

PILOT HYDRATION

TESTING UNIT



General Description

A flexible pilotscale unit designed to perform hydration testing of powders (e.g., cement, polymers) and fluid systems (e.g., drilling muds, slurries). Suitable for laboratory and pilot plant use.



Main Components

Reaction Vessel

- Material: 316 Stainless Steel
- Volume: 20 to 50 liters (usable)
- Design: Vertical cylindrical vessel with removable top lid
- Ports: Inlet for water addition, inlet for powder addition, sample withdrawal ports, pressure relief port
- Accessories: Sight glass, drain valve at bottom

Mixing System

- Mixer Type: Top entry motorized mixer
- Motor: Variable speed (0-1500 RPM)
- Impellers: Highshear blade impeller for fluids
- Paddle impeller for slurries and thicker mixtures
- Shaft Material: Stainless Steel 316L

Water Dosing System

- Pump Type: Peristaltic or diaphragm precision dosing pump
- Flow Rate: Adjustable between 0.1 to 5 L/min
- Manual alternative: Graduated burette with precision control valve

Temperature Control:

- Heating Jacket: Electrically heated jacket around vessel
- Control System: PID temperature controller
- Operating Range: Ambient to 90°C
- Sensor: PT100 or equivalent RTD temperature probe



Weighing System (Optional):	
Load Cell Platform: 0–50 kg range, precision ±0.05 kg Integrated under the vessel for dynamic mass measurement	
Sampling System	
Sample ports at different heights (with ball valves) Quick-connect fittings for sample bottles	
Data Logging and Control	
Parameters Monitored: Temperature, Mixing Speed (RPM), Time Optional Sensors: Viscosity meter (inline or offline), pH meter Data Storage: Local data logger or cloud integration option	
Safety Features	
Pressure Relief Valve Emergency Stop Button Splash guards around the top opening	
Performance Parameters	
Maximum Operating Pressure: Atmospheric (with optional slight positive pressure) Maximum Operating Temperature: 90°C Water Addition Precision: ±1% Mixing Speed Range: 0–1500 RPM	
Optional Addons	
Inline Viscosity Sensor Automated sampling system PLC with HMI screen for full process automation	
Power Requirements	
Electrical Supply: 220V or 110V, single phase, 50/60Hz Power Rating: Approx. 2 kW (depends on mixer motor and heater)	
Footprint and Size	
Estimated Dimensions: 0.8 m (W) x 0.8 m (D) x 1.8 m (H) Estimated Weight: ~150 kg fully assembled	
	
Documentation Provided	
User Manual Calibration Certificates (for weighing and sensors) Safety Instructions Warranty: 1 year standard	

