MODEL DB877

DEKABOX
DECADE RESISTOR

Instruction Manual

Doc. No. 19199 Rev. B October 1999

Geneva, Ohio, U.S.A.

SAFETY SUMMARY

REVIEW MANUAL

The  symbol on the instrument front-panel denotes that the user should read the Instruction Manual before operating the instrument.

INSTALLATION CATEGORY

In accordance with EN61010-1, the Model DB877 is rated for Installation Category II.

ENVIRONMENTAL CONDITIONS

The DB877 is specified for operation at 23°C ± 1°C.

POTENTIAL HAZARDS

When in use, the front panel “GND” terminal should be connected to a suitable safety ground.

The instrument does not protect against hazards created by equipment to which it is connected.

Upon loss of the protective ground connection, all accessible parts (including knobs and controls that appear to be insulated) can render an electrical shock.

INTRODUCTION

The Model DB877 DEKABOX Decade Resistor is designed to provide long-term dependable service in precision DC and audio frequency applications. Eight decades of precision fixed resistors are mounted in an extruded metal case for shielding and mechanical protection. A case-connected ground terminal and two input terminals are conveniently located on the front of each unit.

Featured is the TEGAM DEKADIAL coaxial dial arrangement that provides up to 120 million divisions of resolution. It allows first, coarse approximation and then progressively finer steps to arrive at an exact resistance value. The dials turn independently through 360 degrees of rotation. A special detent design facilitates dial location.

Accuracy over a wide range of ambient conditions is assured by the use of resistors exhibiting low temperature and power coefficients. A single continuous filament winding on a thin mica card is used wherever possible. For high-resistance values, a non-inductive winding on a ceramic bobbin is used. Switches with multiple contacts of solid silver-alloy provide low, stable contact resistance.

