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Service Record

Date: 02 dec 2015
RMA No: MP 1696744
PO Number: 0163L28374
Contact:
Telephone:
Fax:

Ship To:

CNRS
Labo LLR- Aile 04- 1er étage
(Livraison 9h/12h-14h/17H) Route de Saclay,
Ecole Polytechnique
91128 Palaiseau
France

Bill To:

CNRS/ IN2P3- laboratoire LLR
0163
UMR 7638 0163 Ecole Polytechnique
91128 Palaiseau
France

Line	Product	Serial No	Manufacturer	Description
3	2612	1151821	KEITHLEY, INC.	DUAL SOURCEMETER, 200V

Accessories:

Customer Comments: standard cal + data

Type of Service F:Standard price calibration.
F:Standard price test data.

Repair Description: battery error
-battery renewed

Special Requirements:

NOUS OPERONS DESORMAIS UN SYSTEME D'AUTORISATION DE RETOUR DE MATERIEL (RMA) AFIN DE REDUIRE LE TEMPS D'IMMOBILISATION DE VOS PRODUITS. MERCI D'APPELER LE 01 69 86 81 80 POUR PRE-ENREGISTRER VOTRE DEMANDE DE SERVICE. VOUS DEVREZ NOUS PRECISER LES MODELES ET NUMEROS DE SERIE DE VOS PRODUITS, AINSI QUE LA PRESTATION DESIREE. NOS SERVICES VOUS DONNERONT, EN RETOUR, UN NUMERO DE SUIVI RMA ET DES CONSEILS POUR L'EXPEDITION DE VOS PRODUITS.



A Tektronix Company

Calibration Facility:
Keithley Instruments Germany
Tektronix GmbH
Landsberger Strasse 65
82110 Germering, Germany

Calibration Results / Kalibrierschein

Report Nr.: 1696744-325.11.2015 - 10:16:29

Keithley PO-No.: 1696744-3 Auftragsnummer:	Result: Ergebnis: FAIL
Object: System SourceMeter Gegenstand:	Performed by: Ludwig Haas Prüfer:
Model: Keithley 2612 Modell:	Performed on: 25.11.2015 Prüfdatum:
Serial No.: 1151821 Serien Nr.:	Temperature: 24,0 °C Temperatur:
Customer: CNRS Auftraggeber:	Rel. Humidity: 44 % Rel. Luftfeuchte:
Address: Anschrift:	Remarks: Anmerkungen: outgoing data report
Customer PO-No.: Bestellnummer:	
Used Procedure: Keithley 2612 (1-Year) 200V fixed Verwendete Prozedur:	

- This calibration certificate documents the traceability to national standards or international standards, which realize the physical units of measurement according to the International System of Units (SI).
- The TUR (Test Uncertainty Ratio) is 4 or greater, otherwise it will be indicated.
- The calibration is performed by comparison with reference standards, with standard measuring equipment or on the basis of documented calibration procedures. The calibration results refer exclusively to the object identified above.
- This calibration certificate may not be reproduced other than in full except with the permission of the issuing laboratory. Calibration certificates without signature and seal are not valid.
- Test status is PASS unless indicated otherwise.

- Dieser Kalibrierschein dokumentiert die Rückführbarkeit auf nationale Normale zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI).
- Das Maßunsicherheitsverhältnis (TUR) zwischen Kalibrator und Prüfling ist 4 oder größer. Andernfalls wird es auf dem Kalibrierschein angegeben.
- Die Kalibrierung erfolgt durch den Vergleich mit Normalen oder Normalmesseinrichtungen oder auf der Grundlage dokumentierter Kalibrierverfahren. Die Kalibrierergebnisse beziehen sich ausschliesslich auf den Kalibriergegenstand.
- Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung des ausstellenden Kalibrierlaboratoriums. Kalibrierscheine ohne Unterschrift und Stempel haben keine Gültigkeit.
- Wenn nichts anderes angezeigt wird, ist das Resultat der Messung "Pass".



