PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Calibration Specialty, Inc.

2500 E. Grauwyler Road, Irving, TX 75061

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

ISO/IEC 17025:2017

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 and Mechanical 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

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

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
February 27, 2014	January 08, 2024	February 28, 2026

Accreditation No.:	*Certificate No.:*
74313	L24-23

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.pjlabs.com

Certificate of Accreditation: Supplement

Calibration Specialty, Inc.
2500 E. Grauwyler Road. Irving, TX 75061
Contact Name: Phil Nordquist Phone: 972-438-3774

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 (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Gage Blocks [F]	0.01 in to 0.05 in	2.2 µin	Mahr Federal 130B-24 Gage Block Comparator Master Gage Blocks 33K6-4-1-1
	0.05 in to 4 in	(3.3 + 1.3L) µin	
	4 in to 10 in	(0.89 + 1.9L) µin	Edmunds TOL 2200 Twin Head Gage Block Comparator 33K6-4-1-1
	10 in to 20 in	(1.9 + 1.9L) µin	
Cylindrical Gages [F]	up to 1 in	41 µin	P & W Model C Supermicrometer 33K6-4-121-1
Ring Gages [F]	0.125 in to 12 in	(12 + 2L) µin	Sheffield N-9 Ring Gage Comparator 33K6-4-2-1
Digital/Dial Indicators [FO]	up to 1 in	(38 + 0.91L) µin	P & W Model C Supermicrometer NA17-20MD-11
	1 in to 10 in	(74 + 9.2L) µin	Surface Plate and Gage Blocks NA17-20MD-11
Calipers [FO]	up to 36 in	(410 + 6L) µin	Gage Blocks Long Blocks 33K6-4-552-1
Micrometers [FO]	up to 36 in	(31 + 10L) µin	Gage Blocks Long Blocks NA17-20MD-06
Thread Plugs – Pitch Diameter [F]	0.001 in to 6 in	81 µin	Supermicrometer and Thread wires 33K6-4-203-1
Threads Plugs – Major Diameter [F]	0.001 in to 6 in	47 µin	

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Mechanical

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Absolute Pneumatic pressure gauge [FO]	0.2 psia to 50 psia	0.002 6 % + 0.000 9 psia	Ruska 2465 A (2465-725 & 2465-799) (2465-729 & 2465-799) 33K6-4-427-1
Pneumatic pressure gauge [FO]	0.2 psig to 50 psig	0.002 6 % + 0.000 86 psig	
	2 psig to 1 000 psig	0.002 6 % + 0.000 83 psig	
Hydraulic pressure gauge [FO]	6 psig to 2 417 psig	0.006 8 % + 0.014 psig	Ruska 2400 A (2400 -736 & 2402) (2400 -735 & 2402) 33K6-4-427-1
	30 psig to 12 140 psig	0.005 7 % + 0.033 psig	
Hydraulic pressure gauge [FO]	5 000 psi to 20 000 psi	(0.05 % + 1.0) psi	Additel 672 33K6-4-427-1
	10 000 psi to 40 000 psi	(0.10 % + 1.0) psi	
Torque Wrench [FO]	4 lbf•in to 50 lbf-in	1.2 % + 0.071 lbf-in	Torque Calibration System 33K6-4-2193-1
	30 lbf•in to 400 lbf-in	0.37 % + 0.44 lbf-in	
	80 lbf•in to 1 000 lbf-in	0.56 % + 0.79 lbf-in	
	20 lbf•ft to 250 lbf-ft	0.47 % + 0.28 lbf-ft	
	60 lbf•ft to 600 lbf-ft	0.29 % + 0.57 lbf-ft	
	200 lbf•ft to 2 000 lbf-ft	0.56 % + 1.2 lbf-ft	
	10 lbf•in to 100 lbf-in	0.39 % + 0.26 lbf-in	Torque Calibration System 33K6-4-3015-1
	120 lbf•in to 1 200 lbf-in	0.53 % + 0.56 lbf-in	
	200 lbf•ft to 2 000 lbf-ft	0.27 % + 0.61 lbf-ft	
Torque Analyzer/Tester [FO]	10 ozf-in to 110 ozf-in	0.13% + 0.05 ozf-in	2-1/2” Wheel 5” Wheel 10” Butterfly 40” Arm Class F weights NA17-20MU-03
	20 lbf•in to 200 lbf-in	0.18% + 0.31 lbf-in	
	25 lbf•ft to 250 lbf-ft	0.18% + 0.71 lbf-ft	
	200 lbf•ft to 2 000 lbf-ft	0.19% + 1.2 lbf-ft	

