



SCOPE OF ACCREDITATION

IAS Accreditation Number	CL-112
Accredited Entity	Field Calibrations, Inc.
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Accreditation Standard	ISO/IEC 17025:2005

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
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<i>Electrical/DC/Low Frequency</i>			
DC Voltage – Generate + Measure	(0 to 200) mV	(ppm RDG + ppm RNG) 5.0 + 0.5	Fluke 5720A w/Fluke 8508A
	200 mV to 2 V	3.5 + 0.2	
	(2 to 20) V	3.5 + 0.2	
	(20 to 200) V	5.5 + 0.2	
	(200 to 1050) V	5.5 + 0.5	
DC Voltage – Generate	(1050 to 1100) V	(ppm output + µV) 6.5 + 400 µV	Fluke 5720A
DC Voltage – Generate + Measure	(0 to 2) kV	0.04% RDG + 0.02% RNG + 0.1 ppm/V	Glassman LG40, Vitrek 4620B
	(2 to 20) kV		
DC Voltage – Measure	(1050 to 1100) V	(ppm RDG + ppm RNG) 22 + 0.7	Keithley 2002
	(20 to 100) kV	(% RDG + offset) 0.0035% + 0.1005 kV	Spellman HVD-100-1 w/HP 34401A
DC Current – Generate	50 nA to 2 pA	(% setting + offset) 0.43% + 10 fA	Keithley 263
	(2 to 20) pA	0.38% + 10 fA	
	(20 to 200) pA	0.25% + 30 fA	
	200 pA to 2 nA	0.065% + 100 fA	
	(0.1 to 1) A	(ppm output + offset) 120 µA/A + 10 µA	Fluke 5720A w/HP 3458A
	(10 to 100) µA	25 µA/A + 0.8 nA	
	(0.1 to 1) mA	25 µA/A + 5 nA	
	(1 to 10) mA	25 µA/A + 50 nA	
	(10 to 100) mA	40 µA/A + 0.5 µA	
	(0.022 to 0.220) A	45 µA/A + 0.7 µA	Fluke 5720A
	(0.22 to 2.2) A	80 µA/A + 12 µA	Fluke 5720A
	(2.2 to 11) A	360 µA/A + 480 µA	Fluke 5720A w/5725A
	(11 to 20.5) A	0.1% + 750 µA	Fluke 5520A



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	(20 to 150) A	(% RDG + offset) 0.26% + 0.05 A	Fluke 5520A w/50 Turn Coil
	(150 to 550) A	0.25% + 0.06 A	
	(550 to 1000) A	0.27% + 0.06 A	
	(0 to 100) A	(% RDG + offset) 0.1007% + 0.3 mA + 0.06 mA/A*	EMS 5.5-150-1-D w/HP 3458A & LAB100-100 *6 mA & 150 mA offset applies at FS only
	(100 to 120) A	0.1007% + 3 mA + 0.15 mA/A*	EMS 5.5-150-1-D w/HP 3458A & LAB1000-100 *6 mA & 150 mA offset applies at FS only
DC Current - Measure	10 fA to 2 nA	(% RDG + offset) 0.3% + 500 fA	Keithley 487
	(2 to 20) nA	0.2% + 3 pA	
	(20 to 200) nA	0.15% + 20 pA	
	200 nA to 2 µA	0.15% + 200 pA	
	(2 to 20) µA	0.1% + 2 nA	
	(20 to 200) µA	0.1% + 20 nA	
	200 µA to 2 mA	0.1% + 200 nA	
	(0 to 100) nA	(ppm RDG + ppm RNG) 35 + 400	HP 3458A
	(0.1 to 1) µA	25 + 40	Fluke 8508A
	(1 to 10) µA	25 + 10	
	(10 to 200) µA	12 + 2.0	
	200 µA to 2 mA	12 + 2.0	
	(2 to 20) mA	14 + 2.0	
	(20 to 200) mA	48 + 4.0	HP 3458A
	(10 to 100) mA	40 + 5	Fluke 8508A
	(0.1 to 1) A	115 + 10	
	(0.2 to 2) A	185 + 8.0	
	(2 to 20) A	400 + 20	HP 3458A w/ HP 34330A
	(1 to 30) A	(% RDG + offset) 0.1307% + 0.3 mA	HP 3458A w/LAB100-100
	(10 to 100) A	0.1007% + 0.3 mA + 0.06 mA/A*	*6mA & 150 mA offset applies at FS only
	(100 to 1000) A	0.1007% + 3 mA + 0.15 mA/A*	HP 3458A w/LAB1000-100 *6mA & 150 mA offset



SCOPE OF ACCREDITATION

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DC Resistance – Generate	(1, 10, 100) mΩ	0.22%	applies at FS only
	1 Ω	0.22%	HP 4203x series
	(10, 100) Ω	0.12%	
	(1, 10, 100) kΩ	(ppm RDG + ppm RNG) 0.1% + 200 X 10 ⁻⁶	HP 4203x series
	(0 to 2) Ω	17 + 2.0	Fluke 5500A w/Fluke 8508A
	(2 to 20) Ω	9.5 + 0.7	
	(20 to 200) Ω	8.0 + 0.25	
	190 Ω	(ppm) 10	Fluke 5720A
	(1, 1.9) kΩ	8.5	
	(10,19) kΩ	8.5	
	(100, 190) kΩ	11	
	1 MΩ	20	
	1.9 MΩ	21	
	10 MΩ	40	
	19 MΩ	47	
	100 MΩ	100	Fluke 5520A
	(11 to 32.99999) MΩ	(ppm output + floor) 250 + 2500	
	(33 to 109.9999) MΩ	500 + 3000	
	(110 to 329.9999) MΩ	3000 + 100000	
	(330 to 1100) MΩ	15000 + 500000	PPM R3-1, 110
	(0.1 to 1) GΩ	(% setting) 0.1%	
	(1 to 10) GΩ	0.5%	
	(10 to 100) GΩ	1.0%	Biddle Megadek 72-6345-1
	1 kΩ	0.04%	Keithley 263
	(10, 100) kΩ	0.02%	
	1 MΩ	0.025%	
	10 MΩ	0.037%	
	100 MΩ	0.07%	
	1 GΩ	0.1%	
	10 GΩ	0.23%	
100 GΩ	0.4%		
1 TΩ	0.5670%	Rohde & Schwarz CR504	
DC Resistance – Measure (Normal Mode)	(0 to 2) Ω	(ppm RDG + ppm RNG) 17 + 2.0	Fluke 8508A
	(2 to 20) Ω	9.5 + 0.7	
	20 Ω to 200 kΩ	8.0 + 0.25	
	200 kΩ to 2 MΩ	9.0 + 0.5	
	(2 to 20) MΩ	20 + 5.0	



