CERTIFICATE OF ACCREDITATION

This is to attest that

UL JAPAN, INC.

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Calibration Laboratory CL-236

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories.* This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date September 18, 2024

President

Visit www.iasonline.org for current accreditation information.

SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

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Accredited to ISO/IEC 17025:2017 *Effective Date September 18, 2024*

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Dimensional			
Micrometer	Up to 25 mm Discrete Value: 2 mm 5 mm 10 mm	 0.00066 mm 0.00077 mm 0.0011 mm	Using Block Gauge by Direct Method
Caliper (Inside and Outside Vernier)	Up to 300 mm Discrete Value: 20 mm 50 mm 100 mm 150 mm 200 mm 250 mm 300 mm	 0.0087 mm 0.0088 mm 0.0095 mm 0.011 mm 0.013 mm 0.014 mm 0.016 mm	Using Ceramic Caliper Checker by Direct Method
Dimensional Measurements (Diameter Thickness, and Length of Pin Gauge, Gap Gauge, Mechanical Probe, Impact Ball, Nozzle)	0.1 mm to 25 mm 25 mm to 200 mm	0.0037 mm 0.057 mm	Using Micrometer/ Vernier Caliper by Direct Method
Length Measurement – Optical (Beam Profiler)	1 mm to 10 mm	0.75 % + 0.22 µm	Using Glass Scale by Direct Method
Mechanical			
Weighing Scales (Digital Scale)	Discrete Value: 200 mg 1 g 10 g 20 g	 0.05 mg 0.0001 g 0.0004 g 0.0005 g	Using JIS Standard Weights by Direct Method

** If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Weighing Scales (Digital Scale) (continued)	50 g 100 g 200 g 500 g 1 kg 2 kg 10 kg	0.005 g 0.008 g 0.05 g 0.2 g 0.0003 kg 0.0003 kg 0.004 kg	Using JIS Standard Weights by Direct Method
	10 kg to 60 kg 60 kg to150 kg	0.04 kg 0.11 kg	Using Digital Weighing Scale By Original Method
Vibration Tester Acceleration Displacement (p-p)	Acceleration 0.5 m/s^2 to 500 m/s^2	6.5 %	Using Vibration Meter with Pickup Sensor and Frequency Counter By Direct Method
	Displacement (p-p) 0.03 mm to 10 mm	6.3 %	
	Vibration Tester Frequency 3 Hz to 3000 Hz	0.71 %	
Absolute Pressure Measure[3] Decompression Chamber	7.5 kPa to 16 kPa	0.95 kPa	Using Pressure Meter & Pump by Comparison Method
Load Cell (Crash Tester) Compression Mode (Amount of Travel)	100 N to 1000 N 2 kN to 20 kN	6.5 N 0.076 kN	Using Compression Load Cell and Indicator & Micrometer Head by Direct/Comparison Method
	1 mm to 10 mm	0.013 mm	
Atmospheric Meter	950 hPa to 1040 hPa	0.68 hPa	Using Atmospheric Pressure Meter by Comparison Method
Vicat Tester	Dimensional Parameter 0.1 mm to 1 mm	0.0039 mm	Using Micrometer/ Vernier Caliper by Direct Method
Thermal			
Temperature Sensor with Indicators/ Thermometer/ Temperature Gauges	10 °C to 40 °C	0.84 °C	Using Temperature and Humidity Meter by Comparison Method
Temperature Chamber/Thermal Source/Recorder	-70 °C to 200 °C	0.93 °C	Using Digital Data Logger with RTD by Single Position Calibration (At Measuring location in DUC) by Direct Method)

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Humidity Meter	10 %RH to 85 %RH (20 °C to 40 °C)	2.5 %RH	Using Temperature and Humidity Meter by Comparison Method
Humidity Chamber / Recorder	10 %RH to 95 %RH (30 °C to 40 °C) 20 %RH to 95 %RH (at over 40 °C to 70 °C)	2.6 %RH 3.9% RH	Using Digital Data Logger Temperature and Humidity Sensor by Single Position Calibration (At Measuring location in DUC) by Direct Method
Electrical – DC/LF			
DC Voltage Generate[3]	1 mV to 329.9999 mV 0.33 V to 32.99999 V 33 V to 1020 V	0.002 % +0.001 mV 0.0019 % 0.0024 %	Using Multi-Function Calibrator by Direct Method
DC Voltage Measure[4]	2 mV to 202 mV 202.001 mV to 202 V 202.0001 V to 1020 V 1.020 kV to 10.5 kV	0.00096 % + 0.00028 mV 0.0008 % + 0.0002 mV 0.00095 % 0.67 %	Using Multimeter or AC/DC High Voltage Meter by Direct Method
AC Voltage Generate[3]	1.0 mV to 32.999 mV (10 Hz to 45 Hz) (45 Hz to 10 kHz) 33 mV to 329.999 mV (10 Hz to 45 Hz) (45 Hz to 10 kHz) 0.33 V to 3.29999 V (10 Hz to 45 Hz) (45 Hz to 10 kHz) 3.3 V to 32.9999 V (10 Hz to 45 Hz) (45 Hz to 10 kHz) 33 V to 329.999 V (45 Hz to 1 kHz) 330 V to 1020 V (45 Hz to 1 kHz)	 800 µV/V + 6 µV 150 µV/V + 6 µV 300 µV/V + 8 µV 150 µV/V + 8 µV 300 µV/V + 50 µV 150 µV/V + 60 µV 300 µV/V + 650 µV 150 µV/V + 600 µV 190 µV/V + 2 mV 300 µV/V + 10 mV	Using Multifunction Calibrator by Direct Method

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
AC Voltage Measure[4]	(50 Hz to 60 Hz) 10 mV to 121.2 V 121.2 V to 1020 V 1.020 kV to 10.5 kV	 0.020 % 0.042 % 1.6 %	Using Multimeter or DC High Voltage Meter by Direct Method
DC Current Generate[3]	1 µA to 329.999 µA 330 µA to 3.29999 mA 3.3 mA to 32.9999 mA 33 mA to 329.999 mA 330 mA to 1.09999 A 1.1 A to 2.99999 A 3 A to 10.9999 A 11 A to 20.5 A	0.015 % + 0.02 µA 0.01 % + 0.05 µA 0.01 % + 0.25 µA 0.01 % + 2.5 µA 0.02 % + 40 µA 0.038 % + 40 µA 0.05 % + 500 µA 0.10 % + 0.75 mA	Using Multifunction Calibrator (For over 20.5A, with Current Coil) by Direct Method
DC Current Generate[3] (Only for clamp current meter type.)	21 A to 54.9995 A 55 A to 149.9995 A 150 A to 549.995 A 550 A to 1025 A	0.60 % + 0.16 A 0.89 % 0.62 % + 0.54 A 0.69 % + 0.74 A	
DC Current Measure[4]	10 µA to 20.2 mA 20.2 mA to 20.2 A 20.2 A to 30.2 A	0.009 % + 0.00017 µA 0.096 % 0.11 %	Using Multimeter by Direct Method
	9.5 A to 100 A	0.27 %	Using Resistive Divider with Multimeter by Direct Method
	20 A to 205 A	0.18 %	Using Resistive Divider with Multimeter by Direct Method
AC Current Generate[3]	(45 Hz to 1 kHz) 29 µA to 329.99 µA 0.33 mA to 3.29999 mA 3.3 mA to 32.9999 mA 33 mA to 329.999 mA 0.33 A to 1.09999 A 1.1 A to 2.99999 A (45 Hz to 100 Hz) 3 A to 10.9999 A 11 A to 20.5 A (100 Hz to 1 kHz) 3 A to 10.9999 A 11 A to 20.5 A	 0.13 % + 0.1 µA 0.1 % + 0.15 µA 0.04 % + 2 µA 0.04 % + 20 µA 0.05 % + 100 µA 0.06 % + 100 µA 0.06 % + 2 mA 0.12 % + 5 mA 0.1 % + 2 mA 0.15 % + 5 mA	Using Multifunction Calibrator (For over 20.5A, with Current Coil) by Direct Method

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
AC Current Generate[3] (Only for clamp current meter type.)	(45 Hz to 65 Hz) 21 A to 149.9995 A 150 A to 1025 A (65 Hz to 440 Hz) 21 A to 149.9995 A 150 A to 500 A (65 Hz to 120 Hz) 150 A to 1025 A	 0.67 %+0.29 A 0.70 %+0.97 A 1.3%+0.28 A 1.9 % 1.9 %	Using Multifunction Calibrator (For over 20.5A, with Current Coil) by Direct Method
AC Current Measure[4]	(50 Hz to 60 Hz) 1 mA to 2.02 A 2.02 A to 20.2A	 0.18 % 0.16 %	Using Multimeter by Direct Method
DC Resistance Generate[3]	0.05 Ω to 109.9999 Ω 110 Ω to 109.9999 kΩ 0.11 MΩ to 1.099999 MΩ 1.1 MΩ to 10.99999 MΩ 11 MΩ to 32.99999 MΩ 33 MΩ to 109.9999 MΩ 110 MΩ to 329.9999 MΩ 330 MΩ to 500 MΩ	0.004 %+0.0015 Ω 0.0046 % 0.0032 %+0.000007 MΩ 0.013 %+0.00007 MΩ 0.025 %+0.0027 MΩ 0.05 %+0.0039 MΩ 0.3 %+0.1 MΩ 1.5 %+0.5 MΩ	Using Multifunction Calibrator (By 2 Wire or 4 Wire) by Direct Method
	1.001 MΩ 10 MΩ 100.2 MΩ	0.0075 MΩ 0.075 MΩ 0.75 MΩ	Using Standard Resister, by Direct Method
DC Resistance Measure[4]	1 Ω to 100 kΩ	0.0066 %	Using Multimeter by Direct Method
DC Power Generate[3] (1 V to 1020 V) (1 mA to 1025 mA)	 1 mW to 3059 W 3 W to 20.91 kW 2.1 kW to 1045 kW	 0.024 %+0.00039 mW 0.091%+0.00024 W 0.75 %	Using Multifunction Calibrator (with 50 Turn Current Coil) by Direct Method
AC Power Generate[3] 1 phase, Unity PF	3.3 mW to 20.91 kW (at 1 V to 1020 V, 3.3 mA to 20.5 A, 45 Hz to 65 Hz) 1.089 W to 989.99 W (at 3.3 V to 329.999 V, 0.33 A to 2.99999 A, 65 Hz to 1 kHz) 9.9 W to 6.764 kW (at 3.3 V to 329.999 V, 3 A to 20.5 A, 65 Hz to 1 kHz)	0.13 % 0.097 % 0.22 %	Using Multifunction Calibrator by Direct Method

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
AC Power Generate[3] 0 phase, Unity PF (Only for clamp current meter type.)	210 W to <2.1 kW (10 V to 1020 V, 21 A to 1025 A, 45 Hz to 65Hz) 2.1 kW to 1045 kW (10 V to 1020 V, 21 A to 1025 A, 45 Hz to 65 Hz)	2.2 % 0.94 %	
Voltage Generate[3] (for Voltage Probe)	0.8 V to 1000 V DC Voltage AC Voltage (10 Hz to 500 kHz at 3 Vrms)	1.5 % 0.064 V	Using Multifunction Calibrator with Digital Oscilloscope by Direct Method
DC Resistive Divider	19.5 mΩ to 20.5 mΩ (at 5 A)	0.049 mΩ	Using Multi-Function Calibrator with Multimeter by by Direct Method
Power Factor Generate[3]	0.5 PF to 1 PF	0.000058 PF	Using Multifunction Calibrator by Direct Method
Thermocouple Signal Generate[3] Type J Type K Type T	 -100 °C to 760 °C -100 °C to 1000 °C -150 °C to 400 °C	 0.18 °C 0.27 °C 0.25 °C	Using Multifunction Calibrator by Direct Method
Time and Frequency			
Frequency Generate[3]	5 Hz to 2.000 MHz	0.00025 %+ 0.13 mHz	Using Multifunction Calibrator by Direct Method
Frequency/ Time Duration Measure[4]	0.08 µs to 8 s	0.29 %	Using Digital Oscilloscope by Direct Method
Time Duration Measure[4]	5 s to 3610 s	0.00062 % + 0.047 s	Using Stopwatch by Comparison Method
Time Rate Measure[4]	24 h	0.21 s	Using Watch Tester by Direct Method
Frequency Measure[4]	40 Hz to 300 kHz	0.0058 %	Using Reference Multimeter by Direct Method

[1]The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a

laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

[2]When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

[3]Capability is suitable for the calibration of measuring devices in the stated ranges.

[4]Capability is suitable for the calibration of devices intended to generate the indicated quantity in the stated ranges.

p-p = peak to peak
DUC = device under calibration
PF = power factor