



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

**Premier Scales & Systems, Inc.**

4901 N. St. Joseph Avenue  
Evansville, IN 47720

Nathan Stone 812-422-9838

nstone@premierscales.com www.premierscales.com

**CALIBRATION**

Valid to: **May 17, 2020**

Certificate Number: **AC-1222**

**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>
DC Voltage – Source <sup>1</sup>	Up to 330 mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V (100 to 1 000) V	1.6 μV 16 μV 0.13 mV 1.3 mV 3.1 mV	Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
DC Voltage - Measure <sup>1</sup>	Up to 100 mV 100 mV to 1 V (1 to 10) V (10 to 100) V (100 to 1 000) V	2.4 μV 6.4 μV 0.052 mV 0.67 mV 9.6 mV	Fluke 8846A OEM, GIDEP, Met/Cal Sourced Procedures
DC Current - Source <sup>1</sup>	Up to 330 μA 330 μA to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 1.1 A (1.1 to 3) A (3 to 11) A (11 to 20.5) A	0.014 μA 0.19 μA 0.48 μA 4.4 μA 77 μA 0.31 mA 1.5 mA 23 mA	Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
DC Current - Source for Clamp on Current Meters <sup>1</sup>	(20 to 200) A (200 to 500) A (500 to 1 000) A	0.41 A 1.1 A 2.1 A	Fluke 5520A w/ 50 turn coil. OEM, GIDEP, Met/Cal Sourced Procedures





# ANSI-ASQ National Accreditation Board

## Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current - Measure <sup>1</sup>	Up to 100 $\mu$ A 100 $\mu$ A to 1 mA (1 to 10) mA (10 to 100) mA (100 to 400) mA 400 mA to 1 A (1 to 3) A (3 to 10) A	0.018 $\mu$ A 0.67 $\mu$ A 1.7 $\mu$ A 6.7 $\mu$ A 20 $\mu$ A 0.27 mA 1.1 mA 3.5 mA	Fluke 8846A OEM, GIDEP, Met/Cal Sourced Procedures
Resistance - Source <sup>1</sup>	Up to 11 $\Omega$ (11 to 33) $\Omega$ (33 to 110) $\Omega$ (110 to 330) $\Omega$ (0.33 to 1.1) k $\Omega$ (1.1 to 3.3) k $\Omega$ (3.3 to 11) k $\Omega$ (11 to 33) k $\Omega$ (33 to 110) k $\Omega$ (110 to 330) k $\Omega$ (0.33 to 1.1) M $\Omega$ (1.1 to 3.3) M $\Omega$ (3.3 to 11) M $\Omega$ (11 to 33) M $\Omega$ (33 to 110) M $\Omega$ (110 to 330) M $\Omega$ (330 to 1 100) M $\Omega$	0.67 m $\Omega$ 1.4 m $\Omega$ 1.7 m $\Omega$ 3.4 m $\Omega$ 9.6 m $\Omega$ 38 m $\Omega$ 96 m $\Omega$ 0.39 $\Omega$ 0.99 $\Omega$ 3.8 $\Omega$ 32 $\Omega$ 79 $\Omega$ 0.39 k $\Omega$ 3.5 k $\Omega$ 13 k $\Omega$ 0.29 M $\Omega$ 3.7 M $\Omega$	Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
Resistance - Measure <sup>1</sup>	Up to 10 $\Omega$ (10 to 100) $\Omega$ (0.1 to 1) k $\Omega$ (1 to 10) k $\Omega$ (10 to 100) k $\Omega$ (0.1 to 1) M $\Omega$ (1 to 10) M $\Omega$ (10 to 100) M $\Omega$ (0.1 to 1) G $\Omega$	2 m $\Omega$ 3.6 m $\Omega$ 14 m $\Omega$ 0.14 $\Omega$ 1.4 $\Omega$ 14 $\Omega$ 3.3 k $\Omega$ 60 k $\Omega$ 1.4 M $\Omega$	Fluke 8846A OEM, GIDEP, Met/Cal Sourced Procedures





**ANSI-ASQ National Accreditation Board**

**Electrical – DC/Low Frequency**

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage - Source <sup>1</sup>	(1 to 33) mV		Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
	(10 to 45) Hz	4.7 μV	
	45 Hz to 10 kHz	4.1 μV	
	(10 to 20) kHz	4.2 μV	
	(20 to 50) kHz	4.8 μV	
	(50 to 100) kHz	10 μV	
	(100 to 500) kHz	39 μV	
	(33 to 330) mV		
	(10 to 45) Hz	15 μV	
	45 Hz to 10 kHz	11 μV	
	(10 to 20) kHz	14 μV	
	(20 to 50) kHz	15 μV	
	(50 to 100) kHz	39 μV	
	(100 to 500) kHz	92 μV	
	(0.33 to 3.3) V		
	(10 to 45) Hz	0.12 mV	
	45 Hz to 10 kHz	0.086 mV	
	(10 to 20) kHz	0.09 mV	
	(20 to 50) kHz	0.16 mV	
	(50 to 100) kHz	0.28 mV	
	(100 to 500) kHz	0.93 mV	
	(3.3 to 33) V		
	(10 to 45) Hz	1.2 mV	
	45 Hz to 10 kHz	1.2 mV	
	(10 to 20) kHz	1.7 mV	
	(20 to 50) kHz	1.5 mV	
	(50 to 100) kHz	3.1 mV	
(33 to 330) V			
45 Hz to 1 kHz	8.7 mV		
1 kHz to 10 kHz	9.1 mV		
(10 to 20) kHz	11 mV		
(20 to 50) kHz	12 mV		
(50 to 100) kHz	78 mV		
(330 to 1 020) V			
45 Hz to 1 kHz	73 mV		
(1 to 5) kHz	63 mV		
(5 to 10) kHz	73 mV		





