J&K STATE ELECTRICITY REGULATORY COMMISSION
(GRID INTERACTIVE ROOFTOP SOLAR PHOTO VOLTAIC SYSTEMS BASED ON NET METERING) REGULATIONS, 2015

Notification No.: 47-JKSERC of 2015

Dated: 15.10.2015

In exercise of powers conferred under Section 138 read with Sections 55, 60 and 71(1) (e) of the J&K Electricity Act, 2010 (Act XIII of 2010) and all other powers enabling it in this behalf, the Jammu & Kashmir State Electricity Regulatory Commission hereby makes the following Regulations for Grid Connected Rooftop Solar Photo Voltaic (SPV) Systems based on Net Metering.

1. Short title & commencement:

1.1 These Regulations may be called the Jammu & Kashmir State Electricity Regulatory Commission (Grid Interactive Rooftop Solar Photo Voltaic Systems based on Net Metering) Regulations, 2015, in short, JKSERC Net Metering Regulations, 2015.

1.2 These Regulations shall come into force from the date of publication of the same in the Government Gazette.

2. Definitions & Interpretation:

2.1 In these Regulations, unless the context otherwise requires:-

(a) "Act" means the Jammu and Kashmir Electricity Act, 2010 (Act XIII of 2010), as amended from time to time;

(b) "Agreement" means an agreement signed by the distribution licensee with the eligible consumer for net metering arrangement;

(c) "Billing Cycle" or "Billing Period" means the period for which regular electricity bills as specified by the Commission are issued by the distribution licensee to different categories of consumers;

(d) "Commission" means the Jammu & Kashmir State Electricity Regulatory Commission;

(e) "Connected Load" means the sum of the rated capacities in KW/HP of all energy consuming including portable apparatus duly wired and connected to the power supply system in the consumer's premises. However, this shall not include the load of extension plug sockets, stand-by or spare energy consuming apparatus, installed through change over switch, which cannot be operated simultaneously and any other load exclusively meant for firefighting purposes. In case of domestic consumers, load of geysers plus heaters or of air conditioners without heaters, whichever is higher, is to be considered. Any equipment which is under installation and not connected electrically, equipment stored in warehouse/showrooms either as spare or for sale is not to be considered as part of the connected load.

(f) "Consumer" means any person who is supplied with electricity for his own use by a licensee or the

Government or by any other person engaged in the business of supplying electricity to the public under the Act or any other law for the time being in force and includes any person whose premises are for the time being connected for the purpose of receiving electricity with the works of distribution licensee, the Government or such other person, as the case may be;

(g) "Contract Demand" or "Contracted Load" means the maximum demand (in kW, kVA or BHP units) contracted by the consumer in Agreement with the Licensee. The contract demand cannot be reduced to less than 60% of the sanctioned/connected load.

(h) "Distribution Licensee" or "Licensee" means a person granted a licence under section 14 of the Act and authorized to operate and maintain a distribution system for supplying electricity to the consumers in his area of supply and includes J&K Power Development Department;

(i) "Eligible Consumer" means a consumer of electricity in the area of supply of distribution licensee, who uses a rooftop SPV system installed in his premises to offset part or all of the consumer's own electrical requirements, given that such systems can be 'self owned' or 'third party owned';

(j) "Financial Year" or "Year" means period beginning from first day of April and ending with thirty first day of March of next year;

(k) "Interconnection Point" means the interface of rooftop solar power generation facility under net metering

arrangements with the network of distribution licensee and shall normally be the point where net meter is installed;

(l) "Invoice" means the monthly bill or a supplementary bill or a monthly invoice or a supplementary invoice raised by the distribution licensee to the consumer;

(m) "kWp" means kilo Watt peak;

(n) "Net Metering" means an arrangement under which rooftop SPV system installed at eligible consumer premises delivers surplus electricity, if any, through net meter to distribution licensee for offsetting the electricity supplied by distribution licensee during the applicable or subsequent billing period but within settlement period;

(o) "Obligated Entity" means the entity mandated by the Commission under clause (e) of sub section (1) of section 71 of the Act to fulfill the renewable purchase obligation and identified under JKSERC (Renewable Purchase Obligation, its compliance and REC Framework Implementation) Regulations, 2011, as amended from time to time;

(p) "Premises" means roof tops or/and elevated areas on the land, building or infrastructure or part or combination thereof in respect of which a separate meter or metering arrangement have been made by the distribution licensee for the supply of electricity;

(q) "Renewable Energy Certificate" (REC) means the certificate issued in accordance with the procedures prescribed in Central Electricity Regulatory

Commission(Terms and Conditions for recognition & issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 as amended from time to time;

(r) "Rooftop Solar System" means the Solar Photo Voltaic system installed in the premises of the consumer that uses solar energy for direct conversion into electricity through photo voltaic technology;

(s) "Sanctioned Load" means the load in kW, kVA or BHP, which the Licensee has agreed to supply from time to time subject to the governing terms and conditions. The total Connected Load is required to be sanctioned by the competent authority;

(t) "Settlement Period" means the period beginning from first day of April of a year and ending with thirty first day of March of next year;

(u) "Solar Meter" means a unidirectional energy meter installed as an integral part of the net metering system at the point at which electricity generated by Solar Photo Voltaic (SPV) system, is delivered to the main panel of eligible consumer;

(v) "State Agency" means the agency as designated by the Commission under regulation 9 of the JKSERC (Renewable Power Purchase Obligation, its compliance and REC framework Implementation) Regulations, 2011.

(w) "Supply Code" means the Jammu & Kashmir State Electricity Regulatory Supply Code, 2011, as amended from time to time;

(x) "Tariff Order" in respect of a licensee means the Order issued by the Commission for the relevant year for that licensee indicating the rates to be charged by the licensee from various categories of consumers for supply of electrical energy and for other services;

(y) "Third party owner" means a developer who is generating solar energy on a rooftop but does not own the roof top, and who also enters into a lease/commercial agreement with the roof top owner.

2.2 (a) All other words and expressions used in these Regulations although not specifically defined herein above, but defined in the Act, shall have the meaning assigned to them in the Act.

(b) All other words and expressions used herein but not specifically defined in these Regulations or in the Act but defined under any other law passed by the State Legislature or Regulations framed under the Act, shall have the meaning assigned to them in such Law/Regulations.

