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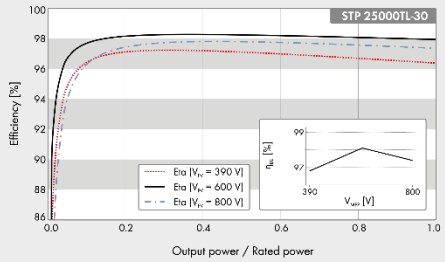
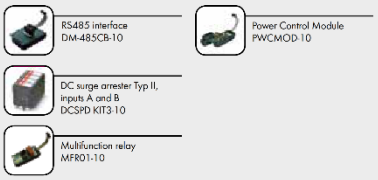
LAMPIRAN-LAMPIRAN

Lampiran 1 Datasheet string inverter (SMA Sunny Tripower 20000TL)

Efficiency Curve



Accessory



● Standard features ○ Optional features – Not available
Data at nominal conditions
Status: 02/2021

Technical Data	Sunny Tripower 15000TL	Sunny Tripower 20000TL	Sunny Tripower 25000TL
Input (DC)			
Max. generator power	27000 Wp	36000 Wp	45000 Wp
DC rated power	15330 W	20440 W	25550 W
Max. input voltage	1000 V	1000 V	1000 V
MPP voltage range / rated input voltage	240 V to 800 V / 600 V	320 V to 800 V / 600 V	390 V to 800 V / 600 V
Min. input voltage / start input voltage	150 V / 188 V	150 V / 188 V	150 V / 188 V
Max. input current input A / input B	33 A / 33 A	33 A / 33 A	33 A / 33 A
Max. DC short-circuit current input A/input B	43 A / 43 A	43 A / 43 A	43 A / 43 A
Number of independent MPP inputs / strings per MPP input	2 / A:3; B:3	2 / A:3; B:3	2 / A:3; B:3
Output (AC)			
Rated power (at 230 V, 50 Hz)	15000 W	20000 W	25000 W
Max. AC apparent power	15000 VA	20000 VA	25000 VA
AC nominal voltage	3 / N / PE; 220 V / 380 V 3 / N / PE; 230 V / 400 V 3 / N / PE; 240 V / 415 V		
AC voltage range	180 V to 280 V		
AC grid frequency / range	50 Hz / 44 Hz to 55 Hz 60 Hz / 54 Hz to 65 Hz		
Rated power frequency / rated grid voltage	50 Hz / 230 V		
Max. output current / Rated output current	29 A / 21.7 A	29 A / 29 A	36.2 A / 36.2 A
Power factor at rated power / Adjustable displacement power factor	1 / 0 overexcited to 0 underexcited		
THD	≤ 3%		
Feed-in phases / connection phases	3 / 3		
Efficiency			
Max. efficiency / European Efficiency	98.4% / 98.0%	98.4% / 98.0%	98.3% / 98.1%
Protective devices			
DC-side disconnection device	●		
Ground fault monitoring / grid monitoring	● / ●		
DC surge arrester (Type II) can be integrated	○		
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / –		
All-pole sensitive residual-current monitoring unit	●		
Protection class (according to IEC 62109-1) / overvoltage category (according to IEC 62109-1)	I / AC: III; DC: II		
General data			
Dimensions (W / H / D)	661 / 682 / 264 mm (26.0 / 26.9 / 10.4 inch)		
Weight	61 kg (134.48 lb)		
Operating temperature range	−25 °C to +60 °C (−13 °F to +140 °F)		
Noise emission (typical)	51 dB(A)		
Self-consumption (at night)	1 W		
Topology / cooling concept	Transformerless / Opticool		
Degree of protection (as per IEC 60529)	IP65		
Climatic category (according to IEC 60721-3-4)	4K4H		
Maximum permissible value for relative humidity (non-condensing)	100%		
Features / function / Accessories			
DC connection / AC connection	SUNCLIX / spring-cage terminal		
Display	○		
Interface: RS485, Speedwire/Webconnect	○ / ●		
Data interface: SMA Modbus / SunSpec Modbus	● / ●		
Multifunction relay / Power Control Module	○ / ○		
Shade management SMA ShadeFix / Integrated Plant Control / Q on Demand 24/7	● / ● / ●		
Off-Grid capable / SMA Fuel Save Controller compatible	● / ●		
Guarantee: 5 / 10 / 15 / 20 years	● / ○ / ○ / ○		
Certificates and permits (more available on request) * Does not apply to all national appendices of EN 50438	AS 4777, BDEW 2008, C10/11, CE, CEI 0-16, CEI 0-21, CNS 15382, CNS 15426, DEWA 2.0, DK1, DK2, EN 50549-1, EN 50549-2, G99/1, EN 50438:2013*, IEC 60068-2-x, IEC 61727, IEC 62109-1/2, IEC 62116, IS 16221-1/2, IS 16169, MEA 2013, NBR 16149, NEN EN 50438, NRS 097-2-1, PEA 2013, NTS, PPC, RD 1699/413, RD 661/2007, Res. n°7:2013, RfG compliant, SI4777, TOR generator, UTE C15-712-1, VDE 0126-1-1, VDE-AR-N 4105, VDE-AR-N 4110, VFR 2014		
Type designation	STP 15000TL-30	STP 20000TL-30	STP 25000TL-30

