



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Industrial Calibration Service (In-Cal)

71C Pine Road, Hudson, NH 03051

*(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 Z540.3-2006 sub-clause 5.3 and Z540-1-1994

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, Mass, Force & Weighing, Mechanical, Thermodynamic, and Time & Frequency 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

Initial Accreditation Date:

April 14, 2008

Issue Date:

October 23, 2024

Expiration Date:

December 31, 2026

Accreditation No.:

60725

Certificate No.:

L24-804

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.pjlabs.com*



Certificate of Accreditation: Supplement

Industrial Calibration Service (In-Cal)

71C Pine Road, Hudson, NH 03051
Contact Name: Richie Fiore Phone: 603-883-5558

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 (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Output DC Voltage ^{FO}	0.01 mV to 100 mV	11 µV/V + 3 µV/V	8.5 Digit Multimeter	OEM Manual IC-EL-7
	100 mV to 1 V	10 µV/V + 0.3 µV/V		
	1 V to 10 V	10 µV/V + 0.1 µV/V		
	10 V to 100 V	12 µV/V + 2.3 µV/V		
	100 V to 1 000 V	24 µV/V + 0.1 µV/V		
Equipment to Output DC Current ^{FO}	Up to 10 µA	27 µA/A + 40 µA/A of range		
	10 µA to 100 µA	9.8 µA/A + 4 µA/A of range		
	100 µA to 1 mA	9.2 µA/A + 4 µA/A of range		
	1 mA to 10 mA	14 µA/A + 4 µA/A of range		
	10 mA to 100 mA	57 µA/A + 10 µA/A of range		
	100 mA to 1 A	132 µA/A + 100 µA/A of range		
	1 A to 10 A	234 µA/A + 40 µA/A of range		
	10 A to 30 A	551 µA/A + 146 µA/A of range		
Equipment to Measure DC Voltage ^{FO}	Up to 220 mV	7.5 µV/V + 0.4 µV	Fluke 5730A	
	220 mV to 2.2 V	5 µV/V + 0.8 µV		
	2.2 V to 11 V	3.5 µV/V + 2.5 µV		
	11 V to 22 V	3.5 µV/V + 4 µV		
	22 V to 220 V	5 µV/V + 40 µV		
	220 V to 1 100 V	6.5 µV/V + 400 µV		
Equipment to Measure DC Current ^{FO}	Up to 220 µA	40 µA/A + 6 nA		
	220 µA to 2.2 mA	35 µA/A + 7 nA		
	2.2 mA to 22 mA	35 µA/A + 40 nA		
	22 mA to 220 mA	45 µA/A + 0.7 µA		
	220 mA to 2.2 A	80 µA/A + 12 µA		
	3 A to 11 A	500 µA/A + 500 µA		
	11 to 20.5 A	1 000 µA/A + 750 µA		
Equipment to Measure DC High Voltage ^{FO}	Up to 30 kV	0.01 % of Reading + 0.01 % of Full Scale	Vitretek 4700 HVL-35 Probe	OEM Manual IC-EL-9
Current Clamp Meters ^{FO}	Up to 1 000 A (DC)	0.99 mA/A + 7.1 mA	Multifunction Calibrator, 50 Turn Coil	
	Up to 1 000 A (AC) (45 Hz to 440 Hz)	1.8 mA/A + 3 mA		
Equipment to Measure DC Power ^{FO}			Multifunction Calibrator	OEM Manual IC-EL-7
0.33 mA to 330 mA	33 mV to 1 020 V	0.03 % of Reading		
0.33 A to 3 A	33 mV to 1 020 V	0.03 % of Reading		
3 A to 20.5 A	33 mV to 1 020 V	0.07 % of Reading		



