Name of Accreditation Program	JCSS Accreditation Program
Accreditation Identification	JCSS 0049 Calibration
Name of Conformity Assessment Body	Japan Electric Meters Inspection Corporation Chubu
Name of Legal Entity	Japan Electric Meters Inspection Corporation JCN 4010405002454
Inquiry Point	Calibration Service Section of JEMIC Chubu Tel: +81-568-53-6336 FAX: +81-568-53-6337

*JCN: Japan Corporate Number

24･05･08-NITE-003
2024-05-08

Certificate of Accreditation

International Accreditation Japan (IAJapan) hereby accredits the following conformity assessment body as a calibration laboratory of Japan Calibration Service System.

Accreditation Identification: JCSS 0049 Calibration

Name of Conformity Assessment Body: Japan Electric Meters Inspection Corporation Chubu

Name of Legal Entity : Japan Electric Meters Inspection Corporation

Location of Conformity Assessment Body: 3-5-7 Kibuki-cho, Kasugai-shi, Aichi 487-0014, JAPAN

Scope of Accreditation: Time & Frequency & Rotational speed,
Electricity (Direct Current & Low Frequency),
Temperature (as the following pages)

Accreditation Requirement: ISO/IEC 17025:2017*

* The relevant accreditation requirements described in the Accreditation Scheme Document for JCSS are also applied.

Effective Date of Accreditation: 2023-07-03

Expiry Date of Accreditation: 2027-07-02

Date of Initial Accreditation: 1995-06-21

Hideaki Tanaka

TANAKA Hideaki
Chief Executive, International Accreditation Japan (IAJapan)
National Institute of Technology and Evaluation

- International Accreditation Japan (IAJapan) is a laboratory accreditation body which has signed MRAs of ILAC (International Laboratory Accreditation Cooperation) and APAC (Asia Pacific Accreditation Cooperation).
- MRA requirements are, in addition to relevant international standards and guides, requirements for participation in proficiency testing programs, surveillance and reassessment, and the policy for the traceability of measurement for MRA purpose.
- This laboratory fulfills ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation means this laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).
- The latest accreditation information is publicly available on IAJapan Website as an accreditation certificate.

General Field of Calibration: Time & Frequency & Rotational speed
Date of Initial Accreditation of the Field: 2018-06-21
Laboratory's permanent facility/On-site Calibration: Laboratory's permanent facility
Calibration and Measurement Capabilities

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Time & Frequency Counter, etc.	Frequency Generator	From 1 Hz up to 200 MHz		2.4×10^{-7} (Relative Expanded Uncertainty)
	Frequency Counter	From 1 Hz up to 200 MHz		2.4×10^{-7} (Relative Expanded Uncertainty)
	Time-Interval Source *1	From 1 s up to 60 s		0.01 s
	Time-Interval Measuring Equipment	Calibration by Frequency Measurement (rate) *2	Up to 9.999 s	0.05 s
		Calibration by Time-Interval Measurement	From 10 ms up to 100 s	4.0×10^{-6} (Relative Expanded Uncertainty)
			More than 100 s up to 3 600 s	0.10 s
	Tachometer	From 60 rpm up to 100 000 rpm		4 ppm＋0.02 rpm

#All Calibration Procedures are in-house procedures developed by this laboratory.
*1：Limited to Withstand Voltage tester or Insulation tester .
*2：Limited to the frequency of Crystal oscillator is 32.768 kHz.
Note: In the Expanded Uncertainty column, the values include sources of uncertainty attributed to a unit under test.

Laboratory's permanent facility/On-site Calibration: On-site Calibration
Calibration and Measurement Capabilities

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Time & Frequency Counter, etc.	Frequency Generator	From 1 Hz up to 200 MHz		4.0×10^{-6} (Relative Expanded Uncertainty)
	Frequency Counter	From 1 Hz up to 200 MHz		4.0×10^{-6} (Relative Expanded Uncertainty)
	Time-Interval Source *1	From 1 s up to 60 s		0.01 s
	Time-Interval Measuring Equipment	Calibration by Time-Interval Measurement	From 10 ms up to 100 s	4.0×10^{-6} (Relative Expanded Uncertainty)
			More than 100 s up to 3 600 s	0.10 s
	Tachometer	From 60 rpm up to 100 000 rpm		4 ppm＋0.02 rpm

#All Calibration Procedures are in-house procedures developed by this laboratory.
*1：Limited to Withstand Voltage tester or Insulation tester.
Note: In the Expanded Uncertainty column, the values include sources of uncertainty attributed to a unit under test.

