



A Tektronix Company

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

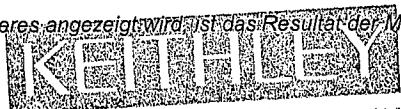
Calibration Results / Kalibrierschein

Report Nr.: 1676087- 23/07/2015 - 13:16:01

Keithley PO-No.: 1676087 Auftragsnummer:	Result: PASS Ergebnis:
Object: SMU Gegenstand:	Performed by: Thomas Schauer Prüfer:
Model: Keithley 237 Modell:	Performed on: 23.07.2015 Prüfdatum:
Serial No.: 976192 Serien Nr.:	Temperature: 24.0 °C Temperatur:
Customer: Ecole Polytechnique Auftraggeber:	Rel. Humidity: 44 % Rel. Luftfeuchte:
Address: Palaiseau Cedex FR 91128 Anschrift:	Remarks: Anmerkungen: Outgoing Data Report
Customer PO-No.: Bestellnummer:	
Used Procedure: Keithley 237:MC7:CAL VER IEEE 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 user is obliged to have the object recalibrated at appropriate intervals.
- 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.
- Keithley Instruments GmbH maintains A2LA accreditation to ISO/IEC 17025:2005; however, the results of this report are not covered under the scope of accreditation.
- 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 Meßunsicherheitsverhältnis (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 Kalbrierverfahren. Die Kalibrierergebnisse beziehen sich ausschliesslich auf den Kalibriergegenstand.
- Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.
- 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.
- Keithley Instruments GmbH unterhält eine Akkreditierung nach ISO/IEC 17025:2005. Dieser Kalibrierschein fällt aber nicht unter diese Akkreditierung.
- Wenn nichts anderes angezeigt wird, ist das Resultat der Messung "Pass".



A Tektronix Company

Tektronix GmbH - Keithley Service
Personal responsible
Landsberger Str. 65
82110 Germering (Germany)

Thomas Worm

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:

☒

Standards Used

Asset	Mfg	Model	Description	Cal Date	Due Date
1620A_A89301	Fluke	1620A	Tem-Hum Sensor	19/05/2015	19/05/2016
5720A_1985204	Fluke	5720A	Calibrator	25/06/2015	25/09/2015
617_367219	Keithley	617	Electrometer	01/07/2015	01/07/2016
HP3458A_20455	Hewlett Packard	3458A	DMM	08/12/2014	08/12/2015
KI263_407469	Keithley	263	Calibrator/Source	30/03/2015	30/03/2016

Test Data

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	TUR	TEST STATUS
Voltage source verification							
1	1.0000 V		0.99994 V	-63.9 ppm	6.52%		
1	-1.0000 V		-1.00009 V	92.3 ppm	9.42%		
10	10.000 V		9.9999 V	-9.20 ppm	1.61%		
10	-10.000 V		-10.0003 V	32.1 ppm	5.63%		
100	100.00 V		100.000 V	-4.06 ppm	0.712%		
100	-100.00 V		-100.003 V	28.9 ppm	5.07%		
1000	1000.0 V		999.98 V	-16.3 ppm	2.55%		
1000	-1000.0 V		-1000.01 V	8.35 ppm	1.3%		
Voltage measure verification							
1	1.000000 V		0.99994 V	-60.0 ppm	10.3%		
1	-1.000000 V		-0.99995 V	-50.0 ppm	8.62%		
11	10.00000 V		10.0006 V	60.0 ppm	16.7%		
11	-10.00000 V		-10.0000 V	0.000 ppm	0%		
110	100.0000 V		100.001 V	10.00 ppm	2.78%		
110	-100.0000 V		-100.000 V	0.000 ppm	0%		
1100	1000.000 V		1000.01 V	10.00 ppm	2.17%		
1100	-1000.000 V		-1000.00 V	0.000 ppm	0%		
Current measure verification							
1	0.900000 nA		0.89859 nA	-0.157 %	50.4%		
1	-0.900000 nA		-0.90177 nA	0.196 %	63.1%		
10	9.00000 nA		9.0014 nA	156 ppm	5%		
10	-9.00000 nA		-9.0001 nA	11.1 ppm	0.357%		
100	90.0000 nA		90.013 nA	144 ppm	6.67%		
100	-90.0000 nA		-89.983 nA	-189 ppm	8.72%		
1	0.900000 µA		0.89999 µA	-11.1 ppm	0.238%		
1	-0.900000 µA		-0.89977 µA	-256 ppm	5.48%		
10	9.00000 µA		9.0002 µA	22.2 ppm	0.519%		
10	-9.00000 µA		-9.0011 µA	122 ppm	2.86%		
100	90.0000 µA		90.004 µA	44.4 ppm	10.7%		
100	-90.0000 µA		-90.009 µA	100.0 ppm	24%		
1	0.900000 mA		0.90003 mA	33.3 ppm	8%		
1	-0.900000 mA		-0.90006 mA	66.7 ppm	16%		
10	9.000000 mA		9.00030 mA	33.3 ppm	7.46%		
10	-9.000000 mA		-9.00070 mA	77.8 ppm	17.4%		
100	90.00000 mA		90.0020 mA	22.2 ppm	2.08%		

