

AUTOMATIC INSTRUMENT TRANSFORMER TEST SET



**MEETS LATEST
IEC, ANSI, IS
ACCURACY
TESTING
REQUIREMENTS.**

AITTS PLUS

FEATURES

- ARM 9 processor controlled measurement.
- Measures total burden connected to test sample.
- Ratio and phase error can be plotted using interface software.
- Internal Results storage facility up to 1 Lakh.
- Alpha numeric metal dome membrane Keypad for parameters entry.
- Digital display of test results on 800 X 480 TFT color display.
- Computer interface using RS-232 or USB.
- USB printer interface.
- Automatic ranging.
- Voltage or current transformer testing with one test set.
- 5 & 1 Ampere current transformer testing using either a 5 or 1 Ampere standard current transformer.
- Auto print and storage facility.
- Identifies ANSI, IEC, IEC-S, IS-P, IS-PR, AS-M, AS-ME, BS and BS-S standards for CT and VT. Latest IEC-61869/ ANSI C57.13-2008/ IS-2705 standards incorporated.
- Ratio & Phase Error Tests as per IEC 61869 for TP-X, TP-Y, TP-Z Class CTs.
- Fast measurements.
- External storage facility using pen drive.
- VGA port to interface with bigger display/ monitor.
- Audible alarm for error message.

DESCRIPTION

The Automatic Instrument Transformer Test Set (AITTS PLUS) is an instrument used for measurement of relative errors of instrument transformers. The instrument reads out the unbalance of a bridge circuit, converts these readings into ratio and phase error values and then presents these values on a TFT panel for the operator.

The instrument is ARM 9 processor controlled and provides very fast measurement (several measurements a second). To this effect, the instrument can be used to measure ratio and phase errors while the Test Current/ Test Voltage is 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.

For customers who are using the Eltel Standard CTs, we have also included the CT ratio selection table in the AITTS Plus menu.

This helps the user to select the standard CT ratio according to the test CT ratio without referring to the CT operation manual.

The test set is available in three versions

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

SPECIFICATIONS

1. Voltage Input	: Range - 1.2 to 400 volts. Consumption - ~ 0.02VA @ 120V Readout - in volts or % of rating Accuracy - $\pm 0.5\%$ of reading $\pm 0.1\%$ FS.
2. Current Input	: Range - 0.05 to 20 amperes Consumption - <0.5 VA @ 5A Range - 0.01 to 4.0 amperes. Consumption - <0.1 VA @ 1A Readout - in amperes or % of rating. Accuracy - $\pm 0.5\%$ of reading $\pm 0.1\%$ FS
3. Measuring Ranges:	Ratio Error - 0 to $\pm 20\%$ Phase Error - 0 to ± 0.2 radians (20 crad) 0 to ± 680 minutes
4. Frequency Range	: Operating - 45 to 65 Hz Indication - 00.00
5. Highest Resolution	: Ratio Error - 0.0001% / 0.1 ppm Phase Error - 0.0001 crad / 0.1 μ rad

SPECIFICATIONS

6. Accuracy

Normal Operating Range (5 to 200%)	: Ratio Error - $\pm 0.4\%$ of reading ± 10 ppm : Phase Error - $\pm 0.5\%$ of reading ± 10 μ rad
Extended Operating Range (1 to 400%)	: Ratio Error - $\pm 0.8\%$ of reading ± 20 ppm : Phase Error - $\pm 1.0\%$ of reading ± 20 μ rad

7. Measuring Time in Normal Operating Range

: The instrument make fast measurements at 50/60 Hz. Instrument readings are synchronized to the power frequency.

8. Display : 800 X 480 TFT color display.

9. VGA Port : Any monitor/display can be connected.

10. Keyboard : Alpha numeric metal dome membrane Keypad

11. Power Input : 90 to 270 volts, 50 / 60 Hz, <40 VA.

12. Accuracy Class : Instrument recognizes IEC, ANSI, IS AS & BS accuracy classes.

13. Burden Measurement Accuracy

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 voltages entered on the keyboard. Burden of current circuit $\leq 0.01 \Omega$
Voltage Impedance	: Infinity to 99.99K Ω to 99.99 Ω 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 $\geq 3M \Omega$ The rated secondary currents are 5 and 1 amperes, but others may be selected and entered.
Current Impedance	: 0 - 9.999 Ω / K Ω OR 0 - 999.9 mVA – 9,999VA at specified current.

