



**THE AMERICAN
ASSOCIATION
FOR LABORATORY
ACCREDITATION**

ACCREDITED LABORATORY

A2LA has accredited

CENTURY LABS II CORP
Fort Wayne, IN

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 also 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 10th day of July 2006





President
For the Accreditation Council
Certificate Number 2417.01
Valid to May 31, 2008

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

CENTURY LABS II CORPORATION
 2808-G Congressional Parkway
 Fort Wayne, IN 46808
 Robin Bork Phone: 260 471 1673

CALIBRATION

Valid To: May 31, 2008

Certificate Number: 2417.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1,3}:

I. Electrical – DC & Low Frequency

Parameter/Equipment	Range	Best Uncertainty ^{2,4} (\pm)	Comments
DC Voltage – Generate	(0 to 220) mV 220 mV to 2.2 V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1100) V	10 μ V/V + 0.9 μ V 9.3 μ V/V + 1.3 μ V 9.3 μ V/V + 4.6 μ V 9.3 μ V/V + 9.2 μ V 10 μ V/V + 120 μ V 13 μ V/V + 690 μ V	Fluke 5700A
DC Voltage – Measure	(10 to 100) mV 100 mV to 1 V (1 to 10) V (10 to 100) V (100 to 1000) V (1 to 20) kV (20 to 50) kV (50 to 100) kV	7.8 μ V/V + 3.7 μ V 6.6 μ V/V + 0.38 μ V 6.6 μ V/V + 0.13 μ V 8.9 μ V/V + 0.4 μ V 8.9 μ V/V + 0.2 μ V + 12 μ V/V ($V_{IN}/1000$) ² 460 V 1200 V 2.3 kV	HP 3458A Opt 002 Hipotronics KV100A

Parameter/Equipment	Frequency	Best Uncertainty ^{2,4} (\pm)	Comments
AC Voltage – Generate			Fluke 5700A
(0.22 to 2.2) mV	(20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.028 % + 5.8 μ V 0.014 % + 5.8 μ V 0.047 % + 5.8 μ V 0.11 % + 9.3 μ V	
(2.2 to 22) mV	(20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.028 % + 6.7 μ V 0.014 % + 6.9 μ V 0.047 % + 6.9 μ V 0.11 % + 9.3 μ V	
(22 to 220) mV	(20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.028 % + 12 μ V 0.013 % + 12 μ V 0.042 % + 12 μ V 0.11 % + 35 μ V	
(0.22 to 2.2) V	(20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.021 % + 350 μ V 98 μ V/V + 8.1 μ V 0.017 % + 23 μ V 0.032 % + 93 μ V	
(2.2 to 22) V	(20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.021 % + 35 μ V 98 μ V/V + 81 μ V 0.017 % + 230 μ V 0.032 % + 470 μ V	
(22 to 220) V	(20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.021 % + 3.5 mV 0.010 % + 1.2 mV 0.029 % + 4.6 mV 0.070 % + 12 mV	
(220 to 1100) V	50 Hz to 1 kHz	0.011 % + 4.6 mV	

Parameter/Equipment	Frequency	Best Uncertainty ^{2,4} (±)	Comments
AC Voltage – Measure			HP 3458A Opt 002
(1 to 10) mV	(1 Hz to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.030 % + 3 μV 0.020 % + 1.1 μV 0.030 % + 1.1 μV 0.1 % + 1.1 μV 0.5 % + 1.1 μV	
(10 to 100) mV	(1 Hz to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	70 μV/V + 4 μV 70 μV/V + 2 μV 0.014 % + 2 μV 0.030 % + 2 μV 0.08 % + 2 μV	
(0.1 to 1) V	(1 Hz to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	70 μV/V + 40 μV 70 μV/V + 20 μV 0.014 % + 20 μV 0.030 % + 20 μV 0.08 % + 20 μV	
(1 to 10) V	(1 Hz to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	70 μV/V + 0.4 mV 70 μV/V + 0.2 mV 0.014 % + 0.2 mV 0.030 % + 0.2 mV 0.08 % + 0.2 mV	
(10 to 100) V	(1 Hz to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.020 % + 4 mV 0.020 % + 2 mV 0.020 % + 2 mV 0.035 % + 2 mV 0.12 % + 2 mV	
(100 to 700) V	(1 Hz to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.040 % + 40 mV 0.040 % + 20 mV 0.060 % + 20 mV 0.12 % + 20 mV 0.3 % + 20 mV	
(1 to 100) kV	50 Hz to 1 kHz	23 mV/V	Hipotronics KV100A