Lampiran 2 Datasheet central inverter (Solectria Renewables SGI 300)

SPECIFICATIONS		SGI 225	SGI 250	SGI 266	SGI 300	SGI 500
DC Input						
Absolute Maximum Input Voltage		625 VDC				
MPPT Input Voltage Range		300-500 VDC				
MPPT Input Voltage Range - Low Voltage Option		285-500 VDC				
Maximum Operating Input Current		768 A	853 A	908 A	1026 A	1721 A
Maximum Input Current - Low Voltage Option		808 A	898 A	956 A	1080 A	1812 A
AC Output						
Nominal Output Voltage		480 or 600 VAC, 3-Ph				
AC Voltage Range		-12%/+10%				
Continuous Output Power		225 kW	250 kW	266 kW	300 kW	500 kW
Continuous Output Current	480 VAC	271 A	301 A	320 A	360 A	602 A
	600 VAC	217 A	240 A	256 A	289 A	480 A
Maximum Backfeed Current		0 A				
Nominal Output Frequency		60 Hz				
Output Frequency Range		59.3-60.5 Hz				
Power Factor		Unity, >0.99				
Total Harmonic Distortion (THD)		<3%				
Efficiency						
Peak Efficiency		98.0%	98.0%	98.0%	97.9%	97.9%
CEC Efficiency		97.5%	97.5%	97.5%	97.5%	97.0%
Tare Loss		28 W	28 W	28 W	28 W	32 W
Subcombiner Options						
		6 positions, 225-400 A				8 positions, 225-400 A
		12 positions, 110-200 A				16 positions, 110-200 A
		24 positions, 70-100 A				32 positions, 70-100 A
Temperature						
Ambient Temperature Range (full power)		-40°F to +122°F (-40°C to +50°C)				
Storage Temperature Range		-40°F to +158°F (-40°C to +70°C)				
Relative Humidity (non-condensing)		5-95%				
Monitoring Options						
Web-based Monitoring (Inverter Direct)		SolrenView				
Revenue Grade Monitoring (Integrated)		400 A	400 A	400 A	400 A	800 A
Sub-Array Monitoring (SolZone)		6 zones	6 zones	6 zones	6 zones	8 zones
Cellular Communication		SolrenView AIR				
Third Party Compatibility		Standard via MODBUS				
Testing & Certifications						
Safety Listings & Certifications		UL 1741/IEEE 1547, IEEE 1547.1, IEEE 62.41.2, IEEE 62.45, IEEE C37.90.2, CSA C22.2#107.1, FCC part 15 B				
Maintenance outage power factor per IEEE 762-2006		0.1				
Testing Agency		ETL				
Warranty						
Standard		5 year				
Optional		10, 15, 20 year; extended service agreement; uptime guarantee				
Enclosure						
Transformer		Standard, fully-integrated (internal); External optional				
AC Breaker/DC Disconnect		Fully-integrated (internal)				
Dimensions (H x W x D)		79 in. x 109 in. x 41 in. (2007 mm x 2769 mm x 1041 mm)				
Shading Set Back		137" (3480 mm) at 30° solar elevation				
Weight		5170 lbs (2350 kg)	5650 lbs (2568 kg)	5650 lbs (2568 kg)	5650 lbs (2568 kg)	6980 lbs (3173 kg)
Enclosure Rating		NEMA 3R				
Enclosure Finish		Polyester powder coated steel; Optional stainless steel				

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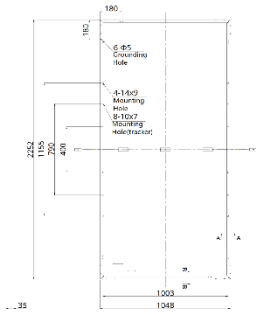
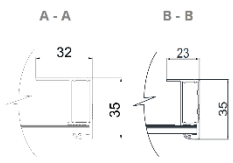
Lampiran 3 Datasheet modul PV jenis poly-crystalline (Canadian Solar CS3W 450P)

ENGINEERING DRAWING (mm)

