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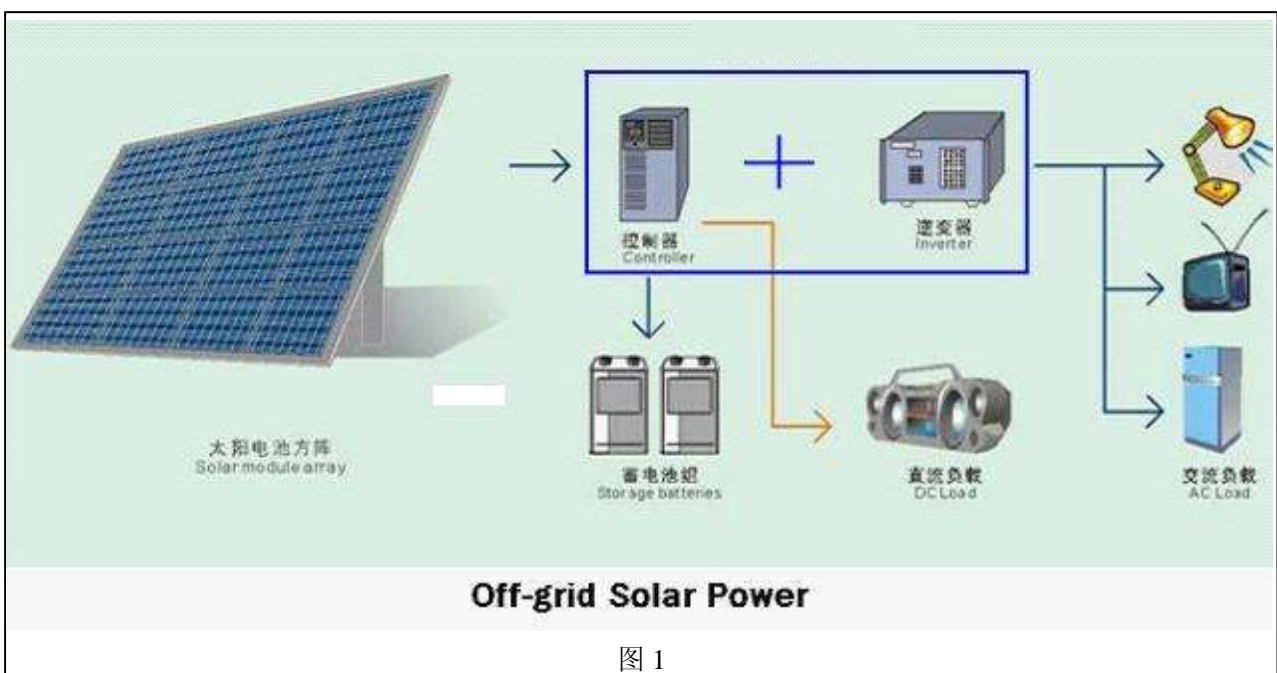
Quote No. 2010JX059 5002 20KW off-grid solar system

## 一、 Example:20KW off-grid solar system brief introduction

1. In this scheme, for the power user low-pressure small power appliances, such as electric fan, lighting, etc. Using 117 pieces of 170W PV modules, component 2million PV. From the nets type inverter controller through to battery and inverter, 220VAC/isolator sine type into ac output.

Note: Different load power, system need to adjust, this is just for reference.

2. : Electricity and electricity load from the network diagram:



3. : Working principle:

By PV modules power, light is produced through the confluence of the input into the inverter controller, the internal control of inverter controller battery, at the same time to ac inverter by output terminals output. Users can pick out from the output terminal of the 220VAC/frequency 50Hz ac power supply electric appliances sine wave. In the light of the circumstances, the battery discharge the inverter to ac inverter power supply electric appliances.

4. : Configuration:

4-1、 Solar panels: Solar panels by 175W/35VDC supply, according to the roof shape (offer by

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customer), we take nine pieces solar panels series connection to be one team, total 13 teams .

4-2、 Inverter: Choice 30KW power inverter , 220VDC, 220VAC/50Hz.

