

Manufacturer	KEITHLEY INSTRUMENTS	Calibration date	09 May 2017
Model Number	Model 2001	Ambient Temperature	23.96 °C
Serial	0544257	Relative Humidity	43.83 %
ID Number	K2001 GPIB10	Pressure	1009.19
Notes	Post-calibration, 24 hour specs	Test type	PERFVAL Tek unit

This is full post-adjustment report, with 24-hour maintained specifications of source references and MFC transfer. Below data presented for reference only.

Reference standard	Mfg	Model	Options	Serial Number	CEID	Calibration date	Due date
TEST MFC	Fluke	5700A		XXX	IL01	2017/05/05	2017/06/05
DMM	HP	3458A	001,X02	MY45040325	XD2	2017/01/05	2017/06/05
Res-STD	xDevs.com	1 GΩ	0.997091G	XXX	MR00	2017/01/12	2018/01/12
Res-STD	Fluke	SL935	10KΩ and 1 Ω	001	MR03	2017/05/07	2017/05/14
SigGen	HP	3245A	Z002	XXXXAXXXXX	XG2	2017/04/12	2017/07/12

Unit last calibrated	5.0 days ago	Unit since DCV ZERO	1.0 days ago
Confidence level	24h 95%	Calibrate date	2017-05-04 00:00:00
Calibrate date Zero	2017-05-08 00:00:00	Calibrate date WB Flatness	1989-05-16 00:00:00
Calibrate date WB Gain	1990-09-13 00:00:00	CAL CONST 6.5V reference voltage	6.88633121415
CAL CONST 13V reference voltage	13.7680578264	CAL CONST 22V range positive zero	398.17567
CAL CONST 22V range negative zero	398.1752	CAL CONST DAC Linearity	0.421480023105
CAL CONST 10KOHM true output resistance	9999.20084312	CAL CONST 10KOHM standard resistance	10000.5030641
CAL CONST, Zero calibration temperature	23.0	CAL CONST, All calibration temp	23.0

Calibrator and all standards are warmed up >24 hours. Cable and function delays are implemented per test procedure.

Meter Info	KEITHLEY INSTRUMENTS INC.,MODEL 2001,0544257,A08 /A01	Test date start	09 May 2017 12:43
Test specification interval	24 hour DUT spec	Line frequency	110V, 60.00 Hz
Next calibration date	05/12/18	Last calibration date	05/12/17
DUT temperature to cal	0.0	Last calibration temperature	+24.0

Service information

Last calibration temperature

+24.2

All CAL values

1.000037E+00,1.524371E-04,1.000473E+01,1.228436E-04,9.999964E-01,1.904664E-05,1.000404E+01,1.104807E-04,1.000188E+02,4.962241E+02,5.590790E-03,1.016507E-02,4.066029E-03,5.082536E-03,1.067333E-02,1.140000E+02,9.300000E+01,1.863839E-04,1.000348E+00,9.999346E-01,1.000342E+00,1.000191E+00,1.073281E-01,1.000351E+00,1.215000E+02,1.155000E+02,1.165000E+02,9.900000E+01,1.500000E+00,2.500000E+00,6.000000E+00,1.395393E+00,-4.599053E-05,1.743987E+00,-4.773223E-06,-6.976383E-01,-1.344775E-05,1.743644E+00,-9.573802E-07,6.974917E-01,5.417248E-04,1.396929E+00,-4.025502E-05,1.396995E+00,-4.429504E-05,1.394314E+00,-4.421005E-05,1.379258E+00,-4.373267E-05,1.394567E+00,-4.421808E-05,1.500317E+00,-9.655786E-03,1.430013E+00,-1.007765E-03,1.787255E+00,-1.009549E-04,1.965809E+00,-1.498667E-05,2.479052E+00,-7.745699E-06,2.273224E+00,-6.317787E-06,2.503674E+00,-6.862064E-06,3.925826E+00,1.217911E-02,1.570408E+00,1.219457E-03,1.500317E+00,3.386930E-05,1.430013E+00,3.228219E-05,1.787255E+00,3.161216E-06,1.965809E+00,3.477033E-06,2.479052E+00,4.384834E-06,6.976290E-01,9.999956E-01,15813,8952,12389,29539,29539,29539,29540,1288,6456,9.300652E-03,9.757904E-04,9.757904E-04,8.871600E-05,7.034895E-06,7.671865E-07,6.965710E-08,4.442343E-09,4.442343E-09

Reference

TK2001 test

DUT Condition

Front terminals used 4W+AUX curr

Test procedure : \$Id: k2001.py | Rev 330 | 2017/05/09 04:00:11 tin_fpga \$

Source procedure : \$Id: f5700a.py | Rev 328 | 2017/05/08 23:53:50 tin_fpga \$

Main DC Voltage ranges performance test.

Checks zero offset and +/-FS calibration on all ranges

The following test for the offset voltage specification using MFC 0V source in 4-wire ext sense mode as reference.

DCV gain range points verify gain of the DC voltage function, using uncorrected 24-hour MFC output. DC voltage offset of DUT is nulled before FS tests.

