Maharashtra State Electricity Distribution Company Limited

SPECIFICATION NO. CE-T / MSC - II / Digital Insulation Tester//2019/08

TECHNICAL SPECIFICATIONS

FOR

5kV DIGITAL INSULATION TESTER

FOR

33 / 11 kV SUBSTATIONS & SECTION OFFICES

IN

MSEDCL

I N D E X

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY
Technical Specifications for
5kV DIGITAL INSULATION TESTER FOR 33/11kV SUBSTATION & SECTION OFFICES

SPECIFICATION NO. MSC / Digital Insulation Tester//2019/08

1.0 SCOPE :

The 5kV Digital Insulation Tester should be compact, microprocessor controlled high voltage DC insulation tester which may be powered by internal rechargeable batteries as well as by connection to AC supply. It should be suitable for heavy duty prolonged tests for the measurement of Insulation Resistance of Distribution Transformers, Low and High Tension lines/cables (upto 33kV level). It should be built into extremely robust molded case with easy portability, internal provision for test lead & main power cord and operate from mains supply & rechargeable battery. Instrument should operate on mains without battery or flat battery.

2.0 SERVICE CONDITIONS:

The 5 kV Digital Insulation Tester to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions.

2.1	Maximum ambient temperature (Degree C)	50
2.2	Maximum temperature in shade (Degree C)	45
2.3	Minimum Temperature (Degree C)	3.5
2.4	Relative Humidity (percent)	10 to 95
2.5	Maximum Annual rain fall (mm)	1450
2.6	Maximum wind pressure (kg/sq.m)	150
2.7	Maximum altitude above mean sea level (Meter)	1000
2.8	Isoceranic level (days per year)	50
2.9	Seismic level (Horizontal Acceleration)	0.3 g

Moderately hot and humid tropical climate conductive to rust and fungus growth.

3.0 APPLICABLE STANDARDS:

a. EN 61010-1:2001, 61010-031 CAT III 600V for Safety Standards.
b. EN 61326-1:2006 for EMC Standard.
c. IEC 60529 for Ingress Protection.
d. IS 11994 for Type Testing.
e. IEC 62133 for Rechargeable Li-ion Battery.
f. IS 10656 for Insulation Resistance Tester.

4.0 GENERAL TECHNICAL REQUIREMENTS:

5kV Digital Insulation Tester shall be designed and constructed in such a way so as it is easy to operate, compact, rugged design and user safety. However, the following main features should be ensured.

4.1 The test kit should display the value of Insulation Resistance after each test.

4.2 Display should contain Digital Insulation Resistance results, Battery condition indication, should be displayed on LCD screen with backlit or on AC Adaptor.

4.3 AC Voltage measurement up to 600V, 50Hz.

4.4 The test kit should be supplied with accessories viz. test leads, guard lead, mains power cord, instruction manual.

4.5 The test kit along with accessories should be supplied with a carrying case so as to be carried to testing site easily.

4.6 The equipment should be enclosed with casing so that in closed condition display, keypad and connection terminal should be fully protected and covered.

4.7 The test kit shall be equipped with High Voltage terminal, Measurement terminal and Guard terminal. These terminals shall be suitably marked for easy identification.

4.8 The test kit should have an indication by Flashing LED to warn the user about High Voltage generated across the test terminals.

4.9 The test kit should discharge the test object after every test.

5.0 PRINCIPAL TECHNICAL PARAMETERS:

Principal Technical Parameters for 5 kV Digital Insulation Tester is as under :-

Sr. No.	Technical Specification	Details
1	**Test Voltage**	
	a) Range (DC Voltage)	1000V-2500V-5000V DC
	b) Accuracy Range	90 to 110% of DC Test Voltage
	c) Short Circuit Current	Minimum 1.5 mA
2	**Insulation Resistance**	
	a) Range	Maximum 200GΩ
	b) Digital Display Range	0.1MΩ to maximum 200GΩ
	c) Accuracy	± (3% of rdg + 5 digit) for 0.1MΩ to 200MΩ ± (5% of rdg + 5 digit) for 200MΩ to 10GΩ ± (10% of rdg + 5 digit) for 10GΩ to 200GΩ
3	**AC Voltage Measurement**	
	a) Range	Upto 600 V AC (50 ± 5 Hz)
	b) Accuracy	± (2% of rdg + 5 digit)
4	**Power supply**	
	a) Battery	Integrated Rechargeable Li-ion Battery within built Battery Charging Circuit.
	b) Battery life	Min. 4 hrs of typical use continuous testing at 5KV with a100MΩ.
	c) Battery Charging	2.5Hrs
5	**Safety Compliance**	The test kit should conform to safety standard 61010-1:2001 & CAT III 600V
6	**EMC Standard**	The test kit shall confirm to EN 61326-1:2006.

