



**SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005  
AND ANSI/NCSL Z540-1-1994 (R2002)**

**Northeast Metrology Corp.**  
4490 Broadway  
Depew, NY 14043  
Basile Korbut 716-827-3770  
nem@nemcal.com

**CALIBRATION**

Valid to: **June 6, 2020**

Certificate Number: **ACT-1116**

**Electrical – DC/Low Frequency**

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
DC Voltage – Source <sup>1,2</sup>	Up to 330 mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V (330 to 1 020) V	7.2 $\mu$ V 55 $\mu$ V 397 $\mu$ V 6 mV 21 mV	Fluke 5520A Multiproduct Calibrator
DC Voltage - Measure <sup>1,2</sup>	Up to 200 mV 200 mV to 2 V (2 to 20) V (20 to 200) V (200 to 1 020) V	7.6 $\mu$ V 37 $\mu$ V 324 $\mu$ V 7 mV 55 mV	Keithley 2002 Multimeter
DC Current - Source <sup>1,2</sup>	Up to 330 $\mu$ A 330 $\mu$ A to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 1.1 A (1.1 to 11) A (11 to 20.5) A	72 nA 377 nA 3.5 $\mu$ A 35 $\mu$ A 474 $\mu$ A 5.1 mA 23 mA	Fluke 5520A Multiproduct Calibrator
DC Current - Source <sup>1,2</sup> Clamp-On Ammeters	(20.5 to 205) A (205 to 1 025) A	208 mA 1 A	Fluke 5520A Multiproduct Calibrator 10 Turn Coil 50 Turn Coil
DC Current - Measure <sup>1,2</sup>	Up to 200 $\mu$ A 200 $\mu$ A to 2 mA (2 to 20) mA (20 to 200) mA 200 mA to 2 A	101 nA 986 nA 10 $\mu$ A 134 $\mu$ A 2.2 mA	Keithley 2002 Multimeter



Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
DC Current - Measure <sup>1,2</sup>	(2 to 10) A	16 mA	Fluke 8846A Multimeter
	(10 to 400) A	8.2 A	
	(400 to 2 000) A	19 A	Fluke 353 Clamp Meter
AC Voltage - Source <sup>1,2</sup>	Up to 33 mV		Fluke 5520A Multiproduct Calibrator
	10 Hz to 10 kHz	15 µV	
	(10 to 20) kHz	14 µV	
	(20 to 50) kHz	101 µV	
	(50 to 100) kHz	135 µV	
	(100 to 500) kHz	304 µV	
	(33 to 330) mV		
	(10 to 45) Hz	128 µV	
	45 Hz to 10 kHz	127 µV	
	(10 to 20) kHz	72 µV	
	(20 to 50) kHz	131 µV	
	(50 to 100) kHz	282 µV	
	(100 to 500) kHz	726 µV	
	330 mV to 3.3 V		
	(10 to 45) Hz	1.2 mV	
	45 Hz to 10 kHz	1.3 mV	
	(10 to 20) kHz	718 µV	
	(20 to 50) kHz	1.1 mV	
	(50 to 100) kHz	2.3 mV	
	(100 to 500) kHz	8.7 mV	
	(3.3 to 33) V		
	(10 to 45) Hz	8.4 mV	
	45 Hz to 10 kHz	13 mV	
	(10 to 20) kHz	9.5 mV	
	(20 to 50) kHz	13 mV	
	(50 to 100) kHz	32 mV	
	(33 to 330) V		
(10 to 45) Hz	112 mV		
45 Hz to 10 kHz	72 mV		
(10 to 20) kHz	95 mV		
(20 to 50) kHz	104 mV		
(50 to 100) kHz	818 mV		
(5 to 10) kHz	72 mV		
(10 to 50) kHz	94 mV		
(330 V to 1 020) V			
45 Hz to 5 kHz	259 mV		
(5 to 10) kHz	320 mV		



