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

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CALIBRATION

Valid to: January 14, 2012 Certificate Number: AC-1183

I. Electromagnetic - DC/Low Frequency

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
DC Voltage - Measure	Up to 100 mV 100 mV to 1 V (1 to 10) V (10 to 100) V 100 V to 1 kV (1 to 20) kV (20 to 70) kV	7 µV/V + 300 nV 6 µV/V + 300 nV 6 µV/V + 500 nV 8 µV/V + 30 µV 8 µV/V + 100 µV + [(12 µV/V)(Vin/1 000)^2] 520 µV/V + 600 mV 520 µV/V + 6 V	HP 3458A Opt 002 Vitrek 4670A	OEM and GIDEP Sourced Procedures
DC Voltage - Source	Up to 220 mV 220 mV to 2.2 V (2.2 to 11) V (11 to 22) V (22 to 220) V 220 V to 1.1 kV	7.5 µV/V + 400 nV 5 µV/V + 700 nV 3.5 µV/V + 2.5 µV 3.5 µV/V + 4 µV 5 µV/V + 40 µV 6.5 µV/V +400 µV	Fluke 5720A	
DC Current - Measure	Up to 100 nA 100 nA to 1 µA (1 to 10) µA (10 to 100) µA 100 µA to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1 A	35 µA/A + 40 pA 25 µA/A + 40 pA 25 µA/A + 100 pA 25 µA/A + 800 pA 25 µA/A + 5 nA 25 µA/A + 50 nA 40 µA/A + 500 nA 115 µA/A + 10 µA	HP 3458A Opt 002	
DC Current - Source	Up to 220 µA 220 µA to 2.2 mA (2.2 to 22) mA (22 to 220) mA 220 mA to 2.2 A	40 µA/A + 6 nA 35 µA/A + 7 nA 35 µA/A + 40 nA 45 µA/A + 700 nA 80 µA/A + 12 µA	Fluke 5720A	

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage - Measure	**(1 to 10) mV**		HP 3458A Opt 002	OEM and GIDEP Sourced Procedures
	(1 to 40) Hz	302 µV/V + 3 µV		
	40 Hz to 1 kHz	202 µV/V + 1.1 µV		
	(1 to 20) kHz	300 µV/V + 1.1 µV		
	(20 to 50) kHz	1 mV/V + 1.1 µV		
	(50 to 100) kHz	5 mV/V + 1.1 µV		
	(100 to 300) kHz	40 mV/V + 2 µV		
	300 kHz to 1 MHz	12 mV/V + 5 µV		
	(1 to 4) MHz	70 mV/V + 7 µV		
	(4 to 8) MHz	200 mV/V + 8 µV		
	(10 to 100) mV			
	(1 to 40) Hz	72 µV/V + 4 µV		
	40 Hz to 1kHz	72 µV/V + 2 µV		
	(1 to 20) kHz	142 µV/V + 2 µV		
	(20 to 50) kHz	302 µV/V + 2 µV		
	(50 to 100) kHz	802 µV/V + 2 µV		
	(100 to 300) kHz	3 mV/V + 10 µV		
	300 kHz to 1 MHz	10 mV/V + 10 µV		
	(1 to 2) MHz	15 mV/V + 10 µV		
	(2 to 4) MHz	40 mV/V + 70 µV		
	(4 to 8) MHz	40 mV/V + 80 µV		
	(8 to 10) MHz	150 mV/V + 100 µV		
	100 mV to 1 V			
	(1 to 40) Hz	72 µV/V + 4 µV		
	40 Hz to 1kHz	72 µV/V + 2 µV		
	(1 to 20) kHz	142 µV/V + 2 µV		
	(20 to 50) kHz	302 µV/V + 2 µV		
	(50 to 100) kHz	802 µV/V + 2 µV		
	(100 to 300) kHz	3 mV/V + 10 µV		
	300 kHz to 1 MHz	10 mV/V + 10 µV		
	(1 to 2) MHz	15 mV/V + 100 µV		
	(2 to 4) MHz	40 mV/V + 700 µV		
	(4 to 8) MHz	40 mV/V + 800 µV		
	(8 to 10) MHz	150 mV/V + 1 mV		
	(1 to 10) V			
	(1 to 40) Hz	72 µV/V + 400 µV		
	40 Hz to 1kHz	72 µV/V + 200 µV		
	(1 to 20) kHz	142 µV/V + 200 µV		
	(20 to 50) kHz	302 µV/V + 200 µV		
	(50 to 100) kHz	802 µV/V + 200 µV		
	(100 to 300) kHz	3 mV/V + 1 mV		
	300 kHz to 1 MHz	10 mV/V + 1 mV		
	(1 to 2) MHz	15 mV/V + 1 mV		
	(2 to 4) MHz	40 mV/V + 7 mV		
	(4 to 8) MHz	40 mV/V + 8 mV		
	(8 to 10) MHz	150 mV/V + 10 mV		

