



# 1.5MW + 4.2MWh BESS

1.5MW photovoltaic solar power plant + 4.2MWh storage

**Location**

Am-Zoer, Wadi Fira (Chad)

**Company**

CBCOM-TECH

**Client**

ADERM

**Partner**

SUNPAL





## ***Description:***

The Sunpal 1.5MW+4.2MWh PV-storage system project in Chad, Africa, is a new energy demonstration project jointly implemented and completed by the Chadian government and CBCOM. The project features a total installed capacity of 1.5MW of solar power and a 4.2MWh energy storage system. It utilizes a containerized, integrated design, suitable for energy independence and grid stability improvements in remote areas.

The entire PV-storage system utilizes a containerized, integrated design, with two 40-foot high-cubic-meter (40HQ) containers housing two PCS units and two DC/DC modules, respectively. This modular, standardized, and easily deployable design not only improves system reliability and security but also facilitates rapid deployment and maintenance in areas with relatively limited infrastructure, such as Chad.

The successful implementation of this project not only provides Chad with a clean and stable power supply but also offers valuable lessons for renewable energy development in other African countries. The collaboration between Sunpal and CBCOM demonstrates the enormous potential for China-Africa cooperation in the field of new energy.



# Project Configuration Checklist

## Equipment Guide



Solar System Kit



Solar Panel



Hybrid Inverter



Lithium Battery



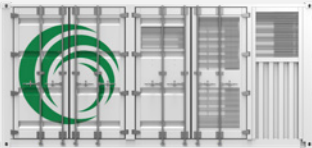
PV Cable



MC4 Connector



Mounting Bracket



Container



EMS

| Description of Goods                                                                  |                                                                                                                                                                         | Quantity |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Solar panel                                                                           | SP580M-72H Mono facial N type half cell Solar Panel                                                                                                                     | 2880     |
| Concrete Based Bracket                                                                | Ground bracket mount system                                                                                                                                             | 1        |
| DC combiner cabinet                                                                   | 400KW / DC 1000V                                                                                                                                                        | 4        |
| MC4                                                                                   | Rated Current: 30A Rated Voltage: 1000V                                                                                                                                 | 1000     |
| PV Cable                                                                              | PV1-6mm²                                                                                                                                                                | 20000    |
| 4.2MWh LiFePO4 Battery 10years                                                        | 51.2V 280h16S1P Battery Module                                                                                                                                          | 294      |
|                                                                                       | Battery Bracket                                                                                                                                                         | 20       |
|                                                                                       | Copper busbar + soft connection + 1.5mm² communication                                                                                                                  | 20       |
|                                                                                       | High voltage box DC1500V125A                                                                                                                                            | 20       |
| Combiner cabinet                                                                      | Customized                                                                                                                                                              | 4        |
| DC/ DC                                                                                | PDS1-400K 400KW                                                                                                                                                         | 4        |
| PCS inverter                                                                          | PWS1-500KTL-NA AC voltage: 400V With isolation transformer                                                                                                              | 4        |
| EMS                                                                                   | Customized according todifferent system requirements, suitable for multi-energy control (photovoltaic, diesel, mains, batteries, etc.) EMS needs to be debugged on site | 1        |
| Energy storage low voltage distribution cabinet Diesel generator distribution cabinet | 2MW/400V                                                                                                                                                                | 1        |
|                                                                                       | 1MW/400V                                                                                                                                                                |          |
| Transformer                                                                           | 0.4/ 15KV 2500KVA EU Tier 1 Standard                                                                                                                                    | 1        |
| 20GP Equipment cabinet container                                                      | 20GP Including fire protection (including fire fighting agents), lighting system, insulation and power distribution system                                              | 1        |
| 40HQ Energy storage container                                                         | Including air conditioning (standard 5KW+7KW), fire protection (including fire fighting agents), lighting system, insulation and power distribution system              | 2        |
| DC Cable and all DC side accessories                                                  | Customized                                                                                                                                                              | 1        |
| Installation Tools                                                                    | Customized                                                                                                                                                              | 10       |
| PV Combiner box-DCDC cabinet                                                          | YJV22-0.6/1KV 2*35mm²                                                                                                                                                   | 3000     |
| Isolation Transformer-PCS                                                             | YJV22-0.6/1KV 3*120+70mm²                                                                                                                                               | 240      |
| Outlet Cabinet-Transformer                                                            | YJV22-0.6/1KV 3*240+120mm²                                                                                                                                              | 200      |
| FLAT Steel                                                                            | Q235B L880000 40x4                                                                                                                                                      | 850      |
| Angle Steel                                                                           | Q235B L2000 40x40x4                                                                                                                                                     | 35       |
| EMS                                                                                   | Lenovo 55 inches                                                                                                                                                        | 4        |
|                                                                                       | Graphics workstation                                                                                                                                                    | 4        |
|                                                                                       | Operating system                                                                                                                                                        | 4        |
|                                                                                       | Huawei Monitoring network switch                                                                                                                                        | 1        |
|                                                                                       | Backup server                                                                                                                                                           | 1        |
|                                                                                       | EMS Software                                                                                                                                                            | 1        |



PHOTOVOLTAIC SIDE

1

Photovoltaic Power Station General Layout

2

Schematic Diagram Of Photovoltaic String Connection

3

Numbering Of PV Strings And Schematic Diagram Of Wiring

7

DCDC Cabinet Connection (12unit)

8

PCS Connection (12unit )

9

Isolation Transformer Connection (12unit)

4

Earthing & Lighting Protection Drawing

5

Schematic Diagram Of The Cable From The Combiner Box To The Bess Container

10

UPS Connection

11

Distribution Board Cabinet

12

Schematic Diagram Of AC Cable Connection

ENERGY STORAGE SIDE

1

System Block Diagram

2

System Single Line Diagram

3

Bess Container Equipment Layout

4

Distribution Board Container Equipment Layout

5

Battery Cluster Connection (12unit)