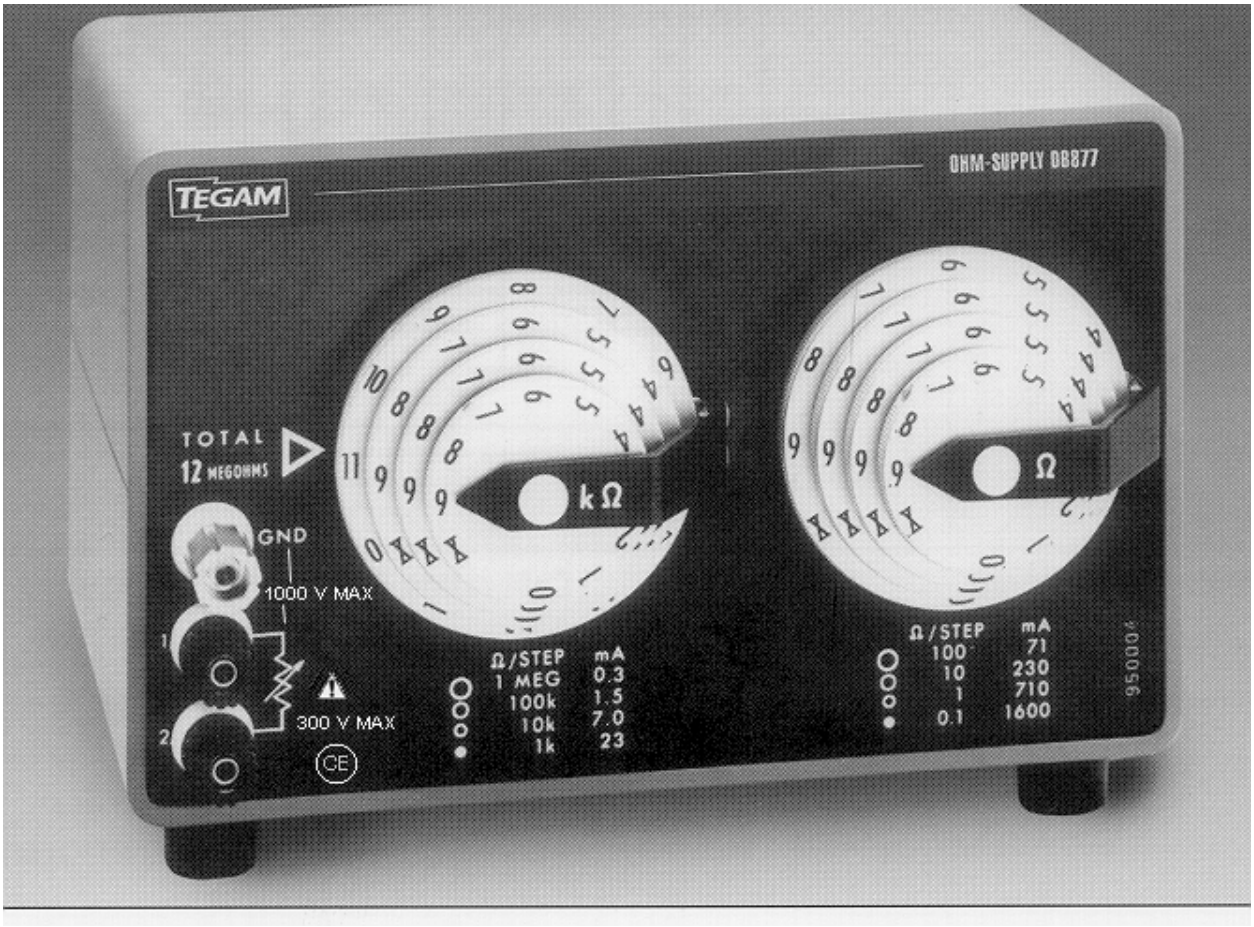

Figure 1 Model DB877

Specifications

CHARACTERISTIC	SPECIFICATION
Accuracy	
Resistance Increments	See Table 1
Initial	(0.01% + 7 milliohms)
Long-term	(0.02% + 10 milliohms)
Short-term Switching Repeatability	1 milliohm (typical)
Number of Decades	Eight
Total Resistance	12.111111 megohms
Resistance per Decade	See Table 1
Smallest Step	0.1 ohm
Resistance at Zero Setting	Approximately 40 milliohms
Breakdown Voltage	1000 volts peak to case
Dimensions	Height 5.9 in. (15.0 cm) Width 8.5 in. (21.6 cm) Depth 6.5 in. (16.5 cm)
Weight	7.5 lbs. (3.4 kg) net

Table 1 Ratings Per Step for Each Decade

RESISTANCE PER DECADE (Ω)	INCREMENTAL ACCURACY			COEFFICIENTS		MEASUREMENT DUTY* MAXIMUM RATINGS		PEAK VOLTAGE (V/step)
	SMALLEST STEP (Ω)	INITIAL (%)	LONG TERM (%)	TEMPERATURE (ppm/°C)	POWER (ppm/mW/step)	POWER (mW/step)	CURRENT (mA)	
11M	1M	0.02	0.03	5	0.3	22	0.3	300
1M	100k	0.02	0.03	5	0.3	220	1.5	150
100k	10k	0.02	0.03	5	0.3	500	7	70
10k	1k	0.02	0.03	5	0.3	500	23	23
1k	100	0.02	0.03	5	0.3	500	71	7
100	10	0.03	0.03	15	0.9	500	230	2.3
10	1	0.1	0.12	20	1.2	500	710	0.7
1	0.1	1.0	1.0	60	6	250	1600	1.6

* Intermittent use such that temperature rise of the resistor will not appreciably exceed that which would occur in free air.

