



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Precision Instrument Correction

933 Mariner Street, Brea, CA 92821

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

ISO/IEC 17025:2005

This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (as outlined by the joint ISO-ILAC-IAF Communiqué dated January 2009):

Calibration of Precision Instruments ***(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>Accreditation No.:</i>	<i>Certificate No.:</i>
January 16, 2003	October 10, 2011	59282	L11-166

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



Certificate of Accreditation: Supplement

Precision Instrument Correction

933 Mariner Street, Brea, CA 92821
 Laura Camacho Phone: 714-671-6018

Accreditation is granted to the facility to the following calibrations

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
Gage Blocks	1.27 mm to 101.6 mm (0.050 in to 4 in)	$(9.575\ 8 \times 10^{-2} + 1.04 \times 10^{-3}L) \mu\text{m}$ [(3.77 + 1.04L) μin]	Gage Block Comparator, Master Gage Blocks
	101.6 mm to 508.0 mm (4 in to 20 in)	$(9.728\ 2 \times 10^{-2} + 1.07 \times 10^{-3}L) \mu\text{m}$ [(3.83 + 1.07L) μin]	
Cylindrical Plug Gages	0.127 mm to 254 mm (0.005 in to 10 in)	$(5.384\ 8 \times 10^{-1} + 4.86 \times 10^{-3}L) \mu\text{m}$ [(21.2 + 4.86L) μin]	Supermicrometer
Cylindrical Ring Gages	1.588 mm to 228.6 mm (0.062 5 in to 9 in)	$(5.918\ 2 \times 10^{-1} + 4.98 \times 10^{-3}L) \mu\text{m}$ [(23.3 + 4.98L) μin]	ID Comparator
	228.6 mm to 304.8 mm (9 in to 12 in)	$(6.629\ 4 \times 10^{-1} + 5.74 \times 10^{-3}L) \mu\text{m}$ [(26.1 + 5.74L) μin]	Gage Blocks and Elec. Amplifier / Ind Probe
Thread Plugs Pitch Diameter	M1.6 x 0.35 to M64.0 x 6.0 (00-120 in to 10-16 in)	$(3.048 + 2.89 \times 10^{-3}L) \mu\text{m}$ [(119 + 5.88L) μin]	Super micrometer & Thread Wires
Thread Plugs Major Diameter	M1.6 x 0.35 to M64.0 x 6.0 (00-120 to 10-16)	$(5.384\ 8 \times 10^{-1} + 4.86 \times 10^{-3}L) \mu\text{m}$ [(21.2 + 4.86L) μin]	Supermicrometer
Thread Rings Pitch and Minor Diameter	M1.6 x 0.35 to M30.0 x 1.5 (0.060-80 to 2.375-20)	$(6.731 + 15.2 \times 10^{-3}L) \mu\text{m}$ [(265 + 15.2L) μin]	Comparison to Set Plugs
Surface Plates Flatness	457.2 mm to 3 657.6 mm (12 in to 144 in diagonal)	$(6.624\ 3 \times 10^{-1} + 1.12 \times 10^{-3}D) \mu\text{m}$ [(26.08 + 1.12D) μin]	Autocollimator
Surface Plates Repeat Measurement	0.0508 mm (0.002 in)	1.371 6 μm (54 μin)	Repeat-O-Meter
Calipers	1.27 mm to 1 524.0 mm (0.05 in to 60 in)	$(5.60 + 10.5 \times 10^{-3}L) \mu\text{m}$ [(220.5 + 10.5L) μin]	Comparison to Gage Blocks
Indicators	1.27 mm to 127.0 mm (0.05 in to 5 in)	$(0.381 + 0.020L) \mu\text{m}$ [(15 + 20L) μin]	Indicator Calibrator
Height Gages	1.27 mm to 1 524.0 mm (0.05 in to 60 in)	$(14.478 + 12.3 \times 10^{-3}L) \mu\text{m}$ [(570 + 12.3L) μin]	Comparison to Gage Blocks
Micrometers	1.27 mm to 1 625.6 mm (0.05 in to 64 in)	$(13.97 + 11.0 \times 10^{-3}L) \mu\text{m}$ [(550 + 11L) μin]	Comparison to Gage Blocks
Angle Blocks	0° to 45°/101.6 mm length 0° to 45°/ (4 in) length	0.005°	Comparison to Angle Blocks
Angle Knees / Plates Squareness	76.2 mm to 1 219.2 mm (3 in to 48 in)	2.184 4 μm (86 μin)	Master Square (Starrett Lab Grade AA) and Elec Amplifier / Ind Probe
Angle Protractor (Digital / Mechanical)	0° to 180°	0.083°	Comparison to Angle Blocks
Height Master	1.27 mm mm to 609.6 mm (0.05 in to 24 in)	$(2.154 + 5.83 \times 10^{-4}L) \mu\text{m}$ [(84.8 + 0.583L) μin]	Comparison to Gage Blocks
Stage Micrometer	1.27 mm to 254 mm (0.05 in to 10 in)	$(68.14 + 16.97L) \mu\text{in}$	Gage Block and Microscope



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Optical Comparators Linearity	1.27 mm to 254 mm (0.05 in to 10 in)	(2.533 + 0.000 8 L) μ m (99.72 + 0.789 L) μ m	Gage Block
Magnification Angle	10X to 100X 0° to 180°	0.03 % of magnification 2 in min.	Magnification Scale Angle Blocks

Electrical

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Equipment to Measure AC Current At the listed frequencies			Multiproduct - Calibrator (Transmille 3041)
10 Hz to 44 Hz	20 μ A to 202 μ A	0.2 % of output + 0.25 μ A	
45 Hz to 999 Hz	20 μ A to 202 μ A	0.1 % of output + 0.25 μ A	
1 kHz to 10 kHz	20 μ A to 202 μ A	1.5 % of output + 0.25 μ A	
Equipment to Measure AC Current At the listed frequencies			Multiproduct - Calibrator (Fluke 5500A)
10 Hz to 5 kHz	0.29 mA to 0.329 99 mA	0.4 % of output + 0.25 μ A	
5 kHz to 10 kHz	0.29 mA to 0.329 99 mA	1.25 % of output + 0.15 μ A	
Equipment to Measure AC Current At the listed frequencies			
10 Hz to 5 kHz	0.33 mA to 3.299 9 mA	0.2 % of output + 0.3 μ A	
5 kHz to 10 kHz	0.33 mA to 3.299 9 mA	0.6 % of output + 0.3 μ A	
Equipment to Measure AC Current At the listed frequencies			
10 Hz to 5 kHz	3.3 mA to 32.999 mA	0.2 % of output + 3 μ A	
5 kHz to 10 kHz	3.3 mA to 32.999 mA	0.6 % of output + 3 μ A	
Equipment to Measure AC Current At the listed frequencies			
10 Hz to 5 kHz	33 mA to 329.99 mA	0.2 % of output + 30 μ A	
5 kHz to 10 kHz	33 mA to 329.99 mA	0.6 % of output + 30 μ A	
AC Current – Generate / Measure At the listed frequencies			
10 Hz to 1 kHz	0.33 A to 2.199 99 A	0.2 % of output + 300 μ A	
1 kHz to 5 kHz	0.33 A to 2.199 99 A	0.75 % of output + 300 μ A	



