



The American Association for Laboratory Accreditation

World Class Accreditation

Accredited Laboratory

A2LA has accredited

ILLIANA INSTRUMENTATION SERVICE LLC

Merrillville, IN

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration. 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 8 January 2009*).

Presented this 24th day of August 2010.




President & CEO

For the Accreditation Council
Certificate Number 2230.01
Valid to September 30, 2012

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005
& ANSI/NCSL Z540-1-1994

ILLIANA INSTRUMENTATION SERVICE LLC
 3218 B East 84th Place
 Merrillville, IN 46410
 Paul Grolla Phone: 219 942 5588

CALIBRATION

Valid To: September 30, 2012

Certificate Number: 2230.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Chemical

Parameter/Equipment	Range	CMC ² (±)	Comments
pH ³	4.01, 7.0, 10.0 pH units	0.04 pH units	NIST traceable buffers
Conductivity ³ – Liquid	10 µS (10 to 1000) µS (1000 to 10 000) µS	0.5 µS 0.5 % of reading 0.5 % of reading	Traceable conductivity standard fluids

II. Electrical – DC & Low Frequency

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Voltage ³ – Generate	(0 to 110) mV 110 mV to 1.1 V (1.1 to 15) V	0.018 mV 0.26 mV 0.0041 V	Fluke 744

Parameter/Equipment	Range ⁶	CMC ^{2,4,5} (±)	Comments
DC Voltage ³ – Measure	(0 to 100) mV 100 mV to 1 V (1 to 10) V (10 to 100) V (100 to 600) V	0.011 mV 0.043 mV 0.51 mV 0.0065 V 0.0071 V	HP 34401A
DC Current ³ – Generate	(0 to 22) mA	0.005 mA	Fluke 744
DC Current ³ – Measure	(0 to 10) mA (10 to 100) mA 100 mA to 1 A (1 to 3) A	0.0077 mA 0.011 mA 0.002 A 0.0045 A	HP 34401A
Resistance ³ – Measure	(0 to 25) Ω (25 to 400) Ω (400 to 1000) Ω (1 to 10) kΩ (10 to 100) kΩ 100 kΩ to 1 MΩ (1 to 10) MΩ (10 to 100) MΩ	0.0017 Ω 0.019 Ω 0.11 Ω 1.2 Ω 12 Ω 120 Ω 4.5 kΩ 880 kΩ	Hart 1560 & 2562 HP 34401A
Resistance ³ – Generate	(0 to 11) Ω (11 to 110) Ω	0.021 Ω 0.041 Ω	Fluke 744
Fixed Point	100 Ω 110 Ω to 1.1 kΩ (1.1 to 11) kΩ	0.039 Ω 0.72 Ω 8.3 Ω	IET SRA fixed resistor Fluke 744
Electrical Calibration of Thermocouple Indicators ³ – Type B	600 °C to 800 °C 800 °C to 1000 °C 1000 °C to 1820 °C	0.69 °C 0.56 °C 0.56 °C	Fluke 744

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Electrical Calibration of Thermocouple Indicators ³ (cont) –			
Type C	0 °C to 800 °C 800 °C to 1200 °C 1200 °C to 1800 °C 1800 °C to 2316 °C	0.44 °C 0.50 °C 0.63 °C 0.88 °C	Fluke 744
Type E	-250 °C to -200 °C -200 °C to -100 °C -100 °C to 600 °C 600 °C to 1000 °C	0.44 °C 0.27 °C 0.27 °C 0.22 °C	
Type J	-210 °C to -100 °C -100 °C to 800 °C 800 °C to 1200 °C	0.27 °C 0.22 °C 0.22 °C	
Type K	-200 °C to -100 °C -100 °C to 400 °C 400 °C to 1200 °C 1200 °C to 1372 °C	0.32 °C 0.27 °C 0.27 °C 0.27 °C	
Type L	-200 °C to -100 °C -100 °C to 800 °C 800 °C to 900 °C	0.27 °C 0.22 °C 0.22 °C	
Type N	-200 °C to -100 °C -100 °C to 900 °C 900 °C to 1300 °C	0.44 °C 0.38 °C 0.27 °C	
Type R	-20 °C to 0 °C 0 °C to 100 °C 100 °C to 1767 °C	0.82 °C 0.75 °C 0.63 °C	
Type S	-20 °C to 0 °C 0 °C to 200 °C 200 °C to 1400 °C 1400 °C to 1767 °C	0.82 °C 0.75 °C 0.63 °C 0.69 °C	
Type T	-250 °C to -200 °C -200 °C to 0 °C 0 °C to 400 °C	0.63 °C 0.32 °C 0.27 °C	
Type U	-200 °C to 0 °C 0 °C to 600 °C	0.32 °C 0.27 °C	