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Equipment to Measure AC Current (At the listed frequencies) ^{FO}			Multifunction Calibrator	OEM Manual IC-EL-7
10 Hz to 20 Hz	29 µA to 330 µA	0.2 % of Reading + 0.1 µA		
20 Hz to 45 Hz	29 µA to 330 µA	0.15 % of Reading + 0.1 µA		
45 Hz to 1 kHz	29 µA to 330 µA	0.13 % of Reading + 0.1 µA		
5 kHz to 10 kHz	29 µA to 330 µA	0.8 % of Reading + 0.2 µA		
10 kHz to 30 kHz	29 µA to 330 µA	1.6 % of Reading + 0.4 µA		
Equipment to Measure AC Current (At the listed frequencies) ^{FO}				
10 Hz to 20 Hz	0.33 mA to 3.3 mA	0.2 % of Reading + 0.15 µA		
20 Hz to 45 Hz	0.33 mA to 3.3 mA	0.13 % of Reading + 0.15 µA		
45 Hz to 1 kHz	0.33 mA to 3.3 mA	0.1 % of Reading + 0.15 µA		
1 kHz to 5 kHz	0.33 mA to 3.3 mA	0.2 % of Reading + 0.2 µA		
5 kHz to 10 kHz	0.33 mA to 3.3 mA	0.5 % of Reading + 0.3 µA		
10 kHz to 30 kHz	0.33 mA to 3.3 mA	1 % of Reading + 0.6 µA		
Equipment to Measure AC Current (At the listed frequencies) ^{FO}				
10 Hz to 20 Hz	3.3 mA to 33 mA	0.18 % of Reading + 2 µA		
20 Hz to 45 Hz	3.3 mA to 33 mA	0.09 % of Reading + 2 µA		
45 Hz to 1 kHz	3.3 mA to 33 mA	0.04 % of Reading + 2 µA		
1 kHz to 5 kHz	3.3 mA to 33 mA	0.08 % of Reading + 2 µA		
5 kHz to 10 kHz	3.3 mA to 33 mA	0.2 % of Reading + 3 µA		
10 kHz to 30 kHz	3.3 mA to 33 mA	0.4 % of Reading + 4 µA		
Equipment to Measure AC Current (At the listed frequencies) ^{FO}				
10 Hz to 20 Hz	33 mA to 330 mA	0.18 % of Reading + 20 µA		
20 Hz to 45 Hz	33 mA to 330 mA	0.09 % of Reading + 20 µA		
45 Hz to 1 kHz	33 mA to 330 mA	0.04 % of Reading + 20 µA		
1 kHz to 5 kHz	33 mA to 330 mA	0.1 % of Reading + 50 µA		
5 kHz to 10 kHz	33 mA to 330 mA	0.2 % of Reading + 100 µA		
10 kHz to 30 kHz	33 mA to 330 mA	0.4 % of Reading + 200 µA		
Equipment to Measure AC Current (At the listed frequencies) ^{FO}				
10 Hz to 45 Hz	0.33 A to 1.1 A	0.18 % of Reading + 100 µA		
45 Hz to 1 kHz	0.33 A to 1.1 A	0.05 % of Reading + 100 µA		
1 kHz to 5 kHz	0.33 A to 1.1 A	0.6 % of Reading + 1 000 µA		
5 kHz to 10 kHz	0.33 A to 1.1 A	2.5 % of Reading + 5 000 µA		



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Equipment to Measure AC Current (At the listed frequencies) ^{FO}			Multifunction Calibrator	OEM Manual IC-EL-7
10 Hz to 45 Hz	1.1 A to 3 A	0.18 % of Rdg + 100 µA		
45 Hz to 1 kHz	1.1 A to 3 A	0.05 % of Rdg + 100 µA		
1 kHz to 5 kHz	1.1 A to 3 A	0.6 % of Rdg + 1 000 µA		
5 kHz to 10 kHz	1.1 A to 3 A	2.5 % of Rdg + 5 000 µA		
Equipment to Measure AC Current (At the listed frequencies) ^{FO}			8.5 Digit Multimeter	
45 Hz to 100 Hz	3 A to 11 A	0.06 % of Rdg + 2 000 µA		
100 Hz to 1 kHz	3 A to 11 A	0.1 % of Rdg + 2 000 µA		
1 kHz to 5 kHz	3 A to 11 A	3 % of Rdg + 2 000 µA		
Equipment to Measure AC Current (At the listed frequencies) ^{FO}				
45 Hz to 100 Hz	11 A to 20.5 A	0.12 % of Rdg + 5 000 µA		
100 Hz to 1 kHz	11 A to 20.5 A	0.15 % of Rdg + 5 000 µA		
1 kHz to 5 kHz	11 A to 20.5 A	3 % of Rdg + 5 000 µA		
Equipment to Output AC Current (at the listed frequencies) ^{FO}				
1 Hz to 2 kHz	Up to 10 µA	0.21 % of reading + 2.5 nA		
2 kHz to 10 kHz	Up to 10 µA	0.21 % of reading + 2.5 nA		
10 kHz to 30 kHz	Up to 10 µA	0.21 % of reading + 2.5 nA		
Equipment to Output AC Current (at the listed frequencies) ^{FO}				
1 Hz to 2 kHz	10 µA to 100 µA	0.029 % of reading + 5 nA		
2 kHz to 10 kHz	10 µA to 100 µA	0.054 % of reading + 5 nA		
10 kHz to 30 kHz	10 µA to 100 µA	0.075 % of reading + 5 nA		
30 kHz to 100 kHz	10 µA to 100 µA	0.41 % of reading + 10 nA		
Equipment to Output AC Current (at the listed frequencies) ^{FO}				
1 Hz to 2 kHz	0.1 mA to 1 mA	0.029 % of reading + 50 nA		
2 kHz to 10 kHz	0.1 mA to 1 mA	0.054 % of reading + 50 nA		
10 kHz to 30 kHz	0.1 mA to 1 mA	0.075 % of reading + 50 nA		
30 kHz to 100 kHz	0.1 mA to 1 mA	0.41 % of reading + 0.1 µA		



