

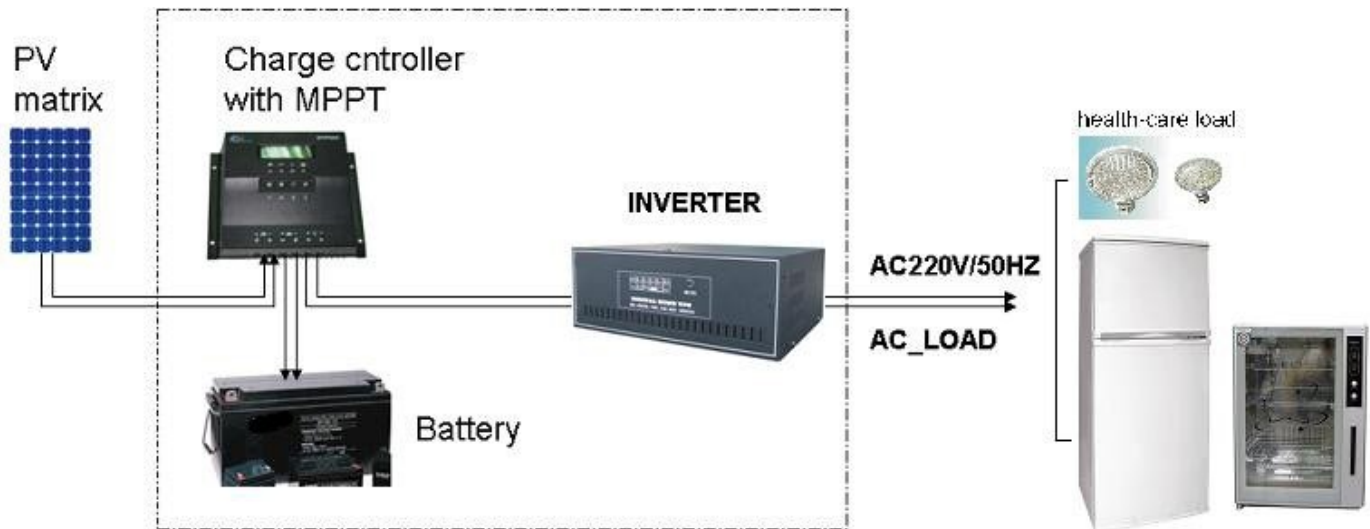
ASIACOST CO LTD has developed a self-running (off-grid) solar system solution for a network of health care centers in remote areas. Each health care center uses these electric devices:

- ✚ 1 unit refrigerator 50W, used 24 hours a day
- ✚ 10 pcs of low consumption LED 3W, used 6 hours a day
- ✚ 1 unit sterilizer 1000W, used 3 hours a week

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1. System design



2. System function

This is an Independent Solar Power System designed for health care centers in remote areas. It provides stable voltage and frequency for equipment while there is no AC current from the electric network. There are three working patterns of the Solar Power Kit:

(1) Solar Power supply:

When the solar power reaches a certain fixed value, the solar modular group will provide the DC current through the charging controller for the inverter, and meanwhile, charges the batteries (MPPT can auto-regulate itself according to the load and charging state of the battery).

(2) Solar battery cooperate:

When the solar power cannot reach a certain fixed value, the solar battery will change to discharging state, and provide DC current for the inverter along with the charging controller, and the inverter will supply power to the load.

(3) Battery supply:

When there is no sunshine (cloudy or at night), the batteries supply power to the inverter until the end of the discharge, and the inverter will supply power to the load.

