



# PERRY JOHNSON LABORATORY ACCREDITATION, INC.

## *Certificate of Accreditation*

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

### ***Servicios de Metrologia TC, S.A. de C.V.***

***Av. de la Esperanza 916, Residencial La Hacienda  
Apodaca, Nuevo León. México. C.P. 66636***

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

### **ISO/IEC 17025:2017**

Whereby, technical competence has been confirmed for the associated scope supplement, in the fields of:

***Dimensional, Mechanical, Mass, Force, and Weighing Devices, Acoustic,  
Chemical, Thermodynamic, Optical, Electrical and Time and Frequency  
Calibration  
(As detailed in the supplement)***

Accreditation claims for conformity assessment activities shall only be made from the addresses referenced within this certificate and shall apply solely to those activities identified in the related scope. This Accreditation is granted subject to the Accreditation Body rules governing the Accreditation referred to above, and the Organization hereby commits to observing and complying with those rules in their entirety.

For PJLA:

*Initial Accreditation Date:*

*Issue Date:*

*Expiration Date:*

June 27, 2025

June 27, 2025

August 31, 2027

*Accreditation No.*

*Certificate No.:*

116274

L25-514

Tracy Szerszen  
President

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



## Certificate of Accreditation: Supplement

### Servicios de Metrología TC, S.A. de C.V.

Av. de la Esperanza 916, Residencial La Hacienda

Apodaca, Nuevo León. México. C.P. 66636

Contact Name: Carlos Alberto Perez Balleza. Phone: 818-259-9192

*Accreditation is granted to the facility to perform the following conformity assessment activities:*

FIELD OF CALIBRATION	MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	EXPANDED MEASUREMENT UNCERTAINTY ( $\pm$ ) <sup>1</sup>	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED	LOCATION OF ACTIVITY
Dimensional	Caliper	0.1 mm to 1524 mm	$(11.54 + 3.36 \times 10^{-4}L) \mu\text{m}$	Master Block	JIS B 7507	F, O
Dimensional	Outside Micrometers	0.1 mm to 609.6mm	$(1.46 + 2.09 \times 10^{-3}L) \mu\text{m}$	Gage Block Grade 0	JIS B 7502	F, O
Dimensional	Micrometer Heads	2.6 mm to 25.4 mm	$(5.76 \times 10^{-4} + 6.1 \times 10^{-6}L) \text{ mm}$	Gage Block Grade 0	DIN-030 CEM	F, O
Dimensional	Coating Thickness Gauge	20 $\mu\text{m}$ to 2 600 $\mu\text{m}$	$(5.78 \times 10^{-2} + 1.84 \times 10^{-1}L) \text{ mm}$	Defelsco Certified Thickness Standard	ASTM-D7091-13	F, O
Dimensional	Height Gage Caliper	12.7 mm to 609.6 mm	$(11.49 + 4.27 \times 10^{-3}L) \mu\text{m}$	Master Block	JIS B 7517	F, O
Dimensional	Linear Gage	12.7 mm to 609.6 mm	$(11.49 + 4.27 \times 10^{-3}L) \mu\text{m}$	Master Block	JIS B 7550	F, O
Dimensional	Dial Indicator	Up to 50.8 mm	$(4.7 + 4 \times 10^{-3}L) \mu\text{m}$	Head Micrometer	JIS B 7503	F, O
Dimensional	Pin Gage	0.152 mm to 25.4 mm	$(2.26 + 1.6 \times 10^{-2}L) \mu\text{m}$	Master Micrometer	ASME B 891.5	F, O
Dimensional	Metal Rules	1 mm to 1 000 mm	$(7.52 + 1.6 \times 10^{-2}L) \mu\text{m}$	Rule, Master Microscope	JIS B 7516	F, O
Dimensional	Sieves	45 $\mu\text{m}$ to 13 200 $\mu\text{m}$	0.38 $\mu\text{m}$	Optical Comparator	ASTM E11-17	F, O
Dimensional	Sieves	Up mm to 200 mm	14 mm	Optical Comparator	ASTM E11-17	F, O
Dimensional	CMM Performance Verification (Coordinate Measuring Machines) Linear Displacement (X, Y, and Z axis)	0.5 mm to 1 000 mm	$(1.16 + 1 \times 10^{-6}L) \mu\text{m}$	Gage Blocks	ISO-10360-2	F, O
Dimensional	Angle Meter	Up to 90°	0.007°	Angle Block	DI-003 CEM	F, O
Dimensional	Tape	Up to 50 m	1 mm	Standard Tape	NOM-046-SGFI	F, O
Dimensional	Thread Plug Pitch Diameter	0-4 to 4-12	5.3 $\mu\text{m}$	Wire with Micrometer	ASME B1.2	F, O



