

Republic of the Philippines  
**ENERGY REGULATORY COMMISSION**  
San Miguel Avenue, Pasig City

**RULES GOVERNING THE TYPE APPROVAL OF METER PRODUCTS TO BE  
USED IN REVENUE METERING BY DISTRIBUTION UTILITIES**

**ERC CASE NO. 2009-020RM**

Pursuant to Section 16 (f) of the Commonwealth Act No. 146, as amended, Section 2 of Commonwealth Act No. 349, and Section 43 (t) of Republic Act No.9136, the Energy Regulatory Commission (ERC) hereby adopts and promulgates the following Rules Governing the Type Approval of Meter Products to be used by Distribution Utilities in Revenue Metering.

**ARTICLE I**

**GENERAL PROVISIONS**

**1.1 Objective**

To ensure that all electric watt-hour meters installed by a Distribution Utility (DU) conform to international standards and requirements adopted by the ERC in order to guarantee the proper functioning of the meters under normal working conditions.

**1.2 Scope**

**1.2.1** These Rules shall apply to the following:

**1.2.1.1** New types of meter products intended for use as billing meters by a DU under the jurisdiction of the ERC;

**1.2.1.2** Reconditioned or repaired meters owned by a DU intended for reinstallation as revenue meters; and

**1.2.1.3** Reconditioned or repaired meters for resale to any DU or end-user by the original manufacturer or its authorized agent.

**1.2.2** These Rules shall not apply to all meters that are already in service before the effectivity of these Rules.

### **1.3 Guiding Principles**

**1.3.1** Only those types of meters with prior approval from the ERC are eligible for use in revenue metering.

**1.3.2** The ERC shall acknowledge certification tests on meter products issued by PAO or any internationally recognized testing laboratory, and use such certifications as its basis in the approval of the new types of meter products.

**1.3.2** The ERC may approve or reject reconditioned or repaired meters on the basis of tests required by these Rules.

### **1.4 Definition of Terms**

**American National Standards Institute (ANSI)** A private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States.

**Distribution Utility (DU)** An electric cooperative, private corporation, government-owned utility or existing local government unit which has an exclusive franchise to operate a distribution system in accordance with its franchise and the Act.

**Energy Regulatory Commission (ERC)** The independent and quasi-judicial regulatory agency created under Section 38 of the Act.

**International Electrotechnical Commission (IEC)** A worldwide organization for standardization comprising all national electrotechnical committees.

**International Laboratory Accreditation Cooperation (ILAC)**

An international cooperation of laboratory and inspection accreditation bodies formed to help remove technical barriers to trade.

**Meter Shop**

A place where meters are inspected, repaired, tested, and adjusted.

**National Institute of Standards and Technology (NIST)**

An agency under the U.S. Department of Commerce, which has the assigned function of taking custody, maintenance, and development of the national standards of measurements and the provision of means and methods for making measurements consistent with the ANSI standards.

**Philippine Accreditation Office (PAO)**

An agency under the Department of trade and Industry which operates a laboratory accreditation wherein laboratories are accredited for their testing and calibration competence.

Capitalized terms not otherwise defined herein shall have the meaning ascribed to them under Republic Act No. 9136.

## **ARTICLE II**

### **TYPE APPROVAL REQUIREMENTS FOR NEW METER PRODUCTS**

#### **2.1 Type Approval Application**

Any DU may file an application in writing with the ERC for the approval of a new type of meter product intended for use as billing meter. A manufacturer or its authorized dealer may also apply, provided the application is accompanied by a statement from a DU certifying that it intends to use such type of meter for revenue metering.

