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

ACCU-CHECK INSTRUMENT SERVICE, INC.
3160 W. Fair Avenue
Lancaster, OH 43130
Robert Vaughan Phone: 740 654 0500

CALIBRATION

Valid until: July 31, 2018 Certificate Number: 1009.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations[1]:

I. Dimensional

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Gage Blocks	Up to 4 in (4 to 12) in	(2.2 + 1.7*L*) µin (3.2 + 1.0*L*) µin	Pratt & Whitney (P & W) Labmaster™ standard
Pin & Plug Gages, Master Disks	Up to 12 in	(5.2 + 1.5*D*) µin	P & W Labmaster™ universal
Indicators[3]	Up to 6 in	(12 + 0.6*R*) µin (43 + 0.6*R*) µin	Gage blocks Gage calibrator
Height Gages[3]	Up to 48 in	(0.6*R* + 13*L*) µin	Gage blocks
Calipers[3]	Up to 120 in	(0.6*R* + 12.5*L*) µin	Gage blocks & rings
Micrometers[3]	Up to 60 in	(0.6*R* + 13*L*) µin	Gage blocks & pins

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Mic/Length Standards[3]	Up to 54 in	33 µin	Optodyne laser
Ring Gages	(0.02 to 12) in	(4.6 + 1.9*D*) µin	P & W Labmaster™ and master ring gages
Thread Plugs	Up to 12 in	(62 + 1.5*D*) µin	Direct comparison, gage blocks & wires
Optical Comparators[3] –			
Travel X-Y Magnification	Up to 12 in 5x to 100x	140 µin 380 µin	Plug/master balls, angle blocks/glass master
Master Levels	(4 to 18) in	31 µin/in	Surface plate & gage blocks
Distance[3] –			
Length Masters	Up to 20 ft	40 µin	Optodyne laser
Thread Wires[5]	(4 to 120) T.P.I.	8.3 µin	P & W Labmaster™ universal
Optical Flats –			
Flatness	Up to 2 in	2.9 µin	Optical flat & monochromatic light
Optical Parallels –			
Parallelism	Up to 2 in	3.8 µin	P & W Labmaster™
1-2-3 Blocks, Box Parallels	Up to 3 in	31 µin	Transfer box
Protractors	(0 to 360)°	0.02°, 1.1′	Angle blocks

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Steel Rules	Up to 72 in (1800 mm)	(0.0012 +0.0000062*L*) µin	Optodyne laser
Tape Measures	Up to 100 ft	(0.00065 + 0.0000062*L*) µin	Comparison
Taper Gages	Up to 3 in	0.00017 in	Comparator, micrometer
Angle Blocks	(0 to 90)°	24″	Transfer box, sine plate
Radius Gages	Up to 3 in	0.00038 in	Comparator
Straight Edges	Up to 6 ft	98 µin	Transfer box
V-Blocks	Up to 12 in	69 µin	Transfer box, sine plate
Squares	Up to 18 in	84 µin	Square checker, electronic indicator
Cylindrical Squares	Up to 18 in	71 µin	Square checker, electronic indicator
Glass Scales	Up to 48 in	52 µin	P & W Lengthmaster™, Optodyne laser

II. Dimensional Testing[1]

Parameter	Range	CMC[2] (±)	Technique
One Dimensional[9] –			
Length	Up to 6 in	300 µin	Optical comparator
Radius	Up to 6 in	290 µin	
Diameter	Up to 6 in	290 µin	
Center to Center	Up to 6 in	300 µin	
Height	Up to 32 in	88 µin	Micro-Vertex
Angles	(0 to 360)°	5′	

III. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC[2, 6, 10] (±)	Comments
DC Current[3] – Generate	(0 to 329.999) µA (0 to 3.29999) mA (0 to 32.9999) mA (0 to 329.999) mA (0 to 1.09999) A (1.1 to 2.99999) A (0 to 10.9999) A (11 to 20.5) A	0.015 % + 0.023 µA 0.013 % + 0.09 µA 0.01 % + 0.26 mA 0.01 % + 2.6 mA 0.038 % + 70 µA 0.045 % + 75 µA 0.07 % + 300 µA 0.12 % + 375 µA	Fluke 5502A
DC Current – Measure[3]	(0 to 100) µA (0 to 1) mA (0 to 10) mA (0 to 100) mA (0 to 400) mA (0 to 1) A (0 to 3) A (0 to 10) A	0.05 % + 0.026 µA 0.05 % + 0.053 µA 0.05 % + 0.053 µA 0.05 % + 8.2 µA 0.05 % + 0.024 mA 0.05 % + 0.28 mA 0.1 % + 0.74 mA 0.15 % + 9.5 mA	Fluke 8845A
DC Voltage[3] – Generate	(0 to 329.9999) mV (0 to 3.299999) V (0 to 32.99999) V (30 to 329.9999) V (100 to 1020.000) V	0.005 % + 3.5 µV 0.005 % + 15 µV 0.005 % + 150 µV 0.0055 % + 1.5 mV 0.0055 % + 4.1 mV	Fluke 5502A

Parameter/Equipment	Range	CMC[2, 6, 10] (±)	Comments
DC Voltage[3] – Measure	(0 to 100) mv (0 to 1) V (0 to 10) V (0 to 100) V (0 to 1000) V	0.005 % + 6.1 µV 0.004 % + 9.2 µV 0.004 % + 11 µV 0.005 % + 0.38 mV 0.0055 % + 2.1 mV	Fluke 8845A
Resistance[3] – Generate	(0 to 11) Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω 330Ω 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 to 1100) MΩ	0.02 % + 0.56 mΩ 0.017 % + 0.42 mΩ 0.01 % + 1.0 mΩ 0.01 % + 0.8 mΩ 0.009 % + 7.6 mΩ 0.01 % + 16 mΩ 0.009 % + 100 mΩ 0.017 % + 0.44 Ω 0.019 % + 1.0 Ω 0.013 % + 1.2 Ω 0.015 % + 8.0 Ω 0.017 % + 60 Ω 0.062 % + 100 Ω 0.12 % + 1.4 kΩ 0.51 % + 6.0 kΩ 0.5 % + 180 kΩ 1.6 % + 800 kΩ	Fluke 5502A
Resistance[3] – Measure	(0 to 100) Ω 100 Ω to 1 kΩ (1 to 10) kΩ (10 to 100) kΩ 100 kΩ to 1 MΩ (1 to 10) MΩ (10 to 100) MΩ	0.05 % + 2.2 mΩ 0.011 % + 1.0 mΩ 0.012 % + 40 mΩ 0.01 % + 2.0 Ω 0.012 % + 10 Ω 0.045 % + 100 Ω 0.88 % + 10 kΩ	Fluke 8845A
High Voltage[3] – Measure DC Voltage AC Voltage	 (0 to 20) kV (0 to 28) kV	 1.9 % 5.1 %	 Fluke 8845A & Fluke 80K40 high voltage probe

Parameter/Equipment	Range	CMC[2, 6, 10] (±)	Comments
Capacitance – Generate[3]	(3.3 to 11) nF (11 to 33) nF (33 to 110) nF (110 to 330) nF 330 nF to 1.1 µF (1.1 to 3.3) µF (3.3 to 11) µF (11 to 33) µF (33 to 110) µF (110 to 330) µF 330 µf to 1.1 mF (1.1 mf to 3.3) mF (3.3 to 11) mF (11 to 33) mF (33 to 110) mF	0.5 % + 2.6 pF 0.5 % + 44 pF 0.4 % + 24 pF 0.4 % + 0.1 nF 0.4 % + 0.52 nF 0.4 % + 0.4 nF 1.0 % + 0.4 nF 0.5 % + 24 nF 0.6 % + 86 nF 0.65 % + 50 nF 0.6 % + 0.3 µF 0.55 % + 1.0 µF 0.6 % + 1.6 µF 0.85 % + 7.0 µF 1.4 % + 14 µF	Fluke 5502A
Electrical Calibration of Thermocouple Indicators[3] – Type J Type K Type T Type R Type S Type E Type N	 (-274 to 2192) ºF (-184 to 2372) ºF (-184 to 752) ºF (932 to 3092) ºF (1472 to 3200) ºF (-238 to 1832) ºF (-328 to 2372) ºF	 0.64 ºF 0.64 ºF 0.64 ºF 0.64 ºF 0.64 ºF 0.64 ºF 0.64 ºF	 CMART 25 calibrator
Calibration of Thermocouples[3] – Type J,K,T,E,R,S,C,U,N Type J Type K Type T Type R Type S Type E Type C Type U Type N	 32 ºF (91 to 660) ºF (91 to 660) ºF (91 to 400) ºF (91 to 662) ºF (91 to 662) ºF (91 to 662) ºF (91 to 662) ºF (91 to 662) ºF (91 to 662) ºF	 0.56 °F 0.97 °F 0.97 °F 0.97 °F 0.97 °F 0.97 °F 0.97 °F 0.97 °F 0.97 °F 0.97 °F	 Ice bath/precision thermometer CMART 25 calibrator, Fluke 5502A Fluke metrology well CMART 25 calibrator, Fluke 5502A

