Vaiśeshika®
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(Winter Issue)

PRODUCT INFORMATION BULLETIN

ISO 9001:2008 CERTIFIED

NABL ACCREDITED LABORATORY
Certificate No. : C-0329
NABL ACCREDITED METROLOGY LABORATORY

Editorial

Vaiseshika take care of your Calibration Needs; As you take care of your Child

Yes, Vaiseshika Electron Devices, Ambala Cantt., has been working in the field of calibrations for the last 40 years. We have established brilliant benchmarks and earned sterling credentials in the domain of metrology and production of calibration standards.

Vaiseshika Metrology Laboratory is having accreditation conforming to ISO 17025 : 2005 standards and protocols for the testing and calibration laboratories. The National Accreditation Board for Testing and Calibration Laboratories (NABL), Govt. of India, New Delhi has conferred the accreditation on our Metrology Laboratory. Our Calibration and Measurement Capability (CMC) in the production of DC resistance parameters span from 1 micro-ohm to 10 Teraohm as precision as 0.0065 % at 0.0001 ohm to 4% at Teraohm. For other parameters please refer to the Scope of our Accreditation described on the inner pages of this Bulletin.

Performance at NMI : 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 50 kN Dead Weight Calibrator as a Master National Calibration Standard for the calibration of load cells. This Machine has been working at the Indian NMI to the total satisfaction of the NPL for the last 13 years.

50 kN Dead Weight Calibrator (having 300 ppm uncertainty) at the National Physical Laboratory, New Delhi since 2001 as National Metrology Standard.

Performance at the Indian Space Mission : Vaiseshika have established 450 Ton Morehouse Load Cell Calibration Facility at the Satish Dhawan Space Centre, Sriharikota in 2010 for the calibration of load cells at the Vehicle Assembly Static Test Bed Facility (VAST). This Machine provides calibration accuracy better than 0.025%. This Machine has been working to the complete satisfaction of the Space Centre for the last four years and is the only such Calibration Facility in the whole of Asia. Likewise another similar Morehouse Load Cell Calibration Machine 0f 60,000 LBF capacity has been established at the Rocket System Test Division (RSTD) of the Vikram Sarabhai Space Centre (VSSC), Thiruvananthapurm.

Vaiseshika successfully installed and commissioned 450 Ton Morehouse Load Cell Calibration Facility (having 0.025% accuracy) at the Satish Dhawan Space Centre, Sriharikota.

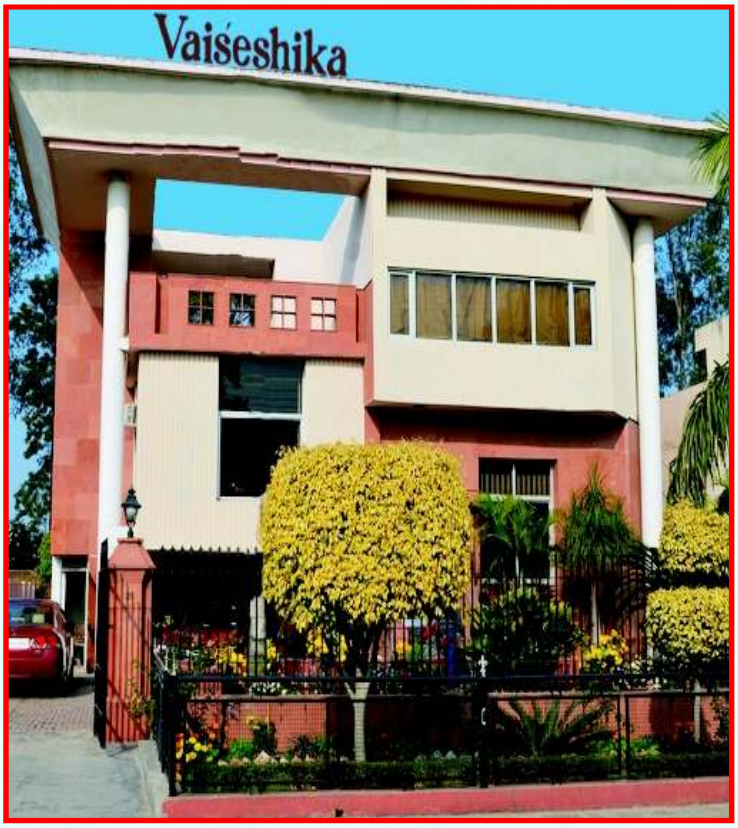
All the Morehouse Load Cell Calibration Machines have been produced by the Morehouse Instrument Co., York., Pennsylvania (US) and are conforming to ISO 376 Calibration Standards and ASTM E 74 standards. Further Morehouse Load Cell Calibration System have been verified and validated at the National Institute of Standards and Technology (NIST), Gaithersburg, US.