**ANSI-ASQ National Accreditation Board**

**Electrical – DC/Low Frequency**

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage - Measure <sup>1</sup>	Up to 100 mV		Fluke 8846A OEM, GIDEP, Met/Cal Sourced Procedures
	(3 to 5) Hz	0.027 mV	
	(5 to 10) Hz	0.027 mV	
	10 Hz to 20 kHz	0.027 mV	
	(20 to 50) kHz	0.033 mV	
	(50 to 100) kHz	0.053 mV	
	(100 to 300) kHz	0.33 mV	
	100 mV to 1 V		
	(3 to 5) Hz	0.87 mV	
	(5 to 10) Hz	0.43 mV	
	10 Hz to 20 kHz	0.24 mV	
	(20 to 50) kHz	0.41 mV	
	(50 to 100) kHz	0.93 mV	
	(100 to 300) kHz	6 mV	
	(1 to 10) V		
	(3 to 5) Hz	8.7 mV	
	(5 to 10) Hz	4.3 mV	
	10 Hz to 20 kHz	2.4 mV	
	(20 to 50) kHz	4.1 mV	
	(50 to 100) kHz	9.3 mV	
	(100 to 300) kHz	60 mV	
	(10 to 100) V		
	(3 to 5) Hz	87 mV	
	(5 to 10) Hz	43 mV	
10 Hz to 20 kHz	24 mV		
(20 to 50) kHz	41 mV		
(50 to 100) kHz	93 mV		
(100 to 300) kHz	0.6 V		
(100 to 1 000) V			
(3 to 5) Hz	0.82 V		
(5 to 10) Hz	0.38 V		
10 Hz to 20 kHz	0.19 V		
(20 to 50) kHz	0.33 V		
(50 to 100) kHz	0.8 V		
(100 to 300) kHz	5.2 V		





Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current - Source <sup>1</sup>	(29 to 330) $\mu$ A		Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
	(10 to 20) Hz	0.11 $\mu$ A	
	(20 to 45) Hz	0.1 $\mu$ A	
	45 Hz to 1 kHz	0.096 $\mu$ A	
	(1 to 5) kHz	0.16 $\mu$ A	
	(5 to 10) kHz	0.29 $\mu$ A	
	(10 to 30) kHz	0.58 $\mu$ A	
	(0.33 to 3.3) mA		
	(10 to 20) Hz	0.55 $\mu$ A	
	(20 to 45) Hz	0.39 $\mu$ A	
	45 Hz to 1 kHz	0.4 $\mu$ A	
	(1 to 5) kHz	0.61 $\mu$ A	
	(5 to 10) kHz	1.4 $\mu$ A	
	(10 to 30) kHz	2.6 $\mu$ A	
AC Current - Source <sup>1</sup>	(3.3 to 33) mA		Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
	(10 to 20) Hz	5.3 $\mu$ A	
	(20 to 45) Hz	3.3 $\mu$ A	
	45 Hz to 1 kHz	3.2 $\mu$ A	
	(1 to 5) kHz	3.7 $\mu$ A	
	(5 to 10) kHz	7 $\mu$ A	
	(10 to 30) kHz	12 $\mu$ A	
	(33 to 330) mA		
	(10 to 20) Hz	0.055 mA	
	(20 to 45) Hz	0.037 mA	
	45 Hz to 1 kHz	0.03 mA	
	(1 to 5) kHz	0.056 mA	
	(5 to 10) kHz	0.11 mA	
	(10 to 30) kHz	0.22 mA	
	(0.33 to 1.1) A		
	(10 to 45) Hz	0.47 mA	
	45 Hz to 1kHz	0.18 mA	
	(1 to 5) kHz	2 mA	
	(5 to 10) kHz	8.8 mA	
	(1.1 to 3) A		
	(10 to 45) Hz	1.4 mA	
45 Hz to 1kHz	0.6 mA		
(1 to 5) kHz	8 mA		
(5 to 10) kHz	22 mA		



