



UGC RECOGNIZED

PDEU PANDIT
DEENDAYAL
ENERGY
UNIVERSITY

Formerly Pandit Deendayal Petroleum University (PDPU)



SCHOOL OF ENERGY TECHNOLOGY

Department of Chemical Engineering

Name of Laboratory : Research Equipments Lab

www.pdeu.ac.in

NAME OF EQUIPMENT :

Orbital shaker

TECHNICAL SPECIFICATIONS :

- CIS-18Plus, Make- Remi
- Operational Ranges-20-300rpm
- Temperature- $50^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$
- Display Resolution- 0.1°C
- Microprocessor controller with large LCD screen for temperature and shaking speed with timing function



NAME OF EQUIPMENT :

Viscosity bath

TECHNICAL SPECIFICATIONS :

- **Temperature Range:** Ambient to 100 °C
- **Temperature Accuracy:** About ± 0.1 °C for precise viscosity testing.
- **Temperature Controller:** Digital PID temperature controller with display.
- **Standards Supported:** Suitable for ASTM D445, ASTM D446, IP-71 viscosity tests.
- **Power Supply:** 220–240 V AC, 50 Hz.



NAME OF EQUIPMENT :

Haake Viscometer IQ Rheometer

TECHNICAL SPECIFICATIONS :

- **Torque Range:** 0.2 mNm to 100 mNm (with 0.01 mNm resolution).
- **Speed Range (Rotation):** 0.01 rpm to 1,500 rpm (0.001 rad/s – 157 rad/s).
- **Oscillation Frequency Range:** 0.1 to 20 Hz.
- **Viscosity Range (Rotation):** 0.001 Pa s to 600000Pa s.
- **Temperature Control:** Peltier (to) or liquid-controlled (up to) modules.
- **Weight:**18 kg
- **Power supply Auto switch:** 100-240 VAC, 50/60 Hz.



NAME OF EQUIPMENT :

Density Meter

TECHNICAL SPECIFICATIONS :

- **Measuring range:** 0 to 3 g/cm³
- **Repeatability density (s. d.)^a:** 0.00001 g/cm³
- **Repeatability temperature (s. d.):** 0.01 °C
- **Measuring time:** approx. 30 sec
- **Measuring temperature:** 0 °C to 100 °C (32 to 212 °F)
- **Pressure range:** up to 10 bar (145 psi) absolute
- **Sample volume:** approx. 1 mL



NAME OF EQUIPMENT :

Auto Titrator

TECHNICAL SPECIFICATIONS :

- **Temperature Range:** -5.0 to 50 °C
- **Burette Sizes:** 50 mL
- **Power Requirements:** 100 to 240 V, 50/60 Hz
- **Dimensions:** L 25.4 cm x W 40.6 cm x H 35.6 cm
- **Weight:** 5.67 kg
- **PH Range:** -2.000 to 20.000 PH



NAME OF EQUIPMENT :
Surface tension

TECHNICAL SPECIFICATIONS :

- **Measuring Range: Surface/interfacial tension:**1-1000 mN/m
- **Resolution:** 0.01 mN/m
- **Accuracy:** 0.2 mN/m
- **Calibration Method:** By external calibration weights
- **Sample Stage Operation:**
- **Speed:** 0.004-5.0 mm/s (software-controlled)
- **Stroke:** 48 mm
- **External Dimensions (WxDxH):** 255 x 309 x 369 mm
- **Weight:** Approximately 12.5 kg
- **Electrical Power:**
- **Voltage:** AC 100-240 V
- **Frequency:** 50/60 Hz
- **Power Consumption:** 35 W / 75 VA
- **Operating Environment:**
- **Temperature:** +10°C to +35°C
- **Humidity:** 30-80% RH (non-condensing)



NAME OF EQUIPMENT :
Refrigerated Centrifuge

TECHNICAL SPECIFICATIONS :

