

**GOVERNMENT OF INDIA  
CENTRAL ELECTRICITY AUTHORITY  
(MINISTRY OF POWER)  
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**PUBLIC NOTICE**

In accordance with the Sub-Section (2) of Section 177 of the Electricity Act, 2003, the Central Electricity Authority (CEA) had notified the Regulations *namely* “**Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006**” on 23.03.2006 which were amended on 26.06.2010 and 03.12.2014. It is now proposed to further amend specific clauses in the said regulations. The proposed draft amendments in the above regulations are available on the CEA Website **www.cea.nic.in**. The draft amendments of regulations can also be inspected in the office of Chief Engineer (Legal), Sewa Bhawan (North Wing), Room No. 622, 6<sup>th</sup> Floor, R. K. Puram, New Delhi-110066 on any working day till **10<sup>th</sup> April, 2019 between 1100 hrs to 1600 hrs.**

All the Stakeholders including the public are requested to send their comments on the draft regulations to Chief Engineer (Legal), Sewa Bhawan (North Wing), Room No. 622, 6<sup>th</sup> Floor, R. K. Puram, New Delhi-110066 by post or through e-mail latest by **10<sup>th</sup> April, 2019.**

**(P C Kureel )  
Secretary, CEA**

**3<sup>rd</sup> Proposed Draft Amendment of the Central Electricity Authority (Installation and Operation of Meters) Amendment Regulations, 2006**

Regulation/Clause No.	Existing Provisions of Regulations	Proposed Amended Provisions of Regulations
Para 1		These regulations may be called the Central Electricity Authority (Installation and Operation of Meters) Amendment Regulations, <b>2018</b> .
Clause 2(1)(g)	'Availability Based Tariff (ABT)' means a tariff structure based on availability of generating units and having components, viz, Capacity Charges (CC), Energy Charges (EC) or Variable Charges (VC) and charges for Unscheduled Interchange (UI);	'Availability Based Tariff (ABT)' means a tariff structure based on availability of generating units and having components, viz, Capacity Charges (CC), Energy Charges (EC) or Variable Charges (VC) and charges for <b>Unscheduled Interchange (UI) Deviation from schedule</b> ;
Clause 2(1)(i)	'Check Meter' means a meter, which shall be connected to the same core of the Current Transformer (CT) and Voltage Transformer (VT) to which main meter is connected and shall be used for accounting and billing of electricity in case of failure of main meter;	'Check Meter' means <b>an Interface</b> meter, which shall be connected to the same core of the Current Transformer (CT) and Voltage Transformer (VT) to which main meter is connected and shall be used for accounting and billing of electricity in case of failure of main meter;
Clause 2(1)(k)	'Correct Meter' means a meter, which shall at least have, features, Accuracy Class and specifications as per the Standards on Installation and Operation of Meters given in Schedule of these Regulations;	'Correct Meter' means a meter, which shall <b>at least</b> have <b>same</b> features, Accuracy Class and specifications as per the Standards on Installation and Operation of Meters given in Schedule of these Regulations;
Clause	'Instrument Transformer' means the 'Current Transformer' (CT),	'Instrument Transformer' means the 'Current Transformer' (CT) <b>or</b>

<b>2(1)(m)</b>	'Voltage Transformer' (VT) and 'Capacitor Voltage Transformer' (CVT);	'Voltage Transformer' (VT) <b>or</b> 'Capacitor Voltage Transformer' (CVT);
<b>Clause 2(1)(o)</b>	'Main Meter' means a meter, which would primarily be used for accounting and billing of electricity;	'Main Meter' means <b>an Interface</b> Meter, which would primarily be used for accounting and billing of electricity;
<b>2(1)(p)</b>	'Meter' means a device suitable for measuring, indicating and recording consumption of electricity or any other quantity related with electrical system and shall include, wherever applicable, other equipment such as Current Transformer (CT), Voltage Transformer (VT) or Capacitor Voltage Transformer (CVT) necessary for such purpose;	'Meter' means a device suitable for measuring, indicating and recording the consumption of electricity or any other quantity related with electrical system and shall include, wherever applicable, other equipment such as <b>Current Transformer (CT), Voltage Transformer (VT) or Capacitor Voltage Transformer (CVT) Instrument Transformer(s) necessary for the purpose of measurement.</b>
<b>Clause 2(1)(r)</b>	'Prepaid Meter' means a meter which facilitates use of electricity only after advance payment	'Prepaid Meter' means <b>Prepayment</b> a meter, <b>which facilitates use of electricity only after advance payment as specified in relevant IS.</b>
<b>Clause 2(1)(v)</b>	'Standby Meter' means a meter connected to CT and VT, other than those used for main meter and check meter and shall be used for accounting and billing of electricity in case of failure of both main meter and check meter;	'Standby Meter' means <b>an Interface</b> Meter connected to CT and VT, other than those used for main meter and check meter and shall be used for accounting and billing of electricity in case of failure of both main meter and check meter;
<b>Clause 2(1)</b>	New Definition	<b>Advanced Metering Infrastructure (AMI) means an integrated system of smart meters, communication network and data management systems that enables two-way communication</b>

		<b>between the licensee and consumer premises equipment.</b>
<b>Clause 2(1)</b>	New Definition	<b>“Prosumer” is a person who consumes electricity from the grid and can also inject electricity into the grid, using same network.</b>
<b>Clause 2(1)</b>	New Definition	<b>‘Smart Meter’ means an alternating current static watt-hour meter with time of use registers , internal connect /disconnect switches with two-way communication capability Note: Instrument transformer operated smart meter shall not have internal connect/disconnect load switche.</b>
<b>Clause 3(3)</b>	These regulations provide for type, standards, ownership, location, accuracy class, installation, operation, testing and maintenance, access, sealing, safety, meter reading and recording, meter failure or discrepancies, anti tampering features, quality assurance, calibration and periodical testing of meters, additional meters and adoption of new technologies in respect of following meters for correct accounting, billing and audit of electricity:  (i) Interface meter (ii) Consumer meter (iii)Energy accounting and audit Meter	These regulations provide for type, standards, ownership, location, accuracy class, installation, operation, testing and maintenance, access, sealing, safety, meter reading and recording, meter failure or discrepancies, anti tampering features, quality assurance, calibration and periodical testing of meters, additional meters and adoption of new technologies in respect of following meters for correct accounting, billing and audit of electricity:  (i) Interface meter (ii) Consumer meter <b>(Renewable energy Meter in case of Prosumer)</b> (iii)Energy accounting and audit Meter
<b>Clause 2(a) and 2(b) of Amendment Regulat</b>	(a)These Regulations shall be applicable for (a) all Grid Interactive Renewable Energy Plants seeking thé connectivity with the grid at 415 V ( or corresponding voltage as per relevant Indian Standard for values of alternating current(AC) nominal system voltage, as amended from time to time) and below Voltage Levels.	<del><b>(a)These Regulations shall be applicable for (a) all Grid Interactive Renewable Energy Plants seeking thé connectivity with the grid at 415 V ( or corresponding voltage as per relevant Indian Standard for values of alternating current(AC) nominal system voltage, as amended from time to time) and below Voltage Levels.</b></del>  <del><b>(b)Grid interactive Renewable Energy Plants connected at above</b></del>

<p><b>ions, 2014 replaced by new clause as Clause 3(4)</b></p>	<p>(b)Grid interactive Renewable Energy Plants connected at above 415 V (or corresponding voltage as per relevant Indian Standard for values of alternating current(AC) nominal system voltage, as amended from time to time) would follow the same metering arrangement as stipulated for generating stations in Central Electricity Authority (Installations and Operations of Meters) Regulations, 2006.</p>	<p><del>415 V (or corresponding voltage as per relevant Indian Standard for values of alternating current(AC) nominal system voltage, as amended from time to time) would follow the same metering arrangement as stipulated for generating stations in Central Electricity Authority (Installations and Operations of Meters) Regulations, 2006.</del></p> <p><b>These Regulations shall also be applicable for all Renewable Energy Plants seeking connectivity with the Electricity System at any voltage level.</b></p>
<p><b>Clause 2(c) of Amendment Regulations, 2014</b></p>	<p>All the clauses of Consumer meters as specified in CEA (Installation and Operation of Meters) Regulations, 2006, would also be applicable for Renewable Energy Meter, unless specified in these Regulations.</p>	<p>All the clauses of Consumer meters as specified in CEA (Installation and Operation of Meters) Regulations, 2006 <b>as amended from time to time, would shall</b> also be applicable for Renewable Energy Meter, unless specified in these Regulations.</p>
<p><b>Clause 4 (1)</b></p>	<p>All interface meters, consumer meters and energy accounting and audit meters shall be of static type.</p>	<p>(a)All interface meters and energy accounting and audit meters shall be of static type <b>and shall have Automatic Remote Meter Reading facility.</b></p> <p><b>Provided that the existing interface meters and energy accounting and audit meters without Automatic Remote Meter Reading facility shall be gradually phased out in accordance with the timelines decided by appropriate commission.</b></p> <p><b>(b)All consumer meters shall be Static or Static Smart Meters.</b></p>

