



BID SPECIFICATION FOR SOLAR HOME LIGHTING SYSTEM



ANNEXURE – I

SECTION – 2A

Technical Specification for CFL based SHLS

1.0 DEFINITION

A Solar Home Lighting System (SHLS) aims at providing solar electricity for operating lights and/or fan or energizing a DC operated portable TV sets for specified hours of operation per day.

2.0 SCOPE OF WORK

The scope of work includes manufacture of Solar Home Lighting System, shop testing, packing & forwarding, transportation, supply, installation and commissioning of CFL based SHLS system complete in all respect alongwith one set of operation instruction cum maintenance manual (Hindi) for each set and delivery on FOR destination/site (door delivery) basis across the state of Jharkhand including, demonstration of performance and training at all sites located within the state of Jharkhand as per direction of JREDA.

3.0 TECHNICAL SPECIFICATION

The CFL based Solar Home Lighting System shall be Indigenous make should conform to the following specifications / model:-

TYPE OF SHLS	COMPONENTS	SPECIFICATION
MODEL 2	PV Module	1x37 Wp under STC
	Lamp	2xCFL, 4-Pin 9W, Base up configuration housed in assembly suitable for indoor use, with reflector in its back.
	Battery	1x12V, 40AH, Tubular Plate, low maintenance type Lead Acid Battery, with c/10 discharge.
	Other Components	Control electronics, Module mounting hardware, Battery box, Inter connecting wires/cables, Switches, Operation/ Instruction and Maintenance Manual.

All models shall have a socket to provide power for a 12V DC TV set, which is purchased separately.

Small white LED shall be provided as an optional feature, with an independent switch.

DUTY CYCLE

Model No	Average Hours of Operation Per Day
Model 2	3-4 Hours

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3.2 LAMPS

- a) The lamps shall be compact fluorescent (2 x CFL) type, 4 – Pin, with rating of 9 W. A suitable pre-heating circuit must be provided.
- b) The light output from the lamps should be around $600 \pm 5\%$ lumens. No blackening or reduction in the lumen output by more than 10% should be observed after 1000 ON/OFF cycles (two minutes ON followed by four minutes OFF is one cycle).
- c) The lamps should be housed in an assembly suitable for indoor use, with a reflector on its back. While fixing the assembly, the lamp should be held preferably in a base up configuration.

3.3 BATTERY

- a) The battery shall be of flooded electrolyte type, positive tubular plate, and low maintenance lead acid battery conforming to relevant BIS standards
- b) The battery will have a minimum rating of 12V, 40AH (at C/10) discharge rate
- c) 75% of the rated capacity of the battery should be between fully charged and load cut off

3.4 ELECTRONICS

- a) The inverter will be of quasi sine wave/sine wave type with a frequency in the range of 20-35 KHz. Half-wave operation is not acceptable.
- b) The total electronic efficiency shall be at least 80%
- c) No blackening or reduction in the lumen output by more than 10% should be observed after 1000 ON/OFF cycles (two minutes ON followed by four minutes OFF is one cycle).
- d) The idle current consumption should not be more than 10mA

3.5 PV MODULE(S)

- (a) The PV Module(s) shall contain crystalline silicon solar cells.
- (b) The power output of the module(s) under STC should be a minimum of 37W.
- (c) The operating voltage corresponding to power output mentioned above should be 16.4V.
- (d) The open circuit voltage of the PV module under STC shall be at least 21.0V.
- (e) The terminal box on the module should have a provision for opening for replacing the cable, if required.
- (f) A strip containing the following details should be laminated inside the module so as to be
 - i. Name of the Manufacturer or distinctive logo.
 - ii. Model or type No.
 - iii. Serial No.
 - iv. Year of make
- (g) Name of the Manufacturer or distinctive logo.
- (h) Models of reputed make shall be offered.



