Vaiseshika


In the domain of DC Resistance we command a CMC of ±0.015% (at 0.0001 Ohm), ±0.005% (at 10 Megohm) and ±3% to ±5% (at 1 Teraohm). Likewise in the domain of DC Voltage our CMC stands 0.002% and ±0.007% (between 1 mV to 1000 Volt).

We offer World Class Force Calibration Standards from 0.1 LBF (0.5 Newton to 2,250,000 LBF (10 Million Newton) and these Force Calibration Instruments namely Load Cells, Torque Cells, Digital Proving Rings, Force Gauges and Dead Weight Force Calibrators are calibrated at Dead Weight Primary Standards of capacity 120,000 LBF (534 kN) for Force calibration and primary Torque Standard accurate to 0.002% of applied torque to 17,700 IN-lbf (2kN-m).

In the domain of Hardness, our CMCs are: HRA ±0.63, HRBW ±0.22 and HRC ±0.56 and subsequently we offer a host of Digital Rockwell Hardness Testers and Metallurgical Microscopes for material testing and micro structure analysis.

In the domain of Pressure Calibration our CMCs stands at ±0.00 bar at the range 0 to 300 bar. We maintain Calibration Standards in our Metrology Laboratory which enable us to offer accurate calibrations and lower your measurement uncertainties. Vaiseshika Calibration Standards meet greater customer confidence and lesser consumer risk. We are producing DC Standard Resistors on Primary Calibration Standards which have shown stability ranging from 0.0004% to 0.0002% and drift of ±0.0002% during a period of 18 years. Thus we ensure precision and reproducibility of calibrations in our Metrology Laboratory. We have been recognized by the National Accreditation Board for Testing and Calibration Laboratories (NABL), Department of Science and Technology, Government of India, New Delhi for DC Resistance, Voltage, Current, AC Voltage and Current, Temperature, Pressure and Hardness conforming to ISO 17025 Accreditation Standards.

Credibility and Credentials of our Calibration Capability:

Vaiseshika has proven its calibration competence by installing and commissioning Vaiseshika Calibration Standards at the most challenging and crucial projects of National Eminence in India. Our Resistance Standards have proven credentials in the most stringent and rigorous applications at the Master Calibration Facility in Vikram Sarabhai Space Centre, Thiruvananthapuram and Satish Dhawan Space Centre, Sriharikota; at the Sukhoi-30, Jaguar, MIG and Light Combat Aircraft Test Beds, Engine Divisions and the Aircraft Design Bureau of the Hindustan Aeronautics Limited and the Base Repair Depots of the Indian Air Force; Agni-III and Agni-IV Missile Test Beds at Integrated Test Range, Chandipur. Our standards have been approved at National Metrology Laboratories in United States, Italy, Singapore, Saudi Arabia, United Arab Emirates and Belgrade.

Morehouse Force Calibration Standards : Vaiseshika have established 50 kN Morehouse Dead Weight Calibrator at the National Physical Laboratory, New Delhi-the National Metrology Institute (NMI) of India in 2001 having stainless steel dead weights with combined uncertainty of 30 ppm (0.003%) and providing an accuracy of better than 0.002% in the 50kN Dead Weight Calibrator as a Master National Calibration Standards for the calibration of Load Cells. This machine has been working at the

For further information on all the products in this Bulletin, please write us on :

VAISESHIKA ELECTRON DEVICES
38-Industrial Estate, Across Tangri River Bridge, Ambala Cantt. –133001, Haryana (INDIA)
Phones : (171)‐2699827, 2699891 | Fax : (171) 2699773 & 2602666
E-mail : vaiseshika@gmail.com | Website : www.vaiseshika.com

www.vaiseshika.com
Vaiseshika Defines Real Meaning of Calibration

Vaiseshika Electron Devices manufacture & produce a wide range of Resistance Calibration Standards from 1 micro ohm to 10 tera ohm. Vaiseshika Resistance Calibration Standards are also provided with ISO 17025 : 2005 Calibration Certificates issued by the Vaiseshika Metrology Laboratory - fully equipped with in-house 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 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 : 2005 (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 Makershift 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).

