

Manufacturer	Datron Instruments	Calibration date	May 28 2019
Model Number	1281	Ambient Temperature	0.00 °C
Serial	MM-GPIB4	Relative Humidity	0.00 %
ID Number	Bot	Pressure	0.00
Notes	Test front V/R ports	Test type	First

This note is test dummy text block for further use. It allow to include user information for further reference

Reference standard	Mfg	Model	Options	Serial / Unc	CEID	Calibration date	Due date
CAL MFC	Fluke	5700A	/03 WB	XXX	MC01	10/09/2018	10/09/2019
DUT MFC	Fluke	5700B	/03 WB	XXX	MC02	03/07/2019	04/07/2019
DC STD	Fluke	732B-3	9.9999323 VDC	±0.55 ppm	SV03	08/20/2016	08/20/2017
DC STD	Fluke	732B-3	9.9999288 VDC	±0.56 ppm	SV03	11/03/2017	11/03/2018
STDR	IET	1 Ohm	0.99997483	±0.17 ppm	SM02	11/03/2017	11/30/2018
STDR	ESI	SR104	10000.0530 KΩ	±0.15 ppm	SM01	10/30/2017	10/30/2018

MFC last calibrated	231.0 days ago	MFC since DCV ZERO	5.0 days ago
MFC since WBFLAT	11469.0 days ago	MFC since WBGAIN	231.0 days ago
MFC Confidence level	24h 95% REL	MFC Calibrate date	2018-10-09 00:00:00
MFC Calibrate date Zero	2019-05-23 00:00:00	Calibrate date WB Flatness	1988-10-01 00:00:00
Calibrate date WB Gain	2018-10-09 00:00:00	CAL CONST 6.5V reference voltage	6.89136058829
CAL CONST 13V reference voltage	13.7948160154	CAL CONST 22V range positive zero	398.17898
CAL CONST 22V range negative zero	398.1784	CAL CONST DAC Linearity	0.0
CAL CONST 10KOHM true output resistance	10000.0833642	CAL CONST 10KOHM standard resistance	10000.4488527
CAL CONST, Zero calibration temperature	23.0	CAL CONST, All calibration temp	23.0

This note is test MFC dummy text block for further use.
Calibrator was warmed up >8 hours.

Meter Info	Datron Instruments,1281,19608-4 ,890144-03.12	Last calibration date	N/A
Next calibration date	N/A	Test date	28 May 2019 00:26

Service information

Confidence test result?

