

PHOTOVOLTAIC





Daftar Isi

Daftar Isi	2
Company Profile	3
Mengapa Solar Cell System (PLTS)	4
Solar Cell Solterra 550 W	5
Jenis Jenis Teknologi Solar	7
On Grid Inverter	11
Energi Meter	17
Hybrid Inverter	19
Off Grid Inverter	22
Batery	24
Project Reference	28



Company Profile



PT Bernadi Utama didirikan pada tahun 1982 sebagai distributor tunggal di Indonesia untuk produk solar water heater merek Solahart Australia. Selama hampir lebih dari 40 tahun kami menjadi perusahaan yang bergerak di bidang water heater dan renewable energy dengan tujuan yang mulia untuk membantu memerangi perubahan iklim di Indonesia dengan menggunakan energi terbarukan.

Di dalam perjalanannya PT. Bernadi Utama terus mengembangkan produk-produknya mencakup storage water heater, heat pump water heater, electric water heater, gas water heater, solar cell pv, energy battery storage, Internet of Things dan Handal solar water heater under license dari Solahart Australia untuk menjawab tantangan masa depan untuk kebutuhan perumahan, apartemen, sports club, sports stadium, hotel, pabrik, rumah sakit dan lain-lain.

Dengan jaringan penjualan lebih dari 50 dealer di seluruh Indonesia dan team penjualan dan engineering yang sudah terbukti selama puluhan tahun, kami yakin bisa untuk terus ber-inovasi dan berkembang untuk terus memberikan layanan yang terbaik untuk pelanggan kami dengan memberikan solusi produk-produk renewable energy dengan slogan best product, best value dan best services.





Mengapa Solar Cell System (PLTS) Adalah Investasi Terbaik Saat Ini ?



Sumber energi berlimpah dan gratis Renewable energi, potensi di Indonesia sangat besar 4,80 kWh/m²/hari.
(Ditjen Listrik dan Pemanfaatan Energi, 2009).



Ramah Lingkungan
Listrik PLTS nyaman dinikmati tanpa polusi suara, asap, getaran atau radiasi berbahaya.



Menyelamatkan Bumi
PLTS mengurangi bahan bakar fosil untuk listrik & mengurangi emisi gas CO₂.



Hemat Tagihan Listrik
Kelebihan tenaga listrik yang dihasilkan diekspor ke PLN
(Peraturan Menteri ESDM Nomor 26 tahun 2021).



Menambah Nilai Jual / Value Properti



Long Lifetime > 25 Tahun

SOLTERRA 550 W

Key Features



Module efficiency up to 21.33%

Highest power brings lowest kilowatt-hour cost, highest lifetime generating capacity, simultaneously lowest annual power attenuation

PID Resistant

Excellent PID resistance test, and also can be improved to meet highest standards for the particularly harsh environment

Low-Light Performance

Excellent power generation performance under low-light conditions with MBB technology

Anti-Crack

Excellent anti-microcracking performance with more balanced interior stress

Strength and Durability

Certified for 5400Pa snow and 2400Pa loads test

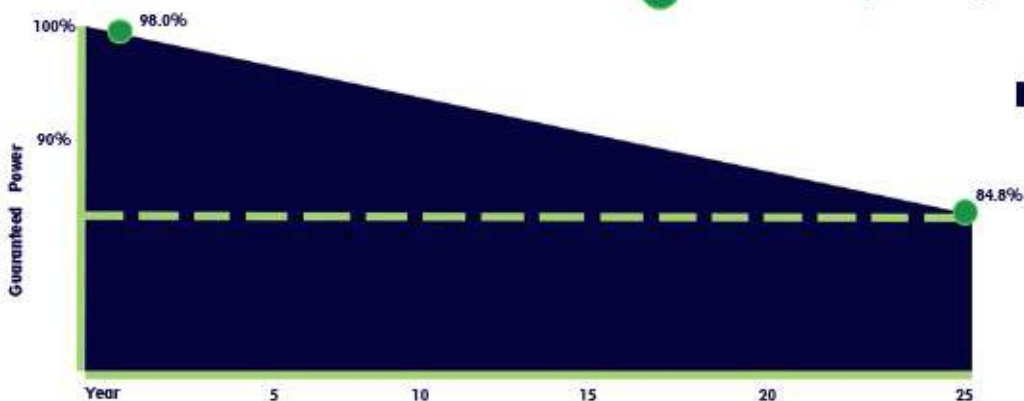


Linear Performance Warranty

Maximum Output Wattage **550W**, Positive Tolerance **0~+3W**, Highest Efficiency **21.33%**

12+ Material & Workmanship Warranty

25+ Linear Power Output Warranty



Electrical Parameters

Module Type

ST - 550W

	STC	NOCT
Rated Maximum Power (P _{max}) [W]	550	409
Maximum Power Voltage (V _{mp}) [V]	40.9	38.42
Maximum Power Current (I _{mp}) [A]	13.45	10.65
Open Circuit Voltage (V _{oc}) [V]	49.62	46.84
Short Circuit Current (I _{sc}) [A]	14.03	11.33
Module Efficiency (%)	21.33	

STC Irradiance 1000 W/m² module temperature 25°C AM=1.5

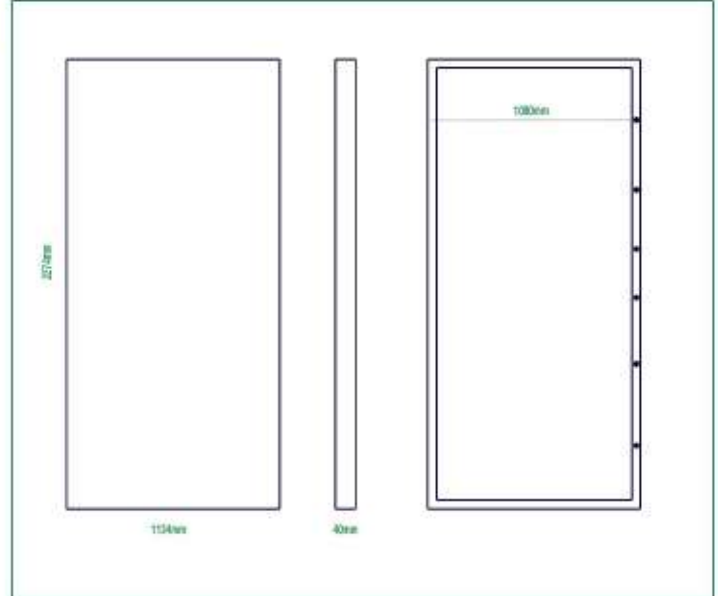
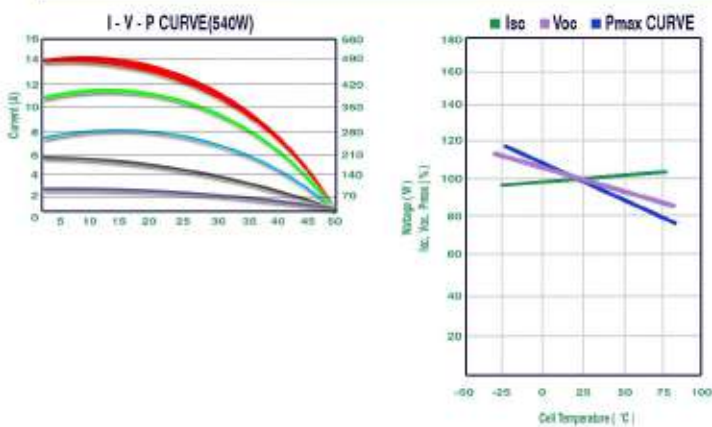
NOCT Irradiance 800 W/m² ambient temperature 20°C wind speed:1m/s

Cell Type	Monocrystalline
Cell Dimensions	182mm
Cell Quantity	144pcs
Weight	29kg
Module Dimensions	2274 X 1134 X 40mm
Cable	4.0 mm ² positive pole:240mm negative pole:120mm 120mm, wire length can be customized
Front Glass	3.2 mm Anti-Reflection Coating High Transmission Low Iron Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Connector	MC4-EVO2
Mechanical Load	Front side 5400Pa/ Rear side 2400Pa

