



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Accurate Instrument Repair, Inc.

27122 Burbank

Foothill Ranch, CA 92610

(and satellite location as shown on the scope)

Fulfills the requirements of

ISO/IEC 17025:2017

and national standard

ANSI/NCSL Z540-1-1994 (R2002)

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

A handwritten signature in black ink, appearing to read 'R. Douglas Leonard Jr.', is positioned above a horizontal line.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 30 July 2025

Certificate Number: L2207



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory
quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

AND

ANSI/NCSL Z540-1-1994 (R2002)

Accurate Instrument Repair, Inc.

27122 Burbank
Foothill Ranch, CA 92610
Anthony Sargent 949-454-2874

CALIBRATION

Valid to: **July 30, 2025**

Certificate Number: **L2207**

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Gage Blocks ²	(0.05 to 4) in	$(2.3 + 1.8L) \mu\text{in}$	Electro-mechanical Comparison
	(5 to 20) in	$(2 + 2L) \mu\text{in}$	
Cylindrical Ring Gages ²	(0.04 to 14) in	$(4.4 + 4.1D) \mu\text{in}$	Labmaster Universal
Cylindrical Plug Gages ² High Accuracy	(0.1 to 6) in	$(5.8 + 3.8L) \mu\text{in}$	Lab Master Universal, Gage Blocks
Cylindrical Plug Gages ² (Plain)	(0.1 to 6) in	$(28 + 3.5L) \mu\text{in}$	Supermicrometer, Gage Blocks
Surface Plates ^{1,2}			In accordance with Fed Spec GGG-P-463 using Leveling System
Overall Flatness	(21 to 140) in <i>DL</i>	$8.5 \sqrt{DL} \mu\text{in}$	
Local Area Flatness (repeat reading)	Up to 0.001 in	33 μin	Repeat Gage
Calipers ^{1,2}	Up to 40 in	$(380 + 1.8L) \mu\text{in}$	Gage Blocks
Indicators ^{1,2}	Up to 0.5 in	30 μin	Indicator Calibrator, Height Master, Gage Blocks
	Up to 1 in	290 μin	
	(1 to 12) in	$(320 + 0.9L) \mu\text{in}$	
Outside Micrometers ^{1,2}	Up to 36 in	$(51 + 2.3L) \mu\text{in}$	Gage Blocks, Ring Gages, Plug Gages
Inside Micrometers ^{1,2}	Up to 24 in	$(350 + 0.3L) \mu\text{in}$	

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Height Gages ^{1,2}	Up to 40 in	(62 + 2.7L) μin	Gage Blocks, Surface Plate, Indicator
Super Micrometers, Bench Micrometers ¹	Up to 1 in	14 μin	Gage Blocks
Optical Comparators ¹			
Linearity	Up to 16 in	120 μin	Glass Master, Magnification Scale
Magnification	Up to 12 in	690 μin	

Services performed at satellite location

26235 Enterprise Court
Lake Forest, CA 92630

(all shipping, receiving and administrative functions are conducted at the main location)

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current – Generate ¹	Up to 329 μA 330 μA to 3.29 mA (3.3 to 32.9) mA (33 to 329.9) mA 330 mA to 1.09 A (1.1 to 2.9) A (3 to 10.9) A (11 to 20.5) A	0.2 nA/μA + 27 nA 0.11 μA/mA + 67 nA 0.12 μA/mA + 0.29 μA 0.12 μA/mA + 2.7 μA 0.23 mA/A + 49 μA 0.43 mA/A + 91 μA 0.57 mA/A + 0.7 mA 1.5 mA/A + 1.1 mA	Fluke Multifunction Calibrator
DC Current – Generate Clamp Meters ¹	Up to 1 000 A	24 μA/A + 64 μA	Multifunction Calibrator, Coil
DC Current – Measure ¹	Up to 10 mA (10.1 to 100) mA 100.1 mA to 1 A (1.1 to 3) A (3.1 to 100) A	0.57 μA/mA + 2.4 μA 0.57 μA/mA + 7.3 μA 1.1 μA/mA + 0.14 mA 1.4 mA/A + 0.7 mA 0.047 % of reading	HP/Agilent Multimeter, Current Shunt



