



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

ISOLAB, Inc.
6260 Hawthorne Drive
Windsor, ON N8T 1J9

Fulfills the requirements of

ISO/IEC 17025:2017

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 be 'Jason Stine', is positioned above a horizontal line.

Jason Stine, Vice President

Expiry Date: 02 December 2025

Certificate Number: L2434



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

ISOLAB, Inc.
 6260 Hawthorne Drive
 Windsor, ON N8T 1J9
 Pradip Jansari 519-948-8371

CALIBRATION

Valid to: **December 2, 2025**

Certificate Number: **L2434**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current – Generate	Up to 330 μ A 330 μ A to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 1.1 A (1.1 to 3) A (3 to 11) A (11 to 20.5) A	0.015% of reading + 0.02 μ A 0.012% of reading + 0.05 μ A 0.010% of reading + 0.25 μ A 0.01% of reading + 2.5 μ A 0.024 % of reading + 40 μ A 0.044 % of reading + 40 μ A 0.01 % of reading + 500 μ A 0.1 % of reading + 0.75 mA	Multifunction calibrator Fluke 5522A
DC Current Measure	(0 to 100) μ A 100 μ A to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1 A (1 to 3) A (3 to 10) A	21 pA/ μ A + 0.8 nA 21 nA/mA + 5 nA 21 nA/A + 50 nA 36 μ A/A + 0.5 μ A 111 μ A/A + 10 μ A 100 μ A/A + 10 μ A 410 μ A/A + 10 μ A	HP 3458A, OPTION II/ Fluke 8846A
AC Current – Generate	(29 to 330) μ A (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.2 % of output + 0.1 μ A 0.15 % of output + 0.1 μ A 0.13 % of output + 0.1 μ A 0.3 % of output + 0.15 μ A 0.8 % of output + 0.2 μ A 1.65 % of output + 0.4 μ A	Multifunction Calibrator Fluke 5522A

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
	(0.33 to 3.3) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.2 % of output + 0.15 μ A 0.13 % of output + 0.15 μ A 0.11 % of output + 0.15 μ A 0.21 % of output + 0.2 μ A 0.5 % of output + 0.3 μ A 1 % of output + 0.6 μ A	
	(3.3 to 33) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz 5 to 10 kHz (10 to 30) kHz	0.18 % of output + 2 μ A 0.09 % of output + 2 μ A 0.04 % of output + 2 μ A 0.08 % of output + 2 μ A 0.2 % of output + 3 μ A 0.4 % of output + 4 μ A	
	(33 to 330) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.18 % of output + 20 μ A 0.09 % of output + 20 μ A 0.046 % of output + 20 μ A 0.1 % of output + 50 μ A 0.2 % of output + 100 μ A 0.4 % of output + 200 μ A	
AC Current Generate	(0.33 to 1.1) A (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.18 % of output + 100 μ A 0.05 % of output + 100 μ A 0.6 % of output + 1 000 μ A 2.5 % of output + 5 000 μ A	Multifunction Calibrator Fluke 5522A
	(1.1 to 3) A (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.18 % of output + 100 μ A 0.06 % of output + 100 μ A 0.66 % of output + 1 000 μ A 2.5 % of output + 5 000 μ A	
	(3 to 11) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.06 % of output + 2 mA 0.1 % of output + 2 mA 3 % of output + 2 mA	
	(11 to 20.5) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.12 % of output + 5 mA 0.151 % of output + 5 mA 3 % of output + 5 mA	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current Measure 1 kHz	(0 to 100) μ A 100 μ A to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1 A (1 to 3) A (3 to 10) A	0.12 % of reading + 3 nA 0.06% of reading + 0.2 μ A 0.06% of reading + 2 μ A 0.062% of reading + 20 μ A 0.2 % of reading + 0.02 mA 0.3 % of reading + 1.8 mA 0.3 % of reading + 6 mA	HP 3458A, OPTION II/ Fluke 8846A
Resistance – Measure	(0 to 100) Ω (10 to 100) Ω 100 Ω to 1 k Ω (1 to 100) k Ω (10 to 100) k Ω 100 k Ω to 1 M Ω (1 to 10) M Ω (10 to 100) M Ω 100 M Ω to 1 G Ω	28 $\mu\Omega$ / Ω + 0.05 m Ω 10 $\mu\Omega$ / Ω + 0.5 m Ω 11 $\mu\Omega$ / Ω + 0.5 m Ω 18 $\mu\Omega$ / Ω + 5 m Ω 26 $\mu\Omega$ / Ω + 50 m Ω 38 $\mu\Omega$ / Ω + 2 Ω 56 $\mu\Omega$ / Ω + 100 Ω 502 $\mu\Omega$ / Ω + 1 k Ω 0.5% of reading + 10 k Ω	HP 3458A, OPTION II
Resistance – Generate	(0 to 11) Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω 330 Ω to 1.1 k Ω (1.1 to 3.3) k Ω (3.3 to 11) k Ω (11 to 33) k Ω (33 to 110) k Ω (110 to 330) k Ω 330 k Ω to 1.1 M Ω (1.1 to 3.3) M Ω (3.3 to 11) M Ω (11 to 33) M Ω (33 to 110) M Ω (110 to 330) M Ω 330 M Ω to 1.1 G Ω	47 $\mu\Omega$ / Ω + 0.001 Ω 25 $\mu\Omega$ / Ω + 0.001 5 Ω 54 $\mu\Omega$ / Ω + 0.001 4 Ω 40 $\mu\Omega$ / Ω + 0.002 Ω 31 $\mu\Omega$ / Ω + 0.002 Ω 35 $\mu\Omega$ / Ω + 0.02 Ω 31 $\mu\Omega$ / Ω + 0.02 Ω 35 $\mu\Omega$ / Ω + 0.2 Ω 42 $\mu\Omega$ / Ω + 0.2 Ω 32 $\mu\Omega$ / Ω + 2 Ω 34 $\mu\Omega$ / Ω + 2 Ω 78 $\mu\Omega$ / Ω + 30 Ω 0.013 % of reading + 50 Ω 0.025 % of reading + 2.5 k Ω 0.05 % of reading + 3 k Ω 0.3 % of reading + 100 k Ω 1.8 % of reading + 500 k Ω	Multifunction calibrator Fluke 5522A and Decade box.

