



Len

Len 200 Wp - 24 V Monocrystalline PHOTOVOLTAIC MODULES



Efficiency
16 %

Certified by B2TE (PMP) based on: EN 12601 & EN 61215
Commission Test Report Number: EN 12601-2000

Modul Surya Len 200 Wp - 24 V Monocrystalline ini dibuat dari solar cell dengan efisiensi tinggi sehingga mampu menghasilkan daya maksimal hingga lebih dari 200 Wp, untuk kerjanya pada intensitas pencahayaan rendah juga sangat bagus sehingga modul ini masih dapat bekerja pada kondisi berawan dan waktu hujan. Modul ini merupakan pilihan yang tepat digunakan dalam berbagai aplikasi seperti untuk daerah terpencil, peralatan instrumen, sensor keamanan navigasi, lampu lalu lintas, dll.

Solar module Len 200 Wp - 24 V Monocrystalline is made of high conversion efficiency cells, so the maximum power of the module can reach as high as 200 Wp or more. Excellent low light performance guarantees our modules work superiorly even under the weak light conditions such as cloudy, foggy and rainy days. They are ideal choice for any application such as remote habitation, instrumentation system, security sensors navigation, traffic light, etc.



Electrical Characteristics

STC

	Len 200 Wp - 24 V Monocrystalline
Optimum Operating Voltage (V _{mp})	37.44 V
Optimum Operating Current (I _{mp})	5.35 A
Open - Circuit Voltage (V _{oc})	45.6 V
Short - Circuit Current (I _{sc})	5.80 A
Maximum Power at STC (P _{max})	200 W
Module Efficiency	16.5%
Operating Module Temperature	-40 °C to +85°C
Maximum System Voltage	1050 V DC
Maximum Series Fuse Rating	20 A
Power Tolerance	+0 - 3 %

STC: irradiance 1000 W/m², module temperature 25 °C, AM=1.5_G

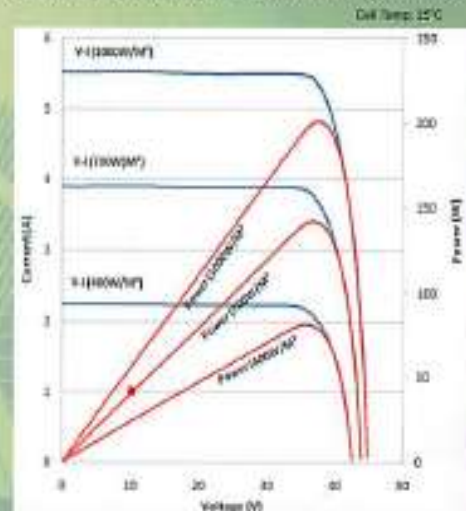
Mechanical Characteristics

Solar Cell	Monocrystalline
No. of Cells	72 (6 X 12)
Dimensions	1580 X 808 X 45 mm
Weight	16 Kg
Front Glass	3.2 mm (1/8 inches) tempered glass
Frame	Anodized aluminum alloy
Junction Box	IP65
Output Cables	1x19/24Hg1149-2007, UL 4703, UL 44, 4 mm ² (0.00375 inches ²)
Connectors	2 JFH connectors MC3 or MC4 type, symmetrical length 1000mm/1 and 1000 mm/1
Diodes	Schottky by-pass diodes

Temperature Characteristics

Nominal Operating Cell Temperature (NOCT)	+45 ± 3 °C
Temperature Coefficient of Power	-0.44 %/°C
Temperature Coefficient of V _{oc}	-0.32 %/°C
Temperature Coefficient of I _{sc}	0.035 %/°C

Current-Voltage & Power-Voltage Curve (Len 200 Wp - 24 V Monocrystalline)

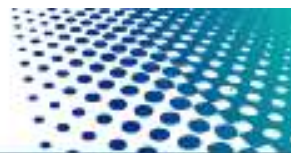


PT Len Industri (Persero)

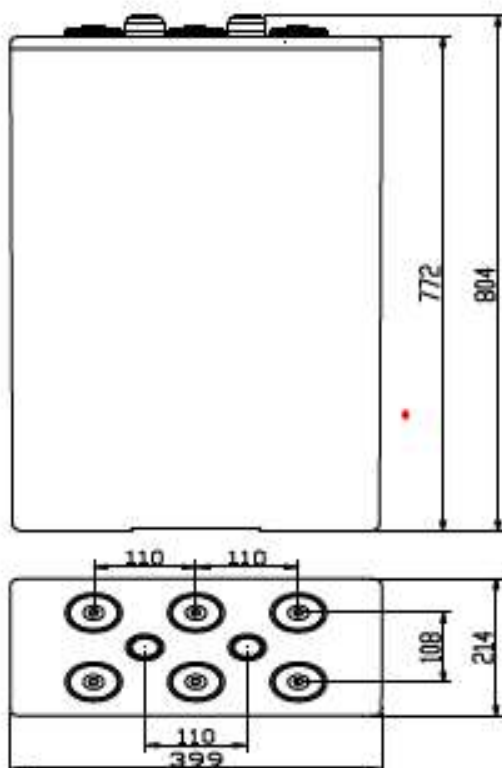
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ISO 9001:2008 QHSA 18001:2007
ISO 14001:2005 SMK3

