

**Project Completion Report
of
Solar Photovoltaic System
for
Soll-Himal-Umbrella Organization Nepal
in
Kalika School, Samundradevi
Nuwakot, Nepal**

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System Designed and Installed By:

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Solar Photovoltaic System in Nuwakot District

Introduction

As per the agreement between the Soll-Himal-Umbrella Organization Nepal and Lasersun Energy Pvt. Ltd., 3 solar systems are installed in 3 different buildings of Kalika School, Samundradevi, Nuwakot, Nepal. Soll-Himal-Umbrella Organization, Nepal decided to install solar PV system to fulfill the demand of electricity in 3 different buildings of Kalika School.

The solar system is designed by Lasersun Energy with the load and operating hour provided by the Soll-Himal-Umbrella Organization Nepal. The system is designed with Solar Array Charging the battery with charge controller to supply the DC load.

The Solar Photovoltaic system has been installed in 1 site. The load requirement for the design of the system is as below.

Requirements per Building:

S.no.	Building	Requirements
1	Building 1(Ground Floor)	Lights, 4Nos. TV12V, 1No.
2	Building 2(Ground Floor)	Lights, 4Nos. TV 12V, 1No.
3	Building 3(two floors)	Lights, 8Nos TV12V, 1No. Extra plug for TV

System Design:

System 1:

For **Ground floor** Building 1:

S.No.	Equipment	Power	Nos.	Use Hrs.	Total Power
1.	Light	7W	4	4	28
2.	TV 12V	60W	1	4	60
					88

Equipments Required:

Solar Module, KC130, 130WP: 1No.

Battery, Sunera 12V,100Ah: 2 Nos.

Charge controller 10A,12V: 1 No.

Wires and Accessories: 1set

System 2:

For **Ground floor** Building 2:

S.No.	Equipment	Power	Nos.	Use Hrs.	Total Power
1.	Light	7W	4	4	28
2.	TV 12V	60W	1	4	60
					88

Equipments Required:

Solar Module, KC130, 130WP: 1No.

Battery, Sunera 12V,100Ah: 2 Nos.

Charge controller 10A,12V: 1 No.

Wires and Accessories: 1set

System 3:

For **Two Floors** Building:

S.No.	Equipment	Power	Nos.	Use Hrs.	Total Power
1.	Light	7W	8	4	56
2.	TV 12V	60W	1	4	60
					116

Equipments Required:

Solar Module, KC85, 87WP: 2No.

Battery, Sunera 12V,100Ah: 2 Nos.

Charge controller 15A,12V: 1 No.

Wires and Accessories: 1set

With the provided load the system is designed using different components for solar PV system. The system is designed with 12 V DC. The system is designed for 4.5 peak sun hours. The components to fulfill the demand are as follow

Solar Module

The solar modules used in the system are Kyocera KC 130 with 130Wp capacity and Kyocera KC85 with 87Wp capacity manufactured by Kyocera, Japan. Array of 1 module (Kyocera KC130) each is installed in 2 sites and array of 2 modules (Kyocera KC85) is installed in 1 site.

Battery

Deep cycle battery manufactured by Sunera, Nepal is used in the system. Each battery is rated for 12V/100 Ah. The battery size is calculated to provide 3 days of autonomy to the system. 2 number of batteries are used in parallel with 12 V DC system in each site.

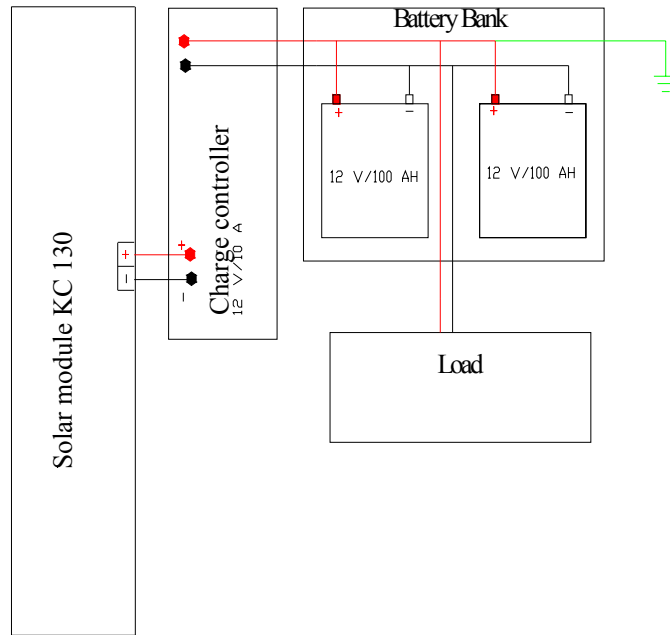
Charge Controller

The charge controller designed for 2 systems is 12V/ 10 A manufactured by Arsh. 170W system has 15A charge controller.

