



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

PreciseCal Services, Inc.

3044 Scherer Drive North, St. Petersburg, FL 33716

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

**ISO/IEC 17025:2005
& 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 April 2017):

Dimensional, Electrical, Mass, Force and Weighing Devices, Mechanical 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:

<i>Initial Accreditation Date:</i>	<i>Issue Date:</i>	<i>Expiration Date:</i>	<i>Extension Date:</i>
March 8, 2008	October 9, 2018	October 9, 2020	November 30, 2020

Tracy Szerszen
President

<i>Accreditation No.:</i>	<i>Certificate No.:</i>
59403	L18-463

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.pjllabs.com



Certificate of Accreditation: Supplement

PreciseCal Services, Inc.

3044 Scherer Drive North, St. Petersburg, FL 33716
 Contact Name: Julio Cuevas Phone: 727-573-5063

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
Gage Blocks ^F	1.27 mm to 101.6 mm (0.05 in to 4.0 in)	(0.1397 μm + 0.002 68L) μm (5.5 μin + 2.68L) μin	Grade 0 & Grade 2 Federal 130B-24
Outside Micrometers ^{FO} (50 μin resolution)	1.27 mm to 101.6 mm (0.05 in to 4 in)	(1.6 μm + 0.008 74L) μm (63 μin + 8.74L) μin	Gage Blocks
Outside Micrometers ^{FO} (0.0001 in resolution)	1.27 mm to 101.6 mm (0.05 in to 4 in)	(1.905 μm + 0.008 35L) μm (75 μin + 8.35L) μin	
Outside Micrometers ^{FO} (0.001 in resolution)	101.85 mm to 304.8 mm (4.01 in to 12 in)	(1.04 μm + 0.016 9L) μm (41 μin + 16.9L) μin	
	1.27 mm to 101.6 mm (0.05 in to 4 in)	(19.304 μm + 0.001L) μm (760 μin + 1.02L) μin	
Outside Micrometers ^{FO} (0.001 in resolution)	101.85 mm to 304.8 mm (4.01 in to 12 in)	(14.22 μm + 0.021 4L) μm (560 μin + 21.4L) μin	
	1.27 mm to 609.6 mm (0.05 in to 24 in)	(3.048 μm + 0.015L) μm (120 μin + 14.7L) μin	
Height Gages ^{FO} (0.001 in resolution)	1.27 mm to 609.6 mm (0.05 in to 24 in)	(14.732 μm + 0.006 8L) μm (580 μin + 6.78L) μin	
Calipers ^{FO} (0.0005 in resolution)	1.27 mm to 1 016 mm (0.05 in to 40 in)	(15.24 μm + 0.009L) μm (600 μin + 8.96L) μin	
Calipers ^{FO} (0.001 in resolution)	1.27 mm to 1 016 mm (0.05 in to 40 in)	(17.78 μm + 0.008 4L) μm (700 μin + 8.38L) μin	
Indicators ^{FO} (20 μin resolution)	0.508 μm to 50.8 μm (20 μin to 2 000 μin)	(0.33 μm + 0.000 005L) μm (13 μin + 0.004 81L) μin	
Indicators ^{FO} (50 μin resolution)	2.5 μm to 101.6 mm (0.000 1 in to 4 in)	(1.60 μm + 0.008 7L) μm (63 μin + 8.74L) μin	
Indicators ^{FO} (0.000 1 in resolution)	2.5 μm to 101.6 mm (0.000 1 in to 4 in)	(2.057 μm + 0.007 9L) μm (81 μin + 7.93L) μin	
Indicators ^{FO} (0.000 5 in resolution)	12.7 μm to 101.6 mm (0.000 5 in to 4 in)	(16.002 μm + 0.000 8L) μm (630 μin + 0.763L) μin	
Indicators ^{FO} (0.001 in resolution)	25.4 μm to 101.6 mm (0.001 in to 4 in)	(14.73 μm + 0.001 3L) μm (580 μin + 1.33L) μin	
Intracmics ^{FO} (0.000 1 in resolution)	6.985 mm to 177.8 mm (0.275 in to 7 in)	(1.75 μm + 0.021L) μm (69 μin + 21.4L) μin	
Pin Gages ^{FO}	0.254 mm to 25.4 mm (0.01 in to 1 in)	(6.096 μm + 0.003 3L) μm (240 μin + 3.27L) μin	Micrometer (50 μin)
Surface Plates, Repeat ^{FO}	0.508 μm to 0.050 8 mm (20 μin to 0.002 in)	0.58 μm (23 μin)	Repeat-O-Meter
Surface Plates, Flatness ^{FO}	304.8 mm to 2 438.4 mm (12 in to 96 in)	(0.843 μm + 0.000 8L) μm (33.19 μin + 0.792L) μin	Planekator, Mahr Indicator
Squares ^{FO}	50.8 mm to 304.8 mm (2 in to 12 in)	3.30 μm 130 μin	Standridge SQ 6x12x2 Taft-Piert 9146 SP48x72A



