

Solar Power System

A standalone solar power system providing power to cell sites, small communities can be provided by Spectrum Communication. Each site's performance requirement is analysed and appropriate solution is provided. Some of the parameters taken into consideration include Site Load (intermittent and continuous) over a 24hour period, location of the site, objective i.e to have site running on batter/solar and genset/grid, autonomy period requirement, load type, single phase/three phase ac requirement.



After collecting the data, Spectrum will design a bespoke system that meets your requirements. Upon supply, Spectrum can also provide installation service if so required.

Some components of a Solar based power system include Solar Panels, Converters, Inverters/Rectifiers, Batteries and controller.

Solar Panel (PV)

Half Cell MBB 550-600 Watt MONO-FACIAL MODULE

Positive power tolerance of 0~+3%

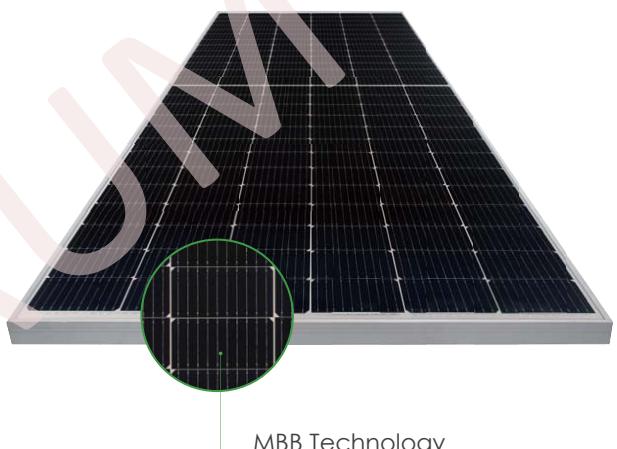
IEC61215(2016), IEC61730(2016)

ISO9001:2015: Quality Management System

ISO14001:2015: Environment Management System

ISO45001:2018

Occupational health and safety management systems



MBB Technology

Key Features



Multi Busbar Technology

Better light trapping and current collection to improve module power output and reliability.



Reduced Hot Spot Loss

Optimized electrical design and lower operating current for reduced hot spot loss and better temperature coefficient.



Longer Life-time Power Yield

0.55% annual power degradation and 25 year linear power warranty.



Durability Against Extreme Environmental Conditions

High salt mist and ammonia resistance.



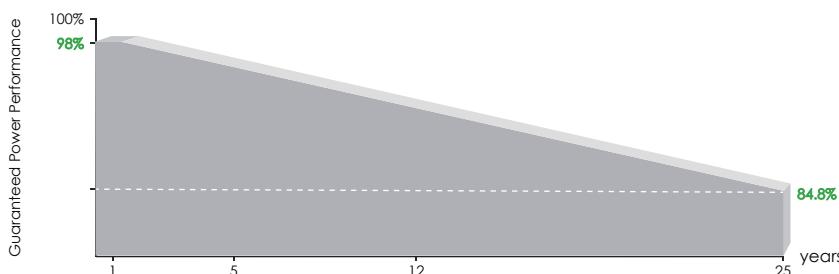
Enhanced Mechanical Load

Certified to withstand: wind load (2400 Pascal) and snow load (5400 Pascal).



POSITIVE QUALITY™
Continuous Quality Assurance

LINEAR PERFORMANCE WARRANTY



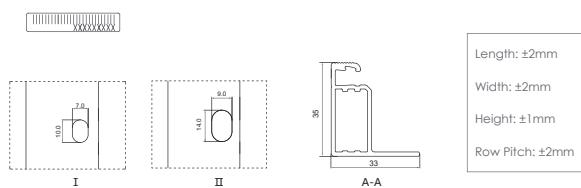
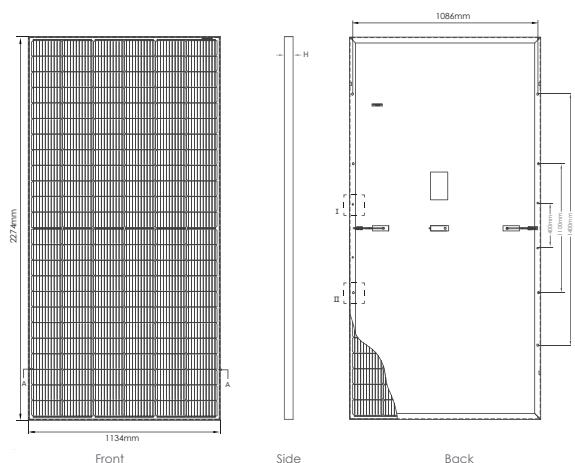
12 Year Product Warranty

