



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Benchmark Calibration Lab
2450 S. Laurel Avenue, Sanford, FL 32771

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

**ISO/IEC 17025:2017
& Meets the Requirements of ANSI/NCSI Z540.1-1994
& ANSI/NCSI Z540.3-2006 subclause 5.3**

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):

Electrical 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

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

<i>Initial Accreditation Date:</i>	<i>Issue Date:</i>	<i>Expiration Date:</i>
September 18, 2011	December 19, 2019	December 31, 2021
<i>Accreditation No.:</i>	<i>Certificate No.:</i>	
60551	L19-625	

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.pjlab.com.



Certificate of Accreditation: Supplement

Benchmark Calibration Lab

2450 S. Laurel Avenue, Sanford, FL 32771
 Contact Name: Jeff Reschke Phone: 407-328-0772

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

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
Equipment to Measure DC Voltage ^F	68 μ V to 329.999 9 mV	3 μ V + 0.006 % of reading	Fluke 5500A
	500 μ V to 3.299 999 V	5 μ V + 0.005 % of reading	
	5 mV to 32.999 99 V	50 μ V + 0.005 % of reading	
	30 V to 329.999 9 V	500 μ V + 0.005 5 % of reading	
	100 V to 102 V	1 500 μ V + 0.005 5 % of reading	
Equipment to Measure DC Current ^F	1.5 μ A to 3.299 99 mA	0.05 μ A + 0.13 % of reading	
	165 μ A to 32.999 9 mA	0.25 μ A + 0.01 % of reading	
	110 μ A to 329.999 mA	3.3 μ A + 0.01 % of reading	
	800 μ A to 2.199 99A	44 μ A + 0.03 % of reading	
	21 mA to 11 A	330 μ A + 0.06 % of reading	
Equipment to Measure Resistance ^F	28 m Ω to 10.99 Ω	0.008 Ω + 0.012 % of reading	
	11 Ω to 32.999 Ω	0.015 Ω + 0.012 % of reading	
	33 Ω to 109.999 Ω	0.015 Ω + 0.009 % of reading	
	110 Ω to 329.999 Ω	0.015 Ω + 0.009 % of reading	
	330 Ω to 1.099 99 k Ω	0.06 Ω + 0.009 % of reading	
	1.1 k Ω to 3.299 99 k Ω	0.06 Ω + 0.009 % of reading	
	3.3 k Ω to 10.999 9 k Ω	0.6 Ω + 0.009 % of reading	
	33 k Ω to 32.999 k Ω	0.6 Ω + 0.009 % of reading	
	33 k Ω to 109.999 k Ω	6 Ω + 0.011 % of reading	
	110 k Ω to 329.999 k Ω	6 Ω + 0.012 % of reading	
	330 k Ω to 1.099 99 M Ω	55 Ω + 0.015 % of reading	
	1.1 M Ω to 3.299 99 M Ω	55 Ω + 0.06 % of reading	
	3.3 M Ω to 10.999 9 M Ω	550 Ω + 0.1 % of reading	
	11 M Ω to 32.999 9 M Ω	550 Ω + 0.5 % of reading	
	33 M Ω to 109.999 M Ω	5 500 Ω + 0.5 % of reading	
110 M Ω to 330 M Ω	16 500 Ω + 0.5 % of reading		
Equipment to Output DC Voltage ^F	10 mV to 100 mV	0.5 μ V + 0.006 4 % of reading	HP 3458A opt 02
	100 mV to 1 V	0.3 μ V + 0.002 % of reading	
	1 V to 10 V	0.5 μ V + 0.002 % of reading	
	10 V to 100 V	30 μ V + 0.003 2 % of reading	
	100 V to 1 000 V	100 μ V + 0.003 2 % of reading	



