

CERTIFICATE OF CALIBRATION

Date Of Issue 20 March 2023
Issue Number 1
Certificate Number TERUKAS77515
Issue By TER Calibration
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UKAS ACCREDITED CALIBRATION LABORATORY NO. 0149

0149



TER CALIBRATION LTD

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Approved Signatory
Les Finnen

A handwritten signature in black ink, appearing to read 'Les Finnen'.

Submitted By MED-LAB a Cytex
Company
Copeland Street
Derby
DE1 2PU
Engineer THOMASH
Procedure Number 010012946
Order Number
Date Received 14 March 2023
Calibration Date 16 March 2023
Request Recalibration 15 March 2024
Equipment ISOTECH IDM203 Digital Multimeter
Serial Number 06401577
Owners Identification
TERID 325386
JobNumber 741604
Conditions of Test
Temperature 19°C \pm 1°C
Humidity 44% \pm 10%

Method Of Test

The instrument was operated in accordance with the manufacturer's instruction manual. All results are recorded in tables 1 to 7.

The instrument was within specification at all points tested, with due allowance made for the uncertainty of measurement.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to Expression of Uncertainty in Measurement and is inclusive of the unit under test. The uncertainties relate only to the measured values and do not carry any implication regarding the long term stability of the instrument.

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Test 1 Direct Voltage

Range	Applied Voltage	Unit Under Test	Specification	Uncertainty of Measurement
400 mV	390.00 mV	389.7 mV	$\pm(0.5\% + 2\text{digits})$	$\pm(0.01\% + 0.1\text{mV})$
4V	3.900 0 V	3.906 V	$\pm(0.5\% + 2\text{digits})$	$\pm(0.01\% + 1\text{mV})$
40 V	39.000 V	39.05 V	$\pm(0.5\% + 2\text{digits})$	$\pm(0.01\% + 10\text{mV})$
40 V	30.000 V	30.04 V	$\pm(0.5\% + 2\text{digits})$	$\pm(0.01\% + 10\text{mV})$
40 V	20.000 V	20.02 V	$\pm(0.5\% + 2\text{digits})$	$\pm(0.01\% + 10\text{mV})$
40 V	10.000 V	10.01 V	$\pm(0.5\% + 2\text{digits})$	$\pm(0.01\% + 10\text{mV})$
40 V	-39.000 V	-39.04 V	$\pm(0.5\% + 2\text{digits})$	$\pm(0.01\% + 10\text{mV})$
400 V	390.00 V	390.2 V	$\pm(0.5\% + 2\text{digits})$	$\pm(0.01\% + 0.1\text{V})$
1 000 V	1000.0 V	1 001 V	$\pm(0.5\% + 2\text{digits})$	$\pm(0.01\% + 1\text{V})$

Test 2 Alternating Voltage

Range	Frequency	Applied Voltage	Unit Under Test	Specification	Uncertainty of Measurement
400 mV	60 Hz	390.00 mV	387.7 mV	$\pm(1\% + 5\text{digits})$	$\pm(0.1\% + 0.1\text{mV})$
4 V	60 Hz	3.900 0 V	3.906 V	$\pm(1\% + 5\text{digits})$	$\pm(0.1\% + 1\text{mV})$
40 V	60 Hz	39.000 V	39.05 V	$\pm(1\% + 5\text{digits})$	$\pm(0.1\% + 10\text{mV})$
40 V	400 Hz	39.000 V	39.04 V	$\pm(1\% + 5\text{digits})$	$\pm(0.1\% + 10\text{mV})$
40 V	1 kHz	39.000 V	39.04 V	$\pm(1\% + 5\text{digits})$	$\pm(0.1\% + 10\text{mV})$
400 V	60 Hz	390.00 V	390.2 V	$\pm(1\% + 5\text{digits})$	$\pm(0.1\% + 0.1\text{V})$
1 000 V	60 Hz	500.0 V	497 V	$\pm(1\% + 5\text{digits})$	$\pm(0.1\% + 1\text{V})$

