



Laboratory  
Accreditation  
Bureau

Certificate of Accreditation

ISO/IEC 17025:2005

Certificate Number L1139-1

Instrumentation Services, Inc.  
3436 Toringdon Way, Suite 105  
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, 2013

R. Douglas Leonard, Jr., Managing Director  
Laboratory Accreditation Bureau  
Presented the 18<sup>th</sup> of January 2011

\*Laboratory Accreditation Bureau is found to be in compliance with ISO/IEC 17011:2004 and recognized by ILAC (International Laboratory Accreditation Cooperation) and NACLA (National Cooperation for Laboratory Accreditation).

# Scope of Accreditation For Instrumentation Services, Inc.

3436 Toringdon Way, Suite 105  
Charlotte, NC 28277  
Tony Hagwood  
800-532-0415

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, 2013**

## Calibration

### Length – Hand Tools and Precision Gages 1D

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

### Mass – Scales and Balances

Calibration Parameter/Equipment <sup>1</sup>	Range	Calibration and Measurement Capability(+/-)	Remarks
Weighing Systems Analytical Balance / Balance 0.0001 g Resolution	(0 to 100) g	0.37 mg	ASTM E617 Class 1 Masses
0.001 g Resolution	(0 to 400) g	1.48 mg	
0.1 g Resolution	(0 to 500) g	57.82 mg	ASTM E617 Class 2 Masses
1 g Resolution	(0 to 4) kg	577.53 mg	

### Mass – Pressure/Low Vacuum

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability(+/-)	Remarks
Pressure Measure (inH <sub>2</sub> O)	(0 to 10) in wc @ 60 °F	0.0323	Fluke 700P (series) Pressure Modules
	(0 to 10) in wc	0.024	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability(+/-)	Remarks
Pressure Measure (psi Differential)	(0 to 5) psi	0.005 psi	
Pressure Measure (psi Gauge)	(0 to 1) psi	0.001 psi	Fluke 700P (series) Pressure Modules
	(0 to 15) psi	0.016 psi	
	(0 to 30) psi	0.09 psi	
	(0 to 100) psi	0.054 psi	
	(0 to 500) psi	0.317 psi	
	(0 to 1000) psi	0.548 psi	
	(0 to 5000) psi	4.457 psi	
	(0 to 10 000) psi	8.444 psi	
		6.029 psi	Druck DPI 104 Pressure Gauge
Vacuum Measure	(-10 to 0) psiv	0.011 psiv	Fluke 700PV4 Pressure Module
	(-15 to 30) psiv	0.023 psiv	Fluke 700PD5 Pressure Module

**Electrical – Voltage**

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability(+/-)	Remarks
DC Current	(0 to 110) mA	0.067 mA	Comparison with Fluke Process Calibrator
	(0 to 22) mA	0.008 mA	
DC Voltage	(0 to 110) mV	0.045 mV	
	(0 to 1.1) V	0.001 V	
	(0 to 11) V	0.002 V	
	(0 to 300) V	0.166 V	
AC Voltage – Measure Only			
(0 to 1.1) VAC	(20 to 40) Hz	0.024 V	
	(40 to 500) Hz	0.008 V	
	(0.5 to 1) kHz	0.024 V	
	(1 to 5) kHz	0.024 V	
(1.1 to 11) VAC	(20 to 40) Hz	0.219 V	
	(40 to 500) Hz	0.057 V	
	(0.5 to 1) kHz	0.904 V	
	(1 to 5) kHz	0.219 V	
(11 to 110) VAC	(20 to 40) Hz	2.19 V	
	(40 to 500) Hz	0.57 V	
	(0.5 to 1) kHz	2.19 V	
	(1 to 5) kHz	10.99 V	
(110 to 300) VAC	(20 to 40) Hz	5.9 V	
	(40 to 500) Hz	1.5 V	
	(0.5 to 1) kHz	5.9 V	
	(1 to 5) kHz	29.9 V	