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OD Measurements ^{FO}	1.27 μ m to 25.4 mm (50 μ in to 1 in)	(0.74 μ m + 0.000 1L) μ m (29 μ in + 0.097 8L) μ in	Micrometer Mitutoyo 293-765-30
	508.0 μ m to 101.6 mm (20.0 μ in to 4 in)	(0.33 μ m + 0.0013L) μ m (13 μ in + 1.32L) μ in	Bench Micrometer Mitutoyo 162-102
OD Measurements ^F	1.27 μ m to 254 mm (50 μ in to 10 in)	(0.31 μ m + 0.003 2L) μ m (12 μ in + 3.24L) μ in	Societe Genovise 305M No 1508
ID Measurements ^F	9.525 mm to 177.8 mm (0.375 in to 7 in)	(0.31 μ m + 0.003 2L) μ m (12 μ in + 3.24L) μ in	Societe Genovise 305M No 1508
Optical Comparator-10X ^F	2.54 μ m to 50.8 mm (0.000 1 in to 2 in)	(10.41 μ m + 0.000 01L) μ m (410 μ in + 0.010 2L) μ in	Nikon Inc 6C
Optical Comparator-20X ^F		(5.84 + 0.000 02L) μ m (230.0 μ in + 0.018 7L) μ in	
Optical Comparator-50X ^F		(3.3 μ m + 0.000 03L) μ m (130 μ in + 0.032 2L) μ in	
Dimensional Inspection Length ^F	254 μ m to 914.4 mm (10 μ in to 36 in)	(0.33 μ m + 0.001 8L) μ m (13 μ in + 1.82L) μ in	Southern Gage 90025 Amplifer
Rulers, Steel ^{FO}	0.01 in to 24 in by 0.01" (1/100th)	0.005 8 in	Gage Blocks
	0.015625 in to 24 in by 0.015625" (1/64th)	0.009 in	
	0.02 in to 24 in by 0.02" (1/50th)	0.012 in	
	0.031 25 in to 24 in by 0.031 25" (1/32nd)	0.018 in	
	0.0625 in to 24 in by 0.062 5" (1/16th)	0.036 in	
	0.1 in to 24 in by 0.1" (1/10th)	0.058 in	
	0.125 in to 24 in by 0.125 (1/8th)	0.072 in	
	0.1 mm to 300 mm by 0.1 mm	(0.051 mm + 0.000 493L) mm	
	0.5 mm to 300 mm by 0.5 mm	(0.28 mm + 0.000 203L) mm	
	1 mm to 300.0 mm by 1 mm	(0.58 mm + 0.000 109L) mm	



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Equipment to Measure DC Voltage ^{FO}	5 μ V to 329.999 9 mV	0.002 % of reading + 1 μ V	Fluke 5522A
	330 mV to 3.299 9 V	0.001 1 % of reading + 2 μ V	
	3.3 V to 32.999 9 V	0.001 2 % of reading + 20 μ V	
	33 V to 329.999 V	0.001 8 % of reading + 150 μ V	
	100 V to 1 000 V	0.001 8 % of reading + 1 500 μ V	
Equipment to Output DC Voltage ^{FO}	0.5 μ V to 199.99 mV	0.000 5 % of reading + 0.1 μ V	Fluke 8508A
	2 μ V to 1.999 9 V	0.000 35 % of reading + 0.4 μ V	
	20 μ V to 19.999 V	0.000 3 % of reading + 4 μ V	
	200 μ V to 199.99 V	0.000 45 % of reading + 40 μ V	
	2 mV to 1 000 V	0.000 45 % of reading + 500 μ V	
Equipment to Measure DC Current ^{FO}	0.3 μ A to 329.999 μ A	0.015 % of reading + 0.02 μ A	Fluke 5522A
	330 μ A to 3.299 99 mA	0.01 % of reading + 0.05 μ A	
	3.30 mA to 32.999 9 mA	0.01% of reading + 0.25 μ A	
	33.0 mA to 329.999 mA	0.01 % of reading + 2.5 μ A	
	330 mA to 1.099 99 A	0.02 % of reading + 40 μ A	
	1.1 A to 2.999 99 A	0.038 % of reading + 40 μ A	
	3 A to 10.999 9 A	0.05 % of reading + 500 μ A	
	11 A to 20.5 A	0.1 % of reading + 750 μ A	
Equipment to Output DC Current ^{FO}	2 nA to 200 μ A	0.001 2 % of reading + 0.4 nA	Fluke 8508A
	20 nA to 2 mA	0.001 2 % of reading + 4 nA	
	200 nA to 20 mA	0.001 4 % of reading + 40 nA	
	4 μ A to 200 mA	0.004 8 % of reading + 0.8 μ A	
	8 μ A to 2 A	0.018 5 % of reading + 1.6 μ A	
	2 mA to 20 A	0.04 % of reading + 400 μ A	
Equipment to Measure AC Voltage – Sine Wave (at the listed frequencies) ^{FO}			Fluke 5522A
10 Hz to 45 Hz	1 mV to 32.999 mV	0.08 % of reading + 6 μ V	
45 Hz to 10 kHz	1 mV to 32.999 mV	0.015 % of reading + 6 μ V	
10 kHz to 20 kHz	1 mV to 32.999 mV	0.02 % of reading + 6 μ V	
20 kHz to 50 kHz	1 mV to 32.999 mV	0.1 % of reading + 6 μ V	
50 kHz to 100 kHz	1 mV to 32.999 mV	0.35 % of reading + 12 μ V	
100 kHz to 500 kHz	1 mV to 32.999 mV	0.8 % of reading + 50 μ V	