25 Year Linear Power Warranty

0.55% Annual Degradation Over 25 years

S P E C T R U M

Engineering Drawings

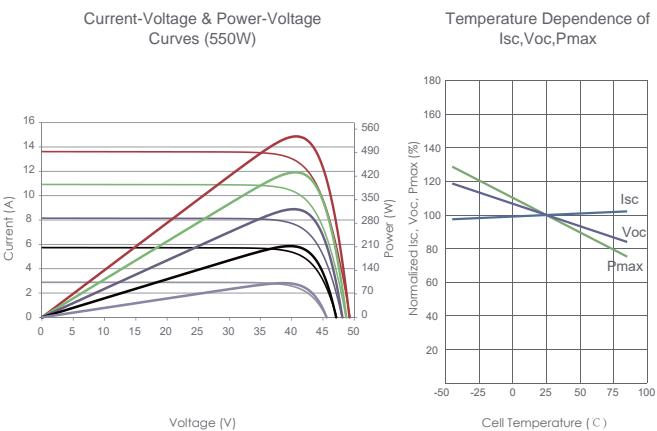


Packaging Configuration

(Two pallets = One stack)

31pcs/pallets, 62pcs/stack, 620pcs/ 40'HQ Container

Electrical Performance & Temperature Dependence



Mechanical Characteristics

Cell Type	MBB Mono-crystalline
No. of cells	144 (6x24)
Dimensions	2274x1134x35mm (89.53x44.65x1.38 inch)
Weight	28.9 kg (63.7 lbs)
Front Glass	3.2mm, Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Output Cables	TUV 1x4.0mm ² (+): 400mm, (-): 200mm or Customized Length

SPECIFICATIONS

Module Type	SP550M-72	SP560M-72	SP570M-72	SP580M-72	SP590M-72	SP600M-72
Maximum Power (Pmax)	550W	560W	570W	580W	590W	600W
Maximum Power Voltage (Vmp)	40.90V	41.10V	41.30V	41.50V	41.90V	42.10V
Maximum Power Current (Imp)	13.45A	13.63A	13.8A	13.98A	14.08A	14.25A
Open-circuit Voltage (Voc)	49.62V	49.72V	49.82V	49.91V	49.95V	49.99V
Short-circuit Current (Isc)	14.03A	14.33A	14.62A	14.81A	14.92A	14.97A
Module Efficiency STC (%)	21.33%	21.72%	22.10%	22.49%	22.87%	23.27%
Operating Temperature(°C)	-40°C~+85°C					
Maximum system voltage	1000/1500VDC (IEC)					
Maximum series fuse rating	25A					
Power tolerance	0~+3%					
Temperature coefficients of Pmax	-0.35%/°C					
Temperature coefficients of Voc	-0.28%/°C					
Temperature coefficients of Isc	0.048%/°C					
Nominal operating cell temperature (NOCT)	45±2°C					

*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

Solar Power System

MPPT Maximum Power Point Tracking Controller

High-performance SM series solar controller is a kind of bulk solar power equipment with MPPT (Maximum Power Point Tracking) calculation, making full use of solar photovoltaic power. PV wide range voltage input can charge many kinds of battery, and three-stage charging way effectively extends the battery life. Because of its modular design, the controller can be multi-parallel connected to use, so that customers can flexibly configure.

Key Features

- ◆ Memory function, save the settings、date and time、power generation etc function ◆
Charging mode: three-stage charging(constant current、constant voltage、float),effectively extending the battery life.
- ◆ LCD and LED display various parameters, such as model, PV input voltage, the battery type, charging voltage, charging current, charging power, working condition etc.
- ◆ MPPT tracking technology automatically make PV modules generate power at the best spot
- ◆ Multiple devices can work in parallel, this expands the using scope and meet the requirements of high-power charging
- ◆ Available for communication power supply fie



SPI series three phase inverter



Single or Three phase inverter, designed and manufactured according to new energy generating system, is mainly used in the fields of PV power plant, wind power plant, wind solar oil storage complementary power generating system and solar home system, especially for the places needing three phases four wires AC electricity. High inverter efficiency and superior performance advantages, using new energy power generating system provides absolute stability to those traffic inconvenience environment without electricity areas like mountain, pastoral, border and island and you can use high-power three phase inverter with centralized power supply for the regions without electricity.

Key Features

- ◆ Advanced DSP digital control technology effectively improve the product feature and system stability
- ◆ Excellent industrial ambient protection performance, applicable to all kinds of working environment
- ◆ Humane voice prompts and high performance big LCD screen, smart boot prompts and operation error alert function, operate visually and easily
- ◆ Powerful communication interfaces and network remote monitoring
- ◆ Wealth of options can be flexibly configured according to the actual needs
- ◆ Independent airtight duct, optimized ventilation design, internal modular

All devices requiring maintenance can be maintained from the front side. Unit can be installed three faces against the wall or parallel Parameter

Appendix Technical Parameters for MPPT Controller

Voltage level	SM48	SM96	SM192	SM220	SM240			
Rated voltage (VDC)	48	96	192	220	240			
Over voltage value(VDC)	62.0	124.0	248.0	279.0	310.0			
Over voltage recovery value(VDC)	60.0	120.0	240.0	270.0	300.0			
Float charge Voltage(VDC)	Settable	54.0	108.0	216.0	243.0			
Bulk charge Voltage(VDC)		56.8	113.6	227.2	255.6			
Maximum charging	60/120	50/100/150/200						
Charging Mode	Three-stage: constant current(MPPT), bulk charge, float charge							
Rated input power (kWp)	3.4/6.8	5.7/11.4/ 17.1/22.8	11.4/22.8/ 34.2/45.6	12.8/25.6/ 38.4/51.2	14.2/28.4/ 42.6/56.8			
Start work voltage(VDC)	8	14	270	290	33			
MPPT voltage range	70-150	130-280	260-450	280-450	320-450			
Maximum input voltage	1	30	480					
Maximum efficiency	>98%							
MPPT efficiency	>99%							
Noise (dB)	<55							
Degree of protection	IP20							
Display	LCD+LED							
Communication	RS485(optional)							
Working temperature	-10~+50°C							
Relative humidity	0 to 95% (non-condensing)							
Altitude (m)	≤5000m, (1000 meters above derating)							
Degree of protection	IP20							
Dimensions (W × H × D)	400*280*160		400*280*160/440*685*440					
Protection	PV array reverse polarity protection; reverse battery protection; nighttime anti-charge protection; battery overcharge protection, output overload protection, over temperature protection ect.							

Above information is just for reference, no inform if there is any change. Special voltage can be customized.

Appendix Technical Parameters for 3 Phase Inverter

Weight (kg)	190-340	450-750	750-950	1100-1600
Color) Black(Optional)	
Noise dB		45~55 (1m from the machine)		
Cooling	Forced cool air			
Altitude (Max.)		<1000 米 (Above 1000m per 100m power derating 1%, Max.5000m)		
Relative Humidity (No condensation)			30%~90%	
Operating temperature			0~40°C	
Computer communication interface		RS232 (485Network remote monitoring Optional)		
100%Inverter efficiency, load			>90%	
Overload capacity		125% 1min , 150% 1S		
Balance load voltage		<±1%; <±5%Unbalance load voltage)		
Instant recovery time			<10ms	
Dynamic load voltage transients (from 0 to 100%)			<±5%	
THD		Liner load<3%; Non-liner load<5%		
Output waveform		Pure sine wave		
Current peak factor		3: 1		
Frequency stability at sync			<±5%	
Frequency stability out sync			<±0.05%	
Nominal frequency		50Hz±0.05%		
Nominal voltage		380/400VAC±1% (Static load) , 380/400VAC±3% (Load fluctuation)		
Phase		Three phases+N+G		
Rated DC voltage(VDC)	192V/220V/240	220/240/360/384	360/384	360/384
Rated power(KW)	10/15/20/25KW SPI	30/40/50 KW SPI	60/80/100KW SPI	120/140/160/200KW

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2V-2000AH Battery

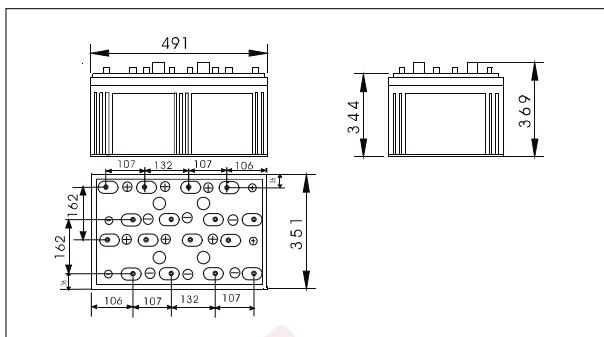
GFM(G)-2000 (2V2000AH)



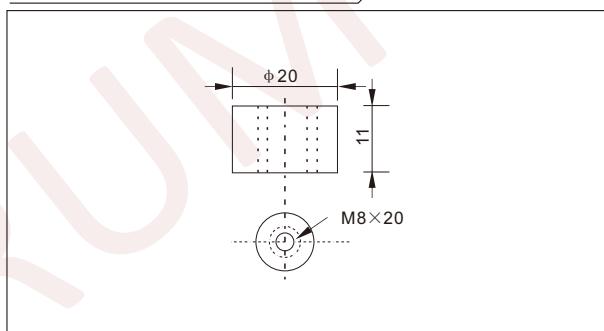
● Specifications

Nominal Voltage	2 V	
Rated capacity (10 hour rate)	2000 Ah	
Dimensions	Total Height	369 mm (14.5 inches)
	Height	344 mm (13.5 inches)
	Length	491 mm (19.3 inches)
	Width	351 mm (13.8 inches)

● Outer dimensions (mm)



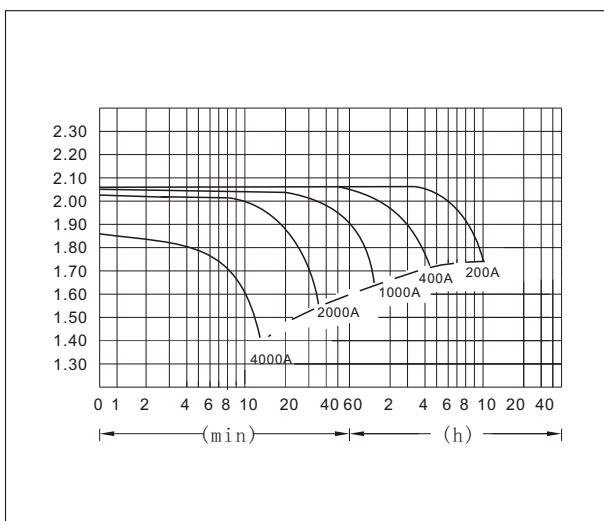
● Terminal Type (mm)



● Characteristics

Capacity 25°C(77°F)	10 hour rate(200 A)	2000 AH
	5 hour rate(320A)	1600 AH
	1 hour rate(1200 A)	1200 AH
	1.5 hour discharge to 1.75 V	800 A
Internal Resistance	Full charged Battery at 25°C(77°F)	0.5 mΩ
Capacity affected by Temperature (10hour rate)	40°C(104°F) 25°C(77°F) 0°C(32°F) -15°C(5°F)	102% 100% 85% 65%
Self-Discharge at 25°C(77°F)	Capacity after 3 month storage Capacity after 6 month storage Capacity after 12 month storage	91% 82% 64%
Terminal	T20	
Charge (constant Voltage)	Cycle	Initial Charging Current less than 500 A Voltage 2.35-2.40V
	Float	Voltage 2.25-2.30V

● Discharge Curves 25°C(77°F)



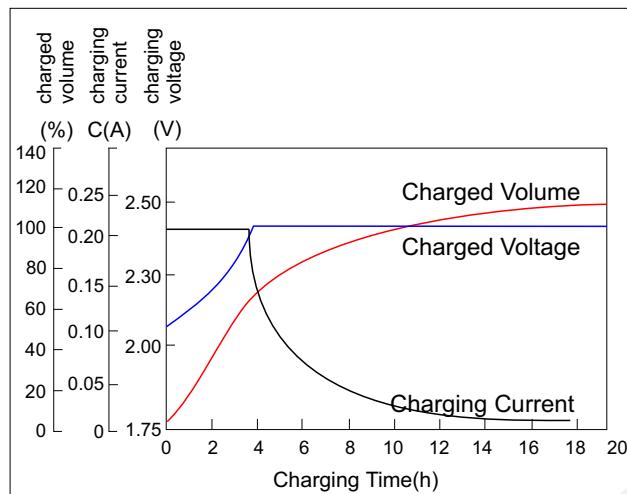
Constant Current(Amp) and Constant Power(Watt) Discharge Table at 25°C (77°F)

Time		10min	30min	1h	2h	3h	4h	5h	8h	10h	20h
1.60V	A	3980.0	2280.0	1200.0	700.0	516.0	400.0	336.83	231.7	220.0	114.0
	W	7820	4080	2320	1360	1000	780.0	640.0	440.0	410.0	217.8
1.70V	A	3780.0	2220.0	1128.0	668.0	500.0	390.0	330.2	227.5	207.0	112.0
	W	7520	4040	2180	1280	960	760.0	620.0	440.0	390.0	214.0
1.75V	A	3580.0	2040.0	1100.0	652.0	488.0	384.0	327.2	225.0	204.0	110.6
	W	7280	3800	2100	1260	940	740.0	612.0	434.0	386.0	210.0
1.80V	A	3380.0	1880.0	1060.0	636.0	476.0	378.0	308.0	219.2	200.0	109.2
	W	7000	3660	2020	1240	920	724.0	600.0	420.0	384.0	208.0
1.85V	A	3180.0	1680.0	1000.0	620.0	460.0	366.7	302.0	213.3	195.0	108.0
	W	6600	3360	1960	1220	920	710.0	596.0	402.0	380.0	205.0

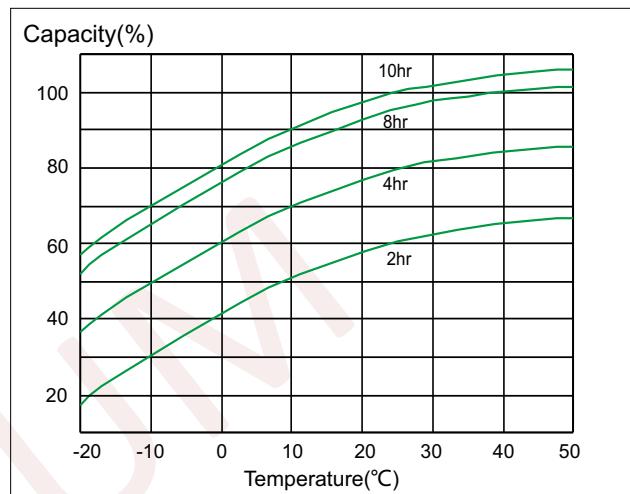
2V-2000AH Battery

- Characteristics curves(25°C)

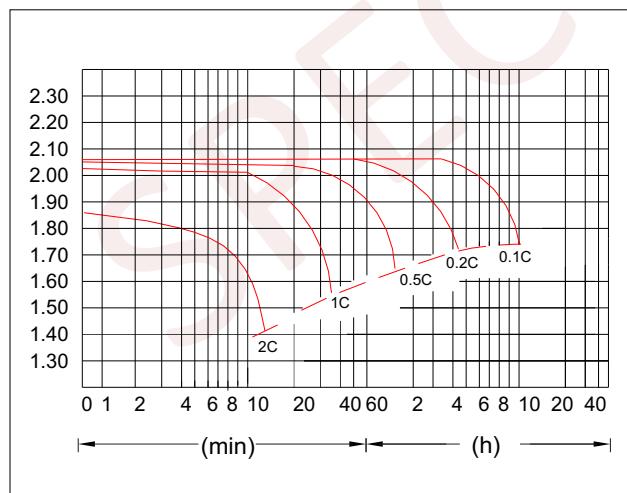
- Charging characteristics



- Curves of discharge capacity and temperature



- Discharge Curves



- Life characteristics of cyclic use