<b>Clause 5(a)</b>	comply with the relevant standards of Bureau of Indian Standards (BIS). If BIS Standards are not available for a particular equipment or material, the relevant British Standards (BS), International Electro-technical Commission (IEC) Standards, or any other equivalent Standard shall be followed: Provided that whenever an international Standard or IEC Standard is followed, necessary corrections or modifications shall be made for nominal system frequency, nominal system voltage, ambient temperature, humidity and other conditions prevailing in India before actual adoption of the said Standard;	comply with the relevant standards of Bureau of Indian Standards (BIS). If BIS Standards are not available for a particular equipment or material, the relevant <del>British Standards (BS)</del> , International Electro-technical Commission (IEC) Standards, or any other equivalent Standard shall be followed: Provided that whenever an international Standard or IEC Standard is followed, necessary corrections or modifications shall be made for nominal system frequency, nominal system voltage, ambient temperature, humidity and other conditions prevailing in India before actual adoption of the said Standard;	
<b>Clause 6(2)(b)</b>	If any consumer elects to purchase a meter, the same may be purchased by him. Meter purchased by the consumer shall be tested, installed and sealed by the licensee. The consumer shall claim the meter purchased by him as his asset only after it is permanently removed from the system of the licensee.	If any consumer <del>elects</del> <b>opts</b> to purchase a meter, the same may be purchased by him and meter purchased by the consumer shall be tested <b>as per relevant IS</b> , installed and sealed by the distribution licensee. <b>Provided that</b> the consumer shall claim the meter purchased by him as his asset only after it is permanently removed from the system of the distribution licensee.	
<b>Clause 7(1)(a)(1)</b>	Generating station / main, check and standby meters  <b>Generating Station</b> (i)On all outgoing feeders	<b>Main and Check Meters</b> <b>Generating Station</b> (i)On all outgoing feeders <b>including bus sectionalizer/tie line between two stages of generating stations having different tariffs</b>	
<b>Clause 7(1) (a)</b>	Transmission and Distribution System At one end of the line between the substations of the same	<b>Main Meter</b>	<b>Standby Meter</b>

(2)	licensee, and at both ends of the line between substations of two different licensees. Meters at both ends shall be considered as main meters for respective licensees.	<p>Transmission and Distribution System</p> <p>(i) <b>At one end of the line between the substations of the same licensee</b></p> <p>(ii) <b>At both ends of the line between substations of two different licensees</b></p> <p>(iii) <b>At both ends of the line between substations of Generating station and licensee.</b></p> <p><b>Provided that</b> meters at both ends shall be considered as main meters for <b>Generating station/respective licensees.</b></p>	There shall be no separate standby meter. Meter installed at other end of the line in case of two different licensees shall work as standby meter.
<b>Clause 7(1) (a) (3)</b>	Inter-Connecting Transformer	Inter-Connecting Transformer/ <b>Power Transformer</b>	
<b>Clause 7(2)(b)</b>	The location of meter and height of meter display from floor shall be as per Indian Standard on Testing, Evaluation, Installation and Maintenance of ac Electricity Meters – Code of Practice.	The location of meter and height of meter display from the floor shall be as <del>per Indian Standard on Testing, Evaluation, Installation and Maintenance of ac Electricity Meters – Code of Practice</del> <b>specified in the relevant IS.</b>	
<b>Clause 7(2)(c)</b>	For outdoor installations, the meters shall be protected by appropriate enclosure of level of protection specified in the Indian Standard on Testing, Evaluation, Installation and Maintenance of ac Electricity Meters – Code of Practice	For outdoor installations, the meters shall be protected by appropriate enclosure of level of protection <b>as</b> specified in the <del>Indian Standard on Testing, Evaluation, Installation and Maintenance of ac Electricity Meters – Code of Practice</del> <b>relevant IS.</b>	

<b>Clause 4 of Amendment Regulations, 2014 replaced by new clause as 7(2)(d)</b>	The location of Renewable Energy Meters shall be as specified below:		The location of <b>Renewable Energy Meters</b> shall be as specified below:  <b>In case of first installation for the purpose of renewable energy metering, the 'Renewable Energy meter' shall be installed at the location specified for consumer meter and in case of existing consumers, the consumer meter shall be replaced with 'Renewable Energy Meter'.</b>						
	Metering arrangement	Location of Renewable Energy Meter							
	Feed in Tariff metering:- Renewable Energy Plant is connected to the grid to inject the entire electricity generated to the grid	Out going feeder from Renewable Energy Plant							
	Net metering :- Renewable Energy Plant is connected to the load bus of the owner to consume	In case of first installation for the purpose of Renewable Energy Metering, the 'Renewable Energy Meter' shall be installed at the location specified for							
			<table border="1"> <thead> <tr> <th>Type of Metering arrangement</th> <th>Location of Renewable Energy Net Metering</th> </tr> </thead> <tbody> <tr> <td><del>Feed in Tariff metering:- Renewable Energy Plant is connected to the grid to inject the entire electricity generated to the grid</del></td> <td><del>Out going feeder from Renewable Energy Plant</del></td> </tr> <tr> <td><del>Net metering :- Renewable Energy Plant is connected to the load bus of the owner to consume electricity generated primarily by the owner of the Plant and excess electricity, if any, is injected to the grid</del></td> <td><del>In case of first installation for the purpose of Renewable Energy Metering, 'Renewable Energy' shall be installed at the location specified for consumer meter and in case of existing consumers, consumer meter shall be replaced with 'Renewable Energy'.</del></td> </tr> </tbody> </table>	Type of Metering arrangement	Location of Renewable Energy Net Metering	<del>Feed in Tariff metering:- Renewable Energy Plant is connected to the grid to inject the entire electricity generated to the grid</del>	<del>Out going feeder from Renewable Energy Plant</del>	<del>Net metering :- Renewable Energy Plant is connected to the load bus of the owner to consume electricity generated primarily by the owner of the Plant and excess electricity, if any, is injected to the grid</del>	<del>In case of first installation for the purpose of Renewable Energy Metering, 'Renewable Energy' shall be installed at the location specified for consumer meter and in case of existing consumers, consumer meter shall be replaced with 'Renewable Energy'.</del>
Type of Metering arrangement	Location of Renewable Energy Net Metering								
<del>Feed in Tariff metering:- Renewable Energy Plant is connected to the grid to inject the entire electricity generated to the grid</del>	<del>Out going feeder from Renewable Energy Plant</del>								
<del>Net metering :- Renewable Energy Plant is connected to the load bus of the owner to consume electricity generated primarily by the owner of the Plant and excess electricity, if any, is injected to the grid</del>	<del>In case of first installation for the purpose of Renewable Energy Metering, 'Renewable Energy' shall be installed at the location specified for consumer meter and in case of existing consumers, consumer meter shall be replaced with 'Renewable Energy'.</del>								



	electricity generated primarily by the owner of the Plant and excess electricity, if any, is injected to the grid	consumer meter and in case of existing consumers, the consumer meter shall be replaced with 'Renewable Energy Meter'.		
<b>Clause 7(3)(i)(a)</b>	At a point after the generator stator terminals and before the tap-off to the unit auxiliary transformer(s);	At a point after the generator stator terminals and before the tap-off to the unit auxiliary transformer(s); <b>Provided that in case of Renewable Energy generating plant/Solar roof top, the meter shall be installed at inverter AC output terminals.</b>		
<b>Clause 9(3)</b>	In case of single phase meters, the consumer shall ensure that there is no common neutral or phase or looping of neutral or phase of two or more consumers on consumers' side wiring. If such common neutral or phase or looping of neutral or phase comes to the notice of the licensee, it shall suitably inform the consumer through installation report or regular electricity bills or meter test report as applicable.	In case of single phase meters, the consumer shall ensure that there is no common neutral or phase or looping of neutral or phase of two or more consumers on consumers' side wiring. If such common neutral or phase or looping of neutral comes to the notice of licensee, it shall suitably inform the consumer through installation report or regular electricity bills or meter test report as applicable, <b>as soon as it comes to their notice.</b>		
<b>Clause 9(5)</b>	If the earth leakage indication is displayed in the meter the licensee shall suitably inform the consumer through installation report or regular electricity bills or meter test report as applicable.	If the earth leakage indication is displayed in the meter the distribution licensee shall suitably inform the consumer through installation report or regular electricity bills or meter test report as applicable, <b>as soon as it comes to their notice.</b>		