A Tektronix Company
Tektronix GmbH - Kalibrier Service

Technician/Bearbeiter
Landsberger Str. 65

82110 Germering (Germany)

Thomas Worm
Head of Laboratory/Leiter der Kalibrierlabors

Incoming Conditions:
Eingangszustand:

Ingoing unit visual in perfect condition:
Angekommenes Gerät optisch in einwandfreiem Zustand:

Yes
Ja

☒

NO
Nein

☐

In need of repair:
Reparaturbedürftig:

☐

Damaged during transportation:
Transportschaden:

☐

In tolerance:
In Toleranz:

Yes
Ja

☐

NO
Nein

☒

Data n/a
Nicht ermittelbar

☐

Work Performed:
Durchgeführte Arbeiten:

Adjustment:
Abgleich:

☐

Repair:
Reparatur:

☐

Cleaning of Unit:
Gerätereinigung:

☐

Modification:
Modifikation:

Safety test following VDE 0701:
Sicherheitstest nach VDE 0701:

☐

Zertifikat geprüft:
Certificate controlled:

☐

Asset	Mfg	Model	Description	Cal Date	Due Date
AG3458A_MY45040557	Agilent	3458A	System DMM	13.05.2015	13.05.2016

Test Data

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	TUR	TEST STATUS
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CH-A VOLTAGE SOURCE ACCURACY TESTS

CONFIG: RESET DEFAULTS | REMOTE SENSE

200mV Range

200	100.000 mV		100.0137 mV	137 ppm	3.46%		
200	190.000 mV		190.0023 mV	12.3 ppm	0.565%		
200	-100.000 mV		-100.0377 mV	377 ppm	9.54%		
200	-190.000 mV		-190.0273 mV	144 ppm	6.62%		

2V Range

2	1.00000 V		1.000000 V	0.000 ppm	0%		
2	1.90000 V		1.899907 V	-49.1 ppm	9.52%		
2	-1.00000 V		-1.000153 V	153 ppm	19.2%		
2	-1.90000 V		-1.900127 V	66.7 ppm	12.9%		

20V Range

20	10.0000 V		10.00017 V	16.7 ppm	2.38%		
20	19.0000 V		18.99970 V	-15.8 ppm	3.41%		
20	-10.0000 V		-10.00163 V	163 ppm	23.3%		
20	-19.0000 V		-19.00050 V	26.3 ppm	5.68%		

200V Range

200	100.000 V		100.0060 V	60.0 ppm	8.57%		
200	190.000 V		190.0010 V	5.26 ppm	1.14%		
200	-100.000 V		-100.0130 V	130 ppm	18.6%		
200	-190.000 V		-190.0067 V	35.1 ppm	7.58%		

CH-A VOLTAGE MEASURE ACCURACY TESTS

CONFIG: RESET DEFAULTS | REMOTE SENSE

200mV Range

200	100.0068 mV		100.017 mV	105 ppm	4.39%		
200	189.9920 mV		190.011 mV	98.2 ppm	7.36%		
200	-100.0248 mV		-100.008 mV	-171 ppm	7.14%		
200	-190.0317 mV		-189.999 mV	-170 ppm	12.8%		

2V Range

2	0.999985 V		0.99999 V	8.33 ppm	1.67%		
2	1.899896 V		1.89990 V	2.11 ppm	0.63%		
2	-1.000161 V		-1.00009 V	-74.3 ppm	14.9%		

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	TUR	ST
2	-1.900118 V		-1.90001 V	-56.8 ppm	17%		

20V Range

20	10.00022 V		10.0000 V	-22.0 ppm	3.38%		
20	18.99971 V		18.9992 V	-26.8 ppm	6.5%		
20	-10.00164 V		-10.0010 V	-64.0 ppm	9.85%		
20	-19.00050 V		-18.9998 V	-36.8 ppm	8.92%		

200V Range

200	100.0059 V		99.999 V	-72.3 ppm	11.1%		
200	190.0007 V		189.992 V	-47.5 ppm	11.5%		
200	-100.0110 V		-100.008 V	-30.0 ppm	4.62%		
200	-190.0039 V		-190.000 V	-20.5 ppm	4.97%		

