THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

PROCESS INSTRUMENTS INC.

Pittsburgh, PA

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 18 June 2005*).

Presented this 11th day of September 2008.

President
For the Accreditation Council
Certificate Number 1894.01
Valid to April 30, 2010

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

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

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CALIBRATION

Valid To: April 30, 2010 Certificate Number: 1894.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations[1]:

I. Electrical – DC & Low Frequency

Parameter/Equipment	Range	Best Uncertainty[2, 3, 4] (±)		Comments
		Laboratory	Field[7]	
DC Voltage – Generate	(0 to 330) mV (0 to 3.3) V (0 to 33) V (30 to 330) V (100 to 1000) V	20 µV/V + 1 µV 11 µV/V + 2 µV 12 µV/V + 20 µV 18 µV/V + 150 µV 18 µV/V + 1.5 mV	See Footnote 6	Fluke 5520A
Fixed Point	10 V	0.5 µV/V	Not available for this point	Fluke 732A
DC Voltage – Measure	(0 to 120) mV (0 to 1.2) V (0 to 12) V (0 to 120) V (0 to 1050) V	7 µV/V + 0.36 µV 6 µV/V + 0.36 µV 6 µV/V + 0.6 µV 8 µV/V + 36 µV 20 µV/V + 0.11 mV	See Footnote 6	HP 3458A with Option 002
Fixed Point	10 V	0.3 µV/V	Not available for this point	Fluke 732A
	(1 to 40) kV	1.0 % of reading	See Footnote 6	Fluke 80K-40 with DMM

Parameter/Equipment	Range	Best Uncertainty[2, 3, 4] (±)		Comments
		Laboratory	Field[7]	
DC Current – Generate	(0 to 330) µA (0 to 3.3) mA (0 to 33) mA (0 to 330) mA (0 to 1.1) A (1.1 to 3) A (0 to 11) A (11 to 20.5) A (20 to 1000) A	0.015 % + 0.02 µA 100 µA/A + 0.05 µA 100 µA/A + 0.25 µA 100 µA/A + 2.5 µA 0.020 % + 40 µA 0.038 % + 40 µA 0.050 % + 500 µA 0.1 % + 750 µA 0.26 %	See Footnote 6	Fluke 5520A Fluke 5520A with 5500/coil
DC Current – Measure	(0 to 120) µA (0 to 1.2) mA (0 to 12) mA (0 to 120) mA (0 to 1.1) A	25 µA/A + 0.8 nA 25 µA/A + 5 nA 25 µA/A + 50 nA 40 µA/A + 0.5 µA 0.012 % + 10 µA	See Footnote 6	HP 3458A
Resistance – Generate	(0 to 11) Ω (11 to 33) Ω (33 to 110) Ω 110 Ω to 1.1 kΩ (1.1 to 11) kΩ (11 to 110) kΩ 110 kΩ to 1.1 MΩ (1.1 to 3.3) MΩ (3.3 to 11) MΩ (11 to 33) MΩ (33 to 110) MΩ (110 to 330) MΩ (330 to 1100) MΩ	40 µΩ/Ω + 1 mΩ 30 µΩ/Ω + 1.5 mΩ 28 µΩ/Ω + 1.4 mΩ 28 µΩ/Ω + 2 mΩ 28 µΩ/Ω + 20 mΩ 28 µΩ/Ω + 200 mΩ 32 µΩ/Ω + 2 Ω 60 µΩ/Ω + 30 Ω 0.013 % + 50 Ω 0.025 % + 2.5 kΩ 0.050 % + 3 kΩ 0.3 % + 100 kΩ 1.5 % + 500 kΩ	See Footnote 6	Fluke 5520A