6

Control Combiner Cabinet Connection (12unit)

DRAWING LIST

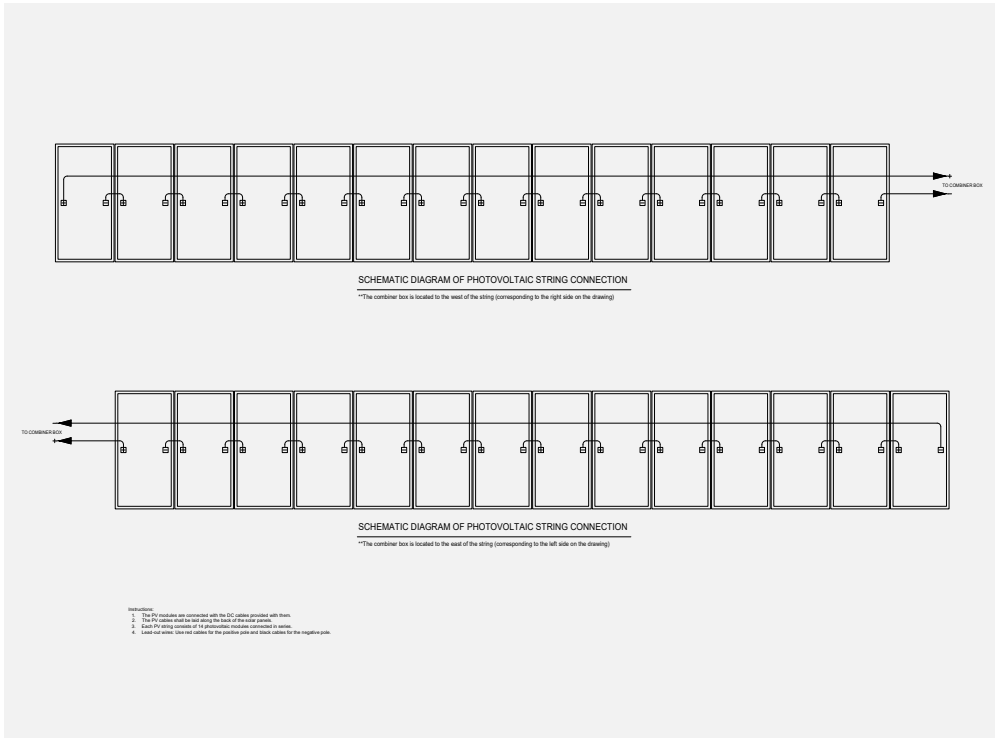
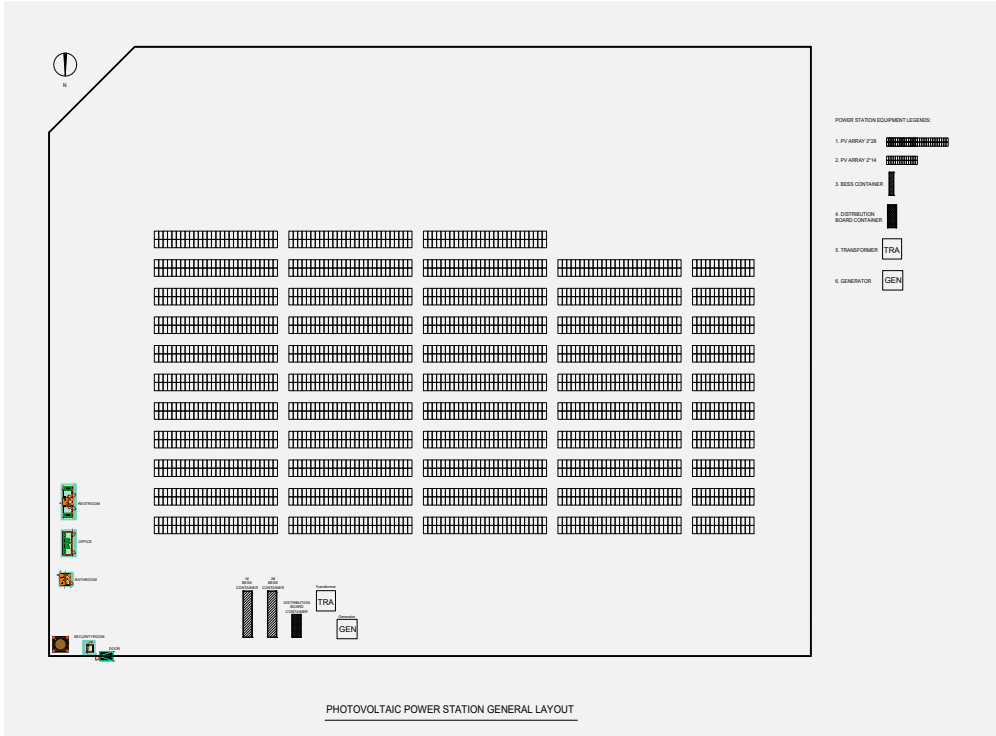




