

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

PHOENIX CALIBRATION
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CALIBRATION

Valid To: October 31, 2012

Certificate Number: 3022.01

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

I. Acoustical Quantities

Parameter/Equipment	Range	CMC ² (±)	Comments
Sound Level / Acoustical Calibrator	(0 to 114) dB	0.61 dB	Sound level calibrator, Genrad 1986

II. Chemical

Parameter/Equipment	Range	CMC ² (±)	Comments
Conductivity – Fixed Points	46.7 µS 229 µS 445 µS 1417 µS 3900 µS 16.63 ms	0.72 µS 3.6 µS 6.9 µS 22 µS 61 µS 260 µS	Conductivity standard solution
pH	4.00 pH unit 7.00 pH unit 10.00 pH unit	0.016 pH 0.019 pH 0.017 pH	pH buffer solution PH Meter Fisher XL20 Accumet



Parameter/Equipment	Range	CMC ² (±)	Comments
Turbidity	<0.1 NTU 20 NTU 100 NTU 200 NTU 800 NTU 1000 NTU	0.002 NTU 0.48 NTU 2.4 NTU 4.8 NTU 20 NTU 24 NTU	Stabilized Formazin turbidity standard
Viscosity	73.24 KU 98.87 KU 502 cp 4900 cp 58560 cp	0.92 KU 1.3 KU 6.2 cp 58 cp 1300 cp	Viscosity standard fluid

III. Dimensional

Parameter/Equipment	Range	CMC ² (±)	Comments
Gage Blocks	(0 to 0.05) in (0.05 to 4) in	25 μin 25 μin	Gage blocks
Pin Gages	(0.01 to 0.025) in (0.025 to 0.5) in (0.5 to 3) in	94 μin 97 μin 95 μin	Pin gages XX
Calipers	(0 to 8) in (8 to 24) in	0.0008 in 0.0016 in	Gage blocks
Micrometers	(0 to 2) in (2 to 6) in (6 to 20) in	0.00008 in 0.0006 in 0.006 in	Gage blocks
Dial Indicators	(0 to 6) in	0.00008 in	Gage blocks
Surface Plate Flatness	Up to 60 in x 60 in	0.0009 in	Granite planeator- grade AA

Parameter/Equipment	Range	CMC ² (±)	Comments
Rulers & Tapes	(0 to 96) in	0.0082 in	Gage blocks

IV. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ² (±)	Comments
DC Current – Generate	(0 to 220) μ A 220 μ A to 2.2 mA (2.2 to 22) mA	9.1 μ A 8.1 μ A 11 μ A	Fluke 5720A
	(22 to 220) mA 220 mA to 2.2 A (2.2 to 5) A	15 μ A 0.22 mA 0.082 A	Fluke 5720A / 5725A
	(5 to 10) A	0.082 A	Fluke 5720A / 5220A
DC Current – Measure	(0 to 1) μ A (1 to 10) μ A (10 to 100) μ A (0.1 to 1) mA (1 to 10) mA (10 to 100) mA (0.1 to 1.1) A	0.00013 μ A 0.00043 μ A 0.0040 μ A 0.036 μ A 0.36 μ A 0.0052 mA 0.15 mA	HP 3458A OPT 002
	(1.1 to 3) A	0.10 A	HP 34401A
DC Current – Generate & Measure, Clamp-On Ammeters Toroidal	(20 to 150) A (150 to 1000) A	1.5 A 6.4 A	Fluke 5720A / Fluke 5725A / Fluke 5220A
DC Voltage – Generate	(0 to 0.22) V (0.22 to 2.2) V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1100) V	6.5 μ V 14 μ V 48 μ V 95 μ V 1.4 mV 8.8 mV	Fluke 5720A / 5725A

