



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

***Metrolab, S.A. de C.V.
Ave. San Nicolás #118, Col. Arboledas de San Jorge,
San Nicolás de los Garza, Nuevo León 66465***

(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):

***Mass and Electrical Calibration
(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 Rd.
Troy, MI 48084

Initial Accreditation Date:
March 26, 2010

Accreditation No.:
48521

Issue Date:
March 26, 2010

Certificate No.:
L10-34

Expiration Date:
August 21, 2014

Page No.:
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Certificate of Accreditation: Supplement

Metrolab, S.A. de C.V.

Ave. San Nicolás #118, Col. Arboledas de San Jorge,
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Accreditation is granted to this facility to perform the following calibrations:

Mass, Force, and Weighing Devices

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	BEST MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	REMARKS	
Mechanical Balances, Electronic and Electromechanical	0.02 g to 1 kg	$(1.20 \times 10^{-3} + 1.12 \times 10^{-6} \text{ Wt}) \text{ g}$	Class F1 Mass Set	
	0.05 g to 2 kg	$(1.20 \times 10^{-3} + 1.41 \times 10^{-6} \text{ Wt}) \text{ g}$		
	0.1 g to 5 kg	$(1.16 \times 10^{-2} + 6.92 \times 10^{-7} \text{ Wt}) \text{ g}$		
	0.2 g to 10 kg	$(1.16 \times 10^{-2} + 1.12 \times 10^{-6} \text{ Wt}) \text{ g}$		
	0.5 g to 20 kg	$(1.16 \times 10^{-2} + 1.41 \times 10^{-6} \text{ Wt}) \text{ g}$		
		10 g to 50 kg	$(1.16 \times 10^{-2} + 1.70 \times 10^{-6} \text{ Wt}) \text{ g}$	Class M2 Mass Set
		20 g to 100 kg	$(1.16 \times 10^{-2} + 1.81 \times 10^{-6} \text{ Wt}) \text{ g}$	
		50 g to 200 kg	$(1.15 \times 10^{-2} + 1.86 \times 10^{-6} \text{ Wt}) \text{ g}$	
		100 g to 500 kg	$(1.15 \times 10^{-2} + 1.70 \times 10^{-6} \text{ Wt}) \text{ g}$	
		0.2 kg to 1000 kg	$(2.31 \times 10^{-1} \text{ Wt} + 1.70 \times 10^{-6} \text{ Wt}) \text{ g}$	
	0.5 kg to 3000 kg	$(5.77 \times 10^{-1} \text{ Wt} + 1.73 \times 10^{-6} \text{ Wt}) \text{ g}$		

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	BEST MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	REMARKS
DC Voltage Measurement	0 mV to 329.99 mV	0.006 % of Reading + 3 μV	Fluke 5500A
	0 mV to 3.299 V	0.005 % of Reading + 5 μV	
	0 mV to 32.999 V	0.005 % of Reading + 50 μV	
	30 mV to 329.99 V	0.005 5 % of Reading + 500 μV	
	100 mV to 1 020.00 V	0.005 5 % of Reading + 1 500 μV	
DC Current	0 mA to 3.299 mA	0.013 % of reading + 0.05 μV	
	0 mA to 32.999 mA	0.01 % of reading + 0.25 μV	
	0 mA to 329.999 mA	0.01 % of reading + 3.3 μV	
	0 mA to 2.199 mA	0.03 % of reading + 44 μV	
	0 mA to 11 A	0.06 % of reading + 330 μV	