Test Description	Expected Value	Measured Value	Measurement Uncertainty	Lower Limit	Upper Limit	Units	Deviation	DUT Spec	Test Status
Short 0 mVDC	0.000000E+00	-0.0000017	8.2 ppm	-0.000002	-0.000001	VDC	N/A	1.20 µV	PASS
Short 0.0 VDC	0.000000E+00	-0.0000015	4.0 ppm	-0.000003	0.000000	VDC	N/A	4.00 µV	PASS
Short 00.0 VDC	0.000000E+00	-0.0000060	3.3 ppm	-0.000046	0.000034	VDC	N/A	80.00 µV	PASS
Short 000.0 VDC	0.000000E+00	-0.0000050	4.4 ppm	-0.000305	0.000295	VDC	N/A	0.60 mV	PASS
Short 0000.0 VDC	0.000000E+00	0.0002500	6.5 ppm	-0.005750	0.006250	VDC	N/A	6.00 mV	PASS
DCV Test	0.1V-1000V	DUT	Source unc.	Low Limit	Hi limit	Units	Measured	24h spec	Result
0.2 VDC (0.1 Range)	0.200000	0.19999775	9.91 ppm	0.199994818	0.200005182	VDC	-11.275 ppm	16.00 ppm	PASS 43.52 %
-0.2 VDC (0.1 Range)	-0.200000	-0.20000116	9.91 ppm	-0.200005182	-0.199994818	VDC	5.800 ppm	16.00 ppm	PASS 22.39 %
0.1 VDC (1.0 Range)	0.100000	0.09999835	9.91 ppm	0.099998109	0.100001891	VDC	-16.500 ppm	9.00 ppm	PASS 87.26 %
1.0 VDC (1.0 Range)	1.000000	0.99999380	4.05 ppm	0.99998695	1.00001305	VDC	-6.200 ppm	9.00 ppm	PASS 47.51 %
2.0 VDC (1.0 Range)	2.000000	1.99998705	4.05 ppm	1.9999739	2.0000261	VDC	-6.475 ppm	9.00 ppm	PASS 49.62 %
-0.1 VDC (1.0 Range)	-0.100000	-0.10000160	9.91 ppm	-0.100001891	-0.099998109	VDC	16.000 ppm	9.00 ppm	PASS 84.61 %
-1.0 VDC (1.0 Range)	-1.000000	-0.99999595	4.05 ppm	-1.00001305	-0.99998695	VDC	-4.050 ppm	9.00 ppm	PASS 31.03 %
-2.0 VDC (1.0 Range)	-2.000000	-1.99998975	4.05 ppm	-2.0000261	-1.9999739	VDC	-5.125 ppm	9.00 ppm	PASS 39.27 %
1.0 VDC (10.0 Range)	1.000000	0.99999300	4.05 ppm	0.99998495	1.00001505	VDC	-7.000 ppm	11.00 ppm	PASS 46.51 %
10.0 VDC (10.0 Range)	10.000000	10.00001450	1.47 ppm	9.9998753	10.0001247	VDC	1.450 ppm	11.00 ppm	PASS 11.63 %
20.0 VDC (10.0 Range)	20.000000	20.00002950	2.36 ppm	19.9997328	20.0002672	VDC	1.475 ppm	11.00 ppm	PASS 11.04 %
-1.0 VDC (10.0 Range)	-1.000000	-0.99999750	4.05 ppm	-1.00001505	-0.99998495	VDC	-2.500 ppm	11.00 ppm	PASS 16.61 %
-10.0 VDC (10.0 Range)	-10.000000	-10.00003400	1.47 ppm	-10.0001247	-9.9998753	VDC	3.400 ppm	11.00 ppm	PASS 27.27 %
-20.0 VDC (10.0 Range)	-20.000000	-20.00004750	2.36 ppm	-20.0002672	-19.9997328	VDC	2.375 ppm	11.00 ppm	PASS 17.78 %
10 VDC (100.0 Range)	10.000000	10.00001500	2.36 ppm	9.9998164	10.0001836	VDC	1.500 ppm	16.00 ppm	PASS 8.17 %
100 VDC (100.0 Range)	100.000000	100.00039500	5.45 ppm	99.997855	100.002145	VDC	3.950 ppm	16.00 ppm	PASS 18.41 %
200 VDC (100.0 Range)	200.000000	200.00056500	5.45 ppm	199.99571	200.00429	VDC	2.825 ppm	16.00 ppm	PASS 13.17 %
-10 VDC (100.0 Range)	-10.000000	-10.00007000	2.36 ppm	-10.0001836	-9.9998164	VDC	7.000 ppm	16.00 ppm	PASS 38.13 %
-100 VDC (100.0 Range)	-100.000000	-100.00005000	5.45 ppm	-100.002145	-99.997855	VDC	0.500 ppm	16.00 ppm	PASS 4.37 %
-200 VDC (100.0 Range)	-200.000000	-200.00012000	5.45 ppm	-200.00429	-199.99571	VDC	0.600 ppm	16.00 ppm	PASS 5.24 %
100 VDC (1000.0 Range)	100.000000	100.00000000	5.45 ppm	99.997855	100.002145	VDC	0.000 ppm	16.00 ppm	PASS 0.00 %
200 VDC (1000.0 Range)	200.000000	199.99950000	5.45 ppm	199.99571	200.00429	VDC	-2.500 ppm	16.00 ppm	PASS 11.66 %
1000 VDC (1000.0 Range)	1000.000000	999.99860000	7.55 ppm	999.96645	1000.03355	VDC	-1.400 ppm	16.00 ppm	PASS 4.17 %
-100 VDC (1000.0 Range)	-100.000000	-99.99860000	5.45 ppm	-100.002145	-99.997855	VDC	-14.000 ppm	16.00 ppm	PASS 65.27 %
-200 VDC (1000.0 Range)	-200.000000	-199.99775000	5.45 ppm	-200.00429	-199.99571	VDC	-11.250 ppm	16.00 ppm	PASS 98.25 %
-1000 VDC (1000.0 Range)	-1000.000000	-999.99590000	7.55 ppm	-1000.01355	-999.98645	VDC	-4.100 ppm	16.00 ppm	PASS 30.26 %