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Equipment to Output DC Current ^F	0.1 μ A to 1 μ A	0.024 % of reading	HP 3458A opt 02
	1 μ A to 10 μ A	0.012 % of reading	
	10 μ A to 100 μ A	0.011 2 % of reading	
	100 μ A to 1 mA	0.01 % of reading	
	1 mA to 10 mA	0.01 % of reading	
	10 mA to 100 mA	0.016 % of reading	
	100 mA to 1 A	0.048 % of reading	
Equipment to Output Resistance ^F	0.1 Ω to 10 Ω	0.008 5 % of reading	HP 3458A opt 02 – 4 wire
	10 Ω to 100 Ω	0.007 5 % of reading	
	100 Ω to 1 k Ω	0.004 5 % of reading	
	1 k Ω to 10 k Ω	0.004 5 % of reading	
	10 k Ω to 100 k Ω	0.004 5 % of reading	
	100 k Ω to 1 M Ω	0.007 5 % of reading	
	1 M Ω to 10 M Ω	0.024 % of reading	
	10 M Ω to 100 M Ω	0.212 % of reading	
Equipment to Measure Capacitance ^F	0.33 nF to 0.499 9 nF	0.01 nF + 0.5 % of reading	Fluke 5500A
	0.5 nF to 1.099 9 nF	0.01 nF + 0.5 % of reading	
	1.1 nF to 3.299 9 nF	0.01 nF + 0.5 % of reading	
	3.3 nF to 10.999 nF	0.01 nF + 0.5 % of reading	
	11 nF to 32.999 nF	0.1 nF + 0.25 % of reading	
	33 nF to 109.99 nF	0.1 nF + 0.25 % of reading	
	110 nF to 329.99 nF	0.3 nF + 0.25 % of reading	
	0.33 nF to 1.099 9 μ F	1 nF + 0.25 % of reading	
	1.1 nF to 3.299 9 μ F	3 nF + 0.35 % of reading	
	3.3 nF to 10.999 μ F	10 nF + 0.35 % of reading	
	11 nF to 32.999 μ F	30 nF + 0.4 % of reading	
	33 nF to 109.99 μ F	100 nF + 0.5 % of reading	
	110 nF to 329.99 μ F	300 nF + 0.7 % of reading	
	330 nF to 1.1 mF	300 nF + 1 % of reading	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type B ^F	600 $^{\circ}$ C to 800 $^{\circ}$ C	0.44 $^{\circ}$ C	Electrical Simulation of Thermocouple Output Fluke 5500A
	800 $^{\circ}$ C to 1 000 $^{\circ}$ C	0.34 $^{\circ}$ C	
	1 000 $^{\circ}$ C to 1 550 $^{\circ}$ C	0.3 $^{\circ}$ C	
	1 550 $^{\circ}$ C to 1 820 $^{\circ}$ C	0.33 $^{\circ}$ C	



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Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type C ^F	0 °C to 150 °C	0.30 °C	Electrical Simulation of Thermocouple Output Fluke 5500A
	150 °C to 650 °C	0.26 °C	
	650 °C to 1 000 °C	0.31 °C	
	1 000 °C to 1 800 °C	0.5 °C	
	1 800 °C to 2 316 °C	0.84 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type E ^F	-250 °C to -100 °C	0.50 °C	
	-100 °C to -25 °C	0.16 °C	
	-25 °C to 350 °C	0.14 °C	
	350 °C to 650 °C	0.16 °C	
	650 °C to 1 000 °C	0.21 °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 1 200 °C	0.23 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type K ^F	-200 °C to -100 °C	0.33 °C	
	-100 °C to -25 °C	0.18 °C	
	-25 °C to 120 °C	0.16 °C	
	120 °C to 1 000 °C	0.26 °C	
	1 000 °C to 1 372 °C	0.4 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type L ^F	-200 °C to -100 °C	0.37 °C	
	-100 °C to 800 °C	0.26 °C	
	800 °C to 900 °C	0.17 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type N ^F	-200 °C to -100 °C	0.4 °C	
	-100 °C to -25 °C	0.22 °C	
	-25 °C to 120 °C	0.18 °C	
	120 °C to 410 °C	0.18 °C	
	410 °C to 1 300 °C	0.27 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type R ^F	0 °C to 250 °C	0.57 °C	
	250 °C to 400 °C	0.35 °C	
	400 °C to 1 000 °C	0.33 °C	
	1 000 °C to 1 767 °C	0.4 °C	



