Scope of Accreditation
For
Instrulab, Inc.

1205 Lamar Street
Dayton, OH 45404-0098
Stanley I. Tekamp
937-223-2241

In recognition of a successful assessment to ISO/IEC 17025:2005, accreditation is granted to **Instrulab, Inc.** to perform the following Calibrations:

Accreditation granted through: **November 11, 2013**

Calibration

Electricity and Magnetism – Resistance

Calibration Parameter/Equipment [1]	Range	Calibration and Measurement Capability(+/-) [2]	Remarks
Resistance, Source[3]	1 Ω 10 Ω 25 Ω 50 Ω 75 Ω 100 Ω	0.0001 Ω 0.0001 Ω 0.0001 Ω 0.0002 Ω 0.0003 Ω 0.0004 Ω	Six Standard Resistors
	(0 to 300) Ω	0.0008 % of reading	Decade Resistance Box
Resistance, Measure[3]	(0 to 16 000) Ω	0.0004 % of reading	L & N 8079 Bridge
100Ω PRT 385 Simulate[4]	(-150 to 750) ºF	0.4 ºF	FGH Ezecal 5 Process Calibrator Reference IEC 751
Thermistor, Simulate (YSI 400 Series 2252 Ω @ 25ºC) [3]	(0 to 80) ºC (80 to 100) ºC	0.002 ºC 0.003 ºC	Decade Resistance Box

Time and Frequency – Time Dissemination

Calibration Parameter/Equipment [1,3]	Range	Calibration and Measurement Capability(+/-) [2]	Remarks
Timer	(0 to 24) hr	2.0 sec / 24 hr	Robic Chronometer

Mass – Pressure

Calibration Parameter/Equipment [1,3]	Range	Calibration and Measurement Capability(+/-) [2]	Remarks
Low Pressure	(0 to 72) psi	0.20 % of reading + 1 LSD	Meriam Pressure Calibrator
Vacuum	(0 to 30) inHg	0.20 % of reading + 1 LSD	

Thermodynamics – Thermocouples

Calibration Parameter/Equipment [1]	Range	Calibration and Measurement Capability(+/-) [2]	Remarks
Thermocouple Measure[3] Type J	(-100 to 500) ºF (500 to 701) ºF (702 to 1 300) ºF (1 300 to 1 500) ºF	0.2 ºF 0.3 ºF 1.4 ºF 1.7 ºF	Comparison technique using 100Ω PRT in liquid bath or dry block calibrators and type "S" thermocouple in calibration furnace.
Type K	(-100 to 100) ºF (100 to 500) ºF (500 to 701) ºF (702 to 1 300) ºF (1 300 to 1 700) ºF (1 700 to 2 000) ºF	0.3 ºF 0.2 ºF 0.3 ºF 1.4 ºF 1.7 ºF 1.8 ºF	
Type N	(-320 to 300) ºF (300 to 701) ºF (702 to 1 100) ºF (1 100 to 2 000) ºF	0.2 ºF 0.3 ºF 1.4 ºF 1.8 ºF	
Type T	(-320 to 100) ºF (100 to 700) ºF 700 ºF	0.3 ºF 0.2 ºF 0.3 ºF	
Type S/R	(100 to 500) ºF (500 to 701) ºF (702 to 1300) ºF (1 300 to 2 000) ºF	0.2 ºF 0.3 ºF 1.4 ºF 1.8 ºF	
100Ω Platinum RTD Measure[3]	(-200 to -100) ºC (-100 to -70) ºC (-70 to 0) ºC 0 ºC (0 to 150) ºC (150 to 200) ºC (200 to 250) ºC (250 to 300) ºC (300 to 350) ºC (350 to 400) ºC 400 ºC	0.028 ºC 0.036 ºC 0.029 ºC 0.009 ºC 0.017 ºC 0.020 ºC 0.023 ºC 0.029 ºC 0.032 ºC 0.035 ºC 0.043 ºC	Distilled water ice bath and comparison technique using a 100Ω PRT in liquid baths and dry block calibrators.
Temperature Source[3]	-196 ºC (-70 to 0) ºC 0 ºC (0 to 100) ºC (100 to 150) ºC (150 to 200) ºC (200 to 250) ºC (250 to 300) ºC (300 to 350) ºC (350 to 400) ºC 400 ºC	0.022 ºC 0.012 ºC 0.009 ºC 0.013 ºC 0.014 ºC 0.016 ºC 0.018 ºC 0.025 ºC 0.026 ºC 0.029 ºC 0.037 ºC	Liquid Nitrogen, Methanol, Dry Ice, Distilled Water Ice Bath and 100Ω PRT in Dry Block Calibrator
Thermistor, Measure (YSI 400 Series 2252 Ohms @ 25 ºC) [3]	0 ºC (1 to 40) ºC (40 to 60) ºC (60 to 80) ºC (80 to 100) ºC	0.012 ºC 0.025 ºC 0.027 ºC 0.031 ºC 0.034 ºC	Distilled Water Ice Bath and 100Ω PRT in Liquid Bath

