



Resistance Standards Catalog

Manufacturing World Class Calibration Standards

Welcome to Vaiseshika®



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I am happy to present the latest catalogue of **VAISESHIKA Resistance Calibration Standards**. We are offering calibration standards catering to the physical parameters of resistance & temperature, instruments encompassing the fields of sound, light intensity, relative humidity, optical, analytical and agri-electronics instrumentation.

The products, showcased in this catalogue, are representing the best manufacturing capabilities and state-of-the-art technologies. All products, are manufactured at Vaiseshika, with purely indigenous technologies, which have been developed and evolved at our manufacturing facility over a long period of research. We have established business partnerships, around the globe, in more than 50 countries, where our Resistance Standards are used by Calibration Labs, Engineering & Oil Industry, Avionics & Master Labs as Master Standards.

Likewise our Master Calibration Standards are compliant to ISO/IEC 17025 Standard and are traceable to the National/ International Standards. We maintain Calibration protocol between Vaiseshika instrument and Reference Calibration Standards. Vaiseshika instruments have been subjected to rigorous in situ trials and are released after successful field trials.

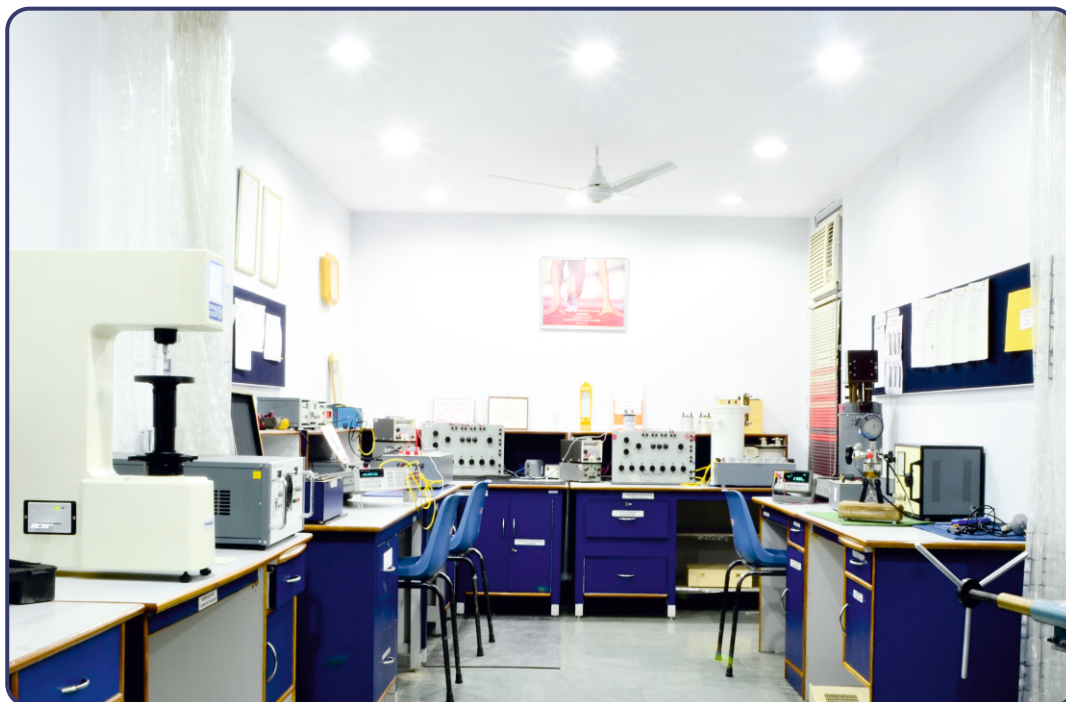
Vaiseshika has developed a strong customer friendly approach for its entire product range with motto “Customer is Supreme”. Vaiseshika believes in providing value rich services like operational training and expertise to the customers at our facility. Our engineers conduct training workshops for the customers at their premises also. Further we maintain and support our customers through service, repair and calibration for a period of more than 10-15 years.

We are confident that our corporate credentials, capabilities, technologies and product range will provide you the confidence and trust of a reliable manufacturer called Vaiseshika Electron Devices.

Praveen Jain (B.E, Aeronautical)
CEO



VAISESHIKA MANUFACTURING FACILITY



CALIBRATION FACILITY

ISO 17025 Compliant Calibration Facilities

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REAL MEANING OF CALIBRATION

Vaiseshika Electron Devices manufacture & produce a wide range of Resistance Calibration Standards ranging from $1 \mu\Omega$ to $20 \text{ Tera } \Omega$. Vaiseshika Resistance Calibration Standards are also accompanied with ISO 17025 Calibration Certificate. The Vaiseshika Metrology Laboratory is fully equipped with in-house ISO/IEC 17025 Compliant Master Calibration Standards.

Calibration is a process wherein your instrument is inspected, assessed and evaluated for its present measurement capability/accuracy. In the process of calibration, we compare the values of measurements of your artefact against a Reference Calibration Standard. If there are deviations (beyond specified accuracy) in your instrument, our engineers adjust, compare and standardize your instrument against our Master Reference Calibration Standards.

Vaiseshika Master Reference Calibration Standards are calibrated at the Government Electronics Research and Testing Laboratories and maintained in our Metrology Laboratory according to ISO 17025 (NABL) protocols. Further our own laboratory is NABL approved.

In ordinary circumstances and with a large number of so called Private Calibration Shops, you only obtain Status Report of your instruments. This means, most of the time, these Makeshift Calibration Shops give you only the results reported in your instrument against casually maintained instrument / makeshift / portable laboratory (sometimes on the back of a bicycle / motorcycle / three wheeler).

UNIQUENESS OF VAISESHIKA CALIBRATION STANDARDS

Whenever you wish to purchase & establish a Master Reference Calibration Standard for your ISO 17025 Accredited Calibration Laboratory, we request you to study the Uniqueness of Vaiseshika Calibration Standards against any other Manufacturer. Vaiseshika provides you the calibration confidence through a Measurement Protocol, documented records & following systematic manner:

1. Maintaining Low Drift (18 years span) for Reference Calibration Standards:

Vaiseshika Metrology Laboratory has been maintaining Master Calibration Standards which have shown Low Drifts of the order of 0.0002% over a period of 18 years. This low drift of our reference standards have provided high stability to the measurement values thereby ensuring precision & reproducibility of calibrations in Vaiseshika metrology Laboratory.

