



**OMEGA TYPE ES-248** Hall Effect Experimental Set Up has been designed specifically for study of Hall Effect in semiconductor and determination of allied parameters. The set-up consists of Digital Gauss Meter with Hall Probe, Hall Effect Volt / current meter with Hall Probe, Constant Current Source (0-4A), And Electromagnet.

The set up is complete in all respect and requires no other apparatus.

Practical experience on this set up carries great educative value for Science and Engineering Students.

**OBJECT**

01 Study of Hall Effect in semiconductor and determination of allied parameters.

1.1 Hall Effect Characteristics and Hall Coefficient ( $R_H$ )

1.2 Charge carrier density (n)

1.3 carrier Mobility ( $\mu$ )

1.4 Hall angle  $\tan(\phi)$

1.5 Conductivity ( $\sigma$ )

**FEATURES**

**HALL EFFECT EXPERIMENTAL SET-UP**

The complete Experimental Set-up consists of the following :

**1.1 DIGITAL GAUSS METER** : Operates on the principle of Hall Effect in semiconductor. The small with HALL PROBE Hall Voltage is amplified through a high stability amplifier connected at the output of the amplifier can be calibrated directly in magnetic field unit (gauss).

Range : 0-2 KG & 0-20 KG.

Resolution : 1G at 0-2 KG range

Accuracy :  $\pm 0.5\%$ .

Special Feature : Indicate the direction of the magnetic field.

**1.2 HALL EFFECT VOLT / CURRENT METER**

A digital meter to read Hall voltage 0-200mV and probe current 0-20mA selectable by a switch .It also provide constant current power supply. Variation in current is achieved by a potentiometer provided.

AMMETER : Range 0-20 mA Resolution 10  $\mu$ A

VOLTMETER : Range 0-200mV Resolution 0.1mV

**1.3 HALL PROBE** : Germanium Single Crystal N-type or P-type with four spring type pressure contact is mounted on a sunmica bakelite strip.

Material : Ge single crystal n or p-type as desired.

Resistivity : 8-10 ohm.cm.

Contacts : Spring type (solid silver)

Zero-field potential : < 1mV (adjustable)

Hall Voltage : 25-35mV/10 mA/KG

**1.4 CONSTANT CURRENT SOURCE (0 - 4Amp.)**

Current range : 0 - 4Amp.

Load regulation : Better than 0.5% of the highest (No Load to Full Load) specified output current.

Line regulation : Better than  $\pm 2\%$  of the specified output (For  $\pm 10\%$  Mains Variation) current

Metering : 3 1/2 digit 7 segment LED DPM.

**02 ELECTROMAGNET :**

The electromagnet have the most widely used 'U' shaped soft iron yoke. The soft iron is of a special quality, structurally uniform, well machined and finished to meet the rigid standards.

Field intensity : 7.5 KG at 10mm air-gap which flat pole pieces.

Pole pieces : 50mm diameter.

Energising coils : Two, each a resistance of about 3.0 ohm.

Power requirement : 0-30V DC, 4A, its coils are connected in series.

03 HALL PROBE STAND (WOODEN)

04 Weight : 58 Kg. (Approx.)

05 Strongly supported by detailed Operating Instructions, giving details of Object, Theory, Design procedures, Report Suggestions and Book References.

We are committed to the continuous development of our products, and therefore reserve the right to amend specifications without prior notice.