



Distribution Metering Code

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Distribution Code Awareness Programme Funded by
Akaun Amanah Industri Bekalan Elektrik (AAIBE)



9.1

Introduction to Distribution Metering Code (DMC)



- The **Distribution Metering Code (DMC)** sets out the requirements for the metering of:
 - **Active Power**
 - **Reactive Power**
 - **Active energy and Reactive energy**For the purpose of **Revenue Metering**



9.2

Objectives to Distribution Metering Code (DMC)

Objectives of Distribution Metering Code



- Ensuring Distributors and users comply with the Electricity Supply Law and License obligations
- Consistency to users by specifying:
 - Technical requirements for the equipment used for measurement and recording of electrical quantities required for Revenue Management
 - Parameters to be measured and accuracy requirements
 - Technical requirements relating to installation, testing, operation and maintenance of metering installation



9.3

Scope of Distribution Metering Code (DMC)

Scope of Distribution Metering Code



- DMC applies to Distributors, Consumers, Embedded Distributors and Distributed Generators in respect of Revenue Metering for the following commercial transactions:
 - Electricity imports from Distributed Generators
 - Bulk electricity supplies to Embedded Distributors
 - Transfers of electricity between Distributors
 - Retail supply of electricity from Distributors and Embedded Distributors to Consumers
- Revenue Metering of the import of electricity from Distributed Generators to the Distribution System as part of a contract with the single buyer, or for any other transactions associated with the Single Buyer.



9.4

General Requirements on DMC

9.4.1 Legal Requirements



- Must meet the Electricity Act Section 32 which requires:
 - Consumer is charged for electricity by reference to the quantity supplied
 - An appropriate meter which meets the technical and accuracy requirements is to be used to measure the quantity.
 - Revenue metering to be provided by the distributors and shall be installed on the consumer's premises at a point determined by the distributor.

9.4.2 Location of Revenue Metering Equipment



- Installed as close as practicable to the connection point as determined by the distributor
- Due to convenient or economic reasons, for location at other than the connection point, the distributor may make adjustment through adjusting the calibration of the meter or by calculating the difference between the electricity supplied and the quantity metered
- User may be required to provide facilities to accommodate the revenue metering equipment according to the specifications and technical requirements of the distributor.
- RME shall be installed so as to conform to the environmental conditions specified by the manufacturer and the distributor. The installation shall provide protection from ingress of moisture and dust and from physical damage and vibration.

9.4.3 Access and Security of Revenue Metering Equipment



- User should has access to RME to obtain metering data
- All RME and any other equipment related to it such as cabinet, CT, Vt, time switches, etc shall be locked and/or sealed by the Distributor.
- Passwords or associated software shall be secured for the use of Distributor's authorized personnel only.

9.4.4 Provision of Metering Signal to Users



- Distributor may provide facilities for obtaining metering data directly from the Revenue Metering Equipment by means of signals or otherwise.
- The facilities should not interfere with the Revenue Metering Equipment to perform the Revenue Metering function on the security and accuracy requirements in DMC.

9.4.5 Transformer Operated Metering



- For the Distributor to measure the quantity of electricity supplied through parameters of current or voltage directly, depending to the tariff and quantity supplied, the type of meter to be used are

<100 Amps

- Whole Current Meter

>100 Amps

- Transformer Operated Metering (Current transformer (CT) and Voltage Transformer (VT))
- Metering VTs and CTs to be provided by Users according to Distributors specification
- Users to provide manufacturer Test Certificate
- Distributor will test the accuracy of VTs and CTs together with the meters.

9.4.5 Transformer Operated Metering (Cont)



- A separate fused VT circuits will be provided for the TOM on Main Metering, Check Metering and additional burdens associated with it.
- Where possible, VT Fused should be positioned such that they can be replaced without requiring a shutdown
- Test Terminals shall be provided for Main and Check meters to facilitate on site tests. These terminals shall be in close proximity to the meters
- Metering CTs and VTs may be used for other purpose with the agreement of Distributors. However, the burden should not effect the overall accuracy requirements in DMC. Evidence has to be made available and accepted by the Distributors.

9.4.6 Main and Check Metering



- Distributors may arrange for the RME to be duplicated either in whole or part to provide Main and Check Metering.
- Main and Check Metering would normally provided for MV Users connected to the Distribution System with a demand of 250,000 kWh per month or as specified by Distributors.
- The primary source for billing purposes by the Distributor is the Main Meter.
- Check Metering shall be used by the Distributor for:
 - Validation of revenue Metering Data
 - Substitution of Revenue Metering Data
 - Account estimation, to provide a means for verifying the quantity of electricity supplied in the event of the failure of the Main Metering or dispute over the quantity of electricity supplied.

9.4.7 Summation Metering



- Summation Metering is for all MV and LV installations where there is more than one circuit involved.
- Distributors must provide RME with summation facilities of the metering data on each circuit.
- A single Connection Point with a single measurement of electricity supplied will be provided.