# PROJECT DRAWINGS

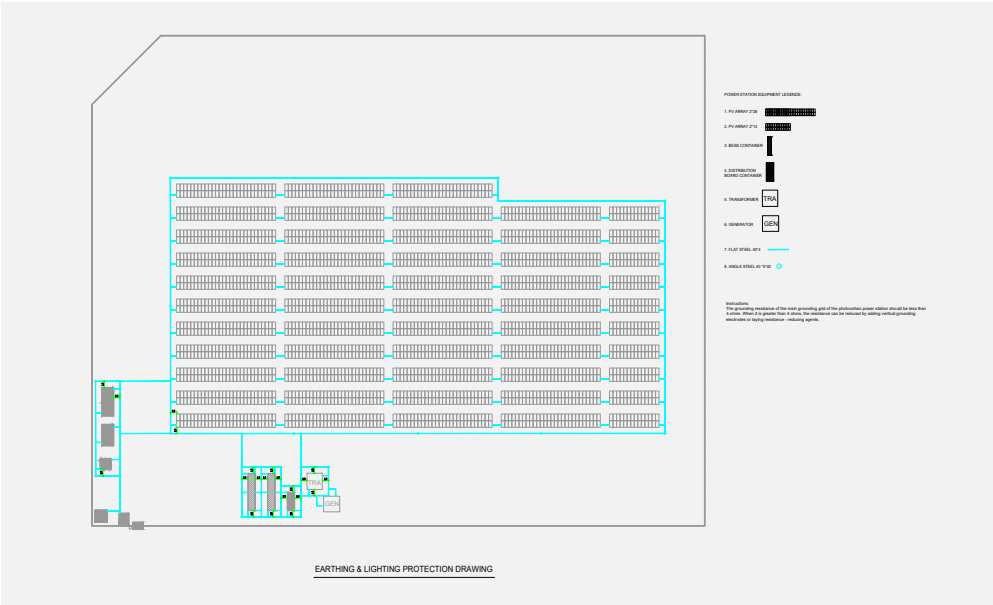
## Photovoltaic Side

Photovoltaic Power Station General Layout



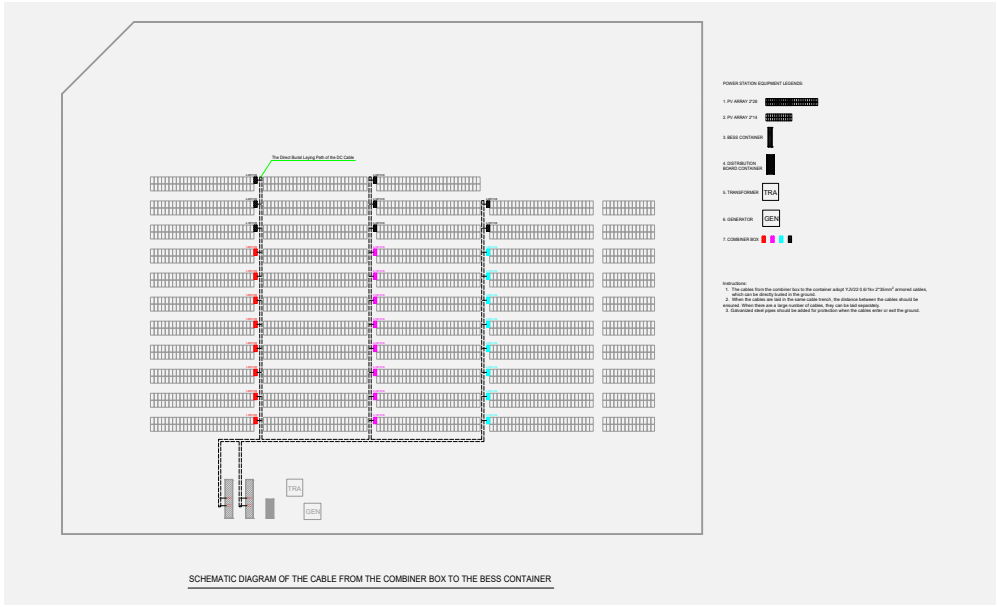
Schematic Diagram Of Photovoltaic String Connection

