

Department of Chemistry



UV Chamber



Conductometer

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Weighing Balance



Distillation Plant

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Colorimeter



Magnetic Stirrer with Heater

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Heating Oven

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Colorimeter



Digital Potentiometer

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Digital Potentiometer

DEPARTMENT OF BOTANY



Laminar Air-flow Hood

The principle of laminar flow cabinet is **based on the laminar flow of air through the cabinet**. The device works by the use of inwards flow of air through one or more HEPA filters to create a particulate-free environment.



Dissecting Microscope

The working principle of the dissection Microscope **depends on the two types of light paths used by the microscope's objectives and eyepiece**. Each light path provides a

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different angle of viewing. They have the top light which is used while dissecting and the bottom light that is used to view the images.



Compound Microscope

The compound microscopes work on the principle that when a tiny specimen to be magnified is placed just beyond the focus of its objective lens, a virtual, inverted and highly magnified image of the object is formed at the least distance of distinct vision from the eye held close to the eyepiece.



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Digital Microscope

Principle of a Digital Microscope

Using installed software, the image from the specimen is captured that can be seen on the computer monitor screen. Depending on the software, the visualized images can be captured as still or motion videos, they can be recorded, edited, cropped, labeled, and saved.



Water Distillation Unit

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During distillation, water is boiled in a boiling chamber until it evaporates into steam. This steam is then captured and condensed into a clean container. The majority of inorganic compounds and non-volatile molecules are unable to evaporate with water, and end up left behind in the boiling chamber.

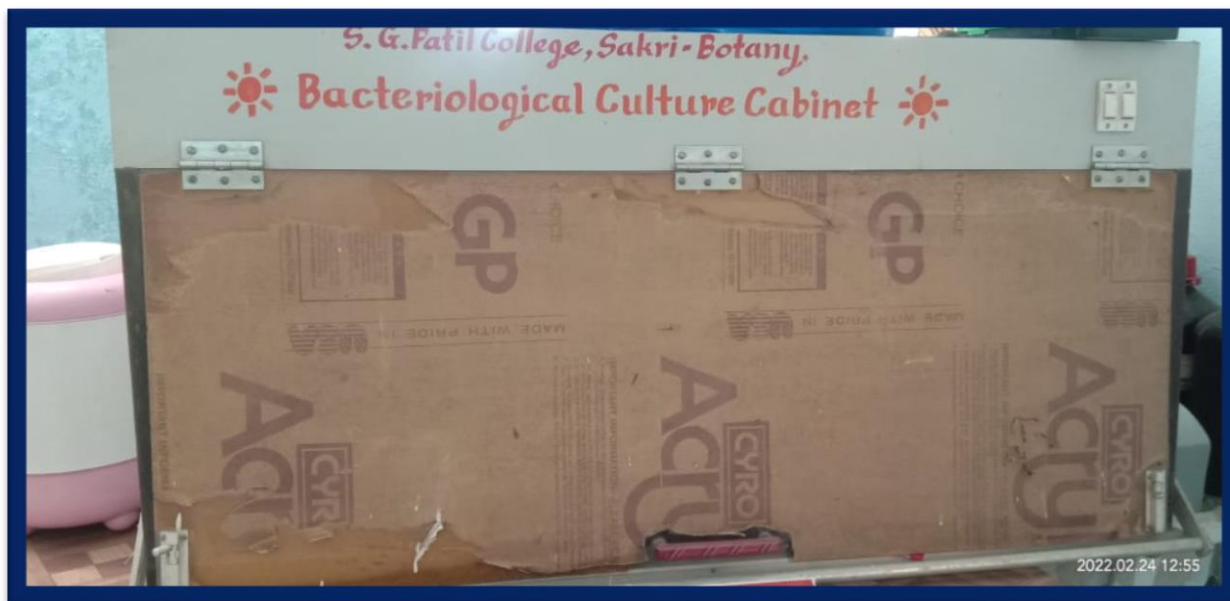


Permanent Slide chamber



Harbarium Rack

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Bacteriological Culture Cabinet

A biosafety cabinet (BSC) is a primary containment device used with biological material. While handling biological agents, it is the biological equivalent of using hazardous chemicals inside a fume hood. Like a chemical fume hood, a biosafety cabinet **protects the user from hazardous material using directional air flow.**



Weighing balance

The working method of weighing cells is based on the principle of **Electro Magnetic Force Restoration (EMFR)**. The basic principle is much comparable to a simple beam balance. The result is that coil attached to the other side and tries to move out of the magnetic field of the object.

