

Schedule

Issue date: 24 March 2025
Valid until: 29 May 2030



NO: SAMM 596

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LABORATORY LOCATION: (PERMANENT LABORATORY)



TRESCAL LABUAN SDN. BHD.
LOT 5 BLOCK B
SHERMADEF COMMERCIAL CENTRE
JALAN PATAU-PATAU
87000 LABUAN
MALAYSIA

FIELDS OF CALIBRATION:

PRESSURE, TORQUE, TEMPERATURE, ELECTRICAL
& DIMENSIONAL

FIELD OF TESTING:

MECHANICAL

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.

SCOPE OF CALIBRATION: PRESSURE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Pneumatic Pressure Instruments	0 bar to 7 bar	0.003 bar	Calibrated using Digital Pressure Indicator
	7 bar to 30 bar	0.02 bar	Calibrated using Digital Pressure Calibrator and Hand Pump
Hydraulic Pressure Instruments	1 bar to 1200 bar	0.022 % of reading + 0.01 bar	Calibrated using Hydraulic Dead Weight Tester
	1200 bar to 2800 bar	0.8 bar	Calibrated using Digital Pressure Hydraulic Dead Weight Tester
	2800 bar to 4100 bar	10 bar	Calibrated using High Pressure Transducer

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SCOPE OF CALIBRATION: PRESSURE**SITE: CATEGORY I**

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Pneumatic Pressure Instruments	0 bar to 7 bar	0.016 bar	Calibrated using Digital Pressure Indicator
	7 bar to 30 bar	0.04 bar	Calibrated using Digital Pressure Calibrator and Hand Pump
Hydraulic Pressure Instrument	0 bar to 70 bar 70 bar to 350 bar 350 bar to 700 bar	0.06 bar 0.25 bar 0.5 bar	Calibrated using Digital Pressure Indicator
	700 bar to 1400 bar	1.1 bar	Calibrated using Digital Pressure Indicator
	1400 bar to 4100 bar	15 bar	Calibrated using High Pressure Transducer

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SCOPE OF CALIBRATION: TORQUE

Schedule

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Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Hand Torque Tools	2 N.m to 1500 N.m	1.0 %	1. Calibrated with general reference to ISO 6789-1 and ISO 6789-2 2. The CMC quoted is the relative expanded uncertainty at each calibration point

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SCOPE OF CALIBRATION: TEMPERATURE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Temperature Sensors with Indicators	-20 °C to 5 °C 5 °C to 100 °C 100 °C to 420 °C 420 °C to 600 °C	0.24 °C 0.24 °C 0.5 °C 1.5 °C	By Comparison Method Using PRT / Type S Thermocouple and Temperature Bath / Dry Block
PT100 & Thermocouple Sensors without Indicators	-20 °C to 100 °C 100 °C to 420 °C 420 °C to 600 °C	0.4 °C 0.6 °C 1.5 °C	By Comparison Method Using PRT / Type S Thermocouple and Temperature Bath / Dry Block
Temperature Indicators			By Electrical Simulation Using Temperature Calibrator and ITS 90 Tables
PT 100 (3926)	-200 °C to 630 °C	0.2 °C	
PT 100 (385)	-200 °C to 800 °C	0.2 °C	
Type E	-200 °C to 0 °C	0.6 °C	
	0 °C to 1000 °C	0.2 °C	
Type J	-210 °C to 1200 °C	0.5 °C	
Type K	-200 °C to 0 °C	1.2 °C	
	0 °C to 1370 °C	0.3 °C	
Type N	-200 °C to 0 °C	1.1 °C	
	0 °C to 1300 °C	0.2 °C	
Type R	0 °C to 300 °C	0.4 °C	
	300 °C to 1760 °C	0.3 °C	
Type S	0 °C to 300 °C	0.4 °C	
	300 °C to 1760 °C	0.3 °C	
Type T	-200 °C to 0 °C	0.7 °C	
	0 °C to 400 °C	0.2 °C	
Temperature Calibrators			By Electrical Measurement Using Temperature Calibrator and ITS 90 Tables
PT 100 (3926)	-200 °C to 630 °C	0.2 °C	
PT 100 (385)	-200 °C to 800 °C	0.2 °C	

