

Sardar Vallabhbhai Patel University of Agriculture & Technology Meerut 250110 (UP) List of Equipment's

S. No.	Name of Equipment	List of Item	Figure
S. No. 1.	Name of Equipment Emissivity Measurement Apparatus	List of ItemApparatus primarily consists of two square/circular plates of 15cm size, one coated black and other has a rough surface. Both the plates are heated from the backside using electric heater. The heat input to both the plates are controlled using two separate variacs and are measured by digital Volt meter 0-200 V l/c 0.1 V and Ammeter 0-5 A l/c 0.01 A. The temperature of the plates are measured by thermocouples1. connect with temp[Indicator 0-200°C l/c 0.1°.	Figure

e of Device





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2.	Stefan Boltzmann	The apparatus consists of a water-heated jacket of hemispherical shape. A copper "Test Disk"	
	Apparatus	is fitted at the center of the bottom portion of the hemisphere.	
		A water level indicator is used to ensure that the water level is sufficiently high over the top	
		of the hemispherical dome.	
		A digital stopwatch is used to measure the temperature, Temp	
		1. Indicator $0-200^{\circ}$ C, $1/c$ 0.1° copper content type	-
			-
			- /
			100
		2.	•





3.	Steady State & Non Steady	The apparatus consists of a solid brass rod of 31.7 mm diameter and length 300.0 mm. One	
	State Heat Transfer (To	end of the rod is fitted with a copper flange An electric heater is attached to this end of rod.	
	measure Thermal	The other end opens to a cooling water chamber through which cooling water at a	
	Conductivity of Metal Bar)	controlled rate is passed.	
		Four thermocouples (No.1 to 4) are also inserted up to the central line of the solid brass rod to	
		measure the axial temperature.	
		Two thermocouples are also pasted over the insulated portion with Digital Temp In/dicator	
		0-200 degree/c 0.1 copper contant vtpe	
		digital voltmeter 0-200 V $1/c$ 0.1 V and ammeter 0-5 A $1/c$ 0.01 A	
		digital volumeter 0-200 v l/e 0.1 v, and animeter 0-5 A l/e 0.01 A.	
4.	Natural Convection	A G.I. tube of 42mm outer diameter is electrically heated.	
	Apparatus	The surface temperature of the tube is measured at 5 different points using thermocouples to its	
		surface.	
		The energy input to the heater is controlled by a variac and is measured by ammeter and	
		voltmeter The tube is placed vertically Digital Temp Indicator 0-200 degree 1/c 0.1 copper	
		content type	
		digital voltmeter 0-200 V $1/c$ 0.1 V and ammeter 0-5 A $1/c$ 0.01 A	
	1		





5.	Lagged Pipe Apparatus	Consists of three electrically heated pipes with different thicknesses of insulation. For each tube electric power to the heated tubes is fed through a variac and is measured using three different ammeters. Digital Temp Indicator 0-200 degree/c 0.1, copper content type, digital voltmeter 0-200 V l/c 0.1 V, and ammeter 0-5 A l/c 0.01 A.	
6.	Composite Wall Apparatus	The apparatus consists of a three wall of different materials (MILD STEEL, ASBESTOS, WOOD). The composite sections are pressed together with the help of clamps. Thermocouples Copper content type are placed at the central line of each junction faces to measure its temperature with digital Temp Indicator 0-200 degree/c 0.1, copper content type, digital voltmeter 0-200 V l/c 0.1 V, and ammeter 0-5 A l/c 0.01 A.	





7.	Forced Convection Apparatus	It consists of an air blower, an air duct and a brass heating tube fitted in vertical orientation. The brass tube is heated by an electric heater embeded inside it. The energy input to the heater is controlled by a variac and is measured by ammeter and voltmeter. The tube is placed vertically. Digital Temp Indicator 0-200 degree/c 0.1, copper content type, digital voltmeter 0-200 V l/c 0.1 V, and ammeter 0-5 A l/c 0.01 A.
8.	Pin Fin Apparatus	Apparatus consists of a brass rod of 10.0 mm diameter and 150.0 mm long. At the base of the brass rod, a brass flange of The flange is heated by an electrical heater controlled by a variac. Six Thermocouples copper content type, digital Temp Indicator 0-200 degree/c 0.1, copper content type, digital voltmeter 0-200 V l/c 0.1 V, and ammeter 0-5 A l/c 0.01 A.





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9.	Multi Heat Exchanger with	In an Apparatus hot water is generated in the hot water tank using an electric heater. The hot	1
	Data Acquisition	water is then pumped to the inner tube using a centrifugal pump and is metered using a	1
		rotameter. Hot water flow rate is controlled by valve.	1
		Air is supplied by the help of a blower in perpendicular direction of hot water flow and measure	1
		the flow rate of air using the turbine type anemometer.	1
		The temperature of the hot water inlet and outlet and air inlet and air	1
		outlet are measured by thermocouples PT 100 type	1
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10.	Parallel Flow & Counter Flow	In an Apparatus hot water is generated in the hot water tank using an electric heater. The hot	
	Heat Exchanger	water is then pumped to the inner tube using a centrifugal pump and is metered using a	1
		rotameter.	1
		Four RTDs (Resistance Temperature Detector) are used to measure the inlet and outlet	1
		temperatures of cooling as well as hot water	1
		streams.	1
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