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Equipment to Measure AC Current At the listed frequencies			Multiproduct - Calibrator (Fluke 5500A)
45 to 500 Hz	2.2 A to 11 A	0.1 % of output + 2 000 μ A	
500 Hz to 1 kHz	2.2 A to 11 A	0.33 % of output + 2 000 μ A	
AC Current – Generate / Measure At the listed frequencies			
30 Hz to 44 Hz	2 A to 30 A	0.2 % of output + 5 000 μ A	
45 Hz to 99 Hz	2 A to 30 A	0.06 % of output + 2 000 μ A	
100 Hz to 1 kHz	2 A to 30 A	0.3 % of output + 4 000 μ A	
Equipment to Measure DC Current			
	0.33 mA to 3.299 99 mA	0.013 % of output + 0.05 μ A	
	3.3 mA to 32.999 9 mA	0.01 % of output + 0.25 μ A	
	33 mA to 329.999 mA	0.01 % of output + 3.3 μ A	
	0.33 A to 2.199 99 A	0.03 % of output + 44 μ A	
	2.2 A to 11 A	0.06 % of output + 330 μ A	
Equipment to Measure AC Voltage At the listed frequencies			
10 Hz to 100 kHz	1.0 mV to 32.999 mV	0.35 % of output + 33 μ V	
100 kHz to 500 kHz	1.0 mV to 32.999 mV	1 % of output + 60 μ V	
Equipment to Measure AC Voltage At the listed frequencies			
10 Hz to 100 kHz	33 mV to 329.999 mV	0.25 % of output + 170 μ V	
100 kHz to 500 kHz	33 mV to 329.999 mV	0.7 % of output + 330 μ V	
Equipment to Measure AC Voltage At the listed frequencies			
10 Hz to 50 kHz	0.33 V to 3.299 99 V	0.15 % of output + 300 μ V	
50 kHz to 100 kHz	0.33 V to 3.299 99 V	0.24 % of output + 1 700 μ V	
100 kHz to 500 kHz	0.33 V to 3.299 99 V	0.5 % of output + 3 300 μ V	
Equipment to Measure AC Voltage At the listed frequencies			
10 Hz to 50 kHz	3.3 V to 32.999 9 V	0.19 % of output + 5 000 μ V	
50 kHz to 100 kHz	3.3 V to 32.999 9 V	0.24 % of output + 17 000 μ V	



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Equipment to Measure AC Voltage At the listed frequencies			Multiproduct - Calibrator (Fluke 5500A)
45 Hz to 1 kHz	33 V to 329.999 V	0.05 % of output + 6.6 mV	
1 kHz to 10 kHz	33 V to 329.999 V	0.08 % of output + 15 mV	
10 kHz to 20 kHz	33 V to 329.999 V	0.09 % of output + 33 mV	
Equipment to Measure AC Voltage At the listed frequencies			Multiproduct - Calibrator (Fluke 5500A)
45 Hz to 1 kHz	330 V to 1 020 V	0.05 % of output + 80 mV	
1 kHz to 5 kHz	330 V to 1 020 V	0.20 % of output + 100 mV	
5 kHz to 10 kHz	330 V to 1 020 V	0.20 % of output + 500 mV	
Equipment to Measure DC Voltage	33 mV to 329.999 9 mV	0.006 % of output + 3 μ V	
	0.33 V to 3.299 999 V	0.005 % of output + 5 μ V	
	3.3 V to 32.999 99 V	0.005 % of output + 50 μ V	
	33 V to 329.999 9 V	0.005 5 % of output + 500 μ V	
330 V to 1 020.000 V	0.005 5 % of output + 1 500 μ V		
Equipment to Measure AC Power At the listed frequencies			
33 mV to 329.999 mV	3.3 mA to 329.99 mA	0.40 % of output	
330 mV to 1 020 V	3.3 mA to 329.99 mA	0.25 % of output	
Equipment to Measure AC Power At the listed frequencies			
33 mV to 329.999 mV	0.33 A to 11 A	0.35 % of output	
330 mV to 1 020 V	0.33 A to 11 A	0.25 % of output	
Equipment to Measure DC Power At the listed frequencies			
33 mV to 1 020 V	3.3 mA to 329.99 mA	0.04 % of output	
Equipment to Measure DC Power At the listed frequencies			
0.33 A to 11 A	33 mV to 1 020 V	0.12 % of output	



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Equipment to Output Capacitance	0.33 nF to 0.499 9 nF	0.5 % of output + 0.01 nF	Multiproduct - Calibrator (Fluke 5500A)
	0.5 nF to 1.099 9 nF	0.5 % of output + 0.01 nF	
	1.1 nF to 3.299 9 nF	0.5 % of output + 0.01 nF	
	3.3 nF to 10.999 nF	0.5 % of output + 0.01 nF	
	11 nF to 32.999 nF	0.25 % of output + 0.1 nF	
	33 nF to 109.99 nF	0.25 % of output + 0.1 nF	
	110 nF to 329.99 nF	0.25 % of output + 0.3 nF	
	0.33 μ F to 1.099 9 μ F	0.25 % of output + 1 nF	
	1.1 μ F to 3.299 9 μ F	0.35 % of output + 3 nF	
	3.3 μ F to 10.999 μ F	0.35 % of output + 10 nF	
	11 μ F to 32.999 μ F	0.40 % of output + 30 nF	
	33 μ F to 109.99 μ F	0.50 % of output + 100 nF	
	110 μ F to 329.99 μ F	0.70 % of output + 300 nF	
	330 μ F to 1.1 mF	1 % of output + 300 nF	
Equipment to Output Resistance	1.00 Ω to 10.99 Ω	0.012 % of output + 0.008 Ω	
	11 Ω to 32.999 Ω	0.012 % of output + 0.015 Ω	
	33 Ω to 109.99 Ω	0.009 % of output + 0.015 Ω	
	110 Ω to 329.999 Ω	0.009 % of output + 0.015 Ω	
	330 k Ω to 1.099 99 k Ω	0.009 % of output + 0.06 Ω	
	1.1 k Ω to 3.299 99 k Ω	0.009 % of output + 0.06 Ω	
	3.3 k Ω to 10.999 9 k Ω	0.009 % of output + 0.6 Ω	
	11 k Ω to 32.999 9 k Ω	0.009 % of output + 0.6 Ω	
	33 k Ω to 109.999 k Ω	0.011 % of output + 6 Ω	
	110 k Ω to 329.999 k Ω	0.012 % of output + 6 Ω	
	330 k Ω to 1.099 99 M Ω	0.015 % of output + 55 Ω	
	1.1 M Ω to 3.299 99 M Ω	0.015 % of output + 55 Ω	
	3.3 M Ω to 10.999 9 M Ω	0.06 % of output + 550 Ω	
	11 M Ω to 32.999 9 M Ω	0.1 % of output + 550 Ω	
	33 M Ω to 109.999 M Ω	0.5 % of output + 5.5 k Ω	
110 M Ω to 330 M Ω	0.5 % of output + 16.5 k Ω		



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Temperature Calibration, Indication and Control Equipment used with Thermocouple Type B Output / Measure	600 °C to 800 °C	0.44 °C	Electrical Simulation of Thermocouple Output Multiproduct - Calibrator (Fluke 5500A)
	800 °C to 1 000 °C	0.34 °C	
	1 000 °C to 1 550 °C	0.30 °C	
	1 500 °C to 1 820 °C	0.33 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type C Output / Measure	0 °C to 150 °C	0.30 °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	0.50 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type E Output / Measure	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	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type J Output / Measure	650 °C to 1 000 °C	0.21 °C	
	210 °C to 100 °C	0.27 °C	
	100 °C to 30 °C	0.16 °C	
	30 °C to 150 °C	0.14 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type K Output / Measure	150 °C to 760 °C	0.17 °C	
	760 °C to 1 200 °C	0.23 °C	
	200 °C to 100 °C	0.33 °C	
	100 °C to 25 °C	0.18 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type L Output / Measure	25 °C to 120 °C	0.16 °C	
	120 °C to 1 000 °C	0.26 °C	
	1 000 °C to 1 372 °C	0.40 °C	
	200 °C to 100 °C	0.37 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type N Output / Measure	100 °C to 800 °C	0.26 °C	
	800 °C to 900 °C	0.17 °C	
	200 °C to 100 °C	0.40 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type N Output / Measure	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	



