

# PROJECT DESCRIPTION:

18 X 400 HANWHA QCELL Q.PEAK DUO BLK ML-G10+ 400 (400 W) MODULES  
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES

## EQUIPMENT SUMMARY

- 18 HANWHA QCELL Q.PEAK DUO BLK ML-G10+ 400 (400 W) MODULES
- 03 GENERAC PV LINK S2502 POWER OPTIMIZERS
- 01 GENERAC PWRCELL XVT076A03 (7.6KW) INVERTER

SYSTEM SIZE: 7.20 kW DC STC  
 ARRAY AREA: ROOF#1 - 253.44 SQ FT  
 ARRAY AREA: ROOF#2 - 126.72 SQ FT

APPLICABLE CODES & STANDARDS  
 NORTH CAROLINA RESIDENTIAL CODE 2018  
 NEC 2017

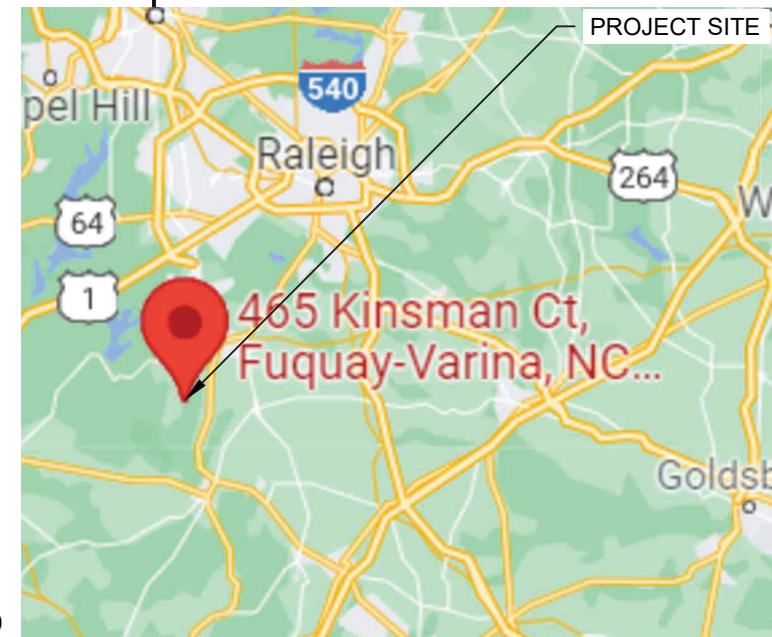
AUTHORITIES HAVING JURISDICTION  
 BUILDING : WAKE COUNTY  
 ZONING : WAKE COUNTY  
 UTILITY : DUKE ENERGY CAROLINAS- NC

DESIGN SPECIFICATIONS  
 OCCUPANCY : II  
 CONSTRUCTION : SINGLE-FAMILY  
 ZONING : RESIDENTIAL  
 GROUND SNOW LOAD : SEE STRUCTURAL LETTER  
 WIND EXPOSURE : SEE STRUCTURAL LETTER  
 WIND SPEED : SEE STRUCTURAL LETTER



**2 HOUSE PHOTO**

PV-1 SCALE: NTS



**3 VICINITY MAP**

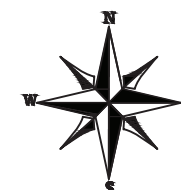
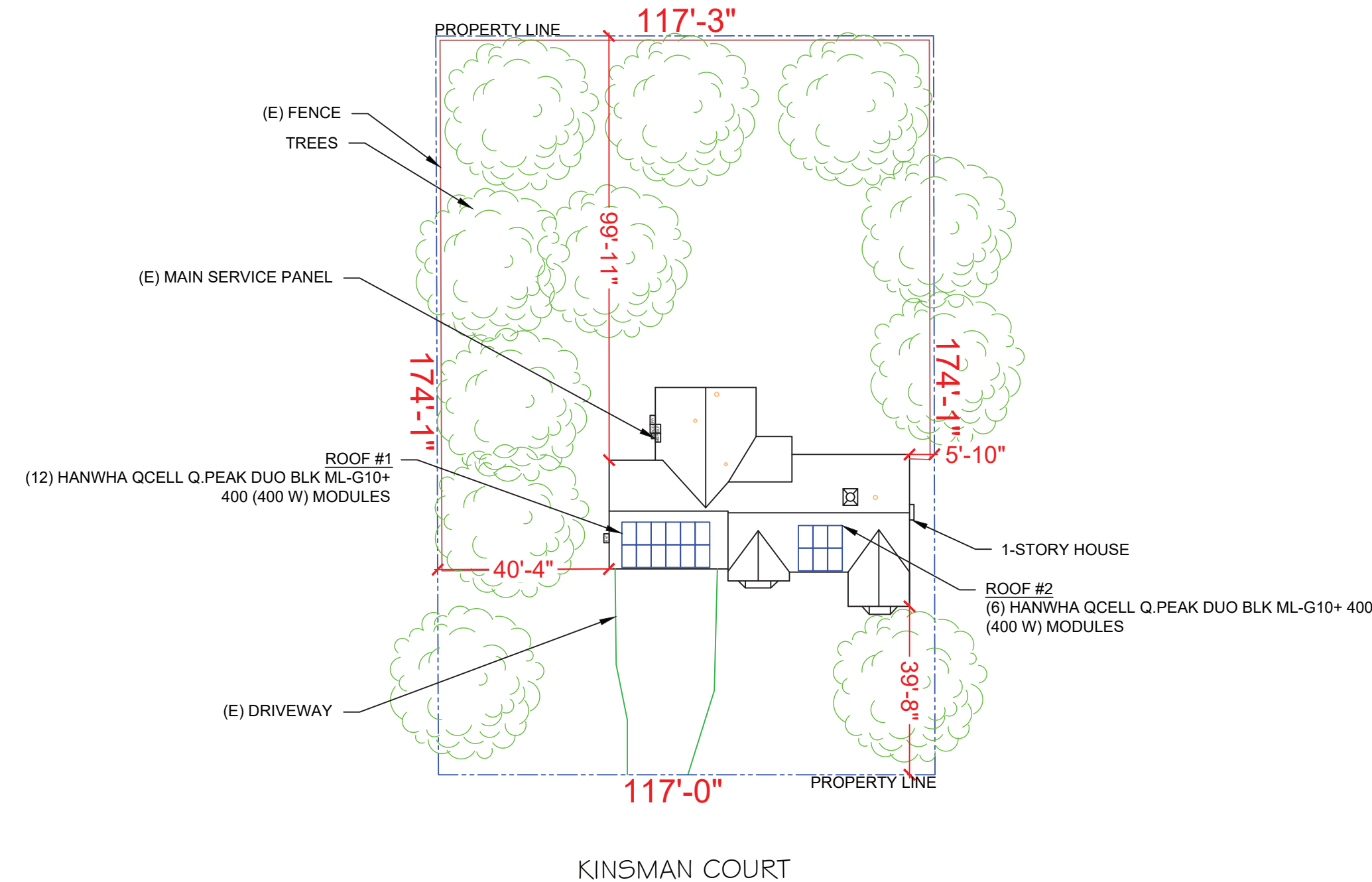
PV-1 SCALE: NTS

## SHEET INDEX

- PV-1 PLOT PLAN & VICINITY MAP
- PV-2 ROOF PLAN & MODULES
- PV-2A STRING LAYOUT
- PV-3 ATTACHMENT DETAIL
- PV-4 ELECTRICAL LINE DIAGRAM
- PV-5 WIRING CALCULATIONS
- PV-6 to 12 EQUIPMENT SPECIFICATIONS

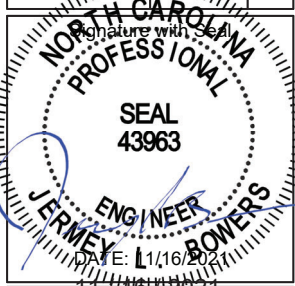
**1 PLOT PLAN & VICINITY MAP**

PV-1 SCALE: 1"=30'-0"



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REVISIONS		
DESCRIPTION	DATE	REV



PROJECT NAME & ADDRESS

**JOHNSON, CRYSTAL  
 RESIDENCE**  
 465 KINSMAN COURT,  
 FUQUAY-VARINA, NC 27526

SHEET NAME  
**PLOT PLAN &  
 VICINITY MAP**

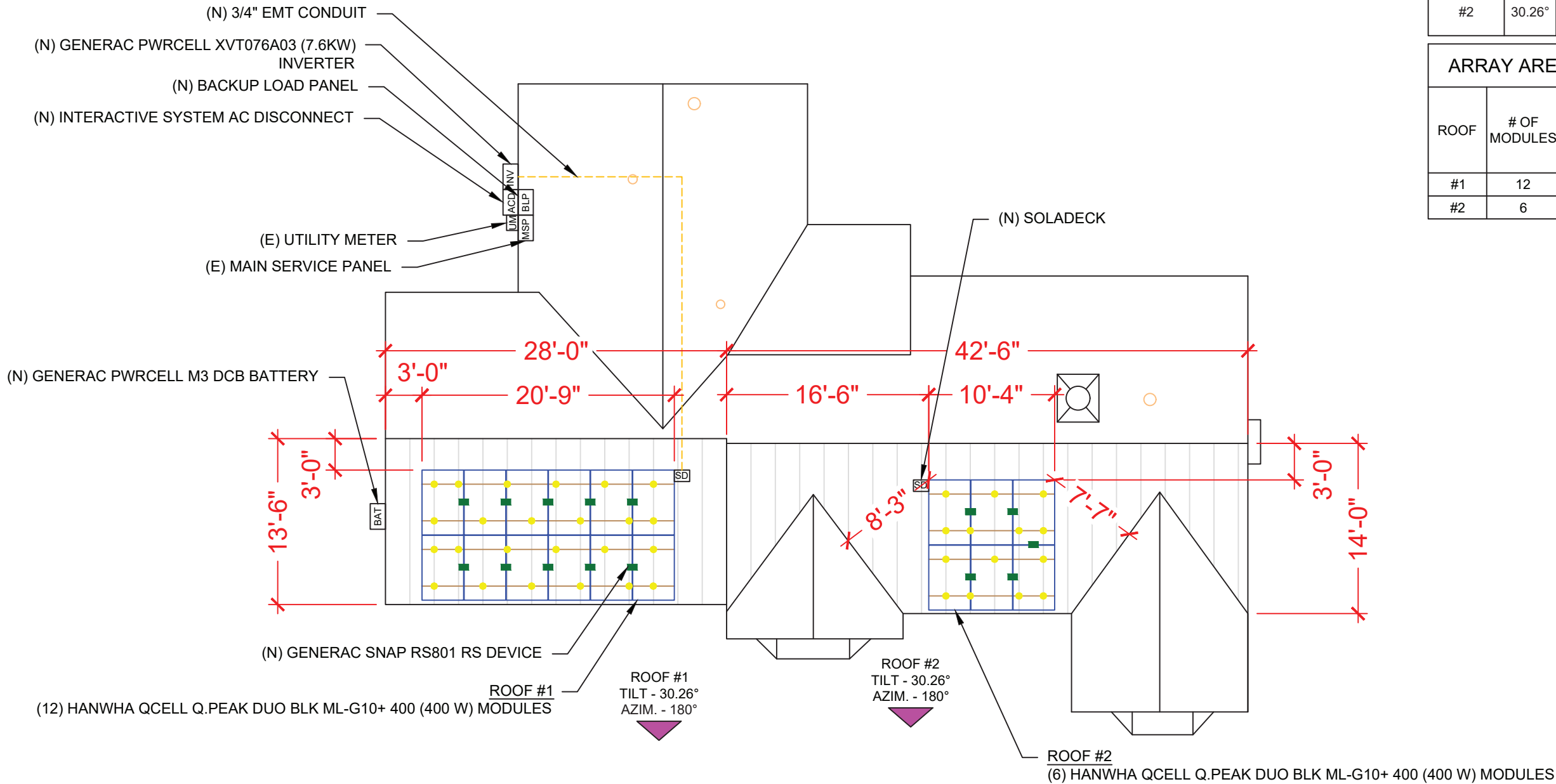
SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-1**