SCOPE OF ACCREDITATION

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	(20 to 200) MΩ	120 + 50	
	200 MΩ to 2 GΩ	1510 + 500	
DC Resistance – Measure (High Voltage Mode)	(2 to 20) MΩ	17 + 0.5	Fluke 8508A
	(20 to 200) MΩ	65 + 5.0	
	200 MΩ to 2 GΩ	180 + 50	
	(2 to 20) GΩ	1510 + 500	
DC Resistance - Measure	10 MΩ	(% of RDG) 0.0050%	HP 3458A; Fluke 5720A
	100 MΩ	0.0064%	
	1 GΩ	0.0149%	
	10 GΩ	0.118%	
	100 GΩ	0.285%	
DC Power – Generate (33 mV to 1020 V)	330 μA to 329.99 mA	(% of watts output) 0.023%	Fluke 5520A
	330 mA to 2.999 A	0.022%	
	(3 to 20.5) A	0.07%	
AC Voltage – Generate (1 nV to 2.2 mV)	10 to 20 Hz	(ppm output + μV) 240 + 4	Fluke 5720A
	(20 to 40) Hz	90 + 4	
	40 Hz to 20 kHz	80 + 4	
	(20 to 50) kHz	200 + 4	
	(50 to 100) kHz	500 + 5	
	(100 to 300) kHz	1050 + 10	
	(300 to 500) kHz	1400 + 20	
500 kHz to 1 MHz	2700 + 20		
AC Voltage – Generate (2.2 to 22 mV)	(10 to 20) Hz	(ppm output + μV) 240 + 4	Fluke 5720A
	(20 to 40) Hz	90 + 4	
	40 Hz to 20 kHz	80 + 4	
	(20 to 50) kHz	200 + 4	
	(50 to 100) kHz	500 + 5	
	(100 to 300) kHz	1050 + 10	
	(300 to 500) kHz	1400 + 20	
500 kHz to 1 MHz	2700 + 20		
AC Voltage – Generate (22 to 220 mV)	(10 to 20) Hz	(ppm output + μV) 240 + 12	Fluke 5720A
	(20 to 40) Hz	90 + 7	
	40 Hz to 20 kHz	80 + 7	
	(20 to 50) kHz	200 + 7	
	(50 to 100) kHz	460 + 17	
	(100 to 300) kHz	900 + 20	
(300 to 500) kHz	1400 + 25		



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	500 kHz to 1 MHz	2700 + 45	
AC Voltage – Generate (220 mV to 2.2 V)	(10 to 20) Hz	(ppm output + μV) 240 + 40	Fluke 5720A
	(20 to 40) Hz	90 + 15	
	40 Hz to 20 kHz	45 + 8	
	(20 to 50) kHz	75 + 10	
	(50 to 100) kHz	110 + 30	
	(100 to 300) kHz	420 + 8	
	(300 to 500) kHz	1000 + 200	
	500 kHz to 1 MHz	1700 + 300	
AC Voltage – Generate (2.2 to 22 V)	(10 to 20) Hz	240 + 400	Fluke 5720A
	(20 to 40) Hz	90 + 150	
	40 Hz to 20 kHz	45 + 50	
	(20 to 50) kHz	75 + 100	
	(50 to 100) kHz	100 + 200	
	(100 to 300) kHz	275 + 600 (0.6 mV)	
	(300 to 500) kHz	1000 + 2000 (2.0 mV)	
	500 kHz to 1 MHz	1500 + 3200 (3.2 mV)	
AC Voltage – Generate (22 to 220 V)	(10 to 20) Hz	(ppm output + mV) 240 + 4	Fluke 5720A
	(20 to 40) Hz	90 + 1.5	
	40 Hz to 20 kHz	52 + 0.6	
	(20 to 50) kHz	80 + 1	
	(50 to 100) kHz	150 + 2.5	
	(100 to 300) kHz	900 + 16	
	(300 to 500) kHz	4400 + 40	
	500 kHz to 1 MHz	8000 + 80	
AC Voltage – Generate (220 to 1100 V)	(15 to 50) Hz	(ppm output + mV) 300 + 16	Fluke 5720A
	50 Hz to 1 kHz	70 + 3.5	
AC Voltage – Generate (220 to 750 V)	(30 to 50) kHz	600 + 11	Fluke 5720A
	(50 to 500) kHz	2300 + 45	
AC Voltage – Generate (220 to 1100 V)	40 Hz to 1 kHz	90 + 4	Fluke 5720A w/5725A
	(1 to 20) kHz	165 + 6	
	(20 to 30) kHz	600 + 11	
AC Voltage – Measure (0 to 10 mV)	(1 to 40) Hz	(% RDG + % RNG) 0.03% + 0.03%	HP 3458A
	40 Hz to 1 kHz	0.02% + 0.011%	



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	(1 to 20) kHz	0.03% + 0.011%	
	(20 to 50) kHz	0.1% + 0.011%	
	(50 to 100) kHz	0.5% + 0.011%	
	(100 to 300) kHz	4% + 0.02%	
AC Voltage - Measure (0 to 200 mV)	(1 to 10) Hz	(ppm RDG + ppm RNG) 165 + 70	Fluke 8508A
	(10 to 40) Hz	140 + 20	
	(40 to 100) Hz	115 + 20	
	100 Hz to 2 kHz	110 + 10	
	(2 to 10) kHz	135 + 20	
	(10 to 30) kHz	340 + 40	
AC Voltage - Measure (10 mV to 10 V)	(1 to 40) Hz	(% RDG + % RNG) 0.007% + 0.004%	HP 3458A
	40 Hz to 1 kHz	0.007% + 0.002%	
	(1 to 20) kHz	0.014% + 0.002%	
	(20 to 50) kHz	0.03% + 0.002%	
	(50 to 100) kHz	0.08% + 0.002%	
	(100 to 300) kHz	0.3% + 0.01%	
	300 kHz to 1 MHz	1% + 0.01%	
AC Voltage - Measure (200 mV to 200 V)	(1 to 10) Hz	(ppm RDG + ppm RNG) 150 + 60	Fluke 8508A
	(10 to 40) Hz	115 + 10	
	(40 to 100) Hz	90 + 10	
	100 Hz to 2 kHz	75 + 10	
	(2 to 10) kHz	110 + 10	
	(10 to 30) kHz	220 + 20	
	(30 to 100) kHz	570 + 100	
	(100 to 300) kHz	0.3% + 0.1%	
AC Voltage - Measure (10 to 100 V)	(1 to 40) Hz	(% RDG + % RNG) 0.02% + 0.004%	HP 3458A
	40 Hz to 1 kHz	0.02% + 0.002%	
	(1 to 20) kHz	0.02% + 0.002%	
	(20 to 50) kHz	0.035% + 0.002%	
	(50 to 100) kHz	0.12% + 0.002%	
	(100 to 300) kHz	0.4% + 0.01%	
	300 kHz to 1 MHz	1.5% + 0.01%	
AC Voltage - Measure (100 to 700) V	(1 to 40) Hz	0.04% + 0.004%	HP 3458A
	40 Hz to 1 kHz	0.04% + 0.002%	
	(1 to 20) kHz	0.06% + 0.002%	
	(20 to 50) kHz	0.12% + 0.002%	