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Electrical

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Equipment to Measure DC Voltage [FO]	Up to 329.999 mV	20 µV/V + 1 µV	Fluke 5522A Fluke Automated MetCal
	0.33 V to 3.2999 99 V	11 µV/V + 2 µV	
	3.3 V to 32.999 99 V	12 µV/V + 20 µV	
	33 V to 339.999 9 V	18 µV/V + 0.15 mV	
	340 V to 1 020 V	18 µV/V + 1.5 mV	
Equipment to Measure DC Current [FO]	Up to 329.99 µV	0.15 mA/A + 20 nA	
	330 µV to 3.299 99 mA	0.1 mA/A + 50 nA	
	3.3 mA to 32.999 9 mA	0.1 mA/A + 0.25 µA	
	33 mA to 329.999 mA	0.1 mA/A + 2.5 µA	
	0.33 A to 1.099 99 A	0.2 mA/A + 40 µA	
	1.1 A to 2.999 99 A	0.38 mA/A + 40 µA	
	3 A to 10.999 9 A	0.5 mA/A + 0.5 mA	
	11 A to 20.5 A	1 mA/A + 0.75 mA	
Equipment to Measure Resistance [FO]	Up to to 10.999 9 Ω	40 µΩ/Ω + 1 mΩ	
	11 Ω to 32.999 9 Ω	30 µΩ/Ω + 1.5 mΩ	
	33 Ω to 109.999 Ω	28 µΩ/Ω + 1.4 mΩ	
	110 Ω to 329.999 9 Ω	28 µΩ/Ω + 2 mΩ	
	330 Ω to 1 099.999 Ω	28 µΩ/Ω + 2 mΩ	
	1.1 kΩ to 3.299 999 kΩ	28 µΩ/Ω + 20 mΩ	
	3.3 kΩ to 10.999 99 kΩ	28 µΩ/Ω + 20 mΩ	
	11 kΩ to 32.999 99 kΩ	28 µΩ/Ω + 0.2 Ω	
	33 kΩ to 109.999 9 kΩ	28 µΩ/Ω + 0.2 Ω	
	110 kΩ to 329.999 9	32 µΩ/Ω + 2	
	330 kΩ to 1 099.99 kΩ	32 µΩ/Ω + 2 Ω	
	1.1 MΩ to 3.299 999 MΩ	60 µΩ/Ω + 30 Ω	
	3.3 MΩ to 10.999 99 MΩ	0.13 mΩ/Ω + 50 Ω	
	11 MΩ to 32.999 99 MΩ	0.25 mΩ/Ω + 2.5 kΩ	
	33 MΩ to 109.999 9 MΩ	0.5 mΩ/Ω + 3 kΩ	
	110 MΩ to 329.999 9 MΩ	3 mΩ/Ω + 0.1 MΩ	
	330 MΩ to 1 100 MΩ	15 mΩ/Ω + 0.5 MΩ	
Equipment to Measure Thermocouple Type B [FO]	600 °C to 800 °C	0.44 °C	
	800 °C to 1000 °C	0.34 °C	
	1 000 °C to 1 550 °C	0.3 °C	
	1 550 °C to 1 820 °C	0.33 °C	

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Equipment to Measure Thermocouple Type C [FO]	Up to 150 °C	0.3 °C	Fluke 5522A Fluke Automated MetCal
	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	
Equipment to Measure Thermocouple Type E [FO]	-240 °C to -100 °C	0.5 °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	
Equipment to Measure Thermocouple Type K [FO]	-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	
Equipment to Measure Thermocouple Type L [FO]	-200 °C to -100 °C	0.37 °C	
	-100 °C to 800 °C	0.26 °C	
	800 °C to 900 °C	0.17 °C	
Equipment to Measure Thermocouple Type N [FO]	-200 °C to -100 °C	0.4 °C	
	-100 °C to -25 °C	0.22 °C	
	-25 °C to 120 °C	0.19 °C	
	120 °C to 410 °C	0.18 °C	
	410 °C to 1 300 °C	0.27 °C	
Equipment to Measure Thermocouple Type R [FO]	Up 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	
Equipment to Measure Thermocouple Type S [FO]	Up to 250 °C	0.47 °C	
	250 °C to 1 000 °C	0.36 °C	
	1 000 °C to 1 400 °C	0.37 °C	
	1 400 °C to 1 767 °C	0.46 °C	

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Equipment to Measure Thermocouple Type T [FO]	-250 °C to -150 °C	0.63 °C	Fluke 5522A Fluke Automated MetCal
	-150 °C to 0 °C	0.24 °C	
	Up to 120 °C	0.16 °C	
	120 °C to 400 °C	0.14 °C	
Equipment to Measure Thermocouple Type U [FO]	-200 °C to 0 °C	0.56 °C	
	Up to 600 °C	0.27 °C	
Equipment to Measure AC Voltage (Sine Wave) (at the listed frequencies) [FO]			
10 Hz to 45 Hz	1 mV to 32.999 mV	0.8 mV/V + 6 µV	
45 Hz to 10 kHz	1 mV to 32.999 mV	0.15 mV/V +6 µV	
10 kHz to 20 kHz	1 mV to 32.999 mV	0.2 mV/V + 6 µV	
20 kHz to 50 kHz	1 mV to 32.999 mV	1 mV/V + 6 µV	
50 kHz to 100 kHz	1 mV to 32.999 mV	3.5 mV/V + 12 µV	
100 kHz to 500 kHz	1 mV to 32.999 mV	8 mV/V + 50 µV	
Equipment to Measure AC Voltage (Sine Wave) (at the listed frequencies) [FO]			
10 Hz to 45 Hz	33 mV to 329.999 mV	0.3 mV/V + 8 µV	
45 Hz to 10 kHz	33 mV to 329.999 mV	0.15 mV/V + 8 µV	
10 kHz to 20 kHz	33 mV to 329.999 mV	0.16 mV/V + 8 µV	
20 kHz to 50 kHz	33 mV to 329.999 mV	0.35 mV/V + 8 µV	
50 kHz to 100 kHz	33 mV to 329.999 mV	0.8 mV/V + 32 µV	
100 kHz to 500 kHz	33 mV to 329.999 mV	2 mV/V + 70 µV	
Equipment to Measure AC Voltage (Sine Wave) (at the listed frequencies) [FO]			
10 Hz to 45 Hz	0.3 V to 3.299 99 V	0.3 mV/V + 50 µV	
45 Hz to 10 kHz	0.3 V to 3.299 99 V	0.15 mV/V + 60 µV	
10 kHz to 20 kHz	0.3 V to 3.299 99 V	0.19 mV/V + 60 µV	
20 kHz to 50 kHz	0.3 V to 3.299 99 V	0.3 mV/V + 50 µV	
50 kHz to 100 kHz	0.3 V to 3.299 99 V	0.7 mV/V + 0.13 mV	
100 kHz to 500 kHz	0.3 V to 3.299 99 V	2.4 mV/V + 0.6 mV	
Equipment to Measure AC Voltage (Sine Wave) (at the listed frequencies) [FO]			
10 Hz to 45 Hz	3.3 V to 32.999 9 V	0.3 mV/V + 0.65 mV	
45 Hz to 10 kHz	3.3 V to 32.999 9 V	0.15 mV/V + 0.6 mV	
10 kHz to 20 kHz	3.3 V to 32.999 9 V	0.24 mV/V + 0.6 mV	
20 kHz to 50 kHz	3.3 V to 32.999 9 V	0.35 mV/V + 0.6 V	
50 kHz to 100 kHz	3.3 V to 32.999 9 V	0.9 mV/V + 1.6 mV	