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current - Source <sup>1</sup>	(3 to 11) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz (11 to 20.5) A (45 to 100) Hz 100 Hz to 440 Hz	2.7 mA 3.4 mA 61 mA 17 mA 18 mA	Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
AC Current - Source for Clamp on Current Meters <sup>1</sup>	(20 to 200) A (45 to 440) Hz (200 to 500) A (45 to 200) Hz (500 to 1 000) A (45 to 200) Hz	0.44 A 1.2 A 2.5 A	Fluke 5520A w/ 50 turn coil OEM, GIDEP, Met/Cal Sourced Procedures
AC Current – Measure <sup>1</sup>	Up to 100 µA (3 to 5) Hz (5 to 10) Hz 10 Hz to 5 kHz (5 to 10) kHz 100 µA to 1 mA (3 to 5) Hz (5 to 10) Hz 10 Hz to 5 kHz (5 to 10) kHz (1 to 10) mA (3 to 5) Hz (5 to 10) Hz 10 Hz to 5 kHz (5 to 10) kHz (10 to 100) mA (3 to 5) Hz (5 to 10) Hz 10 Hz to 5 kHz (5 to 10) kHz (100 to 400) mA (3 to 5) Hz (5 to 10) Hz 10 Hz to 1 kHz (1 to 10) kHz	0.29 µA 0.14 µA 0.041 µA 0.47 µA 6 µA 0.74 µA 0.34 µA 1.8 µA 0.12 mA 0.012 mA 0.005 mA 0.049 mA 0.81 mA 0.13 mA 0.23 mA 0.18 mA 0.93 mA 0.49 mA 0.33 mA 2 mA	Fluke 8846A OEM, GIDEP, Met/Cal Sourced Procedures



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment	
AC Current – Measure <sup>1</sup>	400 mA to 1 A		Fluke 8846A OEM, GIDEP, Met/Cal Sourced Procedures	
	(3 to 5) Hz	5.3 mA		
	(5 to 10) Hz	1.7 mA		
	10 Hz to 5 kHz	0.53 mA		
	(5 to 10) kHz	5.6 mA		
	(1 to 3) A			
	(3 to 5) Hz	8.5 mA		
	(5 to 10) Hz	3.5 mA		
	10 Hz to 5 kHz	2.3 mA		
	(5 to 10) kHz	16 mA		
	(3 to 10) A			
	(3 to 5) Hz	26 mA		
	(5 to 10) Hz	11 mA		
	10 Hz to 5 kHz	7.3 mA		
(5 to 10) kHz	54 mA			
Capacitance – Source <sup>1</sup>	10 Hz to 10 kHz	(0.19 to 0.40) nF	0.0073 nF	Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
	10 Hz to 10 kHz	(0.40 to 1.1) nF	0.009 9 nF	
	10 Hz to 3 kHz	(1.1 to 3.3) nF	0.012 nF	
	10 Hz to 1 kHz	(3.3 to 11) nF	0.06 nF	
	10 Hz to 1 kHz	(11 to 33) nF	0.12 nF	
	10 Hz to 1 kHz	(33 to 110) nF	0.6 nF	
	10 Hz to 1 kHz	(110 to 330) nF	0.69 nF	
	(10 to 600) Hz	(0.33 to 1.1) μF	0.006 1 μF	
	(10 to 300) Hz	(1.1 to 3.3) μF	0.006 9 μF	
	(10 to 150) Hz	(3.3 to 11) μF	0.059 μF	
	(10 to 120) Hz	(11 to 33) μF	0.076 μF	
	(10 to 80) Hz	(33 to 110) μF	0.60 μF	
	Up to 50 Hz	(110 to 330) μF	0.78 μF	
	Up to 20 Hz	(0.33 to 1.1) mF	0.006 mF	
	Up to 6 Hz	(1.1 to 3.3) mF	0.012 mF	
	Up to 2 Hz	(3.3 to 11) mF	0.061 mF	
	Up to 0.6 Hz	(11 to 33) mF	0.14 mF	
	Up to 0.2 Hz	(33 to 110) mF	0.38 mF	



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Capacitance – Measure <sup>1</sup>	Up to 1 nF (1 to 10) nF (10 to 100) nF (0.1 to 1) μF (1 to 10) μF (10 to 100) μF (0.1 to 1) mF (1 to 10) mF (10 to 100) mF	0.017 nF 0.041 nF 0.4 nF 0.004 μF 0.04 μF 0.4 μF 0.004 1 mF 0.04 mF 1.6 mF	Fluke 8846A OEM, GIDEP, Met/Cal Sourced Procedures
DC Power to Source <sup>1</sup>	(33 mv to 1 020 V) (0.33 to 330) mA (0.33 to 3) A (3 to 20.5) A	0.052 % of output in Watts 0.45 % of output in Watts 9.8 % of output in Watts	Fluke 5520A
Electrical Simulation of Thermocouple Devices <sup>1</sup>	Type B (600 to 800) °C (800 to 1 000) °C (1 000 to 1 550) °C (1 550 to 1 820) °C Type C (0 to 150) °C (150 to 650) °C (650 to 1 000) °C (1 000 to 1 800) °C (1 800 to 2 316) °C Type E (-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1 000) °C Type J (-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1 200) °C	0.62 °C 0.34 °C 0.31 °C 0.37 °C 0.42 °C 0.38 °C 0.31 °C 0.5 °C 0.84 °C 0.51 °C 0.16 °C 0.15 °C 0.17 °C 0.21 °C 0.27 °C 0.17 °C 0.14 °C 0.17 °C 0.23 °C	Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures







Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Devices <sup>1</sup>	Type K		Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
	(-200 to -100) °C	0.34 °C	
	(-100 to -25) °C	0.18 °C	
	(-25 to 120) °C	0.16 °C	
	(120 to 1 000) °C	0.26 °C	
	(1 000 to 1 372) °C	0.4 °C	
	Type L		
	(-200 to -100) °C	0.38 °C	
	(-100 to 800) °C	0.26 °C	
	(800 to 900) °C	0.17 °C	
	Type N		
	(-200 to -100) °C	0.64 °C	
	(-100 to -25) °C	0.54 °C	
	(-25 to 120) °C	0.19 °C	
	(120 to 410) °C	0.19 °C	
	(410 to 1 300) °C	0.28 °C	
	Type R		
	(0 to 250) °C	0.48 °C	
	(250 to 400) °C	0.37 °C	
	(400 to 1 000) °C	0.37 °C	
	(1 000 to 1 767) °C	0.46 °C	
	Type S		
	(0 to 250) °C	0.49 °C	
	(250 to 1000) °C	0.37 °C	
(1 000 to 1 400) °C	0.37 °C		
(1 400 to 1 767) °C	0.46 °C		
Type T			
(-250 to -150) °C	0.83 °C		
(-150 to 0) °C	0.59 °C		
(0 to 120) °C	0.34 °C		
(120 to 400) °C	0.33 °C		
Type U			
(-200 to 0) °C	0.57 °C		
(0 to 600) °C	0.3 °C		



ANSI-ASQ National Accreditation Board

Electrical Simulation of RTD Devices <sup>1</sup>	<b>Pt 385, 100 Ω</b>		
	(-200 to -80) °C		0.034 °C
	(-80 to 0) °C		0.034 °C
	(0 to 100) °C		0.047 °C
	(100 to 300) °C		0.06 °C
	(300 to 400) °C		0.068 °C
	(400 to 630) °C		0.08 °C
	(630 to 800) °C		0.15 °C
	<b>Pt 3926, 100 Ω</b>		
	(-200 to -80) °C		0.033 °C
	(-80 to 0) °C		0.036 °C
	(0 to 100) °C		0.047 °C
	(100 to 300) °C		0.06 °C
	(300 to 400) °C		0.067 °C
	(400 to 630) °C		0.08 °C
	<b>Pt 3916, 100 Ω</b>		
	(-200 to -190) °C		0.17 °C
	(-190 to -80) °C		0.027 °C
	(-80 to 0) °C		0.03 °C
	(0 to 100) °C		0.04 °C
	(100 to 260) °C		0.05 °C
	(260 to 300) °C		0.05 °C
	(300 to 400) °C		0.06 °C
	(400 to 600) °C		0.07 °C
	(600 to 630) °C		0.2 °C
	<b>Pt 385, 200 Ω</b>		
	(-200 to -80) °C		0.027 °C
	(-80 to 0) °C		0.027 °C
	(0 to 100) °C		0.027 °C
	(100 to 260) °C		0.034 °C
(260 to 300) °C		0.08 °C	
(300 to 400) °C		0.088 °C	
(400 to 600) °C		0.094 °C	
(600 to 630) °C		0.11 °C	
<b>Pt 385, 500 Ω</b>			
(-200 to -80) °C		0.027 °C	
(-80 to 0) °C		0.034 °C	
(0 to 100) °C		0.034 °C	
(100 to 260) °C		0.041 °C	
(260 to 300) °C		0.054 °C	
(300 to 400) °C		0.053 °C	
(400 to 600) °C		0.064 °C	
(600 to 630) °C		0.073 °C	
			Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures





Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of RTD Devices <sup>1</sup>	Pt 385, 1000 Ω (-200 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C PtNi 385, 120 Ω (-80 to 0) °C (0 to 100) °C (100 to 260) °C Cu 427, 10 Ω (-100 to 260) °C	0.02 °C 0.02 °C 0.027 °C 0.033 °C 0.04 °C 0.047 °C 0.047 °C 0.15 °C 0.053 °C 0.053 °C 0.093 °C 0.2 °C	Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
AC Power – Source <sup>1</sup> @ (45 to 65) Hz, PF = 1	(33 to 330) mV (3.3 to 9) mA (9 to 33) mA (33 to 90) mA (90 to 330) mA (0.33 to 0.9) A (0.9 to 2.2) A (2.2 to 4.5) A (4.5 to 20.5) A 33 mV to 1 020 V (3.3 to 9) mA (9 to 33) mA (33 to 90) mA (90 to 330) mA (0.33 to 0.9) A (0.9 to 2.2) A (2.2 to 4.5) A (4.5 to 20.5) A	0.002 8 % of output in Watts 0.007 3 % of output in Watts 0.028 % of output in Watts 0.073 % of output in Watts 0.26 % of output in Watts 0.53 % of output in Watts 0.001 3 % of output in Watts 0.005 % of output in Watts 0.007 3 % of output in Watts 0.018 % of output in Watts 0.073 % of output in Watts 0.18 % of output in Watts 0.67 % of output in Watts 1.4 % of output in Watts 3.7 % of output in Watts 14 % of output in Watts	Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures



Length – Dimensional metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Gage Blocks <sup>2</sup>	Up to 4 in	$(2.9 + 1.2L) \mu\text{in}$	Dual Head Comparator Grade 00 Gage Blocks ASTM Procedure
Gage Balls <sup>2</sup>	(0.039 37 to 2) in	$(13 + 0.4L) \mu\text{in}$	ULM GIDEP Sourced Procedures
Plain Ring Gages <sup>2</sup>	(0.4 to 4) in	$(10 + 4.3L) \mu\text{in}$	ULM XXX Master Rings OEM, GIDEP Sourced Procedures
Micrometers, ID, OD & Depth <sup>1,2</sup>	Up to 6 in (6 to 60) in	$(21 + 9.8L) \mu\text{in}$ $(34 + 6L) \mu\text{in}$	Gage Blocks Federal Grade 2 / ASME Grade 0 OEM, GIDEP Sourced Procedures
Calipers, ID, OD & Depth <sup>1,2</sup>	Up to 6 in (6 to 84) in	$(57 + 0.96L) \mu\text{in}$ $(30 + 3.1L) \mu\text{in}$	Gage Blocks Federal Grade 2 / ASME Grade 0 OEM, GIDEP Sourced Procedures
Indicators <sup>1,2</sup>	Up to 2 in	$(27 + 1.2L) \mu\text{in}$	ULM OEM, GIDEP Sourced Procedures
Pin Gages <sup>2</sup>	Up to 1 in	$(11 + 1.5L) \mu\text{in}$	ULM OEM, ASME Standards, GIDEP Sourced Procedures
Plain Plug Gages <sup>2</sup>	Up to 2 in (2 to 4) in	$(11 + 1.5L) \mu\text{in}$ $(3.5 + 6.5L) \mu\text{in}$	ULM ULM, Gage Blocks OEM, ASME Standards, GIDEP Sourced Procedures
Rulers <sup>1</sup>	Up to 24 in	0.009 6 in	Master Steel Ruler OEM, GIDEP Sourced Procedures
Height Gauges <sup>1,2</sup>	Up to 24 in	$(44 + 2.1L) \mu\text{in}$	Gage Blocks Federal Grade 2 / ASME Grade 0 OEM, GIDEP Sourced Procedures



# ANSI-ASQ National Accreditation Board

## Mass

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Class I & Unclassified Balances <sup>1</sup> (resolution)	Up to 100 g (0.01 mg)	0.034 mg	ASTM Class 1 Weights NIST Handbook 44 and WI-09
	Up to 100 g (0.02 mg)	0.036 mg	
	Up to 100 g (0.05 mg)	0.045 mg	
	Up to 200 g (0.1 mg)	0.089 mg	
	Up to 200 g (0.2 mg)	0.13 mg	
	Up to 200 g (0.5 mg)	0.3 mg	
Class II & Unclassified Balances <sup>1</sup> (resolution)	Up to 100 g (0.001 g)	0.58 mg	ASTM Class 1 or 2 Weights NIST Handbook 44 and WI-09
	Up to 200 g (0.002 g)	1.2 mg	
	Up to 500 g (0.005 g)	2.9 mg	
	Up to 1 kg (0.01 g)	5.8 mg	
	Up to 2 kg (0.02 g)	12 mg	
	Up to 5 kg (0.05 g)	29 mg	
	Up to 10 kg (0.1 g)	58 mg	
	Up to 20 kg (0.2 g)	0.12 g	
	Up to 50 kg (0.5 g)	0.29 g	
	Up to 50 kg (1 g)	0.58 g	
Class III & Unclassified Light Capacity Scales <sup>1</sup> (resolution)	Up to 1 lb (0.0001 lb)	0.026 g	NIST Class F Weights NIST Handbook 44 and WI-09
	Up to 2 lb (0.0002 lb)	0.054 g	
	Up to 5 lb (0.0005 lb)	0.13 g	
	Up to 10 lb (0.001 lb)	0.26 g	
	Up to 20 lb (0.002 lb)	0.54 g	
	Up to 50 lb (0.005 lb)	1.3 g	
	Up to 100 lb (0.01 lb)	2.6 g	
Class III & Unclassified Medium Capacity Scales <sup>1</sup> (resolution)	Up to 500 lb (0.05 lb)	0.029 lb	NIST Class F Weights NIST Handbook 44 and WI-09
	Up to 1 000 lb (0.1 lb)	0.058 lb	
	Up to 2 000 lb (0.2 lb)	0.12 lb	
	Up to 5 000 lb (0.5 lb)	0.29 lb	
	Up to 10 000 lb (1 lb)	0.58 lb	
	Up to 20 000 lb (2 lb)	1.2 lb	
Class III & Unclassified Heavy Capacity Scales <sup>1</sup> (resolution)	Up to 50 000 lb (10 lb)	5.8 lb	NIST Class F Weights NIST Handbook 44 and WI-09
	Up to 200 000 lb (20 lb)	12 lb	
	Up to 400 000 lb (50 lb)	29 lb	
Class IV & Unclassified Scales <sup>1</sup> (resolution)	Up to 12 000 lb (10 lb)	5.8 lb	NIST Class F Weight NIST Handbook 44 and WI-09s
	Up to 24 000 lb (20 lb)	12 lb	
	Up to 60 000 lb (50 lb)	29 lb	