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	(50 to 100) kHz	0.3% + 0.002%	
AC Voltage – Measure (200 to 1050 V)	(1 to 10) Hz	(ppm RDG + ppm RNG) 150 + 70	Fluke 8508A
	(10 to 40) Hz	120 + 20	
	40 Hz to 10 kHz	115 + 20	
	(10 to 30) kHz	225 + 40	
	(30 to 100) kHz	580 + 200	
AC Voltage – Measure (0 to 2 kV)	(20 to 100) Hz	(% RDG + % RNG + offset) 0.07% + 0.1% + 0.2 ppm/V	Vitrek 4620B
	(100 to 400) Hz	0.4% + 0.2% + 0.2 ppm/V	
AC Voltage – Measure (2 to 20 kV)	(20 to 100) Hz	0.2% + 0.1% + 0.2 ppm/V	Vitrek 4620B
AC Voltage – AC Band >2 MHz Measure (0 to 10 mV)	45 Hz to 100 kHz	(% RDG + % RNG) 0.09% + 0.06%	HP 3458A
	100 kHz to 1 MHz	1.2% + 0.05%	
	(1 to 4) MHz	7% + 0.07%	
	(4 to 8) MHz	20% + 0.08%	
AC Voltage – AC Band >2 MHz Measure (10 mV to 10 V)	45 Hz to 100 kHz	0.09% + 0.06%	HP 3458A
	100 kHz to 1 MHz	2% + 0.05%	
	(1 to 4) MHz	4% + 0.07%	
	(4 to 8) MHz	4% + 0.08%	
	(8 to 10) MHz	15% + 0.1%	
AC Voltage – AC Band >2 MHz Measure (10 to 100 V)	45 Hz to 100 kHz	0.12% + 0.002%	HP 3458A
AC Voltage – AC Band >2 MHz Measure (100 to 700 V)	45 Hz to 100 kHz	0.3% + 0.01%	HP 3458A
AC Voltage – Amplitude Flatness, Measure, (0 to 1.5 V)	10 Hz to 10 MHz	0.08%	HP 3458A w/Fluke A55
	(10 to 30) MHz	0.16%	
	(30 to 50) MHz	0.4%	
	(50 to 100) MHz	0.8%	
		(ppm output + nA)	Fluke 5720A



SCOPE OF ACCREDITATION

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AC Current – Generate (1 nA to 220 µA)	(10 to 20) Hz	250 + 16	
	(20 to 40) Hz	160 + 10	
	40 Hz to 1 kHz	120 + 8	
	(1 to 5) kHz	280 + 12	
	(5 to 10) kHz	1100 + 65	
AC Current – Generate (220 µA to 2.2 mA)	(10 to 20) Hz	(ppm output + nA) 250 + 40	Fluke 5720A
	(20 to 40) Hz	160 + 35	
	40 Hz to 1 kHz	120 + 35	
	(1 to 5) kHz	200 + 110	
	(5 to 10) kHz	1100 + 650	
AC Current – Generate (2.2 to 22 mA)	(10 to 20) Hz	(ppm output + nA) 250 + 400	Fluke 5720A
	(20 to 40) Hz	160 + 350	
	40 Hz to 1 kHz	120 + 350	
	(1 to 5) kHz	200 + 550	
	(5 to 10) kHz	1100 + 5000	
AC Current – Generate (22 to 220 mA)	(10 to 20) Hz	(ppm output + µA) 250 + 4	Fluke 5720A
	(20 to 40) Hz	160 + 3.5	
	40 Hz to 1 kHz	120 + 2.5	
	(1 to 5) kHz	200 + 3.5	
	(5 to 10) kHz	1100 + 10	
AC Current – Generate (220 mA to 2.2 A)	20 Hz to 1 kHz	260 + 35	Fluke 5720A
	(1 to 5) kHz	450 + 80	
	(5 to 10) kHz	7000 + 160	
AC Current – Generate (2.2 to 11 A)	40 Hz to 1 kHz	460 + 170	Fluke 5720A w/5725A
	(1 to 5) kHz	950 + 380	
	(5 to 10) kHz	3600 + 750	
AC Current – Generate (1 to 20 A)	DC to 5 kHz	(0.025% + 0.012%*F) of RDG	Shepherd Scientific 100 w/Fluke Y5020; F is frequency in kHz
AC Current – Generate (20 to 100) A	DC to 1 kHz	0.1% of RNG	Shepherd Scientific 100 w/Valhalla 2575A
AC Current – Generate (11 to 20.5) A	(45 to 100) Hz	(% output + offset) 0.12% + 5 mA	Fluke 5520A
	100 Hz to 1 kHz	0.15% + 5 mA	
	(1 to 5) kHz	3% + 5 mA	
AC Current – Generate (0 to 1000) A	(45 to 440) Hz	0.28% + 0.11 A	Fluke 5520A w/50 turn coil



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<i>AC Current - Measure</i> (0 to 100 µA)	(10 to 20) Hz	(% RDG + % RNG) 0.4% + 0.03%	HP 3458A
	(20 to 45) Hz	0.15% + 0.03%	
	45 Hz to 5 kHz	0.06% + 0.03%	
<i>AC Current - Measure</i> (100 µA to 100 mA)	(10 to 20) Hz	0.4% + 0.02%	HP 3458A
	(20 to 45) Hz	0.15% + 0.02%	
	(45 to 100) Hz	0.06% + 0.02%	
	100 Hz to 5 kHz	0.03% + 0.02%	
	(5 to 20) kHz	0.06% + 0.02%	
	(20 to 50) kHz	0.4% + 0.04%	
<i>AC Current - Measure</i> (0 µA to 20 mA)	(1 to 10) Hz	(ppm RDG + ppm RNG) 310 + 100	Fluke 8508A
	10 Hz to 10 kHz	300 + 100	
	(10 to 30) kHz	710 + 100	
	(30 to 100) kHz	0.4% + 100	
<i>AC Current - Measure</i> (20 to 200 mA)	(1 to 10) Hz	310 + 100	Fluke 8508A
	10 Hz to 10 kHz	290 + 100	
	(10 to 30) kHz	625 + 100	
<i>AC Current - Measure</i> (100 mA to 1 A)	(10 to 20) Hz	0.4% + 0.02%	HP 3458A
	(20 to 45) Hz	0.16% + 0.02%	
	(45 to 100) Hz	0.08% + 0.02%	
	100 Hz to 5 kHz	0.1% + 0.02%	
	(5 to 20) kHz	0.3% + 0.02%	
<i>AC Current - Measure</i> (200 mA to 2 A)	10 Hz to 2 kHz	620 + 100	Fluke 8508A
	(2 to 10) kHz	725 + 100	
	(10 to 30) kHz	0.3% + 100	
<i>AC Current - Measure</i> (2 to 20 A)	10 Hz to 2 kHz	(ppm RDG + ppm RNG) 820 + 100	Fluke 8508A
	(2 to 10) kHz	0.25% + 100	
<i>AC Current - Measure</i> (1 to 20 A)	DC to 5 kHz	(0.025% + 0.012%*F) of RDG	Fluke Y5020; F is Frequency in kHz
<i>AC Current - Measure</i> (20 to 100 A)	DC to 1 kHz	0.1% of RNG	Valhalla 2575A
<i>AC Resistance</i>		% series resistance (reactance)	HP 42030 resistor set
	DC to 1 MHz	0.13% (0.014 Ω)	
	(1 to 2) MHz	0.14% (0.015 Ω)	
	(2 to 3) MHz	0.16% (0.021Ω)	