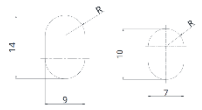
Rear View



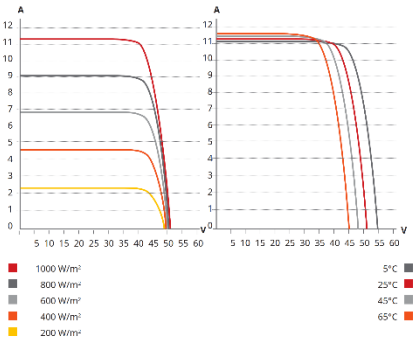
Frame Cross Section



Mounting Hole



CS3Y-450P / I-V CURVES



ELECTRICAL DATA | STC*

CS3Y	435P	440P	445P	450P	455P	460P
Nominal Max. Power (Pmax)	435 W	440 W	445 W	450 W	455 W	460 W
Opt. Operating Voltage (Vmp)	41.8 V	42.0 V	42.2 V	42.4 V	42.6 V	42.8 V
Opt. Operating Current (Imp)	10.41 A	10.48 A	10.55 A	10.62 A	10.69 A	10.75 A
Open Circuit Voltage (Voc)	51.0 V	51.2 V	51.4 V	51.6 V	51.8 V	52.0 V
Short Circuit Current (Isc)	11.13 A	11.18 A	11.23 A	11.28 A	11.33 A	11.38 A
Module Efficiency	18.4%	18.6%	18.9%	19.1%	19.3%	19.5%
Operating Temperature	-40°C ~ +85°C					
Max. System Voltage	1500V (IEC/UL) or 1000V (IEC/UL)					
Module Fire Performance	TYPE 1 (UL 61730 1500V) or TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)					
Max. Series Fuse Rating	20 A					
Application Classification	Class A					
Power Tolerance	0 ~ + 10 W					

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

MECHANICAL DATA

Specification	Data
Cell Type	Poly-crystalline
Cell Arrangement	156 [2 X (13 X 6)]
Dimensions	2252 X 1048 X 35 mm (88.7 X 41.3 X 1.38 in)
Weight	25.7 kg (56.7 lbs)
Front Cover	3.2 mm tempered glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4 mm² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	410 mm (16.1 in) (+) / 290 mm (11.4 in) (-) or customized length*
Connector	T4 series or H4 UTX or MC4-EVO2
Per Pallet	30 pieces
Per Container (40' HQ)	600 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

ELECTRICAL DATA | NMOT*

CS3Y	435P	440P	445P	450P	455P	460P
Nominal Max. Power (Pmax)	324 W	328 W	331 W	335 W	339 W	342 W
Opt. Operating Voltage (Vmp)	38.9 V	39.1 V	39.3 V	39.5 V	39.6 V	39.8 V
Opt. Operating Current (Imp)	8.33 A	8.39 A	8.43 A	8.49 A	8.57 A	8.60 A
Open Circuit Voltage (Voc)	47.9 V	48.1 V	48.3 V	48.5 V	48.7 V	48.8 V
Short Circuit Current (Isc)	8.98 A	9.02 A	9.06 A	9.10 A	9.14 A	9.18 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m² spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.36 % / °C
Temperature Coefficient (Voc)	-0.28 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

PARTNER SECTION

* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. CSI Solar Co., Ltd. reserves the right to make necessary adjustment to the information described herein at any time without further notice.
Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

CSI Solar Co., Ltd.
199 Lushan Road, SND, Suzhou, Jiangsu, China, 215129, www.csisolar.com, support@csisolar.com

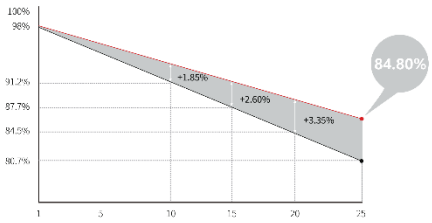
Lampiran 4 Datasheet modul PV jenis mono-crystalline (LONGI Solar LR5-66HPH 500M)

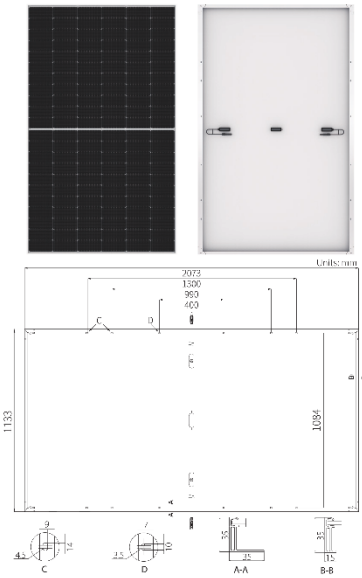
Hi-MO 5m — **LR5-66HPH 480~505M**

21.5%	0~+5W	<2%	0.55%	HALF-CELL
MAX MODULE EFFICIENCY	POWER TOLERANCE	FIRST YEAR POWER DEGRADATION	YEAR 2-25 POWER DEGRADATION	Lower operating temperature

