



SCOPE OF ACCREDITATION

IAS Accreditation Number	CL-121
Accredited Entity	Standard Calibrations, Inc.
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Effective Date of Scope	April 3, 2018
Accreditation Standard	ISO/IEC 17025:2005

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)^{1,2}

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY ³ (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
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<i>Mechanical</i>			
Torque Wrenches	Up to 2700 N m	5.1 N m	Torque Calibrator/Torque Cell
Vacuum and Pressure Gauges/Pressure Transducers	-1 bar to 2 bar	0.02% FS	Mensor 600
	2 to 10 bar	0.02% FS	
	10 to 35 bar	0.02% FS	
	35 to 70 bar	0.02% FS	
	70 to 100 bar	0.05% FS	
	30 to 700 bar	0.05% FS	Mensor 2101
	700 to 2000 bar	0.05% FS	Omegadyne PXD 1S1-30KGI
	0 to 30 in.-Hg	0.02% FS	Mensor 600
<i>Thermal</i>			
Temperature Probes, Dry Block Calibrators, Thermometers	40°F to 1199°F	0.06°F	Reference PRTs with Meters, Oil Baths, Dry Blocks
Infrared	122°F, 212°F, 302°F	1°F	Fluke 9134
Thermocouple – Type B	600°C to 800°C	0.44°C	Agilent 34401A, 5520A
	800°C to 1000°C	0.34°C	
	1,000°C to 1,550°C	0.30°C	
	1,550°C to 1,850°C	0.33°C	
Thermocouple – Type C	0°C to 150°C	0.30°C	Agilent 34401A, 5520A
	150°C to 650°C	0.26°C	
	650°C to 1,000°C	0.31°C	
	1,000°C to 1,800°C	0.50°C	
	1,800°C to 2,316°C	0.84°C	
Thermocouple – Type E	-250°C to -100°C	0.50°C	Agilent 34401A, 5520A
	-100°C to -25°C	0.16°C	
	-25°C to 350°C	0.14°C	
	350°C to 650°C	0.16°C	
	650°C to 1000°C	0.21°C	
	-210°C to -100°C	0.27°C	Agilent 34401A, 5520A



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Thermocouple – Type J	-100°C to -30°C	0.16°C	
	-30°C to 150°C	0.14°C	
	150°C to 760°C	0.17°C	
	760°C to 1200°C	0.23°C	
Thermocouple – Type K	-200°C to -100°C	0.33°C	Agilent 34401A, 5520A
	-100°C to -25°C	0.18°C	
	-25°C to 120°C	0.16°C	
	120°C to 1000°C	0.26°C	
	1000°C to 1372°C	0.40°C	
Thermocouple – Type T	-250°C to -150°C	0.63°C	Agilent 34401A, 5520A
	-150°C to 0°C	0.24°C	
	0°C to 120°C	0.16°C	
	120°C to 400°C	0.15°C	
Electrical/DC/Low Frequency			
DC Voltage – Generate	0 to 329.9999 mV	(ppm of output + μV) 20 + 1	Fluke 5520A
	0 to 3.299999 V	11 + 2	
	0 to 32.99999 V	12 + 20	
	30 to 329.9999 V	18 + 150	
	100 to 1000.000 V	18 + 1500	
AC Voltage – Generate	(1.0 to 32.999 mV) 10 to 45 Hz	800 + 6	Fluke 5520A
	45 Hz to 10 kHz	150 + 6	
	10 to 20 kHz	200 + 6	
	20 to 50 kHz	1000 + 6	
	50 to 100 kHz	3500 + 12	
	100 to 500 kHz	8000 + 50	
	(33 to 329.999 mV) 10 to 45 Hz	300 + 8	
	45 Hz to 10 kHz	145 + 8	
	10 to 20 kHz	160 + 8	
	20 to 50 kHz	350 + 8	
	50 to 100 kHz	800 + 32	
	100 to 500 kHz	2000 + 70	
	(0.33 to 3.29999 V) 10 to 45 Hz	300 + 50	
	45 Hz to 10 kHz	150 + 60	
	10 to 20 kHz	190 + 60	
	20 to 50 kHz	300 + 50	
	50 to 100 kHz	700 + 125	
	100 to 500 kHz	2400 + 600	
	(3.3 to 32.9999 V) 10 to 45 Hz	300 + 650	
	45 Hz to 10 kHz	150 + 600	
	10 to 20 kHz	240 + 600	
	20 to 50 kHz	350 + 600	
	50 to 100 kHz	900 + 1600	