Parameter/Equipment	Range	CMC ² (±)	Comments
DC Voltage – Measure	(0 to 0.1) V (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1000) V	0.44 μV 17 μV 0.17 mV 1.7 mV 17 mV	HP 3458A OPT 002
DC High Voltage – Measure	(1 to 40) kV	0.97 kV	Fluke 80k-40 / HP 3458A OPT 002
Resistance – Generate, Fixed Points	0 Ω 1 Ω 1.9 Ω 10 Ω 19 Ω 100 Ω 190 Ω 1 kΩ 1.9 kΩ 10 kΩ 19 kΩ 100 kΩ 190 kΩ 1 MΩ 1.9 MΩ 10 MΩ 19 MΩ 100 MΩ	30 μΩ 41 μΩ 120 μΩ 95 μΩ 0.23 mΩ 0.28 mΩ 0.34 mΩ 0.37 mΩ 3 mΩ 4.3 mΩ 21 mΩ 0.1 Ω 0.13 Ω 3.7 Ω 47 Ω 0.5 kΩ 1.9 kΩ 0.21 kΩ	Fluke 5720A
Resistance – Measure, Fixed Points	1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ 100 MΩ	28 μΩ 95 μΩ 290 μΩ 820 μΩ 9.1 mΩ 0.16 Ω 5.5 Ω 520 Ω 8600 Ω	HP 3458A OPT 002
Capacitance	(0 to 0.0005) mF (0.0005 to 0.005) mF (0.005 to 0.05) mF (0.05 to 0.1) mF (0.1 to 0.5) mF (0.5 to 1.5) mF	0.0000065 mF 0.0000088 mF 0.00026 mF 0.00015 mF 0.0007 mF 0.0011 mF	Arco Electronics SS-32

Peter M. Meyer

Parameter/Equipment	Range	CMC ² (±)	Comments
Inductance – Generate & Measure	(1 to 10) mH (10 to 100) mH (0.1 to 1) H (1 to 10) H	0.03 mH 0.15 mH 2.0 mH 11 mH	Decade inductor, Genrad 1490D
Electrical Calibration of Thermocouple Indicators – Generate			
Type B	600 °C to 800 °C 800 °C to 1000 °C 1000 °C to 1820 °C	1.2 °C 1.0 °C 1.0 °C	Fluke 743B
Type C	0 °C to 800 °C 800 °C to 1200 °C 1200 °C to 1800 °C 1800 °C to 2316 °C	1.0 °C 1.0 °C 1.1 °C 1.6 °C	
Type E	-250 °C to -200 °C -200 °C to -100 °C -100 °C to 600 °C 600 °C to 1000 °C	0.72 °C 0.37 °C 0.37 °C 0.26 °C	
Type J	-210 °C to -100 °C -100 °C to 800 °C 800 °C to 1200 °C	0.37 °C 0.26 °C 0.26 °C	
Type K	-200 °C to -100 °C -100 °C to 400 °C 400 °C to 1200 °C 1200 °C to 1372 °C	0.49 °C 0.37 °C 0.37 °C 0.37 °C	
Type L	-200 °C to -100 °C -100 °C to 800 °C 800 °C to 900 °C	0.37 °C 0.26 °C 0.26 °C	
Type N	-200 °C to -100 °C -100 °C to 900 °C 900 °C to 1300 °C	0.72 °C 0.61 °C 0.37 °C	
Type R	-20 °C to 0 °C 0 °C to 100 °C 100 °C to 1767 °C	1.5 °C 1.4 °C 1.1 °C	
Type S	-20 °C to 0 °C 0 °C to 200 °C 200 °C to 1400 °C 1400 °C to 1767 °C	1.5 °C 1.4 °C 1.1 °C 1.2 °C	

Peter Mlynar

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of Thermocouple Indicators – Generate (cont)			
Type T	-250 °C to -200 °C -200 °C to 0 °C 0 °C to 400 °C	1.1 °C 0.49 °C 0.37 °C	Fluke 743B
Type U	-200 °C to 0 °C 0 °C to 600 °C	0.48 °C 0.37 °C	
Electrical Calibration of Thermocouple Indicators – Measure			
Type B	600 °C to 800 °C 800 °C to 1000 °C 1000 °C to 1820 °C	1.6 °C 1.2 °C 1.1 °C	Fluke 743B
Type C	0 °C to 800 °C 800 °C to 1200 °C 1200 °C to 1800 °C 1800 °C to 2316 °C	1.1 °C 1.0 °C 1.4 °C 2.4 °C	
Type E	-250 °C to -200 °C -200 °C to -100 °C -100 °C to 600 °C 600 °C to 1000 °C	1.6 °C 0.60 °C 0.37 °C 0.47 °C	
Type J	-210 °C to -100 °C -100 °C to 800 °C 800 °C to 1200 °C	0.37 °C 0.37 °C 0.60 °C	
Type K	-200 °C to -100 °C -100 °C to 400 °C 400 °C to 1200 °C 1200 °C to 1372 °C	0.84 °C 0.37 °C 0.60 °C 0.84 °C	
Type L	-200 °C to -100 °C -100 °C to 800 °C 800 °C to 900 °C	0.8 °C 0.26 °C 0.60 °C	
Type N	-200 °C to -100 °C -100 °C to 900 °C 900 °C to 1300 °C	1.2 °C 0.61 °C 0.70 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of Thermocouple Indicators – Measure (cont)			
Type R	-20 °C to 0 °C 0 °C to 100 °C 100 °C to 1767 °C	2.8 °C 1.8 °C 1.2 °C	Fluke 743B
Type S	-20 °C to 0 °C 0 °C to 200 °C 200 °C to 1400 °C 1400 °C to 1767 °C	2.8 °C 1.8 °C 1.1 °C 1.4 °C	
Type T	-250 °C to -200 °C -200 °C to 0 °C 0 °C to 400 °C	2.1 °C 0.72 °C 0.37 °C	
Type U	-200 °C to 0 °C 0 °C to 600 °C	0.72 °C 0.37 °C	

