

SYSTEM SIZING GUIDELINES

1. Small Solar Home System(SSHS):

A “Small Solar Home System (SSHS)” (hereinafter) is a 10Wp photovoltaic system used for domestic purposes for providing basic lighting services and access to information through a small radio. It consists of WLED DC lamps, radio as well as outlet for mobile phone charging. The system can have separate charge controller and battery or can have an integrated box with charge controller and battery. The SSHS should have its own delivery model.

Load: 3 no. of lamp (2W), charging option for one mobile phone (2.5 W) and one small radio (1W). The load consumption must not be greater than 60% of the generated power.

Panel Battery Ratio: 1: 1 to 1: 1.15 for lead acid battery

: 1: (0.75-0.85) for Ni-MH, Lithium Ion type

Panel:

10Wp, Crystalline Silicon and NEPQA Compliance

Battery: NEPQA Compliance.

- I. Flooded Tubular and Flat plate Gel till end of December 2013.
- II. VRLA tubular:
 - a. AGM tubular
 - b. Gel tubular
- III. Nickel Metal Hydride
- IV. Lithium Ion

The operational life cycle of 12 V lead acid batteries must be at least 3,000 cycles at 20% DoD.

The operational life cycle of Li-Ion and Ni-MH battery must be at least 4,000 cycles at 20% DoD

Charge Controller:

Greater or equal to 3A, PWM or MPPT and NEPQA Compliance

Note: If mobile phone charger (SMPS) not integrated in the charge controller, company /importer must provide charge controller along with SMPS based mobile charger to the RETS.

Lamp:

Luminous Yield of WLED lamp with at least 85 lumen per watt and NEPQA Compliance

Wire:

As per Annex I of NEPQA 2013.

Note: AC Cable will not be accepted. Use of AC cable or undersized cable will be considered as use of non NEPQA compliance product and will be penalized as per the QA & M guideline. Other specification of wire must be as per NEPQA.

Note: There must be provision for charging mobile phone and radio.

Mounting frame:

The panel must be firmly mounted in support structure to hold firmly the PV Module. The support structure should be made of corrosion resistant metallic frame i.e. aluminum with minimum thickness of 3 mm at 30 degree to horizontal and facing south. The height of pole must be at least 30 cm from the holding surface.

Installation:

The installation must be done by Solar Technician Level I and all the cables must be firmly wired using clips and hooks.

2. Solar Home System

20W SHS

Load: 1 no. of lamp (4W), 2 nos. of lamp (3W), 1 no. of lamp (2W), charging option for one mobile phone (2.5 W) and one small radio (1W) and the load consumption must not be greater than 60% of the generated power.

Panel Battery Ratio: 1: 1 to 1: 1.15 for lead acid type

: 1: (0.75-0.85) for Nickel Metal Hydride and Lithium Ion

Panel:

20Wp, Crystalline or amorphous, NEPQA Compliance

Battery: NEPQA Compliance.

I. Flooded Lead Acid Battery

Vented: Tubular Plate

II. VRLA: Tubular Plate

- a. AGM: Tubular Plate
- b. Gel: Tubular Plate
- c. Sealed Maintenance Free: Tubular Plate
- d. Maintenance Free tubular Plate

III. Nickel Metal Hydride

IV. Lithium Ion

The operational life cycle of 12 V lead acid tubular flooded or tubular (VRLA GEL or AGM) must be at least 3,000 cycles at 20% DoD and .

The operational life cycle of Li-Ion and Ni-MH battery must be at least 4,000 cycles at 20% DoD and 2000 cycle at 80% DOD

Charge Controller:

As required by charging current and load current with 50% safety factor, PWM or MPPT and NEPQA Compliance

Note: If mobile phone charger (SMPS) not integrated in the charge controller, company /importer must provide charge controller along with SMPS based mobile charger to the RETS.

Lamp:

Luminous Yield of WLED lamp with at least 85 lumen per watt and NEPQA Compliance

Wire:

As per Annex I of NEPQA 2013.

Note: AC Cable will not be accepted. Use of AC cable or undersized cable will be considered as use of non NEPQA compliance product and will be penalized as per the QA & M guideline. Other specification of wire must be as per NEPQA.

Mounting frame:

The panel must be firmly mounted in support structure to hold firmly the PV Module. The support structure should made of corrosion resistant metallic frame i.e aluminum with minimum thickness of 3 mm at 30 degree to horizontal and facing south. The height of pole must be at least 30 cm from the holding surface.

Installation:

The installation must be done by Solar Technician Level - I and all the cables must be firmly wired using clips and hooks.

55 Wp SHS

Load: 6 nos. of lamp (3W), 2nos. of 4W lamp, charging option for two mobile phone (2.5 W) and one small radio (1W) and one LCD TV (15W) and the load consumption must not be greater than 60% of the generated power.

Panel Battery Ratio : 1: 1 to 1: 1.15 for lead acid type
: 1: (0.75-0.85) for Nickel Metal Hydride and Lithium Ion

Panel:

55Wp, Crystalline or amorphous, NEPQA Compliance

Battery: NEPQA Compliance.

I. Flooded Lead Acid Battery

Vented: Tubular Plate

II. VRLA: Tubular Plate

- a. AGM: Tubular Plate
- b. Gel: Tubular Plate
- c. Sealed Maintenance Free: Tubular Plate
- d. Maintenance Free tubular Plate
- e. Nickel Metal Hydride
- f. Lithium Ion

The operational life cycle of 12 V lead acid tubular flooded or tubular (VRLA GEL or AGM) must be at least 3,000 cycles at 20% DoD and .

The operational life cycle of Li-Ion and Ni-MH battery must be at least 4,000 cycles at 20% DoD and 2000 cycle at 80% DOD

Charge controller:

As required by charging current and load current with 50% safety factor, PWM or MPPT and NEPQA Compliance

Note: If mobile charger (SMPS) not integrated in the charge controller, company /importer must provide charge controller along with SMPS based mobile phone charger to the RETS.

Lamp:

Luminous Yield of WLED lamp with at least 85 lumen per watt and NEPQA Compliance

Wire:

As per Annex I of NEPQA 2013.

Note: AC Cable will not be accepted. Use of AC cable or undersized cable will be considered as use of non NEPQA compliance product and will be penalized as per the QA & M guideline. Other specification of wire must be as per NEPQA.

Mounting frame:

The panel must be firmly mounted in support structure to hold firmly the PV Module. The support structure should be made of corrosion resistant metallic frame i.e aluminum with minimum thickness of 3 mm at 30 degree to horizontal and facing south. The height of pole must be at least 30 cm from the holding surface.

Installation:

The installation must be done by Solar Technician Level I and all the cables must be firmly wired using clips and hooks.

Note:

1. Size of cable used for SPV system is indicative. Therefore, company/importer can provide the appropriate or larger size of the cables using following formula for the system

above 55Wp PV System.
$$S = \frac{0.3LI_m}{\Delta V}$$

Where, S - Required wire size (cross-sectional area of the copper wire in sq.mm),

L - Length of the wire in meters,

Im – The maximum current in Ampere, and

ΔV – Maximum allowable voltage drop in percent. (i.e. 3%)

2. Wattage of LED lamp proposed is indicative, company can provide the different watt lamps of at least 2 W capacity as demanded by user and design the system accordingly. The total load consumption must not be greater than 60 percent of the generated power.