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Equipment to Output AC Current (at the listed frequencies) ^{FO}			Multifunction Calibrator	OEM Manual IC-EL-7
1 Hz to 2 kHz	1 mA to 10 mA	0.029 % of reading + 0.5 µA		
2 kHz to 10 kHz	1 mA to 10 mA	0.054 % of reading + 0.5 µA		
10 kHz to 30 kHz	1 mA to 10 mA	0.075 % of reading + 0.5 µA		
30 kHz to 100 kHz	1 mA to 10 mA	0.41 % of reading + 1 µA		
Equipment to Output AC Current (at the listed frequencies) ^{FO}				
1 Hz to 2 kHz	10 mA to 100 mA	0.028 % of reading + 5 µA		
2 kHz to 10 kHz	10 mA to 100 mA	0.052 % of reading + 5 µA		
10 kHz to 30 kHz	10 mA to 100 mA	0.074 % of reading + 5 µA		
Equipment to Output AC Current (at the listed frequencies) ^{FO}				
1 Hz to 2 kHz	100 mA to 1 A	0.03 % of reading + 0.1 mA		
2 kHz to 10 kHz	100 mA to 1 A	0.055 % of reading + 0.1 mA		
10 kHz to 30 kHz	100 mA to 1 A	0.079 % of reading + 0.1 mA		
Equipment to Output AC Current (at the listed frequencies) ^{FO}				
10 Hz to 2 kHz	1 A to 10 A	0.084 % of reading + 0.5 mA		
2 kHz to 10 kHz	1 A to 10 A	0.084 % of reading + 0.5 mA		
Equipment to Output AC Current (at the listed frequencies) ^{FO}				
10 Hz to 2 kHz	10 A to 30 A	0.084 % of reading + 12 mA		
2 kHz to 10 kHz	10 A to 30 A	0.013 % of reading + 12 mA		
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}				
10 Hz to 45 Hz	1 mV to 33 mV	800 µV/V + 6 µV		
45 Hz to 10 kHz	1 mV to 33 mV	150 µV/V + 6 µV		
10 kHz to 20 kHz	1 mV to 33 mV	200 µV/V + 6 µV		
20 kHz to 50 kHz	1 mV to 33 mV	1 000 µV/V 6 µV		
50 kHz to 100 kHz	1 mV to 33 mV	3 500 µV/V 12 µV		
100 kHz to 500 kHz	1 mV to 33 mV	8 000 µV/V + 50 µV		
100 kHz to 500 kHz				
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}				
10 Hz to 45 Hz	33 mV to 330 mV	300 µV/V + 8 µV		
50 kHz to 100 kHz	33 mV to 330 mV	800 µV/V + 32 µV		
100 kHz to 500 kHz	33 mV to 330 mV	2 000 µV/V + 70 µV		



