



# അനേർട്ട് ANERT

AGENCY FOR NON-CONVENTIONAL ENERGY & RURAL TECHNOLOGY  
(DEPARTMENT OF POWER, GOVT. OF KERALA)

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## Technical specifications of Soura Suvidha Kit

A Soura Sudidha kit is a portable lighting device consisting of a PV module, Lithium ferro-phosphate battery, LED lamp and FM radio, Mobile charging port and electronics. Battery, LED lamp optics and electronics should be enclosed in a suitable housing, made of ABS or plastic or fiber glass with handle easy carrying. The Solar lantern is suitable for either indoor or outdoor lighting, covering a full range of 360 degrees.

PV module converts sunlight into electricity, charges the battery which powers the luminaire. Luminaire consists of White Light Emitting Diode (W-LED), a solid state device which emits light when an electric current passes through it.

### 1.1 BROAD PERFORMANCE SPECIFICATIONS

The broad performance specifications of a W-LED light source based solar lantern system are given below:

PV

Module 15Wp under STC

Battery

84 Wh(minimum), Lithium Ferro Phosphate battery

LED

150 Lumen/watt or higher W-LED's (as per LM- 80 certificate) luminaire, top mounted facing down, dispersed beam, soothing to eyes without dark patches with the use of proper dome shaped reflector. **Maximum power consumption of luminaire should be 4 watts( Including driver).**

Light

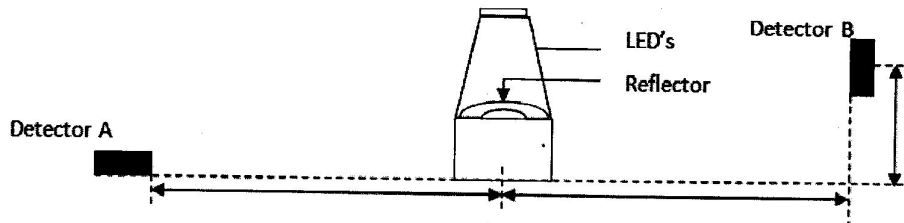
Output

Minimum level of illuminance from W-LED lantern should be as follows

S No.	Horizontal distance (d) of detector from centre of light source (feet)	Illumination level when detector [A] is placed horizontally on the same plane as lantern base.(Lux)	Illumination level when detector [B] is placed vertically at a height of 15cm from plane of lantern base (Lux)
1	1	250	300

2	2	45	125
3	3	17	55
4	4	4	28
5	5	2.5	16

Test certificate regarding light output from MNRE approved or NABL accredited test centres should be submitted with tender.



Note : The shape/ design of soura suvidha kit is indicative only.

Electronics Efficiency approximately 85%

## 1.2 TECHNICAL DETAILS

### 1.2.1 PV MODULE

- i. Indigenously manufactured PV modules should be used in the solar lantern.
- ii. **The PV module should have crystalline silicon solar cells, and should have a test certificate conforming to IEC 61215 Edition II / BIS 14286 from an NABL or IECQ accredited Laboratory.** In case the certificate for the offered module is not available, a test certificate for higher capacity module of same make and series produced by the same PV module manufacturer should be available. Test certificate should be submitted with tender.
- iii. The PV module must have a minimum of 15 Wp at a load voltage\* of 16.40 ± 0.2 V under the standard test conditions (STC) of measurement.
- iv. The open circuit voltage\* of the PV modules under STC should be at least 21.0 Volts.
- v. **The module efficiency should not be less than 10%.**
- vi. The terminal box on the module should have a provision of opening it for replacing the cable, if required.

- vii. There should preferably be an arrangement (stand) for mounting the module at an optimum angle in the direction facing the sun.
- viii. A foil/ strip containing the following details should be fixed inside the module so as to be clearly visible from the front side:-
  - a. Name of the Manufacturer and/ or distinctive Logo
  - b. Model and/ or Type No.
  - c. Serial No.
  - d. Year of manufacture
- ix. The cable connecting module to the lantern should be good quality 2 core, 1 sq. mm double sheathed copper cable suitable for outdoor use and having a length of minimum 10 meters.

### 1.2.2 BATTERY

84 Wh(minimum), Lithium Ferro Phosphate battery (IEC /IS/international test certificate should be submitted with the document)

### 1.2.3 LED

The light source will be of White Light Emitting Diode (W-LED) type, minimum Luminous efficacy 150 Lumen/watt.

- i. The colour temperature of W-LED(s) used in the system should be in the range of 5000°K/5500°K-6500°K.
- ii. W-LED(s) should not emit ultraviolet light.
- iii. The light output from the W-LED should be constant throughout the duty cycle.
- iv. **LM 80 test certificate of the LED should be submitted with the document.**

### 1.2.4 ELECTRONICS

- i. Efficiency of the electronic system should be at least 85%.
- ii. Electronics should have temperature compensation for proper charging of the battery throughout the year.
- iii. The PCB containing the electronics should be capable of solder free installation and replacement.
- iv. Necessary switches suitable for DC use and other protections should be provided.

### 1.2.5 ELECTRONIC PROTECTIONS

- i. Adequate protection is to be incorporated for "No Load" condition, e.g. when the lamp is removed and the lantern is switched ON.
- ii. The system should have protection against battery overcharge and deep discharge conditions.
- iii. Adequate protection should be provided against battery reverse polarity.
- iv. A fuse should be provided to protect against short circuit conditions.
- v. Protection for reverse flow of current through the PV module should be provided.
- vi. During the charging, lamp cannot be Switched "ON".

### 1.2.6 INDICATORS

The system should have two indicators: green and red.

The green indicator should indicate the charging under progress and should glow only when the charging is taking place. It should stop glowing when the battery is fully charged.

Red indicator should indicate the battery "Load Cut Off" condition

**1.2.7 FM Radio**

FM radio with antenna should be provided in the lantern

**1.2.8 Mobile Charging port**

5.1 V, 2A USB port should be provided for charging mobile phone

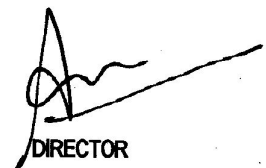
**1.3 QUALITY AND WARRANTY**

- i. **The W-LED, Battery and Solar module will be warranted for five years**
- ii. **The FM Radio and electronic circuit will be warranted for two years**
- iii. The Warrantee/ Guarantee Card to be supplied with the Solar Lantern must contain the details of the system supplied.

**1.4 OTHER FEATURES**

Operation, Instruction and Maintenance Manual, in English and the local language, should be provided with the Solar Lantern. The following minimum details must be provided in the Manual:

- a. Basic principles of Photovoltaics.
- b. A small write-up (with a block diagram) on Solar Lanterns – its components, PV module, battery, electronics and luminaire and expected performance.
- c. Significance of indicators.
- d. Type, Model number, Voltage, capacity of the battery, used in the system.
- e. The make, model number, country of origin and technical characteristics (including IESNA LM-80 report) of W-LEDs used in the lighting system.
- f. Clear instructions on mounting, operation, regular maintenance and trouble shooting of the Solar Lantern.
- g. Instructions on replacement of battery.
- h. DO's and DONT's.
- i. Name and address of the contact person for repair and maintenance during the warranty.



DIRECTOR