Vaiseshika Electron Devices Metrology Laboratory is ISO 17025 : 2005 compliant. Our laboratory has been accredited by the National Accreditation Board for Testing and Calibration Laboratory (NABL), Government of India, Department of Science & Technology, New Delhi.

Scope of Accreditation for Temperature, Pressure and Hardness

<table>
<thead>
<tr>
<th>Quantity Measured / Instrument</th>
<th>Range/ Frequency</th>
<th>Calibration Measurement Capability (±)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Parameter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTD, Digital Thermometers ,</td>
<td>25°C to 200°C</td>
<td>1.7°C</td>
<td>By Comparison method</td>
</tr>
<tr>
<td>Thermocouple with &amp; without</td>
<td>200°C to 600°C</td>
<td>3.87°C</td>
<td></td>
</tr>
<tr>
<td>Indicator, Controls/ Recorder,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature Gauges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature Indicator of</td>
<td>25°C to 200°C</td>
<td>1.79°C</td>
<td>By Comparison method</td>
</tr>
<tr>
<td>Bath, Dry Block</td>
<td>200°C to 600°C</td>
<td>4.03°C</td>
<td></td>
</tr>
<tr>
<td>Mechanical Parameter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic Pressure</td>
<td>0 to 300 bar</td>
<td>0.69 bar</td>
<td>By Comparison method As per DKD-R6-1 Standard</td>
</tr>
<tr>
<td>Digital/ Analog Pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gauges/ Indicators, Pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmitter/Transducer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rockwell</td>
<td>HRA</td>
<td>0.63 HRA</td>
<td>Using Standard Hardness Blocks as per IS-1586 (Part 2: 2012) (Indirect Method)</td>
</tr>
<tr>
<td>Hardness</td>
<td>HBB</td>
<td>1.22 HRBW</td>
<td></td>
</tr>
<tr>
<td>Tester</td>
<td>HRC</td>
<td>0.56 HRC</td>
<td></td>
</tr>
</tbody>
</table>
### Calibration Standards

**Scope of Accreditation for Electro-technical Parameters**

<table>
<thead>
<tr>
<th>Quantity Measured/Instrument</th>
<th>Range/ Frequency</th>
<th>Calibration Measurement Capability (%)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source Mode</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC Resistance</td>
<td>0.0001 Ω, 0.001 Ω, 0.01 Ω, 0.1 Ω, 1 Ω, 10 Ω, 100 Ω, 1 kΩ, 10 kΩ, 100 kΩ, 1 MΩ</td>
<td>0.015 %, 0.015 %, 0.015 %, 0.01 %, 0.004 %, 0.004 %, 0.004 %, 0.004 %, 0.004 %, 0.0065 %</td>
<td>By Direct method</td>
</tr>
<tr>
<td>DC Resistance</td>
<td>0.01 Ω to 100 kΩ, 100 kΩ to 1 GΩ, 1 GΩ to 1 TΩ</td>
<td>2.8 to 0.06, 0.06 to 1.7, 1.7 to 6.0</td>
<td>By Direct method</td>
</tr>
<tr>
<td>Temperature Simulation (T°C)</td>
<td>-200°C to 1368°C, -200°C to 1108°C, -188°C to 699°C, -40°C to 1760°C, -190°C to 830°C</td>
<td>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, 0.7°C to 1.6°C</td>
<td>By Direct method</td>
</tr>
<tr>
<td>Measure Mode</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC Resistance</td>
<td>0.00001 Ω</td>
<td>3.6 %</td>
<td>By Direct method</td>
</tr>
<tr>
<td>DC Resistance</td>
<td>0.0001 Ω to 1 kΩ, 1 kΩ to 10 MΩ</td>
<td>0.9 % to 0.0007 %, 0.004 % to 0.009 %</td>
<td>By Direct method</td>
</tr>
<tr>
<td>DC High Resistance</td>
<td>0.1 MΩ to 500 GΩ, 500 GΩ to 1 TΩ</td>
<td>0.1 % to 2.1 %, 3.0 % to 5.0 %</td>
<td>By V/I Method</td>
</tr>
<tr>
<td>DC Voltage</td>
<td>1 mV to 10 V, 10 V to 1000 V, 1 kV to 5 kV</td>
<td>0.01 % to 0.002 %, 0.02 % to 0.007 %, 1.0 %</td>
<td>By V/I Method</td>
</tr>
<tr>
<td>AC Voltage (50 Hz)</td>
<td>1 mV to 100 V, 100 V to 750 V</td>
<td>0.9 % to 0.09 %, 0.09 % to 0.04 %</td>
<td>By Direct method</td>
</tr>
<tr>
<td>DC Current</td>
<td>10 µA to 1 mA, 1 mA to 1 A</td>
<td>2.1 % to 0.03 %, 0.03 % to 0.12 %</td>
<td>By Direct method</td>
</tr>
<tr>
<td>AC Current (50 Hz)</td>
<td>1 mA to 1 A</td>
<td>0.15 % to 0.3 %</td>
<td>By Direct method</td>
</tr>
</tbody>
</table>