We, at Vaiseshika, produce a host of Resistance Calibration Standards, install and commission World Class Calibration Standards and undertake calibration of measuring instruments as per NABL/IS0/IEC 17025 : 2005 Testing and Calibration Standards and Protocols.

That is why we say that we can take care of your calibration needs as you take care of your child. It sounds to be a tall claim but you can repose your trust in the Metrology Expertise of Vaiseshika.

-Anil Jain
Ph.D. (BITS, Pilani)
President

Vaiśeshika® Landmark Calibration Credentials



Vaiseshika Manufacturing Facility

NABL

National Accreditation Board for Testing and Calibration Laboratories

Department of Science & Technology, India

CERTIFICATE OF ACCREDITATION

VAISESHIKA ELECTRON DEVICES, METROLOGY LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

38, Industrial Estate, Ambala Cantt, Haryana

in the discipline of

ELECTRO-TECHNICAL CALIBRATION

Certificate Number C-0329

Issue Date 17/05/2013 Valid Until 16/05/2015

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.

Signed for and on behalf of NABL

Bibin Philip, General — Anil Relia, Director — Dr. T. Ramasami, Chairman

Vaiseshika NABL Accreditation

Panoramic View of Vaiseshika Metrology Laboratory NABL Accreditation

Vaiseshika Manufacture World Class Calibration Standards and Provide 24x7 Calibration Services

Vaiseshika Electron Devices Metrology Laboratory has the distinction of having ISO 17025 : 2005 Accreditation from the National Board for Testing and Calibration Laboratories (NABL), Department of Science and Technology, Government of India, New Delhi vide NABL Certificate No. C-0329 dated June 17, 2013. The entire scope of Vaiseshika NABL Calibration Measurement Capability (CMC) has been described at the NABL website as well as in the pages of this bulletin.

Collaborative NABL Calibration Agreements

Vaiseshika Electron Devices has established mutual collaborative agreements with a number of NABL Accredited Laboratories in India to get the calibration of various instruments from other NABL Accreditation Laboratories. In this manner, we provide our customers the facility of NABL Calibration to a large number of our customers spread across India. In this manner we can provide NABL Accredited facilities to our customers at one-point-one-stop with maximum efficiency of time and speed.

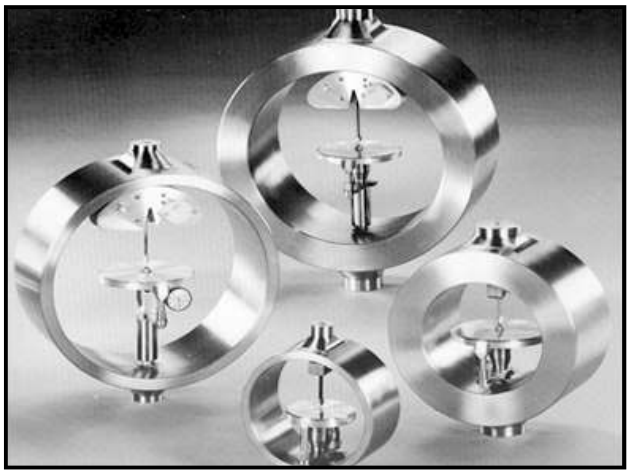
Vaiseshika Micro Ohm Meter Calibrator

Inter Laboratory Comparison of Calibration Artefacts

Vaiseshika Electron Devices Metrology Laboratory provides the facility of Inter Laboratory Comparison (ILC) on top most priority to other NABL laboratories for all those parameters for which Vaiseshika Metrology Laboratory has been granted the best calibration measurement capabilities. In this manner we are helping NABL laboratories in India to get ILC at Vaiseshika Metrology Laboratory with fastest speed and maximum transparency.

