

NO: SAMM 1035

Page: 1 of 15

LABORATORY LOCATION/ CENTRAL OFFICE: 	Symphony Systems Sdn. Bhd. Block B-G-23, Kompleks Suria Kinrara Persiaran Kinrara Sek 3 Taman Kinrara Sek. 3 47100 Puchong, Selangor , 47100, SELANGOR MALAYSIA
ACCREDITED SINCE :	18 MARCH 2025
FIELD(S) OF CALIBRATION:	ELECTRICAL HEAT & TEMPERATURE DIMENSIONAL

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	Symphony Systems Sdn. Bhd. Block B-G-23, Kompleks Suria Kinrara Persiaran Kinrara Sek 3 Taman Kinrara Sek. 3 47100 Puchong, Selangor , 47100, Selangor
FIELD(S) OF CALIBRATION :	ELECTRICAL, HEAT & TEMPERATURE, DIMENSIONAL

SCOPE OF CALIBRATION : ELECTRICAL

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Measuring Instrument A. Dc Voltage	0 mV to 220 mV 0.22 V to 2.2 V 2.2 V to 11 V 11 V to 22 V 22 V to 220 V 220 V to 1100 V	7.9 μ V/V 4.2 μ V/V 3.2 μ V/V 4.7 μ V/V 5.4 μ V/V 6.0 μ V/V	Generating using Calibrator model Fluke 5720A

Schedule

Issue date: 21 November 2024
Valid Until: 23 November 2029



NO: SAMM 1035

Page: 2 of 15

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Measuring Instrument B. Ac Voltage	0 V to 1020 V (See Matrix A)	(See Matrix A)	Generating using Calibrator model Fluke 5720A
Measuring Instrument C. Dc Current	0 mA to 220 mA 0.22 mA to 2.2 mA 2.2 mA to 22 mA 22 mA to 220 mA 0.22 A to 2.2 A 2.2 A to 3 A 3 A to 11 A 11 A to 20.5 A	59 μ A/A 39 μ A/A 49 μ A/A 83 μ A/A 69 μ A/A 320 μ A/A 450 μ A/A 820 μ A/A	Generating using Calibrator model Fluke 5520A
Measuring Instrument D. Ac Current	0 A to 20.5 A (See Matrix B)	(See Matrix B)	Generating using Calibrator model Fluke 5520A
Measuring Instrument E. Resistance (Fixed Value)	1 ? 1.9 ? 10 ? 19 ? 100 ? 190 ? 1 k? 1.9 k? 10 k? 19 k? 100 k? 190 k? 1 M? 1.9 M? 10 M? 19 M? 100 M?	77 μ - _{„I} 48 μ - _{„I} 0.21 m- _{„I} 0.25 m- _{„I} 1.2 m- _{„I} 2.0 m- _{„I} 11 m- _{„I} 20 m- _{„I} 0.11 - _{„I} 0.23 - _{„I} 1.2 - _{„I} 3.4 - _{„I} 19 - _{„I} 62 - _{„I} 0.45 k- _{„I} 1.6 k- _{„I} 15 k- _{„I}	Generated using Calibrator model Fluke 5720A

Scan this QR Code or visit <https://accreditation.ism.gov.my/public/listing/cab/samm-ct/3003531> for the current scope of accreditation