Additional Value

25-Year Power Warranty





Mechanical Parameters

Cell Orientation	132 (6×22)
Junction Box	IP68, three diodes
Output Cable	4mm², positive 400 / negative 200mm length can be customized
Glass	Single glass, 3.2mm coated tempered glass
Frame	Anodized aluminum alloy frame
Weight	25.1kg
Dimension	2073×1133×35mm
Packaging	31pcs per pallet / 155pcs per 20' GP / 682pcs per 40' HC

Electrical Characteristics

STC : AM1.5 1000W/m² 25°C Test uncertainty for Pmax: ±3%

Power Class	480	485	490	495	500	505
Maximum Power (Pmax/W)	480	485	490	495	500	505
Open Circuit Voltage (Voc/V)	44.95	45.10	45.25	45.40	45.55	45.70
Short Circuit Current (Isc/A)	13.59	13.67	13.74	13.82	13.90	13.97
Voltage at Maximum Power (Vmp/V)	37.78	37.93	38.08	38.23	38.38	38.53
Current at Maximum Power (Imp/A)	12.71	12.79	12.87	12.95	13.03	13.11
Module Efficiency(%)	20.4	20.6	20.9	21.1	21.3	21.5

Operating Parameters

Operational Temperature	40°C ~ +85°C
Power Output Tolerance	0 ~ +5 W
Voc and Isc Tolerance	±3%
Maximum System Voltage	DC1500V (IEC/UL)
Maximum Series Fuse Rating	25A
Nominal Operating Cell Temperature	45±2°C
Protection Class	Class II
Fire Rating	UL type 1 or 2

Mechanical Loading

Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

Temperature Ratings (STC)

Temperature Coefficient of Isc	+0.048%/°C
Temperature Coefficient of Voc	-0.270%/°C
Temperature Coefficient of Pmax	-0.350%/°C

LONGi

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826, Pudong Shanghai, China
Tel: +86-21-80162606
Web: en.longi-solar.com

Specifications included in this datasheet are subject to change without notice. LONGi reserves the right of final interpretation. (20201231V12)

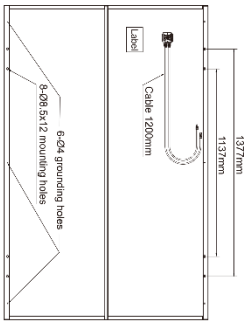
Lampiran 5 Datasheet modul PV jenis CIGS (Eterbright Solar CIGS-3000A1 Series)

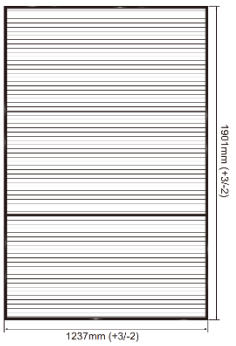
eterbright

Mechanical Specification

Dimensions	1901mm x 1237mm x 45mm (74.8 inches x 48.7 inches x 1.77 inches)
Weight	33.3 kg (73.41lbs)
Cell type	CIGS thin film
Front cover	2.5mm tempered glass with ARC
Cell substrates	1.8mm ultra-thin soda lime glass x 3
Back cover	Al back sheet
Encapsulant	EVA
Frame	Anodized Al frame (black) with screw mounting
Junction Box	IP67 rated with bypass diode
Connectors	MC4 compatible
Cable length	1200mm (47.2 inches)

Module Drawing





Electrical Specification

*Power performance at STC (STC: 1000W/m², 25°C/77°F, AM 1.5)**

Module Models	CIGS-	3350A1	3400A1	3450A1	3500A1	3550A1	3600A1	3650A1
Nominal power	P_{MPP} [W]	335	340	345	350	355	360	365
Open circuit voltage	V_{OC} [V]	73.5	73.6	73.8	73.9	74.0	74.1	74.3
Short circuit current	I_{SC} [A]	6.71	6.73	6.75	6.95	6.96	6.96	6.96
Voltage at P_{max}	V_{MPP} [V]	56.5	56.9	57.1	55.6	56.3	57.0	57.5
Current at P_{max}	I_{MPP} [A]	5.93	5.98	6.04	6.30	6.31	6.32	6.35
Module efficiency	[%]	≧ 14.2	≧ 14.5	≧ 14.7	≧ 14.9	≧ 15.1	≧ 15.3	≧ 15.5

