



CERTIFICATE OF ACCREDITATION

ANSI National Accreditation Board

11617 Coldwater Road, Fort Wayne, IN 46845 USA

This is to certify that

Instech Calibration Services cc
5 Marignane Drive, Bonaero Park
Kempton Park, South Africa, 1619

has been assessed by ANAB and meets the requirements of international standard

ISO/IEC 17025:2017

while demonstrating technical competence in the field of

CALIBRATION

Refer to the accompanying Scope of Accreditation for information regarding the types of activities to which this accreditation applies

L2428

Certificate Number


ANAB Approval

Certificate Valid Through: 09/25/2021
Version No. 003 Issued: 08/14/2019



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Instech Calibration Services cc

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CALIBRATION

Valid to: **September 25, 2021**

Certificate Number: **L2428**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Capacitance – Measure ¹	(1 to 10) nF	0.14 nF	Fluke 8846A Multimeter
	(10 to 100) nF	1.4 nF	
	100 nF to 1 µF	14 nF	
	(1 to 10) µF	0.14 µF	
	(10 to 100) µF	1.4 µF	
	100 µF to 1 mF	14 µF	
	(1 to 10) mF	0.11 mF	
Capacitance – Source ¹	(0.19 to 3.3) nF	0.44 % of reading + 10 pF	Fluke 5500A Multiproduct Calibrator
	(3.3 to 33) nF	0.35 % of reading + 0.1 nF	
	(33 to 330) nF	0.29 % of reading + 0.3 nF	
	(0.33 to 3.3) µF	0.35 % of reading + 3 nF	
	(3.3 to 33) µF	0.62 % of reading + 30 nF	
	(33 to 330) µF	0.76 % of reading + 0.3 µF	
	(0.33 to 3.3) mF	0.92 % of reading + 0.3 µF	
DC Current - Measure ¹	(0 to 100) µA	61 nA	Fluke 8846A Multimeter
	(0.1 to 1) mA	40 nA	
	(1 to 10) mA	5.5 µA	
	(10 to 100) mA	44 µA	
	(100 to 400) mA	0.18 mA	
	(0.4 to 1) A	0.56 mA	
	(1 to 3) A	2.3 mA	Fluke 376 Clamp Meter
	(3 to 10) A	11 mA	
	(10 to 550) A	2 % of reading ± 5 digits	
	(10 to 600) A	0.22 % of reading	Fluke 8846A Multimeter with DC Shunt



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DC Current - Generate ¹	(0 to 3.3) mA (3.3 to 33) mA (33 to 330) mA (0.33 to 2.2) A (2.2 to 11) A	0.11 mA/A + 0.05 μ A 78 μ A/A + 0.25 μ A 87 μ A/A + 3.3 μ A 0.23 mA/A + 44 μ A 0.46 mA/A + 0.33 mA	Fluke 5500A Multiproduct Calibrator
DC Current – Simulate ¹ Clamp Meters	(11 to 550) A	0.25 % of reading	Fluke 5500A Multiproduct Calibrator & Current Coil
AC Current – Measure ¹	10 Hz to 5 kHz (0 to 100) μ A (0.1 to 1) mA (1 to 10) mA (10 to 100) mA (100 to 400) mA (0.4 to 1) A (1 to 3) A (3 to 10) A	0.17 μ A 1.3 μ A 18 μ A 0.12 mA 0.7 mA 1.2 mA 5.3 mA 18 mA	Fluke 8846A Multimeter
	(10 to 550) A (10 to 100) Hz	2 % of reading \pm 5 digits	Fluke 376 Clamp Meter
	(10 to 1 500) A (10 to 100) Hz	0.38 % of reading	Current Transformer with Fluke 8846A Multimeter
AC Current – Generate ¹	(0.03 to 0.33) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (0.33 to 3.3) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (3.3 to 33) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.19 % of reading + 0.15 μ A 0.1 % of reading + 0.15 μ A 0.1 % of reading + 0.25 μ A 0.31 % of reading + 0.15 μ A 0.96 % of reading + 0.15 μ A 0.16 % of reading + 0.3 μ A 0.08 % of reading + 0.3 μ A 0.08 % of reading + 0.3 μ A 0.16 % of reading + 0.3 μ A 0.46 % of reading + 0.3 μ A 0.19 % of reading + 3 μ A 0.08 % of reading + 3 μ A 0.08 % of reading + 3 μ A 0.16 % of reading + 3 μ A 0.46 % of reading + 3 μ A	Fluke 5500A Multiproduct Calibrator