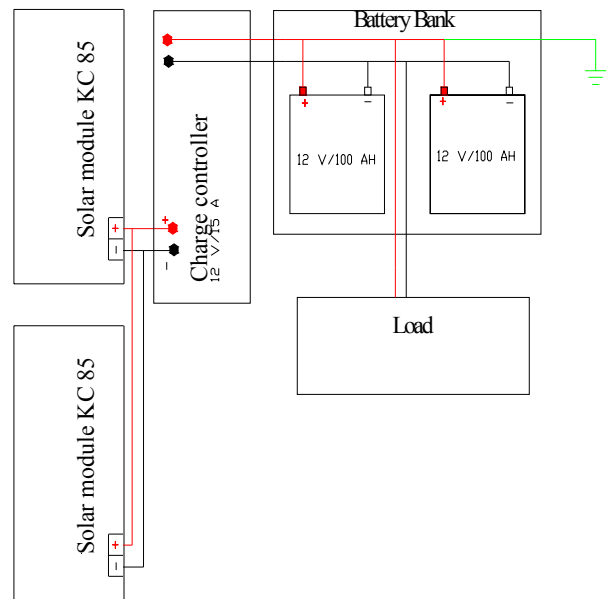
Delivery of the Components

The system components were delivered from Lasersun Head Office in Sanepa, Lalitpur. The goods were packed and taken by jeep up to Nuwakot. The installation was performed by the technical team of Lasersun Energy Pvt. Ltd. being assisted by the villagers and then it was tested successfully. The system was able to fulfill the demand and found to be working quite good as per the design of the system.

The connection diagram of the system is given below.



130 Wp solar power system



174 Wp solar power system

Fig: Connection Diagram of the Solar Photovoltaic System

Installation of the System

The system was designed and installed by technical team of Lasersun energy Pvt. Ltd. The team comprises of

Yogesh Bhandari (Design Engineer)
Rabi Thapa (Technician)
Rabindra K.C. (Technician)

The solar module is mounted in the specially constructed solar mounting structure. The modules are placed in such a way that there is a provision for wind passing in between and all the modules mounted in the structure are earthed. The specification of the individual module installed in the site is

- Model Kyocera KC 130
Rated Power 130Wp
Open circuit Voltage (Voc) 21.7 V
Short circuit Current (Ish) 8.02 A
Voltage at Load (Vmp) 17.6 V
Current at Load (Imp) 7.39 A
- Model Kyocera KC 85
Rated Power 87Wp
Open circuit Voltage (Voc) 21.7 V
Short circuit Current (Ish) 5.39 A
Voltage at Load (Vmp) 17.6 V
Current at Load (Imp) 5.02 A

The power from the solar modules is fed to the charge controller for charging the battery. The battery used in the system is 100 AH/12 V deep cycle battery. 2 number of batteries are used in each system which will provide autonomy of 3 days under full load condition. These batteries are robust in nature and have long life than that of ordinary lead acid battery.

Besides this the cables and other BOS are used in the system to ensure minimum voltage drop and reliable system performance.

Installation pictures:



Fig 1: Lasersun Technicians installing the solar panels



Fig 2: Installation of Solar Panel



Fig 3: Solar panels on school roof



Fig 4: Wiring of TL Lamp



Fig 5: TL Lamp and Charge Controller Connection

Conclusion

The systems are installed and operated successfully according to the requirement of Soll-Himal-Umbrella Organization. The systems are capable of supplying the mentioned load. The installed system will provide the electricity to operate loads in Kalika School, Nuwakot district. The system is expected to work well in the future too provided it is properly maintained and operated. Care should be taken during the days when there is no any sunshine for few days and the voltage levels should be regularly checked to ensure the battery is not too deeply discharged. All the loads should be kept shut off when they are not in use as most of the appliances consume power even in case when they are not operating. Proper care and maintenance will give the sustainability to the system.