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LABORATORY LOCATION/ CENTRAL OFFICE:	Metrology Division, Nusantara Technologies Sdn. Bhd. No 9, Jalan Sungai Jerluh 32/196 Bukit Kemuning Seksyen 32 40460 Shah Alam, Selangor , 40460, SELANGOR MALAYSIA
ACCREDITED SINCE :	07 NOVEMBER 2025
FIELD(S) OF CALIBRATION:	PRESSURE MASS TORQUE ELECTRICAL (TIME AND FREQUENCY) DIMENSIONAL (TIME AND FREQUENCY) HEAT & TEMPERATURE ELECTRICAL

This laboratory has demonstrated its technical competence to operate in accordance with MS ISO/IEC 17025:2017 (ISO/IEC 17025:2017).

This laboratory's fulfillment of the requirements of ISO/IEC 17025 means the 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. The management system requirements in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001 (see Joint ISO-ILAC-IAF Communiqué dated April 2017).

*** The uncertainty covered by the CMC is expressed as the expanded uncertainty corresponding to a coverage probability of approximately 95 % and have a coverage factor of k=2 unless stated otherwise.**

CENTRAL LOCATION	Metrology Division, Nusantara Technologies Sdn. Bhd. No 9, Jalan Sungai Jerluh 32/196 Bukit Kemuning Seksyen 32 40460 Shah Alam, Selangor , 40460, Selangor
FIELD(S) OF CALIBRATION :	PRESSURE, MASS, TORQUE, ELECTRICAL, DIMENSIONAL, HEAT & TEMPERATURE, ELECTRICAL

SCOPE OF CALIBRATION : PRESSURE

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Pressure Gauge pressure Recorder pressure Measuring Device	Hydraulic 10 psi to 16000 psi (100 kPa to 120000 kPa) (0.689 bar to 1102 bar) 16000 psi to 36000 psi	0.03 % of reading 47 psi	Calibration procedure: NTMET-CP-01P Reference standard: BS EN 837-1:1998
	Pneumatic 0 to 30 psi 30 to 300 psi 300 to 3000 psi	0.02 psi 0.2 psi 3 psi	Calibration procedure: NTMET-CP-01P Reference standard: BS EN 837-1:1998
Vacuum Gauge	0 to -13.7 psi (0 to -0.95 bar)	0.2 psi	Calibration procedure: NTMET-CP-01P Reference standard: BS EN 837-1:1998

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SCOPE OF CALIBRATION : MASS

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
1. Standard Weights	1g 2g 5g 10g 20g 50g 100g 200g 500g 1kg 2kg 5kg 10kg 20kg	75mg 75mg 79mg 0.11mg 0.11mg 0.79mg 0.80mg 0.82mg 6.9mg 6.9mg 11mg 13mg 26mg 39mg	Calibrate by comparison against reference standard weights based on OIML R-111- 2:2004

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SCOPE OF CALIBRATION : TORQUE

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Torque Tool Device	0 to 100 Nm Above 100 Nm to 400 Nm Above 400 Nm to 800 Nm Above 800 Nm to 1500 Nm	0.5 Nm 1.4 Nm 4.8 Nm 8.9 Nm	Calibrate using torque calibrator with reference to ISO 6789-1:2017

SCOPE OF CALIBRATION : ELECTRICAL (TIME AND FREQUENCY)

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Measuring Instrument Stop Watch	5 s to 3600 s	0.07 s	Calibration using Keysight 53131A Universal Counter
Measuring Instrument Timer	5 s to 3600 s	0.16 s	Comparison method using Precision Timer

SCOPE OF CALIBRATION : ELECTRICAL

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Measuring Instrument Stop Watch	5 s to 3600 s	0.07 s	Calibration using Keysight 53131A Universal Counter
Measuring Instrument Timer	5 s to 3600 s	0.16 s	Comparison method using Precision Timer

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SCOPE OF CALIBRATION : DIMENSIONAL (TIME AND FREQUENCY)

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Caliper (external)	Up to 150 mm 150.1 mm to 300 mm 300.1 mm to 600 mm	6 µm 7 µm 10 µm	Calibrated by using caliper checker and gauge block as standards with reference to JIS B 7507:2022
External Micrometer	Up to 25 mm 25.1 mm to 125 mm 125.1 mm to 200 mm 200.1 mm to 275 mm	1 µm 2 µm 3 µm 4 µm	Calibrated by using gauge block as standards with reference to JIS B 7502:2016
Dial Gauge	Up to 100 mm (resolution: 0.01 mm) Up to 5 mm (resolution: 0.001 mm) Up to 5 mm (resolution: 0.005 mm)	3 µm 0.5 µm 2 µm	Calibrated by using i-checker as standards with reference to JIS B 7503:2017
Dial Test Indicator	Up to 1 mm	0.5 µm	Calibrated by using i-checker as standards with reference to JIS B 7533:2015
Height Gauge	Up to 100 mm 100.1 mm to 300 mm 300.1 mm to 600 mm	7 µm 8 µm 11 µm	Calibrated by using caliper checker and gauge block as standards with reference to JIS B 7517:2018
Steel Ruler	Up to 1000mm	0.1 mm	Calibrated by using Tape and Scale Measuring Machine as standards with reference to JIS B 7516:2005
Measuring Tape	Up to 10000 mm Up to 18000 mm Up to 30000 mm	0.2 mm 0.4 mm 0.5 mm	Calibrated by using Tape and Scale Measuring Machine as standards with reference to JIS B 7512:2018, JIS B 7522:2016

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Coating Thickness Gauge	23 µm to 1020µm	3.1 mm	Calibrated by using Thickness foil
Holtest	Up to 50 mm 50.1 mm to 100 mm 100.1 mm to 175mm	2 mm 3 µm 7 µm	Calibrated by using Master Ring Gauge as Standards with reference to DIN 863-4 :1999
Thickness Gauge	Up to 5mm Resolution: 0.002mm Up to 50 mm Resolution: 0.01mm	0.5mm 3mm	Calibrated by using gauge block as standards with reference to JIS B 7519:1994
Digital Indicator	Up to 50mm	0.7 µm	Calibrated by using I-Checker as standards with reference to ASME B89.1.10M-2001
Inclinometer	Up to 90 degree	0.0006 degree	Calibrated using angle block
Ultrasonic Thickness Gauge	Up to 100 mm	0.006 mm	Calibrate by using step wedge with reference to ASTM E797/E797M-21