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Equipment to Measure AC Voltage – Sine Wave (at the listed frequencies) ^{FO}			Fluke 5522A
10 Hz to 45 Hz	33 mV to 329.999 mV	0.03 % of reading + 8 μ V	
45 Hz to 10 kHz	33 mV to 329.999 mV	0.015 % of reading + 8 μ V	
10 kHz to 20 kHz	33 mV to 329.999 mV	0.016 % of reading + 8 μ V	
20 kHz to 50 kHz	33 mV to 329.999 mV	0.035 % of reading + 8 μ V	
50 kHz to 100 kHz	33 mV to 329.999 mV	0.08 % of reading + 32 μ V	
100 kHz to 500 kHz	33 mV to 329.999 mV	0.2 % of reading + 70 μ V	
Equipment to Measure AC Voltage – Sine Wave (at the listed frequencies) ^{FO}			
10 Hz to 45 Hz	0.33 V to 3.299 99 V	0.03 % of reading + 50 μ V	
45 Hz to 10 kHz	0.33 V to 3.299 99 V	0.015 % of reading + 60 μ V	
10 kHz to 20 kHz	0.33 V to 3.299 99 V	0.019 % of reading + 60 μ V	
20 kHz to 50 kHz	0.33 V to 3.299 99 V	0.03 % of reading + 50 μ V	
50 kHz to 100 kHz	0.33 V to 3.299 99 V	0.07 % of reading + 125 μ V	
100 kHz to 500 kHz	0.33 V to 3.299 99 V	0.24 % of reading + 600 μ V	
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	0.03 % of reading + 650 μ V	
45 Hz to 10 kHz	3.3 V to 32.999 9 V	0.015 % of reading + 600 μ V	
10 kHz to 20 kHz	3.3 V to 32.999 9 V	0.024 % of reading + 600 μ V	
20 kHz to 50 kHz	3.3 V to 32.999 9 V	0.035 % of reading + 600 μ V	
50 kHz to 100 kHz	3.3 V to 32.999 9 V	0.09 % of reading + 1.6 mV	
Equipment to Measure AC Voltage – Sine Wave (at the listed frequencies)			
45 Hz to 1 kHz	33 V to 329.999 V	0.019 % of reading + 2 mV	
1 kHz to 10 kHz	33 V to 329.999 V	0.02 % of reading + 6 mV	
10 kHz to 20 kHz	33 V to 329.999 V	0.025 % of reading + 6 mV	
20 kHz to 50 kHz	33 V to 329.999 V	0.03 % of reading + 6 mV	
50 kHz to 100 kHz	33 V to 329.999 V	0.2 % of reading + 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	0.03 % 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	



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Equipment to Measure AC Voltage (Sine Wave) Extended Bandwidth (at the listed frequencies) ^{FO}			Fluke 5522A
0.01 Hz to 9.99 Hz	1 mV to 33 mV	5 % of reading + 0.165 mV	
0.01 Hz to 9.99 Hz	34 mV to 330 mV	5 % of reading + 1.65 mV	
0.01 Hz to 9.99 Hz	0.4 V to 33 V	5 % of reading + 0.165 V	
500.1 kHz to 1 MHz	0.3 V to 3.3 V	-10 dB @ 1 MHz typical	
1.001 MHz to 2 MHz	0.3 V to 3.3 V	-31 dB @ 2 MHz typical	
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			Fluke 8508A
1 Hz to 10 Hz	0.1 μ V to 199.99 mV	0.017 % of reading + 14 μ V	
10 Hz to 40 Hz	0.1 μ V to 199.99 mV	0.014 % of reading + 4 μ V	
40 Hz to 100 Hz	0.1 μ V to 199.99 mV	0.012 % of reading + 4 μ V	
100 Hz to 2 kHz	0.1 μ V to 199.99 mV	0.011 % of reading + 2 μ V	
2 kHz to 10 kHz	0.1 μ V to 199.99 mV	0.014 % of reading + 4 μ V	
10 kHz to 30 kHz	0.1 μ V to 199.99 mV	0.034 % of reading + 8 μ V	
30 kHz to 100 kHz	0.1 μ V to 199.99 mV	0.077 % of reading + 20 μ V	
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			
1 Hz to 10 Hz	1 μ V to 1.999 9 V	0.015 % of reading + 0.1 mV	
10 Hz to 40 Hz	1 μ V to 1.999 9 V	0.012 % of reading + 20 μ V	
40 Hz to 2 kHz	1 μ V to 1.999 9 V	0.009 % of reading + 20 μ V	
2 kHz to 10 kHz	1 μ V to 1.999 9 V	0.011 % of reading + 20 μ V	
10 kHz to 30 kHz	1 μ V to 1.999 9 V	0.022 % of reading + 40 μ V	
30 kHz to 100 kHz	1 μ V to 1.999 9 V	0.057 % of reading + 0.2 mV	
100 kHz to 300 kHz	1 μ V to 1.999 9 V	0.3 % of reading + 2 mV	
300 kHz to 1 MHz	1 μ V to 1.999 9 V	1 % of reading + 20 mV	
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			
1 Hz to 10 Hz	10 μ V to 19.999 V	0.015 % of reading + 1.2 mV	
10 Hz to 40 Hz	10 μ V to 19.999 V	0.012 % of reading + 0.2 mV	
40 Hz to 2 kHz	10 μ V to 19.999 V	0.009 % of reading + 0.2 mV	
2 kHz to 10 kHz	10 μ V to 19.999 V	0.011 % of reading + 0.2 mV	
10 kHz to 30 kHz	10 μ V to 19.999 V	0.022 % of reading + 0.4 mV	
30 kHz to 100 kHz	10 μ V to 19.999 V	0.057 % of reading + 2 mV	
100 kHz to 300 kHz	10 μ V to 19.999 V	0.3 % of reading + 20 mV	
300 kHz to 1 MHz	10 μ V to 19.999 V	1 % of reading + 200 mV	