NO: SAMM 1035

Page: 3 of 15

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Measuring Instrument E. Resistance (variable Value)	0 Ω to 11 Ω 11 Ω to 33 Ω 33 Ω to 110 Ω 110 Ω to 330 Ω 0.33 k Ω to 1.1 k Ω 1.1 k Ω to 3.3 k Ω 3.3 k Ω to 11 k Ω 11 k Ω to 33 k Ω 33 k Ω to 110 k Ω 110 k Ω to 330 k Ω 0.33 M Ω to 1.1 M Ω 1.1 M Ω to 3.3 M Ω 3.3 M Ω to 11 M Ω 11 M Ω to 33 M Ω 33 M Ω to 110 M Ω 110 M Ω to 330 M Ω 330 M Ω to 1100 M Ω	160 $\mu\Omega$ / Ω 73 $\mu\Omega$ / Ω 37 $\mu\Omega$ / Ω 30 $\mu\Omega$ / Ω 26 $\mu\Omega$ / Ω 30 $\mu\Omega$ / Ω 26 $\mu\Omega$ / Ω 30 $\mu\Omega$ / Ω 26 $\mu\Omega$ / Ω 34 $\mu\Omega$ / Ω 29 $\mu\Omega$ / Ω 72 $\mu\Omega$ / Ω 110 $\mu\Omega$ / Ω 0.28 m Ω / Ω 0.42 m Ω / Ω 2.7 m Ω / Ω 13 m Ω / Ω	Generating using Calibrator model Fluke 5520A
Measuring Instrument F. Capacitance	0.2 nF to 0.4 nF 0.4 nF to 1.1 nF 1.1 nF to 3.3 nF 3.3 nF to 11 nF 11 nF to 33 nF 33 nF to 110 nF 110 nF to 330 nF 0.33 mF to 1.1 mF 1.1 mF to 3.3 mF 3.3 mF to 11 mF 11 mF to 33 mF 33 mF to 110 mF 110 mF to 330 mF 0.33 mF to 1.1 mF 1.1 mF to 3.3 mF 3.3 mF to 11 mF 11 mF to 33 mF 33 mF to 110 mF	3.7 mF/F 4.0 mF/F 4.1 mF/F 2.1 mF/F 2.0 mF/F 2.1 mF/F 3.0 mF/F 3.2 mF/F 3.1 mF/F 3.2 mF/F 4.2 mF/F 5.3 mF/F 4.6 mF/F 4.5 mF/F 4.5 mF/F 4.5 mF/F 6.8 mF/F 9.6 mF/F	Generating using Calibrator model Fluke 5520A
Measuring Instrument G. Frequency	0.01 Hz to 1200 kHz 1.2 MHz to 2 MHz 10 Hz to 1 MHz	0.068 mHz/Hz 0.35 mHz/Hz 0.079 mHz/Hz	Generating using Calibrator model Fluke 5720A
Measuring Instrument H. Dc Current(via Current Coil)	10 A to 16.5 A 16.5 A to 150 A 150 A to 1025 A	1.3 mA/A 1.2 mA/A 0.60 mA/A	Generating using Calibrator Fluke 5520 A with Fluke 5500A/Coil (50-Turn Coil)

NO: SAMM 1035

Page: 4 of 15

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Measuring Instrument I. Ac Current (via Current Coil)	(45 Hz to 65 Hz) 10 A to 16.5 A 16.5 A to 150 A 150 A to 1025 A (65 Hz to 440 Hz) 10 A to 16.5 A 16.5 A to 150 A 150 A to 1025 A	1.9 mA/A 2.1 mA/A 1.0 mA/A 2.0 mA/A 2.1 mA/A 1.1 mA/A	Generating using Calibrator Fluke 5520 A with Fluke 5500A/Coil (50-Turn Coil)
Sourcing/generating Instrument A. Dc Voltage	0 mV to 100 mV 0.1 V to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	8.9 μ V/V 3.3 μ V/V 1.5 μ V/V 2.9 μ V/V 3.3 μ V/V	Measurement using Multimeter HP 3458A
Sourcing/generating Instrument B. Ac Voltage	0 V to 1000 V (See Matrix C)	(See Matrix C)	Measurement using Multimeter HP 3458A
Sourcing/generating Instrument C. Dc Current	0 nA to 100 nA 0.1 μ A to 1 μ A 1 μ A to 10 μ A 10 μ A to 100 μ A 0.1 mA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 0.1 A to 1 A 1 A to 3 A	87 mA/A 8.7 mA/A 0.87 mA/A 0.057 mA/A 0.021 mA/A 0.019 mA/A 0.026 mA/A 0.038 mA/A 0.060 mA/A	Measurement using Multimeter Agilent 34401A
Sourcing/generating Instrument D. Ac Current	0 A to 3 A (See Matrix D)	(See Matrix D)	Measurement using Multimeter Agilent 34401A & HP 3458A
Sourcing/generating Instrument E. Resistance	0 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 k Ω 1 k Ω to 10 k Ω 10 k Ω to 100 k Ω 100 k Ω to 1 M Ω 1 M Ω to 10 M Ω 10 M Ω to 100 M Ω 100 M Ω to 1 G Ω	13 $\mu\Omega/\Omega$ 6.4 $\mu\Omega/\Omega$ 3.5 $\mu\Omega/\Omega$ 3.3 $\mu\Omega/\Omega$ 6.0 $\mu\Omega/\Omega$ 12 $\mu\Omega/\Omega$ 22 $\mu\Omega/\Omega$ 88 $\mu\Omega/\Omega$ 1.1 m Ω/Ω	Measurement using Multimeter HP 3458A
Sourcing/generating Instrument F. Frequency	1 Hz to 40 Hz 40 Hz to 1 MHz 1 MHz to 4 MHz	2.7 μ Hz/Hz 0.65 μ Hz/Hz 0.96 μ Hz/Hz	