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– Generate (10 Ω)	(3 to 4) MHz	0.17% (0.031 Ω)	
	(4 to 5) MHz	0.2% (0.037 Ω)	
	(5 to 10) MHz	0.5% (0.10 Ω)	
	(10 to 13) MHz	0.7% (0.14 Ω)	
AC Resistance – Generate (100 Ω)	DC to 1 MHz	0.13% (0.14 Ω)	HP 42030 resistor set
	(1 to 2) MHz	0.14% (0.14 Ω)	
	(2 to 3) MHz	0.15% (0.19 Ω)	
	(3 to 4) MHz	0.15% (0.19 Ω)	
	(4 to 5) MHz	0.15% (0.24 Ω)	
	(5 to 10) MHz	0.3% (0.58 Ω)	
AC Resistance – Generate (1 kΩ)	DC to 100 kHz	(Resistance + Stability) (Susceptance) 0.13% + 200 ppm (1.2 μS)	HP 42030 resistor set
	100 kHz to 1 MHz	0.13% + 200 ppm (1.4 μS)	
	(1 to 2) MHz	0.13% + 200 ppm (1.4 μS)	
	(2 to 3) MHz	0.13% + 200 ppm (1.9 μS)	
	(3 to 4) MHz	0.14% + 200 ppm (2.4 μS)	
	(4 to 5) MHz	0.15% + 200 ppm (3.4 μS)	
	(5 to 10) MHz	0.3% + 200 ppm (5.7 μS)	
	(10 to 13) MHz	0.4% + 200 ppm (8.7 μS)	
AC Resistance – Generate (10 kΩ)	DC to 100 kHz	0.12% + 200 ppm (0.14 μS)	HP 42030 resistor set
	100 kHz to 1 MHz	0.13% + 200 ppm (0.24 μS)	
AC Resistance – Generate (100 kΩ)	DC to 100 kHz	0.13% + 200 ppm (0.024 μS)	HP 42030 resistor set
	100 kHz to 1 MHz	0.13% + 200 ppm (0.154 μS)	
AC Resistance – Measure	10 mΩ to 100 MΩ	0.05%	HP 4284A
AC Power – Generate (33 to 330 mV)	(3.3 to 8.999) mA	0.14%	Fluke 5520A
	(9 to 32.999) mA	0.1%	
	(33 to 89.99) mA	0.14%	



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(45 to 65 Hz)	(90 to 329.99) mA	0.1%	
AC Power – Generate (330 mV to 1020 V) (45 to 65 Hz)	(3.3 to 8.999) mA	0.12%	Fluke 5520A
	(9 to 32.999) mA	0.08%	
	(33 to 89.99) mA	0.12%	
	(90 to 329.99) mA	0.08%	
AC Power – Generate (33 to 330 mV) (45 to 65 Hz)	330 mA to 0.8999 A	0.13%	Fluke 5520A
	(0.9 to 2.1999) A	0.11%	
	(2.2 to 4.4999) A	0.13%	
	(4.5 to 20.5) A	0.11%	
AC Power – Generate (330 mV to 1020 V) (45 to 65 Hz)	330 mA to 0.8999 A	0.11%	Fluke 5520A
	(0.9 to 2.1999) A	0.09%	
	(2.2 to 4.4999) A	0.12%	
	(4.5 to 20.5) A	0.1%	
Capacitance – Generate	(0.19 to 3.2999) nF	(% output + floor) 0.5% + 0.01 nF	Fluke 5520A
	(3.3 to 10.9999) nF	0.25% + 0.01 nF	
	(11 to 109.999) nF	0.25% + 0.1 nF	
	(110 to 329.999) nF	0.25% + 0.3 nF	
	330 nF to 1.09999 μF	0.25% + 1 nF	
	(1.1 to 3.29999) μF	0.25% + 3 nF	
	(3.3 to 10.9999) μF	0.25% + 10 nF	
	(11 to 32.9999) μF	0.4% + 30 nF	
	(33 to 109.999) μF	0.45% + 100 nF	
	(110 to 329.999) μF	0.45% + 300 nF	
	330 μF to 1.09999 mF	0.45% + 1 μF	
	(1.1 to 3.2999) mF	0.45% + 3 μF	
	(3.3 to 10.9999) mF	0.45% + 10 μF	
	(11 to 32.9999) mF	0.75% + 30 μF	
(33 to 110) mF	1.1% + 100 μF		
Fixed Points	(1, 10, 1000) pF	0.05%	HP 1638x series
	100 pF	0.0028%	GenRad 1404A
	100 pF to 1 μF	0.05%	Arco SS32 set
	1 μF to 1 F	0.25%	GenRad 1417
Capacitance - Measure	0.1 pF to 10 F	0.05%	HP 4284A
Inductance - Generate, Fixed Values	100 μH to 10 H	0.05%	GenRad 1482x series
Inductance – Measure	0.01 nH to 100 kH	0.05%	HP 4284A
<i>Thermal</i>			