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	TUR	TEST STATUS
100	-90.00000 mA		-90.0010 mA	11.1 ppm	1.04%		
Current source verification							
1	0.9000 nA		0.89967 nA	-367 ppm	1.05%		
1	-0.9000 nA		-0.89850 nA	-0.167 %	4.76%		
10	9.000 nA		8.9986 nA	-156 ppm	0.483%		
10	-9.000 nA		-8.9981 nA	-211 ppm	0.655%		
100	90.00 nA		89.993 nA	-81.9 ppm	3.53%		
100	-90.00 nA		-90.005 nA	56.1 ppm	2.42%		
1	0.9000 µA		0.89995 µA	-56.8 ppm	1.09%		
1	-0.9000 µA		-0.89998 µA	-24.5 ppm	0.47%		
10	9.000 µA		8.9996 µA	-49.6 ppm	0.949%		
10	-9.000 µA		-9.0002 µA	21.6 ppm	0.413%		
100	90.00 µA		89.999 µA	-10.4 ppm	0.2%		
100	-90.00 µA		-90.005 µA	60.5 ppm	1.16%		
1	0.9000 mA		0.89996 mA	-43.5 ppm	0.833%		
1	-0.9000 mA		-0.89998 mA	-26.6 ppm	0.51%		
10	9.000 mA		8.9992 mA	-89.8 ppm	1.72%		
10	-9.000 mA		-8.9998 mA	-20.2 ppm	0.386%		
100	90.00 mA		89.995 mA	-52.3 ppm	4.28%		
100	-90.00 mA		-89.997 mA	-33.8 ppm	2.76%		
End of Test Data							

Calibration Results / Kalibrierschein

Report Nr.: 1679654- 23.07.2015 - 12:44:39

Keithley PO-No.: 1679654 Auftragsnummer:	Result: Ergebnis: PASS
Object: DMM Gegenstand:	Performed by: Ludwig Haas Prüfer:
Model: KEITHLEY 2002 Modell:	Performed on: 23.07.2015 Prüfdatum:
Serial No.: 1322764 Serien Nr.:	Temperature: 24.0 °C Temperatur:
Customer: Andritz Hydro GmbH Auftraggeber:	Rel. Humidity: 44 % Rel. Luftfeuchte:
Address: A-8160 Graz Anschrift:	Remarks: Anmerkungen: Incoming data report = Outgoing Data Report
Customer PO-No.: Bestellnummer:	
Used Procedure: Keithley 2002 (17025)(1Year) 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), and meets the requirements of ISO/IEC 17025:2005.
- The user is obliged to have the object recalibrated at appropriate intervals.
- 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.
- The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of 2 sigma ($k=2$) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.
- Test status is PASS unless indicated otherwise.
- Testpoints marked with a preceding asterisk (*) are not accredited, but traceable to national/international standards.
- Dieser Kalibrierschein dokumentiert die Rückführbarkeit auf nationale oder internationale Normale zur Darstellung der Einheiten in Übereinstimmung mit dem internationalen Einheitensystem. Er erfüllt die Forderungen nach ISO/IEC 17025:2005.
- Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.
- Die Kalibrierung erfolgt durch den Vergleich mit Normalen oder Normalmesseinrichtungen oder auf der Grundlage dokumentierter Kalibrierverfahren.
- 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.
- Die Messunsicherheiten wurden gemäß ISO „Guide to the Expression of Uncertainty in Measurement (GUM)“. Angegeben ist die erweiterte Messunsicherheit, die sich aus der Standardmessunsicherheit durch Multiplikation mit dem Erweiterungsfaktor $k=2$ ergibt. Der Wert der Messgröße liegt mit einer Wahrscheinlichkeit von 95% im zugeordneten Werteintervall.
- Wenn nichts anderes angezeigt wird, ist das Resultat der Messung „Pass“.
- Die mit (*) markierten Messwerte sind rückführbar auf nationale/internationale Normale, aber zur Zeit nicht akkreditiert.