General Field of Calibration: Electricity (Direct Current & Low Frequency)

Date of Initial Accreditation of the Field: 1995-06-21

Laboratory's permanent facility/On-site Calibration: Laboratory's permanent facility

Calibration and Measurement Capabilities

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)
Direct Current & Low Frequency Measuring Equipment, etc.	DC Resistor	0.001 Ω	0.000 03 mΩ
		0.01 Ω	0.000 2 mΩ
		More than 0.01 Ω less than 0.1 Ω	0.001 Ω
		0.1 Ω	0.001 0 mΩ
		More than 0.1 Ω less than 1 Ω	0.10 mΩ
		1 Ω	0.005 mΩ
		More than 1 Ω less than 10 Ω	0.000 20 Ω
		1.9 Ω	0.000 10 Ω
		10 Ω	0.05 mΩ
		More than 10 Ω less than 100 Ω	0.002 0 Ω
		19 Ω	0.001 0 Ω
		100 Ω	0.40 mΩ
		More than 100 Ω less than 1 kΩ	0.020 Ω
		190 Ω	0.010 Ω
		1 kΩ	4.0 mΩ
		More than 1 kΩ less than 10 kΩ	0.20 Ω
		1.9 kΩ	0.10 Ω
		10 kΩ	0.040 Ω
		More than 10 kΩ less than 100 kΩ	2.0 Ω
		19 kΩ	1.0 Ω
		100 kΩ	0.40 Ω
		More than 100 kΩ less than 1 MΩ	0.020 kΩ
		190 kΩ	0.010 kΩ
		1 MΩ	0.005 0 kΩ
		More than 1 MΩ up to 10 MΩ	0.000 3 MΩ
		1.9 MΩ	0.000 2 MΩ
		More than 10 MΩ up to 11 MΩ	0.002 MΩ
		More than 11 MΩ up to 60 MΩ	0.1 %
		19 MΩ	0.006 MΩ
		More than 60 MΩ less than 100 MΩ	0.060 MΩ
		100 MΩ	0.005 MΩ
		More than 100 MΩ less than 1 GΩ	0.1 %
		1 GΩ	1.0 MΩ
		More than 1 GΩ up to 2 GΩ	4 MΩ
		More than 2 GΩ up to 3 GΩ	6 MΩ
		More than 3 GΩ up to 1000 GΩ	0.4 %

#All Calibration Procedures are in-house procedures developed by this laboratory.

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)
Direct Current & Low Frequency Measuring Equipment, etc.	DC Resistance Measuring Equipment	0.001 Ω	0.10 μΩ
		0.01 Ω	0.50 μΩ
		0.1 Ω	2.0 μΩ
		1 Ω	7.0 μΩ
		More than 1 Ω less than 10 Ω	0.20 mΩ
		10 Ω	40 μΩ
		More than 10 Ω less than 100 Ω	1.0 mΩ
		100 Ω	0.40 mΩ
		More than 100 Ω up to 400 Ω	4.0 mΩ
		More than 400 Ω less than 1 kΩ	10 mΩ
		1 kΩ	4.0 mΩ
		More than 1 kΩ less than 10 kΩ	0.10 Ω
		10 kΩ	40 mΩ
		More than 10 kΩ up to 19 kΩ	1.0 Ω
		More than 19 kΩ less than 100 kΩ	2.0 Ω
		100 kΩ	0.40 Ω
		More than 100 kΩ up to 190 kΩ	10 Ω
		More than 190 kΩ less than 1 MΩ	20 Ω
		1 MΩ	5.0 Ω
		More than 1 MΩ up to 1.9 MΩ	0.4 kΩ
		More than 1.9 MΩ up to 10 MΩ	0.5 kΩ
		More than 10 MΩ less than 11 MΩ	2 kΩ
		From 11 MΩ up to 19 MΩ	10 kΩ
		More than 19 MΩ less than 33 MΩ	20 kΩ
		From 33 MΩ less than 100 MΩ	30 kΩ
		100 MΩ	5 kΩ
		More than 100 MΩ less than 110 MΩ	0.1 MΩ
		From 110 MΩ less than 330 MΩ	2.0 MΩ
		From 330 MΩ less than 500 MΩ	1 %
		From 500 MΩ less than 1 GΩ	5.0 MΩ
		1 GΩ	1.0 MΩ
		More than 1 GΩ up to 2 GΩ	1 %
	DC Voltage Source	From 0 V up to 100 mV	4.5 ppm＋0.7 μV
		More than 0.1 V up to 1 V	5.5 ppm＋0.6 μV
		More than 1 V up to 10 V	5.5 ppm＋2 μV
		More than 10 V up to 100 V	7.5 ppm＋0.05 mV
		More than 100 V up to 600 V	13 ppm
		More than 600 V up to 1000 V	34 ppm－12.6 mV
		More than 1 kV up to 1.9 kV	0.004 0 kV
		More than 1.9 kV up to 10 kV	0.020 kV

#All Calibration Procedures are in-house procedures developed by this laboratory.