- **Temperature range:** up to (- 8 °C)
- **Power Supply:**220 V, 50Hz, 10AC
- **Operating speed Max:** 20000rpm
- Acceleration and Deceleration profiles with Preloaded Program
- Safety lid interlock to prevent LID opening during centrifugation



NAME OF EQUIPMENT :

Hollow fiber Membrane Casting Machine

TECHNICAL SPECIFICATIONS :

- **SPINNERET:**
- MOC-SS-304
- Size-1.4mmOD×0.8mmID
- **NEEDLE VALVE FOR BORE FLUID:**
- MOC-SS-304
- Size 1/4" BSP
- **DOPE VESSEL:**
- MOC-SS-304
- Capacity- 300ml
- **PRESSURE GAUGE:**
- MOC-SS-304
- Range-0-2.5Ba
- **CONTAINER BORE FLUID STORAGE:**
- MOC-SS-304
- Capacity-300ml



NAME OF EQUIPMENT :
Programmable – Tube furnace

TECHNICAL SPECIFICATIONS :

- **Input Power:** Single phase 5.52 Kw
- **Temperature range:** Ambient to 1100 °C.
- **Length of tube:**100 cm
- **Tube Dia:**75 mm



NAME OF EQUIPMENT :

Partical size Analyzer

TECHNICAL SPECIFICATIONS :

- **Particle size:**Suspensions, emulsions, dry powders
- **Technology:**Laser light scattering
- **Analysis method:** Mie and Fraunhofer scattering
- **Data acquisition rate:**10 kHz
- **Typical measurement time:**<10 sec
- **Dimensions (W, D, H):**690mm x 300mm x 450mm
- **Weight:**30 kg
- **Red light source:** Max. 4mW He-Ne, 632.8nm
- **Angular range:**0.032 - 60 degrees
- **Particle size:-** 1000 μm
- **Number of size classes:**100 (user adjustable)
- **Power:**100/240 v, 50/60 Hz 50W (no dispersion units connected) 200W maximum (2 dispersion units connected)
- **Operating temperature ($^{\circ}\text{C}$):**+5 $^{\circ}\text{C}$ to +40 $^{\circ}\text{C}$
- **Product storage temperature:**-20 $^{\circ}\text{C}$ to +50 $^{\circ}\text{C}$



NAME OF EQUIPMENT : Contact Angle

TECHNICAL SPECIFICATIONS :

- Contact Angle measurement 0° - 180° with an Accuracy of $\pm 0.05^{\circ}$
- High Speed USB connectivity
- Horizontal Camera Assembly with Integrated Fine Focus
- High Performance C-Mount CCD with Infra-red Cut Filter
- Aberration Corrected High Magnification Lens
- **Max Frame rate** : 200 fps
- **Max Image resolution** : 1280 X 1024 Pixels
- **Magnification** : 5X (10X optional)
- **LED based Lighting with Hysteresis Free Illumination**
- **Software controlled illumination** : Available
- **Substrate Stage Dimension [L X W (in mm)]** : 150 X 100
- **Substrate Stage Z-axis Movement** : Up to 40mm



NAME OF EQUIPMENT :

Photo Chemical Reactor set up

TECHNICAL SPECIFICATIONS :

- Multi-port, Quartz reactor vessel
- Timer Automated 300 W UV & Vis light source
- Magnetic stirrer with stirring beads
- UV protector metallic cabinet
- Provision for cooling water jacket



NAME OF EQUIPMENT :
Ultrasonicator

TECHNICAL SPECIFICATIONS :