4-3、 Battery: 2V1500AH, Gel battery, total 110 pieces

4-4、 Photovoltaic modules to invert controller using lightning confluence device. On one hand, and the other party will lightning effects of numbers of 13 PV power input into 1 road, convergence to inverter the controller.

5、 Electrical connection as shown below: each 6 teams connected to a lightning confluence device, a total of 13 road needs 3 lightning confluence devices.

## 二、 Main Accessories

1、 System consisting mainly of electrical accessories in table 1 below



| No. | Name                           | Description                             | QTY | Remark  |
|-----|--------------------------------|---|-----|---|
| 1   | Solar Panel                    | 170W/35VDC<br>(1580*808*45)             | 117 | Using 1*4mm <sup>2</sup> cable<br>into lightning confluence<br>device |
| 2   | lightning confluence<br>device | Six/seven road<br>input/one road output | 2   |   |
| 3   | Inverter                       | 220VDC/30KW                             | 1   |   |
| 4   | Gel battery                    | 2V/1500Ah                               | 110 |   |
| 5   | Battery frame                  | -                                       | 1   |   |
| 6   | Cable                          | 1*4mm <sup>2</sup> /25m                 | 8   | IP65  |
| 7   | Controller                     | 220V/70A                                | 1   |   |
| 8   | Mounting sets                  | 2133.6mm                                | 91  | GUS-02 (do surface<br>treatment)                                      |

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2. : Roof mounting bracket accessories (table 2) :

Table 2

| Gus_02 | material | Drw.  | unit set Qty. | spec.                  |
|--------|----------|---|---------------|------------------------|
| R2     | 6063     |    | 2             | 2133.6mm<br>(84inches) |
| MC2    | 6063     |    | 4             | 40mm                   |
| EC2-35 | 6063     |  | 4             | 40mm                   |
| EC2-50 | 6063     |  | 4             | 40mm                   |
| LB2    | 6063     |  | 6             | 40mm                   |
| C2     | 6063     |  | 2             | 40mm*70mm*5mm          |
| S650   | ss304    |   | 6             |                        |
| S620   | ss304    |   | 10            |                        |
| WS860  | ss304    |   | 6             |                        |

## 三、 Specification of main parts

### 1、 Off-grid inverter:



| specs                           | model                       | 22030KS     | 22050KS | 22060KS | 22080KS | 220100KS |
|---------------------------------|-----------------------------|-------------|---------|---------|---------|----------|
| DC input                        | Rated voltage               | DC220V      |         |         |         |          |
|                                 | Rated current               | 147A        | 244A    | 293A    | 391A    | 489A     |
|                                 | Allowed input voltage range | 198-300V    |         |         |         |          |
| AC output                       | Rated capacity              | 30kva       | 50kva   | 60kva   | 80kva   | 100kva   |
|                                 | Rated power                 | 24kw        | 40kw    | 48kw    | 64kw    | 80kw     |
|                                 | Rated voltage and frequency | AC220V,50Hz |         |         |         |          |
|                                 | Rated current               | 136.4A      | 227.3A  | 296.4A  | 364A    | 455A     |
|                                 | Voltage accuracy            | AC220V±3%   |         |         |         |          |
|                                 | Frequency accuracy          | 50±0.05     |         |         |         |          |
| Working temperature             |                             | -20—50℃     |         |         |         |          |
| Work height above sea level (m) |                             | ≤5000       |         |         |         |          |

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2、Solar panels performance is introduced:

| TEM NO                              | MP-150WP  | MP-155WP | MP-160WP | MP-165WP | MP-170WP | MP-175WP | MP-180WP | MP-185WP |
|-------------------------------------|---|----------|----------|----------|----------|----------|----------|----------|
| MONO or POLY                        | MONO  |          |          |          |          |          |          |          |
| Maximum power (Wp)                  | 150w  | 155w     | 160w     | 165w     | 170w     | 175w     | 180w     | 185w     |
| Maximum power voltage (V)           | 34.4  | 34.08    | 34.4     | 35.8     | 35.8     | 36.6     | 37       | 37.1     |
| Maximum power current (A)           | 4.36  | 4.56     | 4.65     | 4.62     | 4.75     | 4.8      | 4.86     | 5.01     |
| Open circuit voltage (V)            | 43.2  | 43.1     | 43.2     | 44.5     | 44.2     | 44.9     | 45.4     | 45.4     |
| Short circuit current (A)           | 4.87  | 4.96     | 5        | 5.04     | 5.05     | 5.15     | 5.23     | 5.27     |
| Size of solar cells (mm)            | 125x125   |          |          |          |          |          |          |          |
| Number of cells (Pcs)               | 72 PCS ( 6X12)  |          |          |          |          |          |          |          |
| Size of module (mm)                 | 1580x808x35mm   |          |          |          |          |          |          |          |
| Brand Name of Solar Cells           | CEEG or JA SOLAR  |          |          |          |          |          |          |          |
| Maximum system voltage (V)          | 1000  |          |          |          |          |          |          |          |
| Temperature coefficients of Isc (%) | + 0.1/ °C   |          |          |          |          |          |          |          |
| Temperature coefficients of Voc     | -0.38/ °C   |          |          |          |          |          |          |          |
| Temperature coefficients of Pm (%)  | -0.47/ °C   |          |          |          |          |          |          |          |
| Temperature coefficients of Im (%)  | +0.1/ °C  |          |          |          |          |          |          |          |
| Temperature coefficients of Vm (%)  | -0.38/ °C   |          |          |          |          |          |          |          |
| Temperature Range                   | -40°C ~ +80°C   |          |          |          |          |          |          |          |
| Surface Maximum Load Capacity       | 60m/s(200kg/sq.m)   |          |          |          |          |          |          |          |
| Allowable Hail Load                 | steel ball fall down from 1m height                                   |          |          |          |          |          |          |          |
| Weight per piece (kg)               | 15  |          |          |          |          |          |          |          |
| Junction Box Type                   | Junction box with TUV certificate                                     |          |          |          |          |          |          |          |
| Length of Cables (mm)               | 900mm   |          |          |          |          |          |          |          |
| Cell Efficiency (%)                 | >14%  | >14.5%   | >15%     | >15.4%   | >16%     | >16.35%  | >16.85%  | >17.3%   |
| Module Efficiency (%)               | >13%  | >13%     | >13%     | >14%     | >14%     | >14%     | >14.5%   | >15%     |
| Output tolerance (%)                | ±3%   |          |          |          |          |          |          |          |
| Frame (Material, Corners, etc.)     | Aluminum  |          |          |          |          |          |          |          |
| Standard Test Conditions            | AM 1.5, 1000W/m <sup>2</sup> , 25 °C                                  |          |          |          |          |          |          |          |
| Warranty                            | 5 years product warranty and 20 years 80% of power, 25 years lifetime |          |          |          |          |          |          |          |
| FF (%)                              | 71%   | 73%      | 74%      | 74%      | 76%      | 76%      | 76%      | 78%      |
| Packing                             | 2PCS/CTN , 672PCS/40' FCL   |          |          |          |          |          |          |          |



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## 3、Battery 2V1500AH \*110pcs

### Specification

|                     |              |       |
|---------------------|--------------|-------|
| Nominal Voltage     | 2V           |       |
| Capacity(10HR,25°C) | 1500Ah       |       |
| Designed Life       | 10Years      |       |
| Dimension           | Length       | 404mm |
|                     | Width        | 354mm |
|                     | Height       | 354mm |
|                     | Total Height | 377mm |
| Reference Weight    | 100kg        |       |

### Charateristics

|                                       |                              |        |
|---------------------------------------|------------------------------|--------|
| Capacity 25°C (77°F)<br>To 1.75V/Cell | 20 hr rate                   | 1580Ah |
|                                       | 10 hr rate                   | 1500Ah |
|                                       | 5 hr rate                    | 1350Ah |
|                                       | 1 hr rate                    | 825Ah  |
| Inner Resistance(fully charged 25°C)  | 0.15mΩ                       |        |
| Self-discharge (at 25°C.) :           | 3% of the capacity per month |        |
| Discharge Temperature                 | -20~60°C                     |        |
| Charge Temperature                    | -10~60°C                     |        |
| Storage Temperature                   | -20~60°C                     |        |
| Cyclic use charging voltage(at 25°C)  | 2.35~2.4V                    |        |
| Initial current (at 25°C)             | 300A                         |        |
| Temperature Compensation              | -5.0mV/°C                    |        |
| Float Use charging voltage(at 25°C)   | 2.23~2.27V                   |        |
| Temperature Compensation (at 25°C)    | -3.3mV/°C                    |        |

