



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Mess Servicios Metrológicos S. de R.L. de C.V.

***Acceso III No.16 A, Nave 10, Parque Industrial Benito Juárez
Querétaro, Querétaro, México. C.P.76120***

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

ISO/IEC 17025:2017

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 April 2017):

Thermodynamic, Electrical, Mechanical and Time and Frequency 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:

Initial Accreditation Date:

July 29, 2015

Issue Date:

August 20, 2023

Expiration Date:

October 31, 2025

Tracy Szerszen
President

Accreditation No.:

56695

Certificate No.:

L23-624

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.pjlabs.com*



Certificate of Accreditation: Supplement

Mess Servicios Metrológicos S. de R.L. de C.V.

Acceso III No. 16 A, Nave 10, Parque Industrial Benito Juarez
 Querétaro, Querétaro, México. C.P. 76120
 Contact Name: Jose Oscar Morales García Phone: 442-476-0646

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
Temperature Measurement RTD Pt 100 ^F	-45 °C to 0 °C	0.06 °C	Fluke 9170 Fluke 9173 Fluke 5626 OIML-R-84 ASTM-E-230 Euramet cg-08/v.01
	0 °C to 150 °C	0.08 °C	
	150 °C to 700 °C	0.1 °C	
Thermistor Type NTC, PTC ^F	-45 °C to 0 °C	0.06 °C	
	0 °C to 150 °C	0.08 °C	
	150 °C to 700 °C	0.1 °C	
Temperature Measurement Thermocouple Type B ^{FO}	600 °C to 660 °C	0.1 °C	
	660 °C to 700 °C	0.25 °C	
Temperature Measurement Thermocouple Type C ^{FO}	0 °C to 150 °C	0.08 °C	
	150 °C to 660 °C	0.1 °C	
	660 °C to 700 °C	0.25 °C	
Temperature Measurement Thermocouple Type E ^{FO}	-45 °C to 0 °C	0.06 °C	
	0 °C to 150 °C	0.08 °C	
	150 °C to 660 °C	0.1 °C	
	660 °C to 700 °C	0.25 °C	
Temperature Measurement Thermocouple Type J ^{FO}	-45 °C to 0 °C	0.06 °C	
	0 °C to 150 °C	0.08 °C	
	150 °C to 660 °C	0.1 °C	
	660 °C to 700 °C	0.25 °C	
Temperature Measurement Thermocouple Type K ^{FO}	-45 °C to 0 °C	0.06 °C	
	0 °C to 150 °C	0.08 °C	
	150 °C to 660 °C	0.1 °C	
	660 °C to 700 °C	0.25 °C	
Temperature Measurement Thermocouple Type N ^{FO}	-45 °C to 0 °C	0.06 °C	
	0 °C to 150 °C	0.08 °C	
	150 °C to 660 °C	0.1 °C	
	660 °C to 700 °C	0.25 °C	
Temperature Measurement Thermocouple Type R ^{FO}	0 °C to 150 °C	0.08 °C	
	150 °C to 660 °C	0.1 °C	
	660 °C to 700 °C	0.25 °C	
Temperature Measurement Thermocouple Type S ^{FO}	0 °C to 150 °C	0.08 °C	
	150 °C to 660 °C	0.1 °C	
	660 °C to 700 °C	0.25 °C	



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Bimetallic Thermometer ^F	-45 °C to 0 °C	0.06 °C	Fluke 9170 Fluke 9173 Fluke 5626 NMX-CH-70-SCFI MESS-TE-PRO-002
	0 °C to 150 °C	0.08 °C	
	150 °C to 700 °C	0.1 °C	
Infrared Temperature Measuring Instrument ^F	-20 °C to 35 °C	3.2 °C	Fluke 4181 ASTM E2847 MESS-TE-PRO-003
	35 °C to 100 °C	0.45 °C	
	100 °C to 200 °C	0.64 °C	
	200 °C to 350 °C	1.1 °C	
	350 °C to 500 °C	1.5 °C	
	500 °C to 1 000 °C	4.5 °C	
	1 000 °C to 1 500 °C	7 °C	
Temperature Chamber ^F	-70 °C to 300 °C	0.1 °C	Fluke 1586A AMS 2750F
	301 °C to 650 °C	0.5 °C	
	651 °C to 1 000 °C	1.3 °C	
Hygrometer Humidity Only ^F	10 % RH to 90 % RH	1 % RH	Fluke 1620A Fluke 2626-H ASTM E104-02 XP2001 ASTM E104-02
	90 % RH to 99 % RH	2 % RH	
Hygrometer Temperature Only ^F	10 °C to 50 °C	0.1 °C	Fluke 1620A Fluke 2626-H ASTM E104-02

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	40 μ V/V + 2 μ V	Fluke 5522A NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2--SCFI
	0.33 to 3.3 V	22 μ V/V + 10 μ V	
	3.3 V to 33 V	24 μ V/V + 204 μ V	
	33 V to 330 V	36 μ V/V + 6 mV	
	330 V to 1 025 V	36 μ V/V + 10 mV	
Equipment to Output DC Voltage ^{FO}	10 mV to 100 mV	18 μ V/V + 1 μ V	Transmille 8081 NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2--SCFI
	0.1 V to 1 V	13 μ V/V + 4.3 μ V	
	1 V to 10 V	14 μ V/V + 96 μ V	



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Equipment to Output DC Voltage ^{FO}	10 V to 100 V	19 μ V/V + 330 μ V	Transmille 8081 NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2--SCFI
	100 V to 1 000 V	19 μ V/V + 4.6 mV	
Equipment to Measure DC Current ^{FO}	2 μ A to 200 μ A	0.2 mA/A + 20 nA	Transmille 4010 NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2--SCFI
	0.2 mA to 2 mA	0.1 mA/A + 230 nA	
	2 mA to 20 mA	0.1 mA/A + 3 μ A	
	20 mA to 200 mA	0.1 mA/A + 23 μ A	
	0.2 A to 2 A	0.26 mA/A + 120 μ A	
	2 A to 20 A	0.6 mA/A + 600 μ A	
	20 A to 30 A	1 mA/A + 900 μ A	
Clamp-On Meters ^{FO}	11 A to 1 500 A	1.2 A	Transmille 4010 and 50 Turn Coil (Type Thyroid) NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2--SCFI
Equipment to Output DC Current ^{FO}	0.1 μ A to 1 μ A	1.4 mA/A + 68 pA	Transmille 8081 NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2--SCFI
	1 μ A to 10 μ A	200 μ A/A + 400 pA	
	10 μ A to 100 μ A	56 μ A/A + 5.8 nA	
	0.1 mA to 1mA	56 μ A/A + 62 nA	
	1 mA to 10 mA	64 μ A/A + 660 nA	
	10 mA to 100 mA	94 μ A/A + 1.2 μ A	
	0.1 A to 1 A	470 μ A/A + 26 μ A	
	1 A to 10 A	1.1 mA/A + 700 μ A	
	10 A to 30 A	1.5 mA/A + 9 mA	
Equipment to Measure Resistance ^{FO}	0.11 Ω to 11 Ω	80 $\mu\Omega/\Omega$ + 20 m Ω	Fluke 5522A NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2--SCFI
	11 Ω to 110 Ω	56 $\mu\Omega/\Omega$ + 30 m Ω	
	0.11 k Ω to 1.1k Ω	56 $\mu\Omega/\Omega$ + 40 m Ω	
	1.1 k Ω to 11 k Ω	56 $\mu\Omega/\Omega$ + 400 m Ω	
	11 k Ω to 110 k Ω	56 $\mu\Omega/\Omega$ + 2 Ω	
	0.11 M Ω to 1.1 M Ω	64 $\mu\Omega/\Omega$ + 22 Ω	
	1.1 M Ω to 3.3 M Ω	120 $\mu\Omega/\Omega$ + 820 Ω	
	3.3 M Ω to 11 M Ω	260 $\mu\Omega/\Omega$ + 500 Ω	
	11 M Ω to 33 M Ω	500 $\mu\Omega/\Omega$ + 46 k Ω	
	33 M Ω to 110 M Ω	1 m Ω/Ω + 100 k Ω	
	110 M Ω to 330 M Ω	6 m Ω/Ω + 200 k Ω	



