



SIVA INSTRUMENTS

An ISO 9001: 2000 Company



Siva Instruments

Automatic C & Tan δ Bridge

MLS-11DA & HLS12A



Option 1:
Laptop Controlled

Automatic Capacitance & Tan δ Test Set Useful for condition monitoring insulation tests for power sector equipments such as High Voltage (EHV) class Bushings, Windings of transformer (1/2/3 windings), shunt reactors, Current Transformer, Capacitor Voltage transformer (CVT), grading capacitors of Circuit Breakers, Surge Arrester and other electrical equipments at site automatically in a charged switch yard.

This set includes Bridge Model: MLS11DA & HV Power Supply Model: HLS12A, Laptop controlled as well as front panel controlled versions are available. Very flexible, user friendly visual C++ windows based software. The use of Laptop & Windows based software makes the system more flexible easy to handle & accurate data can be stored, retrieved and analyzed at site.

Colored Screen analysis & graphical plotting of Tan δ Vs Voltage, Tan δ Vs Time. Complied IEC 61010, ASTM D999, EMI/EMC-EN-61326, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8, IEC61000-4-11, CE marked.



Option 2:
Front Panel Controlled

Features

- 1) Automatic Measurement of Capacitance & Tan δ as per the test plan by auto-balancing No need of manual balancing. Automatic voltage setting through software.
- 2) Indication of Leakage current.
- 3) Graphical representation of voltage vs Tan δ to know the Tan δ gradient & data analysis for comparison with old results and manufacturer's data.
- 4) Temperature correction as per IEC for Tan δ .
- 5) Executes all the test modes automatically.
- 6) ON site printout with USB printer.
- 7) Suitable for extraneous conditions in 400KV switch yard under heavy induction.
- 8) More than 10000 Results Data-storage.
- 9) Optional feature available for line as well as generated frequency operation using generated frequency source with dual frequency operation software.
- 10) Optional feature for Leakage Reactance Measurement.
- 11) Kit is supplied with Temperature & Humidity Meter.
- 12) Automatic Interference Suppression.
- 13) High quality & cost effective indigenous design & easy availability of spares.

Measurements:

The system will provide following Information.

PARAMETER	RANGE	RESOLUTION	ACCURACY
CAPACITANCE	1pF - 1.1 μ F	0.01pF	$\pm 0.2\%$ of the reading ± 1 pF
TAN DELTA	0 % - 200%	0.00001	$\pm 1\%$ of the reading $\pm 0.05\%$
VOLTAGE Measurement	0 - 12 KV	1.0 V	$\pm 1\%$, ± 1 digit
CURRENT Measurement	0 - 200 mA	1mA	$\pm 1\%$, ± 1 digit
POWER FACTOR	0.01% - 100%	0.00001	$\pm 1.0\%$ of the reading $\pm 0.05\%$

Additional Parameters:

Apparent Power, True Power, Reactive Power, Test Frequency, Inductance, Magnetizing Current, interference current, Temperature, Humidity, Time & Date.

Input voltage	: 230VAC $\pm 10\%$, 50Hz $\pm 5\%$
Output voltage	: 0-12KVAC, 200mA Continuous, 400mA intermittent.
Test Frequency	: 50Hz lines Frequency, Fixed Generated Frequency with optional Generated Freq. Source
Balancing Method	: Fully Automatic
Interference Suppression	: Fully Automatic
Voltage Setting	: Fully Automatic through software
Display	: Large colored backlit LCD high resolution graphical display on laptop/ Front Panel
Storage Memory	: More than 10000 Results Storage memory
Analysis Software	: Windows based analysis software for Tan δ Vs Time, Tan δ Vs Voltage
Inbuilt Standard Capacitor	: 100pF/200pF $\pm 0.5\%$, Tan δ <0.0001, Max. Voltage Rating: 14KVrms

Essential Accessories:

1. Calibrator Box with one C & three Tan δ Taps Test Voltage 2KVAC
2. Cables: HV Cable-20Meter, LV Cable- 20Meter, Ground Cable, Interconnecting cables
3. Temperature & Humidity Meter.
4. Carrying Cases: Foam Padded Carrying Cases for Bridge & Power supply, Carry Bag for Cables
5. Laptop with accessories supplied with option1
6. Windows based software CD
7. Operational Manual CD
8. Application Notes CD
9. Traceable calibration certificate

Optional Accessories:

1. Resonating Inductor to increase current range to measure 1 μ F @ 10KV
2. Leakage Reactance Module
3. Generated Frequency Source with dual frequency operation software

Protections & Safety Features:

1. Open Ground Protection
2. Zero Start Protection
3. HV interlock
4. Over Voltage Protection
5. Over Current Protection
6. Over Temperature Protection.

