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

Davis Calibration

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CALIBRATION

Valid to: March 22, 2010 Certificate Number: AC-1180

I. Electromagnetic DC/Low Frequency

PARAMETER / EQUIPMENT	RANGE	BEST 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 to 11) V (11 to 22) V (22 to 220) V 220 V to 1.1 kV	9 µV/V + 800 nV 8 µV/V + 1.2 µV 8 µV/V + 4 µV 8 µV/V + 8 µV 9 µV/V + 100 µV 11 µV/V + 600 µV	Fluke 5700A	OEM, GIDEP, and Laboratory Developed Procedures
DC Voltage - Measure	Up to 200 mV 200 mV to 2 V (2 to 20) V (20 to 200) V 200 V to 1 kV	2.7 µV/V + 100 nV 2.7 µV/V + 400 nV 2.7 µV/V + 4 µV 4 µV/V + 40 µV 4 µV/V + 500 µV	Fluke 8508A Opt 01	
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 (2.2 to 11) A (11 to 20.5) A	60 µA/A + 10 nA 60 µA/A + 10 nA 60 µA/A + 100 µA 70 µA/A + 1 µA 95 µA/A + 30 µA 500 µA/A + 500 µA 1 mA/A + 750 µA	Fluke 5700A Fluke 5520A/SC1100	
DC Current - Measure	(100 to 200) µA 200 µA to 2 mA (2 to 20) mA (20 to 200) mA 200 mA to 2 A (2 to 20) A	12 µA/A + 400 pA 12 µA/A + 4 nA 14 µA/A + 40 nA 48 µA/A + 800 nA 185 µA/A + 16 µA 400 µA/A + 400 nA	Fluke 8508A Opt 01	

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage – Source	**Up to 2.2 mV**		Fluke 5700A	OEM, GIDEP, and Laboratory Developed Procedures
	(10 to 20) Hz	600 µV/V + 5 µV		
	(20 to 40) Hz	240 µV/V + 5 µV		
	40 Hz to 20 kHz	120 µV/V + 5 µV		
	(20 to 50) kHz	410 µV/V + 5 µV		
	(50 to 100) kHz	950 µV/V + 8 µV		
	(100 to 300) kHz	1.3 mV/V + 15 µV		
	(300 to 500) kHz	1.8 mV/V + 30 µV		
	500 kHz to 1 MHz	3.6 mV/V + 30 µV		
	(2.2 to 22) mV			
	(10 to 20) Hz	600 µV/V + 6 µV		
	(20 to 40) Hz	240 µV/V + 6 µV		
	40 Hz to 20 kHz	120 µV/V + 6 µV		
	(20 to 50) kHz	410 µV/V + 6 µV		
	(50 to 100) kHz	950 µV/V + 8 µV		
	(100 to 300) kHz	1.3 mV/V + 15 µV		
	(300 to 500) kHz	1.8 mV/V + 30 µV		
	500 kHz to 1 MHz	3.6 mV/V + 30 µV		
	(22 to 220) mV			
	(10 to 20) Hz	600 µV/V + 16 µV		
	(20 to 40) Hz	240 µV/V + 10 µV		
	40 Hz to 20 kHz	110 µV/V + 10 µV		
	(20 to 50) kHz	360 µV/V + 10 µV		
	(50 to 100) kHz	900 µV/V + 30 µV		
	(100 to 300) kHz	1.1 mV/V + 30 µV		
	(300 to 500) kHz	1.8 mV/V + 40 µV		
	500 kHz to 1 MHz	3.6 mV/V + 100 µV		
	220 mV to 2.2 V			
	(10 to 20) Hz	600 µV/V + 100 µV		
	(20 to 40) Hz	180 µV/V + 30 µV		
	40 Hz to 20 kHz	85 µV/V + 7 µV		
	(20 to 50) kHz	140 µV/V + 20 µV		
	(50 to 100) kHz	280 µV/V + 80 µV		
	(100 to 300) kHz	480 µV/V + 150 µV		
	(300 to 500) kHz	1.2 mV/V + 400 µV		
	500 kHz to 1 MHz	2.4 mV/V + 1 mV		
	(2.2 to 22) V			
	(10 to 20) Hz	600 µV/V + 1 mV		
	(20 to 40) Hz	180 µV/V + 300 µV		
	40 Hz to 20 kHz	85 µV/V + 70 µV		
	(20 to 50) kHz	140 µV/V + 200 µV		
	(50 to 100) kHz	280 µV/V + 400 µV		
	(100 to 300) kHz	600 µV/V + 1.7 mV		
	(300 to 500) kHz	1.4 mV/V + 5 mV		
	500 kHz to 1 MHz	3 mV/V + 9 mV		