For the health care center load (refrigerator 50W used 24 hours/day + LED 3W*10 used 6 hours/day + 1000W sterilizer used once each week for 3 hours), the system requires:

- 6 pcs 180W solar panels
- 1 pc 3KVA/48V solar inverter and charger controller (it can support extra solar panel or battery)
- 4 pcs 12V100AH battery built-in (which support about 24hrs backup time for refrigerator and LED load or 3.5 hours for 1080W load; it includes battery wires)

3. Specifications of the Central Unit

SOLAR CHARGE CONTROLLER

Functions:

- ✚ CPU control,
- ✚ Automatic recognition of input voltage
- ✚ Applicable with various types of durable batteries
- ✚ Micro processing controller Pulse Modulation Wide-frequency (PWM) charge
- ✚ Temperature sensor for charging a battery in compensation
- ✚ Overload protection
- ✚ Overcharge protection
- ✚ Short circuit protection
- ✚ Reverse polarity connection protection
- ✚ Converse discharge protection
- ✚ TSInder protection
- ✚ Low voltage protection
- ✚ Working temperature:-25°C to +55°C

Technical Data:

Rated Voltage	48V
Max Load current	30A
Input voltage range	48V ~ 80V
Length≤1m, Charge loop drop	< 0.25V
Length≤1m, Discharge loop drop	< 0.15V
Over voltage protection	68V
Full charge cut	54.8V (Default value, can be otherwise set)
Low voltage cut	42V (Default value, can be otherwise set)
Automatic restoration, low voltage cut	50V (Default value, can be otherwise set)
Temperature compensation	-3mv/°C/cell
No load loss	≤30mA
Max wire area	6mm ²
Ambient temperature	-25°C ~ +55°C

SOLAR INVERTER

Functions:

This type of solar inverter is new, and it adopts the design of microcomputer control technology. It has many good points, including high reliability, complete protection function, small waveform distortion, low price, etc. It can convert the DC power supply into the purity sine wave AC power supply of voltage stabilizing, frequency stabilizing and low noise of 220V and 50Hz. This product has higher conversion efficiency (can reach up to above 85% under the full load) and very strong nonlinear load drive capacity. It can simultaneously implement the inspection and monitoring to input voltage and current, as well as output voltage and current; therefore, it realizes the maintenance function of unattended operation. The power inverter can start all kinds of electronic appliances, such as the computer, television, refrigerator, microwave oven, the lighting etc, and other places that have the 12V - 48VDC dynamic (DC screen).

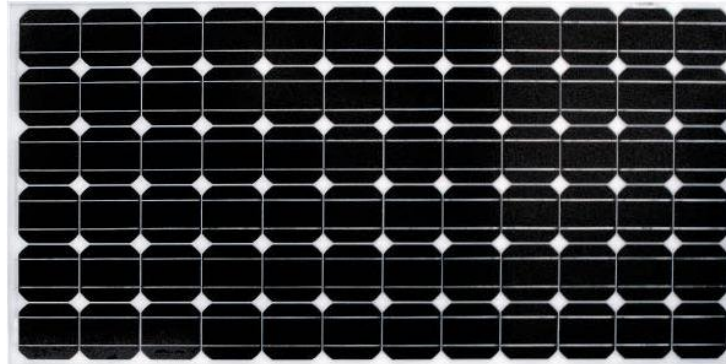
Features:

- ✚ Pure Sine Wave;
- ✚ Long Backup Type;
- ✚ Microprocessor control;
- ✚ Short Circuit & Overload Protection;
- ✚ Cold start function;
- ✚ Output: AC 220+/-10%

Technical Data:

Capacity	W	2400W
Output	Phase	Single
	Voltage range(Vac)	220+/-10%
	Frequency	50/60+/-0.5Hz
	Waveform	Sine wave
Battery	DC Voltage	DC48V
Protection	Full Protection	Discharge, overcharge, and overload protection etc...
Environment	Operating Temp.	0~40 °C, 0~90% relative S/midity (non-condensing)
	Noise Level	Less than 40dB