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Autoclave

An autoclave is a device that works on the principle of **moist heat sterilisation**, wherein saturated steam is generated under pressure in order to kill microorganisms such as bacteria, viruses, and even heat-resistant endospores from various types of instruments.

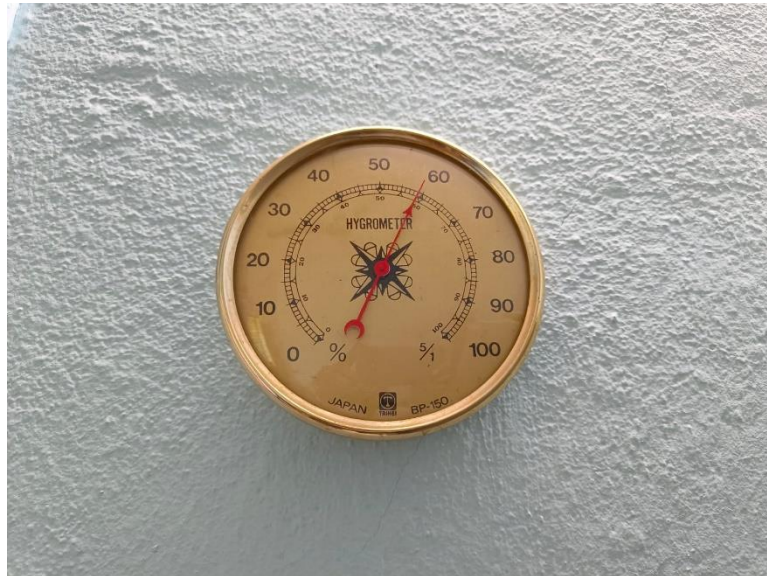


Wet Bulb Dry Bulb Thermometer

A dry thermometer has the bulb exposed to air. A wet thermometer has the bulb covered with a muslin cloth which is dipped in water. It is used to measure the relative humidity of

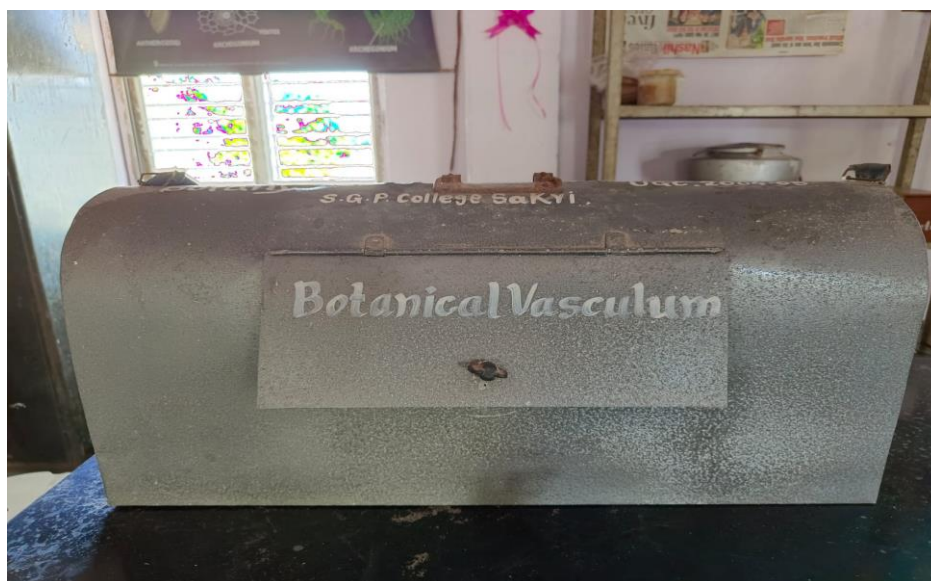
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temperature. When air is saturated, evaporation stops and the two bulbs show the same reading.



Hair Hygrometer

Hair hygrometer is a type of absorption hygrometer, which works on the principle that, **“change in moisture content causes change in physical and chemical properties of certain materials”**, such as, human hair, animal membrane, wood, paper etc.