Electrical – DC/Low Frequency

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AC Current – Generate ¹	(33 to 330) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (0.33 to 2.2) A (10 to 20) Hz (20 to 45) Hz 45 Hz to 5 kHz (2.2 to 11) A (45 to 60) Hz (60 to 500) Hz (0.5 to 1) kHz	0.16 % of reading + 30 μ A 0.08 % of reading + 30 μ A 0.08 % of reading + 30 μ A 0.16 % of reading + 30 μ A 0.46 % of reading + 30 μ A 0.16 % of reading + 0.3 mA 0.08 % of reading + 0.3 mA 0.58 % of reading + 0.3 mA 0.06 % of reading + 2 mA 0.08 % of reading + 2 mA 0.26 % of reading + 2 mA	Fluke 5500A Multiproduct Calibrator
AC Current – Simulate ¹ Clamp Meters	(10 to 550) A (45 to 500) Hz	0.26 % of reading	Fluke 5500A Multiproduct Calibrator & Current Coil
DC Power - Generate ¹	33 mV to 1 020 V (3.3 to 330) mA (0.33 to 11) A	0.13 % of reading 0.09 % of reading	Fluke 5500A Multiproduct Calibrator
AC Power – Generate ¹ PF = 1	33 mV to 1 020 V 3.3 mA to 11 A (45 to 65) Hz	0.28 % of reading	Fluke 5500A Multiproduct Calibrator
Resistance - Measure ¹	(0 to 10) Ω (10 to 100) Ω (0.1 to 1) k Ω (1 to 10) k Ω (10 to 100) k Ω (0.1 to 1) M Ω (1 to 10) M Ω (10 to 100) M Ω	3.7 m Ω 11 m Ω 87 m Ω 0.87 Ω 8.06 Ω 72 Ω 8.4 k Ω 0.63 M Ω	Fluke 8846A Multimeter
Resistance - Generate ¹	(0 to 330) Ω (0.33 to 3.3) k Ω (3.3 to 33) k Ω (33 to 330) k Ω (0.33 to 3.3) M Ω (3.3 to 33) M Ω (33 to 330) M Ω	0.007 % of reading + 0.01 Ω 0.007 % of reading + 0.06 Ω 0.007 % of reading + 0.6 Ω 0.009 % of reading + 6 Ω 0.012 % of reading + 55 Ω 0.08 % of reading + 0.55 k Ω 0.4 % of reading + 16.5 k Ω	Fluke 5500A Multiproduct Calibrator
	(0.1 to 100) M Ω 1 G Ω 10 G Ω	1.4 % of reading 12 M Ω 28 M Ω	High Voltage Reference Resistance Box



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature Simulation for RTD indicators ¹	PT 100 385 Ω (-200 to 630) °C (630 to 800) °C	0.095 °C 0.2 °C	Fluke 5500A Multiproduct Calibrator
	PT 1000 385 Ω (-200 to 600) °C (600 to 630) °C	0.062 °C 0.18 °C	
DC Voltage - Measure ¹	(0 to 100) mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1 000) V	6.5 μV 26 μV 0.24 mV 3.5 mV 33 mV	Fluke 8846A Multimeter
	(1 to 40) kV	1.6 % of reading	Fluke 80k-40 High Voltage Probe with Multimeter
DC Voltage - Generate ¹	(0 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (100 to 1 020) V	47 μV/V + 3 μV 39 μV/V + 5 μV 44 μV/V + 50 μV 43 μV/V + 0.5 mV 42 μV/V + 1.5 mV	Fluke 5500A Multiproduct Calibrator
	(1 to 30) kV	1.6 % of reading	
AC Voltage – Measure ¹	10 Hz to 20 kHz (0 to 100) mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1 000) V	89 μV 0.76 mV 8 mV 79 mV 0.65 V	Fluke 8846A Multimeter
	(1 to 28) kV 50 Hz	4 % of reading	Fluke 80k-40 High Voltage Probe with Multimeter
AC Voltage – Generate ¹	(1 to 33) mV (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz)	0.27 % of reading + 20 μV 0.12 % of reading + 20 μV 0.15 % of reading + 20 μV 0.19 % of reading + 20 μV 0.27 % of reading + 33 μV 0.77 % of reading + 60 μV	Fluke 5500A Multiproduct Calibrator



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Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Generate ¹	(33 to 330) mV (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500 kHz)	0.19 % of reading + 50 μV 0.04 % of reading + 20 μV 0.08 % of reading + 20 μV 0.12 % of reading + 40 μV 0.18 % of reading + 0.17 mV 0.54 % of reading + 0.33 mV	Fluke 5500A Multiproduct Calibrator
	(0.33 to 3.3) V (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (3.3 to 33) V 45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz	0.12 % of reading + 0.25 mV 0.02 % of reading + 60 μV 0.06 % of reading + 60 μV 0.11 % of reading + 0.3 mV 0.18 % of reading + 1.7 mV 0.12 % of reading + 2.5 mV 0.03 % of reading + 0.6 mV 0.06 % of reading + 2.6 mV	
	(33 to 330) V 45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (0.33 to 1 000) V 45 Hz to 1 kHz (1 to 10) kHz	0.04 % of reading + 6.6 mV 1.6 % of reading + 15 μV 1.7 % of reading + 33 μV 0.04 % of reading + 80 mV 0.15 % of reading + 0.6 mV	
	(1 to 20) kV 50 Hz	4.6 % of reading	Fluke 80k-40 High Voltage Probe with Multimeter and Power Supply
Temperature Measure and Simulation for Thermocouple Indicators ¹ Type K Type J Type T Type S Type R	(-200 to 1 372) °C (-200 to 1 372) °C (-250 to 400) °C (0 to 1 767) °C (0 to 1 767) °C	0.32 °C 0.23 °C 0.5 °C 0.38 °C 0.45 °C	Fluke 5500A Multiproduct Calibrator

