

Scope of Accreditation

For ISOLAB Inc

6260 Hawthorne Dr
Windsor, ON N8T 1J9
Pradip Jansari
519-948-8371

In recognition of a successful assessment to ISO/IEC 17025:2005 to the following Calibration and Measurement Capabilities, accreditation has been granted to **ISOLAB Inc.** for the following:

Accreditation granted through: **December 2, 2018**

Calibration

Electrical – Current

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
DC Current Generate	(1 to 10) mA	0.004 mA	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
	(10 to 20) mA	0.006 mA	
	(20 to 100) mA	0.06 mA	
	(0.1 to 1) A	0.006 A	
	(1 to 3) A	0.02 A	
	(3 to 10) A	0.06 A	
DC Current Measure	(1 to 10) mA	0.007 mA	Measurement with Fluke 8846A/Agilent 34401A Multimeter
	(10 to 20) mA	0.003 mA	
	(20 to 100) mA	0.055 A	
	(0.1 to 1) A	0.0075 A	
	(1 to 3) A	0.003 A	
	(3 to 10) A	0.017 A	
AC Current Generate 1 kHz	(0 to 100) μ A	0.65 μ A	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
	(0.1 to 100) mA	0.6 mA	
	(0 to 1) A	0.007 A	
	(0 to 3) A	0.02 A	
	(0 to 10) A	0.07 A	
AC Current Measure 1 kHz	(0 to 100) μ A	0.22 μ A	Measurement with 8846A/Agilent 34401A Multimeter
	(0.1 to 100) mA	0.016 mA	
	(0 to 1) A	0.0016 A	
	(0 to 3) A	0.005 A	
	(0 to 10) A	0.022 A	

Electrical – Resistance

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Resistance	(0 to 10 Ω)	0.004 Ω	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
	(1 to 100) Ω	0.015 Ω	
	(0.1 to 1) k Ω	0.16 Ω	
	(1 to 10) k Ω	1.5 Ω	
	(10 to 100) K Ω	15 Ω	
	(0.1 to 1) M Ω	0.002 M Ω	
	(1 to 10) M Ω	0.0045 M Ω	
(10 to 100) M Ω	0.82 M Ω		
RTD Temperature Simulation – Temperature Recorder/ Controller/indicator	(-200 to 400) $^{\circ}\text{C}$	0.17 $^{\circ}\text{C}$	Fluke 741B/Fluke 743 B/Decade box.

Electrical – Voltage

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
DC Voltage Generate	(0 to 100) mV	0.0075 mV	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
	(0.1 to 1) V	0.35 mV	
	(1 to 10) V	0.0046 V	
	(10 to 100) V	0.0055 V	
	(100 to 1 000) V	0.053 V	
DC Voltage Measure	(0 to 100) mV	0.0075 mV	Measurement with Fluke 8846A/Agilent 34401A Multimeter
	(0.1 to 1) V	0.35 mV	
	(1 to 10) V	0.0046 mV	
	(10 to 100) V	0.0053 mV	
	(100 to 1 000) V	0.053 mV	
AC Voltage Generate	(1 to 100) mV		Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
	10 Hz	0.6 mV	
	20 kHz	0.6 mV	
	50 kHz	1.0 mV	
	100 kHz	1.0 mV	
	(1 to 1) V		
	10 Hz	0.006 V	
	20 kHz	0.006 V	
	50 kHz	0.007 V	
	100 kHz	0.01 V	
	(0 to 10) V		
	10 Hz	0.06 V	
	20 kHz	0.06V	
	50 kHz	0.07 V	
	100 kHz	0.1 V	
(0 to 100) V			
10 Hz	0.7 V		
20 kHz	0.7 V		
50 kHz	0.8 V		
100 kHz	0.25 V		