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Equipment to Measure AC Voltage (Sine Wave) (at the listed frequencies) FO			Fluke 5522A Fluke Automated MetCal
45 Hz to 1 kHz	33 V to 329.999 V	0.19 mV/V + 2 mV	
1 kHz to 10 kHz	33 V to 329.999 V	0.2 mV/V + 6 mV	
10 kHz to 20 kHz	33 V to 329.999 V	0.25 mV/V + 6 mV	
20 kHz to 50 kHz	33 V to 329.999 V	0.3 mV/V + 6 mV	
50 kHz to 100 kHz	33 V to 329.999 V	2 mV/V + 50 mV	
Equipment to Measure AC Voltage (Sine Wave) (at the listed frequencies) FO			
45 Hz to 1 kHz	330 V to 1 020 V	0.3 mV/V + 10 mV	
1 kHz to 5 kHz	330 V to 1 020 V	0.25 mV/V + 10 mV	
5 kHz to 10 kHz	330 V to 1 020 V	0.3 mV/V + 10 mV	
Equipment to Measure AC Current (Sine Wave) (at the listed frequencies) FO			
10 Hz to 20 Hz	29 µA to 329.99 µA	2 mA/A + 0.1 µA	
20 Hz to 45 Hz	29 µA to 329.99 µA	1.5 mA/A + 0.1 µA	
45 Hz to 1 kHz	29 µA to 329.99 µA	1.3 mA/A + 0.1 µA	
1 kHz to 5 kHz	29 µA to 329.99 µA	3 mA/A + 0.15 µA	
5 kHz to 10 kHz	29 µA to 329.99 µA	8 mA/A + 0.2 µA	
10 kHz to 30 kHz	29 µA to 329.99 µA	16 mA/A + 0.4 µA	
Equipment to Measure AC Current (Sine Wave) (at the listed frequencies) FO			
10 Hz to 20 Hz	0.33 mA to 3.299 99 mA	2 mA/A + 0.15 µA	
20 Hz to 45 Hz	0.33 mA to 3.299 99 mA	1.3 mA/A + 0.15 µA	
45 Hz to 1 kHz	0.33 mA to 3.299 99 mA	1 mA/A + 0.15 µA	
1 kHz to 5 kHz	0.33 mA to 3.299 99 mA	2 mA/A + 0.2 µA	
5 kHz to 10 kHz	0.33 mA to 3.299 99 mA	5 mA/A + 0.3 µA	
10 kHz to 30 kHz	0.33 mA to 3.299 99 mA	10 mA/A + 0.6 µA	
Equipment to Measure AC Current (Sine Wave) (at the listed frequencies) FO			
10 Hz to 20 Hz	3.3 mA to 32.999 9 mA	1.8 mA/A + 2 µA	
20 Hz to 45 Hz	3.3 mA to 32.999 9 mA	0.9 mA/A + 2 µA	
45 Hz to 1 kHz	3.3 mA to 32.999 9 mA	0.4 mA/A + 2 µA	
1 kHz to 5 kHz	3.3 mA to 32.999 9 mA	0.8 mA/A + 2 µA	
5 kHz to 10 kHz	3.3 mA to 32.999 9 mA	2 mA/A + 3 µA	
10 kHz to 30 kHz	3.3 mA to 32.999 9 mA	4 mA/A + 4 µA	

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Equipment to Measure AC Current (Sine Wave) at the listed frequencies) FO			Fluke 5522A Fluke Automated MetCal
10 Hz to 20 Hz	33 mA to 329.999 mA	1.8 mA/A +20 µA	
20 Hz to 45 Hz	33 mA to 329.999 mA	0.9 mA/A + 20 µA	
45 Hz to 1 kHz	33 mA to 329.999 mA	0.4 mA/A + 20 µA	
1 kHz to 5 kHz	33 mA to 329.999 mA	1 mA/A + 50 µA	
5 kHz to 10 kHz	33 mA to 329.999 mA	2 mA/A + 0.1 mA	
10 kHz to 30 kHz	33 mA to 329.999 mA	4 mA/A + 0.2 mA	
Equipment to Measure AC Current (Sine Wave) (at the listed frequencies) FO			
10 Hz to 45 Hz	0.33 A to 1.099 99 A	1.8 mA/A + 0.1 mA	
45 Hz to 1 kHz	0.33 A to 1.099 99 A	0.5 mA/A + 0.1 mA	
1 kHz to 5 kHz	0.33 A to 1.099 99 A	6 mA/A + 1 mA	
5 kHz to 10 kHz	0.33 A to 1.099 99 A	25 mA/A + 5 mA	
Equipment to Measure AC Current (Sine Wave) (at the listed frequencies) FO			
10 Hz to 45 Hz	1.1 A to 2.999 99 A	1.8 mA/A + 0.1 mA	
45 Hz to 1 kHz	1.1 A to 2.999 99 A	0.6 mA/A + 0.1 mA	
1kHz to 5 kHz	1.1 A to 2.999 99 A	6 mA/A + 1 mA	
5 kHz to 10 kHz	1.1 A to 2.999 99 A	25 mA/A + 5 mA	
Equipment to Measure AC Current (Sine Wave) (at the listed frequencies) FO			
45 Hz to 100 Hz	3 A to 10.999 9 A	0.6 mA/A + 2 mA	
100 Hz to 1 kHz	3 A to 10.999 9 A	1 mA/A + 2 mA	
1 kHz to 5 kHz	3 A to 10.999 9 A	30 mA/A + 2 mA	
Equipment to Measure AC Current (Sine Wave) (at the listed frequencies) FO			
45 Hz to 100 Hz	11 A to 20.5 A	1.2 mA/A + 5 mA	
100 Hz to 1 kHz	11 A to 20.5 A	1.5 mA/A + 5 mA	
1 kHz to 5 kHz	11 A to 20.5 A	30 mA/A + 5 mA	