Personal responsible
Bearbeiter

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:

☒

Standards Used

Asset	Mfg	Model	Description	Cal Date	Due Date
33220A_MY44024614	Agilent	33220A	Function Generator	04.09.2014	04.09.2015
5720A_9542210	Fluke	5720A	Calibrator	29.06.2015	29.09.2015
5725_5410002	FLUKE	5725A	AMPLIFIER	29.06.2015	29.09.2015
Keithley 2001-758D	Keithley	2001-758	1 GOhm STD	19.01.2015	19.01.2016
TM-4_00611	Spectrum	TM-4	GPS Standard	01.04.2015	01.04.2016

Test Data

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	MEASUREMENT UNCERTAINTY	TEST STATUS
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mV SIMULATED THERMOCOUPLE ACCURACY TESTS - TYPE J

CONFIG: NPLC=1 | FILT=OFF

750	-190.000 °C		-190.00 °C	0.000 ppm	0%	2.1e-002 °C	
750	0.000 °C		0.00 °C	0.000 °C	0%	1.2e-002 °C	
750	25.000 °C		24.99 °C	-572 ppm	2.86%	3.6e-002 °C	
750	100.000 °C		100.00 °C	0.000 ppm	0%	1.2e-002 °C	
750	750.000 °C		750.00 °C	0.000 ppm	0%	1.2e-002 °C	

DC VOLTAGE ACCURACY TESTS - ENHANCED ACCURACY

CONFIG: NPLC=10 | FILT=10 COUNT,REP

200mV Range

200	100.00000000 mV		100.001832 mV	18.3 ppm	45.6%	1.0e-006 V	
200	190.00000000 mV		190.002789 mV	14.7 ppm	46.3%	1.5e-006 V	
200	-100.00000000 mV		-100.001705 mV	17.0 ppm	42.4%	1.0e-006 V	
200	-190.00000000 mV		-190.003186 mV	16.8 ppm	52.9%	1.5e-006 V	

2V Range

2	1.000000000 V		1.00000531 V	5.31 ppm	35.4%	4.2e-006 V	
2	1.900000000 V		1.90000848 V	4.46 ppm	31.6%	7.4e-006 V	
2	-1.000000000 V		-1.00000805 V	8.05 ppm	53.6%	4.2e-006 V	
2	-1.900000000 V		-1.90001550 V	8.16 ppm	57.6%	7.4e-006 V	

20V Range

20	10.00000000 V		10.0000362 V	3.62 ppm	28%	2.8e-005 V	
20	19.00000000 V		19.0000676 V	3.56 ppm	27.9%	5.2e-005 V	
20	-10.00000000 V		-10.0000505 V	5.05 ppm	39.1%	2.8e-005 V	
20	-19.00000000 V		-19.0000926 V	4.87 ppm	38.2%	5.2e-005 V	

200V Range

200	100.0000000 V		99.999922 V	-0.784 ppm	2.74%	3.9e-004 V	
200	190.0000000 V		189.999588 V	-2.17 ppm	8.11%	7.1e-004 V	
200	-100.0000000 V		-100.000217 V	2.17 ppm	7.59%	3.9e-004 V	
200	-190.0000000 V		-190.000250 V	1.32 ppm	4.92%	7.1e-004 V	

1000V Range

1000	500.000000 V		500.00065 V	1.30 ppm	4.29%	2.7e-003 V	
1000	1000.000000 V		1000.00268 V	2.68 ppm	5.95%	4.9e-003 V	
1000	-500.000000 V		-500.00145 V	2.89 ppm	9.52%	2.7e-003 V	
1000	-1000.000000 V		-1000.00452 V	4.52 ppm	10%	4.9e-003 V	

