODULES
PV-2.1	STRING LAYOUT
PV-3	ATTACHMENT DETAIL
PV-3.1	EQUIPMENT ELEVATION
PV-4	SINGLE LINE DIAGRAM
PV-5	WIRING CALCULATION
PV-6	PLACARDS
PV-7+	EQUIPMENT SPECIFICATION

AHJ: SAVANNAH (CITY OF), GEORGIA
UTILITY: GEORGIA POWER CO



HOUSE PHOTO

SCALE: NTS



VICINITY MAP

SCALE: NTS

CONTRACTOR: SUNPATH SOLAR
ADDRESS: 718 MUSTANG DRIVE, DALLAS
GEORGIA 30157
PHONE: 14044349745
EMAIL: Seth@sunpath.solar
LICENSE #: NABCEP Cert #: PV-102117-016852
ELECTRICAL LICENSE #: N/A

REVISIONS

DESCRIPTION	DATE	REV

SIGNATURE & SEAL

HOMEOWNER INFO

STEPHANIE KAPLE
516 SEILER AVENUE,
SAVANNAH, GA 31401, USA
APN: 20064 35021 PHONE: +13057313038
EMAIL: N/A

SHEET NAME
COVER PAGE

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

MODULE AREA & WEIGHT CALCULATIONS

PV PANELS (COUNT, AREA, WEIGHT):
- (11x) HANWHA Q CELLS Q.PEAK DUO BLK ML-G10+ 405 (74.0" x 41.1", 48.5 LB)

MICRO-INVERTERS (COUNT, WEIGHT):
- (11x) ENPHASE ENERGY INC. IQ8PLUS-72-2-US [240V] (2.38 LB)

ROOF PLANE #1:
- ATTACHMENT COUNT: 24
- MOUNTING SYSTEM WEIGHT / MODULE: 1.5 LB
- MOUNTING SYSTEM WEIGHT: (11) 1.5 LB = 16.5 LB

NEW PANELS:
- PANEL AREA: (11) 74.0" x 41.1" = 232 SF
- PANEL WEIGHT: (11) 48.5 = 534 LB
- MICRO-INVERTER WEIGHT: (11) 2.4 = 26 LB
- TOTAL SYSTEM WEIGHT: 534 + 26 + 16.5 = 576 LB
- WEIGHT PER CONNECTION: 576 LB / 24 = 24 LB
- DISTRIBUTED LOAD: 576 LB / 232 SF = 2.48 PSF
- ROOF AREA COVERAGE: 232 SF / 1729 SF = 13.4%

BILL OF MATERIALS

EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULES	11	HANWHA Q CELLS Q.PEAK DUO BLK ML-G10+ 405
MICRO INVERTERS	11	ENPHASE ENERGY INC. IQ8PLUS-72-2-US [240V]
BATTERIES	2	ENPHASE ENERGY INC. IQBATTERY-5P-1P-NA
SMART SWITCH	1	ENPHASE IQ SYSTEM CONTROLLER 3
RSD	1	ENPHASE RAPID SHUTDOWN
JUNCTION BOX (AC)	1	JUNCTION BOX 600V, NEMA 3R UL LISTED
LOAD CENTER (AC)	1	ENPHASE IQ COMBINER 5/5C
AC DISCONNECT	1	PV VISIBLE LOCKABLE LABELED DISCONNECT (30A UNFUSED 1PH 240VAC)
ATTACHMENTS	24	IRONRIDGE RESOURCES - HALO ULTRAGRIP
RAIL	8	IRONRIDGE RESOURCES - XR10
RAIL SPLICES	2	RAIL SPLICES (FOR ABOVE)
MID CLAMPS	16	MID CLAMPS
END CLAMPS	12	END CLAMPS
GROUNDING LUG	3	GROUNDING LUG

ROOF DESCRIPTION TABLE

ROOF PLANE	ROOF PITCH	ROOF AZIMUTH	ROOF MATERIAL	RAFTER SIZE	RAFTER SPACING	ATTACHMENT SPACING	MODULES (PITCH)
#1	27°	108°	ASPHALT SHINGLE	2" x 6"	24" O.C.	48" O.C.	11 (27°)

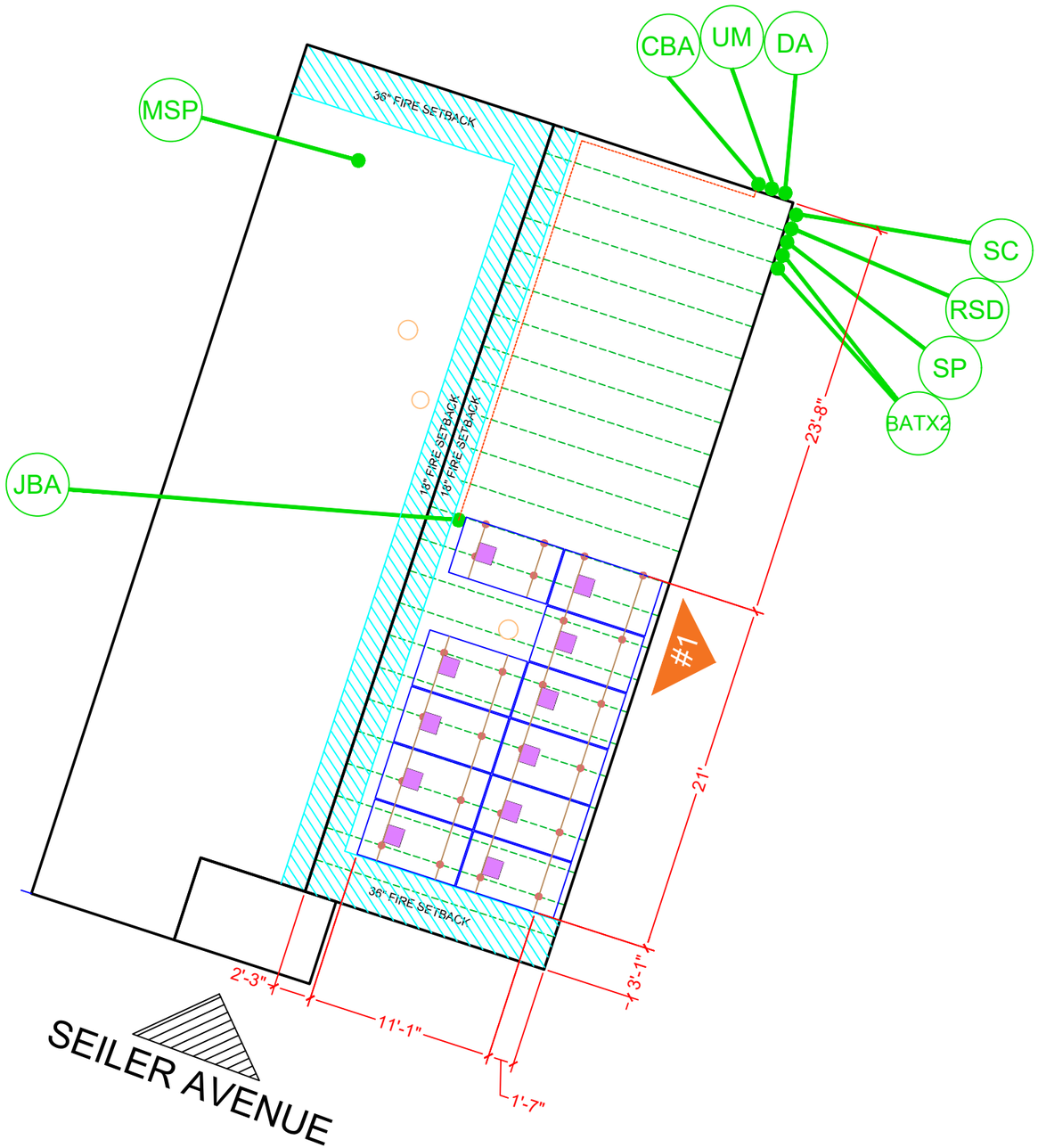
ROOF ACCESS POINT

- 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 WHERETHE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES OR SIGNS.