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	(33 to 329.999 V) 45 Hz to 1 kHz	200 + 6000	
	1 to 10 kHz	250 + 6000	
	10 to 20 kHz	300 + 6000	
	20 to 50 kHz	2000 + 50000	
	50 to 100 kHz	300 + 10000	
	(330 to 1020 V) 45 Hz to 1 kHz	300 + 10000	
	1 to 5 kHz	250 + 10000	
	5 to 10 kHz	300 + 10000	
DC Current – Generate	0 to 329.999 µA	(ppm of Output + µA) 150 + 0.02	Fluke 5520A
	0 to 3.29999 mA	100 + 0.05	
	0 to 32.9999 mA	100 + 0.25	
	0 to 329.999 mA	100 + 2.5	
	0 to 1.09999 A	200 + 40	
	1.1 to 2.99999 A	380 + 40	
	0 to 10.9999 A	500 + 500	
	11 to 20.5 A	1000 + 750	
AC Current – Generate	30 to 330 µA	(% of Output + µA) 0.13% + 0.1 µA	Generate is at 1 kHz only, LCOMP is off
	330 µA to 3.3 mA	0.1% + 0.15 µA	
	3.3 to 33 mA	0.04% + 2 µA	
	33 to 330 mA	0.04% + 20 µA	
	330 mA to 1.1 A	0.05% + 0.1 mA	
	1.1 to 3 A	0.06% + 0.1 mA	
	3 to 11 A	0.1% + 2 mA	
	11 to 20.5 A	0.15% + 5 mA	
Ohms – Generate	0 to 11 Ω	(ppm of Output + Floor) 40 + 1 mΩ	Floor is 12 hours at 1°C
	11 to 33 Ω	30 + 1.5 mΩ	
	33 to 110 Ω	28 + 1.4 mΩ	
	110 to 330 Ω	28 + 2 mΩ	
	330 Ω to 1.1 kΩ	8 + 2 mΩ	
	1.1 to 3.3 kΩ	28 + 0.02 Ω	
	3.3 to 11 kΩ	28 + 0.02 Ω	
	11 to 33 kΩ	28 + 0.2 Ω	
	33 to 110 kΩ	28 + 0.2 Ω	
	110 to 330 kΩ	32 + 2 Ω	
	330 kΩ to 1.1 MΩ	32 + 2 Ω	
	1.1 to 3.3 MΩ	60 + 30 Ω	
	3.3 to 11 MΩ	(% of Output + Floor) 0.13% + 50 Ω	
	11 to 33 MΩ	0.025% + 2.5 kΩ	
	33 to 110 MΩ	0.05% + 3 kΩ	
	110 MΩ to 1.1 GΩ	1.5% + 500 kΩ	
	Up to 100 mV	5 µV/V + 0.8 µV	Agilent 34401A