0.0

Options

1,1,1,1,0,1,0

Reference

Direct MFC test, verification 5720MMA

DUT Condition

Test after manual DCV/Res cal

Test procedure : \$Id: d1281.py | Rev 1341 | 2019/05/28 04:25:59 MM \$

Source procedure : \$Id: f5720a.py | Rev 1196 | 2019/03/11 16:10:33 clu \$

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	Deviation	DUT Spec	Test Status
Short 0 mVDC	0.000000E+00	-0.95 µV	0.75 µV	-0.910 µV	0.910 µV	N/A	0.16 µV	FAIL
Short 0.0 VDC	0.000000E+00	-0.36 µV	0.75 µV	-0.900 µV	0.900 µV	N/A	0.15 µV	PASS
Short 00.0 VDC	0.000000E+00	-0.60 µV	0.75 µV	-1.070 µV	1.070 µV	N/A	0.32 µV	PASS
Short 000.0 VDC	0.000000E+00	-22.00 µV	0.75 µV	-14.750 µV	14.750 µV	N/A	14.00 µV	FAIL
Short 0000.0 VDC	0.000000E+00	30.00 µV	0.75 µV	-41.750 µV	41.750 µV	N/A	41.00 µV	PASS
DCV Test	0.1V-1000V	DUT	Source unc.	Low Limit	Hi limit	Measured	24h spec	Result
0.1 VDC (0.10 Range)	0.1000000	0.10000022	7.27 ppm	0.099998723	0.10000128	2.190 ppm	5.50 ppm	PASS 17.15 %
-0.1 VDC (0.10 Range)	-0.1000000	-0.10000006	7.27 ppm	-0.10000128	-0.099998723	0.570 ppm	5.50 ppm	PASS 4.46 %
0.1 VDC (1.00 Range)	0.1000000	0.09999977	7.27 ppm	0.099999093	0.10000091	-2.300 ppm	1.80 ppm	PASS 25.36 %
0.2 VDC (1.00 Range)	0.2000000	0.20000009	3.86 ppm	0.19999887	0.20000113	0.450 ppm	1.80 ppm	PASS 7.95 %
1.0 VDC (1.00 Range)	1.0000000	0.99999967	3.86 ppm	0.99999434	1.0000057	-0.330 ppm	1.80 ppm	PASS 5.83 %
-0.1 VDC (1.00 Range)	-0.1000000	-0.10000023	7.27 ppm	-0.10000091	-0.099999093	2.300 ppm	1.80 ppm	PASS 25.36 %
-0.2 VDC (1.00 Range)	-0.2000000	-0.20000032	3.86 ppm	-0.20000113	-0.19999887	1.600 ppm	1.80 ppm	PASS 28.27 %
-1.0 VDC (1.00 Range)	-1.0000000	-1.0000001	3.86 ppm	-1.0000057	-0.99999434	0.150 ppm	1.80 ppm	PASS 2.65 %
1.0 VDC (10.00 Range)	1.0000000	0.9999998	3.86 ppm	0.99999559	1.0000044	-0.200 ppm	0.55 ppm	PASS 4.54 %
2.0 VDC (10.00 Range)	2.0000000	1.9999998	2.77 ppm	1.9999934	2.0000066	-0.100 ppm	0.55 ppm	PASS 3.01 %
10.0 VDC (10.00 Range)	10.0000000	9.9999991	2.73 ppm	9.9999672	10.000033	-0.090 ppm	0.55 ppm	PASS 2.74 %
-1.0 VDC (10.00 Range)	-1.0000000	-0.9999997	3.86 ppm	-1.0000044	-0.99999559	-0.300 ppm	0.55 ppm	PASS 6.80 %
-2.0 VDC (10.00 Range)	-2.0000000	-1.9999997	2.77 ppm	-2.0000066	-1.9999934	-0.150 ppm	0.55 ppm	PASS 4.52 %
-10.0 VDC (10.00 Range)	-10.0000000	-9.9999995	2.73 ppm	-10.000033	-9.9999672	-0.050 ppm	0.55 ppm	PASS 1.52 %
10 VDC (100.00 Range)	10.0000000	10.000012	2.77 ppm	9.9999443	10.000056	1.200 ppm	2.80 ppm	PASS 21.54 %
20 VDC (100.00 Range)	20.0000000	20.00004	3.73 ppm	19.999869	20.000131	2.025 ppm	2.80 ppm	PASS 31.01 %
100 VDC (100.00 Range)	100.0000000	100.0002	3.73 ppm	99.999347	100.00065	2.000 ppm	2.80 ppm	PASS 30.63 %
-10 VDC (100.00 Range)	-10.0000000	-10.00005	2.77 ppm	-10.000056	-9.9999443	5.000 ppm	2.80 ppm	PASS 89.77 %
-20 VDC (100.00 Range)	-20.0000000	-20.000077	3.73 ppm	-20.000131	-19.999869	3.850 ppm	2.80 ppm	PASS 58.96 %
-100 VDC (100.00 Range)	-100.0000000	-100.00023	3.73 ppm	-100.00065	-99.999347	2.250 ppm	2.80 ppm	PASS 34.46 %
100 VDC (1000.00 Range)	100.0000000	100.00019	3.73 ppm	99.999367	100.00063	1.900 ppm	2.60 ppm	PASS 30.02 %
200 VDC (1000.00 Range)	200.0000000	200.00025	3.73 ppm	199.99873	200.00127	1.250 ppm	2.60 ppm	PASS 19.75 %
1000 VDC (1000.00 Range)	1000.0000000	1000.0018	5.45 ppm	999.97995	1000.02	1.770 ppm	2.60 ppm	PASS 8.83 %
-100 VDC (1000.00 Range)	-100.0000000	-100.00012	3.73 ppm	-100.00063	-99.999367	1.200 ppm	2.60 ppm	PASS 18.96 %
-200 VDC (1000.00 Range)	-200.0000000	-200.00025	3.73 ppm	-200.00127	-199.99873	1.250 ppm	2.60 ppm	PASS 19.75 %
-1000 VDC (1000.00 Range)	-1000.0000000	-1000.0022	5.45 ppm	-1000.02	-999.97995	2.190 ppm	2.60 ppm	PASS 55.44 %

