



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

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CALIBRATION

Valid to: March 11, 2012

Certificate Number: AC-1440

I. Electromagnetic DC / Low Frequency

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
DC Volts - Source ⁴	(0 to 330) mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V (330 to 100) V	20 µV/V + 1 µV 11 µV/V + 2 µV 12 µV/V + 20 µV 18 µV/V + 150 µV 18 µV/V + 1.5 mV	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
DC Volts - Measure ⁴	(10 to 100) mV 100 mV to 1 V (1 to 10) V (10 to 100) V (100 to 1 000) V Up to 150 kV	11 µV/V + 0.3 µV 10 µV/V + 0.3 µV 10 µV/V + 0.5 µV 12 µV/V + 30 µV 22 µV/V + 0.1 mV 0.019 kV + 0.0064 kV / kV	HP 3458A Ross VD-150-10Y-AK-LB-AL / HP 3458A	OEM, GIDEP and locally developed calibration procedures
DC Current - Source ⁴	(0 to 330) nA 330 nA to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 1.1A (1.1 to 3) A (3 to 11) A (11 to 20.5) A	150 µA/A + 20 nA 100 µA/A + 50 nA 100 µA/A + 0.25 µA 100 µA/A + 2.5 µA 200 µA/A + 40 µA 380 µA/A + 40 µA 500 µA/A + 500 µA 1 mA/A + 750 µA	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
DC Current - Measure ⁴	(10 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 mA	HP 3458A	OEM, GIDEP and locally developed calibration procedures



PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Volts - Source ⁴	(0 to 33) mV (10 to 45) Hz 45 to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	800 μV/V + 6 μV 150 μV/V + 6 μV 200 μV/V + 6 μV 1 000 μV/V + 6 μV 3 500 μV/V + 12 μV 8.0 mV/V + 50 μV	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
	(33 to 330) mV (10 to 45) Hz 45 to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	300 μV/V + 8 μV 145 μV/V + 8 μV 160 μV/V + 8 μV 350 μV/V + 8 μV 800 μV/V + 32 μV 2 mV/V + 70 μV		
	330 mV to 3.3 V (10 to 45) Hz 45 to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	300 μV/V + 50 μV 150 μV/V + 60 μV 190 μV/V + 60 μV 300 μV/V + 50 μV 700 μV/V + 125 μV 2.4 mV/V + 600 μV		
	(3.3 to 33) V (10 to 45) Hz 45 to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	300 μV/V + 650 μV 150 μV/V + 600 μV 240 μV/V + 600 μV 350 μV/V + 600 μV 900 μV/V + 1.6 mV		
	(33 to 330) V (10 to 45) Hz 45 to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	190 μV/V + 2 mV 200 μV/V + 6 mV 250 μV/V + 6 mV 300 μV/V + 6 mV 2 mV/V + 50 mV		
	(330 to 1020) V 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	300 μV/V + 10 mV 250 μV/V + 10 mV 300 μV/V + 10 mV		

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Volts - Measure ⁴	<p>(1 to 10) mV (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1MHz (1 to 4) MHz (4 to 8) MHz</p> <p>(10 to 100) mV (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz (1 to 4) MHz (4 to 8) MHz (8 to 10) MHz</p> <p>100 mV to 1 V (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz (1 to 4) MHz (4 to 8) MHz (8 to 10) MHz</p> <p>(1 to 10) V (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz (1 to 4) MHz (4 to 8) MHz (8 to 10) MHz</p>	<p>0.3 mV/V + 3 μV 0.2 mV/V + 1.1 μV 0.3 mV/V + 1.1 μV 1.0 mV/V + 1.1 μV 5.0 mV/V + 1.1 μV 40 mV/V + 2 μV 12 mV/V + 5 μV 70 mV/V + 7 μV 200 mV/V + 8 μV</p> <p>72 μV/V + 4 μV 72 μV/V + 2 μV 142 μV/V + 2 μV 302 μV/V + 2 μV 802 μV/V + 2 μV 30 mV/V + 10 μV 10 mV/V + 10 μV 15 mV/V + 10 μV 40 mV/V + 8 μV 150 mV/V + 100 μV</p> <p>72 μV/V + 40 μV 72 μV/V + 20 μV 142 μV/V + 20 μV 302 μV/V + 20 μV 802 μV/V + 20 μV 3 mV/V + 0.1 mV 1 mV/V + 0.1 mV 15 mV/V + 0.1 mV 40 mV/V + 0.8 mV 150 mV/V + 1 mV</p> <p>72 μV/V + 0.4 mV 72 μV/V + 0.2 mV 142 μV/V + 0.2 mV 302 μV/V + 0.2 mV 802 μV/V + 0.2 mV 3 mV/V + 1 mV 1 mV/V + 1 mV 15 mV/V + 1 mV 40 mV/V + 8 mV 150 mV/V + 10 mV</p>	HP 3458A	OEM, GIDEP and locally developed calibration procedures

