STATELINE SOLAR

Permit Plan

Michael Miller

11380 Main St.

Roscoe, IL 61073

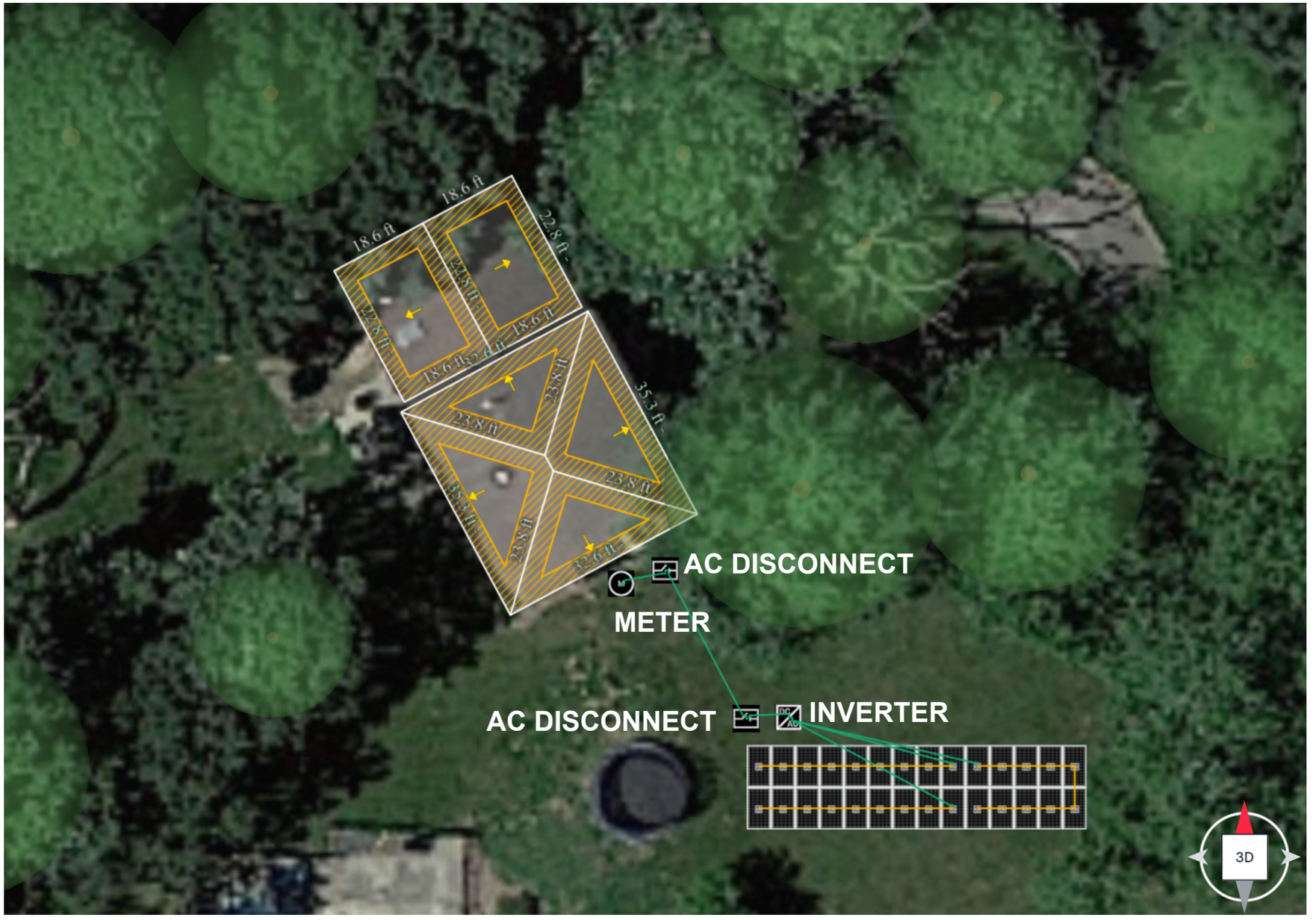
16.24kW DC Grid-Tied
Photovoltaic System