World Class Calibration Standards

We have installed world class reference standards at our manufacturing facility to support the quality standards of Calibration Standards manufactured by Vaiseshika Electron Devices. We proceed a step further, **Keeping in view the urgent requirements of ISO 9001 certified companies & ISO 17025 Accredited Laboratories throughout India; we have decided to extend our calibration facilities (having traceability to National / International Standards) to industrial users round-the-clock (24x7 mode).** This means our customers can bring their healthy instruments to us at any time (with pre-appointment) and can take back their calibrated instruments, within 24 hours along with calibration report.



Morehouse Proving Rings for Load Cell Calibrations

Vaiseshika Calibration : Confidence in No Uncertain Terms

Quality begins with confidence in the tools you use, the measurements you take, the products you make. At Vaiseshika we are fully aware as to how much critical your temperature gauges, your thermocouples, your RTDs, your PT-100 sensors, your temperature controllers, your Kelvin Bridges, your standard cells, your pH meters, your resistance bridges and boxes, your thermohygrometers, your voltage calibrators, your standard cells, your proving rings and your tensile testing machines are to you. Your manufacturing process and product quality directly depend upon your calibrated instruments. According to ISO 9001, 14001 and 14002 requirements, your measuring instruments must have valid calibration certificates. As a reputed manufacturer of test and measuring instruments and calibration standards; we have adhered to and maintain most rigorous standards.

That's why Vaiseshika has always led the way in advancing calibration technology.

Because we have proven Credentials

In the last 40 years, we have earned an enviable reputation throughout India and manufacture, supply and support the

continued on page 4

continued from page 3

calibration activity. More than twelve Electronics Test and Development Centres and Electronics Regional Test Laboratories in India; all the factories of the Hindustan Aeronautics Limited; the Defence Research Laboratories under the control of the Defence Research and Development Organizations and the most prestigious private and public sector undertakings in India have installed our calibration standards and are using them as MASTER CALIBRATION STANDARDS.

The Most Accurate and Reliable Reference Calibration Standards

Vaiseshika has installed the reference calibration standards of world renowned manufacturers. You can refer to the list of reference calibration standards given in the subsequent pages of this Bulletin.

Morehouse NIST Traceable Force Calibration Standards

Universal Calibrating Machine, Ultra Precision Grade and Load Cells, Proving Ring and Ring Force Gauges having calibration traceability to the National Institute of Standards and Technology, Gaithersburg, Washington, USA with force calibration facility upto 15,000 KGF have been installed. These force calibration standards are manufactured by Morehouse Instruments Co, York, Pennsylvania USA who are world leaders in force calibration instruments. The Morehouse Proving Rings conform to ISO 376 and ASTM Standard E-74 and calibrates with uncertainty of 0.0125%. The equipment can calibrate proving rings, ring force gauges and load cells.

Morehouse 5000 kGF Load Cell Calibrating Machine (Made in USA)

Thermocouples, RTDs, PT-100 and Thermistors can be calibrated oer the given range of temperature

SIKA Temperature Calibrator meets the exact temperature measurement and monitoring requirements in various industrial namely : power generation and distribution, ships and hip building, chemical and petrochemicals, pharmaceuticals and process industry.

Dry Block Temperature Calibrator (Made in Germany)

We request you to send us your calibration needs / requirements to us. We shall respond you favourably. We believe that Reference Calibration Standards at Vaiseshika facility will go a long way in supporting our customers in the times to come.

Servicing, Maintenance and Calibration of Vaiseshika Supplied Instruments

Vaiseshika Electron Devices also undertake the repair, servicing, maintenance and calibration of Vaiseshika supplied instruments. Recently we have rehabilitated, serviced, repaired and calibrated the Vaiseshika instruments supplied to our customers even 15 years back. We have special expertise for servicing Kelvin Resistance Bridges, Potentiometers, Standard Resistors and Digital Calibrators in our ultra modern facility at Vaiseshika.

