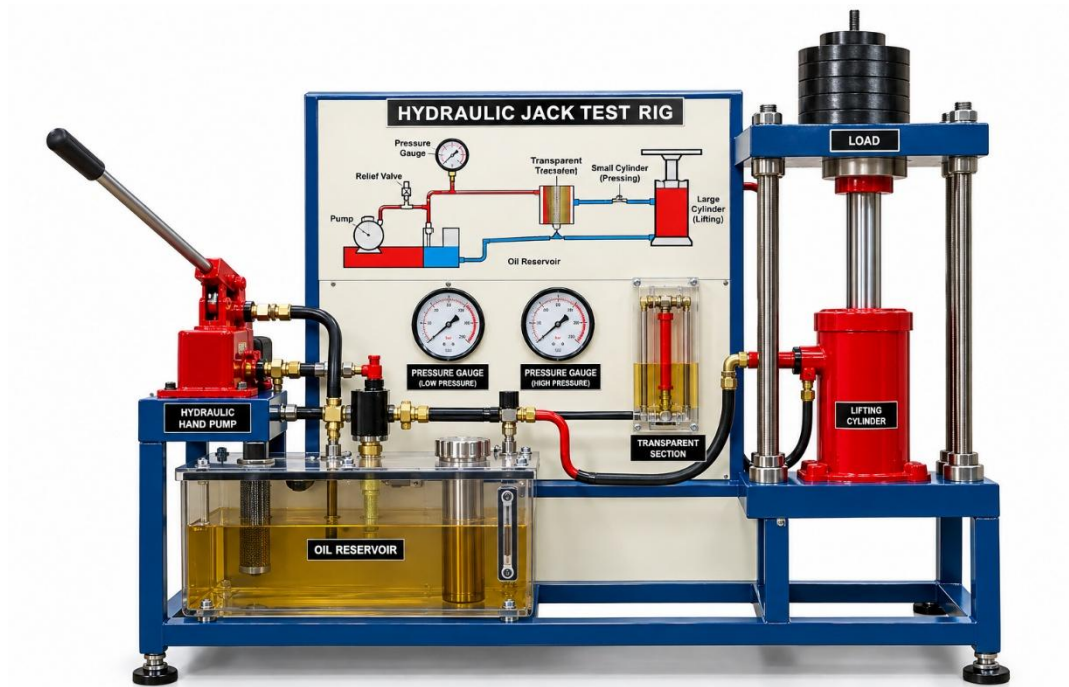


HYDRAULIC LIFTING MACHINE APPRATUS

Make: Hansa, Model: FM-020, Origin: India



Complete demonstrative setup including hydraulic jack, pressure gauge (Bourdon type), loading arrangement, oil reservoir, and transparent section for visualization. Experimental Capabilities: Verification of Pascal's law Determination of mechanical advantage (MA), velocity ratio (VR), and efficiency Study of load–pressure relationship Observation of pressure transmission in hydraulic systems Performance analysis under varying loads Demonstration of practical applications of hydraulic lifting systems

SPECIFIC GRAVITY APPRATUS

Make: Hansa, Model: FM-02, Origin: India



Type: Digital Density/Specific Gravity Meter with Hydrometer setup (combined use) Measurement Range: 0.7 – 2.0 (specific gravity) Accuracy: ± 0.001 Resolution: 0.0001 Temperature Range: 0°C to 100°C Temperature Control: Water bath with digital PID controller ($\pm 0.1^\circ\text{C}$) Measurement Method: Archimedes principle / Hydrometer method Sample Container: Borosilicate glass cylinder (250/500 ml) Temperature Measurement: Digital thermometer ($\pm 0.1^\circ\text{C}$) Calibration: Standard weights / reference liquids provided Construction: SS/MS powder coated frame Corrosion-resistant components Compact and easy-to operate setup Accessories: Hydrometer set (various ranges) Thermometer and measuring cylinder Suspension wire/weight (for solid samples) Power Supply: 220–240 V, 50 Hz, single phase Features: High precision and repeatability Suitable for liquids and solids Easy calibration and maintenance Experimental Capabilities: Determination of specific gravity of liquids and solid materials for laboratory analysis

