

Calibration Certificate No. 10854/V

Manufacturer: Meatest**Model Type Number:** M143**Serial Number:****Customer:****Date of Calibration:** 9. 4. 2015**Place of Calibration:** Calibration laboratory Meatest, Zelezna 3, CZ-619 00 Brno**Number of Pages:** 4**Page:** 1

The instrument has been calibrated in accordance with the manufacturer's User's manual using standards that are traceable to National or International Standards or have been derived by approved ratio techniques.

The measurement uncertainties stated in this document have been determined according EA-4/02. They were estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor $k=2$ with confidence level of 95%.

The measurement results relate only to the calibrated items and do not carry any implication regarding long term stability of the instrument.

Seal	Date of Issue	Head of Calibration Laboratory	Person in Charge
	9. 4. 2015	Ing. Karel Volný	Michal Kalina

Range of Calibration: AC, DC voltage
AC, DC current
DC resistance, Frequency

Calibration Conditions: Temperature (23 ± 1) °C
Humidity (20 ± 15) %

Calibration Procedure: Automatic calibration according to the test procedure 143SFT

Applied Standards: Direct measurement with standard multimeter
Fluke 8508A , S.N. 860948037, Bu1240 0.1 SN:617888,
Agilent A53131A SN:MY47004119.

The following pages contain the calibration results with column indicating the instrument performance relative to the stated specification.

The column headed "%spe" is the measured error as percentage of the stated specification with no allowance being made for the calibration uncertainty.

Measurement Results:

Funct.	Range	Standard	UUT	Deviation	%spe	Allowed	Unct. k=2	
VDC	10 mV	10.00187 mV	10.00000 mV	-1.87 uV	-16	12.00 uV	0.52 uV	ok
VDC	10 mV	-9.99826 mV	-10.00000 mV	-1.74 uV	-15	12.00 uV	0.30 uV	ok
VDC	100 mV	100.00132 mV	100.00000 mV	-1.32 uV	-8	17.00 uV	0.78 uV	ok
VDC	100 mV	-99.99928 mV	-100.00000 mV	-0.72 uV	-4	17.00 uV	0.79 uV	ok
VDC	1 V	1.0000024 V	1.0000000 V	-0.0024 mV	-3	0.0700 mV	0.0051 mV	ok
VDC	1 V	-1.0000038 V	-1.0000000 V	0.0038 mV	5	0.0700 mV	0.0051 mV	ok
VDC	10 V	1.0099808 V	1.0100000 V	0.0192 mV	17	0.1106 mV	0.0052 mV	ok
VDC	10 V	1.999973 V	2.0000000 V	0.027 mV	16	0.170 mV	0.023 mV	ok
VDC	10 V	2.999972 V	3.0000000 V	0.028 mV	12	0.230 mV	0.027 mV	ok
VDC	10 V	3.999974 V	4.0000000 V	0.026 mV	9	0.290 mV	0.030 mV	ok
VDC	10 V	4.999976 V	5.0000000 V	0.024 mV	7	0.350 mV	0.034 mV	ok
VDC	10 V	5.999995 V	6.0000000 V	0.005 mV	1	0.410 mV	0.037 mV	ok
VDC	10 V	6.999999 V	7.0000000 V	0.001 mV	0	0.470 mV	0.041 mV	ok
VDC	10 V	8.000011 V	8.0000000 V	-0.011 mV	-2	0.530 mV	0.044 mV	ok
VDC	10 V	9.000018 V	9.0000000 V	-0.018 mV	-3	0.590 mV	0.047 mV	ok
VDC	10 V	10.000033 V	10.0000000 V	-0.033 mV	-5	0.650 mV	0.051 mV	ok
VDC	10 V	-10.000066 V	-10.0000000 V	0.066 mV	10	0.650 mV	0.051 mV	ok
VDC	100 V	100.00021 V	100.00000 V	-0.21 mV	-3	7.00 mV	0.72 mV	ok
VDC	100 V	-100.00040 V	-100.00000 V	0.40 mV	6	7.00 mV	0.80 mV	ok
VDC	1 kV	0.9500211 kV	0.9500000 kV	-0.0211 V	-18	0.1150 V	0.0073 V	ok
VDC	1 kV	-0.9500041 kV	-0.9500000 kV	0.0041 V	4	0.1150 V	0.0069 V	ok
VAC	10 mV	10.0002 mV; 120Hz	10.0000 mV	-0.2 uV	-1	45.0 uV	4.7 uV	ok
VAC	100 mV	99.998 mV; 120Hz	100.000 mV	2 uV	1	150 uV	15 uV	ok
VAC	1 V	0.999955 V; 120Hz	1.0000000 V	0.045 mV	8	0.550 mV	0.098 mV	ok
VAC	10 V	1.00988 V; 120Hz	1.01000 V	0.12 mV	12	1.01 mV	0.10 mV	ok
VAC	10 V	1.99972 V; 120Hz	2.00000 V	0.28 mV	19	1.50 mV	0.38 mV	ok
VAC	10 V	2.99974 V; 120Hz	3.00000 V	0.26 mV	13	2.00 mV	0.46 mV	ok
VAC	10 V	3.99977 V; 120Hz	4.00000 V	0.23 mV	9	2.50 mV	0.53 mV	ok
VAC	10 V	4.99981 V; 120Hz	5.00000 V	0.19 mV	6	3.00 mV	0.61 mV	ok
VAC	10 V	5.99986 V; 120Hz	6.00000 V	0.14 mV	4	3.50 mV	0.68 mV	ok
VAC	10 V	6.99989 V; 120Hz	7.00000 V	0.11 mV	3	4.00 mV	0.76 mV	ok
VAC	10 V	7.99993 V; 120Hz	8.00000 V	0.07 mV	2	4.50 mV	0.83 mV	ok
VAC	10 V	8.99999 V; 120Hz	9.00000 V	0.01 mV	0	5.00 mV	0.91 mV	ok
VAC	10 V	10.00006 V; 120Hz	10.00000 V	-0.06 mV	-1	5.50 mV	0.98 mV	ok
VAC	10 V	9.9997 V; 50Hz	10.0000 V	0.3 mV	6	5.5 mV	1.2 mV	ok
VAC	10 V	9.99992 V; 400Hz	10.00000 V	0.08 mV	1	5.50 mV	0.98 mV	ok
VAC	10 V	10.00021 V; 1kHz	10.00000 V	-0.21 mV	-2	10.00 mV	0.98 mV	ok
VAC	10 V	10.00004 V; 2kHz	10.00000 V	-0.04 mV	0	10.00 mV	0.98 mV	ok
VAC	100 V	100.0020 V; 120Hz	100.0000 V	-2.0 mV	-3	60.0 mV	9.8 mV	ok
VAC	1 kV	0.95002 kV; 120Hz	0.95000 kV	-0.02 V	-2	0.87 V	0.37 V	ok