**Force Calibration & Measurement Capability with Morehouse Instrument Co., York, Pennsylvania, USA**

Morehouse Instrument Co. & Vaiseshika Electron Devices are Engineering Partners for Morehouse Calibration Standards in India.
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 unexpected. I extend my congratulations & best wishes to their efforts.

Dr. S.K. Mahajan
Former Scientist,
National Physical Laboratory,
New Delhi

The Vaiseshika Electron Devices is very well known for manufacturing of Standard Resistors from 10µΩ to 1TΩ. They have their own NABL Accredited Metrological Laboratory which is used for in-house calibration as well as for outside. I am happy to have 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 Common Wealth Mango Tree” to see the personal standards for ITR which are checked were found excellent. It is neat and clean construction, cooperativeness by the management & staff is more than 1,000 installations in India, United States of America, Europe, Gulf and Asia Pacific National Metrology Accredited Laboratories.

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 Venugopal
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 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 Dr. Anil Jain make me proud to be an Indian.

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 construction, cooperativeness by the management & staff is more than 1,000 installations in India, United States of America, Europe, Gulf and Asia Pacific National Metrology Accredited Laboratories.

Mr. APJ Abdul Kalam
Former Scientist,
Vice Chancellor,
Integrated Test Range (ITR), Chandipur, Balasore (Orissa)

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

- Dr. APJ Abdul Kalam

Technical Description

<table>
<thead>
<tr>
<th>Decade</th>
<th>Resistance per Step</th>
<th>Total Resistance</th>
<th>Max. Current</th>
<th>Max. Voltage</th>
<th>Wattage</th>
<th>Accuracy 7400 Precision</th>
<th>NABL® Compliant CMC</th>
<th>Temp. Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ist</td>
<td>0.01 Ω</td>
<td>0.1 Ω</td>
<td>4 A</td>
<td>0.04V</td>
<td>0.16W</td>
<td>±0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IInd</td>
<td>0.1 Ω</td>
<td>1.0 Ω</td>
<td>1.6 A</td>
<td>0.16V</td>
<td>0.256W</td>
<td>±0.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IIIrd</td>
<td>1.0 Ω</td>
<td>10.0 Ω</td>
<td>800 mA</td>
<td>0.8V</td>
<td>0.64W</td>
<td>±0.02%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IVth</td>
<td>10.0 Ω</td>
<td>100.0 Ω</td>
<td>250 mA</td>
<td>2.5V</td>
<td>0.625W</td>
<td>±0.02%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vth</td>
<td>100.0 Ω</td>
<td>1 KΩ</td>
<td>80 Ω</td>
<td>8V</td>
<td>0.64W</td>
<td>±0.02%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIth</td>
<td>1 KΩ</td>
<td>10 KΩ</td>
<td>23 mA</td>
<td>23V</td>
<td>0.53W</td>
<td>±0.02%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIIth</td>
<td>10 KΩ</td>
<td>100 KΩ</td>
<td>7 mA</td>
<td>70V</td>
<td>0.49W</td>
<td>±0.02%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Message for every Indian