NO: SAMM 1035

Page: 5 of 15

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Sourcing/generating Instrument G. Dc Current (via Current Shunt)	1 A to 10 A 10 A to 20 A 20 A to 30 A 30 A to 40 A 40 A to 50 A	23 μ A/A + 0.37 mA 31 μ A/A + 0.28 mA 35 μ A/A + 0.13 mA 35 μ A/A + 80 μ A 35 μ A/A + 50 μ A	Measurement using Multimeter through Current Shunt
Oscilloscope A. Voltage i) Dc Voltage Signal	50 Ω Load 0 V to 2.2 V 2.2 V to 6.6 V 1 M Ω Load 0 V to 2.2 V 2.2 V to 11 V 11 V to 130 V	2.0 mV/V 2.0 mV/V 0.42 mV/V 0.40 mV/V 0.40 mV/V	Fluke 5520A (SC600)
Oscilloscope A. Voltage ii) Square Wave Signal	50 Ω Load (at 1 kHz) 1 mV to 25 mV 25 mV to 110 mV 110 mV to 2.2 V 2.2 V to 6.6 V 1 M Ω Load (at 1 kHz) 1 mV to 25 mV 25 mV to 110 mV 110 mV to 2.2 V 2.2 V to 11 V 11 V to 130 V	5.4 mV/V 2.4 mV/V 2.0 mV/V 2.0 mV/V 4.2 mV/V 1.2 mV/V 0.88 mV/V 0.80 mV/V 0.79 mV/V	Fluke 5520A (SC600)
Oscilloscope B. Bandwidth Frequency	50 kHz to 1000 kHz 1 MHz to 600 MHz	2.0 μ Hz/Hz 2.0 μ Hz/Hz	Fluke 5520A (SC600)
Oscilloscope C. Time Base (50 Ω Load)	2 ns to 1000 ns 1 ms to 1000 ms 1 ms to 1000 ms 1 s to 5 s	2.0 μ s/s 2.0 μ s/s 2.0 μ s/s 2.0 μ s/s	Fluke 5520A (SC600)

NO: SAMM 1035

Page: 6 of 15

SCOPE OF CALIBRATION : HEAT & TEMPERATURE

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
1. Thermocouple Indicator A. Type K	-200 °C to -100 °C -100 °C to -25 °C -25 °C to 120 °C 120 °C to 1000 °C 1000 °C to 1372 °C	0.26 °C 0.15 °C 0.13 °C 0.21 °C 0.32 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
1. Thermocouple Indicator B. Type J	-210 °C to -100 °C -100 °C to -30 °C -30 °C to 150 °C 150 °C to 760 °C 760 °C to 1200 °C	0.21 °C 0.13 °C 0.11 °C 0.14 °C 0.18 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
1. Thermocouple Indicator C. Type T	-250 °C to -150 °C -150 °C to 0 °C 0 °C to 120 °C 120 °C to 400 °C	0.49 °C 0.19 °C 0.13 °C 0.11 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
1. Thermocouple Indicator D. Type S	0 °C to 250 °C 250 °C to 1400 °C 1400 °C to 1767 °C	0.37 °C 0.29 °C 0.36 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
1. Thermocouple Indicator E. Type E	-250 °C to -100 °C -100 °C to -25 °C -25 °C to 350 °C 350 °C to 650 °C 650 °C to 1000 °C	0.39 °C 0.13 °C 0.11 °C 0.13 °C 0.17 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
1. Thermocouple Indicator F. Type R	0 to 250 °C 250 to 400 °C 400 to 1000 °C 1000 to 1767 °C	0.45 °C 0.28 °C 0.26 °C 0.32 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
1. Thermocouple Indicator G. Type B	600 °C to 800 °C 800 °C to 1000 °C 1000 °C to 1550 °C 1550 °C to 1820 °C	0.35 °C 0.27 °C 0.24 °C 0.27 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
2. Rtd Indicator A. Pt100 (385)	-200 °C to 0 °C 0 °C to 100 °C 100 °C to 400 °C 400 °C to 630 °C 630 °C to 800 °C	0.05 °C 0.06 °C 0.08 °C 0.10 °C 0.18 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
2. Rtd Indicator B. Pt200 (385)	-200 °C to 100 °C 100 °C to 260 °C 260 °C to 300 °C 300 °C to 600 °C 600 °C to 630 °C	0.04 °C 0.05 °C 0.10 °C 0.11 °C 0.13 °C	By electrical simulation using Fluke 5520A and reference table ITS 90