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Dimensional	Granite Surface Plates (Repeat Measurement)	0.05 mm	1.2 $\mu\text{m}$	Repeat-O-Micro Indicator	JIS-B-7513	F, O
Dimensional	Microscopes	0.1 mm to 1 mm	$(1.64 + 8.62 \times 10^{-4}L) \mu\text{m}$	Glass Reticules	JIS B 7153	F, O
Dimensional	Microscopes	1 mm to 200 mm	$(2.57 + 1.65 \times 10^{-4}L) \mu\text{m}$	Glass Reticules	JIS B 7153	F, O
Dimensional	Optical Comparator Length (X Axis Linearity)	1 mm to 200 mm	4.7 $\mu\text{m}$	Glass Reticules	JIS B 7184	F, O
Dimensional	Optical Comparator Length (Y Axis Linearity)	1 mm to 200 mm	4.7 $\mu\text{m}$	Glass Reticules	JIS B 7184	F, O
Dimensional	Optical Comparator (Angularity)	Up to 90°	0.06°	Block Standard	JIS B 7184	F, O
Dimensional	Vision System	Up to 200 mm	$(1.51 \times 10^{-3} + 4.9 \times 10^{-5}L) \text{ mm}$	Glass Reticules	DI-006 CEM	F, O
Dimensional	Feeler Gauges	0.152 mm to 25.4 mm	$(2.26 + 1.6 \times 10^{-2}L) \mu\text{m}$	Master Micrometer	DI-006 CEM	F, O
Dimensional	Radius Gage	0.75 mm to 12.7 mm	14 $\mu\text{m}$	Optical Comparator Mitutoyo	ASME B89.1.1.6	F, O
Dimensional	Angle Gage	Up to 90°	0.1°	Optical Comparator Mitutoyo	ASME B89.1.1.6	F, O
Dimensional	Profilometer (Ra) (Fixed point)	2.97 $\mu\text{m}$	0.15 $\mu\text{m}$	Roughness Specimen	ISO-5432-2	F, O
Dimensional	Profilometer (Ry Fixed point)	9.4 $\mu\text{m}$	0.26 $\mu\text{m}$	Roughness Specimen	ISO-5432-2	F, O



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Dimensional	Direct Verification of Durometer Hardness Tester (Types A, B, C, D, E, O, & DO) (Extension at zero Reading)	2.46 mm to 2.54 mm	0.15 $\mu$ m	Comparator	ASTM D-2240	F, O
Dimensional	Direct Verification of Durometer Hardness Tester Types A, B, C, D, E, O, & DO (Indenter Diameter)	2.46 mm to 2.54 mm	8.5 $\mu$ m	Comparator	ASTM D-2240	F, O
Dimensional	Direct Verification of Durometer Hardness Tester (Types A, B, C, D, E, O, & DO) (Indenter Tip Diameter)	2.46 mm to 2.54 mm	8.5 $\mu$ m	Comparator	ASTM D-2240	F, O
Dimensional	Direct Verification of Durometer Hardness Tester (Types A, B, C, D, E, O, & DO) (Indenter Tip Radius)	2.46 mm to 2.54 mm	8.5 $\mu$ m	Comparator	ASTM D-2240	F, O



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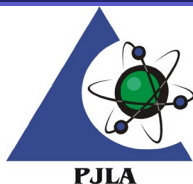
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Dimensional	Direct Verification of Durometer Hardness Tester (Types A, B, C, D, E, O, & DO) (Indenter Tip Angle)	29.5° to 35.25°	0.09°	Comparator	ASTM D-2240	F, O
Mechanical	Indirect Verifications of Rockwell Hardness Tester HRB	40 HRB to 59 HRB	0.61 HRB	Hardness Tester Blocks	ISO 6508-2	F, O
Mechanical	Indirect Verifications of Rockwell Hardness Tester HRB	60 HRB to 79 HRB	0.62 HRB	Hardness Tester Blocks	ISO 6508-2	F, O
Mechanical	Indirect Verifications of Rockwell Hardness Tester HRB	80 HRB to 100 HRB	0.49 HRB	Hardness Tester Blocks	ISO 6508-2	F, O
Mechanical	Indirect Verifications of Rockwell Hardness Tester HRC	20 HRC to 39 HRC	0.52 HRC	Hardness Tester Blocks	ISO 6508-2	F, O
Mechanical	Indirect Verifications of Rockwell Hardness Tester HRC	40 HRC to 59 HRC	0.45 HRC	Hardness Tester Blocks	ISO 6508-2	F, O
Mechanical	Indirect Verifications of Rockwell Hardness Tester HRC	60 HRC to 70 HRC	0.34 HRC	Hardness Tester Blocks	ISO 6508-2	F, O
Mechanical	Indirect Verification of Brinell Hardness Tester HBW/3000	95.5 HBW to 225 HBW/3000	8 HBW	Hardness Tester Blocks	ISO 6506-2	F, O



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Mechanical	Indirect Verification of Brinell Hardness Tester HBW/3000	225 HBW to 450 HBW/3000	6 HBW	Hardness Tester Blocks	ISO 6506-2	F, O
Mechanical	Pressure Gauges	30 psi to 300 psi	0.02 psi	Manometer 700G08	OIML R101	F, O
Mechanical	Pressure Gauges	50 psi to 500 psi	0.04 psi	Manometer PV350	OIML R101	F, O
Mechanical	Pressure Gauges	1 000 psi to 10 000 psi	0.94 psi	Manometer XZT 700bar	OIML R101	F, O
Mechanical	Vacuum Gages	-25.4 in Hg to -5.00 in Hg	0.94 inHg	Transducers	OIML R101	F, O
Mechanical	Torque Wrenches	0.3 Nm to 3.5 Nm	0.26 % of reading	Transducer Crane Torq Star	ISO 6789	F, O
Mechanical	Torque Wrenches	3.5 Nm to 135.6 Nm	0.33 % of reading	Transducer Crane Torq Star	ISO 6789	F, O
Mechanical	Torque Wrenches	200 Nm to 950 Nm	0.33 % of reading	Transducer Daysensor DYJN-107	ISO 6789	F, O
Mechanical	Torque Transducer	0.111 Nm to 338.9 Nm	0.2 % of reading	Torque Arms and Weight F1, M2	DIN 51309	F, O
Mechanical	Anemometer	0.3 m/s to 25 m/s	0.68 % of reading	Master Anemometer Wind Tunnel	IEC 61400-12-1 ASTM D 5096	F, O
Mass, Force, and Weighing Devices	Direct Verification of Durometer Hardness Tester (Types A, B, E & O) (Durometer Indentor Spring)	0.55 N to 9.05 N	1.5 N	Load Cells	ASTM D-2240	F, O