**MODULE TYPE, DIMENSIONS & WEIGHT**

NUMBER OF MODULES = 18 MODULES  
 MODULE TYPE = HANWHA QCELL Q.PEAK DUO BLK ML-G10+ 400 (400 W) MODULES  
 MODULE WEIGHT = 48.5 LBS / 22.0 KG.  
 MODULE DIMENSIONS = 74.00"x 41.1" = 21.12 SF  
 UNIT WEIGHT OF ARRAY = 2.30 PSF

(E) BACK OF RESIDENCE



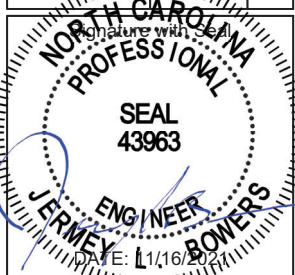
(E) FRONT OF RESIDENCE  
 KINSMAN COURT

ROOF DESCRIPTION				
ROOF TYPE			COMPOSITION SHINGLE	
ROOF	ROOF TILT	AZIMUTH	FRAMING SIZE	FRAMING SPACING
#1	30.26°	180°	SEE STRUCTURAL LETTER	
#2	30.26°	180°		

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	12	253.44	381.53	66
#2	6	126.72	454.47	28

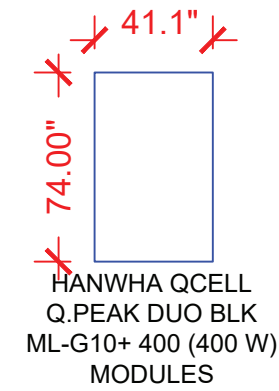
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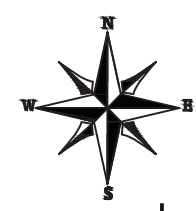


PROJECT NAME & ADDRESS

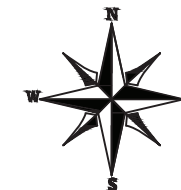
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 FUQUAY-VARINA, NC 27526



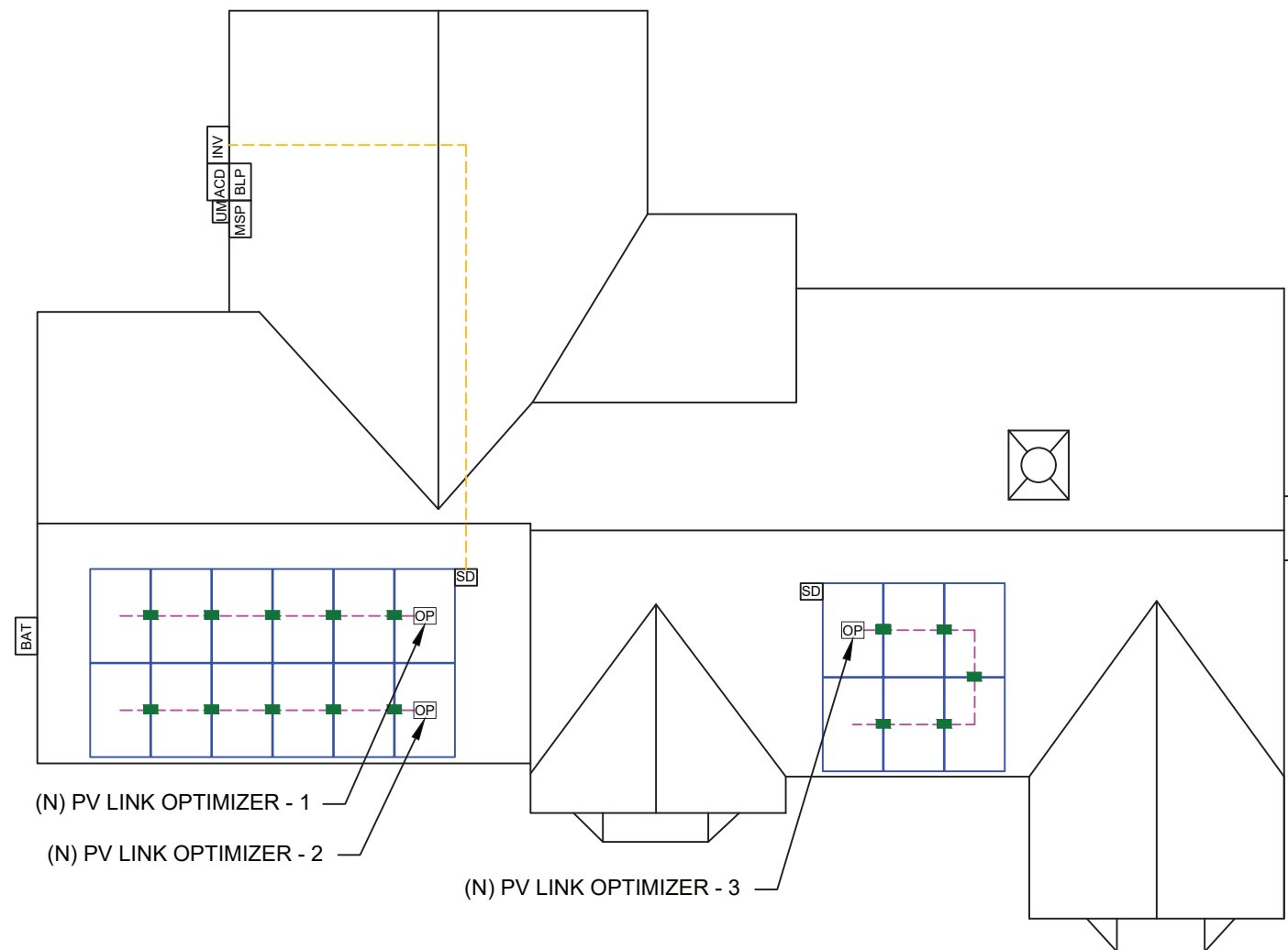
LEGEND	
[SD]	- SOLADECK
[INV]	- INVERTER
[ACD]	- INTERACTIVE SYSTEM AC DISCONNECT
[MSP]	- MAIN SERVICE PANEL
[BLP]	- BACKUP LOAD PANEL
[BAT]	- BATTERY
[OP]	- PV LINK OPTIMIZER
○	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
○	- ROOF ATTACHMENT
---	- RAFTERS
---	- CONDUIT
■	- RAPID SHUTDOWN



ON- SITE CUSTOMER APPROVAL: \_\_\_\_\_



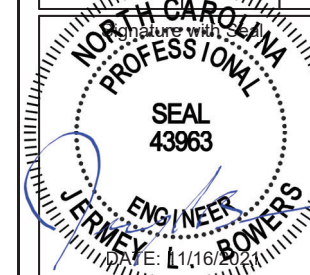
(E) BACK OF RESIDENCE



(E) FRONT OF RESIDENCE  
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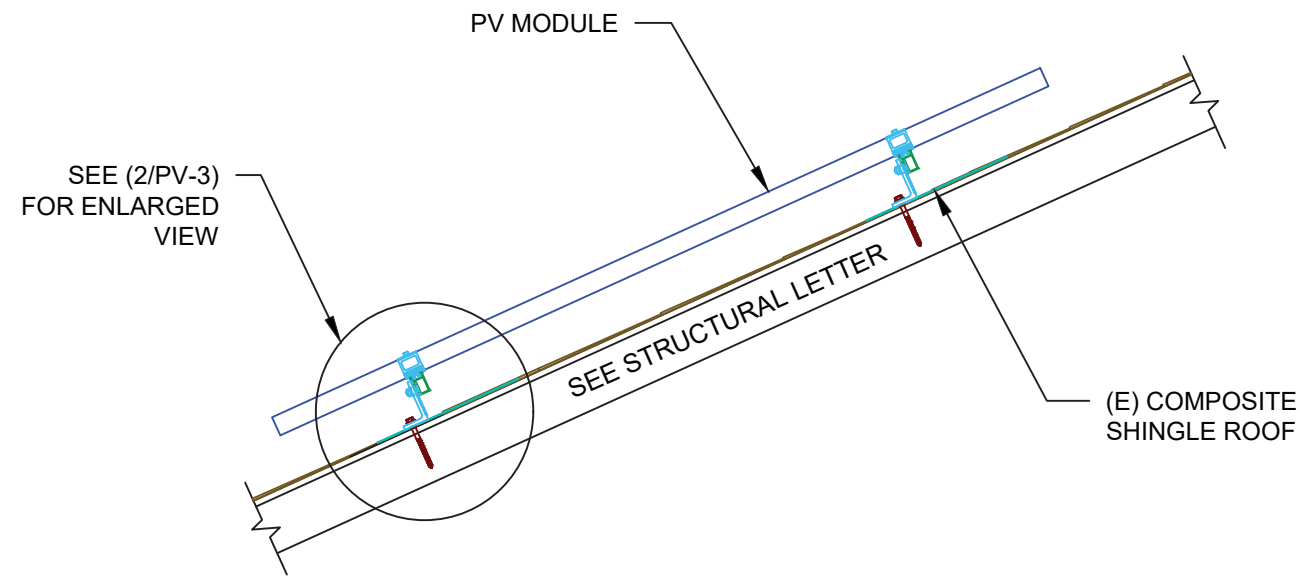
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BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULE	18	HANWHA QCELL Q.PEAK DUO BLK ML-G10+ 400 (400 W) MODULES
OPTIMIZER	03	GENERAC PV LINK S2502 POWER OPTIMIZERS
GENERAC SNAP RS	18	GENERAC SNAPRS MODEL RS801
INVERTER	01	GENERAC PWRCELL XVT076A03 (7.6KW) INVERTER
INTERACTIVE SYSTEM AC DISCONNECT	1	60A FUSED, (2) 40A FUSES, 240V, NEMA 3R, UL LISTED
SOLADECK	2	SOLADECKS 600 V, NEMA 3R, UL LISTED
BATTERY	1	GENERAC PWRCELL OR M3 DCB BATTERY
BACKUP PANEL	1	125A, BACKUP PANEL, 240V
RAILS	10	QRAIL LIGHT 14 FT. BLACK
SPLICE KIT	4	QSPLICE INTERNAL LIGHT
WEEB BMC	0	WEEB BMC MILL
MODULE CLAMPS	28	UNIVERSAL MID CLAMP
GROUNDING LUG	4	WEEB LUG W/ T-BOLT
END CLAMPS	16	UNIVERSAL END CLAMPS
ATTACHMENT	44	L-MOUNT ATTACHMENT (QUICKMOUNT)
T-BOLT	47	T-BOLT W/ NUT M8 X 20MM

