

## HOLLOW CYLINDER TESTING MACHINE

Code : T803



- Purpose-built for investigating soil behavior under principal stress rotation with combined axial load, confining pressure, back pressure, torque, and controlled rotation. Ideal for liquefaction studies, anisotropy assessment, non-coaxiality, and strain-path controlled research.
- Enables independent control of  $\sigma_1$ ,  $\sigma_2$ ,  $\sigma_3$  directions and magnitudes through axial force, cell/back pressure, and torsional shear supporting both static and cyclic modes with precise path following.
- Hollow specimen form reduces end restraint and facilitates uniform shear strain distribution, allowing small-strain characterization as well as large cyclic deformation programs.
- Closed-loop control in torque, rotation, axial load, or axial strain, with configurable endpoints by cycle count, strain limit, pore-pressure ratio ( $ru$ ), stress path limit, or stiffness degradation threshold.
- High-rate acquisition with synchronized channels (axial load/displacement, torque/rotation, cell and pore pressures, volume change) for real-time plots ( $\tau$ - $\gamma$ ,  $q$ - $\epsilon_a$ ,  $\Delta u$ - $N$ , stress path  $p'$ - $q$ ).
- Flexible specimen tooling for saturated and unsaturated testing workflows, with saturation aids ( $CO_2$ /de-aired water), B-value checks, and optional local strain measurement.

## **STANDARDS**

JGS 0511-2009 • JGS 0543

## **TECHNICAL SPECIFICATIONS**

- Axial load capacity: 10–300 kN (50 kN standard)
- Torque capacity: 100–400 N·m (250 N·m standard)
- Rotation range:  $\pm 20^\circ$  (typical programmable limit)
- Cyclic frequency: up to 5 Hz
- Control modes: Torque / rotation / axial load / axial strain (closed loop)
- Volume change resolution:  $\leq 0.01 \text{ cm}^3$  (with digital volume controller)
- Axial displacement range:  $\pm 25\text{--}50 \text{ mm}$  (LVDT, model-dependent)
- Rotation measurement: High-resolution encoder ( $\leq 0.001^\circ$  typical)
- Specimen size (standard): 150 mm OD / 100 mm ID; other sizes on request
- Consolidation modes: Isotropic / anisotropic /  $K_0$ ; strain-path control available
- Waveforms: Sinusoidal (standard), user-defined sequences for stress-rotation paths
- Software: Saturation & B-check, consolidation staging, cyclic scheduler, real-time charts, auto report templates
- Power: Single-phase 208–230 V, 50/60 Hz (region-dependent)
- Optional ALFA Cloud integration for secure, real-time data upload, centralized storage, and web access to results.

## **EQUIPPED WITH**

- Servo-actuated load frame with axial actuator and integrated controller
- Hollow-cylinder cell with torsional drive, upper/lower pedestals and rotation bearings
- Dual pressure/volume controllers for cell and back pressure with de-airing accessories

- Axial load cell, axial LVDT, pore pressure and cell pressure transducers, torque transducer, rotation encoder
- Cabling, tubing, porous stones, membranes, and specimen tooling for standard sizes
- PC control software with cyclic torsional and static modules, plotting and reporting

### **SUPPLIED WITH**

- Membranes, O-rings, filter papers (assorted for standard specimen size)
- Essential fittings, hoses, and quick-connects set
- Starter consumables kit for hollow specimens

### **ORDERING INFORMATION**

*To be added soon ...*