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage - Source (cont.)	**(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 V to 1.1 kV** 50 Hz to 1 kHz	 600 µV/V + 10 mV 180 µV/V + 3 mV 90 µV/V + 1 mV 250 µV/V + 4 mV 600 µV/V + 10 mV 1.6 mV/V + 110 mV 5.4 mV/V + 110 mV 13 mV/V + 220 mV 90µV/V + 4 mV	Fluke 5700A	OEM, GIDEP, and Laboratory Developed Procedures
AC Voltage – Measure	**(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 1 MHz (1 to 4) MHz (4 to 8) MHz **(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 **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	 300 µV/V + 3 mV 200 µV/V + 1.1 mV 300 µV/V + 1.1 mV 1 mV/V + 1.1 mV 5 mV/V + 1.1 mV 40 mV/V + 2 mV 12 mV/V + 5 µV 70 mV/V + 7 µV 200 mV/V + 8 µV 72 µV/V + 5 mV 72 µV/V + 2 mV 142 µV/V + 2 mV 302 µV/V + 2 mV 802 mV/V + 2 mV 3 mV/V + 10 mV 10 mV/V + 10 mV 15 mV/V + 10 mV 40 mV/V + 8 µV 150 mV/V + 100 µV 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 + 100 µV 10 mV/V + 100 µV 15 mV/V + 100 µV 40 mV/V + 800 µV 150 mV/V + 1 mV	HP 3458A	

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PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage - Measure (cont.)	**(1 to 10) V**		HP 3458A	OEM, GIDEP, and Laboratory Developed Procedures
	(1 to 40) Hz	72 µV/V + 40 µV		
	40 Hz to 1 kHz	72 µV/V + 20 µV		
	(1 to 20) kHz	142 µV/V + 20 µV		
	(20 to 50) kHz	302 µV/V + 20 µV		
	(50 to 100) kHz	802 µV/V + 20 µV		
	(100 to 300) kHz	3 mV/V + 100 µV		
	300 kHz to 1 MHz	10 mV/V to 100 µV		
	(1 to 4) MHz	15 mV/V + 100 µV		
	(4 to 8) MHz	40 mV/V + 800 µV		
	(8 to 10) MHz	150 mV/V + 1 mV		
	(10 to 100) V			
	(1 to 40) Hz	200 µV/V + 4 mV		
	40 Hz to 1 kHz	200 µV/V + 2 mV		
	(1 to 20) kHz	200 µV/V + 2 mV		
	(20 to 50) kHz	350 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	150 mV/V + 10 mV		
	100 V to 1 kV			
	(1 to 40) Hz	400 µV/V + 40 mV		
	40 Hz to 1 kHz	400 µV/V + 20 mV		
	(1 to 20) kHz	600 µV/V + 20 mV		
	(20 to 50) kHz	1.2 mV/V + 20 mV		
	(50 to 100) kHz	3.0 mV/V + 20 mV		
AC Current - Source	**Up to 220 µA**		Fluke 5700A	
	(10 to 20) Hz	800 µA/A + 30 nA		
	(20 to 40) Hz	420 µA/A + 25 nA		
	40 Hz to 1 kHz	160 µA/A + 20 nA		
	(1 to 5) kHz	700 µA/A + 50 nA		
	(5 to 10) kHz	1.8 mA/A + 100 nA		
	220 µA to 2.2 mA			
	(10 to 20) Hz	800 µA/A + 50 nA		
	(20 to 40) Hz	420 µA/A + 40 nA		
	40 Hz to 1 kHz	160 µA/A + 40 nA		
	(1 to 5) kHz	700 µA/A + 500 nA		
	(5 to 10) kHz	1.8 mA/A + 1 µA		
	(2.2 to 22) mA			
	(10 to 20) Hz	800 µA/A + 500 nA		
	(20 to 40) Hz	420 µA/A + 400 nA		
	40 Hz to 1 kHz	160 µA/A + 400 nA		
	(1 to 5) kHz	700 µA/A + 5 µA		
	(5 to 10) kHz	1.8 mA/A + 10 µA		

