



1000 V and 20 A
in such a small
calibrator

M143

- DC / AC voltage up to 1000 V
- DC / AC current up to 20 A (1000 A with 140-50 Current Coil)
- Sinusoidal & Non-sinusoidal waveforms
- Fixed standard resistors from 10 Ω to 100 MΩ
- TC / RTD temperature sensor simulation with cold junction compensation
- GPIB & RS232 interface
- Compact dimensions, overall weight 9 kg

M143 / 143i Multifunction calibrator is cost saving solution for calibration of meters of electric quantities up to 1000 V and 20 A. It offers basic accuracy 0.01 % in DC voltage needed for calibration of 3½ and 4½ digit multimeters. Resistance function is covered by eight fix resistors in range from 10 Ω to 100 MΩ. The calibrator offers TC temperature sensor simulation. It can be delivered optionally as well with RTD temperature sensor simulator. Thanks to its small dimensions and low weight the calibrator can be applied easily for field calibrations.

The calibrator main application field are production lines of panel meters, multimeters, transducers, measuring amplifiers, thermometers, and calibration laboratories where the calibrator can be applied as source of standard value for calibrations, verifications and adjustments of units under test.

Interface RS-232 and optionally GPIB interface bus enable automated operation in remote mode offering time saving automatic calibrations. Model M143 / 143i is fully compatible with Meatest calibration SW package CALIBER / WinQbase.

Specification

DC / AC SINE Wave Voltage

Voltage range summary: 0.0000 mV – 1000.00 VDC, 1.0000 mV – 1000.00 VAC

Resolution: 5½ digit

Wave form: sin, saw, triangle, square sym, truncated sin

Voltage accuracy

Range	% of value + % of range			Maximum current
	DC	20.000 Hz – 400.000 Hz	200.000 Hz – 10 000.00 Hz*1	
0.0000 mV – 10.0000 mV*2	0.050 + 0.070	0.20 + 0.25	0.20 + 0.30	3 mA
10.000 mV – 100.000 mV	0.010 + 0.0070	0.10 + 0.05	0.15 + 0.07	5 mA
0.10000 V – 1.00000 V	0.006 + 0.0010	0.05 + 0.005	0.07 + 0.01	20 mAdc / 10 mAac
1.0000 V – 10.0000 V	0.006 + 0.0005		0.07 + 0.03	50 mA
10.000 V – 100.000 V	0.006 + 0.0010	0.05 + 0.010		20 mAdc / 10 mAac
100.00 V – 1000.00 V	0.010 + 0.0020	0.07 + 0.020	0.10 + 0.03	2 mAdc / 1.5 mAac

*1 voltage ranges 100 and 1000V from 40 Hz to 1kHz

*2 AC range starts at 1 mV

DC / AC SINE Wave Current

Current range summary: 0.000 μ A – 20.000 ADC, 1.000 μ A – 20.000 AAC (M143i version to 2A only)

Resolution: 5½ digit

Current accuracy

Range	% of value + % of range		
	DC	20.000 Hz – 200.000 Hz	200.000 Hz – 1000.00 Hz
0.000 μ A – 200.000 μ A ^{*3}	0.050 + 0.010	0.25 + 0.010	0.20 + 0.10
0.20000 mA – 2.00000 mA	0.025 + 0.005	0.10 + 0.010	0.10 + 0.02
2.0000 mA – 22.0000 mA	0.015 + 0.003	0.07 + 0.005	
22.000 mA – 200.000 mA			
0.2000 A – 2.0000 A	0.015 + 0.005	0.10 + 0.005	0.15 + 0.05
2.0000 A – 20.000 A ^{*4}	0.1 + 0.01	0.20 + 0.015	0.25 + 0.05

^{*3} AC range starts at 1 μ A

^{*4} current output limited to 5 minutes above 10 A, 20 A range in M143 only

Resistance

Number of fix resistances: 8, 10 Ω to 100 M Ω

Accuracy: 0.02 - 0.5 %

TC / RTD (optionally) Temperature Sensor Simulation

TC sensor types: B, C, D, E, G2, J, K, M, N, R, S, T

Accuracy: 0.1 - 2.7 $^{\circ}$ C

TC temperature simulation range: -250.0 $^{\circ}$ C to +1820.0 $^{\circ}$ C

RTD sensor types: Pt 1.385, Pt 1.392, Ni

Accuracy: 0.1 $^{\circ}$ C - 0.2 $^{\circ}$ C

RTD temperature simulation range: -200.0 $^{\circ}$ C to +850.0 $^{\circ}$ C

Frequency Output

Waveform type: positive 5 V_{pk}

Accuracy: 0.005 %

Frequency range: 0.100 0 Hz to 2.000 00 MHz

General information

Interface: RS232, (IEEE488 as option)

Reference temperature: 21 ... 25 $^{\circ}$ C

Operating temperature: 10 ... 40 $^{\circ}$ C

Storage temperature: -10 ... +55 $^{\circ}$ C

Power supply: 115 / 230 VAC, 50 / 60 Hz

Consumption: 250 VAC max

Dimensions: W 390 mm, H 128 mm, D 430 mm

Weight: 9 kg

Versions:

M143 20 A version with RS232

M143i 2 A version with RS232

M143(i) RTD RTD simulator option

M143(i) GPIB GPIB interface option

Display information:

- Set calibration value (V, A, Ω , $^{\circ}$ C)
- Auxiliary parameters (deviation, frequency,...)
- Softkey function descriptions
- Output and remote control status
- Calibration uncertainty (%)