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## Constant-current discharge parameter Unit: A (25℃)

| End Point Vol./Cell | 10MIN | 15MIN | 30MIN | 45MIN | 1H  | 3H  | 5H  | 10H   | 20H  |
|---------------------|-------|-------|-------|-------|-----|-----|-----|-------|------|
| 1.60V               | 2710  | 2038  | 1493  | 1126  | 914 | 418 | 287 | 160.0 | 84.0 |
| 1.65V               | 2570  | 1940  | 1426  | 1082  | 881 | 405 | 281 | 158.0 | 83.0 |
| 1.70V               | 2424  | 1839  | 1358  | 1034  | 853 | 397 | 275 | 156.0 | 81.9 |
| 1.75V               | 2274  | 1736  | 1288  | 984   | 825 | 386 | 269 | 152.0 | 79.8 |
| 1.80V               | 2120  | 1632  | 1215  | 933   | 796 | 375 | 261 | 150.0 | 78.8 |

## Constant-current discharge parameter Unit: W (25℃)

| End Point Vol./Cell | 10MIN | 15MIN | 30MIN | 45MIN | 1H   | 2H  | 3H  | 5H  | 10H   |
|---------------------|-------|-------|-------|-------|------|-----|-----|-----|-------|
| 1.60V               | 4246  | 3434  | 2483  | 1980  | 1630 | 970 | 741 | 523 | 290.6 |
| 1.65V               | 4002  | 3250  | 2356  | 1890  | 1555 | 925 | 719 | 517 | 287.2 |
| 1.70V               | 3753  | 3062  | 2231  | 1795  | 1484 | 883 | 697 | 512 | 284.4 |
| 1.75V               | 3506  | 2873  | 2101  | 1696  | 1439 | 856 | 676 | 498 | 276.7 |
| 1.80V               | 3260  | 2682  | 1969  | 1601  | 1328 | 790 | 654 | 490 | 272.2 |

## 4: Controller



### [220V Series specification]

| Model No.                                     | SD220 50                 | SD220 100 | SD220 150 | SD220 200 | SD220 300 |
|---|--------------------------|-----------|-----------|-----------|-----------|
| Rated voltage (V)                             | DC220                    |           |           |           |           |
| Rated current (A)                             | 50                       | 100       | 150       | 200       | 300       |
| Max pv module Power (KWp)                     | 11                       | 22        | 33        | 44        | 66        |
| PV array input controlling path               | 2                        | 4         | 6         |           | 10        |
| Max photovoltaic modul current (A)            | 25                       |           |           | 34        | 30        |
| Battery over discharge Protection voltage (V) | 198                      |           |           |           |           |
| Battery over discharge Recover voltage (V)    | 226                      |           |           |           |           |
| Battery over charge Protection voltage (V)    | 264                      |           |           |           |           |
| Over voltage protection (V)                   | 320                      |           |           |           |           |
| Over voltage recover (V)                      | 280                      |           |           |           |           |
| No load current(mA)                           | <50                      |           |           |           |           |
| battery dropdown                              | PV array and battery (V) |           | 1.35      |           |           |
|   | Battery and load (V)     |           | 0.1       |           |           |
| Temperature compensation                      | 0 ~ 5 (can be changed)   |           |           |           |           |

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|                                 |                  |                     |              |
|---------------------------------|------------------|---------------------|--------------|
| (mv/°C)                         |                  |                     |              |
| Work temperature (°C)           | -20 ~ +50        |                     |              |
| Work height above sea level (m) | ≤5000            |                     |              |
| Protection level                | IP20             |                     |              |
| Measurement (WxHxD) (mm)        | 482x177x400 (4U) | 482x266x455<br>(6U) | 600x1200x600 |

Price :FOB Ningbo \$119,112USD/system (price includes gel battery)

For 20KW off grid system example , on grid systems are also available