



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

**Tektronix Service Solutions**

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CALIBRATION

Valid to: January 31, 2013

Certificate Number: AC-1257

**I. Electromagnetic - DC/Low Frequency**

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
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	8 μV/V + 600 nV 7 μV/V + 1 μV 7 μV/V + 3.5 μV 7 μV/V + 6.5 μV 8 μV/V + 80 μV 9 μV/V + 500 μV	Fluke 5700A	OEM and GIDEP Sourced Calibration Procedures
DC Voltage - Measure	(10 to 100) mV 100 mV to 1 V (1 to 10) V (10 to 100) V 100 V to 1 kV	11 μV/V + 300 nV 10 μV/V + 300 nV 10 μV/V + 500 nV 12 μV/V + 30 μV 22 μV/V + 100 μV	HP 3458A	
DC Current - Source	Up to 220 μA 220 μA to 2.2 mA (2.2 to 22) mA (22 to 100) mA (100 to 220) mA  220 mA to 1 A (1 to 2.2) A  (2.2 to 11) A	50 μA/A + 8 nA 50 μA/A + 8 nA 50 μA/A + 80 nA 60 μA/A + 800 nA 60 μA/A + 800 nA + [(200)(I <sup>2</sup> ppm)] 80 μA/A + 25 μA 80 μA/A + 25 μA + [(10)(I <sup>2</sup> ppm)] 600 μA/A + 330 μA	Fluke 5700A        Fluke 5500A	
DC Current - Measure	100 μA to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1 A	25 μA/A + 5 nA 25 μA/A + 50 nA 40 μA/A + 500 nA 115 μA/A + 10 μA	HP 3458A	



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DC Current - Measure	100 $\mu$ A to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1 A	25 $\mu$ A/A + 5 nA 25 $\mu$ A/A + 50 nA 40 $\mu$ A/A + 500 nA 115 $\mu$ A/A + 10 $\mu$ A	HP 3458A	OEM and GIDEP Sourced Calibration Procedures
Resistance - Source	1 $\Omega$ 1.9 $\Omega$ 10 $\Omega$ 19 $\Omega$ 100 $\Omega$ 190 $\Omega$ 1 k $\Omega$ 1.9 k $\Omega$ 10 k $\Omega$ 19 k $\Omega$ 100 k $\Omega$ 190 k $\Omega$ 1 M $\Omega$ 1.9 M $\Omega$ 10 M $\Omega$ 19 M $\Omega$ 100 M $\Omega$	95 $\mu\Omega$ 181 $\mu\Omega$ 280 $\mu\Omega$ 513 $\mu\Omega$ 1.7 m $\Omega$ 3.23 m $\Omega$ 13 m $\Omega$ 24.7 m $\Omega$ 120 m $\Omega$ 228 m $\Omega$ 1.4 $\Omega$ 2.66 $\Omega$ 20 $\Omega$ 40 $\Omega$ 400 $\Omega$ 893 $\Omega$ 11 k $\Omega$	Fluke 5700A	
Resistance - Measure	Up to 10 $\Omega$ (10 to 100) $\Omega$ 100 $\Omega$ to 1 k $\Omega$ (1 to 10) k $\Omega$ (10 to 100) k $\Omega$ 100 k $\Omega$ to 1 M $\Omega$ (1 to 10) M $\Omega$ (10 to 100) M $\Omega$ 100 M $\Omega$ to 1 G $\Omega$	18 $\mu\Omega/\Omega$ + 50 $\mu\Omega$ 15 $\mu\Omega/\Omega$ + 500 $\mu\Omega$ 13 $\mu\Omega/\Omega$ + 500 $\mu\Omega$ 13 $\mu\Omega/\Omega$ + 5 m $\Omega$ 13 $\mu\Omega/\Omega$ + 50 m $\Omega$ 18 $\mu\Omega/\Omega$ + 2 $\Omega$ 53 $\mu\Omega/\Omega$ + 100 $\Omega$ 503 $\mu\Omega/\Omega$ + 1 k $\Omega$ 5 m $\Omega/\Omega$ + 10 k $\Omega$	HP 3458A	
AC Voltage - Source	<b>Up to 2.2 mV</b> (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	550 $\mu$ V/V + 4.5 $\mu$ V 210 $\mu$ V/V + 4.5 $\mu$ V 105 $\mu$ V/V + 4.5 $\mu$ V 370 $\mu$ V/V + 4.5 $\mu$ V 850 $\mu$ V/V + 7 $\mu$ V 1.1 mV/V + 13 $\mu$ V 1.7 mV/V + 25 $\mu$ V 3.4 mV/V + 25 $\mu$ V	Fluke 5700A	

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AC Voltage - Source (cont.)	<b>(2.2 to 22) mV</b>			
	(10 to 20) Hz	550 $\mu$ V/V + 5 $\mu$ V		
	(20 to 40) Hz	210 $\mu$ V/V + 5 $\mu$ V		
	40 Hz to 20 kHz	105 $\mu$ V/V + 5 $\mu$ V		
	(20 to 50) kHz	370 $\mu$ V/V + 5 $\mu$ V		
	(50 to 100) kHz	850 $\mu$ V/V + 7 $\mu$ V		
	(100 to 300) kHz	1.1 mV/V + 12 $\mu$ V		
	(300 to 500) kHz	1.7 mV/V + 25 $\mu$ V		
	500 kHz to 1 MHz	3.4 mV/V + 25 $\mu$ V		
	<b>(22 to 220) mV</b>			
	(10 to 20) Hz	550 $\mu$ V/V + 13 $\mu$ V		
	(20 to 40) Hz	210 $\mu$ V/V + 8 $\mu$ V		
	40 Hz to 20 kHz	105 $\mu$ V/V + 8 $\mu$ V		
	(20 to 50) kHz	320 $\mu$ V/V + 8 $\mu$ V		
	(50 to 100) kHz	850 $\mu$ V/V + 25 $\mu$ V		
	(100 to 300) kHz	1.1 mV/V + 25 $\mu$ V		
	(300 to 500) kHz	1.7 mV/V + 35 $\mu$ V		
	500 kHz to 1 MHz	3.4 mV/V + 80 $\mu$ V		
	<b>220 mV to 2.2 V</b>			
	(10 to 20) Hz	500 $\mu$ V/V + 80 $\mu$ V		
	(20 to 40) Hz	160 $\mu$ V/V + 25 $\mu$ V		
	40 Hz to 20 kHz	75 $\mu$ V/V + 6 $\mu$ V		
	(20 to 50) kHz	120 $\mu$ V/V + 16 $\mu$ V		
	(50 to 100) kHz	250 $\mu$ V/V + 70 $\mu$ V		
(100 to 300) kHz	430 $\mu$ V/V + 130 $\mu$ V			
(300 to 500) kHz	1.05 mV/V + 350 $\mu$ V			
500 kHz to 1 MHz	2.2 mV/V + 850 $\mu$ V			
<b>(2.2 to 22) V</b>				
(10 to 20) Hz	500 $\mu$ V/V + 800 $\mu$ V			
(20 to 40) Hz	160 $\mu$ V/V + 250 $\mu$ V			
40 Hz to 20 kHz	75 $\mu$ V/V + 60 $\mu$ V			
(20 to 50) kHz	120 $\mu$ V/V + 160 $\mu$ V			
(50 to 100) kHz	250 $\mu$ V/V + 350 $\mu$ V			
(100 to 300) kHz	500 $\mu$ V/V + 1.5 mV			
(300 to 500) kHz	1.25 mV/V + 4.3 mV			
500 kHz to 1 MHz	2.7 mV/V + 8.5 mV			
<b>(22 to 220) V</b>				
(10 to 20) Hz	500 $\mu$ V/V + 8 mV			
(20 to 40) Hz	160 $\mu$ V/V + 2.5 mV			
40 Hz to 20 kHz	80 $\mu$ V/V + 800 $\mu$ V			
(20 to 50) kHz	220 $\mu$ V/V + 3.5 mV			
(50 to 100) kHz	500 $\mu$ V/V + 8 mV			
(100 to 300) kHz	1.5 mV/V + 90 mV			
(300 to 500) kHz	4.7 mV/V + 90 mV			
500 kHz to 1 MHz	115 mV/V + 190 mV			



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AC Voltage - Source (cont.)	<b>(220 to 250) V</b> (15 to 50) Hz 50 Hz to 1kHz <b>250 V to 1.1 kV</b> 50 Hz to 1kHz	400 $\mu$ V/V + 16 mV 80 $\mu$ V/V + 3.5 mV 80 $\mu$ V/V + 3.5 mV	Fluke 5700A	OEM and GIDEP Sourced Calibration Procedures
AC Voltage - Measure	<b>(1 to 10) mV</b> (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 <b>(10 to 100) mV</b> (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 2) MHz (2 to 4) MHz (4 to 8) MHz (8 to 10) MHz <b>100 mV to 1 V</b> (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 2) MHz (2 to 4) MHz (4 to 8) MHz (8 to 10) MHz	302 $\mu$ V/V + 3 $\mu$ V 202 $\mu$ V/V + 1.1 $\mu$ V 302 $\mu$ V/V + 1.1 $\mu$ V 1 mV/V + 1.1 $\mu$ V 5 mV/V + 1.1 $\mu$ V 40 mV/V + 2 $\mu$ V 12 mV/V + 5 $\mu$ V 70 mV/V + 7 $\mu$ V 200 mV/V + 8 $\mu$ V 72 $\mu$ V/V + 4 $\mu$ V 72 $\mu$ V/V + 2 $\mu$ V 142 $\mu$ V/V + 2 $\mu$ V 302 $\mu$ V/V + 2 $\mu$ V 802 $\mu$ V/V + 2 $\mu$ V 3 mV/V + 10 $\mu$ V 10 mV/V + 10 $\mu$ V 15 mV/V + 10 $\mu$ V 40 mV/V + 70 $\mu$ V 40 mV/V + 80 $\mu$ V 150 mV/V + 100 $\mu$ V 72 $\mu$ V/V + 40 $\mu$ V 72 $\mu$ V/V + 20 $\mu$ V 142 $\mu$ V/V + 20 $\mu$ V 302 $\mu$ V/V + 20 $\mu$ V 802 $\mu$ V/V + 20 $\mu$ V 3 mV/V + 100 $\mu$ V 10 mV/V + 100 $\mu$ V 15 mV/V + 100 $\mu$ V 40 mV/V + 700 $\mu$ V 40 mV/V + 800 $\mu$ V 150 mV/V + 1 mV	HP 3458A	

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AC Voltage - Measure (cont.)	<p><b>(1 to 10) V</b>  (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 2) MHz  (2 to 4) MHz  (4 to 8) MHz  (8 to 10) MHz</p> <p><b>10 to 100) V</b>  (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><b>100 V to 1 kV</b>  (1 to 40) Hz  40 Hz to 1 kHz  (1 to 20) kHz  (20 to 50) kHz  (50 to 100) kHz</p>	<p>72 <math>\mu</math>V/V + 400 <math>\mu</math>V  72 <math>\mu</math>V/V + 200 <math>\mu</math>V  142 <math>\mu</math>V/V + 200 <math>\mu</math>V  302 <math>\mu</math>V/V + 200 <math>\mu</math>V  802 <math>\mu</math>V/V + 200 <math>\mu</math>V  3 mV/V + 1 mV  10 mV/V + 1 mV  15 mV/V + 1 mV  40 mV/V + 7 mV  40 mV/V + 8 mV  150 mV/V + 10 mV</p> <p>202 <math>\mu</math>V/V + 4 mV  202 <math>\mu</math>V/V + 2 mV  202 <math>\mu</math>V/V + 2 mV  352 <math>\mu</math>V/V + 2 mV  1.2 mV/V + 2 mV  4 mV/V + 10 mV  15 mV/V + 10 mV</p> <p>402 <math>\mu</math>V/V + 40 mV  402 <math>\mu</math>V/V + 20 mV  602 <math>\mu</math>V/V + 20 mV  1.2 mV/V + 20 mV  3 mV/V + 20 mV</p>	HP 3458A	OEM and GIDEP Sourced Calibration Procedures
AC Current - Source	<p><b>(9 to 220) <math>\mu</math>A</b>  (10 to 20) Hz  (20 to 40) Hz  40 Hz to 1 kHz  (1 to 5) kHz  (5 to 10) kHz</p> <p><b>220 <math>\mu</math>A to 2.2 mA</b>  (10 to 20) Hz  (20 to 40) Hz  40 Hz to 1 kHz  (1 to 5) kHz  (5 to 10) kHz</p> <p><b>(2.2 to 22) mA</b>  (10 to 20) Hz  (20 to 40) Hz  40 Hz to 1 kHz  (1 to 5) kHz  (5 to 10) kHz</p>	<p>700 <math>\mu</math>A/A + 25 nA  350 <math>\mu</math>A/A + 20 nA  140 <math>\mu</math>A/A + 16 nA  600 <math>\mu</math>A/A + 40 nA  1.6 mA/A + 80 nA</p> <p>700 <math>\mu</math>A/A + 40 nA  350 <math>\mu</math>A/A + 35 nA  140 <math>\mu</math>A/A + 35 nA  600 <math>\mu</math>A/A + 400 nA  1.6 mA/A + 800 nA</p> <p>700 <math>\mu</math>A/A + 400 nA  350 <math>\mu</math>A/A + 350 nA  140 <math>\mu</math>A/A + 350 nA  600 <math>\mu</math>A/A + 4 <math>\mu</math>A  1.6 mA/A + 8 <math>\mu</math>A</p>	Fluke 5700A	

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AC Current - Source (cont.)	<b>(22 to 220) mA</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz <b>220 mA to 2.2 A</b> 20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz <b>(2.2 to 11) A</b> (45 to 65) Hz (65 to 500) Hz 500 Hz to 1 kHz	700 $\mu$ A/A + 4 $\mu$ A 350 $\mu$ A/A + 3.5 $\mu$ A 140 $\mu$ A/A + 3.5 $\mu$ A 600 $\mu$ A/A + 40 $\mu$ A 1.6 mA/A + 80 $\mu$ A  650 $\mu$ A/A + 35 $\mu$ A 750 $\mu$ A/A + 80 $\mu$ A 8.5 mA/A + 160 $\mu$ A  600 $\mu$ A/A + 2 mA 1 mA/A + 2 mA 3.3 mA/A + 2 mA	Fluke 5500A	
AC Current - Measure	<b>(5 to 100) <math>\mu</math>A</b> (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 1 kHz <b>100 <math>\mu</math>A to 1 mA</b> (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 <b>(1 to 10) mA</b> (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 <b>(10 to 100) mA</b> (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 600 $\mu$ A/A + 30 nA 600 $\mu$ A/A + 30 nA  4 mA/A + 200 nA 1.5 mA/A + 200 nA 600 $\mu$ A/A + 200 nA 300 $\mu$ A/A + 200 nA 600 $\mu$ A/A + 200 nA 4 mA/A + 400 nA 5.5 mA/A + 1.5 $\mu$ A  4 mA/A + 2 $\mu$ A 1.5 mA/A + 2 $\mu$ A 600 $\mu$ A/A + 2 $\mu$ A 300 $\mu$ A/A + 2 $\mu$ A 600 $\mu$ A/A + 2 $\mu$ A 4 mA/A + 4 $\mu$ A 5.5 mA/A + 15 $\mu$ A  4 mA/A + 20 $\mu$ A 1.5 mA/A + 20 $\mu$ A 600 $\mu$ A/A + 20 $\mu$ A 600 $\mu$ A/A + 20 $\mu$ A 600 $\mu$ A/A + 20 $\mu$ A 4 mA/A + 40 $\mu$ A 5.5 mA/A + 150 $\mu$ A	HP 3458A	OEM and GIDEP Sourced Calibration Procedures



PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Current - Measure (cont.)	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 mA/A + 200 µA 1.6 mA/A + 200 µA 800 µA/A + 200 µA 1 mA/A + 200 µA 3 mA/A + 200 µA 10 mA/A + 400 µA	HP 3458A	OEM and GIDEP Sourced Calibration Procedures
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	Fluke 5500A	
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		
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 L	(-200 to -100) °C (-100 to 800) °C (800 to 900) °C	0.37 °C 0.26 °C 0.17 °C		

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Electrical Simulation of Thermocouple Indicators (cont.)				
Type N	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1 300) °C	0.4 °C 0.22 °C 0.19 °C 0.18 °C 0.27 °C		
Type R	(0 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	(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		
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	Fluke 5500A	OEM and GIDEP Sourced Calibration Procedures
Type U	(-200 to 0) °C (0 to 600) °C	0.56 °C 0.27 °C		
Electrical Simulation of RTDs				
Pt 395 (100 $\Omega$ )	(-200 to -80) °C (-80 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 0.05 °C 0.07 °C 0.09 °C 0.1 °C 0.12 °C 0.23 °C		
Pt 3926 (100 $\Omega$ )	(-200 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	0.05 °C 0.05 °C 0.07 °C 0.09 °C 0.1 °C 0.12 °C		

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Electrical Simulation of RTDs (cont.) Pt 3916 (100 Ω)  Pt 385 (200 Ω)  Pt 385 (500 Ω)  Pt 385 (1 000 Ω)  PtNi 385 (120 Ω) [Ni120]	(-200 to -190) °C	0.25 °C	Fluke 5500A	OEM and GIDEP Sourced Calibration Procedures
	(-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		
	(-200 to -80) °C	0.04 °C		
	(-80 to 0) °C	0.04 °C		
	(0 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		
	(-200 to -80) °C	0.04 °C		
	(-80 to 0) °C	0.05 °C		
	(0 to 100) °C	0.05 °C		
	(100 to 260) °C	0.06 °C		
	(260 to 300) °C	0.08 °C		
	(300 to 400) °C	0.08 °C		
	(400 to 600) °C	0.09 °C		
	(600 to 630) °C	0.11 °C		
	(-200 to -80) °C	0.03 °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	0.06 °C			
(300 to 400) °C	0.07 °C			
(400 to 600) °C	0.07 °C			
(600 to 630) °C	0.23 °C			
(-80 to 100) °C	0.08 °C			
(100 to 260) °C	0.14 °C			

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<p><b>Oscilloscopes</b></p> <p>Amplitude - DC Signal into 50 <math>\Omega</math> Load into 1 M<math>\Omega</math> Load</p> <p>Amplitude - Square Wave into 50 <math>\Omega</math> Load into 1 M<math>\Omega</math> Load</p> <p>Leveled Sine Wave - Flatness Relative to 50 kHz</p> <p>Time Marker into 50 <math>\Omega</math> Load Pulsed Sawtooth Wave</p> <p>Sine Wave Edge Specs into 50<math>\Omega</math> Load Amplitude Frequency</p> <p>Wave Generator Amplitude (10 Hz to 10 kHz)</p> <p>Square, Sine, Triangle into 1 M<math>\Omega</math> Square, Sine, Triangle into 50 <math>\Omega</math></p> <p>Frequency</p>	<p>0 V to <math>\pm</math> 2.2 V 0 V to <math>\pm</math> 33 V</p> <p>1.8 mV to 2.2 V p-p 10 Hz to 10 kHz 1.8 mV to 105 V p-p 10 Hz to 10 kHz</p> <p>[5 mV to 5.5 V] 50 kHz to 100 MHz (100 to 300) MHz</p> <p>5 sec to 100 <math>\mu</math>s (50 to 2) <math>\mu</math>s 1 <math>\mu</math>s to 20 ns (10 to 2) ns</p> <p>4.5 mV to 2.75 V 1 kHz to 1 MHz</p> <p>1.8 mV to 55 V p-p 1.8 mV to 2.5 V p-p</p> <p>10 Hz to 10 kHz</p>	<p>2.5 mV/V + 100 <math>\mu</math>V 2.5 mV/V + 100 <math>\mu</math>V</p> <p>2.5 mV/V + 100 <math>\mu</math>V 2.5 mV/V + 100 <math>\mu</math>V</p> <p>35 mV/V + 300 <math>\mu</math>V 40 mV/V + 300 <math>\mu</math>V</p> <p>(25+1 000t) <math>\mu</math>s/s (25+15 000t) <math>\mu</math>s/s 25 <math>\mu</math>s/s 25 <math>\mu</math>s/s</p> <p>20 mV/V + 200 <math>\mu</math>V 25 <math>\mu</math>V/V + 15 mHz</p> <p>30 mV/V + 100 <math>\mu</math>V 30 mV/V + 100 <math>\mu</math>V</p> <p>25 parts in 10<sup>6</sup> + 15 mHz</p>	<p>Fluke 5500A-SC300</p>	<p>OEM and GIDEP Sourced Calibration Procedures</p>
<p><b>Capacitance - Source</b></p> <p>50 Hz to 1 kHz 50 Hz to 1 kHz 50 Hz to 1 kHz 50 Hz to 1 kHz 50 Hz to 1 kHz (50 to 400) Hz (50 to 400) Hz (50 to 200) Hz (50 to 100) Hz (50 to 100) Hz</p>	<p>330 pF to 11 nF (11 to 110) nF (110 to 330) nF 330 nF to 1.1 <math>\mu</math>F (1.1 to 3.3) <math>\mu</math>F (3.3 to 11) <math>\mu</math>F (11 to 33) <math>\mu</math>F (33 to 110) <math>\mu</math>F (110 to 330) <math>\mu</math>F 330 <math>\mu</math>F to 1.1 mF</p>	<p>5 mF/F + 10 pF 2.5 mF/F + 100 pF 2.5 mF/F + 300 pF 2.5 mF/F + 1 nF 3.5 mF/F + 3 nF 3.5 mF/F + 10 nF 4 mF/F + 30 nF 5 mF/F + 100 nF 7 mF/F + 300 nF 10 mF/F + 300 nF</p>	<p>Fluke 5500A</p>	



PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY ( $\pm$ )]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
DC Power - Source 33 mV to 1.02 kV	(3.3 to 9) mA (9 to 33) mA (33 to 90) mA (90 to 330) mA (330 to 900) mA 900 mA to 2.2 A (2.2 to 4.5) A (4.5 to 11) A	0.04 % of Watts Output 0.03 % of Watts Output 0.04 % of Watts Output 0.03 % of Watts Output 0.08 % of Watts Output 0.06 % of Watts Output 0.12 % of Watts Output 0.9 % of Watts Output	Fluke 5500A-SC300 Fluke 5500A	OEM and GIDEP Sourced Calibration Procedures
AC Power - Source (45 to 65) Hz, PF=1 (33 to 330) mV  330 mV to 1 kV	(3.3 to 9) mA (9 to 33) mA (33 to 90) mA (90 to 330) mA (330 to 900) mA 900 mA to 2.2 A (2.2 to 4.5) A (4.5 to 11) A  (3.3 to 9) mA (9 to 33) mA (33 to 90) mA (90 to 330) mA (330 to 900) mA 900 mA to 2.2 A (2.2 to 4.5) A (4.5 to 11) A	0.4 % of Watts Output 0.25 % of Watts Output 0.35 % of Watts Output 0.25 % of Watts Output 0.35 % of Watts Output 0.25 % of Watts Output 0.35 % of Watts Output 0.25 % of Watts Output  0.25 % of Watts Output 0.15 % of Watts Output 0.25 % of Watts Output 0.15 % of Watts Output 0.25 % of Watts Output 0.15 % of Watts Output 0.2 % of Watts Output 0.15 % of Watts Output		

## II. Time & Frequency

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY ( $\pm$ )]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Frequency - Source	10 MHz (0.01 to 120) Hz 120 Hz to 1.2 kHz (1.2 to 10) kHz (10 to 12) kHz (12 to 120) kHz 120 kHz to 1.2 MHz (1.2 to 2) MHz	0.06 $\mu$ Hz/Hz 25 $\mu$ Hz/Hz + 1 mHz 25 $\mu$ Hz/Hz + 1 mHz 25 $\mu$ Hz/Hz + 1 mHz 25 $\mu$ Hz/Hz + 15 mHz 25 $\mu$ Hz/Hz + 15 mHz 25 $\mu$ Hz/Hz + 15 mHz 25 $\mu$ Hz/Hz + 15 mHz	Datum 9390-6000 Fluke 5500A-SC300	OEM and GIDEP Sourced Calibration Procedures

### III. Thermodynamic

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY ( $\pm$ )]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Temperature	(-80 to 150) °C (20 to 300) °C	0.03 °C 0.05 °C	Hart 5612 w/ 1502 Tweener and Baths	OEM and GIDEP Sourced Calibration Procedures
Relative Humidity	(0 to 100) %RH	1.9 %RH	Vaisala HMI 41/HMP 46 Indicator & Probe	

### IV. Mechanical

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY ( $\pm$ )]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Torque Tools	5 in-lb to 1 000 ft-lb	0.32 % of reading	CDI Suretest Torque Measuring System	OEM and GIDEP Sourced Calibration Procedures

**Notes:**

1. Calibration and Measurement Capabilities (CMC) (Expanded Uncertainties) are based on approximately a 95% confidence interval, using a coverage of  $k=2$ .
2. This laboratory's capabilities include in-laboratory calibrations as well as on-site calibrations 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. The use of (t) signifies an expression of Time in seconds.
4. The CMC listed for Electromagnetic – DC/Low Frequency and Time & Frequency do not include possible contributions to uncertainty from a "best available" unit under test.
5. This scope is part of and must be included with the Certificate of Accreditation No. AC-1257.



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Vice President