Parameter/Equipment	Range	Best Uncertainty[2, 4] (±)		Comments
		Laboratory	Field[7]	
Resistance – Measure	(0.0001 to 0.001) Ω (0.001 to 0.01) Ω (0.01 to 0.1) Ω (0.1 to 1) Ω	1.5 μΩ/Ω 1.1 μΩ/Ω 0.7 μΩ/Ω 0.4 μΩ/Ω	On-Site capabilities listed in subsequent section	MIL 6010B/6011A or 6000B
Fixed Point	1 Ω (1 to 10) Ω (10 to 100) Ω 100 Ω to 1 kΩ	0.13 μΩ/Ω 0.17 μΩ/Ω 0.24 μΩ/Ω 0.28 μΩ/Ω		Thomas-type resistors
Fixed Point	10 kΩ (1 to 13) kΩ (10 to 100) kΩ 100 kΩ to 1 MΩ	0.15 μΩ/Ω 0.33 μΩ/Ω 0.45 μΩ/Ω 0.56 μΩ/Ω		Evanohm-type resistors
	(1 to 10) MΩ (10 to100) MΩ 100 MΩ 1 GΩ (1 to 10) GΩ (10 to 100) GΩ 100 GΩ to 1 TΩ (1 to 10) TΩ	3.8 μΩ/Ω 5 μΩ/Ω 10 μΩ/Ω 20 μΩ/Ω 50 μΩ/Ω 100 μΩ/Ω 350 μΩ/Ω		Guarded active-arm bridge
	(0 to 12) Ω (12 to 120) Ω 120 Ω to 1.2 kΩ (1.2 to 12) kΩ (12 to 120) kΩ 120 kΩ to 1.2 MΩ (1.2 to 12) MΩ (12 to 120) MΩ 120 MΩ to 1.2 GΩ	18 μΩ/Ω + 60 μΩ 15 μΩ/Ω + 0.6 mΩ 13 μΩ/Ω + 0.6 mΩ 13 μΩ/Ω + 6 mΩ 13 μΩ/Ω + 60 mΩ 18 μΩ/Ω + 2.4 Ω 53 μΩ/Ω + 120 Ω 0.050 % + 1 kΩ 0.5 % + 10 kΩ	See Footnote 6	HP 3458A

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)		Comments
		Laboratory	Field[7]	
Electrical Calibration of RTD Indicators & Indicating Systems –				
Pt 385, 100 Ω	-200 °C to -80 °C -80 °C to 0 °C 0 °C to 100 °C 100 °C to 300 °C 300 °C to 400 °C 400 °C to 630 °C 630 °C to 800 °C	0.05 °C 0.05 °C 0.07 °C 0.09 °C 0.10 °C 0.12 °C 0.23 °C	See Footnote 6	Fluke 5520A
Pt 3926, 100 Ω	-200 °C to -80 °C -80 °C to 0 °C 0 °C to 100 °C 100 °C to 300 °C 300 °C to 400 °C 400 °C to 630 °C	0.05 °C 0.05 °C 0.07 °C 0.09 °C 0.10 °C 0.12 °C		
Pt 3916, 100 Ω	-200 °C to -190 °C -190 °C to -80 °C -80 °C to 0 °C 0 °C to 100 °C 100 °C to 260 °C 260 °C to 300 °C 300 °C to 400 °C 400 °C to 600 °C 600 °C to 630 °C	0.25 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.08 °C 0.09 °C 0.10 °C 0.23 °C		
Pt 385, 200 Ω	-200 °C to -80 °C -80 °C to 0 °C 0 °C to 100 °C 100 °C to 260 °C 260 °C to 300 °C 300 °C to 400 °C 400 °C to 600 °C 600 °C to 630 °C	0.04 °C 0.04 °C 0.04 °C 0.05 °C 0.12 °C 0.13 °C 0.14 °C 0.16 °C		

