مركز الإمارات العالمي للاعتماد
Emirates International Accreditation Centre

ACCREDITATION CERTIFICATE

LB-CAL-004

Emirates **I**nternational **A**ccreditation **C**entre

has accredited

GENERAL CONST. LAB CALIBRATION LLC

Industrial Area # 3

Sharjah-United Arab Emirates

In accordance with the requirements of

ISO/IEC 17025:2017

General requirements for the competence of testing and calibration laboratories

to undertake the calibration in the attached accreditation scope

This Accreditation is invalid without the attached accreditation scope and shall remain in force within the validity period printed below, subject to continuing compliance with the requirements of the accreditation criteria.

Validity: 25-05-2021 to 24-05-2024

Initial Accreditation Date: 25-05-2009

ilac-MRA

مركز الإمارات العالمي للاعتماد
Emirates International Accreditation Centre

CHIEF EXECUTIVE OFFICER
APPROVAL

مـركـز الإمـارات الـعـالـمـي لـلاعـتـمـاد
Emirates International Accreditation Centre

Accreditation Scope
LB-CAL-004

General Const. Lab Calibration LLC

Industrial Area # 3, Sharjah-United Arab Emirates

Date: 25-05-2021 **Valid to: 24-5-2024**

Accreditation History			
Scope	**Issue No.**	**Details**	**Date**
Temperature and Humidity	10	Renewal accreditation and modification in Ranges and CMC Values	25-05-2021
Force	10		
Volume	10		
Torque	4		
Electrical	10		
Mass and Balance	10		
Pressure	10		
Dimensional	10		
Temperature and Humidity	9	Re-issued to comply with the new accreditation number format	11-02-2021
Force	9	Re-issued due to rephrasing the scope by merging some cells and made some alignments in addition to compling with the new accreditation number format	
Volume	9	Re-issued to comply with the new accreditation number format	
Torque	3		
Electrical	9		
Mass and Balance	9	Re-issued due to rephrasing the scope by merging some cells and made some alignments in addition to compling with the new accreditation number format	
Pressure	9	Re-issued due to rephrasing the scope by merging some cells, made some alignments, compling with the new accreditation number format in addition to changing the unites (from bar to Pa, kPa and MPa)	
Dimensional	9	Re-issued to comply with the new accreditation number format	

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Accreditation Scope
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Industrial Area # 3, Sharjah-United Arab Emirates

Date: 25-05-2021 **Valid to: 24-5-2024**

Accreditation History			
Scope	**Issue No.**	**Details**	**Date**
Temperature and Humidity	8	First issuance under the name of EIAC (which was formerly known as DAC)	25/12/2019
Force	8		
Volume	8		
Torque	2		
Electrical	8	Extention in the scope, Modification in the CMC values and first issuance under the name of EIAC	
Mass and Balance	8	Modification in in the CMC values and first issuance under the name of EIAC	
Pressure	8		
Dimensional	8		

مـركـز الإمـارات الـعـالـمـي لـلاعـتـمـاد
Emirates International Accreditation Centre

Accreditation Scope

Temperature and Humidity Calibration

LB-CAL-004

General Const. Lab Calibration LLC

Industrial Area # 3, Sharjah-United Arab Emirates

Issue no.: 10 **Date: 25-05-2021** **Valid to: 24-05-2024**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Liquid-in-glass thermometers	GTS-WP-13 Based on BS 1041-2-1	-30 °C up to 150 °C	0.16 °C	Laboratory
Direct reading thermometers	GTS-WP-15 (in house method)	-40 °C up to 160 °C	0.16 °C	
		>160 °C up to 500 °C	0.4 °C	
		>500 °C up to 900 °C	1.3 °C	
		>900 °C up to 1200 °C	4 °C	
Dial Thermometers	GTS-WP-14 Based on EN 13190	-30°C up to 160°C	0.16 °C	
		>160°C up to 400°C	2.0 °C	
		>400°C up to 800°C	4.0 °C	
Base Metal Thermocouples	GTS-WP-12	-40 °C up to 250 °C	0.3 °C	
		>250 °C up to 600 °C	0.6 °C	
		>600 °C up to 900 °C	0.9 °C	
		>900 °C up to 1200 °C	4.0 °C	

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مـركـز الإمـارات الـعـالـمـي لـلاعـتـمـاد
Emirates International Accreditation Centre

Accreditation Scope

Temperature and Humidity Calibration

LB-CAL-004

General Const. Lab Calibration LLC

Industrial Area # 3, Sharjah-United Arab Emirates

Issue no.: 10 **Date: 25-05-2021** **Valid to: 24-05-2024**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Noble Metal Thermocouple	GTS-WP-12	0°C up to 600°C	0.6°C	Laboratory
		>600°C up to 900°C	0.8°C	
		>900°C up to 1200°C	1.7°C	
Climatic Chamber	GTS-09 Based on DKD-R-5-7 (9 points)	30°C up to 180°C	1.1°C	Laboratory/ Client Premises
Water Bath, incubators	GTS-09 Based on DKD-R-5-7 (5 points)	5°C up to 95°C	1.1°C	
Freezer/Chiller	GTS-154 Based on DKD-R-5-7 (9 points)	-30°C up to 95°C	1.1°C	
Furnace, Oven	GTS-WP-09 Based on DKD-R5-7(9 points, muffle furnace: 1 point)	30°C up to 180°C	1.1°C	
		>180°C up to 300°C	1.3°C	
		>300°C up to 800°C	4.0°C	
		>800°C up to 1200°C	9.0°C	

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Accreditation Scope

Temperature and Humidity Calibration

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Auto Clave(Temperature)	GTS-WP-155 Based on DKD-R5-7 (5 – 9 points)	100°C up to 140°C	0.8 °C	Laboratory/ Client Premises
Refrigerator	GTS-WP-176	- 40°C to 20°C	0.8 °C	
Stirred Liquid bath	GTS-WP-182	-35°C to 165°C	0.6 °C	
		>165°C to 300°C	0.7 °C	
Dry Block Calibrator	GTS-WP-177	Atmospheric temp. to 250°C	0.4 °C	
		>250 to 400°C	0.6 °C	
		>400 to 650°C	0.8 °C	
		>650°C to 900°C	1.2 °C	
		900°C to 1100°C	2.5 °C	
Humidity meter / Transmitter	GTS-WP-178	10% of RH to 90 % of RH	1.0% of RH	Laboratory
RTD with/ without Temperature Indicator	GTS-WP-179	-45°C to 40°C	0.22 °C	

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Accreditation Scope

Temperature and Humidity Calibration

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
RTD with/ without Temperature Indicator	GTS-WP-179	>40°C to 200°C	0.37 °C	Laboratory
		>200°C to 600°C	0.45 °C	
Infrared Thermometer	GTS-WP - 150 Comparison method	-30°C to 0°C	3.5 °C	
		>0°C to 600°C	4.0°C	
Temperature Transducer/ Transmitter/ Switch	GTS-WP-181	-30 °C to 150°C	0.8 °C	Laboratory/ Client Premises
		>150°C to 850°C	0.9°C	
Data Logger (Temperature, Humidity)	GTS-WP-183	-10 °C to 70°C	0.8 °C	Laboratory
		10% to 90 % of RH	0.9% of RH	

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مـركـز الإمـارات الـعـالـمـي لـلاعـتـمـاد
Emirates International Accreditation Centre

Accreditation Scope

Force Calibration

LB-CAL-004

General Const. Lab Calibration LLC

Industrial Area # 3, Sharjah-United Arab Emirates

Issue no.: 10 **Date: 25-05-2021** **Valid to: 24-05-2024**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Force Verification /Calibration of Compression testing machines	GTS-WP-06 based on BS EN ISO 7500-1	50 kN up to 3000 kN	0.24% of indicating reading using force transducer class 1, ISO 376	Client Premises
Force Verification /Calibration of tensile testing machines	GTS-WP-06A based on BS EN ISO 7500-1	6,2 kN up to 300 kN	0.24 % of reading using force transducer class 1, ISO 376	Client Premises
Proving rings for soil testing apparatus	GTS-WP-08	400 N up to 50 kN	0.7 %	Laboratory
Push-Pull gauge	GTS-WP-08B	45 N up to 50 kN	0,3 %	
Force gauge and load cell with indicator for industrial applications	GTS-WP-08A and GTS-WP-08B	100 N up to 50 kN	1.0 %	

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مـركـز الإمـارات الـعـالـمـي لـلاعـتـمـاد
Emirates International Accreditation Centre

Accreditation Scope

Volume Calibration

LB-CAL-004

General Const. Lab Calibration LLC

Industrial Area # 3, Sharjah-United Arab Emirates

Issue no.: 10 **Date: 25-05-2021** **Valid to: 24-05-2024**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Liquid Volume/ Fixed and Variable Volume Micro-pipette	GTS-WP-61A Gravimetric method acc. to ISO 8655-6:2002	0.5 µl to 50 µl	0.29 µl	Laboratory
		>100 µl to 100 µl	0.37 µl	
		>100 µl to 500 µl	0.66 µl	
		>500 µl to 1000 µl	1.3 µl	
		>100 µl to 2000 µl	2.6 µl	
		>2000 µl to 5000 µl	6.6 µl	
		> 5000 µl to 10000 µl	14 µl	
Liquid Volume/ Laboratory glassware-Beakers	GTS-WP-61 Gravimetric method according to ISO 4787:2010	50 ml to 5000 ml	0.70%	Laboratory

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Emirates International Accreditation Centre

Accreditation Scope

Volume Calibration

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General Const. Lab Calibration LLC