<b>Clause 9(6)</b>	In case CTs and VTs form part of the meters, the meter shall be installed as near the instrument transformers as possible to reduce the potential drop in the secondary leads.	In case <del>CTs and VTs</del> <b>Instrument transformers</b> form part of the meters, the meter shall be installed as near the instrument transformers as possible to reduce the potential drop in the secondary leads.
<b>Clause 9(7)</b>	New Clause	<b>The meter can also be installed in a separate dedicated metering panel in a kiosk/Control Room. Provided that CT / CVT secondary star point shall be properly grounded in the metering panel as per the safety requirements.</b>
<b>Clause 12 (1) (b)</b>	A tracking and recording software for all new seals shall be provided by the manufacturer of the meter so as to track total movement of seals starting from manufacturing, procurement, storage, record keeping, installation, series of inspections, removal and disposal.	A tracking and recording <b>software mechanism</b> for all <del>new</del> seals shall be <b>maintained</b> by the <b>distribution licensee</b> so as to track total movement of seals starting from <b>manufacturing</b> , procurement ( <b>with manufacturer's details</b> ), storage, record keeping, installation, series of inspections, removal and disposal.
<b>Clause 12(1)(e) &amp; (f)</b>	(e) Polycarbonate or acrylic seals or plastic seals or holographic seals or any other superior seal shall be used.  (f) Lead seals shall not be used in the new meters. Old lead seals shall be replaced by new seals in a phased manner and the time frame of the same shall be submitted by the licensee to the Appropriate Commission for approval.	(e) <b>Seals shall have the following features:</b> (i) <b>There should be a secret code for each seal which is known to the manufacturer of seal only (such that it shall not be visible to the naked eyes).</b> (ii) <b>Identity of manufacturer shall not be revealed on the seal.</b> (iii) <b>Seals shall be tamper evident.</b> (iv) <b>Polycarbonate or holographic seals shall be used. Existing plastic and acrylic seals shall be replaced by new Polycarbonate or holographic seals in a phased manner in a time frame decided by the Appropriate Commission.</b> (v) Lead seals shall not be used in the new meters. Old lead seals

		<p>shall be replaced by new seals in a phased manner <b>and within</b> the time frame <del>of the same shall be submitted by the licensee as specified by the Appropriate Commission for approval.</del></p>
<p><b>Clause 14 (1)</b></p>	<p><b>(1) Interface meters</b></p> <p>It shall be the responsibility of the Appropriate Transmission Utility or the licensee to take down the meter reading and record the metered data, maintain database of all the information associated with the interface meters and verify the correctness of metered data and furnish the same to various agencies as per the procedure laid down by the Appropriate Commission.</p>	<p><b>(1) Interface Meters : The following shall be ensured in respect of the interface meters:</b></p> <p><b>(a)</b> It shall be the responsibility of the Appropriate Transmission Utility or the licensee to <del>take-down</del> <b>download the meter data</b>, record the metered data, maintain database of all the information associated with the interface meters and verify the correctness of the metered data and furnish the same to various agencies as per the procedure laid down by the Appropriate Commission.</p> <p><b>(b) The meter data shall be communicated to the respective Load Despatch Centre by using a dedicated communication port.</b></p> <p><b>(c) Interface meters shall have one port for local communication and shall be made accessible to the Generating Company and licensee for local data monitoring with read only rights.</b></p>
<p><b>Clause 14 (2)</b></p>	<p><b>Consumer Meters</b></p> <p><b>(a)</b> It shall be the responsibility of the licensee to record the metered data, maintain database of all the information associated with the consumer meters and verify the correctness of metered data</p> <p><b>(b)</b> The licensee shall maintain accounts for the electricity consumption and other electrical quantities of its consumers.</p>	<p><b>Consumer meters: The following shall be ensured in respect of the consumer meters:</b></p> <p><b>(a)</b> It shall be the responsibility of the licensee to <b>download the meter data either locally through HHU (Hand held unit)/spot billing or remotely using appropriate communication technology</b>, record the metered data, maintain database of all the information associated with the consumer meters and verify the correctness of the metered data.</p> <p><b>Note: The Appropriate Regulatory Commission shall define suitable time frame for completely eliminating manual meter</b></p>

		<p><b>reading of consumer meters by distribution licensees.</b></p> <p>(b) The licensee shall maintain accounts for the electricity consumption and other electrical quantities of its consumers.</p> <p><b>Provided that, in case of prepaid meters, energy accounting by the distribution licensee shall be done in financial terms based on the amount paid by the consumer for buying electricity. Provided further that, in addition to the above proviso the distribution licensee shall also record the actual consumption over the specified duration.</b></p> <p><b>Provided that, in case of Smart Meters, distribution licensee shall provide information to the consumer related to his energy consumption through Mobile App/Web application/IHD. Provided that, in case of Prepaid meters and Smart meter with prepaid functionality, consumer shall have facility to monitor consumption in monetary terms (in Indian Rupee) either on the meter display or on an additional consumer interface unit, if used.</b></p>
<p><b>Clause 14 (3)</b></p>	<p><b>Energy accounting and audit meters</b></p> <p>It shall be the responsibility of the generating company or licensee to record the metered data, maintain database of all the information associated with the energy accounting and audit meters and verify the correctness of metered data. Each generating company or licensee shall prepare quarterly, half-yearly and yearly energy account for its system for taking appropriate action for efficient operation and system development.</p>	<p>(a) It shall be the responsibility of the generating company or licensee to <b>download the meter data locally or remotely using appropriate communication technology</b>, record the metered data, maintain database of all the information associated with the energy accounting and audit meters and verify the correctness of the metered data.</p> <p>(b) Each generating company or licensee shall prepare quarterly, half-yearly and yearly energy account for its system for taking appropriate action for efficient operation and system development.</p>

Clause  
15, 1(a)

## Meter failure or discrepancies. -

### (1) Interface meters

- (a) Whenever difference between the readings of the Main meter and the Check meter for any month is more than 0.5%, the following steps shall be taken:
- (i) checking of CT and VT connections;
  - (ii) testing of accuracy of interface meter at site with reference standard meter of accuracy class higher than the meter under test.

If the difference exists even after such checking or testing, then the defective meter shall be replaced with a correct meter.

(c) In case where both the Main meter and Check meter fail, at least one of the meters shall be immediately replaced by a correct meter.

(d) Billing for the Failure period:

- (i) The billing for the failure period of the meter shall be done as per the procedure laid down by the Appropriate Commission.
- (ii) Readings recorded by Main, Check and Standby meters for every time slot shall be analysed, crosschecked and validated by the Appropriate Load Despatch Centre (LDC). The discrepancies, if

### (1) Interface meters:

**(a) In case of conspicuous failures like burning of meter and erratic display of metered parameters and when the error found in testing of meter is beyond the permissible limit of error provided in the relevant standard, the meter shall be replaced with a correct meter within 15 days.**

(b) Whenever difference between the readings of the Main meter and the Check meter for any month is more than 0.5%, the following steps shall be taken:

- (i) checking of ~~CT and VT Instrument Transformers~~ connections.
- (ii) testing of accuracy of interface meter at the site with a reference standard meter of accuracy class higher than the meter under test.

**(c) If the reason for difference between the readings could not be established with the help of the test performed as specified in sub regulation (b), then the Testing of CT, VT and functional testing of CVT at site shall be taken.**

**(d) Based on the test results as specified in clause (i) and (ii) of sub regulation (b) and sub regulation (c), the corrective actions shall be taken to replace the defective meter or Instrument Transformer, as the case may be.**

**(e) Whenever there is unreasonable difference between the quantity**

	<p>any, noticed in the readings shall be informed by the LDC in writing to the energy accounting agency for proper accounting of energy. LDC shall also intimate the discrepancies to the Appropriate Transmission Utility or the licensee, who shall take further necessary action regarding testing, calibration or replacement of the faulty meters in accordance with the provisions laid down.</p> <p>(e) The defective meter shall be immediately tested and calibrated</p>	<p><b>recorded by Interface meter and the corresponding value monitored at the billing centre via communication network, the communication system and terminal equipment shall be tested and rectified.</b></p> <p>(ef) In case where both the Main meter and Check meter fail, at least one of the meters shall be immediately replaced by a correct meter.</p> <p>(dg) Billing for the Failure period:  (i) The billing for the failure period of the meter shall be done as per the procedure laid down by the Appropriate Commission.  (ii) Readings recorded by Main, Check and Standby meters for every time slot shall be analysed, crosschecked and validated by the Appropriate Load Despatch Centre (LDC). The discrepancies, if any, noticed in the readings shall be informed by the LDC in writing to the energy accounting agency for proper accounting of energy. LDC shall also intimate the discrepancies to the Appropriate Transmission Utility or the licensee, who shall take further necessary action regarding testing, calibration or replacement of the faulty meters in accordance with the provisions laid down.</p> <p>(eh) The defective meter shall be immediately tested and calibrated</p>
<p><b>Clause 15(3)</b></p>	<p><b>Energy accounting and audit meters</b></p> <p>Energy accounting and audit meters shall be rectified or replaced by the generating company or licensee immediately after notice of any of the following abnormalities:</p> <p>(a) the errors in the meter readings are outside the limits</p>	<p><b>Energy Accounting and Audit meters</b></p> <p>Energy accounting and audit meters shall be rectified or replaced by the generating company or licensee immediately after notice of any of the following abnormalities:</p> <p>(a) the errors in the meter readings are outside the limits prescribed</p>