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

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Test 3 Resistance

Range	Applied Resistance	Unit Under Test	Specification	Uncertainty of Measurement
400 ohm	100.000 ohm	100.4 ohms	$\pm(0.75\% + 2\text{digits})$	$\pm(0.02\% + 0.1\text{ohm})$
4 kohm	1.000 00 kohm	0.999 kohms	$\pm(0.75\% + 2\text{digits})$	$\pm(0.02\% + 1\text{ohm})$
40 kohm	10.000 0 kohm	9.99 kohms	$\pm(0.75\% + 2\text{digits})$	$\pm(0.02\% + 10\text{ohm})$
400 kohm	100.000 kohm	99.9 kohms	$\pm(0.75\% + 2\text{digits})$	$\pm(0.02\% + 0.1\text{kohm})$
4 000 kohm	1.000 00 Mohm	1 000 kohms	$\pm(0.75\% + 2\text{digits})$	$\pm(0.02\% + 1\text{kohm})$
40 Mohm	10.000 0 Mohm	10.01 Mohms	$\pm(0.75\% + 2\text{digits})$	$\pm(0.06\% + 10\text{kohm})$

Test 4 Direct Current

Range	Applied Current	Unit Under Test	Specification	Uncertainty of Measurement
4 mA	3.900 0 mA	3.908 mA	$\pm(0.75\% + 2\text{digits})$	$\pm(0.1\% + 1\mu\text{A})$
40 mA	39.000 mA	39.14 mA	$\pm(0.75\% + 2\text{digits})$	$\pm(0.1\% + 10\mu\text{A})$
400 mA	390.00 mA	388.7 mA	$\pm(0.75\% + 2\text{digits})$	$\pm(0.1\% + 0.1\text{mA})$
10 A	10.000 A	9.95 A	$\pm(0.75\% + 2\text{digits})$	$\pm(0.1\% + 10\text{mA})$

Test 5 Alternating Current

Range	Frequency	Applied Current	Unit Under Test	Specification	Uncertainty of Measurement
4 mA	60 Hz	3.900 0 mA	3.907 mA	$\pm(1.5\% + 5\text{digits})$	$\pm(0.13\% + 1\mu\text{A})$
40 mA	60 Hz	39.000 mA	39.13 mA	$\pm(1.5\% + 5\text{digits})$	$\pm(0.13\% + 10\mu\text{A})$
400 mA	60 Hz	390.00 mA	388.5 mA	$\pm(1.5\% + 5\text{digits})$	$\pm(0.13\% + 0.1\text{mA})$
10 A	60 Hz	10.000 A	9.91 A	$\pm(1.5\% + 5\text{digits})$	$\pm(0.21\% + 10\text{mA})$

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

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Test 6 Frequency

Range	Signal Frequency	Unit Under Test	Specification	Uncertainty of Measurement
100 Hz	100.00 Hz	99.99 Hz	$\pm(0.1\% + 4\text{digits})$	$\pm(0.01\% + 0.01\text{Hz})$
1 kHz	1 000.0 Hz	999.9 kHz	$\pm(0.1\% + 4\text{digits})$	$\pm(0.01\% + 0.1\text{Hz})$
100 kHz	10.000 kHz	9.998 kHz	$\pm(0.1\% + 4\text{digits})$	$\pm(0.01\% + 0.001\text{kHz})$
100 kHz	100.00 kHz	99.99 kHz	$\pm(0.1\% + 4\text{digits})$	$\pm(0.01\% + 0.01\text{kHz})$
1 MHz	1.000 0 MHz	999.9 kHz	$\pm(0.1\% + 4\text{digits})$	$\pm(0.01\% + 0.1\text{kHz})$

Test 7 Capacitance

These measurements are not within the scope of the laboratory's prevailing approval, but are added herein for completeness.

Range	Applied Capacitance	Unit Under Test	Specification	Uncertainty of Measurement
4 nF	1.000 0 nF	1.001 nF	$\pm(1\% + 4\text{digits})$	$\pm(0.05\% + 1\text{pF})$
40 nF	10.000 nF	10.05 nF	$\pm(1\% + 4\text{digits})$	$\pm(0.05\% + 10\text{pF})$
400 nF	100.00 nF	100.2 nF	$\pm(1\% + 4\text{digits})$	$\pm(0.05\% + 0.1\text{nF})$
4 μF	1.000 0 μF	0.999 μF	$\pm(1\% + 4\text{digits})$	$\pm(0.05\% + 1\text{nF})$
40 μF	10.000 μF	10.00 μF	$\pm(1\% + 8\text{digits})$	$\pm(0.05\% + 10\text{nF})$

The calibration was performed at the laboratory's permanent address.

The calibration relates only to the item listed on page 1.

END OF RESULTS