



World Class Accreditation

The American Association for Laboratory Accreditation

Accredited Laboratory

A2LA has accredited

MICRO PRECISION CALIBRATION DE MEXICO

Tijuana, Mexico

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 8 January 2009*).

Presented this 31st day of July 2009.





Peter Meyer

President & CEO
For the Accreditation Council
Certificate Number 935.04
Valid to January 31, 2011

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

MICRO PRECISION CALIBRATION DE MEXICO
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CALIBRATION

Valid To: January 31, 2011

Certificate Number: 935.04

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

I. Chemical Quantities

Parameter/Equipment	Range	CMC ² (±)	Comments
Conductivity – Measure	(111 to 1285) mS (1015 to 1408) µS	0.51 µS 0.51 µS	Comparison to standard solutions
pH – Measure	(4, 7, 10) pH unit	0.02 pH unit	Comparison to standard solutions

II. Dimensional

Parameter/Equipment	Range	CMC ^{2,6} (±)	Comments
Calipers & Height Gages	(0.10 to 24) in	(56 + 0.6L) µin	Mitutoyo gage blocks and length rods
Gage Blocks	(0 to 12) in	(56 + 0.6L) µin	P & W labmaster, master gage blocks

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Parameter/Equipment	Range	CMC ^{2,6} (±)	Comments
Cylindrical Plug Gages	(0 to 12) in	(12 + 0.34L) μin	P & W labmaster, master gage blocks
Thread Plug Gage – Major Diameter Pitch Diameter	(0 to 12) in	(5 + 0.6L) μin	P & W labmaster
Ring Gage – Cylindrical, Tapered	(0.02 to 12) in	(11 + 1.5L) μin	P & W labmaster
Indicators – Resolution: 0.00005 in 0.0001 in 0.001 in	(0 to 1) in (0 to 2) in (0 to 8) in	46 μin 92 μin 870 μin	P & W labmaster, master gage blocks
End Measuring Rods	(0 to 12) in	(5 + 0.6L) μin	P & W labmaster, master gage blocks
Pin Gage – Diameter	(0.02 to 2.00) in	75 μin	P & W labmaster, master gage blocks
Micrometers – Resolution: 100 μin 50 μin	(0.10 to 12) in	(54 + 3L) μin (28 + 2L) μin	Mitutoyo gage blocks
Pitch Diameter, External Threads	(0.10 to 4.00) in	(26 + 10L) μin	Supermicrometer and thread wires (three wire method)

III. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2, 4, 5, 7} (\pm)	Comments
DC Voltage ³ – 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	11 μ V/V + 0.6 μ V 10 μ V/V + 1.0 μ V 11 μ V/V + 3.5 μ V 10 μ V/V + 6.5 μ V 11 μ V/V + 80 μ V 13 μ V/V + 500 μ V	Fluke 5700A
	(0 to 330) mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V (330 to 1100) V	20 μ V/V + 1 μ V 11 μ V/V + 2 μ V 12 μ V/V + 20 μ V 18 μ V/V + 150 μ V 18 μ V/V + 1500 μ V	Fluke 5520A
	High Voltage	Up to 10 kV	1.3 %
DC Voltage ³ – Measure	(0 to 100) mV 100 mV to 1V (1 to 10) V (10 to 100) V (100 to 1000) V	13 μ V/V + 3.0 μ V 17 μ V/V + 0.3 μ V 13 μ V/V + 0.5 μ V 15 μ V/V + 30 μ V 27 μ V/V + 100 μ V	HP 3458A
	High Voltage	(1 to 20) kV	0.1 %
DC Current ³ – Generate	(0 to 220) μ A 220 μ A to 22 mA (22 to 220) mA 220 mA to 2.2 A (2.2 to 11) A	50 μ A/A + 8 nA 50 μ A/A + 8 nA 50 μ A/A + 80 nA 60 μ A/A + 0.8 μ A 80 μ A/A + 25 μ A	Fluke 5700A
	(0 to 330) μ A 330 μ A to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 3 A (3 to 10) A (11 to 20.5) A	0.15 mA/A + 20 nA 0.1 mA/A + 50 nA 0.1 mA/A + 0.25 μ A 0.1 mA/A + 2.5 μ A 0.38 mA/A + 40 μ A 0.50 mA/A + 500 μ A 1.0 mA/A + 750 μ A	Fluke 5520A

