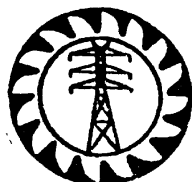


099 : 2001

CEB
STANDARD

**PORTABLE THREE PHASE METER TESTING
EQUIPMENT ACCURACY CLASS 0.2 & 0.5**



CEYLON ELECTRICITY BOARD
SRI LANKA

Specification

for

**PORTABLE THREE PHASE METER TESTING EQUIPMENT
ACCURACY CLASS 0.2 & 0.5**

CEB Standard 099 : 2001

CEYLON ELECTRICITY BOARD

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**SPECIFICATION FOR PORTABLE THREE PHASE
METER TESTING EQUIPMENT
ACCURACY CLASS 0.2 & 0.5**

1.0 SCOPE

This Specification covers the general requirements of the design, manufacture, testing, supply and delivery of Portable Static Three Phase Meter Testing Equipment (MTE) of Accuracy Class 0.2s / 0.5s suitable for field testing of three phase four wire and three phase three wire bulk supply meters

2.0 SYSTEM PARAMETERS

a)	System Voltage	-	400 V three phase four wire
		-	110 V three phase three wire
b)	System Highest Voltage	-	415 V three phase four wire
		-	115 V three phase three wire
c)	System Frequency	-	50 Hz
d)	Type of Earthing	-	Neutral Effectively earthed
e)	System Fault current	-	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 equipment 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 736 (1990)	-	Testing equipment for electrical energy meters.
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5.0 TECHNICAL REQUIREMENTS

a)	Operating voltage range			
	i) For 3 phase 4 wire meters	V	-	240 ± 30% (Phase to neutral)
	ii) For 3 phase 3 wire meters	V	-	110 ± 10% (Phase to phase)
b)	Resolution of voltage measurements	V	-	1
c)	Current measurement range with clamp on CT	A	-	0.5 – 10 (to measure secondary current)
		A	-	0.5 -- 2000 (to measure primary current)

d)	Resolution of current measurement with clamp on CT	A	-	0.02
e)	Accuracy of power/ energy measurement	%	-	0.2s / 0.5s
f)	Input terminal		-	4 for voltage (3phase,1 neutral) 3 for current (in & out) for clamp-on CT & for three phase scanning head)
g)	Calibration pulses		-	MTE shall provide frequency or pulse output for calibration of the unit itself
h)	Interface		-	RS 232

6.0 BASIC FEATURES

6.1 Design

- a) The portable three phase meter testing equipment (MTE) shall be of the static, programmable type of Accuracy Class 0.2 or higher.
- b) The MTE shall be suitable for testing 400 Volts three phase four wire bulk supply meters and 110V three phase three wire bulk supply meters of the following types;
 - i) Electromechanical (Ferraris) meters conforming to IEC 521 of accuracy class 2 and Class1 having rotating disc.
 - ii) Static meters conforming to IEC 1036 & IEC 678 of accuracy class 1 and Class 0.5 having light emitting diodes.
- c) The MTE shall be suitable for testing current transformer operated type three phase three wire and three phase four wire meters. The maximum CT transformation ratio shall be 2000 :1 or 5. The secondary current shall be 1A or 5A
- d) The MTE shall have the following features;
 - i) An input for scanning head, which can be used for sensing of disc revolutions in the electro-mechanical meters and indicating LED in static meters
 - ii) Keys to enter the following data and information
 - a) Meter Constant (Revolutions/kWh or pulses per kWh)
 - b) Current Transformer ratio
 - iii) Start - Stop button to check the meter accuracy without scanning head
 - iv) The MTE shall be capable to display Voltage, Current, Power factor and Power (active, reactive & apparent)
 - v) The MTE shall be capable to display the test progress (to display the average value of the parameters during the test period)

- vi) Facility to check the connection of installed meters at site (through Victoria display).
- vii) Storage of all test results for a minimum of 20 tests together with electrical parameters, meter constant, No of revolutions etc.
- viii) Retrieval of stored data through RS 232 interface and download into PC.
- ix) Software suitable to handle the stored testing results, electrical parameters (like voltage, current, power factor, and power) meter constant etc.).
- x) The software shall also allow operator to enter the details of meter under test, ie. meter number, name of customer/ installation date of testing etc.

6.2 Accessories

Following accessories shall be supplied along with the meter testing equipment.

- i) 1 No. Scanning head suitable for sensing of rotor mark of Ferrari wheel meters and LED of static meters

Suitable clamping components for clamping the optical sensor to the meter.
- ii) 3 No. Clamp on CT (accuracy class 0.2) to measure secondary current of the meter CT up to 10Amp for testing the accuracy of the meter CT
- iii) 3 Nos. Clamp on CT to measure current up to 2000Amp (accuracy class 0.2 for testing of CT operated meters without interrupting meter connection)
- iv) A set of cables for connection
- v) Mains cable
- vi) A set of spare fuses
- vii) RS 232 interface cable
- viii) PC Software for handling the stored results
- ix) Carrying case for instrument and accessories.
- x) Operating manual of equipment in English
- xi) Operating manual of software in English
- xii) Portable printer suitable for field use shall be supplied with each meter testing equipment. Each printer shall be supplied with 50 numbers of paper rolls for printing.