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Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Voltage - Measure <sup>1,2</sup>	Up to 200 mV		Keithley 2002 Multimeter
	(20 to 50) Hz	1.6 mV	
	(50 to 100) Hz	206 $\mu$ V	
	100 Hz to 10 kHz	99 $\mu$ V	
	(10 to 30) kHz	111 $\mu$ V	
	(30 to 50) kHz	758 $\mu$ V	
	(50 to 100) kHz	1.9 $\mu$ V	
	(100 to 200) kHz	5.1 mV	
	200 kHz to 2 MHz	13 mV	
	200 mV to 2 V		
	(20 to 100) Hz	2.1 mV	
	100 Hz to 10 kHz	1 mV	
	(10 to 30) kHz	1.1 mV	
	(30 to 50) kHz	7.6 mV	
	(50 to 100) kHz	19 mV	
	(100 to 200) kHz	51 mV	
	200 kHz to 2 MHz	126 mV	
	(2 to 20) V		
	(20 to 50) Hz	37 mV	
	50 Hz to 1 kHz	11 mV	
	(1 to 5) kHz	13 mV	
	(5 to 25) kHz	16 mV	
	(25 to 50) kHz	76 mV	
(50 to 100) kHz	186 mV		
(20 to 200) V			
(20 to 50) Hz	383 mV		
50 Hz to 1 kHz	119 mV		
(2 to 10) kHz	143 mV		
(10 to 30) kHz	167 mV		
(30 to 50) kHz	767 mV		
(50 to 100) kHz	1.9 V		
(200 to 750) V			
(20 to 50) Hz	1.5 V		
50 Hz to 1 kHz	1.1 V		
(2 to 10) kHz	1.2 V		
(10 to 25) kHz	1.4 V		
AC Current – Source <sup>1,2</sup>	29 to 330 $\mu$ A		Fluke 5520A Multiproduct Calibrator
	(20 to 45) Hz	515 nA	
	45 Hz to 1kHz	515 nA	
	(1 to 5) kHz	873 nA	
	(5 to 10) kHz	2.6 $\mu$ A	
	(10 to 30) kHz	3.9 $\mu$ A	



Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Current – Source <sup>1,2</sup>	330 $\mu$ A to 3.3 mA		Fluke 5520A Multiproduct Calibrator
	(20 to 45) Hz	3.2 $\mu$ A	
	45Hz to 1kHz	3.2 $\mu$ A	
	(1 to 5) kHz	5.2 $\mu$ A	
	(5 to 10) kHz	16 $\mu$ A	
	(10 to 30) kHz	17 $\mu$ A	
	3.3 to 33 mA		
	(20 to 45) Hz	16 $\mu$ A	
	45Hz to 1kHz	16 $\mu$ A	
	(1 to 5) kHz	28 $\mu$ A	
	(5 to 10) kHz	67 $\mu$ A	
	(10 to 30) kHz	131 $\mu$ A	
	33 to 330 mA		
	10 to 20 Hz	635 $\mu$ A	
	20 to 45 Hz	160 $\mu$ A	
	45 Hz to 1 kHz	160 $\mu$ A	
	1 to 5 kHz	397 $\mu$ A	
	5 to 10 kHz	753 $\mu$ A	
	10 to 30 kHz	1.5 mA	
	330 mA to 1.1 A		
	10 to 45 Hz	665 $\mu$ A	
	45 Hz to 1 kHz	665 $\mu$ A	
	1 to 5 kHz	7.8 mA	
	5 to 10 kHz	32 mA	
	1.1 to 3 A		
	10 to 45 Hz	1.8 mA	
	45 Hz to 1 kHz	1.8 mA	
1 to 5 kHz	19 mA		
5 to 10 kHz	78 mA		
3 to 11 A			
45 to 100 Hz	8.4 mA		
100 Hz to 1 kHz	12 mA		
1 to 5 kHz	302 mA		
11 to 20.5 A			
45 to 100 Hz	37 mA		
100 Hz to 1 kHz	25 mA		
1 to 5 kHz	622 mA		
AC Current – Source <sup>1,2</sup> Clamp-On Ammeters	(20.5 to 205) A (45 to 440) Hz	370 mA	Fluke 5520A Multiproduct Calibrator, 10 Turn Coil

