CERTIFICATE OF CALIBRATION
ISSUED BY SERVICECAL LTD

DATE OF ISSUE **12th April 2023** CERTIFICATE NUMBER

DATE OF RECEIPT **6th April 2023** **U367569**

0152

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Approved By **Martin Ashworth**
Signatory

INSTRUMENT DESCRIPTION	**Digital Multimeter**
MANUFACTURER	**Agilent**
MODEL NUMBER	**34401A**
SERIAL NUMBER	**MY44002035**
CUSTOMER REFERENCE NUMBER	
CUSTOMER	**Gjc Instruments Ltd**
ADDRESS	**North West House, Near Brook Hall,Off Chester Road, Tattenhall, Cheshire, CH3 9AH**
ORDER NUMBER	**2023LAB002**
REMARKS	**The instrument was externally cleaned prior to calibration**

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.

✓ checked @ GJC today 12/4/23

CUSTOMER	GJC Instruments Ltd
ADDRESS	Northwest House,Tattenhall,Cheshire.CH3 9AH.
JOB NUMBER	367569
DESCRIPTION	Digital Multimeter
MANUFACTURER	Agilent
MODEL NUMBER	34401A
SERIAL NUMBER	MY44002035
CUSTOMER REFERENCE	None
PREVIOUS CERTIFICATE	U347333 **ISSUED BY** 0152

CALIBRATION INFORMATION.

The instrument was calibrated against the laboratory's standards which are traceable to UK National Standards or are derived by approved ratio techniques. The ambient temperature and relative humidity during the tests were 20°C ± 2°C and 50% ± 20% RH respectively. The uncertainty limits quoted refer to the measured values only, with no account being taken of the instrument's ability to maintain its calibration.
The limits have been derived in accordance with UKAS requirements and are for a confidence level of approximately 95% using a coverage factor of $k=2$.
The instrument was allowed to stabilise in the laboratory for a minimum of 4 hours prior to measurement being performed.

SPECIFICATION USED OR EXTENT OF CALIBRATION PERFORMED.

The instrument was calibrated using laboratory measurement procedures:
UKASP001,002,003,005,007,008,009,053

Checking of instrument ranges to manufacturer's specification
Specification taken from Agilent 34401A users guide p/n 34401-90004 March 2000 edition 5.

SUMMARY

The calibration results are recorded as found upon receipt of the instrument.

At the points tested the instrument was found to meet specification,due allowance having been made for the uncertiainty of measurement.
The Decision Rule : ILAC-G8:09/2019 4.2.3 Non Binary Statement with Guard Band has been applied.
See Appendix A attached.

The instrument was externally cleaned prior to calibration.

Measured Mains Voltage = 235 V.

CALIBRATED BY	M.Ashworth	**Date**	12th April 2023
CHECKED BY	M.Ashworth	**Date**	12th April 2023