Additional test for **combined DUT+MFC** DC Voltage Integral Linearity (INL) using fixed 10V range. Integral linearity is a measure of the device's deviation from ideal linear behaviour.

DCV Linearity	10V Range	DUT	Source unc.	Low Limit	Hi limit	Units	Measured	24h spec	Result
20.99	20.99000000	20.99003050	1.47 ppm	20.989738255	20.990261745	VDC	1.453 ppm	11.00 ppm	PASS 11.65 %
19.999999	19.99999900	20.00002950	1.47 ppm	19.999749600	20.000248400	VDC	1.525 ppm	11.00 ppm	PASS 12.23 %
18.888888	18.88888800	18.88891700	1.47 ppm	18.888652456	18.889123544	VDC	1.535 ppm	11.00 ppm	PASS 12.31 %
17.777777	17.77777700	17.77781350	1.47 ppm	17.777555311	17.777998689	VDC	2.053 ppm	11.00 ppm	PASS 16.46 %
16.666666	16.66666600	16.66669900	1.47 ppm	16.666458167	16.666873833	VDC	1.980 ppm	11.00 ppm	PASS 15.88 %
15.555555	15.55555500	15.55558750	1.47 ppm	15.555361022	15.555748978	VDC	2.089 ppm	11.00 ppm	PASS 16.75 %
14.444444	14.44444400	14.44446500	1.47 ppm	14.444263878	14.444624122	VDC	1.454 ppm	11.00 ppm	PASS 11.66 %
13.333333	13.33333300	13.33335400	1.47 ppm	13.333166733	13.333499267	VDC	1.575 ppm	11.00 ppm	PASS 12.63 %
12.222222	12.22222200	12.22223850	1.47 ppm	12.222069589	12.222374411	VDC	1.350 ppm	11.00 ppm	PASS 10.83 %
11.111111	11.11111100	11.11113400	1.47 ppm	11.110972444	11.111249556	VDC	2.070 ppm	11.00 ppm	PASS 16.60 %
10.999999	10.99999900	11.00001600	1.47 ppm	10.999861830	11.000136170	VDC	1.545 ppm	11.00 ppm	PASS 12.39 %
9.999999	9.99999900	10.00001450	1.47 ppm	9.999874300	10.000123700	VDC	1.550 ppm	11.00 ppm	PASS 12.43 %
8.888888	8.88888800	8.88889900	1.47 ppm	8.888777156	8.888998844	VDC	1.238 ppm	11.00 ppm	PASS 9.92 %
7.777777	7.77777700	7.77778400	1.47 ppm	7.777680011	7.777873989	VDC	0.900 ppm	11.00 ppm	PASS 7.22 %
6.666666	6.66666600	6.66667250	1.47 ppm	6.666582867	6.666749133	VDC	0.975 ppm	11.00 ppm	PASS 7.82 %
5.555555	5.55555500	5.55556000	1.47 ppm	5.555485722	5.555624278	VDC	0.900 ppm	11.00 ppm	PASS 7.22 %
4.444444	4.44444400	4.44444800	1.47 ppm	4.444388578	4.444499422	VDC	0.900 ppm	11.00 ppm	PASS 7.22 %
3.333333	3.33333300	3.33333450	1.47 ppm	3.333291433	3.333374567	VDC	0.450 ppm	11.00 ppm	PASS 3.61 %
2.222222	2.22222200	2.22221800	1.47 ppm	2.222194289	2.222249711	VDC	-1.800 ppm	11.00 ppm	PASS 14.43 %
1.111111	1.11111100	1.11110350	2.45 ppm	1.111096056	1.111125944	VDC	-6.750 ppm	11.00 ppm	PASS 50.19 %
-1.111111	-1.11111100	-1.11111800	2.45 ppm	-1.111125944	-1.111096056	VDC	6.300 ppm	11.00 ppm	PASS 46.84 %
-2.222222	-2.22222200	-2.22223100	1.47 ppm	-2.222249711	-2.222194289	VDC	4.050 ppm	11.00 ppm	PASS 32.48 %
-3.333333	-3.33333300	-3.33334850	1.47 ppm	-3.333374567	-3.333291433	VDC	4.650 ppm	11.00 ppm	PASS 37.29 %
-4.444444	-4.44444400	-4.44446100	1.47 ppm	-4.444499422	-4.444388578	VDC	3.825 ppm	11.00 ppm	PASS 30.67 %
-5.555555	-5.55555500	-5.55558250	1.47 ppm	-5.555624278	-5.555485722	VDC	4.950 ppm	11.00 ppm	PASS 39.70 %
-6.666666	-6.66666600	-6.66669300	1.47 ppm	-6.666749133	-6.666582867	VDC	4.050 ppm	11.00 ppm	PASS 32.48 %
-7.777777	-7.77777700	-7.77780950	1.47 ppm	-7.777873989	-7.777680011	VDC	4.179 ppm	11.00 ppm	PASS 33.51 %
-8.888888	-8.88888800	-8.88891700	1.47 ppm	-8.888998844	-8.888777156	VDC	3.263 ppm	11.00 ppm	PASS 26.16 %
-9.999999	-9.99999900	-10.00003350	1.47 ppm	-10.000123700	-9.999874300	VDC	3.450 ppm	11.00 ppm	PASS 27.67 %
-10.999999	-10.99999900	-11.00003850	1.47 ppm	-11.000136170	-10.999861830	VDC	3.591 ppm	11.00 ppm	PASS 28.80 %
-11.111111	-11.11111100	-11.11115600	1.47 ppm	-11.111249556	-11.110972444	VDC	4.050 ppm	11.00 ppm	PASS 32.48 %
-12.222222	-12.22222200	-12.22226200	1.47 ppm	-12.222374411	-12.222069589	VDC	3.273 ppm	11.00 ppm	PASS 26.24 %
-13.333333	-13.33333300	-13.33337550	1.47 ppm	-13.333499267	-13.333166733	VDC	3.188 ppm	11.00 ppm	PASS 25.56 %
-14.444444	-14.44444400	-14.44448850	1.47 ppm	-14.444624122	-14.444263878	VDC	3.081 ppm	11.00 ppm	PASS 24.71 %
-15.555555	-15.55555500	-15.55561300	1.47 ppm	-15.555748978	-15.555361022	VDC	3.729 ppm	11.00 ppm	PASS 29.90 %
-16.666666	-16.66666600	-16.66672250	1.47 ppm	-16.666873833	-16.666458167	VDC	3.390 ppm	11.00 ppm	PASS 27.19 %
-17.777777	-17.77777700	-17.77783500	1.47 ppm	-17.777998689	-17.777555311	VDC	3.263 ppm	11.00 ppm	PASS 26.16 %
-18.888888	-18.88888800	-18.88894200	1.47 ppm	-18.889123544	-18.888652456	VDC	2.859 ppm	11.00 ppm	PASS 22.93 %
-19.999999	-19.99999900	-20.00005200	1.47 ppm	-20.000248400	-19.999749600	VDC	2.650 ppm	11.00 ppm	PASS 21.25 %
-20.99	-20.99000000	-20.99005400	1.47 ppm	-20.990261745	-20.989738255	VDC	2.573 ppm	11.00 ppm	PASS 20.63 %