The following shall be included in the application:

##### **2.1.1 Name and address of applicant;**

- 2.1.2** Sample of the meter product for type approval;
- 2.1.3** Name and address of the meter product manufacturer or its authorized dealer;
- 2.1.4** Meter brand, type, voltage and ampere ratings, size, shape, and a brief description of the general and physical characteristics of the meter product;
- 2.1.5** Proof of type approval granted by the regulatory body of the country where the product was imported from, if available;
- 2.1.6** A certification from a testing laboratory accredited to the Philippine Accreditation Office (PAO) or to a Regional Cooperation Body which is a signatory to the ILAC arrangement, that the meter product under consideration has been tested and meets all the standards of IEC 62052, IEC 62053, or ANSI C12;

The certification should include the following:

- 2.1.6.1** Statement that all tests have been conducted by personnel who have thorough practical and theoretical knowledge of the meters and adequate training in making precision measurements;
  - 2.1.6.2** Statement that the test equipment employed in these tests conforms to the applicable requirements of IEC or ANSI standards;
  - 2.1.6.3** Statement that the accuracy of the test equipment has been established by comparison with standards whose accuracy is traceable to the National Institute of Standards and Technology (NIST), or its equivalent; and
  - 2.1.6.4** Test report documenting the complete performance testing of all the required tests, test results and appropriate charts, graphs, and data recorded during the testing;
- 2.1.7** Type approval application processing fee, which is non-refundable.

## **ARTICLE III**

### **TYPE APPROVAL REQUIREMENTS FOR RECONDITIONED OR REPAIRED METER PRODUCTS**

#### **3.1 General Requirements**

- 3.1.1** A meter product shall not be reconditioned or repaired and repacked for resale by any DU, person, or entity except its original manufacturer or a manufacturer-authorized licensed agent.
- 3.1.2** A DU may recondition or repair its own meters, provided, that they are only intended for reinstallation in its own services, and provided further, that before their installation they should have been type approved by the ERC.
- 3.1.3** Reconditioned or repaired meter products shall be labeled as repaired, and by whom, and dated accordingly.

#### **3.2 Product Approval Application**

A DU, person, or entity responsible for the reconditioning or repair of a meter product may file an application in writing with the ERC for the approval of such product, provided, that the application is accompanied by a statement from a DU certifying that it intends to use such reconditioned or repaired meter product for revenue metering.

The following shall be included in the application:

- 3.2.1** Name and address of applicant;
- 3.2.2** Sample of the reconditioned or repaired meter product for approval;
- 3.2.3** Name and address of the original meter product manufacturer or its authorized dealer;
- 3.2.4** A certification from the original manufacturer of the meter product authorizing the applicant to recondition or repair and repack the meter for resale (Applies only to reconditioned or repaired meter products for resale.);

- 3.2.5** Meter brand, type, voltage and ampere ratings, size, shape, and a brief description of the general and physical characteristics of the meter product;
- 3.2.6** Description on the modifications made on the meter that may not conform to the original manufacturer's specifications, if applicable;
- 3.2.7** A certification from a Category-A Meter Shop that the meter product under consideration has been tested and meets all the requirements of Article IV of these Rules, if available.

The certification should include the test report documenting the complete performance testing of all the required tests, test results and appropriate charts, graphs, and data recorded during the testing;

- 3.2.8** Product approval application processing fee, which is non-refundable.

If the application does not include a certification from a Category-A Meter Shop, the meter product under consideration shall be subjected to a performance testing by the ERC and a corresponding certification testing fee shall be charged to the applicant.

### 3.3 Required Tests

Table 1 lists the tests which shall be performed on reconditioned or repaired meters prior to their use.

Table 1

No.	Test Description	Applicable to Electromechanical Meters	Applicable to Solid State meters
1	No Load	√	√
2	Starting Load	√	√
3	Load Performance	√	√
4	Effect of Variation of Power Factor	√	√
5	Effect of Variation of Voltage	√	√
6	Effect of Variation of Frequency	√	√
7	Equality of Current Circuits	√	√
8	Effect of Register Friction	√	Not applicable

9	Effect of Internal Heating	√	Not applicable
10	Stability of Performance	√	√

## ARTICLE IV

### CERTIFICATION TESTING REQUIREMENTS FOR RECONDITIONED OR REPAIRED METER PRODUCTS

#### 4.1 General Requirements

- 4.1.1** The tests specified in Section 3.3 shall be conducted on reconditioned or repaired meters in a Category-A Meter Shop or ERC Meter laboratory by qualified personnel and facilities.
- 4.1.2** The tests shall be conducted in sequence using the same sample meter selected for certification testing which must be representative of a group of reconditioned or repaired meters of the same type.
- 4.1.3** A meter product shall be designated as failed if one failure occurs in any test procedure specified in Section 3.3, and the entire group represented by the sample meter shall be rejected.

