

## THERMAL CONDUCTIVITY OF METAL ROD (EE-1562)

The experimental set up consists of metal bar, one end of which is heated by an electric heater while the other end of the bar projects inside the cooling water jacket. A cylindrical shell filled with the asbestos insulating powder surrounds the middle portion of the bar. The temperature of the bar is measured at different sections. Heat Input to the heater is given through variac and measured by Digital Voltmeter & Digital Ammeter. By varying the heat input rates, wide range of experiments can be performed. Water under constant head condition is circulated through the jacket and its flow rate and temperature rise is noted.

### EXPERIMENTS:

- ) To plot the temperature distribution along the length of Bar
- ) To determine the thermal conductivity of given bar at various temperatures

### UTILITIES REQUIRED:

- ) Water supply 3 lit/min (approx.)
- ) Drain
- ) Electricity Supply: 1 Phase, 220 VAC 2 Amp.
- ) Table for set-up support

### TECHNICAL DETAILS:

- ) Metal Bar  
Material : Copper  
Length : 450 mm  
Dia : 25mm
- ) Insulating Powder shell  
Length : 250 mm  
Dia : 200 mm
- ) Cooling Water Jacket  
Length : 75mm  
Dia : 100mm
- ) Heater : Nichrome Wire.
- ) Water Flow measurement: Measuring cylinder & Stopwatch.
- ) Temperature Sensors : RTD PT :100 type (7 Nos.)
- ) Control panel : Digital Voltmeter : 0-300 Volt.,  
Digital Ammeter : 0-2 Amp.,  
Variac : 0-230 V, 2 A,  
Digital Temp. Indicator : 0-199.9°C, with multichannel switch,  
On/off switch, Mains Indicator etc.
- ) The whole setup is mounted on a powder coated base plate.