4.T.200-1876-J-14



GFMJ-2000 (16 OPzV 2000)



Features

- VRLA gel battery with ABS case
- Design life 20 years
- Cyclic and standby duty
- High cycle service life
- Good temperature resistance performance
- Excellent deep cycle performance
- Superior low current discharge performance
- Tubular type positive plate
- PVC- SiO₂ separator
- Double sealed copper core lead terminals
- Reliable opening and closing safety valve

Dimensions

- 399 x 214 x 804mm H

Rated voltage	2 V
Capacity@ 25°C	2000Ah @ 10hr to 1.80V per cell
Weight	about 154.5kg (339.9 lb)
Reference internal resistance (charged)	About 0.22mΩ @ 25°C
Short-circuit current	About 8903A (0.18 reference value)
Max discharge current	6000A (5sec)
Self-discharge	< 20%/180 days @ 25°C
Temperature range	Application: -20°C ~ 50°C Storage: -20°C ~ 50°C Recommendation: 20°C ~ 30°C
Max charge current	400A
Charge voltage @ 25°C	Float charge: 2.23V, average charge: 2.35V Temperature compensation factor: -3 mV/°C
Terminal output	M10 copper terminal (HPb59-1)

2014-01

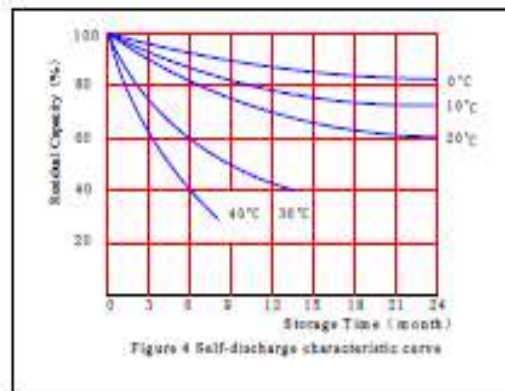
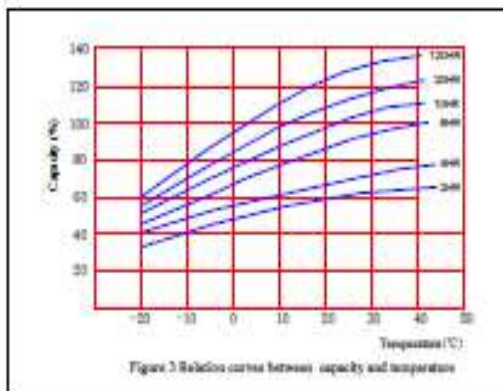
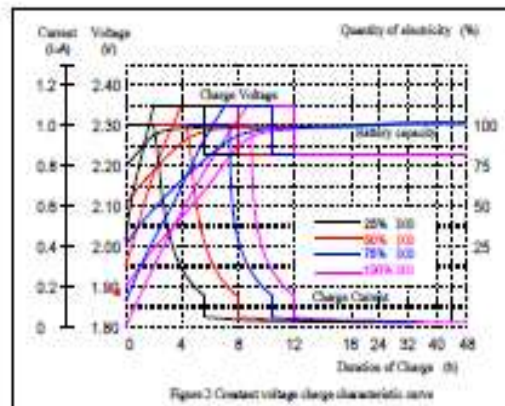
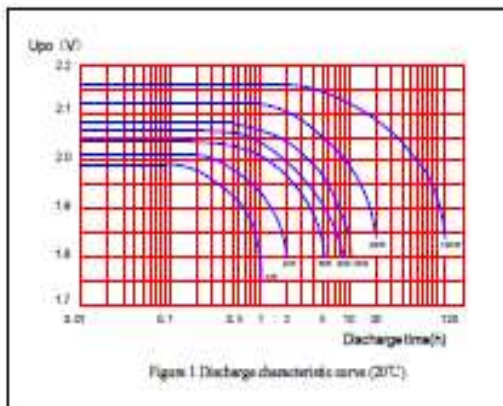
GFMJ-2000 (16 OPzV 2000)

Discharge current at different final voltages and different discharge rates unit: A (25°C)

