

Stamps

LOGO

Street address, City,State,Zip USA

APN# xxxxxxx UTILITY: XXXXXXXXXXX AHJ: XXXXXXXXXXXX SHEET'S NAM

	PIPING.	
E	SHEET SIZE	SHEET NUMBER
E	ANSI B 11" X 17"	PV-1

NOTE: ALL ELECTRICAL EQUIPMENT, COMBINER, DISCONNECTS, MAIN SERVICE PANELS, ETC. SHALL NOT BE INSTALLED WITHIN 3' OF THE GAS METERS' SUPPLY OR DEMAND PIPING.

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 45 MODULES MODULE TYPE = HANWHA SOLAR Q.PEAK DUO-G6+ (350W) MODULES MODULE WEIGHT = 43.9 LBS / 20.0 KG. MODULE DIMENSIONS = 68.5"X 40.6" = 19.31 SF UNIT WEIGHT OF ARRAY = 2.27 PSF

1'-¹

X

, .CK

AMMANAY #4 TILT - 09° TILT - 153° ZIMUTH - 153°

BILL OF MATERIALS					
EQUIPMENT	QTY	DESCRIPTION			
RAIL	23	IRONRIDGE XR100 RAIL			
SPLICE	12	XR-BONDED SPLICE			
MID CLAMP	74	IRONRIDGE MID CLAMP-UFO			
END CLAMP	32	IRONRIDGE END CLAMP-STOPPER SLEEVES			
ATTACHMENT	86	UNIRAC FLASHLOC RM W/IRON RIDGE TITTLEG			
GROUNDING LUG	08	XR-LUG			



		VERSION				
		DESCRIPTION	DATE	REV		
		INITIAL RELEASE	MM/DD/YYYY	UR		
Stomps	LOGO					
Stamps						

Customer Name Street address, City,State,Zip USA APN# xxxxxxx UTILITY: XXXXXXXXXXX AHJ: XXXXXXXXXXXXX

•											└────┘ ┼
#1 04° 63°	$\overline{\mathbf{V}}$										LEGEND
JTH-0											UM - UTILITY METER MSP - MAIN SERVICE PANEL ACD - AC DISCONNECT INV - INVERTER JB - JUNCTION BOX - CHIMNEY
				ROOF DE	SCRIPTI	ON				\circ	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
	R	DOF TY	ΈE		ROLLED CO	OMP. R	OOF	ARRAY DE	SCRIPTION		ROOF ATTACHMENT
ROOF	ROOF SLOPE	RACI TILT RO	KING TO OF	ROOF AZIMUTH	RAFTER SIZE	RAF SPAC	ter Cing	ARRAY TILT TO HORIZON	ARRAY AZIMUTH		- — — - RAFTER
#1	04°	05	ō°	63°	2"x8"	16" C	D.C.	05°	153°		- FIRE PATHWAY
#2	04°	09	9°	333°	2"x8"	16" C	D.C.	05°	153°		
				SHEET	NAME			SHEE	T SIZE		SHEET NUMBER
<			S	SHEET'S	NAME			AN 11"2	SI B X 17"		PV-2



PHOTOVOLTAIC MODULES

NOTE FOR RF#2 -THE MODULES ARE TILTED TO 09° @ 18" INTER-ROW SPACING WITH REFERNCE TO ROOF ATTAINING 5° TILT WITH REFERENCE TO HORIZON

THE MODULES ARE TILTED TO 5° @ 18" INTER-ROW SPACING WITH REFERENCE TO ROOF & HORIZON

AREA AREA ROOF COVERED BY MODULES (Sq. Ft.) (Sq. Ft.) ARRAY (%) #1 20 386.26 551.85 69.99 #2 25 482.83 660.45 73.11 NOTE FOR RF#1 -

INSTALLATION GUIDELINES AND ENGINEERED SPANS FOR ATTACHMENTS						
	ARRAY AREA & ROOF AREA CALC'S					
	ROOF	# OF		ROOF	ROOF AREA	

PLUMBING VENTS, SKYLIGHTS AND MECHANICAL VENTS SHALL NOT BE COVERED, MOVED, RE-ROUTED OR RE-LOCATED.

NOTE: ACTUAL ROOF CONDITIONS AND RAFTER (OR SEAM)

LOCATIONS MAY VARY. INSTALL PER MANUFACTURER(S)





ATTACHMENT DETAIL FOR RF#1(ENLARGED VIEW) 1

			SCALE: N	NTS			
		VERSION DESCRIPTION DATE INITIAL RELEASE MM/DD/YYYY	REV	Customer Name	SHEET NAME	SHEET SIZE	SHEET NUMBER
Stamps	LOGO			Street address, City,State,Zip USA APN# xxxxxxx UTILITY: XXXXXXXXXX AHJ: XXXXXXXXXXX	SHEET'S NAME	ANSI B 11" X 17"	PV-3

