

Portable Low Voltage Capacitance and Tan Delta Test Sets

FEATURES

- ◆ 3 terminal measurements with guard
 - ◆ Transformer ratio arm measurement technique
 - ◆ Grounded and ungrounded specimen tests.
 - ◆ 3 measuring leads with switching.
 - ◆ Numeric readout
 - ◆ Five position measurement selection switch
 - ◆ Built-in calibrator.*
 - ◆ Built-in centre zero synchronous phase sensitive null detector
 - ◆ Mains cum battery operated.*
 - ◆ Measurement not affected by H.V. interference.
 - ◆ Light weight and portable.
 - ◆ 500V operation on CTS-500.
- *Only CTS-30T



CTS - 30T



CTS - 500

APPLICATION

For quick, simple and accurate Low Voltage Capacitance and Tan Delta tests in the shop or field on:

- ◆ Bushings ◆ CVTs ◆ Generators ◆ Insulators
- ◆ Transformer Dry outs ◆ Instrument Transformers
- ◆ Insulating Oils ◆ Power Transformers ◆ Breakers
- ◆ Capacitor Banks ◆ Cables ◆ Motors.

DESCRIPTION

The model CTS-30T Low Voltage Capacitance and Tan Delta Test Set, is designed especially for testing electrical insulation systems in hostile environments like Transformer stations and High Voltage switch-yards as well as on the production shop floor where influence from various nearby excited devices would normally interfere with reliable measurements. The bridge is fully guarded and further, the test frequency is shifted slightly away from, the power frequency. The test frequency is close enough to the power frequency to give the required accuracy, but far enough to avoid power frequency influence on the measurement. The test frequency is 80 Hz. With a fully guarded bridge, measurement of each individual capacitance in a three or four terminal device is carried out effectively without requiring any calculations.

The test set is provided with a mode selector switch. Once the leads are connected, the test mode for the measurement required is easily selected, thus avoiding repeated climbing of the electrical apparatus under test. Both grounded and ungrounded tests can be performed.

The numeric readout allows zero direct reading of capacitance in either μF or pF and the dissipation factor (Tan Delta) is expressed directly in percent. The bridge balance is achieved by using a centre scale null detector which is tuned, synchronous and phase sensitive. The tuning reduces much of the unwanted power frequency interference. The synchronous operation makes the null detector sensitive only to the internal operating frequency.

The very low test voltage 30V of model CTS-30T makes many safety precautions unnecessary and speeds up the testing. For most applications the low test voltage gives the same results as a bridge operating at higher voltages.

The test voltage 500V of model CTS-500 has been carefully chosen, so that it is neither too low to affect the accuracy of measurements nor too high to be dangerous to the operator. To make the instrument safer for operation, cables with insulated connectors are provided.

The Test set uses a transformer ratio arm technique in which capacitive current of the test specimen is compared to the current from the built-in standard capacitor. The transformer ratio arm bridge technique has been proven to be very accurate and reliable especially for application in the power industry where much less than ideal operating conditions or often encountered.

OTHER PRODUCTS

- * Manual & Automatic Transformer Ratio Meters.
- * Digital Micro Ohm Meters with built in 100 Amp source.
- * Manual & Automatic Transformer Winding Resistance & On Load Tap Changer Test sets.
- * Automatic CT/PT Test Sets & Systems
- * Automatic & Semi Automatic HV Capacitance & Tan Delta Test Sets, 10 kV Oil Test Cell.
- * Manual & Automatic Tan Delta & Resistivity Test Sets for Transformer Oil, Solid Test Cell.
- * Portable LV Manual & Automatic Capacitance and Tan Delta Test sets.
- * Realing Current Transformer Analyzer

SPECIFICATIONS

Capacitance

Range CTS-30T : 0-240 pF upto 1.2 μF in 12 ranges with a 1, 2, 5, 10 Sequence

Accuracy : 0.25% of range $\pm 4\text{pF}$

Range CTS-500 : 0-240 pF upto 0.12 μF in 9 ranges with a 1, 2, 5, 10 sequence

Accuracy : 0.2% of range $\pm 4\text{pF}$

Resolution : 0.01% of range

Operating

Temperature : 0 –50 deg. C.

Dissipation Factor

Range : 0-1 0-10 10-20 20-30 %

Resolution : 0.001 0.01 0.01 0.01 %

Accuracy : $\pm 2\%$ of reading $\pm 1\%$ FS

Detector : Synchronous, tuned and phase sensitive null detector

Test Voltage

CTS-30T : 30V, 80Hz

Test Voltage

CTS-500 : 500V, 80Hz

Measurements

: The instrument measures the following combinations:

UST C_{H-L} : (Ungrounded specimen test, Hi to Lo)

GST C_{H-G} : (Grounded specimen test, Hi to Gnd)

GST C_{L-G} : (Grounded specimen test, Lo to Gnd)

GST $C_{H-G} + C_{H-L}$: (Grounded specimen test, Hi to Gnd, Plus Hi to Lo)

GST $C_{L-G} + C_{L-H}$: (Grounded specimen test, Lo to Gnd, Plus Lo to Hi)

CTS-30T Power : 230V $\pm 10\%$, 50Hz, 10VA OR $\pm 12\text{V DC}$
OR 110V $\pm 10\%$ 60Hz, 10VA

Size : 450 x 320 x 200mm

Weight : 12kg

CTS-500 Power : 230V $\pm 10\%$, 50Hz $\pm 100\text{VA}$
OR 110V $\pm 10\%$, 60Hz, 100VA

Size : 19" rack mount chassis/table top

Weight : 20kgs

ACCESSORIES SUPPLIED

Two coaxial cables and one ground cable 10 or 25 meters long

OPTIONAL ACCESSORIES

1. OIL TEST CELL

A three terminal oil Test Cell available for operation with CTS-30T for performing routine Capacitance and Tan Delta Tests on insulating oils. The volume is 45ml; the capacitance is 50-70 pF and maximum test voltage is 2.4 kV.

2. OIL TEST CELL HEATER

This heater is very compact unit and is used to heat the oil in the cell to the required temperature. This uses a high frequency induction heater, which raises temperature to 90 deg C in 15-20 minutes approximately.

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