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Electrical Calibration of RTD³ – Measure			
Cu 427, 10 Ω	-100 °C to 0 °C 0 °C to 260 °C	1.3 °C 1.3 °C	Fluke 744
Pt 3916, 100 Ω	-200 °C to -190 °C -190 °C to 0 °C 0 °C to 630 °C	0.23 °C 0.23 °C 0.35 °C	
Pt 3926, 100 Ω	-200 °C to 0 °C 0 °C to 630 °C	0.23 °C 0.35 °C	
Pt 385, 100 Ω	-200 °C to 0 °C 0 °C to 400 °C 400 °C to 800 °C	0.23 °C 0.35 °C 0.55 °C	
Pt 385, 200 Ω	-200 °C to 0 °C 0 °C to 400 °C 400 °C to 630 °C	0.23 °C 0.35 °C 0.55 °C	
Pt 385, 500 Ω	-200 °C to 0 °C 0 °C to 400 °C 400 °C to 630 °C	0.23 °C 0.33 °C 0.55 °C	
Pt 385, 1000 Ω	-200 °C to 0 °C 0 °C to 400 °C 400 °C to 630 °C	0.23 °C 0.35 °C 0.35 °C	
PtNi 672, 120 Ω	-80 °C to 260 °C	0.23 °C	
Electrical Calibration of RTD³ – Generate			
Cu 427, 10 Ω	-100 °C to 0 °C 0 °C to 260 °C	0.68 °C 0.68 °C	Fluke 744
Pt 3916, 100 Ω	-200 °C to -190 °C -190 °C to 0 °C 0 °C to 630 °C	0.23 °C 0.13 °C 0.18 °C	
Pt 3926, 100 Ω	-200 °C to 0 °C 0 °C to 630 °C	0.13 °C 0.18 °C	
Pt 385, 100 Ω	-200 °C to 0 °C 0 °C to 400 °C 400 °C to 800 °C	0.13 °C 0.18 °C 0.29 °C	

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Electrical Calibration of RTD ³ – Generate (cont)			
Pt 385, 200 Ω	-200 °C to 0 °C 0 °C to 400 °C 400 °C to 630 °C	0.13 °C 0.18 °C 0.29 °C	Fluke 744
Pt 385, 500 Ω	-200 °C to 0 °C 0 °C to 400 °C 400 °C to 630 °C	0.13 °C 0.18 °C 0.29 °C	
Pt 385, 1000 Ω	-200 °C to 0 °C 0 °C to 400 °C 400 °C to 630 °C	0.13 °C 0.18 °C 0.29 °C	
PtNi 672, 120 Ω	-80 °C to 260 °C	0.13 °C	

Parameter/Range	Frequency	CMC ^{2,5} (±)	Comments
AC Voltage ³ – Measure			
(1 to 100) mV	(3 to 5) Hz (5 to 10) Hz (10 to 20) kHz (20 to 500) kHz (50 to 100) kHz	1 % + 0.04 % 0.35 % + 0.04 % 0.06 % + 0.04 % 0.12 % + 0.05 % 0.6 % + 0.08 %	HP 34401A
(1 to 750) V	(3 to 5) Hz (5 to 10) Hz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	1 % + 0.03 % 0.35 % + 0.03 % 0.06 % + 0.03 % 0.12 % + 0.05 % 0.6 % + 0.08 %	
AC Current ³ – Measure			
(0 to 1) A	(3 to 5) Hz (5 to 10) Hz 10 Hz to 5 kHz	1 % + 0.04 % 0.3 % + 0.04 % 0.1 % + 0.04 %	HP 34401A
(1 to 3) A	(3 to 5) Hz (5 to 10) Hz 10 Hz to 5 kHz	1 % + 0.06 % 0.35 % + 0.06 % 0.15 % + 0.06 %	

III. Fluid Quantities

Parameter/Equipment	Range	CMC ² (±)	Comments
Viscosity ³ – Ford Fisher Zahn	2, 3, 4, 5 cups 1, 2, 3, 4 cups 1, 2, 3, 4, 5 cups (19 to 880) cP	1.7 % of reading 1.8 % of reading 2.0 % of reading 1.7 % of reading	Certified viscosity oil

IV. Mechanical

Parameter/Equipment	Range ⁶	CMC ² (±)	Comments
Pressure Measuring Equipment	(-15 to 0) psi (0 to 15) psi (15 to 200) psi (200 to 1500) psi (1500 to 3000) psi	0.017 psi 0.017 psi 0.15 psi 0.77 psi 1.7 psi	Fluke module 700P24 Fluke module 700P24 Fluke module 700PD7 Fluke module 700P09 Beta module PI-03K
Pressure ³ – Measure	(-15 to 0) psi (0 to 15) psi (15 to 200) psi (200 to 1500) psi (1500 to 3000) psi	0.017 psi 0.017 psi 0.15 psi 0.77 psi 1.7 psi	Fluke module 700P24 Fluke module 700P24 Fluke module 700PD7 Fluke module 700P09 Beta module PI-03K
Scales and Balances ³	1 g 5 g 10 g 100 g 500 g 1000 g 5000 g 10 000 g 15 000 g 20 000 g	0.025 mg 0.071 mg 0.051 mg 0.2 mg 0.6 mg 1.2 mg 6 mg 12 mg 18 mg 23 mg	Troemner class 1 weights
Torque – Measure	(0 to 150) ft·lb	4.6 ft·lb	Craftsman torque indicator model 44598