Parameter/Equipment	Range	CMC ^{2, 4, 5, 7} (\pm)	Comments
DC Current ³ – Measure	Up to 100 nA	35 μ A/A + 400 μ A	HP 3458A
	100 nA to 1 μ A	25 μ A/A + 40 μ A	
	(1 to 10) μ A	25 μ A/A + 10 μ A	
	(10 to 100) μ A	25 μ A/A + 5 μ A	
	100 μ A to 10 mA	25 μ A/A + 5 μ A	
	(10 to 100) mA	40 μ A/A + 5 μ A	
	100 mA to 1 A	0.012 % + 10 μ A	
	(1 to 1000) A	0.55 %	Fluke 5520A with current coil
	(1 to 10) A	0.12 %	Shunt monitored with multimeter
	(1 to 100) A	0.12 %	
	(100 to 300) A	0.12 %	
Resistance ³ – Generate	Up to 11 Ω	0.12 % + 0.008 Ω	Fluke 5520A
	(11 to 33) Ω	0.17 %	
	(33 to 110) Ω	0.018 %	
	(110 to 330) Ω	0.024 %	
	(0.33 to 1.1) k Ω	0.009 % + 0.06 Ω	
	(1.1 to 3.3) k Ω	0.024 %	
	(3.3 to 11) k Ω	0.009 % + 0.6 Ω	
	(11 to 33) k Ω	0.012 %	
	(33 to 110) k Ω	0.011 % + 6 Ω	
	(110 to 330) k Ω	0.013 %	
	0.33 k Ω to 1.1 M Ω	0.015 % + 55 Ω	
	(1.1 to 3.3) M Ω	0.019 %	
	(3.3 to 11) M Ω	0.016 %	
	(11 to 33) M Ω	0.041 %	
	(33 to 110) M Ω	0.058 %	
	(110 to 330) M Ω	0.37 %	
	330 M Ω to 1.1 G Ω	1.8 %	
	100 M Ω to 1 G Ω	0.58 %	HRRS-B Decade Resistance
Fixed Points	1 Ω	0.013 %	Fluke 5700A w/ option 03
	10 Ω	39 parts in 10 ⁶	
	100 Ω	24 parts in 10 ⁶	
	1 k Ω	18 parts in 10 ⁶	
	10 k Ω	17 parts in 10 ⁶	
	100 k Ω	19 parts in 10 ⁶	
	1 M Ω	27 parts in 10 ⁶	
	10 M Ω	54 parts in 10 ⁶	
	100 M Ω	0.016 %	

Parameter/Equipment	Range	CMC ^{2, 4, 5, 7} (±)	Comments
Resistance ³ – Measure	(0 to 10) Ω (10 to 100) Ω 100 Ω to 100 kΩ 100 k Ω to 1 MΩ (1 to 10) MΩ (10 to 100) MΩ 100 MΩ to 1 GΩ	19 parts in 10 ⁶ + 0.06 mΩ 13 parts in 10 ⁶ + 0.6 mΩ 10 parts in 10 ⁶ + 0.6 mΩ 15 parts in 10 ⁶ + 2.4 Ω 59 parts in 10 ⁶ + 120 Ω 0.058 % + 1200 Ω 1.8 % + 10 kΩ	HP 3458A
Electrical Calibration of Thermocouple Indicators ³ –			
Type E	-250 °C to -100 °C -100 °C to 650 °C 650 to 1000 °C	0.56 °C 0.54 °C 0.53 °C	Fluke 5520A
Type J	-210 °C to -100 °C -100 °C to 760 °C 760 °C to 1200 °C	0.48 °C 0.45 °C 0.43 °C	
Type K	-200 °C to -100 °C -100 °C to 120 °C 120 °C to 1000 °C 1000 °C to 1372 °C	0.48 °C 0.44 °C 0.46 °C 0.47 °C	
Type S	0 °C to 250 °C 250 °C to 1400 °C 1400 °C to 1767 °C	0.48 °C 0.47 °C 0.54 °C	
Type T	-250 °C to -150 °C -150 °C to 0 °C 0 °C to 400 °C	0.56 °C 0.52 °C 0.58 °C	
Inductance – Generate			
Fixed Points (@ 1 kHz)	1.0 mH 20 mH 200 mH 1 H	0.054 % 0.065 % 0.059 % 0.075 %	Genrad 1482 series

