

Instrument Transformer Test System



The CT/VT test system is designed to test CTs over the range of 5...3,200 amperes and VTs over the range of 100..33,000 volts. The system is self contained and includes all the required power supplies to generate the test voltage & current, the appropriate reference CTs and VTs, a set of burdens to load the test CT/VT to the required operating point and an Automatic CT/VT comparator to measure the errors of the test specimen transformer with respect to the reference transformer. An automatic CT demagnetizer is provided so that the test CTs can be demagnetized prior to conducting the accuracy tests.

The System arrangement is such that all the controls and connections for CT testing are provided on the front Panel while the connections for PT testing are made on the rear of cabinet. The rear end of the cabinet can be fenced off for safety purposes.

The high voltage power supply for the VT test set-up and the Standard Capacitor are provided externally of the cabinet.

The Instrument Transformer test system can be designed to test CTs over the range of 5 - 6000 Amperes and VTs over the range of upto 600kV.

FEATURES

- ◆ Fully pre-wired comprehensive turn key test system
- ◆ Suitable for CTs upto 3200A & VTs upto 33kV
- ◆ Precision (0.005 Class) internal multi-ratio standard CT
- ◆ Internal 4KA current source
- ◆ State of the art Automatic Instrument Transformer Test Set AITTS-98 with computer & printer interfaces
- ◆ Electronic Potential Divider facilitates testing any VT ratio upto 33kV
- ◆ Current & Potential Burdens
- ◆ CT Demagnetizer

THE MAJOR COMPONENTS OF THE TEST SYSTEM ARE

- ◆ An Automatic Instrument Transformer Test Set (AITTS-98)
- ◆ Control Unit
- ◆ Multiratio Precision CT with Current Source
- ◆ CT Burden set
- ◆ CT Demagnetizer
- ◆ Voltage Source for VT testing
- ◆ An Electronic Potential Divider (EPD)
- ◆ Standard Capacitor
- ◆ VT Burden set
- ◆ Set of leads for CT & VT connections

AUTOMATIC INSTRUMENT TRANSFORMER TEST SET



The AITTS-98 is the Instrument Transformer Comparator which is a fully automatic comparator capable of comparing both CTs and VTs. The input ranges of the instrument are 1...400 volts on the VT side and 0.05 to 20 amperes on the CT side (5 ampere input) or 0.01 to 2 amperes (1 ampere input). The comparator has a Ratio Error measuring range of upto 20% for both CTs and VTs. The instrument can be controlled through its keyboard or the RS232 port using an IBM compatible PC. A USB Port is available to drive a dedicated printer. The comparator is designed to compare CTs/VTs of nominally the same ratio. The AITTS-98 measures the burden of the entire test-set up. It can be made to plot the accuracy curves of CTs or VTs. The AITTS-98 recognizes the accuracy classes of ANSI, IEC, BS, IS, AS and other specifications.



CONTROL UNIT

METER PANEL

- ◆ Digital voltmeter and ammeter indicating line supply
- ◆ Digital voltmeter and ammeter indicating output.



SELECTION PANEL

- ◆ Indicators for Line and Output control
- ◆ Selection switch for CT LO, CT HI, PT, DEMAG & OFF
- ◆ Start button to initiate the testing
- ◆ High On Key to override the Zero start facility which helps to conduct more measurement in given period of time.
- ◆ Emergency OFF

FINE ADJUSTMENT PANEL



- ◆ Line MCB to switch ON the system(Here D-type is used to suit the inductive load)
- ◆ Output/Control MCB through which power will be given to the control unit
- ◆ 8A fine adjustment variable source with zero start facility to give input to current /voltage primary injection kit

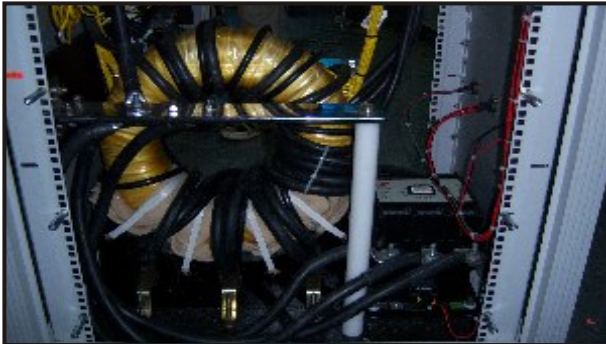


COARSE ADJUSTMENT PANEL

- ◆ 40 A coarse adjustment variable source with zero start facility to give input to current /voltage primary injection kit.

CT SECTION

MULTIRATIO STANDARD CT WITH SOURCE



Available ratios :

The CT is equipped with a tapped primary, tapped secondary winding, thus providing a multiplicity of ratios. Using the above current outputs, the following ratios are available: 5, 7.5, 10, 12.5, 15, 20, 25, 30, 40, 50, 60, 75, 80, 90, 100, 120, 125, 150, 160, 180, 200, 240, 250, 300, 350, 400, 500, 600, 700, 800, 900, 1000, 1200, 1250, 1500, 1600, 1800, 2000, 2400, 2500, 3000, 3200.

Standard CT upto 6000 A can also be offered.