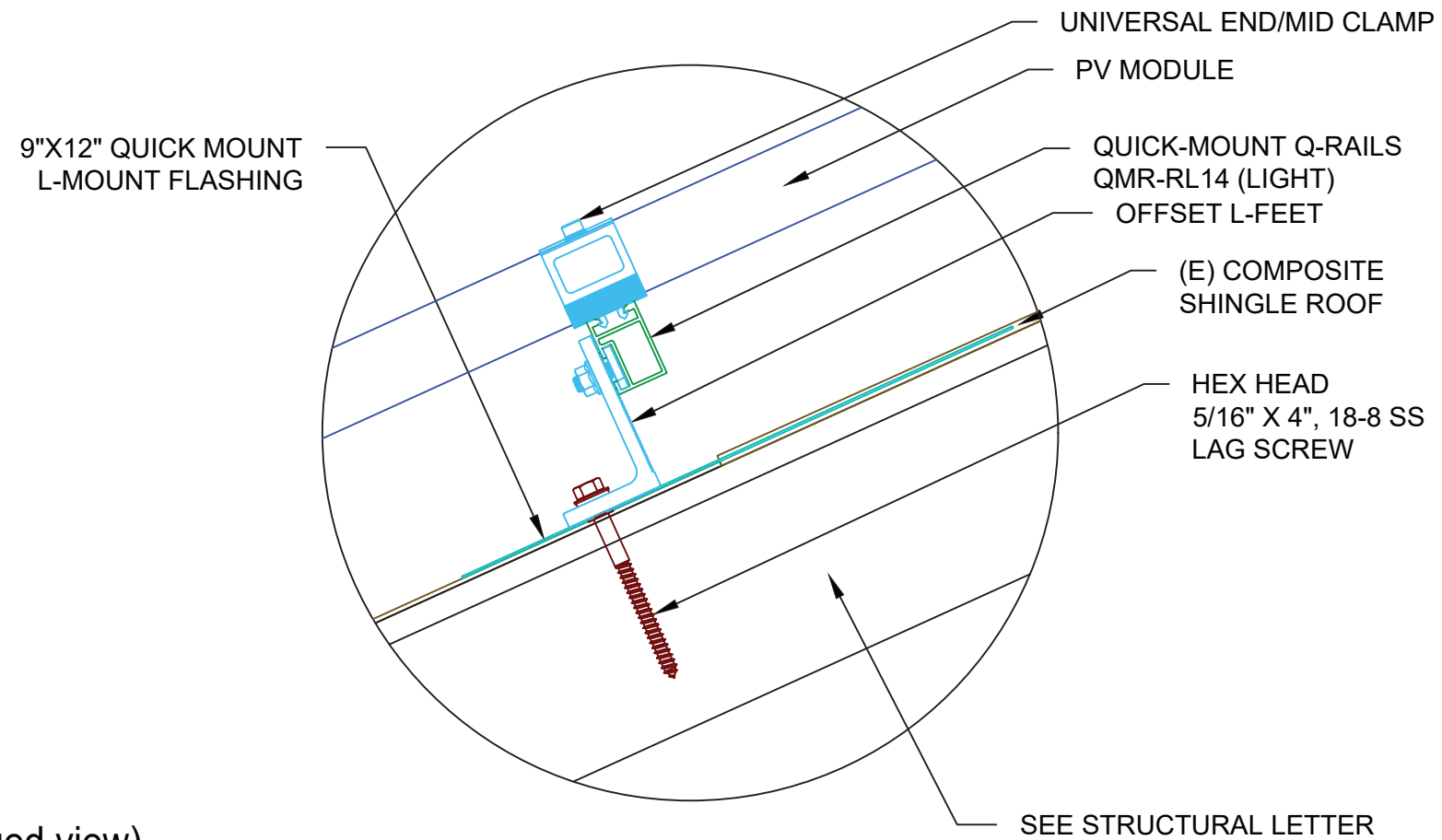
SHEET NAME  
**STRING LAYOUT**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-2A**



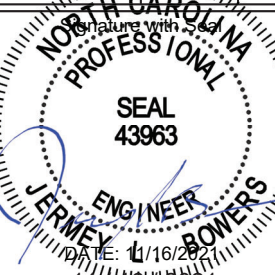
**1** | ATTACHMENT DETAIL  
 PV-3 | SCALE: 1" = 1'-0"



**2** | ATTACHMENT DETAIL (enlarged view)  
 PV-3 | SCALE: NTS

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**JOHNSON, CRYSTAL  
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 465 KINSMAN COURT,  
 FUQUAY-VARINA, NC 27526

SHEET NAME  
**ATTACHMENT  
 DETAIL**

SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-3**

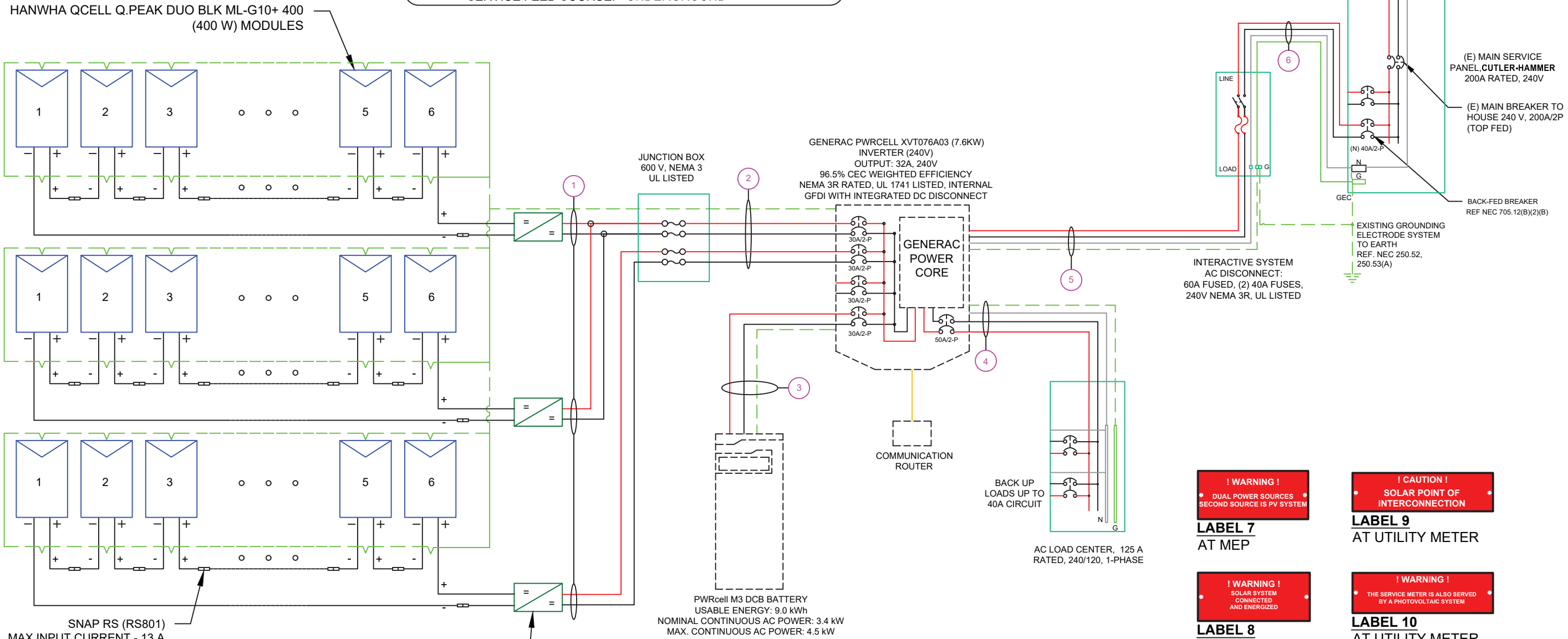
(18) HANWHA QCELL Q.PEAK DUO BLK ML-G10+ 400 (400 W) MODULES  
 (3) PV LINKS OF 6 MODULES CONNECTED IN SERIES

**SERVICE INFO**

UTILITY PROVIDER: DUKE ENERGY CAROLINAS- NC  
 MAIN SERVICE VOLTAGE: 240V  
 MAIN PANEL BRAND: CUTLER-HAMMER  
 MAIN SERVICE PANEL: 200A  
 MAIN CIRCUIT BREAKER RATING: 200A  
 MAIN SERVICE LOCATION: WEST  
 SERVICE FEED SOURCE: UNDERGROUND

**WIRE LEGEND**

- PV ARRAY +VE CONDUCTOR AND L1
- PV ARRAY -VE CONDUCTOR AND L2
- NEUTRAL CONDUCTOR
- EGC AND GEC
- SINGLE TWISTED PAIR, CAT 5 WIRE