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Mass, Force, and Weighing Devices	Direct Verification of Durometer Hardness Tester (Types C, D & DO) (Durometer Indentor Spring)	0.445 N to 44.45 N	1.5 N	Load Cells	ASTM D-2240	F, O
Mass, Force, and Weighing Devices	Direct Verification of Durometer Hardness Tester (Types C, D & DO) (Durometer Indentor Spring)	0.445 N to 44.45 N	1.5 N	Load Cells	ASTM D-2240	F, O
Mass, Force, and Weighing Devices	Force Compression and tension (Force Gages, Load Cell and Universal Machines)	980.66 N to 9 806 N	0.3% of reading	Load Cell Shenzhen	CENAM Technical Guide	F, O
Mass, Force, and Weighing Devices	Force Compression and tension (Force Gages, Load Cell and Universal Machines)	9 806 N to 980 66 N	0.3% of reading	Load Cell Shenzhen	CENAM Technical Guide	F, O
Mass, Force, and Weighing Devices	Force Compression and tensión (Force Gages, Load Cell and Universal Machines)	44.444 N to 222.222N	0.1 % of reading	Load Cell Futek	CENAM Technical Guide	F, O
Mass, Force, and Weighing Devices	Precision Balance	1 g to 2 000 g (Res.= 0.01g)	$(1.16 \times 10^{-2} + 3.35 \times 10^{-6} \text{ Wt}) \text{ g}$	OIML F1 and M1 Weights	CENAM Technical Guide	F, O



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Mass, Force, and Weighing Devices	Balances	2 kg to 200 kg (Res.= 0.01 g)	$(1.2 \times 10^{-2} + 2.5 \times 10^{-6} \text{ Wt}) \text{ g}$	Class F1 Weights	NOM-010-SCF1	F, O
Mass, Force, and Weighing Devices	Scale	200 kg to 10 000 kg (Res.= 0.5 kg)	$(5.85 \times 10^{-1} + 3.1 \times 10^{-5} \text{ Wt}) \text{ kg}$	OIML M2 Weights	CENAM Technical Guide	F, O
Acoustic	Sound Level Meter	94 dB	0.1 dB	Acoustic Calibrator	IEC 61672	F, O
Acoustic	Sound Level Meter	114 dB	0.3 dB	Acoustic Calibrator	IEC 61672	F, O
Chemical	pH Meters	4 pH to 10 pH	0.02 pH	Buffer 4, 7, 10 pH Hanna	CENAM Technical Guide	F, O
Chemical	Conductivity Meters (Fixed Points)	84 $\mu\text{S/cm}$	1 $\mu\text{S/cm}$	SRM NIST Hanna	CENAM Technical Guide	F, O
Chemical	Conductivity Meters (Fixed Points)	1 413 $\mu\text{S/cm}$	7 $\mu\text{S/cm}$	SRM NIST Hanna	CENAM Technical Guide	F, O
Thermodynamic	Bimetallic, Glass Liquid Thermometer	-20 °C to 400 °C	0.065 °C	Datalogger Thermometer with RTD TP-R04	Euramet-cg11	F, O
Thermodynamic	Temperature Measurement Thermocouples Type J, K, R, S	-90 °C to 400 °C	0.065 °C	Datalogger Thermometer with RTD TP-R04 Dry Block	Euramet-cg11	F, O
Thermodynamic	Temperature Measurement Thermocouples Type J, K, R, S	400 °C to 1 100 °C	0.055 °C	Thermometer Fluke 725 With Type K Dry Block	Euramet-cg11	F, O
Thermodynamic	Temperature Measurement RTD Pt 385, 100 $\Omega$	-90 °C to 400 °C	0.065 °C	Datalogger Thermometer with RTD TP-R04 Dry Block	Euramet-cg11	F, O





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Thermodynamic	Temperature- Measure Thermometers Radiation	30 °C to 1 100 °C	1.6 °C	Thermometer Fluke 725 With Type K Data Logger Thermometer with RTD TP-R04 Blackbody	CENAM Technical Guide	F, O
Thermodynamic	Temperature Generation Ovens, Furnaces, Muffles, Plastometer and Freezers	-80 °C to 1 100 °C	0.22 °C	Process Calibrator Thermocouple	CENAM Technical Guide	F, O
Thermodynamic	Thermo-Hygrometers Humidity Recorders (Humidity)	10 % RH to 90 % RH	1.8 % RH	Thermo-Hygrometer Fluke 971	OIML R 121	F, O
Thermodynamic	Thermo-Hygrometers (Temperature)	-20 °C to 80 °C	0.034 °C	Thermo-Hygrometer Fluke 971	ASTM E220	F, O
Optical	P ( $\lambda$ ) Spectral Reflectance (CIE L:)	14 Units to 85 Units	CIE L: 1.69 Units	White Standard Tile	CENAM Technical Guide	F, O
Optical	P ( $\lambda$ ) Spectral Reflectance (CIE a*:	0.22 Units to 0.51 Units	CIE a*: 0.26 Units	White Standard Tile	CENAM Technical Guide	F, O
Optical	P ( $\lambda$ ) Spectral Reflectance (CIE b*:	0.27 Units to 0.45 Units	CIE L: 1.69 Units	White Standard Tile	CENAM Technical Guide	F, O
Optical	Transmittance Spectrophotometers and Absorbance at these Wave Lengths	$\lambda$ : 280 nm to 880 nm	0.18 nm	Neutral Density Filters, Holmium Oxide Glass	CENAM Technical Guide	F, O