*Power performance at NMOT (NMOT: 800W/m². 20°C/68°F, AM1.5)**

Module Models	CIGS-	3350A1	3400A1	3450A1	3500A1	3550A1	3600A1	3650A1
Nominal power	P_{MPP} [W]	247.3	251.2	254.9	258.0	262.0	266.0	269.9
Open circuit voltage	V_{OC} [V]	69.1	69.2	69.4	69.5	69.6	69.7	69.9
Short circuit current	I_{SC} [A]	5.37	5.38	5.40	5.56	5.57	5.57	5.57
Voltage at P_{max}	V_{MPP} [V]	52.1	52.5	52.8	51.2	51.9	52.6	53.1
Current at P_{max}	I_{MPP} [A]	4.74	4.78	4.83	5.04	5.05	5.06	5.08

*All STC characteristics are measured after pre-treatment of 43kWh/m² light soaking. The nominal power is based on the measurement value of stabilized product. The value applies to measurement uncertainty: Pmax : +5%/-3% ; Isc, Voc, Imax, Vmax : ±10%.

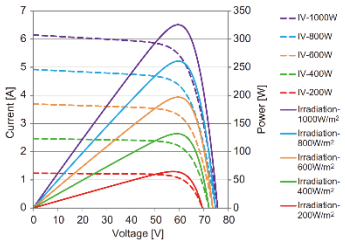
Temperature coefficients

NMOT	TC I_{SC} (α)	TC V_{OC} (β)	TC P_{MPP}(δ)
46°C	+0.01%/°C	-0.27%/°C	-0.28%/°C

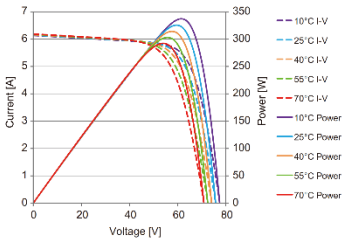
Properties for solar system construction design

Max. system voltage (V_{SYS})	Max. series overcurrent protective devices	Mechanical load	Safety class	Fire rating	Operating temperature
1000V	8A	2400Pa	II	Class C(IEC) Type 1(UL)	-40 ~ 85°C

I-V curves at various irradiation



I-V curves at various temperature



*This datasheet is for informational purposes only. No rights can be derived from the information contained herein.
*The color of each individual product might be slightly different but does not affect the output power performance.

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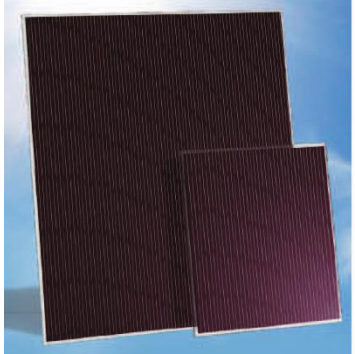
Lampiran 6 Datasheet modul PV jenis Amorphous (ENN Solar Energy EST-500)

ENN SOLAR ENERGY
EST PV Modules - F11 Series

ENN

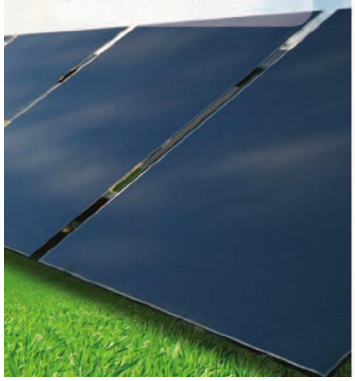


◆ Outstanding performance under low light and high temperature conditions, and at low angles of installation

◆ High efficiency tandem junction converts a broader spectrum of solar radiation, improving return on investment

◆ Significant savings on BOS and installation costs, due to large module size and range of mounting options

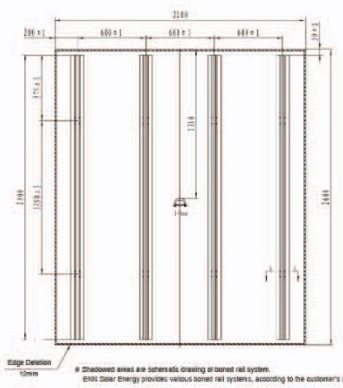
◆ Excellent aesthetic appearance of modules makes them ideal for BIPV and BAPV applications