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage - Measure (cont.)	**(10 to 100) V**			OEM and GIDEP Sourced Procedures
	(1 to 40) Hz	202 µV/V + 4 mV	HP 3458A Opt 002	
	40 Hz to 1 kHz	202 µV/V + 2 mV		
	(1 to 20) kHz	202 µV/V + 2 mV		
	(20 to 50) kHz	352 µV/V + 2 mV		
	(50 to 100) kHz	1.2 mV/V + 2 mV		
	(100 to 300) kHz	4 mV/V + 10 mV		
	300 kHz to 1 MHz	15 mV/V + 10 mV		
	100 V to 1 kV			
	(1 to 40) Hz	400 µV/V + 4 mV		
	40 Hz to 1 kHz	400 µV/V + 20 mV		
	(1 to 20) kHz	600 µV/V + 2 mV		
	(20 to 50) kHz	1.2 mV/V + 20 mV		
	(50 to 100) kHz	3 mV/V + 20 mV		
	(1.1 to 20) kV			
	(20 to 100) Hz	5.2 mV/V + 600 mV	Vitrek 4670A	
	(20 to 70) kV			
	(50 to 60) Hz	6.2 mV/V + 6 V		
AC Voltage - Source	**Up to 2.2 mV**		Fluke 5720A	
	(10 to 20) Hz	240 µV/V + 4 µV		
	(20 to 40) Hz	90 µV/V + 4 µV		
	40 Hz to 20 kHz	80 µV/V + 4 µV		
	(20 to 50) kHz	200 µV/V + 4 µV		
	(50 to 100) kHz	500 µV/V + 5 µV		
	(100 to 300) kHz	1.05 mV/V + 10 µV		
	(300 to 500) kHz	1.4 mV/V + 20 µV		
	500 kHz to 1 MHz	2.7 mV/V + 20 µV		
	(2.2 to 22) mV			
	(10 to 20) Hz	240 µV/V + 4 µV		
	(20 to 40) Hz	90 µV/V + 4 µV		
	40 Hz to 20 kHz	80 µV/V + 4 µV		
	(20 to 50) kHz	200 µV/V + 4 µV		
	(50 to 100) kHz	500 µV/V + 5 µV		
	(100 to 300) kHz	1.05 mV/V + 10 µV		
	(300 to 500) kHz	1.4 mV/V + 20 µV		
	500 kHz to 1 MHz	2.7 mV/V + 20 µV		
	(22 to 220) mV			
	(10 to 20) Hz	240 µV/V + 12 µV		
	(20 to 40) Hz	90 µV/V + 7 µV		
	40 Hz to 20 kHz	80 µV/V + 7 µV		
	(20 to 50) kHz	200 µV/V + 7 µV		
	(50 to 100) kHz	460 µV/V + 17 µV		
	(100 to 300) kHz	900 µV/V + 20 µV		
	(300 to 500) kHz	1.4 mV/V + 25 µV		
	500 kHz to 1 MHz	2.7 mV/V + 45 µV		