UNIRAC FLASHLOC RM W/IRON RIDGE TITTLEG ATTACHMENT SEE ATTACHED SPEC SHEET

- IRONRIDGE U-FOOT

IRONRIDGE XR100 RAIL





E	SHEET SIZE	SHEET NUMBER
E	ANSI B 11" X 17"	PV-3.1





Ξ	SHEET SIZE	SHEET NUMBER
Ξ	ANSI B 11" X 17"	PV-3.2

(XX) HANWHA SOLAR Q.PE (XX) ENPHASE ENERGY IQ8 (XX) BRANCH OF 12 MODUL (XX) BRANCHES OF 11 MOD	AK DUO-G6+ (350W) MODULE 3PLUS-72-2-US MICRO-INVER .ES & DULES CONNECTED IN PARAL	S TERS .LEL PER BRANCH	REARYARD			
1 BRANCH SCALE	BRANCI (XX) XX LAYOUT 1/8" = 1'-0"	BRANCH #1	RONTYARD SAGE DR	BRANCH #3	MODULES	
Stamps	LOGO	DESCRIPTION DATE REV INITIAL RELEASE MM/DD/YYYY UR	Customer Name Street address, City,State,Zip USA APN# xxxxxxx UTILITY: XXXXXXXXXX	SHEET NAME	ANSI B 11" X 17"	SHEET NUMBER PV-4
			AHJ: XXXXXXXXXXXX			



						~		
			SERVICE INFO.					
UND ZE	GR(WIR	OUND E TYPE	UTILITY PRO MAIN SERVICE VO	VIDER: LTAGE:	DUKE ENERGY 240V			
WG	BAF G	RE CU SND	MAIN PANEL E	BRAND:	N/A (N) 225A			
WG	TH	WN-2		ATING:	(N) 200A			
WG	Tł	IWN	SERVICE FEED SC	DURCE:	OVERHEAD			
Ξ			SHEET SIZE	S	HEET NUMBER			
Ξ			ANSI B 11" X 17"		PV-5			

A WARNING

ELECTRIC SHOCK HAZARD

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

LABEL LOCATION:

AC & DC DISCONNECT AND SUB PANEL (PER CODE: NEC 690.13(B))

WARNING DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:

MAIN SERVICE PANEL & NET METER (PER CODE: NEC 705.12(D)(3), NEC 705.12(B)(3-4) & NEC 690.59)

PHOTOVOLTAIC

AC DISCONNECT

LABEL LOCATION: AC DISCONNECT NEC 690.13(B)

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION: RAPID SHUTDOWN (PER CODE: NEC 690.56(C)(3)

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

LABEL LOCATION: AC DISCONNECT & INVERTER (PER CODE: NEC690.54)

POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS **OVERCURRENT DEVICE**

LABEL LOCATION: SERVICE PANEL IF SUM OF BREAKERS EXCEEDS PANEL RATING (PER CODE: NEC 705.12 (B)(2)(3)(b)

WARNING: PHOTOVOLTAIC **POWER SOURCE**

LABEL LOCATION: **EMT / CONDUIT RACEWAYS** (PER CODE: NEC 690.31(G)(3)

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

LABEL LOCATION: MAIN SERVICE DISCONNECT / UTILITY METER (PER CODE: NEC 690.13(B))

SOLAR F	> \
WITH	R

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY

LABEL LOCATION: AC DISCONNECT, DC DISCONNECT, POINT OF INTERCONNECTION (PER CODE: 605.11.3.1(1) & 690.56(C)(1)(a))

XXXXXX XXXX

		\	VERSION		
		DESCRIPTION	DATE	REV	
		INITIAL RELEASE	MM/DD/YYYY	UR	Customer Name
Stamps	LOGO				Street address, City,State,Zip USA APN# xxxxxxx UTILITY: XXXXXXXXXX AHJ: XXXXXXXXXXX

SHEET'S NAM





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

AT: MAIN SERVICE PANEL, UTILITY METER, AC DISCONNECT & ENPHASE IQ COMBINER 4



SHEET NAME	SHEET SIZE	SHEET NUMBER
HEET'S NAME	ANSI B 11" X 17"	PV-6

- 1. EACH MODULE TO BE GROUNDED USING THE SUPPLIED CONNECTION POINT PER MANUFACTURER'S REQUIREMENTS. ALL SOLAR MODULES, EQUIPMENT, AND METALLIC COMPONENTS ARE TO BE BONDED. IF THE EXISTING GROUNDING ELECTRODE SYSTEM CAN NOT BE VERIFIED OR IS ONLY METALLIC WATER PIPING, IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE.
- 2. ALL PLAQUES AND SIGNAGE REQUIRED BY THE LATEST EDITION OF NATIONAL ELECTRICAL CODE. LABEL SHALL BE METALLIC OR PLASTIC, ENGRAVED OR MACHINE PRINTED IN A CONTRASTING COLOR TO THE PLAQUE. PLAQUE SHALL BE UV RESISTANT IF EXPOSED TO SUNLIGHT.
- 3. DC CONDUCTORS SHALL BE RUN IN EMT AND SHALL BE LABELED, "CAUTION DC CIRCUIT" OR EQUIV. EVERY 5 FT.
- 4. EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH 250.134 OR 250.136(A).
- 5. CONFIRM LINE SIDE VOLTAGE AT ELECTRIC UTILITY SERVICE PRIOR TO CONNECTING INVERTER. VERIFY SERVICE VOLTAGE IS WITHIN INVERTER VOLTAGE OPERATIONAL RANGE.
- 6. OUTDOOR EQUIPMENT SHALL BE NEMA-3R RATED OR BETTER.
- 7. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.
- ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE, AND FOR ROOF-MOUNTED SYSTEMS, WIRING MUST BE PERMANENTLY AND COMPLETELY HELP OFF OF THE ROOF SURFACE. NEC 110.2 - 110.4 / 300.4