-77.77777	-77.77777	-77.7779615	2.73 ppm	-77.778025	-77.777515	2.46 ppm	0.55 ppm	PASS 75.07 %
-80.00000	-80.00000	-80.0001965	2.73 ppm	-80.000262	-79.999738	2.46 ppm	0.55 ppm	PASS 74.89 %
-88.88888	-88.88888	-88.8890880	2.73 ppm	-88.889172	-88.888588	2.34 ppm	0.55 ppm	PASS 71.34 %
-90.00000	-90.00000	-90.0002005	2.73 ppm	-90.000295	-89.999705	2.23 ppm	0.55 ppm	PASS 67.92 %
-99.99999	-99.99999	-100.0002060	2.73 ppm	-100.00032	-99.999662	2.16 ppm	0.55 ppm	FAIL 103.85 %
-100.00000	-100.00000	-100.0002240	2.73 ppm	-100.00033	-99.999672	2.24 ppm	0.55 ppm	FAIL 107.69 %
-100.10101	-100.10101	-100.1012240	2.73 ppm	-100.10134	-100.10068	2.14 ppm	0.55 ppm	FAIL 102.84 %
-100.99999	-100.99999	-101.0001995	2.73 ppm	-101.00032	-100.99966	2.07 ppm	0.55 ppm	FAIL 100.30 %

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	Measured	24h spec	Result
TrueOhm 1 Ω	0.9998017	0.99977835	32.0 ppm	9.9976571E-01	9.9983769E-01	-23.355 ppm	4.0 ppm	PASS 64.87 %
TrueOhm 1.9 Ω	1.8995064	1.8994701	25.0 ppm	1.8994513E+00	1.8995615E+00	-19.137 ppm	4.0 ppm	PASS 65.99 %
TrueOhm 10 Ω	9.999933	9.9999304	5.0 ppm	9.9998430E+00	1.0000023E+01	-0.260 ppm	4.0 ppm	PASS 2.89 %
TrueOhm 19 Ω	18.999097	18.999114	4.0 ppm	1.8998987E+01	1.8999207E+01	0.905 ppm	1.8 ppm	PASS 15.61 %
TrueOhm 100 Ω	100.00183	100.00197	1.7 ppm	1.0000148E+02	1.0000218E+02	1.400 ppm	1.8 ppm	PASS 40.00 %
TrueOhm 190 Ω	189.99505	189.99537	1.7 ppm	1.8999448E+02	1.8999562E+02	1.668 ppm	1.3 ppm	PASS 55.62 %
TrueOhm 1.0 kΩ	999.9918	999.99027	1.7 ppm	9.9998880E+02	9.9999480E+02	-1.530 ppm	1.3 ppm	PASS 51.00 %
TrueOhm 1.9 kΩ	1899.9976	1899.9948	1.7 ppm	1.8999919E+03	1.9000033E+03	-1.463 ppm	1.3 ppm	PASS 48.77 %
TrueOhm 10 kΩ	10000.084	10000.093	1.6 ppm	1.0000055E+04	1.0000113E+04	0.920 ppm	1.3 ppm	PASS 31.72 %
TrueOhm 19 kΩ	18999.701	18999.719	1.7 ppm	1.8999644E+04	1.8999758E+04	0.963 ppm	1.3 ppm	PASS 32.11 %
TrueOhm 100 kΩ	100001.4	100001.4	2.0 ppm	1.0000107E+05	1.0000173E+05	0.000 ppm	1.3 ppm	PASS 0.00 %
TrueOhm 190 kΩ	189992.98	189993.1	2.0 ppm	1.8999209E+05	1.8999387E+05	0.616 ppm	2.7 ppm	PASS 13.10 %
1.0 MΩ	1000003.1	1000003.1	2.5 ppm	9.9999790E+05	1.0000083E+06	-0.050 ppm	2.7 ppm	PASS 0.96 %
1.9 MΩ	1899959.2	1899964.4	3.0 ppm	1.8999383E+06	1.8999801E+06	2.711 ppm	8.0 ppm	PASS 24.64 %
10 MΩ	9999407	9999424.7	10.0 ppm	9.9992270E+06	9.9995870E+06	1.770 ppm	8.0 ppm	PASS 9.83 %
19 MΩ	18999096	18999140	20.0 ppm	1.8997291E+07	1.9000901E+07	2.308 ppm	75.0 ppm	PASS 2.43 %
100 MΩ	1.000094E+08	2E+35	50.0 ppm	1.0000400E+08	1.0001480E+08	1999812007671278976202964992.0000 %	4.0 ppm	FAIL 3703355569761627861943199444500480.00 %

