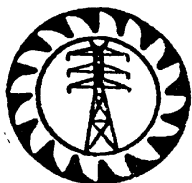


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CEB
STANDARD

**PORTABLE SINGLE PHASE METER TESTING
EQUIPMENT ACCURACY CLASS 0.2**



**CEYLON ELECTRICITY BOARD
SRI LANKA**

CONTENTS

		Page
1.	Scope	2
2.	System Parameters	2
3.	Service Conditions	2
4.	Applicable Standards	2
5.	Technical Requirements	2
6.	Basic Features	3
7.	Quality Assurance	4
8.	Additional Requirements	4
9.	Information to be supplied with the Offer	5
10.	Inspection and Testing	5
11.	Technical Literature and Drawings	5
12.	Annexure	6

SPECIFICATION FOR PORTABLE SINGLE PHASE METER TESTING EQUIPMENT OF ACCURACY CLASS 0.2

1.0 SCOPE

This Specification covers the general requirements of the design, manufacture, testing, supply and delivery of Portable Static Single Phase Meter Testing Equipment (MET) of Accuracy Class 0.2, for testing low voltage direct connected single phase meters.

2.0 SYSTEM PARAMETERS

a)	System Voltage	-	230 / 400 V three phase & neutral
b)	System Highest Voltage	-	240 / 415 V three phase & neutral
c)	System Frequency	-	50 Hz
d)	Method of Earthing	-	Effectively earthed at sub. Station.
e)	System Fault Level	-	25 kA

3.0 SERVICE CONDITIONS

a)	Maximum ambient temperature	-	40°C
b)	Maximum relative humidity	-	90%
c)	Annual average ambient temperature	-	30°C
d)	Environmental condition	-	Humid tropical climate with heavily polluted atmosphere
e)	Highest altitude	-	From MSL to 2000 M above MSL

4.0 APPLICABLE STANDARDS

The meter testing equipment (MTE) and components supplied shall be in accordance with the latest editions/amendments of the Standards specified below. However the CEB Specification shall supersede these Standards in the event there is a discrepancy.

a)	IEC 60736 (1982)	-	Testing equipment for Electrical Energy meters
c)	IEC 61010-2-032 (1994)	-	Safety requirement for hand-held current clamp for electrical measurement and test

5.0 TECHNICAL REQUIREMENTS

a)	Supply voltage range	V	-	240V ± 10% (Phase to neutral)
b)	Resolution of f voltage measurements	V	-	1
c)	Current measurement range with clamp –on CT	A	-	0.5 – 80
d)	Resolution of current measurement	A	-	0.01
e)	Accuracy of energy measurement with clamp on CT		-	0.2
f)	Interface		-	RS232/USB

6.0 BASIC FEATURES

6.1 Design

- a) The Portable Static Single Phase Kilowatt-hour Meter Testing equipment (MTE) of Accuracy Class 0.2 shall be suitable for field testing the installed single phase electronic / electromechanical meters.
- b) The MTE shall be provided with the following accessories;
- i) A Scan head for automatic testing, which can be used to sense disc revolutions in electromechanical meters as well as indicating LED's in static meters.
 - ii) Suitable clamping components for clamping the Scan head to the meter shall also be provided.
 - iii) One number of Clamp-on type current transformers (CT) to measure a maximum of 80 Amp and suitable for use with cables of overall diameter up to 20mm, and the CT leads shall be provided for testing meters without interrupting the power supply.
 - iv) Voltage leads with insulated clips shall be provided for connecting to the main supply without any interruption.
 - v) A 230V portable printer (Thermal Printer) with necessary connecting leads (to take the printouts of the test results in the field) shall also be provided as specified in the Price Schedule
- c) The MTE shall have the following facilities;
- i) Switching facility: - The MTE shall have switching facility For manual counting of number of revolutions / pulse output of the meter under test.
 - ii) Facility for entering data:- The MTE shall have function keys for entering data (meter particulars, installation particulars, Date, etc.)
 - iii) Facility for download the data:- The MTE shall have RS232 port to download the data to a PC or / Printer.
 - iv) Auto checking of connection:- The MTE shall be capable of indicating display for the following conditions,
 - 1) Missing potential
 - 2) Missing current
 - 4) Over current
 - 5) Over Voltage
 - v) Data storing facility:- The MTE shall have facilities to store a minimum of 200 test results and to download to PC / Printer when required.
- d) The MTE shall display the following during the test;
- i) The test conditions, Frequency
 - ii) Instantaneous Voltage / Current, Power factor lag / lead.
 - iii) Meter particulars; Consumer data and test result as percentage error.

6.2 General Requirements

The MTE shall be suitable for operation on 240 Volts single-phase two-wire system.

6.3 Mechanical Requirements

The MTE shall be of rugged construction, lightweight and shall be of portable and compact type. The MTE shall be designed and constructed in such a way as to avoid introducing any danger in normal use and under normal working conditions, so as to ensure specially;

- a) Personal safety against electric shock and effects of excessive temperature.
- b) Safety against spread of fire
- c) Protection against penetration of solid objects, dust and water

6.4 Connections

The MTE shall have facilities for making connection to

- a) Clamp on CT current connection
- b) Mains Voltage connection
- c) Scan head and hand switch
- c) PC / Portable printer

6.5 Display of measured values

The MTE shall be provided with a non-volatile memory type clear electronic display under a viewing panel. The instrument with its case shall conform to IP 51 ratings.