DESIGN CRITERIA

- EXPOSURE CATEGORY = B
- WIND SPEED = 135 MPH
- SNOW LOAD = 0 PSF

WIRE RUN THROUGH THE ATTIC



LEGEND

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

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

ROOF PLAN WITH MODULES

SCALE: 1/8" = 1'-0"

SUNPATH SOLAR

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REVISIONS

DESCRIPTION	DATE	REV

SIGNATURE & SEAL

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SHEET NAME
ROOF PLAN WITH MODULES

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2

MODULE AREA & WEIGHT CALCULATIONS

PV PANELS (COUNT, AREA, WEIGHT):

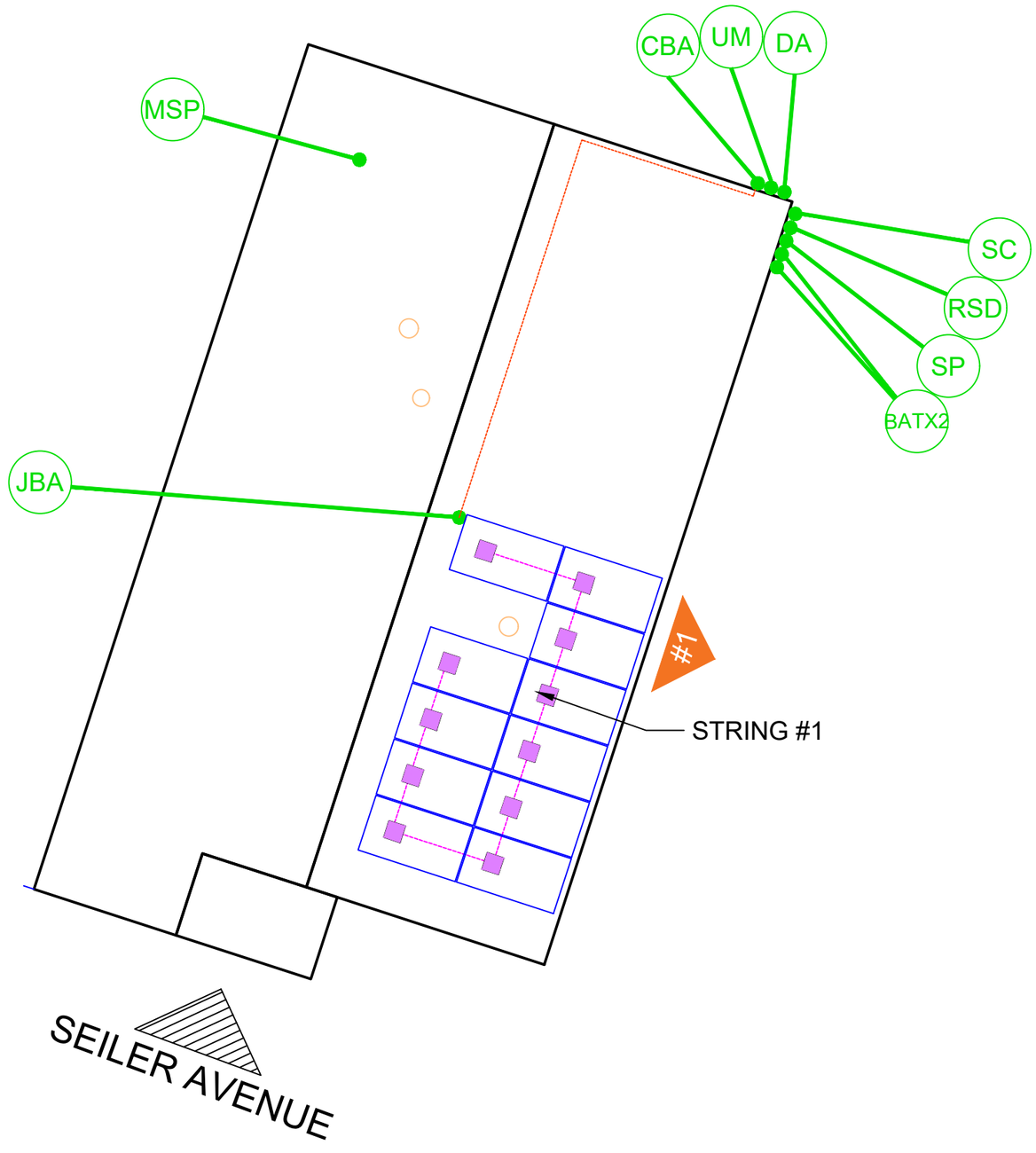
- (11x) HANWHA Q CELLS Q.PEAK DUO BLK ML-G10+ 405 (74.0" x 41.1", 48.5 LB)

MICRO-INVERTERS (COUNT, WEIGHT):

- (11x) ENPHASE ENERGY INC. IQ8PLUS-72-2-US [240V] (2.38 LB)

- 1x BRANCH OF 11 CONNECTED IN PARALLEL

WIRE RUN THROUGH THE ATTIC



LEGEND

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

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

STRING LAYOUT

SCALE: 1/8" = 1'-0"

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SHEET NAME

STRING LAYOUT

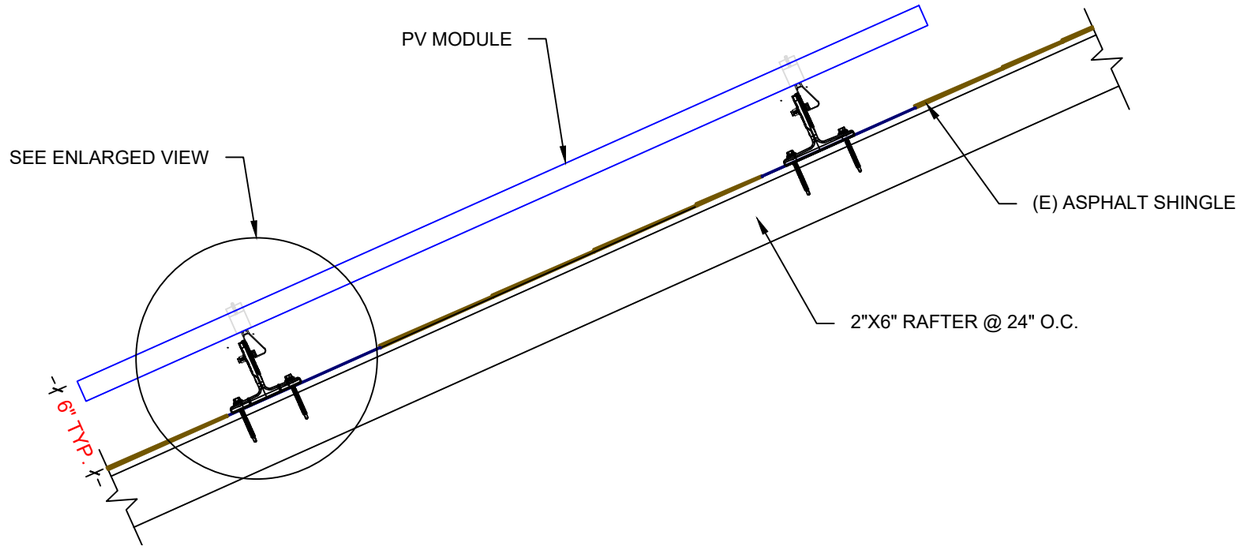
SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