Botanical Vasculum

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A vasculum or a botanical box is a stiff container used by botanists to keep field samples viable for transportation. The main purpose of the vasculum is **to transport plants without crushing them and by maintaining a cool, humid environment.**



Maximum and Minimum Thermometer

Maximum and Minimum thermometer is a U shaped parallel tube made up of glass. **One side registers the maximum temperature and the other side records the minimum temperature.** The bend at the bottom of the thermometer contains mercury which moves up or down based on the expansion and contraction of alcohol.



Cup – Anemometer.

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Information about the cup anemometer

The measuring principle is simple: **the stronger the wind blows, the faster the half-open plastic cups turn.** The speed of the cross rotation determines the wind speed.



centrifuge

centrifuge works by using the principle of sedimentation: **Under the influence of gravitational force (g-force), substances separate according to their density.** Different types of separation are known, including isopycnic, ultrafiltration, density gradient, phase separation, and pelleting.



Laboratory Heating Mantle

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Heating mantles **produce energy by converting AC voltage**. Intense energy is consumed to generate a high degree of required heat. This can result in blowing of the socket or melting of the fuse. For this reason, one should never connect the mantle directly to a wall socket, instead, a transformer can be used.



Hot plate

A hot plate **produces heat by using electricity**, instead of traditional means of producing heat by using fire. How it does this is by running electricity through its heat coils. The heat coils have a relatively high level of electrical resistance.



Wet Dry Thermometer

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A dry thermometer has the bulb exposed to air. A wet thermometer has the bulb covered with a muslin cloth which is dipped in water. It is used to measure the relative humidity of temperature. **When air is saturated, evaporation stops and the two bulbs show the same reading.**