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Optical	Transmittance Spectrophotometers and Absorbance at these Wave Lengths	$\tau$ : 0 % T to 30 % T	0.082 % T	Neutral Density Filters, Holmium Oxide Glass	CENAM Technical Guide	F, O
Optical	Transmittance Spectrophotometers and Absorbance at these Wave Lengths	$\alpha$ : 0.049 $\lambda$ to 1.09 $\lambda$	0.000 27 $\lambda$	Neutral Density Filters, Holmium Oxide Glass	CENAM Technical Guide	F, O
Optical	Gloss/ Specular Reflectance Meter (Angle of Incline)	20° to 21.3°	0.59 Gloss Unit	Ceram Research Gloss and Semi-Gloss Standards	ASTM D-523-14	F, O
Optical	Gloss/ Specular Reflectance Meter (Angle of Incline)	46.2° to 60°	0.6 Gloss Units	Ceram Research Gloss and Semi-Gloss Standards	ASTM D-523-14	F, O
Optical	Gloss/ Specular Reflectance Meter (Angle of Incline)	69.1° to 85°	0.69 Gloss Units	Ceram Research Gloss and Semi-Gloss Standards	ASTM D-523-14	F, O
Optical	Ev Illuminance Light Booth	100 lux to 6 000 lux	0.8 % of reading	Luxmeter	NIST SP 250-37	F, O
Optical	Ev Light Meters	100 lux to 5 000 lux	0.8 % of reading	Luxmeter	NIST SP 250-37	F, O
Optical	Luxometer	20 lux to 5 000 lux	0.6 % of reading	Luxmeter	CENAM Technical Guide	F, O
Optical	Refractive Index	1 °Brix to 80 °Brix	0.55 % of reading	Sucrose Standards	OIML R-108	F, O
Electrical	Equipment to Measure Resistance	1 $\Omega$ to 10 $\Omega$	0.002 4 $\Omega$	Process Calibrator Fluke 725	CENAM Technical Guide	F, O



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Electrical	Equipment to Measure Resistance	2 $\Omega$ to 5 $\Omega$	0.002 5 $\Omega$	Process Calibrator Fluke 725	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	5 $\Omega$ to 10 $\Omega$	0.002 4 $\Omega$	Process Calibrator Fluke 725	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	10 $\Omega$ to 20 $\Omega$	0.004 9 $\Omega$	Process Calibrator Fluke 725	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	20 $\Omega$ to 50 $\Omega$	0.007 $\Omega$	Process Calibrator Fluke 725	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	50 $\Omega$ to 100 $\Omega$	0.003 9 $\Omega$	Process Calibrator Fluke 725	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	100 $\Omega$ to 200 $\Omega$	0.001 7 $\Omega$	Process Calibrator Fluke 725	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	200 $\Omega$ to 500 $\Omega$	0.001 8 $\Omega$	Process Calibrator Fluke 725	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	500 $\Omega$ to 1 000 $\Omega$	0.09 $\Omega$	Process Calibrator Fluke 725	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	1 000 $\Omega$ to 2 800 $\Omega$	0.013 $\Omega$	Process Calibrator Fluke 725	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC Voltage	100 mV to 1 V	0.000 005 7 V	Multimeter Fluke 187 Multimeter HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC Voltage	1 V to 10 V	0.000 005 7 V	Multimeter Fluke 187 Multimeter HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC Voltage	10 V to 100 V	0.000 005 7 V	Multimeter Fluke 187 Multimeter HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O



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Electrical	Equipment to Output DC Voltage	100 V to 1 000 V	0.000 005 7 V	Multimeter Fluke 187 Multimeter HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 50 Hz to 1 KHz)	100 mV to 1 V	0.03 V	Multimeter Fluke 187 Multimeter HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 50 Hz to 1 KHz)	1 V to 10 V	0.03 V	Multimeter Fluke 187 Multimetro HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 50 Hz to 1 KHz)	10 V to 100 V	0.030 V	Multimeter Fluke 187 Multimetro HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 50 Hz to 1 KHz)	100 V to 1 000 V	0.4 V	Multimeter Fluke 187 Multimeter HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC Current	0.01 mA to 9.999 9 mA	0.001 9 mA	Multimeter Fluke 187 Multimeter HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC Current	10 mA to 99.999 mA	0.006 8 mA	Multimeter Fluke 187 Multimeter HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC Current	100 mA to 1 A	0.006 9 mA	Multimeter Fluke 187 Multimeter HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC Current	1 A to 3 A	0.000 7 A	Multimeter Fluke 187 Multimetro HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O



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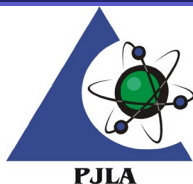
Av. de la Esperanza 916, Residencial La Hacienda