STD-CT SECONDARY SELECTION PANEL



Standard CT ratio selection allows the user to select required ratio according to the test CT ratio. Also there is a provision to select the required current using current selection switch which controls the high current contactors connected between high current primary cables. This arrangement allows the user to select pre-wound primary turns starting from 1 to 200 facilitating the user to test any CT of 5A to 3200A ratio without applying primary turns manually on the standard CT.



CURRENT TRANSFORMER BURDENS

The Current transformer burdens include :

The Current Transformer Burdens are designed for loading instrument current transformers during accuracy tests. Burdens are designed to conform with IEC-60044-2 specifications.

General arrangement is where the burden element can be connected in the circuit of current transformer in any combination for accuracy tests. A large number of possible values of VAs (Volts-Amps) at rated power factor of 0.8 is provided. Each VA element can be suitably selected and added to get required VAs

CT DEMAGNETIZER



CT demagnetizer is provided within the test system. The demagnetizer is suitable for demagnetizing CTs of all ratios, having either 5 or 1 amperes secondary windings.

VT SECTION

Electronic Potential Divider (EPD) is an amplifier aided capacitive divider's designed to operate at high voltages. The EPD uses loss-free high voltage reference capacitor for the high voltage arm of the divider. Unlike other similar dividers, the EPD provides an isolated output whose output is related to the ratio setting. EPDs are used for accurate Voltage measurement in metering circuits as well as for VT calibration.



VT OUTPUT SOURCE

An adjustable output of 0-40 kV, is provided for energizing the test PT and the reference divider (EPD). The 40 kV supply transformer & standard capacitor are kept outside the rack.



STANDARD CAPACITOR:

The Standard capacitor is a extremely stable, low - loss capacitor designed for Use In laboratories and testing departments. The model is of three a terminal design and is insulated with pressurised Sulphur Hexafluoride (SF₆)gas.

C	=	200 pF
Rated Voltage	=	33 kV
D F	=	<1x10 ⁻⁴
Test Voltage	=	36kV
Accuracy	=	1%



POTENTIAL TRANSFORMER BURDENS.

The Potential transformer burdens include :

Potential transformer burden PB-96 IEC, 110 volt are rated for 0 to 207.5 VA in steps of 2.5 VA at 0.8 power factor.

Potential transformer burden PB-96 IEC,63.5V are rated for 0 to 207.5 VA in steps of 2.5 VA at 0.8 power factor.

Potential transformer burdens that meet the ANSI specifications, can also be provided.

POWER LEADS AND CONNECTING CABLES

The equipment is intended to be wired to a 220 volt source capable of supplying 25 amperes. It comes complete with a 3 meter, three-wire power cable for this purpose.

The equipment includes all the typical leads required to connect CTs or PTs and conduct tests. Such leads include the followin

1. VT secondary leads, 4 conductor arrangement for avoiding lead drop in the test set up (10 meters).
2. VT primary leads (2x1 meters).
3. CT secondary leads designed to load the test CT secondary circuit to ~1 VA (3 meters).
4. 400A primary current leads (1.5 meters), 4 Nos.
5. Demagnetizer Leads (5Meters)
6. Bus bars for testing toroidal CTs.
7. Safety switch.
8. VT Source (10 Meters)

PHYSICAL INFORMATION

Size : The equipment is housed in a cabinet consisting of two 19-inch racks. The overall cabinet is approximately 1.6 meters long, 1.9 meters high and 1.1 meters deep. The 40 kV voltage source & standard capacitor are placed outside (behind) the cabinet.

Weight : The weight of the System is approximately 1500kg. (Shipped in 6 Wooden & 7 carton boxes)

The CT/VT Test System can be modified to customer specifications.

Separate CT and VT Test Systems are also available.

OTHER PRODUCTS

- Manual & Automatic Transformer Ratio Meters. ■ Manual & Automatic Transformer Winding Resistance & On Load Tap Changer Test Sets.
- Semi Automatic 12KV & Automatic 12KV & 5KV Capacitance & Tan Delta Test Sets. ■ Digital Micro Ohm Meter with builtin 100A DC Source.
- Automatic CT/VT Test Sets & Systems. ■ Manual & Automatic Tan Delta & Resistivity Test Sets for Transformer Oil. ■ Manual & Automatic Portable LV Capacitance& Tan Delta Test Sets. ■ Relaying Current Transformer Analyser.



ELTEL INDUSTRIES

311 EMBASSY CENTRE, CRESCENT ROAD, BANGALORE-560 001, INDIA

TEL : 91-80-22255467, 22205686, 22284253, 22284298 FAX : 91-80-22252733

E-mail: marketing@eltelindustries.com Web site: http://www.eltelindustries.com

Works : Plot No. 39, KIADB Industrial Area, Veerapura, Doddaballapur, Bangalore – 561 203

TEL : 91-80-27630366, 2630367, 27630368 FAX : 91-80-27630351

CHENNAI: 044 - 24339075 ◆ KOLKATA: 033 - 24765536/ 24752394 ◆ MUMBAI: 022 - 21713579, FAX: 21713496

◆ NOIDA: 0120-2451141, FAX: 0120-2451142



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