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DC Voltage – Measure	100 mV to 1 V	4 µV/V + 0.8 µV	
	1 to 10 V	4 µV/V + 1 µV	
	10 to 100 V	6 µV/V + 31 µV	
	100 to 1000 V	6 µV/V + 100 µV	
DC Current – Measure	Up to 1 µA	22 µA/A + 45 pA	Agilent 34401A
	>1 to 10 µA	22 µA/A + 110 pA	
	>10 to 100 µA	22 µA/A + 900 pA	
	>100 µA to 1 mA	22 µA/A + 6 nA	
	>1 to 10 mA	22 µA/A + 60 nA	
	>10 to 100 mA	37 µA/A + 0.6 µA	
	>100 mA to 1 A	0.01 % + 12 µA	
AC Voltage – Measure	(Up to 10 mV) 40 Hz to 1 kHz	0.02% + 1.1 µV	Agilent 34401A
	1 to 20 kHz	0.03% + 1.1 µV	
	20 to 50 kHz	0.1% + 1.1 µV	
	50 to 100 kHz	0.5% + 1.1 µV	
	100 to 300 kHz	4% + 2 µV	
	(10 to 100 mV) 1 to 40 Hz	0.007% + 4 µV	
	40 Hz to 1 kHz	0.007% + 2 µV	
	1 to 20 kHz	0.014% + 2 µV	
	20 to 50 kHz	0.03% + 2 µV	
	50 to 100 kHz	0.08% + 2 µV	
	100 to 300 kHz	0.3% + 10 µV	
	300 kHz to 1 MHz	1% + 10 µV	
	1 to 2 MHz	1.5% + 10 µV	
	(1 to 10 V) 1 to 40 Hz	0.007% + 400 µV	
	40 Hz to 1 kHz	0.007% + 200 µV	
	1 to 20 kHz	0.014% + 200 µV	
	20 to 50 kHz	0.03% + 200 µV	
	50 to 100 kHz	0.08% + 200 µV	
	100 to 300 kHz	0.3% + 1 mV	
	300 kHz to 1 MHz	1% + 1 mV	
	1 to 2 MHz	1.5% + 1 mV	
	(10 to 100 V) 1 to 40 Hz	0.02% + 4 mV	
	40 Hz to 1 kHz	0.02% + 2 mV	
	1 to 20 kHz	0.02% + 2 mV	
	20 to 50 kHz	0.035% + 2 mV	
	50 to 100 kHz	0.12% + 2 mV	
	100 to 300 kHz	0.4% + 10 mV	
	300 kHz to 1 MHz	1.5% + 10 mV	
	(100 to 1000 V) 1 to 40 Hz	0.04% + 40 mV	
	40 Hz to 1 kHz	0.04% + 20 mV	
	1 to 20 kHz	0.06% + 20 mV	