4W test procedure for all test points that verify Gain of the OHMF function. 4-wire kelvin connection is used between DMM and MFC. 1GΩ resistance range is tested using the external standard, as MFC unable to provide this range value.

OHM Test	1 Ohm to 1 GOhm	DUT	Source unc.	Low Limit	Hi limit	Units	Measured	24h spec	Result
1 Ω	9.99846700E-01	0.999849	40.20 ppm	0.999770511681	0.999922888319	Ω	2.300 ppm	36.00 ppm	PASS 3.02 %
1.9 Ω	1.89952470E+00	1.899568	8.30 ppm	1.89944055106	1.89960884894	Ω	22.795 ppm	36.00 ppm	PASS 51.46 %
10 Ω	1.00001710E+01	10.000293	8.30 ppm	9.99972799242	10.0006140076	Ω	12.150 ppm	36.00 ppm	PASS 27.43 %
19 Ω	1.89991100E+01	18.99936	4.30 ppm	18.9984393314	18.9997806686	Ω	13.159 ppm	31.00 ppm	PASS 37.28 %
100 Ω	1.00001540E+02	100.00119	4.30 ppm	99.9980099456	100.005070054	Ω	-3.450 ppm	31.00 ppm	PASS 9.77 %
190 Ω	1.89992560E+02	189.99215	3.30 ppm	189.986993218	189.998126782	Ω	-2.132 ppm	26.00 ppm	PASS 7.28 %
1.0 kΩ	9.99924900E+02	999.9251	3.30 ppm	999.8956022	999.9541978	Ω	0.200 ppm	26.00 ppm	PASS 0.68 %
1.9 kΩ	1.89987750E+03	1899.8776	3.30 ppm	1899.82753322	1899.92746678	Ω	0.026 ppm	23.00 ppm	PASS 0.10 %
10 kΩ	9.99919800E+03	9999.1485	3.30 ppm	9998.93502109	9999.46097891	Ω	-4.950 ppm	23.00 ppm	PASS 18.82 %
19 kΩ	1.89981250E+04	18998.028	3.30 ppm	18997.5968521	18998.6531479	Ω	-5.132 ppm	24.50 ppm	PASS 18.46 %
100 kΩ	9.99925300E+04	99993.07	3.30 ppm	99989.7502077	99995.3097923	Ω	5.400 ppm	24.50 ppm	PASS 19.43 %
190 kΩ	1.90002100E+05	190005.55	5.30 ppm	189990.737874	190013.462126	Ω	18.158 ppm	54.50 ppm	PASS 30.36 %
1.0 MΩ	9.99916800E+05	999921.1	5.30 ppm	999857.004975	999976.595025	Ω	4.300 ppm	54.50 ppm	PASS 7.19 %
1.9 MΩ	1.89992620E+06	1899751	14.30 ppm	1899586.4932	1900265.9068	Ω	-92.214 ppm	164.50 ppm	PASS 51.57 %
10 MΩ	9.99854800E+06	9997236	14.30 ppm	9996760.25962	10000335.7404	Ω	-131.219 ppm	164.50 ppm	PASS 73.39 %
19 MΩ	1.89996130E+07	18997510	60.30 ppm	18939568.523	19059657.477	Ω	-110.686 ppm	3100.00 ppm	PASS 3.50 %
100 MΩ	9.99943400E+07	99910105	60.30 ppm	99678327.8873	100310352.113	Ω	-842.398 ppm	3100.00 ppm	PASS 26.66 %
1 GΩ STD	9.97091100E+08	9.926831E+08	30000.0 ppm	958104837.99	1036077362.01	Ω	-4420.860 ppm	9100.00 ppm	PASS 11.31 %
OHM Test	10 Ω, 10 KΩ ZERO	DUT	Source unc.	Low Limit	Hi limit	Units	Measured	24h spec	Result
10R REAR Ω	1.00000000E-07	8.0000 μΩ	50.000 μΩ	-2.00000029e-05	0.0001200000029	Ω	N/A	36.00 ppm	PASS 0.00 %

Procedure for all test points in the AC performance verification for ANAlog mode. AC-measurements does not suffer from TEMF offsets, test connection can be made using shielded leads terminated with dual banana plugs. MFC main AC output is used as reference source

ACV ANA Test	1V-10V	DUT	w/Guardband	Low Limit	Hi limit	Units	Measured	24h spec	Result
1.0 VAC @ 50.0 kHz	1.0	0.99970605	129.09	0.99922091	1.00077909	VAC	-293.950 ppm	650.0 ppm	PASS 37.73 %
1.0 VAC @ 1.0 MHz	1.0	0.99978025	0.2500 %	0.9765	1.0235	VAC	-0.0220 %	2.1000 %	PASS 0.94 %
10.0 VAC @ 60 Hz	10.0	9.992157	2085	9.97465	10.02535	VAC	-784.300 ppm	450.0 ppm	PASS 30.94 %
10.0 VAC @ 200 Hz	10.0	9.9968695	73.18	9.9947682	10.0052318	VAC	-313.050 ppm	450.0 ppm	PASS 59.84 %
10.0 VAC @ 500 Hz	10.0	9.997214	73.18	9.9947682	10.0052318	VAC	-278.600 ppm	450.0 ppm	PASS 53.25 %
10.0 VAC @ 50.0 kHz	10.0	9.9957295	129.09	9.9922091	10.0077909	VAC	-427.050 ppm	650.0 ppm	PASS 54.81 %
10.0 VAC @ 1.0 MHz	10.0	10.098575	0.3000 %	9.76	10.24	VAC	0.9858 %	2.1000 %	PASS 41.07 %

Procedure for all test points in the AC performance verification for SYNCronous mode. This is highest AC accuracy test. AC-measurements does not suffer from TEMF offsets, test connection can be made using shielded leads terminated with dual banana plugs. MFC main AC output is used as reference source