**SNAP RS (RS801)**  
 MAX INPUT CURRENT - 13 A  
 UL 1741 LISTED  
 MODULE LEVEL RAPID SHUTDOWN (PVRSS)  
 COMPLIANT  
 NEMA 6P RATED

**PVLINK SUBSTRING OPTIMIZER (S2502)**  
 RATED POWER : 2500W  
 MPPT VOLTAGE RANGE: 60 TO 360 V  
 MAX OUTPUT VOLTAGE: 420V  
 MAX OUTPUT CURRENT: 8A  
 RAPID SHUTDOWN COMPLIANT  
 GROUND-FAULT PROTECTION COMPLIANT

**PWRcell M3 DCB BATTERY**  
 USABLE ENERGY: 9.0 kWh  
 NOMINAL CONTINUOUS AC POWER: 3.4 kW  
 MAX. CONTINUOUS AC POWER: 4.5 kW  
 DIMENSIONS (L X W X H) (IN):  
 22" X 10" X 68"

**! WARNING !**  
 DUAL POWER SOURCES  
 SECOND SOURCE IS PV SYSTEM  
**LABEL 7**  
 AT MEP

**! CAUTION !**  
 SOLAR POINT OF INTERCONNECTION  
**LABEL 9**  
 AT UTILITY METER

**! WARNING !**  
 SOLAR SYSTEM CONNECTED AND ENERGIZED  
**LABEL 8**  
 AT MEP

**! WARNING !**  
 THE SERVICE METER IS ALSO SERVED BY A PHOTOVOLTAIC SYSTEM  
**LABEL 10**  
 AT UTILITY METER

**! WARNING !**  
 PHOTOVOLTAIC POWER SOURCE  
**LABEL 1**  
 ON ALL PV CONDUITS SPACED AT MAX 10FT

**! CAUTION !**  
 SOLAR ELECTRIC SYSTEM CONNECTED AND ENERGIZED  
**LABEL 3**  
 AT INVERTER

**! WARNING !**  
 ELECTRIC SHOCK HAZARD DO NOT TOUCH TERMINALS. TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.  
**LABEL 5**  
 AT EACH AC DISCONNECT

**! WARNING !**  
 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 2**  
 AT INVERTER

**PHOTOVOLTAIC DC DISCONNECT**  
**LABEL 4**  
 AT EACH DC DISCONNECT

**PHOTOVOLTAIC AC DISCONNECT**  
**LABEL 6**  
 AT EACH AC DISCONNECT

QTY	CONDUCTOR INFORMATION	CONDUIT TYPE	CONDUIT SIZE
(6)	#10AWG - PV WIRE/USE-2	N/A	N/A
(1)	#6AWG - BARE COPPER IN FREE AIR	N/A	N/A
(4)	#10AWG - THWN-2	EMT OR FLEX IN ATTIC	3/4"
(1)	#6AWG - THWN-2 GND	EMT OR FLEX	3/4"
(2)	#6AWG - THWN-2	EMT OR FLEX	3/4"
(1)	#6AWG - THWN-2 GND	EMT OR FLEX	3/4"
(3)	#6AWG - THWN-2	EMT OR FLEX	3/4"
(1)	#6AWG - THWN-2 GND	EMT OR FLEX	3/4"
(3)	#6AWG - THWN-2	EMT OR FLEX	3/4"
(1)	#6AWG - THWN-2 GND	EMT OR FLEX	3/4"
(3)	#6AWG - THWN-2	EMT OR FLEX	3/4"
(1)	#6AWG - THWN-2 GND	EMT OR FLEX	3/4"

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DESCRIPTION	DATE	REV



PROJECT NAME & ADDRESS

**JOHNSON, CRYSTAL RESIDENCE**  
 465 KINSMAN COURT,  
 FUQUAY-VARINA, NC 27526

SHEET NAME  
**ELECTRICAL LINE DIAGRAM**

SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-4**

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	HANWHA QCELL Q.PEAK DUO BLK ML-G10+ 400 (400 W)
VMP	37.13V
IMP	10.77A
VOC	45.30V
ISC	11.14A
TEMP. COEFF. VOC	-0.27%/°C
PTC RATING	376.56W
MODULE DIMENSION	74.00"L x 41.1"W x 1.26"D (In Inch)

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	GENERAC PWRCELL XVT076A03 (7.6KW)
AC POWER OUTPUT (LOADS/GRID)	7600VA
AC POWER OUTPUT (BACKUP)	8000VA
NOMINAL OUTPUT VOLTAGE	240 VAC
MAX OUTPUT CURRENT @240V (LOADS/GRID)	32A
MAX OUTPUT CURRENT @240V (BACKUP)	50A
NOMINAL DC INPUT VOLTAGE	380Vdc
MAX DC INPUT VOLTAGE	420Vdc
CEC WEIGHTED EFFICIENCY	96.5%
MAX DC POWER (PV)	10000W
MAX INPUT CURRENT (PV)	20Adc
CONT. PEAK POWER (BATTERY)	8000W

SERIES SUB STRING OPTIMIZER SPECIFICATIONS	
MANUFACTURER / MODEL #	PV LINK S2502
RATED POWER	2500W
MPPT VOLTAGE RANGE	60-360 Vmp
MAXIMUM INPUT VOLTAGE	420Voc
MAXIMUM OUTPUT	420 Adc
NOMINAL OUTPUT	380 Vdc
MAXIMUM OUTPUT CURRENT	8 A
MAXIMUM SHORT CIRCUIT CURRENT	18 A

BATTERY SPECIFICATIONS	
MANUFACTURER / MODEL #	GENERAC PWRCELL M3 DCB BATTERY
USABLE ENERGY	9.0kWH
NOMINAL CONTINUOUS AC POWER	3.4kW
MAX. CONTINUOUS AC POWER	4.5kW
PEAK MOTOR STARTING CURRENT (2 SEC)	25A
REBUS VOLTAGE: INPUT/ OUTPUT	360-420Vdc
MODULE VOLTAGE	46.8Vdc
ROUND-TRIP EFFICIENCY	96.5%

**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 600 V AND 90 DEGREE 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.) THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-19°
AMBIENT TEMP (HIGH TEMP 2%)	34°
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	56°

**DC CONDUCTOR AMPACITY CALCULATIONS:  
PV LINK OPTIMIZER TO JUNCTION BOX:**

EXPECTED WIRE TEMP (In Celsius)	56°
TEMP. CORRECTION PER NEC TABLE 310.15 (B)(2)(a)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	6
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	0.8
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	10A
1.25 X I <sub>max</sub>	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	22.72A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X	
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X	
CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (10A) otherwise less the entry for circuit conductor size and ampacity	

**FROM JUNCTION BOX TO INVERTER:**

EXPECTED WIRE TEMP (In Celsius)	56°
TEMP. CORRECTION PER NEC TABLE 310.15 (B)(2)(a)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	4
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	0.8
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	20A
1.25 X I <sub>max</sub> X # of PV LINKS	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	22.72A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X	
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X	
CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (20A) otherwise less the entry for circuit conductor size and ampacity	

**FROM BATTERY TO INVERTER:**

EXPECTED WIRE TEMP (In Celsius)	34°
TEMP. CORRECTION PER NEC TABLE 310.15 (B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	2
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	1
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	31.25A
1.25 X I <sub>max</sub> (= 25A)	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	38.40A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X	
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X	
CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (31.25A) otherwise less the entry for circuit conductor size and ampacity	

**AC CONDUCTOR AMPACITY CALCULATIONS:  
FROM INVERTER TO BACK-UP PANEL:**

No. OF INVERTER	1
EXPECTED WIRE TEMP (In Celsius)	34°
TEMP. CORRECTION PER NEC TABLE 310.15(B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	3
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	1
CIRCUIT CONDUCTOR SIZE	6 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	75A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	42.5A
1.25 X INVERTER OUTPUT CURRENT (BACKUP POWER)	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	72A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X	
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X	
CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (42.5A) otherwise less the entry for circuit conductor size and ampacity	

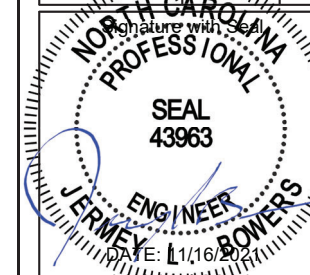
**AC CONDUCTOR AMPACITY CALCULATIONS:  
FROM INVERTER TO MEP:**

No. OF INVERTER	1
EXPECTED WIRE TEMP (In Celsius)	34°
TEMP. CORRECTION PER NEC TABLE 310.15(B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	3
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	1
CIRCUIT CONDUCTOR SIZE	6 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	75A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	40A
1.25 X MAX INVERTER OUTPUT CURRENT (LOADS/GRID)	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	72A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X	
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X	
CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (40A) otherwise less the entry for circuit conductor size and ampacity	



REVISIONS		
DESCRIPTION	DATE	REV



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**JOHNSON, CRYSTAL  
RESIDENCE**  
465 KINSMAN COURT,  
FUQUAY-VARINA, NC 27526

SHEET NAME  
**WIRING  
CALCULATIONS**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-5**

powered by  
**Q.ANTUM DUO Z**

# Q.PEAK DUO BLK ML-G10+

## 385-405

ENDURING HIGH PERFORMANCE



### BREAKING THE 20% EFFICIENCY BARRIER

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.



### THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY

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



### ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID Technology, Anti PID Technology<sup>1</sup>, Hot-Spot Protect and Traceable Quality Tra.Q™.



### EXTREME WEATHER RATING

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



### A RELIABLE INVESTMENT

Inclusive 25-year product warranty and 25-year linear performance warranty<sup>2</sup>.