Checked @ GJC Addy 12/04/23

CALIBRATION RESULTS

VOLTAGE RANGE	APPLIED FREQUENCY	APPLIED VOLTAGE	INSTRUMENT READING
100 mV	DC	100.0000 mV	100.0015 mV
100 mV	DC	-100.0000 mV	-100.0017 mV
1 V	DC	1.000000 V	1.000021 V
1 V	DC	-1.000000 V	-1.000020 V
10 V	DC	1.000000 V	01.00001 V
10 V	DC	3.000000 V	03.00004 V
10 V	DC	6.000000 V	06.00007 V
10 V	DC	10.00000 V	10.00012 V
10 V	DC	11.00000 V	11.00014 V
10 V	DC	-1.000000 V	-01.00002 V
10 V	DC	-3.000000 V	-03.00004 V
10 V	DC	-6.000000 V	-06.00007 V
10 V	DC	-10.00000 V	-10.00011 V
10 V	DC	-11.00000 V	-11.00014 V
100 V	DC	100.0000 V	100.0005 V
100 V	DC	-100.0000 V	-100.0005 V
1000 V	DC	1000.0000 V	0999.993 V
1000 V	DC	-1000.0000 V	-0999.992 V
100 mV	500 Hz	100.0000 mV	099.9757 mV
1 V	500 Hz	1.000000 V	0.999759 V
10 V	500 Hz	10.00000 V	09.99768 V
100 V	500 Hz	100.0000 V	099.9471 V
750 V	500 Hz	500.0000 V	0499.723 V
100 mV	1 kHz	100.0000 mV	099.9753 mV
1 V	1 kHz	1.000000 V	0.999775 V
10 V	1 kHz	1.000000 V	00.99976 V
10 V	1 kHz	5.000000 V	04.99876 V
10 V	1 kHz	10.00000 V	09.99783 V
100 V	1 kHz	100.0000 V	099.9519 V
750 V	1 kHz	500.0000 V	0499.750 V
100 mV	10 kHz	100.0000 mV	099.9747 mV
1 V	10 kHz	1.000000 V	0.999745 V
10 V	10 kHz	10.00000 V	09.99788 V
100 V	10 kHz	100.0000 V	099.9510 V
100 mV	50 kHz	100.0000 mV	099.9750 mV
1 V	50 kHz	1.000000 V	0.999643 V
10 V	50 kHz	10.00000 V	09.99932 V
100 V	50 kHz	100.0000 V	099.9467 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 with UKAS requirements.

CALIBRATED BY M.Ashworth **Date** 12th April 2023

CHECKED BY M.Ashworth **Date** 12th April 2023

✓ checked @ QVC today 12/4/23

CURRENT RANGE	APPLIED FREQUENCY	APPLIED CURRENT	INSTRUMENT READING
10 mA	DC	10.00000 mA	09.99992 mA
100 mA	DC	100.0000 mA	099.9983 mA
1 A	DC	1.000000 A	0.999671 A
3 A	DC	1.900000 A	01.89937 A
3 A	1 kHz	1.000000 A	00.99942 A
1 A	1 kHz	1.000000 A	0.999451 A

FRONT INPUT TERMINALS

RESISTANCE RANGE	APPLIED RESISTANCE	4-WIRE READING
100 Ω	99.99799 Ω	100.0006 Ω
1 kΩ	1.0000006 kΩ	1.000037 kΩ
10 kΩ	1.0000006 kΩ	01.00003 kΩ
10 kΩ	9.999982 kΩ	10.00020 kΩ
100 kΩ	100.00122 kΩ	100.0044 kΩ
1 MΩ	0.999965 MΩ	1.000017 MΩ
10 MΩ	9.998718 MΩ	09.99776 MΩ

REAR INPUT TERMINALS

RESISTANCE RANGE	APPLIED RESISTANCE	4-WIRE READING
100 Ω	99.99799 Ω	100.0004 Ω
1 kΩ	1.0000006 kΩ	1.000038 kΩ
10 kΩ	9.999982 kΩ	10.00020 kΩ
100 kΩ	100.00122 kΩ	100.0047 kΩ
1 MΩ	0.9999648 MΩ	1.000018 MΩ
10 MΩ	9.998718 MΩ	09.99772 MΩ

UNCERTAINTY OF MEASUREMENT:

DC Current	10 mA ± 50 ppm	100 mA ± 60 ppm
	1 A-2 A ± 100 ppm	
Resistance	100 Ω,1 kΩ,10 kΩ,100 kΩ	± 10 ppm
	1 MΩ ± 10 ppm	10 MΩ ± 30 ppm
DC Voltage	100 mV - 1000 V	± 7 ppm
AC Current	1 A (1kHz)	± 0.014%
AC Voltage	100 mV to 100 V (500 Hz,1,10,50 kHz)	± 0.015%
AC Voltage	500V (500 Hz,1 kHz)	± 0.030% + 50 µV

1 LSD must be added to the above uncertainties to allow for the resolution of the instrument under test.

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 with UKAS requirements.

CALIBRATED BY M.Ashworth **Date** 12th April 2023

CHECKED BY M.Ashworth **Date** 12th April 2023

✓ checked @ GSC Today