

CODE OF PRACTICE OF METERING

In compliance of RERC (Metering) practice directions order 2021, the metering committee issuing the code of practice of metering.

1. **Functional requirement of Interface Meters**

- I. The three line to-neutral voltages shall be continuously monitored, and in case any of these falls below 70% for more than 5 minute with restoration time of within one minute, 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.
- II. The meters shall be power up with battery of life at least 15 years in case the VT supply not available for downloading of reading.
- III. The meter shall have non volatile memory and data should retained for a period of not less than 10 years.

2. **Facility for Metering System.**

1. Interface and Energy Accounting Meter
Each generating company or licensee, in whose premises a meter is to be installed, shall make available the required space for the meter and metering system to facilitate the installation in the premises and shall provide access to the licensee for meter readings (including data downloading and communication), its operation, maintenance and testing.
2. Consumer Meter
 - I. The consumer in whose premises the meter is installed shall provide space for location of meter at the main entrance or working entrance of the premises for ease of access to the Licensee for meter readings (including data down loadings and communication), its inspection, maintenance and testing.
 - II. Where access is denied to licensee's employees, agents/duly authorized representative for inspecting, testing, calibrating, sealing, replacing the damaged meter, collecting the data, joint meter reading, recording, other functions necessary and other mutually agreed functions, a notice will be served as per provisions of Supply Code to provide the same. In case access to consumer meter (including open access consumer) is not provided within notice period, his supply can be disconnected. In case of repeated failures, premises/location of installation of meter may be altered.

3. **Inspection Testing and Calibration:**

(1) Calibration and testing in laboratory

A. "Interface meters" and "Energy accounting & audit meters".

I. Test facility for Interface meter instrument and Energy accounting & audit meter instrument testing shall be as under:

a) The STU will have at least one Automatic meter test bench with high accuracy, static source and 0.02 class electronic reference standard meter. This bench with 0.02 class reference standard shall also be used for testing and calibration of portable test sets.

b) Portable test set with static source and electronic reference meter of 0.10 class or one class better accuracy than meter under test shall be used for verification and joint testing of accuracy of static meters at site on regular/routine basis.

c) The testing of Meters will be done by DISCOM and witnessed by RVPN.

4. **Metering System Requirement**

Consumer meter.

a) Location: Consumer meters shall be provided as per provisions of Supply Code. Meters shall generally be installed inside the consumer's premises near the main/working entrance where sufficient space for meter box (for LT consumers up to 50 kVA connected load) or a suitable lockable enclosure for HT consumer is reserved by the consumer and at Sub-station(delivery point) in case of dedicated feeder. The meters shall be installed at proper place, height and in shade to prevent damage to the meter by rainwater etc.

b) Metering cabinet (Box).

I. Meters for LT consumers shall be housed in the meter-box and for HT consumers in metering cabinet provided/ approved by the licensee.

II. No fuse will be provided inside the meter box in order to keep the meters and CTs free from the external tampering. The meter box shall be opened only in the presence of the authorized Engineer of the licensee. Fuses may be in series with line isolator for HT supply, where considered necessary from protection point of view.

- III. For 11kV HT consumer's arrangement of meter cabinet/box which houses CT/PT units and metering equipment inside, shall be installed at consumer's premises in a room exclusively meant for the purpose. The connections from licensee's line and the consumer's premises shall be through 11kV Cables.
- IV. For supply at 33kV, the CT-PT set shall be outdoor type panel mounted / double pole structure mounted and the connections from licensee's line to consumer's premises if so required shall be through 33kV cables.
- V. Secondary wires connections shall be through armoured cable to the meter cabinet in case of HT consumers on 33kV or 11kV, having outdoor CTs and PTs or CT-PT set, .The cable shall be laid in G.I. pipe and not embedded in the ground.
- VI. Cable entry into the marshalling box of the instrument transformers as also the meter box/control panel shall be through glands and check nuts, which may further be sealed with epoxy compound.
- VII. Tight fitting PVC sleeves, Raychem or any other equivalent make, press & heat shrinkable type epoxy sleeves shall be applied for at least 1.5 meter on connections/jumpers from outdoor instrument transformers bushing terminals.
- VIII. Meters shall be kept as near to the instrument transformers as possible.
- IX. HT metering unit including instrument transformer, shall be mounted on double pole/ housed in H.T. cubicle so that licensee's officers can approach the location without assistance of the HT consumers.