NO: SAMM 1035

Page: 7 of 15

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
2. Rtd Indicator C. Pt500 (385)	-200 °C to -80 °C -80 °C to 260 °C 260 °C to 400 °C 400 °C to 600 °C 600 °C to 630 °C	0.04 °C 0.05 °C 0.07 °C 0.08 °C 0.09 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
2. Rtd Indicator D. Pt1000 (385)	-200 °C to 0 °C 0 °C to 100 °C 100 °C to 300 °C 300 °C to 600 °C 600 °C to 630 °C	0.03 °C 0.04 °C 0.05 °C 0.06 °C 0.18 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
2. Rtd Indicator E. Pt100 (3926)	-200 °C to 0 °C 0 °C to 100 °C 100 °C to 400 °C 400 °C to 630 °C	0.05 °C 0.06 °C 0.08 °C 0.10 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator A. Type K	-200 °C to -100 °C -100 °C to -25 °C -25 °C to 120 °C 120 °C to 1000 °C 1000 °C to 1372 °C	0.26 °C 0.15 °C 0.13 °C 0.21 °C 0.32 °C	By electrical measurement using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator B. Type J	-210 °C to -100 °C -100 °C to -30 °C -30 °C to 150 °C 150 °C to 760 °C 760 °C to 1200 °C	0.22 °C 0.13 °C 0.12 °C 0.14 °C 0.19 °C	By electrical measurement using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator C. Type T	-250 °C to -150 °C -150 °C to 0 °C 0 °C to 120 °C 120 °C to 400 °C	0.49 °C 0.19 °C 0.13 °C 0.12 °C	By electrical measurement using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator D. Type S	0 °C to 250 °C 250 °C to 1400 °C 1400 °C to 1767 °C	0.40 °C 0.33 °C 0.40 °C	By electrical measurement using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator E. Type E	250 °C to -100 °C -100 °C to -25 °C -25 °C to 350 °C 350 °C to 650 °C 650 °C to 1000 °C	0.39 °C 0.13 °C 0.12 °C 0.13 °C 0.17 °C	By electrical measurement using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator F. Type R	0 °C to 250 °C 250 °C to 400 °C 400 °C to 1000 °C 1000 °C to 1767 °C	0.47 °C 0.32 °C 0.31 °C 0.35 °C	By electrical measurement using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator G. Type B	600 °C to 800 °C 800 °C to 1000 °C 1000 °C to 1550 °C 1550 °C to 1820 °C	0.45 °C 0.39 °C 0.37 °C 0.38 °C	By electrical measurement using Fluke 5520A and reference table ITS 90

NO: SAMM 1035

Page: 8 of 15

SCOPE OF CALIBRATION : DIMENSIONAL

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
A. Micrometer (external Measurement)	25 mm Travel range	1 μ m	Calibrated using Gauge Blocks with reference to BS EN ISO 14978:2018
B. Caliper	Up to 300 mm	6.1 μ m	Calibrated using Gauge Blocks with reference to on BS EN ISO 13385- 1:2019