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

**Electrical – Resistance**

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability(+/-)	Remarks
Measure	(0 to 11) Ω	0.056 Ω	Comparison with Fluke Process Calibrator
	(0 to 110) Ω	0.113 Ω	
	(0 to 1.1) kΩ	1.155 Ω	
	(0 to 11) kΩ	21.206 Ω	
Source	(0 to 11) Ω	0.021 Ω	
	(0 to 110) Ω	0.052 Ω	
	(0 to 1.1) kΩ	0.835 Ω	
	(0 to 11) kΩ	8.382 Ω	
<b>RTD Resistance Simulation</b>			
100 Ω Pt (3926)	(-200 to 0) °C	0.55 °C	Comparison with Fluke Process Calibrator
	(0 to 630) °C	0.64 °C	
100 Ω Pt (385)	(-200 to 0) °C	0.5 °C	
	(0 to 400) °C	0.66 °C	
	(400 to 800) °C	0.91 °C	
120 Ω Ni (672)	(-200 to 260) °C	0.5 °C	
200 Ω Pt (385)	(-200 to 0) °C	0.5 °C	
	(0 to 400) °C	0.66 °C	
	(400 to 630) °C	1.04 °C	
500 Ω Pt (385)	(-200 to 0) °C	0.5 °C	
	(0 to 400) °C	0.72 °C	
	(400 to 630) °C	1.05 °C	
1000 Ω Pt (385)	(-200 to 0) °C	0.55 °C	
	(0 to 400) °C	0.73 °C	
	(400 to 630) °C	0.96 °C	
10 Ω Cu (427)	(-100 to 0) °C	2.15 °C	
	(0 to 260) °C	2.15 °C	
100 Ω Pt (3916)	(-200 to -190) °C	0.55 °C	
	(-190 to 0) °C	0.55 °C	
	(0 to 630) °C	0.73 °C	

**Time and Frequency – Time Dissemination**

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability(+/-)	Remarks
Rotational Speed	(0.1 to 999.9) RPM	0.08 RPM	Comparison with Tachometer
	(1000 to 9999.9) RPM	0.77 RPM	
	(10 000 to 25 000) RPM	2.39 RPM	
Frequency (Measure)	(1 to 109.99) Hz	0.051 Hz	Comparison with Fluke Process Calibrator
	(110 to 1100) Hz	0.512 Hz	
	(1.1 to 11) kHz	0.005 kHz	
	(11 to 50) kHz	0.051 kHz	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability(+/-)	Remarks
Frequency (Source)	(0 to 10.99) Hz (11 to 110) Hz (110 to 1100) Hz (1.1 to 22) kHz (22 to 50) kHz	0.011 Hz 0.113 Hz 0.113 Hz 0.002 kHz 0.005 kHz	Comparison with Fluke Process Calibrator

**Time and Frequency – Time Dissemination**

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability(+/-)	Remarks
Stopwatch / Timers	3600 s	0.85 s	Comparison with Stopwatch

**Thermodynamic – Humidity**

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability(+/-)	Remarks
Relative Humidity	(10 to 95) %RH	3.6 %RH	Comparison with a Reference RH Probe

**Amount of Substance – Chemical**

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability(+/-)	Remarks
pH Meters / Transmitters	4 pH 7 pH 10 pH	0.05 pH	Comparison with Standard Aqueous Solutions
Conductivity Meters	10 $\mu$ S 100 $\mu$ S 1413 $\mu$ S 10 000 $\mu$ S	0.67 $\mu$ S 0.66 $\mu$ S 2.4 $\mu$ S 26.07 $\mu$ S	

Calibration and Measurement Capability represents expanded uncertainties at approximately a 95% confidence level using a coverage factor of  $k=2$ .

Notes:

- 1)  $L$  = length in inches



Approved By: \_\_\_\_\_

R. Douglas Leonard  
Chief Technical Officer

Date: April 1, 2011