SHAR Space Centre, Sriharikota

Dr. B. Murali
Former Scientist,
National Physical Laboratory,
New Delhi

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 unexpected. I extend my congratulations & best wishes to their efforts.
High Stability Decade Megohm Box, Type : 8400 HV

Features:
- Calibration & Precision obtained through High Stability and Low Drift Reference Standards.
- Calibration verification on 18 years stability data of the Master Calibration Standards
- High Precision Calibration and Measurement Capability of the order of 0.0002% to 0.2% of Measuring Device and 0.045% to 0.096% of supporting device with NABL approval
- Construction: Portable in metallic cabinet

Description:
"Vaiseshika" Decade Megohm Box has been designed and fabricated for the First Time in India to provide Calibration Standard for High Resistance Substitution. This instrument employs silver alloy silver plated and silver alloy gold plated switches mounted on high insulation ceramic wafers/phenolic material.

Specifications:
Function : Calibrated Resistance Simulation
Resistance Range : 0.1 M ohm to 11.111111 Tohms in Eight decades
Resolution : 100 K ohm
Switches : Silver to Silver or Gold plated switches
Switch Resistance : ≤ 0.1 ohms per decade
Construction/Housing Case : Portable in metallic cabinet
Maximum Voltage to Case : 1000 Volt for 8400 & 5000 Volt for 8400HV
Low Reference Standard Drift : + 0.0004% (Documented)
Reference Calibration Standard Stability : 0.0002% to 0.2% of Measuring Device and 0.045% to 0.096% of supporting device (During 18 Years Span)

18 Years Graphical Data on Stability & Drift available on demand.

Technical Description

<table>
<thead>
<tr>
<th>Decade</th>
<th>Resistance Step</th>
<th>Total Resistance</th>
<th>Max. Current</th>
<th>Max. Voltage</th>
<th>Max. Watts</th>
<th>Accuracy 8400 HV (Ω)</th>
<th>NABL* Compliant CMC</th>
<th>Temp. Coefficient in ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ist</td>
<td>100.0 KΩ</td>
<td>1.0 MΩ</td>
<td>10-1 mA</td>
<td>1000V</td>
<td>10W</td>
<td>±0.5%</td>
<td>25</td>
<td>0.1% to 5.0%</td>
</tr>
<tr>
<td>Iind</td>
<td>1.0 MΩ</td>
<td>10.0 MΩ</td>
<td>10.1 mA</td>
<td>1000V</td>
<td>1W</td>
<td>±0.5%</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>I11d</td>
<td>10.0 MΩ</td>
<td>100.0 MΩ</td>
<td>0.5-0.05 mA</td>
<td>5000V</td>
<td>0.5W</td>
<td>±0.5%</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>IVth</td>
<td>100.0 MΩ</td>
<td>1000.0 MΩ</td>
<td>0.05-0.005mA</td>
<td>5000V</td>
<td>50 mW</td>
<td>±0.5%</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Vth</td>
<td>1.0 GΩ</td>
<td>10.0 GΩ</td>
<td>5-0.5µA</td>
<td>5000V</td>
<td>5 mW</td>
<td>±1%</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>V1h</td>
<td>10.0 GΩ</td>
<td>100.0 GΩ</td>
<td>0.5-0.05 µA</td>
<td>5000V</td>
<td>0.5 mW</td>
<td>±2%</td>
<td>100</td>
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<tr>
<td>V11h</td>
<td>100.0 GΩ</td>
<td>1000.0 GΩ</td>
<td>0.05-0.005µA</td>
<td>5000V</td>
<td>0.05 mW</td>
<td>±5%</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>V111h</td>
<td>1.0 TΩ</td>
<td>10.0 TΩ</td>
<td>5-0.5 nA</td>
<td>5000V</td>
<td>0.005 mW</td>
<td>±6%</td>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

Milli & Micro - Ohm Meter Calibrator
Type: 9409 CAL

Description:
Multivalue Calibrator, Type: 9409 CAL is an accurate and reliable calibration instrument suitable for calibration of Kelvin Bridges, Ductor Testers and Micro-Ohmmeter. It employs various of high current standard resistors that ensure precision and reliable calibrations. The instrument consists to two potential terminals and two current terminals. High quality Gold / Silver plated terminals are used to achieve very low contact resistance and thermal EMF. The instrument employees high stability manganin resistance wire and strips to provide precision calibration & stability to the instrument. The whole instrument is housed in a portable cabinet for safe working and onsite calibrations.

Specifications:
- Function : Calibration Resistance Standard
- Resistance Range : 0.000001 ohm to 2.0 ohms
- Temperature Coefficient : ≤ 10 ppm/°C
- Construction/Housing Case : Portable in metallic cabinet
- Maximum Voltage to Case : 2000 volts
- Dielectric Voltage : 500 volt AC for one minute
- Low Reference Drift : 0.0005 %
- Reference Calibration Standard Stability : 0.003 % to 0.0005 %
- 7-18 Years Graphical Data on Stability & Drift available on demand.

Accuracy & Related Parameters:

<table>
<thead>
<tr>
<th>Resistance (Ω)</th>
<th>Maximum Current (A)</th>
<th>Accuracy (±)</th>
<th>Temperature Coefficient</th>
<th>Maximum Voltage to Case</th>
<th>NABL* COMPLIANT CMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000001</td>
<td>200</td>
<td>5%</td>
<td>2000 Volts</td>
<td>5.0% to 0.07%</td>
<td></td>
</tr>
<tr>
<td>0.00001</td>
<td>200</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.001</td>
<td>31.6</td>
<td>0.1%</td>
<td>10ppm/°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.01</td>
<td>10</td>
<td>0.05%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>3.16</td>
<td>0.02%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>1.0</td>
<td>0.02%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>1.0</td>
<td>0.02%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Applications:
Vaiseshika Ductor Tester, Kelvin Bridge and Micro-Ohmmeter Calibrator, Type: 9409 CAL has been designed and fabricated to meet the precision calibration requirements. These resistors are used with transducers to check the performance of the transducers with high accuracy. Calibration of micro-ohm meters, current-limiting applications, in voltage divider and for scaling down the nominal resistance values.
Standard Resistor (First Time in India)

Type: 9409 (Oil Filled)

Description:
"Vaiseshika" DC STANDARD RESISTOR 9409 has been designed and fabricated to meet the standard calibration requirements. These Standard Resistors can be used for calibration.

To ensure stringent accuracy, high degree of stability and utmost reliability, the Manganin wire and strips have been used to construct Standard Resistors. These Standards incorporates the manganin coils which have been subjected to prolonged ageing and heat treatment, to improve stability and to reduce temperature coefficient. Joints are silver soldered with copper being used for connection to terminals. Resistance elements are sealed in aluminium container having moisture free oil. Use of oil improves cooling effect which in turn imparts greater stability to resistance.

Specifications:

Function: Calibration Resistance Standard
Resistance Range: 0.00001 ohm to 100.0 T ohms
Temperature Coefficient: 10 ppm/°C (0.001 to 100K) 25-500 ppm /°C (100K to 100 Tera)
Voltage Coefficient: < 2 to 5 ppm/volt
Maximum Voltage to Case: 2000 volt
Dielectric Voltage: 500 volt AC for one minute
Low Reference Drift: 0.0002 %
Reference Calibration Standard Stability: ±0.003 % to ±0.0002 %
Drift of 7-18 Years Graphical Data on Stability & Drift available on demand.

Vaiseshika has designed a Fixed Value Insulation Tester Calibration System which can be suitably used for the purpose of calibration & testing of Insulation testers and megohm meters with impressed test voltages upto 5000 volt. This instrument provides single point fixed high resistance values anywhere between 100 Kohm to 10 Tera ohm. The fixed point values can be selected by the customer. Custom built instrument can also be designed and manufactured, by Vaiseshika, for the calibration laboratory. The instrument is constructed in metallic / rugged high strength polymer case, for field calibration.

Specifications:

- Fixed value: (Any value / values from 100 K ohm to 10 Tera ohm. (The user can select the set of values according to his requirement)
- Resistance Accuracy:
  - 100 K Ohm to 1 Meg Ohm : ±0.1%
  - 1.1 Meg Ohm to 10 Meg Ohm : ±0.5%
  - 11 Meg Ohm to 100 Meg Ohm : ±1%
  - 101 Meg Ohm to 1 Giga Ohm : ±12%
  - 1.1 Giga Ohm to 1 Tera Ohm : ±5%
  - 1.1 Tera Ohm to 10 Tera Ohm : ±10%
- Resistance Temperature Coefficient: 25ppm/°C from 0° to 89°C available.
- Safety Connection Leads: A set of 3 nos. of high quality robust shielded connection cable with strong grip clip on one side and banana plugs on the other side.

Element : Strain free, Manganin coil/Wire immersed in Oil
Terminals : Brass/Copper
Abbreviation : m = milli, µ = micro, n = nano

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Terminals : Brass/Copper
Abbreviation : m = milli, µ = micro, n = nano
## Air Cooled DC Shunt: 9410

### Description:

"Vaiseshika" DC Shunt 9410 has been designed and fabricated to meet the standard calibration requirements. To ensure stringent accuracy, high degree of stability, and utmost reliability, the Manganin wire and strips have been used to construct DC Shunts. These Standards incorporates the manganin coils which have been subjected to prolonged ageing and heat treatment, to improve stability and to reduce temperature coefficient. Joints are silver soldered with copper being used for connection to terminals. Resistance elements is sealed in aluminium container having moisture free oil. Use of oil improves cooling effect which inturn imparts greater stability to resistance.

### Specifications:

- **Construction**: Portable, Compact and sturdy construction designed in metallic cabinet for easy operation and storage.
- **Current Range**: 1.5 Amp. to 5000 Amp.
- **Manganin wire and strips have been used to construct DC Shunts.**
- **Current Stability**: 0.003% to 0.0004%
- **Low Reference Drift**: 0.0002%
- **Excellent Performance versus Cost**.
- **High Precision Calibration and Measurement Capability of the order of 5% to 0.0007% with NABL approval.**
- **NABL compliant Calibration Certificate is provided.**
- **High Accuracy of Resistance between 0.05% to + 1% (depending upon value).**