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)		Comments
		Laboratory	Field[7]	
Electrical Calibration of RTD Indicators & Indicating Systems (cont.) –				
Pt 385, 500 Ω	-200 °C to -80 °C -80 °C to 0 °C 0 °C to 100 °C 100 °C to 260 °C 260 °C to 300 °C 300 °C to 400 °C 400 °C to 600 °C 600 °C to 630 °C	0.04 °C 0.05 °C 0.05 °C 0.06 °C 0.08 °C 0.08 °C 0.09 °C 0.11 °C	See Footnote 6	Fluke 5520A
Pt 385, 1000 Ω	-200 °C to -80 °C -80 °C to 0 °C 0 °C to 100 °C 100 °C to 260 °C 260 °C to 300 °C 300 °C to 400 °C 400 °C to 600 °C 600 °C to 630 °C	0.03 °C 0.03 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.07 °C 0.23 °C		
PtNi 385, 120 Ω (Ni120)	-80 °C to 0 °C 0 °C to 100 °C 100 °C to 260 °C	0.08 °C 0.08 °C 0.14 °C		
Cu 427, 10 Ω	-100 °C to 260 °C	0.30 °C		
Electrical Calibration of Thermocouple Indicators & Indicating Systems –				
Type B	600 °C to 800 °C 800 °C to 1000 °C 1000 °C to 1550 °C 1550 °C to 1820 °C	0.44 °C 0.34 °C 0.30 °C 0.33 °C	See Footnote 6	Fluke 5520A
Type C	0 °C to 150 °C 150 °C to 650 °C 650 °C to 1000 °C 1000 °C to 1800 °C 1800 °C to 2316 °C	0.30 °C 0.26 °C 0.31 °C 0.50 °C 0.84 °C		

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)		Comments
		Laboratory	Field[7]	
Electrical Calibration of Thermocouple Indicators & Indicating Systems (cont.) –				
Type E	-250 °C to -100 °C -100 °C to -25 °C -25 °C to 350 °C 350 °C to 650 °C 650 °C to 1000 °C	0.50 °C 0.16 °C 0.14 °C 0.16 °C 0.21 °C	See Footnote 6	Fluke 5520A
Type J	-210 °C to -100 °C -100 °C to -30 °C -30 °C to 150 °C 150 °C to 760 °C 760 °C to 1200 °C	0.27 °C 0.16 °C 0.14 °C 0.17 °C 0.23 °C		
Type K	-200 °C to -100 °C -100 °C to -25 °C -25 °C to 120 °C 120 °C to 1000 °C 1000 °C to 1372 °C	0.33 °C 0.18 °C 0.16 °C 0.26 °C 0.40 °C		
Type L	-200 °C to -100 °C -100 °C to 800 °C 800 °C to 900 °C	0.37 °C 0.26 °C 0.17 °C		
Type N	-200 °C to -100 °C -100 °C to -25 °C -25 °C to 120 °C 120 °C to 410 °C 410 °C to 1300 °C	0.40 °C 0.22 °C 0.19 °C 0.18 °C 0.27 °C		
Type R	0 °C to 250 °C 250 °C to 400 °C 400 °C to 1000 °C 1000 °C to 1767 °C	0.57 °C 0.35 °C 0.33 °C 0.40 °C		
Type S	0 °C to 250 °C 250 °C to 1000 °C 1000 °C to 1400 °C 1400 °C to 1767 °C	0.47 °C 0.36 °C 0.37 °C 0.46 °C		

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)		Comments
		Laboratory	Field[7]	
Electrical Calibration of Thermocouple Indicators & Indicating Systems (cont.) –				
Type T	-250 °C to -150 °C -150 °C to 0 °C 0 °C to 120 °C 120 °C to 400 °C	0.63 °C 0.24 °C 0.16 °C 0.14 °C	See Footnote 6	Fluke 5520A
Type U	-200 °C to 0 °C 0 °C to 600 °C	0.56 °C 0.27 °C		
AC Power –				
(45 to 65) Hz:				
(3.3 to 330) mA 330 mA to 11 A (11 to 20.5) A	33 mV to 1020 V	0.05 % 0.06 % 0.15 %	See Footnote 6	Fluke 5520A