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage - Source (cont.)	**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 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz **(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 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz **(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 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz **(220 to 1 100) V** (15 to 50) Hz 50 Hz to 1 kHz	 240 µV/V + 40 µV 90 µV/V + 15 µV 45 µV/V + 8 µV 75 µV/V + 10 µV 110 µV/V + 30 µV 420 µV/V + 80 µV 1 mV/V + 200 µV 1.7 mV/V + 300 µV 240 µV/V + 400 µV 90 µV/V + 150 µV 45 µV/V + 50 µV 75 µV/V + 100 µV 100 µV/V + 200 µV 275 µV/V + 600 µV 1 mV/V + 2 mV 1.5 mV/V + 3.2 mV 240 µV/V + 4 mV 90 µV/V + 1.5 mV 52 µV/V + 600 µV 80 µV/V + 1 mV 150 µV/V + 2.5 mV 900 µV/V + 16 mV 4.4 mV/V + 40 mV 8 mV/V + 80 mV 300 µV/V + 16 mV 70 µV/V + 3.5 mV	Fluke 5720A	OEM and GIDEP Sourced Procedures
AC Current - Measure	**Up to 100 µA** (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 1 kHz **(10 to 100) mA** (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz **(0.1 to 1) A** (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	 4 mA/A + 30 nA 1.5 mA/A + 30 nA 600 µA/A + 30 nA 600 µA/A + 30 nA 4 mA/A + 20 µA 1.5 mA/A + 20 µA 600 µA/A + 20 µA 300 µA/A + 20 µA 4 mA/A + 200 µA 1.6 mA/A + 200 µA 800 µA/A + 200 µA 1 mA/A + 200 µA	HP 3458A Opt 002	

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Current - Source	**Up to 220 µA** (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz **220 µA to 2.2 mA** (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz **(2.2 to 22) mA** (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz **(22 to 220) mA** (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz **220 mA to 2.2 A** 20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	 250 µA/A + 16 nA 160 µA/A + 10 nA 120 µA/A + 8 nA 280 µA/A + 12 nA 1.1 mA/A + 65 nA 250 µA/A + 40 nA 160 µA/A + 35 nA 120 µA/A + 35 nA 200 µA/A + 110 nA 1.1 mA/A + 650 nA 250 µA/A + 400 nA 160 µA/A + 350 nA 120 µA/A + 350 nA 200 µA/A + 550 nA 1.1 mA/A + 5 µA 250 µA/A + 4 µA 160 µA/A + 3.5 µA 120 µA/A + 2.5 µA 200 µA/A + 3.5 µA 1.1 mA/A + 10 µA 260 µA/A + 35 µA 450 µA/A + 80 µA 7 mA/A + 160 µA	Fluke 5720A	OEM and GIDEP Sourced Procedures
Resistance – Source	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	40 µΩ 95 µΩ/Ω 95 µΩ/Ω 23 µΩ/Ω 23 µΩ/Ω 10 µΩ/Ω 10 µΩ/Ω 8.5 µΩ/Ω 8.5 µΩ/Ω 8.5 µΩ/Ω 8.5 µΩ/Ω 11 µΩ/Ω 11 µΩ/Ω 20 µΩ/Ω 21 µΩ/Ω 40 µΩ/Ω 50 µΩ/Ω 100 µΩ/Ω	Fluke 5720A	

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Resistance - Source (cont.) Fixed Values	10 m Ω 100 m Ω 1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ	6.19 µΩ/Ω 2.40 µΩ/Ω 1.26 µΩ/Ω 3.65 µΩ/Ω 2.16 µΩ/Ω 1.03 µΩ/Ω 810 nΩ/Ω 15.6 µΩ/Ω 23.1 µΩ/Ω	L&N 4222 L&N 4015-B L&N 4020-B L&N 8070/10 L&N 100 Gray 1000 Gray 10000 JRL MRS-106 JRL MRS-106	OEM and GIDEP Sourced Procedures
Resistance – Measure	Up to 10 Ω (10 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 100 MΩ to 1 GΩ	18 µΩ/Ω + 50 µΩ 15 µΩ/Ω + 500 µΩ 13 µΩ/Ω + 500 µΩ 13 µΩ/Ω + 5 mΩ 13 µΩ/Ω + 50 mΩ 18 µΩ/Ω + 2 Ω 53 µΩ/Ω + 100 Ω 503 µΩ/Ω + 1 kΩ 5 mΩ/Ω + 10 kΩ	HP 3458A Opt 002	
Capacitance - Measure*	0.01 pF to 10 µF	116 µF/F	General Radio 1616 System	
Capacitance - Source (10 to 1k) Hz (10 to 1k) Hz (10 to 1k) Hz (10 to 1k) Hz (10 to 600) Hz (10 to 300) Hz (10 to 150) Hz (10 to 120) Hz @ 1 kHz	 190 pF to 3.3 nF (3.3 to 11) nF (11 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 100 pF 1 nF 100 pF to 1.11 µF	 5 mF/F + 10 pF 2.5 mF/F + 10 pF 2.5 mF/F + 100 pF 2.5 mF/F + 300 pF 2.5 mF/F + 1 nF 2.5 mF/F + 3 nF 2.5 mF/F + 10 nF 4 mF/F + 30 nF 0.0006 pF 0.007 pF 580 µF/F	Fluke 5520A General Radio 1404-B General Radio 1404-A General Radio 1423A	
Inductance - Measure* – Fixed Points @ 100 Hz and 1 kHz	Up to 100 µH 100 µH to 10 H 100 µH 1 mH 10 mH 100 mH 1 H	12.1 mH/H 2.3 mH/H 320 nH 1.23 µH 17.2 µH 123 µH 1.34 mH	General Radio 1632A General Radio 1482B General Radio 1482E General Radio 1482H General Radio 1482L General Radio 1482P	