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Equipment to Measure AC Voltage At the listed frequencies 45 Hz to 10 kHz ^{FO}	1 mV to 33 mV	0.3 mV/V + 12 μ V	Fluke 5522A NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2—SCFI
	33 mV to 330 mV	0.3 mV/V + 94 μ V	
	0.33 V to 3.3 V	0.3 mV/V + 920 μ V	
	3.3 V to 33 V	0.3 mV /V + 11 mV	
	33 V to 330 V	0.38 mV /V + 90 mV	
Equipment to Measure AC Voltage At the listed frequencies 10 kHz to 20 kHz ^{FO}	33 mV to 330 mV	0.32 mV/V + 30 μ V	
	0.33 V to 3.3 V	0.38 mV /V + 230 μ V	
	3.3 V to 33 V	0.48 mV /V + 3.8 mV	
	33 V to 330 V	0.5 mV /V + 12 mV	
Equipment to Measure AC Voltage At the listed frequencies 45 Hz to 1 kHz ^{FO}	0.33 kV to 1 kV	0.6 mV /V + 56 mV	
Equipment to Output AC Current At the listed frequencies 40 Hz to 1 kHz ^{FO}	0.1 mA to 1 mA	1 mA /A + 240 nA	Transmille 8081 NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2—SCFI
	1 mA to 10 mA	1 mA /A + 2.4 μ A	
	10 mA to 100 mA	1 mA /A + 24 μ A	
	0.1 A to 1 A	1.4 mA/A + 300 μ A	
	1 A to 10 A	2.4 mA /A + 6 mA	
	10 A to 30 A	2.4 mA /A + 18 mA	
Equipment to Output Resistance ^{FO}	0.1 Ω to 1 Ω	94 $\mu\Omega/\Omega$ + 24 $\mu\Omega$	
	1 Ω to 10 Ω	63 $\mu\Omega/\Omega$ + 870 $\mu\Omega$	
	10 Ω to 100 Ω	56 $\mu\Omega/\Omega$ + 7.9 m Ω	
	100 Ω to 1 k Ω	25 $\mu\Omega/\Omega$ + 37 m Ω	
	1 k Ω to 10 k Ω	30 $\mu\Omega/\Omega$ + 400 m Ω	
	10 k Ω to 100 k Ω	31 $\mu\Omega/\Omega$ + 1.6 Ω	
	0.1 M Ω to 1 M Ω	36 $\mu\Omega/\Omega$ + 56 Ω	
	1 M Ω to 10 M Ω	48 $\mu\Omega/\Omega$ + 880 Ω	
Equipment to Output DC Voltage ^{FO}	0.1 kV to 6 kV	0.012 kV	Fluke 80K-6 NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2-SCFI
Equipment to Output AC Voltage At the listed frequencies 40 Hz to 1 kHz ^{FO}	10 mV to 100 mV	0.6 mV/V + 18 μ V	Transmille 8081 NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2-SCFI
	0.1 V to 1 V	0.6 mV/V + 120 μ V	
	1 V to 10 V	0.6 mV/V + 1.2 mV	
	10 V to 100 V	0.6 mV/V + 18 mV	
	1 V to 1 000 V	0.6 mV/V + 180 mV	



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Equipment to Output AC Voltage At the listed frequencies 45 Hz to 500 Hz ^{F0}	0.1 kV to 6 kV	0.012 kV	Fluke 80K-6 NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2—SCFI
Equipment to Measure AC Current At the listed frequencies 45 Hz to 1 kHz ^F	20 μ A to 200 μ A	1.4 mA/A + 1.1 μ A	Transmille 4010 NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2--SCFI
	0.2 mA to 2 mA	1.2 mA/A + 1.7 μ A	
	2 mA to 20 mA	0.8 mA/A + 4 μ A	
	20 mA to 200 mA	0.8 mA/A + 240 μ A	
	0.2 A to 2 A	1.2 mA/A + 4.8 mA	
	2 A to 30 A	1.6 mA/A + 16 mA	
Equipment to Measure AC Current Clamp-On Meters At the listed Frequencies 45 Hz a 65 Hz (Type Thyroid) ^{F0}	11 A to 1 500 A	1.5 A	Transmille 4010 and 50 Turn Coil NMX-CH-131/1-SCFI NMX-CH-110/1-SCFI NMX-CH-131/2--SCFI
Temperature Calibration Indication and Control Equipment used with RTD Type Pt 385, 100 Ω ^{F0}	-100 °C to 800 °C	0.036 °C	Transmille 4010 Electrical Simulation of RTD Output OIML-R-84 ASTM-E-230 “Calibration of Thermocouples” Euramet cg-08/v.01
Temperature Calibration Indication and Control Equipment used with RTD Type Pt 25 ^F	-200 °C to 800 °C	0.036 °C	
Temperature Calibration Indication and Control Equipment used with RTD Type Pt 100 ^F	-200 °C to 800 °C	0.55 °C	
Temperature Calibration Indication and Control Equipment used with RTD Type Pt 250 ^F	-200 °C to 800 °C	0.3 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 500 ^F	-200 °C to 500 °C	0.9 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 1 000 ^F	-200 °C to 800 °C	0.45 °C	