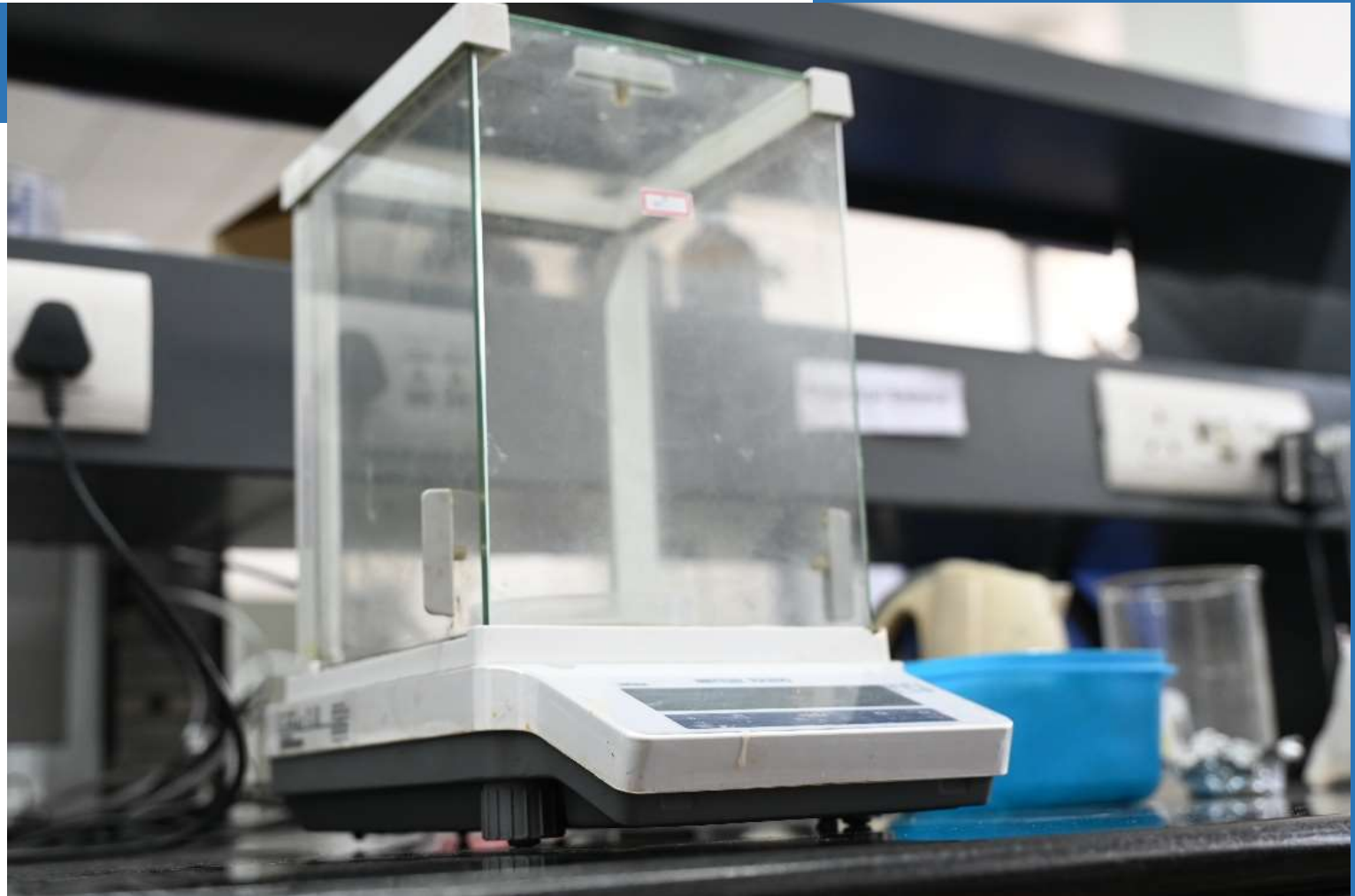
- **Input Voltage:** 230 VAC
- **Power Consumption:** 100 W
- **Capacity (Tank Volume):** 4.5 L
- **Ultrasonic Frequency:** 33 kHz



NAME OF EQUIPMENT :
Analytical Balance

TECHNICAL SPECIFICATIONS :

- **Max :** 220 g
- **D :** 0.1 g
- **Power :** 12V , 0.84 A



NAME OF EQUIPMENT :
Thermogravimetric Analysis

TECHNICAL SPECIFICATIONS :