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JREDA SPECIFICATION

- a. Monogram of JREDA along with following details translated into Hindi language shall be laminated in Devnagari script on the left hand top corner in front of each PV Module.
 - General Programme 2007-08
 - Not for sale or transfer
 - Statutory action would be taken by JREDA, if it found sold or transferred, under different sections of IPC.
- (b) Frame of PV Module shall be painted golden yellow colour.
- (c) A strip containing the following detail should be mentioned in Hindi language and pasted in permanent manner at the back of the module:
 - I. Cost of the system – Rs. 12,691/- (Rs. Twelve Thousand Six Hundred Ninety One Only)
 - II. State subsidy to different categories viz. SC/ST/primitive/General:-
Rs. 8,000/- (Rs. Eight Thousand Only)
 - III. Beneficiary contribution.
Rs. 4,691/- (Rs. Four Thousand Six Hundred Ninety One Only)

3.6 ELECTRONIC PROTECTION

- a) Adequate protection is to be incorporated under no load conditions (e.g. when the lamp is removed and the Home Lighting System is switched ON).
- b) Battery cut offs & reconnects should be provided to protect it against overcharge and deep
- c) A fuse should be provided to protect against short circuit conditions.
- d) A blocking diode, should be provided as part of the Home Lighting System electronics to prevent reverse flow of current through the PV module, if such a diode is not provided with the module itself.
- e) Full protection against open circuit, accidental short circuit and reverse polarity should be provided.

3.7 MECHANICAL COMPONENTS:

Metallic frame structure MS.Flat/MS.Angle size: 25mmx3mm (minimum), with corrosion resistance paint, to be fixed on the roof of the house to hold the SPV module(s). The frame structure shall have provision to adjust its angle of inclination to the horizontal between 0 and 45, so that it can be installed at the specified tilt

A vented metallic box of M.S.(0.70 mm minimum thickness) acid proof, corrosion resistance, painted as per relevant BIS for housing the storage battery indoors shall be provided. The box can be of injection moulded plastic /acrylic / polymer of 2.5mm minimum thickness.The material used should be 100% acid proof, rust proof and good electrical insulator. The box should have grid structure at the base for proper strength.

3.8 OTHER FEATURES

- a. Two LED indicators one for a green light to indicate charging in progress, and another red LED to indicate deep discharge conditions of the battery. The green LED should glow only when the battery is actually being charged.



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- b. The ON/OFF switch used in the SHLS must be suitable for use in DC circuit and be reliable with long life. A cable(2 core \times 1.5 sqmm) of suitable length (at least 5 meters) should be provided for inter connection between the module and the Home Lighting System.
- c. The following details should be marked indelibly on the body of SHLS.
 - I. Name of the Manufacturer or distinctive logo.
 - II. Model or Type No.
 - III. Serial No.
 - IV. Year of make
- d. Components and parts used in solar home lighting systems should confirm to the latest BIS specification, whichever such specifications are available and applicable.

3.9 DOCUMENTATION:

An operation/Instruction/Maintenance Manual in Hindi should be provided with the Solar Home Lighting System. The following minimum details must be provided in the manual:

- i. About Photovoltaic
- ii. About Solar Home Lighting system – its components and expected performance.
- iii. About PV Module.
- iv. About CFL
- v. About Battery
- vi. Clear instructions about mounting of PV module(s)
- vii. About electronics
- viii. About charging and significance of indicators.
- ix. Do's and Don'ts
- x. Clear instructions on regular maintenance and trouble shooting of solar home system.
- xi. Name and address of the person or service center to be contacted in case of failure or complaint.
- xii. Warranty card.

3.10 WARRANTY

The PV module will be warranted for a minimum period of 10 years from the date of supply and the Solar Home Lighting System (including the battery) will be warranted for a minimum period of two years from the date of supply. The warranty card to be supplied with the system must contain the detail of the system supplied as given in the Proforma VIII. The manufacturers can also provide additional information about the system and condition of warranty as necessary.