SCOPE OF CALIBRATION : HEAT & TEMPERATURE

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Temperature Sensors With Indicators	-20 °C to 150 °C above 150 °C to 600 °C above 600 °C to 800 °C above 800 °C to 1200 °C	0.09 °C 0.4 °C 3.4 °C 4.5 °C	By comparison method using SPRT with Thermometer Readout / Field / Metrology Well / Furnace / Thermocouple Type R
Temperature Sensors Without Indicators	-20 °C to 150 °C 150 °C to 600 °C Above 600 °C to 800 °C Above 800°C to 1200°C	0.2 °C 0.4 °C 3.4 °C 4.6 °C	By comparison method using SPRT with Thermometer Readout / Field Metrology Well / Furnace / BEAMEX MC2
Radiation Thermometer	15 °C to 0 °C 0 °C to 119°C 120 °C to 199 °C 200 °C to 299 °C 300 °C to 500 °C	0.5 °C 0.7 °C 1.0 °C 1.6 °C 2.1 °C	Calibrated by using Infrared Calibrator based on ASTME 1256:2017
Temperature Measurement By Electrical Simulation A) Type T	-250 °C to 0 °C Above 0 °C to 400 °C	0.08 °C 0.07 °C	Calibration by Electrical Simulation using Temperature Calibrator with reference to ITS 90 Table
Temperature Measurement By Electrical Simulation B) Type E	-250 °C to 1000 °C	0.07 °C	Calibration by Electrical Simulation using Temperature Calibrator with reference to ITS 90 Table
Temperature Measurement By Electrical Simulation C) Type K	200 °C to 0 °C Above 0 °C to 1370 °C	0.08 °C 0.09 °C	Calibration by Electrical Simulation using Temperature Calibrator with reference to ITS 90 Table
Temperature Measurement By Electrical Simulation D) Type R	-20 °C to 0 °C Above 0 °C to 1760 °C	0.7 °C 0.6 °C	Calibration by Electrical Simulation using Temperature Calibrator with reference to ITS 90 Table

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±)*	Remarks
Temperature Measurement By Electrical Simulation E) Type J	210 °C to 0 °C Above 0 °C to 1200 °C	0.07 °C 0.08 °C	Calibration by Electrical Simulation using Temperature Calibrator with reference to ITS 90 Table
Temperature Measurement By Electrical Simulation F) Type S	-20 °C to 0 °C Above 0 °C to 1760 °C	0.7 °C 0.6 °C	Calibration by Electrical Simulation using Temperature Calibrator with reference to ITS 90 Table
Temperature Measurement By Electrical Simulation G) Type B	600 °C to 1800 °C	0.7 °C	Calibration by Electrical Simulation using Temperature Calibrator with reference to ITS 90 Table
Temperature Measurement By Electrical Simulation H) Type N	-200 °C to 0 °C Above 0 °C to 1300 °C	0.09 °C 0.1 °C	Calibration by Electrical Simulation using Temperature Calibrator with reference to ITS 90 Table
Temperature Measurement By Electrical Simulation I) Pt 100	-200 °C to 800 °C	0.1 °C	Calibration by Electrical Simulation using Temperature Calibrator with reference to ITS 90 Table
Temperature Generation By Electrical Simulation A) Type T	-250 °C to 400 °C	0.2 °C	Calibration by Electrical measurement using Digital Multimeter with reference to ITS 90
Temperature Generation By Electrical Simulation B) Type E	-250 °C to 0 °C Above 0 °C to 1000 °C	0.1 °C 0.2 °C	Calibration by Electrical measurement using Digital Multimeter with reference to ITS 90 table
Temperature Generation By Electrical Simulation C) Type K	-200 °C to 0 °C Above 0 °C to 1370 °C	0.2 °C 0.2 °C	Calibration by Electrical measurement using Digital Multimeter with reference to ITS 90 table

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Temperature Generation By Electrical Simulation D) Type R	-20 °C to 0 °C Above 0 °C to 1760 °C	0.9 °C 0.5 °C	Calibration by Electrical measurement using Digital Multimeter with reference to ITS 90
Temperature Generation By Electrical Simulation E) Type J	-210 °C to 0 °C Above 0 °C to 1200 °C	0.1 °C 0.2 °C	Calibration by Electrical measurement using Digital Multimeter with reference to ITS 90
Temperature Generation By Electrical Simulation F) Type S	-20 °C to 0 °C Above 0 °C to 1760 °C	0.9 °C 0.5 °C	Calibration by Electrical measurement using Digital Multimeter with reference to ITS 90
Temperature Generation By Electrical Simulation G) Type B	600 °C to 1100 °C Above 1100 °C to 1800 °C	1.1 °C 0.9 °C	Calibration by Electrical measurement using Digital Multimeter with reference to ITS 90
Temperature Generation By Electrical Simulation H) Type N	-200 °C to 1300 °C	0.2 °C	Calibration by Electrical measurement using Digital Multimeter with reference to ITS 90
Temperature Generation By Electrical Simulation I) Pt 100	200 °C to 0 °C Above 0 °C to 800 °C	0.2 °C 0.3 °C	Calibration by Electrical measurement using Digital Multimeter with reference to ITS 90
Liquid In Glass Thermometer (total Immersion)	-10 °C to 100 °C	0.3 °C	Comparison method using SPRT / PRT in Liquid Bath and Temperature Calibrator
Liquid In Glass Thermometer (partial Immersion)	-10°C to 100 °C	0.4 °C	Comparison method using SPRT / PRT in Liquid Bath and Temperature Calibrator
Temperature And Humidity Indicator	-20 °C to 0 °C Above 0 °C to 190 °C Relative Humidity at 25 °C	1.1 °C 3.6 °C	Comparison method using PRT in Chamber

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
	20 %rh to 95 %rh	3.6 %rh	Comparison method using Thermohygrometer in Chamber

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SCOPE OF CALIBRATION : ELECTRICAL (TIME AND FREQUENCY)

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±)*	Remarks
Measuring Instrument A) Dc Voltage	(± polarity) 0 to 329.9 mV 330 mV to 3.299 V 3.3 V to 32.99 V 33 V to 329.99 V 330 V to 1020 V	26 µV/V + 1.5 µV 14 µV/V + 4.1 µV 15 µV/V + 39 µV 21 µV/V + 0.5 mV 22 µV/V + 2 mV	Generation using calibrator Fluke 5522A
Measuring Instrument B) Ac Voltage	1 mV to 1000 V	See Matrix A	Generation using calibrator Fluke 5522A
Measuring Instrument C) Resistance	0 to 10.9 ? 10.9 ? to 33 ? 33 ? to 109 ? 109 ? to 330 ? 330 ? to 1.09 k? 1.09 k? to 3.3 k? 3.3 k? to 10.9 k? 10.9 k? to 33 k? 33 k? to 109 k? 109 k? to 330 k? 330k to 1.09 M? 1.09 M? to 3.3 M? 3.3 M? to 10.9 M? 10.9 M? to 33 M? 33 M? to 109 M? 109 M? to 330 M? 330 M? to 1090 M?	150 µ?/? + 1.1 m? 86 µ?/? + 1.3 m? 47 µ?/? + 1.7 m? 39 µ?/? + 1.8 m? 35 µ?/? + 2.7 m? 39 µ?/? + 8.9 m? 35 µ?/? + 32 m? 39 µ?/? + 95 m? 35 µ?/? + 0.33 ? 44 µ?/? + 0.74 ? 39 µ?/? + 0.28 ? 0.08 m?/? + 0.28 ? 0.15 m?/? + 0.73 ? 0.38 m?/? + 0.18 k? 0.60 m?/? + 0.43 k? 3.9 m?/? + 96 k? 18 m?/? + 0.56 M?	Generation using calibrator Fluke 5522A and using decade resistance box
Measuring Instrument D) Capacitance	220 pF to 399.9 pF 0.4 nF to 1.0999 nF 1.1 nF to 3.2999 nF 3.3 nF to 10.999 nF 11 nF to 32.999 nF 33 nF to 109.99 nF 110 nF to 329.99 nF 0.33 µF to 1.0999 µF 1.1 µF to 3.2999 µF 3.3 µF to 10.999 µF 11 µF to 32.999 µF 33 µF to 109.99 µF 110 µF to 329.99 µF 0.33 mF to 1.099 mF 1.1 mF to 3.299 mF 3.3 mF to 10.999 mF 11 mF to 32.999 mF 33 mF to 110 mF	37 mF/F + 13 pF 17 mF/F + 13 pF 9.6 mF/F + 12 pF 4.0 mF/F + 14 pF 3.4 mF/F + 17 pF 3.2 mF/F + 25 pF 3.0 mF/F + 46 pF 4.0 mF/F + 1.1 nF 4.2 mF/F + 2.7 nF 4.0 mF/F + 5.6 nF 5.9 mF/F + 29 nF 6.5 mF/F + 88 nF 6.4 mF/F + 0.31 µF 6.2 mF/F + 1.2 µF 6.1 mF/F + 3.5 µF 6.2 mF/F + 11 µF 9.5 mF/F + 34 µF 14 mF/F + 0.12 mF	Generation using calibrator Fluke 5522A

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Measuring Instrument E) Frequency	0 to 199.99 Hz 120 Hz to 1199.9 Hz 1.2 kHz to 11.99 kHz 12 kHz to 119.9 kHz 120 kHz to 500 kHz	0.61 µHz/Hz + 24 µHz 0.13 µHz/Hz + 13 µHz 1.1 µHz/Hz + 13 mHz 58 µHz/Hz + 0.58 mHz 1.1 µHz/Hz + 0.58 Hz	Generation using calibrator Fluke 5522A
Measuring Instrument F) Dc Current	0 to 329 µA 329 µA to 3.29 mA 3.29 mA to 32.9 mA 32.9 mA to 329 mA 0.33 A to 2.99 A 3.0 A to 20.5 A	0.24 mA/A + 23 nA 0.13 mA/A + 67 nA 0.21 mA/A + 5.1 µA 0.13 mA/A + 3.8 µA 0.45 mA/A + 76 mA 1.2 mA/A + 0.86 mA	Generation using calibrator Fluke 5522A
Measuring Instrument G) Ac Current	29 µA to 20.5 A	(see Matrix B)	Generation using calibrator Fluke 5522A
Measuring Instrument Capacitance	100 Hz & 120 Hz 1 uF to10 uF 10 uF to 100 uF 100 uF to 1 mF 1 mF to 10 mF 1000 Hz 10 pF to 100 pF 100 pF to 1 nF 1 nF to 10 nF 10 nF to100 nF 100 nF to 1 uF 1 uF to10 uF 10 uF to 100 uF 100 uF to1 mF 1 mF to 10 mF	3 mF/F + 15 nF 3 mF/F + 0.2 uF 3 mF/F + 1.5 uF 3 mF/F + 15 uF 6 mF/F + 0.6 pF 1.4 mF/F + 0.6 pF 1.2 mF/F + 0.05 pF 0.6 mF/F + 0.01 nF 0.6 mF/F + 0.1 nF 0.6 mF/F + 0.8 nF 3 mF/F + 0.2 uF 3 mF/F + 1.5 uF 3 mF/F + 15 uF	Calibration using Decade Capacitance IET HACS-Z-A6F:10pF and 4 Terminal Standard Capacitor IET1417-9700
Measuring Instrument Fixed Value	10 pF 100 pF	0.01 F/F 0.01 F/F	Calibration using Standard Capacitor IET SCA-10 pF and IET SCA-100 pF
Measuring Instrument Inductance	1000 Hz 100 uH to 1 mH 1 mH to 10 mH 10 mH to 100 mH 100 mH to 1 H 1 H to 10 H	23 mHz/H + 22 nH 12 mH/H + 25 uH 6 mH/H + 0.1 mH 3 mH/H + 0.4 mH 3 mH/H + 0.3 mH	Calibration using Decade Inductor 1491-G
Measuring Instrument Resistance Fixed Value	0.001 ? 0.01 ? 0.1 ? 1 ? 10 ?	57 u?/? 57 u?/? 57 u?/? 23 u?/? 11 u?/?	Calibration using IET SRX 0.001, 0.01, 0.1, 1, 10

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Measuring Instrument High Current Resistance Fixed Value	0.0001 ? 0.001 ? 0.01 ?	2.9 m?/? 2.9 m?/? 2.9 m?/ ?	Calibration using Megger 249003, 249004, 249005
Measuring Instrument High Current Resistance	0.001 ? 0.01 ? 0.1 ? 1 ? 10 ? 100 ?	0.15 ?/ ? 0.06 ?/ ? 0.06 ?/ ? 0.06 ?/ ? 0.06 ?/ ? 0.06 ?/ ?	Calibration using Valhalla 2575A
Current Clamp Dc Current (50 Turn Coil)	10 A to 16 A 16 A to 150 A 150 A to 1000 A	0.40 mA/A + 5.6 mA 0.59 mA/A + 49 mA 1.3 mA/A + 0.33 A	Generation using Fluke 5522A with Fluke 5500A coil
Current Clamp Ac Current (50 Turn Coil)	10 A to 16 A 45 Hz to 65 Hz 65 Hz to 440 Hz 16 A to 150 A 45 Hz to 65 Hz 65 Hz to 440 Hz 150 A to 1000 A 45 Hz to 65 Hz 65 Hz to 440 Hz	3.6 mA/A + 4.6 mA 9.7 mA/A + 1.5 mA 3.7 mA/A + 42 mA 10 mA/A + 47 mA 3.6 mA/A + 0.3 A 15 mA/A + 0.26 A	Generation using Fluke 5522A with Fluke 5500A coil
Insulation Resistance	0.1 ? to 10 ? 10 ? to 100 ? 100 ? to 1 k? 1 k? to 10 k? 10 k? to 100 k? 100 k? to 1 M? 1 M? to 10 M? 10 M? to 100 M? 100 M? to 1 G? 1 G? to 10 G? 10 G? to 100 G? 100 G? to 1 T? 1 T? to 10 T?	58 m?/? + 18 m? 81 m?/? + 80 m? 0.58 m?/? + 0.57 ? 0.81 m?/? + 5.2 ? 0.80 m?/? + 51 ? 2.3 m?/? + 0.29 k? 2.3 m?/? + 2.9 k? 2.4 m?/? + 51 k? 1.3 m?/? + 0.41 M? 3.1 m?/? + 2.3 M? 6.6 m?/? + 12 M? 7.5 m?/? + 0.11 G? 37 m?/? + 0.22 G?	Direct Measurement using Yokogawa 2793-01,2793-03 and IET HRRS5kV and IET HRRS-10kV High Voltage- High Resistance Decade Substituter
Sourcing/generating Instrument A) Dc Voltage	0 to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	0.12 mV/V + 7.3 µV 79 µV/V + 55 µV 74 µV/V + 0.54 mV 83 µV/V + 5.6 mV 86 µV/V + 29 mV	Measuring using Fluke 8845A
Sourcing/generating Instrument B) Ac Voltage	See Matrix C		Measuring using Fluke 8845A