		<u> </u>	/ERSION			
		DESCRIPTION	DATE	REV		SHEET NAME
		INITIAL RELEASE	MM/DD/YYYY	UR	Customer Name	
					Street address.	
					City State Zin USA	
Stamps	1.000					SHEET'S NAME
Stamps	LUGU				APN# xxxxxxx OTT	SHEET S NAME
					UTILITY: XXXXXXXXXXX	
					ΔΗΙ·ΧΧΧΧΧΧΧΧΧΧΧΧ	
		1				

Ξ	SHEET SIZE	SHEET NUMBER
E	ANSI B 11" X 17"	PV-7

MECHANICAL SPECIFICATION

Format	68.5 × 40.6 × 1.26 in (including frame) (1740 × 1030 × 32 mm)	*	
Weight	43.9 lbs (19.9 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 × 20 monocrystalline Q.ANTUM solar half cells		
Junction Box	2.09-3.98 × 1.26-2.36 × 0.59-0.71 in (53-101 × 32-60 × 15-18 mm), Protection class IP67, with bypass diodes		
Cable	4 mm² Solar cable; (+) ≥45.3 in (1150 mm), (-) ≥45.3 in (1150 mm)		
Connector	Stäubli MC4, Hanwha Q CELLS HQC4, Amphenol UTX, Renhe 05-6, Tongling TL-Cable01S, JMTHY JM601; IP68 or Friends PV2e; IP67	-+ +- 1.26	6" (3

ELECTRICAL CHARACTERISTICS POWER CLASS 340 MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC¹ (POWER TOLERANCE +5W/-0W) Power at MPP¹ $\mathsf{P}_{\mathsf{MPP}}$ [W] 340 Short Circuit Curre 10.68 [A] l_{sc} Open Circuit Voltage 40.24 Voc [V] 10.16 Current at MPP I MPP [A] Voltage at MPP V_{MPP} [V] 33.45 Efficiency ≥19.0 [%] η MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT 254.5 Power at MPP P_{MPP} [W] Short Circuit Current 8.60 [A] SC Open Circuit Voltage [V] 37.94 Voc 8.00 Current at MPP MDD [A] Voltage at MPP V [V] 31.81 ¹Measurement 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 • ²800

Q CELLS PERFORMANCE WARRANTY



	25 Cr	s. Fuil Warranties in he warranty terms o ales organization of ountry.	f the Q CELLS your respective	111 200 400 600 80 IRRADIAP Ə	00 1000 NCE [W/m²]		
Standard ierros of guarantee for the 10 PV companies with the highest production oppraty in 2014 (se at: September 2014)	EARS			Typical module performance under low in comparison to STC conditions (25°C, 10	rradiance co 100 W/m²)	nditions in	
TEMPERATURE COEFFICIENTS							
Temperature Coefficient of Isc	α	[%/K]	+0.04	Temperature Coefficient of Voc	β	[%/K]	-0.27
Temperature Coefficient of P _{MPP}	Ŷ	[%/K]	-0.36	Normal 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)	Safety Class
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 1703
Max. Design Load, Push / Pull ³	[lbs/ft2]	75 (3600 Pa) / 55 (2667 Pa)	Permitted Module Temperature
Max. Test Load, Push / Pull ³	[lbs/ft2]	113 (5400 Pa)/84 (4000 Pa)	on Continuous Duty
³ See Installation Manual			

UL 1703, VDE Quality Tested, CE-compliant, IEC 61215:2016, IEC 61730:2016, Application Class II, U.S. Patent No. 9,893,215 (solar cells)

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Certified UL 1703

CE

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Number of Modules per Pallet Number of Pallets per 53' Trai Number of Pallets per 40' HC-Pallet Dimensions (L×W×H) Pallet Weight

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service d of this product.



VDE

Q.ANTUM TECHNOLOGY: LOW LEVELIZED COST OF ELECTRICITY

Higher yield per surface area, lower BOS costs, higher

Long-term yield security with Anti LID and Anti PID Technology¹,

power classes, and an efficiency rate of up to 20.1%.

INNOVATIVE ALL-WEATHER TECHNOLOGY

Hot-Spot Protect and Traceable Quality Tra.Q™.

Inclusive 25-year product warranty and 25-year

STATE OF THE ART MODULE TECHNOLOGY

Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

High-tech aluminum alloy frame, certified for high snow

Optimal yields, whatever the weather with

EXTREME WEATHER RATING

A RELIABLE INVESTMENT

linear performance warranty².

