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Calibration Laboratory Accreditation No. ACL 0024

is accredited by the GCC Accreditation Center (GAC) in accordance with the recognized International Standard ISO/IEC 17025:2017, "General requirements for the competence of testing and calibration laboratories"

Gulf Calibration & Technical Services L.L.C					
Address. P.O.Box 1197, PC 130, Muscat -Sultanate of Oman Street No. 52, Building No. 4329, Ghala Industrial Area, Muscat, Sultanate of Oman	Contact: Mr. Sabu Thankachen – Laboratory Manger Mrs. Biji Koshy – QHSE Manager Tel: 00968 24504206, 0096824504924 Fax: 00968 24502635 Email: <u>sabu@gulfcalibration.com</u> ; <u>quality@gulfcalibration.com</u> Web Address: www.gulfcalibration.com				

<u>L°Cations where calibration activities covered by the above Accreditation Standard are undertaken</u>

1- address - Street No. 52, Building No. 4329, Ghala Industrial Area, Muscat, Sultanate of Oman

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For the following scope:

Scope:

- 1. Calibration
- 1.03 Engineering metrology equipment
- 1.11 Masses
- 1.12 Weighing devices
- 1.13 Volumetric equipment
- 1.20 Pressure and Vacuum Measuring Devices
- 1.26 Testing machines
- 1.38 Instrument Calibrators
- 1.39 Indicating and Recording Instruments
- 1.41 Frequency and time measuring instruments and standards
- 1.80 Calibration of temperature measuring equipment
- 1.83 Hygrometry
- 1.84 Testing of controlled enclosures

Scope details are as follows:





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Measurand	Measuring Range	CMC Expressed as an Expanded Uncertainty (k = 2) **	Method (standard/guide + internal pr°Cedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *
Temperature	0 ^{°c} (-30 to 150) ^{°c} (> 150 to 250) ^{°c}	0.02 ^{°C} 0.05 ^{°C} 0.07 ^{°C}	GCTS-SOP-08 Stirred Liquid Baths	Digital Thermometers with PRT Sensor	Ρ
Temperature	30 ^{°C} to 250 ^{°C} >250 ^{°C} to 400 ^{°C} >400 ^{°C} to 600 ^{°C}	0.3 ^{°C} 0.6 ^{°C} 1.2 ^{°C}	GCTS-SOP-08 in dry bl°Ck	Digital Thermometers with PRT Sensor	Ρ
Temperature	0 ^{°c} (-30 to 150) ^{°c} (> 150 to 250) ^{°c}	0.1 °C 0.1 °C 0.4 °C	GCTS-SOP-08 Stirred Liquid Baths	Digital Thermometers with TC Sensor	Ρ
Temperature	>250 ^{°C} to 400 ^{°C} >400 ^{°C} to 600 ^{°C} >600 ^{°C} to 1100 ^{°C}	0.6 ^{°C} 0.8 ^{°C} 2.0 ^{°C}	GCTS-SOP-08 in dry bl°Ck	Digital Thermometers with TC Sensor	Ρ
Temperature	-20 ^{°C} to 250 ^{°C} >250 ^{°C} to 400 ^{°C} >400 ^{°C} to 600 ^{°C}	0.25 ^{°C} 0.5 ^{°C} 1.0 ^{°C}	GCTS-SOP-09	Dial Thermometers	P and S

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Measurand	Measuring Range	CMC Expressed as an Expanded Uncertainty (k = 2) **	Method (standard/guide + internal procedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *
Temperature	-20 °C to 250 °C	0.25°C	GCTS-SOP-10	Liquid in glass Thermometers	Ρ
Temperature	50 °C to 300 °C >300 °C to 500 °C	2.0°C 3.0°C	GCTS-SOP-40	IR Thermometers	Ρ
Temperature	-40 °C to 20 °C	0.7 °C	GCTS-SOP-11	Chillers, Freezers (using 9 sensors)	P and S
Temperature	-40 °C to 300 °C	0.7 °C	GCTS-SOP-11	Environmental chambers, Ovens (using 9 sensors)	P and S
Temperature	20 °C to 100 °C	0.3 °C	GCTS-SOP-13	Incubators (using 5 sensors)	P and S
Temperature	100 °C to 140 °C	0.3 °C	GCTS-SOP-38	Aut°Claves (Temperature)	P and S
Temperature	-20 °C to 95 °C >95 °C to 200 °C	0.25 °C 0.4 °C	GCTS-SOP-12	Liquid Baths (using 5 sensors)	P and S
Temperature	Ambient to 300 °C 300 °C to 600 °C 600 °C to 800 °C 800 °C to 1200 °C	1.0 °C 3.0 °C 6.0 °C 10.0 °C	GCTS-SOP-16	Muffle Furnace (1 sensor)	P and S

