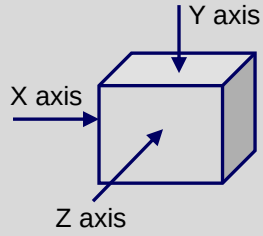
Sample Size:
- 75 x 75 x 150mm.
- Other sizes on request.

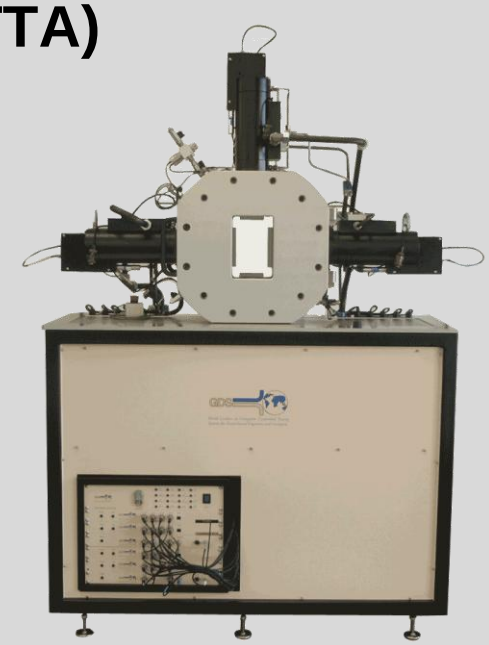
X and Y Axis control:
- 2 pairs of 28kN actuators.
- "sealless" plus hydrostatic bearings – for long life.

Z Axis control:
- 2MPa maximum stress.



Options:
- Bender elements.
- Unsaturated soil testing.
- Hydraulic actuators (available upon request).

True Triaxial Apparatus (GDSTTA)



What is it?

The GDSTTA allows independent control of stresses applied in three dimensions to a cuboidal soil sample. The ability to independently control the stresses applied in three dimensions allows the true stress-strain-strength behaviour of soil to be studied.

How does it work?

A 75mm x 75mm x 150mm specimen (either cohesive or non-cohesive) can be installed into the GDSTTA. Stress or strain can be applied to the sample in the vertical (y) and one of the horizontal directions (x) using two pairs of matched opposing electro-mechanical actuators (Hydraulic actuators are available upon request). A confining fluid, usually water, provides pressure for the third axis (z).

For each axis that uses the actuators, i.e. the x and y axes, two opposing actuators are used. This ensures the central position of the sample is maintained. One actuator of each pair is designated as the primary actuator and this actuator can be controlled in terms of load or displacement. The secondary actuator for each pair matches the displacement of the primary actuator.

Each actuator has its own internal submersible load cell to ensure friction effects from seals are eliminated and platen friction effects can be monitored. The actuators have been custom designed by GDS to be seal-less with hydrostatic bearings. This improves the actuator performance and reduces whole-life servicing costs as there are no piston seals to replace.

Each actuator pair can be controlled in "static-mode" with either constant, ramp or slow cyclic targets in terms of load, stress or displacement. The third axis is controlled in terms of pressure or stress. This high degree of flexibility allows complex stress / strain paths to be modelled in the system.

As well as static tests, the system is capable of driving the two pairs of actuators at frequencies up to 5Hz. Dynamic tests can be controlled in terms of displacement or load control.

Full sample preparation equipment for cohesive and non-cohesive samples are provided with the system including a specially designed soil lathe for producing cuboidal samples.

Technical Specification:
- **Maximum Cell Pressure:** 2 MPa.
- **Actuators:** Electro-mechanical
- **Sample Visibility:** Via large sample viewing window (also in place for PIV applications).
- **Sample Access:** Via front opening cell door.
- **Data Acquisition:** 16 Channel 16-bit data acquisition.
- **Electrical Access Ports:** 16 access ports for pressure or electrical feed throughs into the cell.
- **Hydraulic Power Pack:** Optional air or water cooled.
- **Load Range:** 5kN, 10kN, 20kN Electro-mechanical or 28kN Hydraulic.