



# POWER ELECTRONICAL

Insulation Quality Testing Experts

<http://powerelectronical.com/>

## PE-MCDF-SP15/500 Capacitance & Dissipation Factor (Tan-Delta) test system 15kV / 500mA (special requirement)

Electrical properties of insulating systems change due to age and continuous electrical stress. By measuring electrical properties such as Capacitance and Tan-Delta regularly it is possible to ensure the operational reliability of H.V. insulating systems and to avoid costly breakdowns. This is particularly important for HV bushings, Power Transformers, Generators, Power Capacitors, H.T. cables etc.

*15kV/500mA test sets, in conjunction with tuned reactors are specifically designed to test Generator/Motor of 13.8kV, either individually, or all the 3 phases together.*

*(\*\* the picture below is that of MCDF-6-12/500, and not of the specified equipment. SP15/500 will similarly resemble the below picture)*



### Operation

POWER ELECTRONICAL Capacitance and Tan-Delta Test System (Model SP15/500) includes a HV Power Source, Standard Capacitor (SF6 Gas Filled), and set of cables. The compact design of the system uses the principle of three winding differential transformer on a high permeability mu-metal core. The set is contained in a sturdy metallic housing with mu-metal lining which shields it from external electromagnetic & electrostatic influences. Built-in battery powered Null indicator makes the system suitable for operation in workshop, factories, High Voltage Switch Yards etc. It is suitable for both grounded as well as ungrounded objects.

### Interference Suppression

The Capacitance & Dissipation Factor Test System has been specially shielded with configured layouts of mu-metal sheets to avoid the effect of external interferences. This makes the measurement accurate in out door applications particularly in very high magnetic induction Switch yards. Phase reversal switch provided in the H.V. Power Supply effectively cancels interference/pick up by the object under test in energized environment. There is a separate 3-level Interference Suppression unit that is also provided for situation where the induction is too excessive, and cannot be cancelled even by phase reversal switch.

*PREVENTION is better and cheaper than CURE  
Trust the experts!!*

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## Protection

The system is provided with High Voltage Protection Devices which protect the system and operator against failure of test object or standard capacitor. The other safety features are –

- Zero start control
- Open Ground Indication Lamp
- HT Cut Off on overload
- HT ON/OFF Indication Lamp
- All operating controls are at earth potential

The set consists of heavy shielded HV transformer with required tapings and current ranges with necessary controls and protective circuits, feeding transformer and its guard circuit and auxiliary bridge, all this to eliminate any bit of stray capacitance.

## Technical Parameters

|                      |  |
|----------------------|--|
| Input power required | 230 VAC/ 50 Hz $\pm$ 10% (110V, 60Hz available on special request)   |
| Voltage Range        | 0-15kV   |
| Leakage Current      | 500mA  |
| Voltage Indication   | 3½ digit Digital Panel Meter (DPM)   |
| Resolution           | 10 Volt  |
| Accuracy             | $\pm$ 1% of the reading $\pm$ 2 digit  |
| Standard Capacitor   | SF6 Gas filled, 100pf $\pm$ 1% , Tan $\delta \leq 1 \times 10^{-4}$  |
| Modes for testing    | UST (Ungrounded Specimen Test)<br>GST (Grounded Specimen Test)<br>GSTg (Grounded Specimen Test with Guard) |

Capacitance Range – 1pF to 1.1  $\mu$ fd in 4 ranges [0.01, 0.1, 1 & 10]

| Cx factor Range | Resolution | Accuracy                              |
|-----------------|------------|---------------------------------------|
| 0.01            | 0.1pF      | $\pm$ 0.2 % of reading $\pm$ 2 digits |
| 0.1             | 1pF        |                                       |
| 1               | 10pF       |                                       |
| 10              | 100pF      |                                       |

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Tan-Delta Range – 0 to 1000 % in three ranges ( 0.1 , 1 & 10 )

| Tan-Delta Range | Accuracy  | Resolution         |
|-----------------|---|--------------------|
| 0.1             | $\pm 1\%$ of the reading $\pm 5 \times 10^{-4}$ | $1 \times 10^{-4}$ |
| 1               | $\pm 1\%$ of the reading $\pm 5 \times 10^{-3}$ | $1 \times 10^{-3}$ |
| 10              | $\pm 1\%$ of the reading $\pm 5 \times 10^{-2}$ | $1 \times 10^{-2}$ |

## Standard Accessories

Test equipment – 1 no (consists of integrated unit and a mounting Trolley)

Connecting AC mains cable – 1 no (3 mtrs)

Interconnection cable – 2 set

Cable Test Set - Specially shielded connecting cables to for the object testing.  
15 mtr of 15 KV, Double screened cable with insulated crocodile clip for HV.  
15 mtr Single screened cable with insulated crocodile clip for LV.  
15 mtr 1.0 sq. mm cable for GROUND

User manual – 1 no

Calibrator Decade Box – 3kV AC, 3 tan-delta tapplings for periodic calibration check

Test certificate – 1 no

Warranty Certificate – 1 no (Standard warranty 1 yr)

## Optional Accessory – Tuned Reactor (Resonating Inductor)

It expands the range of measurement of the C&DF test set. Used in conjunction with the C&DF set, it allows extending the short term rating of power supply from 500mA to 4.5A. This capacity is suitable for testing capacitances up to 1000nF (1 $\mu$ F) at 15kV, which is of utmost importance in **HT/MV Generators, Motors** etc.

- Can be used in the UST, GST and GSTg modes
- Use of resonating inductor does not alter the accuracy of the test set in any way
- Has selection tapping of 2A and 4A, at 15kV.

Note – Power Electronical reserves the right to change product specifications for continual improvement. Please order a fresh copy of specs from [contact@powerelectronical.com](mailto:contact@powerelectronical.com), before placing new orders. Jurisdiction limits within territory of Republic of India only.

Our other Products are –

- Automatic Cap & Tan Delta test system 10kV / 12kV
- Manual C&DF test system 12kV
- Auto Oil Breakdown Voltage Tester 80kV / 100kV
- Motorised Oil BDV set 0-100kV
- 3-pc Oil Resistivity & DF test kit
- Insulation Testers (10M to 15T, 2% accuracy)
- High Voltage Breakdown testers (10kV-50kV)
- SF6 Gas filled Standard Capacitors (upto 1000kV)

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