SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

PAZ LABORATORIOS S.R.L
Calle Oscar Benavides 602
Yanahuara, Arequipa 04017 PERU
Erwin Edgardo Paz Gonzales Phone: +51 953 766 470

CALIBRATION

Valid To: November 30, 2026 Certificate Number: 6829.01

In recognition of the successful completion of the A2LA evaluation process (including an assessment of the organization's compliance with R205 – A2LA's Calibration Program Requirements), accreditation is granted to this laboratory to perform the following calibrations:[1]

I. Acoustical

Parameter/Equipment	Range	CMC[2] (±)	Comments
Sound Level Meters – Class I & Class II Acoustic Calibration: (94.104 .11 4) dB Electric Calibration (10 to 150) dB	 (31.5 to 16 000) Hz (31.5 to 16 000) Hz	 0.3 dB 0.1 dB	INACAL PC-023 procedure for calibration of sound level meters. 1st ed, January 2017. The scope includes all time weightings (F, S, Eq and others) and frequency weightings (A, C and others) specified in procedure PC-023
Acoustic Dosimeters – Acoustic Calibration (94.104 .11 4) dB Electric Calibration (20 to 150) dB	 (31.5 to 8000) Hz (31.5 to 8000) Hz	 0.3 dB 0.1 dB	UNE-EN 61252 Electroacoustics. Specifications for personal sound exposure meters The scope includes all time weightings and frequency weightings specified in procedure UNE-EN 61252

II. Chemical

Parameter/Equipment	Range	CMC[2] (±)	Comments
Gas Analyzer[3] – Concentration:			
CO in N_2	Carbon Monoxide (CO): (2 to 10) µmol/mol	$1.7x10^{-02}$(c) + $2.2x10^{-02}$ µmol/mol	CEM QU-006 Ed. 0 by dynamic dilution. Where (c) is gas concentration in unit of µmol/mol, or nmol/mol.
NO_2 in N_2	Nitric Dioxide (NO_2): (50 to 250) nmol/mol (250 to 500) nmol/mol	$1.1x10^{-02}$(c) + 4.7 nmol/mol $1.7x10^{-02}$(c) + 3.3 nmol/mol	
NO in N_2	Nitric Monoxide (NO): (50 to 250) nmol/mol) (250 to 500) nmol/mol	$1.1x10^{-02}$(c) + 4.7 nmol/mol $1.7x10^{-02}$(c) + 3.5 nmol/mol	
H_2S in N_2	Hydrogen Sulfide (H_2S): (25 to 500) nmol/mol	$3.0x10^{-02}$(c) + 3.3 nmol/mol	
SO_2 in N_2	Sulfur Dioxide (SO_2): (25 to 250) nmol/mol (250 to 500) nmol/mol	$2.7x10^{-02}$(c) + $8.0x10^{-01}$ nmol/mol $2.7x10^{-02}$(c) + 1.5 nmol/mol	
Gas Analyzer [3] Ozone Concentration	Ozone (O_3): (6 to 500) nmol/mol	$8.1x10^{-03}$(c) + $8.2x10^{-01}$ nmol/mol	Standard ultraviolet photometer. Where (c) is gas concentration.
Gas Analyzer – Mercury Concentration	(100 to 20 000) ng/m^3	(0.024(c) + 0.52) ng/m^3	Cold-vapor mercury technique using gravimetric dilutions from a mercury CRM. Where (c) is mercury concentration in ng/m^3

Parameter/Equipment	Range	CMC[2,4] (±)	Comments
Dissolved Oxygen – Measuring Devices	0 mg/L (5.2 to 9.4) mg/L	0.35 mg/L (0.0039(c) – 0.0035) mg/L	Comparisson with MRC Comparison to oxygen saturated water at controlled temperature using Benson-Krausen equation. Where (c) is concentration in mg/L
Chlorine Meters	(0.02 to 2.00) mg/L (2.00 to 8.00) mg/L	$1.6c^{-0.74}$ $8.1c^{-0.72}$	PERUVIAN TECHNICAL STANDARD 2020 NTP-ISO 7393-2: Water quality. Determination of free chlorine and total chlorine. Part 2: Colorimetric method for routine monitoring using N,N-diethyl-1,4-phenylenediamine (DPD). Section 9.3. Where (c) is chlorine concentration in mg/L