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Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}			Multifunction Calibrator	OEM Manual
10 Hz to 45 Hz	0.33 V to 3.3 V	300 μV/V + 50 μV		
20 kHz to 50 kHz	0.33 V to 3.3 V	300 μV/V + 50 μV		
50 kHz to 100 kHz	0.33 V to 3.3 V	700 μV/V + 125 μV		
100 kHz to 500 kHz	0.33 V to 3.3 V	2 400 μV/V + 600 μV		
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}				
10 Hz to 45 Hz	3.3 V to 33 V	300 μV/V + 650 μV		
10 kHz to 20 kHz	3.3 V to 33 V	240 μV/V + 600 μV		
20 kHz to 50 kHz	3.3 V to 33 V	350 μV/V + 600 μV		
50 kHz to 100 kHz	3.3 V to 33 V	900 μV/V + 1 600 μV		
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}				
10 Hz to 45 Hz	1 mV to 33 mV	0.08 % of Reading + 6 μV		
45 Hz to 10 kHz	1 mV to 33 mV	0.015 % of Reading + 6 μV		
10 kHz to 20 kHz	1 mV to 33 mV	0.02 % of Reading + 6 μV		
20 kHz to 50 kHz	1 mV to 33 mV	0.1 % of Reading + 6 μV		
50 kHz to 100 kHz	1 mV to 33 mV	0.35 % of Reading + 12 μV		
100 kHz to 500 kHz	1 mV to 33 mV	0.8 % of Reading + 50 μV		
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}				
10 Hz to 45 Hz	33 mV to 330 mV	0.03 % of Reading + 8 μV		
45 Hz to 10 kHz	33 mV to 330 mV	0.013 % of Reading + 8 μV		
10 kHz to 20 kHz	33 mV to 330 mV	0.015 % of Reading + 8 μV		
20 kHz to 50 kHz	33 mV to 330 mV	0.035 % of Reading + 8 μV		
50 kHz to 100 kHz	33 mV to 330 mV	0.08 % of Reading + 32 μV		
100 kHz to 500 kHz	33 mV to 330 mV	0.2 % of Reading + 70 μV		
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}				
10 Hz to 45 Hz	0.33 V to 3.3 V	0.03 % of Reading + 50 μV		
45 Hz to 10 kHz	0.33 V to 3.3 V	0.012 % of Reading + 25 μV		
10 kHz to 20 kHz	0.33 V to 3.3 V	0.019 % of Reading + 50 μV		
20 kHz to 50 kHz	0.33 V to 3.3 V	0.03 % of Reading + 50 μV		
50 kHz to 100 kHz	0.33 V to 3.3 V	0.07 % of Reading + 125 μV		
100 kHz to 500 kHz	0.33 V to 3.3 V	0.24 % of Reading + 600 μV		



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Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}			Multifunction Calibrator	OEM Manual
10 Hz to 45 Hz	3.3 V to 33 V	0.03 % of Reading + 650 µV		
45 Hz to 10 kHz	3.3 V to 33 V	0.015 % of Reading + 200 µV		
10 kHz to 20 kHz	3.3 V to 33 V	0.024 % of Reading + 600 µV		
20 kHz to 50 kHz	3.3 V to 33 V	0.035 % of Reading + 600 µV		
50 kHz to 100 kHz	3.3 V to 33 V	0.09 % of Reading + 1.6 mV		
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}				
45 Hz to 1 kHz	33 V to 330 V	0.019 % of Reading + 2 mV		
1 kHz to 10 kHz	33 V to 330 V	0.02 % of Reading + 6 mV		
10 kHz to 20 kHz	33 V to 330 V	0.025 % of Reading + 6 mV		
20 kHz to 50 kHz	33 V to 330 V	0.03 % of Reading + 6 mV		
50 kHz to 100 kHz	33 V to 330 V	0.2 % of Reading + 50 mV		
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}				
45 Hz to 1 kHz	330 V to 1 020 V	0.03 % of Reading + 10 mV		
1 kHz to 5 kHz	330 V to 1 020 V	0.025 % of Reading + 10 mV		
5 kHz to 10 kHz	330 V to 1 020 V	0.03 % of Reading + 10 mV		
Equipment to Measure AC Voltage -Bandwidth < 2 MHz (At the listed frequencies) ^{FO}				
1 Hz to 40 Hz	1 mV to 10 mV	0.03 % of Reading + 3 µV		
40 Hz to 1 kHz	1 mV to 10 mV	0.02 % of Reading + 1.1 µV		
1 kHz to 20 kHz	1 mV to 10 mV	0.03 % of Reading + 1.1 µV		
20 kHz to 50 kHz	1 mV to 10 mV	0.1 % of Reading + 1.1 µV		
50 kHz to 100 kHz	1 mV to 10 mV	0.5 % of Reading + 1.1 µV		
100 kHz to 300 kHz	1 mV to 10 mV	4 % of Reading + 2 µV		
Equipment to Measure AC Voltage -Bandwidth < 2 MHz (At the listed frequencies) ^{FO}				
1 Hz to 40 Hz	100 mV to 10 V	0.007 % of Reading + 0.4 mV		
40 Hz to 1 kHz	100 mV to 10 V	0.007 % of Reading + 0.2 mV		
1 kHz to 20 kHz	100 mV to 10 V	0.014 % of Reading + 0.2 mV		
20 kHz to 50 kHz	100 mV to 10 V	0.03 % of Reading + 0.2 mV		
50 kHz to 100 kHz	100 mV to 10 V	0.08 % of Reading + 0.2 mV		
100 kHz to 300 kHz	100 mV to 10 V	0.3 % of Reading + 1 mV		
300 kHz to 1 MHz	100 mV to 10 V	1 % of Reading + 1 mV		
1 MHz to 2 MHz	100 mV to 10 V	1.5 % of Reading + 1 mV		



