

CENTRAL ELECTRICITY AUTHORITY

(Installation and Operation of Meters) Regulations, 2006, Dated: 17.03.2006, with amendments Dated: 04.06.2010, 26.11.2014, 23.12.2019.

Sl. No.	Description	Summary
1.	Applicability	<ol style="list-style-type: none"> 1. These Regulations shall be applicable to meters installed and to be installed by all the generating companies and licensees who are engaged in the business of generation, transmission, trading, distribution, supply of electricity and to all categories of consumers. 2. 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 (Installation and Operation of Meters) Regulations, 2006.
2.	Type of Meters	<ol style="list-style-type: none"> 1. (a) all new Interface Meters and Energy Accounting and Audit Meters shall be of static type and shall have automatic remote meter reading facility; (b) all new Consumer Meters shall be Smart Meters with prepayment feature. 2. The meters not complying with these regulations shall be replaced by the licensee on his own or on request of the consumer. The meters may also be replaced as per the regulations or directions of the Appropriate Commission or pursuant to the reforms programme of the Appropriate Government.
3.	Standards	<p>All interface meters, consumer meters and energy accounting and audit meters shall:</p> <ol style="list-style-type: none"> 1. 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 International Electro-technical Commission (IEC) Standards, or any other equivalent Standard shall be followed. 2. Whenever an IEC Standard or any other equivalent Standard is followed, necessary corrections or modifications shall be made for nominal system frequency and nominal system voltage prevailing in India before actual adoption of the said Standard.
4.	Ownership of Meters	<p>Interface Meters:</p> <ol style="list-style-type: none"> (a) All interface meters installed at the points of interconnection with Inter-State Transmission System (ISTS) for the purpose of electricity accounting and billing shall be owned by CTU. (b) All interface meters installed at the points of interconnection with Intra-State Transmission System excluding the system covered under sub-clause (a) above for the purpose of electricity accounting and billing shall be owned by STU. (c) All interface meters installed at the points of inter connection between the two licensees excluding those covered under sub-clauses (a) and (b) above for the purpose of electricity accounting and billing shall be owned by respective licensee of each end. (d) All interface meters installed at the points of inter connection for the purpose of electricity accounting and billing not covered under sub-clauses (a), (b) and (c) above shall be owned by supplier of electricity. <p>Consumer meters</p> <ol style="list-style-type: none"> (a) Consumer meters shall generally be owned by the licensee. (b) If any consumer opts to purchase a meter, the same may be purchased by him as per the technical specifications laid down by the licensee in compliance with these regulations and meter purchased by the consumer shall be tested, installed and sealed by the licensee. (c) All consumer meters shall bear BIS mark, meet the requirements of these regulations and have additional features as approved by the Appropriate

		<p>Commission or pursuant to the reforms programme of the Appropriate Government.</p> <p>Energy Accounting and Audit Meters</p> <p>Energy accounting and audit meters shall be owned by the generating company or licensee, as the case may be.</p>
5.	Locations of Meters	<p>Interface Meters:</p> <p>(a) The location of main, check and standby meters installed at the existing generating stations shall not be changed unless permitted by the Authority.</p> <p>(b) The generating companies or licensees may install meters at additional locations in their systems depending upon the requirement.</p> <p>(c) Generating Station:</p> <ul style="list-style-type: none"> • Main Meter: On all outgoing feeders including bus sectionalizer or tie line between two stages of generating stations having different tariffs or different ownership or both. • Check Meter: On all outgoing feeders including bus sectionalizer or tie line between two stages of generating stations having different tariffs or different ownership or both. • Standby Meter: <ol style="list-style-type: none"> (i) High Voltage (HV) side of Generator Transformers (ii) High Voltage side of all Station Auxiliary Transformers <p>Consumer meters</p> <p>(a) The consumer meter shall be installed by the licensee either at the consumer premises or outside the consumer premises</p> <p>(b) The location of meter and height of meter display from the floor shall be as specified in IS 15707 and as amended from time to time.</p> <p>(c) For outdoor installations, the meters shall be protected by appropriate enclosure of level of protection as specified in the IS 15707 and as amended from time to time.</p> <p>Energy Accounting and Audit Meters</p> <p>The Energy accounting and audit meters shall be installed as per these Regulations locations to facilitate the accounting of the energy generated, transmitted, distributed and consumed in various segments of the power system and the energy loss, namely</p> <ul style="list-style-type: none"> • Generating Stations • Transmission system • Distribution system
6.	Accuracy Class of Meters	Every meter shall meet the requirement of accuracy class as specified in the standards.
7.	Installation of Meters	<ol style="list-style-type: none"> 1. The meter shall be installed at locations, which are easily accessible for installation, testing, commissioning, reading, recording and maintenance. The place of installation of meter shall be such that minimum inconvenience and disruptions are caused to the site owners and the concerned organizations. 2. 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 3. 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 or SMS as applicable, as soon as it comes to it's notice and the same shall be rectified by the consumer within 15 days from such notice by the licensee. 4. In case Instrument Transformer form part of the meters, the meter shall be installed as near as possible to the Instrument Transformer to reduce the potential drop in the secondary leads.
8.	Operation, Testing and Maintenance of Meters	The operation, testing and maintenance of all types of meters shall be carried out by the generating company or the licensee, as the case may be.

