

ETEL CALIBRATION LABORATORY ESTD. 2014

NABL Accredited and ISO/IEC 17025 Certified
NABL Certificate Number: CC-2749



Etel Calibration Laboratory has been accredited by NABL in Electro-Technical & Thermal discipline following ISO/IEC 17025 standards.

Etel offers high-precision calibration services for testing instruments used by transformer manufacturers and power utilities, with customized world-class standards.

- **Comprehensive Calibration:** We ensure the full range of your equipment is calibrated, saving you the effort of choosing calibration points.
- **Expertise:** As manufacturers, we understand your needs and offer precise and reliable calibration services.

Calibrating Etel Test sets in our in-house NABL lab ensures that any measurements outside the accuracy limits can be corrected and brought within the specified accuracy range before proceeding with the NABL calibration.

Calibration Services for Testing Equipment, In-house & On-site

Etel Calibration Laboratory offers calibration services for all types of testing equipment, regardless of make/brand, both in-house and on-site (client premises).

Our distinct standard equipments:

- **Current Transformers (CT):** Our lab ensures highly precise calibration for Current Transformers with industry-leading accuracy and minimal uncertainty.
 - Uncertainty (CMC): 96 PPM and 0.65 minutes
 - STD CT Accuracy: 0.002%
- **Instrument Transformer Test Set (CT/VT):**
Etel is the only lab offering the unique capability to calibrate Ratio & Phase Errors for Instrument Current and Voltage Transformer Test Sets using the Direct Method (errors are introduced directly, covering all ratio and phase error ranges).

Services We Offer:

In-house and On-site Calibration: We conduct calibration of testing equipment, regardless of make/brand, both at our Bengaluru lab and in client premises.

Specialized Standards:

- **Precision Current Transformer** with 0.002% accuracy and 96 PPM CMC.
- **CVRPS-2013** for calibrating CT/VT test sets for ratio and phase errors (Direct Method).
- **Precision Voltage Transformer/EPD** with 0.05% accuracy and 0.06% CMC.
- **Power Analyzer** for calibrating current and voltage transformer burdens.
- **AITTS PLUS** Instrument Transformer Test Set with 0.0082% CMC.
- **Turns Ratio Standard** (1T to 5000T) with 0.05% accuracy.
- **Capacitance & Tan Delta Standard** up to 10KV.
- **High Resistance Standards** (1kΩ to 30TΩ).
- **Low Resistance Standards** (10μΩ to 1KΩ).
- **Fluke 5080A Calibrator** and **Fluke 6½ Digit Multimeter**.
- **Fluke 28KV High Voltage Probe**.
- **Temperature Standard** for calibrating heaters/oil baths (27°C to 110°C).



Precision Current Transformer (20 PPM)



Etel's Precision Current Transformer, paired with a 7200A High Current Source, covers ratios from 5A/5A & 1A up to 6000A/5A & 1A, with an overall uncertainty of 96 PPM — comparable to the best calibration labs worldwide. This range supports the calibration of both standard and commercial-grade Current Transformers

CURRENT & VOLTAGE TRANSFORMER RATIO AND PHASE ERROR STANDARD – CVRPS 2013



The CVRPS 2013 standard generates fixed Ratio and Phase Errors across the entire range, enabling the calibration of Instrument Current Transformer Test Sets and Voltage Transformer Test Sets using the Direct Method. This unique standard, available only at Etel Industries, ensures a Class-leading CMC of 80 PPM and 0.3 minutes. It is currently unavailable in other NABL accredited labs

AUTOMATIC INSTRUMENT TRANSFORMER TEST SET (AITTS PLUS)



AITTS PLUS is a high-accuracy comparator used to calibrate Current and Voltage Transformers for Ratio and Phase Errors. It provides a best uncertainty of 0.0063% (63 PPM) and is also used to calibrate Ratio & Phase error calibrators



CAPACITANCE & TAN DELTA STANDARD SET UP



This setup includes an SF6 gas-filled Standard Capacitor, a Step-down Voltage Transformer (11kV/110V), and a Dissipation Factor Error Standard. It can introduce Tan Delta values from 0% to 10%, making it suitable for calibrating Capacitance and Tan Delta Test Sets up to 10kV. Additionally, Etel offers a portable 15kV C&DF calibrator for both in-house and on-site calibrations, with a CMC of 0.61 pF for Capacitance and 0.014% for Tan Delta