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Equipment to Measure AC Voltage -Bandwidth < 2 MHz (At the listed frequencies) ^{FO}			Multifunction Calibrator	OEM Manual
1 Hz to 40 Hz	10 V to 100 V	0.02 % of Reading + 4 mV		
40 Hz to 1 kHz	10 V to 100 V	0.02 % of Reading + 2 mV		
1 kHz to 20 kHz	10 V to 100 V	0.02 % of Reading + 2 mV		
20 kHz to 50 kHz	10 V to 100 V	0.035 % of Reading + 2 mV		
50 kHz to 100 kHz	10 V to 100 V	0.12 % of Reading + 2 mV		
100 kHz to 300 kHz	10 V to 100 V	0.4 % of Reading + 10 mV		
300 kHz to 1 MHz	10 V to 100 V	1.5 % of Reading + 10 mV		
Equipment to Measure AC Voltage -Bandwidth < 2 MHz (At the listed frequencies) ^{FO}				
1 Hz to 40 Hz	100 V to 1 000 V	0.04 % of Reading + 40 mV		
40 Hz to 1 kHz	100 V to 1 000 V	0.04 % of Reading + 20 mV		
1 kHz to 20 kHz	100 V to 1 000 V	0.06 % of Reading +20 mV		
20 kHz to 50 kHz	100 V to 1 000 V	0.12 % of Reading + 20 mV		
50 kHz to 100 kHz	100 V to 1 000 V	0.3 % of Reading + 20 mV		
Equipment to Measure AC Voltage -Bandwidth > 2 MHz (At the listed frequencies) ^{FO}				
45 Hz to 100 kHz	0.01 mV to 10 mV	0.09 % of Reading + 6 µV		
100 kHz to 1 MHz	0.01 mV to 10 mV	1.2 % of Reading + 5 µV		
1 MHz to 4 MHz	0.01 mV to 10 mV	7 % of Reading + 7 µV		
4 MHz to 8 MHz	0.01 mV to 10 mV	20 % of Reading + 8 µV		
Equipment to Measure AC Voltage -Bandwidth > 2 MHz (At the listed frequencies) ^{FO}				
45 Hz to 100 kHz	100 mV to 10 V	0.09 % of Reading + 6 mV		
100 kHz to 1 MHz	100 mV to 10 V	2 % of Reading + 5 mV		
1 MHz to 4 MHz	100 mV to 10 V	4 % of Reading + 7 mV		
4 MHz to 8 MHz	100 mV to 10 V	4 % of Reading + 8 mV		
8 MHz to 10 MHz	100 mV to 10 V	15 % of Reading + 10 mV		
Equipment to Measure AC Voltage -Bandwidth > 2 MHz (At the listed frequencies) ^{FO}				
45 Hz to 100 kHz	10 V to 100 V	0.12 % of Reading + 2 mV		
Equipment to Measure AC Voltage -Bandwidth > 2 MHz (At the listed frequencies) ^{FO}				
45 Hz to 100 kHz	100 V to 1 000 V	0.3 % of Reading + 0.1 V		
Equipment to Output Frequency ^{FO}	0.01 Hz to 2 MHz	2.5 Hz/MHz + 5 µHz	8.5 Digit Multimeter	



