



**GOVERNMENT ENGINEERING COLLEGE, DAMAN**  
**DEPARTMENT OF MECHANICAL ENGINEERING**  
**HEAT TRANSFER LABORATORY**

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**THERMAL CONDUCTIVITY TEST APPARATUS**



**Basic Details: -**

- Test Bar: 300 mm long / 25 mm Dia./ Brass
- Shell Dia.: 175 mm
- Measuring Flask 1litre

**Control Panel**

- Digital Voltmeter (0-230V)
- Digital Ammeter (0-2 Amps)
- Wattmeter: (400W)
- **Heater** 400 Watt

**Thermocouples**

- K-type (Cr.Al) 8 Nos.
- Multi-Channel Temp. Indicator



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**GUARDED HOT PLATE METHOD APPARATUS**



**Basic Details: -**

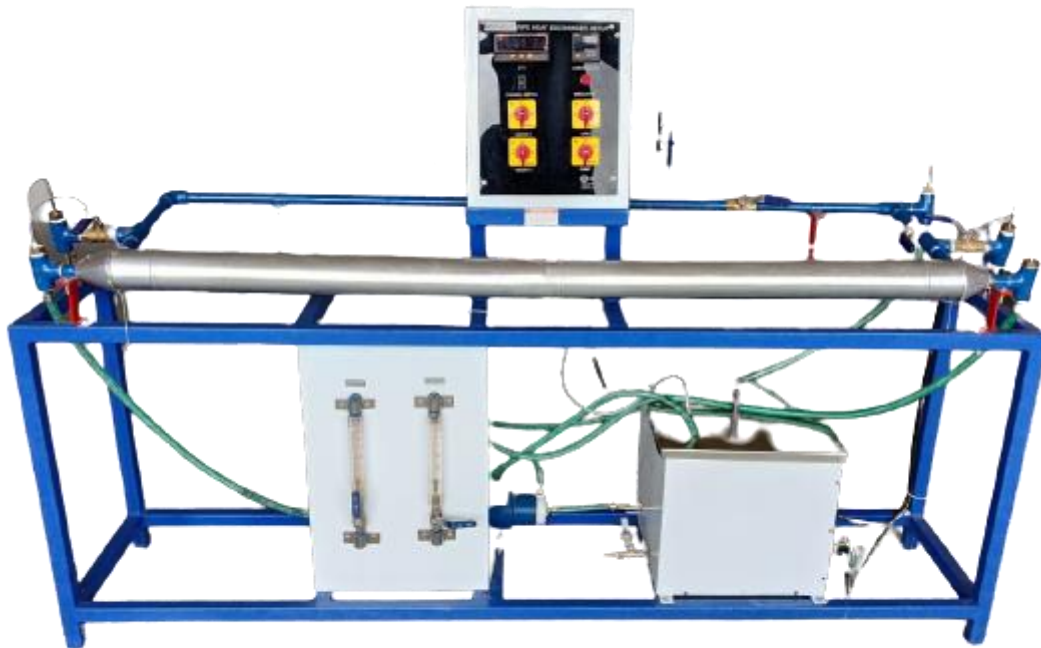
- Heaters –
  - i) Main Heater plate 110mm. dia. with mica heater sandwiched between copper plates.
  - ii) Radial guard heater plate 120mm. I.D.200mm OD mica heater sandwiched between copper plates.
- Water circulated cooling plates- 2nos.
- Dimmerstat 2 A, capacity, 2nos to independently control inputs to the heaters



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**DOUBLE PIPE HEAT EXCHANGER SETUP**



**Basic Details: -**

**Dimension Parameter**

- Inner tube: GI/21 mm Dia
- Outer Tube: GI/60 mm Dia
- Effective Length: 750 mm

**Control Panel**

- Multi-Channel
- Temp. Indicator
- Toggle ON/OFF

**Heater**

- 2 Litre
- Water
- Geyser

**Thermocouples**

- K-type (Cr.Al) 6 Nos.



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**SHELL AND TUBE HEAT EXCHANGER**



**Basic Details: -**

**Dimensional Parameter**

- Shell Dia. 100 mm
- Shell Length: 300 mm
- No. of Baffle: 3 Nos.
- No. of tubes: 17

**Control Panel**

- Multi-Channel Temp.
- Indicator
- Toggle ON/OFF

**Heater**

- 2 Litre Water
- Geyser

**Thermocouples**

- PT-100(RTD) 4 Nos.



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**PIN FIN APPARATUS**



**Basic Details: -**

**Dimensional Parameter**

- Pin Fin MOC: Brass
- Pin Fin Dia: 12 mm
- Duct Length: 150 mm
- Centrifugal Blower
- Orifice meter and Manometer arrangement to measure flow rate

**Control Panel**

- Digital Voltmeter (0-230V)
- Digital Ammeter (0-2Amps)
- Wattmeter:(400W)
- Toggle ON/OFF
- Blower Speed Regulator

**Heater**

- 400 Watt
- Band Type
- Dimmer Controller

**Thermocouples**

- K-type (Cr.Al)• 6 nos.
- Multi-Channel Temp. Indicator



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**THERMAL CONDUCTIVITY OF METAL ROD APPARATUS SETUP**



**Basic Details: -**

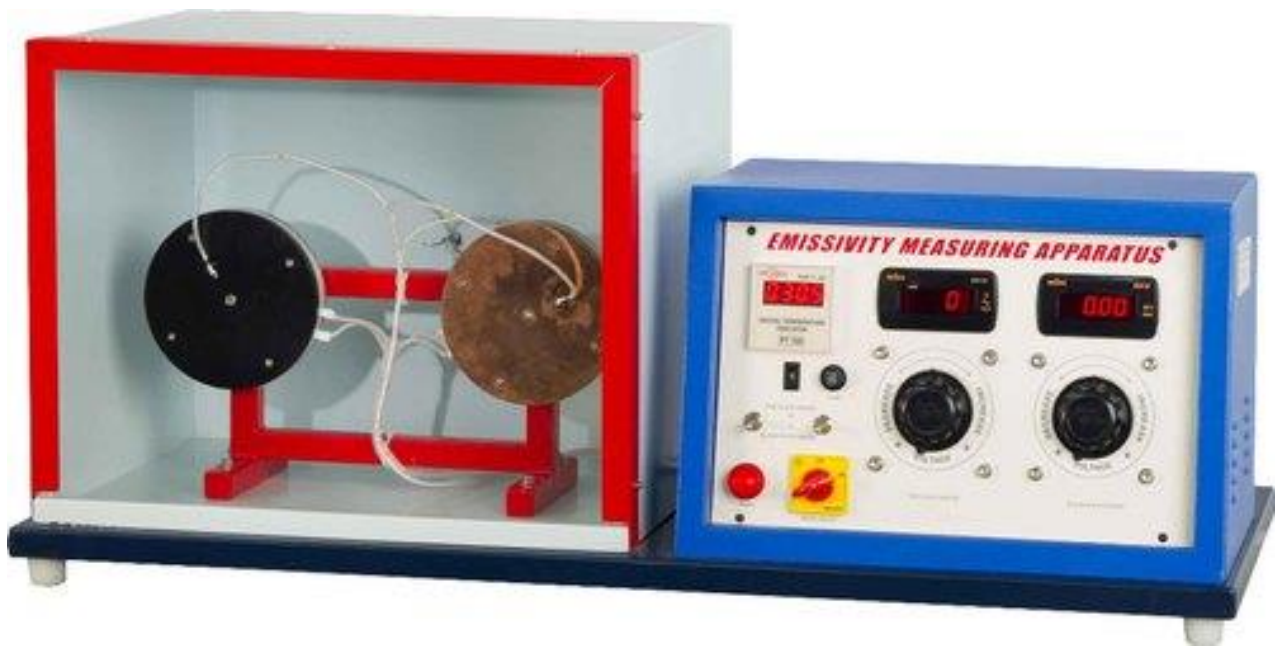
(1) Length of tube metal bar (total)	= 510mm (Appr.)
(2) Diameter of metal bar	= 25.4mm
(3) No. Thermocouples mounted on the bar	= 6
(4) No. Thermocouples in the insulation shell	= 4
(5) Heater	
(6) Cooling jacket diameter	= 90mm
(7) No. of thermocouples for water	= 2
(8) Chromel-Alumel thermocouples	
Position 1 to 6	-on the bar
Position 7 to 10	-in the shell
Position 11 & 12	-cooling water in & out
(9) Dimmerstat for heat input	= 2 A
(10) Voltmeter	= 0 – 300 V
(11) Ammeter	= 0 – 5 A





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**EMISSIVITY MEASUREMENT**



**Basic Details: -**

**Dimensional Parameter**

- Test and Black Plates: 150 mm Dia

**Control Panel**

- Digital Voltmeter (0-230V)
- Digital Ammeter (0-2Amps)
- Wattmeter:(400W)
- Heater 400 Watt

**Thermocouples**

- K-type (Cr.Al) 3 nos., Multi-Channel Temp. Indicator



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**STEFAN BOLTZMANN APPARATUS**



**Basic Details: -**

**Dimensional Parameter**

- Hemisphere Jacket: 110 mm
- Water Jacket: 150 mm Dia

**Control Panel**

- Digital Voltmeter (0-230V)
- (Wattmeter: 400W)
- Digital Ammeter (0-2 Amps)
- Toggle ON/OFF

**Heater**

- 400 Watt
- Immersion Type

- Dimmer Controller

**Thermocouples**

- K-type (Cr.Al) 6 Nos.
- PT-100 2 No. Multi-Channel Temp. Indicator





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**NATURAL AND FORCE CONVECTION APPARATUS**



**Basic Details: -**

**Dimensional Parameter**

- Test Pipe: Brass
- Dia: 32 mm
- Length: 400 mm

**Control Panel**

- Digital Voltmeter (0-230V)
- Digital Ammeter (0-2 Amps)
- Wattmeter: 400W
- Toggle ON/OFF

**Heater**

- 400 Watt
- Immersion Type
- Dimmer Controller

**Thermocouples**

- K-type (Cr.Al) 6 Nos.
- PT-100 2 No. Multi-Channel Temp. Indicator