Pressure Calibrators 600 bar (Made in Germany)

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 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 17025:2005 (NABL) protocols. Further our own metrology 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 instruments / 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 Laboratories (NABL), Government of India, Department of Science & Technology, New Delhi.

SCOPE OF ACCREDITATION

Sr. No.	Parameter/ Quantity measured (Equipment-wise)	Standards/ Master used	Range(s)	Calibration & Measurement Capability (CMC)	Remarks/ Method used
1.	Temperature Simulation	Temperature Calibrator (Model CAL-901)	**K-Type Thermocouple** -200 °C to 485 °C (-5.891mV to 19.962mV) 485 °C to 1368 °C (19.962mV to 54.751mV)	 2.3 °C 2.1 °C	Direct Method
			J-Type Thermocouple -200 °C to 546 °C (-7.890mV to 29.988mV) 546 °C to 1108 °C (29.988mV to 65.255mV)	 1.1 °C 2 °C	
			T-Type Thermocouple -168°C to 369 °C (-5.109mV to 18.969mV)	 2.1 °C	
			R-Type Thermocouple -40.00 °C to 1760 °C (-0.188mV tp 21.003mV)	 1.5°C to 2.1 °C	
			S-Type Thermocouple 0 °C to 1760 °C (0mV to 18.609mV)	 3.7 °C	
			RTD (Pt 100) -190°C to 0 °C (22.8 Ohm to 100.0 Ohm)	 0.7 °C	
			0°C to 830 °C (100.00 Ohm to 384.40 Ohm)	 1.6 °C	

SCOPE OF ACCREDITATION

Sr. No.	Parameter/ Quantity measured (Equipment-wise)	Standards/ Master used	Range(s)	Calibration & Measurement Capability (CMC)	Remarks/ Method used
	Resistance, Current and Voltage Simulation & Measurements				
2	Resistance Simulation	Standard Resistors National Physical Laboratory, Teddington (United Kingdom)	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 10 MΩ	0.01% 0.01% 0.01% 0.01% 0.004% 0.004% 0.004% 0.004% 0.004% 0.004% 0.004% 0.004%	Direct Method
3	DC Resistance (Four Terminal)	8½ DMM & Standard Resistor	0.00001 Ω	3.6%	Potentiometeric Comparison Method
4	DC Resistance (Four Terminal)	Stabaumatic Potentiometer & Standard Resistor	0.0001 Ω to 1 KΩ	0.9% to 0.0007%	Potentiometeric Comparison Method
5	DC Resistance (Two Terminal)	Stabaumatic Potentiometer & Standard Resistor	10 KΩ to 10 MΩ	0.004% to 0.008%	Comparison Method
6	DC Resistance (Two Terminal)	Stabaumatic Potentiometer	0.01 Ω to 1 MΩ	1.14% to 0.004%	Direct Measurement
7	DC High Resistance	8½ DMM-Agilent & 4¾ DMM Rishabh & High Voltage Probe	0.1MΩ to 500 GΩ	0.09% to 2.1%	Voltage / Current (V/I) Method
8	DC High Resistance	3½ Picoamp meter, 4¾ DMM Rishabh & High Voltage Probe	500 GΩ to 1000 GΩ	3% to 5.0%	Voltage / Current (V/I) Method
9	DC Voltage	Stabaumatic Potentiometer & 8½ DMM-Agilent	0.001 V to 1.98 V 1.00 mV to 10 V 10 V to 1000 V	0.15% to 0.002% 0.01% to 0.001% 0.001% to 0.003%	Direct Measurement
10	AC Voltage @50Hz	8½ DMM-Agilent	1 mV to 100 V 100 V to 700 V	0.9% to 0.09% 0.09% to 0.04%	Direct Measurement
11	DC Current	8½ DMM-Agilent	10 uA to 1 mA 1 mA to 1 A	2.1% to 0.03% 0.03% to 0.12%	Direct Measurement
12	AC Current @50Hz	8½ DMM-Agilent	1 mA to 1 A	0.15% to 0.3%	Direct Measurement

