

TECHNICAL SPECIFICATIONS

FOR

SINGLE PHASE STATIC METER

Technical Specifications for Single Phase Static Meter

The equipment covered by these broad specifications shall conform to the requirements stated in latest editions of relevant Indian/ IEC Standards and Regulations.

1.0 STANDARDS APPLICABLE:

Unless specified elsewhere in this specification, the performance & testing of the meters should conform to the following Indian/International standards, to be read with up to date and latest amendments/revisions along with additional requirements at Annexure-I.

| S. No. | Reference Detail | Reference Title |
|---------------|-------------------------|--|
| 1 | IS 13779 (1999) | A.C. Static Watt hour meter class 1.0 and 2.0 |
| 2 | CEA Regulation (2006) | Installation and operation of meters Dtd: 17/03/2006 |
| 3 | CBIP – TR No. 325 | Guide on A.C.Static Electrical Energy Meters - Specification (latest amendment). |
| 4 | IS 9000 | Basic Environmental testing procedure for electrical and electronic items. |
| 5 | IS 12346 (1999) | Specification for testing equipment for A.C.Electrical energy meter. |
| 6 | IS11000 (1984 | Fire hazard testing |
| 7 | IEC 62052-11 (2003) | Electricity Requirements (AC) General Requirements Tests and Test conditions for A.C.Static Watt hour meter for active energy Class 1.0 and 2.0. |
| 8 | IEC 62053-21 (2003) | A.C.Static Watt hour meter for active energy Class 1.0 and 2.0 |
| 9 | IS 15707 (2006) | Testing Evaluation installation and maintenance of AC Electricity Meters- Code of practice. |
| 10 | IEC 60068 | Environmental testing |

2.0 GENERAL TECHNICAL REQUIREMENTS:

| Sl. No. | Particulars | Standard Specification |
|----------------|--|--|
| 1 | Type of the meter | Single phase two wire, whole current meter, direct reading type w/o any meter constant |
| 2 | Accuracy Class | 1.0 |
| 3 | Basic Current (I _b) & rated max. current (I _{max}) | I _b = 10 Amp, I _{max} = 60 Amp. |
| 4 | Operating Voltage | Voltage +20 % to -40 % of V _{ref} . However the meter should withstand the maximum system voltage |
| 5 | Operating Frequency | F = 50 Hz ± 5 % |

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| 6 | Power consumption | As per IS |
| 7 | Starting Current | 0.2 % of Ib |
| 8 | Short time over current | 1800 A for 0.01 sec |
| 9 | Influence of heating | External surface of the meter shall not exceed 20 K at 45° C ambient temperature |
| 10 | Rated impulse withstand voltage | 8 KV |
| 11 | AC withstand voltage for 1 minute | 4 KV |
| 12 | Insulation resistance | |
| a | Between Frame & voltage & current Circuit | 5 M Ohm |
| b | Between each current Circuit & other circuit | 50 M Ohm |
| 13 | Mechanical requirement | As per Clause of 12.3 of IS 13779 |
| 14 | Resistance to heat & fire | Shall not be ignited by thermal overload & material shall be fire retardant |
| 15 | Protection against penetration of dust & water | Degree of protection IP: 51 as per IS 12063 w/o suction in meter |
| 16 | Resistance against climatic influence | Clause 12.6 of IS: 13779 |
| 17 | Electromagnetic compatibility | Requirement shall be as per CBIP technical report no. 325 |
| 18 | power factor range | Zero Lag - Unity- zero Lead |
| 19 | Energy measurement | Fundamental energy + Energy due to harmonics |
| 20 | Test Output Device | Flashing LED visible from the front |
| 21 | Billing Data | <p>a) Meter serial number, Date and time, KWH, MD in KW, History of KWH & MD for last 6 months along with TOD readings & meter shall log monthly ON/ Off hrs as history. Meter shall be capable of recording KVAh and power factor parameters, wherever applicable.</p> <p>b) All these data shall be accessible for reading, recording, and spot billing by downloading through optical port on CMRI or Laptop computers at site</p> |

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| 22 | MD registration | <p>a) Meter shall store MD in every 30 minutes period along with date & time. At the end of every 30 minutes new MD shall be previous MD and store whichever is higher and the same shall be displayed.</p> <p>(b) It should be possible to reset MD automatically on the defined date.</p> |
| 23 | Auto reset of MD | The MD resetting shall be automatic at the 1 st of the month i.e. 0000 hours of 1st of the month. Manual MD reset button shall not be available. Provision shall be made to change MD reset date through MRI even after installation of meter on site. |
| 24 | TOD metering | Meter shall be capable of doing TOD metering for KWH, & MD in KW with 6 time zones wherever applicable. It shall be possible to reconfigure the meters for TOD Tariff, billing date, RTC etc. through proper authentication process via communication port. |
| 25 | Climatic condition | The meter should function satisfactorily with temperature ranging from 0-60°C and humidity upto 95% |
| 26 | Calibration | Meter shall be calibrated at factory and modification in calibration shall not be possible at site by any means. Certified by manufacturer. |
| 27 | Meter Sealing | As per IS 13779 & CEA metering regulation 2006 |
| 28 | Memory | Non-volatile memory independent of battery backup, memory should be retained upto 10 year in case of power failure. |
| 29 | Battery | In case battery removal or total discharge same should not affect the working & memory of the meter. |
| 30 | Load Survey | 36 Days Load Survey for KW with 30 min integration period |
| 31 | Connection diagram | Shall be provided on terminal cover |
| 32 | Initial Startup of meter | Within 5 sec after ref voltage is applied to the meter terminal |
| 33(a) | Internal dia of the terminal hole | As per CBIP |
| 33(b) | Depth of the terminal hole | 25 mm |
| 34 | Clearance between adjacent terminal | 10 mm |

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| 35 | Display | LCD (6 Digit), Height 10 mmX6 mm, pin type, viewing angle min 160 degrees |
| 36 | Security feature | Programmable facility to restrict the access to the information recorded at different security level such as read communication, communication write etc. |
| 37 | Software/ Communication Compatibility/ Communication port | <p>Optical port with RS 232 compatible to transfer the data locally through CMRI & remote through PSTN / Optical fiber / GSM / CDMA / RF / any other technology to the main computer.</p> <p>The Supplier shall supply Software required for CMRI (Atleast for Analogic & SANDS make) & for the connectivity to AMR modules. The software should be compatible to Microsoft Windows systems. The software should have polling feature with optional selection of parameters to be downloaded for AMR application.</p> <p>The Supplier shall provide meter reading protocols.</p> |

Annexure-I

Additional Requirement for Single Phase Energy Meter

| S. No. | Features in addition to BIS | |
|--------|---|---|
| | Features | Requirement |
| 1 | Functional <ul style="list-style-type: none"> Starting current | 0.2 % of I_b |
| 2 | Measuring Parameters | Cumulative kWh Cumulative KVAh, wherever applicable Real time & Date Maximum Demand Six Month History Time of Day tariff ON/ Off hours Instantaneous Voltage Instantaneous Current Instantaneous Load KW Meter Sr. No. |
| 3 | Anti Tamper Features | I/C & O/G Interchanged Phase & Neutral Interchanged I/C Neutral Disconnected, O/G Neutral & Load Connected To Earth. I/C Neutral Disconnected, O/G Neutral Connected To Earth Through Resistor & Load Connected To Earth. I/C Neutral connected, O/G Neutral Connected to Earth through Resistor & Load Connected to Earth. I/C (Phase & Neutral) Interchanged, Load Connected To Earth. I/C & O/G (Phase or Neutral) Disconnected, Load Connected To Earth. Single wire temper (Neutral Missing) Reverse energy Neutral wire energy measurement Neutral wire energy measurement Welded meter body Tamper history |
| 4 | Tamper logging | Low Voltage Protection against HV spark External Magnetic tampers Write Transactions Top cover Open Abnormal Power off |
| 5 | EL LED | EL LED |
| 6 | Additional Features(optional) | <ul style="list-style-type: none"> Mid night data Temperature logging Power factor recording KVAh Net Metering |