(5400 Pa) and wind loads (4000 Pa).

¹ APT test conditions according to IEC/TS 62804-1:2015, method B (–1500 V, 168h) ² See data sheet on rear for further information

excellent low-light and temperature behavior. ENDURING HIGH PERFORMANCE

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<u>S</u>

Rooftop arrays on

commercial/industrial buildings

QCELLS

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



THE IDEAL SOLUTION FOR:

Rooftop arrays on

residential buildings

(P)

Engineered in Germany

powered b Q.ANTUM DUD

340-355

ENDURING HIGH PERFORMANCE

Q.PEAK DUO-G6+

Customer Name Street address, City,State,Zip USA APN# xxxxxxx UTILITY: XXXXXXXXXXXX AHJ: XXXXXXXXXXXXXX

SHEET NAME

SHEET'S NAME

Ē	SHEET SIZE	SHEET NUMBER
Ξ	ANSI B 11" X 17"	PV-8

1	52
er	28
Container	24
	71.5 × 45.3 × 48.0 in (1815 × 1150 × 1220 mm)
	1505lbs (683kg)
epartment for	further information on approved installation and use

Temperature ty	-40°F up to +185°F (-40°C up to +85°C)	
PACKAGING INFORMATION		
r Pallet	32	
3' Treiler	28	

C (IEC) / TYPE 2 (UL)

10.68	10.73	10.79	10.84
40.24	40.49	40.73	40.98
10.16	10.22	10.27	10.33
33.45	33.76	34.07	34.38
≥19.0	≥19.3	≥19.5	≥19.8
254.5	258.2	261.9	265.7
8.60	8.65	8.69	8.74
37.94	38.17	38.41	38.65
8.00	8.04	8.09	8.13
31.81	32.10	32.40	32.69
to IEC 60904-3 •	2800 W/m ² , NMOT, spect	rum AM 1.5	
PERFORMAN	CE AT LOW IRRADIAN	CE	
E 110			

350

350

355

355



345

345



IQ8 Series Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, softwaredefined 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 in advanced 55nm technology with high speed digital logic and has super-fast 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 Enphase IQ Battery, Enphase IQ Gateway, and the Enphase App monitoring and analysis software.





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IQ8SE-DS-0001-01-EN-US-2022-03-01

Stamps

Easy to install

 Lightweight and compact with plug-n-play connectors

DATA SHEET

- 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 highpowered PV modules

Microgrid-forming

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

IQ8 Series Microinverters

INPUT DATA (DC)		108-60-2-US	108PLUS-72-2-US	108M-72-2-US	108A-72-2-US	108H-240-72-2-US	108H-208-72-2-US1
Commonly used module pairings ²	W	235 - 350	235 - 440	260 - 460	295 - 500	320 - 540+	295 - 500+
Module compatibility		60-cell/120 half-cell		60-cell/120) half-cell, 66-cell/132	2 half-cell and 72-cell/	144 half-cell
MPPT voltage range	۷	27 - 37	29 - 45	33 - 45	36 - 45	38 - 45	38 - 45
Operating range	v	25 - 48			25 - 58		
Min/max start voltage	v	30 / 48			30 / 58		
Max input DC voltage	v	50			60		
Max DC current ³ [module lsc]	А				15		
Overvoltage class DC port					II		
DC port backfeed current	mA				0		
PV array configuration		1x1 Ungrounded a	array; No additional D	C side protection requ	uired; AC side protecti	on requires max 20A p	er branch circuit
OUTPUT DATA (AC)		IQ8-60-2-US	IQ8PLUS-72-2-US	108M-72-2-US	108A-72-2-US	IQ8H-240-72-2-US	IQ8H-208-72-2-US
Peak output power	VA	245	300	330	366	384	366
Max continuous output power	VA	240	290	325	349	380	360
Nominal (L-L) voltage/range⁴	v			240 / 211 - 264			208 / 183 - 250
Max continuous output current	А	1.0	1.21	1.35	1.45	1.58	1.73
Nominal frequency	Hz			e	50		
Extended frequency range	Hz			50	- 68		
Max units per 20 A (L-L) branch circuit ⁵		16	13	11	11	10	9
Total harmonic distortion				<	5%		
Overvoltage class AC port					III		
AC port backfeed current	mA			3	30		
Power factor setting				1	.0		
Grid-tied power factor (adjustable)				0.85 leading	– 0.85 lagging		
Peak efficiency	%	97.5	97.6	97.6	97.6	97.6	97.4
CEC weighted efficiency	%	97	97	97	97.5	97	97
Night-time power consumption	mW			e	50		
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				М	C4		
Dimensions (HxWxD)			2	212 mm (8.3") x 175 mm	n (6.9") x 30.2 mm (1.2	")	
Weight				1.08 kg	(2.38 lbs)		
Cooling				Natural conve	ection - no fans		
Approved for wet locations				Y	es		
Acoustic noise at 1 m		<60 dBA					
Pollution degree				P	D3		
Enclosure			Class II dou	uble-insulated, corros	ion resistant polymeri	c enclosure	
Environ. category / UV exposure rating				NEMA Туре	6 / outdoor		
COMPLIANCE							
		CA Rule 21 (UL 1741-5	SA), UL 62109-1, UL174	1/IEEE1547, FCC Part	15 Class B, ICES-000	3 Class B, CAN/CSA-0	C22.2 NO. 107.1-01
Certifications		This product is UL Lis	sted as PV Rapid Shut	Down Equipment and	d conforms with NEC 2	014, NEC 2017, and NE	C 2020 section