TRANSFORMER RATIO STANDARD TRS-5000



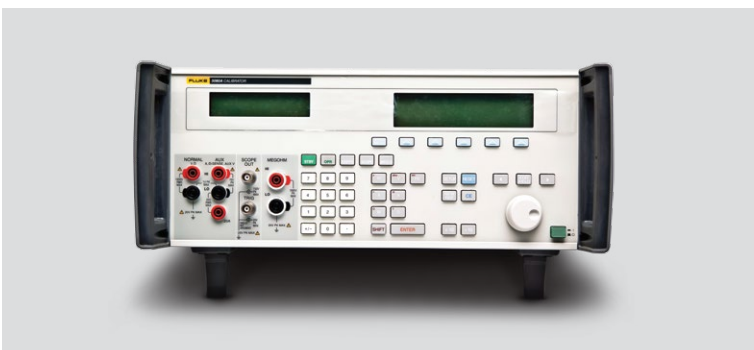
Developed by Etel Industries, the TRS-5000 is a precision Turns Ratio Standard with a range from 1/1 to 5,000/1. It is used for calibrating manual and automatic Transformer Ratio Meters for both single and three-phase transformers

HIGH RESISTANCE STANDARD



Etel uses high-resistance standards from leading manufacturers, covering ranges from 1k Ω to 30T Ω . These standards are used to calibrate High Resistance Insulation Test Sets, Tan Delta, and Resistivity Test Sets

5080A MULTI PRODUCT CALIBRATOR



The Fluke 5080A is a 5½ digit calibrator with compliance for AC/DC voltages up to 50V and a maximum burden of 800mA. It is used to calibrate Multimeters and also serves as a source for AC/DC Current and Voltage

6½ DIGIT PRECISION MULTIMETER



The Fluke 6½ Digit Multimeter is used to calibrate any 5½ digit calibrators and can also calibrate AC/DC current, voltage sources, and resistances

LOW RESISTANCE STANDARD



These Precision Low and Medium Resistance Standards cover ranges from 10μΩ to 1KΩ with an uncertainty of 0.02%. They are used to calibrate low resistance Ohm Meters and Transformer Winding Resistance Meters

DIGITAL POWER ANALYZER - WT210



The WT210 Power Analyzer, with a best uncertainty of 0.25%, is used to calibrate Current and Voltage Transformer burdens at 50Hz and 60Hz

28KV HIGH VOLTAGE PROBE

Etel uses the Fluke 28KV High Voltage Probe to calibrate high-voltage test sets and generators, with a best uncertainty of 3.7%.

TEMPERATURE STANDARD

The TEMPSN Temperature Standard is used for calibrating heaters and oil baths in the range of 27°C to 110°C, with a CMC of 0.14%

SCOPE OF ACCREDITATION



PARAMETERS/ INSTRUMENTS	RANGE
Current Transformers *	PRI:5A to 6000A, SEC:5A & 1A
Potential Transformers	1.1kV to 33kV
Electronic Potential Dividers	1.1kV to 33kV
Current Burden (1A & 5A)	2.5VA to 75VA @ 0.8 PF 50Hz 1VA to 5VA@ UPF 5A-2.5VA to 200VA @ 0.9PF, 60Hz
Potential Burden (63.5V & 110V/ 69.3V & 120V)	1.25VA to 200VA @ 50Hz 69.3V & 120V -12.5VA to 400VA @ 0.1PF to 0.85PF, 60Hz
Instrument Transformer (CT/VT) Test Sets- Ratio & Phase error **	VT, CT-1A & 5A R.E: 0% to $\pm 3\%$, P.E: 0 crad to ± 3 crad
Capacitance, Tan Delta & Resistivity Test Kits/ Bridges	200pF, Tan δ : 0.01% to 10% & 230pF, 1000PF Tan δ : 1×10^{-5} to 0.06
Turns Ratio Meters	1 to 5000 Turns
Capacitance & Tan Delta Measuring	up to 1000pF, Tan δ : 1.2×10^{-5} to 1.2×10^{-3}
High Resistance Measuring	10M Ω to 1T Ω
Winding Resistance Meters (Micro Ohm Meters)	10 $\mu\Omega$ & 100 $\mu\Omega$ @100A, & 1m Ω to 1k Ω
High Resistance Meters, Meggers, Insulation Testers	1k Ω to 30T Ω
Ratio & Phase Error Calibrators VT, CT (1A & 5A)	Ratio Error: 0% to $\pm 3\%$ Phase Error: 0 crad to ± 3 crad
High Voltage Test kits/ Breakdown testers	Up to AC 1kV -28kV
DC / AC Voltmeters	0 to 1000V
DC / AC Ammeters	0 to 20A
Resistance meters	0 to 190M Ω
Frequency meters	up to 1kHz
DC / AC Voltage source	0 to 1000V
DC / AC Current source	0 to 10A
Frequency	up to 1kHz
THERMAL-Temperature Indicator with sensors of Oil bath/Heater	27 $^{\circ}$ C to 110 $^{\circ}$ C