2. Documented Records of Low Drift:

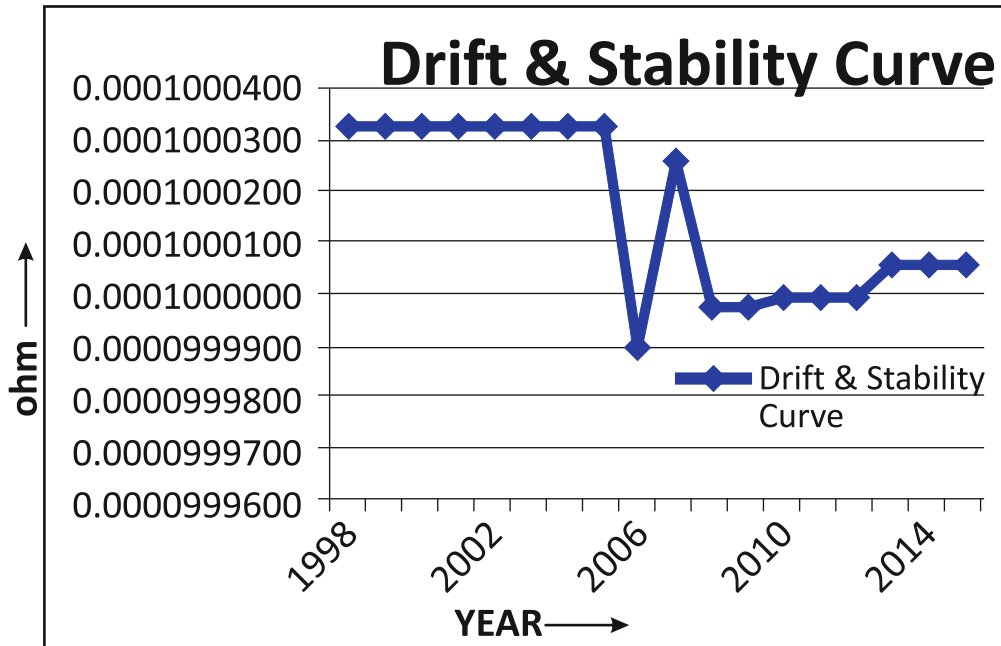
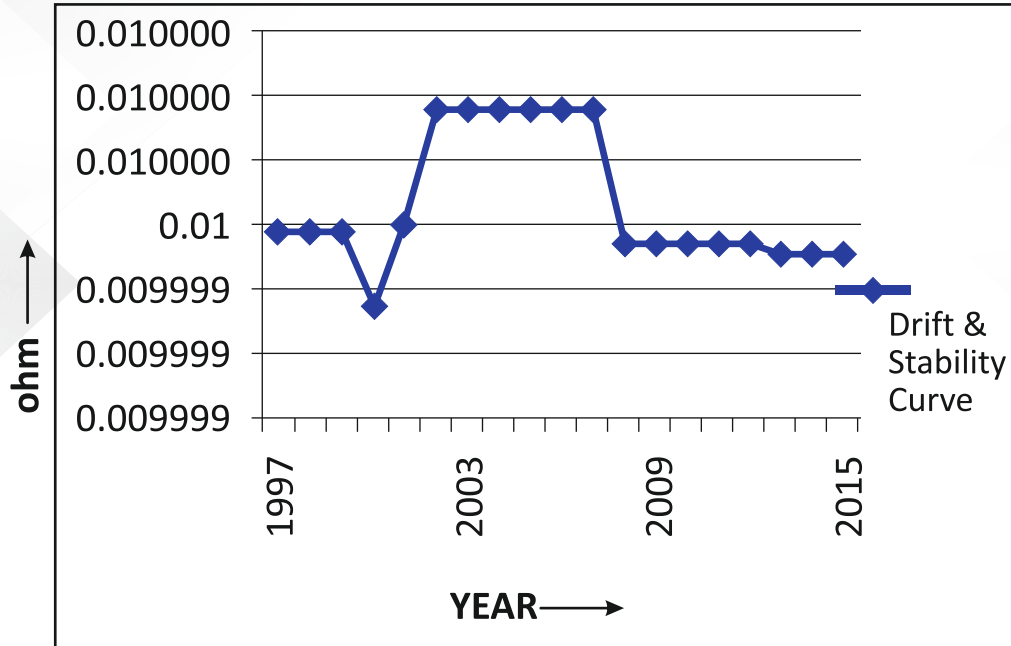
Vaiseshika Metrology Laboratory has documented the entire record of drift & stability through a system of regular periodic calibrations of its reference standards at Echelon-II Electronics Regional Test laboratory, Government of India, New Delhi. Further the performance of these Master Standards has been shown & demonstrated to the NABL assessors during their visits on audits at Vaiseshika Metrology Laboratory.

3. Calibration is a passion at Vaiseshika & it is your Lifeline:

The world of science of measurement and calibration is based on the data that has been collated and gathered by our experts through a well established system of calibration & measurement capability. We ensure precision, repeatability, reproducibility & stability in measurements in our laboratory through a chain of reference calibration standards traceable to the National Physical laboratory, New Delhi.

4. Vaiseshika Resistance Calibration Standards fulfills "Make-in-India" Dream of our Hon'ble Prime Minister Narendra Modi by providing World Class Calibration Standards at affordable prices. Some of our Master Standards like 10kV High Resistance Box has components & material withstanding 10kV Voltage during usage, maintaining claimed accuracies & values, which no other manufacturer, in the world is providing. Appreciating Reliability & Durability of our Standards, Leading Calibration Labs & Industrial Companies, around the globe are preferring Vaiseshika Resistance Standards over other leading manufacturers.

MASTER CALIBRATION STANDARD DRIFT & STABILITY CURVE
Low Drift and High Stability Curve of our Master Calibration Standards.

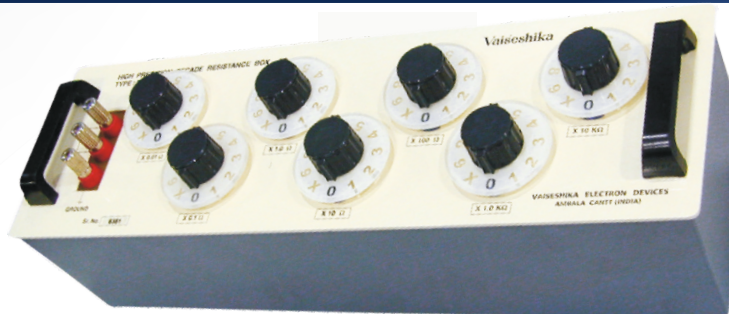


- Drift = + 0.0002 %
- Ensuring Precision & Reproducibility of Calibrations (Year 1997 to 2016)
- Demonstrated during all Vaiseshika NABL Certification Audit

Scope of Calibration

Quantity Measured/ Instrument	Range/ Frequency	Calibration Measurement Capability ($\pm$)	Remarks
Source Mode			
Electro Technical Parameter			
DC Resistance	0.0001 Ω 0.001 Ω 0.01 Ω 0.1 Ω 1 Ω 10 Ω 100 Ω 1 k Ω 10 k Ω 100 k Ω 1 M Ω 10 M Ω	0.015 % 0.015 % 0.015 % 0.01 % 0.004 % 0.004 % 0.004 % 0.004 % 0.004 % 0.004 % 0.004 % 0.0065 %	By Direct method
DC Resistance	0.01 Ω to 100 k Ω 100 k Ω to 1 G Ω 1 G Ω to 1 T Ω	1% to 0.03% 0.03% to 0.7% 0.7% to 1.5%	By Direct method
Temperature Simulation T/C K-Type J-Type T-Type R-Type S-Type RTD (PT 100)	-200°C to 1368°C -200°C to 1108°C -168°C to 369°C -40.00°C to 1760°C 0°C to 1760°C -190°C to 830°C	2.5°C to 2.1°C 1.1°C to 2°C 1.5°C to 2.1°C 1.5°C to 2.1°C 3.7°C 0.7°C to 1.6°C	By Direct method
Measure Mode			
DC Resistance	0.00001 Ω	1.6 %	By Direct method
DC Resistance	0.0001 Ω to 1 k Ω 1 k Ω to 10 M Ω	0.9 % to 0.002 % 0.002 % to 0.006 %	By Direct method
DC High Resistance	0.1 M Ω to 500 G Ω 500 G Ω to 10 T Ω	0.03 % to 1.5 % 0.9 % to 1.25 %	By V/I Method
DC Voltage	1 mV to 10 V 10 V to 1000 V 1 kV to 15 kV	0.006 % to 0.002 % 0.002 % to 0.007 % 0.7 %	By Direct method
AC Voltage (50 Hz)	1 mV to 100 V 100 V to 750 V	0.9 % to 0.09 % 0.09 % to 0.04 %	By Direct method
DC Current	10 μ A to 1000 A	0.03 % to 0.5 %	By Direct method
AC Current (50 Hz)	1 mA to 1 A	0.15 % to 0.3 %	By Direct method

High Precision Decade Resistance Box



Series : 7400

Features

- High precised, through highly reliable resistance element & skilled construction
- Calibration verification on 20 years stability data of the Master Calibration Standards
- CMC of the order of 0.002%
- Safety factor 1.25 is applied in designing
- 15 years maintainability assured.

Applications

- Calibration of RTD Temperature Indicators
- Load Cell and Strain Gauge Calibrations.
- All testing & calibration labs.
- Calibration of Speedo Meters.
- Meter calibrations.
- Calibration of Earth Resistance Meters

Technical Data

- **Function** : Calibration Resistance Standard
- **Range/ Resolution** : 0.0001Ω to 111.11111 KΩ/ 0.0001Ω
- **Switches** : Silver/Gold plated, self wiping, spring loaded
- **Switch Resistance** : ≤ 2 mΩ
- **Resistor Element** : Insulated, Non Inductive, wire wound Manganin Wire
- **Stability** : 1/3 of Accuracy (yearly)
- **Temperature Coefficient** : ≤ 10 ppm/°C
- **Maximum Voltage to Case** : 1000 volts
- **Instrument Housing** : Mild Steel with anti-rust powder coating
- **Calibration Certificate (Optional)** : ISO/IEC 17025 compliant or Factory Cal. Certificate.
- **Accessories (Optional)** : Carrying case & Connecting Cables.