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SCOPE OF CALIBRATION: TEMPERATURE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Temperature Calibrators (continue)			By Electrical Measurement Using Temperature Calibrator and ITS 90 Tables
Type E	-200 °C to 0 °C	0.6 °C	
	0 °C to 1000 °C	0.2 °C	
Type J	-210 °C to 1200 °C	0.2 °C	
Type K	-200 °C to 0 °C	1.1 °C	
	0 °C to 1370 °C	0.2 °C	
Type N	-200 °C to 0 °C	1.1 °C	
	0 °C to 1300 °C	0.2 °C	
Type R	0 °C to 300 °C	0.4 °C	
	300 °C to 1760 °C	0.2 °C	
Type S	0 °C to 300 °C	0.3 °C	
	300 °C to 1760 °C	0.2 °C	
Type T	-200 °C to 0 °C	0.5 °C	
	0 °C to 400 °C	0.2 °C	
Dry Block Calibrators	-20 °C to 420 °C 420 °C to 600 °C	0.16 °C 2.0 °C	Calibrate using PRT and Type S Thermocouple Based on EA-10/13)
Liquid-in-Glass Thermometer (partial immersion)	-20 °C to 5 °C 5 °C to 100 °C	0.45 °C 0.52 °C	By Comparison Method Using PRT and Temperature Bath

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SCOPE OF CALIBRATION: TEMPERATURE**SITE: CATEGORY I**

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Temperature Sensors with Indicators	-15 °C to 420 °C 420 °C to 600 °C	0.51 °C 1.7 °C	By Comparison Method Using PRT / Type S Thermocouple and Dry Block
PT100 & Thermocouple Sensors without Indicators	-15 °C to 420 °C 420 °C to 600 °C	0.6 °C 1.7 °C	By Comparison Method Using PRT / Type S Thermocouple and Dry Block
Temperature Indicators			By Electrical Simulation Using Temperature Calibrator and ITS 90 Tables
PT 100 (3926)	-200 °C to 630 °C	0.71 °C	
PT 100 (385)	-200 °C to 800 °C	0.71 °C	
Type E	-200 °C to 0 °C	1.0 °C	
	0 °C to 1000 °C	0.8 °C	
Type J	-210 °C to 1200 °C	0.9 °C	
Type K	-200 °C to 0 °C	1.4 °C	
	0 °C to 1370 °C	0.8 °C	
Type N	-200 °C to 0 °C	1.4 °C	
	0 °C to 1300 °C	0.8 °C	
Type R	0 °C to 1760 °C	0.8 °C	
Type S	0 °C to 1760 °C	0.8 °C	
Type T	-200 °C to 0 °C	1.0 °C	Using Thermocouple and Temperature Data Logger Based on AS2853-1986
	0 °C to 400 °C	0.8 °C	
Temperature Controlled Enclosures	-20 °C to 200 °C	1.6 °C	
	200 °C to 400 °C	2.3 °C	
	400 °C to 1200 °C	6.5 °C	

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SCOPE OF CALIBRATION: ELECTRICAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Measuring Instruments			
DC Voltage	0 mV to 329 mV 0.33 V to 3.29 V 3.29 V to 32.9 V 30 V to 329 V 329 V to 1020 V	0.08 mV / V 0.06 mV / V 0.06 mV / V 0.066 mV / V 0.066 mV / V	Calibrated according to procedure LCP01701(L), Rev 01 using Direct Method
AC Voltage	1 mV to 33 V <u>33 V to 330 V</u> 45 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 20 kHz <u>330 V to 1020 V</u> 45 Hz to 1 kHz 1 kHz to 5 kHz 5 kHz to 10 kHz	See Matrix A 0.6 mV / V 0.92 mV / V 1.0 mV / V 0.67 mV / V 2.3 mV / V 2.3 mV / V	

MATRIX A
AC VOLTAGE MEASUREMENT

	Frequency					
	Hz	kHz	kHz	kHz	kHz	KHz
	10 to 45	0.045 to 10	10 to 20	20 to 50	50 to 100	100 to 500
1 mV to 32.9 mV	4.7	2.4	3.0	3.6	5.2	14
33 mV to 330 mV	3.1	0.65	1.2	2	3.4	9.2
0.33 V to 3.3 V	1.8	0.37	0.94	1.7	3.4	6.9
3.3 V to 33 V	1.8	0.48	1.0	2.4	3.4	-

The uncertainties given in this table are expressed in mV/V.