9.	Access to Meter	The owner of the premises where, the meter is installed shall provide access to the authorized representative(s) of the licensee for installation, testing, commissioning, reading and recording and maintenance of meters.
10.	Sealing of Meters	<p>1. Sealing Arrangements</p> <p>(a) All meters shall be sealed by the manufacturer at its works.</p> <p>(b) Sealing of interface meters, shall also be done by both the supplier and the buyer.</p> <p>(c) Sealing of consumer meters shall be done by the licensee.</p> <p>(d) Seal shall be unique for each utility and name or logo of the utility shall be clearly visible on the seals.</p> <p>(e) Polycarbonate or acrylic seals or plastic seals or holographic seals or any other superior seal shall be used.</p> <p>(f) A tracking and recording mechanism for all seals shall be maintained by the licensee so as to track total movement of seals starting from procurement (with manufacturer's details), storage, record keeping, installation, series of inspections and removal.</p> <p>2. Removal of Seals from Meters</p> <p>(a) Interface Meters Whenever seals of the interface meters have to be removed for any reason, advance notice shall be given to other party for witnessing the removal of seals and resealing of the interface meter.</p> <p>(b) Consumer Meters Seal of the consumer meter shall be removed only by the licensee. No consumer shall tamper with, break or remove the seal under any circumstances. Any tampering, breaking or removing the seal from the meter shall be dealt with as per relevant provisions of the Act.</p> <p>(c) Energy Accounting and Audit Meters Seal of the energy accounting and audit meter shall be removed only by the generating company or the licensee who owns the meter.</p>
11.	Safety of Meters	<p>1. The supplier or buyer in whose premises the interface meters are installed shall be responsible for their safety.</p> <p>2. The generating company or the licensee who owns the energy accounting and audit meters shall be responsible for its safety.</p>
12.	Meter Reading and Recording	<p>Interface Meters:</p> <ul style="list-style-type: none"> • It shall be the responsibility of the Generating Company or the licensee, in whose premises the meter has been installed, to download the meter data, record the metered data and furnish such data to various agencies as per the procedure laid down by the Appropriate Commission. • The metered data shall be communicated to the respective Load Despatch Centre by using a secured and dedicated communication system. <p>Consumer Meters:</p> <ul style="list-style-type: none"> • It shall be the responsibility of the licensee to download the Meter data either locally or remotely, record the metered data, maintain database of all the information associated with the Consumer Meters and verify the correctness of the metered data. <p>Energy Accounting and Audit Meters:</p> <ul style="list-style-type: none"> • It shall be the responsibility of the generating company or licensee to download the meter data locally or remotely, 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. • 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.