Parameter/Range	Frequency	Best Uncertainty[2, 3] (±)		Comments
		Laboratory	Field[7]	
Capacitance Generate –				
(0.19 to 0.4) nF	10 Hz to 10 kHz	0.5 % + 0.01 nF	See Footnote 6	Fluke 5520A
(0.4 to 1.1) nF	10 Hz to 10 kHz	0.5 % + 0.01 nF		
(1.1 to 3.3) nF	10 Hz to 3 kHz	0.5 % + 0.01 nF		
(3.3 to 11) nF	10 Hz to 1 kHz	0.25 % + 0.01 nF		
(11 to 33) nF	10 Hz to 1 kHz	0.25 % + 0.1 nF		
(33 to 110) nF	10 Hz to 1 kHz	0.25 % + 0.1 nF		
(110 to 330) nF	10 Hz to 1 kHz	0.25 % + 0.3 nF		
330 nF to 1.1 uF	(10 to 600) Hz	0.25 % + 1 nF		
(1.1 to 3.3) µF	(10 to 300) Hz	0.25 % + 3 nF		
(3.3 to 11) µF	(10 to 150) Hz	0.25 % + 10 nF		
(11 to 33) µF	(10 to 120) Hz	0.40 % + 30 nF		
(33 to 110) µF	(10 to 80) Hz	0.45 % + 100 nF		
(110 to 330) µF	(0 to 50) Hz	0.45 % + 300 nF		
330 µF to 1.1 mF	(0 to 20) Hz	0.45 % + 1 µF		
(1.1 to 3.3) mF	(0 to 6) Hz	0.45 % + 3 µF		
(3.3 to 11) mF	(0 to 2) Hz	0.45 % + 10 µF		
(11 to 33) mF	(0 to 0.6) Hz	0.75 % + 30 µF		
(33 to 110) mF	(0 to 0.2) Hz	1.1 % + 100 µF		

Parameter/Range	Frequency	Best Uncertainty[2, 3] (±)		Comments
		Laboratory	Field[7]	
AC Voltage – Generate				
(1 to 33) mV	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.080 % + 6 µV 0.015 % + 6 µV 0.020 % + 6 µV 0.10 % + 6 µV 0.35 % + 12 µV 0.80 % + 50 µV	See Footnote 6	Fluke 5520A
(33 to 330) mV	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.03 % + 8 µV 0.015 % + 8 µV 0.016 % + 8 µV 0.035 % + 8 µV 0.080 % + 32 µV 0.20 % + 70 µV		
330 mV to 3.3 V	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.030 % + 50 µV 0.015 % + 60 µV 0.019 % + 60 µV 0.030 % + 50 µV 0.070 % + 130 µV 0.24 % + 600 µV		
(3.3 to 33) V	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.030 % + 650 µV 0.015 % + 600 µV 0.024 % + 600 µV 0.035 % + 600 µV 0.090 % + 1.6 mV		
(33 to 330) V	45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.019 % + 2 mV 0.020 % + 6 mV 0.025 % + 6 mV 0.030 % + 6 mV 0.20 % + 50 mV		
(330 to 1020) V	45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.030 % + 10 mV 0.025 % + 10 mV 0.030 % + 10 mV		

Parameter/Range	Frequency	Best Uncertainty[2, 4] (±)		Comments
		Laboratory	Field[7]	
AC Voltage – Measure				
(1.2 to 12) mV	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.03 % + 0.03 % 0.02 % + 0.011 % 0.03 % + 0.011 % 0.10 % + 0.011 % 0.50 % + 0.011 % 4.0 % + 0.02 %	See Footnote 6	HP 3458A
(0.012 to 0.12, 1.2, 12) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz (1 to 2) MHz	0.007 % + 0.004% 0.007 % + 0.002 % 0.014 % + 0.002 % 0.03 % + 0.002 % 0.08 % + 0.002 % 0.30 % + 0.01 % 1 % + 0.01 % 1.5 % + 0.01 %		
(12 to 120) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz	0.02 % + 0.004 % 0.02 % + 0.002 % 0.02 % + 0.002 % 0.035 % + 0.002 % 0.12 % + 0.002 % 0.40 % + 0.01 % 1.5 % + 0.01 %		
(70 to 700) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.04 % + 0.004 % 0.04 % + 0.002 % 0.06 % + 0.002 % 0.12 % + 0.002 % 0.30 % + 0.002 %		
(1 to 40) kV	60 Hz	5.1 % of reading		Fluke 80K-40 with DMM

