



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Precise Technical Solutions, LLC
7839 Allentown Boulevard, Suite #300, Harrisburg, PA 17112

(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):

Electrical, Mechanical, Thermodynamic and Chemical 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/Operations Manager

Initial Accreditation Date: *Issue Date:* *Expiration Date:*
March 7, 2011 November 2, 2017 November 2, 2019

Accreditation No.: *Certificate No.:*
69463 L17-459

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.pjilabs.com



Certificate of Accreditation: Supplement

Precise Technical Solutions, LLC

7839 Allentown Boulevard, Suite #300, Harrisburg, PA 17112
 Contact Name: Michael Geppert Phone: 717-635-9879

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 Measure DC Voltage ^{FO}	1 mV to 330 mV	0.073 % of reading + 1 μ V	Fluke 5520A
	330 mV to 3.3 V	0.004 1 % of reading + 2 μ V	
	3.3 V to 33 V	0.005 2% of reading + 20 μ V	
	33 V to 330 V	0.006 8 % + 150 μ V	
	330 V to 1 000 V	0.007 8 % of reading + 1.5 mV	
Equipment to Output DC Voltage ^{FO}	1 mV to 100 mV	0.005 5 % of reading + 0.3 μ V	HP 3458A Option 002
	0.1 V to 1 V	0.001 5 % of reading + 0.3 μ V	
	1 V to 10 V	0.001 2 % of reading + 5 μ V	
	10 V to 100 V	0.001 2 % of reading + 30 μ V	
	100 V to 1 000 V	0.002 % of reading + 100 μ V	
Equipment to Output DC Voltage ^{FO}	10 kV to 20 kV	2.3 % of reading	Fluke 80K-40 w/ HP3458A
	20 kV to 35 kV	1.5 % of reading	
	35 kV to 40 kV	2.3 % of reading	
Equipment to Measure DC Current ^{FO}	1 μ A to 330 μ A	0.019 % of reading + 0.02 μ A	Fluke 5520A
	330 μ A to 3.3 mA	0.018 % of reading + 0.05 μ A	
	3.3 mA to 33 mA	0.016 % of reading + 0.25 μ A	
	33 mA to 330 mA	0.015 % of reading + 2.5 μ A	
	330 mA to 1.1 A	0.029 % of reading + 40 μ A	
	1.1 A to 3 A	0.24 % of reading + 40 μ A	
	3 A to 11 A	0.065 % of reading + 500 μ A	
	11 A to 20 A	0.18 % of reading + 0.75 mA	
Equipment to Measure DC Current Clamp-On ^{FO}	5 A to 600 A	0.33 % of reading + 0.06A	Fluke 5520A w/ 50-Turn Coil
Equipment to Output DC Current ^{FO}	10 μ A to 100 μ A	0.009 2 % of reading + 0.8 nA	HP 3458A (With shunt above 1 Amp)
	0.1 mA to 1 mA	0.007 5 % of reading + 5 nA	
	1 mA to 10 mA	0.001 8 % of reading + 50 nA	
	10 mA to 100 mA	0.016 % of reading + 500 nA	
	0.1 A to 1 A	0.016 % of reading + 10 μ A	
	1 A to 600 A	0.34 % of reading	