Industrial Area # 3, Sharjah-United Arab Emirates

Issue no.: 10 **Date: 25-05-2021** **Valid to: 24-05-2024**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Liquid Volume/ Laboratory glassware- Graduated cylinders	GTS-WP-61 Gravimetric method according to ISO 4787:2010	5 ml to 100 ml	0.10%	Laboratory
		> 100 ml to 5000 ml	0.04%	
Volumetric Measuring Flask	GTS-WP-61 Gravimetric method according to ISO 4787:2010	> 5 ml to 100 ml	0.10%	Laboratory
		> 100 ml to 5000 ml	0.04%	
Liquid Volume/ Laboratory glassware- Specific Gravity Bottle	GTS-WP-61 Gravimetric method according to ISO 4787:2010	5 ml to 100 ml	0.03%	Laboratory
Liquid Volume/ Volumetric prover vessels	GTS-WP-61B Gravimetric method acc. to NIST SP 250-72:2009	5 L to 20 L	0.02%	Laboratory

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Emirates International Accreditation Centre

Accreditation Scope

Torque Calibration

LB-CAL-004

General Const. Lab Calibration LLC

Industrial Area # 3, Sharjah-United Arab Emirates

Issue no.: 04 **Date: 25-05-2021** **Valid to: 24-05-2024**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Torque Hand Torque Tools	GTS-WP-31 based on: ISO 6789-1: 2017 and ISO 6789-2: 2017	0,5 N·m to 2711 N·m	1,0 %	Laboratory
Torque Transducers	GTS-WP-185 based on BS 7882:2017	0.45 N·m to 5.65 N·m	0.50%	
		3.39 N·m to 45.19 N·m	0.40%	
		9.03 N·m to 813,49 N·m	0.30%	
		271 N·m to 2711 N·m	0.80%	

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Accreditation Scope

Electrical Calibration

LB-CAL-004

General Const. Lab Calibration LLC

Industrial Area # 3, Sharjah-United Arab Emirates

Issue no.: 10 **Date: 25-05-2021** **Valid to: 24-05-2024**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration of instruments				
AC Voltage	Direct Method using Fluke 9100 *U = Measured voltage value*	**000.001 mV to 010.000 Mv**		Laboratory/ Customer Premises
		10 Hz to 3 kHz	$0.46 \times 10^3\ U + 0.44$ mV	
		>3 kHz to 10 kHz	$0.46 \times 10^3\ U + 0.59$ mV	
		>10 kHz to 30 kHz	$0.69 \times 10^3\ U + 1.1$ mV	
		>30 kHz to 50 kHz	$1.0 \times 10^3\ U + 2.2$ mV	
		>50 kHz to 100 kHz	$2.3 \times 10^3\ U + 5.9$ mV	
		010.001 mV to 032.000 mV		
		10 Hz to 3 kHz	$0.46 \times 10^3\ U + 0.11$ mV	
		>3 kHz to - 10 kHz	$0.4 \times 10^3\ U + 0.15$ mV	
		>10 kHz to 30 kHz	$0.70 \times 10^3\ U + 0.28$ mV	
		>30 kHz to 50 kHz	$1.0 \times 10^3\ U + 0.56$ mV	
		>50 kHz to 100 kHz	$2.3 \times 10^3\ U + 1.5$ mV	

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Accreditation Scope

Electrical Calibration

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Issue no.: 10 **Date: 25-05-2021** **Valid to: 24-05-2024**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration of instruments				
AC Voltage	Direct Method using Fluke 9100 *U = Measured voltage value*	**032.001 mV to 320.000 mV**		Laboratory/ Customer Premises
		10 Hz to 3 kHz	0.47×10^3 *U* + 22 µV	
		>3 kHz to 10 kHz	0.47×10^3 *U* + 29 µV	
		>10 kHz to 30 kHz	0.70×10^3 *U* + 56 µV	
		032.001 mV to 320.000 mV		
		>30 kHz to 50 kHz	1.1×10^3 *U* + 0.11 mV	
		>50 kHz to 100 kHz	2.3×10^3 *U* + 0.30 mV	
		0.32001 V to 3.20000 V		
		10 Hz to 3 kHz	0.48×10^3 *U* + 0.22 mV	
		>3 kHz to 10 kHz	0.47×10^3 *U* + 0.29 mV	
		>10 kHz to 30 kHz	0.70×10^3 *U* + 0.55 mV	
		>30 kHz to 50 kHz	1.1×10^3 *U* + 1.1 mV	
		>50 kHz to 100 kHz	2.3×10^3 *U* + 3.0 mV	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration of instruments				
AC Voltage	Direct Method using Fluke 9100 *U = Measured voltage value*	**3.2001 V to 32.0000 V**		Laboratory/ Customer Premises
		10 Hz to 3 kHz	$0.48 \times 10^3 U + 2.2$ mV	
		>3 kHz to 10 kHz	$0.71 \times 10^3 U + 2.9$ mV	
		>10 kHz to 30 kHz	$0.93 \times 10^3 U + 5.5$ mV	
		>30 kHz to 50 kHz	$1.7 \times 10^3 U + 11$ mV	
		>50 kHz to 100 kHz	$4.1 \times 10^3 U + 37$ mV	
		032.001 V to 105.000 V		
		10 Hz to 3 kHz	$0.47 \times 10^3 U + 7.3$ mV	
		>3 kHz to 10 kHz	$0.70 \times 10^3 U + 9.7$ mV	
		>10 kHz to 30 kHz	$0.93 \times 10^3 U + 18$ mV	
		>30 kHz to 50 kHz	$1.7 \times 10^3 U + 36$ mV	
		>50 kHz to 100 kHz	$4.1 \times 10^3 U + 0.12$ V	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration of instruments				
AC Voltage	Direct Method using Fluke 9100 *U = Measured voltage value*	**105.001 V to 320.000 V**		Laboratory/ Customer Premises
		40 Hz to 100 Hz	$0.6 \times 10^3 U + 22$ mV	
		>100 Hz to 1 kHz	$0.6 \times 10^3 U + 22$ mV	
		>1 kHz to 3 kHz	$0.94 \times 10^3 U + 22$ mV	
		>3 kHz to 10 kHz	$0.94 \times 10^3 U + 37$ mV	
		>20 kHz to 30 kHz	$1.7 \times 10^3 U + 74$ mV	
		0320.01 V to 0800.00 V		
		40 Hz to 100 Hz	$0.59 \times 10^3 U + 73$ mV	
		>100 Hz to 1 kHz	$0.59 \times 10^3 U + 73$ mV	
		0320.01 V to 0800.00 V		
		>1 kHz to 3 kHz	$0.93 \times 10^3 U + 73$ mV	
		>3 kHz to 10 kHz	$0.93 \times 10^3 U + 0.12$ V	
		0800.01 V to 1050.00 V		
		40 Hz to 100 Hz	$0.59 \times 10^3 U + 0.15$ V	
		>100 Hz to 1 kHz	$0.59 \times 10^3 U + 0.15$ V	
		>1 kHz to 3 kHz	$0.93 \times 10^3 U + 0.15$ V	
		>3 kHz to 10 kHz	$0.93 \times 10^3 U + 0.24$ V	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration of instruments				
AC Voltage	Direct Method using Fluke 5522A *U = Measured voltage value*	**1.0 mV to 32.999 mV**		Laboratory/ Customer Premises
		10 Hz to 45 Hz	0.62×10^{-3} *U* + 4.8 µV	
		>45 Hz to 10 kHz	0.13×10^{-3} *U* +4.8 µV	
		>10 kHz to 20 kHz	0.17×10^{-3} *U* +4.8 µV	
		>20 kHz to 50 kHz	0.78×10^{-3} *U* +4.8 µV	
		>50 kHz to 100 kHz	2.7×10^{-3} *U* +9.4 µV	
		>100 kHz to 500 kHz	6.3×10^{-3} *U* +39 µV	
		33 mV to 329.999 Mv		
		10 Hz to 45 Hz	0.24×10^{-3} *U* +6.1 µV	
		>45 Hz to 10 kHz	0.13×10^{-3} *U* +6.0 µV	
		>10 kHz to 20 kHz	0.14×10^{-3} *U* +6.0 µV	
		>20 kHz to 50 kHz	0.28×10^{-3} *U* +6.0 µV	
		>50 kHz to 100 kHz	0.63×10^{-3} *U* +25 µV	
		>100 kHz to 500 kHz	1.7×10^{-3} *U* +53 µV	

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Calibration of instruments				
AC Voltage	Direct Method using Fluke 5522A *U = Measured voltage value*	**0.33 V to 3.29999 V**		Laboratory/ Customer Premises
		10 Hz to 45 Hz	0.48×10^{-3} *U* +80 µV	
		>45 Hz to 10 kHz	0.13×10^{-3} *U* +45 µV	
		>10 kHz to 20 kHz	0.16×10^{-3} *U* +45 µV	
		>20 kHz to 50 kHz	0.24×10^{-3} *U* +38 µV	
		>50 kHz to 100 kHz	0.55×10^{-3} *U* +97 µV	
		>100 kHz to 500 kHz	1.9×10^{-3} *U* +0.46 mV	
		3.3 V to 32.9999 V		
		10 Hz to 45 Hz	0.48×10^{-3} *U* + 1.0 mV	
		>45 Hz to 10 kHz	0.13×10^{-3} *U* +0.45 mV	
		>10 kHz to 20 kHz	0.20×10^{-3} *U* +0.46 mV	
		>20 kHz to 50 kHz	0.28×10^{-3} *U* +0.46 mV	
		>50 kHz to 100 kHz	0.71×10^{-3} *U* +1.2 mV	