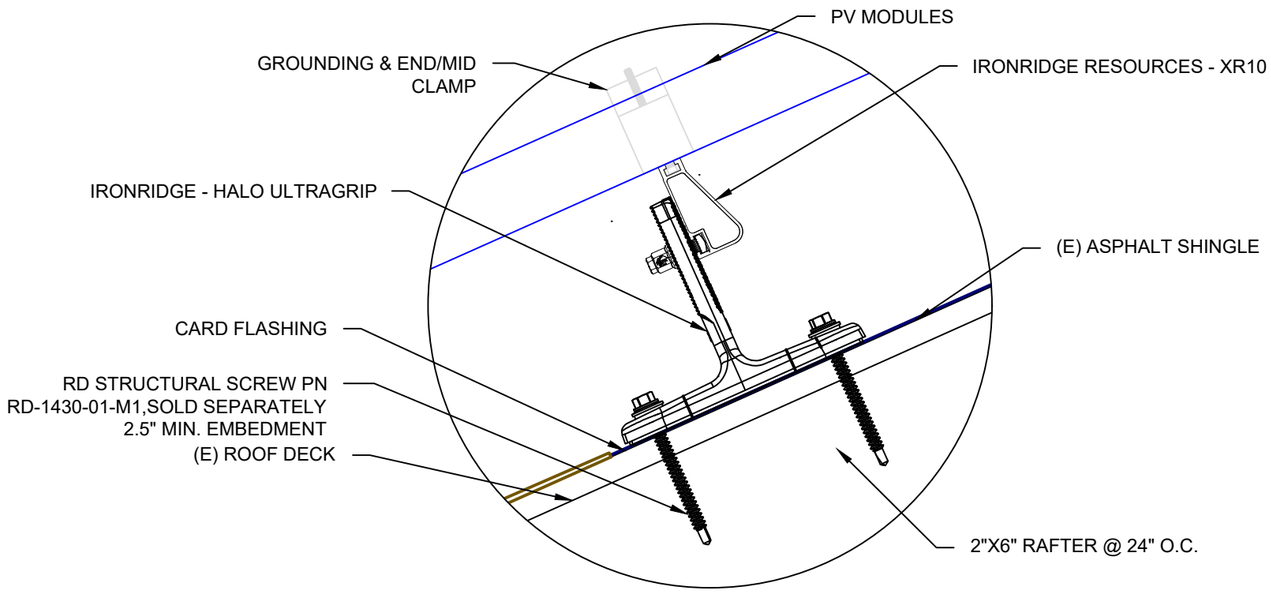
PV-2.1

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



ATTACHMENT DETAIL

SCALE: NTS



ATTACHMENT DETAIL (ENLARGED SECTION VIEW)

SCALE: NTS

TWO RD STRUCTURAL SCREWS MUST BE
INSTALLED INTO THE TRUSS/RAFTER
IF MORE THAN THREE SCREWS MISS THE RAFTER/TRUSS, FOLLOW
THE DECK ATTACHING PROCEDURE AND REDUCE ATTACHMENT
SPACING AS REQUIRED TO MEET SITE SPECIFIC ENGINEERING.
: FOR N/S RAILS, IF THE FIRST TWO SCREWS MISS THE RAFTER/TRUSS,
THE DECK INSTALLATION SHOULD BE FOLLOWED.DO NOT REMOVE
ANY SCREWS THAT
HAVE MISSED THE RAFTER/TRUSS. DO NOT APPLY SEALANT
TO BOTTOM SURFACE OF HUG™

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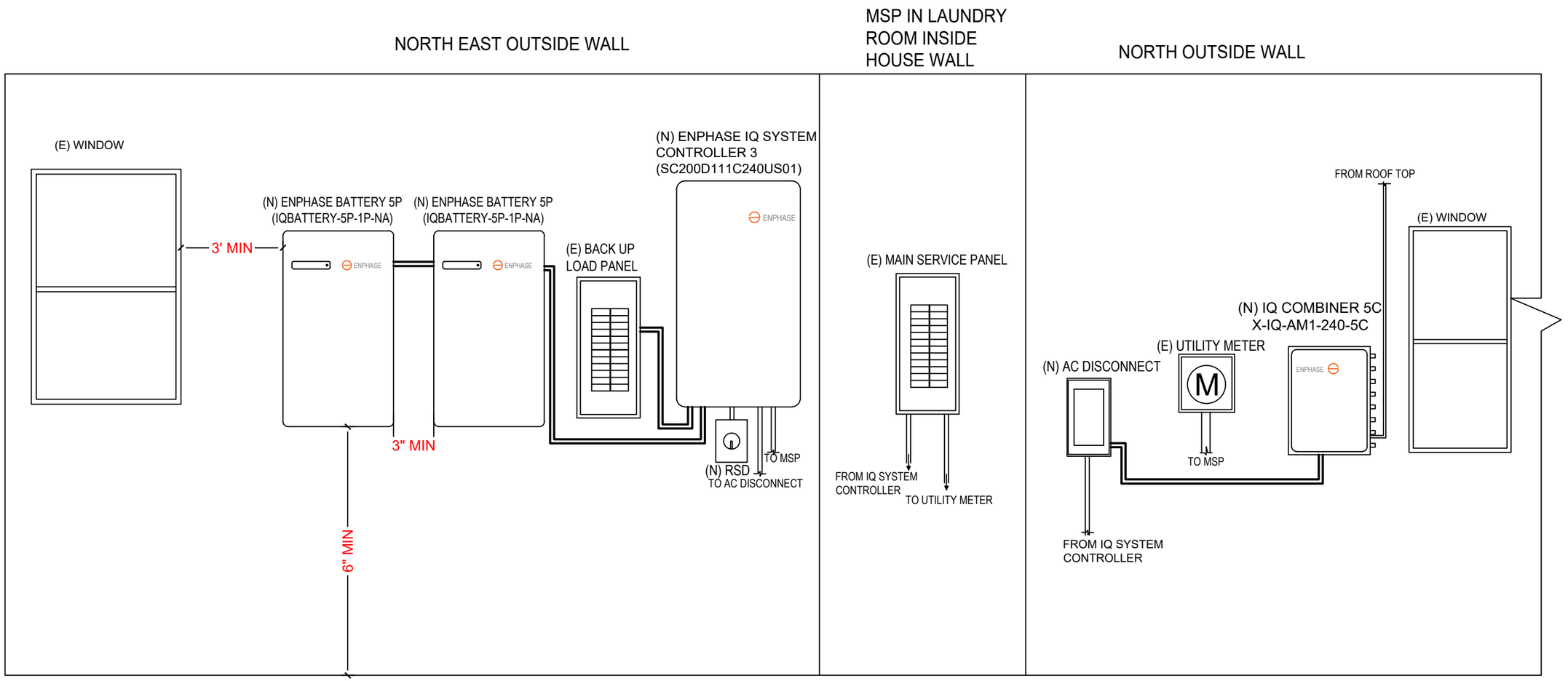
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EMAIL: N/A

SHEET NAME
ATTACHMENT DETAIL

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3



EQUIPMENT ELEVATION

SCALE: NTS

CONTRACTOR: SUNPATH SOLAR
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EMAIL: N/A

SHEET NAME
EQUIPMENT ELEVATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3.1

SYSTEM SUMMARY STC (4.455 kW DC / 3.190 kW AC)

STC DC: (11) 405W = 4.455 kW
STC AC: (11) 290W = 3.190 kW
STORAGE: (2) 3.84kW 5.0kWh = 7.68kW 10.0kWh

- (11) HANWHA Q CELLS Q.PEAK DUO BLK ML-G10+ 405 MODULES
- (11) ENPHASE ENERGY INC. IQ8PLUS-72-2-US [240V] MICROINVERTERS
- (2) ENPHASE ENERGY INC. IQBATTERY-5P-1P-NA BATTERIES
- (1) ENPHASE IQ SYSTEM CONTROLLER 3
- 1x BRANCH OF 9 CONNECTED IN PARALLEL