Operating Conditions	
Power Tolerance (W)	(0, +3)
Maximum System Voltage	1000/1500VDC(IEC)
Temperature Coefficient P _{max}	-0.35 %/°C
Temperature Coefficient V _{oc}	-0.28 %/°C
Temperature Coefficient I _{sc}	+0.048 %/°C
Nominal Operating Cell Temperature	45 ± 2°C
Operating Temperature	-40°C ~ +85°C
Maximum Series Fuse	20A

Packing Configurations	
Quantity/Cartoon	27pcs/big cartoon
Pallets/Container	10big pallet/40HQ
Quantity/Container	540pcs/40HQ

Measurement

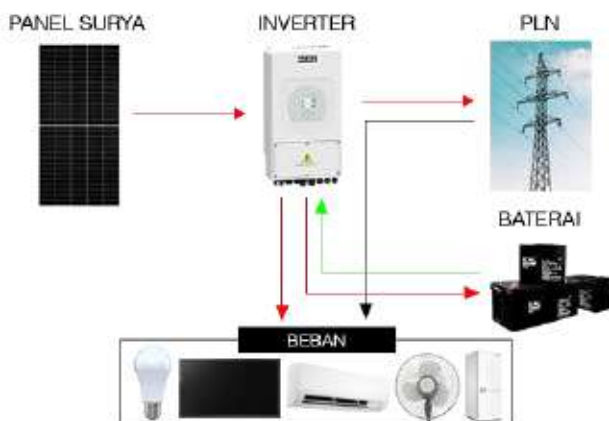


Jenis Jenis Teknologi Solar Cell



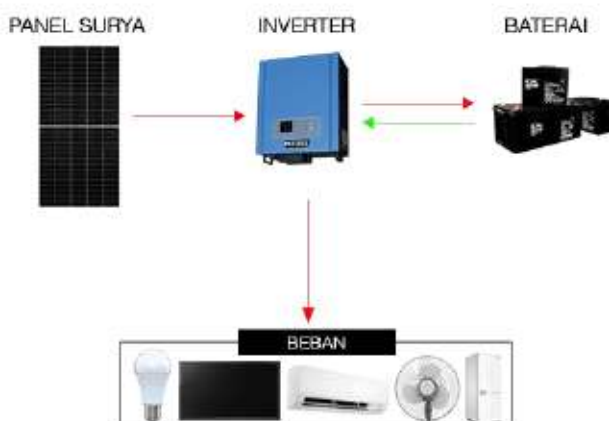
ONGRID Tanpa Baterai

- ✓ Terhubung dengan jaringan PLN
- ✓ Mengurangi tagihan PLN dengan KWh Exim
- ✓ Bila listrik PLN padam PLTS ikut padam



ONGRID dengan Battery (Hybrid)

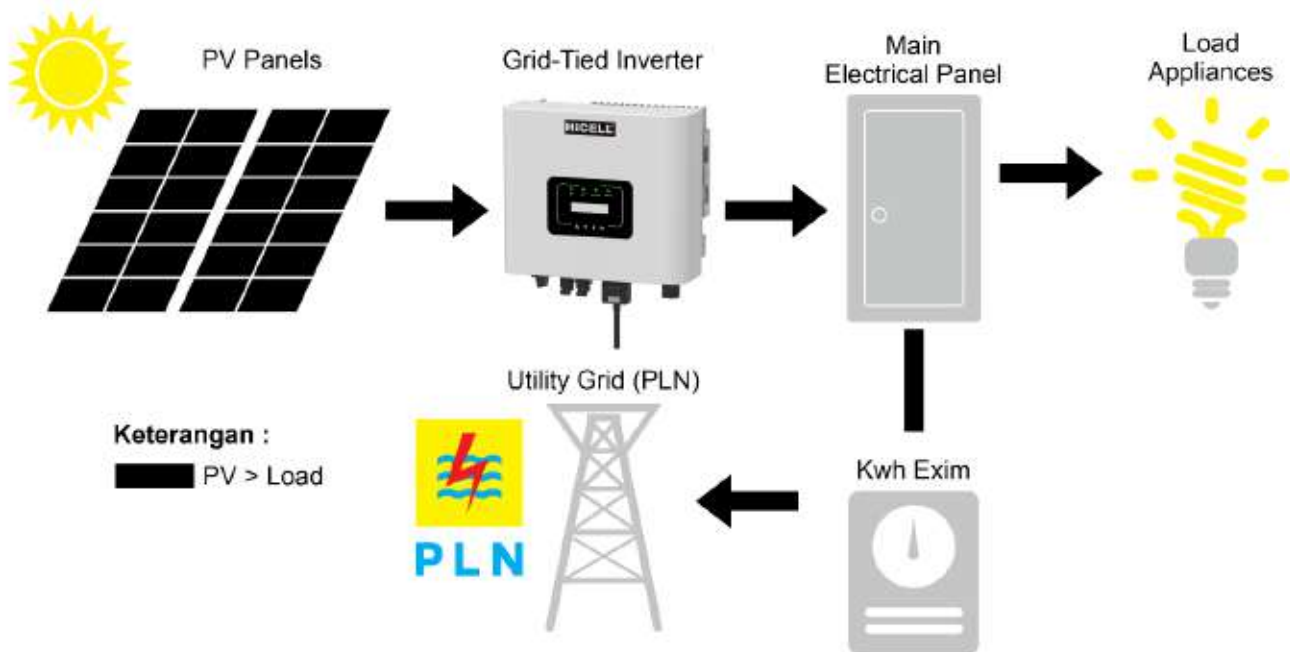
- ✓ Terhubung dengan jaringan PLN
- ✓ Mengurangi tagihan PLN dengan KWh Exim
- ✓ Menggunakan energi baterai saat listrik padam



OFFGRID (Stand Alone)

- ✓ PLTS tetap berjalan walau tanpa PLN
- ✓ Baterai sebagai wadah sumber listrik utama.

HiCELL ONGRID (Tanpa Baterai)

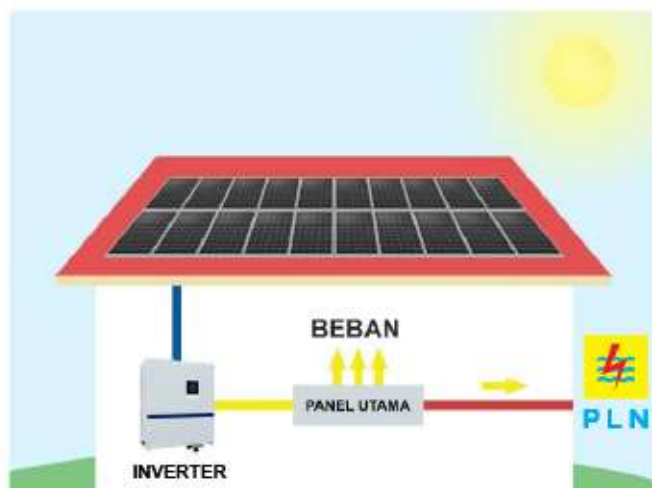


Cara Kerja Sistem Ongrid

1. Solar Panel merubah sinar matahari menjadi arus listrik DC.
2. Inverter merubah arus listrik DC menjadi arus listrik AC, yang sinkron ke jaringan listrik.
3. Listrik AC dikirim ke panel listrik utama yang terhubung langsung ke jaringan.
4. KWh Exim menghitung kelebihan energi yang dihasilkan oleh sistem PV, akan dikirim kembali ke jaringan listrik dan otomatis mengurangi beban listrik tertagih.

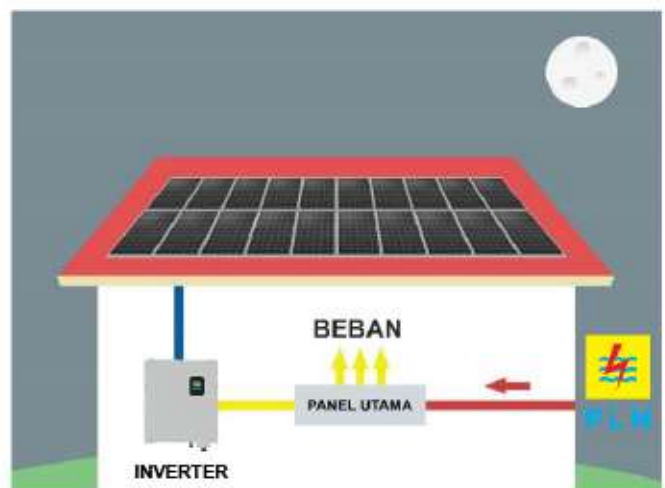
Cuaca Cerah

Kelebihan energi matahari akan diekspor ke jaringan listrik.

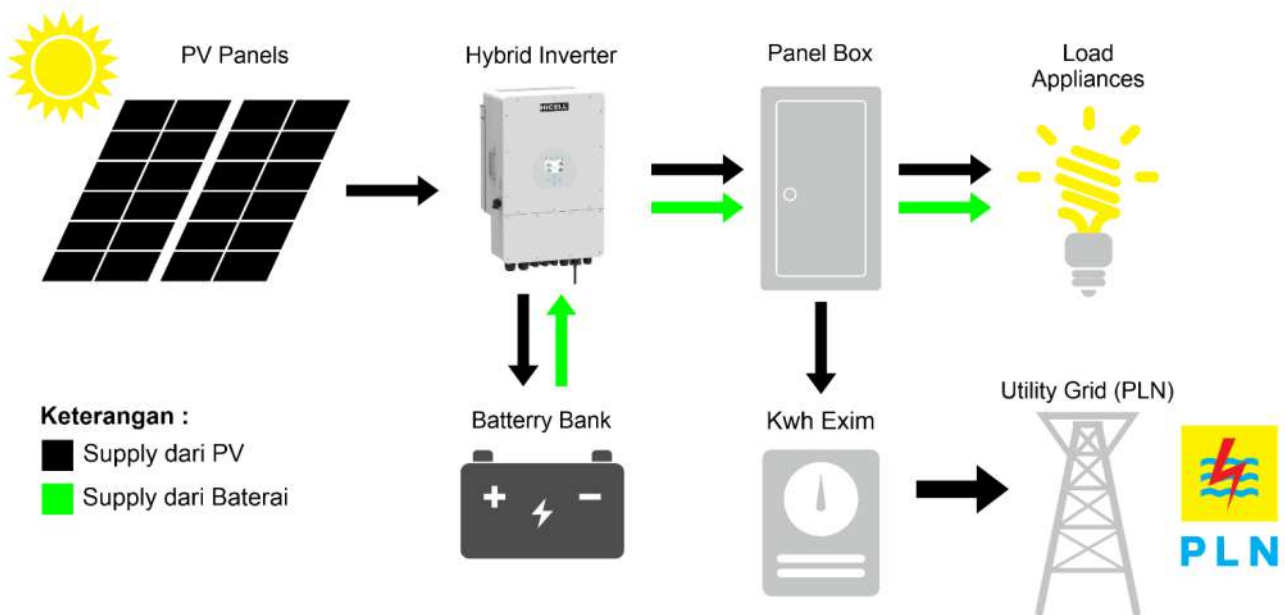


Cuaca Berawan / Malam

Energi matahari tidak mencukupi, sisa energi akan diimpor dari jaringan listrik.



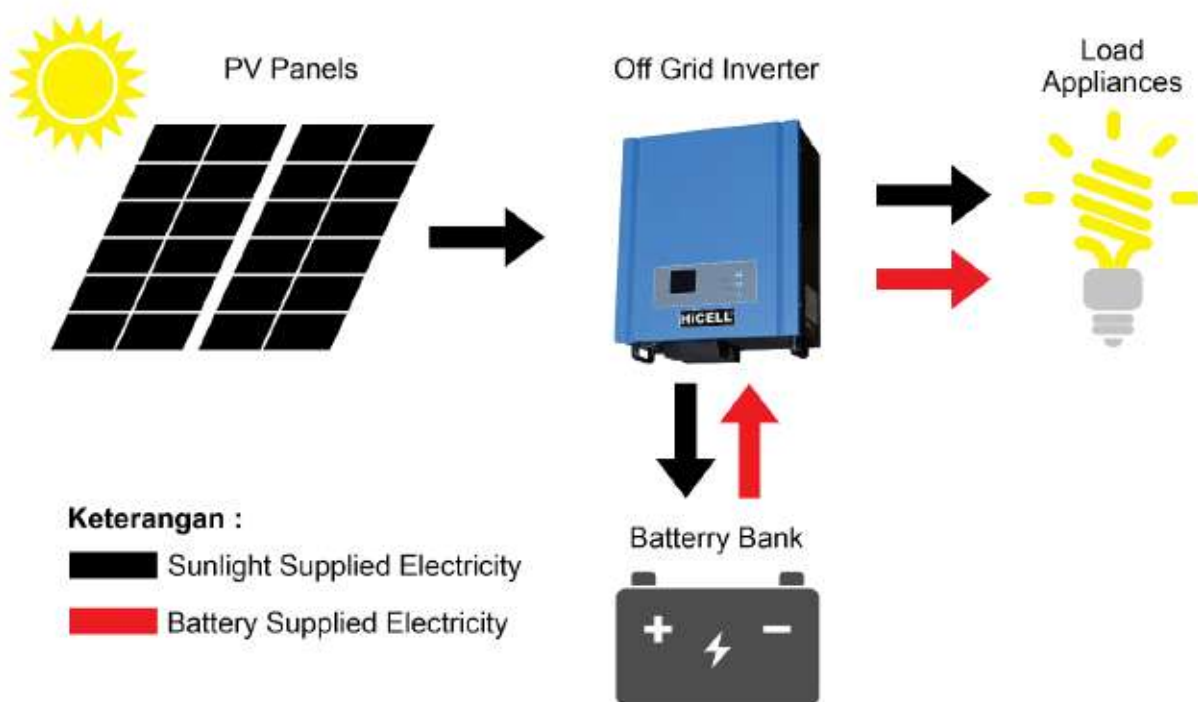
HiCELL HYBRID



Cara Kerja Sistem Hybrid

1. Solar Panel merubah sinar matahari menjadi arus listrik DC.
2. Inverter merubah arus listrik DC menjadi arus listrik AC.
3. Inverter mengirim kelebihan listrik yang dihasilkan solar panel ke baterai
4. Listrik AC dikirim ke panel listrik utama yang terhubung langsung ke jaringan.
5. Ketika baterai penuh, kelebihan listrik dikirim ke jaringan listrik dan otomatis mengurangi beban listrik tertagih.

HiCELL OFFGRID (Standalone)



Cara Kerja Sistem Offgrid

1. Panel surya merubah cahaya matahari menjadi arus listrik DC.
2. Solar Charge Controller membatasi penambahan atau penarikan arus listrik dari baterai guna mencegah tegangan atau pengisian daya berlebih yang dapat mengurangi masa pakai baterai dan juga sebagai pengaman.
3. Sistem PV Offgrid menggunakan deep cycle batteries yang mampu memasok daya dalam jumlah besar baik untuk jangka waktu pendek maupun panjang.
4. Inverter mengubah arus listrik DC dari panel surya menjadi arus AC untuk dapat digunakan untuk kebutuhan sehari-hari.

ONGRID Inverter

String Inverter & Microinverter



Inverter merupakan alat converter listrik yang mengubah arus DC (Direct Current) menjadi arus AC (Alternating Current), hasil dari arus AC tersebut memiliki voltase dan frekuensi tertentu sesuai kebutuhan beban.

Penggunaan inverter dapat ditemukan di berbagai peralatan elektronik, mulai dari yang kecil seperti komputer sampai pada sistem PLTS yang memiliki arus listrik yang lebih tinggi.



ONGRID String Inverter 3 kW – 7,5 kW

1 phase

Feature Highlights:

- ✓ Wifi Plugin (included)
- ✓ Up to 2 MPPT Module Level Monitoring
- ✓ IP65 Protection Degree
- ✓ Zero Export Application (optional)
- ✓ Wide Output Range Voltage



ONGRID String Inverter 6 kW – 30 kW

3 phase

Feature Highlights:

- ✓ Wifi Plugin (included)
- ✓ 2 MPPT Module Level Monitoring
- ✓ IP65 Protection Degree
- ✓ Zero Export Application (optional)
- ✓ Wide Output Range Voltage



ONGRID String Inverter 50 kW – 60 kW

3 phase

Feature Highlights:

- ✓ Wifi Plugin (included)
- ✓ 4 MPPT Module Level Monitoring
- ✓ IP65 Protection Degree
- ✓ Zero Export Application (optional)
- ✓ Wide Output Range Voltage



ONGRID String Inverter 80 kW – 100 kW

3 phase

Feature Highlights:

- ✓ Wifi Plugin (included)
- ✓ 6 MPPT Module Level Monitoring
- ✓ IP65 Protection Degree
- ✓ Zero Export Application (optional)
- ✓ Wide Output Range Voltage



ONGRID Microinverter 1 kW

1 phase

Feature Highlights:

- ✓ Wifi Plugin (included)
- ✓ 2 MPPT Module Level Monitoring
- ✓ IP67 Protection Degree
- ✓ Easy Cable Management



ONGRID Microinverter 2 kW

1 phase

Feature Highlights:

- ✓ Wifi Plugin (included)
- ✓ 4 MPPT Module Level Monitoring
- ✓ IP67 Protection Degree
- ✓ Max. DC input current of 13A, adapt to 550W PV module
- ✓ Wide Output Range Voltage
- ✓ Easy Cable Management

ONGRID String Inverter, 1 Phase 3kW – 7,5 kW

Model	SI-3K-1PH	SI-4K-1PH	SI-5K-1PH	SI-7.5K-1PH
Input Side				
Max. DC Input Power (kW)	3.9	5.2	6.5	9.8
Max. DC Input Voltage (V)		550		
Start-up DC Input Voltage (V)		80		
MPPT Operating Range (V)		70~500		
Max. DC Input Current (A)	13	13+13	13+13	13+26
Max. Short Circuit Current (A)	19.5	19.5+19.5		19.5+39
Number of MPPT / Strings per MPPT	1 / 1	2 / 1		2 / 1+2
Output Side				
Rated Output Power (kW)	3	4	5	7.5
Max. Active Power (kW)	3.3	4.4	5.5	8.25
Nominal Output Voltage / Range (V)	L/N/PE 220V/187V-242V, 230V/ 195.5V-253V (Optional)			
Rated Grid Frequency (Hz)	50 / 60 (Optional)			
Operating Phase	Single phase			
Rated AC Grid Output Current (A)	13	17.4	21.7	32.6
Max. AC Output Current (A)	14.3	19.1	23.9	35.9
Output Power Factor	0.8 leading to 0.8 lagging			
Grid Current THD	<3%			
DC Injection Current (mA)	<0.5%			
Grid Frequency Range	47~52 or 57~62 (Optional)			
Efficiency				
Max. Efficiency		97.5%		97.7%
Euro Efficiency		97.3%		97.5%
MPPT Efficiency		>99%		
Protection				
DC Reverse-Polarity Protection		Yes		
AC Short Circuit Protection		Yes		
AC Output Overcurrent Protection		Yes		
Output Overvoltage Protection		Yes		
Insulation Resistance Protection		Yes		
Ground Fault Monitoring		Yes		
Anti-islanding Protection		Yes		
Temperature Protection		Yes		
Integrated DC Switch		Yes		
Remote software upload		Yes		
Remote change of operating parameters		Yes		
Surge protection		DC Type II / AC Type II		
General Data				
Size (mm) (WxHxD)	280×272.5×184	330×323×190		330×410×198.5
Weight (kg)	4.8	7.5		15.7
Topology		Transformerless		
Internal Consumption		<1W (Night)		
Running Temperature		-25~65°C, >45°C derating		
Ingress Protection		IP65		
Noise Emission (Typical)		<25 dB		
Cooling Concept		Natural cooling		
Max. Operating Altitude Without Derating		2000m		
Warranty		5 years		
Grid Connection Standard	CEI 0-21, VDE-AR-N 4105, NRS 097, IEC 62116, IEC 61727, G99, G98, VDE 0126-1-1, RD 1699, C10-11			
Operating Surroundings Humidity	0-100%			
Safety EMC / Standard	IEC/EN 61000-6-1/2/3/4, IEC/EN 62109-1, IEC/EN 62109-2			
Features				
DC Connection	MC-4 mateable			
AC Connection	IP65 rated plug			
Display	LCD1602			
Interface	RS485/RS232/Wifi/LAN			

ONGRID String Inverter, 3 Phase 6kW – 30 kW

Model	SI-6K-3PH	SI-10K-3PH	SI-15K-3PH	SI-20K-3PH	SI-30K-3PH
Input Side					
Max. DC Input Power (kW)	7.8	13	19.5	26	39
Max. DC Input Voltage (V)	1000				
Start-up DC Input Voltage (V)	140		250		
MPPT Operating Range (V)	120~850		200~850		
Max. DC Input Current (A)	13+13		13+26	32+32	40+40
Max. Short Circuit Current (A)	19.5+19.5		19.5+39	48+48	60+60
Number of MPPT / Strings per MPPT	2 / 1		2/1+2	2 / 2	2 / 3
Output Side					
Rated Output Power (kW)	6	10	15	20	30
Max. Active Power (kW)	6.6	11	16.5	22	33
Nominal Output Voltage / Range (V)	3L/N/PE 380V/323V-418V, 400V/340V-440V				
Rated Grid Frequency (Hz)	50 / 60 (Optional)				
Operating Phase	Three phase				
Rated AC Grid Output Current (A)	8.7	14.5	21.7	29	43.5
Max. AC Output Current (A)	9.6	15.9	23.9	31.9	47.9
Output Power Factor	0.8 leading to 0.8 lagging				
Grid Current THD	<3%				
DC Injection Current (mA)	<0.5%				
Grid Frequency Range	47~52 or 57~62 (Optional)				
Efficiency					
Max. Efficiency	98.3%		98.5%	98.6%	
Euro Efficiency	97.5%			97.8%	
MPPT Efficiency	>99%				
Protection					
DC Reverse-Polarity Protection	Yes				
AC Short Circuit Protection	Yes				
AC Output Overcurrent Protection	Yes				
Output Overvoltage Protection	Yes				
Insulation Resistance Protection	Yes				
Ground Fault Monitoring	Yes				
Anti-islanding Protection	Yes				
Temperature Protection	Yes				
Integrated DC Switch	Yes				
Remote software upload	Yes				
Remote change of operating parameters	Yes				
Surge protection	DC Type II / AC Type II				
General Data					
Size (mm) (WxHxD)	330×457×185		333x472x202	330×508×206	362×577×215
Weight (kg)	10		15	20.8	25.5
Topology	Transformerless				
Internal Consumption	<1W (Night)				
Running Temperature	-25~65°C, >45°C derating				
Ingress Protection	IP65				
Noise Emission (Typical)	<25 dB			<45 dB	
Cooling Concept	Natural cooling			Smart cooling	
Max. Operating Altitude Without Derating	2000m				
Warranty	5 years				
Grid Connection Standard	CEI 0-21, VDE-AR-N 4105, NRS 097, IEC 62116, IEC 61727, G99, G98, VDE 0126-1-1, RD 1699, C10-11				
Operating Surroundings Humidity	0-100%				
Safety EMC / Standard	IEC/EN 61000-6-1/2/3/4, IEC/EN 62109-1, IEC/EN 62109-2				
Features					
DC Connection	MC-4 mateable				
AC Connection	IP65 rated plug				
Display	LCD1602				
Interface	RS485/RS232/Wifi/LAN				

Note : Model, varian, harga dan spesifikasi dapat berubah sewaktu-waktu tanpa pemberitahuan.

ONGRID String Inverter, 3 Phase 50kW – 100 kW

Model	SI-50K-3PH	SI-60K-3PH	SI-70K-3PH	SI-80K-3PH	SI-100K-3PH
Input Side					
Max. DC Input Power (kW)	65	78	91	104	150
Max. DC Input Voltage (V)	1000				
Start-up DC Input Voltage (V)	250				
MPPT Operating Range (V)	200~850				
Max. DC Input Current (A)	40+40+40+40				40+40+40+40+40+40
Max. Short Circuit Current (A)	60+60+60+60				60+60+60+60+60+60
Number of MPPT / Strings per MPPT	4 / 3		4 / 4		6 / 4
Output Side					
Rated Output Power (kW)	50	60	70	80	100
Max. Active Power (kW)	55	66	77	88	110
Nominal Output Voltage / Range (V)	3L/N/PE 380V/323V-418V, 400V/340V-440V				
Rated Grid Frequency (Hz)	50 / 60 (Optional)				
Operating Phase	Three phase				
Rated AC Grid Output Current (A)	72.4	87	101.5	115.9	144.9
Max. AC Output Current (A)	79.7	95.7	111.6	127.5	159.4
Output Power Factor	0.8 leading to 0.8 lagging				
Grid Current THD	<3%				
DC Injection Current (mA)	<0.5%				
Grid Frequency Range	47~52 or 57~62 (Optional)				
Efficiency					
Max. Efficiency	98.7%				
Euro Efficiency	98%		98.3%		
MPPT Efficiency	>99%				
Protection					
DC Reverse-Polarity Protection	Yes				
AC Short Circuit Protection	Yes				
AC Output Overcurrent Protection	Yes				
Output Overvoltage Protection	Yes				
Insulation Resistance Protection	Yes				
Ground Fault Monitoring	Yes				
Anti-islanding Protection	Yes				
Temperature Protection	Yes				
Integrated DC Switch	Yes				
Remote software upload	Yes				
Remote change of operating parameters	Yes				
Surge protection	DC Type II / AC Type II				
General Data					
Size (mm) (WxHxD)	647.5×537×303.5		838×568×323		
Weight (kg)	44.5		73.7		
Topology	Transformerless				
Internal Consumption	<1W (Night)				
Running Temperature	-25~65℃, >45℃ derating				
Ingress Protection	IP65				
Noise Emission (Typical)	<45 dB		<55 dB		
Cooling Concept	Smart cooling				
Max. Operating Altitude Without Derating	2000m				
Warranty	5 years				
Grid Connection Standard	CEI 0-21, VDE-AR-N 4105, NRS 097, IEC 62116, IEC 61727, G99, G98, VDE 0126-1-1, RD 1699, C10-11				
Operating Surroundings Humidity	0-100%				
Safety EMC / Standard	IEC/EN 61000-6-1/2/3/4, IEC/EN 62109-1, IEC/EN 62109-2				
Features					
DC Connection	MC-4 mateable				
AC Connection	IP65 rated plug				
Display	LCD1602				
Interface	RS485/RS232/Wifi/LAN				

ONGRID Microinverter, 1Phase 1 kW – 2 kW

Model	MI-1000	MI-2000
Input Data (DC)		
Recommended input Power (STC)	210~600W (2 Pieces)	210~600W (4 Pieces)
Maximum input DC Voltage	60V	
MPPT Voltage Range	25~55V	
Operating DC Voltage Range	20~60V	
Max. DC Short Circuit Current	19.5A×2	19.5A×4
Max. input Current	13A×2	13A×4
Number of MPPT / Strings per MPPT	2 / 1	4 / 1
Output Data (AC)		
Rated output Power	1000W	2000W
Rated output Current	4.4A	8.7A
Nominal Voltage / Range (this may vary with grid standards)	220V/187~242V	220V/176~242V
Nominal Frequency / Range	50 / 60Hz	
Extended Frequency / Range	47.5~51.5Hz	
Power Factor	>0.99	
Maximum units per branch	5	3
Efficiency		
CEC Weighted Efficiency	95%	
Peak Inverter Efficiency	96.5%	
Static MPPT Efficiency	99%	
Night Time Power Consumption	50mW	
Mechanical Data		
Ambient Temperature Range	-40~65°C	
Size (mm) (Without mounting bracket and cable) (W×H×D)	212×230×40	267×300×42
Weight (kg)	3.15	5.2
Cooling Concept	Natural cooling	
Enclosure Environmental Rating	IP67	
Features		
Compatibility	Compatible with 60~72 cell PV modules	
Communication	Power line / WIFI / Zigbee	
Warranty	10 years	

Note : Model, varian, harga dan spesifikasi dapat berubah sewaktu-waktu tanpa pemberitahuan.

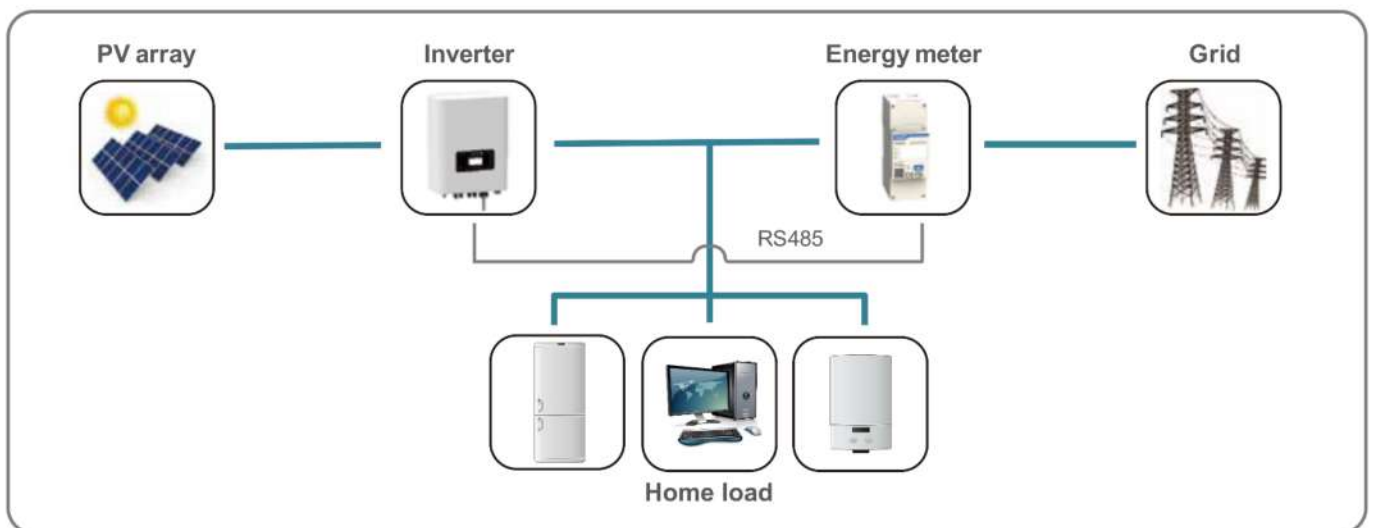
Energi Meter



Feature Highlights:

- ✓ 1 Phase & 3 Phase Input
- ✓ Module DIN rail mounted
- ✓ Backlit display
- ✓ Simple menu navigation
- ✓ Built in Modbus and pulsed outputs or optional Mbus interface
- ✓ Four kWh measurement modes for PV and battery storage

Application Diagram



Energy Meter

Model	EASTRON SDM120CT-M	EASTRON SDM 630-Modbus V2	EASTRON SDM 630 MCT
Battery Data			
Max. direct current measurement (A)	5-9999A	100	1-9999A (with CT)
Direct Voltage measurement between phases	/	147-480V	50-950V
			50-550V
Direct measurement between phase and neutral	176V-276V	85~480V	20-550V
Accuracy Class			
Active power	Class1		
Reactive power	Class2		
Power Supply			
Power consumption	≤2W / 10VA		
AC power supply input voltage	176~276V	85-480V	85-275V / 120-380V
AC power supply input frequency	50/60Hz ±10%	50/60Hz ±2%	
Generation Specifications			
Dimenstions (L/H/W) in mm 36×85×66	18×118×64	72×100×66	72×94.5×65
Weight (kg) 0.21	0.21	0.42	0.29
Mounting options	DIN Rail	DIN Rail	
Degree of protection	IP51	IP51	
Display	LCD	LCD	
Communication interface	RS485	RS485	
Max. number of devices to connect	64	32	
Regulated working temperature range	-25℃~+55℃		
Limited working temperature range	/		
Humidity	0~95%, non-Condensing		
Warranty	1 year		

Note : Model, varian, harga dan spesifikasi dapat berubah sewaktu-waktu tanpa pemberitahuan.

HYBRID Inverter

1 phase



HYBRID Inverter 3,6 kW – 5 kW

1 phase

Feature Highlights:

- ✓ 6 time periods for battery charging/discharging
- ✓ IP65 Protection Degree
- ✓ DC couple & AC couple to retrofit existing solar system
- ✓ Max. charging/discharging current of 135A
- ✓ Support storing energy from diesel generator
- ✓ Frequency droop control, Max.16pcs parallel

Model	HI-3.6K-1PH	HI-5K-1PH
Battery Input Data		
Battery Type	Lead-acid or Lithium-ion	
Battery Voltage Range (V)	40~60	
Max. Charging Current (A)	90	120
Max. Discharging Current (A)	90	120
Charging Curve	3 Stages / Equalization	
External Temperature Sensor	Yes	
Charging Strategy for Li-Ion Battery	Self-adaption to BMS	
PV String Input Data		
Max. DC Input Power (W)	4680	6500
PV Input Voltage (V)	370 (125~500)	
MPPT Range (V)	150~425	
Full Load DC Voltage Range (V)	300~425	
Start-up Voltage (V)	125	
PV Input Current (A)	13+13	
Max. PV ISC (A)	17+17	
No.of MPPT Trackers	2	
No.of Strings Per MPPT Tracker	1+1	

Note : Model, varian, harga dan spesifikasi dapat berubah sewaktu-waktu tanpa pemberitahuan.



HYBRID inverter, 1 Phase 3,6 kW – 5 kW

Model	HI-3.6K-1PH	HI-5K-1PH
AC Output Data		
Rated AC Output and UPS Power (W)	3600	5000
Max. AC Output Power (W)	3960	5500
Peak Power (off grid)	2 times of rated power, 10 S	
AC Output Rated Current (A)	15.7	22.7
Max. AC Current (A)	18	25
Max. Continuous AC Passthrough (A)	35	
Power Factor	0.8 leading to 0.8 lagging	
Output Frequency and Voltage	50/60Hz; 220/230 Vac (single phase)	
Grid Type	Single Phase	
Current Harmonic Distortion	THD<3% (Linear load<1.5%)	
Efficiency		
Max. Efficiency	97.60%	
Euro Efficiency	96.50%	
MPPT Efficiency	99.90%	
Protection		
PV Input Lightning Protection	Integrated	
Anti-islanding Protection	Integrated	
PV String Input Reverse Polarity Protection	Integrated	
Insulation Resistor Detection	Integrated	
Residual Current Monitoring Unit	Integrated	
Output Over Current Protection	Integrated	
Output Shorted Protection	Integrated	
Output Over Voltage Protection	Integrated	
Surge protection	DC Type II / AC Type II	
General Data		
Operating Temperature Range (°C)	-45~60°C, >45°C Derating	
Cooling	Natural cooling	
Noise (dB)	<30 dB	
Communication with BMS	RS485; CAN	
Weight (kg)	20.5	
Size (mm) (WxHxD)	330×580×232	
Protection Degree	IP65	
Installation Style	Wall-mounted	
Warranty	5 years	

Note : Model, varian, harga dan spesifikasi dapat berubah sewaktu-waktu tanpa pemberitahuan.

HYBRID inverter, 3 Phase 8 kW – 10 kW

Model	HI-8K-3PH	HI-10K-3PH
Battery Input Data		
Battery Type	Lead-acid or Li-Ion	
Battery Voltage Range (V)	40~60	
Max. Charging Current (A)	190	210
Max. Discharging Current (A)	190	210
Charging Curve	3 Stages / Equalization	
External Temperature Sensor	Yes	
Charging Strategy for Li-Ion Battery	Self-adaption to BMS	
PV String Input Data		
Max. DC Input Power (W)	10400	13000
Rated PV Input Voltage (V)	550	
Max. PV Input Voltage (V)	800	
Min. PV Input Voltage (V)	150	
Start-up Voltage (V)	160	
MPPT Range (V)	200-650	
Full Load DC Voltage Range (V)	350-650	
PV Input Current (A)	13+13	34+17
Max. PV ISC (A)	17+17	34+17
Number of MPPT / Strings per MPPT	2/1+1	2/2+1
AC Output Data		
Rated AC Output and UPS Power (W)	8000	10000
Max. AC Output Power (W)	8800	11000
Peak Power (off grid)	2 times of rated power, 10 S	
AC Output Rated Current (A)	12.1	15.2/14.5
Max. AC Current (A)	18.2	22.7/21.7
Max. Continuous AC Passthrough (A)	45	
Output Frequency and Voltage	50/60Hz; 220/380, 230/400Vac	
Grid Type	Three Phase	
Current Harmonic Distortion	THD<3% (Linear load<1.5%)	
Efficiency		
Max. Efficiency	97.60%	
Euro Efficiency	97.00%	
MPPT Efficiency	99.90%	
Protection		
PV Input Lightning Protection	Integrated	
Anti-islanding Protection	Integrated	
PV String Input Reverse Polarity Protection	Integrated	
Insulation Resistor Detection	Integrated	
Residual Current Monitoring Unit	Integrated	
Output Over Current Protection	Integrated	
Output Shorted Protection	Integrated	
Output Over Voltage Protection	Integrated	
Surge protection	DC Type II / AC Type II	
General Data		
Operating Temperature Range (°C)	-45~60°C, >45°C Derating	
Cooling	Smart cooling	
Noise (dB)	<45 dB	
Communication with BMS	RS485; CAN	
Weight (kg)	33.6	
Size (mm) (WxHxD)	422×699.2×279	
Protection Degree	IP65	
Installation Style	Wall-mounted	
Warranty	5 years	

Note : Model, varian, harga dan spesifikasi dapat berubah sewaktu-waktu tanpa pemberitahuan.

OFFGRID Inverter

500W – 2000W



Features :

- ✓ High reliability: adopt high-speed DSP control system, combine advanced SPWM technology and high-speed power MOS.
- ✓ Operating mode selectable: energy storage priority or power supply priority.
- ✓ No PID attenuation damage for solar panels to ensure their service life.
- ✓ Flexible battery management system: auto switch three-stage charging mode shortens recharge time; wide charging current is selectable according to configured battery; flexible DOD (Depth of discharge) is settable to meet more applications.

- ✓ AC input with effective online synchronous stabilizing technology.
- ✓ Broad MPPT input voltage range.
- ✓ No-load auto shutdown function (optional).
- ✓ Settable frequency (50Hz / 60Hz).
- ✓ Auto Power-On/Off function; real-time monitoring, test and intelligent startup / shutdown by RS232 or USB interface communicating with PC; remote monitoring by optional SNMP networks.

Specification :

MODEL	OFI-0.5-1PH	OFI-1-1PH	OFI-3-1PH
PV INPUT			
Max. input voltage (VoC)	60 Vdc	100 Vdc	150 Vdc
Optimum operating voltage (Vmp)	16~48Vdc	33~80 Vdc	65~120 Vdc
Max. charging current	50 A	50 A	65 A
Recommended PV configuration	700 W	1400 W	3500 W
AC INPUT			
AC input range (bypass mode)	0~132 Vac / 0~264 Vac (high-end limit)		
Rated input voltage	100 Vac / 110 Vac / 115 Vac / 120 Vac or 200 Vac / 220 Vac / 230 Vac / 240 Vac $\pm$ 25% (2500 W is only for 110 Vac; 3000 W is only for 220 Vac)		
Rated input frequency	50 Hz / 60 Hz $\pm$ 5% / 10% / 15% (settable)		
Max. charging current	20 A		30 A



MODEL		OFI-0.5-1PH	OFI-1-1PH	OFI-3-1PH
INVERTER OUTPUT				
Output voltage		100 Vac / 110 Vac / 115 Vac / 120 Vac ± 2% or 200 Vac / 220 Vac / 230 Vac / 240 Vac ± 2% (settable) (2500 W is only for 110 Vac; 3000 W is only for 220 Vac)		
Rated output power		500 W	1000 W	3000 W
Power factor		1	1	1
Rated output frequency		50 Hz / 60 Hz ± 1% (inverter mode)		
Waveform		Sinusoidal		
Max. efficiency (resistive load)		≥ 78 %	≥ 82 %	≥ 85 %
Sleep mode		Settable (< 3% load) access in ≤ 2min		
Output voltage harmonic		≤ 3% (linear load)		
BATTERIES				
Battery voltage		12 Vdc	24 Vdc	48 Vdc
Battery type		VRLA battery (default)		
Charging current		5~50 A (settable)		5~65 A (settable)
DOD	Settable	10.5~13.2 Vdc	21~26.4 Vdc	42~52.8 Vdc
	Default	12 Vdc	24 Vdc	48 Vdc
EOD	Settable	9.6~12 Vdc	19.2~24 Vdc	38.4~48 Vdc
	Default	10.5 Vdc (default)	21 Vdc	42 Vdc
Equalizing	Settable	13.8~15 Vdc	27.6~30 Vdc	55.2~60 Vdc
charge voltage	Default	14.1 Vdc	28.2 Vdc	56.4 Vdc
Floating	Settable	13.2~13.8 Vdc	26.4~27.6 Vdc	52.8~55.2 Vdc
charge voltage	Default	13.6 Vdc	27.2 Vdc	54.5 Vdc
Restoration point of overvoltage		15.5 Vdc	31 Vdc	62 Vdc
OTHERS				
Transfer time		3~6 ms (typical); ≤ 10 ms (max.)		
Overload (linear load)		110% for 2 min, 125% for 1 min, 150% for 10s, 180% for 1s		
ECO mode (optional)		Load < 3% (settable, Yes / No settable)		
No-load shutdown (optional)		Load < 3%~50%, Yes / No settable		
Load adaptation		Inductive load: ≤ 30%; capacitive load: ≤ 50%; resistive load: ≤ 100%		
Protections		Output overload - short- circuit - overdischarge - overcharge - battery reverse polarity		
		- PV reverse polarity		
Lightning protection		Class III		
Communications		RS232 / USB / RS485 ; SNMP / Wi-Fi / GPRS (optional)		
Standards		IEC62040, IEC / EN 61000		
IP rating		IP21		
Display		LCD & LED		
Operating temperature		0° ~40°C		
Relative humidity		≤ 93%		
Noise		< 50 dB		
Dimensions (WxDxH) (mm)		365.5 x 442 x 210		
Packaged dimensions (WxDxH) (mm)		455 x 520 x 283		
Net weight (kg)		16.6	19.5	38.5
Gross weight (kg)		18.1	21	40

Note : Model, varian dan spesifikasi dapat berubah sewaktu-waktu tanpa pemberitahuan.

Deep Cycle Gel Battery

100Ah – 200Ah



Deep Cycle Gel Battery uses the sealed gel technology and is designed for high reliable, maintenance-free power for renewable energy applications. Depending on the advantage gel technology, optimum grid and plate design, the HiCELL gel battery offers highest power and reliability for your equipments.

APPLICATION :

- ✓ Electric Powered Vehicles
- ✓ Golf cars
- ✓ Commercial deep cycle applications
- ✓ Power plant
- ✓ UPS system
- ✓ Water Pumping
- ✓ Wind Generation
- ✓ Cathodic Protection
- ✓ Communications
- ✓ Solar System

DISCHARGE & CYCLING ABILITY

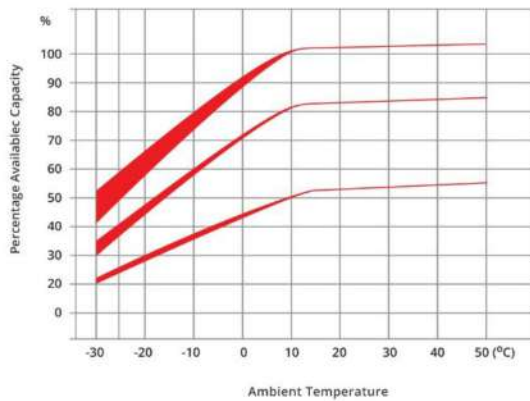
Battery discharge capacity and cyclic life are depended on the depth of discharge (DOD), and the ambient temperature.

The HiCELL gelled battery is designed to the “acid limited.” This means that the power in the acid is used before the power in the plates. This design prevents the plates from ultra-deep discharges. Ultra-deep discharging is what causes life-shortening plates shedding and accelerates positive grid corrosion which destroy a battery.





Capacity VS. Operating Temperature



CAPACITY VS OPERATING TEMPERATURES:

shown are the changes in capacity for a wider ambient temperature range, giving the available capacity, as a percentage of the rated capacity, at different ambient temperatures, for 3 different load examples, with uninterrupted discharge to the appropriate discharge cut-off voltage.

The values for the upper edge of the curves were obtained from charging at an ambient temperature of +20°C with a voltage limit to 2.30V/Cell. For the lower edge, charging was carried out at the specified ambient temperature. The curves show the behavior of battery after a number of cycle.

SPECIFICATION :

Model	Voltage (V)	Capacity (Ah)	Internal Resistance (M)	Dimensions								Terminal		Weight (Kg)
				Length		Width		Height		Total Height				
				mm	in	mm	in	mm	in	mm	in	Type	Position	
Hi-12100-V	12	100	5	330	13	171	6.7	214	8.4	220	8.7	T9	C	32
Hi-12150-V	12	150	4.2	485	19	172	6.8	240	9.4	240	9.4	T11	C	44
Hi-12200-V	12	200	3.3	522	21	238	9.4	222	8.7	222	8.7	T11	E	66

Note : Model, varian dan spesifikasi dapat berubah sewaktu-waktu tanpa pemberitahuan.

Lithium Battery

Lithium Iron Phosphate (LiFePO₄)



BMS Specification

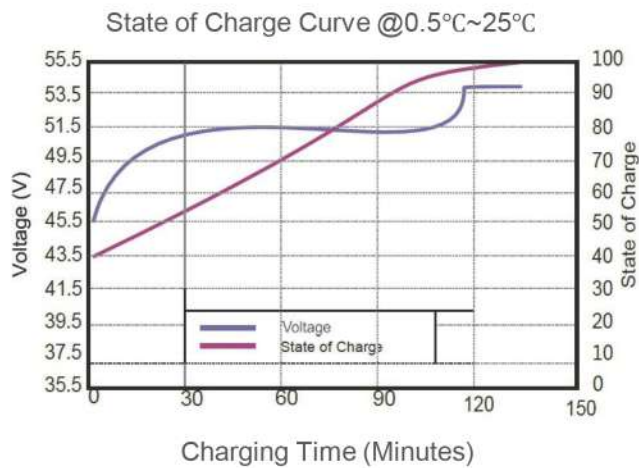
- ✓ Overcharge detection function
- ✓ Discharge detection function
- ✓ Current detection function
- ✓ Temperature protection
- ✓ Short detection function
- ✓ Balance function

Features of LiFePO₄ battery

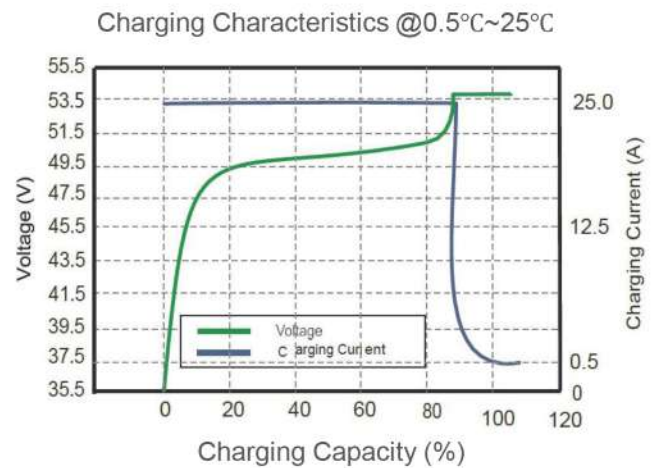
- ✓ **Longer Cycle Life:** Offers up to 10times longer cycle life and five times longer float /calendar life than lead acid battery, helping to minimize replacement cost and reduce total cost of ownership.
- ✓ **Lighter Weight:** About 40% of the weight of a comparable lead acid battery. A 'drop in' replacement for lead acid batteries.
- ✓ **Higher Power:** Delivers twice power of lead acid battery, even high discharge rate, while maintaining high energy capacity.
- ✓ **Wider Temperature Range:** -20°C~60°C.
- ✓ **Superior Safety:** Lithium Iron Phosphate chemistry eliminates the risk of explosion or combustion due to high impact, overcharging or short circuit situation.
- ✓ **Increased Flexibility:** Modular Design enables deployment of up to 15 batteries in parallel.

Electrical Characteristics	Nominal Voltage	48V
	Nominal Capacity	50Ah
	Energy	2400Wh
	Internal Resistance	< 90m Ω
	Cycle Life	>2000 cycles @0.2C & 25°C 100% DOD
	Design life	3 years
	Months Self Discharge	<3%
	Efficiency of Charge	100% @0.2C
Standard Charge	Efficiency of Discharge	96~99% @0.5C
	Charge Voltage	54V
	Standard Charge Current	10A
	Max. Continuous Charge Current	50A
Standard Discharge	Charge Cut-off Voltage	55.5V
	Discharge Cut-off Voltage	40V
	Standard Discharge Current	1 0A
Environmental	Max. Continuous Discharge Current	50A
	Charge Temperature	0°C to 50°C @60±25% Relative Humidity
	Discharge Temperature	-20°C to 60°C @60±25% Relative Humidity
	Storage Temperature	0°C to 40°C @60±25% Relative Humidity
Mechanical	Water Dust Resistance	IP30
	Cell & Method	15S1 P
	Shell material	Iron (SPCC)
	Dimensions (mm)	442*400*135nnnn
	Weight (Kg) per blocks	Approx. 32kg
	Weight (Kg) per box (battery packing)	Approx. 33kg
	Gravimetric specific energy	75WH/KG
	Protocol	Double RS485/RS232
Certificates	SOC	LED
	CE, UN38.3, MSDS, etc	

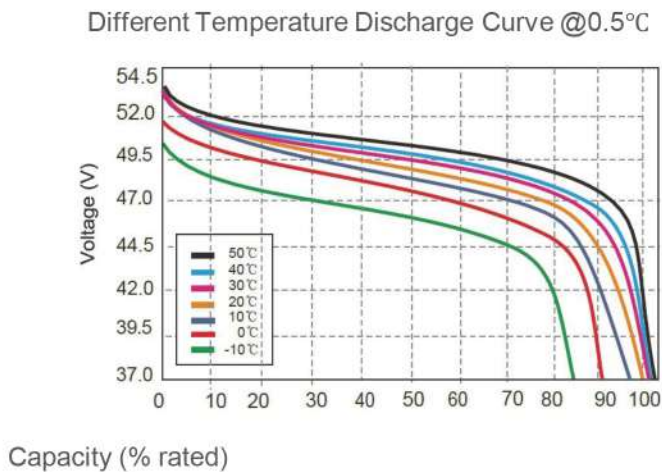
State of Charge Curve



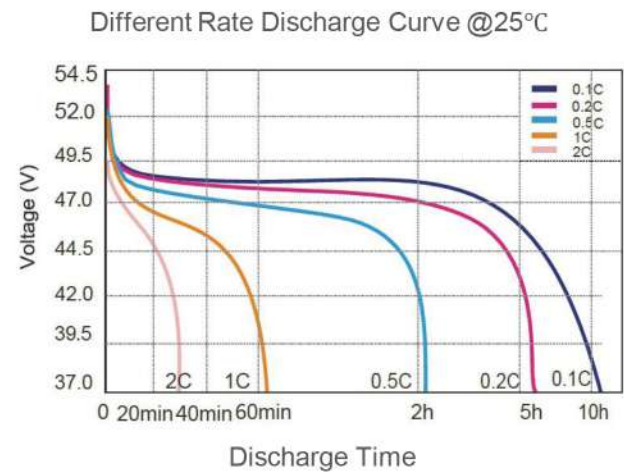
Charging Characteristics



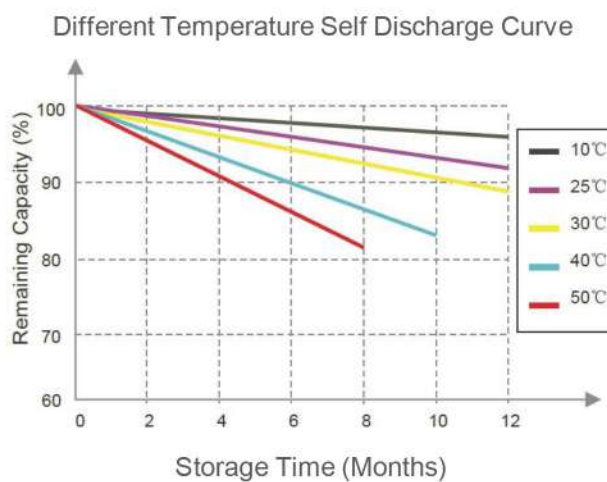
Different Temperature Discharge Curve



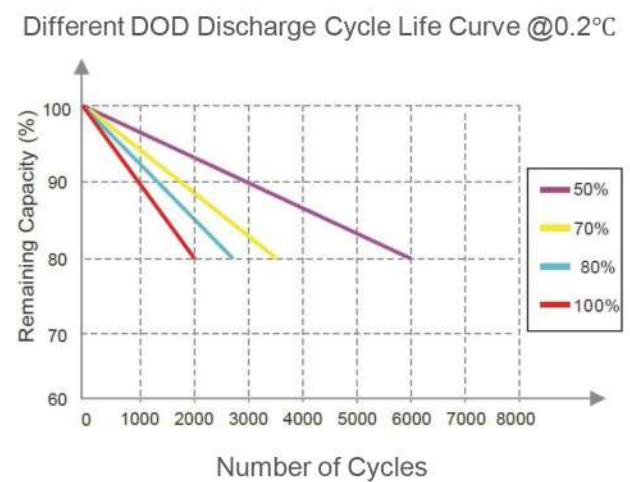
Different Rate Discharge Curve



Self Discharge Characteristics Curve



Cycle Life Curve



PROJECT REFERENCE



**@ Sunter - 2 kW
On Grid**



**@ Ambon - 15 kW
On Grid**



**@ Menteng - 5 kW
Hybrid**



**@ Daanmogot - 1 kW
On Grid**

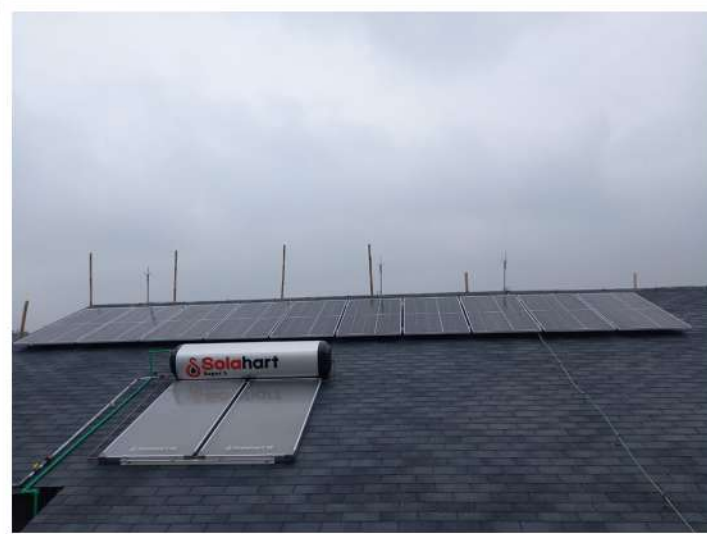
PROJECT REFERENCE



**@ Palembang - 30 kW
On Grid**



**@ Bandung - 5 kW
On Grid**



**@ Jakarta Timur - 5 kW
On Grid**



**@ Bandung - 5 kW
On Grid**

PROJECT REFERENCE



**@ Surabaya - 3 kW
On Grid**



**@ Klaten - 5 kW
On Grid**



**@ Lombok - 10 kW
On Grid**



**@ Bekasi - 15 kW
On Grid**

PROJECT REFERENCE



@ Bekasi - 5 kW
Hybrid



@ Bintaro - 3 kW
On Grid



@ Semarang - 5kW
Hybrid 1 phase



@ Samarinda - 10 kW
On Grid 3 phase



**CHANGING THE
WORLD
WITH THE FUTURE
TECHNOLOGY**

www.solterra.id