Following measuring instruments can be calibrated with NABL Certificate through collaborative arrangements with other NABL Laboratories

Sr. No.	Quantity Measured / Intrument	Range(s)	*Calibration & Measurement Capability (±)	Remarks/ Method used
1	Form Errors Circularity Cylindericity Straightness	 Upto Diameter 350 mm Upto Length 300 mm Upto Length 300 mm	 0.61 µm 2.8 µm 1.5 µm	Using From Tester MMQ 30
2	Straightness (Straight Edge)	+1000 arc sec upto 5 meter	1.5 µm	Using Autocollimator Moller Wedel
3	Flatness (Surface Plates)	Upto 600 arc sec	$1.2\sqrt{L+W/100}$ µm	Using Taylor RTH Electronic Level
4	Surface Roughness	Upto 3 micron Ra	8.3%	Using Surface Roughness Tester
5	Outside Micrometer L.C. 0.010 mm	 Upto 0 mm to 200 mm Upto 200 mm to 400 mm Upto 400 mm to 600 mm	 6.0 µm 9.0 µm 13.0 µm	Using Slip gauges
	L.C. 0.001 mm	Upto 0 mm to 200 mm Upto 200 mm to 400 mm Upto 400 mm to 600 mm	4.2 µm 8.0 µm 13.0 µm	Using Slip gauges
6	Depth Micrometer L.C. 0.010 mm L.C. 0.001mm	 Upto 0 mm to 200 mm Upto 200 mm to 400 mm	 8.0 µm 4.0 µm	Using Slip gauges
7	Vernier Caliper L.C. 0.020 MM	 0 mm to 600 mm	 19.0 µm	Using Slip gauges
8	Height Gauge L.C. 0.010 mm L.C. 0.001 mm L.C. 0.020 mm	 0 mm to 600 mm 0 mm to 600 mm 0 mm to 600 mm	 9.0 µm 14.0 µm 19.0 µm	Using Slip gauges
9	Length Bars, Slip GAUGE	0 mm to 100 mm 100 mm to 300 mm 300 mm to 600 mm	1.8 µm 2.4 µm 3.7 µm	Using ULM, Grade "K" Slip Gauges & Long Slip Gauges Grade "0"
10	Linear Measurement Scale L.C. 0.010 mm L.C. 0.10 mm L.C. 1.00 mm	 0 mm to 200 mm 0 mm to 200 mm 0 mm to 200 mm	 8.0 µm 70.0 µm 620.0 µm	Using Slip gauges
11	Plain Plug Gauges	1 mm to 200 mm	2.0 µm	Using ULM
12	Plain Ring Gauges	3 mm to 200 mm	2.0 µm	Using ULM

Sr. No.	Quantity Measured / Intrument	Range(s)	*Calibration & Measurement Capability (+)	Remarks/ Method used
13	Thread Plug Gauge (Effective Diameter)	1 mm to 200 mm	3.0 µm	Using ULM
14	Thread Ring Gauge (Effective Diameter)	3 mm to 200 mm	3.0 µm	Using ULM
15	Taper Plain Plug Gauge	Upto 200 mm	3.0 µm	Using ULM
16	Radius Gauges	1.0 mm to 25.0 mm	6.0 µm	Using Tool Makers Microscope
17	Snap Gauge	0 to 25 mm 25 to 150 mm	1.1 µm 2.6 µm	Using Slip Gauges
18	V-Block Flatness Squareness Parallelism	 300 mm x 100 mm x 100 mm 300 mm x 100 mm x 100 mm 300 mm x 100 mm x 100 mm	 7.0 µm 6.2 µm 6.0 µm	 Using Dial Indicator & Tool Makers Microscope
19	Dial Gauge L.C. 0.001 mm L.C. 0.010 mm	 0 to 50 mm 0 to 50 mm	 2.0 µm 6.0 µm	Using ULM
20	Micrometer Head L.C. 0.001 mm	 0 to 25 mm	 2.0 µm	Using ULM
21	Angle Gauge	0 to 360	1	Using Tool Makers Microscope
22	Pressure Gauges & Switches	1 kg/cm2 to 30 kg/cm2 20 kg/cm2 to 700 kg/cm2 0.5 kg/cm2 to 30 kg/cm2	0.17 % rdg 0.17% rdg 2.7 % FSD	Using Dead Weight Tester Using Digital Pressure Gauge
23	Torque Wrench	5 Nm to 540 Nm	6.96% FSD	Using Digital Torque Measuring Device as per ISO : 6789 : 2003
24	Profile Projector & Tool Maker Microscope Linear L.C. 0.001 mm Angle	 X=0 to 50 mm Y=0 to 50 mm 0 to 360°	 1.4 1.4 1	 Using "0" or "K" Grade Slip Gauges Master Glass Scale & Angle Gauges
25	Surface Plate	Upto 2500 mm x 1600 mm (Flatness)	$1.5\sqrt{L+W/100}$ m (Where Length is in Meter)	Using Electronic Level

Sr. No.	Quantity Measured / Intrument	Range(s)	*Calibration & Measurement Capability (+)	Remarks/ Method used
26	Weights	1 mg to 500 mg 1 g to 50 g 100 g 200 g 500 g 1 kg to 20 kg 50 kg	0.03 mg 0.1 mg 0.2 mg 0.35 mg 0.91 g 0.91 g 4.1 g	Using Standard Weights (F1 Class) & Balance
27	Balance	1 mg to 500 mg >500 mg to 50 g >50 g to 100 g >100 g to 300 g >300 g to 5 kg >5 kg to 60 kg	0.03 mg 0.1 mg 0.2 mg 0.3 mg 13 mg 1.0 g	Using Standard Weights (F1 Class)
28	Rockwell Hardness Tester	**a. HRA** 20 to 40 HRA 45 to 75 HRA 80 to 88 HRA **b. HRB** 20 to 50 HRB 60 to 80 HRB 85 to 100 HRB **c. HRC** 20 to 30 HRC 35 to 55 HRC 60 to 70 HRC	 ± 0.63 HRA ± 0.40 HRA ± 0.39 HRA ± 1.22 HRB ± 0.60 HRB ± 0.55 HRB ± 0.56 HRC ± 0.38 HRC ±0.32 HRC	Using Standard Hardness Block as Per IS-1586 (Part 2 : 2012) (Indirect Verification)
29	Hydraulic Pressure / Digital / Analog Pressure Gauges / Indicators	2.5 Bar - 1000 Bar	0.23 % FS	Comparison Method
30	SPRT, TRD Glass & Digital Thermometers, Thermocouple with & without Indicator, Controllers / Recorder, Temperature Gauges	-12°C to 200°C 200°C to 600°C	±1.59C ±3.87C	Comparison Method
31	Oven Environmental Chamber, Incubator and Refrigerator	25°C to 100°C	± 8.42C	Direct Measurement
32	Temperature Calibrator (Oil & Dry Block) and Fixed Point Temperature Source	-12°C to 200°C 200°C to 600°C	±1.68C	Director Measurement
33	Speed (RPM)	527 RPM to 25000 RPM	1.44% to 0/18%	By Comparison Method

What the Eminent Experts say about us

- **Dr. V. N. OJHA**

Scientist -in-charge
Sc. 'F' & Head, JVS & DC Standards
National Physical Laboratory, New Delhi

It was really pleasant for me to visit Vaiseshika Electron Device (Metrology Lab) as a nominee of NABL to audit the Electrotechnical Laboratory. I am highly impressed by their expertise in the area of ET & their aim to become the global leader in the world in the near future. I am highly impressed by their dynamic leaders (Dr. Anil Jain) in pursuing the goal and his special interest in academics beside bring a successful enterprener. I wish him, his team & whole family of Vaiseshika a big "Best of Luck" for future endeavour.

- **Mr. B. S. SRIVASTAVA**

Director
Government of India
Ministry of Micro, Small & Medium Enterprises, New Delhi

It was a great privilege to visit the premises of long heard name "VAISESHIKA", serving industries in the field of Metrology in India and abroad by manufacturing precision Standard Resistors. The Vaiseshika management under the dynamic leadership of Dr. Anil Jain has demonstrated that for the people with strong desires, dedication and motivations the geographical barriers are no hurdles. The organistion under a small city of Haryana (India) have not only excelled, raised credentials, they have inspired the pearl in surroundings.
I wish them to continue to excell and proper.