Mass

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Mass - Avoirdupois lb	25 lb	0.1 g	NIST Class F Weights NISTIR 6969 SOP 4, SOP 7 or SOP 8
	50 lb	0.13 g	
	250 lb	0.54 g	
	500 lb	6.4 g	
	1 000 lb	7.2 g	
	2 500 lb	50 g	
	3 000 lb	50 g	
Mass - Avoirdupois lb	5 000 lb	54 g	ASTM Class 4 Weights NISTIR 6969 SOP 4, SOP 7 or SOP 8
	1 lb	0.16 mg	
	2 lb	0.23 mg	
	3 lb	0.64 mg	
	5 lb	1 mg	
	10 lb	1.5 mg	
	20 lb	8.6 mg	
Mass - oz	30 lb	31 mg	ASTM Class 4 Weights NISTIR 6969 SOP 4, SOP 7 or SOP 8
	1/32 oz	3.7 µg	
	1/16 oz	5.1 µg	
	1/8 oz	5.1 µg	
	1/4 oz	13 µg	
	1/2 oz	24 µg	
	1 oz	0.04 mg	
	2 oz	0.034 mg	
Mass - Metric	4 oz	0.22 mg	NIST Class F Weights NISTIR 6969 SOP 4, SOP 7 or SOP 8
	8 oz	0.22 mg	
	20 kg	0.18 g	
Mass - Metric	25 kg	0.17 g	ASTM Class 0 Weights NISTIR 6969 SOP 4, SOP 7 or SOP 8
	200 kg	5.1 g	
	100 g	0.034 mg	
	200 g	0.1 mg	
	300 g	0.10 mg	
	500 g	0.076 mg	
	1 kg	0.19 mg	
	2 kg	0.41 mg	
	3 kg	0.79 mg	
	4 kg	0.68 mg	
	5 kg	0.84 mg	
10 kg	38 mg		



Mass

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Mass - Metric	1 mg	1.1 µg	ASTM Class 0 Weights NISTIR 6969 SOP 4, SOP 7 or SOP 8
	2 mg	1.1 µg	
	3 mg	1.1 µg	
	5 mg	1.1 µg	
	10 mg	1.1 µg	
	20 mg	1.1 µg	
	30 mg	1.1 µg	
	50 mg	1.1 µg	
	100 mg	1.1 µg	
	200 mg	1.1 µg	
	300 mg	1.1 µg	
	500 mg	1.1 µg	
	1 g	3.8 µg	
	2 g	2.3 µg	
	3 g	3.3 µg	
	5 g	3.6 µg	
10 g	7.4 µg		
20 g	7.6 µg		
30 g	11 µg		
50 g	17 µg		
Force <sup>1</sup>	(2 to 200) lbf	0.03 % of reading	Dead Weights Load Cells
	(200 to 10 000) lbf	0.039 % of reading	
	(10 000 to 100 000) lbf	0.039 % of reading	
Pressure Gauges <sup>1</sup>	Up to 3 000 psi	0.93 psi	Pressure Calibrator
Torque Tools <sup>1</sup>	(Up to 50) lbf·in	0.07 lbf·in	Torque Transducers
	(50 to 250) lbf·in	0.44 lbf·in	
	(250 to 400) lbf·in	1.2 lbf·in	
	(400 to 1000) lbf·in	2.9 lbf·in	
	(1000 to 2500) lbf·in	7.2 lbf·in	
	(Up to 100) lbf·ft	0.22 lbf·ft	
(100 to 250) lbf·ft	1.7 lbf·ft		
(250 to 600) lbf·ft	4.1 lbf·ft		
Torque Transducers <sup>1</sup>	(2 to 2 000) lbf·ft	0.012 % of Reading	Radius Arms w/Class F Weights



