



# PERRY JOHNSON LABORATORY ACCREDITATION, INC.

## *Certificate of Accreditation*

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

***Process Control Services, Inc.***  
***401 Industrial Drive, Plymouth, MI 48170***

*(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 Electrical, Mechanical,  
Thermodynamic and Time & Frequency 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

*Initial Accreditation Date:*

October 1, 2014

*Issue Date:*

June 6, 2017

*Expiration Date:*

July 31, 2019

*Accreditation No.:*

76210

*Certificate No.:*

L17-233

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](http://www.pjilabs.com)*



# Certificate of Accreditation: Supplement

## Process Controls Services, Inc.

401 Industrial Drive, Plymouth, MI 48170  
 Contact Name: Greg Parsons Phone: 734-453-0620

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 <sup>FO</sup>	Up to 330 mV	33 $\mu$ V/V + 1 $\mu$ V	Fluke 5520A
	330 mV to 3.3 V	13 $\mu$ V/V + 2 $\mu$ V	
	3.3 V to 33 V	14 $\mu$ V/V + 20 $\mu$ V	
	33 V to 330 V	21 $\mu$ V/V + 0.15 mV	
	330 V to 1 000 V	21 $\mu$ V/V + 1.5 mV	
Equipment to Measure DC Current <sup>FO</sup>	Up to 330 $\mu$ A	0.17 $\mu$ A/A + 0.02 $\mu$ A	Fluke 5520A
	330 $\mu$ A to 3.3 mA	0.11 $\mu$ A/A + 0.05 $\mu$ A	
	3.3 to 33 mA	0.11 $\mu$ A/A + 0.25 $\mu$ A	
	33 to 330 mA	0.11 $\mu$ A/A + 2.5 $\mu$ A	
	330 mA to 3 A	0.44 mA/A + 40 $\mu$ A	
	3 A to 20 A	1.1 mA/A + 0.75 mA	
Equipment to Measure Resistance <sup>FO</sup>	Up to 11 $\Omega$	45 $\mu\Omega/\Omega$ + 1 m $\Omega$	Fluke 5520A
	11 $\Omega$ to 33 $\Omega$	34 $\mu\Omega/\Omega$ + 1.5 m $\Omega$	
	33 $\Omega$ to 109.999 9 $\Omega$	32 $\mu\Omega/\Omega$ + 1.5 m $\Omega$	
	110 $\Omega$ to 329.999 9 $\Omega$	32 $\mu\Omega/\Omega$ + 2.0 m $\Omega$	
	330 $\Omega$ to 1.099 999 k $\Omega$	32 $\mu\Omega/\Omega$ + 20 m $\Omega$	
	1.1 k $\Omega$ to 3.299 999 k $\Omega$	32 $\mu\Omega/\Omega$ + 0.20 $\Omega$	
	3.3 k $\Omega$ to 10.999 99 k $\Omega$	32 $\mu\Omega/\Omega$ + 0.10 $\Omega$	
	11 k $\Omega$ to 32.999 99 k $\Omega$	32 $\mu\Omega/\Omega$ + 1 $\Omega$	
	33 k $\Omega$ to 109.999 k $\Omega$	32 $\mu\Omega/\Omega$ + 1 $\Omega$	
	110 k $\Omega$ to 329.999 9 k $\Omega$	36 $\mu\Omega/\Omega$ + 10 $\Omega$	
	330 k $\Omega$ to 1.099 999 M $\Omega$	36 $\mu\Omega/\Omega$ + 10 $\Omega$	
	1.1 M $\Omega$ to 3.299 999 M $\Omega$	68 $\mu\Omega/\Omega$ + 0.15 k $\Omega$	
	3.3 M $\Omega$ to 10.999 99 M $\Omega$	0.15 m $\Omega/\Omega$ + 0.25 k $\Omega$	
	11 M $\Omega$ to 32.999 99 M $\Omega$	0.28 m $\Omega/\Omega$ + 2.5 k $\Omega$	
	33 M $\Omega$ to 109.999 9 M $\Omega$	0.6 m $\Omega/\Omega$ + 3 k $\Omega$	
110 M $\Omega$ to 329.999 9 M $\Omega$	3.4 m $\Omega/\Omega$ + 0.1 M $\Omega$		
330 M $\Omega$ to 1 100 M $\Omega$	17 m $\Omega/\Omega$ + 0.5 M $\Omega$		
Equipment to Measure DC Voltage <sup>FO</sup>	Up to 200 mV	5.7 $\mu$ V/V + 0.1 $\mu$ V	Fluke 8508A
	200 mV to 2 V	4 $\mu$ V/V + 0.4 $\mu$ V	
	2 V to 20 V	4 $\mu$ V/V + 4 $\mu$ V	
	20 V to 200 V	6.2 $\mu$ V/V + 40 $\mu$ V	
	200 V to 1 000 V	6.2 $\mu$ V/V + 0.5 mV	