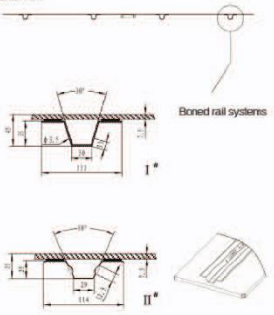
Module	Unit	EST-540	EST-520	EST-500	EST-480	EST-460	EST-440
Electrical Data							
Performance at Standard Test Conditions (STC): 1000W/m², 25°C, AM 1.5 spectrum							
Nominal Power (Pmax)	Wp	540	520	500	480	460	440
Open Current Voltage (Voc)	V	292	288	286	284	282	280
Short Circuit (Isc)	A	2.92	2.88	2.86	2.84	2.82	2.80
Max. Power Voltage (Vmpp)	V	226	222	216	210	206	200
Max. Power Current (Impp)	A	2.39	2.36	2.32	2.28	2.24	2.20
Performance at Normal Operating Cell Temperature (NOCT): 800W/m², 40°C, AM 1.5 spectrum							
Nominal Power (Pmax)	Wp	424	408	392	376	360	344
Open Current Voltage (Voc)	V	272	268	266	264	262	260
Short Circuit (Isc)	A	2.38	2.36	2.34	2.32	2.30	2.28
Max. Power Voltage (Vmpp)	V	218	214	208	202	198	192
Max. Power Current (Impp)	A	1.96	1.92	1.89	1.86	1.83	1.80
ENN Solar Energy's EST series of PV modules experiences an increase of 1% in efficiency at 200W/m², when compared with 1000W/m²							
Mechanical Data							
Length	mm	2600 (8.5')					
Width	mm	2200 (7.2')					
Thickness (excl. J-box & rail)	mm	7.5 (.295")					
Thickness (incl. J-box & rail)	mm	45 (1.77")					
Weight	kg	117					
Front Glass	mm	3.2 (low-iron float glass)					
Back Glass	mm	3.2 (normal float glass)					
PVB	mm	1.14					
Junction Box		Protection class IP 67, with by-pass diode					
Connector		MC-4					
Temperature Coefficient (STC)							
Temperature Coefficient of Voc	%/°C	-0.35					
Temperature Coefficient of Isc	%/°C	+0.1					
Temperature Coefficient of Pmm	%/°C	-0.28					
Limits							
Max. System Voltage	V	IEC1000, UL600					
Max. Operating Temperature	°C	-40 to +85					
Packaging Data							
Quantity/Case	pcs	20					
Quantity/40' HQ	pcs	160					
Warranty							
Output Warranty		≥90% of rated power at 10 years, and ≥80% at 25 years					

+All ratings +/-5%, unless specified otherwise.

Back View#



Side view



Boned rail systems

I#

II#

Edge Deletion 10mm

Shadowed areas are schematic drawing of boned rail system.
ENN Solar Energy provides various boned rail systems, according to the customer's specific requirements.

CE UL TÜV IEC CEC CQC

All data may be subject to change without prior notice by ENN Solar Energy.

Lampiran 7 Datasheet modul PV jenis CdTe (First Solar FS-6450)

FIRST SOLAR SERIES 6

MODEL TYPES AND RATINGS AT STANDARD TEST CONDITIONS (1000W/m², AM 1.5, 25°C)[2]

NOMINAL VALUES		FS-6430 FS-6430A	FS-6435 FS-6435A	FS-6440 FS-6440A	FS-6445 FS-6445A	FS-6450 FS-6450A	FS-6455 FS-6455A	FS-6460 FS-6460A
Nominal Power[3] (-0/+5%)	P_{MAX} (W)	430	435	440	445	450	455	460
Efficiency (%)	%	17.4	17.6	17.8	18.0	18.2	18.4	18.6
Voltage at P_{MAX}	V_{MAX} (V)	182.6	183.6	184.7	185.7	186.8	187.8	188.8
Current at P_{MAX}	I_{MAX} (A)	2.36	2.37	2.38	2.40	2.41	2.42	2.44
Open Circuit Voltage	V_{OC} (V)	219.2	219.6	220.0	220.4	221.1	22.2.0	222.9
Short Circuit Current	I_{SC} (A)	2.54	2.55	2.55	2.56	2.57	2.58	2.59
Maximum System Voltage	V_{SYS} (V)	1500[5]						
Limiting Reverse Current	I_R (A)	5.0						
Maximum Series Fuse	I_{CF} (A)	5.0						

RATINGS AT NOMINAL OPERATING CELL TEMPERATURE OF 45°C (800W/m², 20°C air temperature, AM 1.5, 1m/s wind speed)[2]

Nominal Power	P_{MAX} (W)	324.7	328.5	332.4	336.0	339.9	343.6	347.3
Voltage at P_{MAX}	V_{MAX} (V)	170.9	172.0	173.1	174.1	175.2	176.2	176.3
Current at P_{MAX}	I_{MAX} (A)	1.90	1.91	1.92	1.93	1.94	1.95	1.97
Open Circuit Voltage	V_{OC} (V)	207.0	207.3	207.7	208.0	208.8	209.6	210.4
Short Circuit Current	I_{SC} (A)	2.05	2.06	2.06	2.06	2.07	2.08	2.09