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Calibration field 2: (Masses)

Measurand	Measuring Range	CMC Expressed as an Expanded Uncertainty (k = 2) **	Method (standard/guide + internal procedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *
Conventional Mass	1 mg, 2 mg, 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 100 g 200 g 500 g 1 kg 2 kg 5 kg	0.02 mg 0.025 mg 0.03 mg 0.04 mg 0.05 mg 0.06 mg 0.08 mg 0.12 mg 0.12 mg 0.16 mg 0.2 mg 0.25 mg 0.3 mg 0.5 mg 1.0 mg 2.5 mg 5.0 mg 10 mg 25 mg	GCTS-SOP-28 based on OIML R111	Standard test weights	Ρ
	10 kg 20 kg	0.16 g 0.3 g	GCTS-SOP-28 based on OIML R111	Standard test weights	Р



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Calibration field 3: (Weighing Devices)

Mass	1 mg to 5 kg >5 kg up to 30 kg	5 X 10 ⁻⁶ of FS 1 X 10 ⁻⁵ of FS	GCTS-SOP-01 based EURAMET cg 18:2015 & ASTM F 898	Electronic balances	P and S
	>30 kg up to 1000 kg	5 X 10 [°] of FS	7.5111 2 050		

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Calibration field 4: (Dimensional)

Measurand	Measuring Range	CMC Expressed as an Expanded Uncertainty (k = 2) **	Method (standard/guide + internal pr°Cedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *
Length/Dimensional	Up to 300 mm	0.02 mm	GCTS-SOP-05 based on BSEN ISO 13385-1	All types of Callipers Vernier Dial, Electronic	Ρ
Length/Dimensional	Up to 100 mm	2.0 μm	GCTS-SOP-06 based on BSEN 870	External Micrometer	Ρ
Length/Dimensional	Up to 50 mm	5.0 μm	GCTS-SOP-07 based on BS 907	Dial Gauges- Digital/Analogue	Ρ
Length/Dimensional	Up to 4 mm(using profile projector)	8.0 μm	GCTS-SOP-14 based on	Laboratory Test sieves	Ρ
Length/Dimensional	Above 4 mm(using Digital Caliper)	40 µm	& ISO 3310-1	Laboratory Test sieves	P and S
Length/Dimensional	(0.03 to 1.00) mm	6.0 μm	GCTS-SOP-39 based on BS 957	Feeler Gauges	Р
Length/Dimensional	Up to 100 mm	20 µm	GCTS-SOP-43 based on BS EN ISO 13385-2	All types of depth Gauges (Dial/Vernier/Electronic)	Ρ

Date: 10th March 2022

Approved by: Atta Subhan

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Length/Dimensional	Up to 100 mm	5.0 μm	GCTS-SOP-44 based on BS 6468	Depth Micrometres	Р
Length/Dimensional	Up to 300 mm (x-y axis), 0- 360 degree and Magnification	5 μm (Linear),10 min of ARC(Angular) & 0.5%(Magnification)	GCTS-SOP-45 based on JIS B 7184	Profile Projectors	P and S
Length/Dimensional	Up to 2 mm travel	5.0 μm	GCTS-SOP-47	Bore Gauge	Р
Length/Dimensional	Up to 50 mm (Extension) & Gauge Length up to 600 mm	5.0 μm	GCTS-SOP-48 based on ASTM E 83 & ISO 9513	Extensometers	S



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Calibration field 5: (Force)

Measurand	Measuring Range	CMC Expressed as an Expanded Uncertainty (k = 2) **	Method (standard/guide + internal pr°Cedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *
Force	1 kN up to 3000 kN	0.27% of reading	Verification/Calibratio n of the force measuring system by force proving instruments in compression, acc .ISO 7500-1- GCTS-SOP-02 & Alignment of upper machine platen acc. EN 12390-4 GCTS-SOP-42	Force/Material Testing Machines in Compression	S
Force	1 kN up to 250 kN	0.27% of reading	Verification/Calibration of the force measuring system by force proving instruments in compression, acc .ISO 7500-1 GCTS-SOP-02	Force/Flexural Strength Material Testing Machines	S