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/ EQUIPMENT
<i>Thermocouples Type B</i>	(600 to 800) °C	0.35 °C	Fluke 7526A
	(800 to 1550) °C	0.28 °C	
	(1550 to 1820) °C	0.22 °C	
<i>Type C</i>	(0 to 1000) °C	0.16 °C	Fluke 7526A
	(1000 to 1800) °C	0.23 °C	
	(1800 to 2000) °C	0.26 °C	
	(2000 to 2316) °C	0.35 °C	
<i>Type E</i>	(-250 to -200) °C	0.25 °C	Fluke 7526A
	(-200 to -100) °C	0.12 °C	
	(-100 to 0) °C	0.09 °C	
	(0 to 600) °C	0.08 °C	
<i>Type J</i>	(600 to 1000) °C	0.10 °C	Fluke 7526A
	(-210 to -100) °C	0.14 °C	
	(-100 to 800) °C	0.09 °C	
<i>Type K</i>	(800 to 1200) °C	0.10 °C	Fluke 7526A
	(-250 to -200) °C	0.46 °C	
	(-200 to -100) °C	0.16 °C	
	(-100 to 500) °C	0.10 °C	
	(500 to 800) °C	0.10 °C	
<i>Type L</i>	(800 to 1372) °C	0.13 °C	Fluke 7526A
	(-200 to -100) °C	0.10 °C	
	(-100 to 900) °C	0.09 °C	
<i>Type N</i>	(-250 to -200) °C	0.73 °C	Fluke 7526A
	(-200 to -100) °C	0.23 °C	
	(-100 to 0) °C	0.12 °C	
	(0 to 100) °C	0.11 °C	
	(100 to 800) °C	0.10 °C	
	(800 to 1300) °C	0.12 °C	
<i>Type R</i>	(-50 to -25) °C	0.55 °C	Fluke 7526A
	(-25 to 0) °C	0.45 °C	
	(0 to 100) °C	0.39 °C	
	(100 to 400) °C	0.28 °C	
	(400 to 600) °C	0.22 °C	
	(600 to 1000) °C	0.21 °C	
	(1000 to 1600) °C	0.19 °C	
	(1600 to 1767) °C	0.23 °C	
<i>Type S</i>	(-50 to -25) °C	0.51 °C	Fluke 7526A
	(-25 to 0) °C	0.43 °C	
	(0 to 100) °C	0.38 °C	
	(100 to 400) °C	0.29 °C	
	(400 to 600) °C	0.23 °C	
	(600 to 1000) °C	0.22 °C	
	(1000 to 1600) °C	0.22 °C	



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/EQUIPMENT
Type T	(1600 to 1767) °C	0.26°C	Fluke 7526A
	(-250 to -200) °C	0.35°C	
	(-200 to -100) °C	0.16°C	
	(-100 to 0) °C	0.11°C	
	(0 to 200) °C	0.09°C	
Type U	(200 to 400) °C	0.09°C	Fluke 7526A
	(-200 to 0) °C	0.16°C	
	(0 to 200) °C	0.10°C	
RTD – Generate (Pt 385, 100 Ω)	(200 to 600) °C	0.10°C	Fluke 7526A
RTD – Generate (Pt 385, 100 Ω)	(-200 to 800) °C	0.05°C	Fluke 7526A
RTD – Generate (Pt 3926, 100 Ω)	(-200 to 630) °C	0.05°C	Fluke 7526A
RTD – Generate (Pt 3916, 100 Ω)	(-200 to 630) °C	0.05°C	Fluke 7526A
RTD – Generate (Pt 385, 200 Ω)	(-200 to 100) °C	0.04°C	Fluke 5520A
	(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	
RTD – Generate (Pt 385, 500 Ω)	(-200 to -80) °C	0.04°C	Fluke 5520A
	(-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	Fluke 5520A
	(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	
Ni 120, 120 ohm	(-80 to 260) °C	0.02°C	Fluke 7526A
Cu 427, 10 Ω	(-100 to 260) °C	0.3°C	Fluke 5520A
Thermistor – Generate YSI 400	(15 to 50) °C	0.007°C	Fluke 7526A
Temperature – Generate	(-10 to 122)°C	0.14°C	Hart 9102 w/1502 & 5612
	(-10 to 300)°C	0.63°C	
	(-30 to 125)°C	0.027°C	Hart 1502A & 5612



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/ EQUIPMENT
	(-65 to 200)°C	0.027°C	w/Hart 7103 Tenney T6RC w/Hart 1502A + 5612
	(35 to 200)°C	0.027°C	Hart 6102 w/Hart 1502A & 5612
	Ambient to 200 °C	0.052°C	Hart 9125 w/1502 & 5612
	Ambient to 650 °C	0.030°C	Jofra 650SE w/Hart 1502A + 5628 (PRT)
	(10 to 60) °C	0.08°C	Thunder Scientific 1200
	<i>RTD – Measure, 4-wire</i>	(-100 to 100) °C	0.021 °C
(-200 to 630) °C		0.068 °C	
(-148 to 212) °F		0.036 °F	
(-328 to 1166) °F		0.12 °F	
<i>Temperature – Measure</i>	(-200 to 660) °C	0.030°C	Hart 1502A w/5628 Hart 1502A w/5612
	(-200 to 500) °C	0.027°C	
<i>Infrared Temperature – Measure</i>	Ambient to 100 °C	2°C	Fluke VT02
	(>100 to 300) °C	2% of RDG	
<i>Dew Point – Generate</i>	(-20 to 0) °C	0.17°C	Thunder Scientific 1200
	(>0 to 50) °C	0.14°C	
<i>Dewpoint – Measure 10-80% RH</i>	-40 °C	1.9°C @ 10% 0.43°C @ 80%	Vaisala HMP233/HMP235
	-20 °C	2.2°C @ 10% 0.48°C @ 80%	
<i>Dewpoint – Measure 10-100% RH</i>	0 °C	2.5°C @ 10% 0.48°C @ 80%	
	20 °C	2.9°C @ 10% 0.53°C @ 80%	
	40 °C	3.2°C @ 10% 0.58°C @ 80%	
	60 °C	3.6°C @ 10% 0.64°C @ 80%	
	80 °C	4°C @ 10% 0.7°C @ 80%	
	100 °C	4.4°C @ 10% 0.76°C @ 80%	
	120 °C	4.9°C @ 10% 0.84°C @ 80%	
	140 °C	5.3°C @ 10% 0.91°C @ 80%	
<i>Relative Humidity – Generate</i>	10 to 30% RH	0.52%	Thunder Scientific 1200
	30 to 80% RH	0.58%	