Decade	Resistance Per Step (Ω)	Total Resistance (Ω)	Max. Current (A)	Max. Voltage (V)	Max. Power (W)	Accuracy:			
						Ultra Precision	Precision	Standard	Economy
First	0.0001	0.001	20	0.002	0.04	±8%	±10%	±10%	±15%
Second	0.001	0.01	10	0.01	0.1	±5%	±8%	±10%	±15%
Third	0.01	0.1	4	0.04	0.16	±1%	±1%	±2%	±5%
Fourth	0.1	1.0	1.6	0.16	0.256	±0.2%	±0.2%	±0.5%	±1%
Fifth	1.0	10.0	800 m	0.8	0.64	±0.02%	±0.02%	±0.05%	±0.5%
Sixth	10.0	100.0	250 m	2.5	0.625	±0.01%	±0.02%	±0.05%	±0.5%
Seventh	100.0	1.0 k	80 m	8	0.64	±0.01%	±0.02%	±0.05%	±0.5%
Eighth	1.0 k	10.0 k	23 m	23	0.53	±0.01%	±0.02%	±0.05%	±0.5%
Ninth	10.0 k	100 k	7 m	70	0.49	±0.01%	±0.02%	±0.05%	±0.5%

Thumb Wheel Decade Resistance Box



Series : 7400A

Features

- High precised, through highly reliable resistance element & skilled construction
- Calibration verification on 20 years stability data of the Master Calibration Standards
- CMC of the order of 0.002%
- Safety factor 1.25 is applied in designing
- 15 years maintainability assured.

Applications

- Calibration of RTD Temperature Indicators
- Load Cell and Strain Gauge Calibrations.
- All testing & calibration labs.
- Calibration of Speedo Meters.
- Meter calibrations.
- Calibration of Earth Resistance Meters

Technical Data

Function	: Calibration Resistance Standard
Range/ Resolution	: 0.01 Ω to 99.99999999 M Ω / 0.01 Ω
Switches	: Selectable Thumb Wheel with Gold plated Contacts
Switch Resistance	: 60 m Ω
Resistor Element	: Non Inductive Metal Film & Manganin Wire
Stability	: 1/3 of Accuracy (yearly)
Temp. Coefficient	: Standard & Precision: 100 ppm/ $^{\circ}$ C, Ultra Precision 50 ppm/ $^{\circ}$ C
Instrument Housing	: Mild Steel With Anti-rust powder coated
Maximum Voltage to Case	: 2000 volts
Max.Voltage Capacity	: 250V DC & 176 VAC FSD
Calibration Certificate(Optional)	: ISO/IEC 17025 compliant or Factory Calibration Certificate.
Accessories Optional	: Carrying Case & Connecting Cables

Decade (Ω)	Total Resistance (Ω)	Max Power (W)	Accuracy Standard		Accuracy Precision		Accuracy Ultra Precision	
			individual DIAL	FSD	individual DIAL	FSD	individual DIAL	FSD
0.01	0.09		$\pm 15\%$		$\pm 15\%$		$\pm 10\%$	
0.1	0.9		$\pm 5\%$		$\pm 5\%$		$\pm 5\%$	
1.0	9.0		$\pm 1\%$		$\pm 1\%$		$\pm 1\%$	
10.0	90.0		$\pm 1\%$		$\pm 0.5\%$		$\pm 0.5\%$	
100.0	900	1	$\pm 1\%$	$\pm 1\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 0.1\%$	$\pm 0.1\%$
1.0 K	9.0 K	or	$\pm 1\%$		$\pm 0.5\%$		$\pm 0.1\%$	
10.0 K	90.0 K	2	$\pm 1\%$		$\pm 0.5\%$		$\pm 0.1\%$	
100.0 K	900.0 K		$\pm 1\%$		$\pm 0.5\%$		$\pm 0.1\%$	
1 M	9 M		$\pm 1.1\%$		$\pm 0.5\%$		$\pm 0.1\%$	
10 M	90 M		$\pm 1\%$		$\pm 0.5\%$		$\pm 0.1\%$	

ISO 17025 Compliant Calibration Facilities

High Precision Decade Resistor Box



Series : 7400SD

Features

- High precision, through highly reliable resistance element & skilled construction
- Calibration verification on 20 years stability data of the Master Calibration Standards
- CMC of the order of 0.002%
- Safety factor 1.25 is applied in designing
- 15 years maintainability assured.

Applications

- Calibration of RTD Temperature Indicators
- Load Cell and Strain Gauge Calibrations.
- All testing & calibration labs.
- Calibration of Speedo Meters.
- Meter calibrations.
- Calibration of Earth Resistance Meters

Technical Data

- | | |
|---|---|
| • Function | : Calibration Resistance Standard |
| • Range | : 0.0001Ω to 10 MΩ |
| • Switches | : Silver or Gold plated, self wiping, spring loaded |
| • Switch Resistance | : ≤ 2 mΩ |
| • Resistor Element | : Insulated, Non Inductive, wire wound Manganin Wire |
| • Stability | : 1/3 of Accuracy (Yearly) |
| • Temperature Coefficient | : ≤ 10 ppm/°C upto 100kΩ & 25 ppm > 100kΩ |
| • Maximum Voltage to Case | : 1000 volts |
| • Instrument Housing | : Mild Steel with anti-rust powder coating |
| • Calibration Certificate (Optional) | : ISO/IEC 17025 compliant or Factory Calibration Certificate |

Nominal Value (Ω)	Maximum Power (W)	Max. Current (A)	Max. Voltage (V)	Accuracy			
				Ultra Precision	Precision	Standard	Economy
0.0001	0.04	20	0.002	±8%	±10%	±10%	±15%
0.001	0.1	10	0.01	±5%	±8%	±0.10%	±15%
0.01	0.16	4	0.04	±1%	±1%	±2%	±5%
0.1	0.256	1.6	0.16	±0.2%	±0.2%	±0.5%	±1%
1	0.64	800 m	0.8	±0.02%	±0.02%	±0.05%	±0.5%
10	0.625	250 m	2.5	±0.01%	±0.02%	±0.05%	±0.5%
100	0.64	80 m	8	±0.01%	±0.02%	±0.05%	±0.5%
1 K	0.53	23 m	23	±0.01%	±0.02%	±0.05%	±0.5%
10 K	0.49	7 m	70	±0.01%	±0.02%	±0.05%	±0.5%
100 K	10	10 m	1000	±0.01%	±0.5%	±0.5%	±5%
1 M	1	1m	1000	±0.01%	±0.5%	±0.5%	±5%
10 M	0.1	0.1 m	1000	±0.03%	±0.5%	±1%	±10%

ISO 17025 Compliant Calibration Facilities

High Value Decade Resistance Box



Series : 8400/ 8400HV

Features

- High precision through highly reliable resistance element & skilled construction
- Calibration verification on 20 years stability data of the Master Calibration Standards
- CMC of the order of 0.03% to 1.5%
- Safety factor 1.25 applied in designing
- 15 years maintainability assured.

Applications

For the calibration of:

- Insulation Testers upto 10 kV
- Megohm Meters
- Digital Meters
- Insulation Bridges
- Components comparison
- NABL Calibration Labs

Technical Data

- | | |
|--|--|
| • Function | : Calibration Resistance Standard |
| • Range/ Resolution | : 100 k Ω to 11.111111 T Ω / 100.0 k Ω |
| • Switches | : Silver or Gold plated, self wiping, spring loaded |
| • Switch Resistance | : $\leq$ 5 m Ω |
| • Switch Material | : Glass Epoxy |
| • Resistor Element | : Non Inductive, High Voltage, Epoxy Coated |
| • Stability | : 1/3 of Accuracy (yearly) |
| • Temperature Coefficient | : 100 k Ω to 1.0 G Ω $\leq$ 25ppm/ $^{\circ}$ C, 1.0 G Ω to 1 T Ω $\leq$ 100ppm/ $^{\circ}$ C, above 1 T Ω 250ppm/ $^{\circ}$ C |
| • Voltage Coefficient >5 kV | : Upto 1 T Ω $\leq$ 3ppm/volt & above 1 T Ω $\leq$ 12ppm/volt |
| • Instrument Housing | : Mild Steel with anti-rust powder coated |
| • Maximum Voltage to Case | : 1 kV for 8400 & 5/10 kV for 8400HV |
| • Dielectric Voltage | : 500 Volt AC for one minute |
| • Calibration Certificate (Optional) | : ISO/IEC 17025 compliant or Factory Cal. Certificate. |
| • Accessories (Optional) | : Carrying case & Connecting Cables. |

Decade	Step Resistance (Ω)	Total Resistance (Ω)	Maximum Voltage (V)			Accuracy			
			8400	8400-5 kV	8400-10 kV	Ultra Precision	Precision	Standard	Economy
First	100 k	1 M	1000	1000	1000	$\pm 0.01\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 2\%$
Second	1 M	10 M	1000	1000	1000	$\pm 0.01\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 2\%$
Third	10 M	100 M	1000	5000	5000	$\pm 0.03\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
Fourth	100 M	1000 M	1000	5000	10000	$\pm 0.1\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
Fifth	1 G	10 G	1000	5000	10000	$\pm 0.2\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
Sixth	10 G	100 G	1000	5000	10000	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 5\%$
Seventh	100 G	1 T	1000	5000	10000	$\pm 0.5\%$	$\pm 1.5\%$	$\pm 2\%$	$\pm 5\%$
Eight	1 T	10 T	1000	5000	10000	$\pm 3\%$	$\pm 3\%$	$\pm 5\%$	$\pm 10\%$
* Total Resistance Available: 11.111111 T Ω									