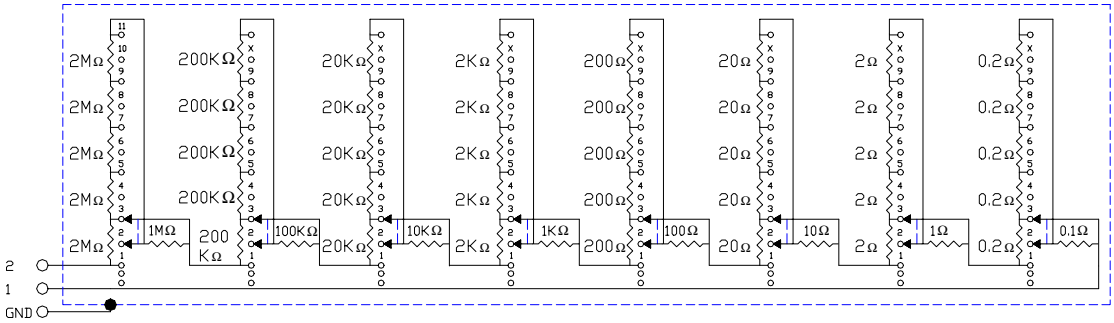

Figure 2 Model DB877 Schematic

OPERATION

Three binding posts are provided on the front panel of the DEKABOX. The GND binding post is connected to the metal case which forms a shield for the instrument. The resistance between the other two binding posts corresponds to the setting of the coaxial dials, which are arranged to read resistance directly in ohms.

All decade dials can be turned 360°, which allows settings to be changed rapidly and directly from X to 0. Seven of the decade dials (0.1 ohm – 100 kilohms) have an X position that corresponds to ten steps on the dial or one step of the next higher decade dial. The total resistance for the seven decade dials is 1.111111 megohms. The eighth decade dial (1 megohm) has 12 positions, 0 through 11 for a total resistance of 11.0 megohms.

MAINTENANCE

TEGAM recommends cleaning and lubrication on a yearly basis. Only chemicals approved by the manufacturer should be used for cleaning and lubrication. Contact TEGAM before performing any maintenance on the switch wafers.

INCREMENTAL ACCURACY PERFORMANCE CHECK

To check the instrument's incremental accuracy, use a resistance bridge of 0.01% accuracy or better in a temperature controlled environment. TEGAM's Model 242D Resistance Measuring System is recommended for this use. The procedure is as follows:

1. Set all dials to 0, measure and record zero resistance.
2. In turn, step each dial from 1 to its maximum setting, measure the resistance at each setting, then return the dial to 0. (Subtract the zero resistance from each measured resistance less than 1 kilohm.) Compare the readings against the incremental accuracy specification in Table 1.
3. If the accuracy of the measured reading does not meet its rated specification, consult TEGAM for further instructions. Do not attempt to calibrate without consulting TEGAM.

MISUSE OF INSTRUMENT

Misuse can result in unsafe operation and/or damage to the instrument. Do not use the instrument in any manner that is not specified in this Manual.

Warranty

TEGAM, Inc. warrants this product to be free from defects in material and workmanship for a period of one year from date of shipment. During the warranty period, we will at our option, either repair or replace any product that proves to be defective.

TEGAM, Inc. warrants the calibration of this product for a period of one year from date of shipment. During this period we will recalibrate any product that does not conform to the published accuracy specification.

To exercise the warranty, contact TEGAM, Inc., Ten TEGAM Way, Geneva, Ohio 44041, phone 440-466-6100, fax 440-466-6110, M-F, 8 a.m.-5 p.m. ET. You will be given prompt assistance and return instructions. Send the instrument, transportation prepaid, to the indicated service facility. Repairs will be made and the instrument returned, transportation prepaid. Repaired products are warranted for the balance of the original warranty, or at least 90 days, whichever is longer.

Limitation of Warranty

TEGAM, Inc. warranty does not apply to defects resulting from unauthorized modification or misuse of any product or part. This warranty also does not apply to fuses, batteries, or damage from battery leakage.

This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of merchantability or fitness for a particular use. TEGAM, Inc shall not be liable for any indirect, special or consequential damages.

Statement of Calibration

This instrument has been inspected and tested in accordance with specifications published by TEGAM, Inc.

The accuracy and calibration of this instrument are traceable to the National Institute of Standards and Technology through equipment that is calibrated at planned intervals by comparison to certified standards maintained in the Laboratories of TEGAM, Inc.

How to Contact TEGAM

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