6.0 ACCESSORIES:

1) Kit should be supplied with IEC 61010-031 complied 10 meter long Testing Leads with suitable Insulated Clamps / Crocodile Clips for connection and Mains Power cord with Adaptor.
2) Every kit should be supplied with Works Test and Calibration Certificate which is traceable to NPL / NABL.
3) Warranty :- 5 Years from Date of Delivery.

7.0 TYPE TEST :

1. The tenderer shall furnish detailed Type Test Reports of the offered or similar Tester of 5kV for all the tests as per IS 11994 – 1986 / 10656 - 1983 Standard(clearly stating the ambient condition under which the test has been conducted) along with the offer. The effect of variation in temperature and vibration on accuracy limits should also be stated. Such Type Test Certificates and Reports should not be older than 5 (Five) years from the due date of opening of the bid. In case such Type Test Certificates and Reports are older than 5 years, the bidder has to conduct the Type Tests again as above mentioned and submit the reports. All the above Type Tests shall be carried out from the National Board of Testing and Calibration Laboratories (NABL) of Govt. of India to prove that the Tester offered meets the requirements of the specification. However, the tenderer who have supplied the offered Tester to MSEDCL against order from Central Purchase Agency of MSEDCL shall be exempted from submission of Type Test Reports against this tender provided that :
    i. Their offered Testers are already fully Type Tested at Laboratories accredited by NABL within five years prior to date of opening of the tender.
    ii. There is no change in the design of type tested Tester and those offered against this tender.
    iii. Such tenderers complying (i) and (ii) above, shall furnish an undertaking in the format "Schedule C" enclosed herewith.

2.01 The Purchaser reserves the right to demand repetition of some or all the Type Tests in presence of purchaser's representative at purchaser's cost. For this purpose, the tenderer shall quote unit rates for carrying out each Type Test. However, such unit rates will not be considered for evaluation of the offer. Incase the unit fails in Type Test, the complete supply shall be rejected. The successful tenderer shall take approval of Type Test from Chief Engineer (Testing & Quality Control), MSEDCL, Prakashgad, Bandra, Mumbai prior to commencement of supply.

8.0 PRE DESPATCH INSPECTION:

The inspection shall be carried out at the place of manufacturer unless otherwise agreed upon by the manufacturer and purchaser at the time of purchases. For imported equipments the supplier/bidder shall offer the equipment at the authorized service centre /works of the original manufacturer in India or at the supplier's works/Testing centre. The manufacturer shall offer to the inspector representing.

The manufacturer shall provide all the reasonable facilities, free of charge, for inspection and testing to satisfy, the material is being supplied in accordance with this specification.

The joint inspection of the equipment will be carried out by inspection wing & the appointed Executive Engineer testing division.

9.0 GUARANTEE:

The instrument shall be guaranteed for the period of **Five** years from the date of Dispatch. The

Instrument found defective within the above guarantee period shall be replaced /repaired by the supplier free of cost within one month of the receipt of intimation, if the defective instruments are not replaced/repaired within the specified period above, the MSEDCL shall recover an equivalent amount plus 10 % supervision charges from any of the bills of the supplier.

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 the 5 kV Digital insulation tester.

12.0 SCHEDULES :

The bidder shall fill in the following schedules which are part and parcel of the tender specification and offer. If the schedules are not submitted duly filled in with the offer, the offer shall be liable for rejection.

Schedule ‘A’ - Guaranteed Technical Parameters
Schedule ‘B’ - Tenderer’s experience.
Schedule ‘C’ - Proforma of Undertaking.

The tenderer shall submit the list of orders for similar type of equipment, executed or under execution during the last three years, with full details in the schedule of tenderer’s experience (Schedule ‘B’) to enable the purchaser to evaluate the tender.