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Equipment to Measure DC Current <sup>FO</sup>	Up to 200 $\mu$ A	14 $\mu$ A/A + 0.4 $\mu$ A	Fluke 8508A
	200 $\mu$ A to 2 mA	14 $\mu$ A/A + 4 $\mu$ A	
	2 mA to 20 mA	16 $\mu$ A/A + 40 $\mu$ A	
	20 mA to 200 mA	54 $\mu$ A/A + 0.8 $\mu$ A	
	200 mA to 2 A	0.21 mA/A + 16 $\mu$ A	
	2 A to 20 A	0.45 mA/A + 0.4 mA	
Equipment to Measure Resistance <sup>FO</sup>	Up to 2 $\Omega$	21 $\mu\Omega/\Omega$ + 4 $\mu\Omega$	
	2 $\Omega$ to 20 $\Omega$	11 $\mu\Omega/\Omega$ + 13 $\mu\Omega$	
	20 $\Omega$ to 200 $\Omega$	9.3 $\mu\Omega/\Omega$ + 45 $\mu\Omega$	
	200 $\Omega$ to 2 k $\Omega$	9.2 $\mu\Omega/\Omega$ + 0.45 m $\Omega$	
	2 k $\Omega$ to 20 k $\Omega$	9.2 $\mu\Omega/\Omega$ + 4.5 m $\Omega$	
	20 k $\Omega$ to 200 k $\Omega$	9.4 $\mu\Omega/\Omega$ + 50 m $\Omega$	
	200 k $\Omega$ to 2 M $\Omega$	11 $\mu\Omega/\Omega$ + 1 $\Omega$	
	2 M $\Omega$ to 20 M $\Omega$	25 $\mu\Omega/\Omega$ + 0.1 k $\Omega$	
	20 M $\Omega$ to 200 M $\Omega$	0.14 m $\Omega/\Omega$ + 1 k $\Omega$	
	200 M $\Omega$ to 2 G $\Omega$	1.7 m $\Omega/\Omega$ + 1 M $\Omega$	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			Fluke 5520A
10 Hz to 45 Hz	Up to 33 mV	0.91 mV/V + 6 $\mu$ V	
45 Hz to 10 kHz	Up to 33 mV	0.19 mV/V + 6 $\mu$ V	
10 kHz to 20 kHz	Up to 33 mV	0.24 mV/V + 6 $\mu$ V	
20 kHz to 50 kHz	Up to 33 mV	1.1 mV/V + 6 $\mu$ V	
50 kHz to 100 kHz	Up to 33 mV	4.0 mV/V + 12 $\mu$ V	
100 kHz to 500 kHz	Up to 33 mV	9.1 mV/V + 50 $\mu$ V	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
10 Hz to 45 Hz	33 mV to 330 mV	0.34 mV/V + 8 $\mu$ V	
45 Hz to 10 kHz	33 mV to 330 mV	0.17 mV/V + 8 $\mu$ V	
10 kHz to 20 kHz	33 mV to 330 mV	0.18 mV/V + 8 $\mu$ V	
20 kHz to 50 kHz	33 mV to 330 mV	0.4 mV/V + 8 $\mu$ V	
50 kHz to 100 kHz	33 mV to 330 mV	0.91 mV/V + 32 $\mu$ V	
100 kHz to 500 kHz	33 mV to 330 mV	2.3 mV/V + 70 $\mu$ V	



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Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			Fluke 5520A
10 Hz to 45 Hz	0.33 V to 3.3 V	0.34 mV/V + 50 $\mu$ V	
45 Hz to 10 kHz	0.33 V to 3.3 V	0.17 mV/V + 60 $\mu$ V	
10 kHz to 20 kHz	0.33 V to 3.3 V	0.27 mV/V + 60 $\mu$ V	
20 kHz to 50 kHz	0.33 V to 3.3 V	0.40 mV/V + 50 $\mu$ V	
50 kHz to 100 kHz	0.33 V to 3.3 V	1 mV/V + 0.13 mV	
100 kHz to 500 kHz	0.33 V to 3.3 V	2.7 mV/V + 0.6 mV	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
10 Hz to 45 Hz	3.3 V to 33 V	0.34 mV/V + 0.65 mV	
45 Hz to 10 kHz	3.3 V to 33 V	0.27 mV/V + 0.6 mV	
10 kHz to 20 kHz	3.3 V to 33 V	0.4 mV/V + 0.6 mV	
20 kHz to 50 kHz	3.3 V to 33 V	1 mV/V + 1.6 mV	
50 kHz to 100 kHz	3.3 V to 33 V	2.3 mV/V + 2 mV	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
10 Hz to 45 Hz	33 V to 330 V	0.22 mV/V + 6 mV	
45 Hz to 10 kHz	33 V to 330 V	0.23 mV/V + 6 mV	
10 kHz to 20 kHz	33 V to 330 V	0.28 mV/V + 6 mV	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
20 kHz to 50 kHz	33 V to 330 V	0.35 mV/V + 6 mV	
50 kHz to 100 kHz	33 V to 330 V	2.3 mV/V + 50 mV	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
45 Hz to 1 kHz	330 V to 1 020 V	0.34 mV/V + 10 mV	
1 kHz to 5 kHz	330 V to 1 020 V	0.28 mV/V + 10 mV	
5 kHz to 10 kHz	330 V to 1 020 V	0.34 mV/V + 10 mV	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
10 Hz to 20 Hz	Up to 330 $\mu$ A	2.3 $\mu$ A/A + 0.1 $\mu$ A	
20 Hz to 45 Hz	Up to 330 $\mu$ A	1.7 $\mu$ A/A + 0.1 $\mu$ A	
45 Hz to 1 kHz	Up to 330 $\mu$ A	1.4 $\mu$ A/A + 0.1 $\mu$ A	
1 kHz to 5 kHz	Up to 330 $\mu$ A	3.4 $\mu$ A/A + 0.15 $\mu$ A	
5 kHz to 10 kHz	Up to 330 $\mu$ A	9.1 mA/A + 0.2 $\mu$ A	
10 kHz to 30 kHz	Up to 330 $\mu$ A	18 mA/A + 0.4 $\mu$ A	