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Current - Source (cont.)	**(22 to 220) mA**		Fluke 5700A	OEM, GIDEP, and Laboratory Developed Procedures
	(10 to 20) Hz	800 µA/A + 5 µA		
	(20 to 40) Hz	420 µA/A + 4 µA		
	40 Hz to 1 kHz	180 µA/A + 4 µA		
	(1 to 5) kHz	700 µA/A + 50 µA		
	(5 to 10) kHz	1.8 mA/A + 100 µA		
	220 mA to 2.2 A			
	40 Hz to 1 kHz	750 µA/A + 40 µA		
	(1 to 5) kHz	850 µA/A + 100 µA		
	(5 to 10) kHz	10 mA/A + 200 µA		
	(2.2 to 3) A			
	(10 to 45) Hz	1.8 mA/A + 100 µA	Fluke 5520A/SC1100	
	45 Hz to 1 kHz	600 µA/A + 100 µA		
	(1 to 5) kHz	6 mA/A + 1 mA		
	(5 to 10) kHz	25 mA/A + 5 mA		
	(3 to 11) A			
	(45 to 100) Hz	600 µA/A + 2 mA		
	100 Hz to 1 kHz	1 mA/A + 2 mA		
	(1 to 5) kHz	30 mA/A + 2 mA		
	(11 to 20.5) A			
	(45 to 100) Hz	1.2 mA/A + 5 mA		
	100 Hz to 1 kHz	1.5 mA/A + 5 mA		
	(1 to 5) kHz	30 mA/A + 5 mA		
AC Current - Measure	**Up to 200 µA**		Fluke 8508A Opt 01	
	(1 to 10) Hz	310 µA/A + 20 nA		
	10 Hz to 10 kHz	300 µA/A + 20 nA		
	(10 to 30) kHz	710 µA/A + 20 nA		
	(30 to 100) kHz	4 mA/A + 20 nA		
	200 µA to 2 mA			
	(1 to 10) Hz	310 µA/A + 200 nA		
	10 Hz to 10 kHz	300 µA/A + 200 nA		
	(10 to 30) kHz	710 µA/A + 200 nA		
	(30 to 100) kHz	4 mA/A + 200 nA		
	(2 to 20) mA			
	(1 to 10) Hz	310 µA/A + 2 µA		
	10 Hz to 10 kHz	300 µA/A + 2 µA		
	(10 to 30) kHz	710 µA/A + 2 µA		
	(30 to 100) kHz	4 mA/A + 2 µA		

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Current - Measure (cont.)	**(20 to 200) mA** (1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz **200 mA to 2 A** 10 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz **(2 to 20) A** 10 Hz to 2 kHz (2 to 10) kHz	 310 µA/A + 20 µA 290 µA/A + 20 µA 625 µA/A + 20 µA 620 µA/A + 200 µA 725 µA/A + 200 µA 3 mA/A + 200 µA 820 µA/A + 2 mA 2.5 mA/A + 2 mA	Fluke 8508A Opt 01	
Resistance – Source	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	40 µΩ/ Ω + 1 mΩ 30 µΩ/ Ω + 1.5 mΩ 28 µΩ/ Ω + 1.4 Ω 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	OEM, GIDEP, and Laboratory Developed Procedures
Resistance – Measure	Up to 2 Ω (20 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 2 GΩ	17 µΩ/ Ω + 4 µΩ 9.5 µΩ/ Ω + 14 µΩ 8 µΩ/ Ω + 50 µΩ 8 µΩ/ Ω + 500 µΩ 8 µΩ/ Ω + 5 mΩ 8 µΩ/ Ω + 50 mΩ 9 µΩ/ Ω + 1 Ω 20 µΩ/ Ω + 100 Ω 120 µΩ/ Ω + 10 kΩ 1.5 mΩ/ Ω + 1 MΩ	Fluke 8508A OPT 01	

