ACCESSORIES FOR TESTING LARGE MOTORS & GENERATORS

COMPENSATING REACTOR

The Compensating reactors are accessories for the ACTS-12K / ACTS-12K PLUS Capacitance & Tan Delta Test Set. The use of one or more compensating reactors increases the Capacitance current that the internal power supply can excite to conduct measurements. As the measuring range of the ACTS-12K / ACTS-12K PLUS exceeds the kVA rating of the internal power supply, one way of using the test set over its entire measuring range is to form a resonant circuit with the test sample. The use of one or more compensating reactors forms partial resonating circuit with the test specimen, thereby reducing the power supply requirement.

The use of one or more compensating reactors will allow the user to extend the practical measuring range of the ACTS-12K/ ACTS-12KPLUS to its full potential, 0.26mF (ACTS - 12K / ACTS-12K PLUS). The Bridge measuring range of ACTS-12K/ ACTS-12K PLUS can be extended to 2.6mF. By the use of a Range Extension Transformer, the use of the appropriate number of compensating reactors can extend the measuring range to the desired level.

SPECIFICATIONS

With a rating of 200mA, the internal power source can excite a sample of 0.064mF @10kV, 50Hz. & 0.05mF @10kV, 60Hz. To excite larger samples, the reactors are used to supply the required charging current.

The smallest available reactor is one that will resonate a sample of 0.1mF at 50Hz approximately. The other size available is 0.2mF. For resonating a test sample of 0.5mF, one would use, tow 0.2mF and 0.1mF reactors. For resonating with 1.1mF test sample, one would use a 0.1mF, and five 0.2mF reactors.

The reactors are available in four ratings

- 104 Henneries at 300mA, for compensating 0.1mF@10kV
- 52 Henneries at 600mA, for compensating 0.2mF@10kV
- 150 Henneries at 250mA, for compensating 0.07mF@12kV
- 75 Henneries at 500mA, for compensating 0.140mF@12kV

The bridge power source would normally be used to excite test samples in the range of 0 to 0.064mF at 10kV (0 to 0.05mF at 12kV).

With the 104H (0.1mF) compensating reactor the bridge power source can excite samples in the range of approx. 0.06-0.16mF at 10kV.

With the 52H (0.2mF) compensating reactor the bridge power source can excite samples in the range of approx. 0.15-0.26mF.

With both the 102H (0.1mF) and 52H (0.2mF) reactors connected, the bridge power source can excite samples in the range of 0.25 – 0.36mF approximately. Typical maximum Capacitance of the test sample is about 1mF.

APPLICATION

The primary application for the inductors is to allow power factor test of motors, generators, and cables at higher voltage than would be possible with the ACTS-12K / ACTS-12K PLUS internal power source alone.

Whenever a large Capacitance needs to be tested, its Capacitance must be measured in order to determine the amount of reactor compensation needed. This measurement can be done using the ACTS-12K/ ACTS-12K PLUS at a low voltage, typically in the 300-2500 voltages ranges. The maximum Capacitance of the ACTS-12K/ACTS-12K PLUS, 0.26mF can be easily measured at a voltage of 2400 volts without overloading the power source. A capacitance of 1mF can be measured using the ACTS-12K/ACTS-12K PLUS and a range extender at a voltage of 300 volts.

Once the Capacitance of the test specimen is known, the value of the required compensating reactor can be determined from a graph or simple calculation. The required reactors can now be connected together with the test specimen to the ACTS-12K/ACTS-12K PLUS and the measurement conducted in the normal manner and at the desired test voltage.

Most of the measurements using compensating reactors involve motors and generators. Measurements on such test samples typically require the determination of "tip-up". "Tip-up" is referred to as the increase in Dissipation Factor with an increase in test voltage. To determine tip-up, the test on motors and generators would be taken at rated, ½ rated and ¼ rated voltages. "Tip-up" would be calculated by subtracting the DF measured at ½ test voltage from the DF measured at rated voltage; a second and equally valid tip-up would be determined by subtracting the DF measured at ¼ rated test voltages from the DF measured at rated test voltage.

RANGE EXTENSION TRANSFORMER

The Range Extension Transformer Model CTS-RE is an accessory for ACTS-12K & ACTS-12K PLUS Capacitance & Tan Delta Test Sets. The CTS-RE extends the Capacitance measuring range of the ACTS-12K & ACTS-12K PLUS by a factor of ten (10), from 0.26mF to 2.6mF.