CH-A CURRENT SOURCE ACCURACY TESTS

CONFIG: RESET DEFAULTS

100nA Range

100	50.000 nA		49.9990 nA	-20.0 ppm	0.769%		
100	90.000 nA		90.0010 nA	11.1 ppm	0.649%		
100	-50.000 nA		-50.0103 nA	207 ppm	7.95%		
100	-90.000 nA		-90.0107 nA	119 ppm	6.93%		

1uA Range

1	0.50000 μ A		0.499917 μ A	-167 ppm	8.77%		
1	0.90000 μ A		0.899893 μ A	-119 ppm	9.97%		
1	-0.50000 μ A		-0.500130 μ A	260 ppm	13.7%		
1	-0.90000 μ A		-0.900087 μ A	96.3 ppm	8.1%		

10uA Range

10	5.0000 μ A		4.99967 μ A	-66.7 ppm	5.13%		
10	9.0000 μ A		8.99947 μ A	-59.3 ppm	6.93%		
10	-5.0000 μ A		-5.00050 μ A	100 ppm	7.69%		
10	-9.0000 μ A		-8.99993 μ A	-7.41 ppm	0.866%		

100uA Range

100	50.000 μ A		50.0010 μ A	20.0 ppm	1.33%		
100	90.000 μ A		89.9970 μ A	-33.3 ppm	3.45%		
100	-50.000 μ A		-50.0080 μ A	160 ppm	10.7%		
100	-90.000 μ A		-90.0053 μ A	59.3 ppm	6.13%		

1mA Range

1	0.50000 mA		0.500003 mA	6.67 ppm	0.741%		
1	0.90000 mA		0.899967 mA	-37.0 ppm	5.85%		
1	-0.50000 mA		-0.500043 mA	86.7 ppm	9.63%		

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	TUR	TEST STATUS
	-0.90000 mA		-0.900003 mA	3.70 ppm	0.585%		
10mA Range							
10	5.0000 mA		4.99977 mA	-46.7 ppm	3.11%		
10	9.0000 mA		8.99960 mA	-44.4 ppm	4.6%		
10	-5.0000 mA		-5.00090 mA	180 ppm	12%		
10	-9.0000 mA		-9.00063 mA	70.4 ppm	7.28%		
100mA Range							
100	50.000 mA		49.9933 mA	-133 ppm	14.8%		
100	90.000 mA		89.9913 mA	-96.3 ppm	15.2%		
100	-50.000 mA		-50.0010 mA	20.0 ppm	2.22%		
100	-90.000 mA		-89.9977 mA	-25.9 ppm	4.09%		
1A Range							
1	0.50000 A		0.499747 A	-507 ppm	12.4%		
1	0.90000 A		0.899717 A	-315 ppm	12.6%		
1	-0.50000 A		-0.500413 A	827 ppm	20.2%		
1	-0.90000 A		-0.900320 A	356 ppm	14.2%		
CH-A CURRENT MEASURE ACCURACY TESTS							
CONFIG: RESET DEFAULTS							
100nA Range							
100	49.9977 nA		49.995 nA	-60.7 ppm	2.43%		
100	90.0006 nA		89.992 nA	-95.6 ppm	5.93%		
100	-50.0097 nA		-50.005 nA	-94.0 ppm	3.76%		
100	-90.0096 nA		-90.003 nA	-77.0 ppm	4.78%		
1uA Range							
1	0.499891 uA		0.49994 uA	91.3 ppm	7.31%		
1	0.899876 uA		0.89990 uA	26.7 ppm	3.31%		
1	-0.500108 uA		-0.50008 uA	-62.7 ppm	5.01%		
1	-0.900077 uA		-0.90005 uA	-33.7 ppm	4.18%		
10uA Range							
10	4.99958 uA		4.9997 uA	24.0 ppm	4.36%		
10	8.99942 uA		8.9995 uA	8.89 ppm	2.13%		
10	-5.00037 uA		-5.0004 uA	12.7 ppm	2.3%		
10	-8.99995 uA		-9.0000 uA	1.85 ppm	0.444%		
100uA Range							
100	49.9979 uA		49.994 uA	-71.3 ppm	10.2%		
100	89.9945 uA		89.990 uA	-44.6 ppm	9.33%		
100	-50.0081 uA		-50.012 uA	71.3 ppm	10.2%		