ACV SYNC Test	0.01V-1000V	DUT	w/Guardband	Low Limit	Hi limit	Units	Measured	24h spec	Result, % spec
0.02 VAC @ 20 Hz	0.02	0.019970275	0.0372 %	0.0199060534	0.0200939466	VAC	-0.1486 %	0.4325 %	PASS 31.64 %
0.02 VAC @ 60 Hz	0.02	0.0199883	0.0372 %	0.0199060534	0.0200939466	VAC	-0.0585 %	0.4325 %	PASS 12.45 %
0.02 VAC @ 100 Hz	0.02	0.01999305	0.0372 %	0.0199060534	0.0200939466	VAC	-0.0348 %	0.4325 %	PASS 7.40 %
0.02 VAC @ 1.0 kHz	0.02	0.019996985	0.0372 %	0.0199060534	0.0200939466	VAC	-0.0151 %	0.4325 %	PASS 3.21 %
0.02 VAC @ 10.0 kHz	0.02	0.02000051	0.0372 %	0.0199060534	0.0200939466	VAC	0.0026 %	0.4325 %	PASS 0.54 %
0.02 VAC @ 20.0 kHz	0.02	0.020001475	0.0372 %	0.0199060534	0.0200939466	VAC	0.0074 %	0.4325 %	PASS 1.57 %
0.02 VAC @ 50.0 kHz	0.02	0.02000137	0.0613 %	0.0199012454	0.0200987546	VAC	0.0069 %	0.4325 %	PASS 1.39 %
0.02 VAC @ 100.0 kHz	0.02	0.01998641	0.1200 %	0.0199095	0.0200905	VAC	-0.0680 %	0.3325 %	PASS 15.02 %
0.02 VAC @ 300.0 kHz	0.02	0.01989507	0.1800 %	0.0198075	0.0201925	VAC	-0.5246 %	0.7825 %	PASS 54.51 %
0.02 VAC @ 500.0 kHz	0.02	0.01988223	0.2900 %	0.019522	0.020478	VAC	-0.5888 %	2.1000 %	PASS 24.64 %
0.02 VAC @ 1.0 MHz	0.02	0.01999418	0.4400 %	0.019492	0.020508	VAC	-0.0291 %	2.1000 %	PASS 1.15 %
0.2 VAC @ 20 Hz	0.2	0.19970525	0.0206 %	0.199608728	0.200391272	VAC	-0.1474 %	0.1750 %	PASS 75.33 %
0.2 VAC @ 60 Hz	0.2	0.19987933	206.36	0.199868728	0.200131272	VAC	-603.325 ppm	450.0 ppm	PASS 91.92 %
0.2 VAC @ 100 Hz	0.2	0.19994357	121.36	0.199885728	0.200114272	VAC	-282.125 ppm	450.0 ppm	PASS 49.38 %
0.2 VAC @ 1.0 kHz	0.2	0.19998513	121.36	0.199885728	0.200114272	VAC	-74.350 ppm	450.0 ppm	PASS 13.01 %
0.2 VAC @ 10.0 kHz	0.2	0.19999678	121.36	0.199875728	0.200124272	VAC	-16.125 ppm	500.0 ppm	PASS 2.60 %
0.2 VAC @ 20.0 kHz	0.2	0.19999807	121.36	0.199875728	0.200124272	VAC	-9.625 ppm	500.0 ppm	PASS 1.55 %
0.2 VAC @ 50.0 kHz	0.2	0.19996798	345.45	0.19980091	0.20019909	VAC	-160.125 ppm	650.0 ppm	PASS 16.09 %
0.2 VAC @ 100.0 kHz	0.2	0.19979514	0.0886 %	0.199192728	0.200807272	VAC	-0.1024 %	0.3150 %	PASS 25.38 %
0.2 VAC @ 300.0 kHz	0.2	0.19896577	0.1100 %	0.19823	0.20177	VAC	-0.5171 %	0.7750 %	PASS 58.43 %
0.2 VAC @ 500.0 kHz	0.2	0.198694	0.1700 %	0.19546	0.20454	VAC	-0.6530 %	2.1000 %	PASS 28.77 %
0.2 VAC @ 1.0 MHz	0.2	0.19871568	0.3500 %	0.1951	0.2049	VAC	-0.6422 %	2.1000 %	PASS 26.21 %
2.0 VAC @ 20 Hz	2.0	1.9977913	0.0141 %	1.99621728	2.00378272	VAC	-0.1104 %	0.1750 %	PASS 58.39 %
2.0 VAC @ 60 Hz	2.0	1.9993698	141.36	1.99881728	2.00118272	VAC	-315.075 ppm	450.0 ppm	PASS 53.28 %