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
DC Current – Generate	(0 to 220) µA	50 µA/A + 8 nA	Fluke 5700A
	220 µA to 2.2 mA	50 µA/A + 8 nA	
	(2.2 to 22) mA	50 µA/A + 80 nA	Add 200 I ² µA/A for I > 100 mA
	(22 to 220) mA	60 µA/A + 0.8 µA	
	220 mA to 2.2 A	80 µA/A + 25 µA	Add 10 I ² µA/A for I > 1 A
	(2.2 to 11) A	0.58 mA/A + 0.39 mA	Fluke 5520A
	(11 to 20) A	0.12 % + 0.9 mA	
	(20 to 100) A	0.27 %	Guildline 9211A HP 3458A Fluke 5700A Rotek 780A
DC Current – Measure	(0 to 100) nA	34 µA/A + 40 pA	HP 3458A Opt 002
	100 nA to 1µA	24 µA/A + 40 pA	
	(1 to 10) µA	24 µA/A + 0.10 nA	
	(10 to 100) µA	24 µA/A + 0.8 nA	
	100 µA to 1 mA	24 µA/A + 5 nA	
	(1 to 10) mA	24 µA/A + 50 nA	
	(10 to 100) mA	39 µA/A + 0.5 µA	
	100 mA to 1 A	0.012 % + 10 µA	

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
AC Current – Generate			Fluke 5700A
(9 to 220) µA	(10 to 20) Hz	0.070 % + 25 nA	
	(20 to 40) Hz	0.035 % + 20 nA	
	40 Hz to 1 kHz	0.014 % + 16 nA	
	(1 to 5) kHz	0.060 % + 40 nA	
	(5 to 10) kHz	0.16 % + 80 nA	
220 µA to 2.2 mA	(10 to 20) Hz	0.070 % + 40 nA	
	(20 to 40) Hz	0.035 % + 35 nA	
	40 Hz to 1 kHz	0.014 % + 35 nA	
	(1 to 5) kHz	0.060 % + 400 nA	
	(5 to 10) kHz	0.16 % + 800 nA	

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
AC Current – Generate			
(2.2 to 22) mA	(10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.070 % + 0.4 µA 0.035 % + 0.35 µA 0.014 % + 0.35 µA 0.060 % + 4 µA 0.16 % + 8 µA	Fluke 5700A
(22 to 220) mA	(10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.070 % + 4 µA 0.035 % + 3.5 µA 0.014 % + 3.5 µA 0.060 % + 40 µA 0.16 % + 80 µA	
220 mA to 2.2 A	(20 to 1) kHz (1 to 5) kHz (5 to 10) kHz	0.065 % + 35 µA 0.075 % + 80 µA 0.85 % + 160 µA	
(3 to 11) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.06 % + 2 mA 0.01 % + 2 mA 3 % + 2 mA	Fluke 5520A
(11 to 20.5) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.12 % + 5 mA 0.15 % + 5 mA 3 % + 5 mA	
(20.5 to 100) A	60 Hz	1 %	
			Guidline 9211A HP 3458A Fluke 5700A Rotek 780A
AC Current – Measure			HP 3458A Opt 002
(5 to 100) µA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 1 kHz	0.46 % + 0.03 µA 0.17 % + 0.03 µA 0.07 % + 0.03 µA 0.07 % + 0.03 µA	
100 µA to 1 mA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	0.5 % + 0.2 µA 0.17 % + 0.2 µA 0.07 % + 0.2 µA 0.04 % + 0.2 µA	