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Direct Current & Low Frequency Measuring Equipment, etc.	DC Voltage Measuring Equipment	From 0 V up to 1 V		5.5 ppm＋0.5 μV
		More than 1 V up to 10 V		5.5 ppm＋2 μV
		More than 10 V up to 100 V		7.5 ppm＋0.05 mV
		More than 100 V up to 600 V		13 ppm
		More than 600 V up to 1000 V		34 ppm－12.6 mV
		More than 1 kV up to 10 kV		0.09 %＋1 V
		More than 10 kV up to 50 kV		0.12 %＋2 V
	DC Voltage Ratio Measuring Equipment	From 0 mV/V up to 10 mV/V		0.000 25 mV/V
	Direct Current Source	From 0 μA up to 100 μA		10 ppm＋0.001 0 μA
		More than 0.1 mA up to 1 mA		10 ppm＋0.015 μA
		More than 1 mA up to 10 mA		10 ppm＋0.15 μA
		More than 10 mA up to 100 mA		10 ppm＋2.0 μA
		More than 0.1 A up to 1 A		30 ppm＋0.010 mA
		More than 1 A up to 30 A		35 ppm＋0.15 mA
	Direct Current Measuring Equipment	0 μA		0.001 0 μA
		From 10 pA up to 1 nA		0.10 % ＋ 0.010 pA
		More than 1 nA up to 100 nA		0.020 %
		More than 100 nA up to 100 μA		0.002 0 %
		More than 0.1 mA up to 1 mA		10 ppm＋0.015 μA
		More than 1 mA up to 10 mA		10 ppm＋0.15 μA
		More than 10 mA up to 100 mA		10 ppm＋2.0 μA
		More than 0.1 A up to 1 A		30 ppm＋0.010 mA
		More than 1 A up to 30 A		35 ppm＋0.15 mA
		More than 30 A less than 150 A		0.7% ＋ 0.3 A
		From 150 A up to 1000 A		0.7% ＋ 1 A
	Direct Current Standard Shunt	0.5 Ω	From 1 A up to 2 A	0.000 20 Ω
		0.2 Ω	From 1 A up to 5 A	0.000 10 Ω
		0.1 Ω	10 A, 8 A, 6 A, 4 A, 2 A, 1 A	0.000 004 0 Ω
			More than 1 A less than 2 A	0.000 025 Ω
			More than 2 A less than 4 A	
			More than 4 A less than 6 A	
			More than 6 A less than 8 A	
			More than 8 A less than 10 A	
		0.05 Ω	From 2 A up to 20 A	0.000 030 Ω
		0.02 Ω	From 5 A up to 50 A	0.000 015 Ω
		0.01 Ω	100 A, 60 A, 50 A,40 A, 30 A, 20 A, 10 A	0.000 000 80 Ω
			More than 10 A less than 20 A	0.000 005 5 Ω
			More than 20 A less than 30 A	
			More than 30 A less than 40 A	
			More than 40 A less than 50 A	
			More than 50 A less than 60 A	
			More than 60 A less than 100 A	
		0.001 Ω	From 10 A up to 100 A	0.000 001 0 Ω

#All Calibration Procedures are in-house procedures developed by this laboratory.

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Direct Current & Low Frequency Measuring Equipment, etc.	AC Voltage Source	From 10 mV up to 20 mV	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz	0.005 mV
		More than 20 mV up to 60 mV	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz	0.025 %
		More than 60 mV up to 200 mV	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz	0.015 %
		More than 200 mV up to 600mV	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz	95 ppm
		From 300 mV up to 600 mV	10 kHz	95 ppm
		300 mV, 600 mV	100 kHz	0.015 %
		More than 600 mV up to 200 V	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz, 10 kHz	50 ppm
		1 V, 2 V, 6 V, 10 V,20 V 60 V, 100 V, 200 V	100 kHz	0.010 %
		600 V	100 kHz	0.040 %
		More than 200 V up to 1000 V	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz, 10 kHz	60 ppm
		More than 1 kV up to 1.9 kV	50 Hz, 60 Hz	0.004 0 kV
		More than 1.9 kV up to 10 kV	50 Hz, 60 Hz	0.020 kV
	AC Voltage Measuring Equipment	From 10 mV up to 20 mV	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz	0.005 mV
		More than 20 mV up to 60 mV	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz	0.025 %
		More than 60 mV up to 200 mV	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz	0.015 %
		More than 200 mV up to 600 mV	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz	95 ppm
		From 300 mV up to 600 mV	10 kHz	95 ppm
		300 mV, 600 mV	100 kHz	0.015 %
		More than 600 mV up to 200 V	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz, 10 kHz	50 ppm
		1 V, 2 V, 6 V, 10 V,20 V 60 V, 100 V, 200 V	100 kHz	0.010 %
		600 V	100 kHz	0.040 %
		More than 200 V up to 1000 V	40 Hz, 50 Hz, 60 Hz, 400 Hz, 1 kHz, 10 kHz	60 ppm
		More than 1 kV up to 2 kV	50 Hz, 60 Hz	0.07 % + 0.8 V
		More than 2 kV up to 10 kV	50 Hz, 60 Hz	0.07 % + 4 V
		More than 10 kV up to 30 kV	50 Hz, 60 Hz	0.14 %＋8 V