V. Thermodynamic

Parameter/Equipment	Range ⁶	CMC ² (±)	Comments
Temperature ³ – Measure	-15 °C to 0 °C 0.01 °C 0.02 °C to 231.928 °C 231.928 °C to 660.323 °C 661 °C to 1093 °C	0.03 °C 0.02 °C 0.03 °C 0.04 °C 1 °C	Hart 5626 SPRT Hart 1560 black stack Hart 2562 PRT scanner Platinum thermocouple
Temperature ³ – Measuring Equipment	-15 °C to 140 °C 141 °C to 250 °C 251 °C to 660 °C 661 °C to 1093 °C	0.05 °C 0.12 °C 0.13 °C 1.4 °C	Hart 5626 SPRT Hart 1560 black stack Hart 2562 PRT scanner Platinum thermocouple
Humidity ³ – Measuring Equipment	(10 to 15) % RH (15 to 78) % RH	1.6 % RH 2 % RH	Vaisala HMI 41 and HMP 46
Humidity ³ – Measure	(10 to 15) % RH (15 to 78) % RH	1.6 % RH 2 % RH	Vaisala HMI 41 and HMP 46
Thermocouple ³ – Measure			
Type B	600 °C to 800 °C 800 °C to 1000 °C 1000 °C to 1820 °C	0.88 °C 0.69 °C 0.63 °C	Fluke 744
Type C	0 °C to 800 °C 800 °C to 1200 °C 1200 °C to 1800 °C 1800 °C to 2316 °C	0.44 °C 0.56 °C 0.75 °C 1.3 °C	
Type E	-250 °C to -200 °C -200 °C to -100 °C -100 °C to 600 °C 600 °C to 1000 °C	0.88 °C 0.38 °C 0.27 °C 0.32 °C	
Type J	-210 °C to -100 °C -100 °C to 800 °C 800 °C to 1200 °C	0.44 °C 0.27 °C 0.38 °C	
Type K	-200 °C to -100 °C -100 °C to 400 °C 400 °C to 1200 °C 1200 °C to 1372 °C	0.50 °C 0.27 °C 0.38 °C 0.5 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Thermocouple – Measure ³ (cont)			
Type L	-200 °C to -100 °C -100 °C to 800 °C 800 °C to 900 °C	0.44 °C 0.27 °C 0.38 °C	Fluke 744
Type N	-200 °C to -100 °C -100 °C to 900 °C 900 °C to 1300 °C	0.69 °C 0.38 °C 0.44 °C	
Type R	-20 °C to 0 °C 0 °C to 100 °C 100 °C to 1767 °C	1.5 °C 1 °C 0.69 °C	
Type S	-20 °C to 0 °C 0 °C to 200 °C 200 °C to 1400 °C 1400 °C to 1767 °C	1.5 °C 1.0 °C 0.63 °C 0.75 °C	
Type T	-250 °C to -200 °C -200 °C to 0 °C 0 °C to 400 °C	1.2 °C 0.44 °C 0.27 °C	
Type U	-200 °C to 0 °C 0 °C to 600 °C	0.44 °C 0.27 °C	

VI. Time & Frequency

Parameter/Range	Frequency	CMC ^{2,4,5} (±)	Comments
Frequency ³ – Measure	(3 to 10) Hz (10 to 40) Hz 40 Hz to 100 kHz	0.01 Hz 0.05 Hz 0.047 %	HP 34401A
Frequency ³ – Measuring Equipment	(1 to 10.99) Hz (11 to 109.9) Hz (110 to 1099.9) Hz (1.1 to 21.99) kHz (22 to 50) kHz	0.01 Hz 0.01 Hz 0.01 Hz 2 Hz 5.5 Hz	Fluke 744

¹ This laboratory offers commercial calibration service and field calibration service.

- ² Calibration and Measurement Capability (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. Calibration and Measurement Capabilities represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.
- ³ Field calibration service is available for this calibration and this laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.
- ⁴ The measurands stated are generated with the Fluke 744 series of instruments. This capability is suitable for the calibration of the devices intended to measure the stated measurand in the ranges indicated. CMCs are expressed as either a specific value that covers the full range or as a fraction of the reading plus a fixed floor specification.
- ⁵ The measurands stated are measured with the HP 34401A series of instruments. This capability is suitable for the calibration of the devices intended to generate the measurand in the ranges indicated. CMCs are expressed as either a specific value that covers the full range or as a combination of the fraction of the reading/output plus a range specification.
- ⁶ Where ranges are not specified, the CMC stated is for the cardinal points only.