4W and 2W Zero test procedure for all test points that verify Zero offset 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 ZERO 4W	DUT	Source unc.	Low Limit	Hi limit	Measured	24h spec	Result
TrueOhm 10 Ω	Range 0.0000128 Ω	5.000e-05 Ω	-5e-05	5e-05	N/A	4.0000e-06 Ω	PASS
TrueOhm 100 Ω	Range -0.0000160 Ω	5.500e-04 Ω	-0.00055	0.00055	N/A	1.3000e-06 Ω	PASS
TrueOhm 1.0 kΩ	Range -0.0000300 Ω	5.500e-03 Ω	-0.0055	0.0055	N/A	1.3000e-06 Ω	PASS
TrueOhm 10 kΩ	Range -0.0003000 Ω	5.500e-02 Ω	-0.055	0.055	N/A	1.3000e-06 Ω	PASS
TrueOhm 100 kΩ	Range -0.0020000 Ω	5.500e-01 Ω	-0.55	0.55	N/A	1.3000e-06 Ω	PASS
1.0 MΩ	Range -0.0030000 Ω	5.500e+00 Ω	-5.5	5.5	N/A	1.3000e-06 Ω	PASS
10 MΩ	Range -0.0030000 Ω	5.500e+01 Ω	-55	55	N/A	1.3000e-06 Ω	PASS
100 MΩ	Range -0.0060000 Ω	5.500e+02 Ω	-550	550	N/A	1.3000e-06 Ω	PASS
1 GΩ	Range -0.0040000 Ω	5.500e+03 Ω	-5500	5500	N/A	1.3000e-06 Ω	PASS
OHM ZERO 2W	DUT	Source unc.	Low Limit	Hi limit	Measured	24h spec	Result
TrueOhm 10 Ω	Range 0.9755530 Ω	3.000e-01 Ω	-0.3	0.3	N/A	4.0000e-06 Ω	FAIL
TrueOhm 100 Ω	Range 0.9749530 Ω	3.500e-01 Ω	-0.35	0.35	N/A	1.3000e-06 Ω	FAIL
TrueOhm 1.0 kΩ	Range 0.9741000 Ω	4.000e-01 Ω	-0.4	0.4	N/A	1.3000e-06 Ω	FAIL
TrueOhm 10 kΩ	Range 0.9687000 Ω	4.000e-01 Ω	-0.4	0.4	N/A	1.3000e-06 Ω	FAIL
TrueOhm 100 kΩ	Range 0.9880000 Ω	5.500e-01 Ω	-0.55	0.55	N/A	1.3000e-06 Ω	FAIL
1.0 MΩ	Range 1.0900000 Ω	5.500e+00 Ω	-5.5	5.5	N/A	1.3000e-06 Ω	PASS
10 MΩ	Range 1.2000000 Ω	5.500e+01 Ω	-55	55	N/A	1.3000e-06 Ω	PASS
100 MΩ	Range 1.2000000 Ω	5.500e+02 Ω	-550	550	N/A	1.3000e-06 Ω	PASS
1 GΩ	Range 1.5000000 Ω	5.500e+03 Ω	-5500	5500	N/A	1.3000e-06 Ω	PASS