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Calibration of instruments				
AC Voltage	Direct Method using Fluke 5522A *U = Measured voltage value*	**33 V to 329.9999 V**		Laboratory/ Customer Premises
		45 Hz to 1 kHz	0.16×10^{-3} *U* +1.6 mV	
		>1 kHz to 10 kHz	0.17×10^{-3} *U* +4.5 mV	
		>10 kHz to 20 kHz	0.21×10^{-3} *U* +4.6 mV	
		>20 kHz to 50 kHz	0.26×10^{-3} *U* +4.4 mV	
		>50 kHz to 100 kHz	1.6×10^{-3} *U* +39 mV	
		330 V to 1020 V		
		45 Hz to 1 kHz	0.24×10^{-3} *U* +8.5 mV	
		>1 kHz to 5 kHz	0.21×10^{-3} *U* +8.5 mV	
		>5 kHz to 10 kHz	0.26×10^{-3} *U* +8.0 mV	
DC Voltage	Direct Method using Fluke 9100 *U = Measured Voltage value*	0.001 mV to 320.000 mV	14×10^{6} *U* + 1,7 µV	Laboratory/ Customer Premises
		0.32001 V to 3.20000 V	$9{,}0 \times 10^{6}$ *U* + 1,7 µV	
		3.2001 V to 32.0000 V	10×10^{6} *U* + 17 µV	
		32.001 V to 320.000 V	15×10^{6} *U* + 0,13 mV	
		320.01 V to 1050.00 V	15×10^{6} *U* + 1,3 mV	

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Calibration of instruments				
DC Voltage	Direct Method using Fluke 5522A *U = Measured Voltage value*	0 V to 329.9999 mV	56×10^{-6} *U* +2 µV	Laboratory/ Customer Premises
		0.33 V to 3.299999 V	58×10^{-6} *U* +0.3 µV	
		3.3 V to 32.99999 V	59×10^{-6} *U* +3.5 µV	
		33 V to 329.9999 V	60×10^{-6} *U* +0.035 mV	
		330 to 1020.000 V	60×10^{-6} *U* +0.36 mV	
DC Current	Direct Method using Fluke 9100 *I = Measured Current value*	0.001 µA to 320.000 µA	0.17×10^{3} / + 0.013 µA	Laboratory/ Customer Premises
		0.32001 mA to 3.20000 mA	0.18×10^{3} /+ 0.094 µA	
		3.2001 mA to 32.0000 mA	0.18×10^{3} / + 1.0 µA	
		32.001 mA to 320.000 mA	0.20×10^{3} / + 11 µA	
		0.32001 A to 3.20000 A	0.70×10^{3} / + 0.14 mA	
		3.2001 A to 10.5000 A	0.64×10^{3} / + 1.1 mA	
		10-turn current coil		
		3.2001 A to 32.0000 A	2.4×10^{-3} / + 0.51 mA	
		32.001 A to 105.000 A	2.4×10^{-3} / + 3.8 mA	

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Calibration of instruments				
DC Current	Direct Method using Fluke 9100 *I = Measured Current value*	**50-turn current coil**		Laboratory/ Customer Premises
		16.001 A to 160.000 A	2.4×10^{-3} / + 2.5 mA	
		160.01 A to 525.00 A	2.4×10^{-3} / + 19 mA	
		525.01 A to 1000.00 A	2.4×10^{-3} / + 0.104 A	
	Direct Method using Fluke 5522A *I = Measured Current value*	0 µA to 329.999 µA	0.12×10^{-3} / +0.011 µA	
		0.33 mA to 3.29999 mA	0.08×10^{-3} / + 0.04 µA	
		3.3 mA to 32.99999 mA	0.08×10^{-3} / +0.21 µA	
		33 mA to 329.999 mA	0.16×10^{-3} / +4.2 µA	
		0.33 A to 1.09999 A	0.16×10^{-3} / +0.031 mA	
		1.1 A to 2.99999 A	0.30×10^{-3} / +0.031 mA	
		3 A to 10.9999 A	0.41×10^{-3} / +0.38 mA	
		11 A to 20.5 A	0.85×10^{-3} / +0.54 mA	
		50 turn coil		Laboratory/ Customer Premises
		0.2 A to 0.33 A	4.0×10^{-3} / +16 mA	
		>0.33 A to 2.9999 A	4.0×10^{-3} / +0.11 A	
		3 A to 20.5 A	4.0×10^{-3} / +0.39 A	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration of instruments				
AC Current	Direct Method using Fluke 9100 *I = Measured Current value*	**0.001 µA to 320.000 µA**		Laboratory/ Customer Premises
		10 Hz to 3 kHz	0.83×10^{-3} / + 0.35 µA	
		>3 kHz to 10 kHz	1.2×10^{-3} / + 0.69 µA	
		>10 kHz to 20 kHz	2.3×10^{-3} / + 2.3 µA	
		>20 kHz to 30 kHz	2.9×10^{-3} / + 3.5 µA	
		0.32001 mA to 3.20000 mA		
		10 Hz to 3 kHz	0.85×10^{-3} / + 0.34 µA	
		>3 kHz to 10 kHz	1.2×10^{-3} /+ 0.68 µA	
		>10 kHz to 20 kHz	2.4×10^{-3} /+ 2.3 µA	
		>20 kHz to 30 kHz	2.9×10^{-3} / + 3.5 µA	
		10 Hz to 3 kHz	0.85×10^{-3} / + 3.6 µA	
		>3 kHz to 10 kHz	1.2×10^{-3} / + 7.3 µA	
		>10 kHz to 20 kHz	2.4×10^{-3} /+ 15 µA	
		>20 kHz to 30 kHz	2.9×10^{-3} / + 26 µA	

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Calibration of instruments				
AC Current	Direct Method using Fluke 9100 *I = Measured Current value*	**32.001 mA to 320.000 mA**		Laboratory/ Customer Premises
		10 Hz to 3 kHz	0.9×10^{-3} / + 36 µA	
		>3 kHz to 10 kHz	1.2×10^{-3} / + 54 µA	
		>10 kHz to 20 kHz	2.4×10^{-3} / + 74 µA	
		>20 kHz to 30 kHz	2.9×10^{-3} / + 0.11 mA	
		0.32001 A to 3.20000 A		
		10 Hz to 3 kHz	1.2×10^{-3} / + 0.55 µA	
		>3 kHz to 10 kHz	2.9×10^{-3} / + 3 mA	
		3.2001 A to 10.5000 A		
		10 Hz to 3 kHz	2.3×10^{-3} /+ 3.5 mA	
		>3 kHz to 10 kHz	5.8×10^{-3} / + 12 mA	
		10-turn current coil		
		3.2001 A to 32.0000 A		
		10 Hz to 100 Hz	3.3×10^{-3} /+ 5.2 mA	
		>100 Hz to 440 Hz	9.3×10^{-3} / + 31 mA	

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Calibration of instruments				
AC Current	Direct Method using Fluke 9100 *I = Measured Current value*	**10-turn current coil**		Laboratory/ Customer Premises
		32.001 A to 200.000 A		
		10 Hz to 100 Hz	3.3×10^{-3} / + 91 mA	
		>100 Hz to 440 Hz	8.1×10^{-3} / + 0.28 A	
		50-turn current coil		
		16.001 A to 160.000 A		
		10 Hz to 100 Hz	3.3×10^{-3} / + 27 mA	
		160.01 A to 1000.00 A		
		10 Hz to 100 Hz	3.3×10^{-3} / + 0.45 A	
	Direct Method using Fluke 5522A *I = Measured Current value*	**29 µA to 329.99 µA**		
		10 Hz to 20 Hz	1.6×10^{-3} / +0.10 µA	
		>20 Hz to 45 Hz	1.2×10^{-3} / +0.10 µA	
		>45 Hz to 1 kHz	0.97×10^{-3} / +0.10 µA	
		>1 kHz to 5 kHz	2.3×10^{-3} / +0.12 µA	

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Calibration of instruments				
AC Current	Direct Method using Fluke 5522A *I = Measured Current value*	**29 µA to 329.99 µA**		Laboratory/ Customer Premises
		>5 kHz to 10 kHz	6.2×10^{-3} / +0.16 µA	
		>10 kHz to 30 kHz	12×10^{-3} / +0.31 µA	
		0.33 mA to 3.29999 mA		
		10 Hz to 20 Hz	1.6×10^{-3} / +0.12 µA	
		>20 Hz to 45 Hz	0.97×10^{-3} / +0.12 µA	
		>45 Hz to 1 kHz	0.78×10^{-3} / +0.12 µA	
		>1 kHz to 5 kHz	1.55×10^{-3} / +0.16 µA	
		>5 kHz to 10 kHz	3.9×10^{-3} / +0.23 µA	
		>10 kHz to 30 kHz	7.8×10^{-3} / +0.46 µA	
		3.3 mA to 32.9999 mA		
		10 Hz to 20 Hz	1.4×10^{-3} / +1.6 µA	
		>20 Hz to 45 Hz	0.71×10^{-3} / +1.5 µA	
		>45 Hz to 1 kHz	0.35×10^{-3} / +1.5 µA	
		>1 kHz to 5 kHz	0.69×10^{-3} / +1.5 µA	
		>5 kHz to 10 kHz	1.6×10^{-3} / +1.5 µA	
		>10 kHz to 30 kHz	3.1×10^{-3} / +1.5 µA	

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Calibration of instruments				
AC Current	Direct Method using Fluke 5522A *I = Measured Current value*	**33 mA to 329.999 mA**		Laboratory/ Customer Premises
		10 Hz to 20 Hz	1.4×10^{-3} / +16 µA	
		>20 Hz to 45 Hz	0.70×10^{-3} / +16 µA	
		>45 Hz to 1 kHz	0.32×10^{-3} / +15 µA	
		>1 kHz to 5 kHz	0.78×10^{-3} / +39 µA	
		>5 kHz to 10 kHz	1.6×10^{-3} / +78 µA	
		>10 kHz to 30 kHz	3.1×10^{-3} / +0.16 mA	
		0.33 A to 1.09999 A		
		10 Hz to 45 Hz	1.4×10^{-3} / +76 µA	
		>45 Hz to 1 kHz	0.41×10^{-3} / +76 µA	
		>1 kHz to 5 kHz	4.7×10^{-3} / +0.77mA	
		>5 kHz to 10 kHz	19×10^{-3} / +3.9 mA	
		1.11 A to 2.99999 A		
		10 Hz to 45 Hz	1.4×10^{-3} / +77 µA	
		>45 Hz to 1 kHz	0.48×10^{-3} / +76 µA	
		>1 kHz to 5 kHz	4.7×10^{-3} / +0.77 mA	
		>5 kHz to 10 kHz	19×10^{-3} / +3.9 mA	