Parameter/Range	Frequency	Best Uncertainty[2, 3] (±)		Comments
		Laboratory	Field[7]	
AC Current – Generate				
(29 to 330) µA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.20 % + 0.1 µA 0.15 % + 0.1 µA 0.13 % + 0.1 µA 0.3 % + 0.15 µA 0.8 % + 0.2 µA 1.6 % + 0.4 µA	See Footnote 6	Fluke 5520A
330 µA to 3.3 mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.2 % + 0.2 µA 0.13 % + 0.2 µA 0.1 % + 0.2 µA 0.2 % + 0.2 µA 0.5 % + 0.3 µA 1 % + 0.6 µA		
(3.3 to 33) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.18 % + 2 µA 0.09 % + 2 µA 0.04 % + 2 µA 0.08 % + 2 µA 0.20 % + 3 µA 0.4 % + 4 µA		
(33 to 330) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.18 % + 20 µA 0.09 % + 20 µA 0.04 % + 20 µA 0.10 % + 50 µA 0.20 % + 100 µA 0.40 % + 200 µA		
330 mA to 1.1 A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.18 % + 100 µA 0.05 % + 100 µA 0.6 % + 1 mA 2.5 % + 5 mA		
(1.1 to 3) A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.18 % + 100 µA 0.06 % + 100 µA 0.6 % + 1 mA 2.5 % + 5 mA		

Parameter/Range	Frequency	Best Uncertainty[2, 3, 4] (±)		Comments
		Laboratory	Field[7]	
AC Current – Generate (cont.)				
(3 to 11) A	45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.06 % + 2 mA 0.1 % + 2 mA 3 % + 2 mA	See Footnote 6	Fluke 5520A
(11 to 20.5) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.12 % + 5 mA 0.15 % + 5 mA 3 % + 5 mA		
(20 to 1000) A Clamp meters	(45 to 65) Hz (65 to 440) Hz	0.3 % 0.81 %		Fluke 5520A w/5500A coil
AC Current – Measure				
(6 to 120) μA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 1 kHz	0.40 % + 0.03 % 0.15 % + 0.03 % 0.06 % + 0.03 % 0.06 % + 0.03 %	See Footnote 6	HP 3458A
(7.2 to 1.2, 12, 120) mA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	0.40 % + 0.02 % 0.15 % + 0.02 % 0.06 % + 0.02 % 0.03 % + 0.02 %		
(0.05 to 1.1) A	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	0.40 % + 0.02 % 0.16 % + 0.02 % 0.08 % + 0.02 % 0.10 % + 0.02 %		
Leveled Sine Wave –				
Absolute 5 mV to 5.5 V	50 kHz reference 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz (600 to 1100) MHz	2 % + 300 μV 3.5 % + 300 μV 4 % + 300 μV 6 % + 300 μV 7 % + 300 μV	See Footnote 6	Fluke 5520A with SC1100 option. Uncertainties do not include loading effect of UUT.
Flatness (Relative to 50 kHz) 5 mV to 5.5 V	50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz (600 to 1100) MHz	1.5 % + 100 μV 2 % + 100 μV 4 % + 100 μV 5 % + 100 μV		

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)		Comments
		Laboratory	Field[7]	
Amplitude – Oscilloscope				
DC Signal				
50 Ω load	(-6.6 to 6.6) V	0.25 % + 40 μV	See Footnote 6	Fluke 5520A with SC1100
1 MΩ load	(-130 to 130) V	0.05 % + 40 μV		
Time Marker, 50 Ω load	5 s to 50 ms	(25 +1000*t*) parts in 10^6 of rdg		*t* is the time in seconds
	20 ms to 100 ns			
	(50 to 20) ns	2.5 parts in 10^6 of rdg		Markers in a 5-2-1 sequence
	10 ns	2.5 parts in 10^6 of rdg		
	(5 to 1) ns	2.5 parts in 10^6 of rdg		
Edge – Rise Time				
50 Ω load	≤ 300 ps	+0 ps/-100 ps		
≤ 2 MHz	≤ 300 ps	+0 ps/-100 ps		
> 2 MHz	> 350 ps			