INTERCONNECTION 120% RULE (SPANEL01)

INTERCONNECTION 120% RULE NOT APPLICABLE

NO DIRECT BACKFEED INTO PANEL ROUTED THROUGH ENPOWER INSTEAD

INTERCONNECTION 120% RULE (MAIN PANEL)

UTILITY FEED + TOTAL BACKFEED
150A + 60A = 210A

LESS OR EQUAL TO
BUS RATING x 120%
200A x 120% = 240A

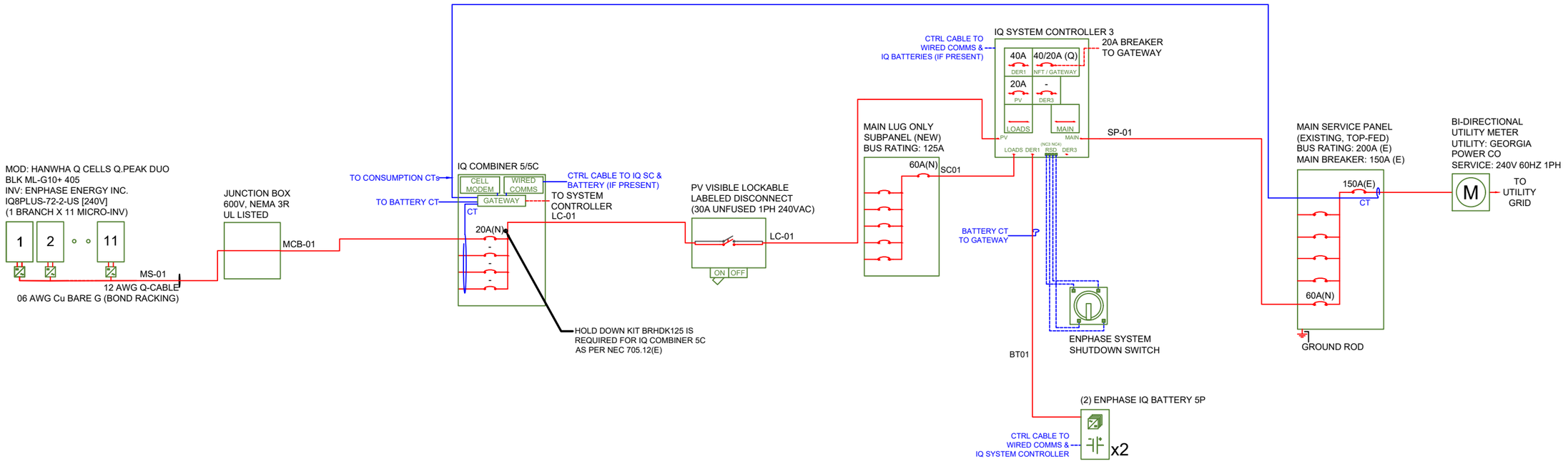
CALCULATION ENSURES BUS IS SAFE REGARDLESS OF LOADS

EXTREME CASE MODULE OUTPUT (HANWHA Q CELLS Q.PEAK DUO BLK ML-G10+ 405)

Isc(25°C) = 11.17A, Tisc = 0.040%/°C
Isc(T) = Isc(25°C) x [1 + Tisc x (T-25°C)]
Isc(-6°C) = 11.03A, Isc(35°C) = 11.21A

Voc(25°C) = 45.34V, Tvoc = -0.270%/°C
Voc(T) = Voc(25°C) x [1 + Tvoc x (T-25°C)]
Voc(-6°C) = 49.13V, Voc(35°C) = 44.12V

WIRE RUN THROUGH THE ATTIC



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 5/5C REQUIRES ENPHASE HOLD DOWN KIT .
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) INPUT AND OUTPUT CAPACITY, PER NEC 710.15.
9) IQ SYSTEM CONTROLLER 3 MAIN INPUT AND 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.

ELECTRICAL SINGLE LINE DIAGRAM

SCALE: NTS

AC wire details

Wire	Min Ampacity	Live	Neutral	Ground	Min EMT	Min PVC	Min RMC
MS-01	16.63A	12 AWG (Q-Cable)	-	06 AWG BARE (NOT IN CONDUIT)	-	-	-
MCB-01	16.63A	(2) 10 AWG THWN-2	-	10 AWG THWN-2	1/2 in	1/2 in	1/2 in
LC-01	16.63A	(2) 10 AWG THWN-2	10 AWG THWN-2	10 AWG THWN-2	1/2 in	1/2 in	1/2 in
SP-01	60A (loads)	(2) 06 AWG THWN-2	06 AWG THWN-2	10 AWG THWN-2	3/4 in	3/4 in	3/4 in
BT01	40A (OCPD)	(2) 08 AWG THWN-2	-	10 AWG THWN-2	3/4 in	3/4 in	3/4 in
SC01	60A (loads)	(2) 06 AWG THWN-2	06 AWG THWN-2	10 AWG THWN-2	3/4 in	3/4 in	3/4 in

SUNPATH SOLAR

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SHEET NAME
SINGLE LINE DIAGRAM

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-4

SYSTEM SUMMARY STC (4.455 kW DC / 3.190 kW AC)

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- (1) ENPHASE IQ SYSTEM CONTROLLER 3
- 1x BRANCH OF 9 CONNECTED IN PARALLEL

WIRE RUN THROUGH THE ATTIC

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
MS-01	11	240 V	16.63 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	0.79 %	-	-	-
MCB-01	11	240 V	16.63 A	20 A	1	2	35	35 x 0.94 x 1.00 = 32.90 A	10 AWG THWN-2	10 AWG THWN-2	Cu	50 ft	0.47 %	1/2 in	1/2 in	1/2 in
LC-01	11	240 V	16.63 A	20 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	0.09 %	1/2 in	1/2 in	1/2 in
SP-01	11	240 V	56.63 A	60 A	1	2	35	65 x 0.94 x 1.00 = 61.1 A	06 AWG THWN-2	10 AWG THWN-2	Cu	10 ft	0.06 %	3/4 in	3/4 in	3/4 in

INTERCONNECTION 120% RULE (SPANEL01)

INTERCONNECTION 120% RULE NOT APPLICABLE

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INTERCONNECTION 120% RULE (MAIN PANEL)

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LESS OR EQUAL TO
BUS RATING x 120%
200A x 120% = 240A

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Voc(T) = Voc(25°C) x [1 + Tvoc x (T-25°C)]
Voc(-6°C) = 49.13V, Voc(35°C) = 44.12V

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 5/5C REQUIRES ENPHASE HOLD DOWN KIT .
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 INPUT AND 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

SUNPATH SOLAR

CONTRACTOR: SUNPATH SOLAR
ADDRESS: 718 MUSTANG DRIVE, DALLAS GEORGIA 30157
PHONE: 14044349745
EMAIL: Seth@sunpath.solar
LICENSE #: NABCEP Cert #: PV-102117-016852
ELECTRICAL LICENSE #: N/A

REVISIONS

DESCRIPTION	DATE	REV

SIGNATURE & SEAL

HOMEOWNER INFO

STEPHANIE KAPLE
516 SEILER AVENUE,
SAVANNAH, GA 31401, USA
APN: 20064 35021 PHONE: +13057313038
EMAIL: N/A

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: 13.31 AMPS
NOMINAL OPERATING AC VOLTAGE: 240 VAC

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

PV SYSTEM DISCONNECT

MAXIMUM AC OPERATING CURRENT: 45.31 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 BACKFEED BREAKER IN SUBPANEL/MSP (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