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Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			Fluke 5520A
10 Hz to 20 Hz	0.33 mA to 3.3 mA	2.3 mA/A + 0.15 $\mu$ A	
20 Hz to 45 Hz	0.33 mA to 3.3 mA	1.4 mA/A + 0.15 $\mu$ A	
45 Hz to 1 kHz	0.33 mA to 3.3 mA	1.1 mA/A + 0.15 $\mu$ A	
1 kHz to 5 kHz	0.33 mA to 3.3 mA	2.3 mA/A + 0.2 $\mu$ A	
5 kHz to 10 kHz	0.33 mA to 3.3 mA	5.7 mA/A + 0.3 $\mu$ A	
10 kHz to 30 kHz	0.33 mA to 3.3 mA	11 mA/A + 0.6 $\mu$ A	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
10 Hz to 20 Hz	3.3 mA to 33 mA	2.0 mA/A + 2 $\mu$ A	
20 Hz to 45 Hz	3.3 mA to 33 mA	1.0 mA/A + 2 $\mu$ A	
45 Hz to 1 kHz	3.3 mA to 33 mA	0.47 mA/A + 2 $\mu$ A	
1 kHz to 5 kHz	3.3 mA to 33 mA	0.92 mA/A + 2 $\mu$ A	
5 kHz to 10 kHz	3.3 mA to 33 mA	2.3 mA/A + 3 $\mu$ A	
10 kHz to 30 kHz	3.3 mA to 33 mA	4.5 mA/A + 4 $\mu$ A	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
10 Hz to 20 Hz	33 mA to 330 mA	2 mA/A + 20 $\mu$ A	
20 Hz to 45 Hz	33 mA to 330 mA	1 mA/A + 20 $\mu$ A	
45 Hz to 1 kHz	33 mA to 330 mA	0.46 mA/A + 20 $\mu$ A	
1 kHz to 5 kHz	33 mA to 330 mA	1.1 mA/A + 50 $\mu$ A	
5 kHz to 10 kHz	33 mA to 330 mA	2.3 mA/A + 0.1 mA	
10 kHz to 30 kHz	33 mA to 330 mA	4.5 mA/A + 0.2 mA	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
10 Hz to 45 Hz	0.33 to 1.1 A	2 mA/A + 0.1 mA	
45 Hz to 1 kHz	0.33 to 1.1 A	5.7 mA/A + 0.1 mA	
1 kHz to 5 kHz	0.33 to 1.1 A	6.8 mA/A + 1.1 mA	
5 kHz to 10 kHz	0.33 to 1.1 A	28 mA/A + 5.1 mA	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
10 Hz to 45 Hz	1.1 A to 3 A	2 mA/A + 0.1 mA	
45 Hz to 1 kHz	1.1 A to 3 A	0.68 mA/A + 0.1 mA	
1 kHz to 5 kHz	1.1 A to 3 A	6.8 mA/A + 1 mA	
5 kHz to 10 kHz	1.1 A to 3 A	28 mA/A + 5 mA	



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Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			Fluke 5520A
45 Hz to 100 Hz	3 A to 11 A	0.69 mA/A + 2 mA	
100 Hz to 1 kHz	3 A to 11 A	1.1 mA/A + 2 mA	
1 kHz to 5 kHz	3 A to 11 A	34 mA/A + 2 mA	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
45 Hz to 100 Hz	11 A to 20.5 A	1.4 mA/A + 5.1 mA	
100 Hz to 1 kHz	11 A to 20.5 A	1.7 mA/A + 5.1 mA	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
1 Hz to 20 Hz	Up to 200 mV	0.16 mV/V + 4 $\mu$ V	
20 Hz to 55 Hz	Up to 200 mV	0.13 mV/V + 4 $\mu$ V	
55 Hz to 300 Hz	Up to 200 mV	0.12 mV/V + 2 $\mu$ V	
300 Hz to 1 kHz	Up to 200 mV	0.12 mV/V + 2 $\mu$ V	
1 kHz to 10 kHz	Up to 200 mV	0.15 mV/V + 4 $\mu$ V	
10 kHz to 30 kHz	Up to 200 mV	0.39 mV/V + 8 $\mu$ V	
30 kHz to 100 kHz	Up to 200 mV	0.87 mV/V + 20 $\mu$ V	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			Fluke 8508A
1 Hz to 20 Hz	200 mV to 2 V	0.13 mV/V + 20 $\mu$ V	
20 Hz to 55 Hz	200 mV to 2 V	0.1 mV/V + 20 $\mu$ V	
55 Hz to 300 Hz	200 mV to 2 V	85 $\mu$ V/V + 20 $\mu$ V	
300 Hz to 1 kHz	200 mV to 2 V	85 $\mu$ V/V + 20 $\mu$ V	
1 kHz to 10 kHz	200 mV to 2 V	0.12 mV/V + 20 $\mu$ V	
10 kHz to 30 kHz	200 mV to 2 V	0.25 mV/V + 40 $\mu$ V	
30 kHz to 100 kHz	200 mV to 2 V	0.65 mV/V + 0.2 mV	
100 kHz to 1 MHz	200 mV to 2 V	11 mV/V + 20 mV	