Apodaca, Nuevo León. México. C.P. 66636

Contact Name: Carlos Alberto Perez Balleza. Phone: 818-259-9192

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Electrical	Equipment to Output DC Current	3 A to 10 A	0.000 09 A	Multimeter Fluke 187 Multimetro HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC High Current, Hall Effect Current Sensor Close Loop (@ 60 Hz.)	0 A to 600 A	2.3 A	Multimeter Fluke 374 FC	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC High Current, Hall Effect Current Sensor Close Loop	0 A to 600 A	2.3 A	Multimeter Fluke 374 FC	CENAM Technical Guide	F, O
Electrical	Equipment to Output Resistance	Up to 100 $\Omega$	0.01 % of reading + 0.004 range	Multimeter Fluke 187 Multimetro HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output Resistance	1 k $\Omega$ to 10 k $\Omega$	0.01 % of reading + 0.001 range	Multimeter Fluke 187 Multimetro HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output Resistance	10 k $\Omega$ to 100 k $\Omega$	0.01 % of reading + 0.001 range	Multimeter Fluke 187 Multimetro HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output Resistance	100 k $\Omega$ to 1 M $\Omega$	0.01 % of reading + 0.001 range	Multimeter Fluke 187 Multimetro HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output Resistance	1 M $\Omega$ to 10 M $\Omega$	0.04 % of reading + 0.001 range	Multimeter Fluke 187 Multimetro HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O



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Electrical	Equipment to Output Resistance	10 M $\Omega$ to 100 M $\Omega$	0.8 % of reading + 0.01 range	Multimeter Fluke 187 Multimeter HP 3458A KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Electrical Current Derivator (Shunt)	10 A to 150 A	0.007 9 A	Wavetek 9100 Keysight 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC High Voltage (Hy-Pot)	1 kV to 20 kV	0.38 kV	Fluke 187 Multimeter Fluke 80K-40	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC High Voltage (Hy-Pot)	1 kV to 20 kV	0.1 kV	Fluke 187 Multimeter Fluke 80K-40	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	100 $\Omega$	0.05 % of reading	Megabox Resistance	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	500 $\Omega$	0.05 % of reading	Megabox Resistance	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	1 k $\Omega$	0.05 % of reading	Megabox Resistance	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	10 k $\Omega$	0.05 % of reading	Megabox Resistance	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	470 k $\Omega$	0.05 % of reading	Megabox Resistance	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	831 k $\Omega$	0.05 % of reading	Megabox Resistance	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	33 M $\Omega$	0.05 % of reading	Megabox Resistance	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	400 M $\Omega$	0.05 % of reading	Megabox Resistance	CENAM Technical Guide	F, O





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Electrical	Equipment to Measure DC Voltage	Up to 329.99 mV	0.006 % of reading + 3 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure DC Voltage	329.99 mV to 3.299 V	0.005 % of reading + 5 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure DC Voltage	3.299 V to 32.999 V	0.005 % of reading + 50 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure DC Voltage	30 V to 329.99 V	0.005 5 % of reading + 500 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure DC Voltage	100 V to 1 020 V	0.005 5 % of reading + 1 500 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure DC Current	Up to 3.299 99 mA	0.013 % of reading + 0.05 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure DC Current	3.299 99 mA to 32.999 9 mA	0.01 % of reading + 0.25 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure DC Current	32.999 9 mA to 329.999 mA	0.01 % of reading + 3.3 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure DC Current	329.999 mA to 2.199 99 A	0.03 % of reading + 44 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure DC Current	2.199 99 A to 18 A	0.06 % of reading + 330 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure DC Current Toroidal-Type Clamps	10 A to 100 A	0.4 % of Output	WAVETEK 9100 Coil Toroidal	CENAM Technical Guide	F, O
Electrical	Equipment to Measure DC Current Toroidal-Type Clamps	100 A to 500 A	0.4 % of Output	WAVETEK 9100 Coil Toroidal	CENAM Technical Guide	F, O



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Electrical	Equipment to Measure DC Current Toroidal-Type Clamps	500 A to 900 A	0.4 % of Output	WAVETEK 9100 Coil Toroidal	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current Toroidal-Type Clamps (@ 60 Hz)	10 A to 100 A	0.4 % of Output	WAVETEK 9100 Coil Toroidal	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current Toroidal-Type Clamps (@ 60 Hz)	100 A to 500 A	0.4 % of Output	WAVETEK 9100 Coil Toroidal	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current Toroidal-Type Clamps (@ 60 Hz)	500 A to 900 A	0.4 % of Output	WAVETEK 9100 Coil Toroidal	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	Up to 10.999 $\Omega$	0.012 % of reading + 0.008 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	11 $\Omega$ to 32.999 $\Omega$	0.012 % of reading + 0.001 5 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	33 $\Omega$ to 109.999 $\Omega$	0.009 % of reading + 0.001 5 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	110 $\Omega$ to 329.999 $\Omega$	0.009 % of reading + 0.001 5 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	330 $\Omega$ to 1.099 99 $\Omega$	0.009 % of reading + 0.06 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	1.1 k $\Omega$ to 3.299 k $\Omega$	0.009 % of reading + 0.06 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	3.3 k $\Omega$ to 10.999 k $\Omega$	0.009 % of reading + 0.6 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O