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Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type S ^F	0 °C to 250 °C	0.47 °C	Electrical Simulation of Thermocouple Output Fluke 5500A
	250 °C to 400 °C	0.36 °C	
	400 °C to 1 000 °C	0.37 °C	
	1 000 °C to 1 767 °C	0.46 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type T ^F	-250 °C to -150 °C	0.63 °C	
	-150 °C to 0 °C	0.24 °C	
	0 °C to 120 °C	0.16 °C	
	120 °C to 400 °C	0.14 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type U ^F	-200 °C to -150 °C	0.56 °C	
	0 °C to 600 °C	0.27 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 385, 100 Ω^F	-200 °C to -80 °C	0.05 °C	
	-80 °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	
	630 °C to 800 °C	0.23 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 3926, 100 Ω^F	-200 °C to -80 °C	0.05 °C	
	-80 °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 Type Pt 3916, 100 Ω^F	-200 °C to -190 °C	0.25 °C	
	-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	0.08 °C	
	300 °C to 400 °C	0.09 °C	
	400 °C to 600 °C	0.1 °C	
	600 °C to 630 °C	0.23 °C	



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Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 385, 200 Ω^F	-200 °C to -80 °C	0.04 °C	Electrical Simulation of Thermocouple Output Fluke 5500A
	-80 °C to 0 °C	0.04 °C	
	0 °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	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 385, 500 Ω^F	-200 °C to -80 °C	0.04 °C	
	-80 °C to 0 °C	0.05 °C	
	0 °C to 100 °C	0.05 °C	
	100 °C to 260 °C	0.06 °C	
	260 °C to 300 °C	0.08 °C	
	300 °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 Type Pt 385, 1000 Ω^F	-200 °C to -80 °C	0.03 °C	
	-80 °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 400 °C	0.07 °C	
	400 °C to 600 °C	0.07 °C	
	600 °C to 630 °C	0.23 °C	
Temp. Calibration, Indication, and Control Equipment used with RTD Type Pt Ni 385, 120 Ω (Ni 120) ^F	-80 °C to 0 °C	0.08 °C	
	0 °C to 100 °C	0.08 °C	
	100 °C to 260 °C	0.14 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Cu 427, 10 Ω^F	-100 °C to 260 °C	0.3 °C	



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Equipment to Measure AC Current At the listed Frequencies ^F			Fluke 5500A
10 Hz to 45 Hz	1.0 mV to 32.999 mV	20 μ V + 0.35 % of reading	
45 Hz to 10 kHz	1.0 mV to 32.999 mV	20 μ V + 0.15 % of reading	
10 kHz to 20 kHz	1.0 mV to 32.999 mV	20 μ V + 0.2 % of reading	
20 kHz to 50 kHz	1.0 mV to 32.999 mV	20 μ V + 0.25 % of reading	
50 kHz to 100 kHz	1.0 mV to 32.999 mV	33 μ V + 0.35 % of reading	
100 kHz to 500 kHz	1.0 mV to 32.999 mV	60 μ V + 1 % of reading	
Equipment to Measure AC Current At the listed Frequencies ^F			
10 Hz to 45 Hz	33 mV to 329.999 mV	50 μ V + 0.25 % of reading	
45 Hz to 10 kHz	33 mV to 329.999 mV	20 μ V + 0.05 % of reading	
10 kHz to 20 kHz	33 mV to 329.999 mV	20 μ V + 0.1 % of reading	
20 kHz to 50 kHz	33 mV to 329.999 mV	40 μ V + 0.16 % of reading	
50 kHz to 100 kHz	33 mV to 329.999 mV	170 μ V + 0.24 % of reading	
100 kHz to 500 kHz	33 mV to 329.999 mV	330 μ V + 0.7 % of reading	
Equipment to Measure AC Current At the listed Frequencies ^F			
10 Hz to 45 Hz	0.33 V to 3.299 99 V	250 μ V + 0.15 % of reading	
45 Hz to 10 kHz	0.33 V to 3.299 99 V	60 μ V + 0.03 % of reading	
10 kHz to 20 kHz	0.33 V to 3.299 99 V	60 μ V + 0.08 % of reading	
20 kHz to 50 kHz	0.33 V to 3.299 99 V	300 μ V + 0.14 % of reading	
50 kHz to 100 kHz	0.33 V to 3.299 99 V	1 700 μ V + 0.24 % of reading	
100 kHz to 500 kHz	0.33 V to 3.299 99 V	3 300 μ V + 0.5 % of reading	
Equipment to Measure AC Current At the listed Frequencies ^F			
10 Hz to 45 Hz	3.3 V to 32.999 9 V	2 500 μ V + 0.15 % of reading	
45 Hz to 10 kHz	3.3 V to 32.999 9 V	600 μ V + 0.04 % of reading	
10 kHz to 20 kHz	3.3 V to 32.999 9 V	2 600 μ V + 0.08 % of reading	
20 kHz to 50 kHz	3.3 V to 32.999 9 V	5 000 μ V + 0.19 % of reading	
50 kHz to 100 kHz	3.3 V to 32.999 9 V	17 000 μ V + 0.24 % of reading	



