

144HC M10 Bifacial Module

144 Half-Cut Monocrystalline 520W - 540W



Utilizes the latest M10 size super high efficiency Monocrystalline PERC cells. Half cut design further reduces cell to module (CTM) losses.

Stability & Looks

Rugged, double webbed frame design withstands wind, snow, and other mechanical stresses. Framed Glass-Backsheet aesthetic is ideal for high visibility installation.

Anti-Reflective

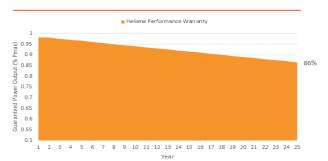
Premium solar glass with anti reflective coating delivers more energy throughout the day

High Reliability

Proven resistance to PID and reliable in high temperature and humidity environments.

No Compromise Guarantee

15 Year Workmanship Warranty 25 Year Linear Performance Guarantee



Manufactured Using International Quality System Standards: ISO9001

Half-Cut Design with Split Junction Box Technology

Bifacial Technology Enabling Additional Energy Harvest from Rear Side

1500V System Voltage Rating

World-class Quality

- Heliene's fully automated manufacturing facilities with state-of-the-art robotics and computer aided inspection systems ensure the highest level of product quality and consistency
- All manufacturing locations are compliant with international quality standards and are ISO 9001 certified
- Heliene modules have received Top Performer rankings in several categories from PV Evolution Labs (PV EL) independent quality evaluations

Bankable Reputation

- Established in 2010, Heliene is recognized as highly bankable Tier 1 manufacturer of solar modules and has been approved for use by the U.S. Department of Defense, U.S. Army Corps of Engineers and from numerous top tier utility scale project debt providers
- By investing heavily in research and development, Heliene has been able to stay on the cutting edge of advances in module technology and manufacturing efficiency

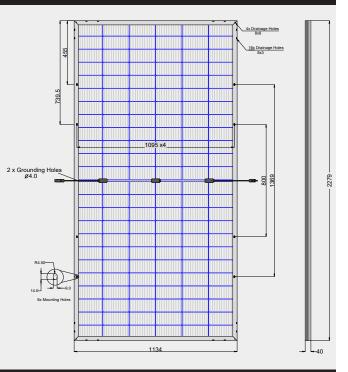
Local Sales, Service, and Support

- With sales offices across the U.S. and Canada, Heliene prides itself on unsurpassed customer support for our clients. Heliene has become the brand of choice for many of the leading residential installers, developers and Independent Power Producers due to our innovative technology, product customization capability and just in time last-mile logistics support
- Local sales and customer support means answered phone calls and immediate answers to your technical and logistics questions. We understand your project schedules often change with little warning and endeavor to work with you to solve your project management challenges

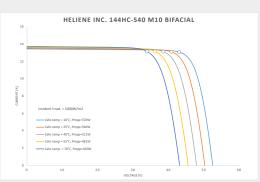


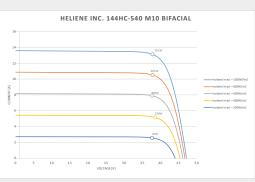


Dimensions for 144HC M10 Bifacial Series Modules



I-V Curves for 144HC M10 Bifacial Series Modules





Certifications & Listing







Electrical Data (STC)

Peak Rated Power	P _{mpp} (W)	540	535	530	525	520
Maximum Power Voltage	$V_{mpp}(V)$	42.32	42.13	41.94	41.75	41.56
Maximum Power Current	I _{mpp} (A)	12.77	12.70	12.64	12.58	12.52
Open Circuit Voltage	$V_{oc}(V)$	50.22	49.97	49.72	49.23	48.73
Short Circuit Current	Isc (A)	13.50	13.44	13.37	13.32	13.28
Module Efficiency *	Eff (%)	20.9	20.7	20.5	20.3	20.1
Maximum Series Fuse Rating	MF (A)	30	30	30	30	30
Power Output Tolerance	[- 0/+3%]					
Bifaciality Factor			70%			

STC - Standard Test Conditions: Irradiation 1000 W/m2 - Air mass AM 1.5 - Cell temperature 25 °C

Electrical Data (NMOT)

