

## Automatic Instrument Transformer Test Set



**AITTS-98**

### FEATURES

- Automatic micro-processor controlled measurement.
- Measures the total burden connected to the test sample.
- Plots ratio & phase errors on screen.
- Digital display of test results on 240 x128 dot matrix back-lit LCD screen.
- Keyboard entry of parameters.
- RS-232C computer interface.  
(Compatible with Windows & DOS).
- Centronix parallel port printer interface.
- Automatic ranging.
- Voltage & Current Transformer testing with one test set.
- 5 & 1 Amp CT testing using either a 5 or 1 Amp Standard CT.
- Identifies ANSI, IEC, IS-P, IS-PR, BS, BS-S, IEC-S, AS-M, AS-ME standards for CT & VT.
- Fast measurements-typically 5 readings per second.
- Audible alarm for error message.
- Data Hold & Data Storage Facility.
- Ratio Correction Factor (ANSI).

## DESCRIPTION

The Automatic Instrument Transformer Test Set (AITTS-98) is used for the measurement of relative errors of Instrument Voltage as well as Instrument Current Transformers. The Test Set reads out the unbalance of a bridge circuit, converts these readings into ratio and phase error values and then presents these values on a LCD screen for the operator.

The Test Set is microprocessor controlled and provides very fast measurements (several measurements in a second). To this effect, the instrument can be used to measure and plot the ratio and phase errors while the test voltage or test current are varied slowly over the band of interest.

In addition to measuring the ratio and phase errors, the instrument measures the burden connected to the test sample. This feature is very useful when testing Instrument Transformers in the "installed condition" and the burden is not known.

The test set is available in three versions

- Automatic Instrument Transformer Test Set AITTS-98
- Automatic Current Transformer Test Set ACTTS-98
- Automatic Voltage Transformer Test Set AVTTS-98

## SPECIFICATIONS

<b>1. Voltage Input</b>	Range	- 1.2 ... 400 volts.
	Consumption	- ~ 0.02 VA @ 120 V
	Readout	- in volts or % of rating.
	Accuracy	- ± 0.5% of reading ± 0.1% FS.
<b>2. Current Input</b>	5A Range	- 0.05 .. 20 amperes
	Input	
	consumption	- < 0.5 VA @ 5A
	1A Range	- 0.01 .. 4.0 amperes.
	Consumption	- < 0.1 VA @ 1A
	Readout	- in amperes or % of rating.
	Accuracy	- ± 0.5% of reading ±0.1% FS
<b>3. Measuring Ranges</b>	Ratio Error	- 0 to ±20%
	Phase Error	- 0 to ± 0.2 radians (20 crad.) 0 to ±680 minutes
<b>4. Frequency Range</b>	Operating	- 45 to 65 Hz
	Indication	- 00.00
<b>5. Highest Resolution</b>	Ratio Error	- 0.1 ppm
	Phase Error	- 0.1 µrad

## SPECIFICATIONS

<b>6. Measuring Time in Normal Operating Range</b>	:	Instrument readings are synchronized to the power frequency. The instrument makes 5-6 readings a second at 50 / 60 Hz.
<b>7. Display</b>	:	240 by 128 dot matrix back-lit LCD screen.
<b>8. Keyboard</b>	:	20 key membrane keyboard.
<b>9. Power Input</b>	:	90 to 270 volts, 50 / 60 Hz, 40 VA.
<b>10. Accuracy Class</b>	:	Instrument recognizes IEC, ANSI, IS AS & BS accuracy classes.
<b>11. Burden Measurement</b>	:	
Accuracy	:	± 1%
Voltage Burden Range	:	0 -999.9 mVA - 9,999 VA.
		Burden is expressed in VA and power factor at rated input voltage. The rated secondary voltage is entered using the keyboard. Burden of current circuit » 0.01w .
Voltage Impedance	:	Infinity to 99.99 K $\Omega$ OR 0-999.9 mVA - 9.999VA.
Current Burden Range	:	0-999.9mVA - 9,999VA.
		Burden is expressed in VA and power factor at rated input current.
		Burden of voltage circuit»3 Mw .
Current Impedance	:	0-9.999 K $\Omega$ OR 0-999.9 mVA - 9.999VA at specified current.
<b>12. Power Factor</b>	:	0 - 1.000.
<b>13. Computer Interface</b>	:	An opto isolated RS-232 computer interface is provided in the instrument. This port can be used for remotely controlling the instrument or for downloading test results.
<b>14. Printer Output</b>	:	An opto-isolated Centronix parallel printer port is provided in the instrument. This port will directly drive a Centronix compatible printer.
<b>15. Accuracy</b>		
<b>Accuracy - CT</b>		
Normal operating range (5 to 120%)	Ratio Error	±0.6% of reading ±10 ppm
	Phase Error	±0.6% of reading ±10 µrad
Extended Operating range (1 to 400%)	Ratio Error	±1% of reading ±20 ppm
	Phase Error	±1% of reading ±20 µrad
<b>Accuracy - VT</b>		
Normal operating range (5 to 120%)	Ratio Error	±0.6% of reading ±10 ppm
	Phase Error	±0.6% of reading ±10 µrad
Extended Operating range (1 to 200%)	Ratio Error	±1% of reading ±20 ppm
	Phase Error	±1% of reading ±20 µrad