1 2 3 4 5 6 7 8 9 10

Designed By: Kenji Grahame	Project: Michael Miller	Stateline Solar LLC
Date: 08/06/2024	Location: 11380 Main St. Roscoe, IL 61073	815-580-3011 310 W. Main St. Lena IL 61048

STATELINE SOLAR

1 2 3 4 5 6 7 8 9 10



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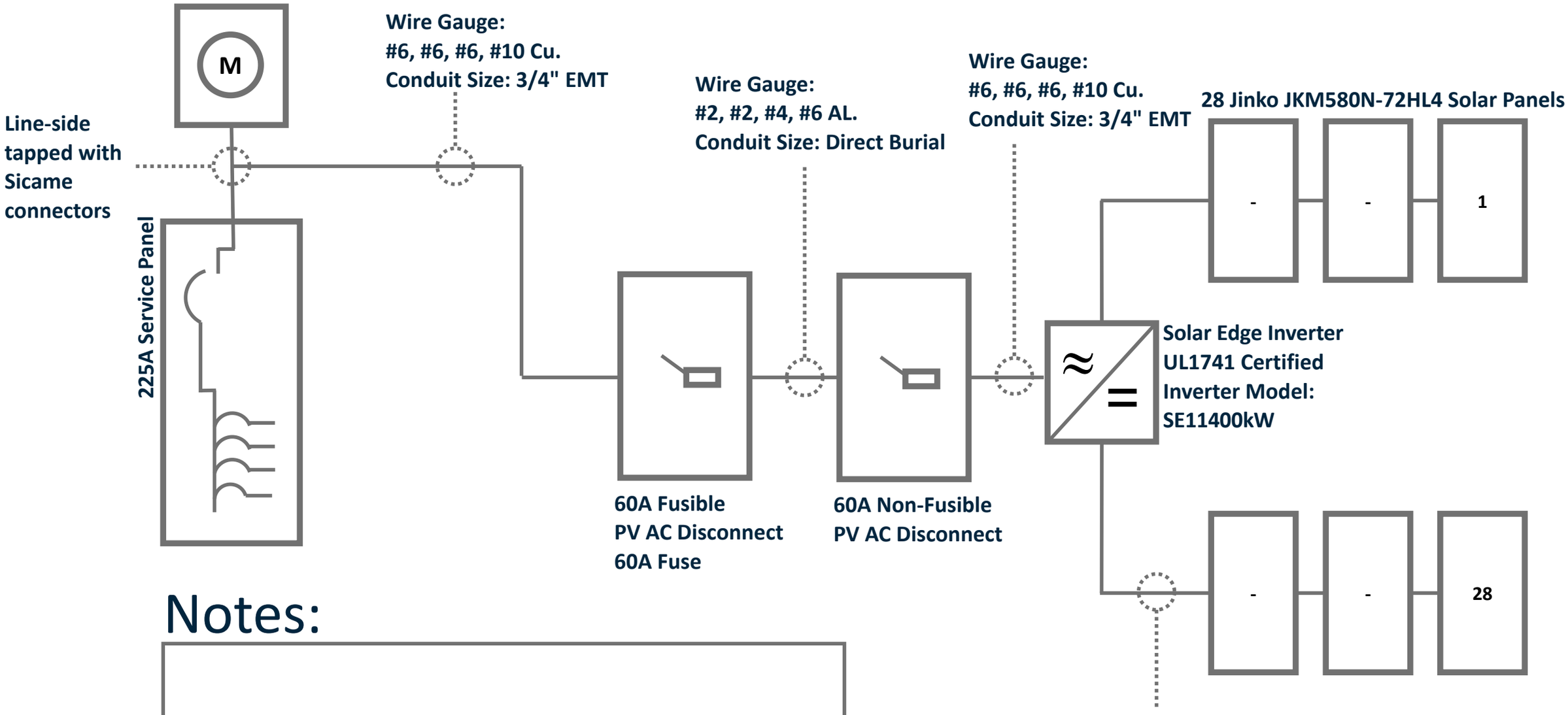

Notes:

1. 28 Jinko JKM580N-72HL4 solar panels connected in series

2. Two strings of 14 solar panels connected in parallel

3. Number of PV wire correlates to total PV system, not to each string

Michael Miller
11380 Main St
Roscoe, IL 61073

U-BUILDER PROJECT REPORT

APPLICATION VERSION: 6.6.0
PROJECT VERSION: 0.0.53

PROJECT TITLE
NXT UMOUNT

PROJECT ID
2844BCD1

LAST UPDATED
Aug. 6, 2024

ORIGINALLY CREATED
Jul. 16, 2024

NAME	James Goff
ADDRESS	15N141 Romke Rd, Hampshire, IL 60140, USA
CITY, STATE	Hampshire, IL
MODULE	Jinko Solar JKM580N-72HL4-BDV

Designed by kenji.grahame@statelinesolar.net

NXT UMOUNT

Jinko Solar

18 - JKM580N-72HL4-BDV

10.44 KW

NOTE: Installation of the project is intended to happen within the year of project designed in UBuilder. If it's past one year please rerun the design or contact Unirac Engineering Services.

ENGINEERING REPORT

Plan Review

* Distributed Dead Load	2.63 psf
* Average Roof Point Dead Load	54.82 lbs

TOTAL NUMBER OF MODULES	18
TOTAL KW	10.44 KW
TOTAL AREA	~501 ft^2

Loads Used for Design

BUILDING CODE	ASCE 7-10
BASIC WIND SPEED	115.00 mph
GROUND SNOW LOAD	0.00 psf
SEISMIC, S_S	0.155
ELEVATION	995.00 ft
WIND EXPOSURE	B
TOPOGRAPHICAL FACTOR K_{ZT}	1.00

Inspection

PRODUCT	NXT UMOUNT
MODULE MANUFACTURER	Jinko Solar
MODEL	18 - JKM580N-72HL4-BDV
MODULE WATTS	580 watts
MODULE LENGTH	89.69"
MODULE WIDTH	44.65"
MODULE THICKNESS	1.18"
MODULE WEIGHT	68.34 lbs
EXPANSION JOINTS	Every 40'
RAILS DIRECTION	EW
BUILDING HEIGHT	15.00 ft
SHORTEST BUILDING LENGTH	40.00 ft
ROOF TYPE	R panel
ATTACHMENT TYPE	PM-9000S
RAFTER SPACING	24.00"
* TOTAL WEIGHT	1315.64 lbs
ROW SPACING	0.50"
COLUMN SPACING	0.50"
MID CLAMP	NXT UMOUNT COMBO CLAMP
END CLAMP	NXT UMOUNT COMBO CLAMP

* Calculated based on suggested quantity given on part list.

Roof Area 1: Array 1

Portrait Modules - Rails Running Across Slope

NXT UMOUNT RAIL SPANS [IN]	ZONE 1	ZONE 2	ZONE 3
DESIGN SPAN	**72**	**48**	**48**
Max Cantilever	24	16	16
Max Span	72	67	58

ZONES	ZONE 1	ZONE 2	ZONE 3
NO OF RAILS	**2**	**2**	**2**

DESIGN PRESSURES [PSF]	ZONE 1	ZONE 2	ZONE 3
Up	-9.7	-19.3	-30.2
Down	13.2	13.2	13.2
Downslope	1.7	1.7	1.7
Lateral	0.5	0.5	0.5

MAXIMUM POINT LOADS [LBS]	ZONE 1	ZONE 2	ZONE 3
Up	-271.9	-360.6	-564.3
Down	370.0	246.6	246.6
Downslope	47.6	31.8	31.8
Lateral	14.0	9.3	9.3
Tributary Area [ft^2]	28.0	18.7	18.7
ROOF PITCH:	18°		

Clamp Checks

ZONES		ZONE 1			ZONE 2			ZONE 3		
CONNECTION-TYPE		End-End	End-Mid	Mid-Mid	End-End	End-Mid	Mid-Mid	End-End	End-Mid	Mid-Mid
Up	Load	N/A	270	270	N/A	N/A	N/A	N/A	N/A	N/A
	Check	OK	OK	OK	OK	OK	OK	OK	OK	OK
Side	Load	N/A	270	270	N/A	N/A	N/A	N/A	N/A	N/A
	Check	OK	OK	OK	OK	OK	OK	OK	OK	OK
Lateral	Load	N/A	270	270	N/A	N/A	N/A	N/A	N/A	N/A
	Check	OK	OK	OK	OK	OK	OK	OK	OK	OK

N/A stands for not applicable

NXT UMOUNT U-BUILDER PRODUCT ASSUMPTIONS

Limitations of Responsibility: It is the user's responsibility to ensure that inputs are correct for your specific project.
Unirac is not the solar, electrical, or building engineer of record and is not responsible for the solar, electrical, or building design for this project.