4. Specifications of the Solar Panels



SPECIFICATIONS

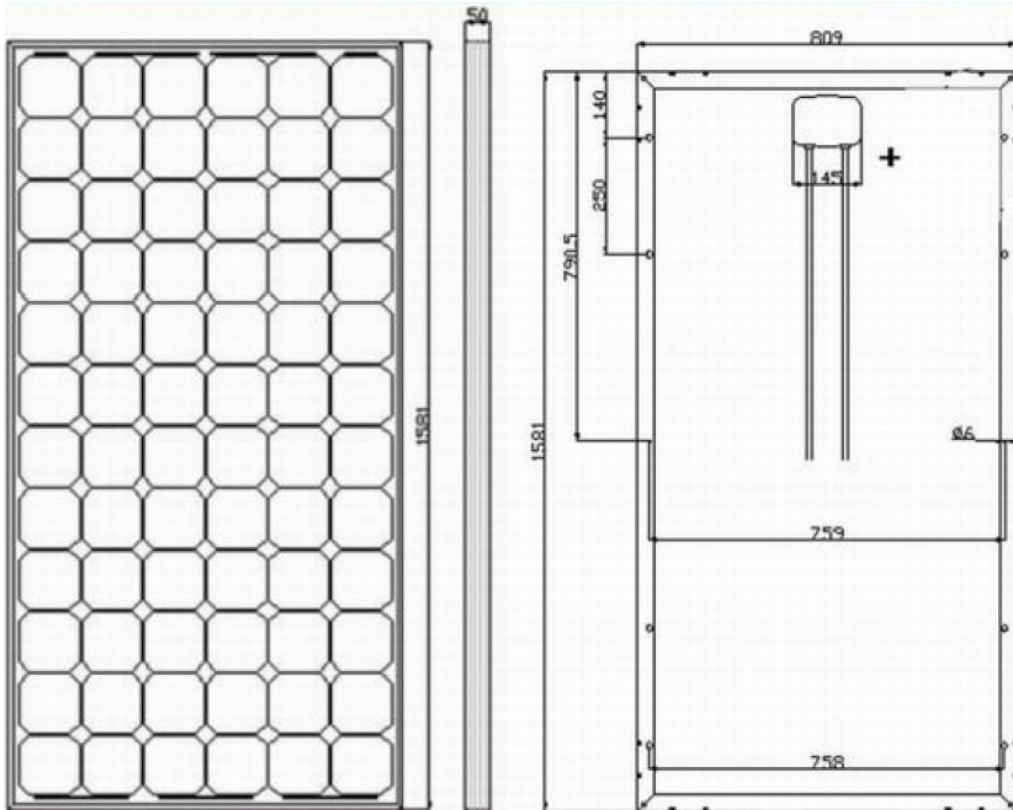
Type	Data
Cells	Mono crystal, 125x125mm
Number of cells	6x12 pieces in series
Max power output (Pm)	180 Watt
Output tolerance	±3%
Open circuit voltage (Voc)	43.40V
Short circuit current (Isc)	5.50A
Max power current (Ipm)	5.10A
Max power voltage (Vpm)	35.20V
Type of output terminal	IP65 rated Junction box with MC connectors
Max system voltage	1000 VDC
Max storage & operating temperature	-40 / +85 °C
Series fuse rating	10A
Number of diodes	3 pieces
Voltage temperature coefficient (Voc)	-0.38%/°C
Current temperature coefficient (Isc)	0.10%/°C
Power temperature coefficient (Wp)	-0.47%/°C

Testing conditions: under irradiance level of 1000W/m², air mass 1.5 spectrum, cell temperature of 25°C