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Sourcing/generating Instrument C) Resistance	10 ? to 100 ? 100 ? to 1 k? 1 k? to 10 k? 10 k? to 100 k? 100 k? to 1 M? 1 M? to 10 M? 10 M? to 100 M?	0.16 m?/? + 5.9 m? 0.13 m?/? + 25 m? 0.13 m?/? + 0.25 ? 0.13 m?/? + 2.5 ? 1.1 m?/? + 1.1 k? 1.2 m?/? + 11 k? 9.3 m?/? + 49 k?	Measuring using Fluke 8845A
Sourcing/generating Instrument D) Dc Current	0 to 100 µA 100 µA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A	0.92 mA/A + 42 nA 0.85 mA/A + 0.53 µA 0.80 mA/A + 2.5 µA 0.63 mA/A + 9.6 µA 1.0 mA/A + 0.51 mA 1.9 mA/A + 3.0 mA	Measuring using Fluke 8845A
Sourcing/generating Instrument E) Ac Current	see Matrix D		Measuring using Fluke 8845A
Sourcing/generating Instrument F) Frequency	0 to 5 Hz 5 Hz to 10 Hz 10 Hz to 40 Hz 40 Hz to 300 kHz	1.6 mHz/Hz + 5.2 mHz 0.80 mHz/Hz + 4.5 mHz 0.37 mHz/Hz + 4.6 mHz 3.2 mHz/Hz + 0.95 kHz	Measuring using Fluke 8845A
Sourcing/generating Instrument Dc Current	0 to 10 A 10 A to 100 A 100 A to 500 A	0.6 mA/A + 0.01 A 0.6 mA/A + 0.06 A 3 mA/A + 4 mA	Calibration using Megger 249003, 249004, 249005 and Valhalla 2575A
	0 to 10 µA 10 µA to 100 µA 100 µA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A	0.2 mA/A + 2 nA 37 µA/A + 2 nA 30 µA/A + 6 nA 30 µA/A + 52 nA 47 µA/A + 0.6 µA 0.1 mA/A + 5 µA	Calibration using HP 3458A and Fluke 8845A
Sourcing/generating Instrument Ac Current	1000 Hz: 0 to 10 A 10 A to 100 A 5000 Hz: 0 to 10 A 10 A to 100 A 10000 Hz: 0 to 10 A 10 A to 100 A	1.3 mA/A + 0.01 A 1.1 mA/A + 0.1 A 1.3 mA/A + 0.01 A 1.1 mA/A + 0.1 A 1.3 mA/A + 0.01 A 1.1 mA/A + 0.1 A	Calibration using Valhalla 2575A

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	See Matrix F		Calibration using HP 3458A and Fluke 8845A
Sourcing/generating Instrument Dc Voltage	0 to 100 mV 0.1 V to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	14 µV/V + 0.5 µV 10 µV/V + 1.3 µV 10 µV/V + 6 µV 12 µV/V + 0.1 mV 12 µV/V + 0.9 mV	Calibration using HP 3458A and Fluke 8845A
Sourcing/generating Instrument Ac Voltage	See Matrix E		Calibration using HP 3458A and Fluke 8845A
Sourcing/generating Instrument Resistance	0 to 10 ? 10 ? to 100 ? 100 ? to 1000 ? 1 k? to 10 k? 10 k? to 100 k? 100 k? to 1000 k? 1000 k? to 1 M? 1 M? to 10 M?	24 µ?/? + 87 µ? 20 µ?/? + 0.7 m? 12 µ?/? + 1.9 m? 12 µ?/? + 0.2 m? 13 µ? + 0.4 ? 22 µ?/? + 10 ? 70 m?/? + 192 ? 0.6 ?/? + 3.6 k?	Calibration using HP 3458A and Fluke 8845A
High Voltage Generation A) Dc Voltage	0.5 kV to 10 kV	6.0 mV/V + 5.5 mV	Measuring using Kikusui 149-10A High Voltage meter
High Voltage Generation B) Ac Voltage At 50 Hz	0.5 kV to 10 kV	12 mV/V + 13 mV	Measuring using Kikusui 149-10A High Voltage meter
Oscilloscope Vertical Deflection Dc Signal	50 ? Load 0 to 2.49 mV 2.49 mV to 9.9 mV 9.9 mV to 24.9 mV 24.9 mV to 109.9 mV 109.9 mV to 499 mV 499 mV to 2.19 V 2.19 V to 6.6 V	20 mV/V + 46 µV 7.5 mV/V + 46 µV 4.7 mV/V + 45 µV 3.3 mV/V + 46 µV 3 mV/V + 41 µV 2.9 mV/V + 72 µV 3.1 mV/V + 3 mV	Calibration using Fluke 5522A SC600