13.	Meter Failure or Discrepancies	<p>1. Interface meters</p> <ul style="list-style-type: none"> Whenever difference between the readings of the Main Meter and the Check Meter for any month is more than 0.5%, follow the procedure as per the regulation. 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 immediately. <p>2. Consumer Meters In case the consumer reports to the licensee about consumer meter readings not commensurate with his consumption of electricity, stoppage of meter, damage to the seal, burning or damage of the meter, the licensee shall take necessary steps as per the procedures given in the Electricity Supply Code of the Appropriate Commission read with the notified conditions of supply of electricity.</p> <p>3. Energy Accounting and Audit Meters Energy accounting and audit meters shall be rectified or replaced by the generating company or licensee immediately after notice.</p>
14.	Anti-tampering Features of Meters	The meters shall be provided with anti-tampering features as per the Standards.
15.	Quality Assurance of Meters	<p>The distribution licensee shall put in place a system of quality assurance and testing of meters with the approval of Appropriate Commission.</p> <p>The licensee shall set up accredited testing laboratories or utilise the services of other accredited testing laboratories.</p>
16.	Calibration and Periodical Testing of Meters	<p>1. Interface Meter</p> <ul style="list-style-type: none"> At the time of commissioning, each interface meter shall be tested by the owner at site for accuracy using standard reference meter of better accuracy class than the meter under test. All Interface Meters shall be tested on-site using accredited test laboratory for routine accuracy testing at least once in five years and recalibrated if required. Testing and calibration of Interface Meters shall be carried out in the presence of the representatives of the supplier and buyer by giving the advance notice to the other party regarding the date of testing. <p>2. Consumer Meters</p> <p>(a) The testing of Consumer Meters shall be done at site through accredited test laboratory at least once in five years and recalibrated, if required.</p> <p>(b) The meter used for testing shall be of better accuracy class than the meter under test.</p> <p>Energy Accounting and Audit Meters</p> <ul style="list-style-type: none"> Energy Accounting and Audit Meters shall be tested at site through accredited test laboratory 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 and defective meters shall be recalibrated, if required. Meter shall have one port for downloading facilities of metered data through Common Meter Reading Instrument (CMRI) and another port/system for remote communication.
17.	Cyber Security	Generating Company and licensee shall comply with cyber security guidelines issued by the Central Government, from time to time, and the technical standards for communication system in Power Sector laid down by the Authority.
18.	Standard Reference Parameters	Standard Reference Voltage, Voltage Range, Standard Frequency, Starting Current and Maximum Current, Power Factor Range, Power Frequency withstand voltage, Impulse voltage withstand test for 1.2/50 micro sec, Power Consumption As per relevant Indian Standards (IS).

19.	Standard Basic Current	As per relevant IS. Current range of consumer meters shall be so chosen as to record the load current corresponding to the sanctioned load.	
20.	Accuracy Class	Meters shall meet the following requirements of Accuracy Class:	
		Interface meters	0.2S
		Consumer meters	
		Up to 650 volts	1.0
		Upto 650 volts CT Connected	Class 0.5S as per relevant IS where separate CTs are used Or Class 1.0 as per relevant IS for terminal less direct connected long current range meters.
		Above 650 volts and up to 33 kilo volts	0.5S
		Above 33 kilo volts	0.2S
		Energy Accounting and Audit Meters:	
<ul style="list-style-type: none"> In generating stations, the accuracy class of meter(s) at a point after the generator stator terminals, before the tap off to the unit auxiliary transformer(s) and at the inverter AC output terminals in case of Renewable Energy generating station, shall not be inferior to that of 0.2S accuracy class. The accuracy class of meters in 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 where separate CTs are used with meter. The accuracy class of Energy accounting and Audit Meters for renewable energy generating station located at consumer premises shall be same as that of consumer meter. 			
21.	Ambient Temperature and Humidity	Temperature range: Limit range of operation: -10 °C to +70 °C Limit range for storage and transport: -10 °C to +70 °C Relative Humidity: up to 100%	
22.	Frequency	Only fundamental frequency quantities shall be measured and computed while measuring Wh and VARh.	
23.	Functional Requirements of interface meters	<ol style="list-style-type: none"> The Interface Meters shall be three phase four wire static type, composite meters, self-contained devices for measurement of active and reactive energy, and certain other parameters are - 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 or 5A. There shall be two reactive energy registers, one for the period when average RMS voltage is above 103% and the other for the period when the voltage is below 97%. The Wh recording 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 three line-to-neutral voltages shall be continuously monitored, and in case any of these falls below 80%, the same shall be suitably indicated and recorded in the meter memory. All new meters shall have capability of recording frequency in steps of 0.01 Hz. 	
24.	Standards for consumers meters	<ol style="list-style-type: none"> The Consumer Meter shall have the facilities to measure, record and display parameters depending upon the tariff requirement for various categories of consumers in line with the relevant Indian Standards. All meters shall have data storage capacity for at least 35 days in a non-volatile memory. Additional anti-tampering features including logging of tampers such as current circuit reversal, current circuit short or open and presence of abnormal magnetic field may be provided as per the regulations or directions of the Appropriate Commission. 	

25.	Standards for energy accounting and audit meters	The Energy Accounting and Audit Meters shall have the facility to measure, record and display parameters depending upon the energy accounting and audit requirement of the respective Generating Company or licensee in line with relevant Indian Standards. The energy accounting and audit meter shall have data storage capacity for at least 35 days in a non-volatile memory.
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