The Range Extension Transformer is provided in the form of a toroid.

SPECIFICATIONS

Ratio	:	10 to 1
Accuracy	:	**Capacitance:** ±0.2% of reading ±1pF (UST) ±0.2% of reading ± 10pF (GST) **Dissipation Factor (Tan Delta):** ±1% of reading ± 0.05%
Dimensions	:	240mm x 220mm x 125mm (LxBxH)
Weight	:	Approx. 5 Kgs

SPECIFICATION

CTS-100 REACTOR (10KV)
Inductance : 104 Henries ±5%, 3kVA at 10kV, 50Hz Q<40

CTS-50 REACTOR (10KV)
Inductance : 52 Henries ±5%, 3kVA at 10kV, 50Hz Q<20

CTS-150 REACTOR (12KV)
Inductance : 152 Henries ±5%, 3kVA at 10kV, 50Hz Q<60

CTS-75 REACTOR (12KV)
Inductance : 76 Henries ±5%, 3kVA at 10kV, 50Hz Q<30

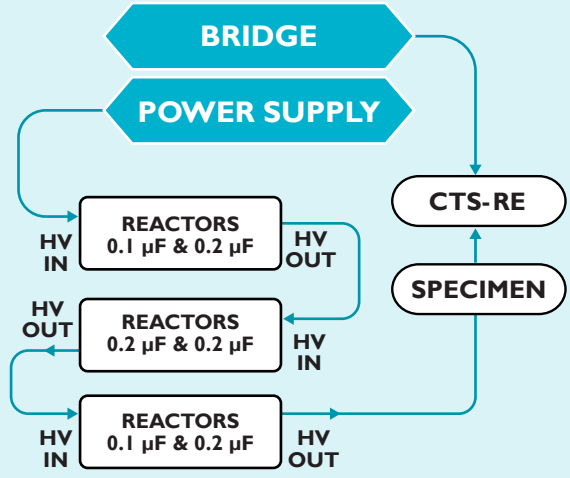
Dimensions	:	410mm x 340mm x 265mm (LxHxB)
Weight	:	Appox. 40 Kgs. (each box containing 2 coils)
Temperature Range	:	–10 to 50 deg C
Humidity	:	Ambient to 90%, RH

Model ACTS-12K Plus with Range Extension Transformer Model CTS-RE, 7 Compensating reactors Model CTS-75 (0.14µ F each) and one Compensating reactor Model CTS-150 (0.07µ F) – total 8 Reactors will measure a max Capacitance of 1.1µF @ 12kV, 50Hz.

10kV/ 12kV CAPACITANCE MEASURING RANGE-GENERATOR/MOTOR TESTING

EQUIPMENT	ACCESSORY	TEST VOLTAGE	MAX CAPACITANCE (50HZ)	MAX. CAPACITANCE (60HZ)
ACTS-12K PLUS/ ACTS-12K	–	10 KV 2.4KV	0.06 µF 0.26 µF	0.05 µF 0.2 µF
ACTS-12K PLUS/ ACTS-12K	CTS-RE	10 KV 2.4KV	0.06 µF 1.2 µF	0.05 µF 1.0 µF
ACTS-12K PLUS/ ACTS -12K	CTS-RE + CTS-100 (1 NO OF 0.1µF) + CTS-50 (1 NO OF 0.2µF)	10 KV	0.36 µF	0.3 µF
ACTS-12K PLUS/ ACTS -12K	CTS-RE + CTS-100 (1 NO OF 0.1µF) + CTS-50 (5 NOs OF 0.2 µF)	10 KV	1.1 µF	1.0 µF
ACTS-12K PLUS/ ACTS -12K	CTS-RE + CTS-150 (1 NO OF 0.07µF) + CTS-75 (7 NOs OF 0.14 µF)	12 KV	1.1 µF	1.0 µF

BLOCK DIAGRAM OF ACTS-12K/ ACTS-12K PLUS WITH RANGE EXTENSION TRANSFORMER AND COMPENSATING REACTORS



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Eltel Industries, established in 1983, is a market leader in the development and manufacturing of test instruments for electrical power industries and utilities. **We are pleased to announce the NABL-accreditation of the Eltel Industries – Calibration Laboratory (including on-site calibrations) in electro-technical discipline in accordance to ISO/ IEC:17025/2005.**