	<p>prescribed for the specified Accuracy Class;</p> <p>(b) meter readings are not in accordance with the normal pattern of the load demand;</p> <p>(c) meter tampering, or erratic display or damage.</p>	<p>for the specified Accuracy Class;</p> <p>(b) meter readings are not in accordance with the normal pattern of the load demand;</p> <p>(c) meter tampering, or erratic display or damage.</p> <p><b>(d) Whenever the readings are not in conformity with the readings of Interface meters</b></p>
<p>Clause 17 (2)</p>	<p><b>Quality Assurance of Meters</b></p> <p>The licensee shall set up appropriate number of accredited testing laboratories or utilize the services of other accredited testing laboratories. The licensee shall take immediate action to get the accreditations of their existing meter testing laboratories from NABL, if not already done</p>	<p><b>(a)</b> The licensee shall set up appropriate number of accredited testing laboratories or utilize the services of other accredited testing laboratories.</p> <p><b>(b)</b> The licensee shall take immediate action to get the accreditations for their existing meter testing laboratories from NABL, if not already done.</p> <p><b>(c) NABL accreditation for on site testing shall also be obtained by the licensee/third party as per the requirement.</b></p>
<p>Clause 17 (3)</p>	<p>The generating company or licensee shall ensure that all type, routine and acceptance tests are carried out by the manufacturer complying with the requirement of the relevant IS or BS or IEC as the case may be</p>	<p>The generating company or licensee shall ensure that all type, routine and acceptance tests are carried out by the manufacturer complying with the requirement of the relevant IS. <del>or BS or IEC as the case may be</del></p>
<p>Clause 18(1)</p>	<p>Interface meter</p> <p>(b)All interface meters shall be tested at least once in five years. These meters shall also be tested whenever the energy and other quantities recorded by the meter are abnormal or inconsistent with electrically adjacent meters. Whenever there is unreasonable difference between the quantity recorded by interface meter and the corresponding value monitored at the</p>	<p>Interface meters</p> <p>(b) All interface meters <b>including separate online field testing for accuracy of CT and PT (except CVTs till field testing of CVTs is available in the country) for voltages less than 132kV</b>, shall be tested <b>after every</b> five years. <del>These meters shall also be tested whenever the energy and other quantities recorded by the meter are abnormal or inconsistent with electrically adjacent meters.</del></p>

	<p>billing center via communication network, the communication system and terminal equipment shall be tested and rectified. The meters may be tested using NABL accredited mobile laboratory or at any accredited laboratory and recalibrated if required at manufacturer's works.</p> <p>(c) Testing and calibration of interface meters may be carried out in the presence of the representatives of the supplier and buyer. The owner of the meter shall send advance notice to the other party regarding the date of testing.</p>	<p><del>Whenever there is unreasonable difference between the quantity recorded by interface meter and the corresponding value monitored at the billing center via communication network, the communication system and terminal equipment shall be tested and rectified.</del>–The meters shall be tested on site using accredited test mobile laboratory <del>or at any accredited laboratory</del> and recalibrated, if required, at manufacturer's works.</p> <p><b>Provided that the on-site testing of instrument transformers of 132kV and above shall be introduced after availability of mobile testing facilities in the country.</b></p> <p>(c) Testing and calibration of interface meters <del>may</del> <b>shall</b> be carried out in the presence of the representatives of the supplier and buyer. The owner of the meter shall send advance notice to the other party regarding the date of testing.</p>
<p><b>18(2)</b></p>	<p><b>Consumers meters</b></p> <p>The testing of consumer meters shall be done at site at least once in five years. The licensee may instead of testing the meter at site can remove the meter and replace the same by a tested meter duly tested in an accredited test laboratory. In addition, meters installed in the circuit shall be tested if study of consumption pattern changes drastically from the similar months or season of the previous years or if there is consumer's complaint pertaining to a meter. The standard reference meter of better accuracy class than the meter under test shall be used for site testing of consumer meters up to 650</p>	<p>Consumer Meters</p> <p>(a) The testing <b>along with installation audit</b> of consumer meters shall be done at site at least once in five years <b>and the minimum attributes which are to be captured under Installation Audit are given below:</b></p> <ul style="list-style-type: none"> <li><b>(i) Make, type and serial number of meter</b></li> <li><b>(ii) Physical status of meter (OK/Burnt/ No display)</b></li> <li><b>(iii) Seal status</b></li> <li><b>(iv) Presence of any foreign device near the meter</b></li> <li><b>(v) Correctness of connection</b></li> <li><b>(vi) Indoor/outdoor installation</b></li> <li><b>(vii) Wire dressing</b></li> </ul>



	<p>volts. The testing for consumers meters above 650 volts should cover the entire metering system including CTs, VTs. Testing may be carried out through NABL accredited mobile laboratory using secondary injection kit, measuring unit and phantom loading or at any accredited test laboratory and recalibrated if required at manufacturer's works.</p>	<p>(viii) <b>Terminal cover and meter box condition</b>          (ix) <b>Type of connection (residential/ commercial/industrial)</b>          (x) <b>Joint in service cable (Yes/No)</b>          (xi) <b>Meter cabinet earthing status, if the cabinet is made of metal.</b></p> <p>(b) The licensee <b>may</b> instead of testing the meter at site can remove the meter and replace the same by a <b>tested</b> meter duly tested in an accredited test laboratory.</p> <p>(c) <del>In addition,</del> <b>Meters installed in the circuit</b> shall be tested if a <b>study finds that</b> the consumption pattern changes drastically from <del>that in during</del> the similar months or season of the previous years or if there is consumer's complaint pertaining to a meter.</p> <p>(d) The standard reference meter of better accuracy class than the meter under test shall be used for site testing of consumer meters up to <b>650 600</b> volts.</p> <p>(e) The testing for consumer meters above <b>650 600</b> volts <b>shall</b> cover the entire metering system including <b>instrument transformers</b> and testing <b>shall</b> be carried out <del>on site through</del> <b>by</b> accredited <b>test</b> laboratory <del>using secondary injection kit, measuring unit and phantom loading and recalibrated, if required, at manufacturer's works.</del></p>
<p><b>Clause 18(3)</b></p>	<p><b>Energy accounting and audit meters</b>          Energy accounting and audit meters shall be tested at site at least once in five years or whenever the accuracy is suspected or whenever the readings are inconsistent with the readings of other meters, e.g., check meters, standby meters. The testing must be carried out without removing the CTs and VTs connection. Testing may be carried out through NABL accredited mobile laboratory using secondary injection kit, measuring unit and phantom loading or at any accredited test</p>	<p>(a) Energy accounting and audit meters shall be tested at site at least once in five years or whenever the accuracy is suspected or whenever the readings are inconsistent with the readings of other meters, e.g., check meters, standby meters.</p> <p>(b) The testing <b>must</b> shall be carried out <b>onsite</b> without removing the <del>CTs and VTs instrument transformers'</del> connection <b>by</b> accredited <b>test</b> laboratory <del>results and secondary injection kit, measuring unit and phantom loading</del> and recalibrated, if required, at manufacturer's works.</p>

	laboratory and recalibrated if required at manufacturer's works.	
<b>Clause 20</b>	<b>Adoption of new technologies. -</b> The distribution licensee shall make out a plan for introduction and adoption of new technologies such as pre-paid meters, time of the day meters (TOD), automatic remote meter reading system through appropriate communication system with the approval of the Appropriate Commission or as per the regulations or directions of the Appropriate Commission or pursuant to the reforms programme of the Appropriate Government.	The distribution licensee shall make out a plan for adoption of new technologies such as <del>pre-paid meters</del> <b>Pre-payment metering</b> , Time of the Day meters <b>metering</b> (TOD), <b>Advanced Metering Infrastructure (AMI)</b> <del>automatic remote meter reading system through appropriate communication system with the approval of the Appropriate Commission or</del> as per the regulations or directions of the Appropriate Commission <del>or pursuant to the reforms programme of the Appropriate Government.</del>
<b>Clause 21</b>	<b>New Clause</b>	(1)It shall be the responsibility of each Generating Company and Licensee to ensure security and privacy of meter data, consumer data, meter keys, password etc. (2)Necessary IT policy, processes and practices shall be designed to protect networks, computers, programs and data from cyber-attack, damage or unauthorized access.
<b>Clause 22</b>	<b>New Clause</b>	<b>Relaxation of Regulations:</b> The Authority, by order in writing, may allow deviation from any provision of the said Regulations on its own or in respect of the matters referred to the Authority on case to case basis.
<b>SCHEDULE</b>		
<b>Part I</b>	(1)These standards provide for specification of meters, immunity to external factors, sealing points and functional	(1)These standards provide for specification of meters, immunity to external factors, sealing points and functional requirements that are