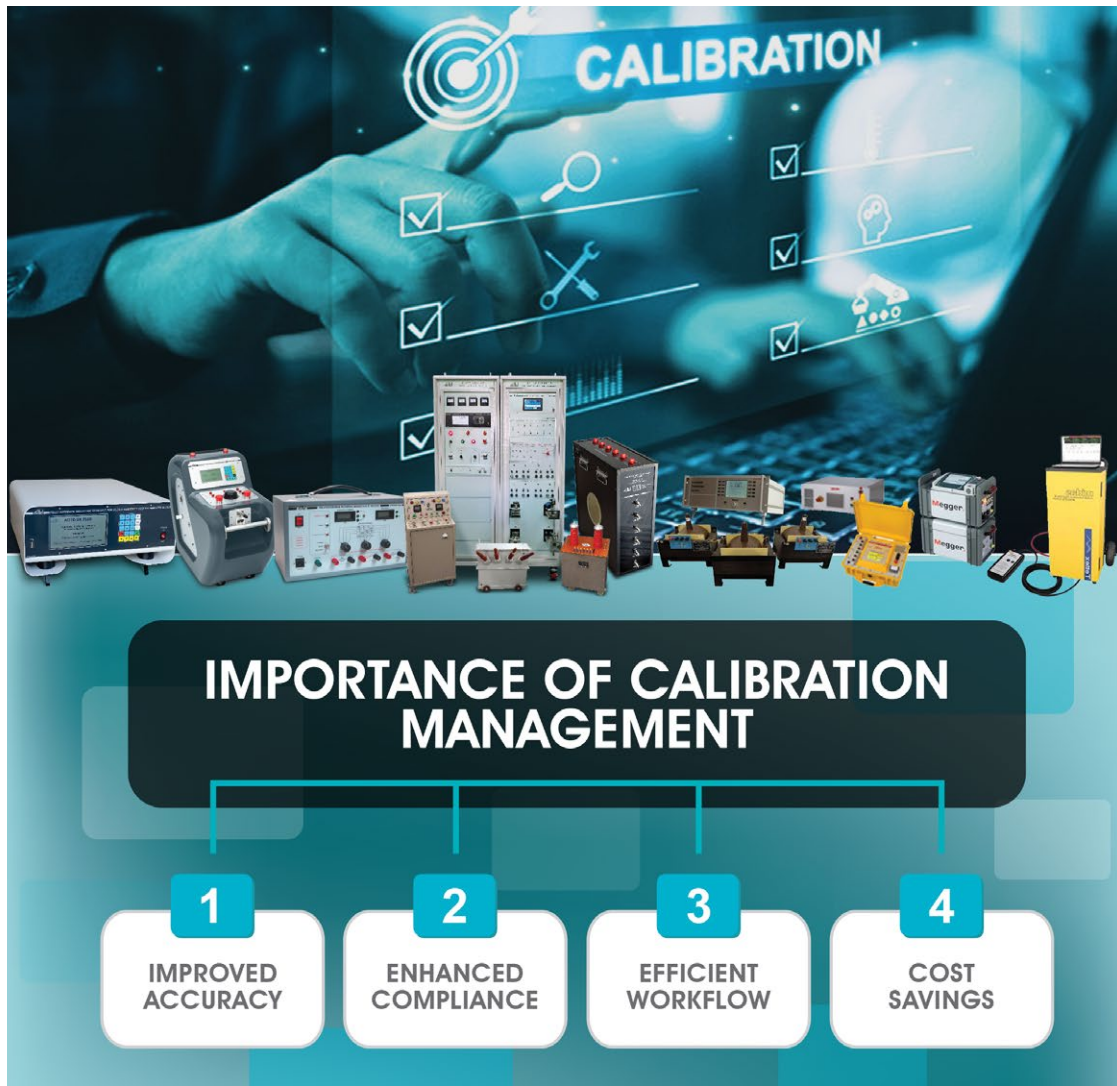
*Current Transformers:

The uncertainty (CMC) of our lab is 96ppm & 0.65min, our STD CT accuracy is 0.002%.

**Instruments Transformer Test Set:

Only our lab has the unique facility to calibrate Ratio & Phase errors covering all ranges for Instrument Current & Voltage

Transformer Test set using Direct method (Errors introduced Directly).



Etel Industries' state-of-the-art calibration technology will cover almost all electrical parameters related to the power industry. These standards are developed in our R&D Centre under the technical guidance of our expert Canadian consultant Mr. Oleh Iwanusiw. The Calibration Lab is staffed by a highly experienced team with a strong technical background. Our goal is to provide our customers with quick and timely support - talk to us about any questions or concerns regarding our calibration services.

Etel Industries, established in 1983, is a market leader in the manufacturing and development of test instruments for electrical power industries and utilities. Customers in over 50 countries rely on Eltel's original design technology, global accreditation and timely customer support, making Eltel a premier source for test instruments and calibration services that are renowned for accuracy and reliability. Based in India, Eltel's experienced team looks to optimize innovation and support, building strong and lasting relationships within the global industry.



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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.

Etel Industries – Calibration Laboratory (including on-site calibrations) is NABL - ACCREDITED in electro-technical discipline in accordance to ISO/IEC:17025/2017.

An ISO 9001-2015 Certified Company

(Specifications subject to change without notice)