

MATERIAL SPECIFICATIONS CELL

TECHNICAL SPECIFICATION

OF

AC/DC CLAMP METER

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1.0 SCOPE

The specification for Hand held AC/DC True RMS CLAMP METER suitable for load current measurement in selectable ranges upto 400 A.

2.0 CLIMATIC CONDITIONS:

The Measuring Instrument should work in following climate.

- | | |
|-------------------------------------|---------------------------|
| i) Maximum Ambient Air Temperature | 55°C |
| ii) Minimum Ambient Air Temperature | 05°C. |
| iii) Maximum Relative Humidity | Upto 95% (non-condensing) |
| iv) Storage Temperature | -20°C to 70°C |
| v) Storage Humidity | Upto 95% (non condensing) |
| vi) Max. Altitude | 1000 meter |

3.0 GENERAL & CONSTRUCTIONAL REQUIREMENTS

CLAMP METER shall be designed and constructed in such a way so as to easy to operate compact and rugged design, designed for user safety. However, the following General features should be ensured.

4.0 GENERAL FEATURES & TECHNICAL REQUIREMENTS

- 4.01 The meter should have 4 ^{1/2} Digits 4000 counts LCD Display.
- 4.02 It should be Auto ranging as well as Manual range Selection function.
- 4.03 The clamp meter shall be capable of measuring true RMS AC/DC current up to 400 A.
- 4.04 It should have low maintenance flat jaw & max. Jaw opening capability of 60mm.
- 4.05 The inner diameter of the clamp in a closed condition shall be 60 mm.
- 4.06 It should have over range, data hold, low battery mark on LCD.
- 4.07 It should have Data Hold, Relative Zero Mode and minimum/ maximum mode.
 - ✓ Data Hold: To freeze the display at the push of a button.
 - ✓ Relative Zero Mode: To allow the user to offset the meter consecutive measurements with the displaying reading as a reference value.
 - ✓ Minimum/ maximum mode : The display shall show maximum, minimum and average for a selected parameter during measuring period.
- 4.08 The clamp meter shall be capable of measuring resistance up to 40 Mega ohm
- 4.09 The clamp meter shall be capable of measuring continuity below 10 Ohm
- 4.10 The clamp meter shall be capable of measuring capacitance up to 50 micro farad
- 4.11 The clamp meter shall be capable of measuring AC/DC voltage up to 1000Volts
- 4.12 The clamp meter supplied shall have safety category rating of CAT III 1000V and CAT IV 600Volts
- 4.13 The display should show readings relative to the stored reference value.
- 4.14 It should have Overload Protection on all ranges.
- 4.15 It should have water resistance front panel, fireproof heavy duty ABS casing.

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- 4.16 It should have battery access door for battery replacement without voiding calibration (rechargeable batteries having continuous operation for 5 to 6 hrs.)
- 4.17 Documentation- Sufficient no. of Operating/Service Manuals shall be provided along with supplied material
- 4.18 It should have continuity check & diode test function.
- 4.19 It should have frequency, capacitance & duty cycle measurement function.
- 4.20 It should have facility of over voltage protection.
- 4.21 Overload Protection: AC/DC 500mA (Fuse), AC/DC 400A/1000V
- 4.22 Frequency response: 45Hz to 1 KHz
- 4.23 After sales support: The after – sales service support / warranty services has to be provided.
- 4.24 Technical evaluation: Technical evaluation of offer of the equipment shall be carried out
- 4.25 Basic Accuracy:

Function	Ranges	Resolution	Accuracy
Volt DC	400.0 mV to 1000V selectable	0.1mV	± (0.5% of rdg)
Volt AC	4.000V to 1000V selectable	0.001V	± (1.2% of rdg)
Current DC/AC (Direct Input)	400.0µA to 400.0mA. selectable	0.1µ A	± (1.2% of rdg)
Current DC/AC (Through Clamp)	400.0A	0.1A	± (2% of rdg)
Resistance	400.0 OHM to 40.00M OHM	0.1 OHM	± (1% of rdg)
Capacitance	50.00nF to 50.00µF selectable	0.01nF	± (3% of rdg)
Frequency	50.00Hz, to 100.00kHz, selectable	0.01Hz	± (1% of rdg)
Duty Cycle	1% to 99%	0.1%	