<b>rds Comm on to all type of Meters</b>	requirements that are required from regulatory perspective. Detailed technical specification shall be prepared by the purchaser of the meter.	required from regulatory perspective. <del>Detailed technical specification shall be prepared by the purchaser of the meter.</del>										
	<b>(2)Specification of meters</b> <table border="1" data-bbox="205 526 942 1318"> <tr> <td data-bbox="205 526 422 732">Standard Reference Voltage</td> <td data-bbox="422 526 942 732">As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S</td> </tr> <tr> <td data-bbox="205 732 422 938">Voltage Range</td> <td data-bbox="422 732 942 938">As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S</td> </tr> <tr> <td data-bbox="205 938 422 1144">Standard Frequency</td> <td data-bbox="422 938 942 1144">As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S</td> </tr> <tr> <td data-bbox="205 1144 422 1318">Standard Basic Current –</td> <td data-bbox="422 1144 942 1318">As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S</td> </tr> </table>	Standard Reference Voltage	As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S	Voltage Range	As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S	Standard Frequency	As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S	Standard Basic Current –	As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S	<b>(2)Specification of meters</b> <table border="1" data-bbox="1077 532 1814 1318"> <tr> <td data-bbox="1077 532 1293 1318"> <b>Standard Reference Voltage, Voltage Range, Standard Frequency, Standard Basic Current, Starting Current and Maximum Current, Power Factor Range, Power Frequency withstand voltage,</b> </td> <td data-bbox="1293 532 1814 1318"> <b>As per IS</b> </td> </tr> </table>	<b>Standard Reference Voltage, Voltage Range, Standard Frequency, Standard Basic Current, Starting Current and Maximum Current, Power Factor Range, Power Frequency withstand voltage,</b>	<b>As per IS</b>
Standard Reference Voltage	As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S											
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<b>Standard Reference Voltage, Voltage Range, Standard Frequency, Standard Basic Current, Starting Current and Maximum Current, Power Factor Range, Power Frequency withstand voltage,</b>	<b>As per IS</b>											

		and 1.0S (Current range of consumer meters shall be so chosen as to record the load current corresponding to the sanctioned load)													
	Accuracy Class	Meters Shall meet the following requirements of Accuracy Class:													
		<table border="1"> <tr> <td>Inter face Meters</td> <td>0.2S</td> </tr> <tr> <td colspan="2">Consumer Meters</td> </tr> <tr> <td>Upto 650 Volts</td> <td>1.0 or better</td> </tr> <tr> <td>Above 650 volts and upto 33 kilo volts</td> <td>0.5S or better</td> </tr> <tr> <td>Above 33 kilo volts</td> <td>0.2S</td> </tr> </table>	Inter face Meters	0.2S	Consumer Meters		Upto 650 Volts	1.0 or better	Above 650 volts and upto 33 kilo volts	0.5S or better	Above 33 kilo volts	0.2S			
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				<b>Impulse voltage withstand test for 1.2/50 micro sec, Power Consumption</b>											
				<b>Standard Reference Voltage</b>	<del>As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S</del>										
				<b>Voltage Range</b>	<del>As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S</del>										
				<b>Standard Frequency</b>	<del>As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S</del>										
				<b>Standard Basic Current –</b>	<del>As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated</del>										

		<p>Energy Accounting and Audit Meters</p> <p>The accuracy class of meters in generation and transmission system shall not be inferior to that of 0.2S accuracy class. The accuracy class of meters in distribution system shall not be inferior to that of 0.5S Accuracy Class.</p>			<p><del>watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S (Current range of consumer meters shall be so chosen as to record the load current corresponding to the sanctioned load)</del></p>									
				Accuracy Class	Meters Shall meet the following requirements of Accuracy Class:									
	Starting Current and Maximum Current	As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S			<table border="1"> <tr> <td data-bbox="1304 737 1398 980">Inter face Meters</td> <td data-bbox="1398 737 1803 980">0.2S</td> </tr> <tr> <td colspan="2" data-bbox="1304 980 1803 1117">Consumer Meters</td> </tr> <tr> <td data-bbox="1304 1117 1398 1321">Upto 650 600 Volt s or Direct Connect ed</td> <td data-bbox="1398 1117 1803 1321">1.0 or better</td> </tr> <tr> <td data-bbox="1304 1321 1398 1403">Upto 600 volt s LT CT</td> <td data-bbox="1398 1321 1803 1403">Class 0.5S or better as per latest relevant IS where separate CTs are used Or Class 1.0 as per latest</td> </tr> </table>	Inter face Meters	0.2S	Consumer Meters		Upto 650 600 Volt s or Direct Connect ed	1.0 or better	Upto 600 volt s LT CT	Class 0.5S or better as per latest relevant IS where separate CTs are used Or Class 1.0 as per latest	
Inter face Meters	0.2S													
Consumer Meters														
Upto 650 600 Volt s or Direct Connect ed	1.0 or better													
Upto 600 volt s LT CT	Class 0.5S or better as per latest relevant IS where separate CTs are used Or Class 1.0 as per latest													
	Power Factor Range	As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S												
	Power Frequency Withstand	As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static												

voltage	transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S	con nect ion	relevant IS for terminal less direct connected long current range meter.	
Impulse Voltage withstand test for 1.2/50 micro second	As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S	Abo ve 650 600 volts and upto 33 kilo volts	0.5S or better	
Power Consumption	As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S	Abo ve 33 kilo volts	0.2S	
		<p>Energy Accounting and Audit Meters</p> <p>(i) In generating stations, the accuracy class of meters at a point after the generator stator terminals and before the tap off to the unit auxiliary transformer(s) shall not be inferior to that of 0.2S accuracy class.</p> <p>However, the accuracy class of</p>		

			<p>other meters shall not be inferior to that of 1.0S accuracy class.</p> <p>(ii)The accuracy class of meters in transmission system shall not be inferior to that of 0.2S accuracy class.</p> <p>(iii)The accuracy class of meters in distribution system shall not be inferior to that of 0.5S accuracy class <b>where separate LT CTs are used with meter.</b></p> <p><b>Provided that in case of terminal less direct connected long range meters accuracy class shall not be inferior to class 1.0</b></p>	
		<p><b>Starting Current and Maximum Current</b></p>	<p><del>As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S</del></p>	
		<p><b>Power Factor Range</b></p>	<p><del>As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S</del></p>	
		<p><b>Power Frequency withstand</b></p>	<p><del>As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for</del></p>	

		<p><b>voltage</b></p> <p><b>Impulse voltage withstand test for 1.2/50 micro sec</b></p> <p><b>Power Consumption</b></p>	<p><del>ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S</del></p> <p><del>As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S</del></p> <p><del>As per Indian Standard for ac Static watt-hour meters, Class 1 and 2, and Indian Standard for ac Static transformer operated watt-hour and VAR-hour meters, class 0.2S, 0.5S and 1.0S</del></p>	
	(3) Meter shall have the downloading facilities of metered data through Meter Reading Instrument (MRI)	(3) Meter shall have <b>one port for</b> downloading facilities of metered data through Meter Reading Instrument (MRI) <b>and another port for remote communication.</b>		
	<p><b>(5) Sealing Points</b></p> <p>Sealing shall be done at the following points (as applicable):</p> <ul style="list-style-type: none"> <li>(a) Meter body or cover</li> <li>(b) Meter terminal cover</li> <li>(c) Meter test terminal block</li> <li>(d) Meter cabinet</li> </ul>	<p><b>(5) Sealing Points</b></p> <p>Sealing shall be done at the following points (as applicable):</p> <ul style="list-style-type: none"> <li>(a) Meter body <del>or with</del> cover</li> <li>(b) Meter terminal cover</li> <li>(c) Meter test terminal block</li> <li>(d) Meter cabinet</li> <li><b>(e) Instrument Transformers terminal box for metering purpose, and junction box, if any.</b></li> </ul>		
	(6) The accuracy class of Current transformers (CTs) and Voltage transformers (VTs) shall not be inferior to that of	<p><b>(6)</b></p> <p><b>(a)</b> The accuracy class of <b>Instrument Transformers Current</b></p>		



