



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

Perry Johnson Laboratory Accreditation, Inc. has assessed the Laboratory of:

PCI

8100 Brownleigh Dr., #100A, Raleigh, NC 27617

(Hereinafter called the Organization) and hereby declares that Organization is accredited in accordance with the recognized International Standard:

ISO/IEC 17025:2005

This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (as outlined by the joint ISO-ILAC-IAF Communiqué dated April 2017):

Dimensional, Electrical, Mechanical, Chemical, Time & Frequency, and Thermodynamic Calibration
(As detailed in the supplement)

Accreditation claims for such testing and/or calibration services shall only be made from addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation body's duty to observe and comply with the said rules.

For PJLA:

Tracy Szerszen
President/Operations Manager

Initial Accreditation Date:

September 12, 2011

Issue Date:

October 12, 2017

Expiration Date:

November 30, 2019

Revision Date:

January 8, 2019

Accreditation No.:

54363

Certificate No.:

L17-436-R1

Perry Johnson Laboratory
Accreditation, Inc. (PJLA)
755 W. Big Beaver, Suite 1325
Troy, Michigan 48084

The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: www.pjilabs.com



Certificate of Accreditation: Supplement

PCI

8100 Brownleigh Dr., #100A, Raleigh, NC 27617
 Contact Name: Frank Reagan Phone: 919-781-7787

Accreditation is granted to the facility to perform the following calibrations:

Dimensional

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Measure Length ^F	0.001 in to 0.4 in	21 μ in/in + 30 μ in	Gage Block Set
	0.401 in to 1 in	48 μ in/in + 19 μ in	
	1.001 in to 7 in	59 μ in/in + 8.4 μ in	
	7.001 in to 24 in	57 μ in/in + 140 μ in	Distance Bars

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Measure DC Voltage ^F	0.01 mV to 329.99 mV	0.0013 mV + 0.000 023 mV/mV	Fluke 5520A
	0.33 V to 3.299 999 V	0.000 58 V + 0.000 005 4 V/V	
	3.3 V to 32.999 99 V	0.000 58 V + 0.000 005 5 V/V	
	33 V to 329.999 9 V	0.000 32 V + 0.000 021 V/V	
	330 V to 1 020 V	0.001 7 V + 0.000 021 V/V	
Equipment to Output DC Voltage ^F	0.000 3 μ V to 200 mV	5 μ V/V + 0.1 μ V	Fluke 8508A Reference Multi-meter
	200 mV to 2 V	3.5 μ V/V + 0.4 μ V	
	2 V to 20 V	3.5 μ V/V + 4 μ V	
	20 V to 200 V	5.5 μ V/V + 0.04 mV	
	200 V to 1 000 V	5.5 μ V/V + 0.5 mV	Fluke 80K-6 HV Probe with 8060A Multi-meter
	1 000 V to 6 000 V	10 mV/V + 2 V	
Equipment to Measure DC Current ^F	0.001 μ A to 329.999 μ A	0.23 μ A + 0.00 18 μ A/A	Fluke 5520A
	0.33 mA to 3.299 99 mA	0.000 084 mA + 0.000 11 mA/mA	
	3.3 mA to 32.999 9 mA	0.000 65 mA + 0.000 11 mA/mA	
	33 mA to 329.999 mA	0.003 mA + 0.000 11 mA/mA	
	0.33 mA to 1.099 99 mA	0.000 047 A + 0.000 24 A/A	
	3 A to 10.999 9 A	0.000 83 A + 0.000 56 A/A	
	11 A to 20.5 A	0.002 6 A + 0.001 2 A/A	
Equipment to Output DC Current ^F	0.001 2 μ A to 200 μ A	12 μ A/A + 0.4 nA	Fluke 8508A Reference Multi-meter
	200 μ A to 2 mA	12 μ A/A + 4 nA	
	2 mA to 20 mA	14 μ A/A + 0.04 μ A	
	20 mA to 200 mA	48 μ A/A + 0.8 μ A	
	200 mA to 2 A	185 μ A/A + 16 μ A	
	2 A to 20 A	400 μ A/A + 400 μ A	