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
AC Current – Measure (cont)			HP 3458A Opt 002
(1 to 10) mA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	0.46 % + 2 μA 0.17 % + 2 μA 0.07 % + 2 μA 0.04 % + 2 μA	
(10 to 100) mA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	0.46 % + 20 μA 0.17 % + 20 μA 0.07 % + 20 μA 0.04 % + 20 μA	
100 mA to 1 A	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	0.46 % + 200 μA 0.18 % + 200 μA 0.09 % + 200 μA 0.12 % + 200 μA	

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Resistance – Generate	(0 to 11) Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω 330 Ω to 1.1 kΩ (1.1 to 3.3) kΩ (3.3 to 11) kΩ (11 to 33) kΩ (33 to 110) kΩ (110 to 330) kΩ 330 kΩ to 1.1 MΩ (1.1 to 3.3) MΩ (3.3 to 11) MΩ (11 to 33) MΩ (33 to 110) MΩ (110 to 330) MΩ 330 MΩ to 1GΩ	46 μΩ/Ω + 1 mΩ 35 μΩ/Ω + 2 mΩ 32 μΩ/Ω + 2 mΩ 32 μΩ/Ω + 2 mΩ 32 μΩ/Ω + 2 mΩ 32 μΩ/Ω + 23 mΩ 32 μΩ/Ω + 23 mΩ 32 μΩ/Ω + 0.2 Ω 32 μΩ/Ω + 0.2 Ω 37 μΩ/Ω + 2 Ω 37 μΩ/Ω + 2 Ω 69 μΩ/Ω + 35 Ω 130 μΩ/Ω + 58 Ω 290 μΩ/Ω + 2.9 kΩ 580 μΩ/Ω + 3.5 kΩ 3 % + 100 kΩ 17 μΩ/Ω + 500 kΩ	Fluke 5520A

Parameter/Equipment	Range	Best Uncertainty ² (\pm)	Comments
Resistance – Measure	(0 to 10) Ω (10 to 100) Ω 100 Ω to 1 k Ω (1 to 10) k Ω (10 to 100) k Ω 100 k Ω to 1 M Ω (1 to 10) M Ω (10 to 100) M Ω 100 M Ω to 1 G Ω	15 $\mu\Omega/\Omega$ + 50 $\mu\Omega$ 12 $\mu\Omega/\Omega$ + 500 $\mu\Omega$ 10 m $\Omega/K\Omega$ + 0.5 m Ω 10 m $\Omega/K\Omega$ + 5 m Ω 10 m $\Omega/K\Omega$ + 50 m Ω 15 $\Omega/M\Omega$ + 2 Ω 50 $\Omega/M\Omega$ + 100 Ω 500 $\Omega/M\Omega$ + 1 k Ω 0.5 % + 10 k Ω	HP 3458A Opt 002

Parameter/Range	Frequency	Best Uncertainty ² (\pm)	Comments
Capacitance – Generate			
(0.19 to 0.4) nF	10 Hz to 10 kHz	0.5 % + 0.01 nF	Fluke 5520A
(0.4 to 1.1) nF		0.5 % + 0.01 nF	
(1.1 to 3.3) nF		0.5 % + 0.01 nF	
(3.3 to 11) nF		0.25 % + 0.01 nF	
(11 to 33) nF		0.25 % + 0.1 nF	
(33 to 110) nF		0.25 % + 0.1 nF	
(110 to 330) nF		0.25 % + 0.3 nF	
330 nF to 1.1 μ F	(10 to 600) Hz	0.25 % + 1 nF	
(1.1 to 3.3) μ F	(10 to 300) Hz	0.25 % + 3 nF	
(3.3 to 11) μ F	(10 to 150) Hz	0.25 % + 10 nF	
(11 to 33) μ F	(10 to 120) Hz	0.40 % + 30 nF	
(33 to 110) μ F	(10 to 80) Hz	0.45 % + 100 nF	
(110 to 330) μ F	(0 to 50) Hz	0.45 % + 300 nF	
330 μ F to 1.1 mF	(0 to 20) Hz	0.45 % + 1 nF	

