



Measurements International

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6000C AUTOMATED HIGH RESISTANCE RATIO BRIDGE



Overview

The NEW model 6000C is a fully automated bridge using the Cutkosky Divider principle. This technology offers new solutions for measuring high value resistors more accurately and at lower currents. The Cutkosky or Binary Voltage Divider Technology, solves all errors normally associated with a direct current comparator while offering significantly improved uncertainties. An internal guard circuit is used to guard the measuring circuit. This guard may also be used to drive the measuring leads, a guarded detector and resistor enclosures to increase the effective insulation resistance and improve overall performance.

The measurement system requires a stable voltage source and a DVM detector. The preferred voltage source is the MI 1000B as it offers good voltage stability and allows for additional automation capabilities. The system is compatible with many DVM detectors such as the Fluke 8508A/8588A, Keysight 3458A, or Keithley 2000, while optimum performance is typically achieved using the Keysight 3458A as the guarded detector.

The model 6000C has a four-channel matrix scanner with inputs labeled R1, R2, R3 and R4. The number of inputs can be expanded to 40 when the 6000C is used in conjunction

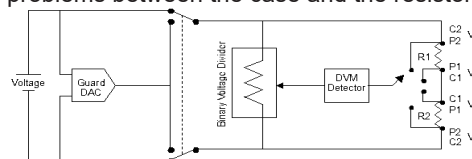
Featuring

- ▶ True Ratio Self Calibration
- ▶ Range 10 k Ω to 1 T Ω
- ▶ Built In 4 Channel Matrix Scanner
- ▶ Accuracy < 20×10^{-9} for 10 k Ω Ratios
- ▶ Accuracy < 0.5×10^{-6} for 100 M Ω
- ▶ Linearity < 5×10^{-9}
- ▶ Full System Solutions and Full System Integration Using MI 1000B 110 V Source, 6000C Software and 4200 Series of Matrix Scanners

with 4200 Series Low Thermal Four Terminal Matrix Scanners.

Calibration of the 6000C is performed easily and automatically. Calibration data is stored to file for history analysis. New calibration data is compared to the last calibration data for tracking drift of the BVD.

The principle of the 6000C Automated High Resistance Ratio Bridge is based on the Binary Voltage Divider (BVD). The reference to the BVD is supplied from a stable voltage reference, Model 1000B. The Model 1000B is a low drift, stable, low noise, programmable DC reference. The DC reference is connected to the rear of the 6000C Source input terminals. The DVM detector with an input impedance of 10 G Ω or higher is used to measure the difference between the output of the BVD and the test voltage. An isolated guard circuit is provided to guard the BVD and the DVM detector when performing measurements. The guard voltage can also be used to drive the cans and/or shields of resistors under test to reduce leakage problems between the case and the resistor.



Feature	Benefit
Advanced Cutkosky/Binary Voltage Divider Technology	This innovation addresses all the inaccuracies typically found in direct current comparators, significantly improving measurement uncertainties
Enhanced Internal Guard Circuit	Boosts insulation resistance and overall performance
Upgraded Divider Board Design	Featuring new high-precision resistors and an optimized design for superior temperature stability, the 6000C ensures enhanced performance over its predecessor
New Microcontroller	Advanced microcontroller enhances the overall performance and functionality of the 6000C, marking a significant upgrade from the 6000B



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Specifications: Rev 0

Resistor Range	Accuracy (95 %) (2 σ) Ratio 0.1 through 10	Applied Voltage
10 k Ω to 10 k Ω	$< 0.02 \times 10^{-6}$	10 V to 20 V
10 k Ω to 100 k Ω	$< 0.1 \times 10^{-6}$	10 V to 50 V
100 k Ω to 1 M Ω	$< 0.1 \times 10^{-6}$	10 V to 110 V
1 M Ω to 10 M Ω	$< 0.1 \times 10^{-6}$	10 V to 110 V
10 M Ω to 100 M Ω	$< 0.5 \times 10^{-6}$	10 V to 110 V
100 M Ω to 1 G Ω	$< 5 \times 10^{-6}$	10 V to 110 V
<i>Measurements above 1 GΩ Require Special Resistor Configurations</i>		
10 G Ω	$< 20 \times 10^{-6}$	10 V to 110 V
100 G Ω	$< 200 \times 10^{-6}$	10 V to 110 V
1 T Ω	$< 500 \times 10^{-6}$	10 V to 110 V
Ratio 100:1	$< 2 \times 10^{-6}$	10 V to 110 V
Ratio 1000:1	$< 200 \times 10^{-6}$	10 V to 110 V

Note: Specifications are achievable with the resistors in MIL 9400A Oil Bath at 25 °C for 10 k Ω & 100 k Ω measurements and MIL 9300A Air Bath at 23 °C for 1 M Ω to 1 T Ω measurements.

Linearity	0.005 ppm
Short Term Drift (2 Hours) Stabilization	< 0.2 ppm for 8 hours
Operating Environment	18 °C to 34 °C, 10 % to 80 %
Warranty	1 Year Parts & Labour

Accessories:

1000B - Programmable Voltage Source - 110 V
 4200 - Series Scanners - 10, 16, and 20 Channel
 9400 - Standard Resistor Oil Bath
 9300A - Standard Resistor Air Bath/GPIB

How to Order:

Model: 6000C - Automated
 High Resistance Ratio Bridge

Dimensions (L x W x H):

378 x 439 x 267 (mm)

Weight:

15 kg max

Shipping Weight:

20 kg

Mains Power:

100 V_{ac}/120 V_{ac}/220 V_{ac}/240 V_{ac}
 50/60 Hz

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