Maximum Power	P _{mpp} (W)	400	395	390	385	380
Maximum Power Voltage	$V_{mpp}(V)$	39.19	38.58	38.58	37.97	37.96
Maximum Power Current	I _{mpp} (A)	10.21	10.24	10.11	10.14	10.01
Open Circuit Voltage	V _{oc} (V)	47.13	46.89	46.66	46.20	45.73
Short Circuit Current	Isc (A)	10.87	10.82	10.77	10.72	10.70

NMOT - Nominal Module Operating Temperature: Irradiance at 800W/m2, Ambient Temperature 20°C, Wind speed 1m/s

Mechanical Data

Solar Cells	144 Half Cut, M10, 182mm, PERC Cells
Module Construction	Framed Glass-Backsheet
Dimensions (L x W x D)	2279 x 1134 x 40 mm (89.72 x 44.65 x 1.6 inch)
Weight	29.2 kg (64.3 lbs)
Frame	Double Webbed 15-Micron Anodized Aluminum Alloy
Glass	3.2mm Low-Iron Content, High-Transmission, PV Solar Glass with Anti Reflective Coating
Junction Box	IP-68 rated with 3 bypass diodes
Output Cables	0.3-meter Symmetrical Cables
Connectors	Multi-Contact/ Stäubli MC4

Certifications

UL Certification

UL61215, UL61730

Maximum Ratings

Operational Temperature

Max System Voltage

Mech. Load Test (Front)

Mech. Load Test (Back)

Fire Type

Temperature Ratings

Nominal Operating Cell	+45°C
Temperature (NOCT)	(±2°C)
Temperature Coefficient of $P_{\scriptscriptstylemax}$	-0.36%/°C
Temperature Coefficient of $V_{\rm oc}$	-0.28%/°C
Temperature Coefficient of I _{sc}	0.034%/°C

Warranty

15 Year Manufacturer's Workmanship Warranty25 Year Linear Power Guarantee

Packaging Configuration

-40°C to +85°C 1500V

113 psf / 5400 Pa

50 psf / 2400 Pa

Type 1

Modules per box: 27 pieces
Modules per 53' trailer: 702 pieces







SOLECTRIA® XGI 1500-166 SERIES

PREMIUM 3-PHASE TRANSFORMERLESS UTILITY-SCALE INVERTERS

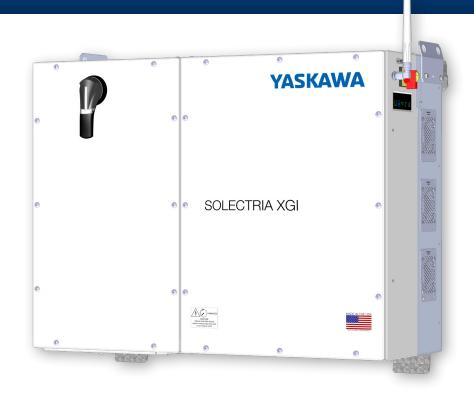
FEATURES

- Made in the USA with global components
- Buy American Act (BAA) compliant
- · Four models:
 - 125kW/125kVA,
 - · 125kW/150kVA,
 - · 150kW/166kVA,
 - · 166kW/166kVA
- Additional models available certified to UL1699b, Photovoltaic DC Arc-Fault Circuit Protection
- 99.0% peak efficiency
- Flexible solution for distributed and centralized system architecture
- Advanced grid-support functionality Rule 21/UL1741SB
- Robust, dependable, & built to last
- Lowest O&M and installation costs
- Access all inverters on site via WiFi from one location
- Remote diagnostics and firmware upgrades
- SunSpec Modbus Certified
- Tested compatible with the TESLA PowerPack Microgrid System app for system visibility

OPTIONS

- String combiners for distributed and centralized systems
- Web-based monitoring
- Extended warranty





Yaskawa Solectria Solar's XGI 1500 utility-scale string inverters are designed for high reliability and built of the highest quality components that were selected, tested and proven to last beyond their warranty.

XGI 1500 inverters provide advanced grid-support functionality and meet the latest IEEE 1547 and UL1741SB standards for safety. They are the most powerful 1500 VDC string inverters in the PV market and have been engineered for both distributed and centralized system architecture.

