

Rev. 01
Dated: 19.08.24

Frequently Asked Questions (FAQs)
About
Solar Roof Top Plants
Being Installed Under PM, Surya Ghar: Muft Bijli Yojna
(For Installers and Inspectors of KPDCL)

Q:1 What are the approved documents for implementation of PM Surya Ghar: Muft Bijli Scheme

Ans: Following are the approved documents. Every Empanelled Installer/ Inspector should go through these documents before taking up the job on ground:

- i. Guidelines for PM-Surya Ghar: Muft Bijli Yojana issued vide MNRE Office Memorandum: 318/17/2024 dated: 07/06/2024
- ii. EOI Document of KPDCL for empanelment of Installers issued vide No. CED/EOI/06-TS Dated. 06-06-2024
- iii. Site Survey Report: Form No. PMSGMBY/KPDCL/MATERIAL/01/R0
- iv. Material Inspection Report: Form No.PMSGMBY/KPDCL/MATERIAL/02/R0
- v. Project Completion Report: Form No. PMSGMBY/KPDCL/MATERIAL/03/R0

Q:2 Who can avail subsidy under PM-Surya Ghar: Muft Bijli Yojana?

Ans The consumer must satisfy following conditions for availing subsidy under PMSGMBY:

1. He should be a registered consumer of KPDCL under Schedule-1(Domestic Supply) of JERC, JKL Tariff Order. Commercial, Industrial and Government installations are not eligible for the scheme.
2. He should have sufficient shadow free roof space at a height of minimum 8 feet from ground. The requirement of space per kWp is 60 to 80 sft.
3. He should have a bank account in his name. The spelling of the name on electricity bill of consumer and bank account should match.

Q:3 A prosumer has already installed a solar roof top under MNRE-II Scheme. Can he avail subsidy under PMSGMBY?

Ans Yes, he can avail subsidy provided total installed capacity under MNRE-II and PMSGMBY does not exceed 3kW. For example:

- (i) In case capacity installed under MNRE-II was 1kW, subsidy will be provided for remaining 2kW only
- (ii) In case capacity installed under MNRE-II was 2kW, subsidy will be provided for remaining 1kW only
- (iii) In case capacity installed under MNRE-II was 3kW or above, no subsidy will be provided under current scheme

Q:4 A consumer has sanctioned load of 1kW but he intends to install solar roof top of 3kWp capacity. Is he eligible for the scheme?

Ans: Yes he is eligible provided his sanctioned load is enhanced to 3kW. The sanctioned load should be at least equal to the proposed SRT capacity. Due to enhancement of load fixed charges increase by Rs. 8/- per kW per month only.

Q:5 Where shall the consumer apply for enhancement of sanctioned load. Can the consumer / installer proceed with installation without final approval of load enhancement?

Ans: Consumer/ Installer can proceed with installation without final approval of load enhancement by SDO, KPDCL. The consumer can apply for online load enhancement through the website of KPDCL: <https://onlineapplication.jkpdd.net/>, generate acknowledgement slip and produce same to installer for commencement of work. However, plant shall be commissioned only after approval of load enhancement.

Q:6 In a locality having 63kVA transformer large number of consumers applied for installation of solar roof top. The cumulative capacity of the SRT applied for exceeds the transformer capacity. The transformer may get overloaded due to reverse power flow from consumer installations to the grid especially at noon time when generation is at its peak and consumer load is also less. Are there any guidelines to prevent this situation?

Ans: The cumulative capacity of all SRT systems connected to a particular Distribution Transformer shall be allowed up to 100% of its rated capacity. The connectivity shall be permitted on a non-discriminatory "first come, first serve" basis to the Eligible Consumers who have installed or intend to install SRT System connected to the Network of such Distribution Licensee

Q:7 What are the guidelines for procurement of PV Modules:

Ans: Solar modules used in the installation must satisfy the Domestic Content Requirement (DCR) condition i.e., domestically manufactured modules manufactured from domestically manufactured cells. This is an essential condition for the installation to be eligible for the CFA. Use of non-DCR modules in any form in the installation is a criminal offence and shall render the installation ineligible for CFA. Only modules approved as per Approved List of Modules and Manufacturers (ALMM) can be used for the installation. The ALMM is available on the website of MNRE and it is being updated from time to time. The installers must keep track of ALMM on MNRE website.

Q:8 What are the guidelines for installation of PV Modules

Ans: The PV modules must be installed on roof at a height of minimum 8 feet from ground in such a manner that all modules in a string receive sunlight simultaneously at sun rise and stop receiving sun light at sunset simultaneously. Partial exposure of string to sunlight makes whole string dysfunctional.

Q:9 Are there any guidelines regarding Module Mounting Structure (MMS)?

Ans: Yes, guidelines for MMS are provided in the PM-Surya Ghar: Muft Bijli Yojana guideline, issued vide MNRE Office Memorandum: 318/17/2024 dated: 07/06/2024. In case Aluminum MMS is used, same may be preferably of Anodized Aluminum for prolonged life of 25 years.

Q:10 What are the guidelines for procurement of Lightning Arrester?



Ans: Please refer to above picture of LA. It should have insulated base and Earth Terminal. Without these the LA will be rejected during inspection.

Q:11 What are the guidelines for installation of Lightning Arrester?

Ans: The Lightning Arrester shall be installed at the highest point of the SRT on roof, preferably on the ridge line of roof in case of tin sheet type of roofs. The base of LA shall be well insulated from the metallic tin sheets, otherwise potential of the roof may rise abnormally during lightning strike and pose risk to life and property.

Q:12 What are the guidelines for earthing of Lightning Arrester?

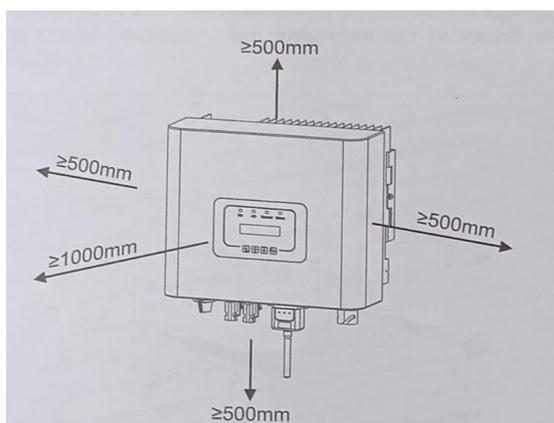
Ans: The current carrying cable from Lightning Arrestor to the earth pit should have sufficient current carrying capacity. Separate earth electrode shall be used for LA. The minimum requirement for a lightning protection system designed is a 6 sq. mm copper/ 16 sq. mm aluminum or GI strip bearing size 25 X 3 mm thick. Separate conduit for running earth wires of Lightning Arrestor shall be used. In case all earthing cables including LA earthing cables and inverter earthing cables are laid through a single conduit, the earthing cable of LA may discharge to earthing cables of inverter and may damage inverter and pose risk to life and property at the time of lightning strike.

Q:13 What are the guidelines for procurement of Solar Inverter?

Ans: The Solar Inverter shall be BIS certified and the installer shall produce BIS certificate of the make and model of inverter for verification of KPDCI Inspector. The input rated DC Voltage and rated current of the inverter shall be compatible for the combined voltage / current rating of the modules. It Shall have Remote Monitoring Unit (RMU) Feature.

Q:14 What are the guidelines for installation of Solar Roof Top Inverter?

Ans:



The installation guidelines are provided with the packing of each solar inverter. Please refer to these guidelines carefully before installation of an inverter. Unlike many other electrical equipment, Solar Roof Top inverters dissipate huge heat during operation which should not be inhibited to dissipate. Avoid installation in small closed spaces where air cannot circulate. The inverter should be installed at a ventilated place leaving clear space on each side. It should not be installed on flammable material like wooden panelling, Plyboard wall or other synthetic walls/ insulated walls which are flammable. It should not be installed at places where flammable materials or gases are stored. The concrete walls, brick walls and AAC Block walls are best suited for installation of Solar Roof Top Inverters. Above is the installation layout of Deye Solar Inverter of rating upto 10kW. As per this drawing you have to leave minimum 500 mm (half a meter) clearance on each side of inverter. On front side clearance should be minimum 1000 mm (one meter). Other equipment like ACDB, DCDB may be installed beyond this mandatory spacing. The enclosures of these DBs are generally of polycarbonate material which is fire hazardous. It shall be installed beyond reach of children and preferably at line of sight height (around 5 feet) so that prosumer can read the LCD Display with convenience. The Solar Inverter can be installed outdoors also like on the balcony wall etc provided location is not exposed to direct sunshine, rain and snow.

Q:14 Can we go for three phase inverter in case installation is of single phase type for plants of capacity larger than 5kW?

Ans: It is always advisable to go for three phase type inverter in case plant capacity is larger than 5kW. The per phase current of a 10kW connection is 43.47 Amps at unity power factor for single phase, whereas current is only 14.43 Amps for a similar three phase connection. The phase current therefore gets reduced to one third in case of three phase connection. The three phase supply is available wherever LTAB Cables are laid. The consumer may have to modify his inner wiring slightly to make it suitable for three phase supply. Three phase supply is good for service line, utility meter as well as for consumer installation and for the solar roof top. It also improves

quality of supply at the consumer installation. In case three phase supply to consumer is not feasible due to technical constraint on Discom or Consumer side, single phase inverter may be allowed for sanctioned load above 5kW provided full load rated capacity does not exceed meter or service line rated current carrying capacity.

Q:15 A consumer intends to install a solar roof top of 3kWp capacity but he wants to increase capacity of the same to 5kWp in future at his cost. Can he provide a 5kW inverter in place of 3kW inverter whereas PV module capacity is 3kWp only?

Ans: This is known as over-sizing of inverter and it is allowed. But subsidy will be payable on PV Module capacity only.

Q:16 What are the guidelines for Earthing of Solar Roof Top Inverter

Ans: The Solar Roof Top inverter shall be earthed through two separate Earth Wires of size as per inverter specs (normally Earth Wire size is mentioned in the Inverter manual). One earth wire shall be used for DC Earthing and other for AC and body earthing of Inverter .

Q:17 What are the guidelines for procurement of DC Distribution Board?

Ans: The DCDB shall be provided with MCB/Fuse of rating 32 Amp. A surge protection device (SPD) shall also be provide to protect the Inverter from the surges emanating from the solar array.

Q:18 What are the guidelines for installation of DC Distribution Board

Ans: The DCDB shall be installed at an accessible location near inverter. The DCDB/ACDB shall be installed at least 500 mm away from Inverter. Lugs shall be used for making connections to the DCDB/ACDB

Q:19 What are the guidelines for procurement of AC Distribution Board?

Ans: The ACDB shall be provided with MCB of rating as per the peak capacity of SRT plus 20% overload capacity. A surge protection device (SPD) shall also be provided to protect the Inverter from the surges from the AC system of installation.

Q:20 What are the guidelines for installation of AC Distribution Board?

Ans: The ACDB shall be installed at an accessible location near inverter. The DCDB/ACDB shall be installed at least 500 mm away from Inverter. Lugs shall be used for making connections to the DCDB/ACDB

Q;21 What are the guidelines for procurement of DC Wire?

Ans: DC Wires conduct solar electricity from the string to junction box, DCDB and Inverter. These are special wires and shall be UV protected because these are exposed to solar radiation. The sizes of cables between array interconnections, array to junction boxes, junction boxes to DCDB and to Inverter etc. shall be so selected to keep the voltage drop less than 2% (DC Cable losses). Common practice is to use 4 sq. mm DC wire from solar array upto junction box/DCDB, provided voltage drop does not exceed 2%.

Q:22 What are the guidelines for installation of DC Wire?

Ans: The DC wire shall be connected to modules and other equipment through MC4 connectors only.

Q:23 What are the guidelines for procurement of AC Wire?

Ans: AC wires conduct solar electricity from the Inverter to ACDB and then to the Main AC Distribution Board of installation. Sizes of cables shall be so selected to keep the voltage drop less than 2% (AC Cable losses). The color coding of AC wires for single phase shall be 'Red' for Phase, 'Black' for Neutral and 'Green' for Earth and for three phase supply it shall be 'Red', 'Yellow' and 'Blue' for phases, 'Black' for neutral and 'Green' for Earthing.

Q:24 What are the guidelines for installation of AC Wire?

Ans: The AC wire shall be connected to ACDBs through standard copper lugs only.

Q:25 What are the guidelines for procurement and installation' of Earth Pit Material:



Ans: Please refer to above picture. The earthing material comprises of three Earthing Electrodes, Chemical Earthing Bag, Three Earth Pit Covers and three Copper Lugs. Please note that each Earth Electrode should have connection pad with holes to facilitate interconnection between the electrode to copper lug. The flat connection pad provides sufficient contact area for interconnection between the lug and the electrode. The lugs shall be crimped with a standard crimping tool and not to be hammered for fixing the cable.

Q:26 What are the formalities post final inspection of SRT Plant ?

Ans: The consumer shall approach his sub divisional office with following documents for net metering agreement:

- i. Copy of Joint Inspection Report/ Project Completion Report
- ii. Application for Solar Power Connectivity titled "*Model Application Form for installation of Renewable Energy System under Net Metering*" as per Annexure-1 to JERCJKL (*Grid Interactive Renewable Energy system and its related matters*) Regulations, 2023
- iii. Net Metering Interconnection Agreement to be executed on non-judicial stamp paper of Rs. 50/- as per Annexure-3 to above regulations.
- iv. Interconnection Charges through Government Receipt (GR) of Rs. 500/-
- v. After receiving above documents, the SDO shall send request to IT&C Division for configuration of smart meter as Net Meter (For Smart Metered Consumers)
- vi. For Non Smart Metered consumers, the SDO may request IT&C Division to provide pre-configured Smart Net Meter, free of cost, to be used in stand alone mode for the SRT.
- vii. Alternatively for Non Smart Metered consumers, the installer can also provide conventional Net Meter to consumer who will further submit the same to SDO alongwith above documents and SDO shall install the meter and meter change shall be uploaded in the system. Meter Reader shall note down Import/Export/Net Reads from the meter and billing shall be done on Net Reading only (Manual Bill Calculation Sheet available on KPDCL website to be used for billing of Non Smart Metered Consumers).

Q:27 In case consumer installs his own SRT without availing any subsidy, what procedure is to be followed for connectivity to the distribution system.

Ans: For connectivity of SRTs upto 10kW, installed by consumers themselves without availing any subsidy from government, the procedure for connectivity shall remain same, as explained under answer to question no. 26 above, except that no Joint Inspection Report/ Project Completion Report shall be required to be submitted by the consumer. The consumer shall produce the project completion certificate by his Installer, duly signed by consumer as well. The certificate shall include the GSTN No. and Registration No. of the installer as well. The inspection by KPDCL shall be limited to safety inspection only like; inspection of Earthings and Anti-islanding feature of Inverter etc.

The procedure for SRTs of capacity above 10kW shall be issued separately.

Q:28 Since two sources of supply will be available at the consumer installation; one from grid and other from SRT, are there any precautions to be followed during repair or maintenance of consumer inner wiring?

WARNING

DUAL POWER SOURCE SECOND SOURCE IS A PV SYSTEM

Ans: Yes both the supplies are to be switched off while conducting any repair or maintenance work, as such above warning board / sticker may be displayed at some conspicuous location within the consumer installation.

Q:29 What are the safety guidelines for SRT sites?

Ans: The installers are solely responsible for any accident at site. Since works are to be carried out at heights exceeding 8 feet, following safety guidelines shall be followed:

(i) The workers have to work on the slanting roofs, so they are vulnerable to fall. As such they shall use safety helmets and safety belts while working on the roof.

(ii) The workers and supervisors on ground are also vulnerable to head injury due to falling objects like: PV modules, MMS members, Bolts, Nuts, Tools etc. They shall also wear helmets while working on ground.

(iii) The helmets shall bear ISI marks, shall have chin strap and the workers shall tie the chin strap while at work site.

(iv) The inspectors of KPDCL shall also wear safety helmet while conducting inspection. This is not only necessary for their own safety but this shall also convey a message to the installers regarding seriousness of KPDCL about safety standards.

(v) In case an inspector of KPDCL or any officer of KPDCL detects violation to safety standards, he shall report the matter to the Executive Engineer of the Division under whose jurisdiction installation falls and the Executive Engineer shall impose a fine of Rs. 500/- for first violation reported. For second violation the fine imposed shall be Rs. 700/- and for each subsequent violation Rs. 200/- each shall be enhanced. A warning letter shall also be issued for each violation.

Q:30 Since works related to SRT installation are hazardous in nature and workers are vulnerable to accidents, is it necessary for the installer to provide insurance cover to his workers?

Ans: Yes, it is mandatory for every Installer to provide insurance cover to his workers. The Installer shall be required to provide documentary evidence of the same to KPDCL inspectors at each level of inspection.

Q:31 Which types of Insurance Scheme are available to the workers of Installers:

1. As mentioned above, it is mandatory for the installer to provide insurance cover to his workers. He may go for group insurance or any other suitable insurance for his workers with any registered insurance company.

2. In addition to above he shall also encourage his workers to enroll themselves under Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) which offers one year term life cover of Rs. 2/- Lakh to all the subscribers in the age group of 18-50 years. It covers death due to any reason. Premium payable is Rs. 436/- per annum per subscriber, to be auto debited from the subscriber's bank/post office account.

3. He shall also encourage workers to enrol themselves under Pradhan Mantri Suraksha Bima Yojana (PMSBY) which is available for age groups 18 years to 70 years and for those who hold a bank account. The yearly premium, excluding service tax, is Rs. 20/-, automatically deducted from the scheme holder's bank account. In case of total incapacitation or accident-related death, the nominee receives Rs. 2/- lakh.

4. The workers also qualify for various insurance and welfare schemes available from J&K Building and other Construction Workers Welfare Board. It is available for Age group of 18-60 on production of 90 days employment certificate from the empanelled Installer. The online registration fee for the same is Rs. 120/- and insurance cover is Rs. 2/- lac in case of death and Rs. 75000/- in case of disability. It also includes coverage of medical claims in case of life consuming diseases, educational assistance for children, assistance for marriage of children etc.

Disclaimer: This FAQ has been prepared for the guidance of Installers and Inspectors involved in installation and inspection of Solar Roof Top Plants under PMSGMBY within the jurisdiction of KPDCL. It shall be especially fruitful for those installers who are empanelled for solar roof top installation for the first time. Please note that the FAQ shall not be treated as approved guideline or any specification of either MNRE or of KPDCL. For detailed specifications for procurement of materials and for installation at site, please refer to the MNRE guidelines, EoI/Formats issued by KPDCL, material specifications as per BIS/IEC and Safety Regulations of CEA. The purpose of this FAQ is to educate the Installers / Inspectors about various policies, regulations, working of various components of solar roof top, general field practices being followed and to encourage them to refer to these approved guidelines, regulations and specification only.