TEMPERATURE CHARACTERISTICS

Module Operating Temperature Range	(°C)	-40 to +85
Temperature Coefficient of P_{MAX}	T_K (P_{MAX})	-0.32%/°C [Temperature Range: 25°C to 75°C]
Temperature Coefficient of V_{OC}	T_K (V_{OC})	-0.28%/°C
Temperature Coefficient of I_{SC}	T_K (I_{SC})	+0.04%/°C

MECHANICAL DESCRIPTION

Length	2009mm
Width	1232mm
Thickness	49mm
Area	2.47m²
Module Weight	34.5kg
Leadwire[6]	2.5mm², 720mm (+) & Bulkhead (-)
Connectors	MC4-EVO 2 or TE Connectivity PV4-S
Bypass Diode	N/A
Cell Type	Thin film CdTe semiconductor, up to 264 cells
Frame Material	Anodized Aluminum
Front Glass	Heat strengthened
Back Glass	Heat strengthened
Encapsulation	Laminate material with edge seal
Frame to Glass Adhesive	Silicone
Load Rating[7]	2400Pa

PACKAGING INFORMATION

Modules Per Pack	27	Pack Dimensions (L x W x H)	2200 x 1300 x 1164mm (86 x 51 x 45.8in)
Packs per 40' Container	18	Pack Weight	1032kg

CERTIFICATIONS AND TESTS[4]

IEC

61215:2016 & 61730-1:2016[5], CE
61701 Salt Mist Corrosion
60068-2-68 Dust and Sand Resistance

UL

UL 1703 1500V Listed[5]
UL 61730 1500V Listed

REGIONAL CERTIFICATIONS

InMetro SII
BIS FSEC
MyHijau
Buy American Act (BAA) Compliant

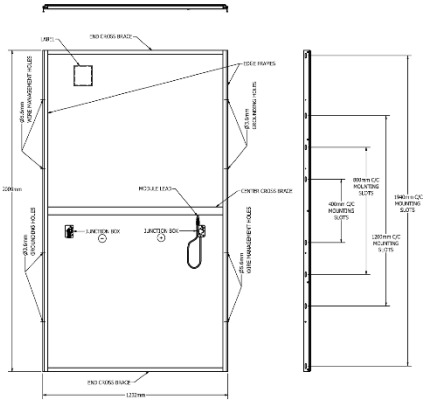
EXTENDED DURABILITY TESTS

ANSI/CAN/CSA-C450-18
Long-Term Sequential
Thresher Test
PID Resistant

QUALITY & EHS

ISO 9001:2015
ISO 14001:2015
ISO 45001:2018
EPEAT Silver Registered

MECHANICAL DRAWING



Install in portrait only

1 Limited power output and product warranties subject to warranty terms and conditions
2 All ratings ±10%, unless specified otherwise. Specifications are subject to change
3 Measurement uncertainty applies
4 Testing Certifications/Listings pending
5 IEC 61730-1: 2016 Class II | ULC (Canada) 1703 1000V listed
6 Leadwire length from junction box exit to connector mating surface
7 1000Pa tentative design load rating for 1940mm mounting slots. Higher loads may be acceptable, subject to testing

Lampiran 8 Datasheet inverter baterai (SMA Sunny Island 8.0H)