9.5

Specification and Accuracy of Revenue Metering

9.5.1 General



- Revenue Metering Equipment shall apply to the following Non-Exhaustive list as below:
 - Active Power Meters
 - Reactive Power Meters
 - Active Energy Meters
 - Reactive Energy Meters
 - Metering Current Transformers
 - Metering Voltage Transformers
 - Summation Metering Equipment
 - Time Switches
 - Test Terminal Blocks
 - Associated wiring fuses and auxiliary power supplies
 - Data Loggers and handheld meter reading equipment
 - Communication equipment such as modems
 - Antenna for transformer operated metering

9.5.2 Revenue Metering Equipment Specifications



- The **Revenue Metering Equipment** shall be in accordance with and conform to relevant technical specifications and standards which shall include:
 - Relevant Malaysian National Standards (MS);
 - Relevant International, European technical standards, such as **IEC**, ISO and EN; and
 - Other relevant national standards such as BS, DIN and ASA.
- Existing **Revenue Equipment** manufactured and tested to earlier specifications comply with this **DMC** provided that they were manufactured and tested to the equivalent specifications at the time of manufacture and meet the accuracy requirements of this **DMC**

9.5.3 General



- **9.5.3.1 General**
- **Revenue Metering Equipment** shall meet the accuracy requirements specified in this section of the **DMC**.

- **9.5.3.2 Single Phase Whole Current Metering**
- Single phase whole current metering shall be either electromechanical or electronic with current ratings up to 100 Amps.
- Meter accuracy shall be class 2.0 for KWh meters.

- **9.5.3.3 Three Phase Whole Current Metering**
- Three phase whole current metering shall be either electromechanical or electronic with current ratings up to 100 Amps per phase.
- Meter accuracy shall be class 2.0 for KWh meters and class 3.0 for kVArh meters.

9.5.3.4 Three Phase Transformer Operated Metering



Active Energy (kWh) Meters

Monthly Consumptions	>50,000 units/mth <250,000 units/mth	250,000 units/mth – 5,000,000 units/mth	>5,000,000 units/mth or >7.5 MW MD
METER			
Class	2	0.5	0.2
Accuracy	± 2%	± 0.5%	± 0.2%
Allowed Error	± 4%	± 1%	± 0.6%
CT			
Class	0.5	0.2	0.2
Accuracy	± 0.5%	± 0.2%	± 0.2%
Burden	7.5VA	15VA	15VA (Indoor) 30VA (Outdoor)
VT			
Class		0.5	0.5
Accuracy		± 0.5%	± 0.2%
Burden		75 VA	75 VA (Indoor) 100 VA (Outdoor)



Reactive Energy KVArh Meter

Monthly Consumption	>50,000 units/mth <250,000 Units/Mth	>250,000 units/mth >7.5 MW MD
Class	3.0	2.0
Accuracy	± 3%	± 2%
Allowed Error	± 6% Main Meter Only	± 4% Main and Check Meter

- Reactive energy meter are not required for residential customers and street lights in all categories.



9.6

Testing Requirements

9.6.1 Test and Certification Procedures



- **Distributor** shall prepare procedures for test, calibration and certification of RME before installation.
- Testing Procedures shall be in accordance with the Electricity Supply Laws, other requirements under the Laws of Malaysia and the requirement of the Commission.
- The procedures shall include the following non exhaustive list of features:
 - The test calibration and certification process shall be overseen by the Dept of Standards Malaysia under ISO/IEC 17025 accreditation scheme.
 - All **RME** shall be sealed by the **Distributor's** seals and accredited sticker wherever applicable to indicate that the **RME** has been tested, calibrated and its accuracy certified to comply the requirements of this **DMC** and legal requirements and in accordance with the certification process adopted by the **Distributor**.
 - All instruments used for testing and calibration of **RME** shall be calibrated regularly by a recognised/accredited testing and certification laboratory, according to the ISO/IEC17025 requirements.
 - The **Distributor** shall maintain records relating to the calibration of all **RME** including the dates and results of any tests and any other details as may be reasonably required by the **Commission**. Any such records shall be complete and accurate and retained for the life of the relevant item of **RME**

9.6.2 On-Site Testing of Revenue Metering Equipment



- Any **User** may request a test to be carried out to check the accuracy of **RME**. Charges of such testing, shall be set out in the **Distributors** charging statement prepared under the **Licence**.
- On-site tests shall be organised such that all relevant **Users** are aware of the tests and **Users** are invited to witness them if required and the test results made available to the **User** involved.
- The **Distributor** shall ensure that when carrying out tests any interruption to measurement is avoided or minimized and arrangements made to provide substituted or estimated metering data where necessary.
- Where a test indicates that an error is outside the specified limits of error then the error shall be recorded and the **RME** replaced with **RME** operating within the specified limits of accuracy as soon as is reasonably practicable.
- Meters shall be tested if a divergence occurs between the Main Metering and Check Metering that is more than 2 times the prescribed limit of error.
- Requirements for coordinating the maintenance of **RME** between the **Distributor** and **User** to safeguard electricity supply is set out provision 6.10.4 of the **DOC**



THANK YOU



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