

Bishop Ring Shear System

Related Standards

British	BS EN ISO 17892-10 : 2018
Other	ICP Method (Soil Steel Interface testing)

The Bishop Ring Shear System is a new torsional shear device, based on the principles introduced by Bishop et al (1971). VJ Tech's Bishop Ring Shear apparatus utilises two electromechanical stepper motors for vertical and torsional control, and closed-loop control for the determination of the residual shear strength of fine-grained soils.

Specimens are held inside a non-deformable cutting ring which allows the application of various stresses prior to shear testing. With unlimited horizontal linear displacement, the Bishop Ring Shear apparatus is ideal for testing fine-grained soils (i.e. Clays and Silts) over their stress-strain relationship and volume change characteristics due to shearing.

Additionally, the Bishop Ring Shear System can be used to predict the interface friction between the soil mass and displacement piles (ICP testing method).

Steel rings of specific roughness, simulating the surface of the piles, are tested against the soil mass to determine the soil steel interface friction angle. This parameter is very important for the design of displacement piles in sands and clays.

The maximum height of the specimen can reach 20mm, which makes it less sensitive to the presence of large particles in the soil.

As well as the Vertical Load Cell for the determination of the normal load, a pair of horizontal load cells are used for measuring the resistance of the soil mass to shearing. The design of this testing system implements an additional beam cell for the determination of the wall friction, thus the calculation of the **net normal stress**. An adjustable gap is created between the upper and lower soil mass, on the sliding surface, to minimise the friction between the fixed upper portion of the annular specimen and the rotating lower part.

In addition to the Axial Strain Transducer that determines the sample's volume change, there is a pair of additional Displacement Sensors for the determination of the upper confining ring's movement.

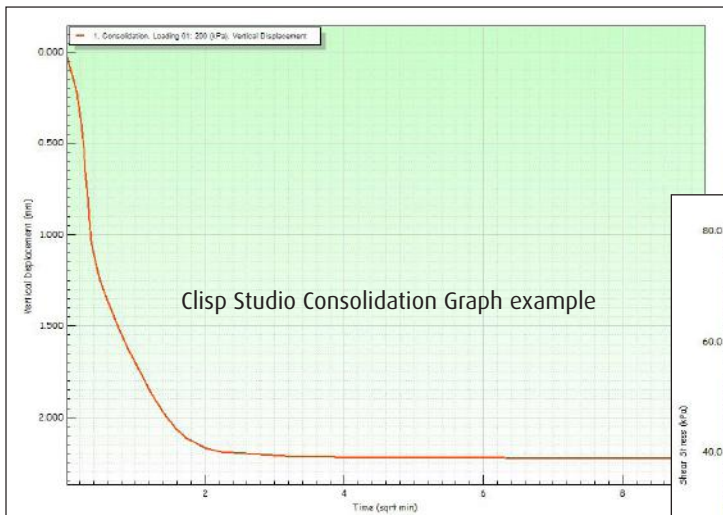
The apparatus can be fully automated when is used with the Ring Shear module of Clisp studio, allowing the user to tailor their test with multiple consolidation, shear, fast shear and reverse stages. Vertical control can be selected between a Constant Normal Stress, Constant Net Normal Stress and Constant Volume.

Features

- Conforms to BS EN ISO 17892-10: 2018
- USB or Ethernet Interface for computer control
- 7" touchscreen display and control panel
- Motorised actuation of normal stress using a stepper motor
- Motorised actuation of torsional stress using a stepper motor
- Partial or complete test automation using Clisp Studio Ringshear software
- On board data logging (16 GB standard), able to store thousands of Tests, each with thousands of data points
- Data export via USB link for manipulation within Excel
- High speed ARM processor
- High speed sensor data conversion (24 bit up to 5000 sample/sec)
- Build-in live data and graphs
- Non-volatile Memory for sensitive data

Specification

Sample Size	150 mm outside diameter x 100 mm inside diameter x 20 mm height
Speed Range	0.0001 to 900 degrees/min
Max. Vertical Load	20 kN
Max. Horizontal Load	10 kN
Maximum Shear Stress	1000 kPa
Maximum Normal Stress	1000 kPa
Dimensions (W x D x H)	780 mm x 720 mm x 1370 mm
Weight	220 kg
Electrical Requirement	90-240 Volts, 50/60Hz, single Phase



Ordering Information

VJT5605	Bishop Ring Shear System Main Unit (no sensors)
Load Cells (3 DDENs required: 2 Shear Load & 1 Beam)	
VJT50361	5 kN Beam Load Cell (Beam Load Cell)
VJT5605-5K	BRS 5kN Compact load cell
VJT5605-10K	BRS 10kN Compact load cell
VJT5605-20K	BRS 20kN Compact load cell

Displacement Transducers

VJT0270	LSCT Displacement Transducer (10 mm) (x2)
VJT0272	LSCT Displacement Transducer (50 mm)

Sample Preparation Kit

VJT5605-SP	Bishop Ring Shear Sample Preparation Kit
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Items for Soil-Steel Interface (SSI) Testing

VJT5605-SSI	Bishop Ring Shear container for SSI Testing
VJT5605-SSI-DISC	Soil-Steel Interface Disc

Software

VJT-csRING	Clisp Studio Bishop Ring Shear Software Module
VJT-csRING-SSI	Clisp Studio Ring Shear Software for Soil-Steel Interface

Clisp Studio Ring Shear Pro Software

- Easy Test configuration using the built in wizard
- Transducer Configuration and Calibration
- Live views of transducer readings & calculated parameters
- Live graphs and tabulated data
- User configurable views tables and graphs
- Data export to Excel
- Test script export and import
- Live Test status and notification
- Soil-soil and soil-steel interface tests can be conducted using the csRING-SSI Testing Software Module