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Capacitance – Source			Fluke 5520A/SC1100	OEM, GIDEP, and Laboratory Developed Procedures
(190 to 400) pF	10 Hz to 10 kHz	5 mΩ/ Ω + 10 pF		
400 pF to 1.1 nF	10 Hz to 10 kHz	5 mΩ/ Ω + 10 pF		
(1.1 to 3.3) nF	10 Hz to 3 kHz	5 mΩ/ Ω + 10 pF		
(3.3 to 11) nF	10 Hz to 1 kHz	2.5 mΩ/ Ω + 10 pF		
(11 to 33) nF	10 Hz to 1 kHz	2.5 mΩ/ Ω + 100 pF		
(33 to 110) nF	10 Hz to 1 kHz	2.5 mΩ/ Ω + 100 pF		
(110 to 330) nF	10 Hz to 1 kHz	2.5 mΩ/ Ω + 300 pF		
330 nF to 1.1 µF	(10 to 600) Hz	2.5 mΩ/ Ω + 1 nF		
(1.1 to 3.3) µF	(10 to 300) Hz	2.5 mΩ/ Ω + 3 nF		
(3.3 to 11) µF	(10 to 150) Hz	2.5 mΩ/ Ω + 10 nF		
(11 to 33) µF	(10 to 120) Hz	4 mΩ/ Ω + 30 nF		
(33 to 110) µF	(10 to 80) Hz	4.5 mΩ/ Ω + 100 nF		
(110 to 330) µF	(0 to 50) Hz	4.5 mΩ/ Ω + 300 nF		
330 µF to 1.1 mF	(0 to 20) Hz	4.5 mΩ/ Ω + 1 µF		
(1.1 to 3.3) mF	(0 to 6) Hz	4.5 mΩ/ Ω + 3 µF		
(3.3 to 11) mF	(0 to 2) Hz	4.5 mΩ/ Ω + 10 µF		
(11 to 33) mF	(0 to 0.6) Hz	7.5 mΩ/ Ω + 30 µF		
(33 to 110) mF	(0 to 0.2) Hz	110 mΩ/ Ω + 100 µF		
1 kHz Test Frequency	1 pF	1.15 mF/F	HP 16380A Standard Air Capacitors	
1 kHz Test Frequency	10 pF	1.15 mF/F		
1 kHz Test Frequency	100 pF	1.15 mF/F		
1 kHz Test Frequency	1 000 pF	1.15 mF/F		
Inductance – Source				
1 kHz Test Frequency	100 µH	210 µH/H	Genrad 1482 – B	
1 kHz Test Frequency	1 mH	210 µH/H	Genrad 1482 – E	
1 kHz Test Frequency	10 mH	210 µH/H	Genrad 1482 – H	
1 kHz Test Frequency	100 mH	210 µH/H	Genrad 1482 – L	
1 kHz Test Frequency	1 H	510 µH/H	Genrad 1482 – P	

