floXlab

Your supplier of high-pressure laboratory instruments

and advanced geotechnical testing equipment

HYDRATEST

Gas Hydrate Triaxial

Compression Test System

Triaxial testing of sediments containing methane hydrates under extreme low-temperature and high-pressure conditions.

ROCK MECHANICS TESTERS • GAS HYDRATE TRIAXIAL SYSTEM

What is HYDRATEST?

- Servo-controlled triaxial testing system for gas hydrate-bearing sediments
- Operates under high pressure and sub-zero (below freezing) temperatures
- Investigates mechanical properties of Methane Hydrate-Bearing Sediments (MHBS)
- Simulates in-situ conditions: temperature, pore & confining pressure, hydrate saturation
- Full hydrate formation and dissociation cycles
- Accurate measurement of Young's modulus, cohesion, internal friction angle
- Automated control and data acquisition via Floxlab proprietary software

KEY SPECIFICATIONS

100 kN

Axial Load Capacity

70 MPa

Max Confining & Pore Pressure

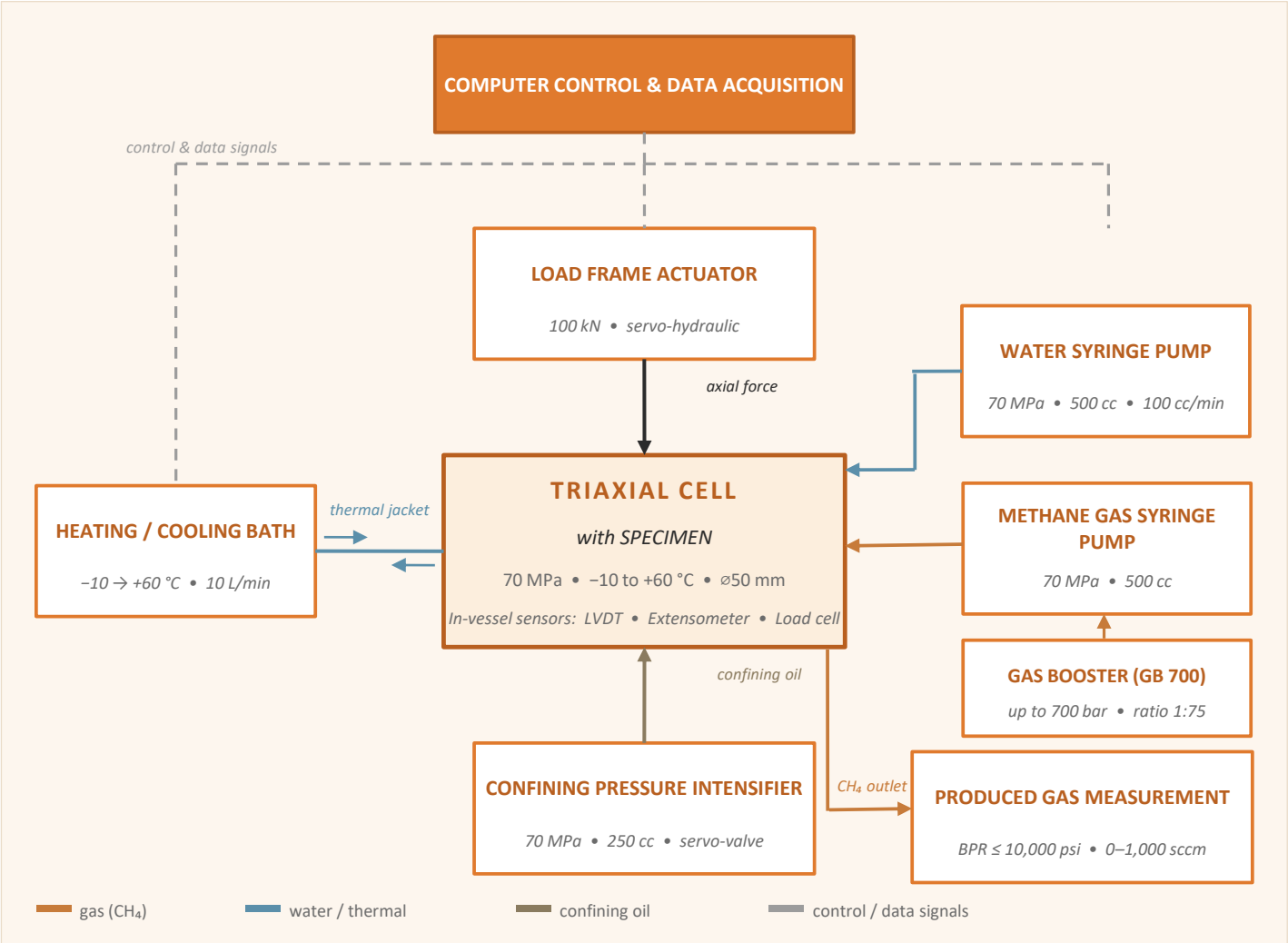
−10 → +60 °C

Operating Temperature

50 mm

Specimen Diameter

SYSTEM BLOCK DIAGRAM



TEST PRINCIPLE

1. Sand specimen initially saturated with 10% water, sealed in a Teflon sleeve
2. Placed in triaxial cell; water injected by syringe pump until target saturation
3. Methane injected at controlled flow rate under confining pressure
4. Constant pore pressure for 24 h → CH_4 dissolution in pore water
5. Temperature lowered into hydrate-stability range → MH formation
6. Axial load applied; strain, force, pore pressure recorded
7. Temperature raised → MH dissociation; released CH_4 volume measured

TESTS, RESULTS & SCOPE OF SUPPLY

TESTS PERFORMED

- Triaxial tests on gas hydrate sediment specimens
- Hydrate formation tests
- Hydrate dissociation tests
- Drained & undrained compression tests
- Creep & strength characterization of MHBS
- Controlled cooling, heating & thermal cycling

MEASURED RESULTS

- Young's modulus
- Poisson's ratio
- Mohr circle envelope