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Equipment to Measure Capacitance FO	220 pF to 399.9 pF	5 mF/F + 10 pF	Fluke 5522A Fluke Automated MetCal
	0.4 nF to 1.099 9 nF	5 mF/F + 10 pF	
	1.1 nF to 3.299 9 nF	5 mF/F + 10 pF	
	3.3 nF to 10.999 9 nF	2.5 mF/F + 10 pF	
	11 nF to 32.999 9 nF	2.5 mF/F + 10 pF	
	33 nF to 109.999 nF	2.5 mF/F + 10 pF	
	110 nF to 329.999 nF	2.5 mF/F + 30 pF	
	0.33 µF to 1.099 99 µF	2.5 mF/F + 1 nF	
	1.1 µF to 3.299 99 µF	2.5 mF/F + 3 nF	
	3.3 µF to 10.999 9 µF	2.5 mF/F + 10 nF	
	11 µF to 32.999 9 µF	4 mF/F + 30 nF	
	33 µF to 109.999 µF	4.5 mF/F + 0.1 µF	
	110 µF to 329.999 µF	4.5 mF/F + 0.3 µF	
	0.33 mF to 1.099 99 mF	4.5 mF/F + 1 µF	
	1.1 mF to 3.299 99 mF	4.5 mF/F + 3 µF	
	3.3 mF to 10.999 9 mF	4.5 mF/F + 10 µF	
	11 mF to 32.999 9 mF	7.5 mF/F + 30 µF	
	33 mF to 110 mF	11 mF/F + 0.1 mF	
Temperature Calibration, Indication, Control Equipment used with Thermocouple Type B FO	600 °C to 800 °C	0.44 °C	
	800 °C to 1 000 °C	0.34 °C	
	1 000 °C to 1 550 °C	0.3 °C	
	1 550 °C to 1 820 °C	0.33 °C	
Temperature Calibration, Indication, Control Equipment used with Thermocouple Type C FO	Up to 150 °C	0.3 °C	
	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, Control Equipment used with Thermocouple Type E FO	-240 °C to -100 °C	0.5 °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	

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Temperature Calibration, Indication, Control Equipment used with Thermocouple Type J [FO]	-210 °C to -100 °C	0.27 °C	Fluke 5522A Fluke Automated MetCal
	-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, Control Equipment used with Thermocouple Type K [FO]	-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, Control Equipment used with Thermocouple Type L [FO]	-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, Control Equipment used with Thermocouple Type N [FO]	-200 °C to -100 °C	0.4 °C	
	-100 °C to -25 °C	0.22 °C	
	-25 °C to 120 °C	0.19 °C	
	120 °C to 410 °C	0.18 °C	
	410 °C to 1 300 °C	0.27 °C	
Temperature Calibration, Indication, Control Equipment used with Thermocouple Type R [FO]	Up 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	
Temperature Calibration, Indication, Control Equipment used with Thermocouple Type S [FO]	Up to 250 °C	0.47 °C	
	250 °C to 1 000 °C	0.36 °C	
	1 000 °C to 1 400 °C	0.37 °C	
	1 400 °C to 1 767 °C	0.46 °C	
Temperature Calibration, Indication, Control Equipment used with Thermocouple Type T [FO]	-250 °C to -150 °C	0.63 °C	
	-150 °C to 0 °C	0.24 °C	
	Up to 120 °C	0.16 °C	
	120 °C to 400 °C	0.14 °C	
Temperature Calibration, Indication, Control Equipment used with Thermocouple Type U [FO]	-200 °C to 0 °C	0.56 °C	
	Up to 600 °C	0.27 °C	

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Contact Name: Phil Nordquist Phone: 972-438-3774

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

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Temperature Calibration Indication and Control Equipment used with RTD Pt 385 100 Ω FO	-200 °C to -80 °C	0.05 °C	Fluke 5522A Fluke Automated MetCal
	-80 °C to 0 °C	0.05 °C	
	Up to 100 °C	0.07 °C	
	100 °C to 300 °C	0.09 °C	
	300 °C to 400 °C	0.10 °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 Pt 3926 100 Ω FO	-200 °C to -80 °C	0.05 °C	
	-80 °C to 0 °C	0.05 °C	
	Up 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 FO	-200 °C to -190 °C	0.25 °C	
	-190 °C to -80 °C	0.04 °C	
	-80 °C to 0 °C	0.05 °C	
	Up 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	
Temperature Calibration Indication and Control Equipment used with RTD Pt 385 200 Ω FO	-200 °C to -80 °C	0.04 °C	
	-80 °C to 0 °C	0.04 °C	
	Up 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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Temperature Calibration Indication and Control Equipment used with RTD Pt 385 500 Ω [FO]	-200 °C to -80 °C	0.04 °C	Fluke 5522A Fluke Automated MetCal
	-80 °C to 0 °C	0.05 °C	
	Up 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 Pt 385 1 000 Ω [FO]	-200 °C to -80 °C	0.03 °C	
	-80 °C to 0 °C	0.03 °C	
	Up 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	
	-200 °C to -80 °C	0.03 °C	
Temperature Calibration Indication and Control Equipment used with RTD Pt 385 1 000 Ω [FO]	-80 °C to 0 °C	0.08 °C	
	Up 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 [FO]	-100 °C to 260 °C	0.3 °C	
Clamp-On Meters [FO]	16.5 to 1 000 A DC	0.092 ADC/A + 0.342 % of reading	Fluke 5522A Fluke 5500A/COIL Fluke Automated MetCal
	16.5 to 1 000 A AC (45 Hz to 440 Hz)	0.063 AAC/A + 0.342 % of reading	
Equipment to Output DC Current [FO]	30 µA to 100 µA	0.002 5 % of reading + 0.8 nA	HP 3458A Fluke Automated MetCal
	100 µA to 1 mA	0.002 5 % of reading + 5 nA	
	1 mA to 10 mA	0.002 5 % of reading + 50 nA	
	10 mA to 100 mA	0.004 % of reading + 500 nA	
	100 mA to 1 A	0.012 % of reading + 10 µA	