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Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			Fluke 8508A
1 Hz to 10 Hz	100 μ V to 199.99 V	0.015 % of reading + 12 mV	
10 Hz to 40 Hz	100 μ V to 199.99 V	0.012 % of reading + 2 mV	
40 Hz to 2 kHz	100 μ V to 199.99 V	0.009 % of reading + 2 mV	
2 kHz to 10 kHz	100 μ V to 199.99 V	0.011 % of reading + 2 mV	
10 kHz to 30 kHz	100 μ V to 199.99 V	0.022 % of reading + 4 mV	
30 kHz to 100 kHz	100 μ V to 199.99 V	0.057 % of reading + 20 mV	
100 kHz to 300 kHz	100 μ V to 199.99 V	0.3 % of reading + 200 mV	
300 kHz to 1 MHz	100 μ V to 199.99 V	1 % of reading + 2 V	
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			
1 Hz to 10 Hz	1 mV to 300 V	0.015 % of reading + 70 mV	
1 Hz to 10 Hz	301 V to 1 050 V	0.015 % of reading + 89.6 mV	
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			
10 Hz to 10 kHz	1 mV to 300 V	0.012 % of reading + 20 mV	
10 Hz to 10 kHz	301 V to 1 050 V	0.012 % of reading + 39.6 mV	
10 kHz to 30 kHz	1 mV to 300 V	0.023 % of reading + 40 mV	
10 kHz to 30 kHz	301 V to 1 050 V	0.023 % of reading + 10.04 V	
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			
30 kHz to 100 kHz	1 mV to 300 V	0.058 % of reading + 200 mV	
30 kHz to 100 kHz	301 V to 1 050 V	0.058 % of reading + 1.38 V	
Equipment to Measure AC Current – Sine Wave (at the listed frequencies) ^{FO}			Fluke 5522A
10 Hz to 20 Hz	29 μ A to 329.999 μ A	0.2 % of reading + 0.1 μ A	
20 Hz to 45 Hz	29 μ A to 329.999 μ A	0.15 % of reading + 0.1 μ A	
45 Hz to 1 kHz	29 μ A to 329.999 μ A	0.13 % of reading + 0.1 μ A	
1 kHz to 5 kHz	29 μ A to 329.999 μ A	0.3 % of reading + 0.15 μ A	
5 kHz to 10 kHz	29 μ A to 329.999 μ A	0.8 % of reading + 0.2 μ A	
10 kHz to 30 kHz	29 μ A to 329.999 μ A	1.6 % of reading + 0.4 μ A	



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Equipment to Measure AC Current- Sine Wave (LCOMP) (at the listed frequencies) ^{FO}			Fluke 5522A
10 Hz to 100 Hz	29 μ A to 329.999 μ A	0.25 % of reading + 0.2 μ A	
100 Hz to 1 kHz	29 μ A to 329.999 μ A	0.6 % of reading + 0.5 μ A	
Equipment to Measure AC Current- Sine Wave (LCOMP) (at the listed frequencies) ^{FO}			
10 Hz to 100 Hz	0.33 mA to 3.299 99 mA	0.25 % of reading + 0.3 μ A	
100 Hz to 1 kHz	0.33 mA to 3.299 99 mA	0.6 % of Reading + 0.8 μ A	
Equipment to Measure AC Current- Sine Wave (LCOMP) (at the listed frequencies)			
10 Hz to 100 Hz	3.3 mA to 32.999 9 mA	0.08 % of reading + 4 μ A	
100 Hz to 1 kHz	3.3 mA to 32.999 9 mA	0.2 % of reading + 10 μ A	
Equipment to Measure AC Current- Sine Wave (LCOMP) (at the listed frequencies) ^{FO}			
10 Hz to 100 Hz	33 mA to 329.999 mA	0.08 % of reading + 40 μ A	
100 Hz to 1 kHz	33 mA to 329.999 mA	0.2 % of reading + 100 μ A	
Equipment to Measure AC Current- Sine Wave (LCOMP) (at the listed frequencies) ^{FO}			
10 Hz to 100 Hz	0.33 A to 2.999 99 A	0.12 % of reading + 200 μ A	
100 Hz to 400 Hz	0.33 A to 2.999 99 A	0.3 % of reading + 1 mA	
Equipment to Measure AC Current- Sine Wave (LCOMP) (at the listed frequencies) ^{FO}			
10 Hz to 100 Hz	3 A to 20.5 A	0.12 % of reading + 2 mA	
100 Hz to 1 kHz	3 A to 20.5 A	1 % of reading + 5 mA	
Equipment to Measure AC Current (at the listed frequencies) ^{FO}			
10 Hz to 20 Hz	0.33 mA to 3.299 99 mA	0.2 % of reading + 0.15 μ A	
20 Hz to 45 Hz	0.33 mA to 3.299 99 mA	0.13 % of reading + 0.15 μ A	
45 Hz to 1 kHz	0.33 mA to 3.299 99 mA	0.1 % of reading + 0.15 μ A	
1 kHz to 5 kHz	0.33 mA to 3.299 99 mA	0.2 % of reading + 0.2 μ A	
5 kHz to 10 kHz	0.33 mA to 3.299 99 mA	0.5 % of reading + 0.3 μ A	
10 kHz to 30 kHz	0.33 mA to 3.299 99 mA	1 % of reading + 0.6 μ A	



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Equipment to Measure AC Current (at the listed frequencies) ^{FO}			Fluke 5522A
10 Hz to 20 Hz	3.3 mA to 32.999 9 mA	0.18 % of reading + 2 μ A	
20 Hz to 45 Hz	3.3 mA to 32.999 9 mA	0.09 % of reading + 2 μ A	
45 Hz to 1 kHz	3.3 mA to 32.999 9 mA	0.04 % of reading + 2 μ A	
1 kHz to 5 kHz	3.3 mA to 32.999 9 mA	0.08 % of reading + 2 μ A	
5 kHz to 10 kHz	3.3 mA to 32.999 9 mA	0.2 % of reading + 3 μ A	
10 kHz to 30 kHz	3.3 mA to 32.999 9 mA	0.4 % of reading + 4 μ A	
Equipment to Measure AC Current (at the listed frequencies) ^{FO}			
10 Hz to 20 Hz	33 mA to 329.999 mA	0.18 % of reading + 20 μ A	
20 Hz to 45 Hz	33 mA to 329.999 mA	0.09 % of reading + 20 μ A	
45 Hz to 1 kHz	33 mA to 329.999 mA	0.04 % of reading + 20 μ A	
1 kHz to 5 kHz	33 mA to 329.999 mA	0.1 % of reading + 50 μ A	
5 kHz to 10 kHz	33 mA to 329.999 mA	0.2 % of reading + 100 μ A	
10 kHz to 30 kHz	33 mA to 329.999 mA	0.4 % of reading + 200 μ A	
Equipment to Measure AC Current (at the listed frequencies) ^{FO}			
10 Hz to 45 Hz	0.33 A to 1.099 99 A	0.18 % of reading + 100 μ A	
45 Hz to 1 kHz	0.33 A to 1.099 99 A	0.05 % of reading + 100 μ A	
1 kHz to 5 kHz	0.33 A to 1.099 99 A	0.6 % of reading + 1 mA	
5 kHz to 10 kHz	0.33 A to 1.099 99 A	2.5 % of reading + 5 mA	
Equipment to Measure AC Current (at the listed frequencies) ^{FO}			
10 Hz to 45 Hz	1.1 A to 2.999 99 A	0.18 % of reading + 100 μ A	
45 Hz to 1 kHz	1.1 A to 2.999 99 A	0.06 % of reading + 100 μ A	
1 kHz to 5 kHz	1.1 A to 2.999 99 A	0.6 % of reading + 1 mA	
5 kHz to 10 kHz	1.1 A to 2.999 99 A	2.5 % of reading + 5 mA	
Equipment to Measure AC Current (at the listed frequencies)			
45 Hz to 100 Hz	3 A to 10.999 9 A	0.06 % of reading + 2 mA	
100 Hz to 1 kHz	3 A to 10.999 9 A	0.1 % of reading + 2 mA	
1 kHz to 5 kHz	3 A to 10.999 9 A	3 % of reading + 2 mA	
Equipment to Measure AC Current (at the listed frequencies)			
45 Hz to 100 Hz	11 A to 20.5 A	0.12 % of reading + 5 mA	
100 Hz to 1 kHz	11 A to 20.5 A	0.15 % of reading + 5 mA	
1 kHz to 5 kHz	11 A to 20.5 A	3 % of reading + 5 mA	



Certificate of Accreditation: Supplement

PreciseCal Services, Inc.

3044 Scherer Drive North, St. Petersburg, FL 33716
 Contact Name: Julio Cuevas Phone: 727-573-5063

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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Output AC Current (at the listed frequencies) ^{FO}			Fluke 8508A
1 Hz to 10 kHz	0.1 nA to 199.99 μ A	0.05 % of reading + 20 nA	
10 kHz to 30 kHz	0.1 nA to 199.99 μ A	0.071 % of reading + 20 nA	
30 kHz to 100 kHz	0.1 nA to 199.99 μ A	0.4 % of reading + 20 nA	
1 Hz to 10 kHz	1 nA to 1.999 9 mA	0.031 % of reading + 200 nA	
10 kHz to 30 kHz	1 nA to 1.999 9 mA	0.071 % of reading + 200 nA	
30 kHz to 100 kHz	1 nA to 1.999 9 mA	0.4 % of reading + 200 nA	
1 Hz to 10 kHz	1 nA to 19.999 mA	0.031 % of reading + 2 μ A	
10 kHz to 30 kHz	1 nA to 19.999 mA	0.071 % of reading + 2 μ A	
30 kHz to 100 kHz	1 nA to 19.999 mA	0.4 % of reading + 2 μ A	
Equipment to Output AC Current (at the listed frequencies) ^{FO}			
10 Hz to 10 kHz	0.1 μ A to 199.99 mA	0.031 % of reading + 20 μ A	
10 kHz to 30 kHz	0.1 μ A to 199.99 mA	0.029 % of reading + 20 μ A	
30 kHz to 100 kHz	0.1 μ A to 199.99 mA	0.063 % of reading + 20 μ A	
Equipment to Output AC Current (at the listed frequencies)			
10 Hz to 2 kHz	1 μ A to 1.999 9 A	0.062 % of reading + 200 μ A	
2 kHz to 10 kHz	1 μ A to 1.999 9 A	0.074 % of reading + 200 μ A	
10 kHz to 30 kHz	1 μ A to 1.999 9 A	0.3 % of reading + 200 μ A	
Equipment to Output AC Current (at the listed frequencies) ^{FO}			
10 Hz to 2 kHz	10 μ A to 19.999 A	0.082 % of reading + 2 mA	
2 kHz to 10 kHz	10 μ A to 19.999 A	0.25 % of reading + 2 mA	
Equipment to Measure Resistance ^{FO}			Fluke 5522A
0.1 m Ω to 10.999 9 Ω		0.004 % of reading + 0.001 Ω	
11 Ω to 32.999 9 Ω		0.003 % of reading + 0.001 5 Ω	
33 Ω to 109.999 9 Ω		0.002 8 % of reading + 0.001 4 Ω	
110 Ω to 329.999 9 Ω		0.002 8 % of reading + 0.002 Ω	
0.33 k Ω to 1.099 999 k Ω		0.002 8 % of reading + 0.002 Ω	
1.1 k Ω to 3.299 999 9 k Ω		0.002 8 % of reading + 0.02 Ω	
3.3 k Ω to 10.999 99 k Ω		0.002 8 % of reading + 0.02 Ω	
11 k Ω to 32.999 99 k Ω		0.002 8 % of reading + 0.2 Ω	
33 k Ω to 109.999 9 k Ω		0.002 8 % of reading + 0.2 Ω	
110 k Ω to 329.999 9 k Ω		0.003 2 % of reading + 2 Ω	



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Equipment to Measure Resistance ^{FO}	0.33 M Ω to 1.099 999 M Ω	0.003 2 % of reading + 2 Ω	Fluke 5522A
	1.1 M Ω to 3.299 99 M Ω	0.006 % of reading + 30 Ω	
	3.3 M Ω to 10.999 99 M Ω	0.013 % of reading + 50 Ω	
	11 M Ω to 32.999 99 M Ω	0.025 % of reading + 2 500 Ω	
	33 M Ω to 109.999 9 M Ω	0.05 % of reading + 3 000 Ω	
	110 M Ω to 329.999 9 M Ω	0.3 % of reading + 0.1 M Ω	
	330 M Ω to 1 100 M Ω	1.5 % of reading + 0.5 M Ω	
Equipment to Output Resistance ^{FO}	20 $\mu\Omega$ to 1.999 9 Ω	0.001 7 % of reading + 4 $\mu\Omega$	Fluke 8508A
	70 $\mu\Omega$ to 19.999 Ω	0.001 % of reading + 1.4 $\mu\Omega$	
	0.3 m Ω to 199.99 Ω	0.000 8 % of reading + 60 $\mu\Omega$	
	3 m Ω to 1.999 9 k Ω	0.000 8 % of reading + 0.6 m Ω	
	30 m Ω to 19.999 k Ω	0.000 8 % of reading + 6 m Ω	
	300 m Ω to 199.99 k Ω	0.000 8 % of reading + 60 m Ω	
	5 Ω to 1.999 9 M Ω	0.000 9 % of reading + 1 Ω	
	500 Ω to 19.999 M Ω	0.002 % of reading + 100 Ω	
	50 k Ω to 199.99 M Ω	0.012 % of reading + 10 k Ω	
	5 M Ω to 1.999 9 G Ω	0.151 % of reading + 1 M Ω	
Equipment to Output Resistance High Voltage ^{FO}	50 Ω to 19.999 M Ω	0.001 7 % of reading + 10 Ω	
	5 k Ω to 199.99 M Ω	0.006 5 % of reading + 1 k Ω	
	500 k Ω to 1.999 9 G Ω	0.018 % of reading + 100 k Ω	
	50 M Ω to 19.999 G Ω	0.151 % of reading + 10 M Ω	



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Equipment to Measure Capacitance ^{FO}	0.19 nF to 3.299 9 nF	0.5 % of reading + 0.01 nF	Fluke 5522A
	3.3 nF to 10.999 9 nF	0.25 % of reading + 0.01 nF	
	11 nF to 32.999 9 nF	0.25 % of reading + 0.1 nF	
	33 nF to 109.999 nF	0.25 % of reading + 0.1 nF	
	110 nF to 329.999 nF	0.25 % of reading + 0.3 nF	
	0.33 μ F to 1.099 99 μ F	0.25 % of reading + 1 nF	
	1.1 μ F to 3.299 99 μ F	0.25 % of reading + 3 nF	
	3.3 μ F to 10.999 9 μ F	0.25 % of reading + 10 nF	
	11 μ F to 32.999 9 μ F	0.4 % of reading + 30 nF	
	33 μ F to 109.999 μ F	0.45 % of reading + 100 nF	
	110 μ F to 329.999 μ F	0.45 % of reading + 300 nF	
	0.33 mF to 1.099 99 mF	0.45 % of reading + 1 μ F	
	1.1 mF to 3.299 99 mF	0.45 % of reading + 3 μ F	
	3.3 mF to 10.999 9 mF	0.45 % of reading + 10 μ F	
	11 mF to 32.999 9 mF	0.75 % of reading + 30 μ F	
33 mF to 110 mF	1.1 % of reading + 100 μ F		
Temperature calibration, Indication and Control Equipment used with Thermocouple Type E ^{FO}	-250 °C to -100 °C	0.5 °C	Electrical Simulation of Thermocouple Output Fluke 5522A
	-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 ^{FO}	-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	
Temperature calibration, Indication and 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	



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Temperature calibration, Indication and Control Equipment used with Thermocouple Type R ^{FO}	0 °C to 250 °C	0.57 °C	Electrical Simulation of Thermocouple Output Fluke 5522A
	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}	0 °C 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	
	0 °C to 120 °C	0.16 °C	
	120 °C to 400 °C	0.14 °C	
Temperature calibration, Indication and Control Equipment used with RTD Type Pt 3926, 100 Ω ^{FO}	-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 385, 100 Ω ^{FO}	-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	



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Temperature calibration, Indication and Control Equipment used with RTD Type Pt 3916, 100 Ω ^{FO}	-200 °C to -190 °C	0.25 °C	Electrical Simulation of RTD output Fluke 5522A
	-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	
	400 °C to 600 °C	0.14 °C	
600 °C to 630 °C	0.16 °C		
Equipment to Measure DC Power (At the listed voltages and current ranges) ^{FO}			Fluke 5522A
33 mV to 1 020 V 0.33 mA to 329.99 mA	0.011 mW to 336.59 W	0.023 % of reading	
33 mV to 1 020 V 0.33 A to 2.999 9 A	0.011 W to 3 059.9 W	0.022 % of reading	
33 mV to 1 020 V 3 A to 20.5 A	0.099 W to 20 910 W	0.07 % of reading	
Equipment to Measure AC Power (At the listed voltages, current ranges, and frequencies) ^{FO}			
33 mV to 329.999 mV 3.3 mA to 8.999 mA 45 Hz to 65 Hz	0.11 mW to 2.97 mW	0.14 % of reading	
33 mV to 329.999 mV 9 mA to 32.999 mA 45 Hz to 65 Hz	0.297 mW to 10.9 mW	0.1 % of reading	
33 mV to 329.999 mV 33 mA to 89.99 mA 45 Hz to 65 Hz	1.1 mW to 29.7 mW	0.14 % of reading	
33 mV to 329.999 mV 90 mA to 329.99 mA 45 Hz to 65 Hz	2.97 mW to 108.9 mW	0.1 % of reading	
33 mV to 329.999 mV 0.33 A to 0.899 9 A 45 Hz to 65 Hz	10.9 mW to 296.97 mW	0.13 % of reading	
33 mV to 329.999 mV 0.9 A to 2.189 99 A 45 Hz to 65 Hz	29.7 mW to 722.7 mW	0.11 % of reading	



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Equipment to Measure AC Power (At the listed voltages, current ranges, and frequencies) ^{FO}			Fluke 5522A
33 mV to 329.999 mV 2.2 A to 4.4999 9 A 45 Hz to 65 Hz	72.6 mW to 1.49 W	0.13 % of reading	
33 mV to 329.999 mV 4.5 A to 20.5 A 45 Hz to 65 Hz	148.5 mW to 6.77 W	0.11 % of reading	Fluke 5522A
Equipment to Measure AC Power (at the listed frequencies) ^{FO}			
330 mV to 1 020 V 3.3 mA to 8.999 mA 45 Hz to 65 Hz	1.09 mW to 9.18 W	0.12 % of reading	
330 mV to 1 020 V 9 mA to 32.999 mA 45 Hz to 65 Hz	2.97 mW to 33.66 W	0.08 % of reading	
330 mV to 1 020 V 33 mA to 89.99 mA 45 Hz to 65 Hz	10.9 mW to 91.8 W	0.12 % of reading	
330 mV to 1 020 V 90 mA to 329.99 mA 45 Hz to 65 Hz	29.7 mW to 336.6 W	0.08 % of reading	
Equipment to Measure AC Power (at the listed frequencies) ^{FO}			
330 mV to 1 020 V 0.33 A to 0.899 9 A 45 Hz to 65 Hz	0.11 mW to 917.9 W	0.11 % of reading	
330 mV to 1 020 V 0.9 A to 2.189 99 A 45 Hz to 65 Hz	297 mW to 2 234 W	0.09 % of reading	
330 mV to 1 020 V 2.2 A to 4.4999 9 A 45 Hz to 65 Hz	726 mW to 4 590 W	0.12 % of reading	
330 mV to 1 020 V 4.5 A to 20.5 A 45 Hz to 65 Hz	1.49 W to 20910 W	0.1 % of reading	
Equipment to Measure Frequency ^{FO}	0.01 Hz to 2 MHz	5 μ Hz + 0.000 25 % of reading	



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

Mass, Force, and Weighing Devices

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
Scales & Balances ^{FO}	0.01 g to 200 g	0.094 mg + 0.004 95 mg/g	Class 1
	200 g to 1 000 g	0.005 86 mg/g	Class 1, Class 2
	1 000 g to 22 680 g	94 mg + 0.016 8 mg/g	Class 4
Force Gages ^{FO}	1 g to 200 g	0.023 g + 0.002 4 g/g	Class 1
Compression ^{FO}	2 N to 889.64 N	(0.62 + 2.45 x 10 ⁻³ F) N	Class F / Load Cell
Mass Weights ^F	0.05 mg to 220 000 mg	(0.036 mg + 0.000 001 03K) mg	A&D Balance GH-2020
	0.001 g to 1 212 g	(2.5 mg + 0.000 000 018 8K) mg	A&D Balance MC-100
	0.1 g to 10 100 g	(0.066 mg+ 0.000 000 009 38K) mg	Mettler Toldeo XP10002S
	0.002 lb to 50 lb	(0.34 mg + 0.000 012 9K) mg	A&D Balance HP-30K
Class F Weights ^F	1 mg	0.024 mg	Rice Lake/ A&D Balance Class 1 Weight Set
	2 mg	0.023 mg	
	3 mg	0.023 mg	
	5 mg	0.023 mg	
	10 mg	0.023 mg	
	20 mg	0.023 mg	
	30 mg	0.023 mg	
	50 mg	0.023 mg	
	100 mg	0.023 mg	
	200 mg	0.023 mg	
	300 mg	0.023 mg	
	500 mg	0.023 mg	
	1 g	0.024 mg	
	2 g	0.023 mg	Rice Lake/ A&D Balance Class 1 Weight Set
	3 g	0.024 mg	
	5 g	0.024 mg	
	10 g	0.026 mg	
	20 g	0.029 mg	
	30 g	0.029 mg	
	50 g	0.039 mg	
100 g	0.063 mg		
200 g	0.075 mg		
300 g	1.5 mg	A&D Balance MC-100 Class 1 Weight Set	
500 g	1.5 mg	A&D Balance MC100 Troemner Class 2 Weight Set	