- Axial stress & strain
- Diametral strain
- Pore pressure
- Confining pressure
- Specimen temperature
- Water pressure & volume
- Produced CH_4 gas volume

Complete HYDRATEST system

Deep-sea conditions | **Cryogenic capability** | **Full automation**

SCOPE OF SUPPLY

- Servo-controlled hydraulic load frame (100 kN)
- High-pressure triaxial loading cell
- In-vessel axial & diametral deformation sensors
- In-vessel strain-gauge load cell
- Thermostatic bath with cooling / heating jacket
- Confining pressure intensifier
- Water syringe pump
- Methane gas syringe pump
- Produced gas measurement unit (BPR + flowmeter)
- Gas booster (up to 700 bar)
- Computer workstation with proprietary Floxlab software

COMPONENTS & SPECIFICATIONS

LOADING SYSTEM	
Servo-Hydraulic Load Frame	100 kN • stiffness 70 kN/mm • piston stroke 50 mm
Triaxial Cell	100 kN axial • 70 MPa • −10 to +60 °C • ⌀50 mm specimen

PRESSURE & FLUID CONTROL	
Confining Pressure Intensifier	70 MPa • accuracy 0.25% FS • 250 cc • 20-litre reservoir
Water Syringe Pump	70 MPa • 500 cc • flow 0.0001–100 cc/min
Methane Gas Syringe Pump	70 MPa • 500 cc • flow 0.0001–100 cc/min

IN-VESSEL INSTRUMENTATION	
Diametral Extensometer	range 2.5 mm • linearity 0.3% FS • −10 to +60 °C
Axial LVDT Transducer	±5 mm • linearity 0.15% FS • 3 LVDTs at 120°
Strain-Gauged Load Cell	100 kN • accuracy ±0.5% • sensitivity ≈ 2 mV/V

THERMAL & GAS MANAGEMENT	
Thermostatic Bath & Cooling Jacket	−10 to +60 °C • resolution 0.1 °C • 10 L/min • 4.5 L
Produced Gas Measurement Unit	BPR up to 10,000 psi • 0–1,000 sccm • stainless steel
Gas Booster (GB 700)	inlet 15–200 bar • outlet up to 700 bar • ratio 1:75

CONTROL & ACQUISITION	
Floxlab Proprietary Software	real-time monitoring • automated sequences • synchronized logging • standardized reports

GET IN TOUCH

We look forward to discussing your project.

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SCAN ME

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