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

### THE IDEAL SOLUTION FOR:



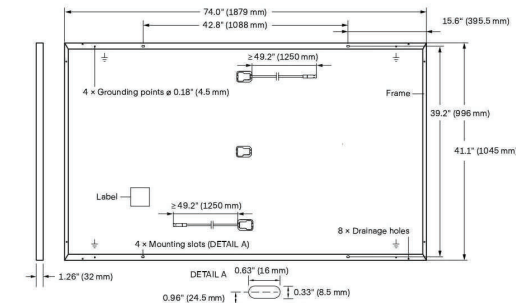
Rooftop arrays on residential buildings

Engineered in Germany



Format	74.0 in × 41.1 in × 1.26 in (including frame) (1879 mm × 1045 mm × 32 mm)
Weight	48.5 lbs (22.0 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 22 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm <sup>2</sup> Solar cable; (+) ≥ 49.2 in (1250 mm), (-) ≥ 49.2 in (1250 mm)
Connector	Stäubli MC4; IP68

### MECHANICAL SPECIFICATION

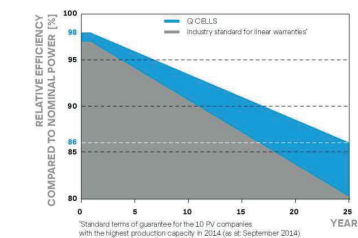


### ELECTRICAL CHARACTERISTICS

POWER CLASS		385	390	395	400	405
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC <sup>1</sup> (POWER TOLERANCE +5 W / -0 W)						
Power at MPP <sup>1</sup>	$P_{MPP}$ [W]	385	390	395	400	405
Short Circuit Current <sup>1</sup>	$I_{SC}$ [A]	11.04	11.07	11.10	11.14	11.17
Open Circuit Voltage <sup>1</sup>	$V_{OC}$ [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 <sup>1</sup>	$\eta$ [%]	≥ 19.6	≥ 19.9	≥ 20.1	≥ 20.4	≥ 20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT <sup>2</sup>						
Power at MPP	$P_{MPP}$ [W]	288.8	292.6	296.3	300.1	303.8
Short Circuit Current	$I_{SC}$ [A]	8.90	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

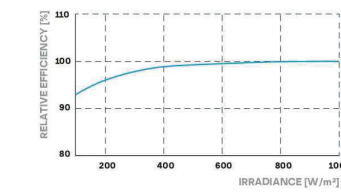
<sup>1</sup> Measurement tolerances  $P_{MPP} \pm 3\%$ ;  $I_{SC}$ ;  $V_{OC} \pm 5\%$  at STC: 1000 W/m<sup>2</sup>, 25 ± 2°C, AM 1.5 according to IEC 60904-3 • 2800 W/m<sup>2</sup>, NMOT, spectrum AM 1.5

### Q CELLS PERFORMANCE WARRANTY



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

### PERFORMANCE AT LOW IRRADIANCE



### TEMPERATURE COEFFICIENTS

Temperature Coefficient of $I_{SC}$	$\alpha$ [%/K]	+0.04	Temperature Coefficient of $V_{OC}$	$\beta$ [%/K]	-0.27
Temperature Coefficient of $P_{MPP}$	$\gamma$ [%/K]	-0.34	Nominal Module Operating Temperature	NMOT [°F]	109 ± 5.4 (43 ± 3 °C)

### PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage $V_{SYS}$ [V]	1000 (IEC) / 1000 (UL)	PV module classification	Class II
Maximum Series Fuse Rating [A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 2
Max. Design Load, Push / Pull <sup>3</sup> [lbs/ft <sup>2</sup> ]	75 (3600 Pa) / 55 (2660 Pa)	Permitted Module Temperature on Continuous Duty	-40 °F up to +185 °F (-40 °C up to +85 °C)
Max. Test Load, Push / Pull <sup>3</sup> [lbs/ft <sup>2</sup> ]	113 (5400 Pa) / 84 (4000 Pa)		

<sup>3</sup> See Installation Manual

### QUALIFICATIONS AND CERTIFICATES

UL 61730, CE-compliant, Quality Controlled PV - TÜV Rheinland, IEC 61215:2016, IEC 61730:2016, U.S. Patent No. 9,893,215 (solar cells), GCPV Certification ongoing.



### PACKAGING INFORMATION

Horizontal packaging	76.4 in 1940 mm	43.3 in 1100 mm	48.0 in 1220 mm	1656 lbs 751 kg	24 pallets	24 pallets	32 modules
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**Note:** Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

### Hanwha Q CELLS America Inc.

400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL inquiry@us.q-cells.com | WEB www.q-cells.us

Specifications subject to technical changes © Q CELLS Q.PEAK DUO BLK ML-G10+ 385-405 2021-05\_Rev01\_MA



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Web: www.powerhome.com

### REVISIONS

DESCRIPTION	DATE	REV



PROJECT NAME & ADDRESS

JOHNSON, CRYSTAL  
RESIDENCE  
465 KINSMAN COURT,  
FUQUAY-VARINA, NC 27526

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-6

**GENERAC**

# PWRCELL

7.6kW 1Ø PWRcell Inverter with CTs  
Model #: XVT076A03

11.4 kW 3Ø PWRcell Inverter with CTs  
Model #: X11402 (Ordering SKU: APKE00013)



Solar + storage is simple with the Generac PWRcell™ Inverter. This bi-directional, REbus™-powered inverter offers a simple, efficient design for integrating smart batteries with solar. Ideal for self-supply, backup power, zero-export and energy cost management, the PWRcell Inverter is the industry's most feature-rich line of inverters, available in single-phase and three-phase models.

## FEATURES & BENEFITS

- Single inverter for grid-tied solar with smart battery integration
- Simplified system design: No autotransformer or battery inverter needed
- User-selectable modes for backup power, self-supply, time-of-use, zero-import and export limiting
- Free system monitoring included via PWRview™ Web Portal and Mobile App

AC OUTPUT/GRID-TIE	MODEL XVT076A03	MODEL X11402
CONT. GRID-TIED AC POWER @ 50°C (122°F):	7600 W	11400 W
AC OUTPUT VOLTAGE:	120/240, 1Ø VAC	120/208, 3Ø VAC
AC FREQUENCY:	60 Hz	
MAXIMUM CONTINUOUS OUTPUT CURRENT:	32 A, RMS	
GROUND-FAULT ISOLATION DETECTION:	Included	
CHARGE BATTERY FROM AC:	Yes	
THD (CURRENT):	< 2%	
TYPICAL NIGHTTIME POWER CONSUMPTION <sup>1</sup> :	< 7 W	

AC OUTPUT/ISLAND MODE	MODEL XVT076A03	MODEL X11402
MAX. CONT. AC POWER WHILE IN ISLAND MODE WITHOUT AN EXTERNAL TRANSFER SWITCH <sup>2</sup> :	7600 W	
MAX. CONT. AC POWER WHILE IN ISLAND MODE W/ EXTERNAL TRANSFER SWITCH AND SINGLE 6 MODULE BATTERY CABINET <sup>3</sup> :	9000 W	
MAX. CONT. AC POWER WHILE IN ISLAND MODE W/ EXTERNAL TRANSFER SWITCH AND 2 BATTERY CABINETS (8 MODULES MINIMUM) <sup>3</sup> :	11000 W	9600 W-11000 W*
PEAK MOTOR STARTING CURRENT (2 SEC):	50 A, RMS	
AC BACKUP OUTPUT VOLTAGE:	120/240, 1Ø VAC	120/208, 1Ø VAC
AC FREQUENCY:	60 Hz	
THD (VOLTAGE):	< 2%	
ALLOWABLE SPLIT PHASE IMBALANCE:	Up to 30%	

DC INPUT	MODEL XVT076A03	MODEL X11402
DC INPUT VOLTAGE RANGE:	360-420 VDC	
NOMINAL DC BUS VOLTAGE:	380 VDC	
DC DISTRIBUTION INPUT BREAKERS:	4 x 2P30 A	
MAX INPUT CURRENT PER DC INPUT:	30 A	
REVERSE-POLARITY PROTECTION:	Yes	
TRANSFORMERLESS, UNGROUNDED:	Yes	
DC BUS EXPORT FUSES (+/-):	40 A	
2-POLE DISCONNECTION:	Yes	

EFFICIENCY	MODEL XVT076A03	MODEL X11402
PEAK EFFICIENCY:	97.3%	97.7%
CEC WEIGHTED EFFICIENCY:	96.5%	97.5%

<sup>1</sup>Nighttime power consumption depends on the system mode  
<sup>2</sup>In Island Mode, continuous power output is restricted to 7.6kW unless backup power is routed through an external transfer switch in a whole home backup application.  
<sup>3</sup>Peak performance, values provided for 40°C (104°F).  
 \*In Island mode X11402 protected loads only supply 2 phases 120 VAC L-N, 208 L-L which results in lower power than in a grid tied 3 phase state. The low value of the range is for full L-L loading while high value of the range is full L-N loading

## Specifications

### FEATURES AND MODES

ISLAND MODE <sup>4</sup> :	Yes
GRID SELL:	Yes
SELF CONSUMPTION:	Yes
PRIORITIZED CHARGING FROM RENEWABLES:	Yes
GRID SUPPORT - ZERO EXPORT:	Yes
ESS PCS OPERATION MODES (IMPORT ONLY, EXPORT ONLY):	Yes

### ADDITIONAL FEATURES

SUPPORTED COMMUNICATION INTERFACES:	REbus™, CANbus, Ethernet
SYSTEM MONITORING:	PWRview™ Web Portal and Mobile App
BACKUP LOADS DISCONNECT <sup>5</sup> :	Yes, 50 A Circuit Breaker
INVERTER BYPASS SWITCH:	Automatic
WARRANTY:	10 Years

### STANDARDS COMPLIANCE

SAFETY:	UL 1741 SA, CSA 22.2 #107.1, UL 1998
GRID CONNECTION STANDARDS:	IEEE 1547, Rule 21, Rule 14H (HECO V1.1), CSIP, UL 1741 PCS CRD (Import Only, Export Only)
EMISSIONS:	FCC Part 15 Class B

### DIMENSIONS AND INSTALLATION SPECIFICATIONS

ENCLOSURE KNOCKOUTS - QTY, SIZE - IN (MM):	6 x Combo 3/4" x 1" (19 x 25.4) 7 x Combo 1/2" x 3/4" (12.7 x 19)	1 x 0.575" exclusively for optional LTE antenna mounting
DIMENSIONS L x W x H - IN (MM):	24.5" x 19.25" x 8" (622.3 x 488.9 x 203.2)	
WEIGHT - LB (KG):	62.7 (28.4)	
COOLING:	Forced convection	
AUDIBLE NOISE:	< 40 dBA	
OPERATING TEMPERATURE:	-4 to 122 °F (-20 to 50 °C) <sup>6</sup>	
ENCLOSURE TYPE:	Type 3R	

### INSTALLATION GUIDELINES

BATTERY TYPES SUPPORTED:	PWRcell™ Battery
MODULE SUBSTRING SIZE PER PV LINK OPTIMIZER:	Varies, refer to PV Link Installation Manual
MAXIMUM RECOMMENDED DC POWER FROM PV <sup>6</sup> :	10 kW (1Ø), 15 kW (3Ø)

<sup>4</sup>3Ø inverters offer backup for [single phase] 208 V loads.  
<sup>5</sup>Includes ambient temperature rising from inverter operation. Reduced power at extreme temperatures.  
<sup>6</sup>Values provided for PV-only or small storage systems. Additional PV power is permissible if sufficient battery storage capacity is installed.

