ENERGY COMMISSION OF SABAH

GP(E)/ECoS/002/2024

GUIDELINES

FOR ELECTRICITY METERS: APPROVAL, TESTING AND INITIAL VERIFICATION REQUIREMENTS

Electricity Supply Enactment 2024

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ELECTRICITY SUPPLY ENACTMENT 2024

GUIDELINES FOR ELECTRICITY METERS: APPROVAL, TESTING AND INITIAL VERIFICATION REQUIREMENTS

[GP(E)/ECoS/002/2024]

IN exercise of the power conferred by Section 101 of Electricity Supply Enactment 2024, the Commission issues the following guidelines.

Citation and Commencement

1. These guidelines may be cited as the Guidelines for Electricity Meters: Approval, Testing and Initial Verification Requirements ("Guidelines").
2. These Guidelines shall come into operation on the date of its registration.

Purpose of these Guidelines

3. The purpose of these Guidelines is to set out the requirements to be fulfilled by manufacturer for the electricity meter before it can be installed at any premises.

Amendment and Variation

4. The Commission may at any time modify, vary, review or revoke these Guidelines.

Dated: 3rd January 2024

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PART 1 PRELIMINARY

Interpretation

1. In these Guidelines, unless the context otherwise requires:

"Accredited Laboratory" means a testing facility accredited to MS ISO/IEC 17025 general requirements for the competence of testing and calibration laboratories or other laboratory recognised by national accreditation and standardisation authority.

"Accredited Certification Bodies" means accredited by Standards Malaysia.

"Accreditation and Standardisation Authority" means Department of Standards Malaysia.

"Applicant" means any company who is supplied electricity meter to licensee used for the sale of electricity.

"Authorised Manufacturer" means any company who manufactures electricity meters which complies with these Guidelines and operates a quality management system which conformsto MS ISO 9001 or equivalent.

"Batch Certification" means conformity assessment requirement for imported meters through consignment or batch testing.

"Certificate of Approval" means approved document issued by Commission (in line with Regulation 100 of Electricity Supply Regulations 2024).

"Certificate of Pattern Approval" means approved document issued by National Measurement Standard Laboratory.

"Commission" means Energy Commission of Sabah.

"Consumer" means as prescribed in the Enactment.

"Electricity Meter" means self-contained measuring instrument intended to measure electrical energy continuously by integrating power with respect to time and to store the result.

"Enactment" means the Electricity Supply Enactment 2024.

"International Recognised Laboratory" means an international testing and calibration laboratory which is accredited by recognised international accreditation and standardization body which signatory to Asia Pacific Laboratory Accreditation Cooperation (APLAC) or International Laboratory Accreditation Cooperation (ILAC), Mutual Recognition Arrangement (MRA).

"Licensee" means as prescribed in the Enactment.

"National Measurement Standards Laboratory" means National Metrology Laboratory (NML), SIRIM Berhad.

"Pattern Approval" means a meter type which has been evaluated and approved by a National Measurement Standards Laboratory through compliance with International Organization of Legal Metrology (OIML) standards, and by then issued a Certificate of Pattern Approval.

"Product Certification" means a conformity assessment system operated by Accredited Certification Bodies related to product to which the same product certification requirements, specified standard and procedure including relevant regulatory provisions apply.

"Product Certification License" means a document issued by Accredited Certification Bodies recording the conformance of a product to the specified standard(s) and the Accredited Certification Bodies certification requirements in accordance to the product certification agreement.

"Reference Standard" means electricity measurement standard which traceable to national standards by periodic calibration interval National Measurement Standards Laboratory.

"Testing facility" means a combination of meter test bench and working standards, used for the testing and verification of electricity meters.

"Transfer Standard" means a Standard that has been verified by comparison to a Reference Standard and is used to compare Working Standards indirectly against Reference Standards.

"Type Test Report" means a full type test report issued by an independent accredited test laboratory recognised by accredited certification bodies.

"Working Standard" means a standard that has been verified by comparison to a Reference Standard or to a Transfer Standard and is used for testing and verification of electricity meters. Test equipment used for onsite testing and dispute resolution is deemed 'Working Standards'.

"Year" means calendar year, according to the Gregorian calendar.

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PART 2

APPROVAL REQUIREMENT

Obligation of Parties to Ensure Fairness

2. The sale of electricity through electricity meters shall be subjected to practices that ensure fairness and equity for both the customer and the supplier. Both parties must understand their rights and responsibilities. Meters and their installation must be practical and where appropriate, consistent with international standards.

Regulatory Requirement on Electricity Meters

3. (1) In ensuring all meters when manufacture is in compliance with the regulatory requirement, reference to **Annex 1** stipulate the overall regulatory requirements that need to be complied with by manufacturer for the electricity meter before it can be installed at any premises.

(2) With a view to use for trade, the pattern or design of electricity meters shall be approved by National Measurement Standard Laboratory.

(3) All electricity meters used for billing purposes by a licensee must be certified by Accredited Certification Bodies to show that, when tested, they conformed to the original pattern approval and operated within the prescribed levels of accuracy.

(4) The licensee shall be supplied with appropriate documentation to certify that all meters are manufactured and individually tested in accordance with MS Standards, where the standards state it is applicable to newly manufactured electricity meters and the requirements of this guideline.

Appropriate Meter

4. For the purpose of Subsection 50 (6) of the Enactment, a meter is appropriate if it complies with the following requirements;
   (a) MS 62053-21: Static Meters for active energy (classes 0.5);
   (b) MS 62053-22: Static Meters for active energy (classes 0.2S and 0.5S);
   (c) MS 62053-23: Static Meters for reactive energy (classes 2 and 3);
   (d) MS 62052-11: Electricity metering equipment (AC) – General requirements, tests and test conditions, Part 11: Metering equipment; and
   (e) Metering Code as specified in the Sabah Distribution Code.

Pattern Approval

5. (1) Before any electricity meters can be manufactured, the authorised manufacturer shall apply to the National Measurement Standards Laboratory for Pattern Approval, where such approval may include metrological performance and maintaining calibration in the range of operating conditions that is stated in this guideline.

   (2) The process for Pattern Approval includes an assessment of the prototype of the electric meter to ensure that they meet the required standards. Type Test Report of the product shall be included.

   (3) Once approved, a Certificate of Pattern Approval will be issued by National Measurement Standards Laboratory. Evaluation report and recommendation for new Pattern Approval will be then issued by National Measurement Standards Laboratory.

   (4) Any changes to the pattern found during Product Certification audit, shall be reported to National Measurement Standards Laboratory and Commission.

   (5) The validity of Type Test Report is not more than 10 years and for new application, the validity period must not less than 1 year.

   (6) Pattern Approval validity is 10 years.

Certificate of Approval (COA)

6. (1) The authorised manufacturer shall apply to Commission for new meter to have Certificate of Approval (COA).

(2) The application shall be done via ECoS online services or any other method as specified by the Commission. Type Test Report shall be included and Commission will verify the validity and authenticity of the report.

(3) Once approved, a Certificate of Approval will be issued by Commission and must be renewed every year.

Product Certification

7. (1) Accredited Certification Bodies, with the participation of the Commission where necessary, will carry out preliminary examination and evaluation of manufacturing production of electricity meters.

(2) Authorised manufacturer shall submit the Certificate of Pattern Approval or letter of consent from NMSL, Certificate of Approval and Type Test Report during application to Accredited Certification Bodies.

(3) Accredited Certification Bodies will evaluate the Type Test Report in which referring to stipulated requirements and international standards. The validity of Type Test Report is not more than 10 years and for new application, the validity period must not less than one year.

(4) Pre-requisite for the audit, the manufacturer shall have Accredited Laboratory or the meters shall be calibrated and tested by Accredited Laboratory.

(5) Accredited Certification Bodies will perform the audit on the production of electricity meters to ensure that the quality system and product conform to the stipulated requirements and standard. Verification test may be conducted using in depth surveillance method according to accredited test laboratory practices.

(6) Examination of the facts from the verification tests will be documented in the test report that will determine the basis for the certification of the product.

(7) Only authorised manufacturer with electricity meters that complies with product certification processes and received a valid Certificate of Approval by the Commission will have the right to affix the Accredited Certification Bodies certification mark or label on electricity meters.

(8) Surveillance audit by Accreditation Certified Bodies with the participation of Commission where necessary will be performed every year.

(9) Where non-conformity or defects identified in the production process or during the auditing process control of the electricity meters, Accredited Certification Bodies will require the manufacturers to do corrective action within a reasonable period of time. Accredited Certification Bodies will confirm satisfactory action has been implemented by the Authorised Manufacturer before issuing the product certification license.

(10) If the action taken is not satisfactory or if additional testing fails to meet specified criteria, the Accreditation Certified Bodies in consultation with the Commission shall issue a notice of suspension of production to the manufacturer.

(11) If a Certificate of Approval has been issued, the Commission has the right to revoke or suspend it under the following circumstances:

i) if the Authorised Manufacturer has failed to maintain its quality control such that the electricity meters installed in the consumers' premises are found to be of non-compliance to the requirement of this guideline;

ii) if the Authorised Manufacturer is found to have made false declaration or giving misleading information;

iii) if the Authorised Manufacturer ceases its operation or in the process of winding up;

iv) if there is a Court order to the effect of preventing the use of such meter;

v) if the usage of the particular meter can pose danger to the consumer; and

vi) any other circumstances that the Commission feels reasonable to suspend or revoke in view of public interest.

(12) Once the Certificate of Approval is suspended or revoked, the manufacturer is not permitted to use the Accredited Certification Bodies certification mark or labels on electricity meters.

(13) The Authorised Manufacturer shall be required to comply with the Accredited Certification Bodies procedures with regards to suspension, revocation, withdrawal and termination of product certification license.

Batch Certification

8. (1) Every imported electricity meter shall be verified through the batch certification procedure, performed by Accredited Certification Bodies.

(2) Applicant shall submit application to Accredited Certification Bodies with complete documentation. Document required as mentioned in sub-requirement 7(2).

(3) The evaluation of document by applicant as mentioned in sub-requirement 7(3).

(4) The consignment test shall be performed by sampling method. Approval is given only to consignments which have satisfactorily gone through the inspection and testing process.

(5) Only applicant with electricity meters that complies with batch certification processes and received a valid Certificate of Approval by the Commission will have the right to affix the Accredited Certification Bodies certification mark or label on electricity meters.

Markings

9. (1) The electricity meter shall be legibly & durably marked as a minimum with the followings:

a) Manufacturer
b) V_{nom}
c) I_{max}
d) f_{nom}
e) I_b / I_n
f) Serial number
g) Number of phases
h) Number of wires
i) Meter constant (s)
j) Year of manufacture
k) Accuracy class
l) Directionality of energy flow if the meter is bidirectional or unidirectional. No marking is required if the meter is capable only of positive direction of positive direction energy flow

m) Meter type

n) The connection mode (s) for which the meter is specified

o) Connection terminals uniquely identified to distinguish between terminals

p) “Product Certification” mark or labels approved by Commission

(2) The marking on the meters shall be indelible, distinct and legible from outside the meter. The markings of electricity meter intended for outdoor locations shall withstand solar radiation. If the serial number is affixed to dismountable parts, the serial number shall also be provided in a position where it is not readily dissociated from parts determining the metrological characteristics.

(3) Electricity meters shall be provided with suitable means of sealing metrological sensitive parts. A seal is used to provide security for the electricity meter from tampering and it can be in the form of a crimped security seal or any suitable form.

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PART 3

TESTING & INITIAL VERIFICATION

Initial verification

10. (1) Every electricity meter shall be tested and calibrated with the applicable standard(s) by Authorised Manufacturer with an Accredited Laboratory.

(2) Initial verification process shall be performed in the manner as stipulated in Annex 1 of this guideline or in such manner as determine by the Commission in consultation with National Measurement Standards Laboratory.

(3) Each meter shall display the year it was last tested and verified.

(4) Once verified, a meter may remain in service for a period of 10 years of any such period as approved by the Commission, except where the meter is suspected to be malfunctioning.

(5) Each meter type shall have ascribed to it a certification life (time to allow on circuit). If no supporting evidence is available, a period of 10 years or such time that the meter to operate within permitted margins of error, whichever is least. In any event no meter shall remain on circuit for periods exceeding 20 years.

Records

11. (1) The licensee shall maintain auditable records of all meters on circuit and their projected date of replacement. The minimum retention period for the records is 10 years.

(2) The following records shall be kept and made available for inspection by the Commission or its representative at any time;

(a) Test certificate of all in service electricity meters,
(b) Meter test equipment / standards calibration history,
(c) Meter re-certification or replacement schedules,
(d) Result of all ad hoc on site or laboratory meter testing initiated by the customer or licensee,
(e) For every account, details of the meter(s) installed.

Meter testing equipment

12. (1) The following pieces of test equipment are deemed by these Guidelines to be Standards;

(a) Reference standards,
(b) AC/DC Transfer standards,
(c) AC transfer standard,
(d) Working standards.

(2) All Standards shall be maintained and calibrate at the following intervals by an approved accredited laboratory and/or National Measurement Standards Laboratory;

Standard type	Maximum period between calibrations
Reference Standards	2 years
AC/DC Transfer Standards	1 year
AC Transfer Standards	1 year
Working Standards	1 year

(3) Test reports provided by approved accredited laboratories, shall be retained for inspection on request by the Commission.

(4) Apparatus used for the regulating and testing of electricity meters shall cease to be used if periodic verification shows the instrument to be inaccurate or unstable. Such apparatus must not be brought back into service until it has been repaired and re-calibrated.

(5) For any test load, the load applied to a working standard integrating meter shall not be less than 25% or more than 125% of its full load rating. For a working standard, the applied load shall not be less than 40% or more than 100% of its full scale or range reading.

PART 4 GENERAL

Public information

13. (1) The licensee shall provide metering information as public handouts available from their offices and other suitable facilities. These include, but not limited to the following advice;

a) How to read a meter,
b) Customer obligations on meter care,
c) What to do if you think your bill is too high.
d) Advice who to contact with queries,
e) How to get meter checked,
f) Dispute resolution procedure.

(2) Once metered consumption has commenced the licensee is responsible for maintenance and replacement of the meter. However, both the licensee and consumershall have obligations in keeping electricity meter in good order, and these obligations should be emphasized in published documentation.

Transition

14. (1) The licensee, in implementing this guideline shall produce a transition plan to ensure that all metering procedures are in compliance by nominated future dates.

(2) The plan, which shall be provided to the Commission, shall include but not be limited to;

a) Phasing out of non-compliance meters,
b) Meter replacement programs which take account of failure rates,
c) Production of Public Information,
d) Procurement of meters only in compliance with this regulation,
e) Upgrading of Test & Calibration facilities,
f) Implementation and phasing of 100% customer metering for electricity,
g) Phasing out of meters older than 15 years

ANNEX 1: NEW APPROVAL REQUIREMENT FOR ELECTRICITY METER