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Equipment to Measure Frequency ^{FO}	1 Hz to 10 MHz	0.05 % of Reading	Multifunction Calibrator	OEM Manual
	1 Hz to 40 Hz	0.05 % of Reading		
	40 Hz to 10 MHz	0.01 % of Reading		
Temperature Calibration, Indication and control Equipment used with Thermocouple Type B ^{FO}	600 °C to 800 °C	0.44 °C	Electrical Simulation of Thermocouple Output Ectron 1140A	
	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 and 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 and control Equipment used with Thermocouple Type E ^{FO}	-250 °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		
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type J	-210 °C to -180 °C	0.12 °C		
	-180 °C to -120 °C	0.10 °C		
	-120 °C to -50 °C	0.08 °C		
	-50 °C to 990 °C	0.07 °C		
	990 °C to 1 200 °C	0.07 °C		
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type K	-255 °C to -195 °C	0.7 °C		
	-195 °C to -115 °C	0.12 °C		
	-115 °C to -55 °C	0.09 °C		
	-55 °C to 1 000 °C	0.07 °C		
	1 000 °C to 1 372 °C	0.08 °C		
Temperature Calibration, Indication and 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 and 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		



Certificate of Accreditation: Supplement

Industrial Calibration Service (In-Cal)

71C Pine Road, Hudson, NH 03051
Contact Name: Richie Fiore Phone: 603-883-5558

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 (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Calibration, Indication and control Equipment used with Thermocouple Type R ^{FO}	Up to 250 °C	0.57 °C	Electrical Simulation of Thermocouple Output Ectron 1140A	OEM Manual
	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 and 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 and 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 and Control Equipment Used with Thermocouple Type U ^{FO}	-200 °C to 0 °C	0.56 °C		
	Up to 600 °C	0.27 °C		
Temperature Calibration, Indication and control Equipment used with RTD Type Pt 395, 100 Ω ^{FO}	-200 °C to 800 °C	0.23 °C	Electrical Simulation of RTD Output Fluke 5520A Fluke 5522A Fluke 5730A	
Temperature Calibration, Indication and control Equipment used with RTD Type Pt 3926, 100 Ω ^{FO}	-200 °C to 630 °C	0.12 °C		
Temperature Calibration, Indication and control Equipment used with RTD Type Pt 3916, 100 Ω ^{FO}	-200 °C to 630 °C	0.25 °C		
Temperature Calibration, Indication and control Equipment used with RTD Type Pt 385, 200 Ω ^{FO}	-200 °C to 630 °C	0.16 °C		
Temperature Calibration, Indication and control Equipment used with RTD Type Pt 385, 500 Ω ^{FO}	-200 °C to 630 °C	0.11 °C		
Temperature Calibration, Indication and control Equipment used with RTD Type Pt 385, 1 000 Ω ^{FO}	-200 °C to 630 °C	0.23 °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	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Calibration, Indication and control Equipment used with RTD Type Pt Ni 385, 120 Ω ^{FO}	-80 °C to 260 °C	0.14 °C	Electrical Simulation of RTD Output Fluke 5520A	OEM Manual
Temperature Calibration, Indication and control Equipment used with RTD Type Cu 427, 10 Ω ^{FO}	-100 °C to 260 °C	0.3 °C	Fluke 5522A Fluke 5730A	
Equipment to Measure Resistance ^{FO}	Up to 11 Ω	40 $\mu\Omega/\Omega$ + 1 m Ω	Multifunction Calibrator	
	11 Ω to 33 Ω	30 $\mu\Omega/\Omega$ + 1.5 m Ω		
	33 Ω to 110 Ω	28 $\mu\Omega/\Omega$ + 1.4 m Ω		
	110 Ω to 330 Ω	28 $\mu\Omega/\Omega$ + 2 m Ω		
	330 Ω to 1.1 k Ω	28 $\mu\Omega/\Omega$ + 2 m Ω		
	1.1 k Ω to 3.3 k Ω	28 $\mu\Omega/\Omega$ + 20 m Ω		
	3.3 k Ω to 11 k Ω	28 $\mu\Omega/\Omega$ + 20 m Ω		
	11 k Ω to 33 k Ω	28 $\mu\Omega/\Omega$ + 200 m Ω		
	33 k Ω to 110 k Ω	28 $\mu\Omega/\Omega$ + 200 m Ω		
	110 k Ω to 330 k Ω	32 $\mu\Omega/\Omega$ + 2 Ω		
	330 k Ω to 1.1 M Ω	32 $\mu\Omega/\Omega$ + 2 Ω		
	1.1 M Ω to 3.3 M Ω	60 $\mu\Omega/\Omega$ + 30 Ω		
	3.3 M Ω to 11 M Ω	130 $\mu\Omega/\Omega$ + 50 Ω		
	11 M Ω to 33 M Ω	250 $\mu\Omega/\Omega$ + 2.5 k Ω		
	33 M Ω to 110 M Ω	500 $\mu\Omega/\Omega$ + 3 k Ω		
	110 M Ω to 330 M Ω	0.3 m Ω/Ω + 100 k Ω		
	330 M Ω to 1 100 M Ω	1.5 m Ω/Ω + 500 k Ω		
Equipment to Measure Capacitance ^{FO}	220 pF to 400 pF	10 pF + 0.5% of Reading	Multifunction Calibrator	
	400 pF to 1.1 nF	0.01 nF + 0.5% of Reading		
	1.1 nF to 3.3 nF	0.01 nF + 0.5% of Reading		
	3.3 nF to 11 nF	0.01 nF + 0.25% of Reading		
	11 nF to 33 nF	0.1 nF + 0.25% of Reading		
	33 nF to 110 nF	0.1 nF + 0.25% of Reading		
	110 nF to 330 nF	0.3 nF + 0.25% of Reading		
	330 nF to 1.1 μ F	1 nF + 0.25% of Reading		
	1.1 μ F to 3.3 μ F	3 nF + 0.25% of Reading		
	3.3 μ F to 11 μ F	10 nF + 0.25% of Reading		
	11 μ F to 33 μ F	30 nF + 0.4% of Reading		



