



MICRO PRECISION CALIBRATION PTE LTD
BLOCK 5008 ANG MO KIO AVENUE 5 #07-04
TECHPLACE II SINGAPORE 569874
65 67484384



Certificate of Calibration

Date: November 17, 2017

Cert No. 512200813125459

Customer:

GES SINGAPORE PTE LTD
28 MARSILING LANE
SINGAPORE 739152

Work Order #: SG-11006714

MPC Control #: US38010248
Asset ID: N/A
Gage Type: 6 1/2 DIGIT MULTIMETER
Manufacturer: RACAL-DANA INSTRUMENTS
Model Number: 4152A
Size: N/A
Temp/RH: 23°C / 44 %
Location: Calibration performed at Customer's facility

Serial Number: US38010248
Department: N/A
Performed By: SENGTHYE CHEW
Received Condition: IN TOLERANCE
Returned Condition: IN TOLERANCE
Cal. Date: November 17, 2017
Cal. Interval: 12 MONTHS
Cal. Due Date: November 17, 2018

Calibration Notes:

Please refer to the attached calibration data. (2 pages).

Standards Used to Calibrate Equipment

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
DB8884	CALIBRATOR	5500A	7520009	FLUKE	Sep 13, 2018	512200813028827

Procedures Used in this Event

Procedure Name	Description
RACAL 4152A	6.5 Digit Multimeter Product Specification

Calibrating Technician:


SENGTHYE CHEW

QC Approval:


GARLO DOMINGO

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA's Publication and NIST Technical Note 1297, 1994 Edition. Services rendered comply with ISO/IEC 17025:2005, ANSI/NCSL Z540-1-1994, ANSI/NCSL Z540.3-2006, MPC Quality Manual, MPC CSD and with customer purchase order instructions.

Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. The information on this report, pertains only to the instrument identified.

All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. This report may not be reproduced in part or in a whole without the prior written approval of the issuing MPC lab.



Racal Dana 4152A Multimeter

Procedure Ref: Racal 4152A Multimeter
ID Number: US38010248
Asset Number: NA

Order Number: SG-11006714
Serial Number: US38010248
Calibration Date: November 17, 2017

DC Voltage Accuracy

Standard Input Value	Nominal Value	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)
100 mV	100.0000 mV	99.9958 mV	100.0011 mV	100.0011 mV	100.0042 mV	PASS	0.0044 mV
100 mV	-100.0000 mV	-100.0042 mV	-100.0022 mV	-100.0022 mV	-99.9958 mV	PASS	0.0044 mV
1 V	1.000000 V	0.999974 V	1.000011 V	1.000011 V	1.000026 V	PASS	0.0031 V
1 V	-1.000000 V	-1.000026 V	-1.000009 V	-1.000009 V	-0.999974 V	PASS	0.000032 V
10 V	10.00000 V	9.99976 V	10.00012 V	10.00012 V	10.00024 V	PASS	0.000061 V
10 V	-10.00000 V	-10.00024 V	-10.00011 V	-10.00011 V	-9.99976 V	PASS	0.000061 V
100 V	100.0000 V	99.9964 V	99.9994 V	99.9994 V	100.0036 V	PASS	0.0016 V
100 V	-100.0000 V	-100.0036 V	-100.0013 V	-100.0013 V	-99.9964 V	PASS	0.0016 V
199 V	199.0000 V	198.9932 V	199.0028 V	199.0028 V	199.0068 V	PASS	0.0016 V
199 V	-199.0000 V	-199.0068 V	-199.0031 V	-199.0031 V	-198.9932 V	PASS	0.0016 V

AC Voltage Accuracy

Standard Input Value	Nominal Value	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)
100 mV @ 1 kHz	100.000 mV	99.925 mV	99.995 mV	99.995 mV	100.075 mV	PASS	0.067 mV
100 mV @ 30 kHz	100.000 mV	99.860 mV	99.989 mV	99.989 mV	100.140 mV	PASS	0.10 mV
1 V @ 1 kHz	1.00000 V	0.99945 V	1.00012 V	1.00012 V	1.00055 V	PASS	0.00067 V
1 V @ 30 kHz	1.00000 V	0.99860 V	0.99994 V	0.99994 V	1.00140 V	PASS	0.00090 V
10 V @ 1 kHz	10.0000 V	9.9945 V	10.0011 V	10.0011 V	10.0055 V	PASS	0.0067 V
10 V @ 30 kHz	10.0000 V	9.9860 V	9.9987 V	9.9987 V	10.0140 V	PASS	0.0090 V
100 V @ 1 kHz	100.000 V	99.945 V	99.979 V	99.979 V	100.055 V	PASS	0.063 V
100 V @ 30 kHz	100.000 V	99.860 V	99.947 V	99.947 V	100.140 V	PASS	0.078 V
199 V @ 1 kHz	199.000 V	198.901 V	198.951 V	198.951 V	199.099 V	PASS	0.063 V
199 V @ 30 kHz	199.000 V	198.741 V	198.927 V	198.927 V	199.259 V	PASS	0.078 V

Resistance Accuracy

Standard Input Value	Nominal Value	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)
100 Ω	100.0000 Ω	99.9953 Ω	100.0030 Ω	100.0030 Ω	100.0047 Ω	PASS	0.00089 Ω
1 kΩ	1.000000 kΩ	0.999964 kΩ	1.000018 kΩ	1.000018 kΩ	1.000036 kΩ	PASS	0.000033 kΩ
10 kΩ	10.00000 kΩ	9.99964 kΩ	10.00010 kΩ	10.00010 kΩ	10.00036 kΩ	PASS	0.00015 kΩ
100 kΩ	100.0000 kΩ	99.9954 kΩ	100.0013 kΩ	100.0013 kΩ	100.0046 kΩ	PASS	0.0014 kΩ
1 MΩ	1.000000 MΩ	0.999912 MΩ	1.000015 MΩ	1.000015 MΩ	1.000088 MΩ	PASS	0.000038 MΩ
10 MΩ	10.00000 MΩ	9.99792 MΩ	10.00089 MΩ	10.00089 MΩ	10.00208 MΩ	PASS	0.00037 MΩ

Jeff 04-08-17
JASON AEBAYANI



DC Current Accuracy

Standard Input Value	Nominal Value	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty ($\pm$)
1 A	1.000000 A	0.999780 A	1.000046 A	1.000046 A	1.000220 A	PASS	0.00023 A
1 A	-1.000000 A	-1.000220 A	-1.000049 A	-1.000049 A	-0.999780 A	PASS	0.00023 A

AC Current Accuracy

Standard Input Value	Nominal Value	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty ($\pm$)
1 A @ 1 kHz	1.00000 A	0.99860 A	1.00063 A	1.00063 A	1.00140 A	PASS	0.00090 A

Jeff 04-DEC-17
JASON DEBAYANI