Technical data	Sunny Island 4.4M	Sunny Island 6.0H	Sunny Island 8.0H
Operation on the utility grid or generator			
Rated grid voltage / AC voltage range		230 V / 172.5 V to 264.5 V	
Rated grid frequency / permitted frequency range		50 Hz / 40 Hz to 70 Hz	
Maximum AC current for increased self-consumption (grid operation)	14.5 A	20 A	26 A[6]
Maximum apparent AC power for increased self-consumption (grid operation)	3.3 kVA	4.6 kVA	6 kVA[6]
Maximum AC input current	50 A	50 A	50 A
Maximum AC input power	11500 W	11500 W	11500 W
Adjustable displacement power factor		0.8 overexcited to 0.8 underexcited	
Stand-alone or emergency power operation			
Rated grid voltage / AC voltage range		230 V / 202 V to 253 V	
Rated frequency / frequency range (adjustable)		50 Hz / 45 Hz to 65 Hz	
Rated power (at Unom, fnom / 25°C / cos φ = 1)	3300 W	4600 W	6000 W
AC power at 25 °C for 30 min / 5 min / 3 sec	4400 W / 4600 W / 5500 W	6000 W / 6800 W / 11000 W	8000 W / 9100 W / 11000 W
AC power at 45 °C continuously	3000 W	3700 W	5430 W
Rated current / maximum output current (peak)	14.5 A / 60 A	20 A / 120 A	26 A / 120 A
Total harmonic distortion output voltage / power factor at rated power	< 5% / −1 to +1	< 1.5% / −1 to +1	< 1.5% / −1 to +1
Battery DC input			
Rated input voltage / DC voltage range	48 V / 41 V to 63 V	48 V / 41 V to 63 V	48 V / 41 V to 63 V
Maximum battery charging current / rated DC charging current / DC discharging current	75 A / 63 A /75 A	110 A / 90 A / 103 A	140 A / 115 A /130 A
Battery type / battery capacity (range)		Li-Ion[1], FLA, VRLA / 100 Ah to 10000 Ah (lead-acid) 50 Ah to 10000 Ah (li-Ion)	
Charge control	IUoU charge procedure with automatic full charge and equalization charge		
Efficiency / self-consumption of the device			
Maximum efficiency	95.5 %	95.8 %	95.8 %
No-load consumption / standby	18 W / 6.8 W	25.8 W / 6.5 W	25.8 W / 6.5 W
Protective devices (equipment)			
AC short-circuit / AC overload		● / ●	
DC reverse polarity protection / DC fuse		– / –	
Overtemperature / battery deep discharge		● / ●	
Overvoltage category as per IEC 60664-1		III	
General Data			
Dimensions (W / H /D)	467 mm / 612 mm / 242 mm (18.4 inches / 21.1 inches / 9.5 inches)		
Weight	44 kg (97 lbs)	63 kg (138.9 lbs)	63 kg (138.9 lbs)
Operating temperature range	−25°C to +60°C (−13°F to +14°F)		
Protection class as per IEC 62103	I		
Climatic category as per IEC 60721	3K6		
Degree of protection according to IEC 60529	IP54		
RoHS-III compliant	●		
Features / function			
WLAN, Speedwire / Webconnect / SI-SYSCAN (Multicluster)	● / ● / –	● / ● / ○	● / ● / ○
Direct connection to Sunny Portal via Webconnect		●	
Sunny Portal powered by ennexOS via SMA Data Manager M or L		●	
Micro SD memory card for extended data logging		○	
Display via smartphone, tablet, laptop / multifunction relay		● / 2	
Three-phase systems (including rotating magnetic field)[2] / battery-backup function		● / ●	
State of charge calculation / full charge / equalization charge		● / ● / ●	
Battery temperature sensor / data cables		○ / ●	
Certificates and approvals		www.SMA-Solar.com	
Cover color yellow / aluminum white		○ / ○	
Warranty 5/10 years		● / ●[5]	
For off-grid applications			
Switching times for backup operation (without switch box or MC-Box)[4]	–	0 ms (high impedance) / 20 ms (low impedance)	
Automatic rotating magnetic field detection / generator support		● / ●	
Parallel connection / Multicluster	– / –	● / ●	● / ●
Integrated soft start		●	
Accessories			
For off-grid applications			
Multicluster boxes: MC-BOX-6.3 / MC-BOX-12.3 / MC-BOX-36.3		○	
Battery fuse[5]		○	
Sunny Island Charger: SIC50-MPT[3] / SI Charger Piggy Back SIC-PB		○ / ○	
Data Manager M		○	
For on-grid applications			
Sunny Home Manager / SMA Energy Meter		○ / ○	
Automatic transfer switch for battery backup[3]		○	
Type designation	SI4.4M-13	SI6.0H-13	SI8.0H-13

● Standard feature ○ Optional feature – Not available All specifications as of 09/2020

1] See "List of Approved Batteries" at www.SMA-Solar.com 2) 3 x Sunny Island 3) When registering in Sunny Portal 4] See "Switchovertime-TI-en-11 | Version 1.1" at www.SMA-Solar.com
5] Procurement from external suppliers 6] Different limitation depending on the configured country data set (e.g., VDE-AR-N 4105:2018– 4.6 kVA and 20 A)

Lampiran 9 Datasheet baterai (Pylontecht US2000B)

US2000B FROM PYLONTECH
PRODUCT DATA

SOLAX POWER

5 YEAR WARRANTY
10 YEAR LIFESPAN
SCALABLE STORAGE
CUTTING EDGE DESIGN

Dimension (mm)	440 x 410 x 89
Weight (Kg)	24
Nominal Capacity (Ah)	50 (2.4kWh)
Nominal Voltage (V)	48
Discharge Voltage (V)	45 ~ 54
Charge Voltage (V)	52.5 ~ 54
Maximum Discharge Current (A)	100 (2C)@1Min
Maximum Charge Current (A)	100 (2C)@1Min
Life cycle	>6000 (80% DoD)
Depth of Discharge	80%
Working Temperature	0°C~50°C
Communication Interface	RS232, RS485, CAN
Certification	TüV / CE / UN38.3 / TLC
Warranty	5 years

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