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SCOPE OF CALIBRATION: ELECTRICAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Measuring Instruments (Continued)			
DC Current	0 mA to 3.3 mA 3.3 mA to 33 mA 33 mA to 0.330 A 0.330 A to 2.2 A 2.2 A to 11 A	0.17 mA / A 0.13 mA / A 0.15 mA / A 0.37 mA / A 0.71 mA / A	Calibrated according to procedure LCP01701(L), using Direct Method
	11 A to 550 A (current coil)	3.1 mA / A	Calibrated according to procedure LCP01705(L), using Direct Method
AC Current	0.029 mA to 330 mA	See Matrix B	Calibrated according to procedure LCP01701(L), using Direct Method
	<u>0.33 A to 2.2 A</u> 10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 5 kHz	2.5 mA / A 1.4 mA / A 8.8 mA / A	
	<u>2.2 A to 11 A</u> 45 Hz to 65 Hz 65 Hz to 500 Hz 500 Hz to 1 kHz	1.0 mA / A 1.4 mA / A 4.0 mA / A	
	<u>11 A to 550 A (current coil)</u> 45 Hz to 65 Hz 65 Hz to 440 Hz	3.4 mA / A 3.2 mA / A	Calibrated according to procedure LCP01705(L), using Direct Method

MATRIX B
AC CURRENT MEASUREMENT

Range	Frequency				
	Hz	Hz	kHz	kHz	kHz
	10 to 20	20 to 45	0.045 to 1	1 to 5	5 to 10
0.029 mA to 0.33 mA	3.4	2	2.3	5.1	15
0.33 mA to 3.3 mA	2.4	1.3	1.3	2.4	7
3.3 mA to 33 mA	2.4	1.3	1.1	2.4	7
33 mA to 330 mA	-	1.3	1.2	2.4	7

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SCOPE OF CALIBRATION: ELECTRICAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Measuring Instruments (Continued)			
Resistance (DMM)	0 Ω to 11 Ω 11 Ω to 33 Ω 33 Ω to 110 Ω 110 Ω to 330 Ω 330 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 330 k 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	1.1 m Ω / Ω 0.66 m Ω / Ω 0.26 m Ω / Ω 0.16 m Ω / Ω 0.17 m Ω / Ω 0.13 m Ω / Ω 0.19 m Ω / Ω 0.13 m Ω / Ω 0.19 m Ω / Ω 0.16 m Ω / Ω 0.23 m Ω / Ω 0.20 m Ω / Ω 0.75 m Ω / Ω 1.2 m Ω / Ω 5.8 m Ω / Ω 6.5 m Ω / Ω	Calibrated according to procedure LCP01701(L), using Direct Method
Capacitance	0.33 nF to 0.5 nF 0.5 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 0.330 μ F 0.330 μ F to 1.1 μ F 1.1 μ F to 3.3 μ F 3.3 μ F to 11 μ F 11 μ F to 33 μ F 33 μ F to 110 μ F 110 μ F to 330 μ F 330 μ F to 1.1 mF	29 mF / F 16 mF / F 9.3 mF / F 6.8 mF / F 6.4 mF / F 4.0 mF / F 4.0 mF / F 4.0 mF / F 5.1 mF / F 5.1 mF / F 5.7 mF / F 6.8 mF / F 9.1 mF / F 12 mF / F	
Frequency	0.01 Hz to 12 kHz 12 kHz to 100 kHz	0.062 mHz / Hz 0.057 mHz / Hz	

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SCOPE OF CALIBRATION: ELECTRICAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Measuring Instruments			
Resistance (Insulation Resistance)	1 Ω to 10 Ω	12 m Ω / Ω	Calibrated according to Procedure LCP01709(L), using Direct Method
	10 Ω to 100 Ω	5.8 m Ω / Ω	
	100 Ω to 1000 Ω	1.2 m Ω / Ω	
	1 k Ω to 10 k Ω	1.2 m Ω / Ω	
	10 k Ω to 100 k Ω	1.2 m Ω / Ω	
	0.1 M Ω to 1 M Ω	5.8 m Ω / Ω	
	1 M Ω to 10 M Ω	5.8 m Ω / Ω	
	10 M Ω to 25 G Ω	12.0 m Ω / Ω	
Sourcing Instruments			
DC Voltage	1 mV to 100 mV	0.098 mV / V	Calibrated according to procedure LCP01703(L) & LCP01715(L), using Direct Method
	100 mV to 1V	0.054 mV / V	
	1 V to 10 V	0.046 mV / V	
	10 V to 100 V	0.059 mV / V	
	100 V to 1000 V	0.064 mV / V	
	1 kV to 30 kV	23 mV / V	Calibrated according to procedure LCP01707(L), using Direct Method
AC Voltage	1 mV to 750 V	See Matrix C	Calibrated according to procedure LCP01703(L), using Direct Method
	750 V to 1000 V		
	45 Hz to 1 kHz 1 kHz to 10 kHz	9.2 mV / V 9.2 mV / V	