ISO 17025 Compliant Calibration Facilities

Decade Resistor Box



8400 HVSD

Features

- High precised, highly reliable element
- 20 years stability data of the Master Standards
- CMC of the order of 0.03% to 1.5%
- Safety factor 1.25 is applied in designing

Applications

For the calibration of:

- Insulation Testers $\geq 10\text{ kV}$
- Megohm Meters
- Digital Meters
- Insulation Bridges

Technical Data

- | | |
|--|--|
| • Function | : Calibration Resistance Standard |
| • Resistance Range | : 1 k Ω to 10 T Ω |
| • Switches | : Silver or Gold plated, self wiping, spring loaded |
| • Switch Resistance | : $\leq 5\text{ m}\Omega$ |
| • Switch Material | : Glass Epoxy |
| • Resistor Element | : Non Inductive, High Voltage, Epoxy Coated |
| • Stability | : 1/3 of Accuracy (yearly) |
| • Temperature Coefficient | : $\leq 10\text{ ppm}$ upto 10k Ω , 100 k Ω to 1 G Ω $\leq 25\text{ ppm}/^\circ\text{C}$,
1 G Ω to 1 T Ω $\leq 100\text{ ppm}/^\circ\text{C}$, above 1 T Ω 250ppm/ $^\circ\text{C}$ |
| • Voltage Coefficient | : Upto 1 T Ω $\leq 3\text{ ppm/volt}$ & above 1 T Ω $\leq 12\text{ ppm/V}$ |
| • Instrument Housing | : Mild Steel with anti-rust powder coated |
| • Maximum Voltage to Case | : 1 kV for 8400 & 5/10 kV for 8400HV |
| • Dielectric Voltage | : 500 Volt AC for one minute |
| • Calibration Certificate(Optional) | : ISO/IEC 17025 compliant or Factory Cal. Certificate. |
| • Accessories (Optional) | : Carrying case & Connecting Cables. |

Nominal Value	Maximum Voltage (In Volts)			Accuracy			
	8400	8400-5 kV	8400-10 kV	Ultra Precision	Precision	Standard	Economy
1k	50	50	50	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	$\pm 0.5\%$
10k	150	150	150	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	$\pm 0.5\%$
1 M	1000	1000	1000	$\pm 0.01\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 2\%$
10 M	1000	1000	1000	$\pm 0.01\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 2\%$
100 M	1000	5000	5000	$\pm 0.03\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
1000 M	1000	5000	10000	$\pm 0.1\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
10 G	1000	5000	10000	$\pm 0.2\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
100 G	1000	5000	10000	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 5\%$
1 T	1000	5000	10000	$\pm 0.5\%$	$\pm 1.5\%$	$\pm 2\%$	$\pm 5\%$
10 T	1000	5000	10000	$\pm 3\%$	$\pm 3\%$	$\pm 5\%$	$\pm 10\%$

ISO 17025 Compliant Calibration Facilities

Decade Resistance/ Megohm Box



Series : 7484HV

Technical Data

- **Function** : Calibration Resistance Standard
- **Range/ Resolution** : 0.0001 Ω to 11.1111111111 T Ω / 0.0001 Ω
- **Switches** : Silver or Gold plated, self wiping, spring loaded
- **Switch Resistance** : ≤ 2 m Ω upto X10k Ω & ≤ 5 m Ω more than X10k Ω
- **Switch Material** : Glass Epoxy
- **Resistor Element** : Non Inductive, High Voltage, Epoxy Coated
- **Stability** : 1/3 of Accuracy (yearly)
- **Temperature Coefficient** : 10ppm upto 10k Ω , 100 k Ω to 1.0 G Ω ≤ 25 ppm/ $^{\circ}$ C, 1.0 G Ω to 1 T Ω ≤ 100 ppm/ $^{\circ}$ C, above 1 T Ω 250ppm/ $^{\circ}$ C
- **Voltage Coefficient** >5 kV : Upto 1 T Ω ≤ 3 ppm/volt & above 1 T Ω ≤ 12 ppm/volt
- **Instrument Housing** : Mild Steel with anti-rust powder coated
- **Maximum Voltage to Case** : 1 kV for 8400 & 5/10 kV for 8400HV
- **Dielectric Voltage** : 500 Volt AC for one minute
- **Calibration Certificate(Optional)** : ISO/IEC 17025 compliant or Factory Cal. Certificate.
- **Accessories (Optional)** : Carrying case & Connecting Cables.

Decade	Step Resistance	Total Resistance	Maximum Voltage			Accuracy:			
			7484-1kV	7484-5 kV	7484-10 kV	Ultra Precision	Precision	Standard	Economy
First	0.0001	0.001	0.002	0.002	0.002	$\pm 8\%$	$\pm 10\%$	$\pm 10\%$	$\pm 15\%$
Second	0.001	0.01	0.01	0.01	0.01	$\pm 5\%$	$\pm 8\%$	$\pm 10\%$	$\pm 15\%$
First	0.01	0.1	0.04	0.04	0.04	$\pm 1\%$	$\pm 1\%$	$\pm 2\%$	$\pm 5\%$
Second	0.1	1.0	0.16	0.16	0.16	$\pm 0.2\%$	$\pm 0.2\%$	$\pm 0.5\%$	$\pm 1\%$
Third	1.0	10.0	0.8	0.8	0.8	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	$\pm 0.5\%$
Fourth	10.0	100.0	2.5	2.5	2.5	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	$\pm 0.5\%$
Fifth	100.0	1.0 k	8	8	8	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	$\pm 0.5\%$
Sixth	1.0 k	10.0 k	23	23	23	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	$\pm 0.5\%$
Seventh	10.0 k	100 k	70	70	70	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	$\pm 0.5\%$
Eighth	0.1 M	1 M	1000	1000	1000	$\pm 0.01\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 2\%$
Ninth	1 M	10 M	1000	1000	1000	$\pm 0.01\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 2\%$
Tenth	10 M	100 M	1000	5000	5000	$\pm 0.03\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
Eleventh	100 M	1000 M	1000	5000	10000	$\pm 0.1\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
Twelvth	1 G	10 G	1000	5000	10000	$\pm 0.2\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
Thirteenth	10 G	100 G	1000	5000	10000	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 5\%$
Fourteenth	100 G	1 T	1000	5000	10000	$\pm 0.5\%$	$\pm 1.5\%$	$\pm 2\%$	$\pm 5\%$
Fifteenth	1 T	10 T	1000	5000	10000	$\pm 3\%$	$\pm 3\%$	$\pm 5\%$	$\pm 10\%$

ISO 17025 Compliant Calibration Facilities

Standard Resistor (Oil Cooled/Air Cooled)

Applications

For the Calibration of

- Earth Resistance Meter
- Micro/Mili Ohm Meter
- Ductor Tester
- RTD Temperature Indicators
- Contact Resistance Meter
- Kelvin Bridge
- Multimeter
- Load Cell and Strain Gauge



Series : 9409

Technical Data

Function	: Calibration Resistance Standard
Range	: 0.000001 Ω to 100.0 T Ω
Resistor Element	: Stain free non inductive Manganin coil/wire immersed in oil upto 100 k Ω and >100 k Ω epoxy coated high voltage resistors, hermetically sealed
Stability	: 1/3 of Accuracy (yearly)
Temperature Coefficient	: ≤ 10 ppm/ $^{\circ}$ C upto 100k Ω , 25 ppm/ $^{\circ}$ C from 0.1 M to 1.0 G Ω ≤ 100 ppm/ $^{\circ}$ C from 1.0 G to 1 T, 250 ppm/ $^{\circ}$ C above 1T
Voltage Coefficient (Applicable above 5 kV)	: 3 ppm/volt ≥ 100 k Ω to 1 T Ω , 12 ppm/volt > 1 T Ω
Instrument Housing	: Metallic Container
Maximum Voltage to Case	: 2000 volt
Dielectric Voltage	: 500 volt AC for one minute
Terminals	: Brass/Copper
Calibration Certificate (Optional)	: ISO/IEC 17025 compliant or Factory Calibration Certificate
Accessories (Optional)	: Carrying case & Connecting Cables.