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Equipment to Measure DC Resistance ^{FO}	1 m Ω to 11 Ω	0.065 % of reading + 0.001 Ω	Fluke 5520A (Applies to 4-wire compensation only. 2-wire above 100 k Ω)
	11 Ω to 33 Ω	0.015 % of reading + 0.001 5 Ω	
	33 Ω to 110 Ω	0.005 3 % of reading + 0.001 4 Ω	
	110 Ω to 330 Ω	0.004 6 % of reading + 0.002 Ω	
	330 Ω to 1.1 k Ω	0.004 % of reading + 0.002 Ω	
	1.1 k Ω to 3.3 k Ω	0.004 6 % of reading + 0.02 Ω	
	3.3 k Ω to 11 k Ω	0.003 9 % of reading + 0.02 Ω	
Equipment to Measure DC Resistance ^{FO}	11 k Ω to 33 k Ω	0.004 5 % of reading + 0.2 Ω	
	33 k Ω to 110 k Ω	0.003 9 % of reading + 0.2 Ω	
	110 k Ω to 330 k Ω	0.005 1 % of reading + 2 Ω	
	330 k Ω to 1.1 M Ω	0.004 31 % of reading + 2 Ω	
	1.1 M Ω to 3.3 M Ω	0.009 % of reading + 30 Ω	
	3.3 M Ω to 11 M Ω	0.016 % of reading + 50 Ω	
	11 M Ω to 33 M Ω	0.044 % of reading + 2.5 k Ω	
	33 M Ω to 110 M Ω	0.17 % of reading + 3 k Ω	
	110 M Ω to 330 M Ω	0.49 % of reading + 0.1 M Ω	
	330 M Ω to 1 100 M Ω	0.91 % of reading + 0.5 M Ω	
Equipment to Output DC Resistance ^{FO}	1 m Ω to 10 Ω	0.072 % of reading + 50 $\mu\Omega$	HP 3458A
	10 Ω to 100 Ω	0.003 1 % of reading + 500 $\mu\Omega$	
	100 Ω to 1 k Ω	0.002 1 % of reading + 0.5 m Ω	
	1 k Ω to 10 k Ω	0.002 1 % of reading + 5 m Ω	
	10 k Ω to 100 k Ω	0.002 1 % of reading + 50 m Ω	
	100 k Ω to 1 M Ω	0.002 % of reading + 2 Ω	
	1 M Ω to 10 M Ω	0.007 6 % of reading + 100 Ω	
	10 M Ω to 100 M Ω	0.06 % of reading + 1 k Ω	
	100 M Ω to 1 G Ω	0.6 % of reading + 10 k Ω	
Equipment to Output AC Voltage At listed frequencies ^{FO}			HP 3458A
1 Hz to 40 Hz	5 mV to 10 mV	0.06 % of reading + 3 μ V	
40 Hz to 1 kHz	5 mV to 10 mV	0.031 % of reading + 1.1 μ V	
1 kHz to 20 kHz	5 mV to 10 mV	0.042 % of reading + 1.1 μ V	
20 kHz to 50 kHz	5 mV to 10 mV	0.11 % of reading + 1.1 μ V	
50 kHz to 100 kHz	5 mV to 10 mV	0.51 % of reading + 1.1 μ V	
100 kHz to 300 kHz	5 mV to 10 mV	4 % of reading + 2 μ V	



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Equipment to Output AC Voltage At listed frequencies ^{FO}			HP 3458A
1 Hz to 40 Hz	10 mV to 100 mV	0.012 % of reading + 4 μ V	
40 Hz to 1 kHz	10 mV to 100 mV	0.009 8 % of reading + 2 μ V	
1 kHz to 20 kHz	10 mV to 100 mV	0.017 % of reading + 2 μ V	
20 kHz to 50 kHz	10 mV to 100 mV	0.03 % of reading + 2 μ V	
50 kHz to 100 kHz	10 mV to 100 mV	0.084 % of reading + 2 V	
100 kHz to 300 kHz	10 mV to 100 mV	0.31 % of reading + 10 μ V	
300 kHz to 1 MHz	10 mV to 100 mV	1 % of reading + 10 μ V	
1 MHz to 2 MHz	10 mV to 100 mV	1.7 % of reading + 10 μ V	
Equipment to Output AC Voltage At listed frequencies ^{FO}			
1 Hz to 40 Hz	100 mV to 1 V	0.012 % of reading + 40 μ V	
40 Hz to 1 kHz	100 mV to 1 V	0.009 5 % of reading + 20 μ V	
1 kHz to 20 kHz	100 mV to 1 V	0.017 % of reading + 20 μ V	
20 kHz to 50 kHz	100 mV to 1 V	0.036 % of reading + 20 μ V	
50 kHz to 100 kHz	100 mV to 1 V	0.084 % of reading + 20 μ V	
100 kHz to 300 kHz	100 mV to 1 V	0.43 % of reading + 0.1 mV	
300 kHz to 1 MHz	100 mV to 1 V	1 % of reading + 0.1 mV	
1 MHz to 2 MHz	100 mV to 1 V	1.5 % of reading + 0.1 mV	
Equipment to Output AC Voltage At listed frequencies ^{FO}			
1 Hz to 40 Hz	1 V to 10 V	0.012 % of reading + 0.4 mV	
40 Hz to 1 kHz	1 V to 10 V	0.009 5 % of reading + 0.2 mV	
1 kHz to 20 kHz	1 V to 10 V	0.024 % of reading + 0.2 mV	
20 kHz to 50 kHz	1 V to 10 V	0.036 % of reading + 0.2 mV	
50 kHz to 100 kHz	1 V to 10 V	0.084 % of reading + 0.2 mV	
100 kHz to 300 kHz	1 V to 10 V	0.35 % of reading + 1 mV	
300 kHz to 1 MHz	1 V to 10 V	1 % of reading + 1 mV	
1 MHz to 2 MHz	1 V to 10 V	1.5 % of reading + 1 mV	



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Equipment to Output AC Voltage At listed frequencies ^{FO}			HP 3458A
1 Hz to 40 Hz	10 V to 100 V	0.024 % of reading + 4 mV	
40 Hz to 1 kHz	10 V to 100 V	0.022 % of reading + 2 mV	
1 kHz to 20 kHz	10 V to 100 V	0.022 % of reading + 2 mV	
20 kHz to 50 kHz	10 V to 100 V	0.038 % 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	0.48 % of reading + 10 mV	
300 kHz to 1 MHz	10 V to 100 V	1.8 % of reading + 10 mV	
Equipment to Output AC Voltage At listed frequencies ^{FO}			
1 Hz to 40 Hz	100 V to 1 000 V	0.044 % of reading + 40 mV	
40 Hz to 1 kHz	100 V to 1 000 V	0.042 % of reading + 20 mV	
1 kHz to 20 kHz	100 V to 1 000 V	0.062 % 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 At listed frequencies ^{FO}			Fluke 5520A
10 Hz to 45 Hz	1 mV to 33 mV	0.13 % of reading + 6 μ V	
45 Hz to 10 kHz	1 mV to 33 mV	0.05 % of reading + 6 μ V	
10 kHz to 20 kHz	1 mV to 33 mV	0.053 % of reading + 6 μ V	
20 kHz to 50 kHz	1 mV to 33 mV	0.16 % of reading + 6 μ V	
50 kHz to 100 kHz	1 mV to 33 mV	0.53 % of reading + 12 μ V	
100 kHz to 500 kHz	1 mV to 33 mV	1.3 % of reading + 50 μ V	
Equipment to Measure AC Voltage At listed frequencies ^{FO}			
10 Hz to 45 Hz	33 mV to 330 mV	0.063 % of reading + 8 μ V	
45 Hz to 10 kHz	33 mV to 330 mV	0.023 % of reading + 8 μ V	
10 kHz to 20 kHz	33 mV to 330 mV	0.024 % of reading + 8 μ V	
20 kHz to 50 kHz	33 mV to 330 mV	0.04 % of reading + 8 μ V	
50 kHz to 100 kHz	33 mV to 330 mV	0.11 % of reading + 32 μ V	
100 kHz to 500 kHz	33 mV to 330 mV	0.32 % of reading + 70 μ V	



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Equipment to Measure AC Voltage At listed frequencies ^{FO}			Fluke 5520A
10 Hz to 45 Hz	0.33 V to 3.3 V	0.036 % of reading + 50 μ V	
45 Hz to 10 kHz	0.33 V to 3.3 V	0.022 % of reading + 60 μ V	
10 kHz to 20 kHz	0.33 V to 3.3 V	0.026 % of reading + 60 μ V	
20 kHz to 50 kHz	0.33 V to 3.3 V	0.04 % of reading + 50 μ V	
50 kHz to 100 kHz	0.33 V to 3.3 V	0.087 % of reading + 0.13 mV	
100 kHz to 500 kHz	0.33 V to 3.3 V	0.37 % of reading + 0.6 mV	
Equipment to Measure AC Voltage At listed frequencies ^{FO}			
10 Hz to 45 Hz	3.3 V to 33 V	0.037 % of reading + 0.65 mV	
45 Hz to 10 kHz	3.3 V to 33 V	0.022 % of reading + 0.6 mV	
10 kHz to 20 kHz	3.3 V to 33 V	0.031 % of reading + 0.6 mV	
20 kHz to 50 kHz	3.3 V to 33 V	0.043 % of reading + 0.6 mV	
50 kHz to 100 kHz	3.3 V to 33 V	0.12 % of reading + 1.6 mV	
Equipment to Measure AC Voltage At listed frequencies ^{FO}			
10 Hz to 45 Hz	33 V to 330 V	0.05 % of reading + 2 mV	
45 Hz to 10 kHz	33 V to 330 V	0.028 % of reading + 6 mV	
10 kHz to 20 kHz	33 V to 330 V	0.037 % of reading + 6 mV	
20 kHz to 50 kHz	33 V to 330 V	0.053 % of reading + 6 mV	
50 kHz to 100 kHz	33 V to 330 V	0.26 % of reading + 50 mV	
Equipment to Measure AC Voltage At listed frequencies ^{FO}			
45 Hz to 1 kHz	330 V to 1 020 V	0.64 % of reading + 10 mV	
1 kHz to 5 kHz	330 V to 1 020 V	0.58 % of reading + 10 mV	
5 kHz to 10 kHz	330 V to 1 020 V	0.64 % of reading + 10 mV	
Equipment to Measure AC Current At the listed frequencies 45 Hz to 5 kHz ^{FO}			
	1 μ A to 100 μ A	0.42 % of reading + 0.03 μ A	
	100 μ A to 1 mA	0.37 % of reading + 0.2 μ A	
	1 mA to 10 mA	0.15 % of reading + 2 μ A	
	10 mA to 100 mA	0.14 % of reading + 20 μ A	
	100 mA to 1 A	0.23 % of reading + 200 μ A	



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Equipment to Measure AC Current At the listed frequencies 45 Hz to 1 kHz ^{FO}	29 μ A to 330 μ A	0.76 % of reading + 0.1 μ A	Fluke 5520A
	0.33 mA to 3.3 mA	0.29 % of reading + 0.15 μ A	
	3.3 mA to 33 mA	0.24 % of reading + 2 μ A	
	33 mA to 330 mA	1.1 % of reading + 20 μ A	
	0.33 A to 1.1 A	0.13 % of reading + 0.1 mA	
	1.1 A to 3 A	0.27 % of reading + 0.1 mA	
	3 A to 11 A	0.29 % of reading + 0.1 mA	
Equipment to Measure AC Current At the listed frequencies 45 Hz to 440 Hz ^{FO}	11 A to 20 A	0.38 % of reading + 5 mA	Fluke 5520A w/ Coil
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type E ^{FO}	-250 °C to -100 °C	0.8 °C	Electrical Simulation of Thermocouple Output Fluke 5520A
	-100 °C to 650 °C	0.4 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type J ^{FO}	-210 °C to -100 °C	0.47 °C	
	-100 °C to 760 °C	0.33 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type K ^{FO}	-200 °C to -100 °C	0.52 °C	
	-100 °C to 120 °C	0.31 °C	
	120 °C to 1 000 °C	0.37 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type R ^{FO}	0 °C to 250 °C	0.65 °C	
	250 °C to 1 000 °C	0.47 °C	
	1 000 °C to 1 760 °C	0.74 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type T ^{FO}	-250 °C to -150 °C	0.9 °C	
	-150 °C to 0 °C	0.51 °C	
	0 °C to 400 °C	0.35 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 395, 100 Ω ^{FO}	-200 °C to -80 °C	0.07 °C	
	-80 °C to 0 °C	0.07 °C	
	0 °C to 100 °C	0.09 °C	
	100 °C to 300 °C	0.11 °C	
	300 °C to 400 °C	0.12 °C	
	400 °C to 630 °C	0.14 °C	
	630 °C to 800 °C	0.27 °C	



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Temperature Calibration, Indication, and Control Equipment used with RTD Pt 3926, 100 Ω ^{FO}	-200 °C to -80 °C	0.07 °C	Electrical Simulation of RTD Output Fluke 5520A
	-80 °C to 0 °C	0.07 °C	
	0 °C to 100 °C	0.09 °C	
	100 °C to 300 °C	0.11 °C	
	300 °C to 400 °C	0.12 °C	
	400 °C to 630 °C	0.14 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 3916, 100 Ω ^{FO}	-200 °C to -190 °C	0.29 °C	
	-190 °C to -80 °C	0.06 °C	
	-80 °C to 0 °C	0.07 °C	
	0 °C to 100 °C	0.08 °C	
	100 °C to 260 °C	0.09 °C	
	260 °C to 300 °C	0.1 °C	
	300 °C to 400 °C	0.11 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 385, 200 Ω ^{FO}	-200 °C to -80 °C	0.06 °C	
	-80 °C to 0 °C	0.06 °C	
	0 °C to 100 °C	0.06 °C	
	100 °C to 260 °C	0.07 °C	
	260 °C to 300 °C	0.14 °C	
	300 °C to 400 °C	0.15 °C	
	400 °C to 600 °C	0.17 °C	
	600 °C to 630 °C	0.19 °C	
Temperature calibration, Indication, and Control Equipment used with RTD Pt 385, 500 Ω ^{FO}	-200 °C to -80 °C	0.06 °C	
	-80 °C to 0 °C	0.07 °C	
	0 °C to 100 °C	0.11 °C	
	100 °C to 260 °C	0.08 °C	
	260 °C to 300 °C	0.1 °C	
	300 °C to 400 °C	0.1 °C	
	400 °C to 600 °C	0.11 °C	
	600 °C to 630 °C	0.13 °C	



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Chemical

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Conductivity Meter/Probe ^{FO}	45 μ S to 4 500 μ S	1.1 % of reading	Standard Solutions

Mechanical

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Pressure ^F	-14 psig to 250 psig	0.048 % of reading	Ruska 7250 xi Dead Weight Tester
	200 psig to 10 000 psig	0.049 % of reading	
Pipettes, Burettes, Diluters, Dispensers, Repeaters, Syringes, Liquid Handlers and Automated Dispensing Machines ^{FO}	2 μ L	0.15 μ L	Mettler-Toledo, MCP105 for Multi-Channel Pipettes A and D Weighing, AD4212B-101 PT for Single Channel Pipettes ISO 8655-1 through 7
	2.5 μ L	0.15 μ L	
	5 μ L	0.14 μ L	
	10 μ L	0.16 μ L	
	15 μ L	0.22 μ L	
	20 μ L	0.28 μ L	
	25 μ L	0.37 μ L	
	30 μ L	0.46 μ L	
	40 μ L	0.57 μ L	
	50 μ L	0.69 μ L	
	60 μ L	0.86 μ L	
	70 μ L	1.0 μ L	
	80 μ L	1.2 μ L	
	90 μ L	1.3 μ L	
	100 μ L	1.5 μ L	
	200 μ L	1.7 μ L	
	250 μ L	1.7 μ L	
	300 μ L	2.1 μ L	
400 μ L	2.4 μ L		
450 μ L	3.3 μ L		
500 μ L	3.6 μ L		
600 μ L	4.0 μ L		
700 μ L	4.9 μ L		
800 μ L	5.7 μ L		
850 μ L	6.5 μ L		



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Pipettes, Burettes, Diluters, Dispensers, Repeaters, Syringes, Liquid Handlers and Automated Dispensing Machines	900 μ L	6.9 μ L	Mettler-Toledo, MCP105 for Multi-Channel Pipettes A and D Weighing, AD4212B-101 PT for Single Channel Pipettes ISO 8655-1 through 7
	1 000 μ L	7.4 μ L	
	2 000 μ L	8.1 μ L	
	2 500 μ L	19 μ L	
	3 000 μ L	24 μ L	
	4 000 μ L	29 μ L	
	5 000 μ L	35 μ L	
	10 000 μ L	42 μ L	
	20 000 μ L	85 μ L	

Mass, Force, and Weighing Devices

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Scales ^o	5 lb to 25 lb	0.01 lb	Class F Weights
	25 lb to 100 lb	0.02 lb	
	100 lb to 1 000 lb	0.1 lb	
	1 g to 500 g	0.07 g	
	500 g to 5 kg	0.19 g	
	5 kg to 50 kg	1.8 g	
Class I Weighing Device (Balances) ^o			ASTM E1617 Class 1 Test Weights, NIST Handbook 44 and NISTIR 6919 Chapter 3
0.000 001 g resolution	1 mg to 5 g	0.000 056 mg	
0.000 01 g resolution	1 mg to 40 g	0.000 15 g	
0.000 1 g resolution	1 mg to 200 g	0.000 49 g	
0.001 g resolution	1 mg to 200 g	0.003 4 g	
Class II Weighing Device (Scales and Balances) ^o			ASTM E1617 Class 1 Test Weights, NIST Handbook 44 and NISTIR 6919 Chapters 3 and 4
0.1 g resolution	10 mg to 10 000 g	0.36 g	
Class III Weighing Device (Scales and Balances) ^o			NIST Class F Test Weights, NIST Handbook 44 and NISTIR 6919 Chapters 3, 4, and 5
0.1 lb resolution	5 lb to 100 lb	0.32 lb	



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Thermodynamic

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 Measure Temperature ^F	-196 °C	0.011 °C	Hart 1502A w/ 5614 PRT Using Liquid Nitrogen
	-78 °C	0.008 8 °C	Hart 1502A w/ 5614 PRT Using Dry Ice Sublimation point
Equipment to Measure Temperature ^{FO}	-45 °C to 0 °C	0.011 °C	Hart 1502A w 5614 PRT and Baths
	0 °C to 50 °C	0.021 °C	
	50 °C to 100 °C	0.104 3 °C	
	100 °C to 150 °C	0.008 8 °C	
	150 °C to 200 °C	0.022 °C	
	200 °C to 250 °C	0.016 °C	
	250 °C to 300 °C	0.025 °C	
	300 °C to 350 °C	0.021 °C	
Equipment to Measure Temperature ^{FO}	350 °C to 400 °C	0.022 °C	IsoTech Milli K w/ Type R Thermocouple and Hart Scientific 9112 Calibration furnace, and Isotech 465 High temp Furnace
	400 °C to 450 °C	0.13 °C	
	450 °C to 850 °C	0.12 °C	
	850 °C to 900 °C	0.14 °C	
	900 °C to 950 °C	0.42 °C	
	950 °C to 1 000 °C	0.16 °C	
	1 000 °C to 1 050 °C	0.73 °C	
	1 050 °C to 1 100 °C	0.76 °C	
	1 100 °C to 1 150 °C	1.2 °C	
1 150 °C to 1 200 °C	1.3 °C		
Equipment to Measure Temperature ^F	-196 °C	0.12 °C	Hart 1590 Super Thermometer II w/ AM1960 PRT Using Liquid Nitrogen
	-78 °C	0.29 °C	Hart 1590 Super Thermometer II w/ AM1960 PRT using Dry Ice Sublimation Point
	-45 °C to 0 °C	0.014 °C	Hart 1590 Super Thermometer II w/ AM1960 PRT and Baths
	0 °C to 50 °C	0.042 °C	
	50 °C to 100 °C	0.042 °C	
	100 °C to 150 °C	0.04 °C	
	150 °C to 200 °C	0.16 °C	



Certificate of Accreditation: Supplement

Precise Technical Solutions, LLC

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

Thermodynamic

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 Measure Temperature ^F	200 °C to 250 °C	0.046 °C	Hart 1590 Super Thermometer II w/ AM1960 PRT and Baths
	250 °C to 300 °C	0.04 °C	
	300 °C to 350 °C	0.094 °C	
	350 °C to 400 °C	0.084 °C	
Equipment to Measure IR Temperature ^{FO}	35 °C to 100 °C	0.76 °C	Fluke 4181 Blackbody Source
	100 °C to 200 °C	1.2 °C	
	200 °C to 350 °C	2.2 °C	
	350 °C to 500 °C	2.6 °C	

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 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 O means that the laboratory performs calibration of the indicated parameter onsite at customer locations. Example: Outside Micrometer^O would mean that the laboratory performs this calibration onsite at the customer's location.
5. The presence of a superscript FO means that the laboratory performs calibration of the indicated parameter both at its fixed location and onsite at customer locations. Example: Outside Micrometer^{FO} would mean that the laboratory performs this calibration at its fixed location and onsite at customer locations.