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	20 to 50 kHz	0.12% + 20 mV	
	50 to 100 kHz	0.3% + 20 mV	
AC Current – Measure	5 to 100 µA	0.06% + 0.03 µA	Measure is at 1 kHz only
	100 µA to 1 mA	0.03% + 0.2 µA	
	1 to 10 mA	0.03% + 2 µA	
	10 to 100 mA	0.03% + 20 µA	
	100 mA to 1 A	0.1% + 0.2 mA	
Resistance - Measure	Up to 10 Ω	16 µΩ/Ω + 50	Measure is at 1 kHz only
	10 to 100 Ω	13 µΩ/Ω + 0.5 mΩ	
	100 Ω to 1 kΩ	11 µΩ/Ω + 1 mΩ	
	1 to 10 kΩ	11 µΩ/Ω + 0.01 Ω	
	10 to 100 kΩ	11 µΩ/Ω + 0.6 Ω	
	100 kΩ to 1 MΩ	16 µΩ/Ω + 3 Ω	
	1 to 10 MΩ	55 µΩ/Ω + 120 Ω	
	10 to 100 MΩ	0.052% + 1.2 kΩ	
Capacitance - Source	100 MΩ to 1 GΩ	0.75% + 12 kΩ	Fluke 5520A
		(% of Output + Floor)	
	0.19 to 0.4 nF	0.5% + 0.01 nF	
	0.4 to 1.1 nF	0.5% + 0.01 nF	
	1.1 to 3.3 nF	0.5% + 0.01 nF	
	3.3 to 11 nF	0.25% + 0.01 nF	
	11 to 33 nF	0.25% + 0.1 nF	
	33 to 110 nF	0.25% + 0.1 nF	
	110 to 330 nF	0.25% + 0.3 nF	
	330 nF to 1.1 µF	0.25% + 1 nF	
	1.1 to 3.3 µF	0.25% + 3 nF	
	3.3 to 11 µF	0.25% + 10 nF	
	11 to 33 µF	0.40% + 30 nF	
	33 to 110 µF	0.45% + 100 nF	
	110 to 330 µF	0.45% + 300 nF	
	330 µF to 1.1 mF	0.45% + 1 µF	
	1.1 to 3.3 mF	0.45% + 3 µF	
	3.3 to 11 mF	0.45% + 10 µF	
	11 to 33 mF	0.75% + 30 µF	
33 to 110 mF	1.1% + 100 µF		
Dimensional			
Dial Calipers	0 to 100 mm/0.02 mm	0.02 mm	Gauge Blocks, 81 Piece Set and Long Block Set
	0 to 150 mm/0.02 mm	0.03 mm	
	0 to 200 mm/0.02 mm	0.04 mm	
	0 to 300 mm/0.02 mm	0.04 mm	
	0 to 450 mm/0.02 mm	0.05 mm	
	0 to 600 mm/0.02 mm	0.06 mm	
Digital Calipers	0 to 100 mm/0.01 mm	0.01 mm	
	0 to 150 mm/0.01 mm	0.02 mm	
	0 to 200 mm/0.01 mm	0.03 mm	
	0 to 300 mm/0.01 mm	0.04 mm	



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Outside Micrometers	0 to 450 mm/0.01 mm	0.05 mm	Gauge Blocks, 81 Piece set and Long Block Set
	0 to 600 mm/0.01 mm	0.05 mm	
	Up to 25 mm/0.001 mm	0.003 mm	
	25 to 100 mm/ 0.001 mm	0.003 mm	
	100 to 150 mm/0.001 mm	0.003 mm	
	150 to 200 mm/0.001 mm	0.004 mm	
	200 to 300 mm/0.001 mm	0.004 mm	
	300 to 450 mm/0.001 mm	0.005 mm	
	450 to 600 mm/0.001 mm	0.005 mm	
Inside Micrometers	Up to 25 mm/0.01 mm	0.01 mm	
	25 to 100 mm/ 0.01 mm	0.013 mm	
	100 to 150 mm/0.01 mm	0.013 mm	
	150 to 200 mm/0.01 mm	0.015 mm	
	200 to 300 mm/0.01 mm	0.02 mm	
	300 to 450 mm/0.01 mm	0.025 mm	
Depth Micrometers	450 to 600 mm/0.01 mm	0.03 mm	
	Up to 25 mm/0.02 mm	0.02 mm	
	25 to 100 mm/ 0.02 mm	0.024 mm	
	100 to 150 mm/0.02 mm	0.024 mm	
	150 to 200 mm/0.02 mm	0.03 mm	
Height Gauge	200 to 300 mm/0.02 mm	0.032 mm	
	0 to 300 mm/0.001 mm	0.004 mm	
	300 to 450 mm/0.001 mm	0.007 mm	
Dial Indicator	450 to 1000 mm/0.001 mm	0.0010 mm	Super Micrometer, Gauge Blocks
	Up to 25 mm/0.001 mm	0.003 mm	
	25 to 100 mm/ 0.001 mm	0.003 mm	
	100 to 150 mm/0.001 mm	0.003 mm	
	150 to 200 mm/0.001 mm	0.004 mm	
End Standards	200 to 300 mm/0.001 mm	0.004 mm	
	Up to 650 mm	0.0008 mm	

Conformity Specification

ANSI/NCSL Z540.3

American National Standard for calibration – requirements for the calibration of measuring and test equipment

*‘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)