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of RTD Indicating Systems ³ –			
Pt 395, 100 Ω	-200 °C to 0 °C 0 °C to 100 °C 100 °C to 400 °C 400 °C to 630 °C 630 °C to 800 °C	0.05 °C 0.07 °C 0.10 °C 0.12 °C 0.23 °C	Fluke 5520A
Pt 3926, 100 Ω	-200 °C to 0 °C 0 °C to 100 °C 100 °C to 400 °C 400 °C to 630 °C	0.05 °C 0.07 °C 0.10 °C 0.12 °C	
Pt 3916, 100 Ω	-200 °C to -190 °C -190 °C to 0 °C 0 °C to 300 °C 300 °C to 600 °C 600 °C to 630 °C	0.25 °C 0.05 °C 0.08 °C 0.10 °C 0.23 °C	
Pt 385, 200 Ω	-200 °C to 100 °C 100 °C to 260 °C 260 °C to 600 °C 600 °C to 630 °C	0.04 °C 0.05 °C 0.14 °C 0.16 °C	
Pt 385, 500 Ω	-200 °C to 100 °C 100 °C to 260 °C 260 °C to 600 °C 600 °C to 630 °C	0.05 °C 0.06 °C 0.09 °C 0.11 °C	
Pt 385, 1 kΩ	-200 °C to 100 °C 100 °C to 260 °C 260 °C to 600 °C 600 °C to 630 °C	0.03 °C 0.05 °C 0.07 °C 0.23 °C	
PtNi 385, 100 Ω	-80 °C to 100 °C 100 °C to 260 °C	0.08 °C 0.14 °C	
Cu 427, 10 Ω	-100 °C to 260 °C	0.3 °C	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage ³ – Generate			
(0 to 220) mV	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz 100 kHz to 1 MHz	0.055 % + 13 μV 0.021 % + 8 μV 0.011 % + 8 μV 0.037 % + 8 μV 0.085 % + 25 μV 0.34 % + 80 μV	Fluke 5700A w/option 03
220 mV to 2.2 V	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz 100 kHz to 1 MHz	0.05 % + 80 μV 0.016 % + 25 μV 75 μV/V + 6 μV 0.012 % + 16 μV 0.025 % + 70 μV 0.22 % + 850 μV	
(2.2 to 22) V	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz 100 kHz to 1 MHz	0.05 % + 0.8 mV 0.016 % + 0.25 mV 75 μV/V + 0.06 mV 0.012 % + 0.16 mV 0.025 % + 0.35 mV 0.34 % + 8.5 mV	
(22 to 220) V	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz 100 kHz to 1 MHz	0.05 % + 8 mV 0.016 % + 2.5 mV 80 μV/V + 0.8 mV 0.022 % + 3.5 mV 0.05 % + 8 mV 0.27 % + 190 mV	
(220 to 750) V	(30 to 50) kHz (50 to 100) kHz	0.06 % + 11 mV 0.23 % + 45 mV	
(220 to 1100) V	(15 to 50) Hz 50 Hz to 1 kHz	0.04 % + 16 mV 90 μV/V + 4 mV	
(0 to 33) mV	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	80 μV/V + 6 μV 0.015 % + 6 μV 0.02 % + 6 μV 0.1 % + 6 μV 0.35 % + 12 μV 0.8 % + 50 μV	

Parameter/Range	Frequency	CMC ^{2, 4, 5} (\pm)	Comments
AC Voltage ³ (cont.) – Generate			
(33 to 330) mV	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.03 % + 8 μ V 0.015 % + 8 μ V 0.016 % + 8 μ V 0.035 % + 8 μ V 0.08 % + 32 μ V 0.2 % + 70 μ V	Fluke 5520A
330 mV to 3.3 V	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.03 % + 50 μ V 0.015 % + 60 μ V 0.019 % + 60 μ V 0.03 % + 50 μ V 0.07 % + 130 μ V 0.24 % + 600 μ V	
(3.3 to 33) V	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.03 % + 650 μ V 0.015 % + 600 μ V 0.024 % + 600 μ V 0.035 % + 600 μ V 0.09 % + 1600 μ V	
(33 to 330) V	45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.019 % + 2000 μ V 0.02 % + 6000 μ V 0.025 % + 6000 μ V 0.03 % + 6000 μ V 0.09 % + 50 000 μ V	
(330 to 1100) V	45 Hz to 10 kHz	0.03 % + 10 000 μ V	
AC Voltage ³ – Measure			
Up to 10 mV	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.03 % + 3 μ V 0.02 % + 2 μ V 0.03 % + 2 μ V 0.12 % + 2 μ V 0.58 % + 2 μ V 4.6 % + 2 μ V	HP 3458A, synchronous sub-sampled mode
10 mV to 10 V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz (1 to 2) MHz	80 μ V/V + 0.4 mV 80 μ V/V + 0.2 mV 0.02 % + 0.2 mV 0.03 % + 0.2 mV 0.09 % + 0.2 mV 0.35 % + 1 mV 1.2 % + 1 mV 1.7 % + 1 mV	

Parameter/Range	Frequency	CMC ^{2, 5, 7} (±)	Comments
AC Voltage ³ (cont.) – Measure			
(10 to 100) V	(1 to 40) Hz 40 Hz to 1 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz	0.02 % + 4 mV 0.02 % + 2 mV 0.04 % + 2 mV 0.14 % + 2 mV 0.46 % + 10 mV 1.7 % + 10 mV	HP 3458A, synchronous sub-sampled mode
(100 to 1000) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.05 % + 40 mV 0.05 % + 20 mV 0.07 % + 20 mV 0.14 % + 20 mV 0.35 % + 20 mV	
(1 to 15) kV	Up to 1 kHz	1 %	Vitrek 4600A
AC Current ³ – Generate			
(1 to 220) µA 220 µA to 22 mA (22 to 220) mA 220 mA to 2.2 A	40 Hz to 1 kHz	0.09 % 0.024 % 0.026 % 0.093 %	Fluke 5700A w/option 03
(1 to 1000) A	60 Hz	0.54 %	Fluke 5520A with current coil
AC Current ³ – Measure			
Up to 100 µA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz	0.46 % + 0.03 µA 0.18 % + 0.03 µA 0.078 % + 0.03 µA	HP 3458A
100 µA 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 0.073 % + 20 µA 0.042 % + 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 0.19 % + 200 µA 0.10 % + 200 µA 0.12 % + 200 µA	

Parameter/Range	Frequency	CMC ^{2,4,7} (±)	Comments
Capacitance ³ – Generate (0.19 to 3.3) nF (3.3 to 330) nF 330 nF to 3.3 μF (3.3 to 33) μF (33 to 330) μF (330 μF to 3.3 mF) (3.3 to 33) mF (33 to 110) mF (0.97 to 10) μF	50 Hz to 1 kHz 50 Hz to 300 Hz 60 Hz to 1 kHz	0.5 % + 0.01 nF 0.25 % + 0.3 nF 0.25 % + 3 nF 0.4 % + 30 nF 0.45 % + 0.3 μF 0.45 % + 3 μF 0.75 % + 30 μF 1.1 % + 100 μF 0.097 %	Fluke 5520A Capacitance decade HACS-Z-A-4E
Oscilloscope ³ – Level Sine Amp 50 kHz ref. Level Sine Flatness 5 mV to 5.5 V relative to 50 kHz reference Square Wave 1 MΩ, 100 Hz 50 Ω, 1 kHz Time Marker Output Into 50 Ω Pulse Rise Time 0.5 V, 1 V _(p-p) 1 V _(p-p)	5 mV to 5 V (V _(p-p)) 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz 1 mV to ± 130 V ± 1 mV to ± 6.6 V 2 ns to 20 ms 50 ms to 5 s 10 MHz 1 MHz	2 % + 300 μV 3.5 % + 300 μV 4 % + 300 μV 6 % + 300 μV 0.1 % + 40 μV 0.25 % + 40 μV (25 + 1000t) parts in 10 ⁶ 25 parts in 10 ⁶ 100 ps 100 ps	Fluke 5520A/SC600 <i>t</i> is the time in seconds Fluke 5520A/SC600

VI. Electrical – RF/Microwave

Parameter/Range	Frequency	CMC ² (±)	Comments
RF Tuned Power – Generate, Connector Type N, (0 to -100) dB	Up to 1.3 GHz Up to 18 GHz	0.40 dB 0.72 dB	HP 8902A w/HP11722A HP 11793A

Parameter/Range	Frequency	CMC ^{2,7} (±)	Comments
RF Absolute Power – Generate Connector Type N 50 MHz to 18 GHz	(-30 to -20) dB (-20 to 10) dB (10 to 20) dB	0.06 dB 0.068 dB 1.2 dB	HP 437B 8484A 8482A
Amplitude Modulation – Measure Rate: 150 kHz to 10 MHz Depth: (5 to 99) % Rate: 10 MHz to 1.3 GHz Depth: (5 to 99) %	50 Hz to 10 kHz 20 Hz to 100 kHz 50 Hz to 50 kHz 20 Hz to 100 kHz	4.0 % 4.6 % 3.6 % 4.6 %	HP 8902A
Frequency Modulation – Measure Rate: 250 kHz to 10 MHz Dev: ≤ 40 kHz Rate: 10 MHz to 1.3 GHz Dev: ≤ 400 kHz	20 Hz to 10 kHz 20 Hz to 200 kHz 50 Hz to 100 kHz	3.1 % 7.7 % 1.6 %	HP 8902A
Phase Modulation – Measure Rate: 10 MHz to 1.3 GHz	200 Hz to 20 kHz	7.0 %	HP 8902A

V. Fluid Quantities

Parameter/Equipment	Range	CMC ^{2,7} (±)	Comments
Viscosity – @ 25 °C	(1990 to 200 400) cP	0.52 %	Cannon viscosity standards

Parameter/Equipment	Range	CMC ^{2,7} (±)	Comments
Flow – Air	(10 to 300) ml/min 100 ml/min to 10 L/min 500 ml/min to 50 L/min	1.3 % 2.2 % 1.7 %	Bios DC-LC-1 Bios DC-MC-1 Bios DC-HC-1

VI. Mechanical

Parameter/Equipment	Range	CMC ^{2,7} (±)	Comments
Indirect Verification of Rockwell Hardness Testers ³	HRC: 26.37 52.78 HR15N: 69.67 85.25 HR15T: 73.34 88.14 HRB: 49.15	1.0 HRC 1.0 HRC 1.0 HR15N 1.0 HR15N 1.0 HR15T 1.0 HR15T 1.5 HRB	ASTM E18-05e1
Pressure	(-15 to 30) psi Up to 1000 psi Up to 10000 psi	0.10 % 0.09 % 0.10 %	Fluke 725, Fluke 700PV4, Fluke 700P08, Fluke 700P31
Torque	(16 to 160) in·oz (0 to 100) in·lb (50 to 500) ft·lb	0.77 % 0.65 % 0.71 %	Torque transducer, BTSX 16oz torque analyzer, S-100 torque transducer, BTSX 500F
Tension & Compression	Up to 10 000 lb	0.53 %	Load Cell

Parameter/Equipment	Range	CMC ^{2,7} (±)	Comments
Mass	Up to 500 mg Up to 500 g	0.015 % 0.019 %	Double substitution NIST handbook 44 using Class 1 weights
	Up to 1200 lb	0.30 %	NIST handbook 44 using Class F weights

V. Optical Quantities

Parameter/Equipment	Range	CMC ^{2,7} (±)	Comments
Fiber Optics – Measure 1310 nm 1550 nm	(10 to -60) dB	4.9 % 4.9 %	Exfo optical calibration system

VI. Thermodynamics

Parameter/Equipment	Range	CMC ² (±)	Comments
Humidity – Measuring Equipment	11 % RH 33 % RH 75.4 % RH 97 % RH	1.6 % RH 1.7 % RH 1.5 % RH 2 % RH	Standard salt solutions
Temperature – Measuring Equipment	(0 to 300) °C	0.33 °C	Hart 9100
Temperature – Measure	(-20 to 200) °C	1.0 °C	DP 97

VII. Time & Frequency

Parameter/Equipment	Range	CMC ² (±)	Comments
Frequency ³ – Measure	Up to 26.5 GHz	5 parts in 10 ¹¹	EIP 548A, HP 53132 ^a , BALL Rubidium frequency standard

¹ This laboratory offers commercial calibration service and field calibration service.

² Calibration and Measurement Capability (CMC) 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 or nearly ideal measuring equipment. Calibration and Measurement Capabilities represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

³ Field calibration service is available for this calibration and this laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found 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 actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

⁴ The measurands stated are generated with the Fluke 5500A, Fluke 5700A and 5520A series of instruments. This capability is suitable for the calibration of the devices intended to measure the stated measurand in the ranges indicated. CMCs are expressed as either a specific value that covers the full range or as a fraction of the reading plus a fixed floor specification.

⁵ The measurands stated are measured with the HP 3458A series of instruments. This capability is suitable for the calibration of the devices intended to generate the measurand in the ranges indicated. CMCs are expressed as either a specific value that covers the full range or as a combination of the fraction of the reading/output plus a range specification.

⁶ In the statement of CMC, L is the numerical value of the nominal length of the device measured in inches. In the statement of CMC, R is the numerical value of the resolution of the device in microinches. Pitch diameter is measured by the three-wire method.

⁷ In the statement of CMC, the value is defined as the percentage of reading.