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/EQUIPMENT
	80 to 95% RH	0.69%	Salt Solutions
	(11.3, 33.1, 75.5)% RH	1%	
	97.6% RH	2%	
Relative Humidity – Measure	0 to 90% RH	1%	Vaisala HM70
	90 to 100% RH	1.7%	
<i>Time and Frequency</i>			
Timers/Stop Watches	0.001 to 99999.999 sec	0.001% RDG	VWR 62344-880
	5 mHz to 500 MHz	5x10e-12	HP 5345A, Fluke 910R as external time base
Oscilloscopes Voltage Function - DC Signal 50 Ω	±1 mV to ±5 V	(% output + μV) 0.025% + 25 μV	Fluke 9500B w/9530
Oscilloscopes Voltage Function - DC Signal 1 MΩ	±1 mV to ±200 V	0.025% + 25 μV	
Square Wave Signal (<10 kHz) 50 Ω, 40 μV to 5 Vp-p	≥1 mV	0.1% + 10 μV	Fluke 9500B w/9530
	≤1 mV	1.0% + 10 μV	
Square Wave Signal (<10 kHz) 1 MΩ, 40 μV to 200 Vp-p	≥1 mV	0.1% + 10 μV	
	≤1 mV	1.0% + 10 μV	
Square-wave Frequency	10 Hz to 100 kHz	0.25 ppm	Fluke 9500B w/9530
Edge Function - Rise/Fall Time	150 ps Fast Edge	15 ps	Fluke 9500B w/9530
	500 ps Edge	40 ps	
Edge Amplitude	5 mV to 3 Vp-p	(% output) 2%	Fluke 9500B w/9530
HV Edge Amplitude – 50 Ω	(1 to 5) Vp-p	2%	Fluke 9500B w/9530
HV Edge Amplitude – 1 MΩ	(1 to 200) Vp-p	2%	
Edge Frequency	10 kHz to 2 MHz	0.25 ppm	Fluke 9500B w/9530
HV Edge Frequency	10 Hz to 100 kHz	0.25 ppm	
Levelled Sine	(5 mV to 5 Vp-p)	(% output)	Fluke 9500B w/9530



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/EQUIPMENT
Function - Leveled Sine Amplitude Single Ref Frequency 50 kHz to 10 MHz	0.1 Hz to 550 MHz	1.5% @ single Ref Freq	
	(5 mV to 3 Vp-p) 550 MHz to 2.5 GHz	1.5% @ single Ref Freq	
	(5 mV to 2 Vp-p) 2.5 GHz to 3.2 GHz	1.5% @ single Ref Freq	
Leveled Sine Flatness wrt Freq: Into VSWR of 1.6:1	0.1 Hz to 300 MHz	4%	Fluke 9500B w/9530
	300 MHz to 550 MHz	4%	
	550 MHz to 1.1 GHz	5%	
	(1.1 to 3.2) GHz	5%	
Leveled Sine Flatness wrt Freq: Into VSWR of 1.2:1	0.1 Hz to 300 MHz	2%	Fluke 9500B w/9530
	300 MHz to 550 MHz	2.5%	
	550 MHz to 1.1 GHz	3.5%	
	(1.1 to 3.2) GHz	4%	
Timing Marker Function - Square	9.0091 ns to 55 s	(ppm output) 0.25 ppm	Fluke 9500B w/9530
Timing Marker Function - Pulse and Narrow Triangle	900.91 ns to 55 s	0.25 ppm	
Timing Marker Function - Sine	450.5 ps to 9.009 ns	0.25 ppm	
Input Impedance Function Resistance Measurement	(10 to 40) Ω	(% output) 0.5%	Fluke 9500B w/9530
	(40 to 90) Ω	0.1%	
	(90 to 150) Ω	0.5%	
	(50 to 800) kΩ	0.5%	
	800 kΩ to 1.2 MΩ	0.1%	
	(1.2 to 12) MΩ	0.5%	
Input Impedance Function Capacitance Measurement	(1 to 35) pF	(% output + pF) 2% + 0.25 pF	Fluke 9500B w/9530
	(35 to 95) pF	3% + 0.25 pF	
Pulse Width Function	(1 to 100) ns	(% output + offset) 5% + 200 ps	Fluke 9500B w/9530
Current Output Function DC Signal Square Wave Signal @ 1 kHz	±100 μA to ±100 mA	0.25% + 0.5 μA	Fluke 9500B w/9530
	±100 μA to ±100 mAp-p	0.25% + 0.5 μA	
Frequency -	0.1, 1, 5, 10 MHz	1 X 10 ⁻¹²	Fluke 910R



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/ EQUIPMENT
Generate	001 Hz to 20 MHz	5×10^{-12}	HP 3325B, Fluke 910R as external timebase
	10 MHz to 26.5 GHz	5×10^{-12}	HP 8340B, Fluke 910R as external timebase
Frequency – Measure	5 mHz to 500 MHz 100 second to 10 second Gate Time	5×10^{-12}	HP 5345A, Fluke 910R as external time base
	(0.4 to 1.5) GHz	5×10^{-12}	HP 5345A, HP 5355A, Fluke 910R as external time base
	(1.5 to 26.5) GHz	5×10^{-12}	HP 5345A, HP 5355A, HP 5356B, Fluke 910R as external time base
<i>RF/Microwave and Electromagnetics</i>			
Amplitude Modulation – Measure (150 kHz to 10 MHz)	Rate: 50 Hz to 10 kHz Depth: 5% to 99%	2% + 1 digit	HP 8902A w/HP 11793A (using peak detector)
	Rate: 20 Hz to 10 kHz Depth: 5% to 99%	3% + 1 digit	HP 8902A w/HP 11793A (using peak detector)
Amplitude Modulation – Measure (10 to 1300 MHz)	Rate: 50 Hz to 50 kHz Depth: 5% to 99%	1% + 1 digit	HP 8902A w/HP 11793A (using peak detector)
	Rate: 20 Hz to 20 kHz Depth: 5% to 99%	3% + 1 digit	HP 8902A w/HP 11793A (using peak detector)
Amplitude Modulation – Measure (1.3 to 26.5 GHz)	Rate: 50 Hz to 50 kHz Depth: 5% to 99%	1.5% + 1 digit	HP 8902A w/HP 11793A (using peak detector)
	Rate: 20 Hz to 100 kHz Depth: 5% to 99%	3% + 1 digit	
Frequency Modulation – Measure 250 kHz to 10 MHz	Rate: 20 Hz to 10 kHz Deviation: 40 kHz peak	2% + 1 digit	HP 8902A w/HP 11793A (using peak detector)
Frequency Modulation – Measure 10 MHz to 1.3 GHz	Rate: 50 Hz to 100 kHz Deviation: 400 kHz peak	1% + 1 digit	



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/EQUIPMENT
Frequency Modulation - Measure 10 MHz to 1.3 GHz	Rate: 20 Hz to 200 kHz Deviation: 400 kHz peak	5% + 1 digit	HP 8902A w/HP 11793A (using peak detector)
Frequency Modulation - Measure (1.3 to 26.5 GHz)	Rate: 50 Hz to 100 kHz Deviation: 400 kHz peak	1% + 1 digit	
Frequency Modulation - Measure (1.3 to 26.5 GHz)	Rate: 20 Hz to 200 kHz Deviation: 40 kHz peak	5% + 1 digit	HP 8902A w/HP 11793A (using peak detector)
Amplitude Modulation - Flatness Measure 10 MHz to 1.3 GHz Carrier Frequency	Rate: 90 Hz to 10 kHz Depth: 20% to 80%	0.3% + 1 digit	HP 8902A w/HP 11793A (using peak detector)
Modulation Residual AM - Measure 50 Hz to 3 kHz BW	(0 to 100)% rms	<0.01% rms	HP 8902A
Modulation Residual FM - Measure 50 Hz to 3 kHz BW	≤100 MHz	<1 Hzrms	HP 8902A
	1300 MHz	increasing linearly with frequency to <8 Hzrms	
Phase Modulation - Measure 150 kHz to 10 MHz	200 Hz to 10 kHz	4% + 1 digit	HP 8902A w/HP 11793A (using peak detector)
Phase Modulation - Measure 10 MHz to 1.3 GHz	200 Hz to 20 kHz	3% + 1 digit	
Phase Modulation - Measure (1.3 to 26.5)	200 Hz to 20 kHz	3% + 1 digit	



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/ EQUIPMENT
GHz			
Noise Measurement Distortion Harmonics <330 kHz	20 Hz to 20 kHz	1 dB	HP 8903B
	(20 to 100) kHz	2 dB	
Single Side Band Phase Noise (SSB)	(10 to 1300) MHz	1 dB	HP 8902A-030, 037
Frequency – Generate	10 MHz to 26.5 GHz	5×10^{-12}	HP 8340B, Fluke 910R as external time base
Attenuators – Generate DC to 18 GHz	1 dB	0.35 dB	Agilent 84904K, APC 3.5 mm connector
	2 dB	0.45 dB	
	(3 to 6) dB	0.55 dB	
	(7 to 8) dB	0.60 dB	
	9 dB	0.65 dB	
	10 dB	0.70 dB	
	11 dB	0.80 dB	
Attenuators – Generate (>18 to 26.5) GHz	1 dB	0.40 dB	Agilent 84904K, APC 3.5 mm connector
	2 dB	0.50 dB	
	(3 to 6) dB	0.70 dB	
	(7 to 8) dB	0.80 dB	
	9 dB	0.85 dB	
	10 dB	0.90 dB	
	11 dB	1.10 dB	
Attenuators – Generate DC to 6 GHz	10 dB	0.3 dB	HP 8497K, APC 3.5 mm connector
	20 dB	0.5 dB	
	30 dB	0.6 dB	
	40 dB	0.7 dB	
	50 dB	0.8 dB	
	60 dB	1.0 dB	
	(70 to 80) dB	1.1 dB	
Attenuators – Generate (>6 to 12.4) GHz	10 dB	0.4 dB	HP 8497K, APC 3.5 mm connector
	20 dB	0.5 dB	
	30 dB	0.7 dB	
	40 dB	0.9 dB	
	50 dB	1.0 dB	
	60 dB	1.3 dB	
	70 dB	1.5 dB	
	80 dB	1.6 dB	
90 dB	1.7 dB		



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/EQUIPMENT
Attenuators – Generate (>12.4 to 18) GHz	10 dB	0.5 dB	HP 8497K, APC 3.5 mm connector
	20 dB	0.6 dB	
	30 dB	0.8 dB	
	40 dB	1.1 dB	
	50 dB	1.2 dB	
	60 dB	1.4 dB	
	70 dB	1.7 dB	
	80 dB	1.8 dB	
	90 dB	2.1 dB	
Attenuators – Generate (>18 to 26.5) GHz	10 dB	0.7 dB	HP 8497K, APC 3.5 mm connector
	20 dB	0.8 dB	
	30 dB	1.0 dB	
	40 dB	1.5 dB	
	50 dB	1.6 dB	
	60 dB	1.9 dB	
	70 dB	2.3 dB	
	80 dB	2.5 dB	
	90 dB	2.8 dB	
Attenuators – Generate 200 Hz to 80 MHz	(0 to 18) dB	0.04 dB	HP 3335A
	(20 to 58) dB	0.09 dB	
	(60 to 98) dB	0.20 dB	
Attenuators – Measure 100 kHz to 26.5 GHz	(0 to -20) dB	0.05 dB + M	Where: M is the mismatch uncertainty. HP 8902A w/11722A and 11793A
	(-20 to -40) dB	0.18 dB + M	
	(-40 to -60) dB	0.20 dB + M	
	(-60 to -80) dB	0.24 dB + M	
	(-80 to -100) dB	0.28 dB + M	
	(-100 to -127) dB	0.35 dB + M	
Power – Generate 0.001 Hz to 100 kHz (into 50 Ω)	(-56.02 to 13.52) dBm	0.2 dB	HP 3325B (sinewave 0 dB attenuation, BNC connector)
	(13.52 to 23.98) dBm	0.1 dB	
Power – Generate 100 kHz to 10 MHz (into 50 Ω)	(-56.02 to +13.52) dBm	0.6 dB	
Power – Generate (10 to	(-56.02 to -16.02) dBm	0.9 dB	



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/ EQUIPMENT
20) MHz (into 50 Ω)			
Power – Generate (10 to 20) MHz (into 50 Ω)	(-16.02 to +13.52) dBm	0.6 dB	
Power – Generate 100 kHz to 20 MHz (into 50 Ω)	(13.52 to 23.98) dBm	0.4 dB	
Power – Generate (0.01 to 3) GHz	(+10 to -9.95) dBm	0.9 dBm	HP 8340B, internally leveled type N connector
	(-10 to -19.95) dBm	1.2 dBm	
	(-20 to -49.95) dBm	1.5 dBm	
	(-50 to -79.95) dBm	1.8 dBm	
	(-80 to -100) dBm	2.1 dBm	
Power – Generate (2.3 to 20) GHz	(+18 to +10) dBm	1.8 dBm	HP 8340B, internally leveled Type N connector
	(+10 to -9.95) dBm	1.5 dBm	
	(-10 to -19.95) dBm	2.0 dBm	
	(-20 to -49.95) dBm	2.3 dBm	
	(-50 to -79.95) dBm	2.6 dBm	
	(-80 to -100) dBm	2.9 dBm	
Power – Generate (20 to 26.5) GHz	(+18 to +10) dBm	2.3 dBm	HP 8340B, internally leveled Type N connector
	(+10 to -9.95) dBm	2.0 dBm	
	(-10 to -19.95) dBm	2.5 dBm	
	(-20 to -49.95) dBm	2.8 dBm	
	(-50 to -79.95) dBm	3.1 dBm	
	(-80 to -100) dBm	3.4 dBm	
Power – Measure 100 kHz to 4.2 GHz	(+10 to +20) dBm	0.02 dB + 0.001 dB/°C	HP 437B, assuming VSWR of calibration item of 1:1 w/8482A
	(-30 to +10) dBm	0.02 dB + 0.001 dB/°C	
Power – Measure 50 MHz to 26.5 GHz	(-30 to +20) dBm	0.02 dB + 0.001 dB/°C	w/8485A
Return Loss – Measure (into 50 Ω)	10 dB	1.2921 dB	HP 85021B w/8755C and 8340B
	20 dB	1.4467 dB	
	30 dB	1.5134 dB	
	40 dB	1.5023 dB	
10 MHz to 8.4 GHz			



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/EQUIPMENT
Return Loss – Measure (into 50 Ω) (>8.4 to 12.4) GHz	10 dB	1.3009 dB	HP 85021B w/8755C and 8340B
	20 dB	1.4556 dB	
	30 dB	1.5223 dB	
	40 dB	1.5112 dB	
Return Loss – Measure (into 50 Ω) (>12.4 to 20) GHz	10 dB	1.3383 dB	HP 85021B w/8755C and 8340B
	20 dB	1.4934 dB	
	30 dB	1.5602 dB	
	40 dB	1.5491 dB	
Return Loss – Measure (into 50 Ω) (>20 to 26.5) GHz	10 dB	1.4822 dB	HP 85021B w/8755C and 8340B
	20 dB	1.6385 dB	
	30 dB	1.7058 dB	
	40 dB	1.6945 dB	
Harmonic and Non-Harmonic Amplitude Measure 0.02 Hz to 25.5 kHz	(+30 to -120) dBV	0.6 dB Log	HP 3582A
Harmonic and Non-Harmonic Amplitude Measure 9 kHz to 25 GHz	(0 to 60) dB Reference level	0.2 dB/2 dB Log; 0.75 dB maximum cumulative 3% linear	HP 8592B
	(<-60 to -70) dB Reference level	0.2/2 dB log; 1 dB maximum cumulative 3% linear	
<i>Dimensional</i>			
Micrometer	0.0625 to 60 in.	(20 + 7L) μin.	Gage blocks, and micrometer standards Where: L is the length in inches
Calipers	Up to 60 in.	(35 + 10L) μin.	Gage blocks, and micrometer standards Where: L is the length in inches
	1 in. (internal diameter)	80 μin.	Ring Gage
	2.8 in. (internal diameter)	80 μin.	Ring Gage
<i>Mechanical</i>			
Totalizers (Contact)	(0.01 to 100 000) ft.	1.0%	Electromatic CDT2000
	(0.02 to 100 000) m		



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/EQUIPMENT
Speed – Generate (Contact)	(1 to 100 000) in.		Quantum N-11-ECS/3A w/HP 53132A
	(55 to 5000) rpm	0.001 rpm	
	(5000 to 7000) rpm	0.0012 rpm	
	(7000 to 46 000) rpm	0.000018%	
Speed – Generate (Non-contact)	(0 to 100 000) rpm	1×10^{-12}	HP 3325B w/Fluke 910R
Speed – Measure (Non-contact)	(0 to 99 999) rpm	0.03%	Electromatic CDT2000
	(0.3 to 6500) fpm		
	(4 to 78 000) ipm		
	(0.1 to 1999) mpm		
Speed – Measure (Contact)	(1 to 99 999) rpm	1.0%	Electromatic CDT2000
	(0.3 to 6500) fpm	1.0%	
	(4 to 78 000) ipm	1.0%	
	(0.1 to 1999) mpm	1.0%	
Speed – Measure (Contact) [continued]	(0.1 to 999.99) fpm	(% RDG + offset) 0.13% + 0.06 fpm	Shimpo DT-107A
	(1000 to 9999.9) fpm	0.13% + 0.6 fpm	
	(10 000 to 25 000) fpm	0.13% + 1 fpm	
Acceleration/Vibration – Measure (at 1 g)	(1 to 10) Hz	2.9%	Dytran 3120BK w/Keithley 2002
	(10 to 100) Hz	2.4%	
	100 Hz to 10 kHz	2.3%	
Scales and Balances - Class 1 and Class 3 (200 mg to 20 kg)	200 mg	0.060 mg	Class 3 Weights
	1 g	0.10 mg	
	2 g	0.13 mg	
	5 g	0.18 mg	
	Class 1 Weights	10 g	0.051 mg
		30 g	0.076 mg
		50 g	0.13 mg
		100 g	0.26 mg
		400 g	0.77 mg
		1 kg	2.6 mg
		3 kg	7.8 mg
		5 kg	13 mg
	10 kg	100 mg	Class 3 Weights
Scales and Balances - Class 7 and Class F (0.5 lb. to 400 lb.)	0.5 lb.	0.0005 lb.	Class 7 Weights
	1 lb.	0.0007 lb.	
	2 lb.	0.0010 lb.	
	5 lb.	0.0022 lb.	
	10 lb.	0.0031 lb.	
	50 lb.	0.0051 lb.	Class F Weights



SCOPE OF ACCREDITATION

CALIBRATION AREA	RANGE & RESOLUTION	CALIBRATION & MEASUREMENT CAPABILITY ¹ (CMC) (±)	REFERENCE STANDARD/ EQUIPMENT
Force Gages (0.5 lb. to 100 lb.)	0.5 lb.	0.0005 lb.	Class 7 Weights
	1 lb.	0.0007 lb.	
	2 lb.	0.0010 lb.	
	5 lb.	0.0022 lb.	
	10 lb.	0.0031 lb.	
Pressure – Generate and Measure	(0 to 10) in.-H ₂ O	0.03 in.-H ₂ O	Fluke 700P01 w/718
	(0 to 12) in.-H ₂ O	0.0025 in.-H ₂ O	Dwyer 1425-12
	(-12 to 30) psi	0.015 psi	Fluke 717-30G
	(-12 to 100) psi	0.035 psi	Fluke 719-100G
	(0 to 30) psia	0.021 psi	Fluke 700PA5 w/718
	(-12 to 300) psi	0.11 psi	Fluke 719 Pro 300G
	(0 to 500) psi	0.25 psi	Fluke 700P07 w/718
	(0 to 1000) psi	0.5 psi	Fluke 700P08
	(0 to 3000) psi	1.5 psi	Ametek XP2i 3000
	(0 to 5000) psi	2.5 psi	Druck DPI104 5k
	(0 to 7000) psi	4 psi	Ashcroft 7000
(0 to 10 000) psi	8 psi	Fluke 700P31	
Force – Measure	(0 to 10 000) lbf	0.1% FS + 0.005% RDG	Interface 1211NE w/Newport Infinity INFS
	(0 to 100 000) lbf	200 lbf	Transcell TI-500E w/VMC VLC-120
	0 to 275 000) lbf	0.55% RDG + 100 lbf	Omega PX105 w/Analogic AN2559
Vacuum – Generate and Measure	(-24.432 to 61.080) in.-Hg	0.031 in.-Hg	Fluke 717-30G
	(-25 to 204) in.-Hg	0.072 in.-Hg	Fluke 719-100G
	(-12 to 0) psi	0.035 psi	Fluke 719-100G
<i>Chemical/Gas</i>			
pH - Generate	(4, 7) units	0.002 units	Solutions
	10 units	0.005 units	

¹'Calibration and Measurement Capability' is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation (at a confidence level of 95% with a coverage factor of 2)