2.3 Abbreviations used in these Regulations shall have the meanings as stated in (***Annexure – I).***

3. Scope and Application:

3.1 These Regulations shall apply to distribution licensee and consumers of such distribution licensee in the State of Jammu & Kashmir.

3.2 Any consumer in the area of supply of distribution licensee may install rooftop solar system under net metering arrangement which:

a) Shall be of minimum 1 kWp & upto 1 MWp (AC side) capacity with or without battery backup support.

b) Shall be located in the consumer premises.

c) Shall interconnect and operate safely in parallel with the distribution licensee's network.

3.3 These Regulations do not preclude the right of any person to undertake rooftop solar projects above 1 MWp capacity through alternative mechanism.

3.4 The net metering facility shall also be applicable to such consumers who have installed rooftop solar system before commencement of these Regulations subject to compliance of these Regulations.

4. General Conditions:

The distribution licensee shall offer the provision of net metering arrangement to the eligible consumer, who intends to install grid connected rooftop solar system, in its area of supply on non-discriminatory and first come first serve basis subject to target capacity:

Provided, the consumer is eligible to install the grid connected rooftop solar system of the rated capacity as specified in these Regulations:

Provided further that the distribution licensee shall offer the provision of net metering to the consumer for the target capacity as specified in these Regulations:

Provided also that the interconnection of such system with the grid is undertaken as specified in CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013, as amended from time to time:

Provided also that the distribution licensee shall accept the SPV power as per the useful life of the SPV system as per CERC Regulations.

5. Capacity Target for Distribution Licensee:

5.1 The distribution licensee shall provide net metering arrangement to eligible consumers as long as the total capacity (in MW) of rooftop solar systems does not exceed the target capacity determined by the Commission:

Provided that initially, a maximum cumulative capacity to be installed by eligible consumers under net metering in the area of supply of each distribution licensee shall be as decided by the Commission. Thereafter, the target capacity shall be reviewed on yearly basis by the Commission:

Provided further the cumulative capacity of rooftop solar system to be allowed to a particular distribution transformer shall not exceed 20% of the rated capacity of the distribution transformer.

5.2 The distribution licensee shall provide information regarding distribution transformer level capacity available for connecting rooftop solar system under net metering arrangement within six (6) months from the date of notification of these regulations. The distribution licensee thereafter shall update the distribution transformer level capacity available and the cumulative capacity of the rooftop solar systems installed under net metering arrangement on yearly basis by 30th April and shall provide the information on its website as well as to the Commission.

6. Eligible consumer and individual project capacity:

6.1 All eligible consumers of electricity in the area of the supply of distribution licensee can participate in the solar rooftop net metering arrangement subject to target capacity.

6.2 The maximum capacity of rooftop solar system shall not exceed 50% of the sanctioned load of the consumer (for kVA conversion to kW use a power factor of 0.9):

Provided that the installed capacity shall not be less than 1 kWp and shall not exceed 1MWp (AC side) for a single eligible consumer:

Provided further that a variation in the rated capacity of the system within a range of five percent shall be allowed.

7. Procedures for application and registration:

7.1 The Eligible Consumer who proposes to install a solar energy system in his premises shall apply in the application form ***(Annexure – II),*** which the distribution licensee shall notify on its website as downloadable as well as make available at the relevant sub divisional office of the distribution licensee along with the application/processing fee of Rs.100/kW subject to a maximum of Rs. 10,000.

7.2 The licensee shall acknowledge the receipt of the application form and register the application and shall process the application in the order of the receipt.

7.3 Within fifteen (15) working days of receipt of the Eligible Consumer's application, the distribution licensee shall provide written notice that it has received all documents required by the standard interconnection agreement or indicate how the application is deficient.

7.4 The Distribution Licensee shall assess the feasibility and intimate the same to the Eligible Consumer within thirty (30) days from the receipt of completed application. The feasibility shall be valid for a period of six months, unless extended by the Distribution Licensee.

Provided that if the Distribution Licensee determines that an interconnection study is necessary as per sub regulation 7.5, the Distribution Licensee shall intimate feasibility or otherwise within sixty (60) days from the receipt of completed application.

7.5 While intimating the feasibility for the connection of Rooftop PV Solar Power Plant as specified in sub-regulation 7.4, the Distribution Licensee shall also intimate the Eligible Consumer:

(a) The details of documents to be submitted by the Eligible Consumer.

(b) Particulars of any deficiencies, if noticed, along with instructions to remove such defects.

(c) Details of any interconnection study required.

7.6 The Distribution Licensee shall, on receipt of the report on removing defects, if any and the documents submitted under sub regulation 7.5, convey the approval within ten(10) working days from the date of receipt.

Provided that if the deficiency as per sub regulation 7.5 is not removed by the Eligible Consumer within sixty (60) days from the date of receipt of such intimation to the Eligible Consumer, the application shall stand cancelled and the application/processing fee shall be forfeited.

7.7 The interconnection agreement ***(Annexure-III)*** shall be executed by the distribution licensee with the eligible

consumer within thirty (30) days of the accord of approval under regulation 7.6.

8. Interconnection with the Grid, Standards & Safety:

8.1 The interconnection of the Rooftop PV Solar Power Plant with the network of the distribution licensee shall be made as per the technical specifications and standards for connectivity provided in the Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013, as amended from time to time.

8.2 The connectivity levels at which the Rooftop PV Solar Power Plants shall be connected with the grid are as specified below:

S.No.	Connected load of Eligible Consumer	Connectivity level
1	Upto 5 kW	240 V- single phase
2	Above 5 kW and upto100 kW	415 V-Three phase
3	Above 100 kW	HT/EHT level

8.3 The above connectivity norms are applicable to all the solar power generators who seek connectivity with network of the distribution licensees. EHT/HT consumers may install solar power generators at LT/HT voltage and connect them to their LT/HT system.

8.4 In the interconnection of roof top PV solar energy generator with the local distribution licensee's grid, the relevant provisions of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010 as amended from time to time shall apply.

8.5 The solar energy generator shall be responsible for safe operation, maintenance and rectification of defect of its

system up to the interconnection point beyond which the responsibility of safe operation, maintenance and rectification of any defect in the system including the net meter shall rest with the distribution licensee.