#### 4.2 Test Procedures

##### 4.2.1 Adjustment Prior to Tests

Before commencing with the performance tests, the meter product selected for certification testing shall be calibrated to closely as possible to zero error. To allow for the necessary variations, the tolerance limits are hereby fixed as follows:

**4.2.1.1** For solid state meters and poly-phase meters, it should not exceed the error of plus or minus five-tenths percent ( $\pm 0.5\%$ ) at specified test load points.

**4.2.1.2** For electro-mechanical single phase meters:

- a) Not to exceed the error of plus or minus one percent ( $\pm 1\%$ ) at light load test and seven and one half-tenths

percent ( $\pm 0.75\%$ ) at full load test from July 12, 2009 to July 11, 2012.

- b) Not to exceed the error of plus or minus five-tenths percent ( $\pm 0.5\%$ ) at specified test load points starting July 12, 2012.

If the meter product selected for certification testing cannot be calibrated or adjusted to the allowable tolerance limit, the tests specified in Section 3.3 shall no longer be performed and the certification test shall be declared a failed test.

#### 4.2.2 No Load test

**4.2.2.1** An electro-mechanical meter with the voltage circuit(s) energized and current circuit(s) open, the disk shall not make one complete revolution within ten (10) minutes and no additional complete revolution of the disk in the next twenty (20) minutes. For poly-phase meters, a poly-phase voltage of proper phase sequence shall be applied.

**4.2.2.2** A solid state meter with the voltage circuit(s) energized and with no current flowing in the current circuit, the test output of the meter shall not produce more than one pulse within ten (10) minutes.

#### 4.2.3 Starting Load Test

The metering device shall operate continuously with a load current as specified in the Table 2.

Table 2

Current Class	Current in Amperes
10	0.025
20	0.025
100	0.15
200	0.30
320	0.50

The lowest rated voltage value should be used for wide voltage ranging metering devices.

#### 4.2.4 Load Performance test

The performance of the metering device shall not deviate from the reference registration by an amount exceeding the maximum deviation specified in Table 3, except that the tests for conditions (9) through (11) shall be omitted for two-element four-wire metering devices.

Table 3

Condition	Current Class					Max. Deviation in Percent from Reference Performance
	10	20	100	200	320	
	Current in Amperes					
(1)	0.15	0.15	1	2	3	±2.0
(2)	0.25	0.25	1.5	3	5	±1.0
(3)	0.5	0.5	3	6	10	±1.0
(4)	1.5	1.5	10	20	30	±1.0
(5)	2.5	2.5	15	30	50	Reference
(6)	-	5	30	60	75	±1.0
(7)	5	10	50	100	100	±1.5
(8)	7.5	15	75	150	150	±2.0
(9)	-	18	90	180	250	±2.0
(10)	10	-	100	200	300	±2.0
(11)	-	20	-	-	320	±2.5

#### 4.2.5 Effect of variation of power factor

Each element of a multi-element metering device shall be tested as a single-element metering device, except that all voltage circuits shall be effectively in parallel.

##### 4.2.5.1 Single-element meters

The effect of variation of power factor upon performance of the metering device shall not exceed the maximum deviation specified in Table 4.

Table 4

Condition	Current Class				Power Factor	Max. Deviation in Percent from Reference Performance
	10	100	200	320		
	Current in Amperes					
Reference Performance for Condition (1)	0.25	1.5	3	5	1.0	Reference ±2.0
Condition (1)	0.5	3	6	10	0.5 lag	
Reference Performance for Condition (2)	5	50	100	150	1.0	Reference ±2.0
Condition (2)	5	50	100	150	0.5 lag	
Reference Performance for Condition (3)	10	100	200	320	1.0	Reference ±2.0
Condition (3)	10	100	200	320	0.5 lag	

**4.2.5.2 Two-element (network meters, three-phase three wire meters, three-phase four-wire delta meters, and two-phase five-wire meters)**

The effect of variation of power factor upon the performance of the metering device shall not exceed the maximum deviation specified in Table 5.

Table 5

Condition	Current Class					Power Factor	Maximum Deviation in Percent from Reference Performance
	10	20	100	200	300		
	Current Amperes						
Reference Performance for Conditions (1) and (2)	0.5	0.5	3	6	10	1.0	Reference ±2.0
Condition (1)	0.5	0.5	3	6	10	0.866 lead	
Condition (2)	1	1	6	12	20	0.5 lag	
Reference performance for Condition (3)	2.5	2.5	15	30	50	1.0	Reference ±1.0
Condition (3)	2.5	2.5	15	30	50	0.866 lead	

Reference Performance for Conditions (4) and (5)	5	10	50	100	150	1.0	Reference
Condition (4)	5	10	50	100	150	0.866 lead	±1.0
Condition (5)	5	10	50	100	150	0.5 lag	±1.5
Reference Performance for Conditions (6) and (7)	10	20	100	200	320	1.0	Reference
Condition (6)	10	20	100	200	320	0.866 lead	±1.5
Condition (7)	10	20	100	200	320	0.5 lag	±2.0

#### 4.2.5.3 Two-element three-phase four-wire meters

The effect of variation of power factor upon the performance of the metering device shall not exceed the maximum deviation specified in Table 6.

Table 6

Condition	Current Class				Power factor	Maximum Deviation in Percent from Reference Performance
	10	20	100	200		
	Current in Amperes					
Reference Performance for Conditions (1) and (2)	1	1	6	12	1.0	Reference
Condition (1)	1	1	6	12	0.866 lead	±2.0
Condition (2)	2	2	12	24	0.5 lag	±2.0
Reference performance for Condition (3)	5	10	30	60	1.0	Reference
Condition (3)	5	10	30	60	0.866 lead	±1.0
Reference Performance for Conditions (4) and (5)	10	20	100	200	1.0	Reference
Condition (4)	10	20	100	200	0.866 lead	±1.0
Condition (5)	10	20	100	200	0.5 lag	±1.5

Load current shall not be applied to the current circuit that is common to both elements.

#### 4.2.5.4 Three-element three-phase four-wire wye meters

The effect of variation of power factor upon the performance of the metering device shall not exceed the maximum deviation specified in Table 7.

Table 7

Condition	Current Class					Power factor	Maximum Deviation in Percent from Reference Performance
	10	20	100	200	320		
	Current in Amperes						
Reference Performance for Condition (1)	0.5	0.5	3	6	10	1.0	Reference ±2.0
Condition (1)	1.0	1.0	6	12	20	0.5 lag	
Reference Performance for Condition (2)	5	10	50	100	150	1.0	Reference ±1.5
Condition (2)	5	10	50	100	150	0.5 lag	
Reference Performance for Condition (3)	10	20	100	200	320	1.0	Reference ±2.0
Condition (3)	10	20	100	200	320	0.5 lag	

#### 4.2.6 Effect of variation of voltage

The effect of variation of voltage upon the performance of the metering device shall not exceed the maximum deviation specified in Table 8.

Table 8

Condition	Current Class					Max. Deviation in Percent from Reference Performance
	10	20	100	200	320	
	Current in Amperes					
Reference Performance 100% of calibration voltage for Condition (1) and (2)	0.25	0.25	1.5	3	5	Reference

Condition (1) 90% of calibration voltage	0.25	0.25	1.5	3	5	±1.0
Condition (2) 110% of calibration voltage	0.25	0.25	1.5	3	5	±1.0
Reference Performance 100% of calibration voltage for Conditions (3) and (4)	2.5	2.5	15	30	50	Reference
Condition (3) 90% of calibration voltage	2.5	2.5	15	30	50	±1.0
Condition (4) 110% of calibration voltage	2.5	2.5	15	30	50	±1.0

#### 4.2.7 Effect of Variation of Frequency

The effect of variation of frequency upon the registration of a metering device shall not exceed the maximum deviation specified in Table 9.

Table 9

Condition	Current Class					Percent Rated Frequency	Max. Deviation in Percent from Reference Performance
	10	20	100	200	320		
	Current in Amperes						
Reference Performance for Conditions (1) & (2)	0.25	0.25	1.5	3	5	100	Reference
Condition (1)	0.25	0.25	1.5	3	5	98	±1.0
Condition (2)	0.25	0.25	1.5	3	5	102	±1.0
Reference Performance for Conditions (3) & (4)	2.5	2.5	15	30	50	100	Reference
Condition (3)	2.5	2.5	15	30	50	98	±1.0
Condition (4)	2.5	2.5	15	30	50	102	±1.0

## 4.2.8 Equality of Current Circuits

### 4.2.8.1 Single-element meters

The change in performance produced by using only one current circuit of the single-element meter, as compared with the performance when both current circuits are used, shall not exceed the maximum deviation specified in Table 10.

Table 10

Condition	Connections of Current Circuits	Current Class					Max. Deviation in Percent from Reference Performance
		10	20	100	200	320	
		Current in Amperes					
Reference performance for Conditions (1) & (2)	Both circuits	0.2	0.2	1.5	3	5	Reference
Condition (1)	Circuit A only	5	0.5	3	6	10	±1.0
Condition (2)	Circuit B only	0.5	0.5	3	6	10	±1.0
Reference performance for Conditions (3) & (4)	Both Circuits	2.5	2.5	15	30	50	Reference
Condition (3)	Circuit A only	5	5	30	60	100	±1.0
Condition (4)	Circuit B only	5	5	30	60	100	±1.0

### 4.2.8.2 Two elements, three-wire meters

The change in performance produced by using only one current circuit of the two-elements, three-wire meter, as compared with the performance when both current circuits are used, shall not exceed the maximum deviation specified in Table 11.

Table 11

Condition	Connections of Current Circuits	Current Class					Maximum Deviation in Percent from Reference Performance
		10	20	100	200	320	
Reference performance for Conditions (1) & (2)	Both Circuits	0.5	0.5	3	6	12	Reference
Condition (1)	Circuit A only	1	1	6	12	20	±1.0
Condition (2)	Circuit B only	1	1	6	12	20	±1.0
Reference Performance for Conditions (3) & (4)	All Circuits	5	5	30	60	100	Reference
Condition (3)	Circuit A only	10	10	60	120	200	±1.0
Condition (4)	Circuit B only	10	10	60	120	200	±1.0

These tests shall be made on each element separately with no current flowing in the current circuits of the remaining element but with the voltage circuits of all elements energized effectively in parallel.

#### 4.2.8.3 Multi-element meters

The change in performance produced by using only one current circuit of the multi-element meter, as compared with the performance when all current circuits are used, shall not exceed the maximum deviation specified in Table 12.

Table 12

Condition	Connections of Current Circuits	Current Class					Max. Deviation in Performance from Reference Performance
		10	20	100	200	320	
		Current in Amperes					
Reference performance for Conditions (5), (6), (7), (8), etc.	All Circuits	0.25	0.25	1.5	3	5	Reference
Condition (5)	Circuit A only	0.25N*	0.25N*	1.5N*	3N*	5N*	±1.5
Condition (6)	Circuit B only	0.25N*	0.25N*	1.5N*	3N*	5N*	±1.5
Condition (7), (8), etc.	Circuits C, D, etc.	0.25N*	0.25N*	1.5N*	3N*	5N*	1.5
Reference Performance for Conditions (9), (10), (11), (12), etc.	All Circuits	2.5	2.5	15	30	50	Reference
Condition (9)	Circuit A only	2.5	2.5	15	30	50	±1.5
Condition (10)	Circuit B only	2.5	2.5	15	30	50	±1.5
Condition (11), (12), etc.	Circuits C, D, etc.	2.5	2.5	15	30	50	±1.5

\*N represents the number of elements in the metering device

The current circuits that are not common to both elements of a two-element, three-phase, four-wire wye metering device shall be loaded with twice the test current specified. The current circuits of any three-wire element shall be connected in series and treated as one circuit.

#### 4.2.9 Effect of Register Friction

The change in error after removal of a dial or cyclometer type of register shall not exceed ±0.5% at 10% of test amperes (TA). This test may be omitted for solid-state metering devices.

#### 4.2.10 Effect of Internal Heating

The test shall be made with the metering device mounted in a conventional manner on a suitably rated meter mounting device and wired with not less than 4 ft. of conductor (8 ft. jumper between terminals) of a size adequate for the load range of the metering device. Openings around the conductor, and any other openings, shall be closed with suitable material to prevent drafts. The effect of internal heating upon the performance of a metering device shall not exceed the maximum deviation specified in Table 13.

Table 13

Condition	Current Class					Maximum Deviation in Percent from Reference Performance
	10	20	100	200	320	
	Current in Amperes					
Reference Performance for conditions (1) , (2), and (7)	10	20	100	200	320	Reference
Reference performance for conditions (3) and (5)	0.25	0.25	1.5	3	5	Reference
Reference performance for conditions (4) and (6)	2.5	2.5	15	30	50	Reference
Condition (1) One-half hour after application of load	10	20	100	200	320	±1.0
Condition (2) One hour after application of load	10	20	100	200	320	±1.5
Condition (3) Immediately following test for condition (2)	0.25	0.25	1.5	3	5	±1.5
Condition (4) Immediately following test for condition (3)	2.5	2.5	15	30	50	±1.5
Condition (5) Two hours after test for condition (4) with meter at no load current during the two-hour interval	0.25	0.25	1.5	3	5	±1.5
Condition (6) Immediately following test for condition (5)	2.5	2.5	15	30	50	±1.0
Condition (7) Immediately following test for condition (6)	10	20	100	200	320	±1.0

#### **4.2.11 Stability of Performance**

With a constant voltage and current applied continuously to the metering device for a period of eleven (11) days, the percentage difference in the total kWh registration between the registration taken after the first twenty four (24) hours and each of the registrations taken at ten (10) successive intervals twenty four (24) hours apart shall not exceed one percent (1.0%).

### **ARTICLE V**

#### **FINES AND PENALTIES**

Violation of any provisions of these Rules shall be subject to the imposition of fines and penalties in accordance with the Guidelines to Govern the Imposition of Administrative Sanctions in the Form of Fines and Penalties pursuant to Section 46 of the Act promulgated by the ERC on May 17, 2002.

### **ARTICLE VI**

#### **FINAL PROVISIONS**

##### **6.1 Rescission of Approvals**

The ERC reserves the right, when it deems necessary, to rescind approvals made in accordance with these Rules.

##### **6.2 Exception Clause**

Where good reason appears, the ERC may allow an exception from any provision of these Rules, if such exception is found to be in the public interest and is not contrary to the law or any other pertinent rules and regulations.

### **6.3 Separability Clause**

If for any reason, any part or section of these Rules is declared unconstitutional or invalid, the parts or section hereof which are not affected thereby shall continue to be in full force and effect, unless such declaration would render the whole rules unenforceable or cannot be implemented.

### **6.4 Repealing Clause**

All rules and guidelines, or portions thereof, issued by the ERC, not consistent with these Rules are hereby repealed or modified accordingly.

### **6.5 Effectivity**

These Rules shall take effect fifteen (15) days following its publication in a newspaper of general circulation.

Pasig City. \_\_\_\_\_, 2009

**ZENAIDA G. CRUZ-DUCUT**  
Chairperson

**RAUF A. TAN**  
Commissioner

**ALEJANDRO Z. BARIN**  
Commissioner

**MARIA TERESA A. R. CASTAÑEDA**  
Commissioner

**JOSE C. REYES**  
Commissioner