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	1.000091	129.09	0.99937091	1.00062909	VAC	91.000 ppm	500.0 ppm	PASS 14.47 %
1.0 VAC @ 1.0 MHz	1.0	1.002942	0.2500 %	0.9845	1.0155	VAC	0.2942 %	1.3000 %	PASS 18.98 %
1.9 VAC @ 10 Hz	1.9	1.906495	73.18	1.899613958	1.900386042	VAC	3418.421 ppm	130.0 ppm	FAIL 1682.46 %
1.9 VAC @ 200 Hz	1.9	1.900484	73.18	1.899784958	1.900215042	VAC	254.737 ppm	40.0 ppm	FAIL 225.07 %
1.9 VAC @ 500 Hz	1.9	1.900512	73.18	1.899784958	1.900215042	VAC	269.474 ppm	40.0 ppm	FAIL 238.09 %
1.9 VAC @ 50.0 kHz	1.9	1.90032	129.09	1.899089729	1.900910271	VAC	168.421 ppm	350.0 ppm	PASS 35.15 %
1.9 VAC @ 1.0 MHz	1.9	1.901105	0.3000 %	1.8658	1.9342	VAC	0.0582 %	1.5000 %	PASS 3.23 %
10.0 VAC @ 10 Hz	10.0	10.03705	73.18	9.9979682	10.0020318	VAC	3705.000 ppm	130.0 ppm	FAIL 1823.51 %
10.0 VAC @ 200 Hz	10.0	10.00131	73.18	9.9988682	10.0011318	VAC	131.000 ppm	40.0 ppm	FAIL 115.74 %
10.0 VAC @ 500 Hz	10.0	10.00146	73.18	9.9988682	10.0011318	VAC	146.000 ppm	40.0 ppm	FAIL 129.00 %
10.0 VAC @ 50.0 kHz	10.0	10.00018	129.09	9.9952091	10.0047909	VAC	18.000 ppm	350.0 ppm	PASS 3.76 %
10.0 VAC @ 1.0 MHz	10.0	10.08094	0.3000 %	9.82	10.18	VAC	0.8094 %	1.5000 %	PASS 44.97 %
19 VAC @ 10 Hz	19	18.98271	73.18	18.99613958	19.00386042	VAC	-910.000 ppm	130.0 ppm	FAIL 447.88 %
19 VAC @ 200 Hz	19	19.00394	73.18	18.99784958	19.00215042	VAC	207.368 ppm	40.0 ppm	FAIL 183.22 %
19 VAC @ 500 Hz	19	19.00424	73.18	18.99784958	19.00215042	VAC	223.158 ppm	40.0 ppm	FAIL 197.17 %
19 VAC @ 50.0 kHz	19	19.00151	129.09	18.99089729	19.00910271	VAC	79.474 ppm	350.0 ppm	PASS 16.59 %
19 VAC @ 1.0 MHz	19	19.10399	0.3000 %	18.658	19.342	VAC	0.5473 %	1.5000 %	PASS 30.41 %

100.0 V AC+DC @ 50.0 kHz	100.0065	0.0095 %	99.955455	100.044545	0.0065 %	0.0350 %	PASS 14.55 %
100.0 V AC+DC @ 100.0 kHz	100.0119	0.0174 %	99.732636	100.267364	0.0119 %	0.2500 %	PASS 4.45 %
190.0 V AC+DC @ 10 Hz	192.0789	0.0060 %	189.963866	190.036134	1.0942 %	0.0130 %	FAIL 5685.12 %
190.0 V AC+DC @ 20 Hz	189.1948	0.0060 %	189.963866	190.036134	-0.4238 %	0.0130 %	FAIL 2201.96 %
190.0 V AC+DC @ 50 Hz	190.0561	0.0060 %	189.980966	190.019034	0.0295 %	0.0040 %	FAIL 288.17 %
190.0 V AC+DC @ 100 Hz	190.0719	0.0060 %	189.980966	190.019034	0.0378 %	0.0040 %	FAIL 369.34 %
190.0 V AC+DC @ 1.0 kHz	190.0519	0.0060 %	189.980966	190.019034	0.0273 %	0.0040 %	FAIL 266.60 %
190.0 V AC+DC @ 10.0 kHz	190.0543	0.0060 %	189.965766	190.034234	0.0286 %	0.0120 %	FAIL 156.63 %
190.0 V AC+DC @ 20.0 kHz	190.0403	0.0060 %	189.965766	190.034234	0.0212 %	0.0120 %	FAIL 116.25 %
190.0 V AC+DC @ 50.0 kHz	190.0234	0.0095 %	189.915365	190.084635	0.0123 %	0.0350 %	PASS 27.51 %
190.0 V AC+DC @ 100.0 kHz	190.0258	0.0174 %	189.492008	190.507992	0.0136 %	0.2500 %	PASS 5.07 %
700.0 V AC+DC @ 50 Hz	700.186	0.0079 %	699.902952	700.097048	0.0266 %	0.0060 %	FAIL 180.71 %
700.0 V AC+DC @ 100 Hz	700.217	0.0079 %	699.902952	700.097048	0.0310 %	0.0060 %	FAIL 210.83 %
700.0 V AC+DC @ 1.0 kHz	700.156	0.0079 %	699.902952	700.097048	0.0223 %	0.0060 %	FAIL 151.56 %

Test completed

Test date

29 May 2019 02:15

Lab temperature maintained +24°C ±2°C

Internal use only

Not validated

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