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	TUR	ST
100	-90.0044 μ A		-90.007 μ A	28.9 ppm	6.05%		
1mA Range							
1	0.499997 mA		0.49999 mA	-14.0 ppm	2.33%		
1	0.899964 mA		0.89997 mA	6.67 ppm	1.58%		
1	-0.500041 mA		-0.50005 mA	18.0 ppm	3%		
1	-0.899998 mA		-0.90001 mA	17.0 ppm	4.04%		
10mA Range							
10	4.99952 mA		4.9995 mA	-10.7 ppm	1.52%		
10	8.99928 mA		8.9991 mA	-20.0 ppm	4.19%		
10	-5.00062 mA		-5.0012 mA	116 ppm	16.6%		
10	-9.00037 mA		-9.0009 mA	62.6 ppm	13.1%		
100mA Range							
100	49.9926 mA		49.999 mA	128 ppm	21.3%		
100	89.9910 mA		89.997 mA	66.7 ppm	15.8%		
100	-50.0022 mA		-50.006 mA	82.7 ppm	13.8%		
100	-89.9984 mA		-90.004 mA	58.5 ppm	13.9%		
1A Range							
1	0.499709 A		0.49985 A	282 ppm	8.55%		
1	0.899718 A		0.89987 A	169 ppm	8.59%		
1	-0.500435 A		-0.50021 A	-456 ppm	13.8%		
1	-0.900343 A		-0.90015 A	-218 ppm	11.1%		
1.5A Range							
1.5	0.499548 A		0.49979 A	491 ppm	6.54%		
1.5	0.999488 A		0.99985 A	365 ppm	9.13%		
1.5	-0.500461 A		-0.50003 A	-855 ppm	11.4%		
1.5	-1.000386 A		-1.00003 A	-356 ppm	8.9%		
CH-A CURRENT SOURCE ACCURACY TESTS - 1.5A Range							
CONFIG: RESET DEFAULTS							
1.5	0.50000 A		0.499547 A	-907 ppm	10.5%		
1.5	1.00000 A		0.999503 A	-497 ppm	10.8%		
1.5	-0.50000 A		-0.500457 A	913 ppm	10.6%		
1.5	-1.00000 A		-1.000397 A	397 ppm	8.62%		
CH-B VOLTAGE SOURCE ACCURACY TESTS							
CONFIG: RESET DEFAULTS REMOTE SENSE							
200mV Range							
200	100.000 mV		100.0013 mV	13.3 ppm	0.338%		
200	190.000 mV		190.0043 mV	22.8 ppm	1.05%		

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	TUR	TEST STATUS
200	-100.000 mV		-100.0100 mV	100 ppm	2.53%		
200	-190.000 mV		-189.9967 mV	-17.5 ppm	0.807%		
2V Range							
2	1.00000 V		1.000100 V	100 ppm	12.5%		
2	1.90000 V		1.900040 V	21.1 ppm	4.08%		
2	-1.00000 V		-0.999960 V	-40.0 ppm	5%		
2	-1.90000 V		-1.899940 V	-31.6 ppm	6.12%		
20V Range							
20	10.0000 V		10.00060 V	60.0 ppm	8.57%		
20	19.0000 V		19.00040 V	21.1 ppm	4.55%		
20	-10.0000 V		-10.00057 V	56.7 ppm	8.1%		
20	-19.0000 V		-18.99997 V	-1.75 ppm	0.379%		
200V Range							
200	100.000 V		100.0080 V	80.0 ppm	11.4%		
200	190.000 V		190.0023 V	12.3 ppm	2.65%		
200	-100.000 V		-100.0110 V	110 ppm	15.7%		
200	-190.000 V		-190.0030 V	15.8 ppm	3.41%		

CH-B VOLTAGE MEASURE ACCURACY TESTS

CONFIG: RESET DEFAULTS | REMOTE SENSE

200mV Range

200	100.0277 mV		99.985 mV	-427 ppm	17.8%		
200	190.0011 mV		189.988 mV	-67.2 ppm	5.04%		
200	-100.0103 mV		-100.029 mV	184 ppm	7.65%		
200	-190.0021 mV		-190.015 mV	66.1 ppm	4.96%		

2V Range

2	1.000097 V		1.00009 V	-10.3 ppm	2.07%		
2	1.900032 V		1.90002 V	-8.07 ppm	2.41%		
2	-0.999973 V		-0.99996 V	-13.0 ppm	2.6%		
2	-1.899933 V		-1.89991 V	-10.4 ppm	3.1%		

20V Range

20	10.00061 V		9.9999 V	-71.0 ppm	10.9%		
20	19.00054 V		18.9993 V	-65.3 ppm	15.8%		
20	-10.00064 V		-10.0001 V	-50.7 ppm	7.79%		
20	-18.99993 V		-18.9992 V	-36.7 ppm	8.87%		

200V Range

200	100.0085 V		100.003 V	-58.3 ppm	8.97%		
200	190.0018 V		189.997 V	-25.3 ppm	6.11%		

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	TUR	ST
200	-100.0083 V		-100.008 V	-3.00 ppm	0.462%		
200	-190.0011 V		-190.001 V	-0.526 ppm	0.127%		

CH-B CURRENT SOURCE ACCURACY TESTS

CONFIG: RESET DEFAULTS

100nA Range

100	50.000 nA		1.0000e+047 nA	-0.526 %	7.69e+04		FAIL
100	90.000 nA		1.0000e+047 nA	-0.526 %	6.49e+04		FAIL
100	-50.000 nA		-1.0000e+047 nA	-0.526 %	7.69e+04		FAIL
100	-90.000 nA		-1.0000e+047 nA	-0.526 %	6.49e+04		FAIL

1uA Range

1	0.50000 uA		0.500090 uA	180 ppm	9.47%		
1	0.90000 uA		0.900087 uA	96.3 ppm	8.1%		
1	-0.50000 uA		-0.499943 uA	-113 ppm	5.96%		
1	-0.90000 uA		-0.899890 uA	-122 ppm	10.3%		

10uA Range

10	5.0000 uA		5.00007 uA	13.3 ppm	1.03%		
10	9.0000 uA		8.99987 uA	-14.8 ppm	1.73%		
10	-5.0000 uA		-4.99990 uA	-20.0 ppm	1.54%		
10	-9.0000 uA		-8.99960 uA	-44.4 ppm	5.19%		

100uA Range

100	50.000 uA		50.0033 uA	66.7 ppm	4.44%		
100	90.000 uA		90.0020 uA	22.2 ppm	2.3%		
100	-50.000 uA		-50.0017 uA	33.3 ppm	2.22%		
100	-90.000 uA		-89.9983 uA	-18.5 ppm	1.92%		

1mA Range

1	0.50000 mA		0.500027 mA	53.3 ppm	5.93%		
1	0.90000 mA		0.900000 mA	0.000 ppm	0%		
1	-0.50000 mA		-0.500007 mA	13.3 ppm	1.48%		
1	-0.90000 mA		-0.899980 mA	-22.2 ppm	3.51%		

10mA Range

10	5.0000 mA		4.99987 mA	-26.7 ppm	1.78%		
10	9.0000 mA		8.99963 mA	-40.7 ppm	4.21%		
10	-5.0000 mA		-5.00070 mA	140 ppm	9.33%		
10	-9.0000 mA		-9.00043 mA	48.1 ppm	4.98%		

100mA Range

100	50.000 mA		49.9950 mA	-100 ppm	11.1%		
100	90.000 mA		89.9930 mA	-77.8 ppm	12.3%		

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	TUR	TEST STATUS
100	-50.000 mA		-49.9963 mA	-73.3 ppm	8.15%		
100	-90.000 mA		-89.9947 mA	-59.3 ppm	9.36%		
1A Range							
1	0.50000 A		0.499903 A	-193 ppm	4.72%		
1	0.90000 A		0.899907 A	-104 ppm	4.15%		
1	-0.50000 A		-0.500160 A	320 ppm	7.8%		
1	-0.90000 A		-0.900123 A	137 ppm	5.48%		
CH-B CURRENT MEASURE ACCURACY TESTS							
CONFIG: RESET DEFAULTS							
100nA Range							
100	1.0000e+047 nA		50.079 nA	137 %	8e+049%		FAIL
100	1.0000e+047 nA		90.135 nA	137 %	6.89e+04		FAIL
100	-1.0000e+047 nA		-50.088 nA	137 %	8e+049%		FAIL
100	-1.0000e+047 nA		-90.134 nA	137 %	6.89e+04		FAIL
1uA Range							
1	0.500053 uA		0.50008 uA	60.7 ppm	4.85%		
1	0.900092 uA		0.90008 uA	-17.0 ppm	2.11%		
1	-0.499897 uA		-0.49993 uA	66.0 ppm	5.28%		
1	-0.899863 uA		-0.89990 uA	41.1 ppm	5.1%		
10uA Range							
10	5.00001 uA		5.0001 uA	18.0 ppm	3.27%		
10	8.99981 uA		8.9999 uA	10.0 ppm	2.4%		
10	-4.99977 uA		-4.9999 uA	26.0 ppm	4.73%		
10	-8.99949 uA		-8.9997 uA	23.3 ppm	5.6%		
100uA Range							
100	50.0034 uA		50.006 uA	52.0 ppm	7.43%		
100	90.0012 uA		90.005 uA	40.5 ppm	8.47%		
100	-49.9998 uA		-50.000 uA	4.00 ppm	0.571%		
100	-89.9960 uA		-89.996 uA	0.000 ppm	0%		
1mA Range							
1	0.500017 mA		0.50003 mA	19.3 ppm	3.22%		
1	0.899995 mA		0.90002 mA	27.8 ppm	6.58%		
1	-0.499995 mA		-0.50001 mA	30.0 ppm	5%		
1	-0.899972 mA		-0.89999 mA	20.0 ppm	4.74%		
10mA Range							
10	4.99985 mA		5.0008 mA	197 ppm	28.1%		
10	8.99940 mA		9.0006 mA	130 ppm	27.1%		

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	TUR	TEST STATUS
10	-5.00059 mA		-5.0003 mA	-64.7 ppm	9.24%		
10	-9.00029 mA		-9.0000 mA	-32.2 ppm	6.74%		
100mA Range							
100	49.9941 mA		50.002 mA	158 ppm	26.3%		
100	89.9929 mA		90.002 mA	101 ppm	23.9%		
100	-49.9973 mA		-50.001 mA	74.0 ppm	12.3%		
100	-89.9948 mA		-90.001 mA	68.9 ppm	16.3%		
1A Range							
1	0.499908 A		0.50002 A	217 ppm	6.59%		
1	0.899914 A		0.90001 A	110 ppm	5.61%		
1	-0.500179 A		-0.50002 A	-325 ppm	9.84%		
1	-0.900155 A		-0.89997 A	-202 ppm	10.3%		
1.5A Range							
1.5	0.499788 A		0.49998 A	377 ppm	5.03%		
1.5	0.999777 A		1.00005 A	270 ppm	6.74%		
1.5	-0.500186 A		-0.49992 A	-525 ppm	7%		
1.5	-1.000181 A		-1.00000 A	-181 ppm	4.52%		
CH-B CURRENT SOURCE ACCURACY TESTS - 1.5A Range							
CONFIG: RESET DEFAULTS							
1.5	0.50000 A		0.499833 A	-333 ppm	3.88%		
1.5	1.00000 A		0.999813 A	-187 ppm	4.06%		
1.5	-0.50000 A		-0.500213 A	427 ppm	4.96%		
1.5	-1.00000 A		-1.000193 A	193 ppm	4.2%		

End of Test Data