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Capacitance – Generate	(0.19 to 0.4) nF (0.4 to 1.1) nF (1.1 to 3.3) nF (3.3 to 11) nF (11 to 33) nF (33 to 110) nF (110 to 330) nF (0.33 to 1.1) μF (1.1 to 3.3) μF (3.3 to 11) μF (11 to 33) μF (33 to 110) μF (110 to 330) μF (0.33 to 1.1) mF (1.1 to 3.3) mF (3.3 to 11) mF (11 to 33) mF (33 to 110) mF	0.6 % of reading + 0.01 nF 0.6 % of reading + 0.01 nF 0.55 % of reading + 0.01 nF 0.27 % of reading + 0.01 nF 0.25 % of reading + 0.01 nF 0.25 % of reading + 0.01 nF 0.25 % of reading + 0.03 nF 0.25 % of reading + 1 nF 0.25 % of reading + 3 nF 0.25 % of reading + 10 nF 0.4 % of reading + 30 nF 0.45 % of reading + 100 nF 0.45 % of reading + 300 nF 0.55 % of reading + 1 μF 0.45 % of reading + 3 μF 0.45 % of reading + 10 μF 0.75 % of reading + 30 μF 1 % of reading + 100 μF	Multifunction Calibrator Fluke 5522A
DC Voltage - Generate	(0 to 330) mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V (330 to 1000) V	15 μV/V + 1 μV 18 μV/V + 2 μV 18 μV/V + 20 μV 19 μV/V + 150 μV 28 μV/V + 1.5 mV	Multifunction calibrator Fluke 5522A
DC Voltage - Measure	0 to 100 mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1 000) V	10 μV/V + 0.3 μV 10 μV/V + 0.3 μV 15 μV/V + 0.5 μV 12 μV/V + 30 μV 92 μV/V + 0.1 mV	HP 3458A, OPTION II
AC Voltage - Generate	(1 to 33) mV (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.08 % of output + 6 μV 0.017 % of output + 6 μV 0.021 % of output + 7 μV 0.1 % of output + 6 μV 0.35 % of output + 12 μV 0.8 % of output + 50 μV	Multifunction Calibrator Fluke 5522A

