PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

METROLOGIA MESSTECHNIK, S.A. DE C.V.

Calzada México Tacuba No. 1186, Col. Argentina Antigua
Alcaldía Miguel Hidalgo, Ciudad de México, México. C.P. 11270

(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):

Mechanical, Thermodynamic, Time and Frequency and Electrical 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

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

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
August 30, 2016	December 01, 2020	December 31, 2022

Accreditation No.:	*Certificate No.:*
82612	L20-717

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

METROLOGIA MESSTECHNIK, S.A. DE C.V.

Calzada México Tacuba No. 1186, Col. Argentina Antigua
Delegación Miguel Hidalgo, Ciudad de México, México. C.P. 11270
Contact Name: Ing. Raúl Galindo Nolasco Phone: 555-399-5576

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

Mechanical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Pressure Gages and Transducers[F]	68.947 kPa to 68.947 MPa (10 psi to 10 000 psi)	62 Pa (0.008 9 psi)	Balance of Pressure Fluke Mod: P3124 ASME-B-40.1 and 40.7
	1 Pa to 6.894 kPa (0.000 14 psi to 1 psi)	0.52 Pa (0.000 075 psi)	Digital Pressure Transducer Fluke Mod: 700P02 ASME-B-40.1 and 40.7
	0.198 kPa to 1.98 kPa (0.03 psi to 0.29 psi)	0.9 Pa (0.000 13 psi)	Micro Manometer Test Mod: 512 ASME-B-40.1 and 40.7
	2,068 kPa to 206,84 kPa (0.3 psi to 30 psi)	4 Pa (0.000 58 psi)	Digital Pressure Transducer Fluke Mod: 700P05 ASME-B-40.1 and 40.7
	6.849 kPa to 689.47 kPa (1 psi to 100 psi)	0.042 kPa (0.006 1 psi)	Pressure Gage Digital Fluke Mod: 719 100G ASME-B-40.1 and 40.7
	68.947 kPa to 6.894 MPa (10 psi to 1 000 psi)	0.75 kPa (0.108 psi)	Digital Pressure Transducer Fluke Mod: 700 P08 ASME-B-40.1 and 40.7
	689.47 kPa to 68.947 MPa (100 psi to 10 000 psi)	5.6 kPa (0.81 psi)	Digital Pressure Gage Additel Mod: ADT681 ASME-B-40.1 and 40.7
Vacuum Gages and Tranducers[F]	-68.947 kPa to 0 Pa (-10 psi to 0 psi)	0.058 kPa (0.008 4 psi)	Digital Pressure Gage Fluke Mod: 719 100G NMX-CH-006-SCFI

Thermodynamic

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Liquid Glass Thermometer[F]	-40 °C to 400 °C	0.18 °C	SPRT Accumac Pt-25 and Liquid Bath Fluke 6331, Dry Block Mod: Europa 4520, and Dry Block Ametek Mod: CTC650A NOM-011-SCFI and ASTM-E-1
Bimetallic Thermometer and Digital Thermometers[F]	-40 °C to 500 °C	0.12 °C	SPRT Accumac Pt-25 by and Hart Scientific Liquid Bath 6331 and Dry Block Ametek CTC-650A and Dry Block Isotech Mod: Europa 4520 NMX-CH-070-SCFI

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Thermodynamic

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Environmental Thermometer[F]	20 °C to 50 °C	0.12 °C	Thermometer of Platinum Resistance Accumac PT-25 and Environmental Chamber Metmess NMX-CH-070-SCFI
Platinum Resistance Thermometer RTD´S Pt-100 Pt-200 Pt-500 y Pt-1 000[F]	-40 °C to 150 °C	0.019 °C	SPRT Accumac Pt-25 and Dry Block Isotech Mod: Europa 4520 and Dry Block Ametek CTC-650A and Dry Block Isotech Mod: Pegasus 4853 ASTM-E-1137
	150 ºC to 600 ºC	0.033 °C	
	600 ºC to 800 ºC	1 ºC	
	800 ºC to 1 000 ºC	1.2 ºC	
	1 000 ºC to 1 100 ºC	1.6 ºC	
	1 100 ºC to 1 200 ºC	1.9 ºC	
Infrared Thermometers / Radiation Thermometer[F]	-40 ºC to 150 ºC	0.019 °C	Black Body Calibrator Hart Scientific Mod. 9132 Dry Block Calibrator Europa 4520 with Black Body Incerts. SPRT Accumac Pt-25 Ohms Black Body Calibrator Hart Scientific Mod: 9132 Dry Block Isotech Mod: Pegasus 4853 with Black Body Incerts. Thermocouple type “R” Metmess Mod: MET-R OIML-D-24
	150 ºC to 600 ºC	0.22 °C	
	600 ºC to 800 ºC	1 ºC	
	800 ºC to 1 000 ºC	1.2 ºC	
	1 000 ºC to 1 100 ºC	1.6 ºC	
	1 100 ºC to 1 200 ºC	1.9 ºC	
Temperature Measurement Thermocouple Type B[F]	-40 ºC to 0 ºC	0.065 °C	SPRT Accumac Pt-25 and Thermocouple Type “R” Metmess Mod: MET-R Dry Block Calibrator Isotech Mod: Europa 4520 Dry Block Calibrator Ametek Mod: CTC-650A Dry Block Calibrator Isotech Mod: Pegasus 4853 ASTM-E-230
	0 ºC to 600 ºC	0.063 °C	
	600 ºC to 800 ºC	1 ºC	
	800 ºC to 1 000 ºC	1.2 ºC	
	1 000 ºC to 1 100 ºC	1.6 ºC	
	1 100 ºC to 1 200 ºC	1.9 ºC	
Temperature Measurement Thermocouple Type C[F]	-40 ºC to 0 ºC	0.065 °C	
	0 ºC to 600 ºC	0.063 °C	
	600 ºC to 800 ºC	1 ºC	
	800 ºC to 1 000 ºC	1.2 ºC	
	1 000 ºC to 1 100 ºC	1.6 ºC	
	1 100 ºC to 1 200 ºC	1.9 ºC	

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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 (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Temperature Measurement Thermocouple Type E[F]	-40 ºC to 0 ºC	0.065 °C	SPRT Accumac Pt-25 and Thermocouple Type "R" Metmess Mod: MET-R Dry Block Calibrator Isotech Mod: Europa 4520 Dry Block Calibrator Ametek Mod: CTC-650A Dry Block Calibrator Isotech Mod: Pegasus 4853 ASTM-E-230
	0 ºC to 600 ºC	0.063 °C	
	600 ºC to 800 ºC	1 ºC	
	800 ºC to 1 000 ºC	1.2 ºC	
	1 000 ºC to 1 100 ºC	1.6 ºC	
	1 100 ºC to 1 200 ºC	1.9 ºC	
Temperature Measurement Thermocouple Type J[F]	-40 ºC to 0 ºC	0.065 °C	
	0 ºC to 600 ºC	0.063 °C	
	600 ºC to 800 ºC	1 ºC	
	800 ºC to 1 000 ºC	1.2 ºC	
	1 000 ºC to 1 100 ºC	1.6 ºC	
	1 100 ºC to 1 200 ºC	1.9 ºC	
Temperature Measurement Thermocouple Type K[F]	-40 ºC to 0 ºC	0.065 °C	
	0 ºC to 600 ºC	0.063 °C	
	600 ºC to 800 ºC	1 ºC	
	800 ºC to 1 000 ºC	1.2 ºC	
	1 000 ºC to 1 100 ºC	1.6 ºC	
	1 100 ºC to 1 200 ºC	1.9 ºC	
Temperature Measurement Thermocouple Type N[F]	-40 ºC to 0 ºC	0.065 °C	
	0 ºC to 600 ºC	0.063 °C	
	600 ºC to 800 ºC	1 ºC	
	800 ºC to 1 000 ºC	1.2 ºC	
	1 000 ºC to 1 100 ºC	1.6 ºC	
	1 100 ºC to 1 200 ºC	1.9 ºC	
Temperature Measurement Thermocouple Type R[F]	-40 ºC to 0 ºC	0.065 °C	
	0 ºC to 600ºC	0.063 °C	
	600 ºC to 800 ºC	1 ºC	
	800 ºC to 1 000 ºC	1.2 ºC	
	1 000 ºC to 1 100 ºC	1.6 ºC	
	1 100 ºC to 1 200 ºC	1.9 ºC	

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Contact Name: Ing. Raúl Galindo Nolasco Phone: 555-399-5576

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 (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Temperature Measurement Thermocouple Type S[F]	-40 ºC to 0 ºC	0.065 °C	SPRT Accumac Pt-25 and Thermocouple Type "R" Metmess Mod: MET-R Dry Block Calibrator Isotech Mod: Europa 4520 Dry Block Calibrator Ametek Mod: CTC-650A Dry Block Calibrator Isotech Mod: Pegasus 4853 ASTM-E-230
	0 ºC to 600ºC	0.063 °C	
	600 ºC to 800ºC	1 ºC	
	800 ºC to 1 000 ºC	1.2 ºC	
	1 000 ºC to 1 100 ºC	1.6 ºC	
	1 100 ºC to 1 200 ºC	1.9 ºC	
Temperature Measurement Thermocouple Type T[F]	-40 ºC to 0 ºC	0.065 °C	
	0 ºC to 400 ºC	0.063 °C	

Time and Frequency

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Contact Tachometers[F]	Up to 4 800 rpm (Up to 502.656 rad/s)	0.28 rpm (0.029 rad/s)	Hewlett Packard Arbitrary Wave Generator Mod: 33120A Up to 15 MHz Shimpo Reference Tachometer Mod: DT-107A ASTM-F-2046
Digital Photometers and Speed Encoders[F]	UP to 60 000 rpm (Up to 6 283.2 rad/s)	0.005 8 rpm (0.006 1 rad/s)	Hewlett Packard Arbitrary Wave Generator Mod: 33120A Up to 15 MHz Infrared Diode Mooring ASTM-F-2046
Stopwatch and Timer[F]	1 s to 86 400 s (1 s to 24 h)	0.000 58 s (1.61×10^{-7} h)	Hewlett Packard Arbitrary Wave Generator Mod: 33120A Up to 15 MHz Hewlett Packard Digital Frequency Counter Mod: 5300A Stopwatch Master CENAM Technical Guide

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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 (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Temperature Calibration Indication and Control, Equipment used with Thermocouple Type B[F]	0 ºC to 1 820 ºC	0.006 5 °C	8 ½ Digits Multimeter Agilent Model: 3458A and Fluke 5500A (0 mV to 13.82 mV) ASTM-E-230
Temperature Calibration Indication and Control, Equipment used with Thermocouple Type C[F]	0 ºC to 2 315 ºC	0.006 5 °C	
Temperature Calibration Indication and Control, Equipment used with Thermocouple Type E[F]	-270 ºC to 1 000 ºC	0.006 5 °C	
Temperature Calibration Indication and Control, Equipment used with Thermocouple Type J[F]	-210 ºC to 1 200 ºC	0.006 5 °C	
Temperature Calibration Indication and Control, Equipment used with Thermocouple Type K[F]	-270 ºC to 1 372 ºC	0.006 5 °C	
Temperature Calibration Indication and Control, Equipment used with Thermocouple Type N[F]	-270 ºC to 1 300 ºC	0.006 5 °C	
Temperature Calibration Indication and Control, Equipment used with Thermocouple Type R[F]	-50 ºC to 1 768 ºC	0.006 5 °C	
Temperature Calibration Indication and Control, Equipment used with Thermocouple Type S[F]	-50 ºC to 1 768 ºC	0.006 5 °C	
Temperature Calibration Indication and Control, Equipment used with Thermocouple Type T[F]	-270 ºC to 400 ºC	0.006 5 °C	

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Contact Name: Ing. Raúl Galindo Nolasco Phone: 555-399-5576

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^{FO} 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.