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Volts - Measure ^{4,6} (Cont.)	<p>(10 to 100) V (1 to 40) Hz 40Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz</p> <p>(100 to 700) V (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz</p> <p>Up to 100 kV @ 60 Hz</p>	<p>0.2 mV/V + 4 mV 0.2 mV/V + 2 mV 0.2 mV/V + 2 mV 0.35 mV/V + 2 mV 1.2 mV/V + 2 mV 4 mV/V + 10 mV 15 mV/V + 10 mV</p> <p>0.4 mV/V + 40 mV 0.4 mV/V + 20 mV 0.6 mV/V + 20 mV 1.2 mV/V + 20 mV 3 mV/V + 20 mV</p> <p>0.0026 kV + 0.0095 kV / kV</p>	<p>HP 3458A</p> <p>Ross VD-150-10Y-AK-LB-AL / HP 3458A</p>	OEM, GIDEP and locally developed calibration procedures
AC Current - Source ⁴	<p>(29 to 330) 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</p> <p>0.33 to 3.3 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</p> <p>(3.3 to 33) 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</p> <p>(33 to 330) 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</p>	<p>2 mA/A + 0.1 µA 1.5 mA/A + 0.1 µA 1.25 mA/A + 0.1 µA 3 mA/A + 0.15 µA 8 mA/A + 0.2 µA 16 mA/A + 0.4 µA</p> <p>2 mA/A + 0.15 µA 1.25 mA/A + 0.15 µA 1 mA/A + 0.15 µA 2 mA/A + 0.2 µA 5 mA/A + 0.3 µA 10 mA/A + 0.6 µA</p> <p>1.8 mA/A + 2 µA 0.9 mA/A + 2 µA 0.4 mA/A + 2 µA 0.8 mA/A + 2 µA 2 mA/A + 3 µA 4 mA/A + 4 µA</p> <p>1.8 mA/A + 20 µA 0.9 mA/A + 20 µA 0.4 mA/A + 20 µA 1 mA/A + 50 µA 2 mA/A + 100 µA 4 mA/A + 200 µA</p>	<p>Fluke 5520A-SC1100⁵</p>	OEM, GIDEP and locally developed calibration procedures

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Current - Source ⁴ (Cont.)	330 mA to 1.1 A (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (1.1 to 3) A (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (3 to 11) A (40 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz (11 to 20.5) A (40 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	1.8 mA/A + 100 µA 0.5 mA/A + 100 µA 6.0 mA/A + 1 mA 25 mA/A + 5 mA 1.8 mA/A + 100 µA 0.6 mA/A + 100 µA 6.0 mA/A + 1 mA 25 mA/A + 5 mA 0.6 mA/A + 2 mA 1 mA/A + 2 mA 30 mA/A + 2 mA 1.2 mA/A + 5.0 mA 1.5 mA/A + 5.0 mA 30 mA/A + 5.0 mA	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
AC Current - Measure ⁴	(5 to 100) µA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 1 kHz 100 µA to 1 mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz (1 to 10) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz	4 mA/A + 30 nA 1.5 mA/A + 30 nA 0.6 mA/A + 30 nA 0.6 mA/A + 30 nA 4.0 mA/A + 0.2 µA 1.5 mA/A + 0.2 µA 0.6 mA/A + 0.2 µA 0.3 mA/A + 0.2 µA 0.6 mA/A + 0.2 µA 4.0 mA/A + 0.4 µA 5.5 mA/A + 1.5 µA 4.0 mA/A + 2 µA 1.5 mA/A + 2 µA 0.6 mA/A + 2 µA 0.3 mA/A + 2 µA 0.6 mA/A + 2 µA 4.0 mA/A + 4 µA 5.5 mA/A + 15 µA	HP 3458A	OEM, GIDEP and locally developed calibration procedures