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Oscilloscopes Leveled Sine Wave 50 kHz reference	5 mV to 5 V p-p	20 mV/V + 300 µV	Fluke 5520A/SC600	OEM and GIDEP Sourced Procedures
(50 kHz reference)	**5 mV to 5.5 V p-p** (50 to 100) kHz (100 to 300) kHz 300 kHz to 600 MHz	 15 mV/V + 100 µV 20 mV/V + 100 µV 40 mV/V + 100 µV		
10 Hz to 100 kHz Into 1 MΩ	(0 to 33) V p-p	500 µV/V		
Into 50 Ω	(0 to 6.5) V p-p	500 µV/V		
Pulse Rise Time 4 mV to 2.5 V p-p	1 kHz to 10 MHz	300 ns		
Time Marker into 50 Ω	2 ns to 20 ms 50 ms to 5 s	2.5 µs/s (25 + 1 000*t*) µs/s		
Phase Angle - Source 500 mV to 3 V	65 Hz 400 Hz 1 kHz 10 kHz 30 kHz	0.1 ° 0.25 ° 0.5 ° 5 ° 10 °		
Electrical Simulation of Thermocouple Indicators Type B	 (600 to 800) °C (800 to 1 000) °C (1 000 to 1 550) °C (1 550 to 1 820) °C	 0.44 °C 0.34 °C 0.3 °C 0.33 °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	0.3 °C 0.26 °C 0.31 °C 0.5 °C 0.84 °C		
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1 000) °C	0.5 °C 0.16 °C 0.14 °C 0.16 °C 0.21 °C		

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Electrical Simulation of Thermocouple Indicators (cont.)			Fluke 5520A	OEM and GIDEP Sourced Procedures
Type J	(-210 to -100) ˚C (-100 to -30) ˚C (-30 to 150) ˚C (150 to 760) ˚C (760 to 1 200) ˚C	0.27 ˚C 0.16 ˚C 0.14 ˚C 0.17 ˚C 0.23 ˚C		
Type K	(-200 to -100) ˚C (-100 to -25) ˚C (-25 to 120) ˚C (120 to 1 000) ˚C (1 000 to 1 372) ˚C	0.33 ˚C 0.18 ˚C 0.16 ˚C 0.26 ˚C 0.4 ˚C		
Type R	Up to 250 ˚C (250 to 400) ˚C (400 to 1 000) ˚C (1 000 to 1 767) ˚C	0.57 ˚C 0.35 ˚C 0.33 ˚C 0.4 ˚C		
Type S	Up to 250 ˚C (250 to 1 000) ˚C (1 000 to 1 400) ˚C (1 400 to 1 767) ˚C	0.47 ˚C 0.36 ˚C 0.37 ˚C 0.46 ˚C		
Type T	(-250 to -150) ˚C (-150 to 0) ˚C Up to 120 ˚C (120 to 400) ˚C	0.63 ˚C 0.24 ˚C 0.16 ˚C 0.14 ˚C		
Electrical Simulation of RTD Indicators				
Pt 385, 100 Ω	(-200 to 0) ˚C (0 to 100) ˚C (100 to 300) ˚C (300 to 400) ˚C (400 to 630) ˚C (630 to 800) ˚C	0.05 ˚C 0.07 ˚C 0.09 ˚C 0.1 ˚C 0.12 ˚C 0.23 ˚C		
Pt 3926, 100 Ω	(-200 to 0) ˚C (0 to 100) ˚C (100 to 300) ˚C (300 to 400) ˚C (400 to 630) ˚C	0.05 ˚C 0.07 ˚C 0.09 ˚C 0.1 ˚C 0.12 ˚C		