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Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Direct Current & Low Frequency Measuring Equipment, etc.	Alternating Current Source	From 100 μA up to 1 mA	50 Hz, 60 Hz	0.30 μA
		More than 0.001 A up to 0.006 A	50 Hz, 60 Hz	0.025 %＋0.1 μA
		More than 0.006 A less than 0.01 A	50 Hz, 60 Hz	0.025 %＋0.5 μA
		From 0.01 A up to 0.02 A	50 Hz, 60 Hz	0.015 %＋0.3 μA
		More than 0.02 A up to 0.2 A	50 Hz, 60 Hz	0.015 %＋3 μA
		More than 0.2 A up to 2 A	50 Hz, 60 Hz	0.028 %＋0.03 mA
		More than 2 A up to 10 A	50 Hz, 60 Hz	0.038 %＋0.2 mA
		More than 10 A up to 20 A	50 Hz, 60 Hz	0.045 %＋0.5 mA
		More than 20 A up to 60 A	50 Hz, 60 Hz	0.045 %＋1 mA
	Alternating Current Measuring Equipment	From 100 μA up to 1 mA	50 Hz, 60 Hz	0.50 μA
		More than 0.001 A less than 0.01 A	50 Hz, 60 Hz	0.030 %＋0.5 μA
		From 0.01 A up to 0.02 A	50 Hz, 60 Hz	0.015 %＋0.3 μA
		More than 0.02 A up to 0.2 A	50 Hz, 60 Hz	0.015 %＋3 μA
		More than 0.2 A up to 2 A	50 Hz, 60 Hz	0.028 %＋0.03 mA
		More than 2 A up to 10 A	50 Hz, 60 Hz	0.038 %＋0.2 mA
		More than 10 A up to 20 A	50 Hz, 60 Hz	0.15 %
		More than 20 A up to 60 A	50 Hz, 60 Hz	0.18 %＋0.01 A
		More than 60 A up to 100 A	50 Hz, 60 Hz	0.2 %
		More than 100 A less than 150 A	50 Hz, 60 Hz	0.7 %＋0.3 A
		From 150 A up to 1000 A	50 Hz, 60 Hz	0.7 %＋1 A

#All Calibration Procedures are in-house procedures developed by this laboratory.

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Direct Current& Low Frequency Measuring Equipment, etc.	Temperature Indicator	Thermocouple B, with Reference Junction	From 291 μV up to 13820 μV (From 250 ˚C up to 1820 ˚C)	4 μV
		Thermocouple R, with Reference Junction	From -226 μV up to 21103 μV (From -50 ˚C up to 1768.1 ˚C)	4 μV
		Thermocouple S, with Reference Junction	From -236 μV up to 18694 μV (From -50 ˚C up to 1768.1 ˚C)	4 μV
		Thermocouple N, with Reference Junction	From -3990 μV up to 47513 μV (From -200 ˚C up to 1300 ˚C)	20 μV
		Thermocouple K, with Reference Junction	From -5891 μV up to 54886 μV (From -200 ˚C up to 1372 ˚C)	21 μV
		Thermocouple E, with Reference Junction	From -8825 μV up to 76373 μV (From -200 ˚C up to 1000 ˚C)	25 μV
		Thermocouple J, with Reference Junction	From -8095 μV up to 69553 μV (From -210 ˚C up to 1200 ˚C)	23 μV
		Thermocouple T, with Reference Junction	From -5603 μV up to 20872 μV (From -200 ˚C up to 400 ˚C)	22 μV
		Thermocouple B, without Reference Junction	From 291 μV up to 13820 μV (From 250 ˚C up to 1820 ˚C)	2 μV
		Thermocouple R, without Reference Junction	From -226 μV up to 21103 μV (From -50 ˚C up to 1768.1 ˚C)	2 μV
		Thermocouple S, without Reference Junction	From -236 μV up to 18694 μV (From -50 ˚C up to 1768.1 ˚C)	2 μV
		Thermocouple N, without Reference Junction	From -3990 μV up to 47513 μV (From -200 ˚C up to 1300 ˚C)	4 μV
		Thermocouple K, without Reference Junction	From -5891 μV up to 54886 μV (From -200 ˚C up to 1372 ˚C)	4 μV
		Thermocouple E, without Reference Junction	From -8825 μV up to 76373 μV (From -200 ˚C up to 1000 ˚C)	6 μV
		Thermocouple J, without Reference Junction	From -8095 μV up to 69553 μV (From -210 ˚C up to 1200 ˚C)	5 μV
		Thermocouple T, without Reference Junction	From -5603 μV up to 20872 μV (From -200 ˚C up to 400 ˚C)	5 μV
		Resistance thermometer Sensor : Pt100	From 18.52 Ω up to 390.48Ω (From -200 ˚C up to 850 ˚C)	0.010 Ω
		Resistance thermometer Sensor : JPt100	From 17.14 Ω up to 317.28 Ω (From -200 ˚C up to 600 ˚C)	0.010 Ω

#All Calibration Procedures are in-house procedures developed by this laboratory.