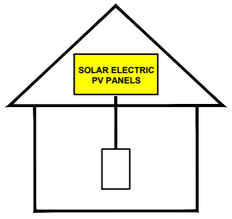
⚠ CAUTION

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

LABEL LOCATION: MAIN PANEL & SUB PANELS
CODE REF: NEC 2020 - 705.12(C)

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

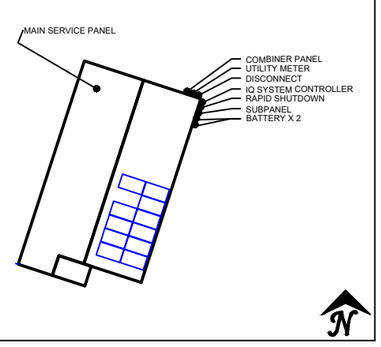
LABEL LOCATION: ESS DISCONNECT (IF INSTALLED)
CODE REF: NEC 2020 - 706.15(C)

FOR ESS DISCONNECT

NOMINAL ESS VOLTAGE : 240 VAC
MAXIMUM AVAILABLE SHORT-CIRCUIT CURRENT DERIVED FROM THE ESS : 32.0 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 : 19-AUG-2024

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)

CAUTION:
MULTIPLE SOURCES OF POWER



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

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 - 2020, PRODUCT SAFETY SIGNS AND LABELS, UNLESS OTHERWISE SPECIFIED.
6) DO NOT COVER EXISTING MANUFACTURER LABELS.

BATTERY

1 OF 2

2 OF 2

LABEL LOCATION: BATTERY

SUNPATH SOLAR

CONTRACTOR: SUNPATH SOLAR
ADDRESS: 718 MUSTANG DRIVE, DALLAS GEORGIA 30157
PHONE: 14044349745
EMAIL: Seth@sunpath.solar
LICENSE #: NABCEP Cert #: PV-102117-016852
ELECTRICAL LICENSE #: N/A

REVISIONS

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APN: 20064 35021 PHONE: +13057313038
EMAIL: N/A

SHEET NAME

PLACARDS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-6

Q.PEAK DUO BLK ML-G10+ SERIES

385 - 405 Wp | 132 Cells
20.6 % Maximum Module Efficiency

MODEL Q.PEAK DUO BLK ML-G10+
Q.PEAK DUO BLK ML-G10.4+



Breaking the 20 % efficiency barrier

Q.ANTUM DUO Z technology with zero gap cell layout boosts module efficiency up to 20.6 %.

A reliable investment

Inclusive 25-year product warranty and 25-year linear performance warranty[1].

Enduring high performance

Long-term yield security with Anti LeTID Technology, Anti PID Technology[2] and Hot-Spot Protect.

Extreme weather rating

High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).

Innovative all-weather technology

Optimal yields, whatever the weather with excellent low-light and temperature behaviour.

The most thorough testing programme in the industry

Qcells is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.

[1] See data sheet on rear for further information.
[2] APT test conditions according to IEC/TS 62804-1:2015, method A (−1500 V, 96 h)

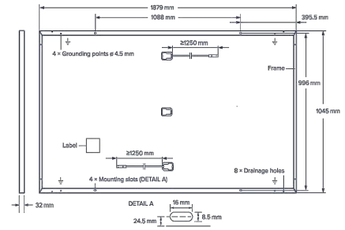
The ideal solution for:

Rooftop arrays on residential buildings

Q.PEAK DUO BLK ML-G10+ SERIES

Mechanical Specification

Format	1879 mm × 1045 mm × 32 mm (including frame)
Weight	22.0 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 22 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥1250 mm, (−) ≥1250 mm
Connector	Stäubli MC4; IP68

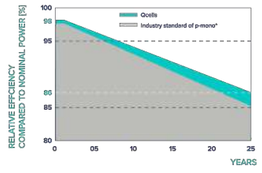


Electrical Characteristics

POWER CLASS			385	390	395	400	405
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W/−0 W)							
Minimum	Power at MPP[1]	P_{MPP} [W]	385	390	395	400	405
	Short Circuit Current[1]	I_{SC} [A]	11.04	11.07	11.10	11.14	11.17
	Open Circuit Voltage[1]	V_{OC} [V]	45.19	45.23	45.27	45.30	45.34
	Current at MPP	I_{MPP} [A]	10.59	10.65	10.71	10.77	10.83
	Voltage at MPP	V_{MPP} [V]	36.36	36.62	36.88	37.13	37.39
	Efficiency[1]	η [%]	≥19.6	≥19.9	≥20.1	≥20.4	≥20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	Power at MPP	P_{MPP} [W]	288.8	292.6	296.3	300.1	303.8
	Short Circuit Current	I_{SC} [A]	8.9	8.92	8.95	8.97	9.00
	Open Circuit Voltage	V_{OC} [V]	42.62	42.65	42.69	42.72	42.76
	Current at MPP	I_{MPP} [A]	8.35	8.41	8.46	8.51	8.57
	Voltage at MPP	V_{MPP} [V]	34.59	34.81	35.03	35.25	35.46

[1]Measurement tolerances P_{MPP} ±3 %; I_{SC}; V_{OC} ±5 % at STC: 1000 W/m², 25 ± 2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

Qcells PERFORMANCE WARRANTY

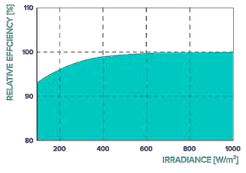


At least 98 % of nominal power during first year. Thereafter max. 0.5 % degradation per year. At least 93.5 % of nominal power up to 10 years. At least 86 % of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organisation of your respective country.

*Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

PERFORMANCE AT LOW IRRADIANCE



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

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°C]	43 ± 3

Properties for System Design

Maximum System Voltage	V_{SYS}	[V]	1000	PV module classification		Class II
Maximum Reverse Current	I_R	[A]	20	Fire Rating based on ANSI / UL 61730		C / TYPE 2
Max. Design Load, Push / Pull		[Pa]	3600 / 2660	Permitted Module Temperature on Continuous Duty		−40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 4000			

Qualifications and Certificates

Quality Controlled PV - TÜV Rheinland; IEC 61215:2016; IEC 61730:2016. This data sheet complies with DIN EN 50380.

www.tuv.com ID 1111230277

Qcells pursues minimizing paper output in consideration of the global environment.

Note: Installation instructions must be followed. Contact our technical service for further information on approved installation of this product.
Hanwha Q CELLS GmbH Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | TEL +49 (0)3494 66 99-23444 | FAX +49 (0)3494 66 99-23000 | EMAIL sales@q-cells.com | WEB www.qcells.com

Specifications subject to technical changes © Qcells Q.PEAK_DUO_BLK_ML-G10+_series_385-405_2022-06_Rev02_EN

SUNPATH SOLAR

CONTRACTOR: SUNPATH SOLAR
ADDRESS: 718 MUSTANG DRIVE, DALLAS GEORGIA 30157
PHONE: 14044349745
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LICENSE #: NABCEP Cert #: PV-102117-016852
ELECTRICAL LICENSE #: N/A

REVISIONS

DESCRIPTION	DATE	REV

SIGNATURE & SEAL

HOMEOWNER INFO

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516 SEILER AVENUE,
SAVANNAH, GA 31401, USA
APN: 20064 35021 PHONE: +13057313038
EMAIL: N/A

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-7

ENPHASE.

DATA SHEET



IQ8 and IQ8+ Microinverters

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



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

Enphase 25 year limited warranty

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



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

UL CERTIFIED SAFETY

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

*Meets UL 1741 only when installed with IQ System Controller 2 or 3.
**IQ8 and IQ8+ support split-phase, 240 V installations only.