8.6 The consumer shall be solely responsible for any accident to human being/animals, whatsoever, (fatal/nonfatal) that may occur due to back feeding from the Solar Plant when the grid supply is off. The distribution licensee reserves the right to disconnect the consumer's installation at any time in the event of such exigencies to prevent accident or damage to man and material.

8.7 The tests as per distribution licensee's standards shall be done to ensure the quality of power generated from the Solar PV systems.

8.8 Any alternate source of supply shall be restricted to the consumer's network and the consumer shall be responsible to take adequate safety measures to prevent battery power/diesel generator power/ backup power extending to distribution licensee's LT grid on failure of distribution licensee's grid supply.

8.9 The distribution licensee shall have the right to disconnect the roof top PV solar energy generator from its system at any time in the following conditions:

i. Emergencies or maintenance requirement on the distribution licensee's electric system;

ii. Hazardous condition existing on the distribution licensee's system due to operation of solar energy generator or protective equipment as determined by the Distribution Licensee/Transmission Licensee/SLDC.

iii. Adverse electrical effects, such as power quality problems, on the electrical equipment of the other consumers of the distribution licensee caused by the solar energy generation as determined by the distribution licensee.

8.10 Subject to sub regulation 8.5 above, the distribution licensee may call upon the roof top PV solar energy generator to rectify the defect within a reasonable time.

8.11 The Rooftop PV Solar Power Plant should be capable of detecting an unintended islanding condition. These systems must have anti-islanding protection to prevent any unfavorable conditions including failure of supply. IEC-62116 shall be followed to test islanding prevention measure for grid connected photovoltaic inverters.

8.12 Every Rooftop PV Solar Power Plant shall be equipped with automatic synchronization device:

Provided that Rooftop PV Solar Power Plant using inverter shall not be required to have separate synchronizing device, if the same is inherently built into the inverter.

8.13 The Rooftop PV Solar Power Plant operating in parallel with electricity system shall be equipped with the following protective functions to sense abnormal conditions on electricity system and cause the Rooftop PV Solar Power Plant to be automatically disconnected from the electricity system or to prevent the Rooftop PV Solar Power Plant from being connected to electricity system inappropriately:

i. Over and under voltage trip functions if voltage reaches above 110% or below 80% respectively with a clearing time upto two seconds; however, appropriate licensee may prescribe a narrower range of voltage for the purpose.

ii. Over and under frequency trip functions, if frequency reaches 50.5 Hz or below 47.5 Hz with a clearing time upto 0.2 seconds; however, appropriate licensee may prescribe a narrower range of frequency for the purpose.

iii. The Rooftop PV Solar Power Plant shall cease to energize the circuit to which it is connected in case of any fault in this circuit.

iv. A voltage and frequency sensing and time delay function to prevent the Rooftop PV Solar Power Plant from energizing a de-energized circuit and to prevent the Rooftop PV Solar Power Plant from reconnecting with electricity system unless voltage and frequency is within the prescribed limits and are stable for at least sixty seconds; and

v. A function to prevent the Rooftop PV Solar Power Plant from contributing to the formation of an unintended island, and cease to energize the electricity system within two seconds of the formation of an unintended island.

8.14 The equipment of the Rooftop PV Solar Power Plant shall meet following requirements, namely:

i. Circuit Breakers or other interrupting equipment shall be suitable for their intended application with the capability of interrupting the maximum available fault current expected at their location.

ii. The Rooftop PV Solar Power Plant and associated equipment shall be designed so that the failure of any single device or component shall not potentially compromise the safety and reliability of the electricity system.

iii. Paralleling device of the Rooftop PV Solar Power Plant shall be capable of withstanding 220% of the nominal voltage at the interconnection point.

8.15 Every time the Rooftop PV Solar Power Plant of the Eligible Consumer is synchronized to the electricity system, it shall not cause voltage fluctuation greater than ±5% at the point of inter connection.

8.16 After considering the maintenance and safety procedures, the distribution licensee may require a Rooftop PV Solar Power Plant to provide a manually operated isolating switch between the Rooftop PV Solar Power Plant and the electricity system, which shall meet following requirements:

i. Allow visible verification that separation has been accomplished;

ii. Include indications to clearly show open and closed positions;

iii. Be capable of being reached quickly and conveniently twenty four hours a day by licensee's personnel without requiring clearance from the applicant;

iv. Be capable of being locked in the open position;

v. May not be rated for load break nor may have feature of over-current protection; and

vi. Be located at a height of at least 2.44 m above the ground level.

8.17 Prior to synchronization of the Rooftop PV Solar Power Plant for the first time with electricity system, the applicant and the appropriate licensee shall agree on the protection features and control diagrams.

8.18 The power conditioning unit shall have the features of filtering out harmonics and other distortions before injecting the energy into the system of the distribution utility. The

technical standards, power quality standards and inverter standards shall be as per (***Annexure–IV)*** of these Regulations or any other standards as may be specified by CEA from time to time.

9. Third Party Owned Rooftop Solar PV system based on Net Metering:

9.1 The third party owned rooftop solar PV net metering model may consist of the developer or intermediaries leasing out solar PV system to interested rooftop owners. The owner of the premises provides the rooftop and engages a turnkey installer to design and install the system. The installers may also offer integrated service of leasing, commissioning and maintenance of Solar PV system to owners and guaranteeing standards of performance.

9.2 In the third party owned solar PV system based on net metering, the electricity generated from such plants/system shall be used to meet the eligible consumer's internal electricity needs, while the excess generation shall be fed into the Grid (network of licensee) on Net Metering basis.

9.3 The developer shall continue to be the owner of equipment in third party owned system, to qualify for claiming depreciation on capital cost for the solar PV system with associated direct tax benefits, if any.

9.4 For all intents and purposes, the distribution licensee shall deal with the consumer only and arrangement between rooftop owner and developer shall be personal to them.

10. Metering Arrangement:

10.1 The metering system shall be as per the Regulations for installation & operation of meters for rooftop solar systems

under net-metering arrangement specified in these regulations.

10.2 The schematic arrangement for interconnection of Rooftop & Small PV Solar Power Plant with the Distribution Licensee's grid is shown at **(Annexure–V).** There shall be two meters. The metering arrangement shall be as per **(Annexure–VI).**

10.3 The bi-directional (net meter) shall be installed at the interconnection point of the Eligible Consumer with the network of the distribution licensee:

Provided that for the existing consumers, the consumer meter shall be replaced with the bi-directional/ net meter:

Provided further that consumers having ABT compliant meters shall not be required to install additional net meter.