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Resistance Measurement	0 Ω to 10.99 Ω	0.012 % of reading + 0.008 Ω	Fluke 5500A
	11 Ω to 32.99 Ω	0.012 % of reading + 0.015 Ω	
	33 Ω to 109.99 Ω	0.009 % of reading + 0.015 Ω	
	110 Ω to 329 Ω	0.009 % of reading + 0.015 Ω	
	330 Ω to 1.099 k Ω	0.009 % of reading + 0.06 Ω	
	1.1 k Ω to 3.299 k Ω	0.009 % of reading + 0.06 Ω	
	3.3 k Ω to 10.999 k Ω	0.009 % of reading + 0.6 Ω	
	11 k Ω to 32.999 k Ω	0.009 % of reading + 0.6 Ω	
	33 k Ω to 109.99 k Ω	0.011 % of reading + 6 Ω	
	110 k Ω to 329.99 k Ω	0.012 % of reading + 6 Ω	
	330 k Ω to 1.099 M Ω	0.015 % of reading + 55 Ω	
	1.1 M Ω to 3.299 M Ω	0.015 % of reading + 55 Ω	
	3.3 M Ω to 10.999 M Ω	0.06 % of reading + 550 Ω	
	11 M Ω to 32.999 M Ω	0.1 % of reading + 550 Ω	
33 M Ω to 109.999 M Ω	0.5 % of reading + 5500 Ω		
AC Voltage Measurement At the listed frequencies			
10 Hz to 45 Hz	1.0 mV to 32.999 mV	0.35 % of reading + 20 μ V	
45 kHz to 10 kHz	1.0 mV to 32.999 mV	0.15 % of reading + 20 μ V	
10 kHz to 20 kHz	1.0 mV to 32.999 mV	0.2 % of reading + 20 μ V	
20 kHz to 50 kHz	1.0 mV to 32.999 mV	0.25 % of reading + 20 μ V	
50 kHz to 100 kHz	1.0 mV to 32.999 mV	0.35 % of reading + 33 μ V	
100 kHz to 500 kHz	1.0 mV to 32.999 mV	1 % of reading + 60 μ V	
AC Voltage Measurement At the listed frequencies			
10 Hz to 45 Hz	33 mV to 329.999 mV	0.25 % of reading + 50 μ V	
45 kHz to 10 kHz	33 mV to 329.999 mV	0.05 % of reading + 20 μ V	
10 kHz to 20 kHz	33 mV to 329.999 mV	0.1 % of reading + 20 μ V	
20 kHz to 50 kHz	33 mV to 329.999 mV	0.16 % of reading + 40 μ V	
50 kHz to 100 kHz	33 mV to 329.999 mV	0.24 % of reading + 170 μ V	
100 kHz to 500 kHz	33 mV to 329.999 mV	0.7 % of reading + 330 μ V	



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AC Voltage Measurement At the listed frequencies			Fluke 5500A
10 Hz to 45 Hz	0.33 V to 3.299 V	0.15 % of reading + 250 μ V	
45 kHz to 10 kHz	0.33 V to 3.299 V	0.03 % of reading + 60 μ V	
10 kHz to 20 kHz	0.33 V to 3.299 V	0.08 % of reading + 60 μ V	
20 kHz to 50 kHz	0.33 V to 3.299 V	0.14 % of reading + 300 μ V	
50 kHz to 100 kHz	0.33 V to 3.299 V	0.24 % of reading + 1 700 μ V	
100 kHz to 500 kHz	0.33 V to 3.299 V	0.5 % of reading + 3 300 μ V	
AC Voltage Measurement At the listed frequencies			
10 Hz to 45 Hz	3.3 V to 32.999 V	0.15 % of reading + 2 500 μ V	
45 kHz to 10 kHz	3.3 V to 32.999 V	0.04 % of reading + 600 μ V	
10 kHz to 20 kHz	3.3 V to 32.999 V	0.08 % of reading + 2 600 μ V	
20 kHz to 50 kHz	3.3 V to 32.999 V	0.19 % of reading + 5 000 μ V	
50 kHz to 100 kHz	3.3 V to 32.999 V	0.24 % of reading + 17 000 μ V	
AC Voltage Measurement At the listed frequencies			
10 Hz to 45 Hz	33 V to 329.999 V	0.05 % of reading + 6.6 mV	
45 kHz to 10 kHz	33 V to 329.999 V	0.08 % of reading + 15 μ V	
10 kHz to 20 kHz	33 V to 329.999 V	0.09 % of reading + 33 μ V	
AC Voltage Measurement At the listed frequencies			
45 Hz to 1 kHz	330 V to 1 020 V	0.05 % of reading + 80 mV	
1 kHz to 5 kHz	330 V to 1 020 V	0.20 % of reading + 100 μ V	
5 kHz to 10 kHz	330 V to 1 020 V	0.20 % of reading + 500 μ V	
AC Current At the listed frequencies			
10 Hz to 20 Hz	0.029 mA to 0.329 9 mA	0.25 % of reading + 0.15 μ A	
20 Hz to 45 Hz	0.029 mA to 0.329 9 mA	0.125 % of reading + 0.15 μ A	
45 Hz to 1 kHz	0.029 mA to 0.329 9 mA	0.125 % of reading + 0.25 μ A	
1 kHz to 5 kHz	0.029 mA to 0.329 9 mA	0.4 % of reading + 0.3 μ A	
5 kHz to 10 kHz	0.029 mA to 0.329 9 mA	1.25 % of reading + 0.15 μ A	