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Electrical Simulation of RTD Indicators (cont.)			Fluke 5520A	OEM and GIDEP Sourced Procedures
Pt 3916, 100 Ω	(-200 to -190) ˚C	0.25 ˚C		
	(-190 to -80) ˚C	0.04 ˚C		
	(-80 to 0) ˚C	0.05 ˚C		
	(0 to 100) ˚C	0.06 ˚C		
	(100 to 260) ˚C	0.07 ˚C		
	(260 to 300) ˚C	0.08 ˚C		
	(300 to 400) ˚C	0.09 ˚C		
	(400 to 600) ˚C	0.1 ˚C		
	(600 to 630) ˚C	0.23 ˚C		
Pt 385, 200 Ω	(-200 to 100) ˚C	0.04 ˚C		
	(100 to 260) ˚C	0.05 ˚C		
	(260 to 300) ˚C	0.12 ˚C		
	(300 to 400) ˚C	0.13 ˚C		
	(400 to 600) ˚C	0.14 ˚C		
	(600 to 630) ˚C	0.16 ˚C		
Pt 385, 500 Ω	(-200 to -80) ˚C	0.04 ˚C		
	(-80 to 100) ˚C	0.05 ˚C		
	(100 to 260) ˚C	0.06 ˚C		
	(260 to 400) ˚C	0.08 ˚C		
	(400 to 600) ˚C	0.09 ˚C		
	(600 to 630) ˚C	0.11 ˚C		
Pt 385, 1000 Ω	(-200 to 0) ˚C	0.03 ˚C		
	(0 to 100) ˚C	0.04 ˚C		
	(100 to 260) ˚C	0.05 ˚C		
	(260 to 300) ˚C	0.06 ˚C		
	(300 to 600) ˚C	0.07 ˚C		
	(600 to 630) ˚C	0.23 ˚C		
PtNi 385, 120 Ω	(-80 to100) ˚C	0.08 ˚C		
	(100 to 260) ˚C	0.14 ˚C		
Cu 427, 10 Ω`	(-100 to 260) ˚C	0.3 ˚C		

II. Time and Frequency

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Frequency - Measure *	1 Hz to 10 MHz	5 X 10^{-12} per 24 hours	Datum 9390-6000, ExacTime GPS	OEM and GIDEP Sourced Procedures
Frequency -Source *	10 MHz	5 X 10^{-12} per 24 hours		

III. Thermodynamic

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Temperature - Measure	Ice Point (-50 to 350) ˚C (350 to 600) ˚C	0.09 ˚C 0.08 ˚C 0.75 ˚C	Kaye Ice Point Reference Rosemont 162C SPRT Fluke 2625A w / RTD	OEM and GIDEP Sourced Procedures

IV. Mechanical

PARAMETER/ EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Force - Compression	Up to 60 lbf (60 to 500) lbf (500 to 2 000) lbf (2 000 to 5 000) lbf (5 000 to 20 000) lbf	0.01 lbf + 0.6R 0.06 % + 0.6R 0.06 % + 0.6R 0.07 % + 0.6R 0.07 % + 0.6R	Class F Weights Tovey SSC-500 Cooper LFS230-2K Sensotec 41/0572 Lebow 3194-20K	OEM and GIDEP Sourced Procedures
Force - Tension	Up to 60 lbf (60 to 600) lbf (600 to 2 000) lbf	0.01 lbf + 0.6R 0.06 % + 0.6R 0.06 % + 0.6R	Class F Weights Lebow 3136-600 Lebow 3185-2K	
Torque Transducers	(1 to 500) ozf·in (30 to 2 000) lbf·in (150 to 1 000) lbf·ft	0.1 ozf·in + 0.6R 0.03 lbf·in + 0.6R 0.05 lbf·ft + 0.6R	Torque Wheel w/Weights Torque Arm w/Weights	
Torque Wrenches	(10 to 200) ozf·in (1 to 5) lbf·ft (5 to 100) lbf·ft (100 to 1 000) lbf·ft	0.0058 ozf·in + 0.6R 0.012 lbf·ft + 0.6R 0.0058 lbf·ft + 0.6R 0.0058 lbf·ft + 0.6R	Lebow 2120-200 ASG DT-100 Lebow 2133-105 Lebow 2133-106	