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Calibration of instruments				
AC Current	Direct Method using Fluke 5522A *I = Measured Current value*	**3 A to 10.9999 A**		Laboratory/ Customer Premises
		45Hz to 100 Hz	0.48×10^{-3} / +1.5 mA	
		>100 Hz to 1 kHz	0.79×10^{-3} / +1.5 mA	
		>1 kHz to 5 kHz	23×10^{-3} / +1.6 mA	
		11 A to 20.5 A		
		45 Hz to 100 Hz	0.95×10^{-3} / +3.8 mA	
		>100 Hz to 1 kHz	1.2×10^{-3} / +3.8 mA	
		>1 kHz to 5 kHz	23×10^{-3} / +3.9 mA	
		Magnitude (50 turn)		
		0.2 A to 0.33 A/45 Hz to 65 Hz		
		10 to 16.4999A	3.3×10^{-3} + 1.6 mA	
		> 0.33 A to 2.9999 A/45 Hz to 65 Hz		
		16.5 to 149.999 A	3.3×10^{-3} + 1.5 mA	
		3.0 A to 20.5 A/45 Hz to 65 Hz		
		150 to 1025 A	3.4×10^{-3} + 47 mA	

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Calibration of instruments				
AC Current	Direct Method using Fluke 5522A *I = Measured Current value*	**0.2 A to 0.33 A/65 Hz to 440 Hz**		Laboratory/ Customer Premises
		10 to 16.4999 A	6.6×10^{-3} + 2.2 mA	
		Magnitude (50 turn)		
		> 0.33 A to 2.9999 A/65 Hz to 440 Hz		
		16.5 to 149.999 A	6.6×10^{-3} + 20 mA	
		3.0 A to 20.5 A/65 Hz to 440 Hz		
		150 to 1025 A	6.7×10^{-3} + 72 mA	
Resistance	Direct Method using Fluke 9100 *R = Measured Resistance value*	0.0001 Ω to 40.0000 Ω	0.33×10^{-3} *R* + 12 mΩ	Laboratory/ Customer Premises
		40.001 Ω to 400.000 Ω	0.23×10^{-3} *R* + 23 mΩ	
		0.40001 kΩ to 4.00000 kΩ	0.17×10^{-3} *R* + 93 mΩ	
		4.0001 kΩ to 40.0000 kΩ	0.17×10^{-3} *R* + 0.93 Ω	
		40.001 kΩ to 400.000 kΩ	0.21×10^{-3} *R* + 9.3 Ω	
		0.40001 MΩ to 4.00000 MΩ	0.23×10^{-3} *R* + 0.12 kΩ	
		4.0001 MΩ to 40.0000 MΩ	0.59×10^{-3} *R* + 2.3 kΩ	
		40.001 MΩ to 400.000 MΩ	0.71×10^{-3} *R* + 46 kΩ	

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Calibration of instruments				
Resistance	Direct Method using Fluke 5522A *R = Measured Resistance value*	0 Ω to 10.9999 Ω	31 x10^{-6} *R* +7.8 mΩ	Laboratory/ Customer Premises
		11 Ω to 32.9999 Ω	23 x10^{-6} *R* +12mΩ	
		33 Ω to 109.9999 Ω	22 x10^{-6} *R* +12 mΩ	
		110 Ω to 329.9999 Ω	22 x10^{-6} *R* +16 mΩ	
		330 Ω to 1.099999 kΩ	22 x10^{-6} *R* +15 mΩ	
		1.1 kΩ to 3.299999 kΩ	22 x10^{-6} *R* +0.15 Ω	
		3.3 kΩ to 10.99999 kΩ	22 x10^{-6} *R* +0.077 Ω	
		11 kΩ to 32.99999 kΩ	22 x10^{-6} *R* +0.77 Ω	
		33 kΩ to 109.9999 kΩ	22 x10^{-6} *R* +0.77 Ω	
		110 kΩ to 329.99999 kΩ	25 x10^{-6} *R* +7.7 Ω	
		330 kΩ to 1.099999 MΩ	26 x10^{-6} *R* +7.7 Ω	
		1.1 MΩ to 3.299999 MΩ	48 x10^{-6} *R* +0.12 kΩ	
		3.3 MΩ to 10.99999 MΩ	0.10 x 10^{-3} *R* +0.19 kΩ	
		11 MΩ to 32.99999 MΩ	0.21 x 10^{-3} *R* +1.9 kΩ	
		33 MΩ to 109.9999 MΩ	0.44 x 10^{-3} *R* +2.1 kΩ	
		110 MΩ to 329.9999 MΩ	2.3 x 10^{-3} *R* +0.077 MΩ	
		330 MΩ to 1100 MΩ	12 x 10^{-3} *R* +0.39 MΩ	

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Calibration of instruments				
Capacitance	Direct Method using Fluke 9100	0.5000 nF to 4.0000 nF	3.5×10^{-3} C+ 18 pF	Laboratory/ Customer Premises
		4.0001 nF to 40.000 nF	3.5×10^{-3} C+ 35 pF	
		40.001 nF to 400.00 nF	3.5×10^{-3} C+ 0.18 nF	
		400.01 nF to 4.0000 µF	4.7×10^{-3} *C* + 1.9 nF	
		4.0001 µF to 40.000 µF	5.8×10^{-3} *C* + 19 nF	
		40.001 µF to 400.00 µF	5.8×10^{-3} *C* + 0.19 µF	
		400.01 µF to 4.0000 mF	5.8×10^{-3} *C* + 1.8 µF	
		4.0001 mF to 40.000 mF	12×10^{-3} *C* + 69 µF	
	Direct Method using Fluke 5522A *C = Measured Capacitance value*	220 pF to 399.9 pF	8.6×10^{-3} *C* +7.2 pF	
		0.4 nF to 1.0999 nF	4.5×10^{-3} *C* +7.6 pF	
		1.1 nF to 3.2999 nF	4.1×10^{-3} *C* +7.6 pF	
		3.3 nF to 10.9999 nF	2.1×10^{-3} *C* +7.6 pF	
		11 nF to 32.9999 nF	2.0×10^{-3} *C* +77 pF	
		33 nF to 109.999 nF	2.1×10^{-3} *C* +76 pF	
		110 nF to 329.999 nF	2.1×10^{-3} *C* +0.23 nF	
		0.33 µF to 1.09999 µF	2.1×10^{-3} *C* +0.76 nF	
		1.1 µF to 3.29999 µF	2.1×10^{-3} *C* +2.3 nF	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration of instruments				
Capacitance	Direct Method using Fluke 5522A *C = Measured Capacitance value*	3.3 µF to 10.9999 µF	2.1×10^{-3} *C* +7.6 nF	Laboratory/ Customer Premises
		11 µF to 32.9999 µF	3.2×10^{-3} *C* +23 nF	
		33 µF to 109.999 µF	3.7×10^{-3} *C* +75 nF	
		110 µF to 329.999 µF	3.7×10^{-3} *C* +0.22 µF	
		0.33 mF - 1.09999 mF	5.4×10^{-3} *C* +0.75 µF	
		1.1 mF to 3.29999 mF	5.4×10^{-3} *C* +2.2 µF	
		3.3 mF to 10.9999 mF	5.4×10^{-3} *C* +7.5 µF	
		11 mF to 32.9999 mF	8.8×10^{-3} *C* +23 µF	
		33 mF to 110 mF	13×10^{-3} *C* +77 µF	
Frequency	Direct Method using Fluke 9100	0.5 Hz to 10.0 MHz	29×10^{-6} *f*	
	Direct Method using Fluke 5522A *f = Measured Frequency value*	0.01 Hz to 119.99 Hz	1.9×10^{-6} *f* +12 µHz	
		120 Hz to 1199.9 Hz	2.0×10^{-6} *f* +32 µHz	
		1.200 kHz to 11.999 kHz	2.0×10^{-6} *f* +0.29 mHz	
		12.00 kHz to 119.99 kHz	2.0×10^{-6} *f* +2.9 mHz	
		120.00 kHz to 1199.9 kHz	2.0×10^{-6} *f* +29 mHz	
		1.200 MHz to 2.000 MHz	1.9×10^{-6} *f* +0.42 Hz	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
RTD - simulation	Simulation Method using Fluke 5522A	-200 °C to -80 °C RTD-pt385, 100Ω	0.04 °C	Laboratory/ Customer Premises
		> -80 °C to 0.003 °C RTD-pt385, 100Ω	0.04 °C	
		0.03 °C to 100 °C RTD-pt385, 100Ω	0.06 °C	
		>100 °C to 300 °C RTD-pt385, 100Ω	0.07 °C	
		>300 °C to 400 °C RTD-pt385, 100Ω	0.08 °C	
		>400 °C to 630 °C RTD-pt385, 100Ω	0.09 °C	
		>630 °C to 800 °C RTD-pt385, 100Ω	0.18 °C	
		-200 °C to -80 °C RTD-pt3926, 100Ω	0.04 °C	
		>-80 °C to 0.003 °C RTD-pt3926, 100Ω	0.06 °C	
		0.03 °C to 100 °C / RTD-pt3926, 100Ω	0.07 °C	
		>100 °C to 300 °C RTD-pt3926, 100Ω	0.08 °C	
		>300 °C to 400 °C RTD-pt3926, 100Ω	0.09 °C	
		>400 °C to 630 °C RTD-pt3926, 100Ω	0.18 °C	