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Electrical	Equipment to Measure Resistance	11 k $\Omega$ to 32.999 k $\Omega$	0.009 % of reading + 0.06 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	33 k $\Omega$ to 109.999 k $\Omega$	0.011 % of reading + 0.6 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	110 k $\Omega$ to 329.999 k $\Omega$	0.012 % of reading + 0.6 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	330 k $\Omega$ to 1.099 99 M $\Omega$	0.015 % of reading + 55 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	330 M $\Omega$ to 1.099 99 M $\Omega$	0.015 % of reading + 55 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	3.3 M $\Omega$ to 10.999 M $\Omega$	0.06 % of reading + 550 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	11 M $\Omega$ to 32.999 M $\Omega$	0.1 % of reading + 550 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	33 M $\Omega$ to 109.999 M $\Omega$	0.5 % of reading + 5 500 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Resistance	110 M $\Omega$ to 330 M $\Omega$	0.5 % of reading + 16 500 $\Omega$	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 10 Hz to 45 Hz)	1 mV to 32.999 mV	0.35 % of reading + 20 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 45 kHz to 10 kHz)	1 mV to 32.999 mV	0.15 % of reading + 20 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 10 kHz to 20 kHz)	1 mV to 32.999 mV	0.2 % of reading + 20 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O



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Electrical	Equipment to Measure AC Voltage (@ 20 kHz to 50 kHz)	1 mV to 32.999 mV	0.25 % of reading + 20 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 50 kHz to 100 kHz)	1 mV to 32.999 mV	0.35 % of reading + 33 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 100 kHz to 500 kHz)	1 mV to 32.999 mV	1 % of reading + 60 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 10 Hz to 45 Hz)	33 mV to 329.999 mV	0.25 % of reading + 50 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage At the (@ 45 kHz to 10 kHz)	33 mV to 329.999 mV	0.05 % of reading + 20 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 10 kHz to 20 kHz)	33 mV to 329.999 mV	0.1 % of reading + 20 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 20 kHz to 50 kHz)	33 mV to 329.999 mV	0.16 % of reading + 40 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 50 kHz to 100 kHz)	33 mV to 329.999 mV	0.24 % of reading + 170 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 100 kHz to 500 kHz)	33 mV to 329.999 mV	0.7 % of reading + 330 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O



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Electrical	Equipment to Measure AC Voltage (@ 10 Hz to 45 Hz)	33 mV to 329.999 V	0.15 % of reading + 250 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 45 kHz to 10 kHz)	0.33 V to 3.299 99 V	0.03 % of reading + 60 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 10 kHz to 20 kHz)	0.33 V to 3.299 99 V	0.08 % of reading + 60 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 20 kHz to 50 kHz)	0.33 V to 3.299 99 V	0.014 % of reading + 300 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 50 kHz to 100 kHz)	0.33 V to 3.299 99 V	0.24 % of reading + 1 700 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 100 kHz to 500 kHz)	0.33 V to 3.299 99 V	0.5 % of reading + 1 3 300 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 10 Hz to 45 Hz)	3.3 V to 32.999 V	0.15 % of reading + 2 500 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 45 kHz to 10 kHz)	3.3 V to 32.999 V	0.04 % of reading + 600 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 10 kHz to 20 kHz)	3.3 V to 32.999 V	0.08 % of reading + 2 600 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O





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Electrical	Equipment to Measure AC Voltage (@ 20 kHz to 50 kHz)	3.3 V to 32.999 V	0.19 % of reading + 5 000 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 50 kHz to 100 kHz)	3.3 V to 32.999 V	0.24 % of reading + 17 000 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 45 Hz to 1 kHz)	33 V to 329.999 9 V	0.05 % of reading + 6 600 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 1 kHz to 10 kHz)	33 V to 329.999 9 V	0.08 % of reading + 15 000 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 10 kHz to 20 kHz)	33 V to 329.999 9 V	0.09 % of reading + 33 000 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 45 Hz to 1 kHz)	330 V to 1 020 V	0.05 % of reading + 80 000 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 1 kHz to 5 kHz)	330 V to 1 020 V	0.2 % of reading + 100 000 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Voltage (@ 5 kHz to 10 kHz)	330 V to 1 020 V	0.2 % of reading + 500 000 $\mu$ V	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 10 Hz to 20 Hz)	0.029 mA to 0.329 99 mA	0.25 % of reading + 0.15 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O





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Electrical	Equipment to Measure AC Current (@ 20 Hz to 45 Hz)	0.029 mA to 0.329 99 mA	0.13 % of reading + 0.15 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 45 Hz to 1 kHz)	0.029 mA to 0.329 99 mA	0.13 % of reading + 0.25 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 1 kHz to 5 kHz)	0.029 mA to 0.329 99 mA	0.4 % of reading + 0.15 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 5 kHz to 10 kHz)	0.029 mA to 0.329 99 mA	1.3 % of reading + 0.15 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 10 Hz to 20 Hz)	0.33 mA to 3.299 9 mA	0.2 % of reading + 0.3 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 20 Hz to 45 Hz)	0.33 mA to 3.299 9 mA	0.1 % of reading + 0.3 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 45 Hz to 1 kHz)	0.33 mA to 3.299 9 mA	0.1 % of reading + 0.3 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 1 kHz to 5 kHz)	0.33 mA to 3.299 9 mA	0.2 % of reading + 0.3 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 5 kHz to 10 kHz)	0.33 mA to 3.299 9 mA	0.6 % of reading + 0.3 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O



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Electrical	Equipment to Measure AC Current (@ 10 Hz to 20 Hz)	3.3 mA to 32 99 9 mA	0.2 % of reading + 0.3 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 20 Hz to 45 Hz)	3.3 mA to 32 99 9 mA	0.1 % of reading + 0.3 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 45 Hz to 1 kHz)	3.3 mA to 32 99 9 mA	0.1 % of reading + 0.3 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 1 kHz to 5 kHz)	3.3 mA to 32 99 9 mA	0.2 % of reading + 0.3 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 5 kHz to 10 kHz)	3.3 mA to 32 99 9 mA	0.6 % of reading + 0.3 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 10 Hz to 20 Hz)	33 mA to 329 999 mA	0.2 % of reading + 30 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 20 Hz to 45 Hz)	33 mA to 329 999 mA	0.1 % of reading + 30 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 45 Hz to 1 kHz)	33 mA to 329 999 mA	0.1 % of reading + 30 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 1 kHz to 5 kHz)	33 mA to 329 999 mA	0.2 % of reading + 30 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O



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### Servicios de Metrología TC, S.A. de C.V.

Av. de la Esperanza 916, Residencial La Hacienda

Apodaca, Nuevo León. México. C.P. 66636

Contact Name: Carlos Alberto Perez Balleza. Phone: 818-259-9192

*Accreditation is granted to the facility to perform the following conformity assessment activities:*

FIELD OF CALIBRATION	MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	EXPANDED MEASUREMENT UNCERTAINTY ( $\pm$ ) <sup>1</sup>	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED	LOCATION OF ACTIVITY
Electrical	Equipment to Measure AC Current (@ 5 kHz to 10 kHz)	33 mA to 329 999 mA	0.6 % of reading + 30 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 10 Hz to 1 Hz)	0.33 mA to 2.199 99 A	0.2 % of reading + 300 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 45 kHz to 1 kHzv	0.33 mA to 2.199 99 A	0.1 % of reading + 300 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 1 kHz to 5 kHz)	0.33 mA to 2.199 99 A	0.75 % of reading + 300 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 45 Hz to 65 Hz)	2.2 A to 18 A	0.06 % of reading + 2 000 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure AC Current (@ 500 Hz to 1 kHz)	2.2 A to 18 A	0.33 % of reading + 2 000 $\mu$ A	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	0.33 nF to 0.499 9 nF	0.5 % of reading + 0.01 pF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	0.5 nF to 1.099 9 nF	0.5 % of reading + 0.01 pF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	1.1 nF to 3.299 9 nF	0.5 % of reading + 0.01 pF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	3.3 nF to 10.999 nF	0.5 % of reading + 0.01 pF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O



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Electrical	Equipment to Measure Capacitance	11 nF to 32.999 nF	0.25 % of reading + 0.1 pF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	33 nF to 109.99 nF	0.25 % of reading + 0.1 pF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	110 nF to 329.99 nF	0.25 % of reading + 0.3 pF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	0.33 $\mu$ F to 1.099 9 $\mu$ F	0.25 % of reading + 1 pF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	1.1 $\mu$ F to 3.299 9 $\mu$ F	0.35 % of reading + 3 pF	WAVETEK 9100	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	3.3 $\mu$ F to 10.999 $\mu$ F	0.35 % of reading + 10 nF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	11 $\mu$ F to 32.999 $\mu$ F	0.4 % of reading + 30 nF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	33 $\mu$ F to 109.99 $\mu$ F	0.5 % of reading + 100 nF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	110 $\mu$ F to 329.99 $\mu$ F	0.7 % of reading + 300 nF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Capacitance	0.33 mF to 1.1 $\mu$ F	1 % of reading + 300 nF	WAVETEK 9100 Decade Capacitor	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Inductance	10 mH to 100 mH	0.2 mH	Decade Inductance	CENAM Technical Guide	F, O
Electrical	Equipment to Measure Inductance	100 mH to 1 000 mH	0.2 mH	Decade Inductance	CENAM Technical Guide	F, O



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Electrical	Temperature Calibration Indication and Control Equipment used with Thermocouple Type E	-171 °C to -38 °C	0.5 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O
Electrical	Temperature Calibration Indication and Control Equipment used with Thermocouple Type E	190 °C to 850 °C	0.22 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O
Electrical	Temperature Calibration Indication and Control Equipment used with Thermocouple Type J	-171 °C to -38 °C	0.34 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O
Electrical	Temperature Calibration Indication and Control Equipment used with Thermocouple Type J	270 °C to 1 230 °C	0.4 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O
Electrical	Temperature Calibration Indication and Control Equipment used with Thermocouple Type K	-171 °C to -38 °C	0.34 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O
Electrical	Temperature Calibration Indication and Control Equipment used with Thermocouple Type K	270 °C to 1 230 °C	0.4 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O



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Electrical	Temperature Calibration Indication and Control Equipment used with Thermocouple Type R	350 °C to 1 570 °C	0.7 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O
Electrical	Temperature Calibration Indication and Control Equipment used with Thermocouple Type S	350 °C to 1 570 °C	0.8 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O
Electrical	Temperature Calibration Indication and Control Equipment used with Thermocouple Type T	-38 °C to -171 °C	0.63 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O
Electrical	Temperature Calibration Indication and Control Equipment used with Thermocouple Type T	80 °C to 360 °C	0.2 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O
Electrical	Temperature Calibration Indication and Control Equipment used with RTD Pt 385, 100 $\Omega$	-38 °C to - 170 °C	0.05 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O
Electrical	Temperature Calibration Indication and Control Equipment used with RTD Pt 385, 100 $\Omega$	160° to 720°C	0.05 °C	Process Calibrator Fluke 725, Electrical Simulation of Thermocouple Output	CENAM Technical Guide	F, O





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Electrical	Equipment to Output AC Voltage	Up to 100 mV	0.005 % of reading + 0.003 5 % range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage	100 mV to 1 V	0.004 % of reading + 0.000 7 % range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage	1 V to 10 V	0.003 5 % of reading + 0.000 5 % range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage	10 V to 100 V	0.004 5 % of reading + 0.000 6 % range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage	100 V to 1 000 V	0.004 5 % of reading + 0.001 % range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 3 Hz to 5 Hz)	Up to 100 mV	1 % of reading + 0.04 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 5 Hz to 10 Hz)	Up to 100 mV	0.35 % of reading + 0.04 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 10 Hz to 20 kHz)	Up to 100 mV	0.06 % of reading + 0.04 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 20 kHz to 50 kHz)	Up to 100 mV	0.012 % of reading + 0.04 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 50 kHz to 100 kHz)	Up to 100 mV	0.6 % of reading + 0.08 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O



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Electrical	Equipment to Output AC Voltage (@ 100 kHz to 300 kHz)	Up to 100 mV	4 % of reading + 0.05 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 3 Hz to 5 Hz)	Up to 750 mV	1 % of reading + 0.03 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 5 Hz to 10 Hz)	Up to 750 mV	0.35 % of reading + 0.04 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 10 Hz to 20 kHz)	Up to 750 mV	0.06 % of reading + 0.04 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 20 kHz to 50 kHz)	Up to 750 mV	0.012 % of reading + 0.04 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 50 kHz to 100 kHz)	Up to 750 mV	0.6 % of reading + 0.08 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Voltage (@ 100 kHz to 300 kHz)	Up to 750 mV	4 % of reading + 0.05 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC Current	Up to 10 mA	0.05 % of reading + 0.02 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC Current	10 mA to 100 mA	0.05 % of reading + 0.005 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O



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Electrical	Equipment to Output DC Current	100 mA to 1 A	0.1 % of reading + 0.01 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC Current	1 A to 3 A	0.12 % of reading + 0.02 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output DC Current	3 A to 10 A	1 % of reading + 0.04 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Current (@5 Hz to 10 Hz)	Up to 1 A	0.3 % of reading + 0.04 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Current (@ 10 Hz to 5 kHz)	Up to 1 A	0.1 % of reading + 0.04 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Current (@ 3 Hz to 5 Hz)	Up to 3 A	1.1 % of reading + 0.06 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Current (@ 5 Hz to 10 Hz)	Up to 3 A	0.35 % of reading + 0.06 range	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Electrical	Equipment to Output AC Current (@ 10 Hz to 5 kHz)	Up to 3 A	0.15 % of reading + 0.06 range	MULTIMETRO HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Time and Frequency	Equipment to Output Frequency	3 Hz to 5 Hz	0.1 % of reading	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Time and Frequency	Equipment to Output Frequency	5 Hz to 10 Hz	0.05 % of reading	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Time and Frequency	Equipment to Output Frequency	10 Hz to 40 kHz	0.03 % of reading	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O



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Time and Frequency	Equipment to Output Frequency	40 Hz to 300 kHz	0.01 % of reading	Multimeter HP 3458, KEYSIGHT 34461A	CENAM Technical Guide	F, O
Time and Frequency	Equipment to Measure Frequency	0.01 Hz to 119.99 Hz	0.000 025 Hz	WAVETEK 9100	CENAM Technical Guide	F, O
Time and Frequency	Equipment to Measure Frequency	120 Hz to 1 199.9 Hz	0.000 025 Hz	WAVETEK 9100	CENAM Technical Guide	F, O
Time and Frequency	Equipment to Measure Frequency	1.2 kHz to 11.999 kHz	0.016 Hz	WAVETEK 9100	CENAM Technical Guide	F, O
Time and Frequency	Equipment to Measure Frequency	12 kHz to 119.99 kHz	0.016 Hz	WAVETEK 9100	CENAM Technical Guide	F, O
Time and Frequency	Equipment to Measure Frequency	120 kHz to 1 199.9 kHz	0.016 Hz	WAVETEK 9100	CENAM Technical Guide	F, O
Time and Frequency	Equipment to Measure Frequency	1.2 MHz to 2 MHz	0.016Hz	WAVETEK 9100	CENAM Technical Guide	F, O
Time and Frequency	Equipment to Measure Tachometer Contact, No Contact	1 rpm to 60 000 rpm	0.2 % of reading	WAVETEK 9100 Mengshen MS-AF02	CENAM Technical Guide	F, O
Time and Frequency	Equipment to Measure Stopwatch	60 s to 86 400 s	16 s/Dia	Stopwatch XINCO	CENAM Technical Guide	F, O

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



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capacity.

3. Location of activity:

**Location**

**Code**

F

Conformity assessment activity is performed at the CABs fixed facility

O

Conformity assessment activity is performed onsite at the CABs customer location

**Location**

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.
5. The term L represents length in inches or millimeters as appropriate to the uncertainty statement.
6. The term Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement.