



THE AMERICAN ASSOCIATION FOR
LABORATORY ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

CONRAD KACSIK INSTRUMENT SYSTEMS, INC.
Solon, OH

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 18 June 2005*).



Presented this 28th day of March 2008.

A handwritten signature in cursive script, reading "Peter Abney".

President
For the Accreditation Council
Certificate Number 1385.01
Valid to March 31, 2010
Revised February 26, 2010

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005
& ANSI/NCSL Z540-1-1994

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CALIBRATION

Valid To: March 31, 2010

Certificate Number: 1385.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Electrical – DC & Low Frequency

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
DC Voltage ⁵ – Measure	(0 to 100) mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1050) V	25 µV/V + 1 µV 10 µV/V + 1 µV 8 µV/V + 1 µV 10 µV/V + 30 µV 25 µV/V + 100 µV	HP 3458A, opt 002
DC Voltage ⁴ – Generate	(0 to 330) mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V (330 to 1000) V	25 µV/V + 1 µV 14 µV/V + 2 µV 15 µV/V + 15 µV 22 µV/V + 150 µV 24 µV/V + 1.5 mV	Fluke 5520A/SC600
DC Current ⁵ – Measure	(0 to 100) µA (0.1 to 1) mA (1 to 10) mA (10 to 100) mA (100 to 1) A	43 µA/A + 8 nA 40 µA/A + 5 nA 40 µA/A + 50 nA 60 µA/A + 500 nA 0.016 % + 10 µA	HP 3458A, opt 002

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
DC Current ⁴ – Generate	(0 to 299.9) μ A (0.3 to 3.299) mA (3 to 32.99) mA (33 to 329.9) mA (.3 to 1) A (1 to 3) A (3 to 11) A (11 to 20.5) A	0.026 % + 20 nA 0.014 % + 50 nA 0.013 % + 250 nA 0.013 % + 2.5 μ A 0.028 % + 40 μ A 0.047 % + 40 μ A 0.065 % + 500 μ A 0.13 % + 750 μ A	Fluke 5520A/SC600
Resistance ⁴ – Generate	(0 to 11) Ω (11 to 110) Ω (0.11 to 1.1) k Ω (1.1 to 11) k Ω (11 to 110) k Ω 110 k Ω to 1 M Ω (1 to 10) M Ω	0.016 % + 1.0 m Ω 50 $\mu\Omega/\Omega$ + 1.5 m Ω 35 $\mu\Omega/\Omega$ + 2.0 m Ω 36 $\mu\Omega/\Omega$ + 20 m Ω 36 $\mu\Omega/\Omega$ + 0.2 Ω 40 $\mu\Omega/\Omega$ + 2 Ω 0.017 % + 50 Ω	Fluke 5520A/SC600
Resistance ⁵ – Measure	(0 to 10) Ω (10 to 100) Ω (0.10 to 1.0) k Ω (1.0 to 10) k Ω (10 to 100) k Ω 100 k Ω to 1.0 M Ω (1 to 10) M Ω	33 $\mu\Omega/\Omega$ + 1 m Ω 27 $\mu\Omega/\Omega$ + 1 m Ω 16 $\mu\Omega/\Omega$ + 1 m Ω 16 $\mu\Omega/\Omega$ + 5 m Ω 17 $\mu\Omega/\Omega$ + 0.05 Ω 25 $\mu\Omega/\Omega$ + 2 Ω 75 $\mu\Omega/\Omega$ + 20 Ω	HP 3458A, opt 002
Electrical Calibration of mV Thermocouple Sources –			
Type J	-210°C to 760°C	0.14 °C	HP 3458A and Kaye Ice Point
Type K	-270°C to 1372°C	0.16 °C	
Type N	-270°C to 1300°C	0.15 °C	
Type R	-50°C to 1767°C	0.35 °C	
Type S	-50°C to 1767°C	0.35 °C	
Type T	-270°C to 400°C	0.23 °C	

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Electrical Calibration of Thermocouple Indicators – Type J Type K Type N Type R Type S Type T	-210°C to 760°C -270°C to 1372°C -270°C to 1300°C -50°C to 1767°C -50°C to 1767°C -270°C to 400°C	0.15 °C 0.15 °C 0.18 °C 0.30 °C 0.30 °C 0.17 °C	Fluke 5520A and Kaye Ice Point
Electrical Calibration of RTD Indicators – Pt 385, 100 Ω Pt 385, 200 Ω Pt 385, 500 Ω Pt 385, 1 kΩ Pt 3916, 100 Ω Pt 3926, 100 Ω PtNi 385, 120 Ω	-200°C to 800°C -200°C to 630°C -200°C to 630°C -200°C to 630°C -200°C to 630°C -200°C to 630°C -80°C to 260°C	0.27 °C 0.19 °C 0.13 °C 0.27 °C 0.27 °C 0.14 °C 0.14 °C	Fluke 5520A