SITE LOCATION (HQ)	1. CATEGORY I
FIELD(S) OF CALIBRATION :	DIMENSIONAL,ELECTRICAL,HEAT & TEMPERATURE

SCOPE OF CALIBRATION : ELECTRICAL

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Measuring Instrument A. Dc Voltage	0 mV to 220 mV 0.22 V to 2.2 V 2.2 V to 11 V 11 V to 22 V 22 V to 220 V 220 V to 1100 V	7.9 μ V/V 4.2 μ V/V 3.2 μ V/V 4.7 μ V/V 5.4 μ V/V 6.0 μ V/V	Generating using Calibrator model Fluke 5720A
Measuring Instrument B. Ac Voltage	0 V to 1020 V (See Matrix E)	(See Matrix E)	
Measuring Instrument C. Dc Current	0 mA to 220 mA 0.22 mA to 2.2 mA 2.2 mA to 22 mA 22 mA to 220 mA 0.22 A to 2.2 A 2.2 A to 3 A 3 A to 11 A 11 A to 20.5 A	59 μ A/A 39 μ A/A 49 μ A/A 83 μ A/A 69 μ A/A 320 μ A/A 450 μ A/A 820 μ A/A	Generating using Calibrator model Fluke 5520A
Measuring Instrument D. Ac Current	0 A to 20.5 A (See Matrix F)	(See Matrix F)	

Schedule

Issue date: 21 November 2024
Valid Until: 23 November 2029



NO: SAMM 1035

Page: 9 of 15

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Measuring Instrument E. Resistance (Fixed Value)	1 ? 1.9 ? 10 ? 19 ? 100 ? 190 ? 1 k? 1.9 k? 10 k? 19 k? 100 k? 190 k? 1 M? 1.9 M? 10 M? 19 M? 100 M?	77 μ_{-}^{+} 48 μ_{-}^{+} 0.21 m $_{-}^{+}$ 0.25 m $_{-}^{+}$ 1.2 m $_{-}^{+}$ 2.0 m $_{-}^{+}$ 11 m $_{-}^{+}$ 20 m $_{-}^{+}$ 0.11 - $_{-}^{+}$ 0.23 - $_{-}^{+}$ 1.2 - $_{-}^{+}$ 3.4 - $_{-}^{+}$ 19 - $_{-}^{+}$ 62 - $_{-}^{+}$ 0.45 k $_{-}^{+}$ 1.6 k $_{-}^{+}$ 15 k $_{-}^{+}$	Generating using Calibrator model Fluke 5720A
Measuring Instrument E. Resistance (variable Value)	0 ? to 11 ? 11 ? to 33 ? 33 ? to 110 ? 110 ? to 330 ? 0.33 k? to 1.1 k? 1.1 k? to 3.3 k? 3.3 k? to 11 k? 11 k? to 33 k? 33 k? to 110 k? 110 k? to 330 k? 0.33 M? to 1.1 M? 1.1 M? to 3.3 M? 3.3 M? to 11 M? 11 M? to 33 M? 33 M? to 110 M? 110 M? to 330 M? 330 M? to 1100 M?	160 $\mu_{-}^{+}/-_{-}^{+}$ 73 $\mu_{-}^{+}/-_{-}^{+}$ 37 $\mu_{-}^{+}/-_{-}^{+}$ 30 $\mu_{-}^{+}/-_{-}^{+}$ 26 $\mu_{-}^{+}/-_{-}^{+}$ 30 $\mu_{-}^{+}/-_{-}^{+}$ 26 $\mu_{-}^{+}/-_{-}^{+}$ 30 $\mu_{-}^{+}/-_{-}^{+}$ 26 $\mu_{-}^{+}/-_{-}^{+}$ 34 $\mu_{-}^{+}/-_{-}^{+}$ 29 $\mu_{-}^{+}/-_{-}^{+}$ 72 $\mu_{-}^{+}/-_{-}^{+}$ 110 $\mu_{-}^{+}/-_{-}^{+}$ 0.28 m $_{-}^{+}/-_{-}^{+}$ 0.42 m $_{-}^{+}/-_{-}^{+}$ 2.7 m $_{-}^{+}/-_{-}^{+}$ 13 m $_{-}^{+}/-_{-}^{+}$	Generating using Calibrator model Fluke 5520A

Scan this QR Code or visit <https://accreditation.ism.gov.my/public/listing/cab/samm-ct/3003531> for the current scope of accreditation

