



Laboratory  
Accreditation  
Bureau

Certificate of Accreditation

ISO/IEC 17025:2005

Certificate Number L1139-1

Instrumentation Services Inc  
3436 Toringdon Way, Suite 200B  
Charlotte, NC 28277

has met the requirements set forth in L-A-B's policies and procedures, and all requirements of ISO/IEC 17025:2005  
"General Requirements for the competence of Testing and Calibration Laboratories." 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 January 2009).

Accreditation valid through September 18, 2010

R. Douglas Leonard, Jr., Managing Director  
Laboratory Accreditation Bureau

## Scope of Accreditation For Instrumentation Services Inc.

3436 Toringdon Way, Suite 200B  
Charlotte, NC 28277  
Tony Hagwood  
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In recognition of a successful assessment to ISO/IEC 17025:2005, accreditation is granted to **Instrumentation Services Inc.** to perform the following Calibrations:

Accreditation granted through: **September 18, 2010**

### Calibration

#### Length - Dimensional Metrology – Hand Tools and Precision Gages 1D

Calibration Parameter/Equipment	Range	Best Measurement Capability (+/-) <sup>2</sup>	Remarks
OD/ID Micrometer	0 in to 18 in	(55 + 30L) $\mu$ in	Comparison with Gage Blocks
Caliper	0 in to 18 in	(189 + 29L) $\mu$ in	
Dial Indicator	0 in to 4 in	(55 + 59L) $\mu$ in	
Length	0 in to 192 in	0.042 in	Comparison with Tape Measure

#### Mass – Scale and Balances

Calibration Parameter/Equipment	Range	Best Measurement Capability (+/-) <sup>2</sup>	Remarks
Weighing Systems <sup>1</sup> Analytical Balance/Balance  0.0001g resolution 0.001g resolution	0 g to 100 g 0 g to 400 g	0.37 mg 1.48 g	ASTM E617 Class 1 weights and NIST Handbook 44 utilized for the calibration of the weighing system.
0.1 g resolution 0.2 1g resolution	0 g to 500 g 0 kg to 4 kg	57.82 mg 577.53 mg	ASTM E617 Class 2 weights and NIST Handbook 44 utilized for the calibration of the weighing system.

**Mass – Pressure**

Calibration Parameter/Equipment	Range	Best Measurement Capability(+/-) <sup>2</sup>	Remarks
Pressure Measure (inH <sub>2</sub> O)	0 inH <sub>2</sub> O to 10 inH <sub>2</sub> O	0.032 inH <sub>2</sub> O	Fluke 700P01 Pressure Module
Pressure Measure (psi Differential)	0 psi to 5 psi	0.005 psi	Fluke 700P03 / 700P23 Pressure Module(s)
Pressure Measure (psi Gauge)	0 psi to 15 psi	0.016 psi	Fluke 700P04 / 700P24 Pressure Module (s)
	psi to 30 psi	0.09 psi	Fluke 700P05 Pressure Module
	0 psi to 100 psi	0.054 psi	Fluke 700P06 Pressure Module
	0 psi to 500 psi	0.317psi	Fluke 700P07 Pressure Module
	0 psi to 1000 psi	0.548 psi	Fluke 700P08 Pressure Module
	0 psi to 1 psi	0.001 psi	Fluke 700P22 Pressure Module
	0 psi to 5000 psi	4.457 psi	Fluke 700P30 Pressure Module
	0 psi to 10 000 psi	8.444 psi	Fluke 700P31 Pressure Module

**Mass – Vacuum**

Calibration Parameter/Equipment	Range	Best Measurement Capability(+/-) <sup>2</sup>	Remarks
Pressure Measure (psi Vacuum)	-10 psi to 0 psi	0.011 psi	Fluke 700PV4 Pressure Module
	-15 psi to 30 psi	0.023 psi	Fluke 700PD5 Pressure Module