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Current - Measure ⁴ (Cont.)	(10 to 100) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz 100 mA to 1 A (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz	4.0 mA/A + 20 μA 1.5 mA/A + 20 μA 0.6 mA/A + 20 μA 0.3 mA/A + 20 μA 0.6 mA/A + 20 μA 4.0 mA/A + 40 μA 5.5 mA/A + 150 μA 4.0 mA/A + 200 μA 1.6 mA/A + 200 μA 0.8 mA/A + 200 μA 1.0 mA/A + 200 μA 3.0 mA/A + 200 μA 10 mA/A + 400 μA	HP 3458A	OEM, GIDEP and locally developed calibration procedures
Resistance- Source ⁴	(0 to 11) Ω (11 to 33) Ω (33 to 111) Ω (110 to 330) Ω 330 Ω to 1.1k Ω (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 1.19 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 1 100) MΩ	40 μΩ/ Ω + 1 mΩ 30 μΩ/ Ω + 1.5 mΩ 28 μΩ/ Ω + 1.4 mΩ 28 μΩ/ Ω + 2 mΩ 28 μΩ/ Ω + 2 mΩ 28 μΩ/ Ω + 20 mΩ 28 μΩ/ Ω + 20 mΩ 28 μΩ/ Ω + 200 mΩ 28 μΩ/ Ω + 200 mΩ 32 μΩ/ Ω + 2 Ω 32 μΩ/ Ω + 2 Ω 60 μΩ/ Ω + 30 Ω 130 μΩ/ Ω + 50 Ω 250 μΩ/ Ω + 2.5 kΩ 500 μΩ/ Ω + 3 kΩ 3 mΩ/ Ω + 100 kΩ 15 mΩ/ Ω + 500 kΩ	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
Resistance- Measure ⁴	(0 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 + 0.5 mΩ 13 μΩ/ Ω + 0.5 mΩ 13 μΩ/ Ω + 5 mΩ 13 μΩ/ Ω + 50 mΩ 18 μΩ/ Ω + 2Ω 53 μΩ/ Ω + 100Ω 503 μΩ/ Ω + 1 kΩ 5 000 μΩ/ Ω + 10 kΩ	HP 3458A	OEM, GIDEP and locally developed calibration procedures

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Electrical Simulation of Thermocouple Indicators - Source and Measure ⁴	Type "B"	(600 to 800) °C	0.44 °C	Fluke 5520A-SC1100 ⁵ OEM, GIDEP and locally developed calibration procedures
		(800 to 1 000) °C	0.34 °C	
		(1 000 to 1 550) °C	0.30 °C	
		(1 550 to 1 820) °C	0.33 °C	
	Type "C"	(0 to 150) °C	0.30 °C	
		(150 to 650) °C	0.26 °C	
		(650 to 1 000) °C	0.31 °C	
		(1 000 to 1 800) °C	0.50 °C	
		(1 800 to 2 316) °C	0.84 °C	
	Type "E"	(-250 to -100) °C	0.50 °C	
		(-100 to -25) °C	0.16 °C	
		(-25 to 350) °C	0.14 °C	
		(350 to 650) °C	0.16 °C	
		(650 to 1 000) °C	0.21 °C	
	Type "J"	(-210 to -100) °C	0.27 °C	
		(-100 to -30) °C	0.16 °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	0.33 °C	
		(-100 to -25) °C	0.18 °C	
		(-25 to 120) °C	0.19 °C	
		(120 to 1 000) °C	0.26 °C	
		(1 000 to 1 372) °C	0.40 °C	
	Type "L"	(-200 to -100) °C	0.37 °C	
		(-100 to 800) °C	0.26 °C	
		(800 to 900) °C	0.17 °C	
	Type "N"	(-200 to -100) °C	0.40 °C	
		(-100 to -25) °C	0.22 °C	
		(-25 to 120) °C	0.19 °C	
		(120 to 410) °C	0.18 °C	
		(410 to 1 300) °C	0.27 °C	
	Type "R"	(0 to 250) °C	0.57 °C	
		(250 to 400) °C	0.35 °C	
		(400 to 1 000) °C	0.33 °C	
		(1 000 to 1 767) °C	0.40 °C	

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Electrical Simulation of Thermocouple Indicators - Source and Measure ⁴ (Cont.)						
Type "S"	(0 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	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures		
Type "T"	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.63 °C 0.24 °C 0.16 °C 0.14 °C				
Type "U"	(-200 to 0) °C (0 to 600) °C	0.56 °C 0.27 °C				
Electrical Simulation of RTDs ⁴						
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 0.10 °C 0.12 °C 0.23 °C			Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
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 0.10 °C 0.12 °C				
Pt 3916 (100 Ω)	(-200 to -190) °C (-190 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	0.25 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.08 °C 0.09 °C 0.10 °C 0.23 °C				
Pt 385 (200 Ω)	(-200 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.04 °C 0.05 °C 0.12 °C 0.13 °C 0.14 °C 0.16 °C				

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Electrical Simulation of RTDs ⁴ (Cont.)				
Pt 385 (500 Ω)	(-200 to 080) °C (-80 to 100) °C (100 to 260) °C (260 to 400) °C (400 to 600) °C (600 to 630) °C	0.04 °C 0.05 °C 0.06 °C 0.08 °C 0.09 °C 0.11 °C	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
Pt 385 (1 000 Ω)	(-200 to 0) °C (0 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 600) °C (600 to 630) °C	0.03 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.23 °C		
PtNi 385 (120 Ω)	(-80 to 1 000) °C (100 to 260) °C	0.08 °C 0.14 °C		
Capacitance - Source ⁴				
(0.19 to 0.4) nF	10Hz to 10kHz	5 mF/F + 10 pF	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
(0.4 to 1.1) nF	10Hz to 10kHz	5 mF/F + 10 pF		
(1.1 to 3.3) nF	10Hz to 3kHz	5 mF/F + 10 pF		
(3.3 to 11) nF	10Hz to 1kHz	2.5 mF/F + 10 pF		
(11 to 33) nF	10Hz to 1kHz	2.5 mF/F + 100 pF		
(33 to 110) nF	10Hz to 1kHz	2.5 mF/F + 100 pF		
(110 to 330) nF	10Hz to 1kHz	2.5 mF/F + 300 pF		
(0.33 to 1.1) μF	(10 to 600) Hz	2.5 mF/F + 1 nF		
(1.1 to 3.3) μF	(10 to 300) Hz	2.5 mF/F + 3 nF		
(3.3 to 11) μF	(10 to 150) Hz	2.5 mF/F + 10 nF		
(11 to 33) μF	(10 to 120) Hz	4 mF/F + 30 nF		
(33 to 110) μF	(10 to 80) Hz	4.5 mF/F + 100 nF		
(110 to 330) μF	(0 to 50) Hz	4.5 mF/F + 300 nF		
(0.33 to 1.1) mF	(0 to 20) Hz	4.5 mF/F + 1 μF		
(1.1 to 3.3) mF	(0 to 6) Hz	4.5 mF/F + 3 μF		
(3.3 to 11) mF	(0 to 2) Hz	4.5 mF/F + 10 μF		
(11 to 33) mF	(0 to 0.66) Hz	7.5 mF/F + 30 μF		
(33 to 110) mF	(0 to 0.2) Hz	11 mF/F + 100 μF		

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Calibration of Oscilloscopes ⁴ DC Signal into 50 Ω Load into 1 MΩ Load	(-6.6 to 6.6) V (-130 to 130) V	2.5 mV/V + 40 μV 0.5 mV/V + 40 μV	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
Squarewave 50 Ω Load	1 mV to 6.6 Vp-p 10 Hz to 10 kHz	2.5 mV/V + 40 μV		
1 MΩ Load	1 mV to 130 Vp-p 10 Hz to 10 kHz	1.0 mV/V + 40 μV		
Leveled Sine Wave - Flatness Relative to 50 kHz [5 mV to 5.5 V]	50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz (600 to 1 100) MHz	15 mV/V + 100 μV 20 mV/V + 100 μV 40 mV/V + 100 μV 50 mV/V + 100 μV		
[5mV to 3.5V]				
Time Marker into 50 Ω Load-Source ⁷	5 s to 50 ms 20 ms to 100 ns (50 to 20) ns 10 ns (5 to 1) ns	(25 + 1 000t) parts in 10 ⁶ 2.5 parts in 10 ⁶ 2.5 parts in 10 ⁶ 2.5 parts in 10 ⁶ 2.5 parts in 10 ⁶		
Edge Specs into 50 Ω Load-Source Rise Time Amplitude Frequency	≤ 300 ps 5.0 mV to 2.5V 1 kHz to 10 MHz	0ps /-100 ps 20 mV/V + 200 μV 2.5 parts in 10 ⁶ of setting		
Wave Generator - Source ⁴ Amplitude (10 Hz to 10 kHz) Square, Sine, Triangle into 1 MΩ Square, Sine, Triangle into 50 Ω	1.8 mV to 55 Vp-p 1.8 mV to 2.5 Vp-p	30 mV/V + 100 μV 30 mV/V + 100 μV	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
Frequency ⁴	10 Hz to 100 kHz	25 parts in 10 ⁶ + 15 mHz	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
Calibration of Power Measuring Equipment ⁴ DC Power - Source (33 to 1 000) V	(0.33 to 330) mA (0.33 to 3) A (3 to 20.5) A	0.023 % of Watts Output 0.022 % of Watts Output 0.07 % of Watts Output	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures

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AC Power - Source ⁴ (45 to 65) Hz P=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	0.14 % of Watts Output 0.10 % of Watts Output 0.14 % of Watts Output 0.10 % of Watts Output 0.13 % of Watts Output 0.11 % of Watts Output 0.13 % of Watts Output 0.11 % of Watts Output	Fluke 5520A-SC1100 ⁵	OEM, GIDEP and locally developed calibration procedures
(0.33 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	0.12 % of Watts Output 0.08 % of Watts Output 0.12 % of Watts Output 0.08 % of Watts Output 0.11 % of Watts Output 0.09 % of Watts Output 0.12 % of Watts Output 0.10 % of Watts Output		

II. Time and Frequency

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Frequency - Source ⁴	0.01 Hz to 2 MHz 10 MHz	2.6 µHz/Hz + 5 µHz 1 part in 10 ¹¹	Fluke 5520A-SC1100 ⁵ Spectracom 8194	OEM, GIDEP and locally developed calibration procedures

III. Mechanical

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Torque Wrenches ^{4,9}	5 to 50) lbf·in (40 to 400) lbf·in (100 to 1 000) lbf·in (25 to 250) lbf·ft	(0.25 + 0.026T) lbf·in (2.1 + 0.0053T) lbf·in (3.8 + 0.0015T) lbf·in (0.7 + 0.023T) lbf·ft	CDI 5000ST and 2000-400-02	OEM, GIDEP and locally developed calibration procedures
Pressure Gages, Transducers - Measure ^{4,10}	(3 to 30) psi (20 to 100) psi (100 to 500) psi (200 to 1 000) psi (1 000 to 5 000) psi (2 000 to 10 000) psi	(0.0086 + 0.00092P) psi (0.038 + 0.00087P) psi (0.04 + 0.0011P) psi (0.076 + 0.0011P) psi (0.40 + 0.0011P) psi (0.69 + 0.0011P) psi	Crystal 30PSIXP2I Crystal 100PSIXP2I Crystal 500PSIXP2I Crystal 1KPSIXP2I Crystal 5KPSIXP2I Crystal 10KPSIXP2I	OEM, GIDEP and locally developed calibration procedures

IV. Dimensional

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Micrometers ⁴	Up to 1 in	37 µin	Grade 2 Gage Blocks	OEM, GIDEP and locally developed calibration procedures
Calipers ⁴	Up to 6 in	(290 + 0.51L) µin	Grade 2 Gage Blocks	OEM, GIDEP and locally developed calibration procedures
Plain Plug and Pin Gages	Up to 1 in	51 µin	P&W Model C With Grade 2 Gage Blocks	OEM, GIDEP and locally developed calibration procedures
Thread Plugs Pitch Diameter Major Diameter	Up to 5 in Up to 5 in	105 µin 51 µin	P&W Model C With Grade 2 Gage Blocks and Thread Wires	OEM, GIDEP and locally developed calibration procedures

V. Thermodynamic

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Temperature – Measure ^{4,11}	(-250 to 660) °C	(0.03 + 0.00042Y) °C	Advanced Sensing Products WSP660 PRT and HP 3458A	OEM, GIDEP and locally developed calibration procedures
IR Temperature - Source ⁴	(122 to 350) °F (350 to 565) °F (565 to 740) °F (740 to 932) °F (740 to 932) °F	1.1 °F 1.5 °F 1.6 °F 1.8 °F 1.8 °F	Hart 9132	OEM, GIDEP and locally developed calibration procedures

Notes:

1. Calibration and Measurement Uncertainties (Expanded Uncertainty) are based on approximately a 95% confidence interval, using a coverage of k=2
2. This laboratory's capabilities include both in-laboratory and on-site calibration services. 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. Calibration and Measurement Capabilities (Expanded Uncertainties) are based on approximately a 95% Confidence Interval, using a coverage factor of k=2, except where noted.
4. On-Site calibration service is available for this parameter.
5. 5520A Expanded Uncertainties are based on a 99% Confidence Interval, using a coverage factor of k=2.576.
6. In the statement of Calibration and Measurement Capabilities, x is the numerical value of the nominal voltage being measured in kV.
7. In the statement of Calibration and Measurement Capabilities, t is the time in seconds.
8. In the statement of Calibration and Measurement Capabilities, L is the nominal value of Length being measured in inches.
9. In the statement of Calibration and Measurement Capabilities, T is the nominal value of Torque being measured in lbf-in or lbf-ft.
10. In the statement of Calibration and Measurement Capabilities, P is the nominal value of Pressure being measured in psi.
11. In the statement of Calibration and Measurement Capabilities, Y is the nominal value of temperature being measured in degrees C.
12. This scope is part of and must be included with the Certificate of Accreditation No.AC-1440

Karl Greenway

Vice President