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
	1 M? Load 0 to 1.25 mV 1.25 mV to 2.5 mV 2.5 mV to 6.25 mV 6.25mV to 10 mV 10 mV to 17.5 mV 17.5 mV to 25 mV 25 mV to 67.5 mV 67.5 mV to 110 mV 0.11 to 0.305 V 0.305 V to 0.5 V 0.5 V to 1.35 V 1.35 V to 2.2 V 2.2 V to 6.6 V 6.6 V to 11 V 11 V to 70.5 V 70.5 V to 130 V	37 mV/V + 46 µV 19 mV/V + 46 µV 8 mV/V + 46 µV 5 mV/V + 46 µV 3.2 mV/V + 46 µV 2.4 mV/V + 46 µV 1.2 mV/V 46 µV 1.1 mV/V + 21 µV 0.7 mV/V + 63 µV 0.7 mV/V + 56 µV 0.6 mV/V + 52 µV 0.6 mV/V + 0.3 mV 0.6 mV/V + 0.2 mV 0.6 mV/V + 0.11 mV 0.6 mV/V + 2.4 mV 0.7 mV/V + 41 mV	Calibration using Fluke 5522A SC600
Square Wave Peak To Peak Voltage	50 ? Load 0 to 1 mV 1 mV to 2 mV 2 mV to 5 mV 5 mV to 10 mV 10 mV to 20 mV 20 mV to 50 mV 50 mV to 100 V 100 mV to 200 mV 0.2 V to 0.5 V 0.5 V to 1 V 1 V to 2 V 2 V to 6.6 V	49 mV/V + 46 µV 26 mV/V + 46 µV 12 mV/V + 46 µV 7.4 mV/V + 46 µV 5.1 mV/V + 46 µV 3.8 mV/V + 48 µV 3.3 mV/V + 42 µV 3.1 mV/V + 60 µV 3 mV/V + 53 µV 2.9 mV/V + 58 µV 2.9 mV/V + 0.1 mV 2.9 mV/V + 0.2 mV	Calibration using Fluke 5522A SC600
	1 M? Load 0 to 1 mV 1 mV to 10 mV 10 mV to 25 mV 25 mV to 110 mV 110 mV to 200 mV 0.2 mV to 0.5 V 0.5 V to 2.2 V 2.2 V to 11 V 11 V to 130 V	42 mV/V + 46 uV 5.7 mV/V + 46 uV 3 mV/V + 46 uV 1.6 mV/V + 47 uV 1.4 mV/V + 57 uV 1.7 mV/V + 0.5 mV 1.2 mV/V + 0.2 mV 1.1 mV/V + 0.1mV 1.2 mV/V + 33 mV	Calibration using Fluke 5522A SC600
Bandwidth Frequency	50 kHz to 500 kHz 500 kHz to 5 MHz 5 MHz to 50 MHz 50 MHz to 600 MHz	3.1 µHz/Hz + 0.4 Hz 12 µHz/Hz + 56 Hz 12 µHz/Hz + 0.6 kHz 12 µHz/Hz + 6 kHz	Calibration using Fluke 5522A SC600

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Rise Time	250 ps Nominal 1 kHz to 10 MHz 250 mV to 2.5 V pp into 50 Ohm	0.6 ns	Calibration using Fluke 5522A SC600
Time Marker	50 -.¦ Load: 2 ns to 5 ns 5 ns to 10 ns 10 ns to 20 ns 20 ns to 50 ns 50 ns to 100 ns 100 ns to 10 µs 10 µs to 20 µs 20 µs to 50 µs 50 µs to 1 ms 1 ms to 10 ms 10 ms to 20 ms 20 ms to 50 ms 50 ms to 2 s 2 s to 5 s	0.1 ms/s + 0.6 ps 60 µs/s + 0.6 ps 0.3 ms/s + 6 ps 0.1 ms/s + 6 ps 60 µs/s + 6 ps 6.3 µs/s + 55 ps 30 µs/s + 0.6 ns 0.2 ms/s + 11 ns 6.6 µs/s + 6 ns 6.3 µs/s + 55 ns 28 µs/s + 0.6 µs 11 µs/s + 0.6 µs 5.2 ms/s + 28 ms 11 µs/s + 11 ms	Calibration using Fluke 5522A SC600

SCOPE OF CALIBRATION : ELECTRICAL

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Measuring Instrument A) Dc Voltage	(± polarity) 0 to 329.9 mV 330 mV to 3.299 V 3.3 V to 32.99 V 33 V to 329.99 V 330 V to 1020 V	26 µV/V + 1.5 µV 14 µV/V + 4.1 µV 15 µV/V + 39 µV 21 µV/V + 0.5 mV 22 µV/V + 2 mV	Generation using calibrator Fluke 5522A
Measuring Instrument B) Ac Voltage	1 mV to 1000 V	See Matrix A	Generation using calibrator Fluke 5522A

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Measuring Instrument C) Resistance	0 to 10.9 ? 10.9 ? to 33 ? 33 ? to 109 ? 109 ? to 330 ? 330 ? to 1.09 k? 1.09 k? to 3.3 k? 3.3 k? to 10.9 k? 10.9 k? to 33 k? 33 k? to 109 k? 109 k? to 330 k? 330k to 1.09 M? 1.09 M? to 3.3 M? 3.3 M? to 10.9 M? 10.9 M? to 33 M? 33 M? to 109 M? 109 M? to 330 M? 330 M? to 1090 M?	150 µ?/? + 1.1 m? 86 µ?/? + 1.3 m? 47 µ?/? + 1.7 m? 39 µ?/? + 1.8 m? 35 µ?/? + 2.7 m? 39 µ?/? + 8.9 m? 35 µ?/? + 32 m? 39 µ?/? + 95 m? 35 µ?/? + 0.33 ? 44 µ?/? + 0.74 ? 39 µ?/? + 0.28 ? 0.08 m?/? + 0.28 ? 0.15 m?/? + 0.73 ? 0.38 m?/? + 0.18 k? 0.60 m?/? + 0.43 k? 3.9 m?/? + 96 k? 18 m?/? + 0.56 M?	Generation using calibrator Fluke 5522A and using decade resistance box
Measuring Instrument D) Capacitance	220 pF to 399.9 pF 0.4 nF to 1.0999 nF 1.1 nF to 3.2999 nF 3.3 nF to 10.999 nF 11 nF to 32.999 nF 33 nF to 109.99 nF 110 nF to 329.99 nF 0.33 µF to 1.0999 µF 1.1 µF to 3.2999 µF 3.3 µF to 10.999 µF 11 µF to 32.999 µF 33 µF to 109.99 µF 110 µF to 329.99 µF 0.33 mF to 1.099 mF 1.1 mF to 3.299 mF 3.3 mF to 10.999 mF 11 mF to 32.999 mF 33 mF to 110 mF	37 mF/F + 13 pF 17 mF/F + 13 pF 9.6 mF/F + 12 pF 4.0 mF/F + 14 pF 3.4 mF/F + 17 pF 3.2 mF/F + 25 pF 3.0 mF/F + 46 pF 4.0 mF/F + 1.1 nF 4.2 mF/F + 2.7 nF 4.0 mF/F + 5.6 nF 5.9 mF/F + 29 nF 6.5 mF/F + 88 nF 6.4 mF/F + 0.31 µF 6.2 mF/F + 1.2 µF 6.1 mF/F + 3.5 µF 6.2 mF/F + 11 µF 9.5 mF/F + 34 µF 14 mF/F + 0.12 mF	Generation using calibrator Fluke 5522A
Measuring Instrument E) Frequency	0 to 199.99 Hz 120 Hz to 1199.9 Hz 1.2 kHz to 11.99 kHz 12 kHz to 119.9 kHz 120 kHz to 500 kHz	0.61 µHz/Hz + 24 µHz 0.13 µHz/Hz + 13 µHz 1.1 µHz/Hz + 13 mHz 58 µHz/Hz + 0.58 mHz 1.1 µHz/Hz + 0.58 Hz	Generation using calibrator Fluke 5522A