Parameter/Range	Frequency	CMC ² (±)	Comments
AC Current – Generate			
(0 to 220) µA	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	84 µA 81 µA 77 µA 77 µA 130 µA 340 µA	Fluke 5720A
(0.22 to 2.2) mA	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	110 µA 51 µA 120 µA 50 µA 79 µA 220 µA	
(2.2 to 22) mA	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	83 µA 60 µA 55 µA 58 µA 95 µA 220 µA	

Parameter/Range	Frequency	CMC ² (±)	Comments
AC Current – Generate (cont)			
(22 to 220) mA	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	96 µA 89 µA 68 µA 61 µA 97 µA 370 µA	Fluke 5720A
(0.22 to 2.2) A	(0 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.71 mA 1.3 mA 18 mA 18 mA	
(2.2 to 5) A	(0 to 1) kHz	6.9 mA	Fluke 5720A / 5220A
(5 to 10) A	(0 to 1) kHz	0.013 A	
AC Current – Measure			
(0 to 10) µA	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz	0.053 µA 0.050 µA 0.022 µA 0.013 µA 0.013 µA	HP 3458A OPT 002
(10 to 100) µA	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz	0.050 µA 0.050 µA 0.021 µA 0.011 µA 0.011 µA	
(0.1 to 1) mA	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	28 µA 28 µA 25 µA 24 µA 24 µA 24 µA	
(1 to 10) mA	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	70 µA 70 µA 41 µA 27 µA 27 µA 31 µA	

Parameter/Range	Frequency	CMC ² (±)	Comments
AC Current – Measure (cont)			
(10 to 100) mA	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	470 µA 470 µA 180 µA 38 µA 38 µA 71 µA	HP 3458A OPT 002
(0.1 to 1.05) A	(20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	2.2 mA 1.5 mA 1.5 mA 3.9 mA	
(1.05 to 3) A	(0 to 1) kHz	0.009 A	HP 34401A
AC Voltage – Generate			
(0 to 2.2) mV	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (500 to 1000) kHz	500 µV 730 µV 710 µV 520 µV 710 µV 530 µV 0.10 mV 0.13 mV 0.21 mV 0.24 mV	Fluke 5720A
(2.2 to 22) mV	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (500 to 1000) kHz	120 µV 98 µV 98 µV 72 µV 76 µV 140 µV 220 µV 310 µV 460 µV 530 µV	

Parameter/Range	Frequency	CMC ² (±)	Comments
AC Voltage – Generate (cont)			
(22 to 220) mV	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (500 to 1000) kHz	120 µV 110 µV 71 µV 69 µV 70 µV 96 µV 180 µV 300 µV 420 µV 790 µV	Fluke 5720A
(0.22 to 2.2) V	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (500 to 1000) kHz	1.5 mV 1.1 mV 0.85 mV 0.83 mV 0.84 mV 0.84 mV 0.88 mV 1.5 mV 2.9 mV 4.8 mV	
(2.2 to 22) V	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (500 to 1000) kHz	9.9 mV 8.8 mV 6.4 mV 6.0 mV 6.0 mV 6.2 mV 6.5 mV 9.7 mV 29 mV 43 mV	
(22 to 220) V	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	120 mV 110 mV 86 mV 83 mV 83 mV 85 mV 92 mV	
(220 to 1100) V	(0 to 50) Hz (0.05 to 1) kHz	410 mV 94 mV	