7.0 QUALITY ASSURANCE

The manufacturer shall possess ISO 9001 Quality assurance certification for the manufacturer of portable three phase meter testing equipment for the plant where the offered portable three phase meter testing equipment is manufactured. 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 10 years of experience in the manufacture of portable three phase Static Meter testing equipment of Accuracy Class .2 to the IEC 736. The manufacturer shall furnish sufficient documentary evidence in the Bid to prove his manufacturing experience.
- b) The Meter testing equipment shall be rugged construction, proven design and reliable so that the equipment shall operate within the stipulated error limits for a period of 10 years with re-calibration by purchaser once in every two years.
- c) The manufacturer shall have supplied portable static three phase 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 and the names and communication address shall be clearly indicated
- d) 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

Every meter testing equipment shall have a name plate with the information stipulated in Clause 4.2.1.1 of IEC 1036 as applicable.

8.3 Carrying Case

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

9.0 INFORMATION TO BE SUPPLIED WITH THE OFFER

9.1 The following shall be furnished with the offer.

- a) Catalogues describing the equipment and indicating the type and model number.
- b) Operational manual.
- c) Complete dimensional drawings.
- d) List of deviation (if any)
- e) Duly completed schedule of guaranteed technical particulars
- f) Quality assurance certificate as per ISO 9001
- g) List of Utilities who purchased the similar equipment
- h) Calibration and test certificates of each equipment.

9.2 Test Certificates

Copy of the following test certificates of formally supplied equipment shall be furnished.

- a) Accuracy Test for;
 - i) Meter testing equipment
 - ii) Clamp on current transformers

- b) Functional Test for;
 - i) Meter testing Equipment
 - ii) Software
- c) Insulation withstand voltage test

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

10.0 INSPECTION AND TESTING

10.1 Inspection

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 on the Meter Testing Equipment offered.

10.2 Acceptance / Sample Test

The following acceptance test as per IEC 687 shall be witnessed by the representative of the Purchaser.

- a) Accuracy Test for;
 - i) Meter testing equipment
 - ii) Clamp on current transformers
- b) Functional Test for;
 - i) Meter testing Equipment
 - ii) Software
- c) Insulation withstand voltage test

Extra copies of these Test Certificates shall also be supplied with the Meter Testing i Equipment.

11.0 TECHNICAL LITERATURE AND DRAWINGS

Technical Literature in English language with regard to the operation 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 - To be filled by the Bidder

ANNEX - A

SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS

(This schedule shall be duly filled by the Manufacturer)

1)	Name of Manufacturer & Country of origin		-
2)	Model Number/ Catalog Ref. Number		-
3)	Type (portable / stationary)		-
4)	Applicable Standards		-
5)	Supply voltage range	V	-
6)	Accuracy of voltage measurements	%	-
7)	Current Range		
	a) For direct measurement	A	-
	b) For clamp on CT measurement	A	-
8)	Accuracy of current measurement		
	a) For direct measurement	%	-
	b) For clamp on CT measurement	%	-
9)	Accuracy of power/energy measurement	%	
	a) For direct measurement	%	-
	b) For clamp on CT measurement	%	-
10)	Display Size	mmXmm	-
11)	Whether the MTE will provide frequency / pulse for calibration of the unit itself.	Yes/No	-
12)	Whether the MTE is of static programmable type		-
13)	Whether the MTE is suitable for field testing;		
	a) Electromechanical meters of accuracy class 1 class 2 having rotating disc.	Yes/No	-
	b) Static meters of accuracy class 1 & class 0.5 having Light emitting diodes.	Yes/No	-
14)	Whether the MTE is suitable to test ;		
	a) CT (1Amp & 5 Amp) operated Meters	Yes/No	-
	b) Meter CT (by measuring the secondary current)	Yes/No	-
15)	Whether the scan head suitable to sense disc revolution and LED is provided	Yes/No	-
16)	Whether the start, stop button to check the accuracy of the meter without the scan head	Yes/No	-
17)	Whether the MTE is capable of displaying instantaneous voltage, current, power factor and power	Yes/No	-

18)	Whether the MTE is capable of display voltage, current, power factor and kWh & kVA	Yes/No -
19)	Whether the MTE has facility for storage of test results	Yes/No -
20)	Whether the stored data could be down load to a PC	Yes/No -
21)	Whether the software conform to Clause 6.1 ix) & x)	Yes/No -
22)	Whether the accessories as per Clause 6.2 provided	Yes/No -
23)	Whether the ISO 9001 quality assurance certificate furnished	Yes/No -
24)	Whether the calibration certificates of same equipment (formally supplied) provided	Yes/No -
25)	Whether the documents to prove the manufacturing experience as per Clause 7.1 is furnished	Yes/No -
26)	Whether list of utilities who purchased the MTE as per clause 7.1 is furnished	Yes/No -
27)	Whether the marking as per Clause 7.2 provided	Yes/No -
28)	Whether the carrying case provided	Yes/No -
29)	Whether the acceptance test as per clause 10.2 will be carried at the time of inspection	Yes/No -
30)	Whether the display is of Non-volatile memory type Memory retention period	Yes/No - Months -
31)	Guaranteed life span	Years -
32)	Insulation level	
	i) Insulation Withstand voltage for 1 min.	-
	ii) Impulse withstand voltage	-
	iii) Insulation resistance	-
33)	Power Losses	-
34)	Temperature rise / temperature coefficient as per IEC 1036	-
35)	Degree of protection (IP Category)	-
36)	Any deviation	-

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

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Seal and Signature of the Manufacturer/ Date