Ballistic Galvanometer

OSAW India

- **Ballistic Galvanometer Overview:**
  - Developed in the 19th century.
  - Measures the total quantity of electric charge passing through a circuit.
  - Designed for short-duration currents (transient effects).
  - Operates by observing coil deflection in a magnetic field.
  - Deflection magnitude is proportional to total charge.
  - Widely used in 19th and early 20th-century physics labs.
  - Significant in electromagnetic induction, magnetic flux, capacitance, and inductance studies.
- **Construction:**
  - Coil suspended in a magnetic field.
  - Mirror attached to the coil.
  - Optical measurement of deflection using a reflected light beam.
- **Operation Principle:**
  - Based on electromagnetic induction.
  - Charge passing through the coil causes deflection.
  - Deflection magnitude proportional to total charge, not current.
- **Ballistic Nature:**
  - Measures total displacement from a current pulse.
  - Differs from standard galvanometers that measure steady currents.
- **Applications:**
  - Measurement of magnetic flux.
  - Measurement of capacitance and inductance.
- **Instructions for Use:**
  - Place on a stable, vibration-free surface.
  - Ensure proper coil alignment and mirror adjustment.
  - Establish a zero reference point with no current.
  - Use a known charge or calibrated capacitor for scale checks.
  - Verify sensitivity with different charges.
  - Insert coil into the experimental circuit with a smooth-action switch.
  - Position light source for clear scale observation.
  - Activate switch to initiate current and deflection.
  - Measure deflection from zero point.
  - Ensure coil returns to zero without residual deflection.
  - Take multiple readings for accuracy.
  - Safely disconnect from the circuit.
  - Recalibrate regularly and check for wear.
  - Operate in a stable environment.
  - Handle carefully to avoid damage.
  - Keep currents and voltages within limits.
  - Keep away from strong magnetic fields.

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References:

1. https://en.wikipedia.org/wiki/Ballistic_galvanometer#:~:text=When%20an%20electric%20charge%20is,galvanometer's%20magnet%2C%20generating%20an%20opposing

1. https://www.osawglobal.com/