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Equipment to Measure Resistance ^F	0.001 Ω + 10.999 9 Ω	0.001 2 Ω + 0.000 047 Ω/Ω	Fluke 5520A
	11 Ω to 32.999 9 Ω	0.001 7 Ω + 0.000 035 Ω/Ω	
	33 Ω to 109.999 9 Ω	0.006 1 Ω + 0.000 27 Ω/Ω	
	110 Ω to 329.99 9 Ω	0.002 3 Ω + 0.000 033 Ω/Ω	
	0.33 k Ω to 1.099 999 k Ω	0.000 003 9 k Ω + 0.000 032 k Ω/Ω	
	1.1 k Ω to 3.299 999 k Ω	0.000 053 k Ω + 0.000 017 k $\Omega/k\Omega$	
	3.3 k Ω to 10.999 99 k Ω	0.000 55 k Ω + 0.000 014 k $\Omega/k\Omega$	
	11 k Ω to 32.999 99 k Ω	0.000 52 k Ω + 0.000 029 k $\Omega/k\Omega$	
	33 k Ω to 109.999 9 k Ω	0.000 39 k Ω + 0.000 033 k $\Omega/k\Omega$	
	110 k Ω to 329.999 9 k Ω	0.005 k Ω + 0.000 033 k $\Omega/k\Omega$	
	330 k Ω to 1.099 999 M Ω	0.000 003 8 M Ω + 0.000 037 M $\Omega/M\Omega$	
	1.1 M Ω to 3.299 999 M Ω	0.000 051 M Ω + 0.000 068 M $\Omega/M\Omega$	
	3.3 M Ω to 10.999 99 M Ω	0.000 37 M Ω + 0.000 14 M $\Omega/M\Omega$	
	11 M Ω to 32.999 99 M Ω	0.002 8 M Ω + 0.000 3 M $\Omega/M\Omega$	
	33 M Ω to 109.999 9 M Ω	0.003 5 M Ω + 0.000 59 M $\Omega/M\Omega$	
110 M Ω to 329.999 9 M Ω	0.12 M Ω + 0.003 5 M $\Omega/M\Omega$		
330 M Ω to 1 100 M Ω	0.58 M Ω + 0.018 M $\Omega/M\Omega$		
Equipment to Output Resistance ^F	0.000 012 Ω to 2 Ω	17 $\mu\Omega/\Omega$ + 4 $\mu\Omega$	Fluke 8508A Reference Multi-meter
	2 Ω to 20 Ω	9.5 $\mu\Omega/\Omega$ + 28 $\mu\Omega$	
	20 Ω to 200 Ω	8 $\mu\Omega/\Omega$ + 50 $\mu\Omega$	
	200 Ω to 2 k Ω	8 $\mu\Omega/\Omega$ + 500 $\mu\Omega$	
	2 k Ω to 20 k Ω	8 $\mu\Omega/\Omega$ + 5.0 m Ω	
	20 k Ω to 200 k Ω	8 $\mu\Omega/\Omega$ + 50 m Ω	
	200 k Ω to 2 M Ω	9 $\mu\Omega/\Omega$ + 1 Ω	
	2 M Ω to 20 M Ω	20 $\mu\Omega/\Omega$ + 100 Ω	
	20 M Ω to 200 M Ω	120 $\mu\Omega/\Omega$ + 10 k Ω	
	200 M Ω to 2 G Ω	1 510 $\mu\Omega/\Omega$ + 100 k Ω	
2 G Ω to 20 G Ω	1 510 $\mu\Omega/\Omega$ + 1 M Ω		



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Equipment to Measure Capacitance ^F	0.19 nF to 0.399 9 nF	0.11 nF + 0.009 1 nF/nF	Fluke 5520A
	0.4 nF to 1.099 9 nF	0.011 nF + 0.006 6 nF/nF	
	1.1 nF to 3.299 9 nF	0.012 nF + 0.005 9 nF/nF	
	3.3 nF to 10.999 9 nF	0.012 nF + 0.002 9 nF/nF	
	11 nF to 32.999 9 nF	0.12 nF + 0.003 nF/nF	
	33 nF to 109.999 nF	0.12 nF + 0.002 9 nF/nF	
	110 nF to 329.999 nF	0.33 nF + 0.003 1 nF/nF	
	0.33 μ F to 1.099 99 μ F	0.001 3 μ F + 0.002 9 μ F/ μ F	
	1.1 μ F to 3.299 99 μ F	0.003 4 μ F + 0.003 μ F/ μ F	
	3.3 μ F to 10.999 9 μ F	0.011 μ F + 0.003 1 μ F/ μ F	
	11 μ F to 32.999 9 μ F	0.33 μ F + 0.004 8 μ F/ μ F	
	33 μ F to 109.99 μ F	0.11 μ F + 0.005 5 μ F/ μ F	
	110 μ F to 329.99 μ F	0.34 μ F + 0.005 4 μ F/ μ F	
	0.33 mF to 1.099 99 mF	0.001 3 mF + 0.005 2 mF/mF	
	1.1 mF to 3.299 9 mF	0.003 5 mF + 0.005 2 mF/mF	
3.3 mF to 10.999 9 mF	0.12 mF + 0.005 3 mF/mF		
11 mF to 32.999 9 mF	0.034 mF + 0.008 7 mF/mF		
33 mF to 110 mF	0.12 mF + 0.013 mF/mF		
Equipment to Measure AC Voltage (at the listed frequencies) ^F			
10 Hz to 45 Hz	1 mV to 32.999 mV	0.008 9 mV + 0.000 878 mV/mV	
45 Hz to 10 kHz	1 mV to 32.999 mV	0.009 mV + 0.000 148 mV/mV	
10 kHz to 20 kHz	1 mV to 32.999 mV	0.009 mV + 0.000 202 mV/mV	
20 kHz to 50 kHz	1 mV to 32.999 mV	0.008 8 mV + 0.001 11 mV/mV	
50 kHz to 100 kHz	1 mV to 32.999 mV	0.015 mV + 0.004 02 mV/mV	
100 kHz to 500 kHz	1 mV to 32.999 mV	0.058 mV + 0.009 23 mV	
Equipment to Measure AC Voltage (at the listed frequencies) ^F			
10 Hz to 45 Hz	33 mV to 329.999 mV	0.009 2 mV + 0.003 49 mV/mV	
45 Hz to 10 kHz	33 mV to 329.999 mV	0.009 mV + 0.001 74 mV/mV	
10 kHz to 20 kHz	33 mV to 329.999 mV	0.009 mV + 0.002 23 mV/mV	
20 kHz to 50 kHz	33 mV to 329.999 mV	0.009 2 mV + 0.004 04 mV/mV	
50 kHz to 100 kHz	33 mV to 329.999 mV	0.037 mV + 0.000 924 mV/mV	
100 kHz to 500 kHz	33 mV to 329.999 mV	0.081 mV + 0.002 31 mV/mV	