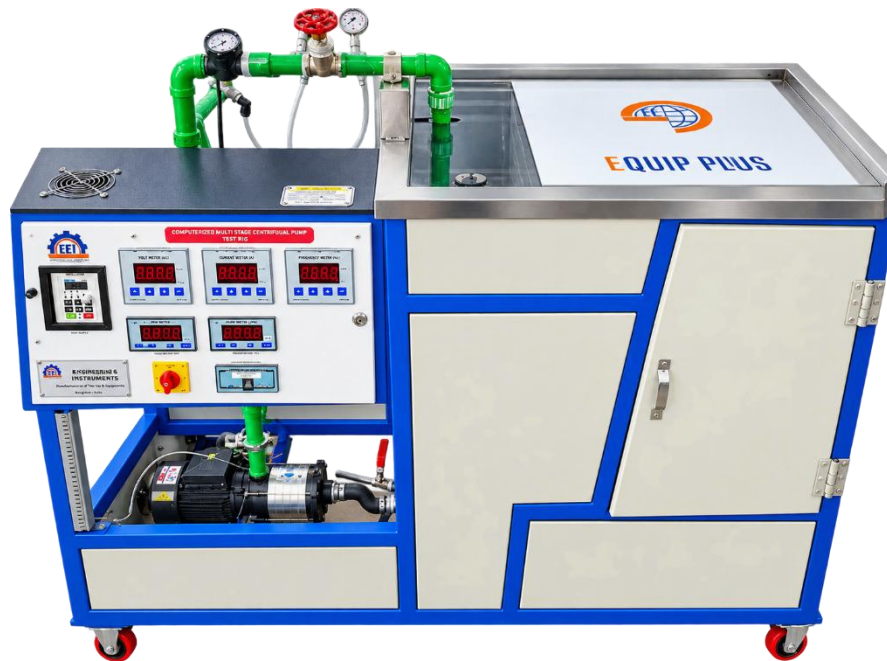
VISCOCITY APPRATUS

Make: Hansa, Model: FM-010, Origin: India



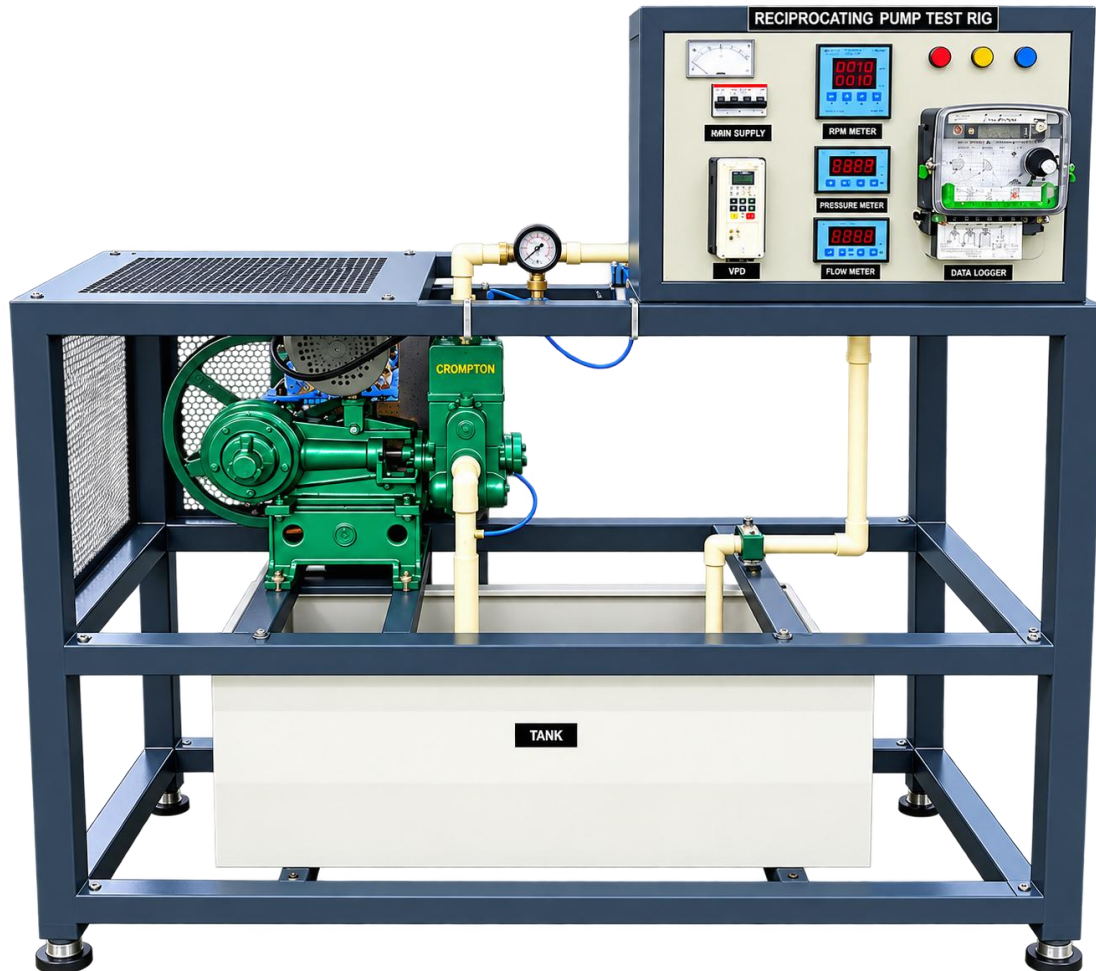
Brookfield Digital Viscometer setup with constant temperature oil bath, heating arrangement, digital thermometer, standard orifice, stopwatch, and stand. Wide Range: 1 to 1,00,000 cP (covers almost all fluids) High Accuracy: $\pm 1\%$ with repeatability $\pm 0.2\%$ Variable Speed: 0.5100 RPM for detailed analysis Digital Display: Direct viscosity reading (no manual calculation) Temperature Control: Can be used with external water bath/heating system Multi-Spindle Set: Suitable for different fluid types (low to high viscosity) Ease of Use: Fast, precise, and user-friendly Experimental Capabilities: Determination of viscosity of liquids and study of temperature–viscosity relationship