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Source ¹	Up to 10 kHz Up to 329.9 μ A 330 μ A to 3.29 mA (3.3 to 32.9) mA (33 to 329.9) mA	9 nA/ μ A + 0.23 μ A 5.8 μ A/mA + 0.4 μ A 2.3 μ A/mA + 3.5 μ A 2.3 μ A/mA + 0.12 mA	Fluke Multifunction Calibrator
AC Current – Source ¹	Up to 5 kHz 330 mA to 2.9 A (3 to 10.9) A (11 to 20.5) A	6.9 mA/A + 1.2 mA 35 mA/A + 2.3 mA 35 mA/A + 5.3 mA	Fluke Multifunction Calibrator
AC Current – Measure ¹	Up to 3 A 10 Hz to 5 kHz	2.8 mA/A	HP/Agilent Multimeter
Resistance – Generate ¹ (Simulation)	Up to 10.9 Ω (11 to 32.9) Ω (33 to 109.9) Ω (110 to 329.9) Ω (0.33 to 1.09) k Ω (1.1 to 3.29) k Ω (3.3 to 10.9) k Ω (11 to 109.9) k Ω (0.11 to 1.09) M Ω (1.1 to 3.29) M Ω (3.3 to 10.9) M Ω (11 to 32.9) M Ω (33 to 109.9) M Ω (110 to 329.9) M Ω (0.33 to 1.1) G Ω	50 $\mu\Omega/\Omega$ + 1.2 m Ω 36 $\mu\Omega/\Omega$ + 1.8 m Ω 33 $\mu\Omega/\Omega$ + 1.6 m Ω 33 $\mu\Omega/\Omega$ + 2.3 m Ω 34 $\mu\Omega/\Omega$ + 2.1 m Ω 34 m Ω /k Ω + 24 m Ω 33 m Ω /k Ω + 27 m Ω 34 m Ω /k Ω + 0.23 Ω 38 m Ω /k Ω + 2.2 Ω 70 Ω /M Ω + 37 Ω 157 Ω /M Ω + 52 Ω 0.31 k Ω /M Ω + 2.6 k Ω 0.57 k Ω /M Ω + 4.4 k Ω 3.7 k Ω /M Ω + 0.11 M Ω 17 k Ω /M Ω + 1.1 M Ω	Fluke Multifunction Calibrator
Resistance – Measure ¹	Up to 100 Ω 100.1 Ω to 1 M Ω (1.1 to 10) M Ω (10.1 to 100) M Ω	0.12 m Ω / Ω + 4.6 m Ω 0.13 m Ω / Ω + 14 m Ω 0.46 k Ω /M Ω + 0.11 k Ω 9.2 k Ω /M Ω + 12 k Ω	HP/Agilent Multimeter
DC Voltage – Source ¹	Up to 329 mV (0.33 to 3.29) V (3.3 to 32.9) V (33 to 329) V (330 to 1 000) V	0.2 μ V/mV + 1.7 μ V 13.1 μ V/V + 2.3 μ V 14 μ V/V + 29 μ V 20.8 μ V/V + 0.24 mV 20.6 μ V/V + 2.3 mV	Fluke Multifunction Calibrator