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### REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal

DATE: 11/16/2021

PROJECT NAME & ADDRESS

JOHNSON, CRYSTAL  
 RESIDENCE  
 465 KINSMAN COURT,  
 FUQUAY-VARINA, NC 27526

SHEET NAME  
**EQUIPMENT SPECIFICATION**

SHEET SIZE

ANSI B  
 11" X 17"

SHEET NUMBER

PV-7



**GENERAC**

# SnapRS™

Inline Disconnect Switch  
Model #: RS801 (Ordering SKU: APKE00011)



Generac SnapRS are a simple way to satisfy rapid shutdown compliance for solar + storage systems. Generac SnapRS are 2017/2020 NEC 690.12 compliant, don't require any extra hardware to mount, and need no pairing or fussy digital communications.

## FEATURES & BENEFITS

- Fast, easy, and simple to install
- One SnapRS device per PV module
- Achieves PVRSS Compliance
- Low cost, high efficiency solution

## SYSTEM DESIGN

Snap a Generac SnapRS disconnect device (RS) to the negative lead (-) of each module in the solar array for simple module-level rapid shutdown compliance. SnapRS devices isolate array voltage when a rapid shutdown is initiated at a PWRcell™ Inverter. When rapid shutdown is initiated, SnapRS units isolate each PV module in the array, reducing array voltage to <80V in seconds.

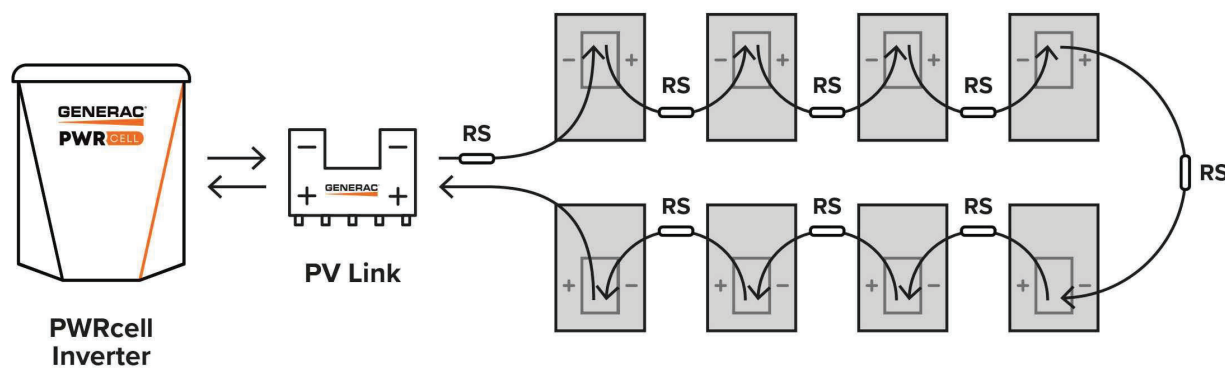


Diagram is applicable for most 60 cell PV modules. Modules with higher cell count may require a different arrangement. Contact Generac for more details.

## Specifications

### SnapRS™ (APKE00011)

PV MODULE MAX VOC:	75 V
EFFICIENCY:	99.8%*
MAX INPUT CURRENT:	13 A
MAX TOTAL QTY IN SUBSTRING:	10
SHUTDOWN TIME:	<10 Seconds
ENCLOSURE RATING:	NEMA 6P
OPERATING TEMPERATURE - FAHRENHEIT (CELSIUS):	-40 to 158 °F (-40 to 70 °C)
CERTIFICATIONS:	UL1741
PROTECTIONS:	PVRSE
WEIGHT - LB (KG):	0.17 (0.08)
DIMENSIONS, L x W x H - IN (MM):	7" x 1" x 1" (177.8 x 25.4 x 25.4)
WARRANTY:	25 Years

\*When used with a 50V panel

Connect one SnapRS device to the negative lead of each PV module in the PV Link controlled array for complete PV Rapid shutdown performance



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Web: [www.powerhome.com](http://www.powerhome.com)

### REVISIONS

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DATE: 11/16/2021

PROJECT NAME & ADDRESS

JOHNSON, CRYSTAL  
RESIDENCE  
465 KINSMAN COURT,  
FUQUAY-VARINA, NC 27526

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-8

**GENERAC**

# PWRCELL

## 3.0kWh DCB BATTERY MODULE

3.0kWh PWRcell DCB Battery Module  
Model #: BJ-DCB05ZK8G (Ordering SKU: G0080040)



Build a better backup system with the Generac DCB Battery Module for PWRcell™. Add capacity and backup power with as few as three or as many as six modules. Upgrade a PWRcell Battery post-installation with the addition of more DCB modules for more power and capacity.

### FEATURES & BENEFITS

- Suitable for indoor and outdoor cabinets
- Modular: Stack the right number of battery modules for the application
- Upgradeable: Add more modules later when consumer needs change
- Easy to install: At just 55lbs, installers won't need special equipment to move and install these batteries

### SPECIFICATIONS

NOMINAL VOLTAGE:	46.8 VDC
USABLE CAPACITY @ TYPICAL VOLTAGE:	3.00 kWh
MAXIMUM AMBIENT OPERATING TEMPERATURE:	14 to 122 °F (-10 to 50 °C)
OPTIMAL AMBIENT OPERATING TEMPERATURE:	41 to 104 °F (5 to 40 °C)
STORAGE TEMPERATURE RANGE:	68 °F (20 °C)
SCALABILITY:	3-6 pcs in series
DIMENSIONS, L x W x H - IN (MM):	17.3" x 17.7" x 3.3" (440 x 450 x 84)
WEIGHT - LB (KG):	55 (25)
BATTERY CHEMISTRY:	Lithium Nickel Manganese Cobalt (NMC)
WARRANTY:	10 years or 7.56MWh Throughput (per module)

Note: Charge/discharge rate may be reduced at temperature extremes

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## Specifications

### PWRcell™ BATTERY CONFIGURATIONS

BATTERY MODULE SERIES:	3.0 kWh DCB / 3.0 kWh EX			
BATTERY MODULES:	3	4	5	6
USABLE ENERGY:	9 kWh	12 kWh	15 kWh	18 kWh
NOMINAL CONT. AC POWER <sup>1</sup> :	3.4 kW	4.5 kW	5.6 kW	6.7 kW
MAX. CONT. AC POWER <sup>2</sup> :	4.5 kW	6 kW	7.5 kW	9 kW
NOMINAL CONT. DC (CHARGE/DISCHARGE) - A:	11.6	15.5	19.4	23.3
PEAK MOTOR STARTING CURRENT (2 SEC) - A, RMS:	25	33	42	50
REbus™ VOLTAGE - INPUT/OUTPUT:	360-420 VDC			
NOMINAL VOLTAGE:	380 VDC			
DC-DC ROUND-TRIP EFFICIENCY:	96.5%			
MAXIMUM AMBIENT OPERATING TEMPERATURE:	14 TO 122 °F (-10 TO 50 °C)			
OPTIMAL AMBIENT OPERATING TEMPERATURE:	41 to 104 °F (5 to 40 °C)			
MAXIMUM INSTALLATION ALTITUDE - FT (M):	9834 (3000)			
DIMENSIONS, L x W x H - IN (MM):	22" x 10" x 68" (559 x 254 x 1727)			
WEIGHT, ENCLOSURE - LB (KG):	115 (52)			
WEIGHT, INSTALLED W/ DCB MODULES - LB (KG):	280 (127)	335 (152)	390 (177)	445 (202)
WEIGHT, INSTALLED W/ EX MODULES - LB (KG):	287 (130)	344 (156)	401 (182)	459 (208)
WEIGHT, ACCESSORY MOUNTING HARDWARE - LB (KG):	21 (10)			
ENCLOSURE TYPE:	Type 3R			
WARRANTY - LI-ION MODULES:	10 Years, (7.56MWh)			
WARRANTY - ELECTRONICS AND ENCLOSURE:	10 Years			
COMMUNICATION PROTOCOL:	REbus™ DC Nanogrid™			
SEISMIC RATING:	IEEE 693-2018 (HIGH)			
COMPLIANCE:	UL 9540, UL 1973, UL 1642, CSA 22.2 #107.1			

<sup>1</sup>Average AC power over a complete discharge cycle. <sup>2</sup>Peak Performance, values provided for 40°C (104°F).  
Note: Charge/discharge rate may be reduced at temperature extremes

### PWRcell ACCESSORIES

Inside of the PWRcell Battery Cabinet, battery modules are stacked two deep on three levels, allowing for up to six modules to be connected in series. You can upgrade an existing PWRcell Battery Cabinet by adding Battery Modules and a Module Spacer (APKE00008). A Module Spacer is only required for battery configurations with an odd number of modules (i.e. 3 or 5).

Generac offers a convenient PWRcell Battery Upgrade Kit (APKE00009) to help replace lost or misplaced hardware.

Note: When adding modules, be sure all modules within an individual cabinet are of the same series type (i.e., EX or DCB).

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### PWRcell MODEL BUILDER



Sample Model Name: PWRcell OR M3 DCB



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Web: www.powerhome.com

### REVISIONS

DESCRIPTION	DATE	REV

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DATE: 11/16/2021

### PROJECT NAME & ADDRESS

JOHNSON, CRYSTAL  
RESIDENCE  
465 KINSMAN COURT,  
FUQUAY-VARINA, NC 27526

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-9

# GENERAC<sup>®</sup>

# PWRCELL

## OUTDOOR RATED BATTERY

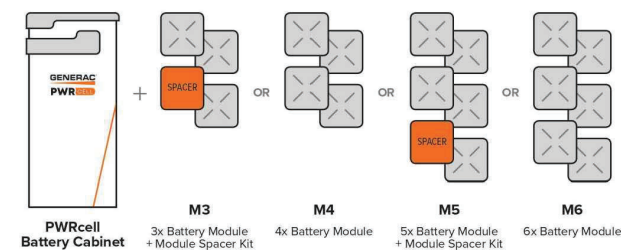
PWRcell Outdoor Rated Battery Cabinet (Ordering SKU: APKE00028)  
 3.0kWh PWRcell DCB Battery Module  
 Model #: BJ-DCB05ZKBG (Ordering SKU: G0080040)  
 3.0kWh PWRcell EX Battery Module  
 Model #: G0080001

The PWRcell™ Outdoor Rated (OR) Battery Cabinet is a Type 3R smart battery enclosure that allows for a range of configurations to suit any need, small or large, indoor or outdoor. No other smart battery offers the power and flexibility of PWRcell.