	5min	10min	15min	30min	45min	1hr	1.5hr	2hr	3hr	4hr	5hr	8 hr	10 hr	20hr	100 hr	120hr
1.90	1387	1229	873	800	780	696	620	520	410	331	282	205	170	91.0	23.6	20.1
1.85	1509	1284	1000	960	827	792	680	576	453	365	311	218	181	100	24.9	21.2
1.80	1681	1614	1331	1232	1017	984	860	676	520	418	351	240	210	104	25.7	21.9
1.75	1748	1729	1584	1408	1200	1100	946	720	544	435	363	246	214	108	26.4	22.5

Discharge power at different final voltages and different discharge rates unit: W (25°C)

	5min	10min	15min	30min	45min	1hr	1.5hr	2hr	3hr	4hr	5hr	8 hr	10 hr	20hr	100 hr	120hr
1.90	2808	2376	1132	1069	1040	1010	942	873	725	621	540	392	338	182	47.3	40.2
1.85	2985	2474	1556	1360	1274	1188	1090	992	816	688	595	426	367	198	49.3	42.0
1.80	3090	2966	2096	1935	1789	1643	1437	1231	990	815	691	488	409	204	50.5	43.0
1.75	3196	3160	2453	2205	2020	1835	1601	1367	1071	861	716	488	409	209	50.9	43.4



2014-01

Three Reasons to Choose the FLEXmax 60/80 Charge Controllers from OutBack Power:

1. DESIGNED FOR PERFORMANCE

- The **de facto standard in the industry**, from the originators of the multiple voltage MPPT charge controller and the first choice for system design professionals
- Innovative FLEXmax MPPT software algorithm is both continuous and active; increases PV array output by up to 30%
- Lower PV array voltage means maximum resistance from shading versus higher voltage controllers
- Full power output in ambient temperature up to 104°F (40°C)
- Battery voltages from 12 to 60VDC
- Greater than 98% peak efficiency; less than 1W self-consumption

2. ENGINEERED FOR RELIABILITY

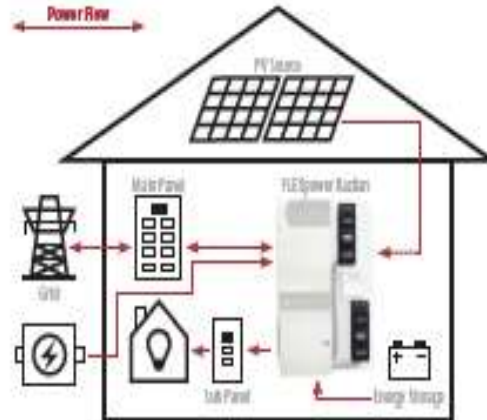
- Extensive **quality and reliability testing**, including Highly Accelerated Life Testing (HALT)
- 15 years of experience manufacturing products for fault intolerant, mission-critical applications
- Standard 5 year warranty (extended 10 year warranty available)

3. EASY-TO-INSTALL, MONITOR AND CONTROL

- System **configures quickly** with smart programming wizards (MATE3 required)
- Built in 4 line 80-character display for easy programming with no other equipment required
- Monitor, command and control from any internet-connected device with OPTICS RE
- Fully OutBack network integrated and programmable
- Programmable auxiliary control output for smart load controls
- Built-in 128 days of data logging
- Global technical support



OutBack FLEXmax 60/80 Typical System Integration (w/ FLEXpower Radian):



OUTBACK POWER — MASTERS OF THE OFF-GRID. FIRST CHOICE FOR THE NEW GRID.



MAKE THE POWER

- FLEXpower Integrated Systems
- Inverter/Chargers & Charge Controllers



STORE THE ENERGY

- EnergyCell RE, GH, NC and OPzV Batteries
- Battery Enclosures and Racking



MANAGE THE SYSTEM

- OPTICS RE System Monitoring and Control
- MATE3 System Display and Communications