- **Temperature Range:** room temperature to 1000 °C or higher.
- **Heating Rate:** Adjustable heating rate, normally 1–50 °C per minute.
- **Sample Size:** Small sample required, 5–20 mg.
- **Atmosphere Control:** Can operate
- **Weight Measurement:** High-precision microbalance to detect very small weight changes.
- **Output Data:** Produces a TGA curve (weight vs temperature)



NAME OF EQUIPMENT :
UV-spectrophotometer

TECHNICAL SPECIFICATIONS :

- **Wavelength:**190-1100 nm
- **Range:** ± 0.5 nm , ± 0.8 nm
- **Scanning speed:**<1 to 6000 nm/min;
variable
- **Range:**>3.5 A
- **Drift (Stability):** <0.0005 A/hr
- 500 nm, 1.0 nm SBW, 1 hour warm-up
- **Dimensions (W x D x H):**62.2 x 48.6 x
27.9 cm (24" x 19" x 11")
- **Weight:**14.4 kg (32 lb)
- **Electrical supply:**100-240 V, 50-60 Hz,
selected automatically 150 W
maximum



NAME OF EQUIPMENT :

Gas Chromatography-Mass Spectrometry (GC-MS)

TECHNICAL SPECIFICATIONS :

- Ion gauge controller
- **Ionization mode** - Electron Ionization (EI) / Chemical Ionization (CI)
- **Detector** - Flame ionization Detector (FID) and Thermal conductivity detector (TCD), mass detectors (MD)
- **Columns**-suitable for Packed and Capillary columns
- NIST Ms library and RTL database EI library of common solvents
- **Includes :**
- Gas filter with Gas purifiers, gas cylinders
- UPS-1Hr back up



NAME OF EQUIPMENT :
Hot air Oven

TECHNICAL SPECIFICATIONS :

- **Temperature Range:** 40°C to 200°C
- Air circulation Facility
- **Rating:** 750W



NAME OF EQUIPMENT :
Vacuum Oven

TECHNICAL SPECIFICATIONS :

- Temperature Range: Ambient to 200°C
- No. of trays: 03 Nos.
- Doubled wall construction



NAME OF EQUIPMENT :
Digital v Rotary evaporator

TECHNICAL SPECIFICATIONS :

- 4-liter heating bath
- Universal water/oil heating bath
- Vertical glassware
- Motorized lift with "safety-stop" function
- RS 232 and IR interface
- Optimized heating bath volume for fast heat-up
- Highly efficient 1500 cm² condenser unit
- Rugged design
- Ergonomically placed handles on Heating bath
- Smooth start
- Left-right interval
- Timer function
- Dry-run protection
- Safety temperature circuits
- Lower-end stop
- Choice of coated glassware
- Push-off mechanism to loosen tight fitted glassware
- Easy and safe operation due to ergonomical design of the user interface