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Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 385, 500 Ω^{FO}	-200°C to 630 °C	0.031 °C	Fluke 754 Electrical Simulation of RTD Output OIML-R-84 ASTM-E-230 "Calibration of Thermocouples" Euramet cg-08/v.01
Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 385, 1 000 Ω^{FO}	-200 °C to 630 °C	0.027 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Type Pt Ni 385, 120 Ω (Ni 120 Ω)	-80 °C to 260 °C	0.051 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Type Cu 42 710 Ω^{FO}	-100 °C to 260 °C	0.17 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type B FO	600 °C to 1 820 °C	0.19 °C	Fluke 754 Electrical Simulation of Thermocouple Output Transmille 4010 + EA001A OIML-R-84 ASTM-E-230 Euramet cg-08/v.01
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type C FO	0 °C to 2 316 °C	0.17 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type E FO	-250 °C to 1 000 °C	0.11 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type J FO	-210 °C to 1 200 °C	0.11 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type K FO	-200 °C to 1 372 °C	0.12 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type N FO	-200 °C to 1 300 °C	0.13 °C	



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Temperature Calibration, Indication and Control Equipment used with Thermocouple Type R ^{FO}	0 °C to 1 767 °C	0.2 °C	Fluke 754 Electrical Simulation of Thermocouple Input / Output Transmille 4010+EA001A/ OIML-R-84 ASTM-E-230 -Euramet cg-08/v.01
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type S ^{FO}	0 °C to 1 767 °C	0.22 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type T ^{FO}	-250 °C to 400 °C	0.11 °C	

Mechanical

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Vacuum Gage ^{FO}	-12 psi to 0 psi	0.01 psi	2700G-BG200K MESS-PR-PRO-001
Pressure Gage ^{FO}	Up to 100 psi	0.025 psi	2700G-BG200K 2700G-BG700K MESS-PR-PRO-001
	100 psi to 1 000 psi	0.25 psi	2700G-BG2M 2700G-BG3.5M 2700G-BG7M MESS-PR-PRO-001
	1 000 psi to 5 000 psi	1.3 psi	2700G-G20M 2700G-G35M MESS-PR-PRO-001
	5 000 psi to 10 000 psi	2.5 psi	2700G-G70M MESS-PR-PRO-001
	10 000 psi to 30 000 psi	15 psi	ADT672 MESS-PR-PRO-001
	30 000 psi to 60 000 psi	30 psi	ADT672-10-GP60K-PSI-AM MESS-PR-PRO-001

Time and Frequency

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Frequency Calibration Equipement to Measure Frecuency (Non-Contact Tachometer) ^{FO}	10 Hz to 119.99 Hz (600 rpm to 7 199.4 rpm)	0.0058 Hz [(0.35 RPM)]	Fluke 5522A MESS-EL-PRO-007



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Frequency Calibration Equipment to Measure Frequency (Non-Contact Tachometer) ^{FO}	120 Hz to 1 199.9 Hz (7 200 rpm to 71 994 rpm)	0.058 Hz (3.5 rpm)	Fluke 5522A MESS-EL-PRO-007
	1.2 kHz to 10 000 kHz (72 000 rpm to 600 000 rpm)	0.58 Hz (35 rpm)	

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 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 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.
5. 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.