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Oscilloscopes				
DC Signal into 50 Ω Load	0 V to ± 6.6 V	2.5 mV/V + 40 µV	Fluke 5520A/SC1100	
DC Signal into 1 MΩ Load	0 V to ± 130 V	500 µV/V + 40 µV		
Amplitude Square Wave				
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 mV/V + 40 µV		
Leveled Sine Wave – Flatness				
Relative to 50 kHz Time Marker into 50 Ω Load	**[5 mV to 5.5 V]** 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz	 15 mV/V + 100 µV 20 mV/V + 100 µV 40 mV/V + 100 µV		OEM, GIDEP, and Laboratory Developed Procedures
	5 mV to 3.5 V 600 MHz to 1.1 GHz	 50 mV/V + 100 µV		
Spike or Square Wave	5 s to 50 ms	(25 + 1 000t) µs/s		
Spike, Square, 20 % Pulse	20 ms to 100 ns	2.5 µs/s		
Spike or Square Wave	(50 to 20) ns	2.5 µs/s		
Square or Sine Wave	10 ns	2.5 µs/s		
Sine Wave	(5 to 1) ns	2.5 µs/s		
Edge Specs into 50 Ω Load – Source				
Rise Time	≤350 ps	+0 ps/-100 ps		
Amplitude (Peak to Peak)	5 mV to 2.5 V	20 mV/V + 200 µV		
Frequency	1 kHz to 10 MHz	2.5 µs/s		

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Wave Generator - Source: Amplitude (10 Hz to 10 kHz) Square,Sine,Triangle into 1 MΩ Square,Sine,Triangle into 50 MΩ Frequency	 1.8 mV to 55 V p-p 1.8 mV to 2.5 V p-p 10 Hz to 100 kHz	 30 mV/V +100 µV 30 mV/V + 100 µV 25 µHz/Hz + 15 mHz	Fluke 5520A/SC1100	OEM, GIDEP, and Laboratory Developed Procedures
Pulse Generator - Source Width Period 50 Hz to 5 MHz	 (4 to 500) ns 20 ms to 200 ns	 50 ms/s ± 2 ns 2.5 µs/s		
DC Power - Source	**33 mV to 1 000 V** 330 µA to 330 mA 330 mA to 3 A (3 to 20.5) A	 2.3 mW/W of Watts Output 2.2 mW/W of Watts Output 700 µW/W of Watts Output		
AC Power (45 to 65)Hz PF=1 - Source	**(33 to 330) mV** (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 20.5) A **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 20.5) A	 1.4 mW/W of Watts Output 1 mW/W of Watts Output 1.4 mW/W of Watts Output 1 mW/W of Watts Output 1.3 mW/W of Watts Output 1.1 mW/W of Watts Output 1.3 mW/W of Watts Output 1.1 mW/W of Watts Output 1.2 mW/W of Watts Output 800 µW/W of Watts Output 1.2 mW/W of Watts Output 800 µW/W of Watts Output 1.1 mW/W of Watts Output 900 µW/W of Watts Output 1.2 mW/W of Watts Output 1 mW/W of Watts Output		

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PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Electrical Simulation of Thermocouples			Fluke 5520A/SC1100	OEM, GIDEP, and Laboratory Developed Procedures
Type B	(600 to 800) °C (800 to 1 000) °C (1 000 to 1 550) °C (1 550 to 1 820) °C	0.51 °C 0.39 °C 0.35 °C 0.38 °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	0.35 °C 0.3 °C 0.36 °C 0.58 °C 0.97 °C		
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1 000) °C	0.58 °C 0.19 °C 0.16 °C 0.19 °C 0.24 °C		
Type J	(-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1 200) °C	0.32 °C 0.19 °C 0.17 °C 0.2 °C 0.27 °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	0.38 °C 0.21 °C 0.19 °C 0.3 °C 0.46 °C		
Type N	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1 300) °C	0.46 °C 0.25 °C 0.22 °C 0.21 °C 0.31 °C		
Type R	(0 to 250) °C (250 to 400) °C (400 to 1 000) °C (1 000 to 1 767) °C	0.66 °C 0.4 °C 0.38 °C 0.46 °C		

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Electrical Simulation of Thermocouples (cont.)			Fluke 5520A/SC1100	OEM, GIDEP, and Laboratory Developed Procedures
Type S	(0 to 250) °C (250 to 1 000) °C (1 000 to 1 400) °C (1 400 to 1 767) °C	0.54 °C 0.42 °C 0.43 °C 0.53 °C		
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.73 °C 0.28 °C 0.19 °C 0.17 °C		
Type U	(-200 to 0) °C (0 to 600) °C	0.65 °C 0.31 °C		
Electrical Simulation of RTDs				
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	0.06 °C 0.08 °C 0.1 °C 0.12 °C 0.14 °C 0.27 °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	0.05 °C 0.06 °C 0.14 °C 0.15 °C 0.16 °C 0.18 °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	0.05 °C 0.06 °C 0.14 °C 0.15 °C 0.16 °C 0.18 °C		
Pt 385 (500 Ω)	(-200 to -80) °C (-80 to 100) °C (100 to 260) °C (260 to 400) °C (400 to 600) °C (600 to 630) °C	0.05 °C 0.06 °C 0.07 °C 0.09 °C 0.1 °C 0.13 °C		