SPECIFICATIONS

- 14. Power Factor** : 0 – 1.000
- 15. Computer Interface** : RS-232 USB computer interface is provided on the instrument. This port can be used for remotely controlling the instrument or for downloading test results.
- 16. Printer Output** : A USB printer port is provided on the instrument. This port will directly drive a USB or centronix compatible Dot matrix printer with proper adaptor cable.
- 17. Error Plotting** : Error plotting facility is provided with interface software.
- 18. PC Operation** : Can be controlled from a PC using PC key board. Results are shown on the PC display and test results can be transferred to the PC for the data storage.
- 19. Mechanical Data** : Dimensions - 19-inch rack mount
Weight - 9 kgs. (approx.)
- 20. External Storage** : USB 2.0 port is provided in front panel to store results in pen drive.
- 21. Temperature** : -10 to 50° C
- 22. Humidity** : Ambient to 90% RH.

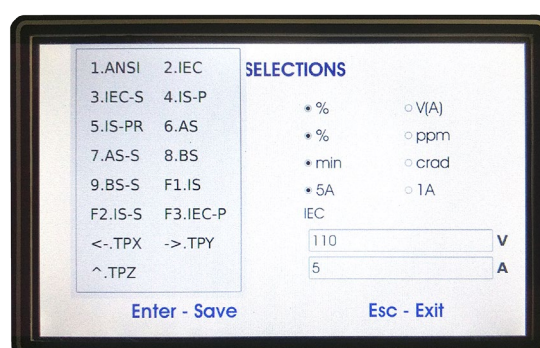
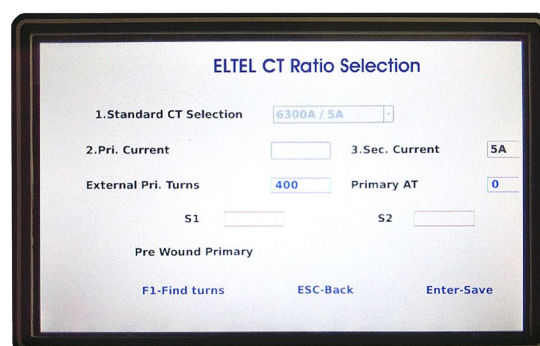


TABLE TOP CT TEST SYSTEM



3200/ 33kV CT/ VT TEST SYSTEM



Eitel also manufactures complete CT/ VT Test systems

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 rating 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'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. 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

Etel manufactures standard capacitors of 15kV, 33kV & 50kV rating. Standard Capacitors are used in voltage dividers for precision measurement of AC voltages, including peak and surge values, and for use when measuring the errors of Potential Transformers.



ACCESSORIES FOR CT TESTING

STANDARD CURRENT TRANSFORMER

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



POTENTIAL TRANSFORMER BURDEN



Potential transformer burden PB-96 IEC, 110 volt & 63.5 volt are rated for 0 to 232.5VA. Burden Power Factor is maintained at 0.8 over the range of 2.5 to 232.5VA & @ 1.0PF from 1VA to 10VA. Potential transformer burdens that meet the ANSI specifications can also be provided.

CURRENT TRANSFORMER BURDEN



Current Transformer burden CB-96 are IEC 5 & 1 ampere, 50 or 60Hz, are rated from 1VA to 3.75VA at 1.0 power factor and from 5VA to 40VA of total VA of 88.75VA at 0.8 Power factor. Current transformer burdens that meet the ANSI specifications can also be provided.

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 CT/VT Test Sets & Systems
- Automatic 12 kV & 5 kV Capacitance & Tan Delta Test Sets.
- Relaying Current Transformer Analyser.



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Etel 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 Etel Industries – Calibration Laboratory (including on-site calibrations) in electro-technical discipline in accordance to ISO/IEC:17025/2005.

An ISO 9001-2008 Certified Company

(Specifications subject to change without notice)