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RTD - simulation	Simulation Method using Fluke 5522A	-200 °C to -190 °C RTD-pt3916, 100Ω	0.19 °C	Laboratory/ Customer Premises
		>-190 °C to -80 °C RTD-pt3916, 100Ω	0.03 °C	
		>-80 °C to 0.003 °C RTD-pt3916, 100Ω	0.04 °C	
		0.03 °C to 100 °C RTD-pt3916, 100Ω	0.05 °C	
		>100 °C to 260 °C RTD-pt3916, 100Ω	0.06 °C	
		>260 °C to 300 °C RTD-pt3916, 100Ω	0.06 °C	
		>300 °C to 400 °C RTD-pt3916, 100Ω	0.07 °C	
		>400 °C to 600 °C RTD-pt3916, 100Ω	0.08 °C	
		>600 °C to 630 °C RTD-pt3916, 100Ω	0.18 °C	
		-200 °C to -80 °C RTD-pt385, 200Ω	0.03 °C	
		>-80 °C to 0.003 °C RTD-pt385, 200Ω	0.03 °C	
		0.03 °C to 100 °C RTD-pt385, 200Ω	0.03 °C	
		>100 °C to 260 °C RTD-pt385, 200Ω	0.04 °C	

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RTD - simulation	Simulation Method using Fluke 5522A	>260 °C to 300 °C RTD-pt385, 200Ω	0.09 °C	Laboratory/ Customer Premises
		>300 °C to 400 °C RTD-pt385, 200Ω	0.10 °C	
		>400 °C to 600 °C RTD-pt385, 200Ω	0.11 °C	
		>600 °C to 630 °C RTD-pt385, 200Ω	0.12 °C	
		-200 °C to -80 °C RTD-pt385, 500Ω	0.03 °C	
		>-80 °C to 0.003 °C RTD-pt385, 500Ω	0.04 °C	
		0.03 °C to 100 °C RTD-pt385, 500Ω	0.04 °C	
		>100 °C to 260 °C RTD-pt385, 500Ω	0.05 °C	
		>260 °C to 300 °C RTD-pt385, 500Ω	0.06 °C	
		>300 °C to 400 °C RTD-pt385, 500Ω	0.06 °C	
		>400 °C to 600 °C RTD-pt385, 500Ω	0.07 °C	
		>600 °C to 630 °C RTD-pt385, 500Ω	0.09 °C	
		-200 °C to -80 °C RTD-pt385, 1000Ω	0.03 °C	

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RTD - simulation	Simulation Method using Fluke 5522A	> -80 °C to 0.003 °C RTD-pt385, 1000Ω	0.03 °C	Laboratory/ Customer Premises
		0.03 °C to 100 °C RTD-pt385, 1000Ω	0.03 °C	
		>100 °C to 260 °C RTD-pt385, 1000Ω	0.04 °C	
		>260 °C to 300 °C RTD-pt385, 1000Ω	0.05 °C	
		>300 °C to 400 °C RTD-pt385, 1000Ω	0.06 °C	
		>400 °C to 600 °C RTD-pt385, 1000Ω	0.06 °C	
		>600 °C to 630 °C RTD-pt385, 1000Ω	0.18 °C	
		-80 °C to 0.003 °C RTD-pt385, 120Ω (Ni120)	0.03 °C	
		0.03 °C to 100 °C RTD-pt385, 120Ω (Ni120)	0.03 °C	
		>100 °C to 260 °C RTD-pt385, 120Ω (Ni120)	0.04 °C	
		-100 °C to 260 °C RTD-Cu427, 10Ω	0.23 °C	
		600 °C to 800 °C	0.34 °C	
		>800 °C to 1000 °C	0.26 °C	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Thermocouple B	Simulation Method using Fluke 5522A	600 °C to 800 °C	0.34 °C	Laboratory/ Customer Premises
		>800 °C to 1000 °C	0.26 °C	
		>1000 °C to 1550 °C	0.23 °C	
		>1550 °C to 1820 °C	0.26 °C	
Thermocouple C	Simulation Method using Fluke 5522A	0.01 °C to 150 °C	0.23 °C	
		>150 °C to 650 °C	0.20 °C	
		>650 °C to 1000 °C	0.24 °C	
		>1000 °C to 1800°C	0.39 °C	
		>1800 °C to 2316°C	0.65 °C	
Thermocouple E	Simulation Method using Fluke 5522A	-250 °C to -100 °C	0.39 °C	
		>-100 °C to -25 °C	0.12 °C	
		>-25 °C to 350 °C	0.11 °C	
		>350 °C to 650°C	0.12 °C	
		>650 °C to 1000°C	0.16 °C	
Thermocouple J	Simulation Method using Fluke 5522A	-210 °C to -100 °C	0.21 °C	
		>-100 °C to -35 °C	0.12 °C	
		>-30 °C to 150 °C	0.11 °C	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Thermocouple J	Simulation Method using Fluke 5522A	>150 °C to 760°C	0.13 °C	Laboratory/ Customer Premises
		>760 °C to 1200°C	0.18 °C	
Thermocouple K	Simulation Method using Fluke 5522A	-200 °C to -100 °C	0.26 °C	
		>-100 °C to -25 °C	0.14 °C	
		>-25 °C to 120 °C	0.12 °C	
		>120 °C to 1000 °C	0.20 °C	
		>1000 °C to 1372 °C	0.31 °C	
Thermocouple L	Simulation Method using Fluke 5522A	-200 °C to -100 °C	0.29 °C	
		>-100 °C to 800 °C	0.20 °C	
		>800°C to 900 °C	0.13 °C	
Thermocouple N	Simulation Method using Fluke 5522A	-200 °C to -100 °C	0.31 °C	
		>-100 °C to -25 °C	0.17 °C	
		>-25 °C to 120 °C	0.15 °C	
		>120 °C to 410 °C	0.14 °C	
		>410 °C to 1300 °C	0.21 °C	
Thermocouple R	Simulation Method using Fluke 5522A	0.01 °C to 250 °C	0.44 °C	
		>250 °C to 400 °C	0.27 °C	

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Thermocouple R	Simulation Method using Fluke 5522A	>400 °C to 1000 °C	0.26 °C	Laboratory/ Customer Premises
		>1000 °C to 1767°C	0.31 °C	
Thermocouple S	Simulation Method using Fluke 5522A	0.01 °C to 250 °C	0.36 °C	
		>250 °C to 1000 °C	0.28 °C	
		>1000 °C to 1400 °C	0.29 °C	
		>1400 °C to 1767°C	0.36 °C	
Thermocouple T	Simulation Method using Fluke 5522A	-250 °C to -150 °C	0.49 °C	
		> -150 °C to 0.003 °C	0.19 °C	
		0.01 °C to 120 °C	0.12 °C	
		>120 °C to 400°C	0.11 °C	
Thermocouple U	Simulation Method using Fluke 5522A	-200 °C to 0.01 °C	0.43 °C	
		>0.01 °C to 600 °C	0.21 °C	
DC Power	Direct Method using Fluke 5522A with PQ Option	33 mV/0.33mA	0.28×10^{-3} *P*	
		33 mV/329.99 mA	0.20×10^{-3} *P*	
		1020 V/0.33mA	0.29×10^{-3} *P*	
		1020 V/329.99 mA	0.20×10^{-3} *P*	
		33 mV/0.33 A	0.40×10^{-3} *P*	

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DC Power	Direct Method using Fluke 5522A with PQ Option	33 mV/2.9999 A	0.48×10^{-3} *P*	Laboratory/ Customer Premises
		1020 V/0.33 A	0.40×10^{-3} *P*	
		1020 V/2.9999 A	0.48×10^{-3} *P*	
		33 mV/3 A	0.83×10^{-3} *P*	
		33 mV/20.5 A	1.3×10^{-3} *P*	
		1020 V/3 A	0.84×10^{-3} *P*	
		1020 V/20.5 A	1.3×10^{-3} *P*	
AC Power	Direct Method using Fluke 5522A with PQ Option	**45 Hz to 65 Hz PF=1**		
		33 mV/3.3mA	1.4×10^{-3} *P*	
		33 mV/8.999 mA	1.0×10^{-3} *P*	
		33 mV/9 mA	0.92×10^{-3} *P*	
		33 mV/32.999 mA	0.78×10^{-3} *P*	
		33 mV/33 mA	1.3×10^{-3} *P*	
		33 mV/89.99 mA	0.99×10^{-3} *P*	
		33 mV/90 mA	0.91×10^{-3} *P*	
		33 mV/329.99 mA	0.77×10^{-3} *P*	

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AC Power	Direct Method using Fluke 5522A with PQ Option	329.99 mV/3.3 mA	$1.3 \times 10^{-3} P$	Laboratory/ Customer Premises
		329.99 mV/8.999 mA	$0.94 \times 10^{-3} P$	
		329.999 mV/9 mA	$0.86 \times 10^{-3} P$	
		329.999 mV/32.999 mA	$0.71 \times 10^{-3} P$	
		329.999 mV/33 mA	$1.3 \times 10^{-3} P$	
		329.999 mV/89.99 mA	$0.93 \times 10^{-3} P$	
		329.999 mV/90 mA	$0.85 \times 10^{-3} P$	
		329.999 mV/329.99 mA	$0.69 \times 10^{-3} P$	
		330 mV/3.3 mA	$1.4 \times 10^{-3} P$	
		330 mV/8.999 mA	$0.95 \times 10^{-3} P$	
		330 mV/9 mA	$0.89 \times 10^{-3} P$	
		330 mV/32.999 mA	$0.75 \times 10^{-3} P$	
		330 mV/33 mA	$1.3 \times 10^{-3} P$	
		330 mV/89.99 mA	$0.94 \times 10^{-3} P$	
		330 mV/90 mA	$0.88 \times 10^{-3} P$	
		330 mV/329.99 mA	$0.73 \times 10^{-3} P$	
		1020 V/3.3 mA	$1.3 \times 10^{-3} P$	

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AC Power	Direct Method using Fluke 5522A with PQ Option	1020 V/8.999 mA	0.95×10^{-3} *P*	Laboratory/ Customer Premises
		1020 V/9 mA	0.88×10^{-3} *P*	
		1020 V/32.999 mA	0.73×10^{-3} *P*	
		1020 V/33 mA	1.3×10^{-3} *P*	
		1020 V/89.99 mA	0.93×10^{-3} *P*	
		1020 V/90 mA	0.87×10^{-3} *P*	
		1020 V/329.99 mA	0.72×10^{-3} *P*	
		33 mV/0.33 A	1.1×10^{-3} *P*	
		33 mV/0.8999 A	0.96×10^{-3} *P*	
		33 mV/0.9 A	0.92×10^{-3} *P*	
		33 mV/2.1999 A	0.95×10^{-3} *P*	
		33 mV/2.2A	0.99×10^{-3} *P*	
		33 mV/4.4999 A	1.4×10^{-3} *P*	
		33 mV/4.5A	1.4×10^{-3} *P*	
		33 mV/20.5 A	1.8×10^{-3} *P*	
		329.999 mV/0.33 A	1.1×10^{-3} *P*	
		329.999 mV/0.8999 A	0.89×10^{-3} *P*	

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Electrical Calibration

LB-CAL-004

General Const. Lab Calibration LLC

Industrial Area # 3, Sharjah-United Arab Emirates

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
AC Power	Direct Method using Fluke 5522A with PQ Option	329.999 mV/0.9 A	$0.85 \times 10^{-3} P$	Laboratory/ Customer Premises
		329.999 mV/2.1999 A	$0.89 \times 10^{-3} P$	
		329.999 mV/2.2 A	$0.93 \times 10^{-3} P$	
		329.999 mV/4.4999 A	$1.3 \times 10^{-3} P$	
		329.999 mV/4.5 A	$1.3 \times 10^{-3} P$	
		329.999 mV/20.5 A	$1.7 \times 10^{-3} P$	
		330 mV/0.33 A	$1.1 \times 10^{-3} P$	
		330 mV/0.8999 A	$0.91 \times 10^{-3} P$	
		330 mV/0.9 A	$0.88 \times 10^{-3} P$	
		330 mV/2.1999 A	$0.92 \times 10^{-3} P$	
		330 mV/2.2 A	$0.97 \times 10^{-3} P$	
		330 mV/4.4999 A	$1.4 \times 10^{-3} P$	
		330 mV/4.5 A	$1.3 \times 10^{-3} P$	
		330 mV/20.5 A	$1.8 \times 10^{-3} P$	
		1020 V/0.33 A	$1.1 \times 10^{-3} P$	
		1020 V/0.8999 A	$0.90 \times 10^{-3} P$	
		1020 V/0.9A	$0.87 \times 10^{-3} P$	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
AC Power	Direct Method using Fluke 5522A with PQ Option	1020 V/2.1999 A	$0.91 \times 10^{-3} P$	Laboratory/ Customer Premises
		1020 V/2.2 A	$0.96 \times 10^{-3} P$	
		1020 V/4.4999 A	$1.4 \times 10^{-3} P$	
		1020 V/4.5 A	$1.3 \times 10^{-3} P$	
		1020 V/20.5 A	$1.8 \times 10^{-3} P$	
Oscilloscope	**Direct Method using Fluke 5522A with SC1100 Option:**			
	Relative Deviation Δy of the vertical Axis (measurement range):	2.5 mV to 6.6 V/ 50 Ω load, and 110 mV to130 V/ 1 MΩ load at 1 kHz	2.8×10^{-3} U	
	Oscilloscope Band Width	10 Hz to 1.1 GHz	14×10^{-3} f	
Resistance Meters μΩ; mΩ; Ω; kΩ; MΩ	Direct Method using Decade Resistance Boxes: 50 μΩ to 2.0 Ω using Ductor Cal 5070 5.0 Ω to 3.0 MΩ using High Power Resistance Substituter HPRS-C-6-1	50 μΩ;	$4.3 \times 10^{-3} R$	
		100 μΩ;	$2.5 \times 10^{-3} R$	
		150 μΩ;	$1.5 \times 10^{-3} R$	
		200 μΩ	$1.4 \times 10^{-3} R$	
		0.5 mΩ	$12 \times 10^{-3} R$	
		1.0 mΩ	$5.9 \times 10^{-3} R$	
		1.5 mΩ	$3.9 \times 10^{-3} R$	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Resistance Meters μΩ; mΩ; Ω; kΩ; MΩ	Direct Method using Decade Resistance Boxes: 50 μΩ to 2.0 Ω using Ductor Cal 5070 5.0 Ω to 3.0 MΩ using High Power Resistance Substituter HPRS-C-6-1	2.0 mΩ	$2.9 \times 10^{-3} R$	Laboratory/ Customer Premises
		5.0 mΩ	$1.2 \times 10^{-3} R$	
		10 mΩ	$0.72 \times 10^{-3} R$	
		15 mΩ	$0.58 \times 10^{-3} R$	
		20 mΩ	$0.58 \times 10^{-3} R$	
		50 mΩ	$0.16 \times 10^{-3} R$	
		100 mΩ	$0.13 \times 10^{-3} R$	
		150 mΩ	$0.12 \times 10^{-3} R$	
		200 mΩ	$0.13 \times 10^{-3} R$	
		0.5 Ω	$1.8 \times 10^{-3} R$	
		1.0 Ω	$0.89 \times 10^{-3} R$	
		1.5 Ω	$0.60 \times 10^{-3} R$	
		2.0 Ω	$0.46 \times 10^{-3} R$	
		5 Ω to 9 Ω	$1.9 \times 10^{-3} R$	
		10 Ω to 90 Ω	$1.9 \times 10^{-3} R$	
		100 Ω to 900 Ω	$1.9 \times 10^{-3} R$	
		1 kΩ to 9 kΩ	$1.9 \times 10^{-3} R$	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Resistance Meters μΩ; mΩ; Ω; kΩ; MΩ	Direct Method using Decade Resistance Boxes: 50 μΩ to 2.0 Ω using Ductor Cal 5070 5.0 Ω to 3.0 MΩ using High Power Resistance Substituter HPRS-C-6-1	100 Ω to 90 kΩ	$1.9 \times 10^{-3} R$	Laboratory/ Customer Premises
		100 kΩ to 900 kΩ	$1.9 \times 10^{-3} R$	
		1.0 MΩ	$17 \times 10^{-3} R$	
		2.0 MΩ	$17 \times 10^{-3} R$	
		3.0 MΩ	$12 \times 10^{-3} R$	
Insulation Resistance Tester	Direct Method using Decade Meg Ohm Box	0.1 MΩ to 9.99 MΩ	$2.3 \times 10^{-3} R$	
		10 MΩ to 99.9 MΩ	$8.5 \times 10^{-3} R$	
		100 MΩ to 1000 MΩ	$12 \times 10^{-3} R$	
Calibration of calibrators				
DC Voltage	Direct Method using Fluke 8846A *U = Measured Voltage value*	0 to 100 mV	$43 \times 10^{-6} U + 4$ μV	Laboratory/ Customer Premises
		>100mV to 1 V	$31 \times 10^{-6} U + 8$ μV	
		>1V to 10 V	$30 \times 10^{-6} U + 57$ μV	
		>10V to 100V	$46 \times 10^{-6} U + 0.69$ mV	
		>100V to 1000V	$49 \times 10^{-6} U + 12$ mV	
AC Voltage	Direct Method using Fluke 8846A *U = Measured Voltage value*	**0 to 100 Mv**		
		5 Hz	$4.1 \times 10^{-3} U + 46$ μV	
		>10 Hz to 20 kHz	$0.72 \times 10^{-3} U + 46$ μV	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration of calibrators				
AC Voltage	Direct Method using Fluke 8846A *U = Measured Voltage value*	**0 to 100 Mv**		Laboratory/ Customer Premises
		>20 kHz to 50 kHz	$1.5 \times 10^{-3}\ U + 58\ \mu V$	
		>50 kHz to 100 kHz	$7 \times 10^{-3}\ U + 93\ \mu V$	
		>100 mV to 1 V		
		5 Hz to 10 Hz	$4.1 \times 10^{-3}\ U + 0.35$ mV	
		>10 Hz to 20 kHz	$0.70 \times 10^{-3}\ U + 0.35$ mV	
		>20 kHz to 50 kHz	$1.4 \times 10^{-3}\ U + 0.58$ mV	
		>50 kHz to 100 kHz	$6.9 \times 10^{-3}\ U + 0.93$ mV	
		>1V to 10 V		
		5 Hz to 10 Hz	$4.1 \times 10^{-3}\ U + 3.5$ mV	
		10 Hz to 20 kHz	$0.7 \times 10^{-3}\ U + 3.5$ mV	
		20 kHz to 50 kHz	$1.4 \times 10^{-3}\ U + 5.8$ mV	
		50 kHz to 100 kHz	$7 \times 10^{-3}\ U + 9.3$ mV	
		>10 V to 100 V		
		5 Hz to 10 Hz	$4.1 \times 10^{-3}\ U + 35$ mV	
		10 Hz to 20 kHz	$0.7 \times 10^{-3}\ U + 35$ mV	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration of calibrators				
AC Voltage	Direct Method using Fluke 8846A *U = Measured Voltage value*	**>10 V to 100 V**		Laboratory/ Customer Premises
		20 kHz to 50 kHz	1.4×10^{-3} *U* + 58 mV	
		50 kHz to 100 kHz	7×10^{-3} *U* + 93 mV	
		>100 V to 1000 V		
		5 Hz to 10 Hz	4.1×10^{-3} *U* + 0.35 V	
		>10 Hz to 20 kHz	0.72×10^{-3} *U* + 0.35 V	
		>20 kHz to 50 kHz	1.8×10^{-3} *U* + 0.55 V	
		>50 kHz to 100 kHz	7.0×10^{-3} *U* + 0.92 V	
DC Current	Direct Method using Fluke 8846A *I = Measured Current value*	0 to 100 µA	0.59×10^{-3} / + 0.03 µA	
		>100 µA to 1 mA	0.58×10^{-3} / + 0.06 µA	
		>1 mA to 10 mA	0.58×10^{-3} / + 2.3 µA	
		>10 mA to 100 mA	0.58×10^{-3} / + 5.8 µA	
		>100 mA to 1 A	0.59×10^{-3} / + 0.23 mA	
		> 1 A to 10 A	1.8×10^{-3} / + 0.92 mA	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration of calibrators				
AC Current	Direct Method using Fluke 8846A *I = Measured Current value*	0 to 100 µA 10 Hz to 1 kHz	1.2×10^{-3} / + 0.05 µA	Laboratory/ Customer Premises
		>100 µA to 1 mA 10 Hz to 1 kHz	1.2×10^{-3} / + 0.46 µA	
		>1 mA to 10 mA 10 Hz to 1 kHz	1.2×10^{-3} / + 4.6 µA	
		>10 mA to 100 mA 10 Hz to 1 kHz	1.2×10^{-3} / + 46 µA	
		>100 mA to 1 A 10 Hz to 1 kHz	1.2×10^{-3} / + 0.46 mA	
		>1 A to 10 A 10 Hz to 1 kHz	1.8×10^{-3} / + 6.9 mA	
Resistance	Direct Method using Fluke 8846A *R = Measured Resistance value*	0.0001 Ω to 10.0000 Ω	0.12×10^{-3} *R* + 3.5 mΩ	
		10.001 Ω to 100.000 Ω	0.12×10^{-3} *R* + 4.6 mΩ	
		0.1001 kΩ to 1.0 kΩ	0.12×10^{-3} *R* + 12 mΩ	
		1.0001 kΩ to 10.0000 kΩ	0.12×10^{-3} *R* + 0.12 Ω	
		10.001 kΩ to 100.000 kΩ	0.12×10^{-3} *R* + 1.2 Ω	
		0.10001 MΩ to 1.00000 MΩ	0.12×10^{-3} *R* + 11.4 Ω	
		1.0001 MΩ to 10.0000 MΩ	0.47×10^{-3} *R* + 0.12 kΩ	
		10.001 MΩ to 100.000 MΩ	9.3×10^{-3} *R* + 12 kΩ	