2.0 VAC @ 100 Hz	2.0	1.9999541	62.72	1.99897456	2.00102544	VAC	-22.950 ppm	450.0 ppm	PASS 4.48 %
2.0 VAC @ 1.0 kHz	2.0	2.0002627	62.72	1.99897456	2.00102544	VAC	131.350 ppm	450.0 ppm	PASS 25.62 %
2.0 VAC @ 10.0 kHz	2.0	2.0003681	62.72	1.99887456	2.00112544	VAC	184.025 ppm	500.0 ppm	PASS 32.70 %
2.0 VAC @ 20.0 kHz	2.0	2.0003785	62.72	1.99887456	2.00112544	VAC	189.250 ppm	500.0 ppm	PASS 33.63 %
2.0 VAC @ 50.0 kHz	2.0	1.9999929	129.09	1.99844182	2.00155818	VAC	-3.525 ppm	650.0 ppm	PASS 0.45 %
2.0 VAC @ 100.0 kHz	2.0	1.9981546	0.0266 %	1.99316728	2.00683272	VAC	-0.0923 %	0.3150 %	PASS 27.01 %
2.0 VAC @ 300.0 kHz	2.0	1.9906843	0.0468 %	1.98356364	2.01643636	VAC	-0.4658 %	0.7750 %	PASS 56.68 %
2.0 VAC @ 500.0 kHz	2.0	1.9898061	0.1200 %	1.9556	2.0444	VAC	-0.5097 %	2.1000 %	PASS 22.96 %
2.0 VAC @ 1.0 MHz	2.0	1.9952678	0.2500 %	1.953	2.047	VAC	-0.2366 %	2.1000 %	PASS 10.07 %
20 VAC @ 20 Hz	20	19.971384	0.0141 %	19.9621728	20.0378272	VAC	-0.1431 %	0.1750 %	PASS 75.65 %
20 VAC @ 60 Hz	20	19.988796	141.36	19.9861728	20.0138272	VAC	-560.175 ppm	550.0 ppm	PASS 81.03 %
20 VAC @ 100 Hz	20	19.995432	62.72	19.9877456	20.0122544	VAC	-228.425 ppm	550.0 ppm	PASS 37.28 %
20 VAC @ 1.0 kHz	20	19.998669	62.72	19.9877456	20.0122544	VAC	-66.575 ppm	550.0 ppm	PASS 10.87 %
20 VAC @ 10.0 kHz	20	19.993324	62.72	19.9797456	20.0202544	VAC	-333.800 ppm	950.0 ppm	PASS 32.96 %
20 VAC @ 20.0 kHz	20	19.992591	62.72	19.9797456	20.0202544	VAC	-370.425 ppm	950.0 ppm	PASS 36.58 %
20 VAC @ 50.0 kHz	20	19.993167	0.0129 %	19.9744182	20.0255818	VAC	-0.0342 %	0.1150 %	PASS 26.71 %
20 VAC @ 100.0 kHz	20	19.987595	0.0248 %	19.9320364	20.0679636	VAC	-0.0620 %	0.3150 %	PASS 18.25 %
20 VAC @ 300.0 kHz	20	19.97565	0.0577 %	19.8334546	20.1665454	VAC	-0.1218 %	0.7750 %	PASS 14.62 %
20 VAC @ 500.0 kHz	20	20.018301	0.1400 %	19.132	20.868	VAC	0.0915 %	4.2000 %	PASS 2.11 %
20 VAC @ 1.0 MHz	20	20.122893	0.3000 %	19.1	20.9	VAC	0.6145 %	4.2000 %	PASS 13.65 %
200.0 VAC @ 1.0 kHz	200.0	200.02065	65.0	199.877	200.123	VAC	103.250 ppm	550.0 ppm	PASS 16.73 %
200.0 VAC @ 10.0 kHz	200.0	199.93458	65.0	199.797	200.203	VAC	-327.100 ppm	950.0 ppm	PASS 32.16 %
200.0 VAC @ 20.0 kHz	200.0	199.8834	65.0	199.797	200.203	VAC	-582.975 ppm	950.0 ppm	PASS 57.32 %
200.0 VAC @ 50.0 kHz	200.0	199.84481	0.0170 %	199.735996	200.264004	VAC	-0.0776 %	0.1150 %	PASS 58.69 %
200.0 VAC @ 100.0 kHz	200.0	199.77764	0.0400 %	199.289994	200.710006	VAC	-0.1112 %	0.3150 %	PASS 31.30 %
700.0 VAC @ 1.0 kHz	700.0	700.2597	78.64	699.559952	700.440048	VAC	371.000 ppm	550.0 ppm	PASS 58.37 %