II. Time and Frequency

Parameter/Equipment	Range	Best Uncertainty[2] (±)		Comments
		Laboratory	Field[7]	
Frequency Counters, Generators	0.1 Hz to 10 MHz	1 part in 10^{10}	Not Available	SRS FS700
	(0.01 to 225) MHz	1 part in 10^{10}	1 part in 10^7	Fluke PM6680B externally clocked to SRS FS700
Time Intervals, Timers	6 ns to 10^6 s	1 part in 10^{10}	1 part in 10^7	

III. Dimensional

Parameter/Equipment	Range	Best Uncertainty[2] (±)		Comments
		Laboratory	Field[7]	
Ring Gages[5]	Up to 8 in	(17 + 2.2*L*) μin	On-site calibration service is not available for this parameter	Universal Testing Machines

Parameter/Equipment	Range	Best Uncertainty[2] (±)		Comments
		Laboratory	Field[7]	
Micrometers[5]	Up to 4 in (4 to 24) in (24 to 60) in	(30 + 1.5*L*) µin (65 + 3*L*) µin (310 + 2.5*L*) µin	See Footnote 6	Gage blocks
Calipers[5]	Up to 4 in (4 to 24) in (24 to 60) in	(290 + 0.1*L*) µin (290 + 0.9*L*) µin (310 + 2.5*L*) µin	See Footnote 6	Gage blocks
Gage Blocks[5]	(0.01 to 4) in	(4.6 + 0.7*L*) µin	On-site calibration service is not available for this parameter	Gage block comparator
Dial Indicators[5]	Up to 1 in	(10 + 6.1*L*) µin	See Footnote 6	Universal measuring machine
Thread Plugs – Pitch Diameter	Up to 6 in	79 µin	On-site calibration service is not available for this parameter	Universal measuring machine with thread wires
Plain Plugs, Disks, Thread Wires[5]	Up to 8 in	(9 + 2.8*D*) µin	On-site calibration service is not available for this parameter	Universal measuring machine
End Rods[5]	Up to 11 in (11 to 21) in	(9 + 2.9*L*) µin (48 + 3.4*L*) µin	On-site calibration service is not available for this parameter	Universal measuring machine

IV. Mechanical

Parameter/Equipment	Range	Best Uncertainty[2] (±)		Comments
		Laboratory	Field[7]	
Torque –				
Wrenches, Screwdrivers, Watches	(15 to 200) in·oz (4 to 1000) in·lb (20 to 2000) ft·lb	0.25 % of full scale 0.25 % of full scale 0.25 % of full scale	On-site calibration service is not available for this parameter	CDI 2000-610-2
Analyzers, Transducers	Up to 200 in·oz Up to 1000 in·lb Up to 2000 ft·lb	0.05 % of full scale 0.05 % of full scale 0.05 % of full scale		Torque arms with Class F weights
Pressure – Measuring Equipment & Measure	(0 to 2) inH_2O	0.0005 inH_2O	See Footnote 6	Dwyer 1430
	(0 to 600) inH_2O	0.015 % of full scale		Ametek RK-600WC
	(0 to 300) psig	0.015 % of full scale		Ametek RK-300
	(0 to 15) psia	0.0015 psia		DHI PPC2 AF
	(-15 to 0) psig	0.0015 psig		
	(0 to 30) psia	0.003 psia		
	(-15 to 15) psig	0.003 psig		
	(0 to 50) psia	0.005 psia		
	(-15 to 35) psia	0.005 psig		
	(0 to 300) psia/psig	0.03 psia/psig		
	(0 to 600) psia/psig	0.06 psia/psig		
	(0 to 1000) psia/psig	0.10 psia/psig		
	(0 to 15 000) psig	0.03 % of full scale		Ametek TQ-155
	(0 to 1000) psig	25 parts in 10^6	On-site calibration service listed in above section	Ruska 2465
	(0 to 1000) psia	25 parts in 10^6 + 0.0002 psia		Ruska 2465
	(0 to 4000) psig	39 parts in 10^6		Ruska 2450
	(0 to 40 000) psig	77 parts in 10^6		Ruska 2450