CENTRIFUGAL PUMP APPRATUS
Make: Hansa, Model: FM-015, Origin: India



Self-contained experimental setup with centrifugal pump, electric motor, suction and delivery pipes, pressure gauges, flow meter, control valves, and transparent casing for study. Pump: Single-stage centrifugal (monoblock) Motor: 0.5–2 HP, ~1440–2900 RPM Flow Rate: 10–60 LPM Head: Up to 20–40 m Measurement: Pressure & vacuum gauges, measuring tank with scale, tachometer, energy meter Tank: Sump tank (100–150 L), measuring tank (~40 L) Construction: MS powder coated frame, compact unit with wheels Safety: Overload protection, proper earthing Experimental Capabilities: Determination of discharge and total head Calculation of pump efficiency (overall, manometric) Plotting performance curves (Head vs Discharge, Efficiency vs Discharge, Power vs Discharge) Study of effect of flow rate on pump performance

RECIPROCATING PUMP APPRATUS
Make: Hansa, Model: FM-05, Origin: India



Single/double acting reciprocating pump setup with motor drive, pressure gauges, discharge tank, stroke adjustment mechanism, and flow measurement system. Pump Type: Single-cylinder reciprocating pump (single/double acting) Drive Unit: 0.5–1 kW AC/DC motor, ~1420–1500 RPM with speed control Flow Rate: Up to 20–30 LPM (approx.) Head: Up to 20–50 m (approx.) Speed: Variable (pump & motor) Pressure Measurement: Bourdon gauges (suction & delivery) Flow Measurement: Measuring tank with piezometer and scale Power Measurement: Energy meter / digital RPM indicator Tanks: Sump Tank: ~100–150 L (SS/MS with coating) Measuring Tank: ~30–50 L Structure: Compact MS powder coated frame with wheels Safety: Relief valve for overpressure protection Experimental Capabilities: Determination of volumetric efficiency Performance curve plotting (Head vs Discharge) Study of pressure vs power consumption

IMPACT OF JET APPRATUS
Make: Hansa, Model: FM-07, Origin: India



Setup with interchangeable vanes, nozzle arrangement, force measurement mechanism, water circulation system, and collection tank

Test plate: Material Brass 2 Nos (Flat plate and Curved plate)

Nozzle: material Brass Chamber: Perspex cylinder

Water circulation: 0.5 HP Pump

Flow Measurement: using measuring tank with piezometer capacity 35 liter

Sump tank: capacity 70 liter

Tank Material: MS sheet (include surface will be provided with FRP to avoid corrosion)

G.I Pipe of internal dia. 25 mm

Experimental Capabilities: Verification of momentum equation for fluid jets

Measurement of force exerted by jet on different vanes (flat, hemispherical, inclined)

Comparison of theoretical and experimental force values

Determination of jet velocity and discharge

Study of effect of vane shape on force and efficiency

Analysis of momentum change in fluid flow

16 CHANNEL SCANNER & DATA LOGGER



Multispan MS-5716U-M1 16 Channel Process Scanner & Data Logger, Multichannel data acquisition system with minimum 16 inputs, compatible with thermocouples/RTDs and pressure sensors, digital display, USB/PC interface, internal memory, and analysis software.

THERMAL CONDUCTIVITY APPRATUS
Make: Hansa, Model: HT-012, Origin: India



Apparatus for determining thermal conductivity of solid material (good conductors), equipped with heaters, thermocouples, and temperature indicators. Experimental Capabilities: Determination of thermal conductivity of solid materials (good conductors) Verification of Fourier's law of heat conduction Measurement of temperature gradient along the specimen Study of steady-state heat transfer conditions Comparison of thermal conductivities of different materials Analysis of heat flow rate through a material.