MATRIX C**AC VOLTAGE SOURCING**

Range	Frequency					
	Hz	Hz	kHz	kHz	kHz	kHz
	3 to 5	5 to 10	0.01 to 20	20 to 50	50 to 100	100 to 300
1 mV to 100 mV	12	4.5	1.2	2.0	7.9	52
0.1 V to 1 V	12	4.4	1.0	2.0	7.9	52
1 V to 10 V	12	4.4	1.0	2.0	7.9	52
10 V to 100 V	12	4.4	1.0	2.0	7.9	52
100 V to 750 V	12	4.4	1.0	2.0	7.9	52

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SCOPE OF CALIBRATION: ELECTRICAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Sourcing Instruments (Continued)			
AC Voltage	1 kV to 5 kV 45 Hz to 65 Hz	35 mV / V	Calibrated according to procedure LCP01707(L), using Direct Method
DC Current	1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 3 A	0.90 mA / A 0.77 mA / A 1.3 mA / A 1.6 mA / A	Calibrated according to procedure LCP01703(L) & LCP01715(L), using Direct Method
	3 A to 100 A	2.3 mA / A	Calibrated according to procedure LCP01706(L), using V/I Method
AC Current	<u>1 mA to 3 A</u>	See Matrix D	Calibrated according to procedure LCP01703(L), using Direct Method
	<u>3 A to 100 A</u> 45 Hz to 65 Hz	2.4 mA / A	Calibrated according to procedure LCP01706(L), using V/I Method

MATRIX D
AC CURRENT SOURCING

Range	Frequency		
	Hz	Hz	kHz
	3 to 5	5 to 10	0.01 to 5
1 mA to 100 mA	12	4.3	2.4
0.1 A to 1 A	12	4.0	1.8
1 A to 3 A	13	4.8	2.5

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SCOPE OF CALIBRATION: ELECTRICAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Sourcing Instruments (Continued)			
Resistance	0.1 Ω to 100 Ω	0.17 m Ω / Ω	Calibrated according to procedure LCP01703(L), using Direct Method
	100 Ω to 1 k Ω	0.13 m Ω / Ω	
	1 k Ω to 10 k Ω	0.13 m Ω / Ω	
	10 k Ω to 100 k Ω	0.13 m Ω / Ω	
	100 k Ω to 1 M Ω	0.13 m Ω / Ω	
	1 M Ω to 10 M Ω	0.51 m Ω / Ω	
	10 M Ω to 100 M Ω	9.4 m Ω / Ω	
Frequency (100 mV to 750 V)	1 Hz to 40 Hz 40 Hz to 300 kHz	0.62 mHz / Hz 0.12 mHz / Hz	

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SCOPE OF CALIBRATION: ELECTRICAL**SITE: CATEGORY I**

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±)*	Remarks
Measuring Instruments			
DC Voltage	0 V to 20 V	0.58 mV / V	Calibrated according to procedure LCP01701(L), using Direct Method
DC Current	0 mA to 24 mA	0.95 mA / A	
Resistance (Insulation Resistance)	1 Ω to 10 Ω	12 mΩ / Ω	Calibrated according to Procedure LCP01709(L), using Direct Method
	10 Ω to 100 Ω	5.8 mΩ / Ω	
	100 Ω to 1000 Ω	1.2 mΩ / Ω	
	1 kΩ to 10 kΩ	1.2 mΩ / Ω	
	10 kΩ to 100 kΩ	1.2 mΩ / Ω	
	0.1 MΩ to 1 MΩ	5.8 mΩ / Ω	
	1 MΩ to 10 MΩ	5.8 mΩ / Ω	
	10 MΩ to 25 GΩ	12.0 mΩ / Ω	
Frequency	1 Hz to 1000 Hz	0.58 mHz / Hz	Calibrated according to procedure LCP01701(L), using Direct Method
	1 kHz to 10 kHz	1.4 mHz / Hz	
Sourcing Instruments			
DC Voltage	1 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V 1 kV to 40 kV	0.17 mV / V 0.10 mV / V 0.096 mV / V 0.10 mV / V 0.11 mV / V 23 mV / V	Calibrated according to procedure LCP01703(L)& LCP01715(L), using Direct Method
			Calibrated according to procedure LCP01707(L), using Direct Method
AC Voltage	<u>10 mV to 750 V</u> <u>750 V to 1000 V</u> 0.045 kHz to 1 kHz 1 kHz to 10 kHz	See Matrix E 9.2 mV / V 9.2 mV / V	Calibrated according to procedure LCP01703(L), using Direct Method
	<u>1 kV to 40 kV</u> 45 Hz to 65 Hz	62 mV / V	Calibrated according to procedure LCP01707(L), using Direct Method