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
	(33 to 330) mV (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.03 % of output + 8 μ V 0.015 % of output + 8 μ V 0.016 % of output + 8 μ V 0.035 % of output + 8 μ V 0.08 % of output + 32 μ V 0.21 % of output + 70 μ V	
AC Voltage - Generate	(0.33 to 3.3) V (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.03 % of output + 50 μ V 0.015 % of output + 60 μ V 0.019 % of output + 60 μ V 0.032 % of output + 50 μ V 0.07 % of output + 125 μ V 0.24 % of output + 600 μ V	Multifunction Calibrator Fluke 5522A
	(3.3 to 33) V (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.03 % of output + 650 μ V 0.015 % of output + 600 μ V 0.024 % of output + 600 μ V 0.035 % of output + 640 μ V 0.094 % of output + 1 600 μ V	
	(33 to 330) V 45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.019 % of output + 2 mV 0.03 % of output + 6 mV 0.025 % of output + 6 mV 0.03 % of output + 6 mV 0.2 % of output + 50 mV	
	(330 to 1 020) V 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.03 % of output + 10 mV 0.025 % of output + 10 mV 0.03 % of output + 10 mV	
AC Voltage - Measure	0 to 10 mV @ 100 Hz to 20 kHz	0.021 % of reading + 3 μ V	HP 3458A, Fluke 8846.
	10 to 100 mV @ 100 Hz to 20 kHz	0.021 % of reading + 10 μ V	
	100 to 1 V @ 100 Hz to 20 kHz	0.021 % of reading + 20 μ V	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
	1 to 10 V @ 10 Hz to 20 Hz 20 Hz to 40 Hz 100 Hz to 20 kHz 20 kHz to 50 kHz 50 kHz to 100 kHz 500 kHz to 1 MHz	0.4 % of reading + 2 mV 0.16 % of reading + 2 mV 0.02 % of reading + 1 mV 0.15 % of reading + 4 mV 0.6 % of reading + 8 mV 5 % of reading + 200 mV	
	10 to 100 V @ 100 Hz to 20 kHz	0.03 % of reading + 10 mV	
	100 to 1 000 V @ 100 Hz to 20 kHz	0.07 % of reading + 100 mV	
Electrical Simulation of TC Temperature Recorders/ Controllers/Indicators ¹	Type J & K (-180 to 1 370) °C	0.35 °C	Fluke 753 Calibrator
	Type R & S (-50 to 1 760) °C	0.6 °C	
	Type T (-200 to 400) °C	0.15 °C	
Electrical Simulation of TC Temperature Recorders/ Controllers/Indicators ¹	Type E (-250 to -100) °C	0.52 °C	Multifunction Calibrator Fluke 5522A , Fluke 743
	(-100 to -25) °C	0.21 °C	
	(-25 to 350) °C	0.19 °C	
	(350 to 650) °C	0.21 °C	
	(650 to 1 000) °C	0.25 °C	
Electrical Simulation of TC Temperature Recorders/ Controllers/Indicators ¹	Type J (-200 to -100) °C	0.29 °C	Multifunction Calibrator Fluke 5522A,Fluke 753.
	(-100 to -30) °C	0.21 °C	
	(-30 to 150) °C	0.19 °C	
	(150 to 760) °C	0.21 °C	
	(760 to 1 200) °C	0.27 °C	
	Type K (-200 to -100) °C	0.36 °C	
	(-100 to -25) °C	0.23 °C	
	(-25 to 120) °C	0.21 °C	
	(120 to 1 000) °C	0.29 °C	
	(1 000 to 1 372) °C	0.42 °C	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment				
	Type N (-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1 300) °C	0.42 °C 0.26 °C 0.23 °C 0.22 °C 0.30 °C					
	Type R (0 to 250) °C (250 to 400) °C (400 to 1 000) °C (1 000 to 1 767) °C	0.60 °C 0.39 °C 0.37 °C 0.43 °C					
	Type S (0 to 250) °C (250 to 1 000) °C (1 000 to 1 400) °C (1 400 to 1 767) °C	0.50 °C 0.40 °C 0.41 °C 0.49 °C					
	Type T (-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.65 °C 0.29 °C 0.21 °C 0.19 °C					
	Electrical Simulation of RTD signal for Indicators/Recorders/ Controllers etc. Generate ¹	Pt 385 (100 Ω) (-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		0.055 °C 0.055 °C 0.074 °C 0.1 °C 0.12 °C 0.14 °C 0.27 °C	Multifunction Calibrator Fluke 5522A.		
		Electrical Simulation of RTD signal for Indicators/Recorders/ Controllers etc. Generate ¹		Pt 385 (200 Ω) (-200 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		0.05 °C 0.05 °C 0.05 °C 0.06 °C 0.13 °C 0.14 °C 0.15 °C 0.17 °C	Multifunction Calibrator Fluke 5522A

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
	Pt 385 (500 Ω) (-200 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	0.05 °C 0.06 °C 0.06 °C 0.07 °C 0.09 °C 0.09 °C 0.1 °C 0.12 °C	
	Pt 385 (1 000 Ω) (-200 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	0.04 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.08 °C 0.08 °C 0.25 °C	
	Pt 3926 (100 Ω) (-200 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	0.06 °C 0.06 °C 0.08 °C 0.1 °C 0.11 °C 0.13 °C	
Electrical Simulation of RTD signal for Indicators/Recorders/ Controllers etc. Generate ¹	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	0.28 °C 0.05 °C 0.06 °C 0.07 °C 0.08 °C 0.09 °C 0.10 °C 0.11 °C 0.25 °C	Multifunction Calibrator Fluke 5522A

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Micrometer End Rods	(1 to 6) in (7 to 12) in	75 μ in 200 μ in	Gage Blocks and Dial Indicator
Calipers	(1 to 6) in (7 to 12) in	100 μ in 200 μ in	Gauge Blocks/ Micrometer Head
Dial Indicators	(0 to 1) in	15 μ in	
Micrometer (Outside)	(1 to 6) in (7 to 12) in	100 μ in 175 μ in	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Reference Standard, Method, and/or Equipment
Pressure Pneumatic ¹	(0 to 1) inH ₂ O (1 to 4) inH ₂ O	0.002 inH ₂ O 0.01 inH ₂ O	Ametek PTE100 Pressure Indicator
	(4 to 354) inH ₂ O	0.03 % of reading + 0.6R	Ametek PK-II Deadweight Tester
	(10 to 1 000) psi	0.03 % of reading + 0.6R	Ametek HK-1000 Deadweight Tester
Pressure Hydraulic ¹	(50 to 10 000) psi	0.03 % of reading + 0.6R	Ametek T-50 Deadweight Tester
Vacuum Pneumatic ¹	(0 to 29) inHg	0.04 inHg + 0.6R	Ashcroft PTE100 Pressure Indicator
Torque Tools ¹	(0.01 to 250) lbf·in (250 to 1 000) lbf·in (0.01 to 1 000) lbf·ft	0.53 % of reading + 0.6R 0.1 % of reading + 0.6R 0.15 % of reading + 0.6R	Torque Tester
Torque Testers	(1 to 200) lbf·in (10 to 1 000) lbf·ft	0.04 % of reading + 0.6R 0.087 % of reading + 0.6R	Torque Arm and Weights

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Reference Standard, Method, and/or Equipment
Temperature Sources ¹	(-40 to 250) °C (250 to 660) °C	0.1 °C 0.5 °C	PRT and Fluke 753 Calibrator /Hart Scientific 1502 Indicator

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Reference Standard, Method, and/or Equipment
Thermocouples ¹	Type J &K (-40 to 400) °C (401 to 660) C	0.3 °C 0.45 °C	Temperature Bath/Drywell, PRT and Fluke 753 Calibrator /Hart Scientific 1502 Indicator
	Type R &S (-40 to 400) °C (401 to 660) °C	0.45 °C 0.6 °C	
	Type T (-40 to 400) °C	0.3 °C	
RTD and Thermistor Probes ¹	(-40 to 250) °C	0.12 °C	Temperature Bath/Drywell, PRT and Fluke 753 Calibrator /Hart Scientific 1502 Indicator
	(250 to 400) °C	0.17 °C	
	(400 to 660) °C	0.56 °C	
Liquid in Glass Thermometer	(-30 to 250) °C	0.53 °C + 0.6R	Temperature Bath, PRT and Fluke 753 Calibrator /Hart Scientific 1502 Indicator

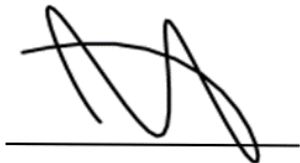
Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency Measure ¹	(1 to 40) Hz	0.005 Hz	HP 3458A/ Fluke 5522A/Fluke 8846A
	40 HZ to 300 kHz	0.005 kHz	
	(300 to 1 000) kHz	0.028 kHz	
Frequency Generate ¹	(1 to 120) Hz	0.001 Hz	HP 3458A/ Fluke 5522A/Fluke 8846A
	(120 to 1000) Hz	0.000 015 Hz	
	(1 to 100) kHz	0.001 kHz	
	100 kHz to 2 MHZ	0.000 02 MHz	

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. R = resolution of unit under test
3. This scope is formatted as part of a single document including Certificate of Accreditation No. L2434.



Jason Stine, Vice President