Procedure for all test points that verify Gain of the DC current DCI function. Both +/-FS points are tested.
 2-wire connection at LO and DCI is used between DMM and MFC.
 DCI gain range points verify gain of the DC current function, using corrected 24-hour MFC output.

DCI Test	100nA-1A	DUT	Source unc.	Low Limit	Hi limit	Units	Measured	24h spec	Result
200 nADC	2E-07	2.01105E-07	71.36 ppm	1.99881728e-07	2.00118272e-07	ADC	5525.000 ppm	520.00 ppm	INFO 934.29 %
-200 nADC	-2E-07	-1.98955E-07	71.36 ppm	-2.00118272e-07	-1.99881728e-07	ADC	-5225.000 ppm	520.00 ppm	INFO 883.56 %
2 µADC	2E-06	2.00111E-06	71.36 ppm	1.99881728e-06	2.00118272e-06	ADC	555.000 ppm	520.00 ppm	INFO 93.85 %
-2 µADC	-2E-06	-1.998875E-06	71.36 ppm	-2.00118272e-06	-1.99881728e-06	ADC	-562.500 ppm	520.00 ppm	INFO 95.12 %
20 µADC	2E-05	2.0001065E-05	71.36 ppm	1.99881728e-05	2.00118272e-05	ADC	53.250 ppm	520.00 ppm	PASS 9.00 %
-20 µADC	-2E-05	-1.999878E-05	71.36 ppm	-2.00118272e-05	-1.99881728e-05	ADC	-61.000 ppm	520.00 ppm	PASS 10.32 %
200 µADC	0.0002	0.00019999909	71.36 ppm	0.000199881728	0.000200118272	ADC	-4.550 ppm	520.00 ppm	PASS 0.77 %
-200 µADC	-0.0002	-0.00019999789	71.36 ppm	-0.000200118272	-0.000199881728	ADC	-10.550 ppm	520.00 ppm	PASS 1.78 %
2.0 mADC	0.002	0.0019999913	38.63 ppm	0.00199888274	0.00200111726	ADC	-4.325 ppm	520.00 ppm	PASS 0.77 %
-2.0 mADC	-0.002	-0.0019999811	38.63 ppm	-0.00200111726	-0.00199888274	ADC	-9.450 ppm	520.00 ppm	PASS 1.69 %
20 mADC	0.02	0.019999906	38.63 ppm	0.0199888274	0.0200111726	ADC	-4.700 ppm	520.00 ppm	PASS 0.84 %
-20 mADC	-0.02	-0.019999808	38.63 ppm	-0.0200111726	-0.0199888274	ADC	-9.600 ppm	520.00 ppm	PASS 1.72 %
200 mADC	0.2	0.19999952	48.63 ppm	0.199886274	0.200113726	ADC	-2.400 ppm	520.00 ppm	PASS 0.42 %
-200 mADC	-0.2	-0.19999909	48.63 ppm	-0.200113726	-0.199886274	ADC	-4.575 ppm	520.00 ppm	PASS 0.80 %
2.0 ADC	2	1.9999848	71.36 ppm	1.99968128	2.00031872	ADC	-7.600 ppm	88.00 ppm	PASS 4.77 %
-2.0 ADC	-2	-1.9999939	71.36 ppm	-2.00031872	-1.99968128	ADC	-3.025 ppm	88.00 ppm	PASS 1.90 %