SCHEDULE – 'A'
GUARANTEED TECHNICAL PARTICULARS

Sr. No.	Particulars	Requirements As Per Tender Specifications	Offered By Tenderer
1.	Name and Address of Bidder / Manufacturer / Authorized Dealer	----------	
2.	Make	----------	
3.	Model / Type Designation	----------	
4.	Application	Testing of Insulation Resistance of Distribution Transformers, Cables, CT's, PT's, Switches, Appliance, Motors etc.	
5.	**Test Voltage**		
	a) Range (DC voltage)	1000V- 2500V – 5000V DC	
	b) Accuracy Range	90 to 110% of DC Test Voltage	
	c) Short Circuit Current	Minimum 1.5 mA	
6.	**Insulation Resistance**		
	a) Range	Maximum 200GΩ	
	b) Digital Display Range	0.1MΩ to maximum 200GΩ	
	c) Accuracy	± (3% of rdg + 5 digit) for 0.1MΩ to 200MΩ ± (5% of rdg + 5 digit) for 200MΩ to 10GΩ ± (10% of rdg + 5 digit) for 10GΩ to 200GΩ	
7.	**AC Voltage Measurement**		
	a) Range	upto 600 V AC. (50 ± 5 Hz)	
	b) Accuracy	± (2% of rdg + 5 digit).	
8.	**Power supply**		
	a) Battery	Integrated Rechargeable Li-ion Battery within built Battery Charging Circuit.	
	b) Battery life	Min. 4 hrs of typical use continuous testing at 5KV with a 100MΩ.	
	c) Battery Charging	2.5Hrs	

9.	Safety Compliance	The test kit should conform to safety standard 61010 -1:2001 & CAT III 600V.	
10.	High Voltage Indication	Should Be Provided	
11.	Operating Principal	Micro Controller Based Tester	
12.	Low Resistance Warning	Buzzer should sounds if the Load is ≤ 1MΩ. The Test Power should be shut off by user if the Buzzer sounds for more than 30 seconds.	
13.	Dielectric Strength	3.5kV at 50Hz for 1 minute between Input Terminals and Case	
14.	Power Consumption	< 10VA	
15.	Environment Condition	Working Temp : 0 to 50°C, RH < 80% storage Temperature : -25°C to 65°C, RH <85% Calibration Temp : 23 ± 5°C, RH < 75 %	
16.	Standards	Tester should meet EMC Compliance Standard as per IEC 61326-1 Class B Tester should meet Safety Compliance as per Standard IEC/ EN61010-1 and IEC/ EN 61010- 031 Over Voltage CAT III 600V Instrument should be ingress Protected for IP54	
17.	Type Test Report	Type Test Report (not older than 5 Years) as per Relevant IS should be submitted before Commencement of bulk supplies.	
18.	Calibration Report	One Sample Tester with Works Calibration Certificate having Traceability to NPL / NABL Laboratory should be submitted at the time of submission of the Tender Documents.	
19.	Dimension and Weight	Tester should be Handy / Portable and can be easily carried at site and not more than 1.5 to 2Kg (Including Batteries and All Accessories).	
20.	Accessories	Insulation Resistance Measurement Test Leads with Crocodile Clips of 10M each x 3pcs, Heavy Duty Carrying Bag x 1pc, Operating Instruction Manual x 1pc, Built-In Rechargeable Batteries (Fitted In) and AC Adaptor x 1pc	

Sr. No	Particulars	Requirements As Per Tender Specifications	

SCHEDULE – 'B'

SCHEDULE OF TENDERER'S EXPERIENCE

Tenderer shall furnish here a list of similar orders executed/under execution by him to whom a reference may be made by Purchaser in case he considers such a reference necessary.

Sr. No.	Name of Client and Description of Order	Value of Order	Period of Supply and commissioning	Name and Address to whom Reference may be made
1	2	3	4	5

NAME OFFIRM_____

NAME & SIGNATURE OETENDERER_____

DESIGNATION_____

DATE_____

SCHEDULE – 'C'

PROFORMA OF UNDERTAKING

We hereby confirm that 5 kV Digital Insulation Tester offered by us against this tender are of thesamedesignandtypeashavebeensuppliedtoMSEDCLagainstearlierOrderNo. _____dtd._____and all the type test reports thereof were approved by C.E.(TQC) vide letter No.__dtd.(copy enclosed).

We further confirm that the said type tests have been carried out at the laboratories accredited by NABL within five years prior to the date of opening of present tender.

NAME OF FIRM_____

NAME & SIGNATURE OETENDERER_____

DESIGNATION_____

DATE_____