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Equipment to Measure Frequency [FO]	1 Hz to 1.2 kHz	1.7 mHz/Hz + 12 mHz	Fluke 5522A Fluke Automated MetCal
	1.2 kHz to 120 kHz	97.8 µHz/Hz + 1.2 Hz	
Equipment to Output Resistance [FO]	200 µΩ to 10 Ω	0.001 5 % of reading + 50 µΩ	HP 3458A Fluke Automated MetCal
	10 Ω to 100 Ω	0.001 2 % of reading + 500 µΩ	
	100 Ω to 1 kΩ	0.001 % of reading + 500 µΩ	
	1 kΩ to 10 kΩ	0.01 % of reading + 5 mΩ	
	10 kΩ to 100 kΩ	0.01 % of reading + 50 mΩ	
	100 kΩ to 1 MΩ	0.15 % of reading + 2 Ω	
	1 MΩ to 10 MΩ	0.05 % of reading + 100 Ω	
	10 MΩ to 100 MΩ	0.05 % of reading + 1 kΩ	
Equipment to Output AC Voltage at the listed Frequencies [FO]			
1 Hz to 40 Hz	1 mV to 10 mV	0.03 % of reading + 0.03 mV	
40 Hz to 1 kHz	1 mV to 10 mV	0.02 % of reading + 0.011 mV	
1 kHz to 20 kHz	1 mV to 10 mV	0.03 % of reading + 0.011 mV	
20 kHz to 50 kHz	1 mV to 10 mV	0.1 % of reading + 0.011 mV	
50 kHz to 100 kHz	1 mV to 10 mV	0.5 % of reading + 0.011 mV	
100 kHz to 300 kHz	1 mV to 10 mV	4 % of reading + 0.02 mV	
Equipment to Output AC Voltage at the listed Frequencies [FO]			
1 Hz to 40 Hz	10 mV to 100 mV	0.007 2 % of reading + 4 µV	
40 Hz to 1 kHz	10 mV to 100 mV	0.007 2 % of reading + 2 µV	
1 kHz to 20 kHz	10 mV to 100 mV	0.014 % of reading + 2 µV	
20 kHz to 50 kHz	10 mV to 100 mV	0.03 % of reading + 2 µV	
50 kHz to 100 kHz	10 mV to 100 mV	0.08 % of reading + 2 µV	
100 kHz to 300 kHz	10 mV to 100 mV	0.3 % of reading + 10 µV	
0.3 MHz to 1 MHz	10 mV to 100 mV	1 % of reading + 10 µV	
1 MHz to 2 MHz	10 mV to 100 mV	1.7 % of reading + 10 µV	
Equipment to output AC Voltage at the listed Frequencies [FO]			
1 Hz to 40 Hz	100 mV to 10 V	0.007 % of reading + 0.004 V	
40 Hz to 1 kHz	100 mV to 10 V	0.007 % of reading + 0.002 V	
1 kHz to 20 kHz	100 mV to 10 V	0.014 % of reading + 0.002 V	
20 kHz to 50 kHz	100 mV to 10 V	0.03 % of reading + 0.002 V	
50 kHz to 100 kHz	100 mV to 10 V	0.08 % of reading + 0.002 V	
100 kHz to 300 kHz	100 mV to 10 V	0.3 % of reading + 0.01 V	
300 kHz to 1 MHz	100 mV to 10 V	1 % of reading + 0.01 V	
1 MHz to 2 MHz	100 mV to 10 V	1.5 % of reading + 0.01 V	

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Equipment to output AC Voltage at the listed Frequencies [FO]			HP 3458A Fluke Automated MetCal
1 Hz to 40 Hz	10 V to 100 V	0.02 % of reading + 0.04 V	
40 Hz to 1 kHz	10 V to 100 V	0.02 % of reading + 0.02 V	
1 KHz to 20 kHz	10 V to 100 V	0.02 % of reading + 0.02 V	
20 kHz to 50 kHz	10 V to 100 V	0.035 % of reading + 0.02 V	
50 kHz to 100 kHz	10 V to 100 V	0.12 % of reading + 0.02 V	
100 kHz to 300 kHz	10 V to 100 V	0.4 % of reading + 0.1 V	
300 kHz to 1 MHz	10 V to 100 V	1.5 % of reading + 0.1 V	
Equipment to output AC Voltage at the listed Frequencies [FO]			
1 Hz to 40 Hz	100 V to 1 000 V	0.04 % of reading + 0.4 V	
40 Hz to 1 kHz	100 V to 1 000 V	0.04 % of reading + 0.2 V	
1 kHz to 20 kHz	100 V to 1 000 V	0.06 % of reading + 0.2 V	
20 kHz to 50 kHz	100 V to 1 000 V	0.12 % of reading + 0.2 V	
50 kHz to 100 kHz	100 V to 1 000 V	0.3 % of reading + 0.2 V	
Equipment to Output DC Voltage [FO]	1 mV to 100 mV	0.000 9 % of reading + 0.3 µV	
	100 mV to 1 V	0.000 8 % of reading + 0.3 µV	
	1 V to 10 V	0.000 8 % of reading + 0.5 µV	
	10 V to 100 V	0.001 % of reading + 30 µV	
	100 V to 1 000 V	0.001 % of reading + 0.1 mV	

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.

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4. The presence of a superscript O means that the laboratory performs calibration of the indicated parameter onsite at customer locations.

5. 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.

6. 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.