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Source ¹	Up to 50 kHz (1 to 32.9) mV (33 to 329) mV 330 mV to 3.29 V (3.3 to 32.9) V Up to 10 kHz (33 to 329.9) V (330 to 1 020) V	1.2 μ V/mV + 7 μ V 0.4 μ V/mV + 11 μ V 0.35 μ V/mV + 59 μ V 0.4 mV/V + 1.4 mV 0.36 mV/V + 7.8 mV 0.36 mV/V + 1.4 mV	Fluke Multifunction Calibrator
DC Voltage – Measure ¹	Up to 100 mV (0.1 to 1) V (1.1 to 10) V (10.1 to 100) V (100.1 to 1 000) V	55 nV/mV + 4.5 μ V 45 nV/mV + 9.6 μ V 40 μ V/V + 69 μ V 54 μ V/V + 0.78 mV 53 μ V/V + 12 mV	HP/Agilent Multimeter
AC Voltage – Measure ¹	Up to 750 V (3 to 5) Hz (5 to 10) Hz 10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	12 μ V/V + 3.5 μ V 4.5 mV/V + 22 μ V 1.2 mV/V + 67 μ V 2 V/V + 45 μ V 7.9 mV/V + 13 μ V 52 mV/V + 1.9 μ V	HP/Agilent Multimeter
Electrical Simulation of Thermocouple Indicating Devices – Source/Measure ¹	Type J (-210 to 1 200) °C Type K (-100 to 1 000) °C Type T (-150 to 400) °C Type E (-100 to 1 000) °C	0.31 °C 0.3 °C 0.28 °C 0.25 °C	Fluke Multifunction Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Capacitance – Source ¹ (Simulation)			Fluke Multifunction Calibrator
10 Hz to 3 kHz	(0.19 to 3.29) nF	5.8 pF/nF + 12 pF	
10 Hz to 1 kHz	(3.3 to 10.9) nF	2.9 pF/nF + 12 pF	
10 Hz to 1 kHz	(11 to 109.9) nF	2.9 nF/nF + 0.12 nF	
10 Hz to 1 kHz	(110 to 329.9) nF	2.9 pF/nF + 0.34 nF	
(10 to 600) Hz	(0.33 to 1.09) μF	2.9 nF/μF + 1.2 nF	
(10 to 300) Hz	(1.1 to 3.29) μF	3.3 nF/μF + 2.5 nF	
(10 to 150) Hz	(3.3 to 10.9) μF	3 nF/μF + 11 nF	
(10 to 120) Hz	(11 to 32.9) μF	4.7 nF/μF + 34 nF	
(10 to 80) Hz	(33 to 109.9) μF	5.3 nF/μF + 0.11 μF	
(10 to 50) Hz	(110 to 329.9) μF	5.3 nF/μF + 0.34 μF	
(10 to 20) Hz	(0.33 to 1.09) mF	5.1 μF/mF + 1.3 μF	
(10 to 6) Hz	(1.1 to 3.29) mF	5.3 μF/mF + 3.6 μF	
(10 to 2) Hz	(3.3 to 10.9) mF	5.3 μF/mF + 12 μF	
(10 to 0.6) Hz	(11 to 32.9) mF	8.9 μF/mF + 36 μF	
(10 to 0.2) Hz	(33 to 110) mF	13 μF/mF + 0.12 mF	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Force ¹	Up to 100 kgf	0.000 012 % of reading + 22 μgf	NIST Class F Weights
	Up to 500 lbf	0.01 % of reading + 0.012 lb	
Torque Indicating Devices ¹	(0.002 to 1 000) lbf·ft	0.12 % of reading	Torque Calibration System
Pressure – Source ¹	(-2 to 2) psig	0.006 % of reading + 0.000 09 psi	Digital Pressure Calibrators
	Up to 29 psig	0.006 % of reading + 0.000 13 psi	
	Up to 50 psia	0.011 % of reading + 0.000 39 psi	
	(35 to 1 000) psig	0.011 % of reading + 0.007 7 psi	
	(300 to 30 000) psig	0.023 % of reading + 0.000 1 psi	
Mass Determination	Up to 200 g	0.000 29 % of reading + 29 μg	ASTM E617 Class 1 Weights, Mass Comparators
	50 g to 5 kg	0.000 26 % of reading + 1.4 mg	
	Up to 20 kg	0.000 23 % of reading + 18 mg	
	Up to 50 lb	0.000 2 % of reading + 0.042 lb	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Balances, Scales ^{1,3}	Up to 200 g (200 to 500) g 500 g to 30 kg	0.000 3 % of reading + 39 µg 0.000 2 % of reading + 0.83 mg 0.000 3 % of reading + 7.3 mg	ASTM E617 Class 1 weights and internal procedure CP-0046.1 utilized in the calibration of the weighing system.
	Up to 90 lb	0.000 05 % of reading + 0.000 5 lb	
Balances, Scales ^{1,3}	Up to 80 kg	0.011 % of reading + 0.11 g	ASTM E617 Class 4 weights and internal procedure CP-0046.1 utilized in the calibration of the weighing system.
Scales ^{1,3}	Up to 600 lb	0.011 % of reading + 0.001 5 lb	NIST Class F weights and internal procedure CP-0046.1 utilized in the calibration of the weighing system.

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Humidity – Generate	(10 to 95) % RH	0.59 % RH	Two-Pressure Humidity Generator
Humidity – Measure ¹	(10 to 95) % RH	1.4 % RH	Humidity Indicator
Electronic based Sensors and Mechanically-driven Thermometers ¹	(-70 to 315) °C	0.001 % of reading + 0.095 °C	PRT, Sun Chamber
	0 °C	0.033 °C	PRT, VWR Liquid Bath
	(-100 to 80) °C	0.001 % of reading + 0.029 °C	PRT, Hart/Lauda Liquid Bath
	(35 to 280) °C	0.005 6 % of reading + 0.019 °C	PRT, Hart Liquid Bath
	(35 to 700) °C	0.004 9 % of reading + 0.021 °C	PRT, Hart Dry Well
Temperature – Measure ¹	(-200 to 660) °C	0.005 % of reading + 0.02 °C	PRT
Infrared Thermometers ¹	(50 to 100) °C	2.4 °C	Fluke 2562 PRT Scanner w/ Omega RTD, Hart 9132 Blackbody $\epsilon = 0.95, \lambda = (8 \text{ to } 14) \mu\text{m}$
	(100 to 200) °C	3.4 °C	
	(200 to 300) °C	4.5 °C	
	(300 to 400) °C	5.7 °C	
	(400 to 500) °C	6.5 °C	

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency – Generate ¹	45 Hz to 2 MHz	5.8 mHz/Hz + 3.7 mHz	Fluke Multifunction Calibrator
Frequency – Measure ¹	45 Hz to 300 kHz	0.12 Hz/kHz	HP/Agilent Multimeter

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ($k=2$), corresponding to a confidence level of approximately 95%.

Notes:

1. On-site calibration service is available for this parameter, 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.
2. L = length in inches, D = diameter in inches, DL = diagonal length in inches.
3. The CMC for Scales and Balances is highly dependent upon the resolution of the unit under test. The CMC presented here does not include the resolution of the unit under test. The resolution will be included in the reported measurement uncertainty at the time of calibration.
4. This scope is formatted as part of a single document including Certificate of Accreditation No. L2207.



R. Douglas Leonard Jr., VP, PILR SBU