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Equipment to Measure AC Voltage (at the listed frequencies) ^F			Fluke 5520A
10 Hz to 45 Hz	0.33 V to 3.299 99 V	0.000 058 V + 0.000 346 V/V	
45 Hz to 10 kHz	0.33 V to 3.299 99 V	0.000 069 V + 0.000 173 V/V	
10 kHz to 20 kHz	0.33 V to 3.299 99 V	0.000 069 V + 0.000 219 V/V	
20 kHz to 50 kHz	0.33 V to 3.299 99 V	0.000 076 V + 0.000 292 V/V	
50 kHz to 100 kHz	0.33 V to 3.299 99 V	0.00 14 V + 0.000 808 V/V	
100 kHz to 500 kHz	0.33 V to 3.299 99 V	0.000 69 V + 0.002 77 V/V	
Equipment to Measure AC Voltage (at the listed frequencies) ^F			
10 Hz to 45 Hz	3.3 V to 32.999 9 V	0.000 75 V + 0.003 46 V/V	
45 Hz to 10 kHz	3.3 V to 32.999 9 V	0.000 69 V + 0.000 173 V/V	
10 kHz to 20 kHz	3.3 V to 32.999 9 V	0.000 69 V + 0.000 277 V/V	
20 kHz to 50 kHz	3.3 V to 32.999 9 V	0.000 69 V + 0.000 404 V/V	
50 kHz to 100 kHz	3.3 V to 32.999 9 V	0.001 8 V + 0.001 04 V/V	
Equipment to Measure AC Voltage (at the listed frequencies) ^F			
45 Hz to 1 kHz	33 V to 329.999 V	0.002 3 V + 0.000 219 V/V	
1 kHz to 10 kHz	33 V to 329.999 V	0.006 9 V + 0.000 231 V/V	
10 kHz to 20 kHz	33 V to 329.999 V	0.006 9 V + 0.000 289 V/V	
20 kHz to 50 kHz	33 V to 329.999 V	0.006 9 V + 0.000 346 V/V	
50 kHz to 100 kHz	33 V to 329.999 V	0.058 V + 0.002 31 V/V	
Equipment to Measure AC Voltage (at the listed frequencies) ^F			
45 Hz to 1 kHz	330 V to 1 020 V	0.12 V + 0.000 346 V/V	
1 kHz to 5 kHz	330 V to 1 020 V	0.04 V + 0.000 261 V/V	
5 kHz 10 kHz	330 V to 1 020 V	0.012 V + 0.000 346 V/V	
Equipment to Measure AC Voltage (at the listed frequencies) ^F			Fluke 8508A Reference Multi-meter
1 Hz to 10 Hz	0.052 mV to 200 mV	165 μ V/V + 14 μ V	
10 Hz to 40 Hz	0.052 mV to 200 mV	140 μ V/V + 4 μ V	
40 Hz to 100 Hz	0.052 mV to 200 mV	115 μ V/V + 4 μ V	
100 Hz to 2 kHz	0.052 mV to 200 mV	110 μ V/V + 2 μ V	
2 kHz to 10 kHz	0.052 mV to 200 mV	135 μ V/V + 4 μ V	
10 kHz to 30 kHz	0.052 mV to 200 mV	340 μ V/V + 8 μ V	
30 kHz to 100 kHz	0.052 mV to 200 mV	765 μ V/V + 20 μ V	



