



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 read 'R.D.L.', is positioned above a horizontal line.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 02 December 2024

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 Dr.
Windsor, ON N8T 1J9
Pradip Jansari 519-948-8371

CALIBRATION

Valid to: **December 2, 2024**

Certificate Number: **L2434**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current Generate	(1 to 10) mA (10 to 20) mA (20 to 100) mA (0.1 to 1) A (1 to 3) A (3 to 10) A	0.004 mA 0.006 mA 0.06 mA 0.006 A 0.02 A 0.06 A	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
DC Current Measure	(1 to 10) mA (10 to 20) mA (20 to 100) mA (0.1 to 1) A (1 to 3) A (3 to 10) A	0.007 mA 0.003 mA 0.055 A 0.007 5 A 0.003 A 0.017 A	Measurement with Fluke 8846A/Agilent 34401A Multimeter
AC Current Generate 1 kHz	(0 to 100) μ A (0.1 to 100) mA (0 to 1) A (0 to 3) A (0 to 10) A	0.65 μ A 0.6 mA 0.007 A 0.02 A 0.07 A	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
AC Current Measure 1 kHz	(0 to 100) μ A (0.1 to 100) mA (0 to 1) A (0 to 3) A (0 to 10) A	0.22 μ A 0.016 mA 0.001 6 A 0.005 A 0.022 A	Measurement with 8846A/Agilent 34401A Multimeter
Electrical Simulation of RTD Temperature Recorders, Controllers, and Indicators ¹	(-200 to 400) $^{\circ}$ C	0.17 $^{\circ}$ C	Flue 741B, Fluke 753 Calibrator, Decade box.



ANSI National Accreditation Board

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance	(0 to 10 Ω) (1 to 100) Ω (0.1 to 1) k Ω (1 to 10) k Ω (10 to 100) k Ω (0.1 to 1) M Ω (1 to 10) M Ω (10 to 100) M Ω	0.004 Ω 0.015 Ω 0.16 Ω 1.5 Ω 15 Ω 0.002 M Ω 0.004 5 M Ω 0.82 M Ω	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
DC Voltage Generate	(0 to 100) mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1 000) V	0.007 5 mV 0.35 mV 0.004 6 V 0.005 5 V 0.053 V	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
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	0.007 5 mV 0.35 mV 6 mV 3 mV 0.053 mV	Measurement with Fluke 8846A/Agilent 34401A Multimeter
AC Voltage Generate	(1 to 100) mV 10 Hz 20 kHz 50 kHz 100 kHz (0.1 to 1) V 10 Hz 20 kHz 50 kHz 100 kHz (0 to 10) V 10 Hz 20 kHz 50 kHz 100 kHz	0.6 mV 0.6 mV 1 mV 1 mV 0.006 V 0.006 V 0.007 V 0.01 V 0.06 V 0.06 V 0.07 V 0.1 V	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
AC Voltage Generate	(0 to 100) V 10 Hz 20 kHz 50 kHz 100 kHz	0.1 V 0.1 V 0.7 V 1 V	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage Generate	(0 to 1 000) V 10 Hz 20 kHz 50 kHz 100 kHz	7 V 7 V 7 V 7 V	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
AC Voltage Measure	(1 to 100) mV 10 Hz 20 kHz 50 kHz 100 kHz (0.1 to 1) V 10 Hz 20 kHz 50 kHz 100 kHz (0 to 10) V 10 Hz 20 kHz 50 kHz 100 kHz (0 to 100) V 10 Hz 20 kHz 50 kHz 100 kHz (0 to 1 000) V 10 Hz 20 kHz 50 kHz 100 kHz	0.11 mV 0.11 mV 0.7 mV 0.7 mV 0.001 mV 0.001 mV 0.002 mV 0.007 mV 0.01 V 0.01 V 0.02 V 0.07 V 0.1 V 0.1 V 0.2 V 0.2 V 0.9 V 0.9 V 0.9 V 1 V	Measurement with Fluke 8846A/Agilent 34401A Multimeter
Electrical Simulation of TC Temperature Recorders/ Controllers/Indicators ¹	Type J & K (-180 to 1 370) °C Type R & S (-50 to 1 760) °C Type T (-200 to 400) °C	0.35 °C 0.6 °C 0.15 °C	Fluke 743, Fluke 753 Calibrator

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 (+/-)	Reference Standard, Method, and/or Equipment
Pressure Pneumatic ^{1,2}	(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 ^{1,2}	(50 to 10 000) psi	0.03 % of reading + 0.6R	Ametek T-50 Deadweight Tester
Vacuum Pneumatic ^{1,2}	(0 to 29) inHg	0.04 inHg + 0.6R	Ashcroft PTE100 Pressure Indicator
Torque Tools ^{1,2}	(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 ²	(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 (+/-)	Reference Standard, Method, and/or Equipment
Temperature Sources	(-40 to 250) °C (250 to 660) °C	0.1 °C 0.5 °C	PRT and Fluke 741B Calibrator /Hart Scientific 1502 Indicator

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Thermocouples	Type J & K (-40 to 400) °C	0.3 °C	Temperature Bath/Drywell, PRT and Fluke 741B Calibrator /Hart Scientific 1502 Indicator
	(401 to 660) C	0.45 °C	
	Type R & S (-40 to 400) °C	0.45 °C	
	(401 to 660) °C	0.6 °C	
	Type T (-40 to 400) °C	0.3 °C	
RTD and Thermistor Probes	(-40 to 250) °C	0.12 °C	Temperature Bath/Drywell, PRT and Fluke 741B Calibrator /Hart Scientific 1502 Indicator
	(250 to 400) °C	0.17 °C	
	(400 to 660) °C	0.56 °C	
Liquid in Glass Thermometer ²	(-30 to 250) °C	0.53 °C + 0.6R	Temperature Bath, PRT and Fluke 741B Calibrator /Hart Scientific 1502 Indicator

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency Generate	(1 to 110) Hz	0.011 Hz	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
	(110 to 1 100) Hz	0.013 Hz	
	(1.1 to 11) kHz	0.028 Hz	
Frequency Measure	(1 to 110) Hz	0.06 Hz	
	(110 to 1 100) Hz	0.6 Hz	
	(1.1 to 11) kHz	0.012 kHz	

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.



R. Douglas Leonard Jr., VP, PILR SBU