Procedure for all test points that verify Gain of the AC Current ACI function. Three frequency band points are tested, 50 Hz, 60 Hz and 1 kHz. 2-wire connection at LO and DCI is used between DMM and MFC.

ACI Test	1μA-1A	DUT	Source unc.	Low Limit	Hi limit	Units	Measured	24h spec	Result, % spec
200 μA AC @ 50 Hz	0.0002	0.00019990615	0.0211 %	0.000199797818	0.000200202182	AAC	-469.250 ppm	0.0800 %	PASS 46.42 %
2.0 mA AC @ 50 Hz	0.002	0.0019994497	0.0211 %	0.00199797818	0.00200202182	AAC	-275.150 ppm	0.0800 %	PASS 27.22 %
20 mA AC @ 50 Hz	0.02	0.019994649	0.0138 %	0.0199812364	0.0200187636	AAC	-267.550 ppm	0.0800 %	PASS 28.52 %
200 mA AC @ 50 Hz	0.2	0.19994603	0.0138 %	0.199772364	0.200227636	AAC	-0.0270 %	0.1000 %	PASS 23.71 %
2.0 A AC @ 50 Hz	2.0	1.9993763	0.0138 %	1.99792364	2.00207636	AAC	-311.825 ppm	0.0900 %	PASS 30.04 %
20 μA AC @ 60 Hz	2e-05	1.999465E-05	0.0618 %	1.99696364e-05	2.00303636e-05	AAC	-267.500 ppm	0.0900 %	PASS 17.62 %
200 μA AC @ 60 Hz	0.0002	0.00019990235	0.0211 %	0.000199797818	0.000200202182	AAC	-488.250 ppm	0.0800 %	PASS 48.30 %
2.0 mA AC @ 60 Hz	0.002	0.0019996058	0.0211 %	0.00199797818	0.00200202182	AAC	-197.100 ppm	0.0800 %	PASS 19.50 %
20 mA AC @ 60 Hz	0.02	0.019995551	0.0211 %	0.0199797818	0.0200202182	AAC	-222.475 ppm	0.0800 %	PASS 22.01 %
200 mA AC @ 60 Hz	0.2	0.19997246	0.0138 %	0.199772364	0.200227636	AAC	-0.0138 %	0.1000 %	PASS 12.10 %
2.0 A AC @ 60 Hz	2.0	1.9993695	0.0138 %	1.99792364	2.00207636	AAC	-315.275 ppm	0.0900 %	PASS 30.37 %
200 μA AC @ 1000.0 Hz	0.0002	0.000199927	0.0618 %	0.000199776364	0.000200223636	AAC	-365.000 ppm	0.0500 %	PASS 32.64 %
2.0 mA AC @ 1000.0 Hz	0.002	0.0019997664	0.0211 %	0.00199857818	0.00200142182	AAC	-116.775 ppm	0.0500 %	PASS 16.43 %
20 mA AC @ 1000.0 Hz	0.02	0.020000241	0.0211 %	0.0199857818	0.0200142182	AAC	12.025 ppm	0.0500 %	PASS 1.69 %
200 mA AC @ 1000.0 Hz	0.2	0.20000345	0.0211 %	0.199717818	0.200282182	AAC	0.0017 %	0.1200 %	PASS 1.22 %
2.0 A AC @ 1000.0 Hz	2.0	2.0000101	0.0138 %	1.99792364	2.00207636	AAC	5.025 ppm	0.0900 %	PASS 0.48 %

Test date

09 May 2017 17:35

Lab temperature maintained +24°C ±2°C

Internal use only

Not validated

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