Type	Resistance (Ω)	Maximum Current (A)	Max. Power Dissipation (W)	Accuracy ($\pm$)
9409HP	0.000001	2000	4.0	5.0 %
9409HP	0.00001	2000	40.0	1.0 %
9409HP	0.0001	1000	100.0	0.5 %
9409A	0.001	31.6	1.0	0.1 %
9409B	0.01	10	1.0	0.05 %
9409C	0.1	3.16	1.0	0.02 %
9409D	1	1.0	1.0	0.01 %
9409E	10	0.316	1.0	0.01 %
9409F	100	0.1	1.0	0.01 %
9409G	1 k	0.0316	1.0	0.01 %
9409H	10 k	0.01	1.0	0.01 %
9409I	100 k	3.16 m	1.0	0.05 %

Type	Resistance (Ω)	Max. Voltage (V)	Accuracy ($\pm$)
9409J	1 M	1000	0.1 %
9409K	10 M	1k/5k/10k	0.5 %
9409L	100 M	1k/5k/10k	0.5 %
9409M	1 G	1k/5k/10k	1.0 %
9409N	10 G	1k/5k/10k	1.0 %
9409O	100 G	1k/5k/10k	2.0 %
9409P	1 T	1k/5k/10k	5.0 %
9409Q	10 T	1k/5k/10k	5 %
9409R	100 T	1k/5k/10k	15 %

Micro & Milli - Ohm Meter Calibrator

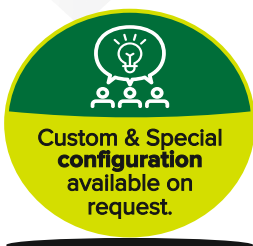
Applications

For the Calibration of

- Earth Resistance Meter
- Micro/Milli Ohm Meter
- Ductor Tester
- RTD / Temperature Indicators
- Contact Resistance Meter
- Kelvin Bridge
- Multimeter
- Load Cell and Strain Gauge



Series : 9409 CAL



Technical Data

Function	: Calibration Resistance Standard
Resistance Range	: 0.000001 Ω to 2 Ω
Resistor Element	: Stain free, non Inductive Wire Wound Manganin wire, immersed in oil
Stability	: 1/3 of Accuracy (yearly)
Temperature Coefficient	: ≤ 10 ppm/ $^{\circ}\text{C}$
Instrument Housing	: Metallic Container
Maximum Voltage to Case	: 2000 volt
Dielectric Voltage	: 500 volt AC for one minute
Terminals	: Brass/Copper
Calibration Certificate (Optional)	: ISO/IEC 17025 compliant or Factory Cal. Certificate
Accessories (Optional)	: Carrying case & Connecting Cables.

Resistance (Ω)	Maximum Current (A)	Accuracy			CMC
		Precision	Standard	Economy	
0.000001	200	$\pm 3\%$	$\pm 5\%$	$\pm 10\%$	
0.00001	200	$\pm 1\%$	$\pm 2\%$	$\pm 5\%$	$\pm 3\%$
0.0001	200	$\pm 0.2\%$	$\pm 0.5\%$	$\pm 1\%$	to
0.001	31.6	$\pm 0.05\%$	$\pm 0.1\%$	$\pm 0.5\%$	$\pm 0.002\%$
0.01	10	$\pm 0.03\%$	$\pm 0.05\%$	$\pm 0.1\%$	or
0.1	3.16	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	Better
1.0	1.0	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	
2.0	1.0	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	

ISO 17025 Compliant Calibration Facilities

Fixed Value Insulation Tester Calibration System



Series : 9409FV

Features

- High precision through highly reliable resistance element & skilled construction
- 20 years stability data of the Master Standards
- CMC of the order of 0.03% to 1.5%
- Safety factor 1.25 applied in designing

Applications

For the calibration of:

- Meggers (upto 10 kV)
- Megohm Meters
- Insulation Testers
- Digital Meters
- Insulation Bridges

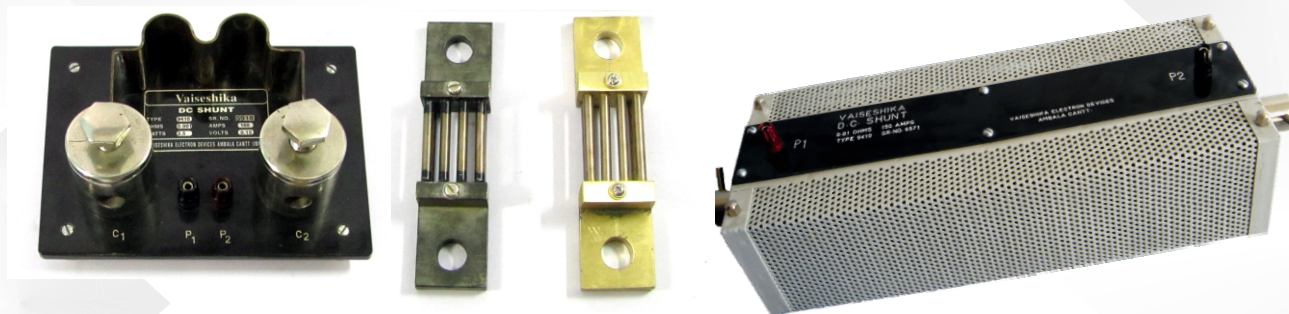
Technical Data

Function	: Calibration Resistance Standard
Resistance Range/ Resolution	: 1k Ω to 20T Ω / 1k Ω
Resistor Element	: Non Inductive, High Voltage, Epoxy Coated
Stability	: 1/3 of Accuracy (yearly)
Temperature Coefficient	: 10ppm upto 10k Ω , 100 k Ω to 1.0 G Ω $\leq$ 25ppm/ $^{\circ}$ C, 1.0 G Ω to 1 T Ω $\leq$ 100ppm/ $^{\circ}$ C, above 1 T Ω 250ppm/ $^{\circ}$ C
Voltage Coefficient >5 kV	: Upto 1 T Ω $\leq$ 3ppm/volt & above 1 T Ω $\leq$ 12ppm/volt
Instrument Housing	: Mild Steel with anti-rust powder coated
Maximum Voltage to Case	: 1 kV/5kV/10kV
Dielectric Voltage	: 500 Volt AC for one minute
Calibration Certificate(Optional)	: ISO/IEC 17025 compliant or Factory Cal. Certificate.
Accessories (Optional)	: Carrying case & Connecting Cables.

Nominal Value (Ω)	Maximum Voltage (V)			Accuracy			
	9409FV-1kV	9409FV-5kV	9409FV-10kV	Ultra Precision	Precision	Standard	Economy
1 k	50	50	50	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	$\pm 0.5\%$
10 k	150	150	150	$\pm 0.01\%$	$\pm 0.02\%$	$\pm 0.05\%$	$\pm 0.5\%$
0.1 M	1000	1000	1000	$\pm 0.01\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 2\%$
1 M	1000	1000	1000	$\pm 0.01\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 2\%$
10 M	1000	5000	5000	$\pm 0.03\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
100 M	1000	5000	10000	$\pm 0.1\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
1 G	1000	5000	10000	$\pm 0.2\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 3\%$
10 G	1000	5000	10000	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 5\%$
100 G	1000	5000	10000	$\pm 0.5\%$	$\pm 1.5\%$	$\pm 2\%$	$\pm 5\%$
1 T	1000	5000	10000	$\pm 3\%$	$\pm 3\%$	$\pm 5\%$	$\pm 10\%$
10 T	1000	5000	10000	$\pm 5\%$	$\pm 3\%$	$\pm 5\%$	$\pm 10\%$
20 T Ω	1000	5000	10000	$\pm 8\%$	$\pm 10\%$	$\pm 10\%$	$\pm 15\%$

ISO 17025 Compliant Calibration Facilities

Air/Oil Cooled DC Shunt



9410

Technical Data

Function	: Calibration Current/ Resistance Standard
Current Range	: upto 20000 Amperes
Resistor Element	: Stain free, Manganin strip/wire
Stability	: 1/3 of Accuracy (yearly)
Temperature Coefficient	: $\leq 10 \text{ ppm/}^\circ\text{C}$
Instrument Housing	: Mild Steel Sieve for Air Cooled & Metallic Container for Oil immersed
Maximum Voltage to Case	: 2000 volt
Dielectric Voltage	: 500 volt AC for one minute
Terminals	: Brass/Copper
Calibration Certificate (Optional)	: ISO/IEC 17025 compliant or Factory Calibration Certificate
Accessories (Optional)	: Carrying case & Connecting Cables.

Current (A)	Resistance (Ω)	Voltage Drop (V)	Wattage (W)	Accuracy	NABL Compliant CMC ($\pm$)
1.5	1.0	1.5	2.25	$\pm 0.05 \%$	
5	0.2	1.0	5.0	$\pm 0.05 \%$	
15	0.1	1.5	22.5	$\pm 0.05 \%$	
15	0.01	0.15	2.25	$\pm 0.05 \%$	
50	0.01	0.5	25.0	$\pm 0.05 \%$	
50	0.02	1.0	50.0	$\pm 0.05 \%$	
75	0.002	0.15	11.25	$\pm 0.05 \%$	
150	0.01	1.5	225.0	$\pm 0.5 \%$	$\pm 1.6\%$
150	0.001	0.15	22.5	$\pm 0.5 \%$	to
300	0.001	0.3	90.0	$\pm 0.5 \%$	$\pm 0.002\%$
500	0.0002	0.10	50.0	$\pm 0.5 \%$	or
750	0.0002	0.15	112.5	$\pm 1.0 \%$	Better
1000	0.0001	0.1	100.0	$\pm 1.0 \%$	
1500	0.0001	0.15	225.0	$\pm 1.0 \%$	
2000	0.00005	0.1	200.0	$\pm 1.0 \%$	
5000	0.00002	0.1	500.0	$\pm 1.0 \%$	
5000	0.000001	0.005	25.0	$\pm 5.0 \%$	5% Non NABL
20000	0.000001	0.02	400	$\pm 5.0 \%$	5% Non NABL

Applications

For the calibration & Testing of

- Battery Testing
- Earth Resistance Meter
- Micro/Mili Ohm Meter
- Ductor Tester
- RTD / Temperature Indicators
- Load Bench/Power Supply
- Contact Resistance Meter
- Kelvin Bridge
- Multimeter
- Load Cell and Strain Gauge

Decade Capacitance Box



Series : 7500

Features

- High accuracy upto $\pm 0.5\%$
- Low zero capacitance: ≤ 3 pF/Switch
- Output: 5-Terminal construction Or BNC
- Stability - 100 ppm/year
- Excellent TC - 50 ppm/ $^{\circ}\text{C}$

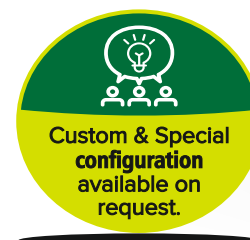
Applications

- Calibration of LCR Meters
- Calibration of Capacitance Meter
- General purpose capacitance substitution.
- Finding optimal operating values in circuits.
- Service work, troubleshooting and maintenance.

Technical Data

- | | |
|--|--|
| • Function | : Calibration Capacitance Standard |
| • Capacitance Range | : 1pF to 11.11111111 mF |
| • Resolution | : 1pF |
| • Switches | : self wiping, better Quality Rotary switches |
| • Switch Capacitance | : ≤ 3 pF |
| • Capacitor Element | : Fix Value Capacitors |
| • Stability | : 1/3 of Accuracy (yearly) |
| • Temperature Coefficient | : 50ppm/ $^{\circ}\text{C}$ |
| • Instrument Housing | : Mild Steel with anti-rust powder coated |
| • Maximum Voltage to Case | : 2000 volts |
| • Dielectric Voltage | : 500 Volt AC for one minute |
| • Calibration Certificate(Optional) | : ISO/IEC 17025 compliant or Factory Cal. Certificate. |
| • Accessories (Optional) | : Carrying case & Connecting Cables. |

Decade (In F)	Total Decade Capacitance (In F)	Maximum Voltage (V)	Accuracy			Accuracy Certified@
			Precision	Standard	Economy	
1p	10p	250	$\pm 4\%$	$\pm 5\%$	$\pm 10\%$	1 kHz
10p	100p	250	$\pm 2\%$	$\pm 3\%$	$\pm 5\%$	1 kHz
100p	1000p	250	$\pm 1\%$	$\pm 2\%$	$\pm 4\%$	1 kHz
1n	10n	250	$\pm 0.5\%$	$\pm 1\%$	$\pm 2\%$	1 kHz
10n	100n	250	$\pm 0.5\%$	$\pm 1\%$	$\pm 2\%$	1 kHz
100n	1000n	250	$\pm 0.5\%$	$\pm 1\%$	$\pm 2\%$	1 kHz
1µ	10µ	250	$\pm 0.5\%$	$\pm 1\%$	$\pm 2\%$	1 kHz
10µ	100µ	250	$\pm 0.5\%$	$\pm 1\%$	$\pm 2\%$	1 kHz
100µ	1000µ	250	$\pm 0.5\%$	$\pm 1\%$	$\pm 2\%$	1 kHz
1m	10m	250	$\pm 0.5\%$	$\pm 1\%$	$\pm 2\%$	1 kHz



ISO 17025 Compliant Calibration Facilities

Decade Inductance Box



Series : 7600

Features

- High accuracy upto $\pm 0.5\%$
- Low zero Inductance
- Output: 5-Terminal construction Or BNC
- Stability - 100 ppm/year
- Excellent TC - 50 ppm/°C

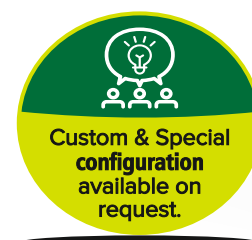
Applications

- Calibration of LCR Meters
- Calibration of Inductance Meter
- General purpose inductance substitution.
- Finding optimal operating values in circuits.
- Service work, troubleshooting and maintenance.

Technical Data

- | | |
|--|--|
| • Function | : Calibration Inductance Standard |
| • Inductance Range | : 10µH to 10 µH |
| • Resolution | : 10µH |
| • Switches | : Self wiping, better quality rotary switches, |
| • Switch Capacitance | : ≤ 3 pF |
| • Inductance Element | : Wire wound inductors |
| • Stability | : 1/3 of Accuracy (yearly) |
| • Temperature Coefficient | : 50ppm/°C |
| • Instrument Housing | : Mild Steel with anti-rust powder coated |
| • Maximum Voltage to Case | : 2000 volts |
| • Dielectric Voltage | : 500 Volt AC for one minute |
| • Calibration Certificate(Optional) | : ISO/IEC 17025 compliant or Factory Cal. Certificate. |
| • Accessories (Optional) | : Carrying case & Connecting Cables. |

Decade (In H)	Total Decade Inductance (In H)	Maximum Voltage (V)	Accuracy			Accuracy Certified@
			Precision	Standard	Economy	
10µ	100µ	1	$\pm 0.5\%$	$\pm 0.7\%$	$\pm 1\%$	1 kHz
100µ	1000µ	1	$\pm 0.5\%$	$\pm 0.7\%$	$\pm 1\%$	1 kHz
1m	10m	1	$\pm 0.5\%$	$\pm 0.7\%$	$\pm 1\%$	1 kHz
10m	100m	1	$\pm 0.5\%$	$\pm 0.7\%$	$\pm 1\%$	1 kHz
100m	1000m	1	$\pm 0.5\%$	$\pm 0.7\%$	$\pm 1\%$	1 kHz
1	10	1	$\pm 0.5\%$	$\pm 0.7\%$	$\pm 1\%$	1 kHz



AC/DC High Voltage Probe



8401

Features

- Glass Epoxy Case to avoid Voltage Shock
- Compatibility with 4.5, 5.5 & 6.5 DMM
- Output Ratio : 1000 : 1

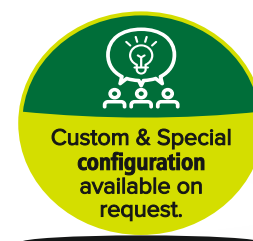
Applications

- Calibration of High Voltage Sources
- Measurement of Voltage above 1 kV
- Step Down High Voltage Measurement

Technical Data

Function	: Calibration Voltage Standard
Range	: 100 Volt to 15 kilo Volts
Accuracy	: 1% in DC & 2.5% in AC
Stability	: 1/3 of Accuracy (Yearly)
Input Impedance	: $\geq 1000 \text{ M}\Omega$
Traceability Drift	: 0.06%
Construction/ Housing Case	: Portable in Glass Epoxy Material
Maximum Voltage to Case	: 15 kV
Cable Length	: 1 Meter
Operating Temperature	: 0°C to 50°C
Storage Temperature	: -10°C to 60°C
Calibration Certificate (optional)	: ISO/IEC 17025 compliant or Factory Cal. Certificate.

Input Voltage	Loading Current	Output Voltage
1 kV	0.1 μA	1 V
5 kV	0.5 μA	5 V
10 kV	1 μA	10 V
15 kV	1.5 μA	15 V



ISO 17025 Compliant Calibration Facilities

What the Eminent Experts say about us

Prof. S.G. Damle
 Vice Chancellor,
 Maharishi Markandeshwar University,
 Mullana, Ambala

It is an immense pleasure to visit Vaiseshika Metrology Laboratory, Ambala Cantt. Really it is an amazing experience to notice the devotion, dedication and commitment of the organization. They have designed indigenous technology, which is of superb quality & also of international standard. All the equipment are standardized following the standardized norms and parameters. The scientific equipments, devices of Vaiseshika organization will be really boon to research professional in technical and health science stream (researchers). I extend my congratulations & best wishes to their efforts.