Building Assumptions

1. Building Risk Category II.
2. Mean Roof Height = 0.00 ft – 60.00 ft unless otherwise specified.
3. Roof Pitch: 5° - 45° for ASCE 7-10 and 9° - 45° for ASCE 7-16 and ASCE 7-22

Wind Design Assumptions

1. Exposure Category B, C, or D
2. Basic Wind Speed 95.00 mph – 190.00 mph for ASCE 7-10, and 85.00 mph - 190.00 mph for ASCE 7-16 and ASCE 7-22.
3. Wind speeds are LRFD values
4. γE = 1.0 for 'Interior' spans, γE = 1.5 for 'Exposed' spans (ASCE 7-16 and ASCE 7-22 Sec. 29.4.3, Fig. 29.4-7)

Snow and Seismic Design Assumptions

1. Ground Snow Load = 0 - 100.00 psf
2. Thermal Factor = 1.0
3. Results based on uniform snow load
4. 0.2-s Spectral Response Acceleration, SS ≤ 3

Array Assumptions

1. Dead Load≤ 5.00 psf (including PV Modules and Racking)
2. Module orientation and Rail direction per user selection
3. Module height above roof surface 5.00" to 10.00" depending on attachment type
4. Gaps between module rows and columns is 0.25" - 1.00"
5. Modules are parallel to the roof surface and within 10.00". of it.
6. 'Exposed' spans shall be used when any part of an exposed module or panel as is attributed to that span.
7. The most restrictive of all roof zone spans shall be used when any part of the module is attributed to that span.

Intermediary Span Distances: Roof attachment point loads be reduced linearly if the installed distance between the attachments is less than the selected span. For example, if the spacing is half the amount shown in the results, then the point loads may also be reduced by half.
Spans greater than 72.00".: While our products are valid for greater spans in many instances, we do not recommend this mounting configuration. Typical residential roofs are not designed for the larger point loads that might result from such excessive spans and we recommend final design by a licensed professional engineer of responsible charge.
Ubuilder does not consider the attachment to the roof structure. Ensure that the supporting roof, its rafters, connections, and any other structural support members can support the array under all code level loading conditions.
Ensure the attachment to the roof structure is adequate to support loads in your installation location.

EAGLE
MODULES

THE MOST DEPENDABLE
SOLAR PRODUCT

EAGLE 72 G6B

570-590 WATT • N-TYPE BIFACIAL

Positive power tolerance of 0~+3%

- NYSE-listed since 2010, Bloomberg Tier 1 manufacturer
- Top performance in the strictest 3rd party labs
- Automated manufacturing utilizing artificial intelligence
- Vertically integrated, tight controls on quality
- Premium solar factories in USA, Vietnam, and Malaysia

KEY FEATURES

N-Type Technology
N-type cells offer Jinko's in-house TOPCon technology with better performance and improved reliability.

Multi Busbar Half Cell Technology
Better light trapping and current collection to improve module power output and reliability.

Bifacial Power Gain
N-Type architecture increases bifaciality for higher backside bonus and better lifetime yield.

Low Temperature Coefficient
Best in class temperature coefficient for highest lifetime energy yield in all climates.

Industrial Grade Construction
Fire Type 29 with optimized dual-glass construction and thick frame for highest mechanical load resistance.

Shade Tolerant
Twin array design allows continued performance even with shading by trees or debris.

Protected Against All Environments
Certified to withstand humidity, heat, rain, marine environments, wind, hailstorms, and packed snow.

Warranty
12-year product and 30-year linear power warranty.