IDC	200 uA	190.0007 uA	190.0000 uA	-0.7 nA	-1	115.0 nA	3.1 nA	ok
IDC	200 uA	-190.0009 uA	-190.0000 uA	0.9 nA	1	115.0 nA	3.1 nA	ok
IDC	2 mA	1.900008 mA	1.900000 mA	-0.008 uA	-1	0.575 uA	0.031 uA	ok
IDC	2 mA	-1.900012 mA	-1.900000 mA	0.012 uA	2	0.575 uA	0.031 uA	ok
IDC	22 mA	2.009993 mA	2.010000 mA	0.007 uA	1	0.962 uA	0.077 uA	ok
IDC	22 mA	4.00000 mA	4.00000 mA	-0.00 uA	0	1.26 uA	0.11 uA	ok
IDC	22 mA	6.00000 mA	6.00000 mA	0.00 uA	0	1.56 uA	0.14 uA	ok
IDC	22 mA	8.00000 mA	8.00000 mA	-0.00 uA	0	1.86 uA	0.17 uA	ok
IDC	22 mA	10.00001 mA	10.00000 mA	-0.01 uA	-1	2.16 uA	0.20 uA	ok
IDC	22 mA	12.00002 mA	12.00000 mA	-0.02 uA	-1	2.46 uA	0.23 uA	ok
IDC	22 mA	14.00003 mA	14.00000 mA	-0.03 uA	-1	2.76 uA	0.26 uA	ok
IDC	22 mA	16.00007 mA	16.00000 mA	-0.07 uA	-2	3.06 uA	0.29 uA	ok
IDC	22 mA	18.00011 mA	18.00000 mA	-0.11 uA	-3	3.36 uA	0.32 uA	ok
IDC	22 mA	19.9994 mA	20.0000 mA	0.6 uA	16	3.7 uA	1.8 uA	ok
IDC	22 mA	21.9994 mA	22.0000 mA	0.6 uA	14	4.0 uA	1.8 uA	ok
IDC	22 mA	-18.00010 mA	-18.00000 mA	0.10 uA	3	3.36 uA	0.32 uA	ok
IDC	200 mA	190.0008 mA	190.0000 mA	-0.8 uA	-2	34.5 uA	5.5 uA	ok
IDC	200 mA	-190.0030 mA	-190.0000 mA	3.0 uA	9	34.5 uA	5.5 uA	ok
IDC	2 A	1.000010 A	1.000000 A	-0.010 mA	-4	0.250 mA	0.027 mA	ok
IDC	2 A	-1.000024 A	-1.000000 A	0.024 mA	10	0.250 mA	0.027 mA	ok
IDC	20 A	9.99760 A	10.00000 A	2.40 mA	20	12.00 mA	0.60 mA	ok
IDC	20 A	-10.00084 A	-10.00000 A	0.84 mA	7	12.00 mA	0.60 mA	ok
IAC	200 uA	189.996 uA; 120Hz	190.000 uA	4 nA	1	495 nA	85 nA	ok
IAC	2 mA	1.90002 mA; 120Hz	1.90000 mA	-0.02 uA	-1	2.10 uA	0.85 uA	ok
IAC	20 mA	19.0001 mA; 120Hz	19.0000 mA	-0.1 uA	0	14.3 uA	8.5 uA	ok
IAC	200 mA	190.003 mA; 120Hz	190.000 mA	-3 uA	-2	143 uA	34 uA	ok
IAC	2 A	0.99993 A; 120Hz	1.00000 A	0.07 mA	7	1.10 mA	0.22 mA	ok
IAC	20 A	10.0081 A; 120Hz	10.0000 A	-8.1 mA	-35	23.0 mA	2.2 mA	ok
RDC	33 Ohm	10.01832 Ohm	10.01770 Ohm	-0.62 mOhm	-1	55.01 mOhm	0.34 mOhm	ok
RDC	330 Ohm	100.0994 Ohm	100.0980 Ohm	-1.4 mOhm	-3	50.0 mOhm	1.6 mOhm	ok
RDC	3.3 kOhm	1.000951 kOhm	1.000930 kOhm	-0.021 Ohm	-10	0.200 Ohm	0.014 Ohm	ok
RDC	33 kOhm	10.00361 kOhm	10.00340 kOhm	-0.21 Ohm	-11	2.00 Ohm	0.14 Ohm	ok
RDC	330 kOhm	99.9719 kOhm	99.9710 kOhm	-0.9 Ohm	-5	20.0 Ohm	1.8 Ohm	ok

Measurement Results:

Funct.	Range	Standard	UUT	Deviation	%spe	Allowed	Unct. k=2	
RDC	3.3 MOhm	0.998818 MOhm	0.998810 MOhm	-0.008 kOhm	-2	0.499 kOhm	0.028 kOhm	ok
RDC	33 MOhm	10.03783 MOhm	10.03770 MOhm	-0.13 kOhm	-3	5.02 kOhm	0.51 kOhm	ok
RDC	330 MOhm	99.664 MOhm	99.641 MOhm	-23 kOhm	-5	498 kOhm	29 kOhm	ok
FREQ	2 MHz	1.000e-2 MHz	1.000e-2 MHz	-0.000004 kHz	-1	0.000500 kHz	0.000058 kHz	ok
FREQ	2 MHz	0.10000004 MHz	0.10000000 MHz	-0.00004 kHz	-1	0.00500 kHz	0.00058 kHz	ok
FREQ	2 MHz	1.00000003 MHz	1.00000000 MHz	-0.0003 kHz	-1	0.0500 kHz	0.0058 kHz	ok

ok ... passed

Statement of Compliance:

Passed