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	MEASUREMENT UNCERTAINTY	TEST STATUS
AC VOLTAGE ACCURACY TESTS - LOW FREQUENCY RMS MODE							
CONFIG: NPLC=1 FILT=OFF COUP=DC DET=LFRMS							
200mV Range							
200	190.0000 mV	10 Hz	190.020 mV	104 ppm	13.7%	5.4e-005 V	
200	190.0000 mV	50 Hz	190.001 mV	6.77 ppm	1.33%	2.1e-005 V	
200	190.0000 mV	100 Hz	189.999 mV	-7.52 ppm	1.47%	2.1e-005 V	
2V Range							
2	1.900000 V	10 Hz	1.90053 V	277 ppm	49.7%	4.6e-004 V	
2	1.900000 V	50 Hz	1.90039 V	204 ppm	49.9%	8.5e-005 V	
2	1.900000 V	100 Hz	1.90034 V	177 ppm	43.2%	8.4e-005 V	
20V Range							
20	19.00000 V	10 Hz	19.0045 V	235 ppm	31%	4.6e-003 V	
20	19.00000 V	50 Hz	19.0037 V	193 ppm	38%	8.2e-004 V	
20	19.00000 V	100 Hz	19.0035 V	186 ppm	40.7%	8.3e-004 V	
200V Range							
200	190.0000 V	10 Hz	190.061 V	323 ppm	46.6%	4.6e-002 V	
200	190.0000 V	50 Hz	190.058 V	305 ppm	61.8%	9.6e-003 V	
200	190.0000 V	100 Hz	190.058 V	305 ppm	61.8%	9.6e-003 V	
750V Range							
750	750.000 V	50 Hz	750.34 V	451 ppm	37.2%	5.2e-002 V	
750	750.000 V	100 Hz	750.38 V	503 ppm	41.5%	5.1e-002 V	
AC VOLTAGE ACCURACY TESTS - RMS MODE							
200mV Range							
CONFIG: NPLC=1 FILT=OFF COUP=AC DET=RMS							
200	190.0000 mV	20 Hz	189.196 mV	-0.425 %	62.9%	5.4e-005 V	
200	190.0000 mV	50 Hz	189.880 mV	-630 ppm	40.4%	2.1e-005 V	
CONFIG: NPLC=1 FILT=OFF COUP=DC DET=RMS							
200	190.0000 mV	20 Hz	189.761 mV	-0.126 %	47.3%	5.4e-005 V	
200	190.0000 mV	50 Hz	189.961 mV	-203 ppm	23.7%	2.1e-005 V	
200	190.0000 mV	1 kHz	189.997 mV	-13.5 ppm	3.3%	2.1e-005 V	
200	190.0000 mV	5 kHz	190.003 mV	15.0 ppm	3.66%	2.1e-005 V	
200	190.0000 mV	25 kHz	190.012 mV	65.4 ppm	14.2%	4.1e-005 V	
200	190.0000 mV	50 kHz	189.999 mV	-5.26 ppm	0.167%	4.1e-005 V	
200	190.0000 mV	100 kHz	189.841 mV	-840 ppm	10.8%	9.7e-005 V	
200	190.0000 mV	0.2 MHz	189.407 mV	-0.313 %	14.9%	1.6e-004 V	
2V Range							
CONFIG: NPLC=1 FILT=OFF COUP=AC DET=RMS							
2	1.900000 V	20 Hz	1.89241 V	-0.401 %	59.3%	4.6e-004 V	
2	1.900000 V	50 Hz	1.89905 V	-501 ppm	32.2%	8.4e-005 V	
CONFIG: NPLC=1 FILT=OFF COUP=DC DET=RMS							
2	1.900000 V	20 Hz	1.89800 V	-0.105 %	39.6%	4.6e-004 V	
2	1.900000 V	50 Hz	1.89999 V	-4.51 ppm	0.526%	8.4e-005 V	