6.6 Input and Output device

The MTE shall have function keys for entering the data as per Clause 6.1 c) ii) and shall have an output device as per Clause 6.1 c) iii) for downloading the data to a PC or printer.

6.7 Electromagnetic compatibility & Radio interference suppression

The MTE shall be designed in such a way that they shall not conducted or radiate electromagnetic disturbance as well as electrostatic discharge shall not damage or influence the meter

The MTE shall not generate, conduct or radiate noise, which could interfere with other equipment.

7.0 QUALITY ASSURANCE

The manufacturer shall possess ISO 9001 Quality assurance certification for the manufacture of Static meter testing equipment for the plant where the manufacture of meter testing equipment is done. Bidders shall furnish a copy of the ISO Certificate certified as true copy of the original by the manufacturer, along with the offer.

8.0 ADDITIONAL REQUIREMENTS

8.1 Manufacturing Experience.

- a) The Manufacturer shall have at least 5 years of experience in the manufacture of portable Single phase Static (Electronic) Kilowatt-hour (kWh) Meter testing equipment of Accuracy Class 0.2 and 0.5 to the IEC 736. The manufacturer shall furnish sufficient documentary evidence in the Bid to prove his manufacturing experience.
- b) The manufacturer shall have supplied portable Static kWh meter testing equipment to a minimum of five Electricity Authorities/Utilities. The manufacturer shall furnish a list of Electricity Authority/Utilities to whom he has supplied meter-testing equipment

- c) The purchaser reserves the right to communicate with Electricity supply authorities/utilities to whom meters have been supplied with regard to the performance of the meter testing equipment.

8.2 Marking of Meter Testing Equipment

Every meter testing equipment shall be provided with a Name - plate incorporating the following minimum information as applicable

- a) Brand and Model No.
- b) Serial No., Year of Manufacture
- c) Accuracy Class and applicable Standards

8.3 Carrying Case

Each Meter Testing Equipment and portable printer shall be supplied with carrying case suitable for carrying out field test and to prevent damage during transit.

8.4 Training and After sale support

The MTE manufacturer shall provide training for CEB engineers and shall have facility to provide after sales service, through local representative

9.0 INFORMATION TO BE SUPPLIED WITH THE OFFER

The following shall be furnished with the offer.

- a) Catalogues describing the equipment and indicating the type and model number.
- b) Operational manual of equipment
- c) Constructional features, materials used for components and relevant technical literature.
- d) Complete dimensional drawings.
- e) Manufacturing Experience and list of Customers as stipulated in clause 8.1 above.
- f) The details of the information that will be indicated on the name plate of the Meter as stipulated in Clause 8.2 above.
- g) Completed Schedule of Guaranteed Technical Particulars (ANNEX - A).
- h) Quality assurance certification conforming to ISO 9001.

9.1 Test Certificates

- a) Copy of a Calibration Certificate of previously manufactured equipment of same model.
- b) Copies of Calibration Certificates of Equipment used to calibrate the Meter Testing Units being manufactured.

Offers of Bidders who fail to furnish the above particulars in full as stipulated in clause 9.0 shall be rejected.

10.0 INSPECTION AND TESTING

The selected Bidder shall make necessary arrangements for inspection by an Engineer appointed by the Purchaser and to carry out in his presence necessary sample/acceptance tests according to IEC 736 on the Meter Testing Equipment offered.

11.0 TECHNICAL LITERATURE AND DRAWINGS

Technical Literature in English language on the operation, calibration and maintenance shall be supplied with each set of equipment and they shall be descriptive and self explanatory, complete with necessary connection diagrams and drawings.

12.0 ANNEX

A - Schedule of Guaranteed Technical Particulars

ANNEX - A**SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS**

To be filled by the manufacturer.

1)	Name of Manufacturer & Country of manufacture	-
2)	Class of Meter & Model No./ Catalog Ref.No.	-
3)	Type (portable / stationary)	-
4)	Applicable Standards	-
5)	Standard Current rating & Rated Maximum Current I_{max}	-
7)	Reference voltage and operating range	-
8)	Limit of errors when operating in the full power factor range	-
9)	Insulation Level	
	i) Insulation Withstand voltage for 1 min.	-
10)	Operating Temperature Range	-
13)	Type of display	-
14)	Degree of protection (IP Category)	-
15)	Whether the meter testing equipment conforming to the following Clauses, indicate deviations if any	
	i) Clause 6.1 - Basic Features - a)	Yes/No -
	ii) Clause 6.1 - Basic Features - b)	Yes/No -
	iii) Clause 6.1 - Basic Features - c)	Yes/No -
	iv) Clause 6.1 - Basic Features - d)	Yes/No -
16)	Whether the display is of non-volatile memory type	Yes/No -
	Memory retention period	Months -
17)	Whether the Certificate of Quality Assurance conforming to ISO 9001 furnished.	Yes/No -
18)	Whether Calibration Certificates as per 9.1 are provided	Yes/No -
18)	Whether the carrying case provided	Yes/No. -
19)	Indicate the extra facilities available with the meters.	Attach separate sheet
20)	Whether the Acceptance/Sample Tests as per Clause 11.0 will be carried out by the Manufacturer	Yes/No -
21)	Guaranteed life span	Years -

I/We certify that the above data are true and correct

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 Seal and Signature of the Manufacturer/ Date