5. **Maintenance of the Metering System.**

Breaking of the seals before maintenance and replacement of seals after Maintenance shall be carried out by the respective agency as under:

- a) Interface meters:- by the authorized persons jointly and/or with mutual consent of concerned parties.
- b) Energy accounting and audit meters: - by the generating company or the licensee as the case may be.
- c) Consumer meters: - by the authorized person in presence of the consumer/Representative of consumer.

6. Mechanism for Dispute Resolution: -

1. Any dispute of metering accuracy shall be resolved by testing the meter at accredited licensees laboratory or an independent NABL accredited laboratory approved by the Commission. The aggrieved parties may depute their representative to witness the testing.
2. Based on the report of meter testing, the power consumption of a consumer for the dispute period shall be assessed under the provision of Supply code and Terms and Conditions of Supply framed by the respective distribution licensees. As regards disputes the consumer may approach grievance redressal forum or other settlement mechanism constituted by the Licensee with a right to appeal before the Ombudsman without prejudice to other rights which consumer may otherwise have.
3. The metering disputes between the generating companies (including RVUN, CPPs), transmission licensees (including RVPN), distribution licensees or a trader shall be settled in accordance the with procedures given in relevant PPAs or Bulk Supply Agreements as the case may be or by reference to the Commission.
4. In case of interface meters, in the event of main meter or more than one meter provided becoming defective, the order of precedence for billing shall be (a) main (b) check (c) standby.

7. Remote Transmitting Units and Transducers.

1. The RTU and Transducers shall be used for SLDC/Sub SLDC data acquisition and monitoring of grid operation and the data so obtained may be used as standby to automatic/remote metering schemes and vice versa.
2. Instantaneous value of following data shall be made available or through transducers and RTUs from selected individual stations to sub-load dispatch center and load dispatch center continuously.
 - (a) MW (Import/export).
 - (b) MVAR (Lag and lead).
 - (c) Voltage.

- (d) Current.
 - (e) Frequency.
 - (f) The status of various isolators, circuit breakers and transformer tap positions shall be communicated through RTUs.
3. The transducers shall be suitable for 3 phase 4 wire MW and MVAR measurement Single transducer giving output of MW, MVAR, voltage, frequency and ampere shall be preferred in place of individual transducers for each metering point.
 4. The RTU shall be located in the PLCC room or at location as per optimum cabling requirement. The size of the CT & VT cable to the transducer shall be the same as provided in the metering circuit.
 5. The data collected by transducers and fed to RTU shall be processed in the RTU and output will be provided in the digital telegraphic form. Transmission of these data to the load dispatch center can be through any of the communication links or private network of licensee or low power radio. The data shall again be processed at the load dispatch end in Data Concentrator Unit and converted to analog data and displayed on the monitor screen. The RTU shall be utilized for monitoring and for remote control of feeders / breakers, located at remote sub-stations.

8. 1A or 5A Meters

Meter of 5A shall be provided upto 33kV level and Meter of 1A shall be provided above 33kV level.

9. The smart meters will also have the facility to measure, record and display at home page for consumer purpose of the following parameters:
 1. Current Parameters
 - (a) Date and time
 - (b) KWH
 - (c) KVAH (Only for Three Phase)
 - (d) KVA (Only for Three Phase)
 - (e) KW
 - (f) Phase Currents
 - (g) Phase Voltage
 - (h) Power factor

2. Billing Parameters
 - (a) KWH
 - (b) KVAH (Only for Three Phase)
 - (c) KVA (Only for Three Phase)
 - (d) Average Power factor

10. The meters for Net/Gross metering will also have the facility to measure, record and display at home page for consumer purpose of the following parameters:
 1. Current Parameters
 - (a) Date and time
 - (b) KWH (Imp/Exp)
 - (c) KVAH (Imp/Exp)
 - (d) KVA (Imp/Exp)
 - (e) KW (Imp/Exp)
 - (f) Phase Currents
 - (g) Phase Voltage
 - (h) Power factor

 2. Billing Parameters
 - (a) Net KWH (Imp/Exp)
 - (b) KWH (Imp/Exp)
 - (c) KVAH (Imp/Exp)
 - (d) KVA (Imp/Exp)
 - (e) Average Power factor

The Meter shall be provided proper identification for Net/Gross Meters.