V. Thermodynamics

Parameter/Equipment	Range	Best Uncertainty[2] (±)		Comments
		Laboratory	Field[7]	
Infrared Pyrometry	-30 °C to 140 °C	1.1 °C	See Footnote 6	Isotech Venus 2140
	150 °C to 1200 °C	1.7 °C		Isotech Pegasus R
	100 °C to 1300 °C	1.4 °C	Not available for these ranges	Isotech Cyclops
	300 °C to 1700 °C	2.7 °C		Mikron M330

Parameter/Equipment	Range	Best Uncertainty[2] (±)		Comments
		Laboratory	Field[7]	
Optical Pyrometry	800 °C to 1100 °C 1100 °C to 1500 °C 1500 °C to 1900 °C 1900 °C to 2300 °C	1.8 °C 1.9 °C 2 °C 3 °C	On-site calibration service is not available for this parameter	Tungsten ribbon filament lamp
Humidity	11.3 %, 43.2 %, 75.3 %	1.1 % RH	On-site calibration service is not available for this parameter	Saturated aqueous salt solutions
Temperature – Measuring Equipment & Measure	-80 °C to 0 °C 0 °C to 300 °C	0.009 °C 0.006 °C	On-Site capabilities listed in subsequent section	Comparison to SPRT in liquid bath
	300 °C to 500 °C	0.011 °C		Salt bath
	-196 °C	0.004 °C		Liquid Nitrogen comparison
	273.16 K	0.5 mK		Triple point of water
	302.9146 K	1 mK		Melting point of Gallium
	429.7485 K	2 mK		Freezing point of Indium
	505.078 K	2 mK		Freezing point of Tin
	692.677 K	3 mK		Freezing point of Zinc
	0 °C to 1250 °C	0.8 °C		Comparison to noble metal thermocouple
	-30 °C to 140 °C 100 °C to 650 °C	0.14 °C 1.0 °C	See Footnote 6	Dry block

VI. Fluid Quantities

Parameter/Equipment	Range	Best Uncertainty[2] (±)		Comments
		Laboratory	Field[7]	
Gas Flow	(0 to 100) slm	0.20 % of rdg	See Footnote 6	DHI molbox1/molblocs

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

[2] "Best Uncertainty" 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 of nearly ideal measuring equipment. Best uncertainties represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The best uncertainty of a specific calibration performed by the laboratory may be greater than the best uncertainty due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

[3] Based on using the standard at the temperature the Fluke 5520A was calibrated (tcal ± 5 °C) and assuming the instrument is zeroed at least every seven days or when the ambient temperature changes more than 5 °C. For resistance, a zero calibration is performed at least every 12 hours within ± 1 °C of use. For AC Current, best uncertainties are determined with LCOMP Off. Best measurement uncertainty is based upon 1-year specifications and is read as ppm or percent output plus floor specification.

[4] Based on using the standard at the temperature the HP 3458A was calibrated (tcal ± 5 °C) and a auto-calibration (ACAL) was performed within the previous 24 hours (± 1 °C of ambient temperature). Best measurement uncertainty is based upon 1-year specifications and is read as ppm or percent output plus floor specification or as ppm or percent of reading plus ppm or percent of range.

[5] L is the length of the Unit Under Test in inches

[6] The best uncertainty stated for calibrations performed in the laboratory is applicable for calibrations performed in the field.

[7] 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 uncertainties achievable on a customer's site can normally be expected to be larger than the Best Measurement Capabilities (BMC) that the accredited laboratory has been assigned as Best Uncertainty 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 uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the calibration uncertainty being larger than the BMC.