(1) The IQ8H-208 variant will be operating in grid-tied mode only at 208V AC. (2) No enforced DC/AC ratio. See the compatibility calculator at https://link.enphase.com/module-compatibility (3) Maximum continuous input DC current is 10.6A (4) Nominal voltage range can be extended beyond nominal if required by the utility. (5) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

manufacturer's instructions.

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	DESCRIPTION	DATE	REV
	INITIAL RELEASE	MM/DD/YYYY	UR
1000			
LUGU			

IQ8 Series Microinverters redefine reliability

standards with more than one million

cumulative hours of power-on testing, enabling an industry-leading limited warranty

IQ8 Series Microinverters are UL Listed as

with various regulations, when installed

according to manufacturer's instructions.

PV Rapid Shut Down Equipment and conform

VERSION

of up to 25 years.

(UL)

CERTIFIED

Customer Name Street address, City,State,Zip USA APN# xxxxxxx UTILITY: XXXXXXXXXXXX AHJ: XXXXXXXXXXXXX

SHEET NAME

SHEET'S NAME

Ξ	SHEET SIZE	SHEET NUMBER
Ξ	ANSI B 11" X 17"	PV-10

IQ8SE-DS-0001-01-EN-US-2022-03-01

	97.5	97	97
60			
: (-	40°F to +140°F)		
(c	ondensing)		
1C	4		
n (6.9") x 30.2 mm (1.2	")	
(2.	38 lbs)		
ect	ion – no fans		
/es			
) d	BA		
D	3		
sio	n resistant polymeri	c enclosure	
e 6	/ outdoor		

Enphase IQ Combiner 4/4C

X-IQ-AM1-240-4 X-IQ-AM1-240-4C



LISTED

To learn more about Enphase offerings, visit enphase.com

The Enphase IQ Combiner 4/4C with Enphase

IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure and streamlines IQ microinverters and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.

Smart

- · Includes IQ Gateway for communication and control
- Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), included only with IQ
- Combiner 4C
- · Includes solar shield to match Enphase IQ Battery aesthetics and deflect heat
- Flexible networking supports Wi-Fi,
- Ethernet, or cellular
- · Optional AC receptacle available for PLC bridge Provides production metering and consumption monitoring

Simple

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

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- Two years labor reimbursement program coverage included for both the IQ Combiner SKU's
- UL listed

Enphase IQ Combiner 4/4C

MODEL NUMBER	
IQ Combiner 4 (X-IQ-AM1-240-4)	IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV p C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C)	IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade P (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase Mobile Con (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modern for systems up to (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is ad the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Com
ACCESSORIES AND REPLACEMENT PARTS	(not included, order separately)
Ensemble Communications Kit COMMS-CELLMODEM-M1-06 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	 Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites 4G based LTE-M1 cellular modem with 5-year Sprint data plan 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V BRK-15A-2-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-50A-2P-240V-B	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 4/4C
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Gateway printed circuit board (PCB) for Combiner 4/4C
X-IQ-NA-HD-125A	Hold down kit for Eaton circuit breaker with screws.
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. total branch circuit breaker rating (input)	80A of distributed generation / 95A with IQ Gateway breaker included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway
Consumption monitoring CT (CT-200-SPLIT)	A pair of 200 A split core current transformers
MECHANICAL DATA	
Dimensions (WxHxD)	37.5 x 49.5 x 16.8 cm (14.75" x 19.5" x 6.63"). Height is 21.06" (53.5 cm) with mounting braining brai
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors 60 A breaker branch input: 4 to 1/0 AWG copper conductors Main lug combined output: 10 to 2/0 AWG copper conductors Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modern Mobile Connect cellular modern is required for all Ensemble installations.
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
compliance, IQ Combiner	UL 1/41, CAN/CSA C22.2 No. 10/1, 47 CHR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production) Consumption metering: accuracy class 2.5
Compliance, IQ Gateway	UL 60601-1/CANCSA 22.2 No. 61010-1

To learn more about Enphase offerings, visit enphase.com

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SHEET'S NAME

Ξ	SHEET SIZE	SHEET NUMBER
Ξ	ANSI B 11" X 17"	PV-11



E-M1 cellular modem). Note that an Enphase

n) with mounting brackets.

rated revenue grade PV production metering es Enphase Mobile Connect cellular modem dem for systems up to 60 microinverters. ands, where there is adequate cellular service in ery and IQ System Controller and to deflect heat.

ed revenue grade PV production metering (ANSI solar shield to match the IQ Battery system and



			VERSION			
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E	ANSI B 11" X 17"	PV-12

FLASHLOC[™] **RM** THE STRONGEST ATTACHMENT FOR EVERY FLAT ROOF



BETTER SOLAR STARTS HERE

YEAF

Unirac's **FLASH**LOC[™] **RM** is a lightweight, durable, powder-coated cast aluminum roof attachment solution that provides fast, easy installation and helps save labor cost. **FLASH**LOC[™]**RM** is compatible with most roofing materials and is applicable for almost all solar racking form factors. Rigorous mechanical, sealing, and ease-of-install testing has been successfully completed for assurance of long-term reliability.