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	MEASUREMENT UNCERTAINTY	TEST STATUS
2	1.900000 V	1 kHz	1.90025 V	132 ppm	32%	8.4e-005 V	
2	1.900000 V	5 kHz	1.90027 V	143 ppm	34.8%	8.4e-005 V	
2	1.900000 V	25 kHz	1.90028 V	147 ppm	32%	1.4e-004 V	
2	1.900000 V	50 kHz	1.89994 V	-29.3 ppm	0.929%	1.4e-004 V	
2	1.900000 V	100 kHz	1.89829 V	-899 ppm	11.6%	2.4e-004 V	
2	1.900000 V	0.2 MHz	1.89382 V	-0.326 %	15.5%	7.3e-004 V	

20V Range

CONFIG: NPLC=1 | FILT=OFF | COUP=AC | DET=RMS

20	19.00000 V	20 Hz	18.9234 V	-0.405 %	59.9%	4.6e-003 V	
20	19.00000 V	50 Hz	18.9906 V	-494 ppm	31.7%	8.1e-004 V	

CONFIG: NPLC=1 | FILT=OFF | COUP=DC | DET=RMS

20	19.00000 V	20 Hz	18.9787 V	-0.112 %	42.2%	4.6e-003 V	
20	19.00000 V	50 Hz	18.9998 V	-11.3 ppm	1.31%	8.1e-004 V	
20	19.00000 V	1 kHz	19.0036 V	192 ppm	41.9%	8.1e-004 V	
20	19.00000 V	5 kHz	19.0037 V	196 ppm	35.2%	8.1e-004 V	
20	19.00000 V	25 kHz	19.0036 V	189 ppm	28.7%	1.4e-003 V	
20	19.00000 V	50 kHz	19.0031 V	162 ppm	5.14%	1.4e-003 V	
20	19.00000 V	100 kHz	18.9953 V	-245 ppm	3.16%	2.0e-003 V	
20	19.00000 V	0.2 MHz	18.9776 V	-0.118 %	2.8%	5.5e-003 V	

200V Range

CONFIG: NPLC=1 | FILT=OFF | COUP=AC | DET=RMS

200	190.0000 V	20 Hz	189.264 V	-0.389 %	57.3%	4.6e-002 V	
200	190.0000 V	50 Hz	189.928 V	-377 ppm	23.6%	9.6e-003 V	

CONFIG: NPLC=1 | FILT=OFF | COUP=DC | DET=RMS

200	190.0000 V	20 Hz	189.806 V	-0.102 %	37.9%	4.6e-002 V	
200	190.0000 V	50 Hz	190.020 V	105 ppm	11.7%	9.6e-003 V	
200	190.0000 V	1 kHz	190.055 V	289 ppm	58.6%	9.5e-003 V	
200	190.0000 V	5 kHz	190.062 V	328 ppm	55.2%	9.6e-003 V	
200	190.0000 V	25 kHz	190.072 V	379 ppm	54.6%	1.5e-002 V	
200	190.0000 V	50 kHz	190.036 V	189 ppm	5.91%	1.5e-002 V	
200	190.0000 V	100 kHz	189.936 V	-338 ppm	4.4%	2.7e-002 V	

750V Range

CONFIG: NPLC=1 | FILT=OFF | COUP=AC | DET=RMS

750	750.000 V	50 Hz	749.80 V	-269 ppm	11.1%	5.1e-002 V	
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CONFIG: NPLC=1 | FILT=OFF | COUP=DC | DET=RMS

750	750.000 V	50 Hz	750.18 V	240 ppm	14%	5.1e-002 V	
750	750.000 V	1 kHz	750.39 V	525 ppm	43.3%	5.1e-002 V	
750	750.000 V	5 kHz	750.45 V	600 ppm	45.7%	1.0e-001 V	
750	750.000 V	25 kHz	750.15 V	200 ppm	13.2%	2.8e-001 V	

AC VOLTAGE ACCURACY TESTS - PEAK MODE

200mV Range

CONFIG: NPLC=1 | FILT=10 COUNT,REP | COUP=DC | DET=PEAK

200	141.40 mVp	20 Hz	142.1 mVp	0.473 %	44.4%	8.4e-005 Vp	
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RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	MEASUREMENT UNCERTAINTY	TEST STATUS
CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=AC DET=PEAK							
200	141.40 mVp	5 kHz	141.9 mVp	0.342 %	31.8%	1.6e-004 Vp	
200	141.40 mVp	25 kHz	141.7 mVp	0.242 %	22.2%	8.0e-005 Vp	
200	141.40 mVp	50 kHz	141.6 mVp	0.151 %	12.2%	8.8e-005 Vp	
200	141.40 mVp	100 kHz	141.4 mVp	0.000 ppm	0%	1.1e-004 Vp	
200	141.40 mVp	250 kHz	140.8 mVp	-0.426 %	21.4%	1.5e-004 Vp	
200	141.40 mVp	500 kHz	139.1 mVp	-1.68 %	25.9%	2.2e-004 Vp	
200	141.40 mVp	750 kHz	137.2 mVp	-3.06 %	30.5%	4.2e-004 Vp	
200	141.40 mVp	1 MHz	136.0 mVp	-3.97 %	39.6%	4.2e-004 Vp	

2V Range

CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=DC DET=PEAK							
2	1.4140 Vp	20 Hz	1.417 Vp	0.192 %	38.1%	7.9e-004 Vp	

CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=AC DET=PEAK							
2	1.4140 Vp	5 kHz	1.416 Vp	0.141 %	27.5%	7.5e-004 Vp	
2	1.4140 Vp	25 kHz	1.414 Vp	0.000 ppm	0%	5.9e-004 Vp	
2	1.4140 Vp	50 kHz	1.413 Vp	-708 ppm	10.5%	5.9e-004 Vp	
2	1.4140 Vp	100 kHz	1.410 Vp	-0.304 %	21.3%	7.2e-004 Vp	
2	1.4140 Vp	250 kHz	1.405 Vp	-0.641 %	44.9%	8.3e-004 Vp	
2	1.4140 Vp	500 kHz	1.388 Vp	-1.87 %	31.6%	1.7e-003 Vp	
2	1.4140 Vp	750 kHz	1.364 Vp	-3.67 %	38.8%	2.6e-003 Vp	
2	1.4140 Vp	1 MHz	1.336 Vp	-5.84 %	61.8%	2.6e-003 Vp	

20V Range

CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=DC DET=PEAK							
20	14.140 Vp	20 Hz	14.19 Vp	0.352 %	32.4%	1.1e-002 Vp	

CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=AC DET=PEAK							
20	14.140 Vp	5 kHz	14.18 Vp	0.312 %	28.5%	1.1e-002 Vp	
20	14.140 Vp	25 kHz	14.17 Vp	0.202 %	17.9%	8.2e-003 Vp	
20	14.140 Vp	50 kHz	14.14 Vp	-101 ppm	0.815%	8.2e-003 Vp	
20	14.140 Vp	100 kHz	14.13 Vp	-0.101 %	5.08%	7.4e-003 Vp	
20	14.140 Vp	250 kHz	14.09 Vp	-0.355 %	17.8%	7.3e-003 Vp	
20	14.140 Vp	500 kHz	14.01 Vp	-0.959 %	14.8%	1.7e-002 Vp	
20	14.140 Vp	750 kHz	13.85 Vp	-2.09 %	20.9%	2.4e-002 Vp	
20	14.140 Vp	1 MHz	13.85 Vp	-2.13 %	21.2%	2.4e-002 Vp	

200V Range

CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=DC DET=PEAK							
200	268.70 Vp	20 Hz	268.8 Vp	531 ppm	16.3%	1.2e-001 Vp	

CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=AC DET=PEAK							
200	268.70 Vp	5 kHz	268.9 Vp	744 ppm	22.1%	5.9e-002 Vp	
200	268.70 Vp	25 kHz	268.7 Vp	-106 ppm	2.9%	7.3e-002 Vp	
200	268.70 Vp	50 kHz	268.5 Vp	-745 ppm	15.6%	6.2e-002 Vp	
200	268.70 Vp	100 kHz	268.1 Vp	-0.224 %	18.2%	6.9e-002 Vp	

750V Range

CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=AC DET=PEAK							
750	1061.0 Vp	5 kHz	1062 Vp	942 ppm	14.7%	6.0e-001 Vp	

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	MEASUREMENT UNCERTAINTY	TEST STATUS
750	1061.0 Vp	25 kHz	1061 Vp	0.000 ppm	0%	7.0e-001 Vp	

AC VOLTAGE ACCURACY TESTS - RMS MODE

CONFIG: NPLC=1 | FILT=OFF | COUP=AC | DET=RMS

200mV Range

* 200	190.0000 mV	2 MHz	194.455 mV	2.29 %	44%	7.7e-004 V
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2V Range

* 2	1.900000 V	2 MHz	1.92355 V	1.22 %	23.5%	6.2e-003 V
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SIMULATED RTD ACCURACY TESTS - PT385

CONFIG: MODE=4W | NPLC=1 | FILT=OFF

600	-0.0100 °C		-0.010 °C	0.000 ppm	0%	3.1e-003 °C
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RESISTANCE ACCURACY TESTS

CONFIG: MODE=4W | NPLC=10 | FILT=10 CNT,REP | OCOM=ON

20 Ω Range

20	9.99945500 Ω		9.9996270 Ω	17.2 ppm	29.4%	2.1e-004 Ω
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200 Ω Range

200	99.9945700 Ω		99.995993 Ω	14.2 ppm	43.5%	9.0e-004 Ω
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2 kΩ Range

2	1.000013100 kΩ		1.00001508 kΩ	1.98 ppm	12.2%	7.5e-003 Ω
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20 kΩ Range

20	9.99989000 kΩ		9.9999171 kΩ	2.71 ppm	15.4%	7.5e-002 Ω
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200 kΩ Range

CONFIG: MODE=4W | NPLC=10 | FILT=10 CNT,REP | OCOM=OFF

200	99.9979700 kΩ		99.998633 kΩ	6.63 ppm	15%	9.0e-001 Ω
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2 MΩ Range

2	0.999964200 MΩ		0.99997472 MΩ	10.5 ppm	13%	1.5e+001 Ω
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20 MΩ Range

CONFIG: MODE=2W | NPLC=10 | FILT=10 CNT,REP | OCOM=OFF

20	9.99857400 MΩ		9.9982897 MΩ	-28.4 ppm	10.7%	3.2e+002 Ω
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200 MΩ Range

200	99.9994300 MΩ		99.994301 MΩ	-51.3 ppm	8.98%	9.5e+003 Ω
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1 GΩ Range

1	0.9108340 GΩ		0.910749 GΩ	-93.8 ppm	4.51%	4.6e+005 Ω
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DC CURRENT ACCURACY TESTS

CONFIG: NPLC=1 | FILT=10 CNT,REP

200uA Range

200	100.000000 μA		100.0022 μA	21.7 ppm	4.9%	9.5e-009 A
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200	190.000000 μA		190.0035 μA	18.5 ppm	4.41%	1.3e-008 A
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200	-100.000000 μA		-100.0038 μA	37.9 ppm	8.55%	9.5e-009 A
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200	-190.000000 μA		-190.0072 μA	37.9 ppm	9.04%	1.3e-008 A
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2mA Range

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	MEASUREMENT UNCERTAINTY	TEST STATUS
2	1.0000000 mA		1.000029 mA	28.7 ppm	6.68%	3.7e-008 A	
2	1.9000000 mA		1.900046 mA	24.4 ppm	5.93%	6.4e-008 A	
2	-1.0000000 mA		-1.000043 mA	43.4 ppm	10.1%	3.7e-008 A	
2	-1.9000000 mA		-1.900085 mA	44.8 ppm	10.9%	6.4e-008 A	
20mA Range							
20	10.000000 mA		10.00045 mA	45.0 ppm	10.1%	3.4e-007 A	
20	19.000000 mA		19.00080 mA	42.0 ppm	9.86%	6.1e-007 A	
20	-10.000000 mA		-10.00063 mA	63.0 ppm	14.2%	3.4e-007 A	
20	-19.000000 mA		-19.00122 mA	64.0 ppm	15%	6.1e-007 A	
200mA Range							
200	100.00000 mA		100.0081 mA	80.7 ppm	14%	4.7e-006 A	
200	190.00000 mA		190.0157 mA	82.6 ppm	14.8%	1.0e-005 A	
200	-100.00000 mA		-100.0109 mA	109 ppm	18.8%	4.7e-006 A	
200	-190.00000 mA		-190.0213 mA	112 ppm	20.1%	1.0e-005 A	
2A Range							
2	1.0000000 A		0.999923 A	-76.6 ppm	8.33%	7.2e-005 A	
2	1.9000000 A		1.899510 A	-258 ppm	28.7%	2.2e-004 A	
2	-1.0000000 A		-0.999942 A	-58.0 ppm	6.31%	7.2e-005 A	
2	-1.9000000 A		-1.899586 A	-218 ppm	24.2%	2.2e-004 A	