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Force	1 kN up to 50kN	1 % of reading	Verification/Calibration of the force measuring system by force proving instruments in compression, acc .ISO 7500-1 GCTS-SOP-30	Force/Proving Ring, Load cell with indicator for CBR, Marshall Testing Machines	P & S
Force	1 kN up to 3000 kN	0.48 % of reading	Verification of the force measuring system by force proving instruments in compression, acc. ASTM E4 GCTS-SOP-57	Force/Material Testing Machines in Compression	S
Force	0.5 kN up to 50 kN	0.48 % of reading	Verification of the force measuring system by force proving instruments in tension, acc. ASTM E4 GCTS-SOP-58	Force/Material Testing Machines in Tension	S

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Calibration field 6: (Pressure)

Measurand	Measuring Range	CMC Expressed as an Expanded Uncertainty (k = 2) **	Method (standard/guide + internal pr°Cedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *
Gauge Pressure	100 kPa to 0 kPa	0.05 kPa	Comparison method, acc. DKD-R 6-1:2014 GCTS-SOP-04	Gas Pressure (Negative Gauge)/Digital & Analogue Indicating Devices	P & S
Gauge Pressure	0.01 MPa to 3.5 MPa	1 kPa	Comparison method, acc. DKD-R 6-1:2014 GCTS-SOP-03	Gas Pressure (Gauge)/Digital & Analogue Indicating Devices	P & S
Gauge Pressure	0.1 MPa to 140 MPa	8 x 10 ⁻⁵ pe + 50 Pa	Pressure generated by dead weight tester, acc. DKD-R 6-1:2014 GCTS-SOP-31	Hydraulic Pressure (Gauge)/Digital & Analogue Indicating Devices	Ρ
Gauge Pressure	0.1 MPa to 300 MPa	0.25 % of F. S	Comparison Method, acc. DKD-R 6-1:2014 GCTS-SOP-03	Hydraulic Pressure (Gauge)-/Digital & Analogue Indicating Devices	P & S
Gauge Pressure	0.01 MPa to 12 MPa	0.01 % of F. S	Pressure generated by dead weight tester, acc. DKD-R 6-1:2014 GCTS-SOP-31	Gas Pressure (Gauge) /Digital & Analogue Indicating Devices	Р

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Calibration field 7: (Electrical)

Measurand	Measuring Range	CMC Expressed as an Expanded Uncertainty (k = 2) **	Method (standard/guide + internal pr°Cedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *
Electrical – DC Voltage Measure	0 mV to 600 mV > 0.60 V to 6 V >6.0 V to 60 V >60.0 V to 600 V >600 V to 1000 V	0.24 mV 8.9 mV 89 mV 0.89 V 4.2 V	Direct Method using Fluke 179 DMM GCTS-SOP- 52	DC Voltage -Measure	P & S
DC High Voltage -Measure	1 kV to 30 kV	20 x 10 ⁻³ U U = Measured voltage value	Direct Method using Fluke 179 DMM & High Voltage Probe GCTS-SOP- 52	DC High Voltage - Measure	P & S
Electrical –	0 mV to 600 mV @ 45 Hz to 1 kHz	0.46 mV	Direct Method using Fluke 179 DMM GCTS-SOP- 52	AC Voltage -Measure	P & S
AC Voltage -Measure	> 6.0 V to 60 V @ 45 Hz to 1 kHz > 6.0 V to 60 V @ 45 Hz to 1 kHz	0.073 V 0.73 V			
	>60.0 V to 600 V @ 45 Hz to 1 kHz >600 V to 1000 V @ 45	7.3 V			
	Hz to 1 kHz	16 V			