### PWRcell BATTERY CABINET DESIGN

The PWRcell Battery Cabinet allows system owners the flexibility to scale from an economical 9kWh to a massive 18kWh by installing additional battery modules to the PWRcell Battery Cabinet. An existing PWRcell Battery Cabinet can be upgraded with additional modules. Use the graphic below and the chart on the back of this sheet to understand what components you need for your chosen PWRcell configuration.

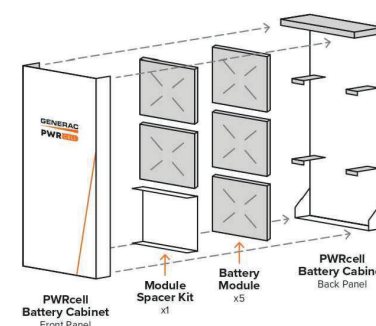
### BATTERY CONFIGURATION GUIDE



### FEATURES & BENEFITS

- Connect 2 PWRcell Battery Cabinets to a single PWRcell Inverter for up to 36kWh of storage
- Best-in-class battery backup power
- Plug-and-play with PWRcell Inverter and PV Link™
- Time-of-use (TOU) and zero-export ready
- Residential and commercial application ready.
- 3R-rated cabinet allows for outdoor or indoor installation
- Additional mounting hardware for outdoor installations comes standard to provide additional ground clearance and support

### BATTERY CABINET ASSEMBLY



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 Email: info@powerhome.com  
 Web: www.powerhome.com

#### REVISIONS

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DATE: 11/16/2021

#### PROJECT NAME & ADDRESS

JOHNSON, CRYSTAL  
 RESIDENCE  
 465 KINSMAN COURT,  
 FUQUAY-VARINA, NC 27526

#### SHEET NAME

EQUIPMENT  
 SPECIFICATION

#### SHEET SIZE

ANSI B  
 11" X 17"

#### SHEET NUMBER

PV-9A

**GENERAC**

# PV Link™

2500W MPPT Substring Optimizer  
Model #: S2502 (Ordering SKU: APKE00010)

PV Link is the simple solar optimizer for quick installation and long-lasting performance. Connect PV modules to each PV Link to overcome shading and challenging roof lines.

## FEATURES & BENEFITS

- Fast, simple installation
- Lower failure risk than module-level optimizers
- 2017/2020 NEC rapid shutdown compliant with SnapRS™
- Quick connections with MC4 connectors
- Exports up to 2500W
- Compatible with PWRcell™ Inverters
- Cost-effective solution for high-performance PV
- Ground-fault protection

## SINGLE-STRING PV ARRAY WITH SnapRS DEVICES

Where PV module-level rapid shutdown is required (NEC 690.12), a SnapRS device (RS) is installed to negative (-) lead of each PV module.

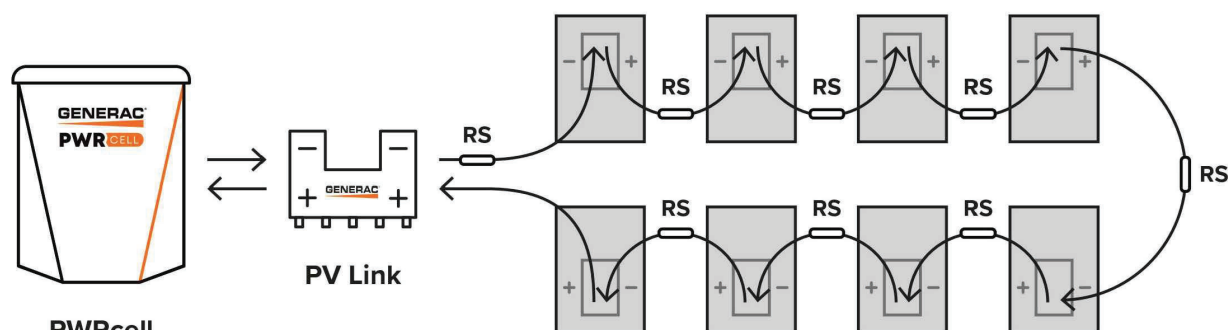


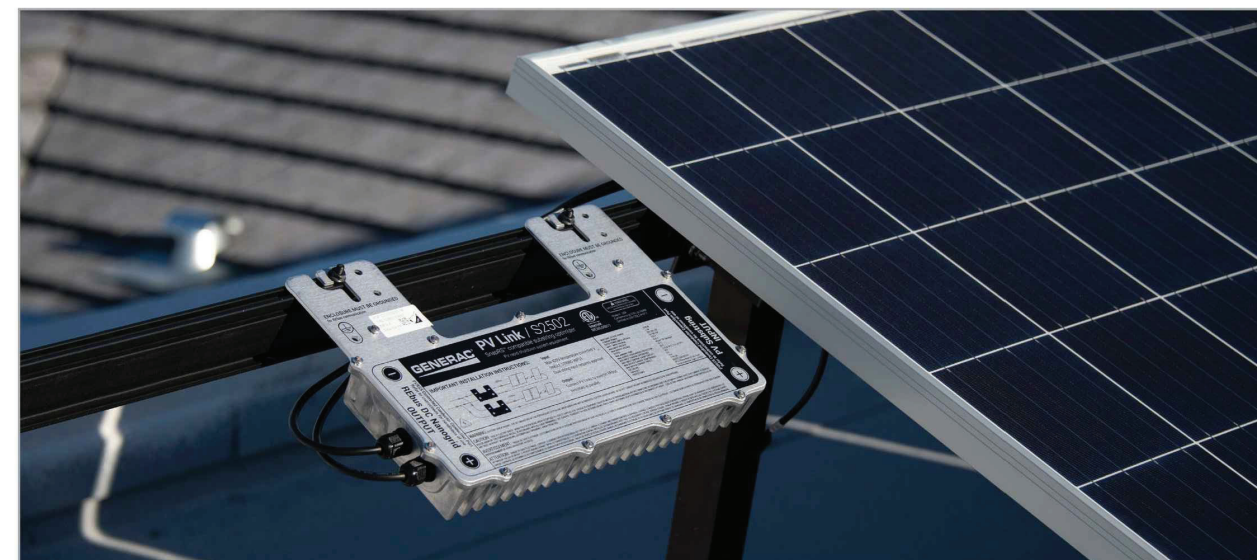
Diagram is applicable for most 60 cell PV modules. Modules with higher cell count may require a different arrangement. Contact Generac for more details.



## Specifications

PV Link™ (APKE00010)	
RATED POWER*:	2500W
PEAK EFFICIENCY:	99%
MPPT VOLTAGE RANGE:	60-360 VMP
MAX INPUT VOLTAGE:	420 VOC; max when cold
MAX OUTPUT:	420 VOC
NOMINAL OUTPUT (REbus™):	380 VDC
MAX OUTPUT CURRENT (CONTINUOUS):	8 A
MAX OUTPUT CURRENT (FAULT):	10 A
MAX INPUT CURRENT (CONTINUOUS):	13 A @ 50°C, 10 A @ 70°C
MAX INPUT SHORT CIRCUIT CURRENT (ISC):	18 A
STANDBY POWER:	< 1 W
PROTECTIONS:	Ground-fault, Arc-fault (Arc-fault Type 1 AFCI, Integrated), PVRSE
MAX OPERATING TEMP: FAHRENHEIT (CELSIUS):	158 °F (70 °C)
SYSTEM MONITORING:	PWRview™ Web Portal and Mobile App
ENCLOSURE:	Type 4X
WEIGHT - LB (KG):	7.3 lb (3.3 kg)
DIMENSIONS, L x W x H - IN (MM):	15.4" x 2" x 9.6" (391.2 x 50.8 x 243.8)
COMPLIANCE:	UL 1741, CSA 22.2
WARRANTY:	25 Years

\*PV Link can tolerate higher than rated power at its input if Max Input Voltage and Short Circuit Current specifications are not exceeded



Generac Power Systems, Inc.  
S45 W29290 Hwy. 59, Waukesha, WI 53189  
[www.Generac.com](http://www.Generac.com) | 888-GENERAC (436-3722)  
A0000528162 REV D

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Specifications are subject to change without notice.

**GENERAC**

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REVISIONS		
DESCRIPTION	DATE	REV

Signature with Seal  
  
DATE: 11/16/2021

PROJECT NAME & ADDRESS

JOHNSON, CRYSTAL  
RESIDENCE  
465 KINSMAN COURT,  
FUQUAY-VARINA, NC 27526

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-10



## QRail™ — Fully Integrated Mounting and Racking System

The QRail Series is a strong and versatile solar array mounting system that provides unrivaled benefits to solar designers and installers. Combined with Quick Mount PV's industry-leading waterproof mounts, QRail offers a complete racking solution for mounting solar modules on any roof.



Easily design array configurations with the QDesign software application. Generate complete engineering reports and calculate a precise bill of materials for all the mounting, racking and accessories needed for a complete solar array.

## Comprehensive, One-Source Solution

QRail, together with Quick Mount PV's waterproof mounting products, provides the benefit of a single-sourced, seamlessly integrated rooftop installation that works with all roof types — composition/asphalt shingles, flat or curved tile, metal shingle, shake, slate and low slope roofs. The QRail system also works with any roof attachment system for maximum flexibility.

## Superior Strength and Versatility

QRail is engineered for optimal structural performance. The system is certified to UL 2703, fully code compliant and backed by a 25-year warranty. QRail is available in Light, Standard and Heavy versions to match all geographic locations. QRail is compatible with virtually all modules and works on a wide range of pitched roof surfaces. Modules can be mounted in portrait or landscape orientation in standard or shared-rail configurations.

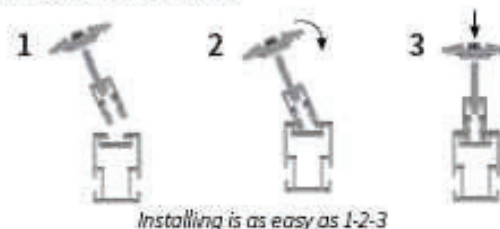


QRails come in two lengths — 168 inches (14 ft) and 208 inches (17.3 ft) Mill and Black Finish

## Fast, Simple Installation: It Just Clicks

### QClick Technology™

The universal mid and end clamps use QClick technology to simply "click" into the rail channel and remain upright, ready to accept the module. The pre-assembled clamps fit virtually all module frames and require no extra hardware, eliminating pre-loading and reducing installation time.