**Electricity and Magnetism - Current**

Calibration Parameter/Equipment	Range	Best Measurement Capability(+/-) <sup>2</sup>	Remarks
DC Current	0 mA to 110 mA	0.067 mA	Comparison with Fluke Process Calibrator
	0 mA to 22 mA	0.008 mA	

**Electricity and Magnetism – Voltage**

Calibration Parameter/Equipment	Range	Best Measurement Capability(+/-) <sup>2</sup>	Remarks		
DC Voltage	0 V to 110 mV	0.045 mV	Comparison with Fluke Process Calibrator		
	0 V to 1.1 V	0.001 V			
	0 V to 11 V	0.003 V			
	0 V to 300 V	0.166 V			
AC Voltage – Measure Only (0 to 1.1) VAC	20 Hz to 40 Hz	0.024 V			
	40 Hz to 500 Hz	0.008 V			
	500 Hz to 1 kHz	0.024 V			
	1 kHz to 5 kHz	0.024 V			
(1.1 to 11) VAC	20 Hz to 40 Hz	0.219 V		Comparison with Fluke Process Calibrator	
	40 Hz to 500 Hz	0.057 V			
	500 Hz to 1 kHz	0.904 V			
	1 kHz to 5 kHz	0.219 V			
(11 to 110) VAC	20 Hz to 40 Hz	2.19 V			Comparison with Fluke Process Calibrator
	40 Hz to 500 Hz	0.57 V			
	500 Hz to 1 kHz	2.19 V			
	1 kHz to 5 kHz	10.99 V			
(110 to 300) VAC	20 Hz to 40 Hz	5.9 V			
	40 Hz to 500 Hz	1.5 V			
	500 Hz to 1 kHz	5.9 V			
	1 kHz to 5 kHz	29.9 V			

**Electricity and Magnetism – Resistance Simulation**

Calibration Parameter/Equipment	Range	Best Measurement Capability(+/-) <sup>2</sup>	Remarks
Measure	(0 to 11) Ω	0.056 Ω	Comparison with Fluke Process Calibrator
	(11 to 110) Ω	0.113 Ω	
	(0.11 to 1.1) kΩ	1.155 Ω	
	(1.1 to 11) kΩ	21.206 Ω	
Source	(0 to 11) Ω	0.021 Ω	
	(11 to 110) Ω	0.052 Ω	
	(0.11 to 1.1) kΩ	0.835 Ω	
	(1.1 to 11) kΩ	8.382 Ω	

**Electricity and Magnetism – Millivolt Temperature Simulation**

<b>Calibration Parameter/Equipment</b>	<b>Range</b>	<b>Best Measurement Capability(+/-) <sup>2</sup></b>	<b>Remarks</b>
Thermocouple Simulation Type E	-250 °C to -200 °C	1.43 °C	Comparison with Fluke Process Calibrator
	-200 °C to -100 °C	0.67 °C	
	600 °C to 1000 °C	0.6 °C	
Type N	-200 °C to -100 °C	1.11 °C	
	-100 °C to 900 °C	0.68 °C	
	900 °C to 1300 °C	0.77 °C	
Type J	-210 °C to -100 °C	0.74 °C	
	-100 °C to 800 °C	0.53 °C	
	800 °C to 1200 °C	0.68 °C	
Type K	-200 °C to -100 °C	0.85 °C	
	-100 °C to 400 °C	0.62 °C	
	400 °C to 1200 °C	0.68 °C	
	1200 °C to 1372 °C	0.85 °C	
Type T	-250 °C to -200 °C	1.84 °C	
	-200 °C to 0 °C	0.76 °C	
	0 °C to 400 °C	0.53 °C	
Type B	600 °C to 800 °C	1.39 °C	
	800 °C to 1000 °C	1.11 °C	
	1000 °C to 1820 °C	1.2 °C	
Type R	-20 °C to 0 °C	2.34 °C	
	0 °C to 100 °C	1.57 °C	
	100 °C to 1767 °C	1.11 °C	
Type S	-20 °C to 0 °C	2.34 °C	
	0 °C to 200 °C	1.63 °C	
	200 °C to 1400 °C	1 °C	
	1400 °C to 1767 °C	1.18 °C	
Type C	0 °C to 800 °C	0.93 °C	
	800 °C to 1200 °C	1.11 °C	
	1200 °C to 1800 °C	1.38 °C	
	1800 °C to 2316 °C	2.25 °C	
Type L	-200 °C to -100 °C	0.76 °C	
	-100 °C to 800 °C	0.57 °C	
	800 °C to 900 °C	0.67 °C	
Type U	-200 °C to 0 °C	0.72 °C	
	0 °C to 600 °C	0.54 °C	