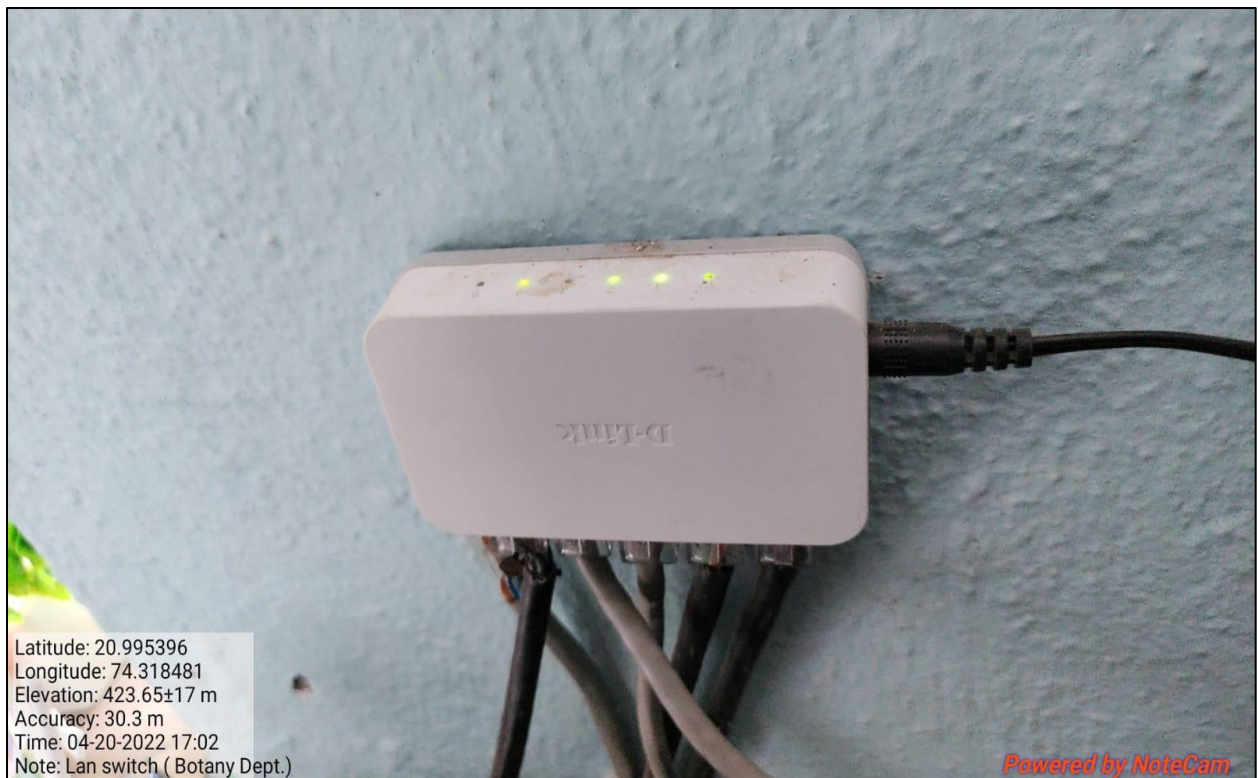
Internet Facilities



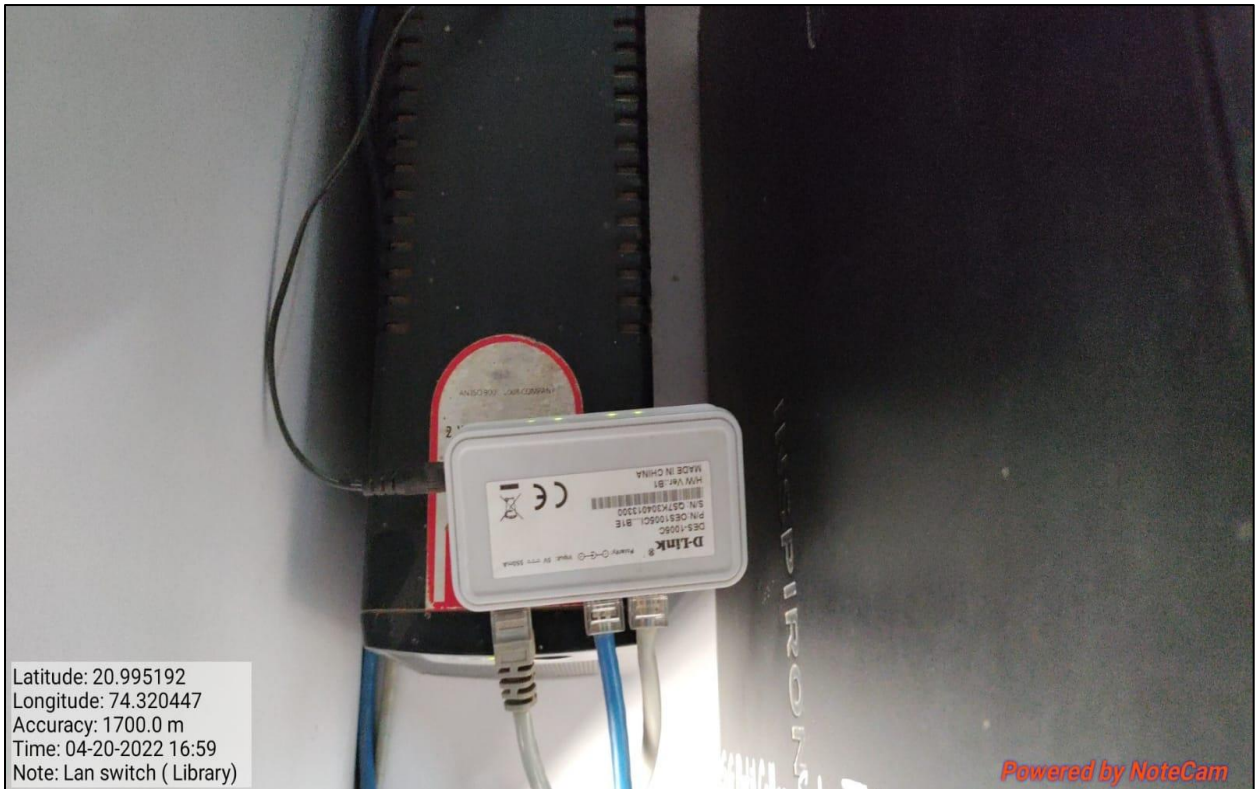
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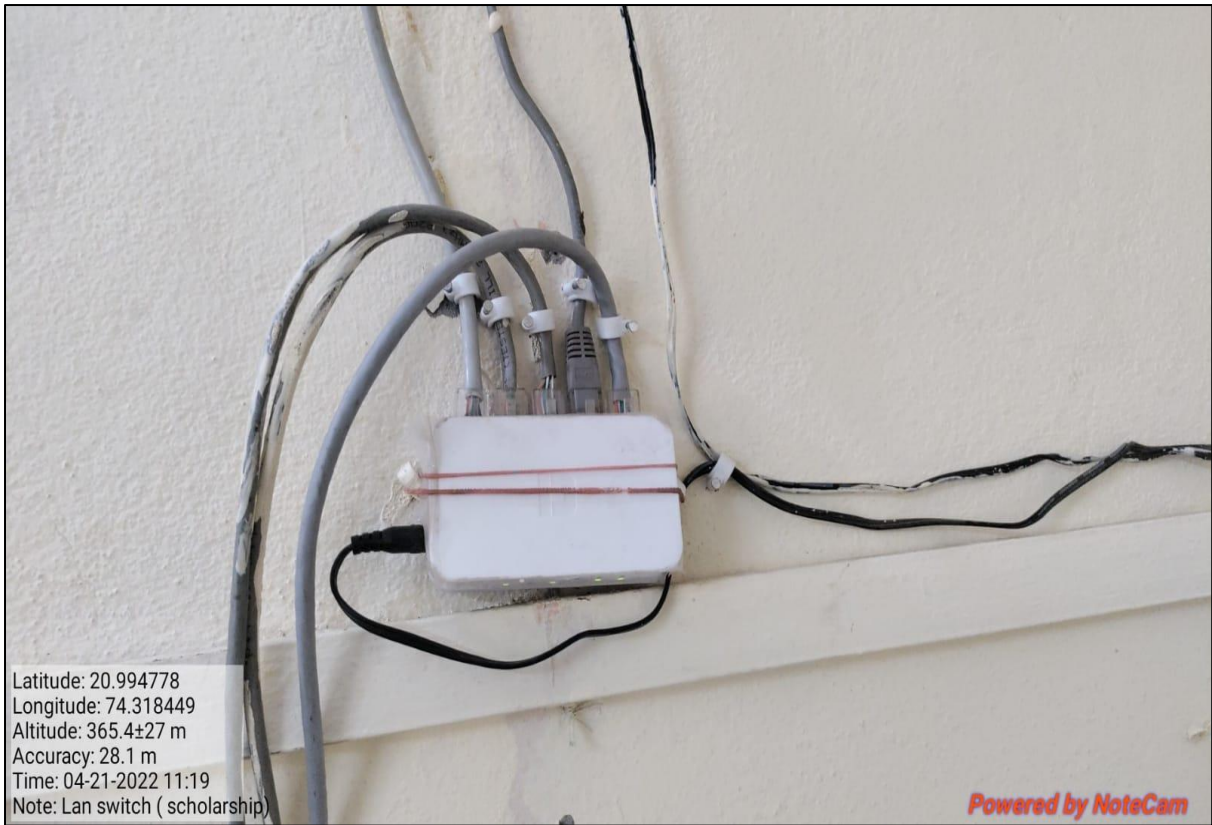
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❖ UV-VIS Spectrophotometer (JASCO V-600 Series)