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Electrical – AC High Voltage - Measure	1 kV to 28 kV	20 x 10 ⁻³ U U = Measured voltage value	Direct Method using Fluke 179 DMM & High Voltage Probe GCTS-SOP- 52	AC High Voltage - Measure	P & S
Electrical – Frequency -Measure	1 Hz to 99.99 Hz 100.0 Hz to 999.9 Hz 1 kHz to 9.99 kHz 10.00 kHz to 99.99 kHz	0.13 Hz 1.3 Hz 13 Hz 0.13 kHz	Direct Method using Fluke 179 DMM GCTS-SOP- 52	Frequency -Measure	P & S
Electrical – Resistance -Measure	0 Ω to 600 Ω >600 Ω to 6kΩ >6.0 Ω to 60kΩ >60.0 kΩ to 600kΩ >600 kΩ to 6MΩ >6.0 MΩ to 50 MΩ	6.4 Ω 64 Ω 0.64 kΩ 6.4 kΩ 64 kΩ 0.54 MΩ	Direct Method using Fluke 179 DMM GCTS-SOP- 52	Resistance - Measure	P & S
Electrical – DC Current -Measure	0 mA to 60 mA >60.0 mA to 400 mA >0.4A to 6 A >6.0 A to 10A	0.73 mA 5.0 mA 73 mA 0.15 A	Direct Method using Fluke 179 DMM GCTS-SOP- 52	DC Current - Measure	P & S

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	0 mA to 60 mA @ 45 Hz to 1 kHz	1.1 mA			
Electrical –	>60.0 mA to 400mA@ 45 Hz to 1 kHz	7.3 mA	Direct Method using	AC Current -	P & S
AC Current -Measure	> 0.40 A to 6 A @ 45 Hz to 1 kHz	0.11 A	GCTS-SOP- 52	Measure	
	>6.0 A to 10 A @ 45 Hz to 1 kHz	0.21 A			
Temperature- by electrical simulation	-200 ° ^c to 850 ° ^c	0.5 ^{°c}	Direct Method using Beamex MC6 /Beamex MC2 Multi-Function Calibrator GCTS-SOP- 52	RTD PT100 -Measure	P & S
Temperature- by electrical simulation	-200ºC to 1370ºC	0.6 °C	Direct Method as per GCTS-SOP- 52	Therm°Couple K Type -Measure	P & S
Temperature- by electrical simulation	-210ºC to 1200ºC	0.6 °C	Direct Method as per GCTS-SOP- 52	Therm°Couple J Type - Measure	P & S
Temperature- by electrical simulation	-250°C to 400°C	0.6 ºC	Direct Method as per GCTS-SOP- 52	Therm°Couple T Type	P & S
Temperature- by electrical simulation	0ºC to 1760ºC	0.6 °C	Direct Method as per GCTS-SOP- 52	Therm°Couple R Type -Measure	P & S
Temperature- by electrical simulation	0ºC to 1760ºC	0.6 °C	Direct Method as per GCTS-SOP- 52	Therm°Couple S Type -Measure	P & S

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Temperature- by electrical simulation	-200ºC to 1300ºC	0.6 °C	Direct Method as per GCTS-SOP- 52	Therm°Couple N Type -Measure	P & S
Temperature- by electrical simulation	600ºC to 1820ºC	0.6 ºC	Direct Method as per GCTS-SOP- 52	Therm°Couple B Type -Measure	P & S
Temperature- by electrical simulation	-250°C to 1000°C	0.6 °C	Direct Method as per GCTS-SOP- 52	Therm°Couple E Type -Measure	P & S
Temperature- by electrical simulation	-200ºC to 900ºC	0.6 ºC	Direct Method as per GCTS-SOP- 52	Therm°Couple L Type -Measure	P & S
Temperature- by electrical simulation	-200ºC to 600ºC	0.6 °C	Direct Method as per GCTS-SOP- 52	Therm°Couple U Type -Measure	P & S
Temperature- by electrical simulation	0ºC to 2300ºC	0.6 °C	Direct Method as per GCTS-SOP- 52	Therm°Couple C Type -Measure	P & S
Temperature- by electrical simulation	-200 ^{°c} to 850 ^{°c}	0.5 ° ^c	Direct Method using Beamex MC6 /Beamex MC2 Multi-Function Calibrator GCTS-SOP- 52	RTD PT100 -Source	P & S
Temperature- by electrical simulation	-200ºC to 1370ºC	0.6 °C	Direct Method using Transmille 3050 A Multi- Function Calibrator & Therm°Couple Simulator/ Beamex MC6 Multi- Function Calibrator GCTS-SOP- 52	Therm°Couple K Type - Source	P & S

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Temperature- by electrical simulation	-210ºC to 1200ºC	0.6 ºC	Direct Method using Transmille 3050 A Multi- Function Calibrator & Therm°Couple Simulator/ Beamex MC6 Multi- Function Calibrator GCTS-SOP- 52	Therm°Couple J Type - Source	P & S
Temperature- by electrical simulation	-250ºC to 400ºC	0.6 ºC	Direct Method as per GCTS-SOP- 52	Therm°Couple T Type - Source	P & S
Temperature- by electrical simulation	0ºC to 1760ºC	0.6 °C	Direct Method as per GCTS-SOP- 52	Therm°Couple R Type - Source	P & S
Temperature- by electrical simulation	0ºC to 1760ºC	0.6 ºC	Direct Method as per GCTS-SOP- 52	Therm°Couple S Type - Source	P & S
Temperature- by electrical simulation	-200ºC to 1300ºC	0.6 °C	Direct Method as per GCTS-SOP- 52	Therm°Couple N Type - Source	P & S
Temperature- by electrical simulation	600ºC to 1820ºC	0.6 ºC	Direct Method as per GCTS-SOP- 52	Therm°Couple B Type - Source	P & S
Temperature- by electrical simulation	-250ºC to 1000ºC	0.6 ºC	Direct Method as per GCTS-SOP- 52	Therm°Couple E Type - Source	P & S
Temperature- by electrical simulation	-200ºC to 900ºC	0.6 ºC	Direct Method as per GCTS-SOP- 52	Therm°Couple L Type - Source	P & S
Temperature- by electrical simulation	-200°C to 600°C	0.6 ^o C	Direct Method as per GCTS-SOP- 52	Therm°Couple U Type - Source	P & S

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Temperature- by electrical simulation	0°C to 2300°C	0.6 °C	Direct Method as per GCTS-SOP- 52	Therm°Couple C Type -Source	P & S
DC Voltage -Source	0 mV to 100 mV	0.022 mV			
	> 0.10 V to 1 V	0.13 mV	Direct Method using		
	>1.0 V to 10 V	1.3 mV	Transmille 1000 A Portable	DC Voltage -Source	P & S
	>10.0 V to 100 V	90 mV	GCTS-SOP- 52		
	>100.0 V to 1000 V	0.13 V			
AC Voltage -Source	0 mV to 100 mV	0.2 mV		AC Voltage -Source @50/60 Hz	
	> 0.10 V to 1 V	0.77 mV	Direct Method using		
	>1.0 V to 10 V	14 mV	Transmille 1000 A Portable		P & S
	>10.0 V to 100 V	0.17 V	GCTS-SOP- 52		
	>100.0 V to 1000 V	2.4 V			
Frequency	1 Hz to 100 Hz	0.0023 Hz			
	>100 Hz to 1 kHz	0.02 Hz			
	>1 kHz to 10 kHz	0.23 Hz	Direct Method using Transmille 1000 A Portable Multi-Function Calibrator GCTS-SOP- 52	Francisco Course	P & S
	>10kHz to 20 kHz	0.46 Hz		Frequency - Source	
	>20 kHz to 50 kHz	1.2 Hz			
	>50 kHz to 100 kHz	2.3 Hz			

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DC Current	0 μA to 100 μA	0.07 μA			
	>0.10 mA to 1 mA	0.46 μA			
	>1.0 mA to 10mA	4.6 μΑ	Transmille 1000 A Portable		
	>10.0 mA to 100 mA	46 µA	Multi-Function Calibrator	DC current - Source	P&S
	>0.10 A to 1 A	0.52 mA	GCTS-SOP- 52		
	>1.0 A to 10A	8.3 mA			
DC Current	10 A to 1000 A	10 X 10 ⁻³ /	Direct Method using Portable Multi- Function Calibrator (Transmille 1000 A) & 2,10 & 50 turn current coil, <i>I</i> =Measured current value GCTS-SOP- 52	DC current - Source	P & S
AC Current	10 A to 1000 A@ 45 Hz to 200 Hz	10 X 10 ⁻³ /	Direct Method using Portable Multi-Function Calibrator (Transmille 1000 A) & 2,10 & 50 turn current coil / =Measured current value GCTS-SOP- 52	AC current - Source	P & S

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AC Current	0 μA to 100 μA @ 45 Hz to 1 kHz	0.6 μΑ			
	>0.10 mA to 1 mA@ 45 Hz to 1 kHz	2.6 μΑ	Direct Method using Transmille 1000 A Portable Multi-Function Calibrator	Aethod using ille 1000 A e Multi-Function AC current - Source or DP- 52	
	>1.0 mA to 10 mA @ 45 Hz to 1 kHz	22 μΑ			
	>10.0 mA to 100mA@ 45 Hz to 1 kHz	0.22 mA			Ac current - Jource
	> 0.10 A to 1 A @ 45 Hz to 1 kHz	2.2 mA			
	>1.0 A to 10 A @ 45 Hz				
	to 1 kHz	0.03 A			
Canacitance	10 nF	0.1 nF	Direct Method using Transmille 1000 A		
Capacitance	100 nF	1.0 nF	Portable Multi-Function	Constribution Commen	D 8. C
	1μF	20 nF	GCTS-SOP- 52	Capacitance- Source	ræs

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	0 Ω to 10 Ω	0.07 Ω			
	>10 Ω to 100 Ω	0.08 Ω	Simulation Mathed		
	>100.0 Ω to 1 kΩ	0.29 Ω	using Transmille 1000 A		
Resistance	>1.0 kΩ to 10 kΩ	2.4 Ω	Portable Multi-Function	Resistance-Source	P & S
	>10.0 kΩ to 100 kΩ	0.024 kΩ	Calibrator		
	>100.1 kΩ to 1 MΩ	0.25 kΩ	GC13-30P- 52		
	>1 MΩ to 10 MΩ	4.1 kΩ			
DC Voltage	0.0 mV to 200 mV	0.016 mV			
	> 0.20 V to 2 V	0.2 mV	Direct Method using Transmille 3050	DC Voltage -Source	Ρ
	>2.0 V to 20 V	1.5 mV	A/3041A Multi-Function Calibrator		
	>20.0 V to 200 V	15 mV			
	>200.0 V to 1000 V	81 mV	GC13-30P- 52		
AC Voltage	0.0 mV to 200 mV @ 45 Hz to 1 kHz	0.14 mV			
	>0.20 V to 2 V @ 45 Hz to 1 kHz	1.2 mV	Direct Method using	AC Voltage -Source	
	> 2.0 V to 20 V @ 45 Hz to 1 kHz	12 mV	A/3041A Multi-Function Calibrator GCTS-SOP- 52		Ρ
	>20.0 V to 200 V @ 45 Hz to 1 kHz	0.14 V			
	>200.0 V to 1000 V @ 45 Hz to 1 kHz	0.72 V			

Approved by: Atta Subhan

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CALIBRATION

ISO/IEC 17025:2017 No. ACL 0024

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	1 Hz to 100 Hz	0.0023 Hz			
	>10 Hz to 1 kHz 0.023 Hz Direct Method using	Direct Method using			
Frequency	>1.0 kHz to 10.0 kHz	0.23 Hz	Transmille 3050	F C	D
	>10.0 kHz to 100 kHz	2.3 Hz	Calibrator	Frequency- Source	P
	>100.0 kHz to 1.0 MHz	20 Hz	GCTS-SOP- 52		
	>1.0 MHz to 10 MHz	0.23 kHz			
DC Current	0.0 μA to 200 μA	0.05 μA			
	>0.20 mA to 2 mA	0.3 μA	Direct Method using		
	>2.0 mA to 20mA	3.3 μA	Transmille 3050	DC Current Course	
	>20.0 mA to 200 mA	40 µA	A/3041A Multi-Function	De current-source	P
	>0.20 A to 2 A	1.3 mA	GCTS-SOP- 52		
	>2.0 A to 30A	13 mA			
DC Current	10 A to 1500 A	10 X 10 ⁻³ /	Direct Method using Portable Multi-Function Calibrator (TRANSMILLE 3050 A / 3041 A) & 2,10 & 50 turn current coil <i>I</i> =Measured current value GCTS-SOP- 52	DC Current-Source	Ρ



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AC Current	10 A to 1500 A@ 45 Hz to 200 Hz	10 X 10 ⁻³ /	Direct Method using Portable Multi-Function Calibrator (TRANSMILLE 3050 A / 3041 A) & 2,10 & 50 turn current coil <i>I</i> =Measured current value GCTS-SOP- 52	AC Current-Source	Ρ
	0 μA to 200 μA @ 45 Hz to 1 kHz	0.52 μΑ			
	>0.20 mA to 2 mA@ 45 Hz to 1 kHz	2.2 μΑ	Direct Method using Portable Multi-		
AC Current	>2.0 mA to 20 mA @ 45 Hz to 1 kHz	21 µA	Function Calibrator (TRANSMILLE 3050 A /	AC Current	D
AC Current	>20.0 mA to 200mA@ 45 Hz to 1 kHz	0.21 mA	3041 A) <i>I</i> =Measured current	Source mode	F
	> 0.20 A to 2 A @ 45 Hz to 1 kHz	2.7 mA	value GCTS-SOP- 52		
	>2.0 A to 30 A @ 45 Hz to 1 kHz	56 mA			

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Capacitance	10 nF	0.052 nF			
	20 nF	0.11 nF	Direct Method using		
	50 nF	0.24 nF	Multi-Function Calibrator	Capacitance - Source	Р
	100 nF	0.48 nF	(Fixed values only)		
	1µF	4.7 nF	0013-307- 32		
	10 Ω	13 mΩ			
	100 Ω	16 mΩ			
	1 kΩ	0.12 Ω	Direct Mathedusian	Resistance Source Fixed values only-2 WIRE	
	10 kΩ	1.2 Ω	Transmille 3050 A / 3041 A Multi-Function Calibrator		D
Resistance	100 kΩ	12 Ω			P
	1 MΩ	0.22 kΩ	GC1S-SOP- 52		
	10 MΩ	7.4 kΩ			
	100 ΜΩ	0.75 MΩ			
			Direct Method using		
	0.01 MΩ to 5 MΩ	10 X 10 ⁻³ <i>R</i>	3200B Electrical Test	Insulation Resistance –	P
Insulation Resistance	>5 MΩ to 2 GΩ	39 X 10 ⁻³ <i>R</i>	R = Measured resistance	Source	·
			value		
Continuity Resistance	100 m Ω to 900 m Ω	40 mΩ	Direct Method using		
	1 Ω to 2 Ω	50 mΩ	3200B Electrical Test Calibrator <i>R</i> = Measured resistance value	Continuity Resistance-	D
	>2 Ω to 900 Ω	20 X 10 ⁻³ R		Source	Г
	1 kΩ to 50 kΩ	20 X 10 ⁻³ R			

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Continuity Current	10 mA to 100 mA	100 mA 2.0 mA Direct Method using	Continuity Current	D	
	>100 mA to 300 mA	5.0 mA	Calibrator	continuity current	F
AC Voltage	100 V to 400 V @ 50 Hz	5.0 X 10 ⁻³ U	Direct Method using 3200B Electrical Test Calibrator U = Measured resistance value	AC Voltage - Source	Ρ
Insulation Resistance Voltage	50 V to 1000 V	30 X 10 ⁻³ U	Direct Method using 3200B Electrical Test Calibrator U = Measured resistance value	Insulation Resistance Voltage-Measure	Ρ
Insulation Resistance DC Current	0.5 mA & 1 mA	20 μΑ	Direct Method using 3200B Electrical Test Calibrator	Insulation Resistance DC Current Measurement	Ρ
Loop Impedance Resistance	0.05 Ω to 10.0 Ω 100 Ω 900.0 Ω	0.5 Ω 6.0 Ω 10 Ω	Direct Method using 3200B Electrical Test Calibrator	Loop Impedance Resistance Measurement	Ρ
RCD Current	2 mA to 10 mA 10.01 mA to 30 mA 30.01 mA to 100 mA 100.01 mA to 300 mA 300.01 A to 1000 mA 1000.01 mA to 3000 mA	0.2 mA 0.5 mA 1.6 mA 4.5 mA 15 mA 30 mA	Direct Method using 3200B Electrical Test Calibrator	RCD Current	Ρ

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RCD Trip Time	20 ms to 390 ms 900 ms	1.3 ms 20 ms	Direct Method using 3200B Electrical Test Calibrator	RCD Trip Time	Ρ
PAT Insulation Resistance	1 MΩ to 10 MΩ	10 X 10 ⁻³ R	Direct Method using 3200B Electrical Test Calibrator <i>R</i> = Measured resistance value	PAT Insulation Resistance	Ρ
PAT Earth Bond Resistance	0.05 Ω to 1.0 Ω >1 Ω to 900.0 Ω	20 mΩ 20 X 10 ⁻³ R	Direct Method using 3200B Electrical Test Calibrator R = Measured resistance value	PAT Earth Bond Resistance	Ρ
Earth Bond Current Measurement	0 mA to 500 mA 1 A to 10 A 11 A to 30 A	16 mA 0.2 A 0.6 A	Direct Method using 3200B Electrical Test Calibrator	Earth Bond Current Measurement	Ρ
PAT Leakage Current	2 mA to 8 mA @ 240 V	20 μΑ	Direct Method using 3200B Electrical Test Calibrator	PAT Leakage Current	Р



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Calibration field 8: (Tachometer)

Measurand	Measuring Range	CMC Expressed as an Expanded Uncertainty (k = 2) **	Method (standard/guide + internal pr°Cedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *
RPM	240 rpm to 20,000 rpm	2 rpm	GCTS-SOP-54 using Transmille EA015 Multi- Function Workstation	RPM Tachometers Non-contact	Ρ

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Calibration field 9: (Volume)

Measurand	Measuring Range CMC Expressed as an Expanded Uncertainty (k = 2) **		Method (standard/guide + internal pr°Cedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *
Volume	(1 to 100) μl (100 to 500) μl (500 to 1000) μl (1 to 10) ml	0.20 μl 0.51 μl 0.86 μl 10 μl	GCTS-SOP-51 based on ISO 8655-6, ISO/TR 20461 & ISO/TR 20461 Corr1:2008	Piston Operated Volumetric Apparatus (Micro- Pipettes & Pipettes)	Ρ
Volume	(1 to 50) ml (>50 to 500) ml (> 500 to 2000) ml	0.05 ml 0.41 ml 1.3 ml	GCTS-SOP-25 based on ISO 4787 & EURAMET cg19	Volumetric Glass Wares (Measuring flasks)	Ρ
Volume	(1 to 10) ml (5 to 25) ml (10 to 100) ml (25 to 250) ml (50 ml to 500) ml (100 ml to 1000) ml (200 ml to 2000) ml	0.06 ml 0.3 ml 0.73 ml 0.85 ml 3.2 ml 6.7 ml 10 ml	GCTS-SOP-25 based on ISO 4787 & EURAMET cg19	Volumetric Glass Wares (Measuring cylinders)	Ρ

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Volume	(0.1 to 1) ml (>1 ml to 10) ml (> 10 to 50) ml	0.012 ml 0.02 ml 0.04 ml	GCTS-SOP-25 based on ISO 4787 & EURAMET cg19	Volumetric Glass Wares (Graduated Pipettes)	Ρ
Volume	1 ml to 50 ml	0.03 ml	GCTS-SOP-25 based on ISO 4787 & EURAMET cg19	Volumetric Glass Wares (Bulb Pipettes – Single Volume)	Ρ
Volume	1 ml to 50 ml	0.03 ml	GCTS-SOP-25 based on ISO 4787 & EURAMET cg19	Volumetric Glass Wares (Graduated Burettes)	Ρ

Calibration field 10: (Hygrometry)

Measurand	Measuring Range	CMC Expressed as an Expanded Uncertainty (k = 2) **	Method (standard/guide + internal pr°Cedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *
Hygrometry	(10 to 50) °C (35 to 80) % RH	0.4°C 3 % RH	GCTS-SOP-27 by comparaison Method.	Direct Reading Thermometer/Hygro meters including Data loggers	Ρ

*: Put only 'P', 'S' or 'P and S'

**Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal

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measuring equipment. CMC's represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of k = 2. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

Note: the text in blue indicates the new scope OR update in the Edition of a method in this issue of the scope of accreditation. Log of Suspended Scopes:

Measurand	Measuring Range	CMC Expressed as an Expanded Uncertainty (k = 2) **	Method (standard/guide + internal pr°Cedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *	Date Suspended	Date Reinstated

Log of Withdrawn Scopes:

Measurand	Measuring Range	CMC Expressed as an Expanded Uncertainty (k = 2) **	Method (standard/guide + internal pr°Cedure)	Type of Instrument or Material	Permanent lab (P) / Client-site (S) *	Date Withdrawn

END

Status of this accreditation can be checked in the GAC's website to confirm the validity of this accreditation - https://www.gac.org.sa/en/



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