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SCOPE OF CALIBRATION: ELECTRICAL**SITE: CATEGORY I****MATRIX E****AC VOLTAGE SOURCING**

Range	Frequency					
	Hz	Hz	kHz	kHz	kHz	KHz
	3 to 5	5 to 10	0.01 to 20	20 to 50	50 to 100	100 to 300
10 mV to 100 mV	12	4.5	1.2	2.0	7.9	52
0.1 V to 1 V	12	4.4	1.0	2.0	7.9	52
1 V to 10 V	12	4.4	1.0	2.0	7.9	52
10 V to 100 V	12	4.4	1.0	2.0	7.9	52
100 V to 750 V	12	4.4	1.0	2.0	7.9	52

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SCOPE OF CALIBRATION: ELECTRICAL**SITE: CATEGORY I**

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Sourcing Instruments (Continued)			
DC Current	50 μ A to 500 μ A 500 μ A to 1000 μ A 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 3 A	3.3 mA / A 3.1 mA / A 0.81 mA / A 0.64 mA / A 1.3 mA / A 1.6 mA / A	Calibrated according to procedure LCP01703(L) & LCP01715(L), using Direct Method
	3 A to 100 A	2.5 mA / A	Calibrated according to procedure LCP01706(L), using Direct Method
AC Current	50 μ A to 3 A	See Matrix F	Calibrated according to procedure LCP01703(L), using Direct Method
	<u>3 A to 100 A</u> 45 Hz to 65 Hz	2.5 mA / A	Calibrated according to procedure LCP01706(L), using Direct Method

MATRIX F
AC CURRENT MEASUREMENT

Range	Frequency				
	Hz	Hz	kHz	kHz	kHz
	3 to 5	5 to 10	0.01 to 5	0.045 to 1	1 to 20
50 μ A to 500 μ A	-		-	9.1	9.1
500 μ A to 1000 μ A	-	-	-	9.2	9.8
1 mA to 100 mA	12	3.9	1.6	-	-
100 mA to 1 A	12	3.9	1.6	-	-
1 A to 3 A	13	4.7	2.4	-	-

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SCOPE OF CALIBRATION: ELECTRICAL**SITE: CATEGORY I**

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Sourcing Instruments (Continued)			
Resistance	10 Ω to 100 Ω	0.16 m Ω / Ω	Calibrated according to procedure LCP01703(L), using Direct Method
	100 Ω to 1 k Ω	0.1 m Ω / Ω	
	1 k Ω to 10 k Ω	0.13 m Ω / Ω	
	10 k Ω to 100 k Ω	0.13 m Ω / Ω	
	100 k Ω to 1 M Ω	0.13 m Ω / Ω	
	1 M Ω to 10 M Ω	0.47 m Ω / Ω	
	10 M Ω to 100 M Ω	9.4 m Ω / Ω	
Frequency (100 mv to 750 v)	3 Hz to 5 Hz	1.2 mHz / Hz	
	5 Hz to 10Hz	0.58 mHz / Hz	
	10 Hz to 40 Hz	0.35 mHz / Hz	
	40 Hz to 300 kHz	0.12 mHz / Hz	

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SCOPE OF CALIBRATION: DIMENSIONAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Vernier, Dial and Digital Caliper (external accuracy)	0 mm to 300 mm	14 μ m	Calibrated using Caliper Checker & Gauge Block with reference to BS EN ISO 13385-1 or JIS B 7507
	0 inch to 12 inch	0.0007 inch	
	300 mm to 1000 mm	0.02 mm	Calibrated using Gauge Block Set. Based on LCP 01409(L)
	12 inch to 40 inch	0.001 Inch	
Vernier, Dial and Digital Depth Caliper	0 mm to 150 mm 0 inch to 6 inch	14 μ m 0.0007 inch	Calibrated using Gauge Block with reference to ISO 13385-2
Vernier, Dial and Digital Height Gauge	0 mm to 300 mm 0 inch to 6 inch	15 μ m 0.0003 inch	Calibrated using Gauge Block & Caliper Checker with reference to BS EN ISO 13225
External Micrometer	Up to 25 mm 25 mm to 100 mm frame (25 mm traverse) 100 mm to 150 mm frame (25 mm traverse)	2 μ m 2 μ m 3 μ m	Calibrated using Gauge Block according to ISO 3611
	Up to 1 inch 1 inch to 6 inch frame (1 inch traverse)	0.0003 inch 0.0003 inch	
	150 mm to 300 mm	0.005 mm	Calibrate using Gauge Block Set. Based on LCP 01403(L)
	300 mm to 600 mm	0.009mm	
	6 inch to 12 inch	0.0003 inch	
	12 inch to 24 inch	0.0004 inch	
Setting Rod	Up to 50 mm 50 mm to 150 mm	0.015 mm 0.015 mm	Calibrated using Gauge Block and DTI according to in-house calibration procedure LCP 01403(L)
	Up to 2 inch 2 inch to 6 inch	0.0006 inch	

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SCOPE OF CALIBRATION: DIMENSIONAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Internal Micrometer including Stick Micrometer	25 mm traverse and setting rod for length up to 150 mm 1 inch traverse and setting rod for length up to 6 inch	4 μ m 0.0003 inch	Calibrated using Gauge Block with reference to BS 959
Depth Micrometer	25 mm traverse with extension rod up to 150 mm 1 inch traverse with extension rod up to 6 inch	3 μ m 0.0001 inch	Calibrated using Gauge Block with reference to BS 6468
Digital Indicator	0 mm to 50 mm 0 inch to 2 inch	3 μ m 0.0001 inch	Calibrated using Gauge Block according to in house calibration procedure LCP 01440(L)

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SCOPE OF TESTING: MECHANICAL (VALVE TESTING)

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Method/ Equipment/Techniques
A. Pressure Relief Valves	1. "As Received" Pop Pressure Test 2. Seat Leakage Test	1. API RP 576 Clause 6.2.9 2. API 527 Section 2,4 & 5
B. Control Valves	1. Shell Test 2. Pressure Closure Test (Seat Leakage Test) 3. Packing Test 4. Rated Valve Travel Test 5. Dead Band Test	1. API 598 Clause 6.3 IEC 60534-4 Section 5.4 ASME B 16.34 Section 7.1 2. API 598 Clause 6.4 IEC 60534-4 Section 5.5 ASME B 16.34 Section 7.2 3. IEC 60534-4 Section 5.6 4. IEC 60534-4 Section 5.7 5. IEC 60534-4 Section 5.8
C. Isolation Valves 1. Parallel Slide Valve 2. Gate Valve 3. Globe Valve 4. Check Valve 5. Plug Valve 6. Butterfly Valve 7. Ball Valve	1. Shell Test 2. Pressure Closure Test (Seat Leakage Test) 3. Back Seat Test	1. API 598 Clause 6.3 ASME B 16.34 Section 7.1 2. API 598 Clause 6.4 ASME B 16.34 Section 7.2 3. API 598 Clause 6.2

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SCOPE OF TESTING: MECHANICAL (VALVE TESTING)**SITE: CATEGORY I**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Method/ Equipment/Techniques
A. Pressure Relief Valves	1. "As Received" Pop Pressure Test 2. Seat Leakage Test	1. API RP 576 Clause 6.2.9 2. API 527 Section 2,4 & 5
B. Control Valves	1. Shell Test 2. Pressure Closure Test (Seat Leakage Test) 3. Packing Test 4. Rated Valve Travel Test 5. Dead Band Test	1. API RP 598 Clause 6.3 IEC 60534-4 Section 5.4 ASME B 16.34 Section 7.1 2. API 598 Clause 6.4 IEC 60534-4 Section 5.5 ASME B 16.34 Section 7.2 3. IEC 60534-4 Section 5.6 4. IEC 60534-4 Section 5.7 5. IEC 60534-4 Section 5.8
C. Isolation Valves 1. Parallel Slide Valve 2. Gate Valve 3. Globe Valve 4. Check Valve 5. Plug Valve 6. Butterfly Valve 7. Ball Valve	1. Shell Test 2. Pressure Closure Test (Seat Leakage Test) 3. Back Seat Test	1. API 598 Clause 6.3 ASME B 16.34 Section 7.1 2. API 598 Clause 6.4 ASME B 16.34 Section 7.2 3. API 598 Clause 6.2

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