Safety Certification	: IEC 61010 Complied.
Vibration Test Certification	: ASTM D999 Complied.
EMI/EMC Certification	: IEC/EN61326 Complied.
Temperature Range	: 0 $^{\circ}$ C to 50 $^{\circ}$ C
Humidity Range	: Ambient to 95%.

Digital Hygro -Thermometer

Temperature Range : -10 to 60°C
Accuracy : ± 1°C Resolution : 0.1°C
Humidity Range : 20 to 99%RH
Accuracy : ± 5% RH
Resolution : 1% RH.



Calibrator Box

Calibrator Box with one C value & three Tan δ values is supplied with the kit.



Laptop PC

Suitable Laptop PC with 1.4GHz or higher, 512 MB RAM, 40GBHDD, USB port, CD/DVD combo drive, 14" TFT Screen, Suitable Printer, wifi, Inbuilt 56KBPS Modem, Carrying Bag is supplied with the Kit.



Windows Based Software

This Windows Based Data Management & analysis software supplied with the kit for Voltage Vs Tan delta, Time Vs Tan delta trend analysis.



Resonating Inductor

The resonating inductor useful to increase the current rating suitable to measure 1μF at 10KV.



Leakage Reactance Module

This is an optional facility supplied on request for Leakage Reactance Measurement.



Generated Freq. Source

This is an optional facility supplied on request for line as well as fixed generated frequency operation. This is supplied with dual frequency operation software.



Carrying Cases & Bags

Foam padded sturdy carrying cases for Bridge & Power Supply & Carry-bag for cables.





TECHNICAL SPECIFICATIONS FOR HIGH VOLTAGE POWER SUPPLY

Test Voltage	: 0 to 12 KV
Rated Current	: 200mA Continuous & 400mA intermittent.
Rated Power	: 4.8KVA intermittent .
Output Frequency	: 50 Hz (Lines Freq.), Fixed generated frequency with optional source.

Automatic balancing through windows based software.
Automatic & software controlled voltage setting to avoid abrupt voltage rise.
Automatic selection of seven different modes of operation for measurement of 3 terminal object from windows based software.

- 1) UST** - Ungrounded Specimen test - 3 combinations
This mode is used when the object under test is not grounded.
This test provides most accurate results.
- 2) GST** - Grounded Specimen test
This mode is used when the object under test is permanently grounded.
This test is used more often in outdoor installations, power systems etc.
- 3) GSTg** - Grounded specimen test with guard. 3 combinations.
This mode is used for measuring them stray capacitances and separating them from basic measurement in GST mode.

Standard capacitor	: 100pF/200pF 12KV built-in.
Input Frequency	: 50 Hz (lines frequency), \pm 5%. Fixed generated frequency with optional source.
Power Required	: 230 VAC \pm 10%, 1 phase AC, 50Hz.

Safety Features :

- ♦ Zero start control
- ♦ Open ground indicating lamp with double grounded connection
- ♦ External interlock.
- ♦ HT cut off on overload
- ♦ HT ON & Supply ON indication.
- ♦ All operating controls at earth potential
- ♦ Necessary terminals & Sockets for connection to Bridge

Safety Specifications : IEC 61010 complied.

Vibration Suitability : ASTM D 999 complied.

EMI/EMC Specifications: Conducted & Radiated Emission **EN 61326** complied,
Radiated Susceptibility **IEC61000-4-3** complied,
Electrical Fast Transients **IEC61000-4-4** complied,
Surge Test **IEC61000-4-5** complied,
Conducted Susceptibility **IEC61000-4-6** complied,
Power Freq. Magnetic Field Immunity **IEC61000-4-8** complied,
Voltage dips / Interruption **IEC61000-4-11** complied.

To keep pace with the latest technology Sivananda Electronics reserves the right to update it's system. Hence, information in the brochure is likely to change without notice.



SIVANANDA ELECTRONICS

DEEPAK MAHAL, LAM ROAD, DEVLALI-422 401, NASHIK. MAHARASHTRA, INDIA.

Phone : 0253-2491423, 2491504, 2491816 E-mail : mkb@sivanandaelectronics.com Fax: 0253-2492291

MUMBAI : 208, SAHAR PLAZA COMPLEX, ANDHERI KURLA ROAD, ANDHERI, MUMBAI-400 059.
PHONE: 022-28271046, 66430590 / 91. FAX: 022-28389232 E-mail: sivabom@vsnl.com

NEW DELHI : G-145, KALKAJI, NEW DELHI-110 019. PHONE: 011-26221582, 26434442. E-mail: sivadel@hotwireindia.com

BANGALORE : 44/2, DICKENSON ROAD, BANGALORE-650 042. PHONE: 080-25585673, 25597416. E-mail: sivablr@vsnl.net

HYDERABAD : 102, ART PLAZA, YWCA LANE, NEAR HIRA HALL, BOGGUL KUNDA, ABIDS, HYDERABAD-500 001. PHONE: 040-23202943,

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