**Thermodynamic**

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Relative Humidity Sensors <sup>1</sup>	(5 to 95) %RH	1.9 %RH	Humidity Chamber w/ Reference Probe Thermohygrometer OEM, GIDEP Sourced Procedures
Temperature -Infrared Non-Contact Measuring Equipment <sup>1</sup>	(35 to 500) °C	1.2 °C	Blackbody Source OEM, GIDEP, Met/Cal, Sourced Procedures
Temperature - Measure <sup>1</sup>	(-40 to 660) °C (660 to 1 450) °C	0.008 9 °C 3.8 °C	Hart 1529 w/ 5628 PRT Hart 1529 w/ 5650 Type S Thermocouple Thermohygrometer OEM, GIDEP, Met/Cal, Sourced Procedures
Temperature - Source <sup>1</sup>	(-40 to 660) °C (660 to 1 200) °C	0.028 °C 4.8 °C	Dry Well and Hart 1529 w/ 5628 PRT Dry Well and Hart 1529 w/ 5650 Type S Thermocouple OEM, GIDEP, Met/Cal, Sourced Procedures

**Time and Frequency**

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Stopwatches/Timers <sup>1</sup>	Up to 86 400 s	3.5 s / 24 hours	US National Time Stopwatch NIST SP 960-12
Frequency – Source <sup>1</sup>	(0.01 to 120) Hz (120 to 1200) Hz (1.2 to 12) kHz (12 to 120) kHz (120 to 1200) kHz (1.2 to 2) MHz	0.18 mHz 0.2 mHz 0.059 Hz 0.12 Hz 0.66 Hz 0.058 kHz	Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures





**Time and Frequency**

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency – Measure <sup>1</sup>	(3 to 5) Hz (5 to 10) Hz (10 to 40) Hz (40 to 1000) Hz (1 to 300) kHz 300 kHz to 1 MHz	3.6 mHz 6.9 mHz 16 mHz 19 mHz 0.16 kHz 0.16 kHz	Fluke 8846A OEM, GIDEP, Met/Cal Sourced Procedures

**Services performed at satellite location**

7133 Global Drive  
Louisville, KY 40258

**Electrical – DC/Low Frequency**

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Devices <sup>1</sup>	Type B (600 to 800) °C (800 to 1 000) °C (1 000 to 1 550) °C (1 550 to 1 820) °C Type C (0 to 150) °C (150 to 650) °C (650 to 1 000) °C (1 000 to 1 800) °C (1 800 to 2 316) °C Type E (-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1 000) °C	0.62 °C 0.34 °C 0.31 °C 0.37 °C 0.42 °C 0.38 °C 0.31 °C 0.5 °C 0.84 °C 0.51 °C 0.16 °C 0.15 °C 0.17 °C 0.21 °C	Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures



# ANSI-ASQ National Accreditation Board

## Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Devices <sup>1</sup>	Type J		Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
	(-210 to -100) °C	0.27 °C	
	(-100 to -30) °C	0.17 °C	
	(-30 to 150) °C	0.14 °C	
	(150 to 760) °C	0.17 °C	
	(760 to 1 200) °C	0.23 °C	
	Type K		
	(-200 to -100) °C	0.34 °C	
	(-100 to -25) °C	0.18 °C	
	(-25 to 120) °C	0.16 °C	
	(120 to 1 000) °C	0.26 °C	
	(1 000 to 1 372) °C	0.4 °C	
	Type L		
	(-200 to -100) °C	0.38 °C	
	(-100 to 800) °C	0.26 °C	
	(800 to 900) °C	0.17 °C	
	Type N		
	(-200 to -100) °C	0.64 °C	
	(-100 to -25) °C	0.54 °C	
	(-25 to 120) °C	0.19 °C	
	(120 to 410) °C	0.19 °C	
	(410 to 1 300) °C	0.28 °C	
	Type R		
	(0 to 250) °C	0.48 °C	
(250 to 400) °C	0.37 °C		
(400 to 1 000) °C	0.37 °C		
(1 000 to 1 767) °C	0.46 °C		
Type S			
(0 to 250) °C	0.49 °C		
(250 to 1000) °C	0.37 °C		
(1 000 to 1 400) °C	0.37 °C		
(1 400 to 1 767) °C	0.46 °C		
Type T			
(-250 to -150) °C	0.83 °C		
(-150 to 0) °C	0.59 °C		
(0 to 120) °C	0.34 °C		
(120 to 400) °C	0.33 °C		
Type U			
(-200 to 0) °C	0.57 °C		
(0 to 600) °C	0.3 °C		