**Electrical – DC/Low Frequency**

<b>Parameter / Equipment</b>	<b>Range</b>	<b>Expanded Uncertainty of Measurement (+/-)</b>	<b>Reference Standard, Method and/or Equipment</b>
AC Current – Source <sup>1,2</sup> Clamp-On Ammeters	(205 to 1 025) A (45 to 440) Hz	1.5 A	Fluke 5520A Multiproduct Calibrator, 50 Turn Coil
Resistance - Source <sup>1,2</sup>	Up 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 1.1 GΩ	1.7 m Ω 2.5 m Ω 4.6 m Ω 11 m Ω 31 m Ω 111 m Ω 318 m Ω 1.1 Ω 3.2 Ω 12 Ω 36 Ω 495 Ω 321 Ω 972 Ω 62 k Ω 21 k Ω 6.0 m Ω	Fluke 5520A Multiproduct Calibrator
Resistance - Measure <sup>1,2</sup>	Up to 20 Ω (20 to 200) Ω 200 Ω to 2 kΩ (2 to 20) kΩ (20 to 200) kΩ 200 kΩ to 2 MΩ (2 to 20) MΩ (20 to 200) MΩ 200 MΩ to 1 GΩ	1.8 mΩ 8.2 mΩ 41 mΩ 438 mΩ 6.5 Ω 107 Ω 4.3 kΩ 1.9 MΩ 18 MΩ	Keithley 2002 Multimeter
Capacitance - Source <sup>1,2</sup>	330 μF to 1.1 mF (1.1 to 3.3) mF (3.3 to 11) mF (11 to 33) mF (33 to 110) mF 190 pF to 3.3 nF (3.3 to 11) nF (11 to 33) nF (110 to 330) nF 330 nF to 1.1 μF	8.1 μF 25 μF 57 μF 515 μF 1.4 mF 13 pF 38 pF 133 pF 1.1 nF 3.8 nF	Fluke 5520A Multiproduct Calibrator



Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Capacitance - Source <sup>1,2</sup>	(1.1 to 3.3) $\mu$ F (3.3 to 11) $\mu$ F (11 to 33) $\mu$ F (33 to 110) $\mu$ F (110 to 330) $\mu$ F	13 nF 38 nF 164 nF 586 nF 2.5 $\mu$ F	Fluke 5520A Multiproduct Calibrator

Length – Dimensional Metrology

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Gage Blocks	(0.050 to 1) in (1 to 4) in (4 to 20) in	3.3 $\mu$ in 5.4 $\mu$ in 9.9 $\mu$ in	Grade 0 & 00 Gage Blocks, Gage Block Comparator
Bench Micrometer	Up to 1 in lead screw	6.3 $\mu$ in	Grade 0 Gage Blocks, Precision Ball, Oz. Testers
O.D. Micrometer <sup>1</sup>	Up to 24 in	602 $\mu$ in	Grade 0 Gage Blocks
Height Gage <sup>1</sup>	Up to 38 in	79 $\mu$ in	Grade 0 Gage Blocks
Height Master <sup>1</sup>	Up to 12 in	35 $\mu$ in	Grade 0 Gage Blocks, Digital Indicator
Plain Plug Gage <sup>1</sup>	Up to 8 in	16 $\mu$ in	Grade 0 Gage Blocks, P&W Supermicrometer
Plain Ring Gage <sup>1</sup>	(0.04 to 12) in	25 $\mu$ in	Grade 0 Gage Blocks, Ring Gage Comparator
Threaded Plugs <sup>1</sup>	(0.06 to 10) in	28 $\mu$ in	Grade 0 Gage Blocks, P&W Supermicrometer, Thread Wires
Threaded Rings <sup>1</sup>	Up to 10 in	28 $\mu$ in	Set Plugs, Bore Gage
Tapered Pipe Thread Plugs <sup>1</sup>	Up to 4 in	38 $\mu$ in	Thread Wires, Sine Block, Supermicrometer, Height Master, Indicator
Tapered Sine Block <sup>1</sup>	(0.0625 to 3) in	15 $\mu$ in	3/8 Ball, P&W Supermicrometer, Gage Block