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AC Current At the listed frequencies			Fluke 5500A
10 Hz to 20 Hz	0.33 mA to 3.299 mA	0.2 % of reading + 0.3 μ A	
20 Hz to 45 Hz	0.33 mA to 3.299 mA	0.1 % of reading + 0.3 μ A	
45 Hz to 1 kHz	0.33 mA to 3.299 mA	0.1 % of reading + 0.3 μ A	
1 kHz to 5 kHz	0.33 mA to 3.299 mA	0.2 % of reading + 0.3 μ A	
5 kHz to 10 kHz	0.33 mA to 3.299 mA	0.2 % of reading + 0.3 μ A	
AC Current At the listed frequencies			
10 Hz to 20 Hz	3.3 mA to 32.999 mA	0.2 % of reading + 3 μ A	
20 Hz to 45 Hz	3.3 mA to 32.999 mA	0.1 % of reading + 3 μ A	
45 Hz to 1 kHz	3.3 mA to 32.999 mA	0.09 % of reading + 3 μ A	
1 kHz to 5 kHz	3.3 mA to 32.999 mA	0.2 % of reading + 3 μ A	
5 kHz to 10 kHz	3.3 mA to 32.999 mA	0.6 % of reading + 3 μ A	
AC Current At the listed frequencies			
10 Hz to 20 Hz	33 mA to 329.999 mA	0.2 % of reading + 30 μ A	
20 Hz to 45 Hz	33 mA to 329.999 mA	0.1 % of reading + 30 μ A	
45 Hz to 1 kHz	33 mA to 329.999 mA	0.09 % of reading + 30 μ A	
1 kHz to 5 kHz	33 mA to 329.999 mA	0.2 % of reading + 30 μ A	
5 kHz to 10 kHz	33 mA to 329.999 mA	0.6 % of reading + 30 μ A	
AC Current At the listed frequencies			
10 Hz to 45 Hz	0.33 A to 2.199 A	0.2 % of reading + 300 μ A	
45 Hz to 1kHz	0.33 A to 2.199 A	0.1 % of reading + 300 μ A	
1 kHz to 5 kHz	0.33 A to 2.199 A	0.75 % of reading + 300 μ A	
AC Current At the listed frequencies			
45 Hz to 65 Hz	2.2 A to 11 A	0.06 % of reading + 2 000 μ A	
65 Hz to 500 Hz	2.2 A to 11 A	0.10 % of reading + 2 000 μ A	
500 Hz to 1 kHz	2.2 A to 11 A	0.33 % of reading + 2 000 μ A	



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Capacitance	0.33 nF to 0.4999 nF	0.5 % of reading + 0.01 nF	Fluke 5500A
	0.5 nF to 1.0999 nF	0.5 % of reading + 0.01 nF	
	1.1 nF to 3.2999 nF	0.5 % of reading + 0.01 nF	
	3.3 nF to 10.999 nF	0.5 % of reading + 0.01 nF	
	11 nF to 32.999 nF	0.25 % of reading + 0.1 nF	
	33 nF to 109.99 nF	0.25 % of reading + 0.1 nF	
	110 nF to 329.99 nF	0.25 % of reading + 0.3 nF	
	0.33 μ F to 1.099 μ F	0.25 % of reading + 1 nF	
	1.1 μ F to 3.299 μ F	0.35 % of reading + 3 nF	
	3.3 μ F to 10.999 μ F	0.35 % of reading + 10 nF	
	11 μ F to 32.999 μ F	0.40 % of reading + 30 nF	
	33 μ F to 109.99 μ F	0.50 % of reading + 100 nF	
	110 μ F to 329.99 μ F	0.70 % of reading + 300 nF	
	330 mF to 1.1 mF	0.1 % of reading + 300 nF	
Temperature Calibration, Indication and Control Equipment used with Thermocouple B	600 °C to 800 °C	0.44 °C	Electrical Simulation of Thermocouple Output Fluke 5500A
	800 °C to 1 000 °C	0.34 °C	
	1 000 °C to 1 550 °C	0.30 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple C	600 °C to 800°C	0.33 °C	
	800 °C to 1 000°C	0.30 °C	
	1 000 °C to 1550 °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		
Temperature Calibration, Indication and Control Equipment used with Thermocouple E	-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	
	650 °C to 1000°C	0.21 °C	



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Temperature Calibration, Indication and Control Equipment used with Thermocouple J	-210 °C to -100 °C	0.27 °C	Electrical Simulation of Thermocouple Output Fluke 5500A
	-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 Calibration, Indication and Control Equipment used with Thermocouple 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	
Temperature Calibration, Indication and Control Equipment used with Thermocouple L	1 000 °C to 1 372 °C	0.40 °C	
	-200 °C to -100°C	0.37°C	
	-100 °C to 800 °C	0.26°C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple N	800 °C to 900°C	0.17°C	
	-200 °C to -100 °C	0.40 °C	
	-100 °C to -25 °C	0.22 °C	
	-25 °C to 120 °C	0.19 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple R	120 °C to 410 °C	0.18 °C	
	410 °C to 1 300 °C	0.27 °C	
	0 °C to 250 °C	0.57 °C	
	250 °C to 400°C	0.35 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple S	400 °C to 1 000°C	0.33 °C	
	1 000 °C to 1 767°C	0.40 °C	
	0 °C to 250 °C	0.47 °C	
	250 °C to 1000°C	0.36 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple T	1 000 °C to 1 400°C	0.37 °C	
	1 400 °C to 1 767°C	0.46 °C	
	-250 °C to -150 °C	0.63 °C	
	-150 °C to 0 °C	0.24 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple T	0 °C to 120 °C	0.16 °C	
	120 °C to 400 °C	0.14 °C	



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Temperature Calibration, Indication and Control Equipment used with Thermocouple U	-200 °C to 0 °C	0.56 °C	Electrical Simulation of Thermocouple Output Fluke 5500A
	0 °C to 600 °C	0.27 °C	
Temperature Calibration, Indication and Control Equipment used with RTD simulation Pt 395 100 Ω	-200 °C to -80 °C	0.05 °C	Electrical Simulation of RTD Output 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 simulation 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	
Temperature Calibration, Indication and Control Equipment used with RTD simulation Pt 3916 10 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	
	300 °C to 400 °C	0.09 °C	
	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 simulation 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	



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Temperature Calibration, Indication and Control Equipment used with RTD simulation Pt 385 200 Ω	100 °C to 260 °C	0.05 °C	Electrical Simulation of RTD Output Fluke 5500A
	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 simulation 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	
Temperature Calibration, Indication and Control Equipment used with RTD simulation Pt 385 1 000 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	
Temperature Calibration, Indication and Control Equipment used with RTD simulation Pt 385 120 Ω	-80 °C to 0 °C	0.08 °C	
	0 °C to 100 °C	0.08 °C	
	100 °C to 260 °C	0.14 °C	
Temperature Calibration, Indication and Control Equipment used with RTD simulation Cu 427 10 Ω	-100 °C to 260 °C	0.3 °C	



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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 wt represents weight in pounds or grams (including SI multiple and submultiples units) appropriate to the uncertainty statement.