NO: SAMM 1035

Page: 10 of 15

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Measuring Instrument F. Capacitance	0.2 nF to 0.4 nF 0.4 nF to 1.1 nF 1.1 nF to 3.3 nF 3.3 nF to 11 nF 11 nF to 33 nF 33 nF to 110 nF 110 nF to 330 nF 0.33 mF to 1.1 mF 1.1 mF to 3.3 mF 3.3 mF to 11 mF 11 mF to 33 mF 33 mF to 110 mF 110 mF to 330 mF 0.33 mF to 1.1 mF 1.1 mF to 3.3 mF 3.3 mF to 11 mF 11 mF to 33 mF 33 mF to 110 mF	3.7 mF/F 4.0 mF/F 4.1 mF/F 2.1 mF/F 2.0 mF/F 2.1 mF/F 3.0 mF/F 3.2 mF/F 3.1 mF/F 3.2 mF/F 4.2 mF/F 5.3 mF/F 4.6 mF/F 4.5 mF/F 4.5 mF/F 4.5 mF/F 6.8 mF/F 9.6 mF/F	
Measuring Instrument G. Frequency	0.01 Hz to 1200 kHz 1.2 MHz to 2 MHz 10 Hz to 1 MHz	0.068 mHz/Hz 0.35 mHz/Hz 0.079 mHz/Hz	Generating using Calibrator model Fluke 5720A
Measuring Instrument H. Dc Current(via Current Coil)	10 A to 16.5 A 16.5 A to 150 A 150 A to 1025 A	1.3 mA/A 1.2 mA/A 0.60 mA/A	Generating using Calibrator Fluke 5520A with Fluke 5500A/Coil (50-Turn Coil)
Measuring Instrument I. Ac Current (via Current Coil)	(45 Hz to 65 Hz) 10 A to 16.5 A 16.5 A to 150 A 150 A to 1025 A (65 Hz to 440 Hz) 10 A to 16.5 A 16.5 A to 150 A 150 A to 1025 A	1.9 mA/A 2.1 mA/A 1.0 mA/A 2.0 mA/A 2.1 mA/A 1.1 mA/A	Generating using Calibrator Fluke 5520A with Fluke 5500A/Coil (50-Turn Coil)
Sourcing/generating Instrument A. Dc Voltage	0 mV to 100 mV 0.1 V to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	8.9 μ V/V 3.3 μ V/V 1.5 μ V/V 2.9 μ V/V 3.3 μ V/V	Measurement using Multimeter HP 3458A
Sourcing/generating Instrument B. Ac Voltage	0 V to 1000 V (See Matrix G)	(See Matrix G)	

NO: SAMM 1035

Page: 11 of 15

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Sourcing/generating Instrument C. Dc Current	0 nA to 100 nA 0.1 μ A to 1 μ A 1 μ A to 10 μ A 10 μ A to 100 μ A 0.1 mA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 0.1 A to 1 A 1 A to 3 A	87 mA/A 8.7 mA/A 0.87 mA/A 0.057 mA/A 0.021 mA/A 0.019 mA/A 0.026 mA/A 0.038 mA/A 0.060 mA/A	Measurement using Multimeter Agilent 34401A
Sourcing/generating Instrument D. Ac Current	0 A to 3 A (See Matrix H)	(See Matrix H)	Measurement using Multimeter Agilent 34401A & HP 3458A
Sourcing/generating Instrument E. Resistance	0 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 k Ω 1 k Ω to 10 k Ω 10 k Ω to 100 k Ω 100 k Ω to 1 M Ω 1 M Ω to 10 M Ω 10 M Ω to 100 M Ω 100 M Ω to 1 G Ω	13 $\mu\Omega/\Omega$ 6.4 $\mu\Omega/\Omega$ 3.5 $\mu\Omega/\Omega$ 3.3 $\mu\Omega/\Omega$ 6.0 $\mu\Omega/\Omega$ 12 $\mu\Omega/\Omega$ 22 $\mu\Omega/\Omega$ 88 $\mu\Omega/\Omega$ 1.1 m Ω/Ω	Measurement using Multimeter HP 3458A
Sourcing/generating Instrument F. Frequency	1 Hz to 40 Hz 40 Hz to 1 MHz 1 MHz to 4 MHz	2.7 μ Hz/Hz 0.65 μ Hz/Hz 0.96 μ Hz/Hz	
Sourcing/generating Instrument G. Dc Current (via Current Shunt)	1 A to 10 A 10 A to 20 A 20 A to 30 A 30 A to 40 A 40 A to 50 A	23 μ A/A + 0.37 mA 31 μ A/A + 0.28 mA 35 μ A/A + 0.13 mA 35 μ A/A + 80 μ A 35 μ A/A + 50 μ A	Measurement using Multimeter through Current Shunt
Oscilloscope A. Voltage i) Dc Voltage Signal	50 Ω Load 0 V to 2.2 V 2.2 V to 6.6 V 1 M Ω Load 0 V to 2.2 V 2.2 V to 11 V 11 V to 130 V	2.0 mV/V 2.0 mV/V 0.42 mV/V 0.40 mV/V 0.40 mV/V	Fluke 5520A (SC600)

NO: SAMM 1035

Page: 12 of 15

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Oscilloscope A. Voltage li) Square Wave Signal	50 Ω Load (at 1 kHz) 1 mV to 25 mV 25 mV to 110 mV 110 mV to 2.2 V 2.2 V to 6.6 V 1 M Ω Load (at 1 kHz) 1 mV to 25 mV 25 mV to 110 mV 110 mV to 2.2 V 2.2 V to 11 V 11 V to 130 V	5.4 mV/V 2.4 mV/V 2.0 mV/V 2.0 mV/V 4.2 mV/V 1.2 mV/V 0.88 mV/V 0.80 mV/V 0.79 mV/V	Fluke 5520A (SC600)
Oscilloscope B. Bandwidth Frequency	50 kHz to 1000 kHz 1 MHz to 600 MHz	2.0 μ Hz/Hz 2.0 μ Hz/Hz	Fluke 5520A (SC600)
Oscilloscope C. Time Base (50 Ω Load)	2 ns to 1000 ns 1 ms to 1000 ms 1 ms to 1000 ms 1 s to 5 s	2.0 μ s/s 2.0 μ s/s 2.0 μ s/s 2.0 μ s/s	Fluke 5520A (SC600)

SCOPE OF CALIBRATION : HEAT & TEMPERATURE

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
1. Thermocouple Indicator A. Type K	-200 °C to -100 °C -100 °C to -25 °C -25 °C to 120 °C 120 °C to 1000 °C 1000 °C to 1372 °C	0.26 °C 0.15 °C 0.13 °C 0.21 °C 0.32 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
1. Thermocouple Indicator B. Type J	-210 °C to -100 °C -100 °C to -30 °C -30 °C to 150 °C 150 °C to 760 °C 760 °C to 1200 °C	0.21 °C 0.13 °C 0.11 °C 0.14 °C 0.18 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
1. Thermocouple Indicator C. Type T	-250 °C to -150 °C -150 °C to 0 °C 0 °C to 120 °C 120 °C to 400 °C	0.49 °C 0.19 °C 0.13 °C 0.11 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
1. Thermocouple Indicator D. Type S	0 °C to 250 °C 250 °C to 1400 °C 1400 °C to 1767 °C	0.37 °C 0.29 °C 0.36 °C	By electrical simulation using Fluke 5520A and reference table ITS 90