AC CURRENT ACCURACY TESTS

CONFIG: NPLC=1 | FILT=OFF | COUP=DC

200uA Range							
200	190.0000 µA	40 Hz	189.960 µA	-212 ppm	5.8%	3.7e-008 A	
200	190.0000 µA	100 Hz	190.003 µA	13.5 ppm	0.627%	2.9e-008 A	
200	190.0000 µA	1 kHz	189.869 µA	-691 ppm	13.4%	2.9e-008 A	
200	190.0000 µA	10 kHz	189.958 µA	-220 ppm	4.27%	2.4e-007 A	
2mA Range							
2	1.900000 mA	40 Hz	1.89960 mA	-212 ppm	6.72%	3.2e-007 A	
2	1.900000 mA	100 Hz	1.90003 mA	15.8 ppm	0.952%	2.6e-007 A	
2	1.900000 mA	1 kHz	1.89992 mA	-43.6 ppm	3.21%	2.6e-007 A	
2	1.900000 mA	10 kHz	1.89990 mA	-54.9 ppm	2.07%	2.4e-006 A	
20mA Range							
20	19.00000 mA	40 Hz	18.9973 mA	-144 ppm	4.55%	3.0e-006 A	
20	19.00000 mA	100 Hz	19.0024 mA	125 ppm	7.53%	2.4e-006 A	
20	19.00000 mA	1 kHz	19.0020 mA	105 ppm	7.75%	2.4e-006 A	
20	19.00000 mA	10 kHz	19.0011 mA	57.1 ppm	2.15%	2.2e-005 A	
200mA Range							
200	190.0000 mA	40 Hz	190.066 mA	346 ppm	11%	3.0e-005 A	
200	190.0000 mA	100 Hz	190.116 mA	611 ppm	36.8%	2.4e-005 A	
200	190.0000 mA	1 kHz	190.116 mA	610 ppm	36.8%	2.3e-005 A	
200	190.0000 mA	10 kHz	190.158 mA	830 ppm	16.1%	1.8e-004 A	
2A Range							
2	1.900000 A	40 Hz	1.89879 A	-639 ppm	17.2%	4.9e-004 A	

RANGE	SYSTEM ACTUAL	MODIFIER	INDICATED VALUE	ERROR	ERROR (%TOL)	MEASUREMENT UNCERTAINTY	TEST STATUS
2	1.900000 A	100 Hz	1.89956 A	-230 ppm	10.4%	4.9e-004 A	
2	1.900000 A	1 kHz	1.89954 A	-243 ppm	5.16%	4.9e-004 A	
2	1.900000 A	10 kHz	1.89994 A	-30.1 ppm	0.198%	1.2e-002 A	

FREQUENCY ACCURACY TESTS

CONFIG: NPLC=1 | VOLTRANG=10 | COUPLING=AC

1.10000 Hz	5 Vpp	1.1000 Hz	-30.1 ppm	0%	5.8e-005 Hz
10.0000 Hz	5 Vpp	10.000 Hz	0.000 ppm	0%	5.8e-004 Hz
100.000 Hz	5 Vpp	100.00 Hz	0.000 ppm	0%	5.8e-003 Hz
1.10000 kHz	5 Vpp	1.1000 kHz	0.000 ppm	0%	5.8e-002 Hz
10.0000 kHz	5 Vpp	10.000 kHz	0.000 ppm	0%	5.8e-001 Hz
100.000 kHz	5 Vpp	100.00 kHz	0.000 ppm	0%	5.8e+000 Hz
1.10000 MHz	5 Vpp	1.1000 MHz	0.000 ppm	0%	5.8e+001 Hz
10.0000 MHz	5 Vpp	10.000 MHz	0.000 ppm	0%	5.8e+002 Hz
15.0000 MHz	5 Vpp	15.000 MHz	0.000 ppm	0%	5.8e+002 Hz

End of Test Data