- **Mr. S. K. KIMOTHI**

Former Director
Electronics Regional Test Laboratory, New Delhi

"I am happy to visit M/s Vaiseshika Electron Devices. It is wonderful to know that they are supplying standard resistors to leading organizations like Space and DRDO and their Metrology Lab is supporting many organisations in establishing their metrological traceability . I was impressed by the commitment of the management."

- **Mr. C. VENUGOPAL**

Group Director RFSG, Avionics
Vikram Sarabhai Space Centre , Thiruvanathapuram

"The Calibration Laboratory, maintained by M/s Vaiseshika Electron Devices, Ambala Cantt. is excellent and they have good capability in designing and manufacturing of Electrical Calibration Systems. They have done good work for import substitution in the area of calibration."

ISRO Chairman appreciates Vaiseshika Calibration Capabilities

इसरो ISRO

Indian Space Research Organisation

A Bhaskaranarayana
Scientific Secretary, ISRO/Director, SCP

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Ref: ISRO:SS:54

December 15, 2009

Dear Dr. Anil Jain,

I wish to acknowledge the receipt of your letter dated 21.11.2009 addressed to Chairman, ISRO and convey his hearty thanks for your greetings and good wishes.

We are aware of the expertise of Vaiseshika in the field of designing and commissioning of calibration standards that are required for many critical facilities in our country including few ISRO Centres.

We wish Vaiseshika, a sustained growth with further innovative capabilities to reach new heights.

Best wishes.

Yours sincerely,

(A Bhaskaranarayana)

Dr. Anil Jain
President
Vaiseshika Electron Devices
Across Tangri River Bridge
36-Industrial Estate
Ambala Cantt – 133 001 (INDIA)

Indian Space Research Organisation

Vaiseshika Load Cell Calibration System, Resistance / RTD Calibration Standards & Standard DC Shunts, Metallographic Investigation System have been successfully installed and commissioned at the Satish Dhawan Space Centre, Sriharikota; the Vikram Sarabhai Space Centre, Thiruvanthapuram; the Liquid Propulsion System Centre, Valiamala & the Space Application Centre, Ahmedabad.

Vaiseshika Master Calibration Standards

Vaiseshika Electron Devices have installed and commissioned the World Class Calibration Standards to Calibrate your Instruments At Vaiseshika Metrology Laboratory

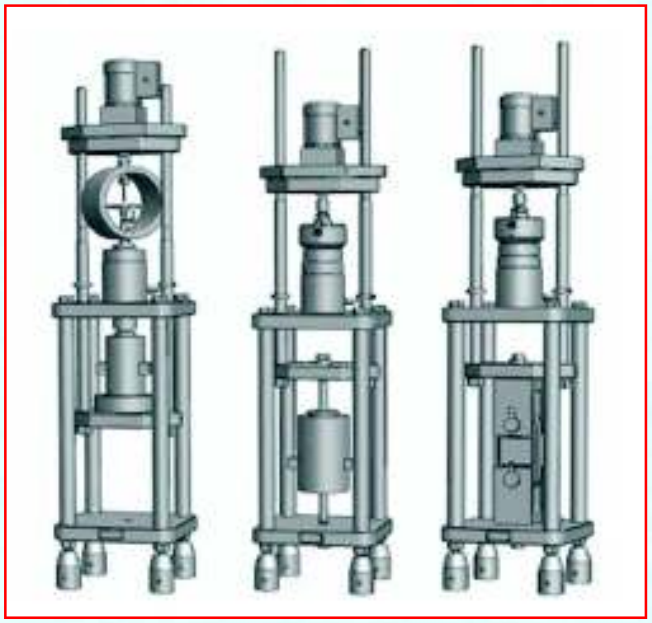
1.0 Stabaumatic Potentiometer, Validated at the National Physical Laboratory, Teddington (United Kingdom).