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Class F Weights ^F	1 kg	1.6 mg	A&D Balance GH-202 Troemner Class 2 Weight
	2 kg	52 mg	Mettler Toledo XP10002S Troemner Class 2 Weight Set and Class 1 Weight Set
	3 kg	52 mg	Mettler Toledo XP10002S Rice Lake Class 1 and 4 Weight Set Troemner Class 2 Weight Set
	5 kg	52 mg	Mettler Toledo XP10002S Rice Lake Class 3 Weight Set
	10 kg	0.34 g	Troemner Class 2 Weight Set A&D Balance HP-30k Class 1 and 2 Weight Set
	20 kg	0.34 g	A&D Balance HP-30K Class 1 Weight Set
	22 679.62 g (50 lbs)	0.35 g	A&D Balance HP-30K Rice Lake Class 4 Weight Set

Mechanical

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
Tachometer, Contact ^{FO}	Up to 25 000 rpm	(1.2 rpm + 0.000 028M) rpm	Extech 461920
Pressure ^{FO}	-100.663 5 to 0.1 kPa	0.058 kPa	Ruska 1132
	0 kPa to 248.21 kPa	0.039 kPa + 4.86 x 10 ⁻⁴ kPa/kPa	Crystal Engineering IS33-16/36
	0 kPa to 2 068.43 kPa	0.14 kPa + 5.66 x 10 ⁻⁴ kPa/kPa	Crystal Engineering IS33-300
	0 kPa to 20 684 kPa	1.9 kPa + 5.75 x 10 ⁻⁴ kPa/kPa	Crystal Engineering IS33-3000
	20 684 kPa to 68 947.57	1.2 kPa + 1.15 10 ⁻³ kPa/kPa	Crystal Engineering 10KPSIXP21
Torque ^{FO}	3.53 N·m to 1 518 N·mm (0.5 ozf·in to 215 ozf·in)	(0.06 7 ozf·in + 0.013 4Q) ozf·in	Waters Mfr 6500-T4
	0.4519 N·m to 5.6492 N·m (4 in·lb to 50 in·lb)	(0.007 3 in·lbs + 0.001 94Q) in·lbs	CDI 2000-40-02/5000ST
	4.519 N·m to 45.1939 N·m (40 in·lb to 400 in·lb)	(0.058 in·lbs + 0.002 49Q) in·lbs	
	11.298 N·m to 112.9848 N·m (100 in·lb to 1 000 in·lb)	(0.003 58Q) in·lbs	
	33.895 N·m to 338.955 N·m (25 ft·lb to 250 ft·lb)	(0.002 83Q) ft·lbs	



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Thermodynamic

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Temperature Measurement Thermocouple Type J ^F	-10 °C to 110 °C	1.1 °C	Hart Scientific 1502A Hart Scientific 5615-9-D Hart Scientific 6300
	110 °C to 305 °C	(2.2 °C + 0.000 438T) °C	
Temperature Measurement Thermocouple Type K ^F	-195.79 °C to -10 °C	(1.3 °C + 0.001 12T) °C	
	-10 °C to 110 °C	1.1 °C	
Temperature Measurement Thermocouple Type T ^F	110 °C to 305 °C	(2.2 °C + 0.000 438T) °C	
	-195.79 °C to -10 °C	(0.87 °C + 0.000 447T) °C	
	-10 °C to 110 °C	0.5 °C	
Glass Thermometer at 0.2 °C ^F	110 °C to 305 °C	(0.12 °C + 0.003 6T) °C	
	-10 °C to 300 °C	0.12 °C	
	-10 °C to 300 °C	0.15 °C	
Glass Thermometer at 0.25 °C ^F	-10 °C to 300 °C	0.29 °C	
Glass Thermometer at 0.5 °C ^F	-10 °C to 300 °C	0.58 °C	
Glass Thermometer at 1 °C ^F	-10 °C to 300 °C	0.58 °C	
Ovens, Dynamic Cal ^O	1 °F to 1 800 °F	(1.6 °F + 0.000 113T) °F	Fluke 744 GeoCorp Inc Spool GK50212-2-5B
Relative Humidity ^{FO}	10 % RH to 80 % RH	(0.3 % RH + 0.005 6R) %RH	Rotronics HF53W General Eastern C-1 Equity 1000H Series Chamber
IR Temperature ^{FO}	30 °C to 500 °C	(0.07 °C + 0.008 2T) °C	Fluke 9132

Time & Frequency

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Stopwatches/Timer ^{FO}	1 sec to 360k sec	500 msec	WWV

- 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.



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

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 L represents length in inches or millimeters as appropriate to the uncertainty statement.
7. The term K represents milligrams as appropriate to the uncertainty statement.
8. The term T represents temperature value in °C or °F as appropriate to the uncertainty statement.
9. The term R represents % RH as appropriate to the uncertainty statement.
10. The term M represents revolutions per minute as appropriate to the uncertainty statement
11. The term Q represents torque ozf·in, in·lbs, ft·lbs as appropriate to the uncertainty statement