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
Capacitance – Generate (cont)			Fluke 5520A
(1.1 to 3.3) mF	(0 to 6) Hz	0.45 % + 3 nF	
(3.3 to 11) mF	(0 to 2) Hz	0.45 % + 10 nF	
(11 to 33) mF	(0 to 0.6) Hz	0.75 % + 30 nF	
(33 to 110) mF	(0 to 0.2) Hz	1.1 % + 100 nF	
Capacitance – Measure	Fixed Points		HP 4274A LCR Meter
Up to 1 pF	100 Hz	0.3 % + 1 fF + 3 cts	Dissipation factor < 0.1
	120 Hz	0.3 % + 1 fF + 3 cts	Cts: Counts of LSD
	200 Hz	0.3 % + 1 fF + 2 cts	
	400 Hz	0.3 % + 1 fF + 6 cts	
	1 kHz	0.3 % + 1 fF + 3 cts	
	2 kHz	0.3 % + 1 fF + 2 cts	
	4 kHz	0.3 % + 1 fF + 6 cts	
	10 kHz	0.3 % + 1 fF + 3 cts	
	20 kHz	0.3 % + 1 fF + 2 cts	
	40 kHz	0.3 % + 1 fF + 6 cts	
	100 kHz	0.3 % + 1 fF + 3 cts	
(1 to 10) pF	100 Hz	0.3 % + 1 fF + 3 cts	
	120 Hz	0.3 % + 1 fF + 3 cts	
	200 Hz	0.3 % + 1 fF + 2 cts	
	400 Hz	0.3 % + 1 fF + 6 cts	
	1 kHz	0.3 % + 1 fF + 3 cts	
	2 kHz	0.3 % + 2 cts	
	4 kHz	0.28 % + 6 cts	
	10 kHz	0.28 % + 3 cts	
	20 kHz	0.28 % + 2 cts	
	40 kHz	0.28 % + 6 cts	
	100 kHz	0.28 % + 3 cts	

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
Capacitance – Measure	Fixed Points		HP 4274A LCR Meter
(10 to 100) pF	100 Hz	0.3 % + 3 cts	Dissipation factor < 0.1 Cts: Counts of LSD
	120 Hz	0.3 % + 3 cts	
	200 Hz	0.3 % + 2 cts	
	400 Hz	0.28 % + 6 cts	
	1 kHz	0.28 % + 3 cts	
	2 kHz	0.28 % + 2 cts	
	4 kHz	0.28 % + 6 cts	
	10 kHz	0.28 % + 3 cts	
	20 kHz	0.28 % + 2 cts	
	40 kHz	0.28 % + 6 cts	
	100 kHz	0.28 % + 3 cts	
	(10 to 100) pF	100 Hz	
120 Hz		0.28 % + 3 cts	
200 Hz		0.28 % + 2 cts	
400 Hz		0.28 % + 6 cts	
1 kHz		0.28 % + 3 cts	
2 kHz		0.28 % + 2 cts	
4 kHz		0.28 % + 6 cts	
10 kHz		0.28 % + 3 cts	
20 kHz		0.28 % + 2 cts	
40 kHz		0.28 % + 6 cts	
100 kHz		0.1 % + 3 cts	
100 pF to 10 nF		100 Hz	0.28 % + 3 cts
	120 Hz	0.28 % + 3 cts	
	200 Hz	0.28 % + 2 cts	
	400 Hz	0.28 % + 6 cts	
	1 kHz	0.28 % + 3 cts	
	2 kHz	0.28 % + 2 cts	
	4 kHz	0.28 % + 6 cts	
	10 kHz	0.28 % + 3 cts	
	20 kHz	0.28 % + 2 cts	
	40 kHz	0.7 % + 1 ct	
	100 kHz	0.3 % + 1 ct	