Features

UV-Vis spectrophotometer has the scanning range of 250 to 1100 nm. It can measure the solid samples like thin films on transparent substrates or liquid samples in quartz cuvettes. It can measure the absorption and transmittance of the prepared samples. In case of thin films, the build in software also helps to determine the thickness of the deposited materials if the material is optically sensitive.

❖ Gas Sensing Apparatus

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Specifications

| | |
|--------------------------|------------------------|
| Usage/Application | Laboratory |
| Brand | Prism |
| Automation Grade | Semi-Automatic |
| Weight | 12 kg |
| Accuracy | 0.2% |
| Voltage | 220 V |
| Frequency | 50 Hz |
| Pressure | 4.2 kg/cm ² |

❖ Twelve Holes Rectangular-Thermostatic Water Bath

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Specifications

| | |
|--------------------------|--|
| Brand : | Bio Technics India |
| Sub-Type : | Rectangular-Thermostatic |
| Number of Holes : | 12 |
| Temperature : | 5°C Above Ambient to 99°C |
| Rating (Watt) : | 1500W |
| Type of Product : | Water Bath |
| Material : | Outer Mild Steel & Inner Stainless Steel |
| Chamber Size : | 40x30x10 cm |
| Model No : | BTI-57 |

- ❖ A water bath is laboratory equipment made from a container filled with heated water.
- ❖ It is used to incubate samples in water at a constant temperature over a long period of time.
 - ❖ An analogue interface to allow users to set a desired temperature.
- ❖ It is also used to enable certain chemical reactions to occur at high temperature.
- ❖ For all water baths, it can be used up to 99 °C. When temperature is above 100 °C, alternative methods such as oil bath, silicone bath or sand bath may be used.

❖ BTI-36 Muffle Furnace(1130°C) Digital Temperature Controlled



Specifications

- ❖ Insulation: Special type ceramic Insulation between body for Insulation.
 - ❖ Coil: Kanthal A1 swaden make coil for long lasting.
 - ❖ Temp Range: 400 C to max 1150C.
 - ❖ Accuracy: +/- 3 deg.
- ❖ Temp Controlled by: PID Dual display to view set & current temp.
 - ❖ Safety: Special type thermocouple fuses to protect overheating.
 - ❖ Sensor: 'K' type calibrated sensor.

❖ **Bio Technics India Ultrasonic Cleaner, Model Number: Bti-48**

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Specifications

| | |
|------------------------|------------------------------------|
| Brand : | Bio Technics India |
| Model Number : | BTI-48 |
| Timer : | 15 minutes digital countdown timer |
| Tank Capacity : | 1.5 litres |
| Display Type : | LED |

Features

- ❖ SMPS power source ensures an amazing > 90 % efficiency, compared to 60 % of Conventional linear source.
- ❖ 50 % of the weight and size of conventional machines.
- ❖ Energy saving, faster cleaning, higher reliability.

❖ Magnetic Stirrer



SALIENT FEATURES

- PMDC motor for higher torque even at low speeds
- Better speed regulation even with small volume and low speeds
- Accurate stepless speed control maintains excellent speed stability.
 - Analog Speed Indicator for stirring speed.
 - Totally enclosed unit.
- Designed for use even in corrosive atmosphere.

❖ Glass Distillation

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Specifications

| | |
|-----------------------------------|--|
| Conductivity(using raw water) | 3.0 - 4.0 X 10 ⁻⁶ S/cm |
| Conductivity(using treated water) | 1.5 - 2.0 X 10 ⁻⁶ S/cm |
| PH | 6.0 - 6.5 |
| Distillate Quality | Pyrogen free |
| Electrical Power | 220/240 Volts, 50 - 60 Hz, Single Phase, 3 KW Heater |

Features

- Abundant Output: Optics still provides 4 lit/hr of distilled water produced through a power input of 3 KW by a chromium plated heater housed in a horizontal borosilicate glass boiler.
- Efficient Boiler & Condenser: The Boiler and Condenser are designed for high efficiency and provided with threading for easy plumbing of condenser. Temperature of distillate 25-40 °C.
- Heater Thermostatically Protected: Heater is a 3 KW Chromium plated heater fitted with a thermostat which shuts off automatically in case of water supply failure.
- Powder coated stand: The stand is zinc plated & powder coated for long rust free operation.

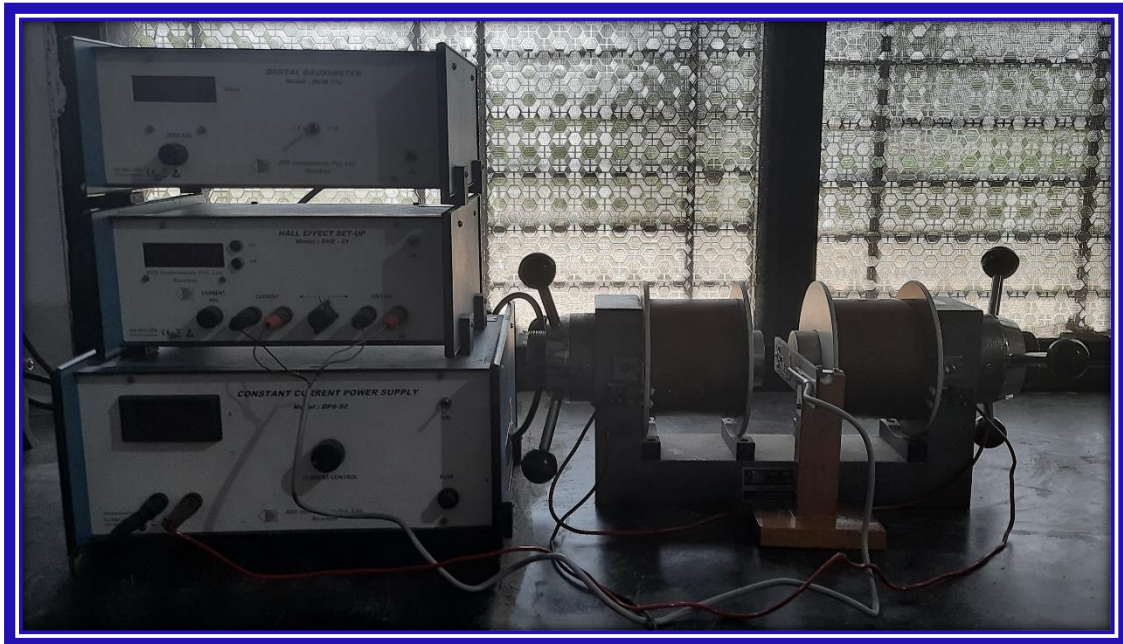
❖ Diamond Cutter and Plier



Features

A versatile diamond cutter is used to cut the glass or silicon substrate as per our laboratory requirement. This particular diamond cutter can cut the glass smoothly of thickness varies from 1 mm to 12 mm. it has diamond coated wheel. The scale on the long aluminium bar help us to cut the glass with appropriate size.

❖ Hall Effect Setup



Features

This is simple experimental setup of Hall-effect to measure the carrier concentration of semiconductor crystals like germanium (Ge) and silicon (Si). We measure the Hall current and Hall voltage by applying different magnetic fields and also we measure the Hall current at constant magnetic field while changing the Hall voltage.

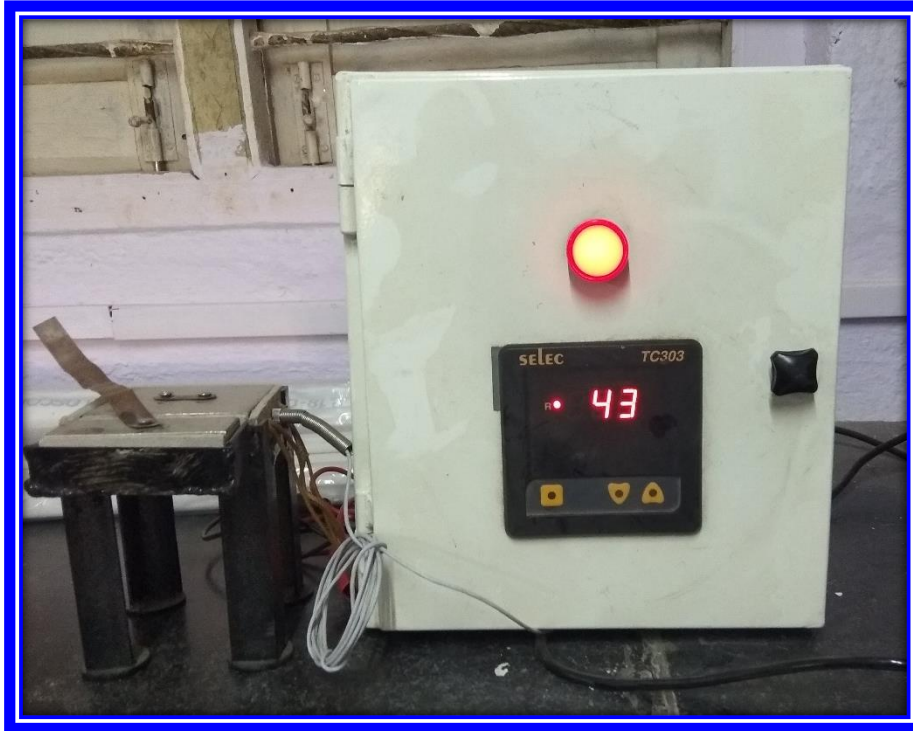
❖ Four Probe Setup



Features

The Four Probe Method is one of the standard and most widely used method for the measurement of resistivity. In its useful form, the four probes are collinear. The error due to contact resistance, which is significant in the electrical measurement on semiconductors, is avoided by the use of two extra contacts (probes) between the current contacts. In this arrangement the contact resistance may all be high compared to the sample resistance, but as long as the resistance of the sample and contact resistance's are small compared with the effective resistance of the voltage measuring device (potentiometer, electrometer or electronic voltmeter), the measured value will remain unaffected. Because of pressure contacts, the arrangement is also especially useful for quick measurement on different samples or sampling different parts of the sample.

❖ Two-Probe Apparatus



Features

Two probe method is used to measure the electrical resistivity of highly resistive materials particularly the materials deposited on glass substrate in thin film form. The temperature range is vary from 25 to 350 oC. We used the pico-ammeter to measure the current so it is possible to note very small increment in current with respect to the temperature provided to the material.