Installing is as easy as 1-2-3



**UNIVERSAL END CLAMP**  
2 clamps for modules from 30-45mm or 38-50mm thick



**UNIVERSAL BONDED MID CLAMP**  
2 clamps for modules from 30-45mm or 38-50mm thick

### QSplice™ Technology

QRail's innovative internal QSplice installs in seconds, requiring no tools or screws. Simply insert QSplice into the rail and slide the other rail on to create a fully structural, bonded splice. An external splice is also available.



Installs in seconds — no tools or hardware required

## Fully Integrated Electrical Bonding

The QRail system provides an integrated electrical bonding path, ensuring that all exposed metal parts and the solar module frames are electrically connected. All electrical bonds are created when the components are installed and tightened down.



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ANSI B  
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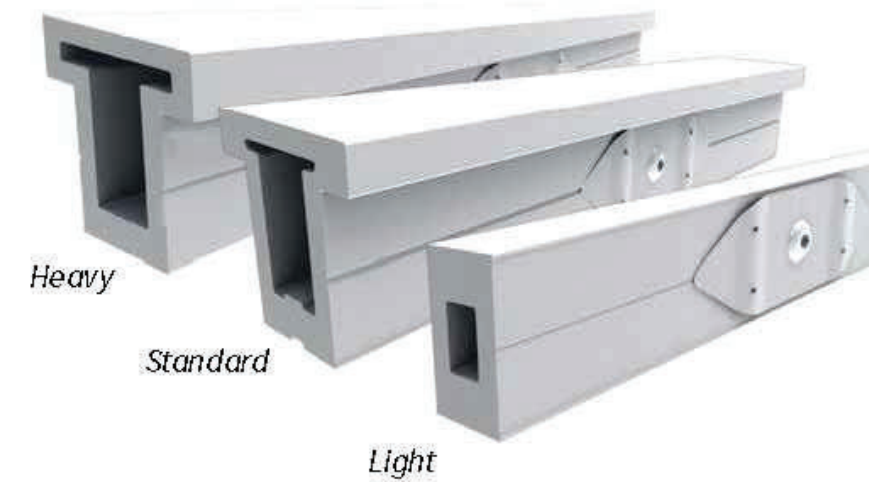
PV-11

## QRail™ Configurations



Item Code	Part Number	Description	Finish
QMR-RL14 A 60	800	QRail Light, 14 ft., 60 Pack	Mill
QMR-RL17.3 A 60	801	QRail Light, 17.3 ft., 60 Pack	Mill
QMR-RL14 B 60	805	QRail Light, 14 ft., 60 Pack	Black
QMR-RL17.3 B 60	806	QRail Light, 17.3 ft., 60 Pack	Black
QMR-RS14 A 60	810	QRail Standard, 14 ft., 60 Pack	Mill
QMR-RS17.3 A 60	811	QRail Standard, 17.3 ft., 60 Pack	Mill
QMR-RS14 B 60	815	QRail Standard, 14 ft., 60 Pack	Black
QMR-RS17.3 B 60	816	QRail Standard, 17.3 ft., 60 Pack	Black
QMR-RH14 A 60	820	QRail Heavy, 14 ft., 60 Pack	Mill
QMR-RH17.3 A 60	821	QRail Heavy, 17.3 ft., 60 Pack	Mill
QMR-RH14 B 60	825	QRail Heavy, 14 ft., 60 Pack	Black
QMR-RH17.3 B 60	826	QRail Heavy, 17.3 ft., 60 Pack	Black

## QSplice™ Internal Structural Splice



Item Code	Part Number	Description	Finish
QMR-ISL A 15	830	QSplice Internal, Light, 15 Pack	Mill
QMR-ISS A 15	831	QSplice Internal, Standard, 15 Pack	Mill
QMR-ISH A 15	832	QSplice Internal, Heavy, 15 Pack	Mill

## QSplice™ External Structural Splice



Item Code	Part Number	Description	Finish
QMR-ESS A 15	834	QSplice External, Standard, 15 Pack	Mill
QMR-ESH A 15	835	QSplice External, Heavy, 15 Pack	Mill



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PV-11A

## Universal End Clamp with QClick™ Technology



Black

Mill

Item Code	Part Number	Description	Finish
QMR-UEC3045 A 20	860	Universal End Clamp, 30-45mm, 20 Pack	Mill
QMR-UEC3850 A 20	861	Universal End Clamp, 38-50mm, 20 Pack	Mill
QMR-UEC3045 B 20	865	Universal End Clamp, 30-45mm, 20 Pack	Black
QMR-UEC3850 B 20	866	Universal End Clamp, 38-50mm, 20 Pack	Black
QMR-UEC3045BP A 20	862	Universal End Clamp, 30-45mm, w/ Bonding, 20 Pack	Mill
QMR-UEC3850BP A 20	863	Universal End Clamp, 38-50mm, w/ Bonding, 20 Pack	Mill
QMR-UEC3045BP B 20	867	Universal End Clamp, 30-45mm, w/ Bonding, 20 Pack	Black
QMR-UEC3850BP B 20	868	Universal End Clamp, 38-50mm, w/ Bonding, 20 Pack	Black

## Mid Clamp with QClick™ Technology



Black

Mill

Item Code	Part Number	Description	Finish
QMR-UMC3045BP 1.2 A 20	872	Universal Mid Clamp, 30-45mm, w/ Bonding, 20 Pack	Mill
QMR-UMC3850BP 1.2 A 20	873	Universal Mid Clamp, 38-50mm, w/ Bonding, 20 Pack	Mill
QMR-UMC3045BP 1.2 B 20	877	Universal Mid Clamp, 30-45mm, w/ Bonding, 20 Pack	Black
QMR-UMC3850BP 1.2 B 20	878	Universal Mid Clamp, 38-50mm, w/ Bonding, 20 Pack	Black

## Single-Slot L-Foot



Item Code	Part Number	Description	Finish
QMC-LF A 12	692	Single-slot L-foot, 12 Pack	Mill
QMC-LF B 12	693	Single-slot L-foot, 12 Pack	Black

## End Caps



Heavy

Standard

Light

Item Code	Part Number	Description	Finish
QMR-CPL B 50	885	End Cap Light, 50 Pack	Black
QMR-CPS B 50	886	End Cap Standard, 50 Pack	Black
QMR-CPH B 50	887	End Cap Heavy, 50 Pack	Black



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ANSI B  
 11" X 17"

SHEET NUMBER

PV-11B

### T-Bolt



Item Code	Part Number	Description	Finish
QMR-TB A 300	880	T-Bolt w/ Nut, 300 Pack	stainless steel

### Grounding Lug



Item Code	Part Number	Description	Finish
QMR-GL A 50	890	WEEB Lug w/ T-Bolt, 50 Pack	n/a

### Wire Clip



*Works with both PV and Trunk Cabling*

Item Code	Part Number	Description	Finish
QMR-WCA 300	892	Trunk/PV Cable, 300 Pack	stainless steel

### WEEB BMC



Item Code	Part Number	Description	Finish
QMR-ECWA 50	891	WEEB BMC, 50 Pack	stainless steel



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#### SHEET NAME

EQUIPMENT  
 SPECIFICATION

#### SHEET SIZE

ANSI B  
 11" X 17"

#### SHEET NUMBER

PV-11C



# L-Mount | QMLM / QMLM-ST

Elevated Water Seal Technology®

ITEM NO.	DESCRIPTION	QTY.
1	FLASHING, ROUNDED CORNERS, 9" X 12" X .040", .438" HOLE, 5052, MILL	1
2	L-FOOT, 2" X 3.30" FOR .438" O.D. FASTENER, 2-1/16" SLOT, 6061-T6/6005A-T61, MILL	1
3	WASHER, SEALING, 5/16" ID X 3/4" OD, EPDM BONDED SS	1
4	LAG SCREW, HEX HEAD, 5/16" x 4", 18-8 SS	1
*5	STRUCTURAL SCREW, QMPV, T-30 HEX WASHER HEAD, 5/16" X 4-1/2", 18-8SS	1

**Quick Mount PV®**  
**QMLM & QMLM-ST: L-MOUNT, 2-1/16" SLOT**

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 FRACTIONAL ± 1/32  
 TWO PLACE DECIMAL ± .015  
 THREE PLACE DECIMAL ± .004

SIZE	DRAWN BY:	REV
A	AAP	11

DATE: 4/4/2019  
 SCALE: 1:4 WEIGHT: 0.7566 SHEET 1 OF 1

DO NOT SCALE DRAWING

## L-Mount Installation Instructions

**Installation Tools Required:** tape measure, roofing bar, chalk line, stud finder, caulking gun, sealant compatible with roofing materials, drill with 7/32" or 1/8" bit, drill or impact gun with 1/2" socket.

**WARNING:** Quick Mount PV products are NOT designed for and should NOT be used to anchor fall protection equipment.

- Locate, choose, and mark centers of rafters to be mounted. Select the courses of shingles where mounts will be placed.
- Carefully lift composition roof shingle with roofing bar, just above placement of mount. Remove nails as required and backfill holes with approved sealant. See "Proper Flashing Placement" on next page.
- Insert flashing between 1st and 2nd course. Slide up so top edge of flashing is at least 3/4" higher than the butt-edge of the 3rd course and lower flashing edge is above the butt-edge of 1st course. Mark center for drilling.
- If attaching with lag bolt use a 7/32" bit (Lag). Use a 1/8" bit (ST) for attaching with the structural screw. Drill pilot hole into roof and rafter, taking care to drill square to the roof. Do not use mount as a drill guide. Drill a 2" deep hole into rafter.
- Clean off any sawdust, and fill hole with sealant compatible with roofing materials.
- Place L-foot onto elevated flange and rotate L-foot to desired orientation.
- Prepare lag bolt or structural screw with sealing washer. Using a 1/2-inch socket on an impact gun, drive prepared lag bolt through L-foot until L-foot can no longer easily rotate. **DO NOT over-torque.** NOTE: Structural screw can be driven with T-30 hex head bit.
- You are now ready for the rack of your choice. Follow all the directions of the rack manufacturer as well as the module manufacturer. NOTE: Make sure top of L-Foot makes solid contact with racking.

**Quick Mount PV®**  
 RESPECT THE ROOF

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SHEET NAME  
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SHEET SIZE  
**ANSI B  
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SHEET NUMBER  
**PV-12**

Apr-2019 Rev 6