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Temperature Calibration, Indication and Control Equipment used with Thermocouple Type R Output / Measure	0 °C to 250 °C	0.57 °C	Electrical Simulation of Thermocouple Output Multiproduct - Calibrator (Fluke 5500A)
	250 °C to 400 °C	0.35 °C	
	400 °C to 1 000 °C	0.33 °C	
	1 000 °C to 1 767 °C	0.40 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type S Output / Measure	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 Output / Measure	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 Output / Measure	200 °C to 0 °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 Measure	200 °C to 80 °C	0.05 °C	Electrical Simulation of RTD Output Multiproduct - Calibrator (Fluke 5500A)
	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	0.10 °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 Type Pt 3916, 100 Ω Measure	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	0.10 °C	
	600 °C to 630 °C	0.23 °C	



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Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 3926, 100 Ω Measure	200 °C to 80 °C	0.05 °C	Electrical Simulation of RTD Output Multiproduct - Calibrator (Fluke 5500A)
	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	0.10 °C	
	400 °C to 630 °C	0.12 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 385, 200 Ω Measure	200 °C to 80 °C	0.04 °C	
	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 Measure	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, 1 000 Ω Measure	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	
Temperature Calibration, Indication and Control Equipment used with RTD Type PtNi 385, 120 Ω Measure	80 °C to 0 °C	0.08 °C	
	0 °C to 100 °C	0.08 °C	
	100 °C to 260 °C	0.14 °C	



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Temperature Calibration, Indication and Control Equipment used with RTD Type Cu 427, 10 Ω Measure	100 $^{\circ}$ C to 260 $^{\circ}$ C	0.30 $^{\circ}$ C	Electrical Simulation of RTD Output Multiproduct - Calibrator (Fluke 5500A)

Time and Frequency

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Frequency	0.01 Hz to 119.99 Hz	25 parts in $10^6 + 1$ mHz	Multiproduct - Calibrator (Fluke 5500A)
	120.0 Hz to 1 199.9 Hz	25 parts in $10^6 + 1$ mHz	
	1 200 Hz to 11.999 kHz	25 parts in $10^6 + 15$ mHz	
	12.00 kHz to 119.99 kHz	25 parts in $10^6 + 15$ mHz	
	120.0 kHz to 1 199.9 kHz	25 parts in $10^6 + 15$ mHz	
	1 200 kHz to 2 000 MHz	25 parts in $10^6 + 15$ mHz	
Stop Watches / Timers Digital 0.1 s resolution	6 hrs to 24 Hrs	0.61 s	NIST Time (Telephone Signal)
Stop Watches / Timers Mechanical 1 s resolution		1.3 s	

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
Pressure Gages Generate / Measure	0.5 psi to 5 psi	0.012 PSI	Pressure Tester OMEGA DPI 603 & DPI 610
	1 psi 300 psi	0.75 PSI	
	2.5 psi 1 000 psi	2.4 PSI	Ashcroft AQS-HQS
	30 psi 10 000 psi	26 PSI	
Torque Wrench / Tester	1 lbf-in to 1 000 lbf-ft	1.17 % of indicated value	Torque Tester (Snap-On Versatorq 1)
Air Flow Meters	0.005 L/min to 100 L/min	0.5 % of reading	Flow Calibrator
Indirect Verification of Rockwell Hardness Testers HRA	20 HRA to 65 HRA	0.8 HRA	ASTM E18 and calibrated Rockwell Hardness Test Blocks
	66 HRA to 78 HRA	0.9 HRA	
	79 HRA to 84 HRA	0.5 HRA	
Indirect Verification of Rockwell Hardness Testers HRB	40 HRB to 59 HRB	0.7 HRB	
	60 HRB to 79 HRB	0.7 HRB	
	80 HRB to 100 HRB	0.6 HRB	