## S P E C I F I C A T I O N S

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|----------------------------------|--|
| <b>16. Data Storage facility</b> | : Can store 34 readings – 17 readings each for CTs and VTs.<br><br>Data is retained in memory even when the Instrument is switched OFF.  |
| <b>17. Data Hold Facility</b>    | : At any given % of Voltage or Current, we can hold the readings displayed by pressing F1. To resume measurements, press F1 again.   |
| <b>18. Error Plotting</b>        | : By Pressing F2 the instrument will plot Ratio and Phase Errors which are displayed on the LCD screen or on the connected PC. The graph can be printed only after it is transferred to the PC.              |
| <b>19. PC Operation</b>          | : Can be controlled from a PC using PC keyboard. Results are shown on PC monitor and test results can be transferred to the PC for data storage. Results can be stored in predefined format or excel format. |
| <b>20. Mechanical data</b>       | : Dimensions : 19-inch rack mount.<br>Weight : Approx 9 kgs.   |
| <b>21. Temperature Humidity</b>  | : -10 to 50° C.<br>: Ambient to 90% RH.  |

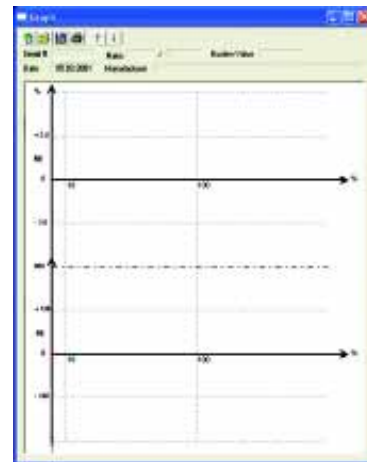
### Sample Windows Software Screens



VT Testing



CT Testing



Graph



3200A/33kV CT/VT TEST SYSTEM

- ◀ The CT/VT test systems are designed to test CTs over the range of 5 to 3200 amperes and Single Phase VTs over the range of 100 to 33000 volts. CTs of both 5A or 1A rating can be tested.
- The system is self contained and includes the appropriate power supplies to generate the required 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. CT demagnetizer is provided so that the CTs can be demagnetized prior to conducting the accuracy tests. The Automatic Instrument Transformer Test Systems can be designed to test CTs over a range of 5 to 6000A and Single Phase VTs over the range of upto 400kV.

## ACCESSORIES FOR VT TESTING



### ELECTRONIC POTENTIAL DIVIDER

Electronic Potential Divider (EPD) is an amplifier aided capacitive divider designed to operate at high voltages. The EPD uses loss-free high voltage reference capacitor externally for the high voltage arm of the divider. EPD along with Std. Capacitor will act as multi ratio standard PT. 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. Advantages of using the Electronic Potential Divider as a Standard VT.

- Provides flexibility of various VT ratios.
- Eliminates the need to have several Standard VTs.
- High Accuracy of measurement – 0.05% ± 2 mins.

### STANDARD CAPACITOR

Eltel manufactures standard capacitors of 15kV & 33kV rating. Standard Capacitors are used as high voltage arm in voltage dividers for precision measurement of AC voltages, including peak and surge values, and for use when measuring the errors of Potential Transformers.



### POTENTIAL TRANSFORMER BURDEN

Burdens for IEC and ANSI specifications rated for various input voltages are available.

The Potential Burdens are rated for continuous operation at 100% of rated voltage and for 200% -short-term rating (5 min).

## ACCESSORIES FOR CT TESTING



### STANDARD CURRENT TRANSFORMER

Eltel manufactures Standard Current Transformers over a range of ratios and accuracies. Reference Standard CTs of 0.05% & 0.005% accuracies are available.

### CURRENT TRANSFORMER BURDEN

Burden for 1A and 5A for IEC and ANSI specifications are available.

The Current Burdens are rated for continuous operation at 100% of rated current and for 200% -short-term rating (5 min).



## OTHER PRODUCTS

- Manual & Automatic Transformer Ratio Meters.
- Digital Micro Ohm Meters with built in 100Amp source.
- Manual & Automatic Transformer Winding Resistance & On Load Tap Changer Test sets.
- Automatic 12kV & 5kV Capacitance & Tan Delta Test Sets.
- Manual & Automatic Tan Delta & Resistivity Test sets for Transformer Oil.
- Manual & Automatic Portable LV Capacitance and Tan Delta Test sets.
- Relaying Current Transformer Analyser.



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(SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE)