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Easy to install

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

High productivity and reliability

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

Microgrid-forming

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

NOTE:

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

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)	UNITS	IQ8-60-2-US	IQ8PLUS-72-2-US
Commonly used module pairings[1]	W	235–350	235–440
Module compatibility	–	To meet compatibility, PV modules must be within maximum input DC voltage and maximum module I_{sc} listed below. Module compatibility can be checked at https://enphase.com/installers/microinverters/calculator.	
MPPT voltage range	V	27–37	27–45
Operating range	V	16–48	16–58
Minimum/Maximum start voltage	V	22/48	22/58
Maximum input DC voltage	V	50	60
Maximum continuous input DC current	A	10	12
Maximum input DC short-circuit current	A	25	
Maximum module (I_{sc})	A	20	
Overvoltage class DC port	–	II	
DC port backfeed current	mA	0	
PV array configuration	–	Ungrounded array; no additional DC side protection required; AC side protection requires maximum 20 A per branch circuit.	
OUTPUT DATA (AC)	**UNITS**	**IQ8-60-2-US**	**IQ8PLUS-72-2-US**
Peak output power	VA	245	300
Maximum continuous output power	VA	240	290
Nominal grid voltage (L-L)	V	240, split-phase (L-L), 180°	
Minimum and Maximum grid voltage[2]	V	211-264	
Maximum continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	47–68	
AC short-circuit fault current over three cycles	Arms	2	
Maximum units per 20 A (L-L) branch circuit[3]	–	16	13
Total harmonic distortion	%	<5	
Overvoltage class AC port	–	III	
AC port backfeed current	mA	30	
Power factor setting	–	1.0	
Grid-tied power factor (adjustable)	–	0.85 leading ... 0.85 lagging	
Peak efficiency	%	97.7	
CEC weighted efficiency	%	97	
Nighttime power consumption	mW	23	25
MECHANICAL DATA			
Ambient temperature range		-40°C to 60°C (-40°F to 140°F)	
Relative humidity range		4% to 100% (condensing)	
DC connector type		MC4	
Dimensions (H × W × D)		212 mm (8.3 in) × 175 mm (6.9 in) × 30.2 mm (1.2 in)	
Weight		1.08 kg (2.38 lbs)	
Cooling		Natural convection–no fans	
Approved for wet locations		Yes	
Pollution degree		PD3	
Enclosure		Class II double-insulated, corrosion-resistant polymeric enclosure	
Environmental category/UV exposure rating		NEMA Type 6/Outdoor	

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

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

SUNPATH SOLAR

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EMAIL: N/A

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-8

COMPLIANCE	
Certifications	CA Rule 21 (UL 1741-SA), UL 62109-1, IEEE 1547:2018 (UL 1741-SB), FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01. This product is UL Listed as PV rapid shutdown equipment and conforms with NEC 2014, NEC 2017, NEC 2020, and NEC 2023 section 690.12 and C22.1-2018 Rule 64-218 rapid shutdown of PV Systems, for AC and DC conductors, when installed according to the manufacturer's instructions.

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GEORGIA 30157
PHONE: 14044349745
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LICENSE #: NABCEP Cert #: PV-102117-016852
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EMAIL: N/A

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-9

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.

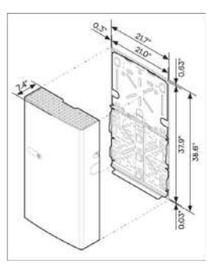
Enphase 15 year limited warranty

UL CERTIFIED SAFETY US-CA E-488100

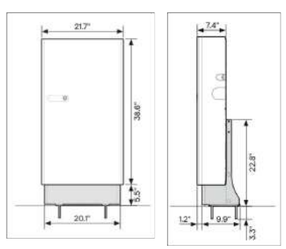


IQ BATTERY 5P SPECIFICATIONS	
Rated (continuous) output power	3.84 kVA
Rated output current (@240 VAC)	16 A
Interconnection	Single-phase
Nominal voltage	240 VAC
Nominal frequency	60 Hz
Usable capacity	5.0 kWh
Ambient operating temperature range (charging)	-20°C to 50°C (-4°F to 122°F) non-condensing
Ambient operating temperature range (discharging)	-20°C to 55°C (-4°F to 131°F) non-condensing
Chemistry	Lithium iron phosphate (LFP)
Mounting	Wall-mount or pedestal-mount (sold separately)

Wall-mounted



Floor-mounted with pedestal



Dimensions in inches

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

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 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 thermal runaway fire propogation 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

MODEL NUMBER	
IQBATTERY-5P-1P-NA	The IQ Battery 5P system with integrated IQ Microinverters (SKU: IQ8D-BAT) and battery management system (BMS) with battery controller
LIMITED WARRANTY	
IQ Battery 5P unit	>60% capacity, up to 15-year or 6,000 cycles[2]
OUTPUT (AC)	@240 VAC[3]
Rated (continuous) output power	3.84 kVA
Peak output power	7.68 kVA (three seconds), 6.14 kVA (ten 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 (three seconds), 25.6 A (ten seconds)
Power Start capability	Up to 48 A LRA[4]
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[5]	90%
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)

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

SUNPATH SOLAR

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PHONE: 14044349745
EMAIL: Seth@sunpath.solar
LICENSE #: NABCEP Cert #: PV-102117-016852
ELECTRICAL LICENSE #: N/A

REVISIONS

DESCRIPTION	DATE	REV

SIGNATURE & SEAL

HOMEOWNER INFO

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APN: 20064 35021 PHONE: +13057313038
EMAIL: N/A

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10

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[6], 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
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

[6] Following local standards, choose a well-ventilated, non-habitable indoor location (like a 2-car garage) or an outdoor location where the ambient temperature and humidity are within -4°F to 131°F (-20°C to 55°C) and 5% to 95% RH, non-condensing. Avoid direct sunlight to ensure the temperature stays in the optimal operating range. This ensures charging and discharging currents are not de-rated due to temperature. The full performance will occur within 59°F to 113°F (15°C to 45°C) while charging and within 41°F to 122°F (5°C to 50°C) while discharging.

Components of the Enphase Energy System



IQ Microinverters

IQ Series Microinverters pack more power into less space than other rooftop solar systems and make rooftop solar more productive, reliable, smart, and safe.



IQ Gateway

The IQ Gateway with Current Transformers provides complete control and insight into the Enphase Energy System.



Communications Kit 2 INT

The Communications Kit 2 INT enables wired communication between the battery and gateway for grid-tied operation.



IQ Battery 5P accessories

The IQ Battery 5P lifting handles are reusable and ease the installation process. The IQ Battery 5P pedestal enables floor mounting of the IQ Battery 5P.

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SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-11

ENPHASE.

DATA SHEET



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

5-year limited warranty

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NOM

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
- 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 both the IQ Combiner SKUs[1]
- UL1741 Listed

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

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Data subject to change.

IQ Combiner 5/5C

MODEL NUMBER	
IQ Combiner 5 (X-IQ-AM1-240-5)	IQ Combiner 5 with IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSIC12.20 ±0.5%), consumption monitoring (± 2.5%), and IQ Battery monitoring (±2.5%). Includes a silver solar shield to deflect heat.
IQ Combiner 5C (X-IQ-AM1-240-5C)	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.
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 1 × IQ Gateway breaker and 4 × 20 A breaker 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-02 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)
XA-COMMS2-PCBA-5	Replacement COMMS-KIT-02 printed circuit board (PCB) for IQ Combiner 5/5C
ELECTRICAL SPECIFICATIONS	
Rating	80 A
System voltage and frequency	120/240 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
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

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.