Certificate of Accreditation: Supplement

Precision Instrument Correction

933 Mariner Street, Brea, CA 92821
 Laura Camacho Phone: 714-671-6018

Accreditation is granted to the facility to the following calibrations

Mechanical

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Indirect Verification of Rockwell Hardness Testers HRC	20 HRC to 30 HRC	0.4 HRC	ASTM E18 and calibrated Rockwell Hardness Test Blocks
	31 HRC to 55 HRC	0.4 HRC	
	56 HRC to 65 HRC	0.4 HRC	
Indirect Verification of Rockwell Hardness Testers HREW	70 HREW to 79 HREW	0.6 HREW	
	80 HREW to 90 HREW	0.6 HREW	
	91 HREW to 100 HREW	0.5 HREW	
Indirect Verification of Rockwell Hardness Testers HR15N	70 HR15N to 77 HR15N	0.5 HR15N	
	78 HR15N to 88 HR15N	0.6 HR15N	
	89 HR15N to 92 HR15N	0.4 HR15N	
Indirect Verification of Rockwell Hardness Testers HR30N	42 HR30N to 50 HR30N	0.7 HR30N	
	51 HR30N to 73 HR30N	0.6 HR30N	
	74 HR30N to 82 HR30N	0.5 HR30N	
Indirect Verification of Rockwell Hardness Testers HR45N	20 HR45N to 31 HR45N	0.5 HR45N	
	32 HR45N to 61 HR45N	0.6 HR45N	
	62 HR45N to 72 HR45N	0.5 HR45N	
Indirect Verification of Rockwell Hardness Testers HR15T	74 HR15T to 80 HR15T	0.7 HR15T	
	81 HR15T to 86 HR15T	0.6 HR15T	
	87 HR15T to 93 HR15T	0.5 HR15T	
Indirect Verification of Rockwell Hardness Testers HR30T	43 HR30T to 56 HR30T	0.6 HR30T	
	57 HR30T to 69 HR30T	0.5 HR30T	
	70 HR30T to 83 HR30T	0.5 HR30T	
Indirect Verification of Rockwell Hardness Testers HR45T	13 HR45T to 32 HR45T	0.6 HR45T	
	33 HR45T to 52 HR45T	0.5 HR45T	
	53 HR45T to 73 HR45T	0.5 HR45T	



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Mass, Force, and 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
Scales	1 g to 20 g	0.03 mg	Class 1 Weights
	20 g to 50 g	0.04 mg	
	50.1 g to 220 g	0.29 mg	Class F Weights
	200.01 g to 5 kg	0.26 mg	
	5.001 kg to 10 kg	269 mg	
	10.000 a kg to 23 kg	1 361 mg	
Force (Tension)	1 g to 2.268 kg	$(2.30 \times 10^{-2} + 1.20 \times 10^{-4} \text{ Wt}) \text{ g}$	Weights (Class F)
	2.268 kg to 4.536 kg	58 g	
	4.536 kg to 45.359 kg	116 g	
	45.359 kg to 226.796 kg	118 g	
Force (Compression)	0.05 kg to 226.796 kg	0.095 kg	Load Cell
	0.5 kg to 4 535.924 kg	0.48 kg	
NIST class F Weights	1 g to 20 g	0.03 mg	Comparison to Weights (ASTM E617-97 Class 1)
	20.01 g to 50 g	0.04 mg	
	50.1 g to 220 g	0.29 mg	
	1 kg to 5 Kg	26 mg	
	5.000 1 Kg to 10 Kg	269 mg	

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 term L represents length in inches or millimeters as appropriate to the uncertainty statement.
3. The term D represents diagonal distance in inches or millimeters as appropriate to the uncertainty statement.
4. The term Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement.