



DE Calibration and Compliance

Client Number 10139

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Programme

Metrology & Calibration Laboratory

Accreditation Number 1416

Initial Accreditation Date 1 November 2022

Conformance Standard

ISO/IEC 17025:2017


General requirements for the competence of testing and calibration laboratories

Laboratory Services Summary

- 5.88 Calibrators for Instrumentation
- 5.89 Indicating Instruments and Recording Instruments
- 5.98 Miscellaneous Electrical Tests

Key Technical Personnel

Mr Phillip Jose 5.88, 5.89, 5.98

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Calibration and Measurement Capability (CMC) Uncertainties are expressed as an expanded uncertainty corresponding to a level of confidence of 95 % ^{Note1}.

Measurement results are traceable to the International System of Units (SI) via an unbroken chain of comparisons to the New Zealand National Standards or to the National Standards of other Signatories to the CIPM MRA.

ppm is Parts Per Million. For example 100 ppm = 100 µV/V. Total CMC uncertainties are a combination of the reading uncertainty and the range uncertainty.

5.88 Calibrators for Instrumentation

In accordance with an in-house method based on equipment manufacturer’s recommendations unless stated otherwise.

(a) DC voltage

- Range
- 100 mV
- 1 V
- 10 V
- 110 V
- 1000 V

- 9 ppm reading + 1.7 ppm range
- 6.4 ppm reading + 0.6 ppm range
- 6.8 ppm reading + 0.6 ppm range
- 9.5 ppm reading + 0.8 ppm range
- 9.5 ppm reading + 1.2 ppm range

(b) AC voltage

- Range
- 100 mV

- 10 Hz to 40 Hz
- 40 Hz to 200 Hz
- 200 Hz to 1000 Hz
- 1 kHz to 2 kHz
- 2 kHz to 20 kHz
- 20 kHz to 100 kHz

- 0.08 % reading + 0.015 % range
- 0.03 % reading + 0.009 % range
- 0.03 % reading + 0.008 % range
- 0.03 % reading + 0.008 % range
- 0.04 % reading + 0.01 % range
- 0.09 % reading + 0.05 % range

- 1 V to 10 V

- 10 Hz to 40 Hz
- 40 Hz to 200 Hz
- 200 Hz to 1000 Hz
- 1 kHz to 2 kHz
- 2 kHz to 20 kHz
- 20 kHz to 100 kHz

- 0.06 % reading + 0.015 % range
- 0.03 % reading + 0.009 % range
- 0.02 % reading + 0.008 % range
- 0.02 % reading + 0.008 % range
- 0.04 % reading + 0.01 % range
- 0.09 % reading + 0.05 % range

- (10 V range limit 200 kHz)

- 100 kHz to 1000 kHz

- 1.5 % reading + 2.5 % range

- 100 V to 1000 V

- 10 Hz to 40 Hz
- 40 Hz to 200 Hz
- 200 Hz to 1000 Hz
- 1 kHz to 2 kHz
- 2 kHz to 20 kHz

- 0.08 % reading + 0.015 % range
- 0.03 % reading + 0.009 % range
- 0.03 % reading + 0.007 % range
- 0.03 % reading + 0.007 % range
- 0.05 % reading + 0.01 % range

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(c)	(1000 V range limit 10 kHz)	20 kHz to 50 kHz	0.12 % reading + 0.058 % range
	DC current		
	Range		
	10 nA		15000 ppm reading + 80 ppm range
	100 nA		3000 ppm reading + 34 ppm range
	1 µA		330 ppm reading + 17 ppm range
	10 µA		50 ppm reading + 10 ppm range
	100 µA		14 ppm reading + 4 ppm range
	1 mA		14 ppm reading + 4 ppm range
	10 mA		14 ppm reading + 4 ppm range
	100 mA		47 ppm reading + 6 ppm range
	1 A		230 ppm reading + 13 ppm range
	10 A		560 ppm reading + 35 ppm range
	30 A		760 ppm reading + 140 ppm range
(d)	AC current		
	Range		
	100 µA to 10 mA	10 Hz to 40 Hz	0.09 % reading + 0.015 % range
		40 Hz to 1000 Hz	0.05 % reading + 0.012 % range
		1 kHz to 10 kHz	0.12 % reading + 0.03 % range
	1 A	10 Hz to 40 Hz	0.11 % reading + 0.02 % range
		40 Hz to 1000 Hz	0.07 % reading + 0.015 % range
		1 kHz to 10 kHz	0.13 % reading + 0.05 % range
	10 A to 30 A	10 Hz to 40 Hz	0.16 % reading + 0.04 % range
		40 Hz to 1000 Hz	0.12 % reading + 0.03 % range
(e)	Resistance		
	Range		
	1 Ω		23 ppm reading + 6 ppm range
	10 Ω		15 ppm reading + 3 ppm range
	100 Ω		14 ppm reading + 1 ppm range
	100 Ω low current range		15 ppm reading + 7 ppm range
	1 kΩ		12 ppm reading + 0.8 ppm range
	1 kΩ low current range		14 ppm reading + 3 ppm range
	10 kΩ		14 ppm reading + 0.8 ppm range
	10 kΩ low current range		16 ppm reading + 8 ppm range
	100 kΩ		15 ppm reading + 8 ppm range
	1 MΩ (2 wire only)		18 ppm reading + 2 ppm range
	10 MΩ (2 wire only)		23 ppm reading + 8 ppm range
5.89 Indicating Instruments and Recording Instruments			

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In accordance with an in-house method based on equipment manufacturer's recommendations unless stated otherwise.

(a)	DC voltmeters		CMC Uncertainty
	0 mV to 202 mV		30 ppm + 3.6 µV
	0.2 V to 2.02 V		30 ppm + 5 µV
	2 V to 20.2 V		25 ppm + 40 µV
	20.2 V to 202 V		30 ppm + 400 µV
	202 V to 1025 V		30 ppm + 4000 µV
(b)	AC voltmeters		
	0 mV to 202 mV	10 Hz to <45 Hz	0.2 % + 50 µV
		45 Hz to <1000 Hz	0.04 % + 20 µV
		1 kHz to <20 kHz	0.09 % + 35 µV
		20 kHz to <100 kHz	0.3 % + 70 µV
		100 kHz to 500 kHz	0.8 % + 380 µV
	0.2 V to 2.02 V	10 Hz to <45 Hz	0.2 % + 350 µV
		45 Hz to <1000 Hz	0.04 % + 90 µV
		1 kHz to <20 kHz	0.09 % + 135 µV
		20 kHz to <100 kHz	0.25 % + 2000 µV
		100 kHz to 500 kHz	0.45 % + 3800 µV
	2 V to 20.2 V	10 Hz to <45 Hz	0.2 % + 3 mV
		45 Hz to <1000 Hz	0.035 % + 0.9 mV
		1 kHz to <20 kHz	0.07 % + 1.3 mV
		20 kHz to 100 kHz	0.22 % + 33 mV
	20 V to 202 V	30 Hz to <45 Hz	0.06 % + 20 mV
		45 Hz to <1000 Hz	0.04 % + 7.5 mV
		1 kHz to 20 kHz	0.09 % + 40 mV
	200 V to 1020 V	30 Hz to <45 Hz	0.06 % + 200 mV
		45 Hz to <1000 Hz	0.04 % + 75 mV
		1 kHz to 20 kHz	0.15 % + 400 mV
(c)	DC ammeters		
	0 µA to 202 µA		0.01 % + 0.03 µA
	0.2 mA to 2.02 mA		0.008 % + 0.04 µA
	2 mA to 20.2 mA		0.005 % + 0.3 µA
	20 mA to 202 mA		0.008 % + 3 µA
	0.2 A to 2.02 A		0.015 % + 35 µA
	2 A to 30 A		0.04 % + 350 µA

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(d) AC ammeters

20 µA to 202 µA	10 Hz to <45 Hz	0.2 % reading + 0.25 µA
	45 Hz to <1000 Hz	0.07 % reading + 0.25 µA
	1 kHz to 10 kHz	0.8 % reading + 0.25 µA
0.2 mA to 2.02 mA	10 Hz to <45 Hz	0.2 % reading + 5 µA
	45 Hz to <1000 Hz	0.06 % reading + 4 µA
	1 kHz to 10 kHz	0.5 % reading + 7 µA
2 mA to 20.2 mA	10 Hz to <45 Hz	0.2 % reading + 0.5 µA
	45 Hz to <1000 Hz	0.06 % reading + 0.4 µA
	1 kHz to 10 kHz	0.7 % reading + 0.7 µA
20 mA to 202 mA	10 Hz to <45 Hz	0.2 % reading + 50 µA
	45 Hz to <1000 Hz	0.06 % reading + 40 µA
	1 kHz to 10 kHz	0.6 % reading + 70 µA
0.2 A to 2.02 A	10 Hz to <45 Hz	0.2 % reading + 500 µA
	45 Hz to <1000 Hz	0.09 % reading + 400 µA
	1 kHz to 5 kHz	0.6 % reading + 700 µA
2 A to 30 A	10 Hz to <45 Hz	0.2 % reading + 5000 µA
	45 Hz to <100 Hz	0.09 % reading + 2000 µA
	100 Hz to 1000 kHz	0.3 % reading + 4000 µA

AC & DC Clamp-on type meters

0 A to 60 A (2 turn coil)	Wound clamps	0.36 % + 0.036 A
	Hall effect clamps	0.49 % + 0.09 A
0 A to 300 A (10 turn coil)	Wound clamps	0.42 % + 0.03 A
	Hall effect clamps	0.60 % + 0.13 A
0 A to 1500 A (50 turn coil)	Wound clamps	0.26 % + 0.06 A
	Hall effect clamps	0.46 % + 0.44 A

(i) Ohmmeters

Range		
0 Ω	0.5 A max current	0.005 Ω
0.1 Ω	0.5 A max current	0.015 % + 0.005 Ω
1 Ω	0.4 A max current	0.01 % + 0.005 Ω
10 Ω	0.3 A max current	0.01 % + 0.005 Ω
100 Ω	0.1 A max current	0.005 % + 0.005 Ω
1 kΩ	10 V max voltage	0.04 % + 0.04 Ω

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10 kΩ	50 V max voltage	0.04 % + 0.4 Ω
100 kΩ	100 V max voltage	0.04 % + 4 Ω
1 MΩ*	100 V max voltage	0.01 % + 40 Ω
10 MΩ*	100 V max voltage	0.035 % + 400 Ω
110 MΩ*	100 V max voltage	0.5 % + 4000 Ω
1 GΩ*	100 V max voltage	1 % + 40000 Ω

* 2 – wire only

(q) Hi Pots

DC Voltage – 5 kV to 60 kV	1 %
AC Voltage – 5 kV to 140 kV	5 %

5.98 Miscellaneous Electrical Tests

Capacity for the following tests is application of test voltage up to 120 kV and measurement of leakage currents.

(a) Insulating gloves and tools

In service checks on insulating protective equipment including gloves, sleeves, mats, blankets, poles & jumper leads, in accordance with specifications such as those listed below (or technically equivalent) and to demonstrate compliance with EEA Dec 2018:

ASTM D120, D1048, D1049, D1050, D1051, F478, F479, F496, F711, F712

(b) High voltage operating equipment

In service insulation checks on instruments used for HV work to customer specified codes such as: Contact VDD and TransPower TP.SS 07.24

(c) Insulated platform vehicles

In service checks on insulated platform vehicles in accordance with specifications such as AS/NZS 1418.10 and ANSI A92.2

Note 1:

Unless stated otherwise the CMC is based on the performance of the best available device and measurement uncertainties achieved for specific calibrations may be greater than the CMC Uncertainty. A laboratory may not report measurement uncertainties lower than its CMC. However, if the device under calibration has a greater accuracy than the device used to calculate the CMC the laboratory may be able to use the calibration data to lower its CMC Uncertainty. Please contact the laboratory to discuss your specific requirements

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