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
Capacitance – Measure (cont)	Fixed Points		HP 4274A LCR Meter
100 nF to 1 µF	100 Hz	0.1 % + 3 cts	Dissipation factor < 0.1
	120 Hz	0.1 % + 3 cts	Cts: Counts of LSD
	200 Hz	0.1 % + 2 cts	
	400 Hz	0.1 % + 6 cts	
	1 kHz	0.1 % + 3 cts	
	2 kHz	0.1 % + 2 cts	
	4 kHz	0.6 % + 1 ct	
	10 kHz	0.3 % + 1 ct	
	20 kHz	0.2 % + 1 ct	
	40 kHz	0.6 % + 1 ct	
	100 kHz	0.3 % + 1 ct	
(1 to 10) µF	100 Hz	0.1 % + 3 cts	
	120 Hz	0.1 % + 3 cts	
	200 Hz	0.1 % + 2 cts	
	400 Hz	0.6 % + 1 ct	
	1 kHz	0.3 % + 1 ct	
	2 kHz	0.2 % + 1 ct	
	4 kHz	0.6 % + 1 ct	
	10 kHz	0.3 % + 1 ct	
	20 kHz	0.2 % + 1 ct	
	40 kHz	0.3 % + 1 ct	
	100 kHz	0.3 % + 1 ct	
(10 to 100) µF	100 Hz	0.1 % + 3 cts	
	120 Hz	0.1 % + 3 cts	
	200 Hz	0.1 % + 2 cts	
	400 Hz	0.6 % + 1 ct	
	1 kHz	0.3 % + 1 ct	
	2 kHz	0.2 % + 1 ct	
	4 kHz	0.6 % + 1 ct	
	10 kHz	0.3 % + 1 ct	
	20 kHz	0.2 % + 1 ct	
	40 kHz	3 % + 1 ct	
	100 kHz	3 % + 1 ct	

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
Capacitance – Measure (cont)	Fixed Points		HP 4274A LCR Meter Dissipation factor < 0.1 Cts: Counts of LSD
100 µF to 1 mF	100 Hz 120 Hz 200 Hz 400 Hz 1 kHz 2 kHz 4 kHz 10 kHz 20 kHz	0.3 % + 1 ct 0.3 % + 1 ct 0.2 % + 1 ct 1 % + 1 ct 1 % + 1 ct 1 % + 1 ct 3 % + 1 ct 3 % + 1 ct 3 % + 1 ct	
(1 to 10) mF	100 Hz 120 Hz 200 Hz 400 Hz 1 kHz 2 kHz	1 % + 1 ct 1 % + 1 ct 1 % + 1 ct 3 % + 1 ct 3 % + 1 ct 3 % + 1 ct	
(10 to 100) mF	100 Hz 120 Hz 200 Hz 400 Hz 1 kHz 2 kHz	3 % + 1 ct 3 % + 1 ct 3 % + 1 ct 5 % + 1 ct 10 % + 1 ct 10 % + 1 ct	
100 mF to 1 F	100 Hz 120 Hz 200 Hz	10 % + 1 ct 10 % + 1 ct 10 % + 1 ct	

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Inductance – Generate			
(0.1 to 1) kHz	1 h 10 mh	0.12 % 0.11 %	GR 1482 series inductors
10 Hz to 1 kHz	200 µh	0.28 %	

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Inductance – Measure	Fixed Points		HP 4274A LCR Meter
Up to 100 nh	(100, 120) Hz 200 Hz 400 Hz 1 kHz 2 kHz 4 kHz 10 kHz 20 kHz 40 kHz 100 kHz	1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts	Cts: Counts of LSD
100 nh to 1 µh	(100, 120) Hz 200 Hz 400 Hz 1 kHz 2 kHz 4 kHz 10 kHz 20 kHz 40 kHz 100 kHz	1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 0.5 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts	
(1 to 10) µh	(100, 120) Hz 200 Hz 400 Hz 1 kHz 2 kHz 4 kHz 10 kHz 20 kHz 40 kHz 100 kHz	1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 1 % + 0.1 nh + 5 cts 0.5 % + 0.1 nh + 5 cts 0.5 % + 0.1 nh + 5 cts 0.5 % + 0.1 nh + 5 cts 0.3 % + 3 cts 0.3 % + 3 cts 0.3 % + 3 cts 0.3 % + 3 cts	

