MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.

Maharashtra State Electricity Distribution Company Limited

SPECIFICATION NO. CE-T/MSC-II / Digital Insulation tester//2019/06

TECHNICAL SPECIFICATION

FOR

5kV DIGITAL INSULATION TESTER

FOR

FOR TESTING DIVISIONS

IN

MSEDCL

I N D E X

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY
Technical Specifications for
5kV DIGITAL INSULATION TESTER FOR TESTING DIVISIONS

SPECIFICATION NO. MSC / Digital Insulation tester//2019/04

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 Power Transformers, Current Transformers, Low and High Tension Cables (33 KV level). It should be built into extremely robust molded case with easy portability, internal provision for test lead & main power cord and operates 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	Siesmic 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 IV 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 REQUIREMENT:

5kV Digital insulation tester shall be designed and constructed in such a way so as to easy to operate, compact, rugged design, 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 The test kit should have automatic test sequence for Automatic IR Test, Polarization Index Test.

4.3 The test kit should have self calibration check up at every start up.

4.4 Display should contain digital resistance results, battery charge indication, mains or battery operation indication should be displayed on LCD screen with backlit.

4.5 AC/DC voltage measurement up to 600 V, 50Hz

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

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

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

4.9 The test kit shall be both AC mains and Battery Operated.

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

4.11 The test kit should display the direct reading of voltage across the test object when the test is in progress.

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

4.13 The test kit should minimum two programmable timers for conducting diagnostic tests.

4.14 There should be the provision of interference suppression unit which nullifies the effect of electrostatic interference as per IEC 61010-031.

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)	250V -500V-1KV -2.5KV -5 KV.
	b) AC voltage	90-264 V rms, 50 Hz.
	c) Resolution	1 V.
	d) Accuracy	±5%
	e) Short circuit Current	Minimum 1.4 mA
2	Insulation Resistance	
	a) Range	Minimum 1 TΩ

	b) Digital Display range	1 kΩ to minimum 1 TΩ
	c) Accuracy	± (5% of rdg + 5 digit) for upto 1TΩ
3	AC/DC Voltage Measurement	
	a) Range	upto 600 V AC/DC.
	b) Accuracy	± 5% of rdg + 5 digit).
4	Timer Range	up to 99 minutes.
5	Power supply	
	a) AC Mains	240V AC±20%, 50Hz±5%.
	b) Battery	Integrated Rechargeable Li-ion Battery with in built battery charging circuit.
	c) Battery life	Min. 4 hrs of typical use continuous testing at 5KV with a 100MΩ.
	d) Battery Charging	2.5Hrs
6	Safety Compliance	The test kit should conform to safety standard 61010-1:2001 & CAT IV 600V.
7	EMC Standard	The test kit shall confirm to EN 61326-1:2006.
8.	Ingress Protection	Minimum IP 54

6.0 ACCESSORIES :

1) Kit should be supplied with IEC 61010-031 complied 10 meter long testing leads with suitable clamps for connection, power cord.
2) Every kit should be supplied with test certificate from NABL accredited lab.
3) Warranty :- 5 years from date of delivery.

7.0 TYPE TEST ;

The instrument should be type tested as per IS 11994.

A) The bidder shall furnish detailed type test reports of the Offered instrument for all the test as per Relevant standards. All the above type testes shall be carried out at laboratories which are accredited by the National Accreditation Board for testing and calibration laboratories (NABL) of Government of India/International accredited laboratories to prove that the instruments offered meet the requirements of specification. However, the bidder who have supplied the offered instrument to MSEDCL against order from MM Cell of MSEDCL shall be exempted from submission of type Test Reports against this tender provided that,

i) Their offered instruments are already fully type tested at Laboratories accredited by the National Accreditation Board for testing and Calibration Laboratories (NABL) prior to the date of opening of the tender.

ii) There is no change in the design of type Tested instruments and those offered against this tender.

iii) Such bidder complying (i) & (ii) above, shall furnish an undertaking in the format schedule 'C' enclosed herewith.

B) 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 bidder shall quote unit rates for carrying out each type test. However, such unit rates will not be considered for evaluation of the offer. In case the unit fails in type test, the complete supply shall be rejected. The Successful bidder shall take approval / waival of type test from (MM Cell), MSEDCL, Prakashgad, Bandra, Mumbai prior to commencement of supply.