Mr. Krishnendu Jana
 Scientist 'F'
 Group Director (HR & QA) & MR
 Integrated Test Range (ITR),
 Chandipur, Balasore (Orissa)

I am really happy for the hospitality and co-operativeness by the management & staff of Vaiseshika Electron Devices. The quality of standards for ITR which are checked were found excellent. It is neat and clean organization and doing excellent work for the service of the Nation. I also came to know that the organization is dedicated and by their innovative ideas have achieved great success in the field of Calibration and making standards for Calibration.

Dr. B. Murali
 United Nations Development Programme,
 New Delhi

Having visited Vaiseshika's old facilities, to come here is a pleasure for two reasons. One - to see an institution so devoted to quality and high standards. Two - to see the personal development of Dr. Anil Jain to become a leading & highly respected entrepreneur. We can only say "God Speed" & "Good Luck" and look forward to visiting your "international class" facility in the near future!

Mr. Ram Venuprasad
 Adviser & Head
 Enterprise & Agriculture
 Commonwealth Secretariat
 London, UK

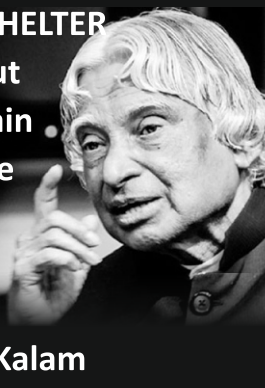
On the occasion of the XI Commonwealth India Small Business Programme, I had the pleasure of visiting the unit along with a lot of delegation of 70+ delegations from 35 commonwealth countries. We were inspired by the work and leadership of this company. Dr. Anil Jain is a true embodiment of Jai Ho!

People like Mr. Jain make me proud to be an Indian.
 Jai Hind.

Message for every Indian

All BIRDS find SHELTER
 during RAIN but
 EAGLE AVOID rain
 by FLYING above
 the CLOUDS.

- Dr. APJ Abdul Kalam



Prestigious Industrial Organizations using Vaiseshika Standards



ISO 17025 Compliant Calibration Facilities

Applications of Resistance Calibration Standards in Industry & Metrology Laboratories

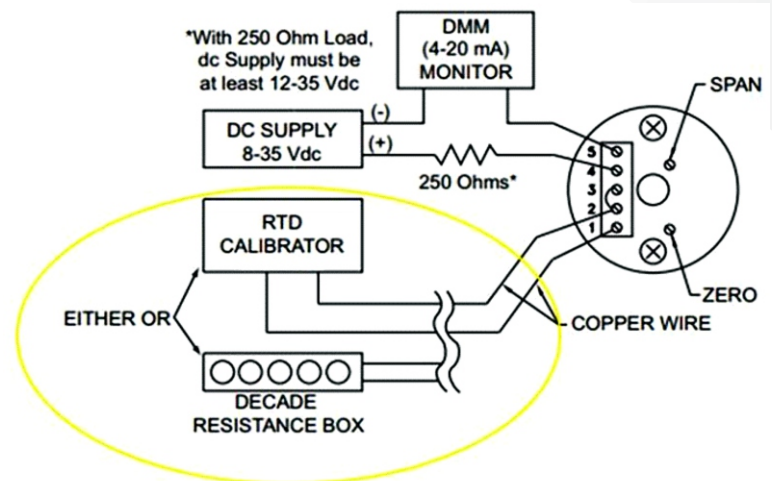
by
Praveen Jain,
B.E (Honours)

CEO, Vaiseshika Electron Devices, Ambala Cantt.

The High Precision Decade Resistance Box, High Resistance Decade Megohm Box, Milli & Micro-Ohm meter Calibrator, Standard Resistor, Fixed Value Insulation Tester Calibration System, Shunt, Capacitance & Inductance Box, are the major calibration standards offered by Vaiseshika for the ISO 17025:2017 Metrology Laboratories. Here are the glimpses of the various applications for your study:

1. Calibrating an RTD Transmitter :

A resistance box can be used as a RTD simulator to provide standard values of resistance for simulation and calibration. RTD simulators provide a resistance simulating the output of a resistance temperature detector (RTD) at a particular temperature.



Connection Diagram of a Resistance Box to a Transmitter

2. Calibrating RTD based automobile Panel Meters :

In automotive industry these are used for the testing and calibration of speedometers. Today speedometers are having electronic circuit to display the speed of the automobile. Therefore feeding predetermine values of precision resistance in the input of the speedometer will be used to calibrate the speedometers.



Instrumentation setup for Precision Calibration of Speedometer.

3. Calibrating Insulation Testers :

The High Value Decade Resistance Boxes are used in the precise calibration of Meggers, Insulation Testers, Insulation Bridges, Megohm Meters, Digital Meters and Components Comparison.

These Boxes are having high voltage rating. This helps in calibration of the above mentioned instruments with latest technology and high voltages upto 10,000 V DC (Resistance from 0.1 Meg Ohm to 10 Tera Ohm).



Calibration setup of a High Value Decade Resistance Box for Insulation Tester

4. Calibrating Micro Ohm Meters and Milli Ohm Meters :

Vaiseshika Milli & Micro Ohm Meter Calibrator can be used by quality control and quality assurance laboratories in manufacturing, plant maintenance and filed use to calibrate your micro ohm meters and milli ohm meters using the four wire Kelvin Measurement Method. Vaiseshika Calibrators can simulate low resistance and check accuracy and reliability of bench top, portable handheld meters with various resolutions, ranges, accuracies and operational modes involving the safety, quality and cost implications for reporting consistently accurate results in the digital milli ohm meters and micro ohm meters.



Calibration setup for Micro ohm Meter Calibration

5. Shunt Calibration of Strain Gage Sensor (Load Cell) :

Since a strain gage load cell is a passive electrical device, there exists a simple, yet effective, method for checking the calibration of a load cell system in the field or when a means of applying actual forces is unavailable. Inducing an electrical imbalance in the cells bridge circuit will simulate the bridge imbalance caused by the application of actual forces to the load cell. Then the system gain may be adjusted so that the system output signal or display indicates a known force on the load cell.

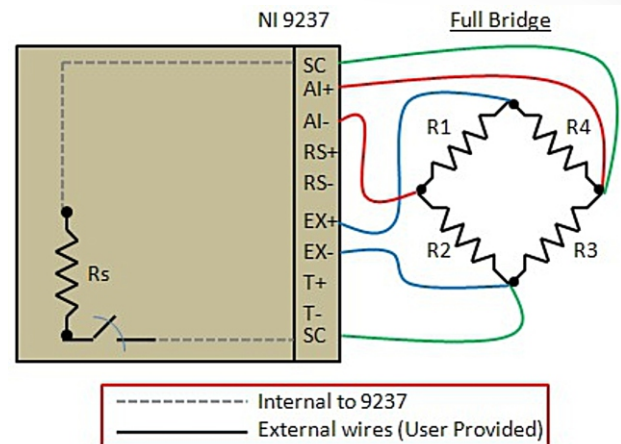
To perform a Shunt Calibration, use the following procedure :

1. Remove or Stabilize all forces on the load cell.
2. Adjust the display or indicator ZERO to read exactly zero.
3. Connect the Shunt Calibration Resistor to the Terminals specified on the Calibration Certificate, and adjust the SPAN or GAIN until the display reads the force value stated on the Certificate.
4. Repeat the procedure to insure a valid Calibration.

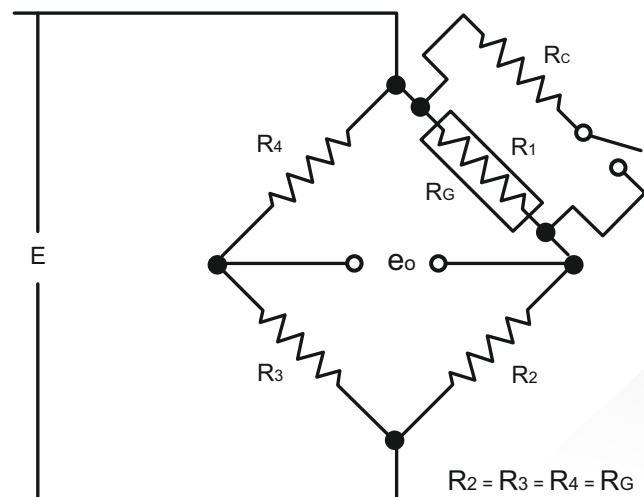
Shunt calibration is accepted throughout the industry as means of constant calibration of a signal conditioner and transducer between calibrations of known, applied, traceable, mechanical, input values. It's important to remember that the shunt resistor can simulate either a tension or compression input in the Wheatstone Bridge.

Thermal EMF and TCR errors can affect the process and should be minimized by choosing a proper resistor. The shunt calibration can be applied conveniently and at any moment and most important during the test programs.

Consequently, strain-gage and transducer manufacturers supply shunt calibration data, along with a shunt calibration precision resistor, as a standard feature. Of course, regular physical calibration is recommended as well to ensure the accuracy, stability, reliability and linearity of the instrument itself.



Shunt-calibration resistors are chosen to accurately simulate resistance change in a strain gage subjected to specified levels of compressive strain. Strain indicators generally will produce a linear output with a fully active half-bridge or full-bridge input circuit, and will be slightly in error when a single active arm is used. The same nonlinearity occurs whether the gage is actually strained in compression or simulated by shunting the gage with the corresponding calibration resistor



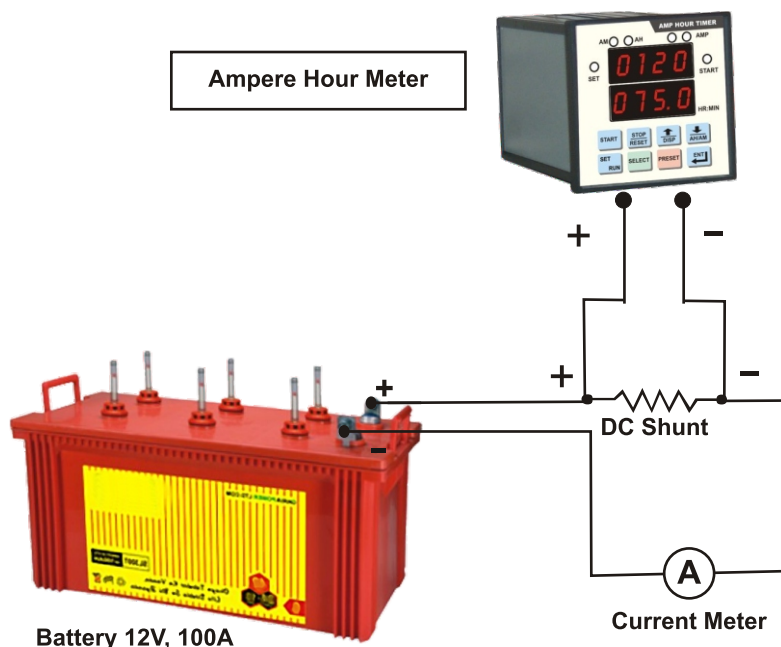
6. Estimating the Charging and Discharging Rate of a Battery :

Air Cooled DC Shunt is also used for fast and controlled Discharging of Batteries.

The battery capacity, that battery manufacturers print on a battery, is usually the product of 20 hours multiplied by the maximum constant current that a new battery can supply for 20 hours at 68 F° (20 C°), down to a predetermined terminal voltage per cell. A battery rated at 100 A·h will deliver 5 A over a 20 hour period at room temperature.

However, if it is instead discharged at 50 A, it will have a lower apparent capacity to last for two hours.

The Vaiseshika DC Shunt is the heart of the below mentioned circuit which is used to verify the ampere-hour capacity of the battery:



Discharging of Battery using Vaiseshika DC Shunt

The charge and discharge current of a battery is measured in C-rate. Most portable batteries are rated at 1C. This means that a 1000mAh battery would provide 1000mA for one hour if discharged at 1C rate. The same battery discharged at 0.5C would provide 500mA for two hours. At 2C, the 1000mAh battery would deliver 2000mA for 30 minutes. 1C is often referred to as a one-hour discharge; a 0.5C would be a two-hour, and a 0.1C a 10- hour discharge. When discharging a battery with Vaiseshika DC Shunt that allows the setting of different discharge C-rates, a higher capacity reading is observed if the battery is discharged at a lower C-rate and vice versa. By discharging the 1000mAh battery at 2C, or 2000mA, the analyzer is scaled to derive the full capacity in 30 minutes. The manufacturer plots the voltage versus the discharge time curve. Using this curve the rated capacity is verified.

Vaiseshika DC Shunts can be used for the testing and calibrations of Charger / Discharger Panel Meters, Battery Testers, Battery Performance Testing Devices, Clamp-on-Meters, Insulation Testers and Tong Testers.

Vaiseshika Air Cooled DC Shunt is also used as a Reference Calibration/Master Standard for comparing and calibrating the Battery Discharging Resistors/Rheostats (of the manufacturers) at their workshops.

Air Cooled DC Shunt is also used for measuring the specification of transformer like its power, voltage and current.

National Awards



**National Award for Quality Products
From President of India**



**National Award for Entrepreneurship
from Prime Minister of India**

Appreciation & Satisfaction Letters


सतीश धवन अन्तरिक्ष केन्द्र
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 तेलुगु - 91 8223 249060 (10 लाईन)
 फ़ोन - 91-8023-245700

Government of India
 Department of Space
Satish Dhawan Space Centre
SHAR
 Sriharikota Range P.O. 524 121, A.P., India
 Telephone: +91-8823-246030 (10 Lines)
 Fax: +91-8823-245100

K. Subhas
Deputy Director
Vehicle Assembly and Static Test Facilities (VAST)

No. SDSC/OD/VAST/2.4/2010/ Dt. 08-12-2010

Sub: Installation and commissioning of 450t Load Cell Calibration Facility at VAST, Satish Dhawan Space Center SHAR.

Ref: Your letter dated 3-11-2010 with Ref no. (F-07) SHAR-AJ-26.

This has the reference to your letters addressed to the undersigned, Director SDSC SHAR and Chairman, ISRO on the above subject.

The calibration machines of capacities 450t and 25t manufactured by M/s Morehouse Instrument Company, USA were installed and commissioned by their Indian agent M/s Vaiseshika Electron Devices, Ambala.

The party has supplied all the items like universal loading machines, proving rings, adapters etc and calibrated load cells ranging from 0.5t to 450t. At present both the machines have been commissioned and are working satisfactorily.

During the course of commissioning our engineers have been given hands-on training for the operations of the 450t Load cell calibration machine and the entire activity has been completed to our satisfaction.


 (K. SUBHAS)
 K. Subhas
 Deputy Director
 VAST

To
Dr. ANIL JAIN
PRESIDENT
M/s VAISESHIKA ELECTRONIC DEVICES
AMBALA.

भारतीय अन्तरिक्ष अनुसंधान संगठन Indian Space Research Organisation

SHAR Space Centre, Sriharikota


LARSEN & TOUBRO

Larsen & Toubro Limited
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 Power Transmission & Distribution
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 Manappuram, P. O. No. 974,
 Chennai - 600 075, India
 Tel: +91-44-2252 6500, 2252 6000
 Fax: +91-44-2270 5462
 www.l-tco.com

18th January 2016

To
Vaiseshika Electron Devices.
38, Industrial Estate
Ambala Cantt-133001
(Haryana)

Dear Sir,

Sub: Letter of Appreciation.

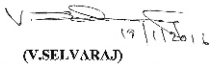
On behalf of L&T Construction, we wish to place on record the efforts made by M/s Vaiseshika Electron Devices for servicing our High Precision Resistor standards which was affected in recent flood in Chennai.

M/s Vaiseshika Electron Devices undertook the servicing, restoration, calibration and standardization of our entire set of standards at free of cost.

This is a brilliant example of customer care, service and support. We really admire M/s Vaiseshika Electron Devices for rendering the restoration of set of Master calibration resistors free of Cost.

We look forward for an enduring relationship with your company in time to come.

Thanking you,

Yours faithfully,

 (V. SELVARAJ)
CHIEF ENGINEERING MANAGER & HEAD
T&C - (IE & SS)
POWER TRANSMISSION & DISTRIBUTION

Registered Office: L&T House, H. M. Nagar, Behind Epsilon, Ambala - 150 001, INDIA
 Licence No. - C-11-119999MNH1960N1004768
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Inverted Metallurgical Microscope



Magnascope/ Magnifier



Stereo Magnifier



Rockwell Hardness Tester



Metallurgical Microscope

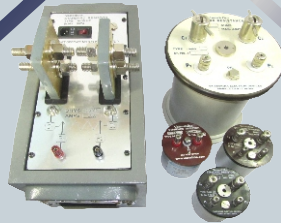
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High Precision Decade
Resistance Box 7400



Fixed Value Insulation
Tester/ Megger
Cal. System: 9409FV

**BUSINESS CHANNEL PARTNER
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Vaiseshika Electron Devices



38-Industrial Estate, Across Tangri River Bridge,
Ambala Cantt.- 133 001 (INDIA)

Phones : (0171)-2699827, 9991157781



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