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
Inductance – Measure (cont)	Fixed Points		HP 4274A LCR Meter
(10 to 100) μh	(100, 120) Hz 200 Hz 400 Hz 1 kHz 2 kHz 4 kHz 10 kHz 20 kHz 40 kHz 100 kHz	0.5 % + 0.1 nh + 5 cts 0.5 % + 0.1 nh + 5 cts 0.5 % + 0.1 nh + 5 cts 0.3 % + 3 cts 0.3 % + 3 cts 0.3 % + 3 cts 0.1 % + 3 cts 0.1 % + 3 cts 0.1 % + 3 cts 0.1 % + 3 cts	Cts: Counts of LSD
100 μh to 1 mh	(100, 120) Hz 200 Hz 400 Hz 1 kHz 2 kHz 4 kHz 10 kHz 20 kHz 40 kHz 100 kHz	0.3 % + 3 cts 0.3 % + 3 cts 0.3 % + 3 cts 0.1 % + 3 cts 0.1 % + 3 cts 0.1 % + 3 cts 0.2 % + 3 cts 0.2 % + 3 cts 0.2 % + 3 cts 0.1 % + 1 ct	
(1 to 10) mh	(100, 120) Hz 200 Hz 400 Hz 1 kHz 2 kHz 4 kHz 10 kHz 20 kHz 40 kHz 100 kHz	0.1 % + 3 cts 0.1 % + 3 cts 0.1 % + 3 cts 0.2 % + 3 cts 0.2 % + 3 cts 0.2 % + 3 cts 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct	

Parameter/Range	Frequency	Best Uncertainty ² (±)	Comments
Inductance – Measure (cont)	Fixed Points		HP 4274A LCR Meter
(10 to 100) mh	(100, 120) Hz 200 Hz 400 Hz 1 kHz 2 kHz 4 kHz 10 kHz 20 kHz 40 kHz 100 kHz	0.2 % + 1 ct 0.2 % + 1 ct 0.2 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct	Cts: Counts of LSD
100 mh to 1 h	(100, 120) Hz 200 Hz 400 Hz 1 kHz 2 kHz 4 kHz 10 kHz 20 kHz 40 kHz 100 kHz	0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 3 % + 1 ct	
(1 to 10) h	(100, 120) Hz 200 Hz 400 Hz 1 kHz 2 kHz 4 kHz 10 kHz 20 kHz 40 kHz	0.1 % + 3 cts 0.1 % + 3 cts 0.1 % + 3 cts 0.1 % + 3 cts 0.1 % + 3 cts 0.1 % + 3 cts 0.3 % + 3 cts 0.3 % + 3 cts 0.3 % + 3 cts	
(10 to 100) h	(100, 120) Hz 200 Hz 400 Hz 1 kHz 2 kHz 4 kHz	0.1 % + 1 ct 0.1 % + 1 ct 0.1 % + 1 ct 3 % + 1 ct 3 % + 1 ct 3 % + 1 ct	

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Dissipation Factor – Measure (Df)			HP 4274A LCR Meter
1 pF to 100 μF	(0.001 to 2) df	3 % + 1 ct	
Electrical Calibration of Thermocouple Indicating Systems –			Fluke 5520A
Type B	(600 to 800) °C (800 to 1000) °C (1000 to 1550) °C (1550 to 1820) °C	0.56 °C 0.46 °C 0.41 °C 0.45 °C	
Type C	(0 to 150) °C (150 to 650) °C (650 to 1000) °C (1000 to 1800) °C (1800 to 2316) °C	0.41 °C 0.38 °C 0.43 °C 0.62 °C 1.0 °C	
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1000) °C	0.62 °C 0.3 °C 0.28 °C 0.3 °C 0.34 °C	
Type J	(-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1200) °C	0.39 °C 0.3 °C 0.28 °C 0.30 °C 0.35 °C	
Type K	(-200 to -100) °C (-100 to -30) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C	0.45 °C 0.31 °C 0.3 °C 0.38 °C 0.52 °C	
Type L	(-200 to -100) °C (-100 to 800) °C (800 to 900) °C	0.49 °C 0.38 °C 0.2 °C	
Type N	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1300) °C	0.52 °C 0.34 °C 0.32 °C 0.31 °C 0.39 °C	