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Mass and Balance Calibration

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General Const. Lab Calibration LLC

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Issue no.: 10 **Date: 25-05-2021** **Valid to: 24-05-2024**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Conventional Mass (F1 , F2 Class) Up to 5 kg. M Class for 10 & 20 kg	GTS-WP-17 Substitution Weighing with air buoyancy Error ABBA weighing cycle based on OIML R-111:2004, OIML-D28:2004, PTB-Guide MA-40	1 mg	0.02 mg	Laboratory
		2 mg	0.02 mg	
		5 mg	0.02 mg	
		10 mg	0.02 mg	
		20 mg	0.02 mg	
		50 mg	0.02 mg	
		100 mg	0.017 mg	
		200 mg	0.02 mg	
		500 mg	0.02 mg	
		1 g	0.02 mg	
		2 g	0.02 mg	
		5 g	0.03 mg	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Conventional Mass (F1 , F2 Class) Up to 5 kg. M Class for 10 & 20 kg	GTS-WP-17 Substitution Weighing with air buoyancy Error ABBA weighing cycle based on OIML R-111:2004, OIML-D28:2004, PTB-Guide MA-40	10 g	0.03 mg	Laboratory
		20 g	0.05 mg	
		50 g	0.09 mg	
		100 g	0.19 mg	
		200 g	0.35 mg	
		500 g	0.81 mg	
		1 kg	1.6 mg	
		2 kg	8.7 mg	
		5 kg	8.4 mg	
		10 kg	0.16 g	
		20 kg	0.17 g	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration of top loading direct reading weighing balance	GTS-WP-01 Based on the requirements of ASTM E 898 Calibrated weights - E1 ,E2,F1, F2 & M1 weights	0 to 100 g	0.1 mg	Laboratory/ Customer Premises
		> 100 - 210 g	0.2 mg	
		> 210 - 500 g	0.6 mg	
		> 0.5 - 1 kg	1.0 mg	
		> 1 - 5 kg	9.0 mg	
		> 5 - 10 kg	13 mg	
		> 10 - 30 kg	0.23 g	
		> 30 - 100 kg	0.45 g	
		> 100 - 500 kg	2.3 g	
		> 500 - 1000 kg	0.46 kg	
		> 1000 - 2000 kg	0.69 kg	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Calibration concrete and asphalt batching plants (Hopper Scale)	Hopper Scale calibration of concrete and asphalt batching plants ASTM C94/C94M & NIST Handbook 44	0 Up to 5000 kg	0.05%	Customer Premises

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Pressure Calibration

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General Const. Lab Calibration LLC

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Pneumatic Pressure Calibration of Digital & Analogue Pressure Gauges	GTS-WP-02 Based on the requirements of BS EN 837-1 : 1998 Using Druck DPI 610, DPI 620	0 - 2 MPa	0.02%	Laboratory/ Customer Premises
Pneumatic Pressure Transducers, Transmitters and Switches	GTS-WP-02 Using Druck DPI 610, DPI 104 and Fluke 8846 multimeter	0 - 10 MPa	0.11%	Laboratory/ Customer Premises
Vacuum gauge calibration –Analogue & Digital	GTS-WP-03 Based on the requirements of BS EN 837-1 : 1998 and ISO/TS 3567 Using Druck DPI 610, DPI 620	0 - (– 0.1) MPa	0.1 kPa	Laboratory/ Customer Premises

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Hydraulic Pressure Transducers, Transmitters and Switches	GTS-WP-02 Using Budenberg DWT 580HX Piston Cylinder 030L & Fluke 8846 multimeter	0.069 - 120 MPa	0.11%	Laboratory
Hydraulic pressure Digital & Analogue Pressure Gauges & pressure modules	GTS-WP-02 Using Budenberg DWT 580HX Piston Cylinder 030L	0.069 - 120 MPa	0.02%	Laboratory
Calibration of hydraulic pressure balance	GTS-WP-143 based on OIML R110 and EURAMET cg-3 Version 1.0 (03/2011)	0.069 - 140 MPa	0.01%	Laboratory
Calibration of pneumatic pressure balance	GTS-WP-143 based on OIML R110 and EURAMET cg-3 Version 1.0 (03/2011)	0.05 - 2.5 MPa	0.01%	Laboratory
Calibration of Mercury and dial Sphygmomanometer	GTS-WP-184	0 - 46.66 kPa 0 - 300 mmHg	0.58 % rdg.	Laboratory/ Customer Premises

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Dimensional Calibration

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Caliper Digital (Resolution:0.01 mm)	GTS-WP-22 Based on BS EN ISO 13385-1:2019 For determining error of indicated size Comparison with gauge blocks/ calliper checker	0 – 200 mm	19 µm	Laboratory/ Customer Premises (Std. room/ Metrology)
		>200mm to 300mm	20 µm	
		>300 mm to 600 mm	25 µm	
		>600 mm to 1000 mm	34 µm	
		>1000 mm to 1500 mm	45 µm	
		>1500 mm to 2000 mm	60 µm	
Caliper Dial/Vernier (Resolution:0.02 mm)	GTS-WP-22 Based on BS EN ISO 13385-1: 2019 For determining error of indicated size Comparison with gauge blocks / calliper checker	0 – 200 mm	25 µm	Laboratory/ Customer Premises (Std. room/ Metrology)
		>200mm to 300mm	27 µm	
		>300 mm to 600 mm	28 µm	

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Caliper Dial/Vernier (Resolution:0.02 mm)	GTS-WP-22 Based on BS EN ISO 13385-1: 2019 For determining error of indicated size Comparison with gauge blocks / calliper checker	>600 mm to 1000 mm	36 µm	Laboratory/ Customer Premises (Std. room/ Metrology)
		>1000 mm to 1500 mm	48 µm	
		>1500 mm to 2000 mm	62 µm	
Vernier Caliper (Resolution: 0.05 mm)	GTS-WP-22 Based on BS EN ISO 13385-1: 2019 For determining error of indicated size Comparison with gauge blocks / calliper checker	0 – 200 mm	41 µm	Laboratory/ Customer Premises (Std. room/ Metrology)
		>200mm to 300mm	43 µm	
		>300 mm to 600 mm	45 µm	

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Vernier Caliper (Resolution: 0.05 mm)	GTS-WP-22 Based on BS EN ISO 13385-1: 2019 For determining error of indicated size Comparison with gauge blocks / calliper checker	>600 mm to 1000 mm	49 µm	Laboratory/ Customer Premises (Std. room/ Metrology)
		>1000 mm to 1500 mm	58 µm	
		>1500 mm to 2000 mm	67 µm	
External Micrometer (Digital) LC: 0.001 mm)	GTS-WP-23 Based on BS EN ISO 3611 & BS 870 (only for limits of error reference) DMS 2014 For determining error of indicated size Comparison with gauge blocks	0-25mm (already available)	2.5 µm	Laboratory/ Customer Premises (Std. room/ Metrology)
		>25 mm up to 100 mm	4 µm	
		>100 mm up to 500 mm	10 µm	
		>500 mm up to 925 mm	20 µm	

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External Micrometer (Analogue LC:0.01 mm)	GTS-WP-23 Based on BS EN ISO 3611 & BS 870 (only for limits of error reference) For determining error of indicated size Comparison with gauge blocks	0 up to 25mm (already available)	3 µm	Laboratory/ Customer Premises (Std. room/ Metrology)
		>25mm up to 100mm	4 µm	
		>100mm up to 500mm	10 µm	
		>500mm up to 925mm	20 µm	
Micrometer Setting Standard	GTS-WP-23 Based on BS EN ISO 3611 For determining length using 1D comparator (ULMS)	Up to 100 mm	2 µm	Laboratory
		>100 up to 600 mm	9 µm	
Micrometer Setting Standard	GTS-WP-23 Based on BS EN ISO 3611 (using HMS) For determining length using HMS	Up to 100mm	3 µm	Laboratory
		>100mm up to 600mm	10 µm	
		>600 mm up to 900 mm	15 µm	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Depth Micrometer (Digital/ analogue)	GTS-WP-28 Based on BS EN ISO 6468 For determining error of indicated depth Comparison with gauge blocks	Up to 25mm	3 µm	Laboratory
		>25 mm up to 100mm	4 µm	
		>100 mm up to 300 mm	6 µm	
		Up to 100mm /0.01mm	7 µm	
		>100mm up to 300mm /0.01 mm	12 µm	
Tubular Micrometer/ Inside Micrometer (Digital / Analogue) and extension rods	GTS-WP-24 Based on BS EN ISO 959 For determining error of indicated size Comparison with gauge blocks and ULMS	Up to 75 mm	3.7 µm	Laboratory
		75 to 150 mm	4.5 µm	
		150 to 300 mm	7.2 µm	

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Tubular Micrometer/ Inside Micrometer (Digital / Analogue) and extension rods	GTS-WP-24 Based on BS 959: 2008 For determining error of indicated size Comparison with gauge blocks and scale of the universal length measuring machine (ULMs)	Up to 75 mm	3.5 µm	Laboratory
		75 to 150 mm	4.2 µm	
		150 to 300 mm	7.0 µm	
		300 to 450 mm	12 µm	
		450 to 680 mm	13 µm	
Inside Micrometer (Caliper Type)	GTS-WP-24 Based on BS EN ISO 959 For determining error of indicated size Comparison with gauge blocks, ring gauges and ULMS	up to 50 mm	5.3 µm	Laboratory

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Dial/Digital Indicators	GTS-WP-26 Based on BS EN ISO 463& BS 907 (only for limits of error reference) For determining error of indicated displacement Comparison with ULMS	0.01mm up to 100mm /0.01mm	8 µm	Laboratory
		0.001 mm up to 50 mm /0.001 mm	3 µm	
	Comparison with dial gauge calibrator	0.01mm up to 25mm /0.01mm	7 µm	Laboratory/ Customer Premises (Std. room)
Bore Gauge(Ordinary/ Digital)	GTS-WP-27 Based on JIS B 7515 For determining error of indicated diameter Comparison with calibration tester and ULMS	Up to 400 mm/0.001mm	9 µm	Laboratory
		Up to 400 mm/0.01mm	10 µm	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
LVDT (Ordinary/ Digital)	GTS-WP-168 Based on ASTM F2537 For determining error of indicated displacement Mechanical comparison to calibrated gauge blocks/ULMS	UP to 200mm	3+(0.05*L) µm; L: mm	Laboratory/ Customer Premises (Std. room)
Dial Test Indicator/ Lever Type Dial Gauges	GTS-WP-172 Based on BS EN ISO 463, BS 2795 & IS 11498 For determining error of indicated displacement Comparison with ULMS	Up to 1mm/0.001mm	2 µm	Laboratory
		Up to 1mm/0.01mm	6 µm	
Dial Test Indicator/ Lever Type Dial Gauges	Comparison with dial gauge calibrator	Up to 1mm/0.01mm	7 µm	Laboratory/ Customer Premises

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Dial/Digital Thickness Gauges	GTS-WP-36 Based on JIS B7503; JIS B7524 For determining error of indicated size Comparison with ULMS / calibrated gauge blocks	Up to 25mm /0.001mm	3 µm	Laboratory
		Up to 25mm /0.01mm	6.5 µm	
Depth Gauge (Dial/Digital/ Vernier)	GTS-WP-29 Based on BS EN ISO 13385-2: 2020 For determining error of indicated depth Comparison with gauge blocks	Up to 300 mm / 0.01 mm	20 µm	Laboratory
		Up to 450 mm / 0.01 mm	25 µm	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Height Gauge (Digital/Dial/ Analogue)	GTS-WP-25 Based on ISO 13225 : 2012 For determining error of indicated vertical size Comparison with gauge blocks and HMS	Up to 300 mm	21 µm	Laboratory/ Customer Premises (Std. room/ Metrology)
		300 to 600 mm	30 µm	
		600 to 1000 mm	41 µm	
Feeler Gauge	GTS-WP-56 Based on BS 957 For determining thickness Comparison method using calibrated digital micrometer	Up to 1mm	3.5 µm	Laboratory/ Customer Premises (Std. room/ Metrology)
Radius Gauge	GTS-WP-81 Based on IS 5273-1969 For determining radius using Profile Projector	Up to 25mm	9 µm	Laboratory

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Thread / Screw Pitch Gauge (Metric/inch)	GTS-WP-126 Based on IS 4211 For determining pitch using Profile Projector	0.4 - 7 mm	6 µm	Laboratory
		4 - 42 TPI	240 µin	
Thread Plug gauges (Metric / Unified/BSP (or) G threads)	GTS-WP-70 Based on EURAMET cg-10 For determining Simple Pitch Diameter using ULMS Metric Threads	1mm Up to 100mm	4 µm	
		>100 Up to 200mm	5 µm	
	For determining Simple Pitch Diameter using ULMS Inch - Unified / BSP	1/16" up to 4"	160 µin	
Thread Plug gauges (Metric / Unified/BSP (or) G threads)	For determining Simple Pitch Diameter using ULMS Inch - Unified / BSP	Above 4" and including 8"	200 µin	Laboratory

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Thread Ring Cauges	GTS-WP-137 Based on EURAMET cg-10 For determining Simple Pitch Diameter using ULMS Metric Threads	3mm up to 14mm	3 µm	Laboratory
		>14mm up to and including 100 mm	4 µm	
	For determining Simple Pitch Diameter using ULMS Inch – Unified /BSP	1/8" up to 1/2"	120 µin	
		1/2"< and including 4"	160 µin	
Thread Plug/Ring gauge – Taper (NPT/BSPT)	GTS-WP-173 Based on JIS B 0262 & EURAMET cg-10 For determining Simple Pitch Diameter using ULMS	1/8" up to 1/2"	140 µin	
		1/2"< and including 4"	180 µin	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Setting / Plain Plug gauge (Metric/Inch)	GTS-WP-80 Based on ASME B89.1.5 & EURAMET cg-6 For determining diameter Comparison with ULMS scale / gauge block using ULMS	1 mm up to 50 mm	1 µm	Laboratory
		>50 mm up to 100 mm	1.5 µm	
		>100 mm up to 400 mm	5 µm	
Setting / Plain Ring gauge (Metric/Inch)	GTS-WP-106 Based on BS EN ISO 4064 & EURAMET cg-6 For determining diamater Comparison with reference ring gauge using ULMS	1 to 14mm	1.3 µm	
		14< to 100mm	1.5 µm	
		100< to 200mm	3 µm	
		200< to 300mm	4.5 µm	
		300< to 400mm	5 µm	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Height Measuring System (HMS) / Digital Height Gauge with resolution of 0.001 mm or better	GTS-WP-169 Based on ISO 13225:2012 For determining error of indicated vertical size Comparison with gauge blocks	Up to 1000mm	1+(0.008*L)µm L: mm	Laboratory
1-D measuring Machine (Universal Length Measuring System (ULMS))	GTS-WP-139 For determining error of indicated size/displacement Mechanical comparison to gauge blocks	Up to 100mm (absolute) Up to 600mm (differential)	0.2+(0.006*L) µm L: mm	Laboratory
Steel Scale	GTS-WP-171 Based on OIML R035-1-e& BS 4372 Measurement of line spacing using profile projector	Up to 300 mm	0.050 mm	Laboratory

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Profile Projector	GTS-WP-158 Based on JIS B 7184 For determining error of indicated size/displacement/Magnification Accuracy/angular displacement Comparison to calibrated Glass scale and angular gauge blocks/Cross wire chart	Up to 200mm (0-360)°	5 + (0.015) µm L: mm 0.14° (8 arc minutes)	Laboratory
Cylindrical Standards / Measuring Pins	GTS-WP-170 Based on IS-11103 For determining diamater Comparison with ULMS scale / reference gauge block using ULMS	Up to 12 mm	1 µm	Laboratory

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Thread Measuring Cylinder	GTS-WP-170 Based on BS 3777 & BS 5590 For determining diamater Comparison with ULMS scale / reference gauge block using ULMS	Up to 6.35mm	1 µm	Laboratory
Caliper Checker	GTS-WP-164 Based on Manufacturer Spec. For determining face spacing Comparison to gauge blocks using precise HMS	Up to 600mm	1 + (0.01*L) µm L: mm	Laboratory

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Depth Micro Checker	GTS-WP-165 and 166 Based on Manufacturer Spec. For determining face spacing Comparison to gauge blocks using precise HMS	Up to 300mm	6.8 µm	Laboratory
Inside Micro checker	GTS-WP-166 Based on Manufacturer Spec. For determining face spacing Comparison to gauge blocks using precise HMS	Up to 300mm	4.6 µm	Laboratory
		>300mm Up to 600mm	7 µm	

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)*	Location
Dial Calibration Tester	GTS-WP-167 Based on Manufactured Spec. For determining error of indicated displacement Mechanical comparison to gauge blocks using precise HMS or ULMS	Up to 25mm	2 µm	Laboratory
Test Sieves	GTS-WP-43 Based on ISO 3310-1 For determining aperture size Using Profile Projector	50µm up to 4.3mm	8 µm	Laboratory
		4.3mm up to 125mm	32 µm	

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