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Direct Current& Low Frequency Measuring Equipment, etc.	Temperature Indicator calibration equipment	Thermocouple B, with Reference Junction	From 291 μV up to 13820 μV (From 250 ˚C up to 1820 ˚C)	4 μV
		Thermocouple R, with Reference Junction	From -226 μV up to 21103 μV (From -50 ˚C up to 1768.1 ˚C)	4 μV
		Thermocouple S, with Reference Junction	From -236 μV up to 18694 μV (From -50 ˚C up to 1768.1 ˚C)	4 μV
		Thermocouple N, with Reference Junction	From -3990 μV up to 47513 μV (From -200 ˚C up to 1300 ˚C)	20 μV
		Thermocouple K, with Reference Junction	From -5891 μV up to 54886 μV (From -200 ˚C up to 1372 ˚C)	21 μV
		Thermocouple E, with Reference Junction	From -8825 μV up to 76373 μV (From -200 ˚C up to 1000 ˚C)	25 μV
		Thermocouple J, with Reference Junction	From -8095 μV up to 69553 μV (From -210 ˚C up to 1200 ˚C)	23 μV
		Thermocouple T, with Reference Junction	From -5603 μV up to 20872 μV (From -200 ˚C up to 400 ˚C)	22 μV
		Thermocouple B, without Reference Junction	From 291 μV up to 13820 μV (From 250 ˚C up to 1820 ˚C)	2 μV
		Thermocouple R, without Reference Junction	From -226 μV up to 21103 μV (From -50 ˚C up to 1768.1 ˚C)	2 μV
		Thermocouple S, without Reference Junction	From -236 μV up to 18694 μV (From -50 ˚C up to 1768.1 ˚C)	2 μV
		Thermocouple N, without Reference Junction	From -3990 μV up to 47513 μV (From -200 ˚C up to 1300 ˚C)	2 μV
		Thermocouple K, without Reference Junction	From -5891 μV up to 54886 μV (From -200 ˚C up to 1372 ˚C)	2 μV
		Thermocouple E, without Reference Junction	From -8825 μV up to 76373 μV (From -200 ˚C up to 1000 ˚C)	2 μV
		Thermocouple J, without Reference Junction	From -8095 μV up to 69553 μV (From -210 ˚C up to 1200 ˚C)	2 μV
		Thermocouple T, without Reference Junction	From -5603 μV up to 20872 μV (From -200 ˚C up to 400 ˚C)	2 μV
		Resistance thermometer Sensor: Pt100	From 18.52 Ω up to 390.48Ω (From -200 ˚C up to 850 ˚C)	0.010 Ω
		Resistance thermometer Sensor: JPt100	From 17.14 Ω up to 317.28 Ω (From -200 ˚C up to 600 ˚C)	0.010 Ω

#All Calibration Procedures are in-house procedures developed by this laboratory.

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Electric Power Measuring Equipment, etc.	AC Voltage Transformer	50 Hz, 60 Hz (Input voltage is from 5 % up to 120% of the rated voltage)	Primary voltage 110 V , 220 V, 440 V 1 100 V, 2 200 V 3 300 V	Ratio error 0.02 % Phase angle 0.6’
		50 Hz, 60 Hz (Input voltage is from 5 % up to 120% of the rated voltage)	Primary voltage 6 600 V, 11 000 V 22 000 V, 33 000 V	Ratio error 0.02 % Phase angle 0.8’
		50 Hz, 60 Hz (Input voltage is from 5 % up to 120% of the rated voltage)	Primary voltage 66 kV, 77 kV, 110 kV	Ratio error 0.03 % Phase angle 0.8’
		50 Hz, 60 Hz (Input voltage is from 5 % up to 120% of the rated voltage)	Primary voltage 110／√3 kV 154／√3 kV 187／√3 kV	Ratio error 0.04 % Phase angle 0.8’
		50 Hz, 60 Hz (Input voltage is from 5 % up to 110% of the rated voltage)	Primary voltage 220／√3 kV	Ratio error 0.04 % Phase angle 0.8’
	Alternating Current Transformer	50 Hz, 60 Hz (Input current is from 2.5 % up to 120% of the rated current)	Primary current From 0.1 A up to 200 A 250 A, 300 A	Ratio error 0.02 % Phase angle 0.6’
		50 Hz, 60 Hz (Input current is from 2.5 % up to 120% of the rated current)	Primary current 400 A, 500 A, 600 A 750 A, 800 A, 1000 A 1200 A, 1500 A, 2000 A 2500 A, 3000 A, 4000 A	Ratio error 0.02 % Phase angle 0.9’

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Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range			Expanded Uncertainty (Level of Confidence Approximately 95 %)
Electric Power Measuring Equipment, etc.	Power Meter	From 10 V up to 300 V From 250 mA up to 30 A 50 Hz, 60 Hz Power factor, whole range			0.28 mW/VA ～ 0.32 mW/VA (Appendix 1)
	Reactive Power Meter	From 10 V up to 300 V From 250 mA up to 30 A 50 Hz, 60 Hz Power factor, whole range			0.30 mvar/VA ～ 0.38 mvar/VA (Appendix 1)
	Energy Meter	110 V, 100 V 5 A 50 Hz, 60 Hz	Three phase three wire *include a unbalanced load	Power factor 1 Power factor 0.866 lag* Power factor 0.866 lead* Power factor 0.5 lag Power factor 0.5 lead *110V only	0.02 %
			Single phase three wire *include a unbalanced load	Power factor 1 Power factor 0.5 lag Power factor 0.5 lead	
			Single phase two wire	Power factor 1 Power factor 0.5 lag Power factor 0.5 lead	

#All Calibration Procedures are in-house procedures developed by this laboratory.

Appendix 1

Category	Range						Expanded Uncertainty (Level of Confidence Approximately 95 %)
	Type	Phase wire	Frequency	Voltage	Current	Power factor	
Power Meter	Active Power	Single phase two wire	50 Hz 60 Hz	100 V	5 A	1	0.30 mW/VA
						0.5 lag	0.28 mW/VA
						0.5 lead	0.28 mW/VA
						0 lag	0.28 mW/VA
						0 lead	0.28 mW/VA
				300 V	5 A	1	0.31 mW/VA
				100 V	0.5 A	1	0.32 mW/VA
		Single phase three wire	50 Hz 60 Hz	100 V	5 A	1	0.29 mW/VA
		Three phase three wire	50 Hz 60 Hz	100 V	5 A	1	0.29 mW/VA
Reactive Power Meter	Reactive power	Single phase two wire	50 Hz 60 Hz	100 V	5 A	1	0.30 mvar/VA
						0.5 lag	0.30 mvar/VA
						0.5 lead	0.30 mvar/VA
						0 lag	0.30 mvar/VA
						0 lead	0.30 mvar/VA
				300 V	5 A	0 lag	0.38 mvar/VA
				100 V	0.5 A	0 lag	0.32 mvar/VA
		Single phase three wire	50 Hz 60 Hz	100 V	5 A	0 lag	0.30 mvar/VA
		Three phase three wire	50 Hz 60 Hz	100 V	5 A	0 lag	0.30 mvar/VA

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Low Frequency Impedance Measuring Equipment, etc.	AC Resistor	0.01 Ω, 0.02 Ω, 0.05 Ω	50 Hz, 60 Hz	0.042 %
		0.1 Ω, 0.2 Ω	50 Hz, 60 Hz	0.032 %
		1 Ω, 10 Ω	50 Hz, 60 Hz	0.020 %
		100 Ω	50 Hz, 60 Hz	0.016 %
	AC Resistance Measuring Equipment	10 mΩ	1 kHz	0.04 mΩ
		100 mΩ	1 kHz	0.13 mΩ
		1 Ω	1 kHz	0.004 7 Ω
		10 Ω	1 kHz	0.030 Ω
		100 Ω	1 kHz	0.16 Ω
		1 kΩ	1 kHz	0.001 6 kΩ
		10 kΩ	1 kHz	0.016 kΩ
		100 kΩ	1 kHz	0.17 kΩ
		From 0.001 Ω up to 2 Ω (From 3 A up to 60 A)	50 Hz, 60 Hz	0.5 % + 0.001 Ω

#All Calibration Procedures are in-house procedures developed by this laboratory.

Laboratory's permanent facility/On-site Calibration: On-site Calibration
Calibration and Measurement Capabilities

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)
Direct Current & Low Frequency Measuring Equipment, etc.	DC Resistance Measuring Equipment	1 mΩ	0.000 30 mΩ
		10 mΩ	0.003 0 mΩ
		100 mΩ	0.030 mΩ
		1 Ω	0.000 30 Ω
		More than 1 Ω less than 10 kΩ	0.050 % (lower limit 10 mΩ)
		10 Ω	0.002 0 Ω
		More than 10 Ω less than 100 Ω	0.050 % (lower limit 10 mΩ)
		100 Ω	0.020 Ω
		More than 100 Ω less than 1 kΩ	0.050 % (lower limit 10 mΩ)
		1 kΩ	0.000 20 kΩ
		More than 1 kΩ less than 10 kΩ	0.050 % (lower limit 10 mΩ)
		10 kΩ	0.002 0 kΩ
		More than 10 kΩ less than 100 kΩ	0.10 %
		100 kΩ	0.020 k Ω
		More than 100 kΩ less than 1 MΩ	0.10 %
		1 MΩ	0.000 20 MΩ
		More than 1 MΩ less than 10 MΩ	0.20 %
		10 MΩ	0.006 0 MΩ
		More than 10 MΩ less than 100 MΩ	1.0 %
		100 MΩ	0.40 MΩ
		More than 100 MΩ up to 190 MΩ	2 .0 MΩ
		More than 190 MΩ up to 2 000 MΩ	1.0 %
	DC Voltage Source	From 0 V up to 100 mV	0.006 % + 0.005 mV
		More than 0.1 V up to 1 V	0.005 % + 0.000 01 V
		More than 1 V up to 10 V	0.005 % + 0.000 1 V
		More than 10 V up to 100 V	0.006 % + 0.001 V
		More than 100 V up to 1 000 V	0.006 % + 0.02 V
		More than1 kV up to 1.9 kV	0.004 kV
		More than 1.9 kV up to 10 kV	0.02 kV
	DC Voltage Measuring Equipment	From 0 V up to 100 mV	0.004 % + 0.005 mV
		More than 0.1 V up to 1 V	0.004 % + 0.000 01 V
		More than 1 V up to 10 V	0.004 % + 0.000 1 V
		More than 10 V up to 100 V	0.005 % + 0.001 V
		More than 100 V up to 1 000 V	0.005 % + 0.01 V
	DC Voltage Ratio Measuring Equipment	From 0 mV/V up to 10 mV/V	0.003 2 mV/V
	Direct Current Source	From 0 μA up to 30 A	0.10 % (lower limit 0.05 μA)
	Direct Current Measuring Equipment	From 0 μA up to 10 A	0.10 % (lower limit 0.05 μA)
		More than 10 A less than 16.5 A	0.7 % + 0.03 A
		From 16.5 A less than 150 A	0.7 % + 0.3 A
		From 150 A up to 1000 A	0.7 % + 1 A