Electricity and Magnetism – Electrical Temperature Simulation

Calibration Parameter/Equipment [1]	Range	Calibration and Measurement Capability(+/-) [2]	Remarks
Thermocouple Simulation[3]			Precision Potentiometer with Distilled Water Ice Bath and Appropriate Thermocouple Wire Reference ASTM E230
Type J	(-150 to 2 000) ºF	0.2 ºF	
Type K	(-150 to 1 500) ºF (1 500 to 2 500) ºF	0.3 ºF 0.4 ºF	
Type T	(-320 to 750) ºF	0.2 ºF	
Type R	(500 to 2 500) ºF (2 500 to 3 200) ºF	0.6 ºF 0.7 ºF	
Type S	(500 to 2 500) ºF (2 500 to 3 200) ºF	0.6 ºF 0.7 ºF	
Type B	(500 to 750) ºF (750 to 3 300) ºF	0.5 ºF 0.4 ºF	
Type N	(-320 to 1 500) ºF (1 500 to 2 370) ºF	0.3 ºF 0.4 ºF	
Type E	(-150 to 1 600) ºF (1 600 to 1 830) ºF	0.2 ºF 0.3 ºF	
Type C 5/26	(500 to 1 000) ºF (1 000 to 2 500) ºF (2 500 to 3 500) ºF (3 500 to 4 000) ºF 4 000 ºF	2.8 ºF 2.9 ºF 3.0 ºF 3.2 ºF 3.4 ºF	
Themocouple Simulate[4] or Measure			FGH Ezecal 5 Process Calibrator Reference ASTM E230
Type E	(-150 to 0) ºF (0 to 1 000) ºF (1 000 to 1 500) ºF (1 500 to 1 830) ºF 1 830 ºF	1.1 ºF 0.9 ºF 1.1 ºF 1.3 ºF 1.5 ºF	
Type J	(-150 to 0) ºF (0 to 250) ºF (250 to 1 000) ºF (1 000 to 1 500) ºF (1 500 to 2 000) ºF 2 000 ºF	1.1 ºF 0.6 ºF 0.9 ºF 1.1 ºF 1.3 ºF 1.5 ºF	
Type K	(-100 to 0) ºF (0 to 750) ºF (750 to 1 500) ºF (1 500 to 2 000) ºF (2 000 to 2 500) ºF 2 500 ºF	1.1 ºF 0.9 ºF 1.1 ºF 1.3 ºF 1.5 ºF 1.7 ºF	
Type T	(-320 to -150) ºF (-150 to 0) ºF (0 to 750) ºF 750 ºF	1.3 ºF 1.1 ºF 0.9 ºF 1.1 ºF	

Calibration Parameter/Equipment [1]	Range	Calibration and Measurement Capability(+/-) [2]	Remarks
Type N	(-320 to -150) ºF (-150 to 0) ºF (0 to 1 000) ºF (1 000 to 1 500) ºF (1 500 to 2 000) ºF (2 000 to 2 370) ºF 2 370 ºF	1.3 ºF 1.1 ºF 0.9 ºF 1.1 ºF 1.3 ºF 1.5 ºF 1.7 ºF	FGH Ezecal 5 Process Calibrator Reference ASTM E230
Type R	(0 to 1 000) ºF (1 000 to 1 500) ºF (1 500 to 2 000) ºF (2 000 to 2 500) ºF (2 500 to 3 000) ºF (3 000 to 3 200) ºF 3 200 ºF	2.8 ºF 3.0 ºF 3.2 ºF 3.4 ºF 3.6 ºF 3.7 ºF 3.9 ºF	
Type S	(0 to 1 000) ºF (1 000 to 1 500) ºF (1 500 to 2 000) ºF (2 000 to 2 500) ºF (2 500 to 3 000) ºF (3 000 to 3 200) ºF 3 200 ºF	2.8 ºF 3.0 ºF 3.2 ºF 3.4 ºF 3.6 ºF 3.8 ºF 3.9 ºF	
Type B	(500 to 1 000) ºF (1 000 to 1 500) ºF (1 500 to 2 000) ºF (2 000 to 2 500) ºF (2 500 to 3 000) ºF (3 000 to 3 300) ºF 3 300 ºF	2.9 ºF 3.1 ºF 3.3 ºF 3.5 ºF 3.7 ºF 3.9 ºF 4.1 ºF	
Type C	(500 to 1 000) ºF (1 000 to 1 500) ºF (1 500 to 2 000) ºF (2 000 to 2 500) ºF (2 500 to 3 000) ºF (3 000 to 3 500) ºF (3 500 to 4 000) ºF 4 000 ºF	6.7 ºF 7.1 ºF 7.4 ºF 7.8 ºF 8.2 ºF 8.5 ºF 8.9 ºF 9.3 ºF	

Notes:

1) Laboratory offers calibration services at the laboratory's own facilities and at the client or other agreed upon facilities.
2) Calibration and Measurement Capability represents expanded uncertainties at approximately a 95% confidence level using a coverage factor of k=2.
3) Parameters that are to be calibrated in-house.
4) Parameters that are to be calibrated on-site.

Approved by: _____ Date: November 11, 2010

R. Douglas Leonard Jr.
Chief Technical Officer

Re-Issued: 11/11/10