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Equipment to Measure AC Current At the listed Frequencies ^F			Fluke 5500A
45 Hz to 1 kHz	33 V to 329.999 V	6.6 mV + 0.05 % of reading	
1 kHz to 10 kHz	33 V to 329.999 V	15 mV + 0.08 % of reading	
10 kHz to 20 kHz	33 V to 329.999 V	33 mV + 0.09 % of reading	
Equipment to Measure AC Current At the listed Frequencies ^F			
45 Hz to 1 kHz	330 V to 102 00 V	80 mV + 0.05 % of reading	
1 kHz to 5 kHz	330 V to 102 00 V	100 mV + 0.2 % of reading	
5 kHz to 10 kHz	330 V to 102 00 V	500 mV + 0.2 % of reading	
Equipment to Measure AC Current At the listed Frequencies ^F			
10 Hz to 20 Hz	30 μ A to 329.99 μ A	0.15 μ A + 0.25 % of reading	
20 Hz to 45 Hz	30 μ A to 329.99 μ A	0.15 μ A + 0.125 % of reading	
45 Hz to 1 kHz	30 μ A to 329.99 μ A	0.15 μ A + 0.125 % of reading	
1 kHz to 5 kHz	30 μ A to 329.99 μ A	0.15 μ A + 0.4 % of reading	
5 kHz to 10 kHz	30 μ A to 329.99 μ A	0.15 μ A + 1.25 % of reading	
Equipment to Measure AC Current At the listed Frequencies ^F			
10 Hz to 20 Hz	0.33 mA to 3.299 9 mA	0.3 μ A + 0.2 % of reading	
20 Hz to 45 Hz	0.33 mA to 3.299 9 mA	0.3 μ A + 0.1 % of reading	
45 Hz to 1 kHz	0.33 mA to 3.299 9 mA	0.3 μ A + 0.1 % of reading	
1 kHz to 5 kHz	0.33 mA to 3.299 9 mA	0.3 μ A + 0.2 % of reading	
5 kHz to 10 kHz	0.33 mA to 3.299 9 mA	0.3 μ A + 0.6 % of reading	
Equipment to Measure AC Current At the listed Frequencies ^F			
10 Hz to 20 Hz	3.3 mA to 32.999 mA	3 μ A + 0.2 % of reading	
20 Hz to 45 Hz	3.3 mA to 32.999 mA	3 μ A + 0.1 % of reading	
45 Hz to 1 kHz	3.3 mA to 32.999 mA	3 μ A + 0.09 % of reading	
1 kHz to 5 kHz	3.3 mA to 32.999 mA	3 μ A + 0.2 % of reading	
5 kHz to 10 kHz	3.3 mA to 32.999 mA	3 μ A + 0.6 % of reading	



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Equipment to Measure AC Current At the listed Frequencies ^F			Fluke 5500A
10 Hz to 20 Hz	33 mA to 329.99 mA	30 μ A + 0.2 % of reading	
20Hz to 45 Hz	33 mA to 329.99 mA	30 μ A + 0.1 % of reading	
45 Hz to 1 kHz	33 mA to 329.99 mA	30 μ A + 0.09 % of reading	
1 kHz to 5 kHz	33 mA to 329.99 mA	30 μ A + 0.2 % of	
5 kHz to 10 kHz	33 mA to 329.99 mA	300 μ A + 0.06 % of reading	
Equipment to Measure AC Current At the listed Frequencies ^F			
10 Hz to 45 Hz	0.33 A to 2.199 99 A	300 μ A + 0.2 % of reading	
45 Hz to 1 kHz	0.33 A to 2.199 99 A	300 μ A + 0.1 % of reading	
1 kHz to 5 kHz	0.33 A to 2.199 99 A	300 μ A + 0.75 % of reading	
Equipment to Measure AC Current At the listed Frequencies ^F			
45 Hz to 65 Hz	2.2 A to 11 A	2 000 nA + 0.6 % of reading	
65 Hz to 500 Hz	2.2 A to 11 A	2 000 nA + 0.1 % of reading	
500 Hz to 1 kHz	2.2 A to 11 A	2 000 nA + 0.33 % of reading	
Equipment to Output AC Current At the listed Frequencies ^F			HP 3458A Opt 02
10 Hz to 20 Hz	5 μ A to 100 μ A	30 nA + 0.04 % of reading	
20 Hz to 45 Hz	5 μ A to 100 μ A	30 nA + 0.15 % of reading	
45 Hz to 100 Hz	5 μ A to 100 μ A	30 nA + 0.06 % of reading	
100 Hz to 1 kHz	5 μ A to 100 μ A	0.2 μ A + 0.06 % of reading	
Equipment to Output AC Current At the listed Frequencies ^F			
10 Hz to 20 Hz	100 μ A to 1 mA	0.2 μ A + 0.4 % of reading	
20 Hz to 45 Hz	100 μ A to 1 mA	0.2 μ A + 0.15 % of reading	
45 Hz to 100 Hz	100 μ A to 1 mA	0.2 μ A + 0.06 % of reading	
100 Hz to 5 kHz	100 μ A to 1 mA	0.2 μ A + 0.03 % of reading	
5 kHz to 20 kHz	100 μ A to 1 mA	0.2 μ A + 0.06 % of reading	
20 kHz to 50 kHz	100 μ A to 1 mA	0.4 μ A + 0.4 % of reading	
50 kHz to 100 kHz	100 μ A to 1 mA	1.5 μ A + 0.55 % of reading	



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Equipment to Output AC Current At the listed Frequencies ^F			HP 3458A Opt 02
10 Hz to 20 Hz	1 mA to 10 mA	2 μ A + 0.4 % of reading	
20 Hz to 45 Hz	1 mA to 10 mA	2 μ A + 0.15 % of reading	
45 Hz to 100 Hz	1 mA to 10 mA	2 μ A + 0.06 % of reading	
100 Hz to 5 kHz	1 mA to 10 mA	2 μ A + 0.03 % of reading	
5 kHz to 20 kHz	1 mA to 10 mA	2 μ A + 0.06 % of reading	
20 kHz to 50 kHz	1 mA to 10 mA	4 μ A + 0.4 % of reading	
50 kHz to 100 kHz	1 mA to 10 mA	15 μ A + 0.55 % of reading	
Equipment to Output AC Current At the listed Frequencies ^F			
10 Hz to 20 Hz	10 mA to 100 mA	20 μ A + 0.4 % of reading	
20 Hz to 45 Hz	10 mA to 100 mA	20 μ A + 0.15 % of reading	
45 Hz to 100 Hz	10 mA to 100 mA	20 μ A + 0.06 % of reading	
100 Hz to 5 kHz	10 mA to 100 mA	20 μ A + 0.03 % of reading	
5 kHz to 20 kHz	10 mA to 100 mA	40 μ A + 0.06 % of reading	
20 kHz to 50 kHz	10 mA to 100 mA	150 μ A + 0.4 % of reading	
50 kHz to 100 kHz	10 mA to 100 mA	20 μ A + 0.55 % of reading	
Equipment to Output AC Current At the listed Frequencies ^F			
10 Hz to 20 Hz	100 mA to 1 A	200 μ A + 0.4 % of reading	
20 Hz to 45 Hz	100 mA to 1 A	200 μ A + 0.16 % of reading	
45 Hz to 100 Hz	100 mA to 1 A	200 μ A + 0.08 % of reading	
100 Hz to 5 kHz	100 mA to 1 A	200 μ A + 0.1 % of reading	
5 kHz to 20 kHz	100 mA to 1 A	200 μ A + 0.3 % of reading	
20 kHz to 50 kHz	100 mA to 1 A	400 μ A + 1 % of reading	
Equipment to Output AC Voltage At the listed Frequencies ^F			
1 Hz to 40 Hz	10 mV to 100 mV	4 μ V + 0.028 % of reading	
40 Hz to 1 000 Hz	10 mV to 100 mV	2 μ V + 0.028 % of reading	
1 kHz to 20 kHz	10 mV to 100 mV	2 μ V + 0.056 % of reading	
20 kHz to 50 kHz	10 mV to 100 mV	2 μ V + 0.12 % of reading	
50 kHz to 100 kHz	10 mV to 100 mV	2 μ V + 0.32 % of reading	
100 kHz to 300 kHz	10 mV to 100 mV	10 μ V + 1.2 % of reading	
300 kHz to 1 MHz	10 mV to 100 mV	10 μ V + 4 % of reading	
1 MHz to 2 MHz	10 mV to 100 mV	10 μ V + 6 % of reading	



Certificate of Accreditation: Supplement

Benchmark Calibration Lab

2450 S. Laurel Avenue, Sanford, FL 32771
 Contact Name: Jeff Reschke Phone: 407-328-0772

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

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
Equipment to Output AC Voltage At the listed Frequencies ^F			HP 3458A Opt 02
1 Hz to 40 Hz	100 mV to 1 V	40 μ V + 0.028 % of reading	
40 Hz to 1 000 Hz	100 mV to 1 V	20 μ V + 0.028 % of reading	
1 kHz to 20 kHz	100 mV to 1 V	20 μ V + 0.056 % of reading	
20 kHz to 50 kHz	100 mV to 1 V	20 μ V + 0.12 % of reading	
50 kHz to 100 kHz	100 mV to 1 V	20 μ V + 0.32 % of reading	
100 kHz to 300 kHz	100 mV to 1 V	100 μ V + 1.2 % of reading	
300 kHz to 1 MHz	100 mV to 1 V	100 μ V + 4 % of reading	
1 MHz to 2 MHz	100 mV to 1 V	100 μ V + 6 % of reading	
Equipment to Output AC Voltage At the listed Frequencies ^F			
1 Hz to 40 Hz	1 V to 10 V	0.4 mV + 0.028 % of reading	
40 Hz to 1 000 Hz	1 V to 10 V	0.2 mV + 0.028 % of reading	
1 kHz to 20 kHz	1 V to 10 V	0.2 mV + 0.056 % of reading	
20 kHz to 50 kHz	1 V to 10 V	0.2 mV + 0.12 % of reading	
50 kHz to 100 kHz	1 V to 10 V	0.2 mV + 0.32 % of reading	
100 kHz to 300 kHz	1 V to 10 V	1 mV + 1.2 % of reading	
300 kHz to 1MHz	1 V to 10 V	1 mV + 4 % of reading	
1 MHz to 2 MHz	1 V to 10 V	1 mV + 6 % of reading	
Equipment to Output AC Voltage At the listed Frequencies ^F			
1 Hz to 40 Hz	10 V to 100 V	4 mV + 0.08 % of reading	
40 Hz to 1 000 Hz	10 V to 100 V	2 mV + 0.08 % of reading	
1 kHz to 20 kHz	10 V to 100 V	2 mV + 0.08 % of reading	
20 kHz to 50 kHz	10 V to 100 V	2 mV + 0.14 % of reading	
50 kHz to 100 kHz	10 V to 100 V	2 mV + 0.48 % of reading	
100 kHz to 300 kHz	10 V to 100 V	10 mV + 1.6 % of reading	
300 kHz to 1 MHz	10 V to 100 V	10 mV + 6 % of reading	



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Equipment to Output AC Voltage At the listed Frequencies ^F			HP 3458A Opt 02
1 Hz to 40 Hz	100 V to 1 000 V	4 mV + 0.16 % of reading	
40 Hz to 1 000 Hz	100 V to 1 000 V	2 mV + 0.16 % of reading	
1 kHz to 20 kHz	100 V to 1 000 V	2 mV + 0.24 % of reading	
20 kHz to 50 kHz	100 V to 1 000 V	2 mV + 0.48 % of reading	
50 kHz to 100 kHz	100 V to 1 000 V	2 mV + 1.2 % of reading	

1. The CMC (Calibration and Measurement Capability) stated for calibrations included on this scope of accreditation represent the smallest measurement uncertainties attainable by the laboratory when performing a more or less routine calibration of a nearly ideal device under nearly ideal conditions. It is 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.