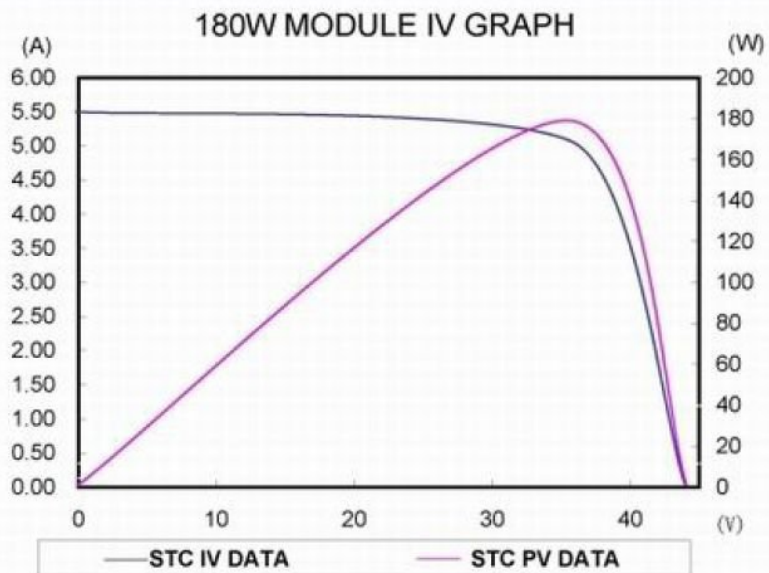
FEATURES

- ✚ By-passed diode to minimize power drop caused by shade
- ✚ Anodized aluminum alloy frame
- ✚ Anti-reflective high transparency tempered glass
- ✚ Solar cell embedded in EVA (ethylene vinyl acetate)
- ✚ SIN surface anti-reflecting coating of solar cells, helping to absorb more light in all weather conditions and provides a uniform blue color
- ✚ Tedlar foil backing.

DIMENSIONS



CHARACTERISTIC CURVES



Testing conditions: under irradiance level of 1000W/m², air mass 1.5 spectrum, cell temperature of 25°C

5. Specifications of the Batteries



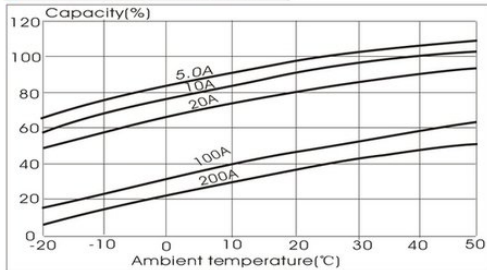
Specifications

Nominal Voltage	12V	
Rated capacity (10 hour rate)	100 Ah	
Dimensions	Total Height	233 mm (9.17 inches)
	Height	213 mm (8.39 inches)
	Length	331 mm (13.03 inches)
	Width	173 mm (6.81 inches)
Weight Approx	31Kg (68.2lbs)	

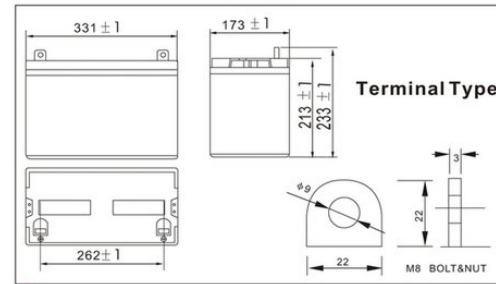
Characteristics

Capacity 25°C(77°F)	10 hour rate(10A)	100 AH
	5 hour rate(16A) 1 hour rate(60A)	80AH 60 AH
Internal Resistance	1.5 hour discharge to 10.5V	6.5m Ω
Capacity affected by Temperature (10hour rate)	40°C(104°F)	102%
	25°C(77°F)	100%
	0°C(32°F)	85%
	-15°C(5°F)	65%
Self-Discharge at 25°C(77°F)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	82%
	Capacity after 12 month storage	64%

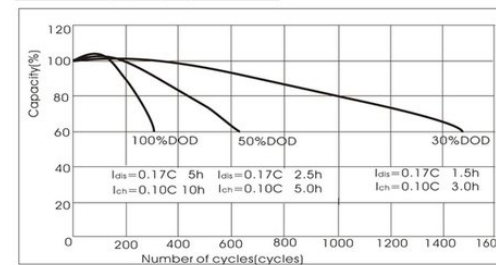
Curves of capacity and temperature



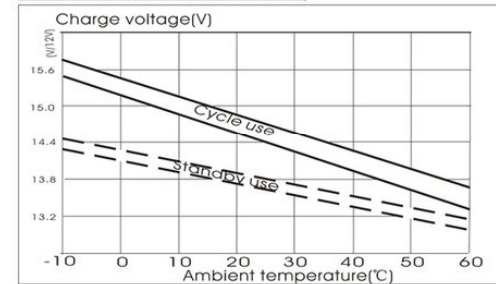
Outer dimensions (mm)



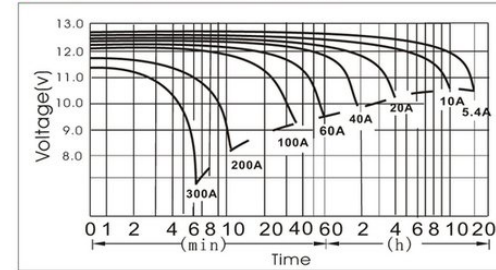
Curves of cycle life(25°C)



Curves of charge voltage and temperature



Curves of discharging characteristic(25°C)



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

Time		5min	10min	15min	30min	1h	2h	3h	4h	5h	8h	10h	20h
9.60V	A	320	211	170	114.0	60.0	35.0	25.7	20.0	16.5	11.70	10.50	5.67
	W	3305	2253	1824	1226	648	384	286	225	188	134	121	65.9
10.20V	A	302	190	160	109.0	56.4	33.4	25.0	19.5	16.2	11.40	10.30	5.50
	W	3229	2126	1793	1224	638	385	290	227	189	133	121	64.5
10.50V	A	271	170	140	102.0	54.6	32.6	24.4	19.2	16.0	11.30	10.10	5.50
	W	2959	1937	1599	1174	632	378	284	225	188	133	120	65.0
10.80V	A	245	161	130	94.0	52.8	31.8	23.8	18.9	15.6	11.00	10.00	5.40
	W	2753	1851	1500	1089	615	372	281	223	184	130	119	64.3
11.10V	A	177	150	120	84.0	51.0	31.0	23.0	18.4	15.2	10.70	9.50	5.10
	W	2003	1742	1399	983	600	366	273	219	181	128	114.7	61.8

6. Specifications of the Refrigerator



Capacity	132 LTR (40L top freezer and 92L down fridge)
Input Voltage	12V/24V DC, 220V AC (by transformer)
Average Power Consumption	Approximately 50W
Average Running time	drop to -18 degree in 60 minutes at 20 degree ambient
Temperature range	ambient to -18°C, adjustable by thermostat
Insulation	CFC-free polyurethane foam
Cooling unit	DC12/24v compressor, Domus brand, model T-26k
Refrigerator color	white
Feature	direct connect to DC12V or DC 24v, anti discharge car battery protect, automatic turn off when low voltage.
Accessory	AC220V/ 12V transformer, DC cable
G.W/ N.W	43KG/ 38KG
Item dimension	450*493*1247 mm (W*D*H)
Carton dimension	520*570*1295 mm (W*D*H)

7. Specifications of the LED



PAR30
H:3.63" D:3.74"

LED Lamp Cup

Specification:

- Base type: E27
- Life time: 50,000H
- Voltage: AC 85-265V
- Constant Current Driver
- Viewing angle: 15°, 120°
- Glass cover
- Driver and LED PCB are separated for better heat radiation
- ★ 4 Lm CW LED and 3.5 Lm WW LED available

Available in



Color	Color Temperature	60LED	
		lm	W
white	6000-7000K	>140	3.00
warm white	2900-3500K	>120	3.00

8. Options

Even though this system has been designed to be used in Medical environments, coupled with a fridge and a sterilizer, it can be customized to accommodate various requirements such as emergency lights, radio systems, smaller refrigerators, etc.

Its usage in the fight against poverty and its help in education programs are obvious. Families will be able to work after sunset and children will be able to learn to read, write and improve themselves in the evening.

9. Trade terms

Price for the health care center kit: USD5500 per kit FOB Shenzhen

This kit includes:

- The Solar System (USD4780):
 - 6 pcs 180W solar panels
 - 1 pcs 3KVA/48V solar inverter and charger controller
 - 4 pcs 12V100AH battery built-in
 - 1 lot of cables
- 10 pcs LED ref. PAR30 E27 60LED 85-268V (USD7 per pc)
- 1 unit refrigerator 132L (USD650 per unit)

This health care center kit does not include the sterilizer.

Payment terms: 30% by T/T on order + 70% by T/T before shipment

Production lead time: approximately 45 days