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Measuring Instrument F) Dc Current	0 to 329 µA 329 µA to 3.29 mA 3.29 mA to 32.9 mA 32.9 mA to 329 mA 0.33 A to 2.99 A 3.0 A to 20.5 A	0.24 mA/A + 23 nA 0.13 mA/A + 67 nA 0.21 mA/A + 5.1 µA 0.13 mA/A + 3.8 µA 0.45 mA/A + 76 mA 1.2 mA/A + 0.86 mA	Generation using calibrator Fluke 5522A
Measuring Instrument G) Ac Current	29 µA to 20.5 A	(see Matrix B)	Generation using calibrator Fluke 5522A
Measuring Instrument Capacitance	100 Hz & 120 Hz 1 uF to10 uF 10 uF to 100 uF 100 uF to 1 mF 1 mF to 10 mF 1000 Hz 10 pF to 100 pF 100 pF to 1 nF 1 nF to 10 nF 10 nF to100 nF 100 nF to 1 uF 1 uF to10 uF 10 uF to 100 uF 100 uF to1 mF 1 mF to 10 mF	3 mF/F + 15 nF 3 mF/F + 0.2 uF 3 mF/F + 1.5 uF 3 mF/F + 15 uF 6 mF/F + 0.6 pF 1.4 mF/F + 0.6 pF 1.2 mF/F + 0.05 pF 0.6 mF/F + 0.01 nF 0.6 mF/F + 0.1 nF 0.6 mF/F + 0.8 nF 3 mF/F + 0.2 uF 3 mF/F + 1.5 uF 3 mF/F + 15 uF	Calibration using Decade Capacitance IET HACS-Z-A6F:10pF and 4 Terminal Standard Capacitor IET1417-9700
Measuring Instrument Fixed Value	10 pF 100 pF	0.01 F/F 0.01 F/F	Calibration using Standard Capacitor IET SCA-10 pF and IET SCA-100 pF
Measuring Instrument Inductance	1000 Hz 100 uH to 1 mH 1 mH to 10 mH 10 mH to 100 mH 100 mH to 1 H 1 H to 10 H	23 mHz/H + 22 nH 12 mH/H + 25 uH 6 mH/H + 0.1 mH 3 mH/H + 0.4 mH 3 mH/H + 0.3 mH	Calibration using Decade Inductor 1491-G
Measuring Instrument Resistance Fixed Value	0.001 ? 0.01 ? 0.1 ? 1 ? 10 ?	57 u?/? 57 u?/? 57 u?/? 23 u?/? 11 u?/?	Calibration using IET SRX 0.001, 0.01, 0.1, 1, 10
Measuring Instrument High Current Resistance Fixed Value	0.0001 ? 0.001 ? 0.01 ?	2.9 m?/? 2.9 m?/? 2.9 m?/ ?	Calibration using Megger 249003, 249004, 249005

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Measuring Instrument High Current Resistance	0.001 ? 0.01 ? 0.1 ? 1 ? 10 ? 100 ?	0.15 ?/ ? 0.06 ?/ ? 0.06 ?/ ? 0.06 ?/ ? 0.06 ?/ ? 0.06 ?/ ?	Calibration using Valhalla 2575A
Current Clamp Dc Current (50 Turn Coil)	10 A to 16 A 16 A to 150 A 150 A to 1000 A	0.40 mA/A + 5.6 mA 0.59 mA/A + 49 mA 1.3 mA/A + 0.33 A	Generation using Fluke 5522A with Fluke 5500A coil
Current Clamp Ac Current (50 Turn Coil)	10 A to 16 A 45 Hz to 65 Hz 65 Hz to 440 Hz 16 A to 150 A 45 Hz to 65 Hz 65 Hz to 440 Hz 150 A to 1000 A 45 Hz to 65 Hz 65 Hz to 440 Hz	3.6 mA/A + 4.6 mA 9.7 mA/A + 1.5 mA 3.7 mA/A + 42 mA 10 mA/A + 47 mA 3.6 mA/A + 0.3 A 15 mA/A + 0.26 A	Generation using Fluke 5522A with Fluke 5500A coil
Insulation Resistance	0.1 ? to 10 ? 10 ? to 100 ? 100 ? to 1 k? 1 k? to 10 k? 10 k? to 100 k? 100 k? to 1 M? 1 M? to 10 M? 10 M? to 100 M? 100 M? to 1 G? 1 G? to 10 G? 10 G? to 100 G? 100 G? to 1 T? 1 T? to 10 T?	58 m?/? + 18 m? 81 m?/? + 80 m? 0.58 m?/? + 0.57 ? 0.81 m?/? + 5.2 ? 0.80 m?/? + 51 ? 2.3 m?/? + 0.29 k? 2.3 m?/? + 2.9 k? 2.4 m?/? + 51 k? 1.3 m?/? + 0.41 M? 3.1 m?/? + 2.3 M? 6.6 m?/? + 12 M? 7.5 m?/? + 0.11 G? 37 m?/? + 0.22 G?	Direct Measurement using Yokogawa 2793-01,2793-03 and IET HRRS5kV and IET HRRS-10kV High Voltage- High Resistance Decade Substituter
Sourcing/generating Instrument A) Dc Voltage	0 to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	0.12 mV/V + 7.3 µV 79 µV/V + 55 µV 74 µV/V + 0.54 mV 83 µV/V + 5.6 mV 86 µV/V + 29 mV	Measuring using Fluke 8845A
Sourcing/generating Instrument B) Ac Voltage	See Matrix C		Measuring using Fluke 8845A