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Electrical Calibration of Thermocouple Indicating Systems – (cont)			Fluke 5520A
Type R	(0 to 250) °C (250 to 400) °C (400 to 1000) °C (1000 to 1767) °C	0.7 °C 0.47 °C 0.45 °C 0.52 °C	
Type S	(0 to 250) °C (250 to 1000) °C (1000 to 1400) °C (1400 to 1767) °C	0.59 °C 0.48 °C 0.49 °C 0.58 °C	
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.76 °C 0.36 °C 0.3 °C 0.28 °C	
Type U	(-200 to 0) °C (0 to 600) °C	0.69 °C 0.39 °C	
Electrical Calibration of RTD Indicators –			Fluke 5520A
Pt 395, 100 Ω	(-200 to 100) °C (100 to 630) °C (630 to 800) °C	0.08 °C 0.14 °C 0.27 °C	
Pt 3926, 100 Ω	(-200 to 0) °C (0 to 300) °C (300 to 630) °C	0.08 °C 0.11 °C 0.14 °C	
Pt 3916, 100 Ω	(-200 to -190) °C (-190 to 260) °C (260 to 600) °C (600 to 630) °C	0.28 °C 0.08 °C 0.12 °C 0.26 °C	
Pt 385, 200 Ω	(-200 to 260) °C (260 to 400) °C (400 to 630) °C	0.06 °C 0.15 °C 0.19 °C	

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Electrical Calibration of RTD Indicators – (cont)			Fluke 5520A
Pt 385, 500 Ω	(-200 to 260) °C (260 to 600) °C (600 to 630) °C	0.07 °C 0.11 °C 0.13 °C	
Pt 385, 1000 Ω	(-200 to 100) °C (100 to 600) °C (600 to 630) °C	0.05 °C 0.08 °C 0.27 °C	
PtNi 385, 120 Ω	(-80 to 100) °C (100 to 260) °C	0.09 °C 0.16 °C	
Cu 427, 10 Ω	(-100 to 260) °C	0.35 °C	
Oscilloscopes –			Fluke 5520A / SC600
Rise Time 50 Ω load (< 2 MHz)	≤ 300 ps	(+ 0 ps / -100 ps)	
DC Voltage 1 M Ω Load 50 Ω Load	(0 to 130) V (0 to 6.6) V	0.05 % + 40 μV 0.25 % + 40 μV	
Square Wave 1 M Ω Load 50 Ω Load	1 mV to 130 V _{pk-pk} 1 mV to 6.6 V _{pk-pk}	0.1 % + 40 μV 0.25 % + 40 μV	
Band Width	50 kHz reference 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz	2.4 % + 350 μV 4.1 % + 350 μV 4.7 % + 350 μV 7.0 % + 350 μV	
Timing	5 s, 2 s, 1 s, 0.5 s, 0.2 s, 0.1 s and 50 ms	(25 + 1000 <i>t</i>) μs/s	<i>t</i> is time mark interval in seconds
	20 ms, 10 ms, 5 ms, 2 ms 1 ms and 500 ns, 200 ns 100 ns, 50 ns, 20 ns, 10 ns, 5 ns and 2 ns	2.5 μs/s	

II. Mechanical

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Pressure	(-15 to 7000) psi	0.058 % + 0.06 psi	Ashcroft 2089 digital pressure gage

III. Time & Frequency

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Frequency – Measuring Equipment	0.01 Hz to 2 MHz	3 µHz/Hz	Fluke 5520A
	50 kHz to 600 MHz	3 µHz/Hz	Fluke 5520A /SC600
Frequency – Measure	20 Hz to 550 MHz	2.1 parts in 10 ⁸	Counter slaved to HP 105B quartz oscillator reference frequency

IV. Thermodynamics

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Infrared	(100 to 1000) °C	3 °C	Micron M305
Relative Humidity – Measure	10 % to 95 %	1.4 %	Vaisala HMI 31 w/HMP 35 probe
Temperature – Measuring Equipment	Ambient to 650 °C	0.9 °C	Jofra 650SE dry well

Parameter/Equipment	Range	Best Uncertainty ² (±)	Comments
Temperature – Measure	(-75 to 400) °C	0.026 °C	Hart 5614 PRT HP 3458A Opt 002

¹ This laboratory offers commercial and on-site calibration services.

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, to the environment (if the calibration is performed in the field) and to influences from the circumstances of the specific calibration.

³ On-site calibrations are available for all parameters. 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.

⁴ Where ranges overlap the uncertainty for the overlapping specification will be the lower of the two uncertainties.