- ISO9001:2015 Quality Standards
- ISO14001:2015 Environmental Standards
- IEC61215, IEC61730 certified products
- ISO45001: 2018 Occupational Health & Safety Standards
- UL61730 certified products

TÜVRheinland CE c UL us LISTED IEC

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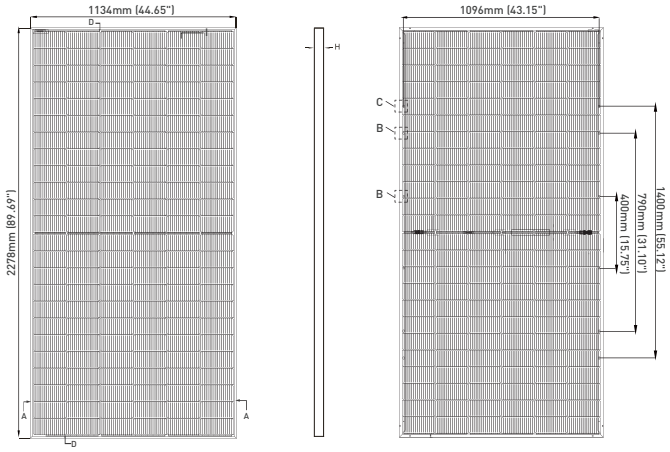
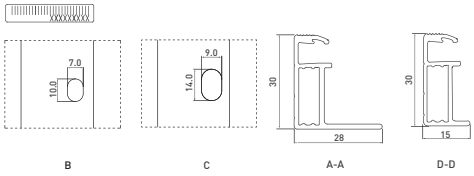
Jinko Solar

ENGINEERING DRAWINGS

Front Side Back

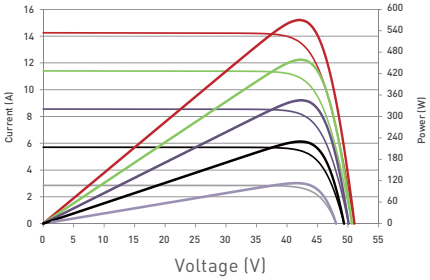




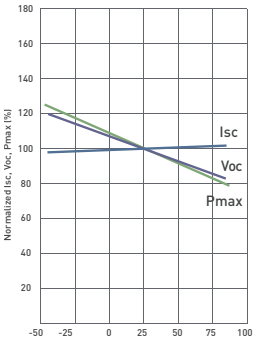
Length: ± 2mm
Width: ± 2mm
Height: ± 1mm
Row Pitch: ± 2mm

ELECTRICAL PERFORMANCE & TEMPERATURE DEPENDENCE

Current-Voltage & Power-Voltage Curves (585W)



Temperature Dependence of Isc, Voc, Pmax



MECHANICAL CHARACTERISTICS

No. of Half Cells	144 (2 x 72)
Dimensions	2278 x 1134 x 30mm (89.69 x 44.65 x 1.18in)
Weight	31kg (68.34lbs)
Front Glass	2.0mm, Anti-Reflection Coating
Back Glass	2.0mm, Heat Strengthened Glass
Frame	Anodized Aluminum Alloy
Junction Box	IP68 Rated
Output Cables	12 AWG, 1400mm (55.12in)
Fire Type	Type 29
Pressure Rating	5400Pa (Snow) & 2400Pa (Wind)
Hailstone Test	25mm Hailstone at 23 m/s

TEMPERATURE CHARACTERISTICS

Temperature Coefficients of Pmax	-0.29%/°C
Temperature Coefficients of Voc	-0.25%/°C
Temperature Coefficients of Isc	0.045%/°C
Nominal Operating Cell Temperature (NOCT)	45±2°C
Bifacial Factor	80±5%

MAXIMUM RATINGS

Operating Temperature (°C)	-40°C~+85°C
Maximum System Voltage	1500VDC
Maximum Series Fuse Rating	30A

PACKAGING CONFIGURATION

(Two pallets = One stack)

