

Hall Effect Experimental Setup

ME 825 - Hall Effect Experimental Setup

Objective:

- To calculate the value of Hall coefficient (R), Carrier Density (n) and carrier mobility.

Setup Consist of :

- Hall Probe (Ge Crystal)
- Hall Effect Set-up (Digital)
- Electromagnet
- Constant Current Power Supply



Hall Probe (Ge Crystal) :

- Contacts : Spring type (Solid Silver)
- Hall Voltage : 0.1- 1 Volt/100 mA/KG
- Resistivity : \sim 10 Ohm cm

Hall Effect Set-up (Digital) :

The set-up consists of a digital millivoltmeter and a constant current power supply. The Hall Voltage and probe current can be read on the same digital panel meter through a selector switch.

A) Digital Milli Voltmeter :

Technical Specifications

- Range : 0-200mV
- Resolution : 100 microV
- Accuracy : \pm 0.1% of reading \pm 1 digit
- Input Impedance : 1 Mohm
- Special Features : Auto zero and polarity indicator
- Overload Indicator : Sign of 1 on the left & blanking of other digits.

B) Constant Current Power Supply

Technical Specifications

- Current : 0-20mA or as required for the hall probe
- Resolution : 10 microA
- Accuracy : \pm 0.2 % of the reading \pm 1 digit
- Load regulation : 0.03% for 0 to full load
- Line regulation : 0.05% for 10% variation

C) Digital Gaussmeter (ME 261)

Technical Specifications:

- Range : 0 - 2K gauss & 0 - 20K gauss
- Resolution : 1 Gauss at 0-2 K gauss range
- Accuracy : \pm 0.5%

- Display : 3 ½ digit 7 Segment LED DPM
- Special : Indicate the direction of the magnetic field.
- Power Requirement : 220 VAC \pm 10%, 50Hz

Electromagnet

Technical Specifications :

- Field Intensity : 7.5k \pm 5%gauss at 10mm
- Pole places : 50mm dia meter
- Energising coil : Resistance 3.0ohm
- Yoke Material : U shaped soft iron
- Power Requirement : 0-30V/4Amp

Constant Current Power Supply

Variable Output

- Output Voltage : 0 ~ 30VDC
- Output Current : 0 ~ 5A
- Source Regulation : \leq 0.05% +10mV
- Load Regulation : \leq 0.05% +10mV
- Ripple & Noise : \leq 1mV (rms)
- Digital Display : 3 digit voltage & current display
- Accuracy : \pm 1%, +1 Digit

Standard Accessories:

- Power Cords, Patch Cords, Instruction Manual.