FEATURES

FLASHLOC[™] Technology – no more membrane SKUs or heat welding

- Works for all roof types see Chemlink M-1's compatibility for details
- Labor and attachment savings
- Industry-leading install time
- 6,600-lb. uplift offset (ultimate)
- Includes 8 fastener holes
- Attachment can accommodate roofing screw sizes #12 #15
- 25-year warranty

PRODUCT SPECIFICATIONS

- 7.5" diameter X 0.94" height
- Included hardware: 1 preassembled bolt and washer
- Chemlink M-1 and 1-Part included in kit

DESCRIPTION LIST PRICE PACK SIZE PART NUMBER 310999 FLASHLOC RM KIT \$44.00 ea. 10

*Check with your local distributor for finalized pricing.







FILL WITH CHEMLINK 1-PART & PLACE CAP

STEP ONE CLEAN SURFACE AND MARK LOCATION

-IMPORTANT: Thoroughly clean roof surface with isopropyl alcohol or denatured alcohol. Bonding surfaces should be clean, dry and free of dirt or contamination. Remove all previously applied caulk, mastic or other contaminants with a wire brush. Brush away all gravel or loose granules.

-Mark center point locations on the roof. **NOTE:** We recommend locating Flashloc RM after your equipment has been installed or layout is confirmed.

STEP TWO APPLY M1 SEALANT

-Apply a 5/16" bead of Chemlink M1 sealant to the entire bottom perimeter AND to the bottom of each bolt location to be used. Tool M1 sealant bead to form a smooth surface along the entire bottom perimeter. Refer to Chemlinks application guidelines with temperatures below 40 degrees F.

ROOF SUBSTRATES MEMBRANES PRIOR TO INSTALLATION.

STEP THREE SECURE ATTACHMENT

- Align mount using alignment marks on roof and base. Using fasteners specified by your P.E. of record, securely fasten attachment to the roof. Drive screws down until the base is firmly attached to the roof and the M1 sealant expands beyond the outer perimeter of the base.

- Tool M1 sealant bead around entire perimeter to form a smooth fillet. TIP: Use caution to avoid over-torqueing the screws.

STEP FOUR FILL BASE WITH CHEMLINK 1-PART

-Completely fill base with Chemlink 1-Part sealant. Sealant must completely cover all screw heads. Do NOT overfill.

- Place cap on base and secure racking to mount with Unirac provided 3/8" hardware or other 3/8"-16 threaded hardware as specified by the P.E. of record.

-IMPORTANT: To ensure robust sealing over the life of the product, the maximum allowed gap between attachment kit strut and the top surface of the flat roof attachment is 1/16".

FASTER INSTALLATION. 25-YEAR WARRANTY.

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

FASTER INSTALLATION. 25-

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRA

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SHEET NAM

SHEET'S NAM



STEP 1



FLASHLOC[™] **RM**





-IMPORTANT: CHEMLINK TPO PRIMER MUST BE USED ON TPO SINGLE-PLY

R WARRANTY.	
DR CALL (505) 248-2702	
SHEET SIZE	SHEET NUMBER
ANSI B 11" X 17"	PV-13
	R CALL (505) 248-2702 SHEET SIZE ANSI B 11" X 17"

Cut Sheet



Tilt Leg



ITEM NO	DESCRIPTION	QTY IN KIT
1	BOLT, BONDING 3/8-16 SQ HEAD, 2.25"	1
2	NORTH TILT LEG, 1.5" SQ, LENGTH VARIES	1
3	NUT, FLANGE HEX 3/8-16 SS	3
4	BOLT, BONDING 3/8-16 SQ HEAD, 1.0"	1
5	PRE-ASSEMBLED SOUTH TILT LEG	1
6	WASHER, FLAT 3/8 SS	1
7	BOLT, 3/8-16 X 2.5" CS SST	1
8	U-FOOT	1

TILT MOUNT KIT OPTIONS

PART NUMBER	DESCRIPTION	NORTH TILT LEG LENGTH
TM-FTL-010	Kit, Fixed Tilt Leg, 10", Mill	10"
TM-FTL-015	Kit, Fixed Tilt Leg, 15", Mill	15"
TM-FTL-020	Kit, Fixed Tilt Leg, 20", Mill	20"
TM-FTL-025	Kit, Fixed Tilt Leg, 25", Mill	25"
TM-FTL-030	Kit, Fixed Tilt Leg, 30", Mill	30"
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Ξ	ANSI B 11" X 17"	PV-14



XR100 Rail

Cut Sheet



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MASTER CONTRACT: 266909 REPORT: 70131735 PROJECT: 80096297

- Edition 1:September 20, 2017; Project 70131735– Albuquerque
Issued by Michael Hoffnagle
- Edition 14: October 9, 2021; Project 80089428 Irvine Prepared By: Michael Hoffnagle Authorized By: Michael Hoffnagle
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Report pages reissued

Contents: Certificate of Compliance - Pages 1 to 6 Supplement to Certificate of Compliance - Pages 1 to 2 Description and Tests - Pages 1 to 25 Att1 Installation Manual SM– Pages 1 to 36 Att2 Schematics SM/ULA– Pages 1 to 64 Att3 Installation Manual ULA– Pages 1 to 21 Att4 RM5_Installation Guide - 1 to 16 Att5 RMDT_Installation Guide - 1 to 17 Att6 RM series schematics – 1 to 26 Att7 Installation Manual, GFT Shared Rail – Pages 1 to 39 Att8 Installation Manual, GFT 4-Rail – Pages 1 to 38 Att9 GFT Schematics – Pages 1 to 42 Att10 NXT Horizon Installation Manual – Pages 1 to 21 Att11 Schematics NXT Horizon – Pages 1 to 13

PRODUCTS

CLASS - C531302 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems - PHOTOVOLTAICS-PV Racking and clamping systems - Certified to US Standards

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DQD 507.10 Rev 2021-09-27

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Electrical Bonding and Grounding Test Modules

The list below is not exhaustive of compliant modules but shows those that have been evaluated and found to be electrically compatible with the SOLARMOUNT system.

Manufacture	Module Model / Series	Manufacture	Module Model / Series	Manufacture	Module Model / Series
Aleo	P-Series & S-Series	GCL	GCL-P6 & GCL-M6 Series		LR4-60HPH, LR4-72HPH,
Astronergy	CHSM6612 M, M/HV CHSM6612P Series CHSM6612P/HV Series	Hanwha SolarOne Hansol	HSL 60 TD-AN3, TD-AN4, UB-AN1, UD-AN1	LONGi	LR6 -60, LR6 -60HV, LR6 -6 LR6 -72, LR6 -72PH, LR6-6 LR6-60PB, LR6-60PE, LR6
	CHSM72M-HC, AXN6M610T,	Heliene	36M, 36P 60M, 60P, 72M & 72P Series		RealBlack LR4-60HPB, RealBlack LR6-60HPB
Auxin	AXN6P610T, AXN6M612T AXN6P612T	HT72-156(H/F), HT72-156P-C HT Solar HT72-156P(V)-C HT60-156M-C	Mission Solar Energy	MSE Mono, MSE Perc	
Axitec	AXI Power, AXI Premium, AXI Black Premium		HT60-156M-C, HT60-156M(V)-C	Mitsubishi	MJE & MLE Series
Boviet	BVM6610, BVM6612	Hvundai	KG, MG, RW, TG, RJ, RG, TJ, KJ Series	Neo Solar Power Co.	D6M Series
BYD	P6K & MHK-36 Series	ITEK	iT-SE Series		VBHNxxxSA06/SA06B/SA
	CS6P-M, CS6P-P, CSX-P, CS5A-M, CS6U-P, CS6U-M, CS6K-MS, CS6K-M, CS6K-P, ELPS CS6A-MM, ELPS CS6P-MM, CS3U-P, JAP6 60-xxx,	Panasonic	VBHNxxxSA15/SA15B/SA VBHNxxxKA, VBHNxxxKA VBHNxxxSA17/SA17G/SA VBHNxxxZA01/ZA02/ZA0		
	CS3U-MS, CS3K-P, CS3K-MS, CS1K-MS, CS3K- MB, CS3K-DB, CS3U-MB, CS3W-D, CS3U-D		JAM6(K)-60/xxx, JAP6(k)-72-xxx/4BB, JAP72SYY-xxx/ZZ	Peimar	SGxxxM (FB/BF)
Canadian Solar	CS3U-PB, CS1H-MS, CS3U-MS, CS3U-PB-AG,		JAP6(k)-60-xxx/4BB, JAP60SYY-xxx/ZZ,	Phono Solar	Standard Modules
	CS3U-MB-AG, CS3K-PB-AG, CS3K-MB-AG, CS3W-P-PB-AG, CS1H-MS, CS1U-MS, CS3U-P HE, CS3K-P HE, CS6U-P HE, CS6K-P HE, CS6K-MS AllBlack, ELPS CS6P-MM, ELPS CS6A-MM	JA Solar	JAM6(k)-72-xxx/ZZ, JAM72SYY-xxx/ZZ, JAM6(k)-60-xxx/ZZ, JAM60SYY-xxx/ZZ. i. YY: 01, 02, 03, 09, 10 ii. ZZ: SC, PR, BP, HiT, IB, MW YY = Backsheet, ZZ Cell technology	Q.Cells	Plus, Pro, Peak, G3, G4, Peak G5, G6(+), G7, G8(+), Plus, Pro, Peak L-G2, L-G4, Peak L-G5, L-G6, L-G7
Centrosolar America	C-Series & E-Series	Jinko	JKM & JKMS Series		RECxxxTP72, RECxxxTP
CertainTeed	CT2xxMxx-01, CT2xxPxx-01, CTxxxMxx-01, CTxxxPxx-01, CTxxxMxx-02, CTxxxMxx-03 CTxxxMxx-04, CTxxxHC11-04	Kyocera KD-F & KU Series N1C-G4, N1K-G4, N2W-G4, S1C-G4,S2W-G4, N1C-A5, N1K-A5, N2W-A5, N2T-A5, E1C-A5, Q1C-A5, Q1K-A5, S1C-A5, S2W-A5,	REC	RECXXXPE72, RECXXXPE RECXXXTP2S72, RECXXXTF RECXXXTP2 RECXXXTP2 RECXXXNP (N-PEAK)	
Eco Solargy	Orion 1000 & Apollo 1000		Renesola	All 60-cell modules	
ET Solar	ET AC Module, ET Module		N1K-V5, E1K-A5, N1K-V5, N1C-V5, Q1C-V5,	Risen	RSM Series
Flextronics	FXS-xxxBB		N2T-J5, N2W-B3	S-Energy	SN72 & SN60 Series