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Scales and Balances	(5 to 150) lb (150 to 500) lb (50 to 200) g 200 g to 2 kg (2 to 6) kg (6 to 12) kg	0.068 lb 0.15 lb 0.15 mg 13 mg 25.9 mg 129 mg	Class F Weights Class S Weights	OEM and GIDEP Sourced Procedures
Pressure - Source	(0.001 to 150) psia (4 to 204) in H_2O (5 to 10 000) psig	0.017 psi 0.06 % of reading 0.02 % of reading	Mensor 2101 Ametek PK104WC Pressurements Deadweight Tester	
Mass	(0.002 to 200) g 200 g to 2.1 kg (2.1to 6.1) kg	0.58 mg 17 mg 200 mg	Class S Weights, Mettler B-5, OHaus GT2100, Sartorious QT6100	

V. Dimensional

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Gage Blocks	Up to 1 in (2 to 4) in (5 to 6) in	(3.7 + 2.3*L*) µin (4.7 + 2.3*L*) µin (11.7 + 2.3*L*) µin	Heidenhain ND281, Grade 0.5 Gage Blocks	OEM and GIDEP Sourced Procedures
Length Standards	Up to 6 in (7 to 12) in (13 to 18) in (19 to 24) in (25 to 30) in (31 to 36) in (37 to 42) in (43 to 48) in	(19.5 + 2.3*L*) µin (82.9 + 2.3*L*) µin (117 + 2.3*L*) µin (153 + 2.3*L*) µin (189 + 2.3*L*) µin (225 + 2.3*L*) µin (261 + 2.3*L*) µin (298 + 2.3*L*) µin	Heidenhain ND281, Grade 2 Gage Blocks w/ Gage Head / Amp, Surface Plate	
Calipers	Up to 80 in	(11.4*L*+ 0.6*R*) µin	Grade 2 Gage Blocks	
Micrometers*	Up to 54 in	(11.4*L*+ 0.6*R*) µin		
Cylindrical O.D.*	Up to 1 in (1 to 4) in (4 to 6) in (6 to 12) in	(6.4 + 2.3*L*) µin (7 + 2.3*L*) µin (12.5 + 2.3*L*) µin (17 + 2.3*L*) µin	Heidenhain ND281, Grades 0.5 and 1 Gage Blocks, Federal Comparator	
Cylindrical I.D.	(0.06 to 12) in	(21.3 + 2.3*L*) µin	Federal Comparator, Grade 1 Gage Blocks	
Thread O.D. Simple Pitch Diameter	Up to 10 in (6 to 120) TPI	(57.9 + 2.3*L*) µin	Bench Micrometer, Gage Blocks, Thread Wires	

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Indicators*	Up to 2 in	(11.4*L*+ 0.6*R*) µin	Grade 2 Gage Blocks	OEM and GIDEP Sourced Procedures
Height Gages*	Up to 48 in	(119 + 11.4*L*) µin		

Notes:

1. *Calibration and Measurement Capabilities (CMCs) (Expanded Uncertainties) are based on approximately a 95% confidence interval, using a coverage of k=2.*
2. *This laboratory's capabilities include in-laboratory and on-site calibration services at customer-designated locations. 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.*
3. *Capabilities denoted with an asterisk (*) cannot be performed in the field.*
4. *This scope of accreditation also applies to the laboratory's satellite facility at 1090 Industrial Park Road, Hornell, NY 14843 (same POC and contact phone number).*
5. *The CMCs listed for Electromagnetic – DC/Low Frequency and Time & Frequency do not include estimations of contributions to uncertainty caused by a "best available" unit under test.*
6. *The use of (L) signifies an expression of Length in inches.*
7. *The use of (R) refers to the Resolution of the unit under test.*
8. *The use of (t) signifies an expression of Time in seconds.*
9. *This scope is part of and must be included with the Certificate of Accreditation No. AC-1183.*

Vice President