36pcs/pallet, 72pcs/stack, 576pcs/40 HQ Container

BIFACIAL OUTPUT-REARSIDE POWER GAIN

5%	Maximum Power (Pmax)	598Wp	604Wp	609Wp	614Wp	620Wp
	Module Efficiency (%)	23.17%	23.37%	23.57%	23.78%	23.98%
15%	Maximum Power (Pmax)	656Wp	661Wp	667Wp	672Wp	679Wp
	Module Efficiency (%)	25.38%	25.60%	25.82%	26.05%	26.27%
25%	Maximum Power (Pmax)	713Wp	719Wp	725Wp	731Wp	738Wp
	Module Efficiency (%)	27.59%	27.83%	28.06%	28.31%	28.55%

WARRANTY

12-year product and 30-year linear power warranty

1st year degradation not to exceed 1%, each subsequent year not to exceed 0.4%, minimum power at year 30 is 87.4% or greater.

ELECTRICAL CHARACTERISTICS

Module Type	JKM570N-72HL4-BDV		JKM575N-72HL4-BDV		JKM580N-72HL4-BDV		JKM585N-72HL4-BDV		JKM590N-72HL4-BDV	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	570Wp	430Wp	575Wp	433Wp	580Wp	437Wp	585Wp	441Wp	590Wp	445Wp
Maximum Power Voltage (Vmp)	43.58V	40.56V	43.73V	40.73V	43.88V	40.89V	44.02V	41.05V	44.17V	41.21V
Maximum Power Current (Imp)	13.08A	10.59A	13.15A	10.64A	13.22A	10.69A	13.29A	10.74A	13.36A	10.79A
Open-circuit Voltage (Voc)	52.10V	39.60V	52.30V	39.75V	52.50V	39.90V	52.70V	40.05V	52.90V	40.20V
Short-circuit Current (Isc)	13.83A	11.16A	13.89A	11.21A	13.95A	11.26A	14.01A	11.31A	14.07A	11.36A
Module Efficiency STC (%)	22.07%		22.26%		22.45%		22.65%		22.84%	

***STC:** Irradiance 1000W/m² Cell Temperature 25°C AM = 1.5
NOCT: Irradiance 800W/m² Ambient Temperature 20°C AM = 1.5 Wind Speed 1m/s

*Power measurement tolerance: ±3%

The company reserves the final right for explanation on any of the information presented hereby. JKM570-590N-72HL4-BDV-F30-F2-US

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Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US

INVERTERS

12-25 YEAR WARRANTY

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking efficiency
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Extremely small
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

solaredge.com

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Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXXXH-XXXXXBXX4							
OUTPUT								
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5[1]							Hz
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	A
Power Factor	1, adjustable -0.85 to 0.85							
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							
INPUT								
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	-	5100	-	7750	-	-	15500	W
Transformer-less, Ungrounded	Yes							
Maximum Input Voltage	480							Vdc
Nominal DC Input Voltage	380				400			Vdc
Maximum Input Current @240V[2]	8.5	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V[2]	-	9	-	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600kΩ Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5							W

[1] For other regional settings please contact SolarEdge support
[2] A higher current source may be used; the inverter will limit its input current to the values stated

/ Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)							
Revenue Grade Data, ANSI C12.20	Optional[3]							
Inverter Commissioning	with the SetApp mobile application using built-in Wi-Fi station for local connection							
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect							
STANDARD COMPLIANCE								
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07							
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)							
Emissions	FCC Part 15 Class B							
INSTALLATION SPECIFICATIONS								
AC Output Conduit Size / AWG Range	3/4" minimum / 14-6 AWG					3/4" minimum /14-4 AWG		
DC Input Conduit Size / # of Strings / AWG Range	3/4" minimum / 1-2 strings / 14-6 AWG					3/4" minimum / 1-3 strings / 14-6 AWG		
Dimensions with Safety Switch (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174					21.3 x 14.6 x 7.3 / 540 x 370 x 185		in / mm
Weight with Safety Switch	22 / 10		25.1 / 11.4		26.2 / 11.9	38.8 / 17.6		lb / kg
Noise	< 25					<50		dBA
Cooling	Natural Convection							
Operating Temperature Range	-40 to +140 / -40 to +60[4]							°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)							

[3] Revenue grade inverter P/N: SExxxxH-US000BNC4
[4] Full power up to at least 50°C / 122°F; for power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf

RoHS