Electrical Simulation of RTD Devices <sup>1</sup>	Pt 385, 100 Ω		
	(-200 to -80) °C		0.034 °C
	(-80 to 0) °C		0.034 °C
	(0 to 100) °C		0.047 °C
	(100 to 300) °C		0.06 °C
	(300 to 400) °C		0.068 °C
	(400 to 630) °C		0.08 °C
	(630 to 800) °C		0.15 °C
	Pt 3926, 100 Ω		
	(-200 to -80) °C		0.033 °C
	(-80 to 0) °C		0.036 °C
	(0 to 100) °C		0.047 °C
	(100 to 300) °C		0.06 °C
	(300 to 400) °C		0.067 °C
	(400 to 630) °C		0.08 °C
	Pt 3916, 100 Ω		
	(-200 to -190) °C		0.17 °C
	(-190 to -80) °C		0.027 °C
	(-80 to 0) °C		0.03 °C
	(0 to 100) °C		0.04 °C
	(100 to 260) °C		0.05 °C
	(260 to 300) °C		0.05 °C
	(300 to 400) °C		0.06 °C
	(400 to 600) °C		0.07 °C
	(600 to 630) °C		0.2 °C
	Pt 385, 200 Ω		
	(-200 to -80) °C		0.027 °C
(-80 to 0) °C		0.027 °C	
(0 to 100) °C		0.027 °C	
(100 to 260) °C		0.034 °C	
(260 to 300) °C		0.08 °C	
(300 to 400) °C		0.088 °C	
(400 to 600) °C		0.094 °C	
(600 to 630) °C		0.11 °C	
Pt 385, 500 Ω			
(-200 to -80) °C		0.027 °C	
(-80 to 0) °C		0.034 °C	
(0 to 100) °C		0.034 °C	
(100 to 260) °C		0.041 °C	
(260 to 300) °C		0.054 °C	
(300 to 400) °C		0.053 °C	
(400 to 600) °C		0.064 °C	
(600 to 630) °C		0.073 °C	
			Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of RTD Devices <sup>1</sup>	Pt 385, 1000 Ω		Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
	(-200 to -80) °C	0.02 °C	
	(-80 to 0) °C	0.02 °C	
	(0 to 100) °C	0.027 °C	
	(100 to 260) °C	0.033 °C	
	(260 to 300) °C	0.04 °C	
	(300 to 400) °C	0.047 °C	
	(400 to 600) °C	0.047 °C	
	(600 to 630) °C	0.15 °C	
	PtNi 385, 120 Ω		
	(-80 to 0) °C	0.053 °C	
(0 to 100) °C	0.053 °C		
(100 to 260) °C	0.093 °C		
Cu 427, 10 Ω			
(-100 to 260) °C	0.2 °C		

Length – Dimensional metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Micrometers, ID, OD & Depth <sup>1,2</sup>	Up to 6 in (6 to 60) in	(21 + 9.8L) μin (34 + 6L) μin	Gage Blocks Federal Grade 2 / ASME Grade 0 OEM, GIDEP Sourced Procedures
Calipers, ID, OD & Depth <sup>1,2</sup>	Up to 6 in (6 to 84) in	(57 + 0.96L) μin (30 + 3.1L) μin	Gage Blocks Federal Grade 2 / ASME Grade 0 OEM, GIDEP Sourced Procedures



## ANSI-ASQ National Accreditation Board

### Mass

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Force <sup>1</sup>	(2 to 200) lbf (200 to 10 000) lbf (10 000 to 100 000) lbf	0.03 % of reading 0.039 % of reading 0.039 % of reading	Dead Weights Load Cells
Pressure Gauges <sup>1</sup>	Up to 3 000 psi	0.93 psi	Pressure Calibrator
Torque Tools <sup>1</sup>	(Up to 50) lbf in (50 to 250) lbf in (250 to 400) lbf in (400 to 1 000) lbf in (1 000 to 2 500) lbf in (Up to 100) lbf ft (100 to 250) lbf ft (250 to 600) lbf ft	0.07 lbf in 0.44 lbf in 1.2 lbf in 2.9 lbf in 7.2 lbf in 0.22 lbf ft 1.7 lbf ft 4.1 lbf ft	Torque Transducers

### Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Relative Humidity Sensors <sup>1</sup>	(5 to 95) %RH	1.9 %RH	Humidity Chamber w/ Reference Probe Thermohygrometer OEM, GIDEP Sourced Procedures
Temperature - Measure <sup>1</sup>	(-40 to 660) °C (660 to 1 450) °C	0.008 9 °C 3.8 °C	Hart 1529 w/ 5628 PRT Hart 1529 w/ 5650 Type S Thermocouple Thermohygrometer OEM, GIDEP, Met/Cal, Sourced Procedures
Temperature - Source <sup>1</sup>	(-40 to 660) °C (660 to 1 200) °C	0.028 °C 4.8 °C	Dry Well and Hart 1529 w/ 5628 PRT Dry Well and Hart 1529 w/ 5650 Type S Thermocouple OEM, GIDEP, Met/Cal, Sourced Procedures



Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency – Source <sup>1</sup>	(0.01 to 120) Hz (120 to 1 200) Hz (1.2 to 12) kHz (12 to 120) kHz (120 to 1 200) kHz (1.2 to 2) MHz	0.18 mHz 0.2 mHz 0.059 Hz 0.12 Hz 0.66 Hz 0.058 kHz	Fluke 5520A OEM, GIDEP, Met/Cal Sourced Procedures
Frequency – Measure <sup>1</sup>	(3 to 5) Hz (5 to 10) Hz (10 to 40) Hz (40 to 1 000) Hz (1 to 300) kHz 300 kHz to 1 MHz	3.6 mHz 6.9 mHz 16 mHz 19 mHz 0.16 kHz 0.16 kHz	Fluke 8846A OEM, GIDEP, Met/Cal Sourced Procedures

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. L = length in inches.
3. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-1222.

Vice President