Parameter/Equipment	Range	CMC[2, 10] (±)	Comments
Oscilloscope[3] –			
DC Gain	(0 to 6.6) V (0 to 130.0) V	0.35 % + 4.0 mV 0.15 % + 7.0 mV	Fluke 5502A/6
Flatness	50 kHz Reference 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz	 2.0 % + 6.6 mV 2.5 % + 2.0 mV 4.3 % + 1.0 mV	
Time Marker	50 ms to 5 s 100 ns to 20 ms (20 to 50) ns 10 ns (2 to 5) ns	0.5 % + 0.2 ms 0.04 % + 0.92 µs 0.016 % + 0.92 ps 0.08 % + 0.92 ps 0.1 % + 0.82 ps	
Standard Amplitude –			
50 Ω @ 10 Hz to 10 kHz	1 mV to 6.6 $V_{(p-p)}$	0.8 % + 1.0 mV	
1 MΩ @ 11 Hz to 10 kHz	1 mV to 130 $V_{(p-p)}$	1.1 % + 4.0 mV	

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
AC Current[3] – Generate			
(29 to 329.99) µA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.2 % + 0.1 nA 0.15 % + 54 nA 0.15 % + 80 nA 0.35 % + 90 nA 0.9 % + 60 nA 0.18 % + 60 nA	Fluke 5502A
(0.33 to 3.29999) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.22 % + 20 nA 0.14 % + 0.12 µA 0.11 % + 24 µA 0.23 % + 0.08 µA 0.53 % + 0.3 µA 1.1 % + 0.4 µA	
(3.3 to 32.9999) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.2 % + 0.2 mA 0.1 % + 3.0 mA 0.057 % + 0.7 mA 0.1 % + 0.8 mA 0.24 % + 1.3 mA 0.4 % + 7.0 mA	
(33 to 329.9999) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.28 % + 4.0 mA 0.11 % + 2.0 µA 0.058 % + 5.0 µA 0.13 % + 8.0 µA 0.26 % + 14 µA 0.55 % + 20 µA	
(0.33 to 1.09999) A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.19 % + 100 µA 0.06 % + 90 µA 0.7 % + 180 µA 2.7 % + 400 µA	
(1.1 to 2.99999) A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.22 % + 80 µA 0.095 % + 85 µA 0.65 % + 850 µA 2.65 % + 3.4 mA	
(3 to 10.9999) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.1 % + 1.0 mA 0.15 % + 0.1 mA 3.0% + 6.0 mA	
(11 to 20.5) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.15 % + 3.6 mA 0.18 % + 2.0 mA 3.0 % + 20 mA	
(20.5 to 1025) A	(45 to 65) Hz (65 to 440) Hz	0.6 % + 0.06 A 0.6 % + 0.04 A	Fluke 5502A w/ coil