Numbering Of PV Strings And Schematic Diagram Of Wiring



Earthing & Lighting Protection Drawing

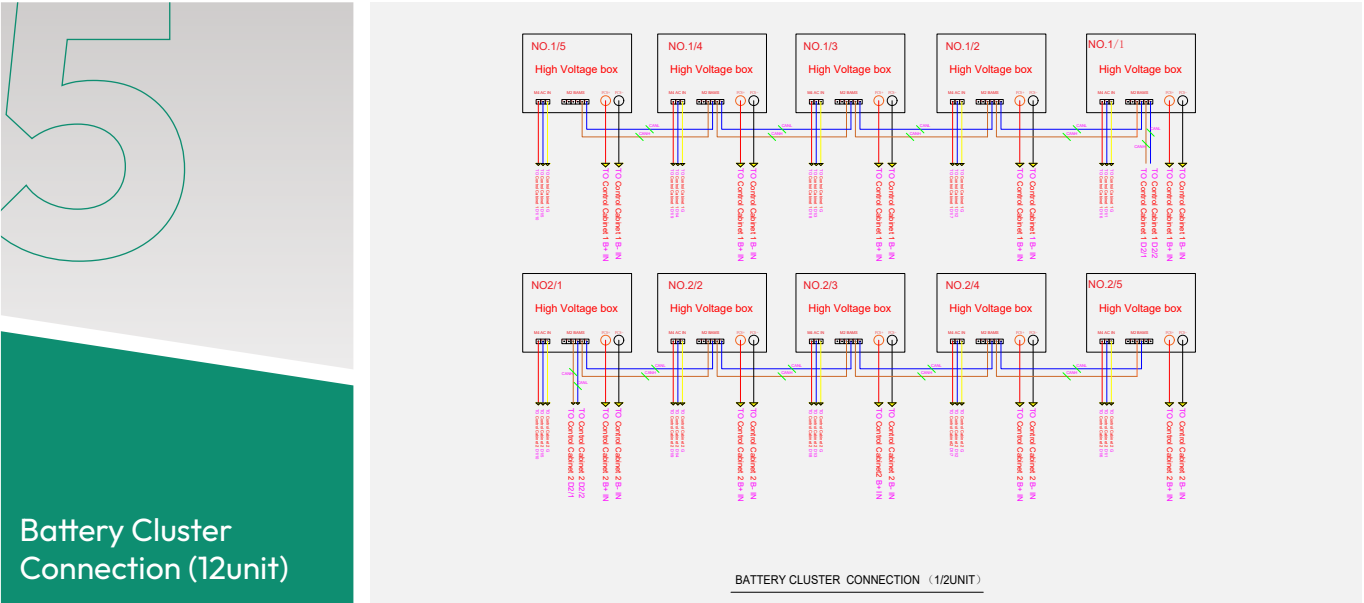
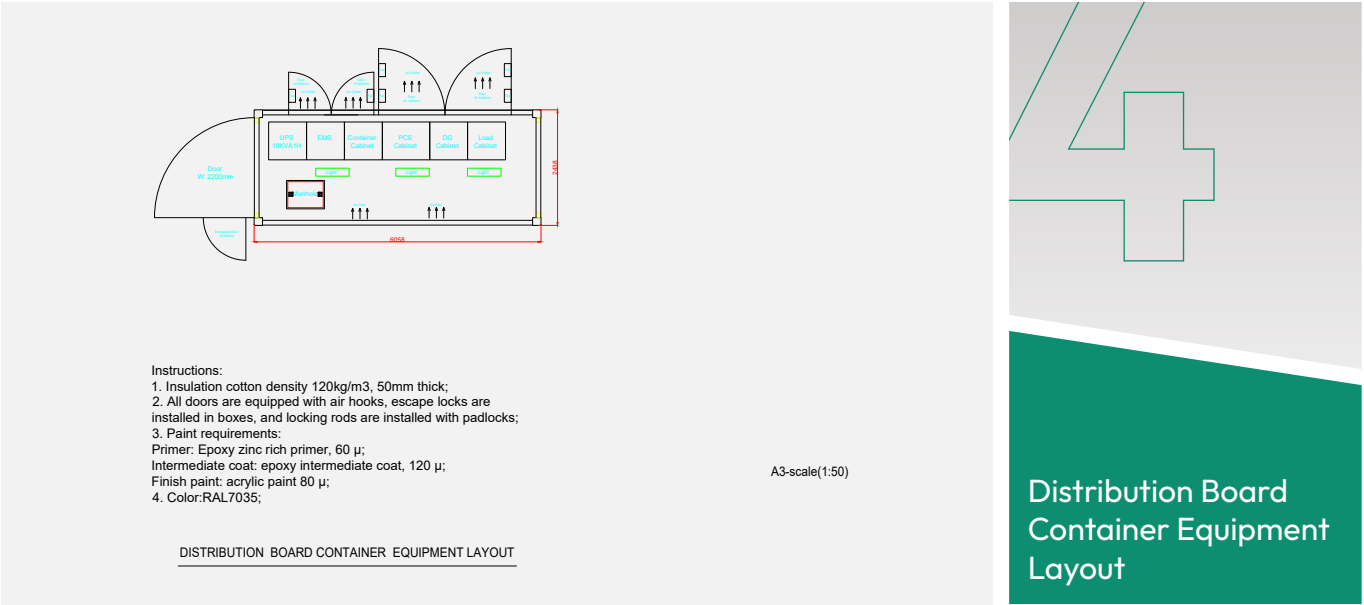