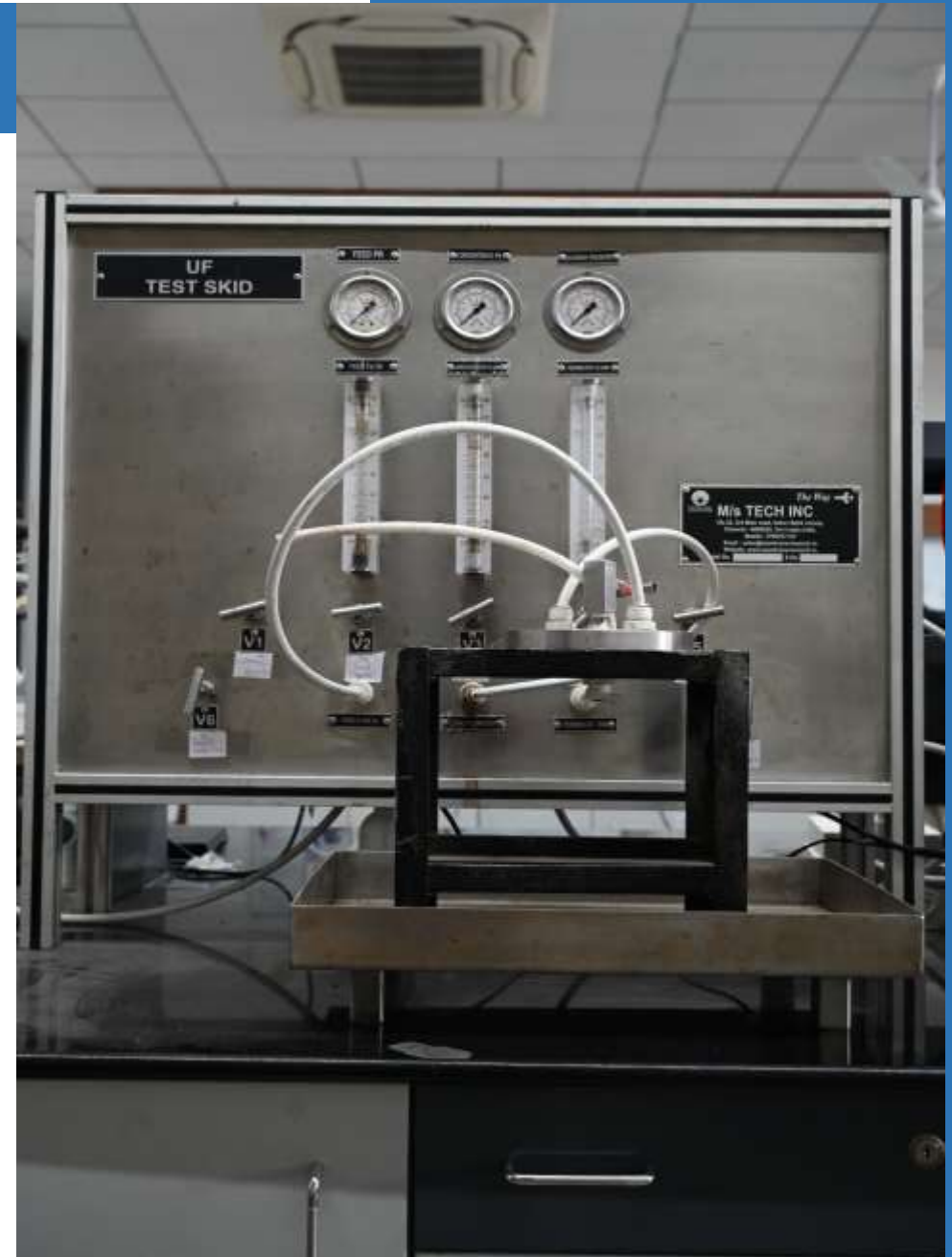


NAME OF EQUIPMENT :

UF- Test Skid

TECHNICAL SPECIFICATIONS :

- The Lab-Scale Ultrafiltration (UF) Test Skid is a compact and efficient system designed for membrane research, testing, and small-scale process validation.
- **Compact Skid-Mounted Design** – Space-saving setup suitable for laboratories.
- **Flexible Membrane Compatibility** – Supports hollow fiber, flat sheet, and tubular UF membranes.
- **Precision Monitoring** – Equipped with flow meters, pressure gauges, and temperature sensors.
- **Manual & Automated Operation** – Available with PLC or touchscreen controls.
- **Customizable Configuration** – Tailored to specific feedwater quality and research needs.
- **Optional Data Logging** – Integration with DAQ systems for real-time performance monitoring.



NAME OF EQUIPMENT :

Membrane Tensile Strength Test

TECHNICAL SPECIFICATIONS :

- Membranes Hollow Fibres are thin by design and the typical sizes are in the range of 0.2mm to 1mm ID/ 0.3mm to 2mm OD.
- **The instrument includes facilities for**
- Hold the fibres between the ends
- Varying load to fibre ends
- Stretching of fibres to varying loads
- Dynamic measuring of stretch to varying load
- Dynamic plotting of stretch to load
- Continuous Data Acquisition of the above
- Transferrable to Laptop/ Desktop