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
AC Current – Measure[3]			Fluke 8845A
(0 to 10) mA	(0 to 10) Hz 10 Hz to 5 kHz (5 to 10) kHz	0.4 % + 0.8 µA 0.21 % + 8.0 µA 1.0 % + 6.0 µA	
(10 to 100) mA	(0 to 10) Hz 10 Hz to 5 kHz (5 to 10) kHz	0.41 % + 8.0 µA 0.15 % + 1.0 µA 0.45 % + 28 µA	
(100 to 400) mA	(0 to 10) Hz 10 Hz to 1 kHz (1 to 10) kHz	0.55 % + 120 µA 0.25 % + 60 µA 1.4 % + 200 µA	
(0.4 to 1) A	0 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.36 % + 100 µA 0.15 % + 20 µA 1.0 % + 800 µA	
(1 to 3) A	(0 to 100) Hz 100 Hz to 1 kHz (1 to 10) kHz	0.4 % + 1.2 mA 0.2 % + 1.1 mA 1.6 % + 1.8 mA	
(3 to 10) A	(0 to 100) Hz 100 Hz to 1 kHz	0.25 % + 1.5 mA 1.1 % + 4.0 mA	

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
AC Voltage[3] – Generate			
(1 to 32.999) 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	0.2 % + 8.0 µV 0.15 % + 8.0 µV 0.2 % + 8.0 µV 0.25 % + 11.2 µV 0.45 % + 11 µV 1.2 % + 22 µV	Fluke 5502A
(33.000 to 329.999) 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	0.055 % + 14 µV 0.035 % + 14 µV 0.075 % + 15 µV 0.11 % + 26 µV 0.29 % + 14 µV 0.63 % + 20 µV	
(0.33 to 3.29999) 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	0.053 % + 60 µV 0.034 % + 30 µV 0.075 % + 10 µV 0.11 % + 30 µV 0.24 % + 100 µV 0.55 % + 300 µV	
(3.3 to 32.9999) V	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.055 % + 0.2 mV 0.034 % + 0.3 mV 0.075 % + 0.1 mV 0.11 % + 0.5 mV 0.24 % + 1.2 mV	
(33 to 329.999) V	45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.054 % + 3.0 mV 0.085 % + 7.0 mV 0.095 % + 7.0 mV 0.13 % + 10 mV 0.27 % + 20 mV	
(330 to 1020) V	45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.055 % + 17 mV 0.085 % + 15 mV 0.095 % + 15 mV	

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
AC Voltage[3] – Measure			
(0 to 100) mV	(0 to 10) Hz 10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.45 % + 14 µV 0.1 % + 5.0 µV 0.15 % + 26 µV 0.6 % + 90 µV 4.5 % + 40 µV	Fluke 8845A
(0.1 to 1) V	(0 to 10) Hz 10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.45 % + 20 µV 0.09 % + 28 µV 0.17 % + 40 µV 0.68 % + 40 µV 4.5 % + 600 µV	
(1 to 10) V	(0 to 10) Hz 10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.43 % + 0.2 mV 0.09 % + 0.38 mV 0.15 % + 2.9 mV 0.7 % + 0.8 mV 1.5 % + 32 mV	
(10 to 100) V	(0 to 100) Hz 100Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.39 % + 2.0 mV 0.09 % + 3.8 mV 0.15 % + 30 mV 0.7 % + 6.0 mV	
(100 to 750) V	(0 to 100) Hz 100Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.38 % + 70 mV 0.1 % + 8.0 mV 0.25 % + 70 mV 0.9 % + 40 mV	

IV. Mechanical

Parameter/Equipment	Range	CMC[2] (±)	Comments
Vacuum[3]	(0 to 30) inHg	0.21 % of full scale	Druck 610
Pressure[3] –			
Hydraulic	(30 to 10 000) psi	0.1 % of full scale	Deadweight tester, weights
	(0 to 1000) psi (0 to 5000) psi	0.11 % of full scale 0.1 % of full scale	Druck 610
Pneumatic	(0 to 300) psi	0.08 % of full scale	Druck 610