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Industrial Calibration Service (In-Cal)

71C Pine Road, Hudson, NH 03051
Contact Name: Richie Fiore Phone: 603-883-5558

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	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Measure Capacitance ^{FO}	33 μ F to 110 μ F	100 nF + 0.45% of Reading	Multifunction Calibrator	OEM Manual
	110 μ F to 330 μ F	300 nF + 0.45% of Reading		
	330 μ F to 1.1 mF	1 μ F + 0.45% of Reading		
	1.1 mF to 3.3 mF	3 μ F + 0.45% of Reading		
	3.3 mF to 11 mF	10 μ F + 0.45% of Reading		
	11 mF to 33 mF	30 μ F + 0.75% of Reading		
	33 mF to 110 mF	100 μ F + 1.1% of Reading		

Dimensional

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	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Gage Blocks ^F	0.05 in to 4 in	(2 + 1.1L) μ in	Gage Block Comparator	IC-DM-1
	0.05 in to 14 in	(3 + 1.1L) μ in	P&W Labmaster	
Outside Micrometers ^{FO}	0.05 in to 40 in	(55 + 18L) μ in	Gage Blocks	IC-DM-2
Inside Micrometers ^{FO}	0.05 in to 40 in	(66 + 18L) μ in		IC-DM-29
Depth Micrometers ^{FO}	0.05 in to 12 in	(66 + 25L) μ in		IC-DM-26
Dial/Digital Indicators ^{FO}	Up to 6 in	(55 + 24L) μ in	Gage Blocks	IC-DM-22
Test Indicators ^{FO}	Up to 0.03 in	(55 + 24L) μ in		
Calipers ^{FO}	0.05 in to 40 in	(230 + 9.3L) μ in	Gage Blocks Surface Plate	IC-DM-2
Height Gages ^{FO}	Up to 40 in	(570 + 23L) μ in		IC-DM-3
Cylindrical Plug Gages ^{FO}	Up to 6 in	(6.6 + 2.6L) μ in	P&W Labmaster	IC-DM-15
Plain Ring Gages ^F	0.02 in to 14 in	(15 + 2.9L) μ in		IC-DM-8
Thread Plug – Major Diameter ^F	Up to 6 in	21 μ in	Supermicrometer	IC-DM-7
Thread Plug – Pitch Diameter ^F	Up to 6 in	86 μ in		
Steel Rules ^{FO}	Up to 40 in	(1 200 + 110L) μ in	Linear Calibrator	IC-DM-31
Tape Measures ^{FO}	Up to 40 in	(1 200 + 110L) μ in		IC-DM-28
Feeler Gages ^{FO}	0.001 in to 0.2 in	16 μ in	Supermicrometer	IC-DM-27



