




**MODEL DB62
IN-LINE DEKABOX
DECADE RESISTOR**

Instruction Manual

Doc. No. 7275 Rev. A July 1999

1. REVIEW MANUAL:

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

2. INSTALLATION CATEGORY:

In accordance with EN61010-1, the Model DB62 is rated for Installation Category II.

3. ENVIRONMENTAL CONDITIONS:

The DB62 is specified for operation at $23^{\circ} \pm 1^{\circ}$ C. Refer to temperature and power coefficients listed in the instruction manual for operation outside these limits.

4. POTENTIAL HAZARDS:

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

WARNING

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

WARNING

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

5. MISUSE OF INSTRUMENT:

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

Table of Contents

SECTION I INTRODUCTION

PURPOSE OF EQUIPMENT	1-1
DESCRIPTION.....	1-1
SPECIFICATIONS	1-1

SECTION II OPERATION

OPERATION INSTRUCTIONS	2-1
THEORY OF OPERATION.....	2-1

SECTION III PREVENTIVE MAINTENANCE

VISUAL INSPECTION.....	3-1
REMOVING THE CASE	3-1
CLEANING AND LUBRICATION.....	3-1

SECTION IV CALIBRATION

ACCURACY	4-1
RECOMMENDED TEST EQUIPMENT.....	4-1
CALIBRATION PROCEDURE.....	4-1
SERVICE AND REPAIR	4-1

SECTION I INTRODUCTION

PURPOSE OF EQUIPMENT

The in-line DEKABOX decade resistors are adjustable resistors that can be easily set to a resistance value for precision dc and audio frequency use.

DESCRIPTION

The DB62 consists of a metal case, three binding posts, and six decade resistance switch assemblies. Figure 1-1 shows a panel arrangement and dimensions.

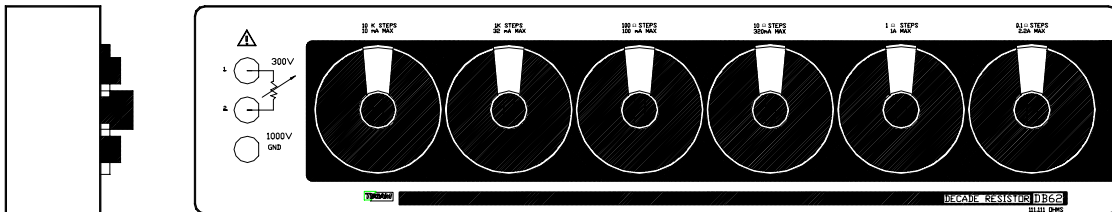


Figure 1-1 DEKABOX OUTLINE

SPECIFICATIONS

INITIAL ACCURACY OF RESISTANCE CHANGE FROM ZERO SETTING	$\pm (0.01\% + 0.0005 \text{ ohm per decade})$ at 23° C
LONG-TERM STABILITY	$\pm (0.02\% + 0.001 \text{ ohm per decade})$ per year
ZERO RESISTANCE	Less than 15 mohms
RATING PER RESISTOR	See Table 1-1
TEMPERATURE COEFFICIENT	See Table 1-1
POWER COEFFICIENT	See Table 1-1
NUMBER OF DECADES	Six
BREAKDOWN VOLTAGE	See Table 1-1
WEIGHT	4 pounds net. 10 pounds packed for shipping
MAXIMUM CURRENT PER RESISTOR	See Table 1-1

Table 1-1 RATINGS PER STEP FOR EACH DECADE

RESIST- ANCE PER DECADE (Ω)	RESIST- ANCE VALUE R (Ω)	ACCURACY		COEFFICIENTS		MEASUREMENT DUTY MAXIMUM RATINGS		
		INITIAL (%)	LONG- TERM (%)	TEMPER- ATURE (ppm/ $^{\circ}$ C)	POWER (ppm/mW/ step)	POWER (mW/step)	CURRENT (mA)	PEAK VOLTAGE (V/step)
10 M	1 M	0.01	0.02	5	0.15	100	0.3	300
1 M	100 k	0.01	0.02	5	0.15	1000	3.2	300
100 k	10 k	0.01	0.02	5	0.15	1000	10	100
10 k	1 k	0.01	0.02	5	0.15	1000	32	32
1 k	100	0.01	0.02	5	0.15	1000	100	10
100	10	0.012	0.025	15	0.45	1000	320	3.2
10	1	0.03	0.07	20	0.6	1000	1000	1.0
1	0.1	0.2	0.5	60	3	500	2200	0.2
0.1	0.01	2	5	400	60	160	4000	0.04

Table 1-2 RESISTANCE AND MINIMUM STEP RESISTANCE AVAILABLE

TOTAL RESISTANCE	OHMS PER STEP
11,111.1 Ω	0.01 Ω
111,111 Ω	0.1 Ω
1,111,110 Ω	1 Ω
11,111,100 Ω	10 Ω

SECTION II OPERATION

OPERATING INSTRUCTIONS

Three binding posts are provided for connections on the panel of the DEKABOX. The GND binding post is connected to the metal case which forms a shield for the unit.

The resistance of the unit corresponds to the setting of the in-line dials. The resistance per step of each decade switch is marked above the dial.

Note that switch positions correspond to clock number positions of the bar knobs: 1 is at one o'clock, 2 is at two o'clock, and 10 is at ten o'clock. This feature allows an operator to set the resistance by feel without looking at the unit.

THEORY OF OPERATION

The circuit consists of resistors switched in a series circuit. Figure 2-1 illustrates schematically the circuit of the Model DB62. Resistance values are related to the total resistance of the unit. These values are listed in Table 2-1.

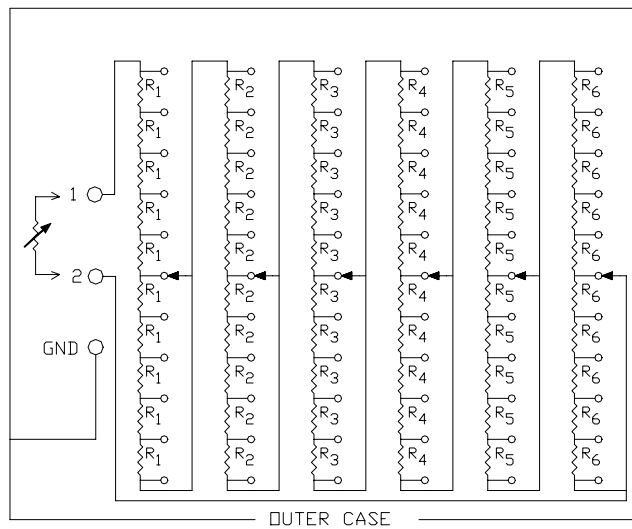


Figure 2-1 DEKABOX SCHEMATIC DIAGRAM

Table 2-1 RESISTANCE VALUES

TOTAL RESISTANCE	OHMS PER STEP	RESISTOR VALUES					
		R ₁	R ₂	R ₃	R ₄	R ₅	R ₆
11,111.1 Ω	0.01 Ω	1 k	100 Ω	10 Ω	1 Ω	0.1 Ω	0.01 Ω
111,111 Ω	0.1 Ω	10 k	1 k	100 Ω	10 Ω	1 Ω	0.1 Ω
1,111,110 Ω	1 Ω	100 k	10 k	1 k	100 Ω	10 Ω	1 Ω
11,111,100 Ω	10 Ω	1 MEG	100 k	10 k	1 k	100 Ω	10 Ω

SECTION III PREVENTIVE MAINTENANCE

The following procedures should be performed periodically (approximately once a year) to insure maximum accuracy and reliability from the Dekabox in-line decade resistors.

If the need for major repairs is apparent, it is recommended that the unit be sent to TEGAM for service. Although repair information and replacement parts are available, unauthorized repairs will invalidate the instrument warranty. If the instrument is more than one year old when returned to TEGAM, a reasonable charge may be expected for replacement of parts or complete reconditioning.

VISUAL INSPECTION

Inspect the unit for dial orientation and damage to binding posts and binding post caps. Also check for dirt around the binding post insulators. Then remove the case as described below and inspect the unit for possible internal defects. These defects include such things as loose or broken connections, damaged or dirty switch contacts, and heat damaged resistors.

REMOVING THE CASE

Prepare a soft, clean place to set the instrument. Be sure that no projections or pointed objects will be underneath the panel. See that there are no metal filings in the area.

Place the unit face down on the prepared surface. Loosen the screws on the back of the instrument and carefully slide the case off.

CLEANING AND LUBRICATION

Clean the front panel with a soft, dry, lint-free cloth, being particularly careful to remove all dirt from around the binding post insulators. The only internal components that require cleaning and lubrication are the switch decks.

The switch decks are carefully lubricated at the time of manufacture and are protected from contamination by the instrument case. They should rarely, if ever, require maintenance. It is recommended that they be cleaned or lubricated only if it is determined that they are not making good electrical contact. If the switch decks are in need of cleaning or lubrications, proceed as follows:

- Apply solvent (Envirotech 1675-225 Dichlorofluoroethane Ethyl-S(-) 2-hydraypropionate carbon dioxide or equivalent) to the contact surfaces with a small brush or pipe cleaner.
- Wipe surfaces with clean, dry brush or dry with low pressure air.
- Apply a thin coating of lubricant (Oak #2008 or equivalent) to the contact surfaces with a hypodermic needle.
- Apply two drops of petroleum jelly to each of the switch bearings and detent mechanisms.
- Remove excess oil with a clean, dry cloth and remove all traces of lint with a soft brush.
- Avoid damaging binding posts with chemicals mentioned above. Clean binding posts with isopropyl alcohol if required.

REPLACING THE CASE

Be sure that the interior of the case is completely clear of all foreign material.

Slip the case over the unit being careful not to touch any resistors with the cover. Replace the screws.

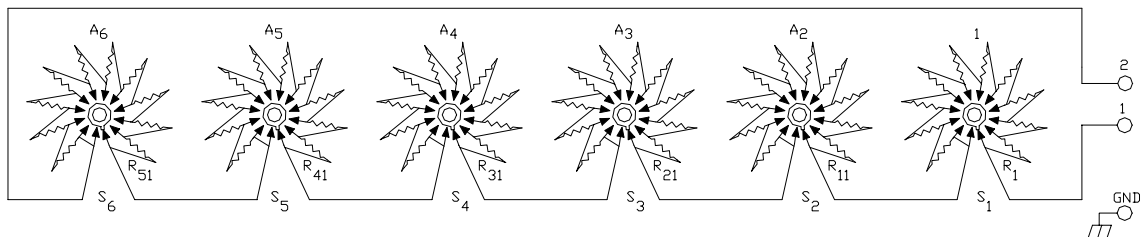


Figure 3-1 DB62 WIRING DIAGRAM

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., 10 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

TEGAM, Inc.
10 TEGAM Way
Geneva, OH 44041

Phone: 440-466-6100
Fax: 440-466-6110
e-mail: sales@tegam.com



TEN TEGAM WAY • GENEVA, OH 44041
PHONE 440-466-6100 • FAX 440-466-6110
sales@tegam.com • www.tegam.com