PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Rays Precision Repair, Inc.
881-3 Nandino Boulevard
Lexington, KY 40511

(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 Dimensional, Weighing Device, Mechanical, Electrical, Acoustic, and Chemical Measuring Equipment
(As detailed in the supplement)

Such testing and/or calibration services shall only be offered at or from the address given above. 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

The validity of this certificate is mandated through ongoing surveillance.

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

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
August 28, 2002	June 10, 2010	June 09, 2012
Accreditation No:	*Certificate No:*	*Page No:*
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Certificate of Accreditation: Supplement

Rays Precision Repair, Inc.
881-3 Nandino Boulevard
Lexington, KY 40511

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

Dimensional

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	BEST MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	REMARKS
Height Gages	0 mm to 1200 mm	(4.3 + 0.38L) µm	Gage Blocks and Height Master
Dial or Digital Indicators	0.01mm to 50 mm	(2.5 + 0.13L) µm	P&W Super Mic.
Calipers (dial or digital)	0 mm to 600 mm	(26 + 0.38L) µm	Caliper Checker Gage Blocks
	600 mm to 1 200 mm	(51 + 0.50L) µm	
Micrometers (outside)	0 mm to 100 mm	(2.2 + 0.23L) µm	Gage Block
	100 mm to 600 mm	(3.5 + 0.23L) µm	
Test Indicators	0.01 mm to 1.5 mm	(2.5 + 0.13L) µm	P&W Super Mic.
Pin/ Plug Gages	0.02 mm to 200 mm	(2 + 0.05D) µm	P&W Super Mic.
Depth Micrometers	0 mm to 300 mm	(2.5 + 0.25L) µm	Gage Blocks
Thread Plugs Pitch Diameter	0-80 to 4-10	(120 + 2D) µin	Measuring over wires with P&W Super Mic.
Thread Plugs Major Diameter	0-80 to 4-10	(66 + 2D) µin	P&W Super Mic.
Thread Ring Gages Major Diameter	1.6 mm to 200 mm	(3.1 + 0.05D) µm	Thread Setting Plugs
Height Masters (Cadillac Gage)	0 mm to 300 mm	(3 + 0.25L) µm	Gage Blocks and Electronic Dimensional Comparator
Plain Ring Gages	2 mm to 150 mm	(1.1 + 0.05D) µm	Universal Measuring Machine & Gage blocks
Bore Gages	1 mm to 200 mm	(26 + 0.35L) µm	P&W Super Mic and or Master Ring Gages
Length Standards (Spherical or Flat end)	10 mm to 200 mm	(2 + 0.05L) µm	P&W Super Mic., Gage
	200 mm to 1 200 mm	(30 + 0.25L) µm	Blocks and Electronic Dimensional Comparator
Dial or Digital Indicators	0.01 mm to 50 mm	(2.5 + 0.13L) µm	P&W Super Mic.
Calipers (dial or digital)	0 mm to 600 mm	(26 + 0.38L) µm	Caliper Checker

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Surface Finish (Profilometers)	0.4 µm	0.15 µm	Master surface
	3.05 µm	0.40 µm	Finish standards
Angle Blocks	2˚ to 90˚	0.05˚	Gage blocks, Optical Comparator
Surface Plate Repeat Measurment	0.002 in	60 µin	Repeat O Meter
Optical Comparators X and Y linearity	6 in to 40 in	(150 + 2L) µin	Glass Standard
Radius Gages	0.5 mm to 25 mm	(0.5 + 0.5L) µm	Optical Comparator
Levels	2˚ to 90˚	0.05˚	Direct Comparison & Gage blocks

Mass, Force, and Weighing Devices

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	BEST MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	REMARKS
Scales and Balances	10 g to 120 g (Resolution = 0.000 1 g)	3 mg	Class 6 Weights
	120 g to 500 g (Resolution = 0.001 g)	6 mg	Class 6 Weights
	1 kg to 22 kg (Resolution = 0.2 g)	4 g	Class F Weights
	22 kg to 90 kg (Resolution = 0.005 kg)	11 g	Class F Weights
Force Gage & Load Cells	0.5 kg to 225 kg	0.1 % of reading	Class F Weights

Mechanical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	BEST MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	REMARKS
Compression	10 kg to 90 kg	0.1% of reading	Class F weights or Direct Comparison
	90 kg to 4 500 kg	0.3 % of reading	
Tension	10 kg to 90 kg	0.1% of reading	With Load Cells
	90 kg to 4 500 kg	0.3 % of reading	
Torque Wrench	5 N·m to 176.6 N·m	0.25 % of reading	Dead Weights & arm Torque Analyzer

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Torque Analyzer	1 N·m to 294.3 N·m	0.3 % of reading	Dead Weights, master arms & wheels
Tachometers	500 rpm to 5 000 rpm (Resolution = 1 rpm)	2 rpm	Comparison with Variable Speed Motor and HT4100 Tachometer
Pressure	0 kPa to 2 000 kPa	0.050 % of reading	Fluke 725 and 700P27 Module Transcat Pressure Gage Dead Weights and Pump
	2 001 kPa to 68 900 kPa	0.106 % of reading	
Indirect Verification of Rockwell Hardness	HRA		
	60 HRA to 69 HRA	0.50 HRA	Indirect Verification methods Calibrated Test Blocks ASTM E18
	70 HRA to 79 HRA	0.50 HRA	
	80 HRA to 93 HRA	0.50 HRA	
	HRB		
	40 HRB to 49 HRB	1.1 HRB	
	60 HRB to 69 HRB	1 HRB	
	80 HRB to 93 HRB	1 HRB	
	HRC		
	20 HRC to 39 HRC	0.50 HRC	
	40 HRC to 59 HRC	0.50 HRC	
	60 HRC to 70 HRC	0.50 HRC	
	HRR		
	108 HRR to 114 HRR	0.5 HRR	
	115 HRR to 121 HRR	0.5 HRR	
	HR15N		
	63 HR15N to 73 HR15N	0.4 HR15N	
	74 HR15N to 83 HR15N	0.4 HR15N	
	84 HR15N to 94 HR15N	0.4 HR15N	
	HR15T		
	63 HR15T to 73 HR15T	0.4 HR15T	
	74 HR15T to 83 HR15T	0.4 HT15T	

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Indirect Verification of Rockwell Hardness	HR30N		Indirect Verification methods Calibrated Test Blocks ASTM E18
	44 HR30N to 55 HR30N	0.55 HR30N	
	56 HR30N to 68 HR30N	0.55 HR30N	
	69 HR30N to 85 HR30N	0.55 HR30N	
	HR30T		
	40 HR30T to 50 HR30T	0.92 HR30T	
	51 HR30T to 62 HR30T	0.67 HR30T	
	63 HR30T to 76 HR30T	0.55 HR30T	
Durometer	30 duro	N/A	Calibrated Test Blocks Indirect Verification is not an Accredited calibration per ASTM D-2240 and is offered only as a service to the customer
	60 duro	N/A	
	90 duro	N/A	

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	BEST MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	REMARKS
Resistance Generate	0 Ω to 10.999 9 Ω	0.004 % of output	Fluke 5520A
	11 Ω to 32.999 9 Ω	0.003 % of output	
	33 Ω to 109.999 9Ω	0.002 8 % of output	
	110 Ω to 329.999 9 Ω	0.002 8 % of output	
	330 Ω to 1.099 999 kΩ	0.002 8 % of output	
	1.1 kΩ to 3.299 999 kΩ	0.002 8 % of output	
	3.3 kΩ to 10.999 99 kΩ	0.002 8 % of output	
	11 kΩ to 32.999 99 kΩ	0.002 8 % of output	
	33 kΩ to 109.999 9 kΩ	0.002 8 % of output	
	110 kΩ to 329.999 9 kΩ	0.003 2 % of output	
	330 kΩ to 1.099 999 MΩ	0.003 2 % of output	
	1.1 MΩ to 3.299 999MΩ	0.006 % of output	
	3.3 MΩ to 10.999 99MΩ	0.013 % of output	

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Resistance Generate	11MΩ to 32.99999MΩ	0.025 % of output	Fluke 5520A
	33MΩ to 109.9999MΩ	0.05 % of output	
	110MΩ to 329.9999MΩ	0.3 % of output	
	330MΩ to 1100MΩ	1.5 % of output	
Capacitance Generate	0.19 nF to 3.299 9 nF	0.5 % RDG + 0.01 nF	Fluke 5520A
	3.3 nF to 10.999 9 nF	0.25 % RDG + 0.01 nF	
	11 nF to 32.999 9 nF	0.25 % RDG + 0.1 nF	
	33 nF to 109.999 nF	0.25 % RDG + 0.1 nF	
	110 nF to 329.999 nF	0.25 % RDG + 0.3 nF	
	0.33 uF to 1.099 99 uF	0.25 % RDG + 1 nF	
	1.1 uF to 3.299 99 uF	0.25 % RDG + 3 nF	
	3.3 uF to 10.999 9 uF	0.25 % RDG + 10 nF	
	11 uF to 32.999 9 uF	0.4 % RDG + 30 nF	
	33 uF to 109.999 uF	0.45 % RDG + 100 nF	
	110 uF to 329.999 uF	0.45 % RDG + 300 nF	
	0.33 mF to 1.099 99 mF	0.45 % RDG + 1 uF	
	1.1 mF to 3.299 9mF	0.45 % RDG + 3 uF	
	3.3 mF to 10.999 9 mF	0.45 % RDG + 10 uF	
	11 mF to 32.999 9 mF	0.75 % RDG + 30 uF	
	33 mF to 110 mF	1.1 % RDG + 100 uF	
Temperature, Indication, and Control Equipment used with Thermocouple Type B	600 °C to 800 °C	0.44 °C	Electrical Simulation of Thermocouple Output Fluke 5520A
	800 °C to 1 000 °C	0.34 °C	
	1 000 °C to 1 550 °C	0.30 °C	
	1 550 °C to 1 800 °C	0.33 °C	
Temperature, Indication, and Control Equipment used with Thermocouple Type C	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	
	1 800 °C to 2 316 °C	0.84 °C	

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Temperature, Indication, and Control Equipment used with Thermocouple Type E	-250 °C to -100 °C	0.50 °C	Electrical Simulation of Thermocouple Output Fluke 5520A
	-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	
	-250 °C to -100 °C	0.50 °C	
Temperature, Indication, and Control Equipment used with Thermocouple Type J	-210 °C to -100 °C	0.27 °C	
	-100 °C to -30 °C	0.16 °C	
	-30 °C to 150 °C	0.14 °C	
	150 °C to 760 °C	0.17 °C	
	760 °C to 1 200 °C	0.23 °C	
Temperature, Indication, and Control Equipment used with Thermocouple Type K	-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	0.40 °C	
Temperature, Indication, and Control Equipment used with Thermocouple Type L	-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, Indication, and Control Equipment used with Thermocouple Type N	-200 °C to 100 °C	0.40 °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, Indication, and Control Equipment used with Thermocouple Type R	0 °C to 250 °C	0.57 °C	
	250 °C to 400 °C	0.35 °C	
	400 °C to 1 000 °C	0.33 °C	
	1 000 °C to 1 767 °C	0.40 °C	
	-200 °C to 0 °C	0.56 °C	

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Temperature, Indication, and Control Equipment used with Thermocouple Type U	0 °C to 600 °C	0.27 °C	Electrical Simulation of Thermocouple Output Fluke 5520A
Temperature, Indication, and Control Equipment used with Thermocouple Type S	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, Indication, and Control Equipment used with Thermocouple Type T	-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 Pt 385, 1 000 Ω	-200 °C to -80 °C	0.05 °C	Electrical Simulation of RTD Output Fluke 5520A
	-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 Pt 3926, 100 Ω	-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	0.10 °C	
	400 °C to 630 °C	0.12 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 3916, 100 Ω	-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	

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Temperature Calibration, Indication and Control Equipment used with RTD Pt 3916, 100 Ω	300 °C to 400 °C	0.09 °C	Electrical Simulation of Thermocouple Output Fluke 5520A
	400 °C to 600 °C	0.10 °C	
	600 °C to 630 °C	0.23 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 385, 200 Ω	-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 Pt 385, 500 Ω	-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 Pt 385, 1000 Ω	-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	

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Temperature Calibration, Indication and Control Equipment used with RTD Pt 3916, 100 Ω	300 ºC to 400 ºC	0.09 ºC	Electrical Simulation of Thermocouple Output Fluke 5520A
Temperature Calibration, Indication and Control Equipment used with RTD PtNi 385, 120 Ω	-80 ºC to 0 ºC	0.08 ºC	
	0 ºC to 100 ºC	0.08 ºC	
	100 ºC to 260 ºC	0.14 ºC	
Temperature Calibration, Indication and Control Equipment used with RTD Cu 427, 10 Ω	-100 ºC to 260 ºC	0.3 ºC	
AC Voltage Generate At the listed Frequencies			Fluke 5520A
10 Hz to 45 Hz	1.0 mV to 32.999 mV	0.08 % RDG + 6 mV	
45 Hz to 10 kHz	1.0 mV to 32.999 mV	0.015 % RDG + 6 mV	
10 kHz to 20 kHz	1.0 mV to 32.999 mV	0.020 % RDG + 6 mV	
20 kHz to 50 kHz	1.0 mV to 32.999 mV	0.1 % RDG + 6 mV	
50 kHz to 100 kHz	1.0 mV to 32.999 mV	0.35 % RDG + 12 mV	
100 kHz to 500 kHz	1.0 mV to 32.999 mV	0.8 % RDG + 50 mV	
AC Voltage Generate At the listed Frequencies			
10 Hz to 45 Hz	33 mV to 329.999 mV	0.03 % RDG + 8 mV	
45 Hz to 10 kHz	33 mV to 329.999 mV	0.0145 % RDG + 8 mV	
10 kHz to 20 kHz	33 mV to 329.999 mV	0.016 % RDG + 8 mV	
20 kHz to 50 kHz	33 mV to 329.999 mV	0.035 % RDG + 8 mV	
50 kHz to 100 kHz	33 mV to 329.999 mV	0.08 % RDG + 32 mV	
100 kHz to 500 kHz	33 mV to 329.999 mV	0.2% RDG + 70 mV	
AC Voltage Generate At the listed Frequencies			
10 Hz to 45 Hz	0.33 V to 3.299 99 V	0.03 % RDG + 50 mV	
45 Hz to 10 kHz	0.33 V to 3.299 99 V	0.015 % RDG + 60 mV	
10 kHz to 20 kHz	0.33 V to 3.299 99 V	0.019 % RDG + 60 mV	
20 kHz to 50 kHz	0.33 V to 3.299 99 V	0.03 % RDG + 50 mV	
50 kHz to 100 kHz	0.33 V to 3.299 99 V	0.07 % RDG + 125 mV	

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AC Voltage Generate At the listed Frequencies			Fluke 5520A
100 kHz to 500 kHz	0.33 V to 3.299 99 V	0.24 % RDG + 600 mV	
AC Voltage Generate At the listed Frequencies			
10 Hz to 45 Hz	3.3 V to 32.999 9 V	0.03 % RDG + 650 mV	
45 Hz to 10 kHz	3.3 V to 32.999 9 V	0.015 % RDG + 600 mV	
10 kHz to 20 kHz	3.3 V to 32.999 9 V	0.024 % RDG + 600 mV	
20 kHz to 50 kHz	3.3 V to 32.999 9 V	0.035 % RDG + 600 mV	
50 kHz to 100 kHz	3.3V to 32.999 9 V	0.090 % RDG + 1 600 mV	
AC Voltage Generate At the listed Frequencies			
45 Hz to 1 kHz	33 V to 329.999V	0.019 % RDG + 2 000 mV	
1 kHz to 10 kHz	33 V to 329.999V	0.020 % RDG + 6 000 mV	
10 kHz to 20 kHz	33 V to 329.999V	0.025 % RDG + 6 000 mV	
20 kHz to 50 kHz	33 V to 329.999V	0.030 % RDG + 6 000 mV	
50 kHz to 100 kHz	33 V to 329.999V	0.2 % RDG + 50 000 mV	
AC Voltage Generate At the listed Frequencies			
45Hz to 1kHz	330 V to 1 020 V	0.03 % RDG + 10 000 mV	
1kHz to 5kHz	330 V to 1 020 V	0.025 % RDG + 10 000 mV	
5kHz to 10kHz	330 V to 1 020 V	0.03 % RDG + 10 000 mV	
AC Voltage Generate At the listed Frequencies			
10 Hz to 20 Hz	10 mV to 329.999 mV	0.2 % RDG + 370 mV	
20 Hz to 45 Hz	10 mV to 329.999 mV	0.1 % RDG + 370 mV	
45 Hz to 1 kHz	10 mV to 329.999 mV	0.1 % RDG + 370 mV	
1 kHz to 5 kHz	10 mV to 329.999 mV	0.2 % RDG + 450 mV	
5 kHz to 10 kHz	10 mV to 329.999 mV	0.4 % RDG + 450 mV	
10 kHz to 30 kHz	10 mV to 329.999 mV	5.0 % RDG + 900 mV	

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AC Voltage Generate At the listed Frequencies			Fluke 5520A
10 Hz to 20 Hz	0.33 V to 3.299 99 V	0.2 % RDG + 450 mV	
20 Hz to 45 Hz	0.33 V to 3.299 99 V	0.1 % RDG + 450 mV	
45 Hz to 1 kHz	0.33 V to 3.299 99 V	0.09 % RDG + 450 mV	
1 kHz to 5 kHz	0.33 V to 3.299 99 V	0.2 % RDG + 1 400 mV	
5 kHz to 10 kHz	0.33 V to 3.299 99 V	0.4 % RDG + 1 400 mV	
10 kHz to 30 kHz	0.33 V to 3.299 99 V	5.0 % RDG + 2 800 mV	
AC Voltage Generate At the listed Frequencies			
10 Hz to 20 Hz	3.3 V to 5 V	0.2% RDG + 450 mV	
20 Hz to 45 Hz	3.3 V to 5 V	0.1 % RDG + 450 mV	
45 Hz to 1 kHz	3.3 V to 5 V	0.09 % RDG + 450 mV	
1 kHz to 5 kHz	3.3 V to 5 V	0.2 % RDG + 1 400 mV	
5 kHz to 10 kHz	3.3 V to 5 V	0.4 % RDG + 1 400 mV	
Frequency Generate	0.01Hz to 119.99 Hz	0.000 25 % +/- 5uHz	Fluke 5520A HP5334B Universal Counter
	120.0 Hz to 1 199.9 Hz	0.000 25 % +/- 5uHz	
	1.200 kHz to 11.999 9kHz	0.000 25 % +/- 5uHz	
	12.0 kHz to 119.99 kHz	0.000 25 % +/- 5uHz	
	120 kHz to 1 199.9 kHz	0.000 25 % +/- 5uHz	
	1.2 MHz to 2 MHz	0.000 25 % +/- 5uHz	
AC Current Generate At the listed Frequencies			Fluke 5520A
10 Hz to 20Hz	29.00 uA to 329.99 uA	0.2 % RDG + 0.1 mA	
20 Hz to 45 Hz	29.00 uA to 329.99 uA	0.15 % RDG + 0.1 mA	
45 Hz to 1 kHz	29.00 uA to 329.99 uA	0.125 % RDG + 0.1 mA	
1 kHz to 5 kHz	29.00 uA to 329.99 uA	0.3 % RDG + 0.15 mA	
5 kHz to 10 kHz	29.00 uA to 329.99 uA	0.8 % RDG + 0.2 mA	
10 kHz t 30 kHz	29.00 uA to 329.99 uA	1.6 % RDG + 0.4 mA	
AC Current Generate At the listed Frequencies			
10 Hz to 20 Hz	0.33 mA to 3.299 9 mA	0.2 % RDG + 0.15 mA	
20 Hz to 45 Hz	0.33 mA to 3.299 9 mA	0.125 % RDG + 0.15 mA	

Certificate of Accreditation: Supplement

Rays Precision Repair, Inc.
881-3 Nandino Boulevard
Lexington, KY 40511

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

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	BEST MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	REMARKS
AC Current Generate At the listed Frequencies			Fluke 5520A
45 Hz to 1 kHz	0.33 mA to 3.299 9 mA	0.1 % RDG + 0.15 mA	
1 kHz to 5 kHz	0.33 mA to 3.299 9 mA	0.2 % RDG + 0.2 mA	
5 kHz to 10 kHz	0.33 mA to 3.299 9 mA	0.5 % RDG + 0.3 mA	
10 kHz t 30 kHz	0.33 mA to 3.299 9 mA	1.0 % RDG + 0.6 mA	
AC Current Generate At the listed Frequencies			
10 Hz to 20 Hz	3.3 mA to 32.999 mA	0.18 % RDG + 2 mA	
20 Hz to 45 Hz	3.3 mA to 32.999 mA	0.09 % RDG + 2 mA	
45 Hz to 1 kHz	3.3 mA to 32.999 mA	0.04 % RDG + 2 mA	
1 kHz to 5 kHz	3.3 mA to 32.999 mA	0.08 % RDG + 2 mA	
5 kHz to 10 kHz	3.3 mA to 32.999 mA	0.2 % RDG + 3 mA	
10 kHz t 30 kHz	3.3 mA to 32.999 mA	0.4 % RDG + 4 mA	
AC Current Generate At the listed Frequencies			
10 Hz to 20 Hz	33 mA to 329.99 mA	0.18 % RDG + 20 mA	
20 Hz to 45 Hz	33 mA to 329.99 mA	0.09 % RDG + 20 mA	
45 Hz to 1 kHz	33 mA to 329.99 mA	0.04 % RDG + 20 mA	
1 kHz to 5 kHz	33 mA to 329.99 mA	0.10 % RDG + 50 mA	
5 kHz to 10 kHz	33 mA to 329.99 mA	0.2 % RDG + 100 mA	
10 kHz to 30 kHz	33 mA to 329.99 mA	0.4 % RDG + 200 mA	
AC Current Generate At the listed Frequencies			
10 Hz to 45 Hz	0.33 A to 1.099 99A	0.18 % RDG + 100 mA	
45 Hz to 1 kHz	0.33 A to 1.099 99A	0.05 % RDG + 100 mA	
1 kHz to 5 kHz	0.33 A to 1.099 99A	0.06 % RDG + 1 000 mA	
5 kHz to 10 kHz	0.33 A to 1.099 99A	2.5 % RDG + 5 000 mA	

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AC Current Generate At the listed Frequencies			Fluke 5520A
10 Hz to 45 Hz	1.1 A to 2.999 99 A	0.18 % RDG + 100 mA	
45 Hz to 1 kHz	1.1 A to 2.999 99 A	0.06 % RDG + 100 mA	
1 kHz to 5 kHz	1.1 A to 2.999 99 A	0.6 % RDG + 1 000 mA	
5 kHz to 10 kHz	1.1 A to 2.999 99 A	2.5 % RDG + 5 000 mA	
AC Current Generate At the listed Frequencies			
45 Hz to 100 Hz	3 A to 10.999 9 A	0.06 % RDG + 2 000 mA	
100 Hz to 1 kHz	3 A to 10.999 9 A	0.10 % RDG + 2 000 mA	
AC Current Generate At the listed Frequencies			
1 kHz to 5 kHz	3 A to 10.999 9 A	3.0 % RDG + 2 000 mA	
AC Current Generate At the listed Frequencies			
45 Hz to 100 Hz	11 A to 20.5 A	0.12 % RDG + 5 000 mA	
100 Hz to 1 kHz	11 A to 20.5 A	0.15 % RDG + 5 000 mA	
1 kHz to 5 kHz	11 A to 20.5 A	3.0 % RDG + 5 000 mA	
AC Current Generate At the listed Frequencies			
10 Hz to 100 Hz	29.00 uA to 329.99 uA	0.25 % RDG + 0.2 mA	
100 Hz to 1 kHz	29.00 uA to 329.99 uA	0.6 % RDG + 0.5 mA	
AC Current Generate At the listed Frequencies			
10 Hz to 100 Hz	0.33 mA to 3.299 9 mA	0.25 % RDG + 0.3 mA	
100 Hz to 1 kHz	0.33 mA to 3.299 9 mA	0.6 % RDG + 0.8 mA	
AC Current Generate At the listed Frequencies			
10 Hz to 100 Hz	3.3 mA to 32.999 mA	0.08 % RDG + 4 mA	
100 Hz to 1 kHz	3.3 mA to 32.999 mA	0.2 % RDG + 10 mA	
AC Current Generate At the listed Frequencies			
10Hz to 100Hz	33 mA to 329.99 mA	0.08 % RDG + 40 mA	
100Hz to 1kHz	33mA to 329.99 mA	0.2 % RDG + 100 mA	

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AC Current Generate At the listed Frequencies			Fluke 5520A
10 Hz to 100 Hz	0.33 A to 2.999 99 A	0.12 % RDG + 200 mA	
100 Hz to 440 Hz	0.33 A to 2.999 99 A	0.3 % RDG + 1 000 mA	
AC Current Generate At the listed Frequencies			
10 Hz to 100 Hz	3 A to 20.5 A	0.12 % RDG + 2 000 mA	
100 Hz to 1 kHz	3 A to 20.5 A	1.0 % RDG + 5 000 mA	
DC Current- Generate	0 mA to 329.999 mA	0.015% RDG + 0.02 µA	
	0 mA to 3.299 99 mA	0.010% RDG + 0.05 µA	
	0 mA to 32.999 9 mA	0.01% RDG + 0.25 µA	
	0 mA to 1.099 99 A	0.02% RDG + 40 µA	
	1.1 A to 2.999 99 A	0.038% RDG + 40 µA	
	0 A to 10.999 9 A (20A range)	0.05% RDG + 500 µA	
	11 A to 20.5 A	0.1% RDG+ 750 µA	
DC Volts- Generate	0 mV to 329.999 mV	0.002 % RDG + 1µV	
	0 mV to 3.299 99 V	0.001 1% RDG + 2 µV	
	0 mV to 32.999 9 V	0.001 2 % RDG + 20 µV	
	30 V to 329.999 V	0.001 8 % RDG + 150 µV	
	100 V to 1 000 V	0.001 8 % RDG + 1 500 µV	
DC Volts-Measure	100 mV	0.004 % RDG + 1.5 uV	
	1 V	0.003 % RDG + 2.5 uV	
	10 V	0.003 % RDG + 2.5 uV	
	100 V	0.004 % RDG + 2.5 uV	
	1 000 V	0.007 % RDG + 2.5 uV	

Acoustic

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	BEST MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	REMARKS
Sound Meter	94 dB	1 dB	Simpson Sound Calibrator 890-2
Output	114 dB	1 dB	

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pH Meter	4.01 units	0.1 units	Buffer Solutions
	7.01 units	0.1 units	
	10.01 units	0.1 units	

1. Remarks: This column shall include pertinent information about the calibration of the Measured Instrument or parameter. The information should include the type of standards used and any pertinent information about the measurement method. This column is not to be used for commercial advertisement of laboratory services.
2. The term L represents length in inches or millimeters as appropriate to the uncertainty statement.