

Model K11

10ppm Accuracy DC Voltage Standard



**KH KROHN-HITE
CORPORATION**

Operating Manual

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MODEL K-11
OPERATORS
MANUAL

Serial No. _____

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K11 OPERATORS MANUAL



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NOTE: Errata and addendum (if any) will appear in the back of this manual.

K-11 MANUAL

LIST OF DRAWINGS

DESCRIPTION	DRAWING #
Power Supply Schematic	A-4852A
K11 Analog Schematic	B-4851A
Calibration Layout	A-4853A

LIMITED WARRANTY

The ELECTRONIC DEVELOPMENT COMPANY (E.D.C.) warrants to the original purchaser each instrument manufactured by them to be free from defects in material and workmanship. This warranty is limited to servicing, repairing and/or replacing any instrument or part thereof returned to the E.D.C. factory for that purpose in accordance with the instructions set forth below; and furthermore to repair or replace all materials, except tubes, fuses, transistors and other semiconductor devices which shall within ONE YEAR of shipment to the original purchaser be returned to the E.D.C. factory and upon examination be deemed defective.

E.D.C. instruments may not be returned to the factory under the terms of this warranty without the prior authorization of the E.D.C. Service Department. All instruments returned to E.D.C. for service hereunder should be carefully packed and shipped. All transportation charges shall be paid by the purchaser.

EDC reserves the right to discontinue instruments without notice and to make changes to any instrument at any time without incurring any obligation to so modify instruments previously sold.

This warranty is expressly in lieu of all other obligations or liabilities on the part of EDC. No other person or persons is authorized to assume in the behalf of EDC any liability in the connection with the sale of its instruments.

CAUTION: The instrument you have purchased is a precision instrument manufactured under exacting standards. Any attempts to repair, modify or otherwise tamper with the instrument by anyone other than an EDC employee or authorized representative may result in this warranty becoming void.

FACTORY SERVICE REQUEST AND AUTHORIZATION

WARRANTY SERVICE

Instruments may be returned only on prior authorization. Please obtain a RETURN AUTHORIZATION NUMBER either directly from the factory or from an authorized E.D.C. Representative. (See General Information below.)

CHARGEABLE REPAIRS

If requested, an estimate of charges will be submitted prior to repairs. We suggest that you request a RETURN AUTHORIZATION NUMBER to facilitate handling.

GENERAL INFORMATION

A) Please provide the following information in order to expedite the repair:

- 1) Indicate MODEL
- 2) Serial Number
- 3) Complete description of the trouble:

Symptoms, measurements taken, equipment used, lash-up procedures, attempted repairs, suspected location of failure and any other pertinent information.

B) Freight Charges must be PREPAID.

C) The RETURN AUTHORIZATION NUMBER should be noted on your documentation.

D) See Packing Suggestions - next page.

PACKING SUGGESTION

Although your E.D.C. instrument is built for laboratory, production environment and some field environment, it is NOT ruggedized.

Therefore

1. Be sure the carton is **STRONG** enough to carry the weight of the instrument, e.g. use double wall corrugation.
2. Be sure the carton is **LARGE** enough to allow for sufficient packing material, e.g., at least 2 inches all around the instrument. The packing material should be able to be compressed and then return to its approximate original volume.
3. For better handling, the shipment should always be by **AIR FREIGHT** (except for short distances). You might use either UPS "blue label" or common air freight carrier, second day air.

Please do not bounce it across the country in a truck. It may not hurt it, but it certainly is not going to do a laboratory instrument much good.

4. **QUESTIONS?** Just contact us. We will be pleased to help you.

SECTION I

1.0.0 DESCRIPTION AND SPECIFICATIONS

1.1.0 General Description and Applications

- 1.1.1 The K-11 DC Voltage Standard has been specifically designed to calibrate Kaye Instruments's DIGISTRIP 4[®], DIGI-LINK 4[®], DIGISTRIP 4 PLUS, and *TruTemp*[™] Data Logging Systems.

DIGISTRIP 4, DIGI-LINK 4, DIGI-LINK 4 PLUS and DIGISTRIP 4 PLUS are registered patents by KAYE INSTRUMENTS, Bedford, Massachusetts. *TruTemp* is a Trade Mark of KAYE INSTRUMENTS COMPANY, Bedford, Massachusetts.

- 1.1.2 The instrument has a specified accuracy, and is traceable through a bank of saturated standard cells to the U.S. National Institute of Standards and Technology.
- 1.1.3 No adjustments are made during normal operation. The trims are made during the calibration and are described under the calibration procedure.
- 1.1.4 The circuitry is completely solid state made of discrete, hybrid and/or integrated circuits packaged on etched glass circuit boards. These are proven circuits, using derated components to insure long life and maximum reliability.
- 1.1.5 The instrument is overload and short-circuit proof, and is fully operational in adverse environmental conditions.
- 1.1.6 The instrument will drive a short circuit indefinitely without damage to the instrument, and will recover to rated specifications in less than two (2) minutes.

1.2.0 Output Specifications:

1.2.1 DC Outputs (Buffered):

+6.2V, +0.2V, -6V, -600mV, -60mV and -30mV.

The output buffer will drive 10mA.

All outputs are floating with respect to earth ground.

1.2.2 Reference Output:

Zero (0) shorted.

1.2.3 Accuracy (Valid for 1 Year):

$\pm 10\text{ppm}$ of selected value or $2\text{ }\mu\text{V}$, whichever is greater.

1.2.4 Calibration Temperature:

$23^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

1.2.5 Temperature Coefficient (0°C to 40°C):

$2\text{ppm}/^{\circ}\text{C}$.

1.2.6 Ripple and Noise:

$10\text{ }\mu\text{V}$ p-p; bandwidth, 0.1Hz to 100Hz.

1.3.0 General Specifications:

1.3.1 Power Requirements:

12 Vac at .85A via a wall transformer,
EDC part number XFM12 for 110V, 50-60Hz. operation,
or XFM-25 for 220V, 50-60Hz operation.

1.3.2 Protection:

Short-circuit protection. Automatic recovery.

1.3.3 Environment:

Operating Temperature: 0° C to 40° C.

Storage Temperature: -20° C to +50° C.

1.3.4 Dimensions:

3.5" (8.9cm) high, 8.75" (22.2cm) wide, 14.5" (36.8cm) deep.

Supplied with tilt bale, feet and carry handle.

1.3.5 Weight:

6 lbs.(2.72kg) net,

11 lbs. (5.0 kg) shipping wt.

1.3.6 Warranty:

ONE YEAR, including accuracy and stability.

1.3.7 Certificate of Compliance and Traceability:

Included with each new instrument and is traceable to the U.S. National Institute of Standards and Technology (N.I.S.T.).

SECTION II

2.0.0 INSTALLATION

2.1.0 Mounting

2.1.1 The K-11 is a portable unit that is rugged and light weight, and is completely enclosed. Being only half rack width, it takes little bench space. The unit is supplied with tilt bale, feet and a carry handle.

2.2.0 AC Power Input Considerations

2.2.1 All instruments are supplied with a plug-in ac to ac wall transformer rated for 12Vac @ .85A, EDC part number XFM12 for 110V 50-60Hz operation, or EDC part number XFM-25 for 220V 50-60Hz operation.

SECTION III

3.0.0 OPERATION OF THE INSTRUMENT

3.1.0 Front Panel Controls

3.1.1 Power Switch:
Rocker, ON-OFF line power.

3.2.0 Front Panel Indicators:

3.2.1 Power on green led lamp.

3.3.0 Output Terminals:

3.3.1 Banana Jacks (gold-plated) with standard 3/4" spacing. It is recommended that gold-plated banana plugs be used as the mating connectors to minimize thermal E.M.F.'s.

3.4.0 Warm-up Time:

3.4.1 It is recommended that the instrument be given a one-hour warmup time before use.