IQC-5-5C-DSH-00007-3.0-EN-US-2024-03-01

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ELECTRICAL LICENSE #: N/A

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EMAIL: N/A

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-12

MECHANICAL DATA		
Dimensions (W × H × D)		37.5 cm × 49.5 cm × 16.8 cm (14.75" × 19.5" × 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°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 IQ Battery 5P and 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 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 60601-1/CANCSA 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

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

Accessories



Mobile Connect

4G-based LTE-M1 cellular modem with a 5-year data plan
(CELLMODEM-M1-06-SP-05 for Sprint and CELLMODEM-M1-06-AT-05 for AT&T)



Circuit breakers

BRK-10A-2-240V Circuit breaker, 2-pole, 10 A, Eaton BR210
BRK-15A-2-240V Circuit breaker, 2-pole, 15 A, Eaton BR215
BRK-20A-2P-240V Circuit breaker, 2-pole, 20 A, Eaton BR220
BRK-15A-2P-240V-B Circuit breaker, 2-pole, 15 A, Eaton BR215B with hold-down kit support
BRK-20A-2P-240V-B Circuit breaker, 2-pole, 20 A, Eaton BR220B with hold-down kit support



CT-200-SOLID

200 A revenue-grade solid core Production CT with <0.5% error rate (replacement SKU)



CT-200-CLAMP

200 A clamp-style consumption and battery metering CT with <2.5% error rate (replacement SKU)

IQC-5-5C-DSH-00007-3.0-EN-US-2024-03-01

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SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-13

ENPHASE.

DATASHEET



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

10-year limited warranty

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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
- 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

DATASHEET

MODEL NUMBER	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'S 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)
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~[6]/±20%
Voltage measurement accuracy	±1% V nominal (±1.2V L-N and ±2.4V 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 x 80 A (IQ System Controller 3 - SC200D111C240US01), 1 x 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.
Integrated hold-down kit also supports GE/ABB and Siemens as mentioned under section alternate DER circuit breakers.
(6) "~" indicates alternating current (AC) supply.
(*) Power Control System.

SUNPATH SOLAR

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SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-14

DATASHEET

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 (WxHxD)	50 cm x 91.6 cm x 24.6 cm (19.7 in x 36 in x 9.7 in)	
Weight	39.4 kg (87 lbs)	
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	2500 meters (8200 feet)	
WIRE SIZES		
Connections (All lugs are rated to 90°C)	Main lugs and backup load lugs CSR breaker bottom wiring lugs AC combiner lugs, IQ Battery lugs, and generator lugs Neutral (large lugs)	Cu/Al: 6 AWG–300 kcmil Cu/Al: 2 AWG–300 kcmil 14 AWG–2 AWG Cu/Al: 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 (under progress)	UL 1741, UL 1741 SA, IEEE 1547:2018 (UL 1741-SB, 3rd Ed.), UL 1741 PCS CRD, UL1 998, UL 869A, UL 675, UL 508[7], UL 50E[7] 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[8]		
Battery	IQ Battery 5P (IQBATTERY-5P-1P-NA)	
Microinverters	IQ8, IQ7, IQ6, and M Series Microinverters[9]	
IQ Combiner	IQ Combiner 5/5C (X-IQ-AM1-240-5C, X-IQ-AM1-240-5)	
Communications Kit 2	COMMS-KIT-02	

(7) Sections from these standards were used during the safety evaluation and included in the UL 1741 listing.
(8) For more details, refer to IQ System Controller 3/3G Quick Install Guide.
(9) 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.

SUNPATH SOLAR

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GEORGIA 30157
PHONE: 14044349745
EMAIL: Seth@sunpath.solar
LICENSE #: NABCEP Cert #: PV-102117-016852
ELECTRICAL LICENSE #: N/A

REVISIONS

DESCRIPTION	DATE	REV

SIGNATURE & SEAL

HOMEOWNER INFO

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EMAIL: N/A

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-15

Datasheet

IRONRIDGE

Flush Mount System



Built for solar's toughest roofs.

IronRidge builds the strongest mounting system for pitched roofs in solar. Every component has been tested to the limit and proven in extreme environments.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 20-year warranty.

Strength Tested
All components evaluated for superior structural performance.

PE Certified
Pre-stamped engineering letters available in most states.

Class A Fire Rating
Certified to maintain the fire resistance rating of the existing roof.

Design Assistant
Online software makes it simple to create, share, and price projects.

UL 2703 Listed System
Entire system and components meet newest effective UL 2703 standard.

20-Year Warranty
Twice the protection offered by competitors.

Datasheet

XR Rails

XR10 Rail



A low-profile mounting rail for regions with light snow.

- 6' spanning capability
- Moderate load capability
- Clear and black finish

XR100 Rail



The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear and black finish

XR1000 Rail



A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

Bonded Splices

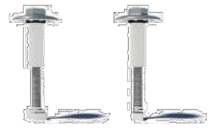


All rails use internal splices for seamless connections.

- Self-drilling screws
- Varying versions for rails
- Forms secure bonding

Clamps & Grounding

UFOs



Universal Fastening Objects bond modules to rails.

- Fully assembled & lubed
- Single, universal size
- Clear and black finish

Stopper Sleeves



Snap onto the UFO to turn into a bonded end clamp.

- Bonds modules to rails
- Sized to match modules
- Clear and black finish

Grounding Lugs



Connect arrays to equipment ground.

- Low profile
- Single tool installation
- Mounts in any direction

Microinverter Kits



Mount MIs or POs to XR Rails.

- Bonds devices to rails
- Kit comes assembled
- Listed to UL 2703

Attachments

FlashFoot2



Flash and mount XR Rails with superior waterproofing.

- Twist-on Cap eases install
- Wind-driven rain tested
- Mill and black finish

Slotted L-Feet



Drop-in design for rapid rail attachment.

- Secure rail connections
- Slot for vertical adjusting
- Clear and black finish

Bonding Hardware



Bond and attach XR Rails to roof attachments.

- T & Square Bolt options
- Nut uses 7/16" socket
- Assembled and lubricated

Flush Standoffs



Raise Flush Mount System to various heights.

- Works with vent flashing
- 4" and 7" lengths
- Ships assembled

Resources



Design Assistant
Go from rough layout to fully engineered system. For free.
Go to IronRidge.com/design

NABCEP Certified Training
Earn free continuing education credits, while learning more about our systems.
Go to IronRidge.com/training

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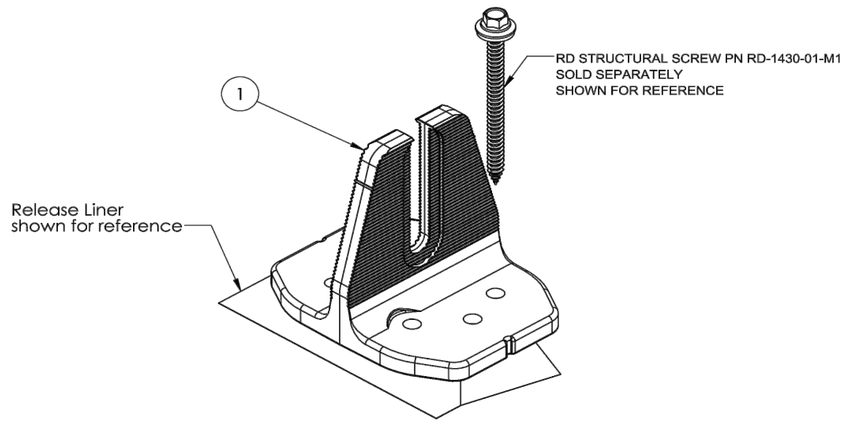
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-16