	AC Voltage Source	From 10 mV up to 40 mV	50 Hz, 60 Hz, 400 Hz, 1 kHz	0.10 mV
		More than 40 mV up to 1 000 V	50 Hz, 60 Hz, 400 Hz, 1 kHz	0.20 %
		More than 1 kV up to 1.9 kV	50 Hz, 60 Hz	0.004 kV
		More than 1.9 kV up to 10 kV	50 Hz, 60 Hz	0.02 kV
	AC Voltage Measuring Equipment	From 10 mV up to 1 000 V	50 Hz, 60 Hz, 400 Hz, 1 kHz	0.10 % (lower limit 0.10 mV)
	Alternating Current Source	From 100 μA up to 1 mA	50 Hz, 60 Hz	1.5 μA
		More than 1 mA up to 60 A	50 Hz, 60 Hz	0.20 %
	Alternating Current Measuring Equipment	From 100 μA up to 1 mA	50 Hz, 60 Hz	1.5 μA
		More than 1 mA up to 10 A	50 Hz, 60 Hz	0.30 %
		More than 10 A up to 60 A	50 Hz, 60 Hz	0.50 %
		More than 60 A less than 150 A	50 Hz, 60 Hz	0.7 % + 0.3 A
		From 150 A up to 1000 A	50 Hz, 60 Hz	0.7 % + 1 A

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Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Direct Current & Low Frequency Measuring Equipment, etc.	Temperature Indicator	Thermocouple B, with Reference Junction	From 291 μV up to 13820 μV (From 250 ˚C up to 1820 ˚C)	10 μV
		Thermocouple R, with Reference Junction	From -226 μV up to 21103 μV (From -50 ˚C up to 1768.1 ˚C)	10 μV
		Thermocouple S, with Reference Junction	From -236 μV up to 18694 μV (From -50 ˚C up to 1768.1 ˚C)	10 μV
		Thermocouple N, with Reference Junction	From -3990 μV up to 47513 μV (From -200 ˚C up to 1300 ˚C)	22 μV
		Thermocouple K, with Reference Junction	From -5891 μV up to 54886 μV (From -200 ˚C up to 1372 ˚C)	23 μV
		Thermocouple E, with Reference Junction	From -8825 μV up to 76373 μV (From -200 ˚C up to 1000 ˚C)	27 μV
		Thermocouple J, with Reference Junction	From -8095 μV up to 69553 μV (From -210 ˚C up to 1200 ˚C)	25 μV
		Thermocouple T, with Reference Junction	From -5603 μV up to 20872 μV (From -200 ˚C up to 400 ˚C)	24 μV
		Thermocouple B, without Reference Junction	From 291 μV up to 13820 μV (From 250 ˚C up to 1820 ˚C)	10 μV
		Thermocouple R, without Reference Junction	From -226 μV up to 21103 μV (From -50 ˚C up to 1768.1 ˚C)	10 μV
		Thermocouple S, without Reference Junction	From -236 μV up to 18694 μV (From -50 ˚C up to 1768.1 ˚C)	10 μV
		Thermocouple N, without Reference Junction	From -3990 μV up to 47513 μV (From -200 ˚C up to 1300 ˚C)	11 μV
		Thermocouple K, without Reference Junction	From -5891 μV up to 54886 μV (From -200 ˚C up to 1372 ˚C)	12 μV
		Thermocouple E, without Reference Junction	From -8825 μV up to 76373 μV (From -200 ˚C up to 1000 ˚C)	14 μV
		Thermocouple J, without Reference Junction	From -8095 μV up to 69553 μV (From -210 ˚C up to 1200 ˚C)	13 μV
		Thermocouple T, without Reference Junction	From -5603 μV up to 20872 μV (From -200 ˚C up to 400 ˚C)	12 μV
		Resistance thermometer Sensor: Pt100	From 18.52 Ω up to 390.48 Ω (From -200 ˚C up to 850 ˚C)	0.10 Ω
		Resistance thermometer Sensor: JPt100	From 17.14 Ω up to 317.28 Ω (From -200 ˚C up to 600 ˚C)	0.10 Ω