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Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			Fluke 8508A
1 Hz to 20 Hz	2 V to 20 V	0.13 mV/V + 0.2 mV	
20 Hz to 55 Hz	2 V to 20 V	0.1 mV/V + 0.2 mV	
55 Hz to 300 Hz	2 V to 20 V	85 $\mu$ V/V + 0.2 mV	
300 Hz to 1 kHz	2 V to 20 V	85 $\mu$ V/V + 0.2 mV	
1 kHz to 10 kHz	2 V to 20 V	0.12 mV/V + 0.2 mV	
10 kHz to 30 kHz	2 V to 20 V	0.25 mV/V + 0.4 mV	
30 kHz to 100 kHz	2 V to 20 V	0.65 mV/V + 2. mV	
100 kHz to 1 MHz	2 V to 20 V	11 mV/V + 0.2 V	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
10 Hz to 20 Hz	20 V to 200 V	0.13 mV/V + 2 mV	
20 Hz to 55 Hz	20 V to 200 V	0.13 mV/V + 2 mV	
55 Hz to 300 Hz	20 V to 200 V	0.1 mV/V + 2 mV	
300 Hz to 1 kHz	20 V to 200 V	85 $\mu$ V/V + 2 mV	
1 kHz to 10 kHz	20 V to 200 V	85 $\mu$ V/V + 2 mV	
10 kHz to 30 kHz	20 V to 200 V	0.25 mV/V + 4 mV	
30 kHz to 100 kHz	20 V to 200 V	0.65 mV/V + 20 mV	
Equipment to Measure AC Voltage (at the listed frequencies) <sup>FO</sup>			
20 Hz to 55 Hz	200 V to 1 000 V	0.13 mV/V + 20 mV	
55 Hz to 300 Hz	200 V to 1 000 V	0.13 mV/V + 20 mV	
300 Hz to 1 kHz	200 V to 1 000 V	0.13 mV/V + 20 mV	
1 kHz to 10 kHz	200 V to 1 000 V	0.13 mV/V + 40 mV	
10 kHz to 30 kHz	200 V to 1 000 V	0.25 mV/V + 0.2 V	
Equipment to Measure AC Current (at the listed frequencies) <sup>FO</sup>			
10 Hz to 10 kHz	Up to 200 $\mu$ A	0.57 $\mu$ A/A + 0.02 $\mu$ A	
10 Hz to 10 kHz	200 $\mu$ A to 2 mA	0.34 $\mu$ A/A + 0.18 $\mu$ A	
10 Hz to 55 Hz	2 mA to 20 mA	0.39 mA/A + 1.8 $\mu$ A	
55 Hz to 10 kHz	2 mA to 20 mA	0.34 mA/A + 1.8 $\mu$ A	
10 Hz to 10 kHz	20 mA to 200 mA	0.33 mA/A + 18 $\mu$ A	
10 Hz to 1 kHz	200 mA to 2 A	0.7 mA/A + 0.18 mA	