III. Dimensional

Parameter/Equipment	Range	CMC[2,4] (±)	Comments
Tape Measures	Up to 1000 mm (1001 to 15 000) mm (15 001 to 20 000) mm (20 000 to 300 000) mm	0.34 mm 0.50 mm 0.62 mm $y = 0.005\,735x^{0.474415}$	OIML R 35-1 Material measures of length for general use Part 1: Metrological and technical requirements Where (x) is nominal value in mm
Angle Measuring Instruments – Wind Direction Sensors (Wind Waves)	(0.1 to 360) °	0.7 °	PL-LCA-PRO-08 Procedure for calibrating angle gauges. Validated.

IV. Electrical – DC /Low Frequency

Parameter/Equipment	Range	CMC[2] (±)	Comments
Tellurometer	1 Ω (2 to 3) Ω (4 to 27) Ω (28 to 30) Ω (31 to 270) Ω (271 to 300) kΩ (301 to 2700) KΩ (2701 to 3000) KΩ (3001 to 27 000) KΩ (27 001 to 30 000) KΩ (27 001 to 30 000) KΩ	0.011 Ω 0.032 Ω 0.28 Ω 0.32 Ω 2.8 Ω 3.2 Ω 27 Ω 32 Ω 280 Ω 320 Ω 1000 Ω	CG-15 Guidelines on the Calibration of Digital Multimeters, ver. 3.0, 2015, EURAMET.
Megohmmeter	10 MΩ 100 MΩ 1 GΩ 10 GΩ	0.09 MΩ 0.91 MΩ 0.0091 GΩ 0.12 GΩ	CG-15 Guidelines on the Calibration of Digital Multimeters, ver. 3.0, 2015, EURAMET.
Low Frequency Magnetic Field 60 Hz 10 Hz to 2 kHz Low Frequency Electric Field 60 Hz 10 Hz to 2 kHz Medium Frequency Electric Field (2 to 10) kHz	 (5 to 1500) µT (5 to 170) µT (10 to 30) V/m (30 to 500) V/m (10 to 500) V/m (10 to 500) V/m	 11 % 11 % 14 % 8. % 11 % 11 %	IEC 61786-1:2013 "Measurement of DC magnetic, AC magnetic and AC electric fields from 1 Hz to 100 kHz with regard to exposure of human beings - Part 1: Requirements for measuring instruments"

V. Fluid Quantities

Parameter/Equipment	Range	CMC[2] (±)	Comments
Volume Flow Rate – Air Flowmeters and Personal Air Sampling Pumps with meter and similar	(0.005 to 0.02) L/min (0.02 to 0.1) L/min (1 to 10) L/min (10 to 19.5) L/min	0.0002 L/min 0.0004 L/min (0.0058Q + 0.000 92) L/min 0.14 L/min	CEM ME-009 by comparison with reference flowmeter. Where (Q) is volume flow rate in cm^3/min. Air flow reference conditions: temperature at 0 °C and absolute pressure at 1013.25 mbar.
Rain Gauges –	Up to 200 mm	(0.0011(x) + 0.30) mm	Guía de instrumentos y métodos de observación meteorológicos, anexo 6.d., edición 2014, 2017, organización meteorológica mundial.
Piston Operated Volumetric Apparatus[3] –			Technical guide on metrological traceability and measurement uncertainty in volumetric vessel calibration services using the gravimetric method. Third revision June 2016, CENAM-EMA.
Piston Micropipettes	1 µL (1 to 2) µL (2 to 5) µL (5 to 10) µL (5 to 20) µL (20 to 50) µL (50 to 100) µL 100 to 200) µL (200 to 500) µL (500 to 1000) µL (1 to 2) mL (2 to 5) mL (5 to 10) mL	0.070 µL 0.078 µL 0.056 µL 0.055 µL 0.055 µL 0.060 µL 0.060 µL 0.16 µL 0.60 µL 0.60 µL 0.0060 mL 0.0065 mL 0.0065 mL	
Piston Burettes	1 mL (1 to 2) mL (2 to 5) mL (5 to 10) mL (10 to 15) mL (15 to 20) mL (20 to 25) mL (25 to 50) mL (50 to 100) mL	0.0018 mL 0.0017 mL 0.0017 mL 0.0014 mL 0.0029 mL 0.0020 mL 0.0060 mL 0.0062 mL 0.016 mL	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Volumetric Glass Material[3] –			
Single-Stroke Glass Pipette	1 mL 2 mL 5 mL 10 mL 15 mL 20 mL 25 mL 50 mL 100 mL	0.0017 mL 0.0017 mL 0.0017 mL 0.0017 mL 0.0017 mL 0.0029 mL 0.0029 mL 0.0037 mL 0.0061 mL	Technical guide on metrological traceability and measurement uncertainty in volumetric vessel calibration services using the gravimetric method. Third revision June 2016, CENAM-EMA.
Graduated Glass Pipette	(1 to 100) mL	0.0017 mL	
Burette	(1 to 5) mL (5 to 10) mL (10 to 25) mL (25 to 50) mL (50 to 100) mL	0.0031 mL 0.018 mL 0.016 mL 0.030 mL 0.030 mL	
Graduated Measuring Cylinders	(1 to 5) mL (5 to 10) mL (10 to 25) mL (25 to 50) mL (50 to 100) mL (100 to 200) mL (200 to 250) mL (250 to 500) mL (500 to 1000) mL (1000 to 2000) mL	0.021 mL 0.021 mL 0.075 mL 0.078 mL 0.16 mL 0.31 mL 0.32 mL 0.75 mL 1.6 mL 3.1 mL	
One-mark Volumetric Flasks	1 mL 5 mL 10 mL 20 mL 25 mL 50 mL 100 mL 200 mL 250 mL 500 mL 1000 mL 2000 mL	0.0017 mL 0.0035 mL 0.0035 mL 0.0049 mL 0.0030 mL 0.0077 mL 0.0084 mL 0.035 mL 0.035 mL 0.043 mL 0.058 mL 0.10 mL	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Volumetric Glass Material[3] (cont) –			
Pycnometer	10 mL 25 mL 50 mL 100 mL	0.000 61 mL 0.000 81 mL 0.0016 mL 0.0041 mL	Technical guide on metrological traceability and measurement uncertainty in volumetric vessel calibration services using the gravimetric method. Third revision June 2016, CENAM-EMA.
Graduated Neck Volumetric Measurement	(1 to 2000) mL (2000 to 5000) mL (5000 to 10 000) mL (10 000 to 20 000) mL (20 000 to 50 000) mL	0.18 mL 0.51 mL 0.87 mL 1.7 mL 4.1 mL	

VI. Mechanical

Parameter/Equipment	Range	CMC[2] (±)	Comments
Balances[3] -			
Class I & II with scale division ≥ 0.001 mg	(0.01 to 6.1) g	(0.010 to 0.050) mg	INDECOPI PC-011 calibration procedure for non-automatic Class I & II balances. Fourth edition 2010 with OIML class E2, F1 reference weights
Class I & II with scale division ≥ 0.01 mg	(0.01 to 220) g	(0.035 to 0.23) mg	
Class I & II with scale division ≥ 1 mg	(0.02 to 2100) g	(7.6 to 33) mg	
Class I & II with scale division ≥ 10 mg	(0.5 to 6100) g	(0.053 to 0.28) g	
Class I & II with scale division ≥ 100 mg	(5 to 62 000) g	(0.17 to 1.1) g	
Class III & IV with scale division ≥ 0.1 g	(2 to 2000) g	(0.38 to 1.0) g	
Class III & IV with scale division ≥ 1 g	(0.02 to 35) kg with resolution ≥ 1 g	(1.2 to 1.4) g	
Class III & IV with scale division ≥ 10 g	(0.2 to 60) kg with resolution ≥ 10 g	(11 to 12) g	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Anemometers & Air Velocity Meters	(1 to 20) m/s	(0.011(x) + 0.31) m/s	Wind tunnel & standard anemometer

[1]This laboratory offers commercial calibration service.

[2] Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of k = 2. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC Uncertainty due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

[3] Field calibration service is available for this calibration. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

[4] The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.

Accredited Laboratory

A2LA has accredited

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Arequipa, PERU

for technical competence in and compliance with the

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of any additional program requirements in the calibration field. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 23rd day of December 23, 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 6829.01
Valid to November 30, 2026
Revised December 24, 2025

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.