In addition to type test reports, the bidder shall furnish detailed Calibration report of the offered instrument carried out at NABL approved Laborites/International accredited laboratories on all the equipment of 5 kV Digital Insulation Tester as per relevant standards to prove that the instrument offered meet the requirements of specification.
The list of type test reports as per applicable standards mentioned in following table shall be submitted with the offer. The offer without type test reports shall not be considered & offer will be treated as irresponsive. Type testing should be carried out within 5 years from the date of opening of tender.

Sr. No.	Type Test Particular	Standard Applicable
1.	EMC Generic Emission	DIN EN 61000-6-4
2.	EMC immunity for industrial environments	DIN EN 61000-6-2
3.	Environmental testing – Part 2 : Test A :Cold	DIN EN 60068-2-1
4.	Environmental testing – Part 2 : Test B : Dry Heat	DIN EN 60068-2-2
5.	Environmental testing – Part 2 : Test C : Damp heat, steady State	DIN EN 60068-2-66
6.	Environmental testing – Part 2 : Test For : Vibrations	DIN EN 60068-2-6
7.	Safety Requirements for electrical equipment	DIN EN 61010-1
8.	Degrees of Protection provided by enclosures (IP Code)	EN 60 529

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)	250V-500V-1 KV - 5 kV	
	b) AC voltage	90-264 V rms, 50 Hz.	
	c) Resolution	1 Volt	
	d) Accuracy	±5%	
	e) Short circuit Current	Min 1.4 mA	
6.	Insulation Resistance		
	a) Range	Minimum up to 1 TΩ.	
	b) Digital Display range	1 kΩ to 1 TΩ.	
	c) Accuracy	± (5% of rdg + 5 digit) upto 1TΩ.	
7.	AC/DC Voltage Measurement		
	a) Range	upto 600 V AC/DC.	
	b) Accuracy	±(5% of rdg + 5 digit).	
8.	Timer Range	up to 99 minutes .	
9.	Power supply		
	a) AC Mains	240V AC±20%, 50Hz±5%.	
	b) Battery	Integrated Rechargeable Li-ion Battery with in built battery charging circuit.	
	c) Battery life	Min 4 Hrs of typical use continuous testing at 5KV with a 100MΩ.	
	d) Battery Charging	2.5Hrs	
10.	Safety Compliance	The test kit should conform to safety standard 61010- 1:2001 & CAT IV 600V.	
11.	EMC Standard	The test kit shall confirm to EN 61326-1:2006.	
12.	Ingress Protection	IP54	

13.	High Voltage Indication	Should Be Provided	
14.	Operating Principal	Micro Controller Based Tester	
15.	Low Resistance Warning	Buzzer sounds if the Load is 1MΩ. The Test Power should be shut off by user if the Buzzer sounds for more than 30 seconds.	
16.	Indication	3.5 Digit 1999 Cont Large Digital LCD Display with Backlight	
17.	Range Selection	Auto Ranging (For Insulation Resistance Test)	
18.	Data Hold Facility	Should Be Provided	
19.	Low Battery Indication	Should Be Provided	
20.	Dielectric Strength	3.5kV at 50Hz for 1 minute between Input Terminals and Case	
21.	Battery Used Type	Internal Rechargeable Battery having In-built Charging Circuit with AC Adapter	
22.	Power Consumption	< 10VA	
23.	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 %	
24.	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 IV, 600V Instrument should be ingress Protected for IP54	
25.	Type Test Report	Type Test Report (not older than 5 Years) as per Relevant IS should be submitted before commencement of bulk supplies.	
26.	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.	
27.	Dimension and Weight	Tester should be portable and not more than 5Kg (including batteries)	

38.	Accessories	Insulation Resistance Measurement Test Leads with Crocodile Clips of 10M each Phase Sequence Test Leads with Crocodile Clips of 1 M each Heavy Duty Carrying Bag Operating Instruction Manual Built-In Rechargeable Batteries AC Adaptor	

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 OF FIRM_____

NAME & SIGNATURE OE TENDERER_____

DESIGNATION_____

DATE_____

SCHEDULE – 'C'

PROFORMA OF UNDERTAKING

We hereby confirm that 5 kV Digital Insulation Tester offered by us against this tender are of the same design and type as have been supplied to MSEDCL against earlier Order No._____ dtd. _____ and all the type test reports thereof were approved by C.E.(MM Cell) 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 OE TENDERER_____

DESIGNATION_____

DATE_____