Resistance Range	:	0 to 10 Megohm	BMC :	±0.008 to 1.0 %
Voltage	:	0 to 2 Volts	BMC :	±0.002 to 0.07 %
Traceability	:	National Physical Laboratory, New Delhi		

2.0 Weston Cadmium Standard Cell, Validated at the National Physical Laboratory, Teddington (United Kingdom).

Calibrated BMC	:	±0.00002 V
Traceability	:	National Physical Laboratory, New Delhi.

4.0 Universal Calibrating Machine with Proving Rings and Ultra Precision Calibration Grade Load Cells from Morehouse Instrument Company, York, Pennsylvania, United States of America for Load Cell Calibrations



Load Cell Calibration Set-ups both in Compression and Tension Modes

Range	:	0 to 12000 kgf
Calibrated BMC	:	±0.327 kgf to 0.481 kgf
Traceability	:	National Institute of Standards and Technology, Gaithersburg, Washington, United States of America

5.0 8½ Digits Digital Multimeter, from Agilent Technologies, USA.

		Range	BMC
DC Voltage	:	10 nV to 1000 V	0.005% to 0.0005%
Resistance	:	10 micro Ohm to 1 G ohm	0.003% to 0.002%
DC Current	:	1 pA to 1A	0.2 nA to 0.001 A
AC Voltage	:	10nV to 1000 V	0.01% to 0.005%
AC Current	:	100 pA to 1 A	0.006 uA to 0.0004 A
Frequency / Period	:	1 Hz to 10 M Hz	0.0009% to 0.007%
Traceability	:	National Physical Laboratory, New Delhi	

6.0 Standard Resistors, Validated at the National Physical Laboratory, Teddington (United Kingdom).

Resistance Range	:	0.0001 Ohm to 10 Mohm
Calibrated BMC	:	±0.002% to 1%
Traceability	:	National Physical Laboratory, New Delhi

7.0 Power Supplies, from Applied Electronics Limited (APLAB), Thane, India.

Range	:	0 to 5000 Volt / 20 mA
Calibrated BMC	:	±1% Load Regulation
Traceability	:	National Physical Laboratory, New Delhi

8.0 Picoammeter, from Sciencitific Equipments & Services, Roorkee, India.

Range	:	1 to 199.9 uA
Calibrated BMC	:	±0.1 nA to 0.6 uA
Traceability	:	National Physical Laboratory, New Delhi

9.0 Pressure Calibrator from SIKA Dr. Siebert & Kuhn GmbH & Co. Kg, Germany

Range	:	0 to 300 bars
Calibrated BMC	:	±0.1% f.s.d.
Traceability	:	National Physical Laboratory, New Delhi

10.0 Dry Block Temperature Calibrator, from Dr. Seibert & Kuhn GmbH & Co., Kaufungen, Germany.

Temperature Range	:	Ambient Temperature to 600°C
Calibrated BMC	:	±0.3% or 1.0°C whichever is greater
Traceability	:	National Physical Laboratory, New Delhi.

Vaiśeshika®

Spectrum Of Vaiseshika Calibration Standards

RESISTANCE CALIBRATION STANDARDS

High Precision Decade Resistance Box
(0.01 ohm to 100 kohm)
for Sensors & Load Cell Calibration

Pt 100 Simulator
for RTD Calibration

Standards Resistor 10 Micro Ohm
for Micro Ohm Meter Calibration

Decade Teraohm Calibration Standard
(0.1 Meg to 10 Teraohm)
for Meggers & Insulation Testers

Digital Micro Hardness Tester with
Standards Calibration Test Blocks

MOREHOUSE FORCE AND LOAD CELL CALIBRATION STANDARDS

(from Morehouse Instrument Co., Inc., York, Pennsylvania, U.S.)

Load Cell Calibration System

Ultra Precision Grade
Load cell

Proving Ring

Ring Force Gauge

Ring Dynamometer

Digital Proving Ring

Dead Weight
Calibrating Machine

Designed & Printed by :
Computers & Printers Ambala Cantt. 133 001
Phone : 0171-2607170, 9896240079

11K / i / 2015

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

VAISESHIKA ELECTRON DEVICES

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