10.4 Solar meter shall be installed at the solar facility after the inverter to measure the solar generation.

10.5 These meters shall have the facility for downloading meter readings using Meter Reading Instrument (MRI). Check meters shall be mandatory for rooftop solar systems having capacity more than 250 kW. For installations size of less than and equal to 250 kW, the solar check meters would be optional:

Provided that the cost of new/additional meter (s) shall be borne by the Eligible Consumer and installed &owned by the distribution licensee:

Provided, if bills are prepared on the basis of MRI downloads or if meter reading is taken on the basis of remote meter reading and the consumer wishes to have a record of the reading taken, he shall be allowed so by the licensee.

10.6 The meters installed shall be jointly inspected and sealed on behalf of both the parties and shall be interfered/tested or checked only in the presence of the representatives of the consumer and distribution licensee or as per the supply code specified by the Commission:

Provided that the Eligible Consumer shall follow the metering specifications and provisions for placement of meter as developed by the distribution licensee from time to time and as per the supply code:

Provided further that in case the Eligible Consumer is under the ambit of time of day (TOD) tariff, meters compliant of recording time of day consumption/generation shall be employed.

10.7 The meter readings taken by the distribution licensee shall form the basis of commercial settlement.

10.8 The technical standards for meters shall be as per ***(Annexure– VII)*** and shall comply with the standards specified by CEA from time to time.

10.9 The meters installed for Rooftop PV Solar Power Plants with capacity above 250 kWp shall have the communication port for exchanging real time information with Distribution Licensee.

11. Energy Accounting and Settlement:

11.1 The accounting of the electricity generated, consumed and injected by the rooftop solar system under these regulations shall become effective from the date of connectivity of such system with the network of distribution licensee.

11.2 The procedure for billing and energy accounting shall be as under:-

a) For each billing cycle the consumer shall receive an energy account statement showing quantum of electricity injected by the eligible consumer in the billing period, electricity supplied by the distribution licensee in the billing period, net billed electricity for payment by the consumer for that billing cycle and net carried over electricity to the next billing period separately.

b) In case the electricity injected exceeds the electricity consumed from licensee's supply system during the billing cycle such excess injected electricity shall be carried forward to the next billing cycle as electricity banked and may be utilized in the next billing cycle(s) within the settlement period. In such a case, the distribution licensee shall issue an invoice containing all these details.

c) In case the electricity supplied by the distribution licensee during any billing period exceeds the electricity injected by the eligible consumer, the distribution licensee shall raise a bill for net electricity consumption as per applicable tariff of that category after taking into account any electricity credit balance from previous billing period.

d) In case the eligible consumer is under the ambit of TOD tariff, the electricity consumption in any time block i.e. peak hours, off peak hours etc. shall be first compensated with the electricity injected in the same time block. Any excess injection over and above the

consumption in any other time block in a billing cycle shall be accounted as if the excess injection occurred during non peak hours.

e) The surplus energy measured in kWh/kVAh shall be utilized to offset the consumption measured in kWh/kVAh and may not be utilized to compensate any other fee and charges imposed by the licensee as per the orders of the Commission.

f) The Monthly Minimum Charges (MMC), if applicable, shall be leviable on total consumption of the consumer of each billing cycle and not on net consumption. A normative power factor of 0.9 shall be considered for conversion of kWh to kVAh, wherever applicable.

g) The distribution licensee shall also take the reading of solar meter for recording total solar power generated by Solar PV system of consumer.

h) The distribution licensee in addition to consumer tariff shall be eligible to raise invoice/bills for any other charges as allowed by the Commission.

i) In case of any dispute in billing, the consumer can approach the licensee, who will deal the complaint under provisions of Regulations 6.23 to 6.26 of the Supply Code. In case the consumer feels aggrieved by the licensee's disposal of the complaint, the consumer can approach Consumer Grievances Redressal Forum and Electricity, Ombudsman in accordance with JKSERC (Consumer Grievances Redressal Forum, Ombudsman and Consumer Advocacy) Regulations, 2012, as amended from time to time.

11.3 The electricity generated from a rooftop solar system shall not exceed 90% of the electricity consumption by the consumer in a settlement period. The excess energy generated in a billing cycle shall be allowed to be carried forward to the next billing cycle upto the end of the settlement period:

Provided that in the event of electricity generated exceeds 90% of the electricity consumed at the end of the settlement period no payment shall be made by the distribution licensee and shall not be carried forward to next settlement period and the same shall be treated as inadvertent injection:

Provided also that at the beginning of each settlement period, cumulative carried over solar electricity injected shall be reset to zero.

11.4 All the rules & regulations applicable to the consumers of the distribution licensee for the applicable category shall also be applicable to the eligible consumer who uses the rooftop solar system.

12. Applicability of other charges:

The rooftop solar system under net metering arrangement whether self-owned or third party owned, installed on the premises of eligible consumer, shall be exempted from various provisions of JKSERC(Terms & Conditions for Intra State Open Access) Regulations, 2015, as amended from time to time:

Provided that the Commission may review such exemption from time to time.

13. Eligibility to Participate under Renewable Energy Certificate (REC) Mechanism:

The eligibility for issuance of renewable energy certificate shall be as per the eligibility criteria specified under Central Electricity Regulatory Commission (Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010, as amended from time to time.

14. Renewable Purchase Obligation (RPO):

The quantum of electricity consumed by eligible consumer, who is not defined as obligated entity, from the rooftop solar system under net metering arrangement shall qualify towards compliance of Renewable Purchase Obligation (RPO) for the distribution licensee.

15. Penalty:

In case of failure to meet the requirements under these regulations for net metering, the solar power generator shall be liable to pay penalty as decided by the Commission from time to time.

16. Termination of agreement:

16.1 The eligible consumer may terminate the agreement at any time by giving 30 days prior written notice to the licensee.

16.2 If an eligible consumer breaches any term of the agreement and does not remedy the breach within 30 days of receipt of written notice from the distribution licensee of the breach or any other valid reason to be recorded in writing, the distribution licensee may terminate the agreement without any further notice.

16.3 Eligible consumer, upon termination of the agreement, shall disconnect forthwith the photovoltaic system from licensee's distribution system.

17. Power to give directions:

The Commission may from time to time issue such directions and orders as considered appropriate for implementation of these Regulations.

18. Removal of difficulties:

If any difficulty arises in giving effect to the provisions of these Regulations, the Commission may, by an order, make such provision, not being inconsistent with the Act and these Regulations, which appears to the Commission to be necessary for removal of the difficulties.

19. Power to relax:

The Commission may by general or special order, for reasons to be recorded in writing and after giving an opportunity of hearing to the parties likely to be affected, may relax any of the provisions of these Regulations on its own or on an application made before it by an interested person.

20. Power to amend:

The Commission may from time to time add, vary, alter, suspend, modify, amend or repeal any provisions of these Regulations.

By Order of the Commission

Secretary
J&K State Electricity Regulatory Commission,
Srinagar

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LIST OF ABBREVIATIONS

AC	Alternating Current
AT&C	Aggregate Technical and Commercial
BHP	Brake Horse Power
BIS	Bureau of Indian Standards
CB	Circuit Breaker
CEA	Central Electricity Authority
CT	Current Transformer
DC	Direct Current
EHT	Extra High Tension
EHV	Extra High Voltage
FOR	Forum of Regulators
GBI	Generation Based Incentive
GIS	Geographic Information System
GOI	Government of India
GOJK	Government of Jammu & Kashmir
GPS	Geographic Positioning System
GSM	Global System for Mobile Communications
GSS	Grid Substation
HT	High Tension
IEC	International Electro-technical Commission
IEEE	Institution of Electrical and Electronics Engineers
JKSERC	J&K State Electricity Regulatory Commission
kV	Kilo Volt
kVA	kilo Volt Ampere
kW	Kilo Watt
kWh	Kilo-Watt Hour
LT	Low Tension
MNRE	Ministry of New and Renewable Energy
MPLS	Multiprotocol Label Switching
MVA	Mega Volt-Ampere
NM	Net-Meter
O&M	Operation and Maintenance
PCU	Power Conditioning Unit
PT/VT	Potential/ Voltage Transformer
RE	Renewable Energy
REC	Renewable Energy Certificate
RPO	Renewable Purchase Obligation
SLDC	State Load Despatch Centre
SM	Solar Meter
SPV	Solar Photo Voltaic
TVM	Tri-Vector Meter

References of the Standards

Standard	*Reference*
IS 13779-1999	Standards for single or polyphase electrostatic watt hour meters
IS 14697	Standards for static transformer operated watt hour meters and VAR hour meters
IEEE 61000	Equipment standards to control/curtail flicker
IEEE 519	Standards for limitation for Total Harmonic Distortion
IEC 61215	Standards for Crystalline Silicon terrestrial photovoltaic (PV) modules- Design qualification and type approval
IEC 61646	Standards for thin film terrestrial photovoltaic (PV) modules-Design qualification and type approval
IEC 61730	Standard for Photovoltaic (PV) module safety qualification-Part1: Requirement for construction Part 2: Requirements for testing
IEC 61701	Standards for Salt mist corrosion testing for modules used in coastal corrosive atmosphere
IEC 60068-2(1,2,14,30)	Standards for power conditioning unit/inverters for efficiency measurement and environment tests
IEC 60502	Standards for power cables with extruded insulation and their accessories for rated voltages from 1 kV(U_m=1.2 kV) upto 30 Kv(U_m=36 kV)
IEC 60227	Standards for polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V
IEC 62116	Standards for utility-inter connected photovoltaic inverters-Test procedures of islanding prevention measures.

Format for Application for Solar Power Connectivity

To:

The Sub-divisional Officer/ Designated Officer
Distribution Licensee

[Name of office]
Date: [date]

I / we herewith apply for a solar energy net-metering connection at the service connection and for the solar PV plant of which details are given below.

1	Name of applicant	
2	Address of applicant	
3	Service connection number/Consumer ID	
4	a) Sanctioned load b) Contracted load/demand	
5	Service connection tariff	
6	Telephone number(s)	
7	Email ID	
8	Solar PV plant capacity (kilo Watts)	
9	Solar grid inverter make and type	
10	Solar grid inverter has automatic isolation protection (Y/N)?	
11	Has a Solar Generation Meter been installed (Y/N)?	
12	Expected date of commissioning of solar PV system.	
13	Details of test certificates of Solar PV plant/inverter for standards required under the Regulations	

Name:

Signature

Net-metering Application Acknowledgement

Received an application for a solar energy net-metering connection from,

Name:

Date:

Service Connection number/Consumer ID:

Application registration no.:

Solar Plant Capacity:

Name of Officer:

Signature:

Designation/ (Name of Discom)

Net Metering inter connection agreement

This Agreement is made and entered into at (location)____ on this (date) _____ day of (month)_____ year _____ between

The Eligible Consumer, by the name of ---------- having premises at (address) _____ _____ as first party

AND

Distribution Licensee (herein after called as Licensee) and represented by ----------(designation of office) and having its registered office at (address)_____ as second party of the agreement

And whereas, the Licensee agrees to provide grid connectivity to the Eligible Consumer for injection of the electricity generated from his SPV plant of capacity ___ kilowatts into the power system of Licensee and as per conditions of this agreement and JKSERC (Grid Interactive Rooftop Solar Photo Voltaic Systems based on Net Metering) Regulations, 2015, issued by the Jammu & Kashmir State Electricity Regulatory Commission.

Both the parties hereby agree to as follows:

1. Eligibility

1.1 Eligibility for net-metering has been specified in the relevant regulations of the Jammu & Kashmir State Electricity Regulatory Commission. Eligible Consumer has to meet the standards and conditions for being integrated into grid/distribution system.

2. Technical and Interconnection Requirements

2.1 The Eligible Consumer agrees that his solar generation plant and net metering system will conform to the standards and requirements specified in JKSERC (Grid Interactive Rooftop Solar Photo Voltaic Systems based on Net Metering) Regulations, 2015and in the following Regulations and codes as amended from time to time.

i. CEA's (Technical Standards for connectivity of the Distributed Generating Resources) Regulations, 2013

ii. Central Electricity Authority (Installation and Operation of Meters) Regulation 2006

iii. JKSERC Electricity Regulatory Supply Code 2011.

2.2 Eligible Consumer agrees that he has installed or will install, prior to connection of Photovoltaic system to Licensee's distribution system, an isolation device (both automatic and inbuilt within inverter and external manual relays) and agrees for the Licensee to have access to and operation of this, if required and for repair & maintenance of the distribution system.

2.3 Eligible Consumer agrees that in case of a power outage on Licensee's system, photovoltaic system will disconnect/isolate automatically and his plant will not inject power into Licensee's distribution system.

2.4 All the equipment connected to distribution system shall be compliant with relevant International (IEEE/IEC) or Indian standards (BIS) and installations of electrical equipment must comply with Central Electricity Authority (Measures of Safety and Electricity Supply) Regulations, 2010.

2.5 Eligible Consumer agrees that licensee will specify the interface/interconnection point and metering point.

2.6 Eligible Consumer and licensee agree to comply with the relevant CEA& JKSERC Regulations in respect of operation and maintenance of the plant, drawing and diagrams, site responsibility schedule, harmonics, synchronization, voltage, frequency, flicker etc.

2.7 Due to Licensee's obligation to maintain a safe and reliable distribution system, Eligible Consumer agrees that if it is determined by the Licensee that Eligible Consumer's photovoltaic system either causes damage to and/or produces adverse effects affecting other consumers or Licensee's assets, Eligible Consumer will have to disconnect photovoltaic system immediately from the distribution system upon direction from the Licensee and correct the problem at his own expense prior to a reconnection.

2.8 The consumer shall be solely responsible for any accident to human being/animals whatsoever (fatal/non-fatal) that may occur due to

back feeding from the solar plant when the grid supply is off. The licensee reserves the right to disconnect the consumer's installation at any time in the event of such exigencies to prevent accident or damage to life and property.

3. Clearances and Approvals

3.1 The Eligible Consumer shall obtain all the necessary approvals and clearances (environmental and grid connection related) before connecting the photovoltaic system to the distribution system.

4. Access and Disconnection

4.1 Licensee shall have access to metering equipment and disconnecting means of the solar photovoltaic system, both automatic and manual, at all times.

4.2 In emergency or outage situation, where there is no access to the disconnecting means, both automatic and manual, such as a switch or breaker, Licensee may disconnect service to the premises of the Eligible Consumer.

5. Liabilities

5.1 Eligible Consumer and Licensee shall indemnify each other for damages or adverse effects from either party's negligence or intentional misconduct in the connection and operation of photovoltaic system or Licensee's distribution system.

5.2 Licensee and Eligible Consumer shall not be liable to each other for any loss of profits or revenues, business interruption losses, loss of contract or loss of goodwill, or for indirect, consequential, incidental or special damages, including, but not limited to, punitive or exemplary damages, whether any of the said liability, loss or damages arise in contract, or otherwise:

Provided that in case of any dispute in respect of clause 5.1 and 5.2 above, the decision of the Commission shall be final and binding on both the parties.

5.3 Licensee shall not be liable for delivery or realization by Eligible Consumer for any fiscal or other incentive provided by the

Central/State Government beyond the scope specified by the Commission in its relevant Order

5.4 The Licensee may consider the quantum of electricity generation from the rooftop solar PV system under net metering arrangement towards RPO. (Applicable only in case of Eligible Consumer who is not defined as an Obligated Entity).

5.5 The proceeds from CDM benefits shall be retained by the Licensee.

6. Commercial Settlement

6.1 All the commercial settlement under this agreement shall follow the Net Metering Regulations, 2015 issued by JKSERC.

7. Connection Costs

7.1 The Eligible Consumer shall bear all costs related to setting up of photovoltaic system including metering and interconnection costs. The Eligible Consumer agrees to pay the actual cost of modifications and upgrades to the service line required to connect photovoltaic system to the grid in case it is required.

8. Termination

8.1 The Eligible Consumer can terminate agreement at any time by providing Licensee with 30 days prior notice.

8.2 Licensee has the right to terminate Agreement on 30 days prior written notice, if Eligible Consumer commits breach of any of the term of this Agreement and does not remedy the breach within 30 days of receiving written notice from Licensee of the breach.

8.3 Eligible Consumer shall upon termination of this Agreement, disconnect the photovoltaic system from Licensee's distribution system in a timely manner and to Licensee's satisfaction.

In witness, whereof, Mr. ---------- for and on behalf of --- -------- (Eligible Consumer) and Mr. ---------- for and on behalf of---------- (Licensee) sign this agreement in two originals.

Eligible Consumer	**Distribution Licensee**
Name	Name
Address	Designation
Service connection No./ Consumer ID	Office Address

Inverter Standards

Inverter should comply with IEC 61683/IS 61683 for efficiency and Measurements and should comply with IEC 60068-2 (1, 2, 14, 30) / Equivalent BIS Standard for environmental testing.

Inverter should supervise the grid condition continuously and in the event of grid failure (or) under voltage (or) over voltage, Solar System should be disconnected by the circuit Breaker/Auto switch provided in the inverter and shall comply with requirements specified at regulation 8 of these Regulations.

Harmonics Standards

As per the standard IEEE 519, the permissible individual harmonics level shall be less than 3% (for both voltage and current harmonics) and Total Harmonics Distortion (THD) for both voltage and current harmonics of the system shall be less than 5%.

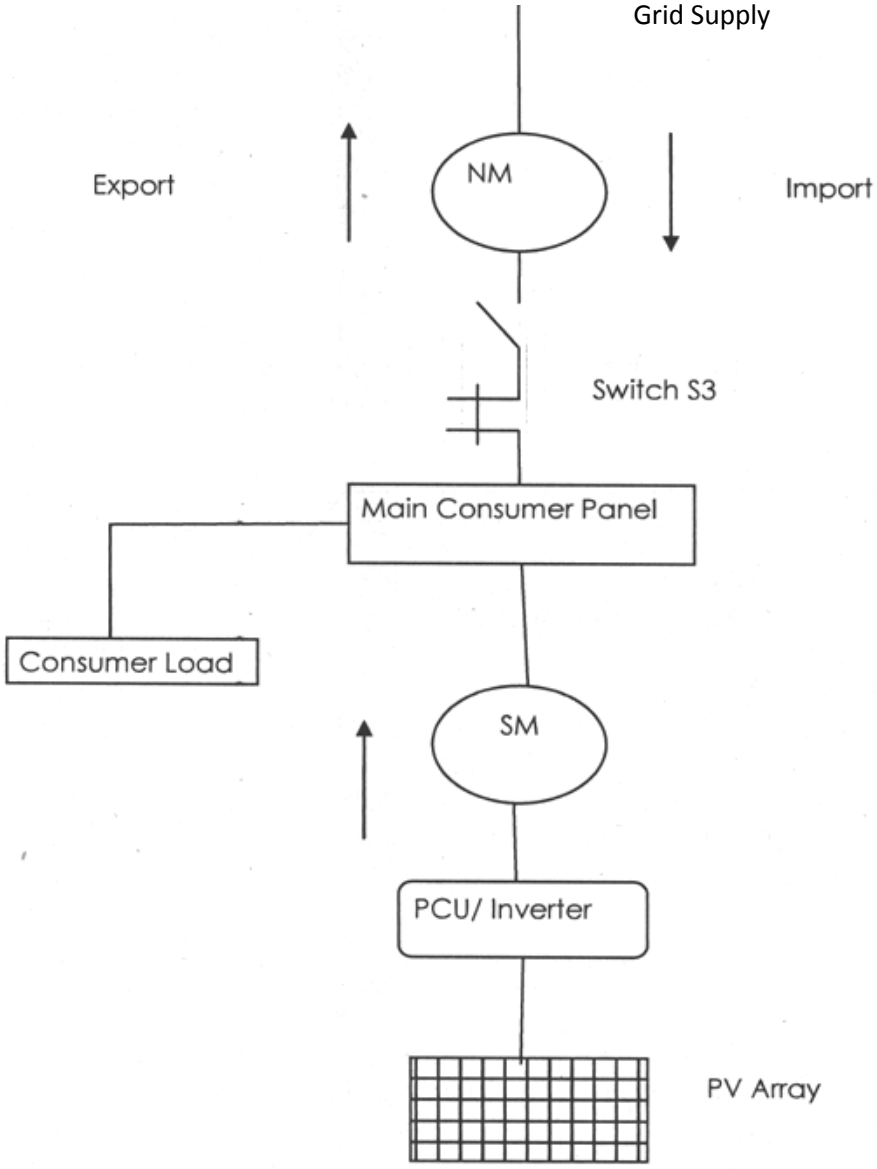
Technical and interconnection requirements Parameters

Parameter	Reference	Requirement
Overall conditions of service	State Distribution/Supply Code	Compliance with the terms and conditions of supply.
Overall Grid Standards	i) Central Electricity Authority (Grid Standard) Regulations 2010. ii) JKSERC Grid Code & iii) JKSERC (Distribution Performance Standards) Regulations, 2006.	Compliance with Grid standards as regards the frequency, voltage and protection coordination.
Meters	Central Electricity authority (Installation & Operation of Meters) Regulations, 2006 as amended from time to time	Compliance with the specifications of the meters.
Safety and supply	Central Electricity Authority(Measures of Safety and Electricity Supply) Regulations, 2010	Compliance with safety provisions for electrical installations and apparatus.
Harmonic Requirements Harmonic Current	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	The Total Harmonic Distortion (THD) for voltage at the interconnection point should not exceed 5%. For the current distortion limits, the Total Demand Distortion (TDD) in terms of ratio of available short circuit current to the demand current (I_{SC}/I_L) should remain within limits specified for various harmonics for different TDD values.
Synchronization	CEA (Technical Standards for	Photovoltaic system must be equipped with a grid frequency synchronization

	Connectivity of the Distributed Generation Resources) Regulations, 2013	device. Every time the generating station is synchronized to the electricity system, it shall not cause voltage fluctuation greater than +/- 5% at point of inter connection.
Voltage	CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	The voltage-operating window should minimize nuisance tripping and should be within operating range of 80% to 110% of the nominal connected voltage. The photovoltaic system must isolate itself from the grid within a clearing time of 2 seconds.
Flicker	CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013.	Operation of Photovoltaic system should not cause voltage flicker in excess of the limits stated in IEC 61000 standards as follows: Short-term flicker (P_{st}): The flicker severity evaluated over a short period of time (10 minutes) should be <=1. Long-term flicker (P_{lt}): The flicker severity evaluated over a long period of time (typically 2 hours) should be <=0.65.
Frequency	CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	There should be over and under frequency trip functions with a clearing time of 0.2 seconds, when the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side).
DC injection	CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013.	Photovoltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating conditions.
Power Factor	CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013.	When the output of the inverter is greater than 50%, the power output from the inverter shall have a lagging power factor of greater than 0.9.
Islanding and Disconnection	CEA (Technical Standards for Connectivity of the	The photovoltaic system must island/disconnect itself within IEC standard stipulated time in the event of

	Distributed Generation Resources) Regulations 2013	fault, voltage or frequency variations.
Overload and Overheat	CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	The inverter should have the facility to automatically switch off in case of overload or overheating and should restart when normal conditions are restored.
Paralleling Device	CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	Paralleling device of photovoltaic system shall be capable of withstanding 220% of the normal voltage at the interconnection point.

Schematic Arrangement for interconnection of Rooftop & Small PV Solar Power Plant with the Distribution Licensee's/Grid