Parameter/Equipment	Range[7]	CMC[2, 4, 6] (±)	Comments
Force, Load Cells[3]	(0 to 500) lbf (500 to 3000) lbf (3000 to 5000) lbf (5000 to 10 000) lbf	0.14 lbf 0.96 lbf 3.7 lbf 16 lbf	Load cell, DRO, Dillon tension & compression tester, ASTM E74
Torque Wrenches[3]	(10 to 600) ft·lbf (600 to 1000) ft·lbf	0.6 % 0.7 %	Digital torque tester Proto 6190
Scales & Balances[3, 8]	1 mg 2 mg 3 mg 5 mg 10 mg 20 mg 30 mg 50 mg 100 mg 500 mg 1 g 2 g 3 g 5 g 10 g 20 g 30 g 50 g 100 g 200 g 500 g 1 kg 2 kg 3 kg 4 kg 5 kg 6 kg 7 kg 7.4 kg	0.4 µg + 0.6*R* 0.42 µg + 0.6*R* 0.41 µg + 0.6*R* 0.4 µg + 0.6*R* 0.44 µg + 0.6*R* 0.37 µg + 0.6*R* 0.4 µg + 0.6*R* 0.46 µg + 0.6*R* 0.6 µg + 0.6*R* 0.79 µg + 0.6*R* 1.2 µg + 0.6*R* 1.5 µg + 0.6*R* 2 µg + 0.6*R* 3.2 µg + 0.6*R* 6.2 µg + 0.6*R* 5.8 µg + 0.6*R* 6.8 µg + 0.6*R* 9.4 µg + 0.6*R* 16 µg + 0.6*R* 40 µg + 0.6*R* 0.045 mg + 0.6*R* 0.099 mg + 0.6*R* 0.2 mg + 0.6*R* 0.65 mg + 0.6*R* 1.1 mg + 0.6*R* 1.2 mg + 0.6*R* 1.3 mg + 0.6*R* 1.4 mg + 0.6*R* 1.5 mg + 0.6*R*	NIST handbook 44, Class 1 weights NIST Handbook 44, Class C weights

Parameter/Equipment	Range[7]	CMC[2, 4] (±)	Comments
Scales & Balances[3, 8] (cont)	0.125 oz (3.6 g) 0.25 oz (7.1 g) 0.5 oz (14 g) 1 oz (29 g) 2 oz (57 g) 4 oz (0.12 kg) 8 oz (0.22 kg) 1 lb (0.45 kg) 5 lb (2.3 kg) 10 lb (4.5 kg) 20 lb (9.1 kg) 25 lb (11 kg) 50 lb (23 kg) 100 lb (45 kg) 200 lb (91 kg) 300 lb (136 kg) 400 lb (181 kg) 500 lb (227 kg)	0.04 mg + 0.6*R* 0.068 mg + 0.6*R* 0.086 mg + 0.6*R* 0.092 mg + 0.6*R* 0.095 mg + 0.6*R* 0.38 mg + 0.6*R* 0.64 mg + 0.6*R* 6.1 mg + 0.6*R* 21 mg + 0.6*R* 24 mg + 0.6*R* 0.2 g + 0.6*R* 0.2 g + 0.6*R* 0.21 g + 0.6*R* 0.42 g + 0.6*R* 0.84 g + 0.6*R* 1.3 g + 0.6*R* 1.7 g + 0.6*R* 2.1 g + 0.6*R*	NIST Handbook 44, Class C weights Class 6 & 7 weights
Indirect Verification of Rockwell Hardness Testers[3] – Rockwell and Portable Rockwell	HRA: Low Medium High HRBW: Low Medium High HRC: Low Medium High HREW: Low Medium High HRHW: Low High HRMW: Low High	 0.42 HRA 0.41 HRA 0.29 HRA 1.5 HRBW 0.92 HRBW 0.66 HRBW 0.59 HRC 0.51 HRC 0.47 HRC 0.78 HREW 0.81 HREW 0.87 HREW 0.69 HRHW 0.56 HRHW 0.67 HRMW 0.79 HRMW	Indirect verification per ASTM E18, E110

Parameter/Equipment	Range	CMC[2] (±)	Comments
Indirect Verification of Rockwell Hardness Testers[3] – (cont)			
Rockwell & Portable Rockwell	HR15N: Low Medium High HR30N: Low Medium High HR45N: Low Medium High HRRW: Low High HR15TW: Low Medium High HR30TW: Low Medium High HR45TW: Low Medium High HR15WW: Low High	 0.36 HR15N 0.39 HR15N 0.52 HR15N 0.64 HR30N 0.67 HR30N 0.65 HR30N 0.89 HR45N 0.74 HR45N 0.58 HR45N 0.59 HRRW 0.29 HRRW 0.47 HR15TW 0.52 HR15TW 0.53 HR15TW 0.82 HR30TW 0.52 HR30TW 0.48 HR30TW 0.75 HR45TW 0.68 HR45TW 0.53 HR45TW 0.75 HR15WW 0.68 HR15WW	Indirect verification per ASTM E18, E110