### Technical Description

<table>
<thead>
<tr>
<th>Current (Amps)</th>
<th>Resistance (Ohms)</th>
<th>Voltage Drop (Volts)</th>
<th>Wattage (Watts)</th>
<th>Accuracy</th>
<th>Stability</th>
<th>NABL* COMPLIANT CMC</th>
<th>Temperature Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>1.0</td>
<td>1.5</td>
<td>2.25</td>
<td>± 0.05 %</td>
<td>0.07 %</td>
<td>10ppm</td>
<td>0.9% to 0.0007%</td>
</tr>
<tr>
<td>15</td>
<td>0.1</td>
<td>1.5</td>
<td>22.5</td>
<td>± 0.05 %</td>
<td>0.07 %</td>
<td>10ppm</td>
<td>0.9% to 0.0007%</td>
</tr>
<tr>
<td>50</td>
<td>0.01</td>
<td>0.15</td>
<td>2.25</td>
<td>± 0.05 %</td>
<td>0.07 %</td>
<td>10ppm</td>
<td>0.9% to 0.0007%</td>
</tr>
<tr>
<td>75</td>
<td>0.002</td>
<td>0.15</td>
<td>11.25</td>
<td>± 0.05 %</td>
<td>0.07 %</td>
<td>10ppm</td>
<td>0.9% to 0.0007%</td>
</tr>
<tr>
<td>150</td>
<td>0.001</td>
<td>0.15</td>
<td>22.5</td>
<td>± 0.05 %</td>
<td>0.07 %</td>
<td>10ppm</td>
<td>0.9% to 0.0007%</td>
</tr>
<tr>
<td>300</td>
<td>0.001</td>
<td>0.1</td>
<td>90.0</td>
<td>± 0.05 %</td>
<td>0.17 %</td>
<td>10ppm</td>
<td>0.9% to 0.0007%</td>
</tr>
<tr>
<td>500</td>
<td>0.0002</td>
<td>0.1</td>
<td>50.0</td>
<td>± 0.05 %</td>
<td>0.17 %</td>
<td>10ppm</td>
<td>0.9% to 0.0007%</td>
</tr>
<tr>
<td>750</td>
<td>0.0002</td>
<td>0.15</td>
<td>112.5</td>
<td>± 1.0 %</td>
<td>0.3%</td>
<td>10ppm</td>
<td>3.6%</td>
</tr>
<tr>
<td>1000</td>
<td>0.0001</td>
<td>0.1</td>
<td>100.0</td>
<td>± 1.0 %</td>
<td>0.3%</td>
<td>10ppm</td>
<td>3.6%</td>
</tr>
<tr>
<td>1500</td>
<td>0.0001</td>
<td>0.15</td>
<td>225.0</td>
<td>± 1.0 %</td>
<td>0.3%</td>
<td>10ppm</td>
<td>3.6%</td>
</tr>
<tr>
<td>2000</td>
<td>0.00005</td>
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<td>200.0</td>
<td>± 1.0 %</td>
<td>0.3%</td>
<td>10ppm</td>
<td>3.6%</td>
</tr>
<tr>
<td>5000</td>
<td>0.00002</td>
<td>0.1</td>
<td>500.0</td>
<td>± 1.0 %</td>
<td>0.3%</td>
<td>10ppm</td>
<td>3.6%</td>
</tr>
<tr>
<td>5000</td>
<td>0.000021</td>
<td>0.005</td>
<td>25.0</td>
<td>± 3.0 %</td>
<td>1.7%</td>
<td>% Non-NABL</td>
<td></td>
</tr>
</tbody>
</table>

### Applications:

- For charging & discharging the batteries.
- For use as current flow source at selected resistance.
- Measurement of precise current.
- Quality Assurance and Calibration laboratories.
- Load testing of batteries & transformers.

### What is the 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.

### MASTER CALIBRATION STANDARD DRIFT & STABILITY CURVE

Low Drift and High Stability Curve of our Master Calibration Standards.
Morehouse Load Cell Tester

Features:
- Speeds Trouble Shooting of Load Cell Scale System
- Compatible with Most Load Cells
- No Need to Disconnect Load Cell to Test
- Stand-Alone, Portable, Battery Operated
- Clear Screen Messages

Description: The Load Cell Tester is a portable device designed to help analyze the condition of strain gage-based load cells in scale and industrial applications. It works with most common types and ranges of load cells found in industry. The unit’s 3 operating keys and concise messages guide the user through testing in a step-by-step process. The Load Cell Tester provides the user with essential data on the condition of the load cell, such as physical condition (including distortions possibly caused by overloading, shock loads, or metal fatigue) and electrical conditions (such as bridge resistance and possible ground faults).

Load Cell Tester Video can be seen at http://www.youtube.com/watch?v=pACHRYK1AQAQ
Vaiseshika Calibration Laboratory

Panoramic View of Vaiseshika Metrology Laboratory Compliant to ISO 17025 : 2005 Protocols

Product Spectrum

Agri - Electronic Instrument

- **Digital Iodine Value Meter** (CSIO, Chandigarh Know-how)
  - Micro-controller based design
  - Iodine Number of oils like Sunflower Oil, Mustard Oil and other similar edible Oils

- **Digital Cereal Grain Analyzer** (CSIO, Chandigarh Know-how)
  - For Oil, Moisture & Protein Determination

- **Fruit Firmness Tester**
  - Range: upto 20 kg
  - Measure the available moisture in availability of Soil

- **Soil Moisture Meter**
  - Measuring range: 0 -200 centibars/-50°C to +150°C

- **Refractometer**
  - Reading sugar level in fruits

- **Small Fruit Sizer**
  - Range: 15 to 28 mm

- **Banana Caliper**
  - Length of Banana

- **Fruit Firmness Tester**

- **Tensimeter**

- **Wood Moisture Meter**

- **Precision Thermocouples & RTDs**

- **Industrial Thermocouples**

- **Lux Meter**

Environmental & Temperature Instrumentation

- **Infrared Thermometer**

- **Digital Thermometer**

- **Digital Thermo Hygrometer**

- **Multi Function Meter**

- **Wood Moisture Meter**

- **Infrared Thermometer**

- **Industrial Thermocouples**

- **Lux Meter**

Resistance Calibration Standards

Spectrum of Vaiseshika Material Inspection & Testing Instruments Calibration Standards

- **METALLURGICAL MICROSCOPE**

- **STEREO ZOOM MICROSCOPE**

- **SIMPLifying POLISHING MACHINE**

- **SURFACE ROUGHNESS TESTER**

- **SAMPLE MOUNTING PRESS**

- **ROCKWELL HARDNESS TEST**

- **MICRO VICKERS HARDNESS TESTER**

- **LEEB HARDNESS TESTER**

- **FIBRE OPTICS COLD LIGHT ILLUMINATION SYSTEM**

- **MAGNASCOPES**

- **QUARTZ/LED MACHINE LIGHTING SYSTEM**
The Press on the contribution of Vaiseshika Calibration Capabilities

The Tribune, 21 November 2013

**Agni-III has parts made in Ambala**

*By: D.S.*

From the Tribune

**Agni-III** missile, that has recently been a part of the recent Uri attack in Kashmir, is expected to become a reality in the near future. The missile, which is designed to hit a target a distance of 200 km, will be armed with a nuclear warhead. It will be a significant weapon in the country’s arsenal, which will be supplied to the armed forces. The missile is expected to be ready for use in the next year. The Tribune, 14 April 2007

**Vaiseshika Calibration Capabilities**

- National Accreditation Board for Testing and Calibration Laboratories (NABL)
- Electro-Technical Accreditation Compliant to ISO 17025 : 2005
- Mechanical Accreditation Compliant to ISO 17025 : 2005
- Thermal Accreditation Compliant to ISO 17025 : 2005

The Hindustan Times, 22 November 2013

**Ambala enterprise installs cell calibration machine at Sriharikota**

**MANISH SINGHVI**

AMBALA, NOVEMBER 20

An Ambala-based small-scale industrial enterprise has contributed its engineering and technical expertise to support the prestigious Mars Orbiter Mission (MOM) of the country for installing and commissioning a 400-tonne load cell calibration machine and system at Thalas Dwaraka Spaceport, Sattur, Tamil Nadu. To add to its achievements, the enterprise has been designated by Vaiseshika, one of the leading engineering and technical experts, as the only laboratory in the country to be accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL). The Tribune, 14 April 2007

**Calibration Standards**

- C-0329, 1234 & 1235

**The Trust in the capabilities of Vaiseshika**

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Vaiseshika Calibration Capabilities