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Equipment to Output AC Voltage (at the listed frequencies) ^F			Fluke 8508A Reference Multi-meter
1 Hz to 10 Hz	200 mV to 2 V	150 μ V/V + 120 μ V	
10 Hz to 40 Hz	200 mV to 2 V	115 μ V/V + 20 μ V	
40 Hz to 100 Hz	200 mV to 2 V	90 μ V/V + 20 μ V	
100 Hz to 2 kHz	200 mV to 2 V	75 μ V/V + 20 μ V	
2 kHz to 10 kHz	200 mV to 2 V	110 μ V/V + 20 μ V	
10 kHz to 30 kHz	200 mV to 2 V	220 μ V/V + 40 μ V	
30 kHz to 100 kHz	200 mV to 2 V	570 μ V/V + 200 μ V	
100 kHz to 300 kHz	200 mV to 2 V	3 mV/V + 2 mV	
300 kHz to 1 MHz	200 mV to 2 V	10 mV/V + 20 mV	
Equipment to Output AC Voltage (at the listed frequencies) ^F			Fluke 8508A Reference Multi-meter
1 Hz to 10 Hz	2 V to 20 V	150 μ V/V + 1.2 mV	
10 Hz to 40 Hz	2 V to 20 V	115 μ V/V + 200 μ V	
40 Hz to 100 Hz	2 V to 20 V	90 μ V/V + 200 μ V	
100 Hz to 2 kHz	2 V to 20 V	75 μ V/V + 200 μ V	
2 kHz to 10 kHz	2 V to 20 V	110 μ V/V + 200 μ V	
10 kHz to 30 kHz	2 V to 20 V	220 μ V/V + 400 μ V	
30 kHz to 100 kHz	2 V to 20 V	570 μ V/V + 2 mV	
100 kHz to 300 kHz	2 V to 20 V	3 mV/V + 20 mV	
300 kHz to 1 MHz	2 V to 20 V	10 mV/V + 200 mV	
Equipment to Output AC Voltage (at the listed frequencies) ^F			Fluke 8508A Reference Multi-meter
1 Hz to 10 Hz	20 V to 200 V	150 μ V/V + 12 mV	
10 Hz to 40 Hz	20 V to 200 V	115 μ V/V + 2 mV	
40 Hz to 100 Hz	20 V to 200 V	90 μ V/V + 2 mV	
100 Hz to 2 kHz	20 V to 200 V	75 μ V/V + 2 mV	
2 kHz to 10 kHz	20 V to 200 V	110 μ V/V + 2 mV	
10 kHz to 30 kHz	20 V to 200 V	220 μ V/V + 4 mV	
30 kHz to 100 kHz	20 V to 200 V	570 μ V/V + 20 mV	
100 kHz to 300 kHz	20 V to 200 V	3 mV/V + 200 mV	
300 kHz to 1 MHz	20 V to 200 V	10 mV/V + 2 V	



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Equipment to Output AC Voltage (at the listed frequencies) ^F			Fluke 8508A Reference Multi-meter
1 Hz to 10 Hz	200 to 1050 V	150 μ V/V + 73.5 mV	
10 Hz to 40 Hz	200 V to 1 050 V	120 μ V/V + 21 mV	
40 Hz to 10 kHz	200 V to 1 050 V	115 μ V/V + 21 mV	
10 kHz to 30 kHz	200 V to 1 050 V	225 μ V/V + 42 mV	
30 kHz to 100 kHz	200 V to 1 050 V	580 μ V/V + 210 mV	
45 Hz to 1 kHz	1 000 V to 6 000 V	11.2 mV/V + 12 V	Fluke 80K-6 HV Probe with 8060A Multi-meter
Equipment to Measure AC Current (at the listed frequencies) ^F			Fluke 5520A
10 Hz to 20 Hz	29 μ A to 329.99 μ A	0.12 μ A + 0.002 31 μ A/ μ A	
20 Hz to 45 Hz	29 μ A to 329.99 μ A	0.12 μ A + 0.001 73 μ A/ μ A	
45 Hz to 1 kHz	29 μ A to 329.99 μ A	0.12 μ A + 0.001 44 μ A/ μ A	
1 kHz to 5 kHz	29 μ A to 329.99 μ A	0.17 μ A + 0.003 46 μ A/ μ A	
5 kHz to 10 kHz	29 μ A to 329.99 μ A	0.23 μ A + 0.009 24 μ A/ μ A	
10 kHz to 30 kHz	29 μ A to 329.99 μ A	0.46 μ A + 0.018 5 μ A/ μ A	
Equipment to Measure AC Current (at the listed frequencies) ^F			
10 Hz to 20 Hz	0.33 mA to 3.299 9 mA	0.000 17 mA + 0.002 31 mA/mA	
20 Hz to 45 Hz	0.33 mA to 3.299 9 mA	0.000 17 mA + 0.001 44 mA/mA	
45 Hz to 1 kHz	0.33 mA to 3.299 9 mA	0.000 17 mA + 0.001 15 mA/mA	
1 kHz to 5 kHz	0.33 mA to 3.299 9 mA	0.000 23 mA + 0.002 31 mA/mA	
5 kHz to 10 kHz	0.33 mA to 3.299 9 mA	0.000 35 mA + 0.005 77 mA/mA	
10 kHz to 30 kHz	0.33 mA to 3.299 9 mA	0.000 69 mA + 0.011 5 mA/mA	
Equipment to Measure AC Current (at the listed frequencies) ^F			
10 Hz to 20 Hz	3.3 mA to 32.999 mA	2 mA/A + 3 μ A	
20 Hz to 45 Hz	3.3 mA to 32.999 mA	1 mA/A + 3 μ A	
45 Hz to 1 kHz	3.3 mA to 32.999 mA	0.9 mA/A + 3 μ A	
1 kHz to 5 kHz	3.3 mA to 32.999 mA	2 mA/A + 3 μ A	
5 kHz to 10 kHz	3.3 mA to 32.999 mA	6 mA/A + 3 μ A	



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Equipment to Measure AC Current (at the listed frequencies) ^F			Fluke 5520A
10 Hz to 20 Hz	33 mA to 329.99 mA	0.023 mA + 0.002 08 mA/mA	
20 Hz to 45 Hz	33 mA to 329.99 mA	0.023 mA + 0.001 04 mA/mA	
45 Hz to 1 kHz	33 mA to 329.99 mA	0.023 mA + 0.000 462 mA/mA	
1 kHz to 5 kHz	33 mA to 329.99 mA	0.023 mA + 0.000 923 mA/mA	
5 kHz to 10 kHz	33 mA to 329.99 mA	0.12 mA + 0.002 31 mA/mA	
10 Hz to 30 Hz	33 mA to 329.99 mA	0.23 mA + 0.004 62 mA/mA	
Equipment to Measure AC Current (at the listed frequencies) ^F			
10 Hz to 45 Hz	0.33 A to 1.099 99 A	0.000 12 A + 0.002 08 A/A	
45 Hz to 1 kHz	0.33 A to 1.099 99 A	0.000 12 A + 0.000 573 A/A	
1 kHz to 5 kHz	0.33 A to 1.099 99 A	0.001 2 A + 0.006 93 A/A	
5 kHz to 10 kHz	0.33 A to 1.099 99 A	0.005 8 A + 0.028 9 A/A	
Equipment to Measure AC Current (at the listed frequencies) ^F			
10 Hz to 45 Hz	1.1 A to 2.999 99 A	0.000 21 A + 0.002 06 A/A	
45 Hz to 1 kHz	1.1 A to 2.999 99 A	0.000 35 A + 0.000 641 A/A	
1 kHz to 5 kHz	1.1 A to 2.999 99 A	0.001 2 A + 0.006 93 A/A	
5 kHz to 10 kHz	1.1 A to 2.999 99 A	0.005 8 A + 0.028 9 A/A	
Equipment to Measure AC Current (at the listed frequencies) ^F			
10 Hz to 45 Hz	3 A to 10.999 9 A	0.002 4 A + 0.000 69 A/A	
45 Hz to 1 kHz	3 A to 10.999 9 A	0.002 3 A + 0.001 15 A/A	
1 kHz to 5 kHz	3 A to 10.999 9 A	0.002 3 A + 0.034 6 A/A	
Equipment to Measure AC Current (at the listed frequencies) ^F			
45 Hz to 100 Hz	11 A to 20.5 A	0.005 8 A + 0.001 39 A/A	
100 Hz to 1 kHz	11 A to 20.5 A	0.005 8 A + 0.001 73 A/A	
1 kHz to 5 kHz	11 A to 20.5 A	0.005 8 A + 0.034 6 A/A	
Equipment to Output AC Current (at the listed frequencies) ^F			Fluke 8508A Reference Multi-meter
1 Hz to 10 Hz	0.06 μ A to 199.990 μ A	500 μ A/A + 0.02 μ A	
10 Hz to 10 kHz	0.06 μ A to 199.990 μ A	500 μ A/A + 0.02 μ A	
10 kHz to 30 kHz	0.06 μ A to 199.990 μ A	710 μ A/A + 0.02 μ A	
30 kHz to 100 kHz	0.06 μ A to 199.990 μ A	4 mA/A + 0.02 μ A	



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Equipment to Output AC Current (at the listed frequencies) ^F			Fluke 8508A Reference Multi-meter
1 Hz to 10 Hz	200 μ A to 1.999 900 mA	310 μ A/A + 0.2 μ A	
10Hz to 10 kHz	200 μ A to 1.999 900 mA	300 μ A/A + 0.2 μ A	
10 kHz to 30 kHz	200 μ A to 1.999 900 mA	710 μ A/A + 0.2 μ A	
30 kHz to 100 kHz	200 μ A to 1.999 900 mA	4 mA/A + 0.2 μ A	
Equipment to Output AC Current (at the listed frequencies) ^F			
1 Hz to 10 Hz	2 mA to 19.999 900 mA	310 μ A/A + 2 μ A	
10Hz to 10 kHz	2 mA to 19.999 900 mA	300 μ A/A + 2 μ A	
10 kHz to 30 kHz	2 mA to 19.999 900 mA	710 μ A/A + 2 μ A	
30 kHz to 100 kHz	2 mA to 19.999 900 mA	4 mA/A + 2 μ A	
Equipment to Output AC Current (at the listed frequencies) ^F			
1 Hz to 10 Hz	20 mA to 199.990 0 mA	310 μ A/A + 20 μ A	
10Hz to 10 kHz	20 mA to 199.990 0 mA	290 μ A/A + 20 μ A	
10 kHz to 30 kHz	20 mA to 199.990 0 mA	625 μ A/A + 20 μ A	
Equipment to Output AC Current (at the listed frequencies) ^F			
1 Hz to 10 Hz	200 mA to 1.999 900 A	620 μ A/A + 200 μ A	
10Hz to 10 kHz	200 mA to 1.999 900 A	735 μ A/A + 200 μ A	
10 kHz to 30 kHz	200 mA to 1.999 900 A	3 mA/A + 200 μ A	
Equipment to Output AC Current (at the listed frequencies) ^F			
1 Hz to 10 Hz	2 A to 19.999 00 A	820 μ A/A + 2 mA	
10Hz to 10 kHz	2 A to 19.999 00 A	2.5 mA/A + 2 mA	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple (Type B) ^F	600 °C to 800 °C	0.51 °C	Electrical Simulation of Thermocouple Output Fluke 5520A
	800.01 °C to 1 000 °C	0.4 °C	
	1 000.01 °C to 1 550 °C	0.35 °C	
	1 550.01 °C to 1 820 °C	0.39 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple (Type C) ^F	0 °C to 150 °C	0.35 °C	
	150.01 °C to 650 °C	0.3 °C	
	650.01 °C to 1 000 °C	0.36 °C	
	1 000.01 °C to 1 800 °C	0.58 °C	
	1 800.01 °C to 2 316 °C	0.97 °C	



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8100 Brownleigh Dr., #100A, Raleigh, NC 27617
 Contact Name: Frank Reagan Phone: 919-781-7787

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Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Temperature Calibration, Indication, and Control Equipment used with Thermocouple (Type E) ^F	-250 °C to -100 °C	0.58 °C	Electrical Simulation of Thermocouple Output Fluke 5520A
	-99.9 °C to -25 °C	0.19 °C	
	-24.99 °C to 350 °C	0.17 °C	
	350.01 °C to 650 °C	0.19 °C	
	650.01 °C to 1 000 °C	0.25 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple (Type J) ^F	-210 °C to -100 °C	0.27 °C	
	-100 °C to -30 °C	0.16 °C	
	-30 °C to 150 °C	0.14 °C	
	150 °C to 760 °C	0.17 °C	
	760 °C to 1200 °C	0.23 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple (Type K) ^F	-200 °C to -100 °C	0.39 °C	Fluke 5520A
	-99 °C to -25 °C	0.21 °C	
	-24.99 °C to 120 °C	0.19 °C	
	120.01 °C to 1 000 °C	0.3 °C	
	1 000.01 °C to 1 372 °C	0.47 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple (Type N) ^F	-200 °C to -100 °C	0.47 °C	
	-99.99 °C to -25 °C	0.26 °C	
	-24.99 °C to 120 °C	0.22 °C	
	120 .01°C to 410 °C	0.21 °C	
	410.01 °C to 1 300 °C	0.32 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple (Type R) ^F	0 °C to 250 °C	0.66 °C	
	250.01 °C to 400 °C	0.41 °C	
	400.01°C to 1 000 °C	0.39 °C	
	1 000 .01 °C to 1 767 °C	0.47 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple (Type S) ^F	0 °C to 250 °C	0.55 °C	
	250.01 °C to 1 000 °C	0.42 °C	
	1 000.01 °C to 1 400 °C	0.43 °C	
	1 400.01 °C to 1 767 °C	0.54 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple (Type T)	-250 °C to -150 °C	0.73 °C	
	-149.99 °C to 0 °C	0.28 °C	
	0 °C to 120 °C	0.19 °C	
	120.01 °C to 400 °C	0.17 °C	



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Temperature Calibration, Indication, and Control Equipment used with Thermocouple (Type U) ^F	-200 °C to 0 °C	0.65 °C	Fluke 5520A
	0.01 °C to 600 °C	0.32 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD (Pt 385) 100 Ω ^F	-200 °C to 0 °C	0.05 °C	
	0 °C to 100 °C	0.07 °C	
	100 °C to 300 °C	0.09 °C	
	300 °C to 400 °C	0.1 °C	
	400 °C to 630 °C	0.12 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD (Pt 3926) 100 Ω ^F	-200 °C to 0 °C	0.05 °C	
	0 °C to 100 °C	0.07 °C	
	100 °C to 300 °C	0.09 °C	
	300 °C to 400 °C	0.1 °C	
	400 °C to 630 °C	0.12 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD (Pt 3916) 100 Ω ^F	-200 °C to -190 °C	0.25 °C	Electrical Simulation of RTD Output Fluke 5500A- SC300 Calibrator
	-190 °C to -80 °C	0.04 °C	
	-80 °C to 0 °C	0.05 °C	
	0 °C to 100 °C	0.06 °C	
	100 °C to 260 °C	0.07 °C	
	260 °C to 300 °C	0.09 °C	
	300 °C to 400 °C	0.1 °C	
	400 °C to 600 °C	0.12 °C	
	600 °C to 630 °C	0.23 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD (Pt 385) 200 Ω ^F	-200 °C to 100 °C	0.04 °C	
	100 °C to 260 °C	0.05 °C	
	260 °C to 300 °C	0.12 °C	
	300 °C to 400 °C	0.13 °C	
	400 °C to 600 °C	0.14 °C	
	600 °C to 630 °C	0.16 °C	