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Equipment to Measure AC Current (at the listed frequencies) <sup>FO</sup>			Fluke 8508A
1 kHz to 10 kHz	200 mA to 2 A	0.83 mA/A + 0.18 mA	
10 kHz to 300 Hz	2 A to 20 A	0.93 mA/A + 1.8 mA	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type B <sup>FO</sup>	600 °C to 799 °C	1.1 °C	Fluke 5520A
	800 °C to 999 °C	0.96 °C	
	1 000 °C to 1 549 °C	0.34 °C	
	1 550 °C to 1 820 °C	0.95 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type C <sup>FO</sup>	0 °C to 149 °C	0.34 °C	
	150 °C to 649 °C	0.29 °C	
	650 °C to 999 °C	0.35 °C	
	1 000 °C to 1 799 °C	0.57 °C	
	1 800 °C to 2 316 °C	0.95 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type E <sup>FO</sup>	-250 °C to -101 °C	0.57 °C	
	-100 °C to -26 °C	0.18 °C	
	-25 °C to 349 °C	0.16 °C	
	350 °C to 649 °C	0.18 °C	
	650 °C to 1 000 °C	0.24 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type J <sup>FO</sup>	-210 °C To -101 °C	0.32 °C	
	-100 °C to -31 °C	0.18 °C	
	-30 °C to 149 °C	0.16 °C	
	150 °C to 759 °C	0.19 °C	
	760 °C to 1 200 °C	0.26 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type K <sup>FO</sup>	-200 °C to -101 °C	0.37 °C	
	-100 °C to -26 °C	0.2 °C	
	-25 °C to 119 °C	0.18 °C	
	120 °C to 999 °C	0.29 °C	
	1 000 °C to 1 372 °C	0.45 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type L <sup>FO</sup>	-200 °C to -101 °C	0.43 °C	
	-100 °C to 799 °C	0.29 °C	
	800 °C to 900 °C	0.19 °C	





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Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type N <sup>FO</sup>	-200 °C to -101 °C	0.45 °C	Fluke 5520A
	-100 °C to -26 °C	0.25 °C	
	-25 °C to 119 °C	0.24 °C	
	120 °C to 409 °C	0.23 °C	
	410 °C to 1 300 °C	0.32 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type R <sup>FO</sup>	0 °C to 249 °C	0.65 °C	
	250 °C to 399 °C	0.4 °C	
	400 °C to 999 °C	0.37 °C	
	1 000 °C to 1 767 °C	1.2 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type S <sup>FO</sup>	0 °C to 249 °C	0.53 °C	
	250 °C to 399 °C	0.41 °C	
	400 °C to 999 °C	0.42 °C	
	1 000 °C to 1 767 °C	0.52 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type T <sup>FO</sup>	-250 °C to -151 °C	0.72 °C	
	-150 °C to -1 °C	0.27 °C	
	0 °C to 119 °C	0.18 °C	
	120 °C to 400 °C	0.16 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type U <sup>FO</sup>	-200 °C to -1 °C	0.63 °C	
	0 °C to 600 °C	0.31 °C	
Temperature Calibration, Indication, and Control Equipment used with Pt 385 100 $\Omega$ <sup>FO</sup>	-200 °C to -81 °C	0.06 °C	
	-80 °C to -1 °C	0.06 °C	
	0 °C to 99 °C	0.08 °C	
	100 °C to 299 °C	0.1 °C	
	300 °C to 399 °C	0.11 °C	
	400 °C to 629 °C	0.14 °C	
	630 °C to 800 °C	0.26 °C	