	<p>associated meters. The existing CTs and VTs not complying with these regulations shall be replaced by new CTs and VTs, if found defective, non-functional or as per the directions of the Appropriate Commission. In case the CTs and VTs of the same Accuracy Class as that of meters can not be accommodated in the metering cubicle or panel due to space constraints, the CTs and VTs of the next lower Accuracy Class can be installed.</p>	<p><del>transformers (CTs) and Voltage transformers (VTs)</del> shall not be inferior to that of associated meters. <del>The existing CTs and VTs not complying with these regulations shall be replaced by new CTs and VTs, if found defective, non-functional or as per the directions of the Appropriate Commission. In case the CTs and VTs of the same Accuracy Class as that of meters can not be accommodated in the metering cubicle or panel due to space constraints, the CTs and VTs of the next lower Accuracy Class can be installed.</del></p> <p>(b) The Instrument Transformers shall comply with latest relevant IS.</p>
	<p>(7) The Voltage Transformers shall be electromagnetic VT or Capacitive Voltage Transformer (CVT).</p>	<p><del>(7) The Voltage Transformers shall be electromagnetic VT or Capacitive Voltage Transformer (CVT).</del></p>
	<p>New clause</p>	<p>(7) An illustrative diagram depicting location of meters with their accuracy class is given at Appendix I.</p>
	<p>New clause</p>	<p>(8) An illustrative diagram depicting location of Renewable Energy Meter with their accuracy class is given at Appendix II.</p>
<p><b>Part II Standards for Interface Meters</b></p>	<p><b>Functional Requirements</b></p> <p>a) The Interface meters suitable for ABT shall be static type, composite meters , as self –contained devices for measurement of active and reactive energy, and certain other parameters as described in the following paragraphs. The meters shall be suitable for being connected directly to voltage transformers (VTs) having a rated secondary line-to-line voltage of 110 V, and to</p>	<p><del>Functional Requirements</del></p> <p>(a)The Interface meters suitable for ABT shall be <b>three phase four wire</b> static type, composite meters, as self –contained devices for measurement of active and reactive energy, and certain other parameters as described in the following paragraphs. The meters shall be suitable for being connected directly to voltage transformers (VTs) having a rated secondary line-to-line voltage of 110 V, and to current transformers (CTs) having a rated secondary current of 1A <del>(Model-A-3</del></p>

current transformers (CTs) having a rated secondary current of 1A (Model-A :3 element 4 wire or Model C: 2 element , 3 wire) or 5A (model-B: 3 element , 4 wire or Model D: 2 element 3 wire). The reference frequency shall be 50Hz.

b) The meters shall have a non-volatile memory in which the following shall be automatically stored:

- i. Average frequency for each successive 15-minute block, as a two digit code (00 to 99 for frequency from 49.0 to 51.0Hz).
- ii. Net Wh transmittal during each successive 15-minute block, upto second decimal, with plus/minus sign.
- iii. Cumulative Wh transmittal at each midnight, in six digits including one decimal.
- iv. Cumulative VARh transmittal for voltage high condition, at each midnight, in six digits including one decimal.
- v. Cumulative VARh transmittal for voltage low condition, at each midnight, in six digits including one decimal.
- vi. Date and time blocks of failure of VT supply on any phase, as a star(\*) mark.

d) The active energy (Wh) measurement shall be carried out on 3-phase, 4-wire principle, with an accuracy as per class 0.2 S of IEC-687/IEC-62053-22. In model-A and C, the energy shall be computed directly in CT and VT secondary quantities, and indicated in watt-hours. In model-B and Model D , the energy display and recording

~~element 4 wire or Model C: 2 element , 3 wire) or 5A (model-B: 3 element , 4 wire or Model D: 2 element 3 wire).~~ The reference frequency shall be 50Hz.

(b)The meters shall have a non-volatile memory ~~in which the following shall be automatically stored;~~ and shall be able to measure following parameters in the manner specified, in addition to those specified in the relevant IS:

- ~~i. Average frequency for each successive 15-minute block, as a two digit code (00 to 99 for frequency from 49.0 to 51.0Hz).~~
- ~~ii. Net Wh transmittal during each successive 15-minute block, upto second decimal, with plus/minus sign.~~
- ~~iii. Cumulative Wh transmittal at each midnight, in six digits including one decimal.~~
- ~~iv. Cumulative VARh transmittal for voltage high condition, at each midnight, in six digits including one decimal.~~
- ~~v. Cumulative VARh transmittal for voltage low condition, at each midnight, in six digits including one decimal.~~

(i) Date and time blocks of failure of VT supply on any phase, as a star(\*) mark.

(ii) Net VARh during each successive block with plus sign for reactive power sent out from station busbars and minus sign for reactive power received into the busbars.

(iii)Average Voltage during each successive block.

c) All new meters shall have facility to record and communicate all the parameters in 5 and 15 minutes time block.

Provided that all the existing meters shall gradually have

shall be one fifth of the Wh computed in CT and VT secondary quantities.

- e) The Var and reactive energy measurement shall also be on 3-phase, 4-wire principle, with an accuracy as per class 2 of IEC-62053-23 or better. In model-A or Model C, the Var and VARh computation shall be directly in CT and VT secondary quantities. In model-B or Model D, the above quantities shall be displayed and recorded as one-fifth of those computed in CT and VT secondary quantities. There shall be two reactive energy registers, one for the period when average RMS voltage is above 103% and the other for the period the voltage is below 97%.
- f) The 15-minute Wh shall have a +ve sign when there is a net Wh export from substation busbars, and a -ve sign when there is a net Wh import. The integrating (cumulative) registers for Wh and Varh shall move forward when there is Wh/Varh export from substation busbars, and backward when there is an import.
- g) The meters shall also display (on demand), by turn, the following parameters :
  - (i) Unique identification number of the meter
  - (ii) Date
  - (iii) Time
  - (iv) Cumulative Wh register reading

facility to record data in both 5 and 15 minutes block within the time frame decided by appropriate Regulatory Commission.

~~d)The active energy (Wh) measurement shall be carried out on 3-phase, 4-wire principle, with an accuracy as per class 0.2 S of IEC-687/IEC-62053-22. In model-A and C, the energy shall be computed directly in CT and VT secondary quantities, and indicated in watt-hours. In model-B and Model D, the energy display and recording shall be one fifth of the Wh computed in CT and VT secondary quantities.~~

~~(e)The Var and reactive energy measurement shall also be on 3-phase, 4-wire principle, with an accuracy as per class 2 of IEC-62053-23 or better. In model-A or Model C, the Var and VARh computation shall be directly in CT and VT secondary quantities. In model-B or Model D, the above quantities shall be displayed and recorded as one-fifth of those computed in CT and VT secondary quantities.~~ There shall be two reactive energy registers, one for the period when average RMS voltage is above 103% and the other for the period the voltage is below 97%.

(f) The 15-minute Wh shall have a +ve sign when there is a net Wh export from substation busbars, and a -ve sign when there is a net Wh import. The integrating (cumulative) registers for Wh and VaArh shall move forward when there is Wh/VARh export from substation busbars, and backward when there is an import.

(g)The meters shall also display (on demand), by turn, the following parameters :