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Sourcing/generating Instrument C) Resistance	10 ? to 100 ? 100 ? to 1 k? 1 k? to 10 k? 10 k? to 100 k? 100 k? to 1 M? 1 M? to 10 M? 10 M? to 100 M?	0.16 m?/? + 5.9 m? 0.13 m?/? + 25 m? 0.13 m?/? + 0.25 ? 0.13 m?/? + 2.5 ? 1.1 m?/? + 1.1 k? 1.2 m?/? + 11 k? 9.3 m?/? + 49 k?	Measuring using Fluke 8845A
Sourcing/generating Instrument D) Dc Current	0 to 100 µA 100 µA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A	0.92 mA/A + 42 nA 0.85 mA/A + 0.53 µA 0.80 mA/A + 2.5 µA 0.63 mA/A + 9.6 µA 1.0 mA/A + 0.51 mA 1.9 mA/A + 3.0 mA	Measuring using Fluke 8845A
Sourcing/generating Instrument E) Ac Current	see Matrix D		Measuring using Fluke 8845A
Sourcing/generating Instrument F) Frequency	0 to 5 Hz 5 Hz to 10 Hz 10 Hz to 40 Hz 40 Hz to 300 kHz	1.6 mHz/Hz + 5.2 mHz 0.80 mHz/Hz + 4.5 mHz 0.37 mHz/Hz + 4.6 mHz 3.2 mHz/Hz + 0.95 kHz	Measuring using Fluke 8845A
Sourcing/generating Instrument Dc Current	0 to 10 A 10 A to 100 A 100 A to 500 A	0.6 mA/A + 0.01 A 0.6 mA/A + 0.06 A 3 mA/A + 4 mA	Calibration using Megger 249003, 249004, 249005 and Valhalla 2575A
	0 to 10 µA 10 µA to 100 µA 100 µA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A	0.2 mA/A + 2 nA 37 µA/A + 2 nA 30 µA/A + 6 nA 30 µA/A + 52 nA 47 µA/A + 0.6 µA 0.1 mA/A + 5 µA	Calibration using HP 3458A and Fluke 8845A
Sourcing/generating Instrument Ac Current	1000 Hz: 0 to 10 A 10 A to 100 A 5000 Hz: 0 to 10 A 10 A to 100 A 10000 Hz: 0 to 10 A 10 A to 100 A	1.3 mA/A + 0.01 A 1.1 mA/A + 0.1 A 1.3 mA/A + 0.01 A 1.1 mA/A + 0.1 A 1.3 mA/A + 0.01 A 1.1 mA/A + 0.1 A	Calibration using Valhalla 2575A

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
	See Matrix F		Calibration using HP 3458A and Fluke 8845A
Sourcing/generating Instrument Dc Voltage	0 to 100 mV 0.1 V to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	14 µV/V + 0.5 µV 10 µV/V + 1.3 µV 10 µV/V + 6 µV 12 µV/V + 0.1 mV 12 µV/V + 0.9 mV	Calibration using HP 3458A and Fluke 8845A
Sourcing/generating Instrument Ac Voltage	See Matrix E		Calibration using HP 3458A and Fluke 8845A
Sourcing/generating Instrument Resistance	0 to 10 ? 10 ? to 100 ? 100 ? to 1000 ? 1 k? to 10 k? 10 k? to 100 k? 100 k? to 1000 k? 1000 k? to 1 M? 1 M? to 10 M?	24 µ?/? + 87 µ? 20 µ?/? + 0.7 m? 12 µ?/? + 1.9 m? 12 µ?/? + 0.2 m? 13 µ? + 0.4 ? 22 µ?/? + 10 ? 70 m?/? + 192 ? 0.6 ?/? + 3.6 k?	Calibration using HP 3458A and Fluke 8845A
High Voltage Generation A) Dc Voltage	0.5 kV to 10 kV	6.0 mV/V + 5.5 mV	Measuring using Kikusui 149-10A High Voltage meter
High Voltage Generation B) Ac Voltage At 50 Hz	0.5 kV to 10 kV	12 mV/V + 13 mV	Measuring using Kikusui 149-10A High Voltage meter
Oscilloscope Vertical Deflection Dc Signal	50 ? Load 0 to 2.49 mV 2.49 mV to 9.9 mV 9.9 mV to 24.9 mV 24.9 mV to 109.9 mV 109.9 mV to 499 mV 499 mV to 2.19 V 2.19 V to 6.6 V	20 mV/V + 46 µV 7.5 mV/V + 46 µV 4.7 mV/V + 45 µV 3.3 mV/V + 46 µV 3 mV/V + 41 µV 2.9 mV/V + 72 µV 3.1 mV/V + 3 mV	Calibration using Fluke 5522A SC600

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
	1 M? Load 0 to 1.25 mV 1.25 mV to 2.5 mV 2.5 mV to 6.25 mV 6.25mV to 10 mV 10 mV to 17.5 mV 17.5 mV to 25 mV 25 mV to 67.5 mV 67.5 mV to 110 mV 0.11 to 0.305 V 0.305 V to 0.5 V 0.5 V to 1.35 V 1.35 V to 2.2 V 2.2 V to 6.6 V 6.6 V to 11 V 11 V to 70.5 V 70.5 V to 130 V	37 mV/V + 46 µV 19 mV/V + 46 µV 8 mV/V + 46 µV 5 mV/V + 46 µV 3.2 mV/V + 46 µV 2.4 mV/V + 46 µV 1.2 mV/V 46 µV 1.1 mV/V + 21 µV 0.7 mV/V + 63 µV 0.7 mV/V + 56 µV 0.6 mV/V + 52 µV 0.6 mV/V + 0.3 mV 0.6 mV/V + 0.2 mV 0.6 mV/V + 0.11 mV 0.6 mV/V + 2.4 mV 0.7 mV/V + 41 mV	Calibration using Fluke 5522A SC600
Square Wave Peak To Peak Voltage	50 ? Load 0 to 1 mV 1 mV to 2 mV 2 mV to 5 mV 5 mV to 10 mV 10 mV to 20 mV 20 mV to 50 mV 50 mV to 100 V 100 mV to 200 mV 0.2 V to 0.5 V 0.5 V to 1 V 1 V to 2 V 2 V to 6.6 V	49 mV/V + 46 µV 26 mV/V + 46 µV 12 mV/V + 46 µV 7.4 mV/V + 46 µV 5.1 mV/V + 46 µV 3.8 mV/V + 48 µV 3.3 mV/V + 42 µV 3.1 mV/V + 60 µV 3 mV/V + 53 µV 2.9 mV/V + 58 µV 2.9 mV/V + 0.1 mV 2.9 mV/V + 0.2 mV	Calibration using Fluke 5522A SC600
	1 M? Load 0 to 1 mV 1 mV to 10 mV 10 mV to 25 mV 25 mV to 110 mV 110 mV to 200 mV 0.2 mV to 0.5 V 0.5 V to 2.2 V 2.2 V to 11 V 11 V to 130 V	42 mV/V + 46 uV 5.7 mV/V + 46 uV 3 mV/V + 46 uV 1.6 mV/V + 47 uV 1.4 mV/V + 57 uV 1.7 mV/V + 0.5 mV 1.2 mV/V + 0.2 mV 1.1 mV/V + 0.1mV 1.2 mV/V + 33 mV	Calibration using Fluke 5522A SC600
Bandwidth Frequency	50 kHz to 500 kHz 500 kHz to 5 MHz 5 MHz to 50 MHz 50 MHz to 600 MHz	3.1 µHz/Hz + 0.4 Hz 12 µHz/Hz + 56 Hz 12 µHz/Hz + 0.6 kHz 12 µHz/Hz + 6 kHz	Calibration using Fluke 5522A SC600