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Industrial Calibration Service (In-Cal)

71C Pine Road, Hudson, NH 03051
Contact Name: Richie Fiore Phone: 603-883-5558

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

Mass, Force & Weighing Devices

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	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Weight- Class F ^F	Up to 2 kg	0.001 1 g	Mass Comparator Class 2 Std. Weights	IC-ME-1
	2 kg to 5 kg	0.045 g		
	5 kg to 25 kg	0.29 g		
Analytical Balances ^{FO}	1 g to 5 000 g	0.000 56 % of Rdg + 230 μ g	Ultra Class Weights	IC-ME-3
Bench/Floor Scales ^{FO}	Up to 600 lbf	0.014 % of Rdg + 0.008 lbf	Class F Weights	IC-ME-2
Equipment to Measure Force - Compression ^{FO}	10 lbf to 500 lbf	0.005 3 % of Rdg + 0.034 lbf	Load Cell Force Stand	IC-ME-11
	500 lbf to 2 000 lbf	0.016 % of Rdg		
	2 000 lbf to 800 klf	0.5 % of Rdg		
Equipment to Measure Force - Tension ^{FO}	10 lbf to 500 lbf	0.005 3 % of Rdg + 0.034 lbf		
	500 lbf to 2 000 lbf	0.016 % of Rdg		

Time & Frequency

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	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Timers/Stopwatches ^{FO}	Up to 24 hrs	0.058 s/day	Timometer	Time Base Method NIST 960-12

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	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Torque Tools - Wrenches, Drivers, Watches, Limiters, Multipliers ^{FO}	5 ozf·in to 100 ozf·in	0.9 % of Rdg + 0.087 ozf·in	Torque Tester	IC-ME-5
	5 lbf·in to 1 000 lbf·in	1.1 % of Rdg + 0.15 lbf·in		
	25 lbf·ft to 250 lbf·ft	1 % of Rdg + 0.01 lbf·ft		
	250 lbf·ft to 600 lbf·ft	0.61 % of Rdg + 0.73 lbf·ft		
Equipment to Measure Pneumatic Pressure ^{FO}	Up to 29 psi	0.011 % + 0.001 8 psi	Pressure Calibrator	IC-TH-8
	29 psi to 290 psi	0.005 4 % + 0.013 psi		
	290 psi to 2 900 psi	0.005 7 % + 0.13 psi		
Equipment to Measure Hydraulic Pressure ^{FO}	Up to 5 000 psi	0.083 % + 0.56 psi		
	5 000 to 20 000 psi	12 psi		
	20 000 to 40 000 psi	25 psi		
Equipment to Measure Vacuum ^{FO}	-14.5 to 0 psi	0.002 psi		



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Industrial Calibration Service (In-Cal)

71C Pine Road, Hudson, NH 03051
Contact Name: Richie Fiore Phone: 603-883-5558

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

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	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Measuring Equipment ^{FO}	-196 °C to 0 °C	0.045 °C	Metrology Well/Bath/Furnace, SPRT, Reference Thermometer, Liquid Nitrogen	IC-TH-3
	0 °C to 200 °C	0.035 °C		
	200 °C to 660 °C	0.042 °C		
	660 °C to 1 000 °C	2.9 °C		
Infrared Thermometers ^{FO}	35 °C to 500 °C	0.38 % + 0.3 °C	Blackbody	IC-TH-16
Equipment to Measure Humidity ^{FO}	10 % RH to 95 % RH	0.53 % RH	Thunder Scientific 2500	IC-TH-5
Temperature Uniformity ^O	-200 °C to 1 300 °C	2.4 °C	Thermocouple Data Logger, Thermocouple Sensors	AMS 2750 IC-TH-17
System Accuracy Test ^O	-200 °C to 1 300 °C	2.4 °C		

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.
4. The presence of a superscript O means that the laboratory performs calibration of the indicated parameter 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 L represents length in inches or millimeters as appropriate to the uncertainty statement.
7. The term Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement.