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

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CALIBRATION

Valid To: September 30, 2018 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 calibrations[1]:

I. Chemical

Parameter/Equipment	Range	CMC[2] (±)	Comments
pH[3]	4.01, 7.0, 10.0 pH Units	0.035 pH Units	NIST traceable buffers

II. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
DC Voltage[3] – Generate	(0 to 100) mV (0.1 to 1) V (1 to 10) V (10 to 100) V	3.3 µV 51 µV 0.45 mV 5 mV	Fluke 525B

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
DC Voltage[3] – Measure	(0 to 10) mV (0 to 100) mV 100 mV to 1 V (1 to 10) V (10 to 100) V (100 to 600) V	4.3 µV 8.8 µV 49 µV 0.52 mV 5.8 mV 18 mV	HP 34401A
DC Current[3] – Generate	(0 to 20) mA (20 to 100) mA	1.0 µA 5.0 µA	Fluke 525B
DC Current[3] – Measure	(0 to 10) mA (10 to 100) mA 100 mA to 1 A (1 to 3) A	0.01 mA 18 µA 2.4 mA 4.8 mA	HP 34401A
Resistance[3] – Measure	(0 to 25) Ω 100 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	1.6 mΩ 4.2 mΩ 16 mΩ 0.09 Ω 1.2 Ω 12 Ω 0.14 kΩ 4.6 kΩ 1.1 %	Hart 1560 & 2562 Fluke 525B, HP 34401A
Resistance[3] – Generate Fixed Point	(0 to 5) Ω (5 to 400) Ω (400 to 4000) Ω (4 to 11) kΩ 100 Ω	38 mΩ 20 mΩ 0.30 Ω 8.9 Ω 6.2 mΩ	Fluke 744 Fluke 525B Fluke 744 IET SRA-100

Parameter/Equipment	Range	CMC[2] (±)	Comments
Electrical Calibration of Thermocouple Indicators[3] – Measure & Simulate			
Type B	(600 to 1820) ºC	0.50 ºC	Fluke 525B
Type C	(0 to 1800) ºC (1800 to 2316) ºC	0.54 ºC 0.86 ºC	Fluke 525B, ice point
Type E	(-270 to -100) ºC (-100 to 1820) ºC	0.54 ºC 0.29 ºC	
Type J	(-210 to 1200) ºC	0.13 ºC	
Type K	(-200 to 1372) ºC	0.15 ºC	
Type L	(-200 to 800) ºC	0.42 ºC	
Type N	(-270 to 1320) ºC	0.10 ºC	
Type R	(-50 to 250) ºC (250 to 1767) ºC	0.61 ºC 0.45 ºC	
Type S	(0 to 250) ºC (250 to 1750) ºC	0.59 ºC 0.50 ºC	
Type T	(-270 to -150) ºC (-150 to 400) ºC	0.25 ºC 0.10 ºC	
Type U	(-200 to 600) ºC	0.59 ºC	
Electrical Calibration of RTD – Measure & Generate[3]			
Pt 385, 100 Ω	(-200 to -80) ^{o}C (-80 to 100) ^{o}C (100 to 400) ^{o}C (400 to 800) ^{o}C	50 m^{o}C 58 m^{o}C 50 m^{o}C 0.064 ^{o}C	Fluke 525B

Parameter/Range	Frequency	CMC[2, 4] (±)	Comments
AC Voltage[3] – Measure			
(1 to 100) mV	(10 to 20) kHz	0.14 mV	HP 34401A
(1 to 600) V	10 Hz to 20 kHz	0.69 V	
AC Current[3] – Measure			
(0 to 1) A	10 Hz to 5 kHz	2.8 mA	HP 34401A
(1 to 3) A	10 Hz to 5 kHz	5.9 mA	

III. Fluid Quantities

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Viscosity[3] –			
Ford	(2, 3, 4, 5) Cups	1.7 %	Certified viscosity oil
Fisher	(1, 2, 3, 4) Cups	1.4 %	
Zahn	(1, 2, 3, 4, 5) Cups (19 to 880) cP	1.6 % 1.7 %	

IV. Mechanical

Parameter/Equipment	Range	CMC[2] (±)	Comments
Pressure[3] – Measure & Measuring Equipment	(-15 to 0) psi 0 to 1 psi (0 to 15) psi (15 to 200) psi (200 to 1500) psi (1500 to 3000) psi	0.024 psi 0.0009 psi 0.024 psi 0.12 psi 0.63 psi 1.7 psi	Fluke module 700P24 Fluke 718 Fluke module 700P24 Fluke module 700PD7 Fluke module 700P09 Beta module PI-03K

Parameter/Equipment	Range	CMC[2] (±)	Comments
Scales & Balances[3]	1 g 5 g 10 g 100 g 500 g 1 kg 5 kg 10 kg 15 kg 20 kg	0.17 mg 0.17 mg 0.18 mg 0.36 mg 2.2 mg 3.6 mg 22 mg 36 mg 50 mg 65 mg	Troemner Class 1 weights
Torque – Measure	(0 to 150) ft·lbf	5.2 ft·lbf	Craftsman torque indicator model 44598

V. Thermodynamic

Parameter/Equipment	Range	CMC[2] (±)	Comments
Temperature[3] – Measure	(-100 to 0) ºC 0.01 ºC (0.02 to 231.928) ºC (231.928 to 660.323) ºC (661 to 1093) ºC	11 mºC 10 mºC 24 mºC 41 mºC 1.1 ºC	Hart 5626 SPRT, Hart 1560 black stack, Hart 2562 PRT scanner Platinum thermocouple – according to AMS2750E secondary standard requirements
Temperature[3] – Measuring Equipment	(-15 to 140) ºC (141 to 250) ºC 0 ºC (251 to 660) ºC (661 to 1093) ºC	0.12 ºC 0.24 ºC 25 mºC 0.58 ºC 1.4 ºC	Hart 5626 SPRT, Hart 1560 black stack, Hart 2562 PRT scanner Platinum thermocouple – according to AMS2750E secondary standard requirements
Humidity[3] – Measuring Equipment	(10 to 15) % RH (15 to 78) % RH	1.9 % RH 1.9 % RH	Vaisala HMI 41 & HMP 46
Humidity[3] – Measure	(10 to 15) % RH (15 to 78) % RH	1.9 % RH 1.9 % RH	Vaisala HMI 41 & HMP 46

VI. Time & Frequency

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Frequency[3] – Measure	(3 to 10) Hz (10.1 to 40) Hz 40 Hz to 100 kHz	0.01 Hz 0.01 Hz 0.03 %	HP 34401A
Frequency[3] – Measuring Equipment	(0.002 to 1.0) kHz (1.0 to 10) kHz	3 Hz 25 Hz	Fluke 725

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

[2] Calibration and Measurement Capability Uncertainty (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. CMCs 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 using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure the measurand in the ranges indicated. CMCs are expressed as either a specific value that covers the full range or as a fraction/percent of the reading plus a fixed floor specification.

[5] In the statement of CMC, percentages are percentage of reading, unless otherwise indicated.

Accredited Laboratory

A2LA has accredited

ILLIANA INSTRUMENTATION SERVICE LLC

Schererville, 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 R205 – *Specific Requirements: Calibration Laboratory Accreditation Program*. 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 18th day of October 2016.

Senior Director of Quality and Communications
For the Accreditation Council
Certificate Number 2230.01
Valid to September 30, 2018

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