



TRANSMISSION COMPANY OF NIGERIA (TCN) MARKET OPERATIONS

GENERAL SPECIFICATIONS FOR NIGERIAN ELECTRICITY MARKET (NEM) COMPLIANT ENERGY METERS IN LINE WITH THE PREVAILING CODES

POWER SUPPLY:

Voltage: - 3x 11000/110V ,33000/110V, 132000/11 and 330000/110V.

Current: - 3 X -/1A 3 X -/1A, 3 X -/5A

Frequency: - 50Hz

System: - 3-Phase 3 wire (or 3-Phase 4 wire for 11,) 33, 132 and 330KV

Secondary voltage variation:- 85V—135V

Supply frequency variation:- +5%

Internal Battery: - Lithium CR20255 –1HF or an equivalent giving a total Stand-by life of 10 years (minimum)

Auxiliary Battery: - Embedded in the meter for down-loading stored data during power outage.

ACCURACY CLASS

(1) **0.2** for 11, 33, 132 and 330kv voltage levels; (**Voltage Programmable**)

DLMS/COSEM COMPLIANCE - For interoperability with other meter makes, with respect to AMR and specifically compliant with ITRON-MV-90 AMR and other Remote Metering systems being implemented by the various Market participants.

BURDEN:

Voltage Circuit: - 1.12W or 2.45VA

Current Circuit: - /5A Meter 0.12 VA; /1A Meter 0.02VA

CASING

Material:- The casing shall be for panel or wall mounting with fire retardant type of Bakelite or Polycarbonate.

Screws: - All Screws should be stainless steel or nickel – plated brass.

Current Terminals: Screw type 2 per terminal (6mm); Cable size: 4.0mm².

Voltage Terminals: Screw type: 1 per terminal (4mm); Cable: 2.5mm².

Auxiliary Terminal: Screw type: 3mm; Cable: 1.5mm².

INSULATION

- 2.0 KV for 1 minute for current circuit
- 2.0 KV for 1 minute for voltage circuit
- 4.0 KV for 1 minute for current, voltage, all relay contacts plus auxiliary inputs plus the RS232/485 ports together.

4.0 KV for 1 minute between all relay contacts and the auxiliary input plus communication port (RS232 or RS485)

4.0 KV for 1 minute between one set of relay contacts and the other relay contacts.

MEASURED QUANTITIES:

- Import KWH
- Export KWH
- Import KVARH

- Export KVAh
- Apparent KVA maximum Demand
- Four Quadrant KVAh
- Load Profile (180-450days)

Line parameters e.g. line voltage, current, power factor, active and reactive power, phase angle, frequency and phase rotation.

TARIFFICATION:

Time of use register

Maximum demand register

Integration period options: 15 min, **30 minutes** etc.

Switching & Seasons times, Billing dates and End of billing dates etc.

DISPLAY

The display should be capable of displaying Default, and Utility modes with user-friendly scrolling buttons.

EVENTS MONITORING:

The meter should be able to monitor the following events among others:-

Battery Fail Indication

Battery Elapse Warning

Meter Fail Indication

Reverse Run Warning

- Over Current

- Phase Failure

- Partial Demand

- Meter Communication Event

- Time and Date of Events etc.

DATA STORAGE:

Capable of storing metered quantities as end-month historical values for up to 32 months.

COMMUNICATION:

- RS232 and RS485 fitted as standard
- Optical port: - Opto – Electronic, Bi-directional
- Protocol: - Flag IEC 62056 - 21 (formerly IEC 61107)
- Built-in GSM Modem, GPRS compatible with omni-directional antenna

SAFETY CLASS

- Category - EN61010, EN61011 Class II;

REAL TIME CLOCK:

- Type: - Capable of synchronizing to A.C. Supply or to a crystal Oscillator
- Accuracy: - Better than 0.5 of a second per day at 50oC

Note:

For reference, the following are the tested compliant trading point meters in the grid. You may still want to explore others, subject to MO's certification of compliance within three months of reference to compliant meters in the circuit:

- **EDMI; ITRON; L&G and EMH**

For further clarifications, please contact the GM(Technical) Market Operations TCN.

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