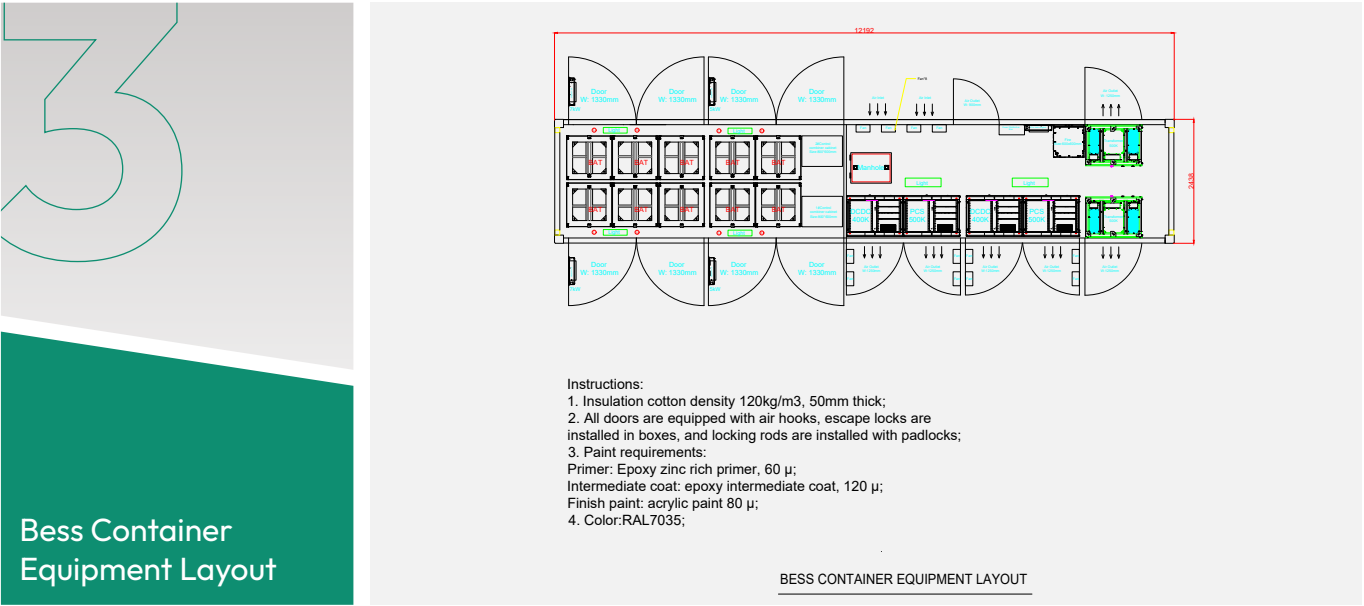
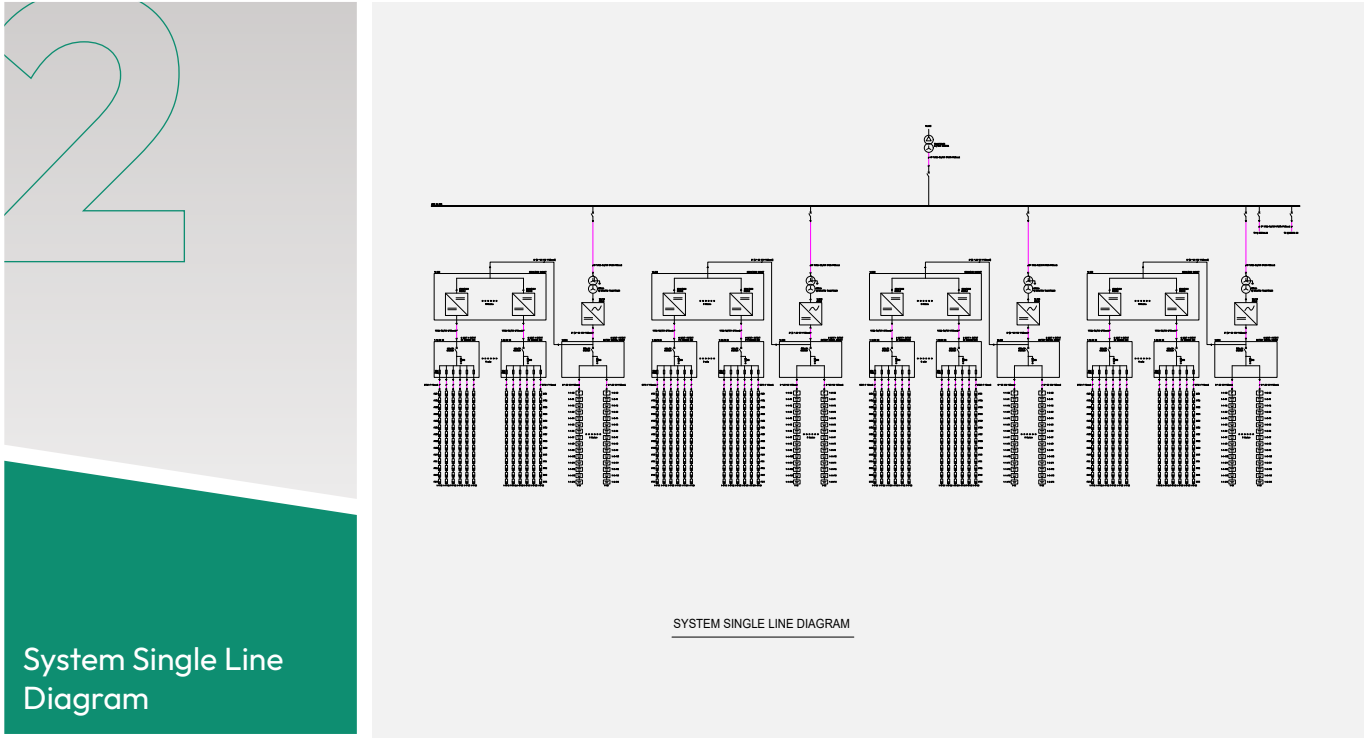
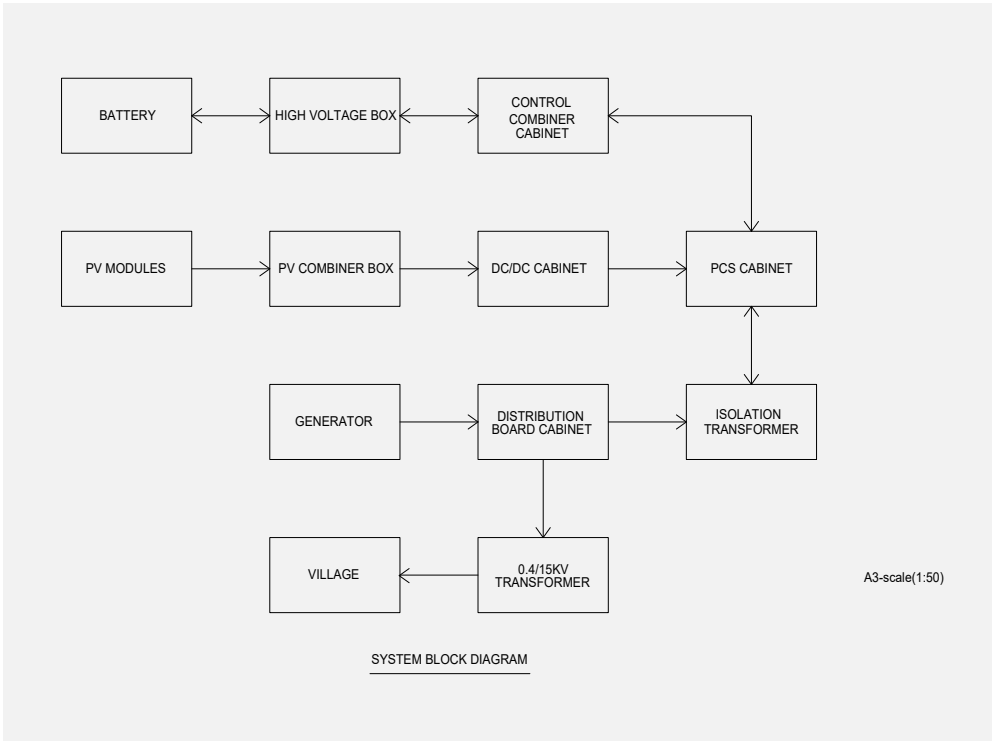
Schematic Diagram Of The Cable From The Combiner Box To The Bess Container