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Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Temperature Calibration, Indication, and Control Equipment used with RTD (Pt 385) 500 Ω ^F	-200 °C to -80 °C	0.04 °C	Electrical Simulation of RTD Output Fluke 5500A- SC300 Calibrator
	-80 °C to 100 °C	0.05 °C	
	100 °C to 260 °C	0.06 °C	
	260 °C to 400 °C	0.08 °C	
	400 °C to 600 °C	0.09 °C	
	600 °C to 630 °C	0.11 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD (Pt 385) 1 000 Ω ^F	-190 °C to 0 °C	0.03 °C	
	0 °C to 100 °C	0.04 °C	
	100 °C to 260 °C	0.05 °C	
	260 °C to 300 °C	0.06 °C	
	300 °C to 600 °C	0.07 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD (Ni 385) 120 Ω ^F	-80 °C to 100 °C	0.08 °C	
	100 °C to 260 °C	0.14 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD (Cu 427) 10 Ω ^F	-100 °C to 260 °C	0.3 °C	
Volts ^F	1.8 mV to 105 V pk-pk	2.5 mV/V + 100 μ V	Fluke 5500A-SC300 Calibrator
Leveled Sine Wave - Flatness ^F	50 kHz Reference	20 mV/V + 200 μ V	
	50 kHz to 100 MHz	15 mV/V + 100 μ V	
	100 MHz to 300 MHz	20 mV/V + 100 μ V	
Time Markers ^F	2 ns to 1 μ s	0.002 5 % of reading	
	2 μ s to 50 μ s	0.002 5 % of reading + 0.015 T	
	100 μ s to 5 s	0.002 5 % of reading + 0.001 T	



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Mechanical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Measure Pressure ^F	-14.5 psig to -1 psig	0.000 07 psig/psig + 0.002 6 psig	Fluke 7250lp
	-30 inH ₂ O to -10 inH ₂ O	0.000 11 inH ₂ O /in inH ₂ O + 0.000 007 3 inH ₂ O	
	-10 inH ₂ O to 10 inH ₂ O	0.000 095 inH ₂ O / inH ₂ O + 0.000 13 inH ₂ O	
	10 inH ₂ O to 30 inH ₂ O	0.000 11 inH ₂ O / inH ₂ O + 0.000 007 3 inH ₂ O	
	1 psig to 25 psig	0.000 058 psig/psig + 0.000 17 psig	GE 3013-6 Dead Weight Tester
	25 psig to 500 psig	0.00016 psig/psig + 0.000 72 psig	Fluke 7250xi
	500 psig to 15 000 psig	0.1 % of reading	Ametek T-150
Torque Wrenches ^F	0.5 lbf•in to 5 lbf•in	1.0 % of reading	Mountz Indicator PTT-2000 w/ BMX250F Transducer
	5 lbf•in to 50 lbf•in	1.0 % of reading	
	50 lbf•in to 500 lbf•in	1.0 % of reading	
	50 lbf•ft to 250 lbf•ft	1.0 % of reading	
Pipettes and Repeaters ^{FO}	0.1 μ L to 2 μ L	0.020 8 μ L/ μ L + 0.017 μ L	Photometric using Artel PCS TM
	2 μ L to 10 μ L	0.001 23 μ L/ μ L + 0.056 μ L	
	10 μ L to 30 μ L	0.002 95 μ L/ μ L + 0.038 μ L	
	20 μ L to 200 μ L	0.002 04 μ L/ μ L + 0.089 μ L	Gravimetric Tare Addition with Moisture Trap
	200 μ L to 1 000 μ L	0.001 58 μ L/ μ L + 0.18 μ L	
	1 000 μ L to 5 000 μ L	0.001 79 μ L/ μ L + 0.76 μ L	
	5 000 μ L to 10 000 μ L	0.006 95 μ L/ μ L + 25 μ L	
	10 000 μ L to 20 000 μ L	0.006 02 μ L/ μ L + 16 μ L	
Equipment to Measure Flow ^F	2 sccm to 20 sccm	0.003 2 sccm/sccm + 0.000 29 sccm	Fluke Molbloc+ System
	20 sccm to 200 sccm	0.003 1 sccm/sccm + 0.057 sccm	
	300 sccm to 3 000 sccm	0.000 55 sccm/sccm + 4.2 sccm	
	3 slm to 50 slm	0.001 9 lm/lm + 0.002 5 lm	
	50 slm to 100 slm	0.003 2 slm/slm + 0.000 16 slm	
Equipment to Measure Pressure ^F	500 psig to 1 000 psig	0.000 13 + 0.000 118 psig/psig	Mensor CPC6050
	1 000 psig to 2 000 psig	0.16 + 0.000 116 psig/psig	Fluke PM600-A14M

Chemical

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Conductivity Meters ^F	18.18 M Ω -cm	0.27 M Ω -cm	Thornton 200CRw/ 240-201 Conductivity



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Accreditation is granted to the facility to perform the following calibrations:

Time & Frequency

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Stopwatches/Timers ^F	60 sec to 86 400 sec	0.038 sec	Fluke PM 6681 NIST 960-12 Totalized Method
	Up to 48 hours	0.05 sec/day	Timometer 4500
Equipment to Output Frequency ^F	0.001 Hz to 300 MHz	1.2×10^{-5} Hz/Hz	Fluke PM6681 Frequency Counter
Equipment to Measure Frequency ^F	10 MHz	4 parts in 10^{-10}	Quartzlock E8-X GPS Reference
	1 Pulse Per Second	4 parts in 10^{-10}	
	Up to 20 MHz	5 parts in 10^{-8}	HP 3325 A with GPS
	20 MHz to 300 MHz	5 parts in 10^{-8}	Fluke 5500A monitored with GPS disciplined Fluke PM 6681
	Up to 300 MHz	5 parts in 10^{-8}	GPS disciplines Fluke PM6681

Thermodynamic

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Temperature Measurement PRT ^F	-196 °C	0.01 °C	Hart 1575 Fluke 5699 Ultra-Bath
	-80 °C to 0 °C	0.007 4 °C – 0.000 088 °C/°C	Hark 1575A
	0 °C to 110 °C	0.007 4 °C + 0.000 028 3 °C/°C	Fluke 5699 Fluke 7381
	110 °C to 150 °C	0.011 °C + 0.000 040 4 °C/°C	Hark 1575A
	150 °C to 200 °C	0.026 °C + 0.000 111 °C/°C	Fluke 5699 Fluke 7341
	200 °C to 550 °C	0.002 8 °C + 0.000 035 °C/°C	Hart 1575 Fluke 5699 Ultra-Bath
Temperature Measurement Thermistor ^F	-40 °C to 140 °C	0.025 °C	Hart 1575 and Hart 5699 SPRT
	0.01 °C	0.005 °C	Triple Point of Water
Temperature Measurement LIG Thermometer ^F	-80 °C to 500 °C	0.025 °C	Hart 2560 and Hart 5628 SPRT
Temperature Measurement Thermocouple – Type T ^F	-196°C to 400 °C	0.25 °C	
Temperature Measurement Thermocouple Types J & K ^F	0°C to 600 °C	0.35 °C	



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Thermodynamic

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Equipment to Measure Humidity ^F	10 % RH to 95 % RH	0.5 % RH	Thunder Scientific 2500 Humidity Generator
Equipment to Measure Temperature ^F	-38.8344 °C	0.001 °C	ISO Tech Fixed Cell-Mercury
	156.5985 °C	0.002 °C	ISO Tech Fixed Cell-Indium
	419.527 °C	0.002 °C	ISO Tech Fixed Cell-Zinc

1. The CMC (Calibration and Measurement Capability) stated for calibrations included on this scope of accreditation represents the smallest measurement uncertainty attainable by the laboratory when performing a more or less routine calibration of a nearly ideal device under nearly ideal conditions. It is typically expressed at a confidence level of 95 % using a coverage factor k (usually equal to 2). The actual measurement uncertainty associated with a specific calibration performed by the laboratory will typically be larger than the CMC for the same calibration since capability and performance of the device being calibrated and the conditions related to the calibration may reasonably be expected to deviate from ideal to some degree.
2. The laboratories range of calibration capability for all disciplines for which they are accredited is the interval from the smallest calibrated standard to the largest calibrated standard used in performing the calibration. The low end of this range must be an attainable value for which the laboratory has or has access to the standard referenced. Verification of an indicated value of zero in the absence of a standard is common practice in the procedure for many calibrations but by its definition it does not constitute calibration of zero capacity.
3. The presence of a superscript F means that the laboratory performs calibration of the indicated parameter at its fixed location. Example: Outside Micrometer^F would mean that the laboratory performs this calibration at its fixed location.
4. The presence of a superscript FO means that the laboratory performs calibration of the indicated parameter both at its fixed location and onsite at customer locations. Example: Outside Micrometer^{FO} would mean that the laboratory performs this calibration at its fixed location and onsite at customer locations.
5. Measurement uncertainties obtained for calibrations performed at customer sites can be expected to be larger than the measurement uncertainties obtained at the laboratories fixed location for similar calibrations. This is due to the effects of transportation of the standards and equipment and upon environmental conditions at the customer site which are typically not controlled as closely as at the laboratories fixed location.
6. The term T represents time in s (seconds).