

# OPERATING INSTRUCTIONS

## Lecture Galvanometer No. 32307

### 1. Introduction

This large-size galvanometer is designed for instructional and educational purposes and offers the special feature of low-current detection. It also features a three-range sensitivity selection switch that enables detection and reading of low current and voltage values in accordance with the range of the experiment being conducted. It is effective for a wide range of experiments including those based on Faraday's Law of Electromagnetic Induction, Lenz's Law, and Fleming's Right-Hand Rule, among others.

### 2. Description

Fig. 1

#### Description of Parts

- a) Meter Zero Adjustment Screw
- b) Sensitivity Selector Switch
- c) Input Terminal
- d) 10x Zero Adjustment Control

The 32307 Lecture Galvanometer utilizes a linear IC for increased sensitivity in the 10X range. The sensitivity of this model is much higher than that of comparable conventional galvanometers, giving large needle deflections, even for low current. It also has smoother operation since it is influenced much less by external magnetic fields than moving-iron type galvanometers.

Specifications      Sensitivity and Measurement Range:  
Current Voltage

| <u>Range</u> | <u>Sensitivity</u>       | <u>Sensitivity</u>       |
|--------------|--------------------------|--------------------------|
| 0.1 X        | ~ $10 \times 10^{-6}$ A  | ~ $40 \times 10^{-3}$ V  |
| 1 X          | ~ $1 \times 10^{-6}$ A   | ~ $2 \times 10^{-3}$ V   |
| 10 X         | ~ $0.1 \times 10^{-6}$ A | ~ $0.1 \times 10^{-3}$ V |

Note: The 10x range has a built-in amplifier.  
Metering Section: Moving coil type with circular arc length of 24cm,  $\pm$  equal scaling; in plastic case.  
Power Source: 100VAC, 50/60Hz (required for 10Xrange only)  
Dimensions: 35H x 26W x 15D cm  
Weight: ~ 1.5kg

### 3. Operation

**Please observe these precautions:** The Lecture Galvanometer is a precision instrument and must be handled carefully. Strong shocks can damage its performance.

When conducting experiments utilizing high-powered magnets, separate the meter from the electromagnet as far as possible, so that the field of the electromagnet does not affect the meter indication.

Be sure to set the sensitivity selector switch at **OFF** when storing the meter. If the meter is stored with the selector switch at positions other than **OFF**, needle performance will become unstable and meter functions could be damaged.

The 10X range is highly sensitive and excessive input should be avoided. Use the 10X range only when the indicator needle swings within the 4th graduation of the 1X scale.

- When the meter hand does not indicate zero following installation, turn the zero adjustment control on the meter until it sets to zero.

Note: When using the 10X range, after performing the above zero setting adjustment, repeat the zero adjustment setting with the 10X zero adjustment control at the base of the meter.

- Three sensitivity ranges can be selected with the sensitivity selector switch. When the measurement range is not known in advance, begin operation from the 0.1X range. Once you have confirmed that the needle does not swing excessively, switch to the 1X range, then to the 10X range.

**Caution!** Take care to prevent possible damage to the meter from excessive current input, particularly in the 10X range. It's a good idea to progressively set the range at a lower setting, 0.1X or 1X, to confirm that the needle will stabilize before switching to the 10X range. This procedure should be followed in the detection of "zero" point settings, for example, for circuit bridges.

- Note on polarity indication: The direction of needle fluctuation helps to distinguish electromotive force, polarity and direction of current flow. The indicator swings to the right when the + terminal is connected to the positive polarity side and to the left when the - terminal is at the negative polarity side.

### 4. Maintenance

Avoid strong shocks and rough handling. Set the sensitivity selector switch at **OFF** when storing the meter. Other than this, the galvanometer needs no special maintenance. If you should experience any difficulty with this piece of equipment, please contact Central Scientific Company, giving details of the problem. To ensure better service, please do not return any apparatus to Central Scientific Company until we have sent you authorization.

Written 11/89