# PROJECT DRAWINGS

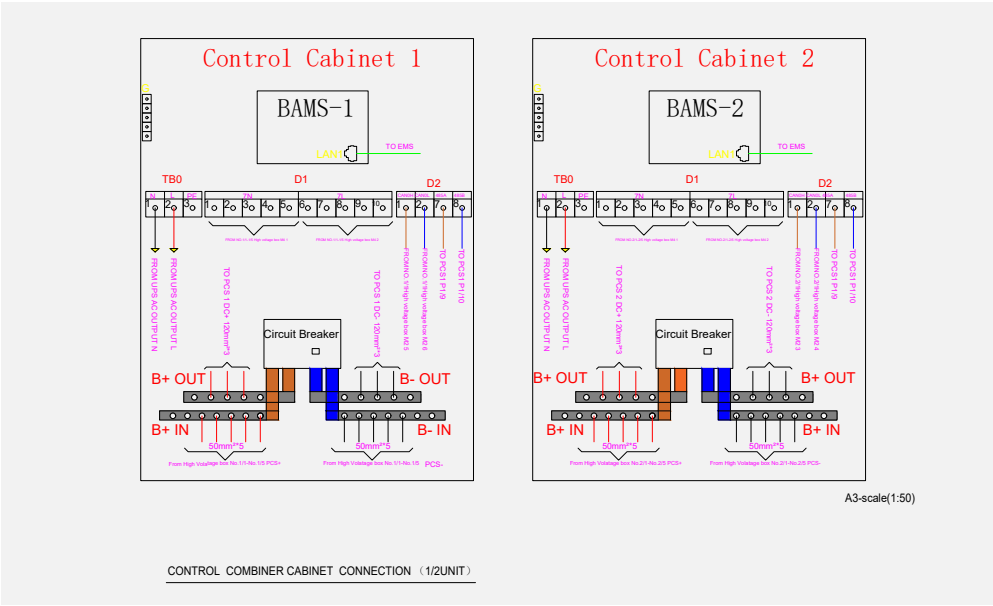
## Energy Storage Side





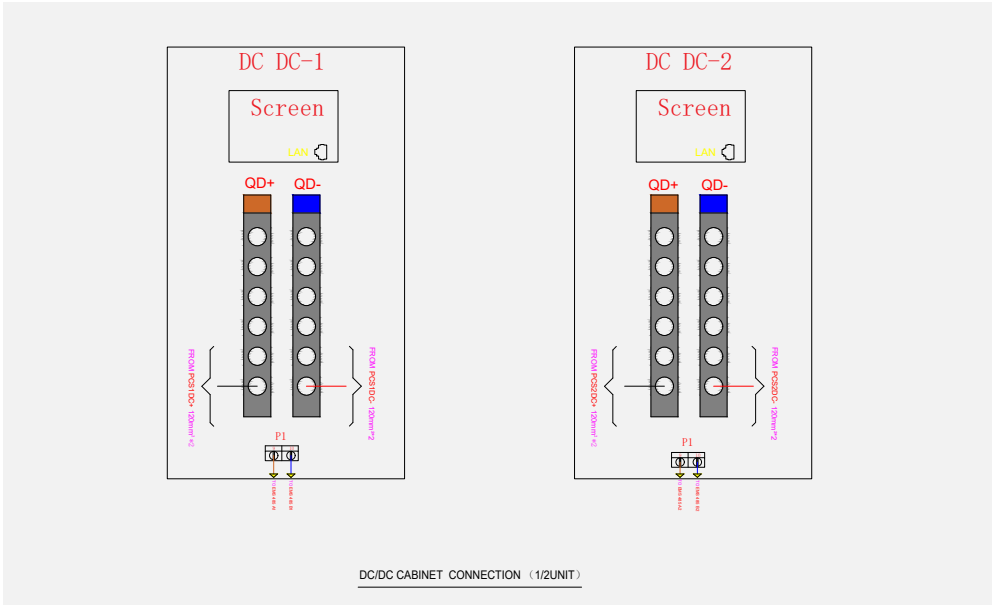
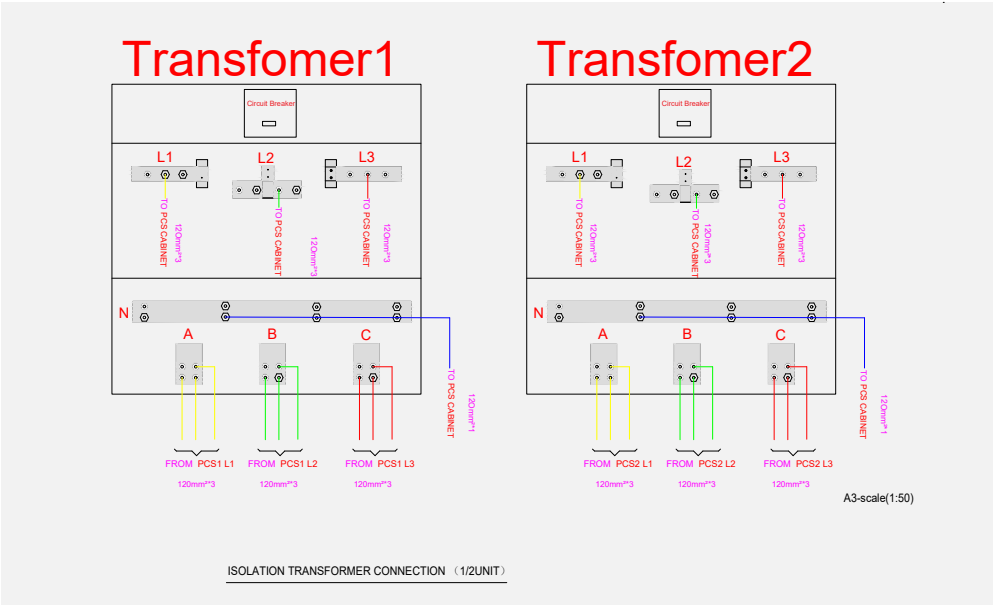
6

Control Combiner Cabinet Connection (12unit)