Parameter/Range	Frequency	CMC ² (±)	Comments
AC Voltage – Measure			
(1 to 10) mV	1 Hz to 1 kHz (1 to 20) kHz (20 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz	61 μV 61 μV 61 μV 470 μV 820 μV	HP 3458A OPT 002
(10 to 100) mV	1 Hz to 1 kHz (1 to 20) kHz (20 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz	330 μV 330 μV 330 μV 1600 μV 2.3 mV	
AC Voltage – Measure (cont)			
100 mV to 1 V	1 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	1.3 mV 1.3 mV 1.3 mV 1.3 mV 4.7 mV 13 mV 13 mV	HP 3458A OPT 002
(1 to 10) V	(0 to 10) Hz (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (500 to 1000) kHz	16 mV 12 mV 12 mV 12 mV 12 mV 12 mV 12 mV 12 mV 37 mV 120 mV 120 mV	
(10 to 100) V	1 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	160 mV 150 mV 150 mV 150 mV	
(100 to 750) V	(0 to 1) kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	2.7 V 2.7 V 2.7 V 2.7 V	

Parameter/Range	Frequency	CMC ² (±)	Comments
AC High Voltage – Generate & Measure @ 60 Hz	(1 to 40) kV	1.0 kV	Fluke 80k-40/HP 3458a OPT 002

V. Fluid Quantities

Parameter/Equipment	Range	CMC ² (±)	Comments
Flow – Gas (Air)	(0 to 250) ccm	1.8 % of rdg	Air flow bubble generator – D800286
	(250 to 6000) ccm	1.8 % of rdg	Air flow bubble generator, Gilibrator 2
	(6000 to 30 000) ccm	1.8 % of rdg	DryCal – DCL-H
	(0 to 10) SLPM (10 to 100) SLPM (100 to 200) SLPM	2.9 % of rdg 2.9 % of rdg 2.9 % of rdg	Mass flowmeter TSI - 4043
	(100 to 2000) cfm	5.1 % of rdg	Air Data ADM-860C w/ 8400 flowhood
Flow – Liquid	(30 to 350) L/min	0.3 % of rdg	Emerson Micromotion F200S
Hydrometry – Specific Gravity (Relative Density) Hydrometers and Equivalent Values in Other Hydrometer Scales: Density (Kg/m ³ , Kg/L) Baume Brix Proof	(0.600 to 2.00) SG	0.006 SG	ASTM E126

VI. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Hardness	(0 to 100) duropoints	2.5 duropoints	Durometer test block kit – TBK-A
Balances	(1 to 500) mg (0.5 to 2) g (2 to 5) g (5 to 20) g (20 to 50) g (50 to 200) g (200 to 500) g (500 to 1000)g	0.0026 mg 0.0050 mg 0.0063 mg 0.011 mg 0.022 mg 0.053 mg 0.27 mg 1.8 mg	Standards weights
Scales	(1 to 5) kg (5 to 10) kg (10 to 25) kg	14 mg 18 mg 190 mg	Standards weights
High Capacity Scale	(25 to 500) kg (500 to 100 000) kg	230 mg 18 kg	Standards weights
Velocity – Measure	(5.0000 to 9.9999) rpm (10.000 to 99.999) rpm (100.00 to 999.99) rpm (1000.0 to 9999.9) rpm (10 000 to 99 999) rpm (99 999 to 100 000) rpm (100 000 to 200 000) rpm (200 000 to 300 000) rpm (300 000 to 400 000) rpm (400 000 to 500 00) rpm	0.082 rpm 0.058 rpm 0.084 rpm 0.84 rpm 13 rpm 13 rpm 13 rpm 13 rpm 15 rpm 16 rpm	Optical tachometer TACH-4A
Velocity – Generate	(0 to 30) rpm (30 to 50 000) rpm	0.83 rpm 13 rpm	Monarch NOVA STROBE PBX
Pipettes	(0.5 to 1000) µL (1000 to 10 000) µL	1.2 µL 7.8 µL	Gravimetric record reference to mass balances and ASTM Class 1 Mass Standards

Parameter/Equipment	Range	CMC ² (±)	Comments
Volumetric Ware/ Equipment	(0 to 2500) mL (1 to 5) gal (5 to 50) gal (50 to 100) gal	0.16 mL 0.06 gal 0.3 gal 0.6 gal	Gravimetric record reference to mass balances and mass standards
Torque	(2.5 to 25) in·lb (25 to 100) in·lb (100 to 500) in·lb (500 to 1000) in·lb (1000 to 12 000) in·lb	0.89 in·lb 3.6 in·lb 11 in·lb 25 in·lb 160 in·lb	Mountz BMX-25i Snap On – TDT-1000 Snap On – TDT-1000 Snap On – TDT-1000 Snap On – YA7445
Force – Tension Compression	(0 to 1000) lbf (1000 to 10 000) lbf (10 000 to 100 000) lbf (0 to 1000) lbf (1000 to 10 000) lbf (10 000 to 100 000) lbf (100 000 to 200 000) lbf (200 000 to 500 000) lbf	5.1 lbf 37 lbf 300 lbf 5.1 lbf 37 lbf 300 lbf 610 lbf 840 lbf	Mark 10 SS1000 VMC, VLC-120 Mark 10 SS1000 VMC, VLC-120 LC1011-200K Benwulf 320
Pressure & Vacuum	(0 to 8) inH ₂ O (-14.7 to -8.7) psi (-8.7 to 0) psi (1 to 300) psi (300 to 500) psi (500 to 3000) psi (3000 to 10 000) psi	1.2 inH ₂ O 0.012 psi 0.007 psi 0.1 psi 0.42 psi 2.6 psi 17 psi	Furness Control PPC 500 Druck DPI 605 Druck DPI610 Crystal Engineering 30 Series Omega DGP 4000-10K

Parameter/Equipment	Range	CMC ² (±)	Comments
Weights, Including Laboratory Weights and Masses: ASTM Classes 1, 2, 3, 4, 5, 6 & 7, OIML Classes E2, F1, F2, M1, M2 & M3	(1 to 10) mg (10 to 100) mg (100 to 500) mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg 2 kg 5 kg 10 kg 25 kg	0.0016 mg 0.0024 mg 0.0035 mg 0.0054 mg 0.01 mg 0.013 mg 0.016 mg 0.021 mg 0.045 mg 0.072 mg 0.13 mg 0.27 mg 0.98 mg 4.5 mg 4.9 mg 6.7 mg 86 mg	Methods: NIST weighing designs, standard operating procedures using standard weights, mass comparators

VII. Optical Quantities

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Color	(0 to 0.24) mg/L (0.25 to 0.95) mg/L (0.96 to 1.70) mg/L	0.11 mg/L 0.13 mg/L 0.18 mg/L	Color standard
Refraction	1.3450 nD 1.3600 nD 1.3700 nD 1.3800 nD 1.4000 nD 1.4180 nD 1.4640 nD	0.0003 nD 0.0003 nD 0.0009 nD 0.0005 nD 0.0015 nD 0.0025 nD 0.0016 nD	Refractive index liquids
Transmittance 10% - 20% - 30%	(440 to 635) nm	(0.0027T) nm	Glass filters
Transmittance Density 10% - 20% - 30%	(440.0 to 635.0) nm	(0.0038Abs) nm	Glass filters

VIII. Thermodynamics

Parameter/Equipment	Range	CMC ² (±)	Comments
Temperature ³ – Measuring Equipment	(-70 to 100) °C (100 to 400) °C (400 to 660) °C	0.08 °C 0.15 °C 0.19 °C	Hart 1502A with Rosemount 162CE SPRT
Infrared Temperature	Ambient to 80 °C (80 to 300) °C	1.1 °C 3.8 °C	BB4000
Relative Humidity	(10 to 90) % RH	1.4 % RH	Vaisala MI70 with HMP75 Probe

IX. Time & Frequency

Parameter/Equipment	Range	CMC ² (±)	Comments
Frequency – Fixed Points	(0 to 10) Hz (10 to 15) Hz (15 to 100) Hz (100 to 200) Hz (200 to 500) Hz (500 to 1000) Hz (1000 to 5000) Hz (5000 to 10 000) Hz (10 000 to 150 000) Hz (150 000 to 200 000) Hz (200 000 to 500 000) Hz (500 000 to 1 000 000) Hz	5.8 mHz 5.8 mHz 12 mHz 24 mHz 58 mHz 120 mHz 1.2 Hz 18 Hz 24 Hz 58 Hz 120 Hz 250 Hz	Fluke 5720A
Time	(0 to 86400) s	0.072 s	Chronometer

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 In the statement of CMC, T is the Transmittance and Abs is the Absorbance Density.



World Class Accreditation

The American Association for Laboratory Accreditation

Accredited Laboratory

A2LA has accredited

PHOENIX CALIBRATION

Santo Domingo, Dominican Republic

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 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 6th day of August 2010.





Peter Meyer

President & CEO
For the Accreditation Council
Certificate Number 3022.01
Valid to October 31, 2012

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