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Rise Time	250 ps Nominal 1 kHz to 10 MHz 250 mV to 2.5 V pp into 50 Ohm	0.6 ns	Calibration using Fluke 5522A SC600
Time Marker	50 -„¦ Load: 2 ns to 5 ns 5 ns to 10 ns 10 ns to 20 ns 20 ns to 50 ns 50 ns to 100 ns 100 ns to 10 µs 10 µs to 20 µs 20 µs to 50 µs 50 µs to 1 ms 1 ms to 10 ms 10 ms to 20 ms 20 ms to 50 ms 50 ms to 2 s 2 s to 5 s	0.1 ms/s + 0.6 ps 60 µs/s + 0.6 ps 0.3 ms/s + 6 ps 0.1 ms/s + 6 ps 60 µs/s + 6 ps 6.3 µs/s + 55 ps 30 µs/s + 0.6 ns 0.2 ms/s + 11 ns 6.6 µs/s + 6 ns 6.3 µs/s + 55 ns 28 µs/s + 0.6 µs 11 µs/s + 0.6 µs 5.2 ms/s + 28 ms 11 µs/s + 11 ms	Calibration using Fluke 5522A SC600

SITE LOCATION (HQ)	1. CATEGORY I
FIELD(S) OF CALIBRATION :	ELECTRICAL,ELECTRICAL (TIME AND FREQUENCY),HEAT & TEMPERATURE,MASS,PRESSURE

SCOPE OF CALIBRATION : PRESSURE

Material / Product Tested	**Type Of Test / Properties Measured / Range Of Measurement**	**Standard Test Methods / Equipment / Techniques**	**Remarks**
Pressure Measuring Device Hydraulic	0 psi to 2400 psi 2400 psi to 9000 psi 9000 psi to 36000 psi	1.8 psi 3.2 psi 47 psi	Calibrate by using pressure calibrator
Pressure Measuring Device Pneumatic	0 psi to 30 psi 30 psi to 300 psi 300 psi to 3000 psi	0.12 psi 0.6 psi 5 ps	Calibrate by using pressure calibrator
Pressure Measuring Device Vacuum	-13.7 psi to 0 psi (-0.95 bar to 0 bar)	0.2 psi (0.013 bar)	Calibrate by using pressure calibrator

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SCOPE OF CALIBRATION : MASS

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Weighing Balances / Scales	Up to 50 g Up to 100 g Up to 200 g Up to 500 g Up to 1 kg Up to 2 kg Up to 5 kg Up to 10 kg Up to 20 kg Up to 50 kg Up to 100 kg Up to 200 kg Up to 500 kg Up to 1000 kg	0.67 mg 0.82 mg 1.3 mg 0.0064 g 0.0083 g 0.013 g 0.064 g 0.082 g 0.13 g 0.64 g 60 g 66 g 0.11 kg 0.18 kg	Calibrate using Standard Weight Sets

SCOPE OF CALIBRATION : ELECTRICAL (TIME AND FREQUENCY)

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Measuring Instrument Timer	5 s to 3600 s	0.16 s	Comparison method using Precision Timer

SCOPE OF CALIBRATION : HEAT & TEMPERATURE

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Temperature Measurement By Electrical Simulation A) Type T	-250 °C to 0 °C Above 0 °C to 400 °C	0.5 °C 0.4 °C	Calibration using Fluke 754 with reference to ITS-90
Temperature Measurement By Electrical Simulation B) Type E	-250 °C to 0 °C Above 0 °C to 1000 °C	0.4 °C 0.3 °C	Calibration using Fluke 754 with reference to ITS-90
Temperature Measurement By Electrical Simulation C) Type K	-200 °C to 1300 °C	0.4 °C	Calibration using Fluke 754 with reference to ITS-90

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Temperature Measurement By Electrical Simulation D) Type R	-20 °C to 0 °C Above 0 °C to 1700 °C	1.7 °C 1.2 °C	Calibration using Fluke 754 with reference to ITS-90
Temperature Measurement By Electrical Simulation E) Type J	-210 °C to 0 °C Above 0 °C to 1100 °C	0.3 °C 0.4 °C	Calibration using Fluke 754 with reference to ITS-90
Temperature Measurement By Electrical Simulation F) Type S	-20 °C to 0 °C Above 0 °C to 1760 °C	1.7 °C 1.3 °C	Calibration using Fluke 754 with reference to ITS-90
Temperature Measurement By Electrical Simulation G) Type B	600 °C to 1800 °C	1.2 °C	Calibration using Fluke 754 with reference to ITS-90
Temperature Measurement By Electrical Simulation H) Pt 100	-100 °C to 0 °C Above 0 °C to 800 °C	0.1 °C 0.4 °C	Calibration using Fluke 754 with reference to ITS-90
Temperature Measurement By Electrical Simulation Temperature Sensor With Indicator	-20 °C to 150 °C Above 150 °C to 600 °C Above 600 °C to 800 °C Above 800 °C to 1100 °C	1.0 °C 3.1 °C 3.4 °C 4.6 °C	Calibration using RTD Pt-100 probe and Thermocouple Type R
Measuring Instruments Temperature Controlled Enclosures	-20 °C to 200 °C Above 200 °C to 600 °C Above 600 °C to 1200 °C	2.0 °C 4.6 °C 5.9 °C	Calibrate by using temperature recorder with thermocouple with reference to DKD-R 5-7

SCOPE OF CALIBRATION : ELECTRICAL

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Generating Instruments Dc Voltage	0.5 kV to 10 kV	6.0 mV/V + 5.5 mV	Calibration using Kikusui 149-10A
Generating Instruments Ac Voltage	0.5 kV to 10 kV	12 mV/V + 13 mV	Calibration using Kikusui 149-10A
Generating Instruments Dc Cutoff Current	0 to 100 µA 100 µA to 1 mA 1 mA to 10 mA 10 mA to 100 mA	0.92 mA/A 0.64 mA/A 0.80 mA/A 0.64 mA/A	Calibration using Fluke 8845A

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Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Generating Instruments Ac Cutoff Current	0 to 10 mA 10 mA to 100 mA	50 Hz & 1 kHz 2.5 mA/A 1.7 mA/A	Calibration using Fluke 8845A