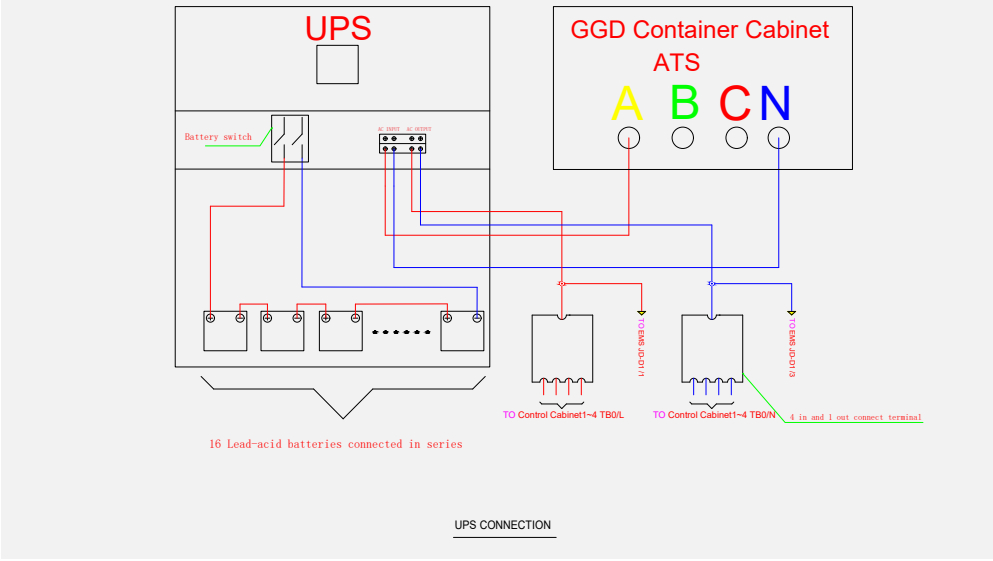
9

Isolation Transformer Connection (12unit)



7

DCDC Cabinet Connection (12unit)

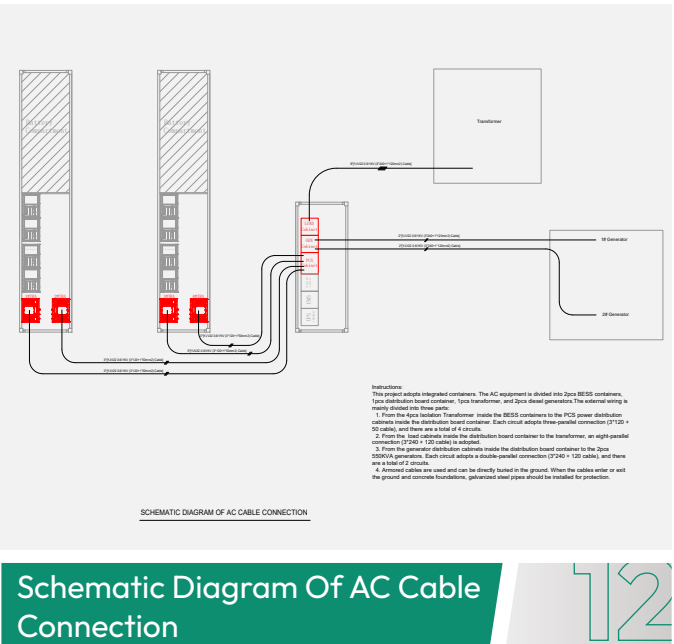
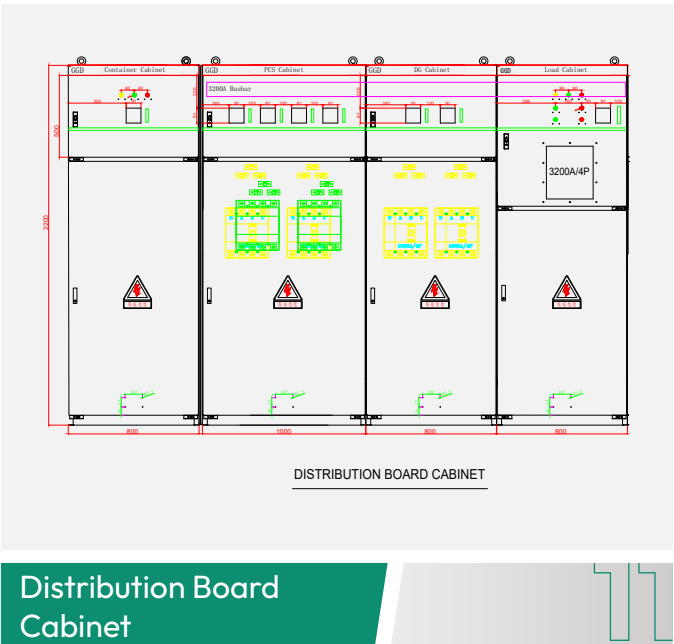
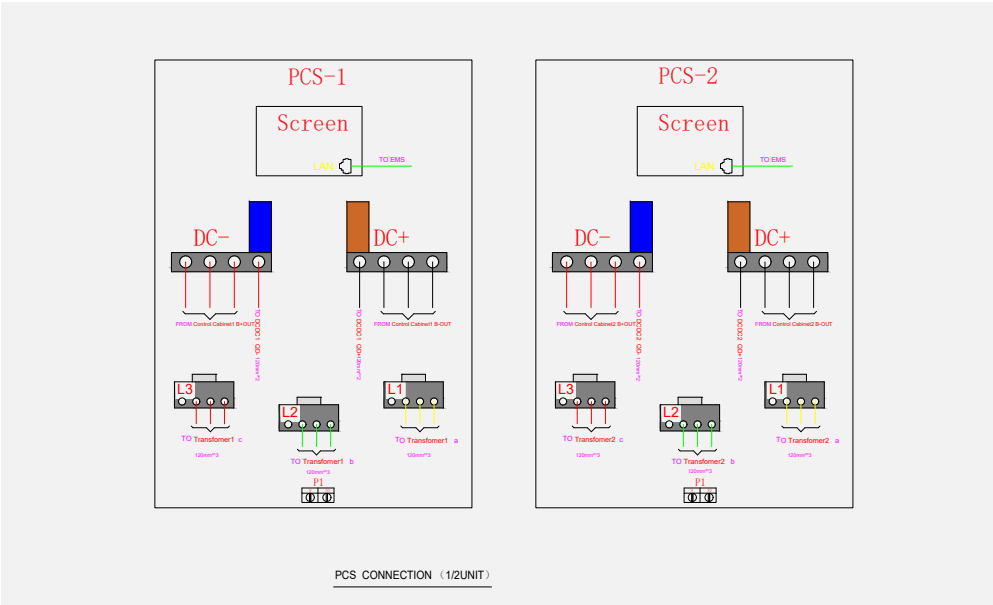


10

UPS Connection

8

PCS Connection (12unit)



11

Distribution Board Cabinet

12

Schematic Diagram Of AC Cable Connection



# PROJECT INSTALLATION

## Field Shots











# 500KW-800KWh

Somalia Water Pump System

Location

Somalia

Company

SUNPAL





# PROJECT INSTALLATION

## Field Shots



|   |                                                                                                                                                                                                                                                                                                                          |                                                                                       |    |       |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----|-------|
| 1 | <b>MEGAREVO Hybrid Solar Inverter MPS500</b><br>Rated power(kW): 500kW<br>Voltage range(V): 320~460V<br>Rated current (A): 722A<br>Max.PV power(kW): 600/660/720<br>MPPT voltage range(V):250-850V<br>Dimension W*D*H(mm):600*720*2,050)*2+<br>1,600*1050*2,050<br><br>Warranty: 10years                                 |    | 1  | PIECE |
| 2 | <b>Battery Module: 51.2V 280AH @14.336kWh</b><br>Battery cell: 3.2V/280AH,<br>Battery module:<br>51.2V/280AH@14.336kWh,16*cell;<br>Battery cluster:<br>716.8V/280AH@200.704kWh,14*modules+1*main<br>controller;<br>with BMS (BCMU/BMU);<br>with battery bracket,DC cables,communication<br>cable;<br>IEC62619/CE/UN38.3; |    | 56 | PIECE |
| 3 | <b>Lithium Battery high voltage control box<br/>(Control and monitoring single battery<br/>module)</b><br><br>Warranty: 10years                                                                                                                                                                                          |    | 4  | PIECE |
| 4 | <b>Battery Rack for battery module and high<br/>voltage box,8 floors 2 columns Power cables,<br/>Communication cables</b><br><br>Warranty: 10years                                                                                                                                                                       |   | 4  | PIECE |
| 5 | <b>Control Combiner Current Cabinet</b><br><br>Warranty: 10years                                                                                                                                                                                                                                                         |  | 1  | PIECE |







# 150KW-50KWh

Residential Energy Storage System

Location

Kenya

Company

SUNPAL





# PROJECT INSTALLATION

## Field Shots



| Parts & Warranty                                                                                                                                              | Picture | Specification                                                                                                                                            | Quantity (PCS) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| TOPCon 625watt<br>N-type TOPCon Solar<br>monofacial Module<br>Warranty: 30 years                                                                              |         | SP625M-66H<br>Power: 625W<br>A grade<br>Weight:29.5 kg<br>Size:2382 × 1134 × 30mm                                                                        | 252            |
| Hybrid Inverter With Wifi<br>10 Years                                                                                                                         |         | Dual MPP Trackers<br>Output Power:50000W<br>Output Voltage:380V/400V                                                                                     | 3              |
| Combiner Box<br>5 Years                                                                                                                                       |         | 4 Input 4 Output<br>1000V                                                                                                                                | 6              |
| 512V100Ah<br>51.2KWh-1C<br>Lithium Battery Cluster<br>with BMS (BCMU/BMU);<br>with battery Cabinet,DC<br>cables,communication cable<br><br>Warranty: 10 years |         | Battery cell: 3.2V/100AH;<br>Battery module:<br>51.2V/100AH@5.12kWh,16"cell;<br>Battery cluster:<br>512V/100AH@51.2kWh,10"mod<br>ules*1"main controller; | 1              |
| Single-core PV Cable<br>10 Years                                                                                                                              |         | 6mm²                                                                                                                                                     | 1000           |
| MC4 Connector<br>5 Years                                                                                                                                      |         | Rated current: 30A<br>Rated voltage: 1000VDC                                                                                                             | 100            |
| Metal Roof installation solar<br>panels Mini mounting system<br>Warranty: 25 years                                                                            |         | Suitable For 240PCS 625W Solar<br>Panels                                                                                                                 | 1              |
| Electrical Design Diagram Service                                                                                                                             |         |                                                                                                                                                          | 1              |
| Mounting System Design Service                                                                                                                                |         |                                                                                                                                                          | 1              |







# MPS500 + 900KWh

Malawi Energy Storage Project

Location

Malawi

Company

SUNPAL





# PROJECT INSTALLATION

## Field Shots







# 100KW-100KWh

Photovoltaic Energy Storage Projects

Location

Ghana

Company

SUNPAL





# PROJECT INSTALLATION

## Field Shots







# Community Project

Home Energy Storage System Installation

Location

Kenya

Company

SUNPAL

## **Description:**

We have installed home storage systems for numerous households in Kenya, Africa, bringing light to the local community. Most of these projects are off-grid type, with photovoltaic systems providing sufficient power to maintain normal loads during the day, and excess power stored in our lithium batteries for use at night.



# PROJECT INSTALLATION

## Field Shots







Add: 398 Ganquan Road, Shushan District, Hefei city, China.

Mobile: + 86 182 6991 2022 | WhatsApp: +86 182 6991 2022 | Web: [www.sunpalpower.com](http://www.sunpalpower.com) | Email: [info@sunpalpower.com](mailto:info@sunpalpower.com)