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PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Electrical Simulation of RTDs (cont.)			Fluke 5520A/SC1100	OEM, GIDEP, and Laboratory Developed 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 0.05 °C 0.06 °C 0.07 °C 0.08 °C 0.27 °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	0.29 °C 0.05 °C 0.06 °C 0.07 °C 0.08 °C 0.09 °C 0.10°C 0.12 °C 0.27 °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	0.06 °C 0.08 °C 0.1 °C 0.12 °C 0.14 °C		
PtNi 385 (120 Ω)	(-80 to 100) °C (100 to 260) °C	0.09 °C 0.16 °C		

II. Time & Frequency

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Frequency – Source	10 MHz DC to 500 MHz 500 MHz to 26.5 GHz	2.31 parts in 10^{-12} 1.15 parts in 10^{-8} 1.15 parts in 10^{-8}	Datum 9390 Datum 9390 w/5335A Datum 9390 w/548A	OEM, GIDEP, and Laboratory Developed Procedures
Frequency – Measure	DC to 500 MHz 500 MHz to 26.5 GHz	1.15 parts in 10^{-8} 1.15 parts in 10^{-8}	Datum 9390 w/5335A Datum 9390 w/548A	

III. Thermodynamic

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Temperature- Measure	-190 °C -39 °C 0.01 °C 231 °C 420 °C	0.003 °C 0.006 °C 0.002 °C 0.007 °C 0.007 °C	Hart 8163B SPRT with ASL F300 Bridge	NIST, ASTM, OEM and GIDEP Sourced Calibration Procedures
Humidity	(10 to 90) %RH	1.26 %RH	Rotronic A2 Humidity - Temperature Indicator	

IV. Mechanical

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Pressure (High)	(30 to 12 000) psi/psig	0.001 %	Ruska 2400 Deadweight Tester	OEM, GIDEP, and Laboratory Developed Procedures
Pressure (Low)	(0.005 to 5) psig/psia (5 to 50) psig/psia	0.024 % 0.027 %	CEC 6-201 Deadweight Tester	
Torque	5 in·lb to 600 ft·lb	1.17 % of reading	CDI Suretest Model 5000ST	
Scale and Balances	Up to 100 g Up to 100 lb (100 to 300) lb (300 to 500) lb	0.33 mg 0.026 lb 0.033 lb 0.435 lb	Class P Weights Class F Weights	

V. Dimensional

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
*Single Axis Dimensional Gaging: Inside: as a comparator	(0.02 to 14) in	6.9 µin	P&W Labmaster	OEM, GIDEP, and Laboratory Developed Procedures
Outside: as a comparator	Up to 13 in	6.9 µin	P&W Labmaster	
Thread Pitch: free measure	Up to 13 in	152 µin	P&W Labmaster with Thread Wires	

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Calipers	(0.01 to 4) in	(580 + 40L) µin	Grade 1 and 2 Gage Blocks	OEM, GIDEP, and Laboratory Developed Procedures
Micrometers	(0.01 to 4) in	(58 + 40L) µin		

Notes:

1. *Best Measurement Uncertainties (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 field (on-site) calibration services. Since field conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected in the field than what is reported on the accredited scope.*
3. *Capabilities denoted by an asterisk (*) are laboratory-only, not available for field calibration activity.*
4. *The use of (t) signifies Time in seconds.*
5. *The use of (L) signifies an expression of length in inches.*
6. *This scope is part of and must be included with the Certificate of Accreditation No. AC-1180*

Vice President

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