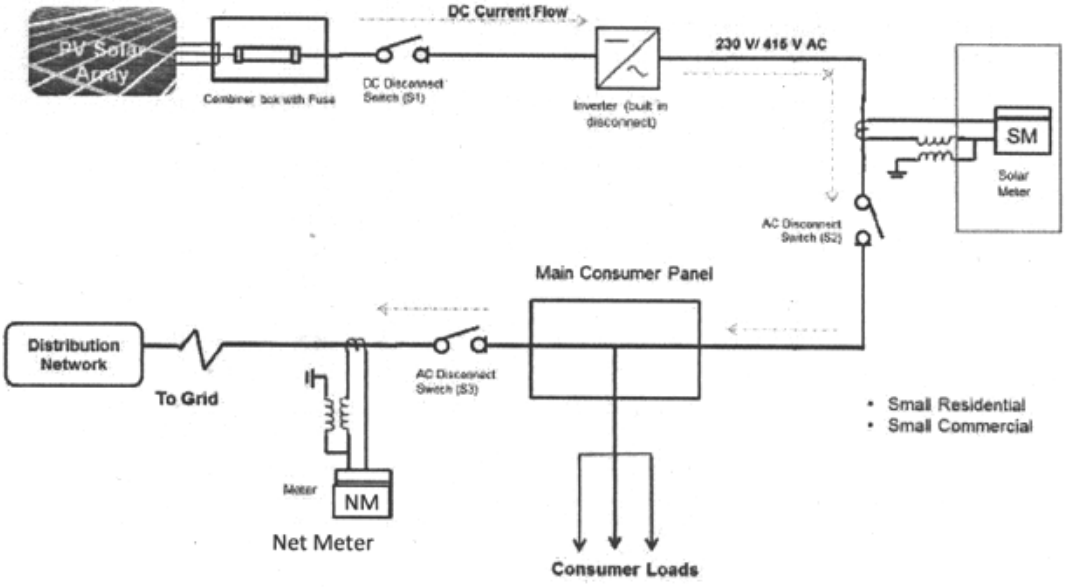


Normally, Solar Generation shall be connected with Grid. When grid fails, Inverter controlled Switch S3 Opens and on restoration of grid S3 Closes.

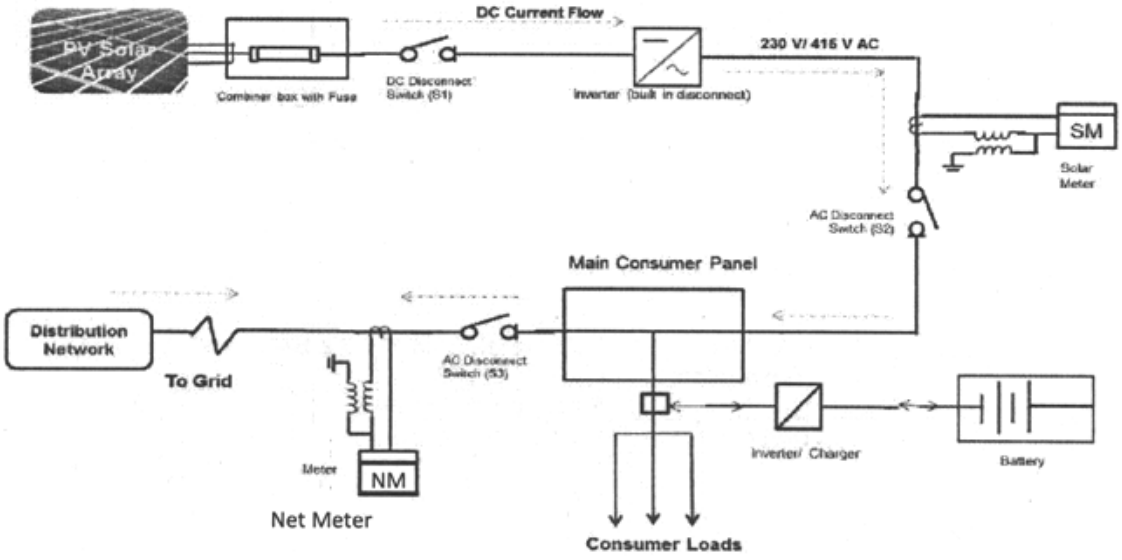
Abbreviations:
NM: Net Meter, SM: Solar Meter, PCU: Power Conditioning Unit

Net Metering configuration options

(1) Two meter configuration without storage



(2) Two meter configuration with storage



Specification for meters for net metering

(a) Meter for Solar Generation Measurements:

Solar Meter Major Technical Parameters

Sl. No.	Technical Parameters	Connectivity at 415 V & below voltage level			Connectivity at above 415 V voltage level
		Whole current meters		CT operated	CT-PT Operated
1	Applicability	Solar plant capacity upto 4 kW	Solar plant capacity above 4 kW and upto 15 kW	Solar Plant Capacity above 15 kW and upto100 kW	HT/EHV supply
2	Number of phases and wires	Single Phase, 2 Wire	Three Phase, 4 Wire	Three Phase, 4 Wire	Three Phase, 4 Wire
3	Measurand(s)	kWh	kWh	kWh, kVAh, kVA, PF	kWh, kVAh, kVA, PF, Max. demand
4	Standard Voltage and frequency	240 V,	3X240 V (P-N), 415 V (P-P) 50±5%	3X240 V (P-N), 415 V (P-P) 50±5%	3X63.5 V (P-N), 110 V (P-P) 50±5%
5	Current Rating	10-60	10-60	1 Amp	1 Amp
6	Accuracy class	1.0	1.0	0.5S	0.5S
7	Indian Standard or IEC to which conforming	IS 13779-1999	IS 13779-1999	IS 14697,IS 13779	IS 14697,IS 13779
8	Import-export feature	Forward import	Forward import	Forward import	Forward import
9	Communication Port/ Protocol	Optical/ DLMS	Optical, RS-232/ DLMS	Optical, RS-232/ DLMS	Optical, RS-232/ DLMS

(b) Meter for Net-Metering Measurements:

Net-Meter Major Technical Parameters

S. No.	Technical Parameters	Connectivity at 415 V & below voltage level			Connectivity at above 415 V voltage level
		Whole current meters		CT operated	CT-PT Operated
1	Applicability	Upto 5 kW connected load	Above 5 kW and upto15 kW connected load	Above 15 kW and upto100kW contract demand	HT/EHV supply
2	Number of phases and wires	Single Phase, 2 Wire	Three Phase, 4 Wire	Three Phase, 4 Wire	Three Phase, 4 Wire
3	Measurand(s)	kWh	kWh	kWh,kVAh,kVA, PF	kWh,kVAh,kVA, PF, Max. demand
4	Standard Voltage and frequency	240 V, 50±5%	3X240 V (P-N), 415 V (P-P) 50±5%	3X240 V (P-N), 415 V (P-P) 50±5%	3X63.5 V (P-N), 110 V (P-P) 50±5%
5	Current Rating	10-60	10-60	1 Amp	1 Amp
6	Accuracy class	1.0	1.0	0.5S	0.5S
7	Indian Standard or IEC to which conforming	IS 13779-1999	IS 13779-1999	IS 14697,IS 13779	IS 14697,IS 13779
8	Import-export feature	Import & Export	Import & Export	Import & Export	Import & Export
9	Communication Port/ Protocol	Optical/ DLMS	Optical, RS-232/ DLMS	Optical, RS-232/ DLMS	Optical, RS-232/ DLMS