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks	
	(0 to 100) V 10 Hz 20 kHz 50 kHz 100 kHz	0.1 V 0.1 V 0.7 V 1 V		
	(0 to 1 000) V 10 Hz 20 kHz 50 kHz 100 kHz	7 V 7 V 7 V 7 V		
AC Voltage Measure	(1 to 100) mV 10 Hz 20 kHz 50 kHz 100 kHz	0.11 mV 0.11 mV 0.7 mV 0.7 mV	Measurement with Fluke 8846A/Agilent 34401A Multimeter	
	(1 to 1) V 10 Hz 20 kHz 50 kHz 100 kHz	0.001 mV 0.001 mV 0.002 mV 0.007 mV		
	(0 to 10) V 10 Hz 20 kHz 50 kHz 100 kHz	0.01 V 0.01 V 0.02 V 0.07 V		
	(0 to 100) V 10 Hz 20 kHz 50 kHz 100 kHz	0.1 V 0.1 V 0.2 V 0.2 V		
	(0 to 1 000) V 10 Hz 20 kHz 50 kHz 100 kHz	0.9 V 0.9 V 0.9 V 1.0 V		
TC Temperature Simulation – Temperature Recorder/ Controller/indicator				
Type J &K	(-180 to 1 370) °C	0.35 °C		Fluke 743/741B
Type R & S	(-50 to 1 760) °C	0.6 °C		
Type T	(-200 to 400) °C	0.15 °C		

Length – Artifacts and Standards 1D

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Micrometer End Rods	(1 to 6) in (7 to 12) in	75 μ in 175 μ in	Gage Blocks and Dial Indicator

Length – Hand Tools and Precision Gages 1D

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Calipers	(1 to 6) in (7 to 12) in	100 μ in 175 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 – Pressure/Low Vacuum

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Remarks
Pressure	(0 to 1) inH ₂ O (1 to 4) In H ₂ O (4 to 354) inH ₂ O (10 to 50) psi (50 to 10 000) psi	0.002 inH ₂ O 0.01 InH ₂ O 0.03% of reading + 0.6R 0.03% of reading + 0.6R 0.03% of reading + 0.6R	Ametek PK-II Ametek HK-1000 Ametek T-50
Vacuum	(0 to 29) inHg	0.04 inHg + 0.06R	Ashcroft PTE100

Mass – Torque

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Remarks
Torque Tools ¹	(0.01 to 250) lbf·in (250 to 1 000) lbf·in (0.01 to 250) lbf·ft	0.6 % of reading + 0.6R 0.6% of reading + 0.6R 0.15% of reading + 0.6R	Torque Tester/Torque Arm and Weights
Torque Tools ¹	(100 to 1 000) lbf·ft	0.15 % of reading + 0.6R	

Thermodynamic – Humidity

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Relative Humidity	(10 to 50) %RH (51 to 95) % RH	0.10 % RH 0.25 % RH	Thunder Scientific Model 6500

Thermodynamic – Thermometers and Probes

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Remarks
Thermocouples Type J &K Type J&K Type R &S Type R &S Type T	(-40 to 400) °C (401 to 660) C (-40 to 400) °C (401 to 660) °C (-40 to 400) °C	0.3 °C 0.45 °C 0.45 °C 0.6 °C 0.3 °C	Temperature Bath/Drywell, SPRT and Fluke 741B/Hart Scientific 1502
RTD and Thermistor Probes	(-40 to 400) °C (400 to 660) °C	0.15 °C 0.5 °C	
Liquid in Glass Thermometer	(-30 to 250) °C	0.5 °C + 0.6R	Temperature Bath, SPRT and Fluke 741B/Hart Scientific 1502

Thermodynamic – Thermodynamic Sources

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Temperature Sources	(-40 to 250) °C (250 to 660) °C	0.10 °C 0.5 °C	SPRT and Fluke 741B/Hart Scientific 1502

Time and Frequency – Frequency / Period

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Frequency Generate	(1 to 110) Hz (110 to 1 100) Hz (1.1 to 11) kHz	0.011 Hz 0.013 Hz 0.028 Hz	Comparison with Fluke 8846A/Agilent 34401A Multimeter (Fluke 741B/760A Calibrator sourcing)
	Frequency Measure	(1 to 110) Hz (110 to 1 100) Hz (1.1 to 11) kHz	

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and remarks. 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) Laboratory offers calibration services at the laboratory's own facilities and at the client or other agreed upon facilities.
- 2) *L* = Length in inches; *R* = Resolution of the unit under calibration.

Approved by: 
R. Douglas Leonard
Chief Technical Officer

Date: December 2, 2015

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