**Length – Dimensional Metrology**

<b>Parameter / Equipment</b>	<b>Range</b>	<b>Expanded Uncertainty of Measurement (+/-)</b>	<b>Reference Standard, Method and/or Equipment</b>
Thread Measuring Wire <sup>1</sup>	(4 to 100) TPI	6.1 μin	Class X Cylindrical Roll, P&W Supermicrometer
Micrometer Standard <sup>1</sup>	(1 to 20) in	49 μin	Grade 0 Gage Blocks, P&W Supermicrometer
Caliper <sup>1</sup>	Up to 60 in	0.001 in	Grade 0 Gage Blocks
Test Indicator <sup>1</sup>	Up to 0.06 in	60 μin	Grade 0 Gage Blocks
Plunger Indicator <sup>1</sup>	Up to 2 in	31 μin	Grade 0 Gage Blocks
Optical Comparator <sup>1</sup> Squareness	Up to 18 in	91 μin	Master Square
Linearity	Up to 18 in	107 μin	Optical Magnification Checker, Gage Blocks
Optical Comparator <sup>1</sup> Magnification	10X 20X 31.25X 50X 100X	487 μin	Glass Scale
Surface Plates <sup>1,3</sup> Grades AA, A and B Overall Flatness Local Area Flatness (repeat reading)	Up to 180 in x 240 in	(25 + 0.7DL) μin	Precision Level System Repeat-O-Meter
Squares, Steps, Angle Plates <sup>1</sup>	Up to 18 in	62 μin	Squareness Checker
Angles & Angle Blocks <sup>1</sup>	Up to 90 °	81 μin	Electronic Gage Head, Mu Checker, Sine Bar
Spheres <sup>1</sup>	Up to 1 in	11 μin	Grade 0 Gage Blocks, P&W Supermicrometer



**Mass and Mass Related**

<b>Parameter / Equipment</b>	<b>Range</b>	<b>Expanded Uncertainty of Measurement (+/-)</b>	<b>Reference Standard, Method and/or Equipment</b>
Pressure - Measure <sup>1</sup>	Up to 1 000 psi	3 psi	Heise Gauge
Pressure - Source <sup>1</sup>	Up to 200 psi Up to 1 500 psi Up to 15 000 psi	0.025 psi 3.1 psi 31 psi	Ametek Calibrator Mansfield & Green Deadweight Tester
Weights	Up to 20 g Up to 32 000 g	0.17 mg 4.2 g	Precision Weights Class 1 Mass Comparator Precision Weights Class 1
Scales and Balances <sup>1</sup>	Up to 20 g	0.03 mg	Class 1 Weights
Scales <sup>1</sup>	Up to 1 000 lb	1.3 lb	Class F Weights
Rockwell Hardness Testers <sup>1,4</sup>	(40 to 95) HR15N (20 to 79) HR15T ≥ 80 HR15T ≥ 80 HR15W ≥80 HR15X (85 to 93) HR15Y ≥94 HR15Y (40 to 59) HR30N (60 to 85) HR30N (20 to 49) HR30T (50 to 56) HR30T ≥57 HR30T (40 to 64) HR30W ≥65 HR30W (60 to 78) HR30X ≥79 HR30X (60 to 87) HR30Y ≥88 HR30Y	0.19 HR15N 0.37 HR15T 0.21 HR15T 0.67 HR15W 0.33 HR15X 1.3 HR15Y 0.63 HR15Y 0.55 HR30N 0.28 HR30N 0.9 HR30T 0.66 HR30T 0.39 HR30T 0.9 HR30W 0.76 HR30W 0.99 HR30X 0.15 HR30X 0.82 HR30Y 0.37 HR30Y	Indirect Verification Hardness Test Blocks





Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Rockwell Hardness Testers <sup>1,4</sup>	(10 to 49) HR45N	0.43 HR45N	Indirect Verification Hardness Test Blocks
	(50 to 66) HR45N	0.22 HR45N	
	(67 to 75) HR45N	0.19 HR45N	
	(1 to 39) HR45T	0.73 HR45T	
	≥40 HR45T	0.41 HR45T	
	(10 to 47) HR45W	0.3 HR45W	
	≥48 HR45W	0.13 HR45W	
	(40 to 68) HR45X	0.81 HR45X	
	≥69 HR45X	0.35 HR45X	
	(60 to 81) HR45Y	0.94 HR45Y	
	≥82 HR45Y	0.35 HR45Y	
	(60 to 69) HRA	0.28 HRA	
	(70 to 79) HRA	0.17 HRA	
	(80 to 85) HRA	0.16 HRA	
	Carbide ≥86 HRA	0.16 HRA	
	(1 to 50) HRBW	1.4 HRBW	
	(51 to 79) HRBW	0.87 HRBW	
	≥80 HRBW	0.42 HRBW	
	(20 to 39) HRC	0.4 HRC	
	(40 to 59) HRC	0.36 HRC	
(60 to 70) HRC	0.32 HRC		
(40 to 49) HRD	0.27 HRD		
(50 to 69) HRD	0.26 HRD		
(70 to 80) HRD	0.18 HRD		
≥65 HRE	0.54 HRE		
(40 to 69) HRF	0.54 HRF		
≥70 HRF	0.4 HRF		
(1 to 39) HRG	0.76 HRG		
≥40 HRG	0.3 HRG		



Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Rockwell Hardness Testers <sup>1,4</sup>	(60 to 79) HRH ≥80 HRH	0.54 HRH <sup>5</sup> 0.41 HRH	Indirect Verification Hardness Test Blocks
	(10 to 29) HRK ≥30 HRK	0.64 HRK 0.40 HRK	
	≥90 HRL	0.36 HRL	
	≥70 HRM	0.56 HRM	
	(40 to 84) HRP	0.91 HRP	
	≥85 HRR	0.65 HRR	
	(100 to 119) HRS ≥120 HRS	0.41 HRS 0.24 HRS	
	(110 to 111) HRV ≥112 HRV ≥80 HRV	0.95 HRV 0.2 HRV 0.21 HRV	
Vickers Hardness Testers <sup>1</sup>	HV1 200 HV 400 HV 700 HV	8.7 HV 21 HV 44 HV	Indirect Verification Hardness Test Blocks
	HV2 200 HV 400 HV 700 HV	6.9 HV 16 HV 31 HV	
	HV5 200 HV 400 HV 700 HV	3.9 HV 11 HV 20 HV	
	HV10 200 HV 400 HV 700 HV	3.1 HV 7.7 HV 15 HV	
	HV20 200 HV 400 HV 700 HV	2.5 HV 6.2 HV 11 HV	

**Mass and Mass Related**

<b>Parameter / Equipment</b>	<b>Range</b>	<b>Expanded Uncertainty of Measurement (+/-)</b>	<b>Reference Standard, Method and/or Equipment</b>		
Vickers Hardness Testers <sup>1</sup>	HV30 200 HV 400 HV 700 HV	2 HV 4.4 HV 9.3 HV	Indirect Verification Hardness Test Blocks		
	HV50 200 HV 400 HV 700 HV	1.9 HV 3.5 HV 6.3 HV			
	HV 0.01 400 HV 700 HV	30 HV 40 HV			
	HV 0.025 200 HV 400 HV 700 HV	9 HV 20 HV 30 HV			
	HV 0.05 200 HV 400 HV 700 HV	8.5 HV 19 HV 27 HV			
	HV 0.1 200 HV 400 HV 700 HV	8 HV 18 HV 25 HV			
	HV 0.2 200 HV 400 HV 700 HV	7 HV 17 HV 20 HV			
	HV 0.3 200 HV 400 HV 700 HV	6 HV 16 HV 19 HV			
	HV 0.5 200 HV 400 HV 700 HV	5 HV 15 HV 17 HV			
	Brinell Hardness Testers <sup>1</sup>	HBW 1 / 62.5 (200 to 400) HBW (400 to 600) HBW		2 HBW 4 HBW	Indirect Verification Hardness Test Blocks

**Mass and Mass Related**

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Brinell Hardness Testers <sup>1</sup>	HBW 2.5 / 187.5		Indirect Verification Hardness Test Blocks
	(200 to 400) HBW	2 HBW	
	(400 to 600) HBW	4 HBW	
	HBW 10 / 500		
	(200 to 400) HBW	2 HBW	
	(400 to 600) HBW	4 HBW	
	HBW 5 / 1 000		
	(200 to 400) HBW	2 HBW	
	(400 to 600) HBW	4 HBW	
	HBW 10 / 1 000		
	(200 to 400) HBW	2 HBW	
	(400 to 600) HBW	4 HBW	
	HBW 10 / 1500		
	(200 to 400) HBW	2 HBW	
	(400 to 600) HBW	4 HBW	
	HBW 10 / 2 000		
(200 to 400) HBW	2 HBW		
(400 to 600) HBW	4 HBW		
HBW 10 / 2 500			
(200 to 400) HBW	2 HBW		
(400 to 600) HBW	4 HBW		
HBW 10 / 3 000			
(200 to 400) HBW	2 HBW		
(400 to 600) HBW	4 HBW		
Knoop Hardness Testers <sup>1</sup>	HK 0.01		Indirect Verification Hardness Test Blocks
	400 HK	30 HK	
	700 HK	40 HK	
	HK 0.025		
	200 HK	9 HK	
	400 HK	20 HK	
	700 HK	30 HK	
	HK 0.05		
	200 HK	8.5 HK	
	400 HK	19 HK	
	700 HK	27 HK	
	HK 0.1		
200 HK	8 HK		
400 HK	18 HK		
700 HK	25 HK		



Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment	
Knoop Hardness Testers <sup>1</sup>	HK 0.2		Indirect Verification Hardness Test Blocks	
	200 HK	7 HK		
	400 HK	17 HK		
	700 HK	20 HK		
	HK 0.3			
	200 HK	6 HK		
	400 HK	16 HK		
	700 HK	19 HK		
	HK 0.5			
	200 HK	5 HK		
	400 HK	15 HK		
	700 HK	17 HK		
HK 1				
200 HK	5 HK			
400 HK	10 HK			
700 HK	15 HK			
Torque	(25 to 250) lbf·in (25 to 250) lbf·ft (100 to 1 000) lbf·ft	0.66 % of reading 0.61 % of reading 0.61 % of reading	Norbar Torque Calibrator	
Force Compression and Tension <sup>1</sup>	(0 to 10) lb (0 to 100) lbf	0.12 % of reading + 0.25 lbf 0.12 % of reading + 0.5 lbf	Class F Weights	
	(100 to 1 124) lbf (1 000 to 3 000) lbf (3 000 to 11 240) lbf (10 000 to 20 000) lbf (20 000 to 50 000) lbf	0.06 % of reading 0.048 % of reading 0.048 % of reading 0.002 % of reading 0.002 % of reading	Load Cell	
	Force Compression	(50 000 to 300 000) lbf	0.099 % of reading	Load Cell

Thermodynamic

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Temperature - Measure <sup>1</sup>	(-35 to 200) °C	0.05 °C 0.08 °C	Fluke 1524 Indicator/ Fluke 5627A PRT
Humidity - Measure <sup>1</sup>	(0 to 90) %RH	1.1 %RH	MI70 / HMP77 Temperature/Humidity Indicator



**Time and Frequency**

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Frequency - Measure <sup>1</sup>	(1.1 to 10) Hz (10 to 100) Hz 100 Hz to 1.1 kHz (1.1 to 10) kHz (10 to 100) kHz 100 kHz to 1.1 MHz (1.1 to 10) MHz (10 to 15) MHz	9.5 mHz 582 mHz 370 mHz 58 mHz 36 Hz 370 Hz 577 Hz 6 kHz	Keithley 2002 Multimeter

**DIMENSIONAL MEASUREMENT**

**Dimensional**

Specific Tests and / or Properties Measured	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
3D Dimensional Parts	X = (0 to 25) in Y = (0 to 35) in Z = (0 to 17) in	272 μin 293 μin 264 μin	B&S Bridge Type CMM Customer Drawing PC DMIS S/W

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ( $k=2$ ), corresponding to a confidence level of approximately 95%.

Notes:

1. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope
2. CMC for Electromagnetic - DC/Low Frequency Calibration do not include possible contributions to uncertainty from a "best available" unit under test
3. The use of (DL) signifies the Diagonal Length of the surface plate in feet
4. The following statement is from the NIST recommended practice guide (Special Publication 960-5, page 60, section 8.3.3, paragraph 2) "Currently, there are no generally agreed upon U.S. or international methods for calculating the measurement uncertainty of a Rockwell hardness machine or the uncertainty in the certified value of standardized test blocks."
5. This scope is formatted as part of a single document including Certificate of Accreditation No. ACT-1116.

  
 Vice President