NO: SAMM 1035

Page: 13 of 15

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
1. Thermocouple Indicator E. Type E	-250 °C to -100 °C -100 °C to -25 °C -25 °C to 350 °C 350 °C to 650 °C 650 °C to 1000 °C	0.39 °C 0.13 °C 0.11 °C 0.13 °C 0.17 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
1. Thermocouple Indicator F. Type R	0 to 250 °C 250 to 400 °C 400 to 1000 °C 1000 to 1767 °C	0.45 °C 0.28 °C 0.26 °C 0.32 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
1. Thermocouple Indicator G. Type B	600 °C to 800 °C 800 °C to 1000 °C 1000 °C to 1550 °C 1550 °C to 1820 °C	0.35 °C 0.27 °C 0.24 °C 0.27 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
2. Rtd Indicator A. Pt100 (385)	-200 °C to 0 °C 0 °C to 100 °C 100 °C to 400 °C 400 °C to 630 °C 630 °C to 800 °C	0.05 °C 0.06 °C 0.08 °C 0.10 °C 0.18 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
2. Rtd Indicator B. Pt200 (385)	-200 °C to 100 °C 100 °C to 260 °C 260 °C to 300 °C 300 °C to 600 °C 600 °C to 630 °C	0.04 °C 0.05 °C 0.10 °C 0.11 °C 0.13 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
2. Rtd Indicator C. Pt500 (385)	-200 °C to -80 °C -80 °C to 260 °C 260 °C to 400 °C 400 °C to 600 °C 600 °C to 630 °C	0.04 °C 0.05 °C 0.07 °C 0.08 °C 0.09 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
2. Rtd Indicator D. Pt1000 (385)	-200 °C to 0 °C 0 °C to 100 °C 100 °C to 300 °C 300 °C to 600 °C 600 °C to 630 °C	0.03 °C 0.04 °C 0.05 °C 0.06 °C 0.18 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
2. Rtd Indicator E. Pt100 (3926)	-200 °C to 0 °C 0 °C to 100 °C 100 °C to 400 °C 400 °C to 630 °C	0.05 °C 0.06 °C 0.08 °C 0.10 °C	By electrical simulation using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator A. Type K	-200 °C to -100 °C -100 °C to -25 °C -25 °C to 120 °C 120 °C to 1000 °C 1000 °C to 1372 °C	0.26 °C 0.15 °C 0.13 °C 0.21 °C 0.32 °C	By electrical measurement using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator B. Type J	-210 °C to -100 °C -100 °C to -30 °C -30 °C to 150 °C 150 °C to 760 °C 760 °C to 1200 °C	0.22 °C 0.13 °C 0.12 °C 0.14 °C 0.19 °C	By electrical measurement using Fluke 5520A and reference table ITS 90

NO: SAMM 1035

Page: 14 of 15

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
3. Thermocouple Simulator C. Type T	-250 °C to -150 °C -150 °C to 0 °C 0 °C to 120 °C 120 °C to 400 °C	0.49 °C 0.19 °C 0.13 °C 0.12 °C	By electrical measurement using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator D. Type S	0 °C to 250 °C 250 °C to 1400 °C 1400 °C to 1767 °C	0.40 °C 0.33 °C 0.40 °C	By electrical measurement using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator E. Type E	250 °C to -100 °C -100 °C to -25 °C -25 °C to 350 °C 350 °C to 650 °C 650 °C to 1000 °C	0.39 °C 0.13 °C 0.12 °C 0.13 °C 0.17 °C	By electrical measurement using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator F. Type R	0 °C to 250 °C 250 °C to 400 °C 400 °C to 1000 °C 1000 °C to 1767 °C	0.47 °C 0.32 °C 0.31 °C 0.35 °C	By electrical measurement using Fluke 5520A and reference table ITS 90
3. Thermocouple Simulator G. Type B	600 °C to 800 °C 800 °C to 1000 °C 1000 °C to 1550 °C 1550 °C to 1820 °C	0.45 °C 0.39 °C 0.37 °C 0.38 °C	By electrical measurement using Fluke 5520A and reference table ITS 90

SCOPE OF CALIBRATION : DIMENSIONAL

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
A. Measuring Microscope (range On Individual Linear Axis Only)	X and Y-Axis Up to 300 mm Z-Axis Up to 300 mm	(0.69 + 1.5L) μ m where L is measurement length in unit meter (0.58 + 0.023L) μ m where L is measurement length in unit meter	Calibration by glass scale and laser measurement system with reference to JIS B 7153
B. Profile Projector (range On Individual Linear Axis Only)	X and Y-Axis Up to 300 mm	(0.69 + 1.5L) μ m where L is measurement length in unit meter	Calibration by glass scale with reference to JIS B 7184

Schedule

Issue date: 21 November 2024
Valid Until: 23 November 2029



NO: SAMM 1035

Page: 15 of 15

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
C. Video Measurement Machine / Non-contact Coordinate Measuring Machine (cmm) (range On Individual Linear And Plane Diagonal Axes)	X and Y-Axis Up to 300 mm Z-Axis Up to 300 mm	(0.40 + 1.9L) μm where L is measurement length in unit meter (0.52 + 0.17L) μm where L is measurement length in unit meter	Calibration by glass scale and laser measurement system with reference to ISO 10360-7

Scan this QR Code or visit <https://accreditation.ism.gov.my/public/listing/cab/samm-ct/3003531> for the current scope of accreditation