Parameter/Equipment	Range	CMC[2] (±)	Comments
Indirect Verification of Rockwell Hardness Testers[3] – (cont)			
Rockwell & Portable Rockwell	HR30WW: Low High HR45WW: Low High HR15YW: Low High HR30YW: Low High HR45YW: Low High	 1.4 HR30WW 0.38 HR30WW 1.54 HR45WW 0.45 HR45WW 0.55 HR15YW 0.36 HR15YW 0.46 HR30YW 0.55 HR30YW 0.51 HR45YW 0.29 HR45YW	Indirect verification per ASTM E18, E110
Indirect Verification of Brinell Hardness Testers at Test Condition(s)[3] –			
HBW 10/500/15 HBW 10/1500/15 HBW 10/3000/15	(16 to 109) HBW (48 to 327) HBW (95.5 to 650) HBW	0.04*d* HBW 0.04*d* HBW 0.04*d* HBW	Indirect verification method per ASTM E10 *d* is the mean of the *n* mean test diameters in millimeters. Uncertainty is stated as a percentage of the standardized test block hardness value.

V. Thermodynamics

Parameter/Equipment	Range	CMC[2] (±)	Comments
Relative Humidity[3]	12.6 % RH 33 % RH 75 % RH 97.6 % RH	2.5 % RH 2.5 % RH 2.5 % RH 2.5 % RH	Comparison to digital meter & saturated salts ASTM E-104
Liquid-In-Glass Thermometers[3]	32 ºF (68 to 662) ºF	0.31 ºF 0.54 ºF	Thermco CT375DIG Fluke 9143
Temperature – Measure & Measuring Equipment[3]	(32 to 750) ºF (30 to 122) ºF (68 to 662) ºF	0.49 ºF 0.40 ºF 0.54 ºF	Thermco CT375DIG Onset UX100 Fluke 9143
Infrared Thermometers[3]	(122 to 932) ºF	0.84 ºF	Fluke 9132

VI. Time & Frequency

Parameter/Equipment	Range	CMC[2, 10] (±)	Comments
Timing Devices[3]	(0 to 3600) s	0.42 s	NIST RP 960-12, digital timing standard
Frequency – Measuring Equipment[3]	(0.01 to 119.99) Hz (120.0 to 1199.9) Hz (1.2 to 11.999) kHz (12.0 to 119.99) kHz (120.0 to 1199.9) kHz (1.2 to 2.000) MHz	0.0055 % + 0.36 mHz 0.0025 % + 1.4 mHz 0.0025 % + 10 mHz 0.0026 % + 20 mHz 0.0025 % + 100 mHz 0.0025 % + 100 mHz	Fluke 5502A

[1] This laboratory offers commercial calibration, dimensional testing and field calibration services.

[2] Calibration and Measurement Capability Uncertainty (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. CMC's 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, L is the length in inches of the unit under test, R is the resolution in inches of the unit under test, D is the diameter in inches of the unit under test.

[5] The uncertainty of the thread wire pertains to a single wire.

[6] In the statement of CMC, the value is defined as the percentage of reading, unless otherwise noted.

[7] Where ranges are not specified, the CMC stated is for the cardinal points only.

[8] The actual uncertainty reported to the client includes the resolution of the UUT in the final uncertainty value.

[9] This test is not equivalent to that of a calibration.

[10] The stated measured values are determined using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure or generate the measured value in the ranges indicated. CMC are expressed as either a specific value that covers the full range or as a fraction/reading of the reading plus a fixed floor specification.

Accredited Laboratory

A2LA has accredited

ACCU-CHECK INSTRUMENT SERVICE, INC.

Lancaster, 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/NCSLI Z540-1-1994 and R205 – *Specific Requirements – Calibration Laboratory Accreditation Program*. 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 4th day of November 2016.

President and CEO
For the Accreditation Council
Certificate Number 1009.01
Valid to July 31, 2018

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