Designed and engineered in Lawrence, MA, XGI inverters are assembled and tested at Yaskawa America's facilities in Buffalo Grove, IL. They are Made in the USA with global components and are compliant with the Buy American Act.



SOLECTRIA® XGI 1500-166 SERIES TECHNICAL DATA

SPECIFICATIONS

SOLECTRIA XGI 150	00 Model	XGI 1500-125/125-UL XGI 1500-125/125-UL-A	XGI 1500-125/150-UL XGI 1500-125/150-UL-A	XGI 1500-150/166-UL XGI 1500-150/166-UL-A	XGI 1500-166/166-UL XGI 1500-166/166-UL-		
	Absolute Max Input Voltage	1500 VDC	1500 VDC	1500 VDC	1500 VDC		
	Max Power Input Voltage Range (MPPT)	860-1250 VDC	860-1250 VDC	860-1250 VDC	860-1250 VDC		
	Operating Voltage Range (MPPT)	860-1450 VDC 860-1450 VDC		860-1450 VDC	860-1450 VDC		
Number of MPP Trackers DC Input Max Operating Input Current		1 MPPT	1 MPPT	1 MPPT 1 MPPT			
		148.3 A 148.3 A		178.0 A 197.7 A			
	Max Operating PV Power	128 kW	128 kW	153 kW	170 kW		
	Max DC/AC Ratio Max Rated PV Power	2.6 332 kW	2.6 332 kW	2.2 332 kW	2.0 332 kW		
	Max Rated PV Short-Circuit Current (ΣIsc x 1.25)	500 A	500 A	500 A	500 A		
	Nominal Output Voltage	600 VAC, 3-Ph	600 VAC, 3-Ph	600 VAC, 3-Ph	600 VAC, 3-Ph		
	AC Voltage Range	-12% to +10%	-12% to +10%	-12% to +10%	-12% to +10%		
	Continuous Real Output Power	125 kW	125 kW	150 kW	166 kW		
	Continuous Apparent Output Power	125 kVA	150 kVA	166 kVA	166 kVA		
	Max Output Current	120 A	144 A	160 A	160 A		
C Output	Nominal Output Frequency	60 Hz	60 Hz	60 Hz	60 Hz		
	Power Factor (Unity default)	+/- 0.80 Adjustable	+/- 0.80 Adjustable	+/- 0.80 Adjustable	+/- 0.80 Adjustable		
	Total Harmonic Distortion (THD) @ Rated Load	<3%	<3%	<3%	<3%		
	Grid Connection Type	3-Ph + N/GND	3-Ph + N/GND	3-Ph + N/GND	3-Ph + N/GND		
	Fault Current Contribution (1 cycle RMS)	144 A	173 A	192 A	192 A		
	Peak Efficiency	98.9%	98.9%	99.0%	99.0%		
fficiency	CEC Average Efficiency	98.5%	98.5%	98.5%	98.5%		
	Tare Loss	2.75 W	2.75 W	2.75 W	2.75 W		
	Ambient Temp Range	-40°F to 140°F	(-40C to 60C)	-40°F to 140°F	(-40C to 60C)		
	De-Rating Temperature	122°F	(50C)	113°F	(45C)		
emperature	Storage Temperature Range	-40°F to 167°F	(-40C to 75C)	-40°F to 167°F	(-40C to 75C)		
	Relative Humidity (non-condensing)	0 - 9	95%	0 - 9	95%		
	Operating Altitude	Full Power up t	to 9,840 ft (3.0 km); De-Rat	e to 70% of Full Power at 13	,123 ft (4.0 km)		
	Advanced Graphical User Interface		W	ïFi			
	Communication Interface		Ethe	ernet			
ommunications	Third-Party Monitoring Protocol		SunSpec Mo	odbus TCP/IP			
	Web-Based Monitoring		Opti	onal			
	Firmware Updates		Remote o	and Local			
	Safety Listings & Certifications	UL 1699i	UL1741SB, IEEE 1547, b Photovoltaic Arc-Fault Cir	UL 1998 (All models) cuit Protection Certified (-A	models)		
esting &	Advanced Grid Support Functionality		Rule 21, l	JL 1741SB			
ertifications	Testing Agency	ETL					
	FCC Compliance	FCC Part 15 (Subpart B, Class A)					
/arranty	Standard and Options	5 Years Standard; Option for 10 Years					
	Acoustic Noise Rating		73 dBA @ 1 m	; 67dBA @ 3 m			
	DC Disconnect	Integrated 2-Pole 250 A DC Disconnect					
nclosure	Mounting Angle	Vertical only					
inclusure	Dimensions	Height: 29.5 in. (750 mm) Width: 39.4 in. (1000 mm) Depth: 15.1 in. (380 mm)					
	Weight	270 lbs (122 kg)					
	Enclosure Rating and Finish Type 4X, Polyester Powder-Coated Aluminum						







SOLAR GROUND MOUNT SYSTEM AT

JEREMY HILL ROAD, STONINGTON, CT 06378





TOTAL SYSTEM SUMMARY:

TOTAL DC SYSTEM SIZE: 5,573.880 kWDC TOTAL AC SYSTEM SIZE: 4,750.000 kWAC

MODULE MANUFACTURER: (QTY) MODULE TYPE:

HELIENE

(10,322) 144HC-M10 540W BIFACIAL

MODULE TILT: MODULE AZIMUTH: SINGLE AXIS TRACKER -15°

INVERTER MANUFACTURER:

SOLECTRIA

(QTY) INVERTER TYPE:

(38) XGI 1500-125/125-UL

SUBSYSTEM SUMMARIES:

SYSTEM A
DC SYSTEM SIZE: 2,709.720 kWDC
AC SYSTEM SIZE: 2,375.000 kWAC SYSTEM B
DC SYSTEM SIZE: 2,864.160 kWDC
AC SYSTEM SIZE: 2,375.000 kWAC

NOTES SPECIFIC TO CONNECTICUT

ADOPTED NEC VERSION: 2020 ADOPTED IBC VERSION: 2021 ADOPTED IFC VERSION: 2021

SCOPE OF WORK SUMMARY

GROUND MOUNT PV ARRAY:

• INSTALL SOLAR MODULES AND RACKING SYSTEM ON GROUND LEVEL. INSTALL INVERTERS AND ELECTRICAL DISTRIBUTION EQUIPMENT.

INTERCONNECT AT NEW UTILITY SERVICE



127 WASHINGTON AVENUE WEST BUILDING, GARDEN LEVEL NORTH HAVEN, CT 06473

ENGINEERED BY:



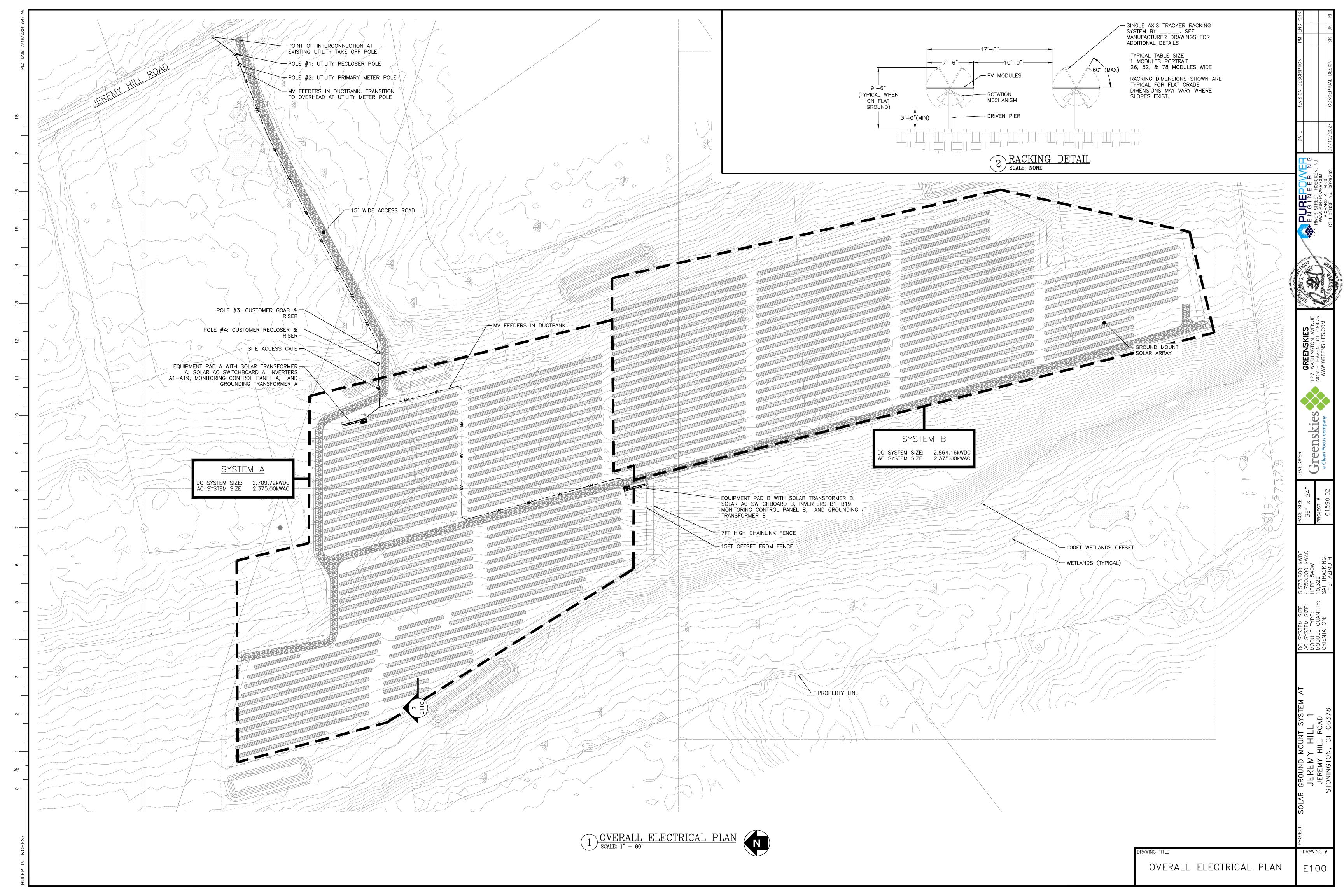
111 RIVER STREET, SUITE 1110 HOBOKEN, NEW JERSEY 07030

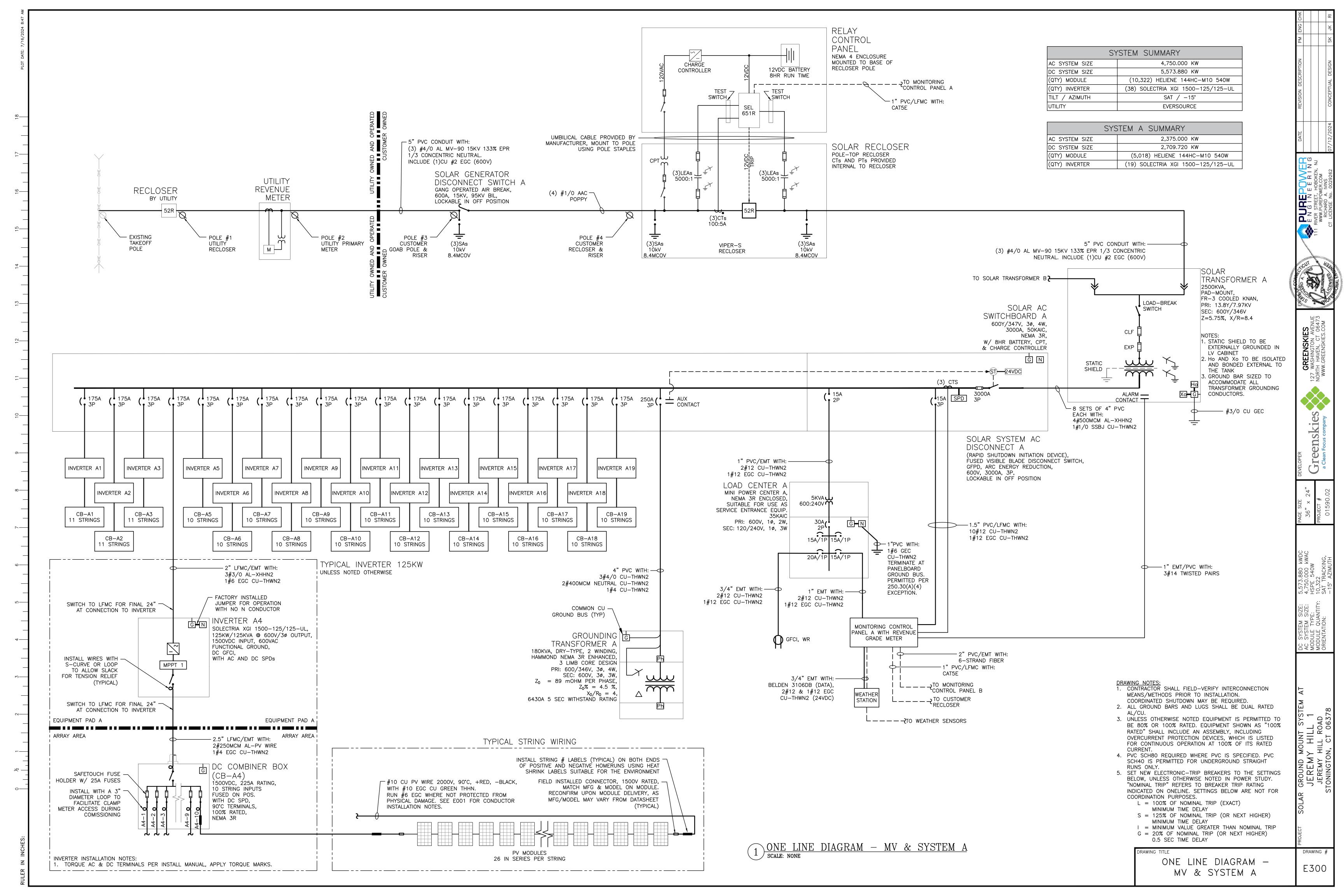
DRAWING INDEX

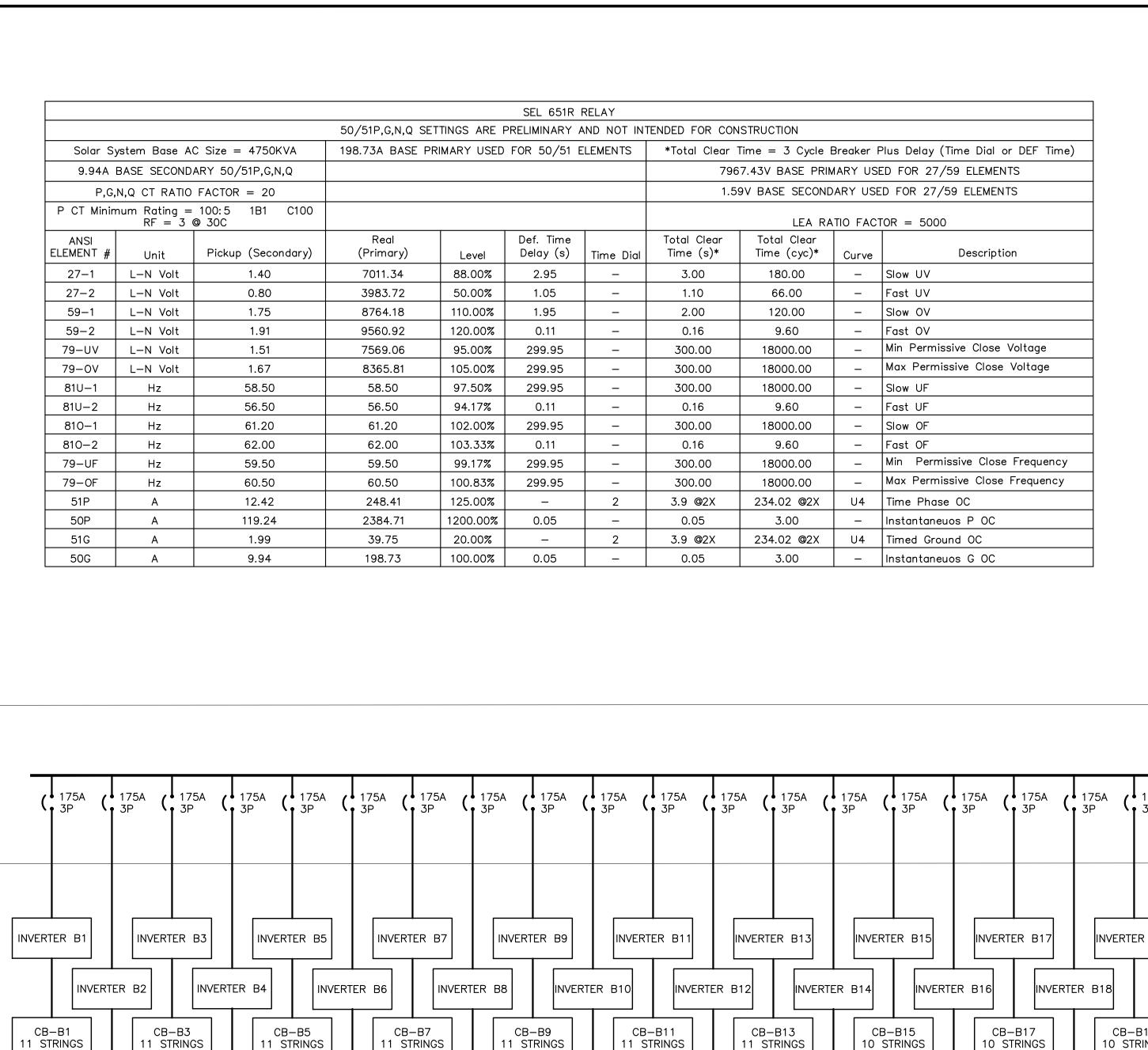
			5/			
GENERAL						
G001	TITLE SHEET					
ELECTRICAL						
E001	ELECTRICAL NOTES & SYMBOLS LIST					
E100	OVERALL ELECTRICAL PLAN					
E110	ELECTRICAL ROOM PLAN & INVERTER AREA					
E200	DC ELECTRICAL PLAN					
E300	ONE LINE DIAGRAM - MV & SYSTEM A					
E301	ONE LINE DIAGRAM - SYSTEM B					
E310	SCHEDULES & CALCULATIONS					
E410	GROUNDING DETAILS					
E420	ELECTRICAL DETAILS					
E500	LABELS & SIGNAGE					
E600	EQUIPMENT DATA SHEETS					

TITLE SHEET

G001







CB-B6 11 STRINGS

11 STRINGS

CB-B2

11 STRINGS

CB-B8 11 STRINGS

CB-B12 11 STRINGS

CB-B10

11 STRINGS

CB-B16 10 STRINGS

CB-B14

11 STRINGS

ANSI ELEMENT #	Pickup	Real	Level	Delay (sec)	Curve	Description	
27–1	304.84	528V	88.0%	3.00		Slow UV	
27-2	173.21	300V	50.0%	1.10		Fast UV	
59-1	381.05	660V	110.0%	2.00		Slow OV	
59-2	415.69	720V	120.0%	0.16		Fast OV	
81U-1	58.50	58.5Hz	97.5%	300.00		Slow UF	
81U-2	56.50	56.5Hz	94.2%	0.16		Fast UF	
810–1	61.20	61.2Hz	102.0%	300.00		Slow OF	
810-2	62.00	62Hz	103.3%	0.16		Fast OF	
PF Set Point		1.00				Power Factor Co	
Var Control		OFF				Reactive Power Control	
Ramp Rate		10%/1 sec				dkw / dt	
Freq Control		OFF				Speed Control	

S	YSTEM B SUMMARY
AC SYSTEM SIZE	2,375.000 KW
DC SYSTEM SIZE	2,864.160 KW
(QTY) MODULE	(5,304) HELIENE 144HC-M10 540W
(QTY) INVERTER	(19) SOLECTRIA XGI 1500-125/125-UL
(4)	(, , , , , , , , , , , , , , , , , , ,

5" PVC CONDUIT WITH: —

(3) #2 AL MV-90 15KV 133% EPR 1/3 CONCENTRIC

NEUTRAL. INCLUDE (1)CU #6 EGC (600V)

TO SOLAR TRANSFORMER A

enskies

DRAWING #