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Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Direct Current& Low Frequency Measuring Equipment, etc.	Temperature Indicator calibration equipment	Thermocouple B, with Reference Junction	From 291 μV up to 13820 μV (From 250 ˚C up to 1820 ˚C)	10 μV
		Thermocouple R, with Reference Junction	From -226 μV up to 21103 μV (From -50 ˚C up to 1768.1 ˚C)	10 μV
		Thermocouple S, with Reference Junction	From -236 μV up to 18694 μV (From -50 ˚C up to 1768.1 ˚C)	10 μV
		Thermocouple N, with Reference Junction	From -3990 μV up to 47513 μV (From -200 ˚C up to 1300 ˚C)	22 μV
		Thermocouple K, with Reference Junction	From -5891 μV up to 54886 μV (From -200 ˚C up to 1372 ˚C)	23 μV
		Thermocouple E, with Reference Junction	From -8825 μV up to 76373 μV (From -200 ˚C up to 1000 ˚C)	27 μV
		Thermocouple J, with Reference Junction	From -8095 μV up to 69553 μV (From -210 ˚C up to 1200 ˚C)	25 μV
		Thermocouple T, with Reference Junction	From -5603 μV up to 20872 μV (From -200 ˚C up to 400 ˚C)	24 μV
		Thermocouple B, without Reference Junction	From 291 μV up to 13820 μV (From 250 ˚C up to 1820 ˚C)	10 μV
		Thermocouple R, without Reference Junction	From -226 μV up to 21103 μV (From -50 ˚C up to 1768.1 ˚C)	10 μV
		Thermocouple S, without Reference Junction	From -236 μV up to 18694 μV (From -50 ˚C up to 1768.1 ˚C)	10 μV
		Thermocouple N, without Reference Junction	From -3990 μV up to 47513 μV (From -200 ˚C up to 1300 ˚C)	11 μV
		Thermocouple K, without Reference Junction	From -5891 μV up to 54886 μV (From -200 ˚C up to 1372 ˚C)	12 μV
		Thermocouple E, without Reference Junction	From -8825 μV up to 76373 μV (From -200 ˚C up to 1000 ˚C)	14 μV
		Thermocouple J, without Reference Junction	From -8095 μV up to 69553 μV (From -210 ˚C up to 1200 ˚C)	13 μV
		Thermocouple T, without Reference Junction	From -5603 μV up to 20872 μV (From -200 ˚C up to 400 ˚C)	12 μV
		Resistance thermometer Sensor : Pt100	From 18.52 Ω up to 390.48 Ω (From -200 ˚C up to 850 ˚C)	0.10 Ω
		Resistance thermometer Sensor : JPt100	From 17.14 Ω up to 317.28 Ω (From -200 ˚C up to 600 ˚C)	0.10 Ω

#All Calibration Procedures are in-house procedures developed by this laboratory.

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Low Frequency Impedance Measuring Equipment, etc.	AC Resistance Measuring Equipment	10 mΩ	1 kHz	0.04 mΩ
		100 mΩ	1 kHz	0.13 mΩ
		1 Ω	1 kHz	0.004 7 Ω
		10 Ω	1 kHz	0.030 Ω
		100 Ω	1 kHz	0.16 Ω
		1 kΩ	1 kHz	0.001 6 kΩ
		10 kΩ	1 kHz	0.016 kΩ
		100 kΩ	1 kHz	0.17 kΩ
		From 0.001 Ω up to 2 Ω (From 3 A up to 60 A)	50 Hz, 60 Hz	0.5 % + 0.001 Ω

#All Calibration Procedures are in-house procedures developed by this laboratory.

General Field of Calibration: Temperature

Date of Initial Accreditation of the Field: 2019-08-01

Laboratory's permanent facility/On-site Calibration: Laboratory's permanent facility

Calibration and Measurement Capabilities

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Contact Type Thermometer	Temperature sensors with display unit (Comparison calibration)	From -40 °C less than 0 °C		0.15 °C
		From 0 °C up to 250 °C		0.050 °C
		Equipped within temperature controlled enclosures	From -40 °C up to 200 °C	0.25 °C
	Thermometer calibration equipment	From -40 °C up to 250 °C		0.060 °C
	Thermocouple (Comparison calibration)	0 °C		0.4 °C (*1)
		More than 0 °C up to 1 100 °C		0.7 °C (*1)

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(*1) Temperature converted from Electromotive Force (EMF)

Laboratory's permanent facility/On-site Calibration: On-site Calibration

Calibration and Measurement Capabilities

Calibration Procedures# and Type of Instruments/Materials to be calibrated		Range		Expanded Uncertainty (Level of Confidence Approximately 95 %)
Contact Type Thermometer	Temperature sensors with display unit (Comparison calibration)	From -40 °C up to 250 °C		0.15 °C
		Equipped within temperature controlled enclosures	From -40 °C up to 200 °C	0.25 °C
	Thermometer calibration equipment	From -40 °C up to 250 °C		0.060 °C

#All Calibration Procedures are in-house procedures developed by this laboratory.