Models*	FLEXmax 40 (FM40-150VDC)	FLEXmax 60 (FM60-150VDC)
Nominal Battery Voltage	12, 24, 36, 48, or 60VDC (Single module, adjustable via field programming at start-up)	12, 24, 36, 48, or 60VDC (Single module, adjustable via field programming at start-up)
Maximum Output Current	80A @ 104°F (40°C) with adjustable current limit	10A @ 104°F (40°C) with adjustable current limit
NEC Recommended Solar Maximum Array STC Transmittance	1200C systems: 1500W / 24VDC systems: 3000W 4800C systems: 6000W / 48VDC systems: 12000W	1200C systems: 2100W / 24VDC systems: 4200W 4800C systems: 8400W / 48VDC systems: 16800W
PV Open Circuit Voltage (VOC)	150VDC absolute maximum cold conditions / 140VDC start-up and operating maximum	150VDC absolute maximum cold conditions / 140VDC start-up and operating maximum
Standby Power Consumption	Less than 1W typical	Less than 1W typical
Power Conversion Efficiency	97.5% @ 60A DC into 48VDC system (typical)	98.1% @ 60A DC into 48VDC system (typical)
Peak Efficiency	98.9% input w/ 48V battery at 55.7WDC (50.4WAC)	98.9% input w/ 48V battery at 52.8WDC (50.57WAC)
Charging Regulation	Bulk, absorption, float, sleep and equalization	Bulk, absorption, float, sleep and equalization
Voltage Regulation Setpoints	12 to 140VDC, user adjustable with password protection	12 to 140VDC, user adjustable with password protection
Equalization Charging	Programmable voltage setpoint and duration, automatic termination when completed	Programmable voltage setpoint and duration, automatic termination when completed
Battery Temperature Compensation	Automatic with optional RTD installed (1.0mV per °C per 24 battery cell)	Automatic with optional RTD installed (1.0mV per °C per 24 battery cell)
Voltage Sleep-Down Capability	Down from 140VDC to programmable sleep voltage in any battery voltage. Example: 12VDC sleep to 24VDC battery, 48VDC sleep to 48VDC battery	Down from 140VDC to programmable sleep voltage in any battery voltage. Example: 12VDC sleep to 24VDC battery, 48VDC sleep to 48VDC battery
Programmable Auxiliary Control Output	12VDC output signal which can be programmed for different control applications (maximum of 0.2A DC)	12VDC output signal which can be programmed for different control applications (maximum of 0.2A DC)
Status Display	3.1" (8 cm) backlit LCD screen, 4 lines with 80 alphanumeric characters total	3.1" (8 cm) backlit LCD screen, 4 lines with 80 alphanumeric characters total
Remote Display and Control	Optional MNTS, MNTC or MNTD	Optional MNTS, MNTC or MNTD
Network Cabling	Proprietary network system using RJ-45 modular connectors with CAT5 cables (8 wires)	Proprietary network system using RJ-45 modular connectors with CAT5 cables (8 wires)
Data Logging	Last 128 days of power-on ramp-down, multi-hour, time in float, peak multi, average, solar array voltage, maximum battery voltage, min. battery voltage and absolute time, accumulated amp-hours, and kWh of production	Last 128 days of power-on ramp-down, multi-hour, time in float, peak multi, average, solar array voltage, maximum battery voltage, min. battery voltage and absolute time, accumulated amp-hours, and kWh of production
Operating Temperature Range	-40 to 60°C (powers automatically derated above 40°C)	-40 to 60°C (powers automatically derated above 40°C)
Environmental Rating	Indoor Type I	Indoor Type I
Control Dimensions	One 1" (25.4mm) on the back; One 1" (25.4mm) on the left side; Two 1" (25.4mm) on the bottom	One 1" (25.4mm) on the back; One 1" (25.4mm) on the left side; Two 1" (25.4mm) on the bottom
Warranty	Standard 5-year / Available 10-year	Standard 5-year / Available 10-year
Weight (lb/kg)	Unit: 12.28 / 5.55 Shipping: 15.5 / 7	Unit: 11.65 / 5.3 Shipping: 14.9 / 6.8
Dimensions (L x W x D) (in/cm)	Unit: 16.25 x 5.25 x 4.5 / 41.3 x 14.6 x 11.4 Shipping: 19 x 8.5 x 8.5 / 48.3 x 21.6 x 21.6	Unit: 11.25 x 5.25 x 4.5 / 28.6 x 14.6 x 11.4 Shipping: 17 x 8.5 x 8.5 / 43.2 x 21.6 x 21.6
Options	Remote Temperature Sensor (RTS), WBA, HBB (L3), MNTC, MNTD, MNTS	Remote Temperature Sensor (RTS), WBA, HBB (L3), MNTC, MNTD, MNTS
Manual Languages	English & Spanish	English & Spanish
Certifications	ETL Listed to UL1741, CSA C22.2 No. 107.1	ETL Listed to UL1741, CSA C22.2 No. 107.1

*Not applicable when also in accordance with NEC.

Low Voltage Charge Controller Advantage—Smaller string size reduces power output loss in the event of inadvertent module shading

OutBack FLEXmax 40 Charge Controller
Lower Voltage Four-String, 3210W Array (315W Modules)
 Shading of a single module affects one string, resulting in a power output loss of up to 25%.

Competitor Charge Controller
Higher Voltage Two-String, 3780W Array (315W Modules)
 Shading of a single module affects one string, resulting in a power output loss of up to 50%.