• The frame profile must not have any feature that might interfere with the bonding devices that are integrated into the racking system

• Use with a maximum over current protection device OCPD of 30A

• Please see the SM UL2703Construction Data Report at Unirac.com to ensure the exact solar module selected is approved for use with SM

• Listed models can be used to achieve a Class A fire system rating, for steep slope applications, only when modules fire typed 1, 2, 3, or 10. See appendix A, page A

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LR6 - 72HV, 60PH, 60BK, 5-72BK,
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P2 BLK2,

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E ANSI B PV-1	7



Certificate of Compliance

The products listed below are eligible to bear the CSA Mark shown with

adjacent indicators 'C' and 'US' for Canada and US or with adjacent

indicator 'US' for US only or without either indicator for Canada only.

CLASS - C531382 - POWER SUPPLIES- PHOTOVOLTAICS PV Racking and clamping systems-Certified

portrait orientations.

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PV modules.

Certificate: 70131735

Master Contract: 266909

Project:

Issued To:

PRODUCTS

to US Standards

SM

ULA

Models:

Solarmount

DQD 507 Rev. 2019-04-30

2021-07-14

Attention: Klaus Nicolaedis

Albuquerque, New Mexico, 87102

CLASS - C531302 - POWER SUPPLIES- PHOTOVOLTAICS- PV Racking

1411 Broadway NE

United States

Date Issued:

80090260

Unirac

Issued by: Michael Hoffnagle Michael Hoffnagle



The system listed is designed to provide bonding/grounding, and mechanical stability for photovoltaic modules. The system is secured to the roof with the L-Foot components through the roofing material to building structure. Modules are secured to the racking system with stainless steel or aluminum mid clamps and Aluminum end clamps. The modules are bonded to the racking system with the stainless-steel bonding mid clamps with piercing points. The system is grounded with 10 AWG copper wire to bonding/grounding lugs. Fire ratings of Class A with Type 1, 2, 3, 10, 19, 22 or 25 for steep slope. Tested at 5" interstitial gap which allows installation at any stand-off height.

The grounding of the system is intended to comply with the latest edition of the National Electrical Code, to include NEC 250 & 690. Local codes compliance is required, in addition to national codes. All grounding/bonding connections are to be torqued in accordance with the Installation Manual and the settings used during the certification testing for the current edition of the project report.

The system may employ optimizers/micro-inverters and used for grounding when installed per installation instructions.

UL 2703 Mechanical Load ratings:

Certificate: 70131735

Project: 80090260

Downward Design Load (lb/ft ²)				
Upward Design Load (lb/ft ²)				
Down-Slope Load (lb/ft ²)				

Test Loads:

Downward Load (lb/ft ²)				
Upward Load (lb/ft ²)				
Down-Slope Load (lb/ft2	?)			

Unirac Large Array

ULA is a ground mount system using the SolarMount (SM) platform for the bonding and grounding of PV modules. ULA aluminum components merge with SM rails and installer-supplied steel pipe. The SM rail system is secured to the horizontal Pipe using the Rail Bracket components. The Rear and Front cap secures the horizontal Pipe to the vertical Pipe. The Front cap is also used to secure the Cross brace. A Slider is attached to the vertical Pipe to secure the Cross brace. The SM rails, caps, slider, rail brackets, and cross braces materials are 6105-T5 aluminum extrusion. Fasteners materials are 304 stainless steel. Horizontal and vertical pipe materials meet the minimum requirements of ASTM A53 for galvanized steel pipe in 2" and 3" diameter.

The mechanical load ratings from the SM test data will be applied to the ULA model.

Fire Testing is not applicable due to being a ground mount system.

DQD 507 Rev. 2019-04-30

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SOLARMOUNT Flush-to-Roof is an extruded aluminum rail PV

racking system that is installed parallel to the roof in landscape or

SolarMount (SM) platform for the bonding and grounding of

Unirac Large Array is a ground mount system using the

Master Contract: 266909 Date Issued: 2021-07-14

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Page 2

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