5.0 APPLICABLE STANDARDS

- i) EN 61010-1:2001, 61010-031 CAT III 600V for Safety requirement for electrical equipment for measurement, control & laboratory use
- ii) EN 61326-1:2006 for EMI & EMC requirement for electrical equipment for measurement, control & laboratory use.
- iii) IEC 60529 for Ingress Protection (IP 54 Required).
- iv) CISPR 16-1 and 16-2 for Radiated emission for enclosure
- v) IEC 61000-4-2 for Electrostatic Discharge (ESD)
- vi) IEC 61000-4-3 RF Electromagnetic Field
- vii) IEC 60068-2-2/IS 9000 Part 3/Sec3 for Dry Heat Test
- viii) IEC 60068-2-78/IS 9000 Part 4 for Steady State Damp Test
- ix) IEC 60068-2-14/IS 9000 Part 14/Sec 1 for Change of temperature
- x) IEC 60068-2-6/IS 9000 Part 8 for Vibration test
- xi) IEC 60068-2-29/IS 9000 Part 7/Sec 2 for Bump Test
- xii) IEC 60068-2-27/IS 9000 Part 7/Sec 1 for Mechanical Shock test

6.0 ACCESORIES

- 1. A pair Of Test leads.
- 2. Carrying case.
- 3. Spare Fuse – 3nos

7.0 CALIBRATION CERTIFICATE

The calibration of equipment shall be carried out at approved laboratory by National Board of Accrediation of Laboratories (NABL).

The manufacturers calibration certificates for all other equipment under supply with report from NABL approved laboratory shall be submitted for approval of C.E. (Testing & QC) before commencement of supply. Validity of calibration certificate shall be one year.

The equipment shall be type tested for IP 54 degree of protection as per IS: 12063/ IEC 60529 against ingress of dust, moisture & vermin. The type test certificate shall be submitted along with the offer

8.0 NAME PLATE & MARKING

Equipment shall have name plate clearly visible, effectively secured against removal and indelibly and distinctly marked with all essential particulars as per relevant standards. Following details shall be marked on the Name Plate

Manufacturer's name & address:

Serial no.

Purchase Order No.

Month and Year of manufacture

Name of purchaser: MSEDCL

Guarantee: Five Years

ISI mark if applicable

9.0 GUARANTEE

The offered equipment shall be guaranteed for the period of five years from the date of commissioning or five and half year from the date of dispatch, whichever is earlier.

10.0 PACKING

The instrument shall be suitably packed in order to avoid damage or disturbance during transit or handling. Each instrument may be suitably packed in the first Instance to prevent ingress of moisture and dust and then placed in a cushioned carton of a suitable material to prevent damage due to shocks during transit. The lid of the carton may be suitably sealed. A suitable number of sealed cartons may be packed in a case adequate strength with extra cushioning if considered necessary. The cases may then be properly sealed against accidental opening in transit. The packing cases may be marked to indicate the fragile nature of the contents.

The following information shall be furnished with the consignment:

- i) Name of consignee.
- ii) Details of consignment
- iii) Destination
- iv) Total Weight of consignment.
- v) Sign showing upper / lower side of the crate.
- vi) Sign showing fragility of the material.
- vii) Handling and unpacking instructions

11.0 TRAINING OF ENGINEERS:

The successful supplier shall train Engineers of MSEDCL free of charge at their works for familiarization of design, operation and maintenance of testing equipments

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GUARANTEED TECHNICAL PARTICULARS OF AC/DC CLAMP METER

Sr. No.	Technical Parameters –	Offered Specification	Remarks
1.	Manufacturer's Name & Country of Manufacture.		
2.	Type/Model details of Equipment.		
3.	Applicable Indian/International Standard to which the equipment conforms	As per clause no. 4.00	
4.	The equipment is Hand Held Type, Battery operated, with Digital Display of 4000 counts, measuring true RMS AC/DC current up to 400A	Yes	
5.	The equipment is provided with manual/auto range selection, Hold & autohold facility & suitable Minimum, maximum, and average reading memory , Auto power OFF, Low Battery Indication, etc.	Yes	
6.	The equipment is provided as per relevant IS/IEC	Yes	
7.	Operating temperature	- 10°C to 50°C	
8.	Equipment is internally protected against over voltages and over currents & Over voltage input warning	Yes	
9.	Type of Display is LCD with backlight viewable in bright sunlight	Yes	
10.	Equipment is warranted for minimum period	5 years.	
11.	Measuring Range & accuracy range as per clause no. 5.22	Yes	
12.	Calibration certificate is submitted	Yes	