Length – Dimensional metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Thickness Gauges ^{1,2}	11µm to 1.5 mm	0.2L µm	Calibration Foils
Thickness Gauges ^{1,2} (Ultrasonic, Magnetic and Eddy Current)	(2 to 25) mm	0.008L mm	Grade 1 Gauge Blocks and Micrometer

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Mass Pieces ¹	(0.1 to 5) g (5 to 100) g	2 mg 5 mg	OIML Class M1 mass pieces and client balance
Mass Pieces ¹	200 g 500 g 1 kg 2 kg 5 kg 10 kg 20 kg	16 mg 33 mg 51 mg 112 mg 9.9 g 8.4 g 9.1 g	OIML Class M2 mass pieces and balance
Hydraulic Gauge Pressure ¹	(-80 to 0) kPa (0 to 700) kPa (0.7 to 7) MPa (7 to 70) MPa	0.13 % of reading + 0.07 kPa 0.02 % of reading + 0.02 kPa 0.02 % of reading + 0.2 kPa 0.03 % of reading + 2 kPa	Wika & Druck Pressure Gages and Comparator
Pneumatic Gauge Pressure ¹	(-80 to 0) kPa (0 to 20) kPa (20 to 700) kPa (0.7 to 6) MPa	0.13 % of reading + 0.07 kPa 0.03 % of reading + 0.001 kPa 0.02 % of reading + 0.02 kPa 0.02 % of reading + 0.2 kPa	Wika & Druck Pressure Gages and Pneumatic Pump
Pneumatic Absolute Pressure ¹	(0 to 200) kPa	0.03 % of reading + 0.01 kPa	Druck Vacuum Gage and Vacuum Pump
Autoclave Gauge Pressure ¹	(0 to 700) kPa	0.02 % of reading + 0.02 kPa	Wika & Druck Pressure Gages and Pneumatic Pump
Scales and Balances ¹	(0.1 to 1) g (1 to 100) g (100 to 1 000) g (1 to 10) kg (10 to 60) kg (60 to 150) kg (10 to 400) kg	0.013 g 0.011 g 0.051 g 0.11 g 5 g 12 g 0.12 kg	OIML Class M1 and M2 Mass Pieces



Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Torque Screwdrivers and Wrenches ^{1,2} (CW Only)	(2 to 1 000) N·m	0.004T N·m	Torque Analyser, Torque Transducer with Display

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Hygrometers - Loggers and Indicators	(11, 33, 53, 75, 95) %RH (18 to 28) °C	1.2 %RH 0.3 °C	Reference Hygrometer and Chambers
Humidity and Temperature Indicators ¹	(11 to 95) %RH (10 to 50) °C	2.7 %RH 1.1 °C	Reference Datalogger
IR Thermometry Measurement Equipment ¹	(50 to 200) °C (200 to 500) °C	2.3 °C 5.2 °C	Portable IR Calibrator $\epsilon = 0.95, \lambda = (8 \text{ to } 14) \mu\text{m}$
Liquid in Glass Thermometry ¹	0 °C (23 to 90) °C	0.31 °C 0.31 °C	PRT and ice point PRT and water bath
Digital and Mechanical Thermometry Systems ¹	(- 15 to -20) °C	0.07 °C	PRT and Alcohol NaCl slurry
	0 °C	0.07 °C	PRT and ice point
	(23 to 90) °C	0.08 °C	PRT and water bath
	(50 to 400) °C	0.08 °C	PRT and dry block
	(400 to 1 200) °C	3.3 °C	Type R TC and dry block
Temperature Uniformity Survey ¹	(-70 to 1 000) °C	2.6 °C	Type K TC and display unit
System Accuracy Test ¹	(-70 to 1 000) °C	2.6 °C	Type K TC and display unit
Autoclave Temperature Uniformity Survey & Accuracy Test ¹	(0 to 200) °C	2.6 °C	Type K TC and display unit

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency - Measure ¹	0.04 kHz to 1 MHz	0.01 % of reading	Fluke 8846A Multimeter
Frequency - Generate ¹	(0.01 to 120) Hz (0.12 to 1.2) kHz (1.2 to 12) kHz (12 to 120) kHz (0.12 to 1.2) MHz (1.2 to 2) MHz	6.9 mHz 61 mHz 0.58 Hz 5.8 Hz 58 Hz 0.58 kHz	Fluke 5500A Multiproduct Calibrator
Stopwatches ¹	(1 to 86 400) s	0.2 s	HP 5228A Counter
Autoclave Timers ¹	(1 to 120) minutes	1 s	Stopwatch
Tachometers ¹ Contact Type Non-Contact Type	(10 to 2 999) rpm (10 to 6 000) rpm	0.1 % of reading	VSD Motor with rpm indicator

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ($k=2$), corresponding to a confidence level of approximately 95%.

Notes:

1. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
2. L = length in mm, T = Torque in N·m
3. This scope is formatted as part of a single document including Certificate of Accreditation No. L2428.



Vice President