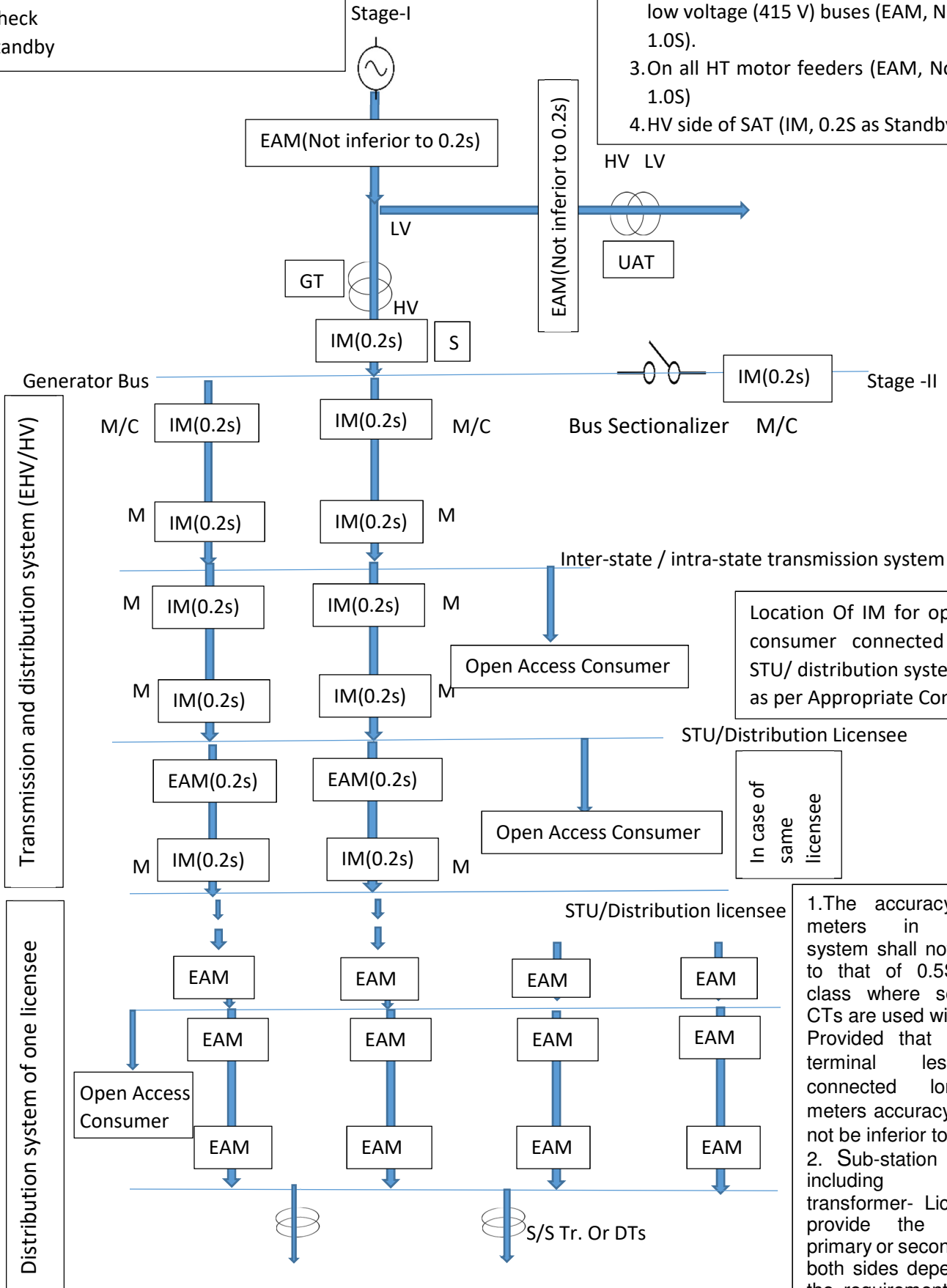
<p>(v) Average frequency of the previous 15-minute block</p> <p>(vi) Net Wh transmittal in the previous 15-minute block, with +/-sign</p> <p>(vii) Average percentage voltage</p> <p>(viii) Reactive power with +/- sign</p> <p>(ix) Voltage-high VARh register reading</p> <p>(x) Voltage-low VARh register reading.</p> <p>h) The three line-to-neutral voltages shall be continuously monitored, and in case any of these falls below 70%, the condition shall be suitably indicated and recorded. The meters shall operate with the power drawn from the VT secondary circuits, without the need for any auxiliary power supply. Each meter shall have a built-in calendar and clock, having an accuracy of 30 seconds per month or better.</p> <p>i) The meters shall be totally sealed and tamper-proof, with no possibility of any adjustment at site, except for a restricted clock correction. The harmonics shall be filtered out while measuring Wh, Var and VARh, and only fundamental frequency quantities shall be measured/computed.</p> <p>j) The Main meter and the Check meter shall be connected to same core of CTs and VTs.</p>	<p>(i) Unique identification number of the meter</p> <p>(ii) Date</p> <p>(iii) Time</p> <p>(iv) Cumulative Wh register reading</p> <p>(v) Average frequency of the previous 15-minute block</p> <p>(vi) Net Wh transmittal in the previous 15-minute block, with +/- sign</p> <p>(vii) Average percentage voltage</p> <p>(viii) Reactive power with +/- sign</p> <p>(ix) Voltage-high VARh register reading</p> <p>(x) Voltage-low VARh register reading.</p> <p><b>(xi) Net VARh transmittal in the previous 15-minute block, with +/-sign</b></p> <p>(h)The three line-to-neutral voltages shall be continuously monitored, and in case any of these falls below <b>780%</b>, the <b>same condition</b> shall be <b>suitably indicated and</b> recorded <b>in the meter memory</b>. The meters shall <b>normally</b> operate with the power drawn from the VT secondary circuits <del>without the need for any auxiliary power supply</del>. <b>In addition, there shall be provision to operate the meter from AC/DC auxiliary power supply</b>. Each meter shall have a built-in calendar and clock, <b>with maximum permissible drift of ±2 minutes per annum. having an accuracy of 30 10 seconds per month or better. All Interface meters shall have a built-in calendar and clock with facility of automatic time synchronization through appropriate communication port/network.</b></p> <p>(i)The meters shall be <b>totally</b> properly sealed and tamper-<b>proof evident</b> with no possibility of any adjustment at site, except for a restricted clock</p>
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		<p>correction. The harmonics shall be filtered out while measuring Wh <del>Var</del> and VArh, and only fundamental frequency quantities shall be measured/computed.</p> <p><del>j) The Main meter and the Check meter shall be connected to same core of CTs and VTs.</del></p> <p><b>(j) All new Interface meters shall have capability of recording frequency in steps of 0.01 Hz.</b></p>
<p><b>Part III Standards for consumer meters</b></p>	<p><b>(1) Measuring Parameters</b></p> <p>a) The consumer meter shall be suitable for measurement of cumulative active energy utilized by the consumer.</p> <p>b) The consumer meter may have the facilities to measure, record and display one or more of the following parameters depending upon the tariff requirement for various categories of consumers. All parameters excluding instantaneous electrical parameters shall also be stored in memory.</p> <ol style="list-style-type: none"> <li>i. Cumulative reactive energy</li> <li>ii. Average power factor</li> <li>iii. Time of use of energy 18</li> <li>iv. Apparent power</li> <li>v. Maximum demand</li> <li>vi. Phase voltage and line currents</li> </ol> <p><b>(2)</b> All the three phase meters shall have data storage capacity for at least 35 days in a non-volatile memory.</p> <p><b>(3) Anti-Tampering Features</b></p>	<p><b>(1) Measuring Parameters</b></p> <p><del>a) The consumer meter shall be suitable for measurement of cumulative active energy utilized by the consumer.</del></p> <p><del>b) The consumer meter may shall have the facilities to measure, record and display one or more of the following parameters depending upon the tariff requirement for various categories of consumers in line with relevant IS. All parameters excluding instantaneous electrical parameters shall also be stored in memory.</del></p> <ol style="list-style-type: none"> <li><del>i. Cumulative reactive energy</del></li> <li><del>ii. Average power factor</del></li> <li><del>iii. Time of use of energy 18</del></li> <li><del>iv. Apparent power</del></li> <li><del>v. Maximum demand</del></li> <li><del>vi. Phase voltage and line currents</del></li> </ol> <p><b>(2) All pre-payment meters shall be as per relevant IS and shall record following parameters in a non-volatile memory:</b></p> <p><b>(i) Energy consumption data (kWh) for last 12 months</b></p> <p><b>(ii) Last 48 entered recharge history with details.</b></p>

	<p>Note: Anti tamper feature as stipulated at (3) (e) above shall not be applicable in case of Renewable Energy Meter.</p>	<p><del>(3)</del>All <del>the three-phase</del> meters shall have data storage capacity for at least 35 days in a non-volatile memory.</p> <p><b>(4) Anti-Tampering Features</b> Note: <b>(i) Respective licensee may adopt additional anti tampering features with approval from appropriate Commission.</b> <b>(ii) Anti-tampering feature as stipulated at (4) (e) above shall not be applicable in case of Renewable Energy Meters.</b></p>
<p><b>Part IV Standards for energy accounting and audit meters</b></p>	<p>(1)The energy accounting and audit meters shall be suitable for measurement, recording and display of cumulative active energy with date and time. (2) The energy accounting and audit meters may also have the facility to measure, record and display one or more of the following parameters depending upon the energy accounting and audit requirement. All parameters excluding instantaneous electrical parameters shall also be stored in memory. (a) Apparent power (b) Phase wise kilowatt at peak KVA (c) Phase wise KVA(reactive) at peak KVA (d) Phase wise voltage at peak KVA (e) Power down time (f) Average power factor (g) Line currents (h) Phase voltages (i) Date and time (j) Tamper events</p>	<p><del>(1)The energy accounting and audit meters shall be suitable for measurement, recording and display of cumulative active energy with date and time.</del> <del>(2) The energy accounting and audit meters may shall also have the facility to measure, record and display one or more of the following parameters depending upon the energy accounting and audit requirement in line with relevant IS. All parameters excluding instantaneous electrical parameters shall also be stored in memory.</del> <del>(a) Apparent power</del> <del>(b) Phase wise kilowatt at peak KVA</del> <del>(c) Phase wise KVA(reactive) at peak KVA</del> <del>(d) Phase wise voltage at peak KVA</del> <del>(e) Power down time</del> <del>(f) Average power factor</del> <del>(g) Line currents</del> <del>(h) Phase voltages</del> <del>(i) Date and time</del> <del>(j) Tamper events</del></p>

IM- Interface Meter  
 EAM- Energy Accounting and Audit Meter  
 CM- Consumer Meter  
 M- Main  
 C- Check  
 S- Standby

1. On each incoming feeder of 3.3kV and above (EAM, Not inferior to 1.0S)
2. LV Side of each incoming transformer feeder of low voltage (415 V) buses (EAM, Not inferior to 1.0S).
3. On all HT motor feeders (EAM, Not inferior to 1.0S)
4. HV side of SAT (IM, 0.2S as Standby)

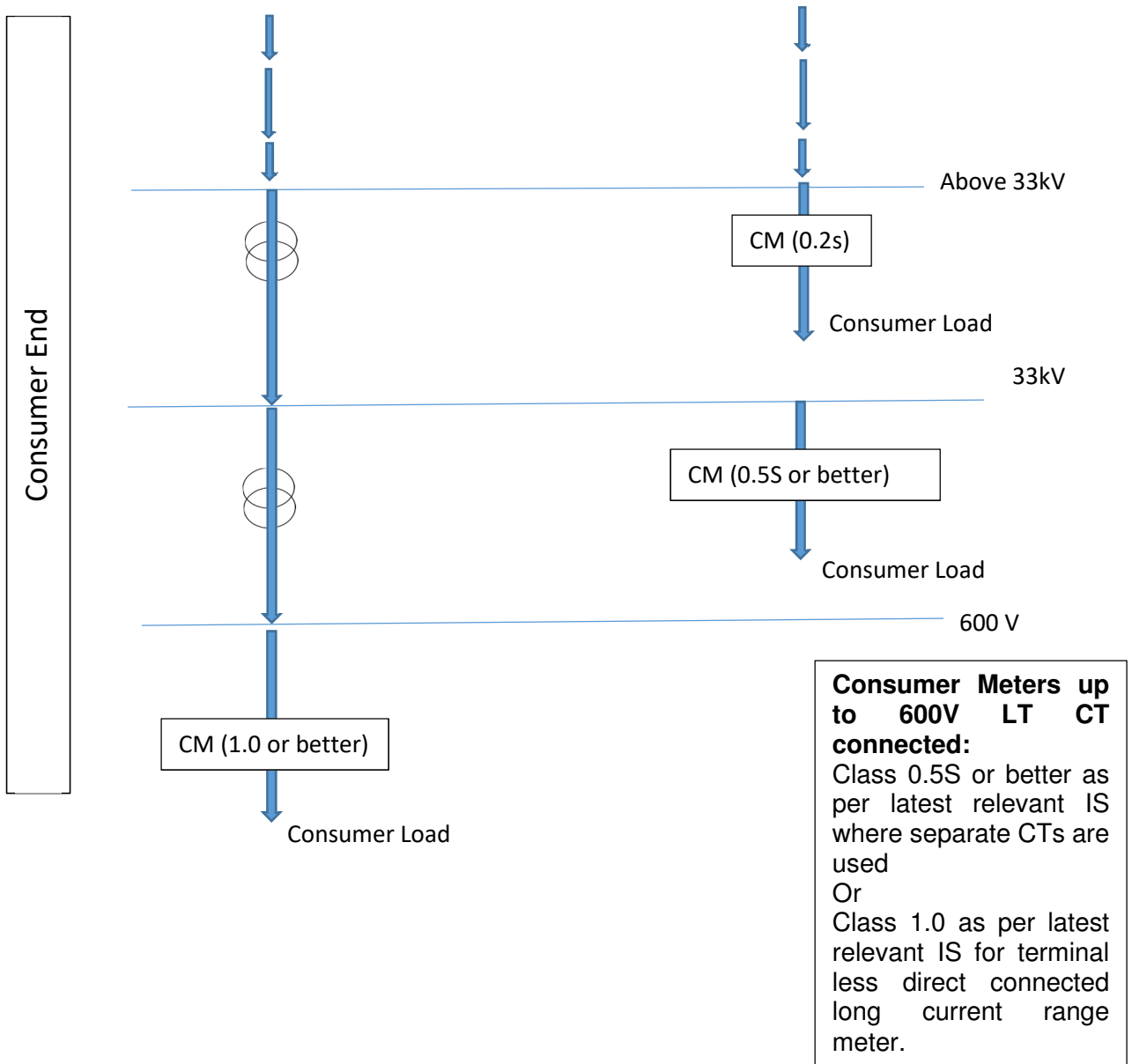


Location Of IM for open access consumer connected to ISTS/ STU/ distribution system shall be as per Appropriate Commission.

In case of same licensee

1. The accuracy class of meters in distribution system shall not be inferior to that of 0.5S accuracy class where separate LT CTs are used with meter. Provided that in case of terminal less direct connected long range meters accuracy class shall not be inferior to class 1.0.
2. Sub-station transformer including distribution transformer- Licensee may provide the meter on primary or secondary side or both sides depending upon the requirement for energy accounting and audit.



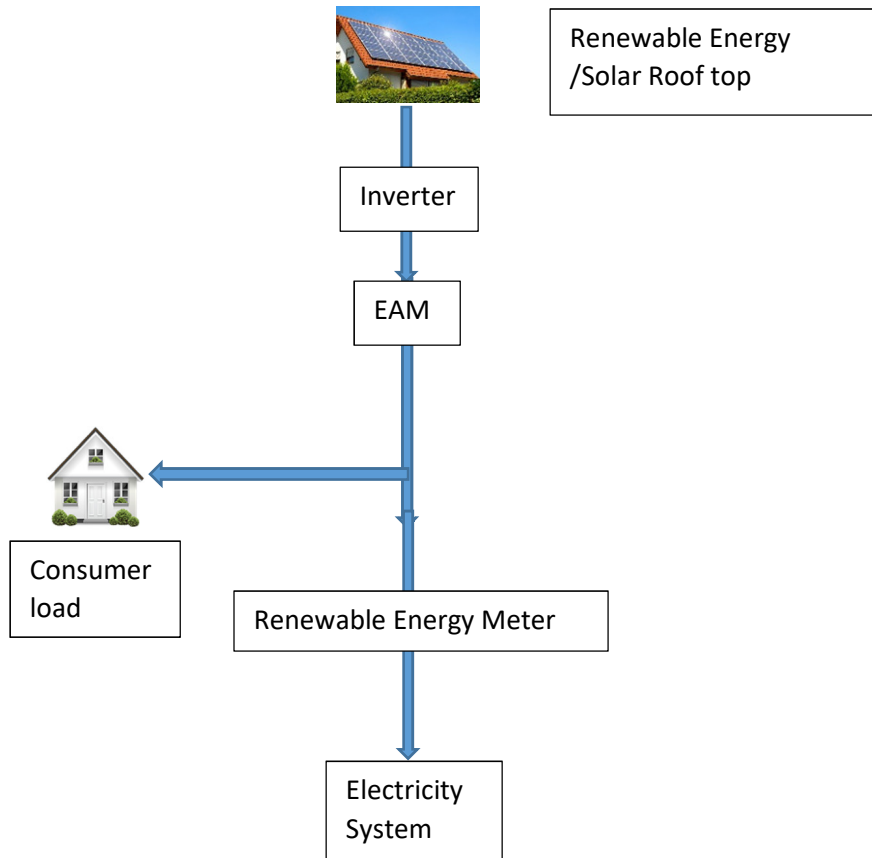


**Note:**

1. Location of Interface Meter at ICT/ Power Transformer:  
 Main meter at HV side  
 Standby Meter at LV side
2. An additional, Energy Accounting and Audit Meter shall be provided at prosumer end for metering renewable energy generated at prosumer premises and its accuracy shall not be inferior to that of Net Meter provided at prosumer premises.
3. The consumer meter shall be installed by the licensee either at the consumer premises or outside the consumer premises.
4. The generating companies or licensees may install interface meters at additional locations in their systems depending upon the requirement.



**Schematic diagram for renewable energy plant located at prosumer premises:**



1. EAM- Energy Accounting and Audit Meter
2. The accuracy class of EAM shall be same as consumer meter.
3. Specifications of Renewable Energy Meter shall be same as that of consumer meter
4. Electricity System shall be as defined in the Electricity Act, 2003.