**Electricity and Magnetism – Resistance Temperature Simulation**

Calibration Parameter/Equipment	Range	Best Measurement Capability(+/-) <sup>2</sup>	Remarks
RTD Simulation 100Ω Pt (3926)	-200 °C to 0 °C	0.55 °C	Comparison with Fluke Process Calibrator
	0 °C to 630 °C	0.64 °C	
100Ω Pt (385)	-200 °C to 0 °C	0.5 °C	
	0 °C to 400 °C	0.66 °C	
	400 °C to 800 °C	0.91 °C	
120Ω Ni (672)	-200 °C to 260 °C	0.5 °C	
200Ω Pt (385)	-200 °C to 0 °C	0.5 °C	
	0 °C to 400 °C	0.66 °C	
	400 °C to 630 °C	1.04 °C	
500Ω Pt (385)	-200 °C to 0 °C	0.5 °C	
	0 °C to 400 °C	0.72 °C	
	400 °C to 630 °C	1.05 °C	
1000Ω Pt (385)	-200 °C to 0 °C	0.55 °C	
	0 °C to 400 °C	0.73 °C	
	400 °C to 630 °C	0.96 °C	
10Ω Cu (427)	-100 °C to 0 °C	2.15 °C	
	0 °C to 260 °C	2.15 °C	
100Ω Pt (3916)	-200 °C to -190 °C	0.55 °C	
	-190 °C to 0 °C	0.55 °C	
	0 °C to 360 °C	0.73 °C	

**Time and Frequency – Time Dissemination**

Calibration Parameter/Equipment	Range	Best Measurement Capability(+/-) <sup>2</sup>	Remarks
Stopwatch/Timers	3600 s	0.85 s	Comparison with stopwatch
Rotational Speed	(0.1 to 999.9) RPM	0.08 RPM	Comparison with Tachometer
	(1000 to 9999.9) RPM	0.77 RPM	
	(0 to 25 000) RPM at 10 000 RPM	2.39 RPM	
	(10 000 to 25 000) RPM at 10 000 RPM	2.76 RPM	

**Thermodynamic – Humidity**

Calibration Parameter/Equipment	Range	Best Measurement Capability(+/-) <sup>2</sup>	Remarks
Relative Humidity	10 % RH to 95 % RH	3.5 % RH	Comparison with a reference rH probe

**Amount of Substance – Chemical**

Calibration Parameter/Equipment	Range	Best Measurement Capability(+/-) <sup>2</sup>	Remarks
pH Transmitter	4 pH 7 pH 10 pH	0.05 pH	Comparison with standard solutions
Conductivity	1411 µmhos/cm	2.38 µmhos/cm	
	100.8 µmhos/cm	0.74 µmhos/cm	

**Notes:**

- 1) Laboratory offers calibration services at the laboratory's own facilities and at the client or other agreed upon facilities.
- 2) Best uncertainties represent expanded uncertainties at approximately the 95% confidence level using a coverage factor of k=2.
- 3) *L* = Length in inches

Approved by:   
 R. Douglas Leonard  
 Chief Technical Officer

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