Cut Sheet

IRONRIDGE

QuickMount® Halo UltraGrip



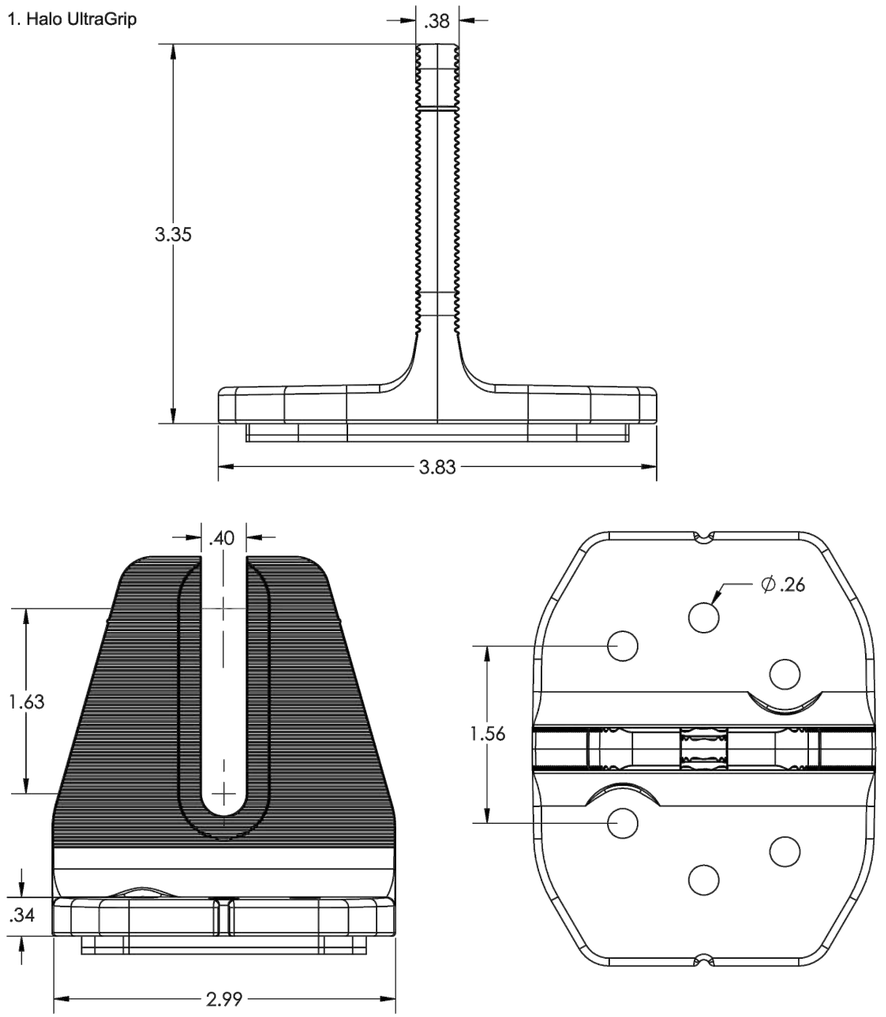
ITEM NO	DESCRIPTION	QTY IN KIT
1	QM Halo UltraGrip(Mill or Black)	1

PART NUMBER	DESCRIPTION
QM-HUG-01-M1	Halo UltraGrip - Mill
QM-HUG-01-B1	Halo UltraGrip - Black

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Cut Sheet

1. Halo UltraGrip



Property	Value
Material	3000 Series Aluminium
Finish	Mill or Black

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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0

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SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-17

CERTIFICATE OF COMPLIANCE

Certificate Number 20220917-E341165
Report Reference E341165-20210317
Date 2022-09-17

Issued to: Enphase Energy Inc.
1420 N. McDowell Blvd. Petaluma, CA 94954-6515

This is to certify that representative samples of Photovoltaic Grid Support Utility Interactive Inverter with Rapid Shutdown Functionality

Models: IQ8-60, IQ8PLUS-72, IQ8M-72, IQ8A-72, IQ8H-208-72, IQ8H-240-72, may be f/b -2, -5, -E or -M, may be f/b -ACM, f/b -US, may be f/b -NM, may be f/b -RMA, may be f/b -&, where "&" designates additional characters.

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: See Page 2

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

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Bruce Mahrenholz, Director North American Certification Program
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CERTIFICATE OF COMPLIANCE

Certificate Number 20220917-E341165
Report Reference E341165-20210317
Date 2022-09-17

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.
Standards for Safety:

UL 1741, Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Edition 3, Issue Date 09/28/2021. Including the requirements in UL 1741 Supplements SA and SB.

IEEE 1547, Interconnection and Interoperability of Distributed Energy Resources (DERs) with Associated Electric Power Systems (EPSs) Interfaces, Issue Date 02/15/2018

IEEE 1547.1, IEEE Standard Conformance Test Procedures for Interconnecting Distributed Energy Resources (DERs) with Electric Power Systems (EPSs) Associated Interfaces, Issue Date 03/05/2020.

UL 62109-1, Safety of Converters for Use in Photovoltaic Power Systems - Part 1: General Requirements; IEC 62109-2, Safety of Power Converters for use in Photovoltaic Power Systems - Part 2: Particular Requirements for Inverters.

CAN/CSA C22.2 No. 62109-1, Safety of Power Converters for use in photovoltaic power systems - Part 1: General Requirements, 2016/07

CAN/CSA C22.2 No. 62109-2, Safety of Power Converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters, 2016/07

[x] R21: The evaluation to the Standards above provides evidence of compliance to the intent of the existing California Rule 21 Interconnection (references to the past publication of IEEE 1547 standards) and UL1741 Table SA1.1 option to use the IEEE 1547.1-2020 and UL1741SB test methods in conjunction with using IEEE 1547-2018 as the SRD under which SA11.2 Normal Ramp Rate is not addressed. Additional testing was conducted to confirmed compliance to Normal Ramp Rate SA11.2 . See also Appendix A.

[ ] 14H (SA): The evaluation to the Standards above provides evidence of compliance to HECO Rule 14H, SRD V1.0, Interconnection Application.

[x] 14H (SB): The evaluation to the Standards above provides evidence of compliance to HECO Rule 14H, SRD V2.0, Interconnection Application.

Bruce Mahrenholz, Director North American Certification Program
UL LLC

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SHEET NUMBER
PV-18

CERTIFICATE OF COMPLIANCE

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Report Reference E341165-20210317
Date 2022-09-17

Inverter Firmware Version:			
Model	UL 1998 (grid support)	Date	Version/Revision
IQ8-60, IQ8PLUS-72, IQ8M-72,	Yes	2022-08-02	2.45.04
IQ8A-72, IQ8H-208-72, IQ8H-240-72	Yes	2022-09-09	2.48.01

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APPENDIX A

As permitted by UL1741, 3rd Edition, Table SA1.1, shown below, allows for the evaluation of products using either the UL 1741 SA tests or alternative testing methods using the requirements of IEEE 1547.1-2020 in accordance with IEEE 1547-2018 and IEEE 1547.1-2020.

UL1741 SA test name	SA test section	Comparable IEEE 1547.1-2020 test section	Subject Inverter complies with UL1741SA
Anti-Islanding Protection	SA8	5.10.2	✓
Low and High Voltage Ride-Through	SA9	5.4.4, 5.4.7	✓
Low and High Frequency Ride-Through	SA10	5.5.3, 5.5.4	✓
Normal Ramp Rates	SA11.2	NA[a]	✓
Soft-Start Ramp Rates	SA11.4	5.6	✓
Specified Power Factor	SA12	5.14.3	✓
Volt/Var Mode	SA13	5.14.4	✓[b]
Frequency-Watt	SA14	5.15.2	✓
Volt-Watt	SA15	5.14.9	✓
Disable Permit Service	SA17	5.6	✓
Limit Active Power	SA18	5.13	✓

[a] IEEE 1547-2018 and IEEE 1547.1-2020 do not have a requirement for, or test equivalent to, the UL 1741 SA Normal Ramp Rate which is presently a local requirement per California Rule 21 and/or Hawaii 14H. This inverter has been additionally tested and is compliance with the Normal Ramp Rate test of SA11.2.

[b] - Functional in the following priority modes: [X] active power [X] reactive power

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