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
AC Voltage ⁵ – Measure (0 to 100) mV 100 mV to 1 V (1 to 10) V (10 to 100) V (100 to 700) V	40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz 40 Hz to 1 kHz	0.013 % + 4 μV 0.02 % + 2 μV 0.039 % + 2 μV 0.012 % + 20 μV 0.02 % + 20 μV 0.038 % + 20 μV 0.011 % + 200 μV 0.02 % + 200 μV 0.038 % + 200 μV 0.026 % + 2 mV 0.026 % + 2 mV 0.044 % + 2 mV 0.049 % + 20 mV	HP 3458A, opt 002, synchronous sub-sampled mode

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
AC Voltage ⁴ – Generate			
(0 to 330) mV	45 Hz to 10 kHz (1 to 20) kHz (20 to 50) kHz	0.021 % + 8 μV 0.023 % + 8 μV 0.045 % + 8 μV	Fluke 5520A
330 mV to 3.3 V	45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz	0.02 % + 60 μV 0.025 % + 60 μV 0.038 % + 60 μV	
(3.3 to 33) V	45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz	0.021 % + 600 μV 0.031 % + 600 μV 0.044 % + 600 μV	
(33 to 330) V	45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz	0.024 % + 6 mV 0.024 % + 6 mV 0.032 % + 6 mV 0.043 % + 6 mV	
(330 to 1000) V	(45 to 999) Hz (1 to 5) kHz	0.037 % +10 mV 0.031 % +10 mV	
AC Current ⁵ – Measure			
(0 to 100) μA	45 Hz to 1 kHz	0.12 % + 0.03 μA	HP 3458A, opt 002
100 μA to 1 mA	(45 to 100) Hz 100 Hz to 5 kHz	0.12 % + 0.2 μA 0.06 % + 0.2 μA	
(1 to 10) mA	(45 to 100) Hz 100 Hz to 5 kHz	0.12 % + 2 μA 0.06 % + 2 μA	
(10 to 100) mA	(45 to 100) Hz 100 Hz to 5 kHz	0.12 % + 20 μA 0.060 % + 20 μA	
100 mA to 1 A	(45 to 100) Hz 100 Hz to 5 kHz	0.12 % + 200 μA 0.15 % + 200 μA	

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
AC Current ⁴ – Generate			
(0 to 330) μA	45 Hz to 1 kHz	0.19 % + 0.1 μA	Fluke 5520A
(0.3 to 3.3) mA	45 Hz to 1 kHz	0.13 % + 0.15 μA	
(3.3 to 33) mA	45 Hz to 1 kHz	0.057 % + 2 μA	
(33 to 330) mA	45 Hz to 1 kHz	0.057 % + 20 μA	
330 mA to 1 A	45 Hz to 1 kHz	0.071 % + 100 μA	
(1 to 3) A	45 Hz to 1 kHz	0.076 % + 100 μA	
(3 to 11) A	(45 to 100) Hz	0.095 % + 2 mA	
	100 Hz to 1 kHz	0.15 % + 2 mA	
(11 to 20.5) A	(45 to 100) Hz	0.17 % + 5 mA	
	100 Hz to 1 kHz	0.21 % + 5 mA	

II. Thermodynamic

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Thermocouples and Extension Wires for Furnaces & Ovens ³	400 °F	2.5 °F	Hart 1560 scanner, Lindberg tube oven
	700 °F	2.5 °F	
	1000 °F	3.0 °F	
	1400 °F	3.6 °F	
	1600 °F	4.0 °F	
	1900 °F	5.1 °F	
	2200 °F	7.3 °F	

¹ This laboratory offers commercial and on-site calibration service. On-site calibration service is available for this calibration. The uncertainties achievable on a customer's site can normally be expected to be larger than the Best Measurement Capabilities (BMC) that the accredited laboratory has been assigned as Best Uncertainty on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the calibration uncertainty being larger than the BMC.

² “Best Uncertainty” is the smallest uncertainty of measurement that a laboratory can achieve within its

scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards of nearly ideal measuring equipment. Best uncertainties represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The best uncertainty of a specific calibration performed by the laboratory may be greater than the best uncertainty due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

³ On-site calibration service is not available for this calibration.

⁴ The measurands stated are generated with the Fluke 5520A. This capability is suited for the calibration of the devices intended to measure the stated measurand in the ranges indicated. Best measurement uncertainties are expressed as either a specific value that covers the full range or as a combination of the percent or portion of the reading plus a fixed floor specification.

⁵ The measurands stated are measured with the HP 3458A. This capability is suitable for the calibration of the devices intended to generate the stated measurand in the ranges indicated. Best Measurement uncertainties are expressed as either a specific value that covers the full range or as a combination of the percent or portion of the reading plus a fixed floor specification.