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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
Temperature Calibration, Indication, and Control Equipment used with Pt 3926 100 $\Omega^{FO}$	-200 °C To -81 °C	0.06 °C	Fluke 5520A
	-80 °C to -1 °C	0.06 °C	
	0 °C to 99 °C	0.08 °C	
	100 °C to 299 °C	0.10 °C	
	300 °C to 399 °C	0.11 °C	
	400 °C to 630 °C	0.14 °C	
Temperature Calibration, Indication, and Control Equipment used with Pt 3916 100 $\Omega^{FO}$	-200 °C to -191 °C	0.28 °C	Fluke 5520A
	-190 °C to -81 °C	0.05 °C	
	-80 °C to 0 °C	0.06 °C	
	0 °C to 100 °C	0.07 °C	
	100 °C to 300 °C	0.08 °C	
	300 °C to 400 °C	0.09 °C	
	400 °C to 600 °C	0.1 °C	
Temperature Calibration, Indication, and Control Equipment used with Pt 385 200 $\Omega^{FO}$	-200 °C to -81 °C	0.05 °C	Fluke 5520A
	-80 °C to -1 °C	0.05 °C	
	0 °C to 99 °C	0.05 °C	
	100 °C to 259 °C	0.06 °C	
	260 °C to 299 °C	0.14 °C	
	300 °C to 399 °C	0.15 °C	
	400 °C to 599 °C	0.16 °C	
Temperature Calibration, Indication, and Control Equipment used with Pt 385 100 $\Omega^{FO}$	-200 °C to -1 °C	0.06 °C	Fluke 8508A
	0 °C to 99 °C	0.06 °C	
	100 °C to 231 °C	0.06 °C	
	232 °C to 400 °C	0.06 °C	



# Certificate of Accreditation: Supplement

## Process Controls Services, Inc.

401 Industrial Drive, Plymouth, MI 48170  
 Contact Name: Greg Parsons Phone: 734-453-0620

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

### Time & Frequency

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 Frequency <sup>FO</sup>	0.01 Hz to 225 MHz	0.44 mHz/Hz	Fluke 8508A

### 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
Temperature Source <sup>FO</sup>	25 °C to 34 °C	0.33 °C	Fluke 9100S
	35 °C to 99 °C	0.36 °C	
	100 °C to 375 °C	0.83 °C	
Humidity <sup>FO</sup>	11 % RH	3.1 % RH	Vaisala HMT 333 ASTM E104
	33 % RH	2.9 % RH	
	53 % RH	3.4 % RH	
	75 % RH	3.4 % RH	
	97 % RH	5.2 % RH	

### 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
Pressure Measure Equipment Absolute <sup>FO</sup>	15 psi to 114.99 psi	0.028 psi	Mensor PCS400
	115 psi to 1 015 psi	0.23 psi	
Vacuum Measure Equipment Absolute <sup>FO</sup>	Up to -14 psi	0.02 psi	
Pressure Hydraulic <sup>FO</sup>	5 psi to 999 psi	0.88 % of reading	Ashcroft 1305B
	1 000 psi to 5 000 psi	1.1 % of reading	



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### Process Controls Services, Inc.

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

1. The CMC (Calibration and Measurement Capability) stated for calibrations included on this scope of accreditation represents the smallest measurement uncertainty attainable by the laboratory when performing a more or less routine calibration of a nearly ideal device under nearly ideal conditions. It is typically expressed at a confidence level of 95 % using a coverage factor  $k$  (usually equal to 2). The actual measurement uncertainty associated with a specific calibration performed by the laboratory will typically be larger than the CMC for the same calibration since capability and performance of the device being calibrated and the conditions related to the calibration may reasonably be expected to deviate from ideal to some degree.
2. The laboratories range of calibration capability for all disciplines for which they are accredited is the interval from the smallest calibrated standard to the largest calibrated standard used in performing the calibration. The low end of this range must be an attainable value for which the laboratory has or has access to the standard referenced. Verification of an indicated value of zero in the absence of a standard is common practice in the procedure for many calibrations but by its definition it does not constitute calibration of zero capacity.
3. The presence of a superscript FO means that the laboratory performs calibration of the indicated parameter both at its fixed location and onsite at customer locations. Example: Outside Micrometer<sup>FO</sup> would mean that the laboratory performs this calibration at its fixed location and onsite at customer locations.
4. 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.