Dynamic Triaxial Testing Systems

Related Standards: ASTM D5311-13

VJ Tech Dynamic Triaxial Systems are capable of providing fully automatic dynamic Triaxial testing in Single or Multi Axis configurations. The systems can incorporate any of the following;

- Loading frame with mechanical or hydraulic actuator(s)
- Hydraulic Power Pack (for hydraulic actuator)
- Dynamic Servo Controller (one per axis)
- Dynamic Pressure Controller (for Dynamic Cell Pressure)
- Pneumatic Automatic Pressure Controller for cell pressure control and feedback (requires air/water bladder)
- Hydraulic Automatic Pressure Controller for back pressure control and feedback
- Dynamic Triaxial Cells (can be fitted with a Balance Ram so that a Hydraulic APC can be used for Cell Pressure)
- Transducers for Dynamic Systems
- User friendly Clisp Studio software providing the necessary test configuration, control and data acquisition.

For lower dynamic loads and frequencies, the loading frame can either be our Triscan 50 or a BASIC frame fitted with a beam mounted 5 kN actuator with a frequency of up to 5 Hz. The BASIC Frame can optionally be fitted with a sliding Base, for easier access to the Cell.

For higher dynamic loads and frequencies, the loading frame can either be a BASIC or TriSCAN 100 frame fitted with a 10 or 20 kN beam mounted electro-mechanical actuator for frequencies up to 10 Hz, or our Triscan 250 fitted with a hydraulic acuator for Dynamic Loads up to 50 kN and frequncy up to 20 Hz. Please note that 3-phase power will be required for these higher specification frames.

Specifications (System dependent)	
Frequency Range	0.0001 up to 20.0000 Hz
Maximum Dynamic Load	Up to +/- 50 kN
Maximum Static Load	Up to 250 kN (TriSCAN Frames only)
Actuator(s)	Electro-Mechanical or Hydraulic
Dynamic Displacement	-35.000 to 35.000 mm possible
Load Frame Capacities	50 kN, 100 kN or 250 kN (TriSCAN only)
Input Channels	Up to 8 per axis
Resolution	24 Bit
PC Interface	Ethernet or USB
Waveforms	Sinusoidal, Square, Triangular, Haversine, Saw Tooth, Inverted Saw Tooth, Rectangle, User Defined
Data Logging Rate	Up to 4000 points per cycle OR 500/Sec
Sample Size	38 - 150 mm (depends on cell size)
Maximum Pressure	2 MPa
Power Supply	Single or three phase (dependent on system specification)

Dynamic Triaxial system with a 50 kN BASIC frame

Dynamic Triaxial system with a 50 kN TriSCAN frame

Dynamic Triaxial (Mechanical (3-Phase)) with DPC System

VJ Tech

Pro Instrument Features

- Integrated 7" Touchscreen for Standalone use
- On-board data logging with large data storage (up to 14 million records) using SD card (8GB standard)
- Data export to PC for manipulation within Excel
- High Speed sensor conversion (24 bit, up to 4000 samples/cycle or 500/sec)
- Auto reverse from limit switch activation
- Built-in auto protection for sensor limits

Dynamic Servo Controller Features

- Up to 8 analogue input channels, Load Channel included, additional Channels as required
- Closed loop control
- Built-in signal conditioning
- Adaptive PID (Peak and Trough Control)
- Lower and upper limit switch motion control

Frame Ordering Information

VJT5000-P-EM	TriSCAN Pro 50kN Load Frame with Electro-mechanical actuator up to 5Hz/10kN
VJT5010-EM-B	BASIC Load Frame with Electro- mechanical actuator up to 5Hz/10kN
SUB17-706	50kN BASIC Load Frame Dynamic Cell Slider Base (option to enable easy Cell access)
VJT5110-P-EM	TriSCAN Pro 100kN Load Frame with Electro-mechanical actuator up to 10Hz / 10kN
VJT5100-EM-B	BASIC Load Frame with Electro- mechanical actuator up to 10Hz / 10kN
VJT5100-EM-B3	BASIC Load Frame with Electro- mechanical actuator up to 10Hz / 20kN
VJT5125-P-EM	TriSCAN Pro 250kN Load Frame with Electro-Mechanical actuator up to 10Hz / 10kN
VJT5025-20HM	TriSCAN 250kN Load Frame with Hydraulic actuator up to 20Hz / 50kN
VJT-HYD1	Hydraulic Power Pack (3-Phase)

Dynamic Servo Controller Ordering Information

VJT-DSC3000M or VJT-DSC3003M	Dynamic Servo Controller Mechanical (Single Axis) (1ph or 3ph)
VJT-DSC3000H	Dynamic Servo Controller Hydraulic (Single Axis) (1ph)
VJT-DSC3000MM	Dynamic Servo Controller Mechanical (Dual Axis) with Rack Cabinet
VJT-DSC3000HM	Dynamic Servo Controller Hydraulic-Mechanical (Dual Axis) with Rack Cabinet
MIS0166D*	Single Channel Signal Conditioning Card
VJT-PSU0015	Isolation Transformer 230VAC with Cables
VJT-PSU0015-110	Isolation Transformer 110VAC with Cables

* *From August 2021 onwards*

Dual Axis Hydraulic Dynamic Triaxial system with a 250 kN TriSCAN frame

Pressure Controller Ordering Information

VJT2266-P	Pro Hydraulic APC (1000 kPa)
VJT2250-P	Pro Pneumatic APC (1000 kPa)
VJT2267D-P	Pro Dual Hydraulic APC (3500 kPa)
VJT-DYN-CP	Dynamic Cell Pressure Controller
VJT0500	Air/Water Cylinder

Triaxial Cell Ordering Information

VJT0549-DYN	Dynamic Triaxial Cell (50 mm)
VJT0475-DYN	Dynamic Triaxial Cell (75 mm)
VJT0400-DYN	Dynamic Triaxial Cell (100 mm)
VJT0400-AR	8-Port Access Ring
VJT0450-DYN	Dynamic Triaxial Cell (150 mm) (with 12-Port Access Ring included)
VJT0450-DYN-BR	Dynamic Triaxial Cell (150 mm) with Balance Ram (12-Port Access Ring included)

Transducer Ordering Information

VJT0351B-DYN	Dynamic Internal Submersible Load Cell (5 kN)
VJT0352B-DYN	Dynamic Internal Submersible Load Cell (10 kN)
VJT0353B-DYN	Dynamic Internal Submersible Load Cell (25 kN)
VJT0359B-DYN	Dynamic Internal Submersible Load Cell (50 kN)
VJT0271-DYN	Dynamic Displacement Transducer (25 mm)
VJT0272-DYN	Dynamic Displacement Transducer (50 mm)
VJT0250-DYN	Dynamic Pressure Transducer (10 bar)
VJT0260-DYN	Dynamic Pressure Transducer (20 bar)

If On-Sample Dynamic Testing is required, please refer to our On-Sample Transducers datasheet for details

Clisp Studio – csDYNA Software

The csDYNA Clisp Studio module is user friendly software designed specifically for dynamic Triaxial testing, providing test functionality and automation,easily viewed results data which can be exported to Excel, and test script import and export.

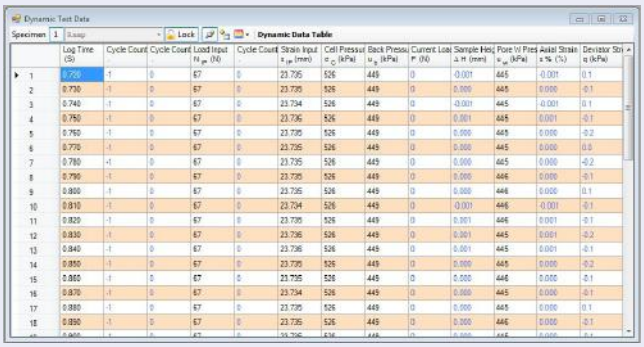
Related Standards: ASTM D5311-11

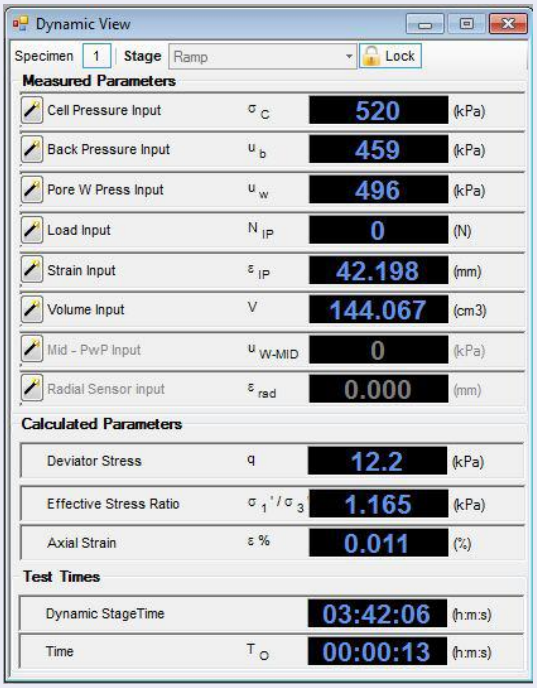
Ordering Information

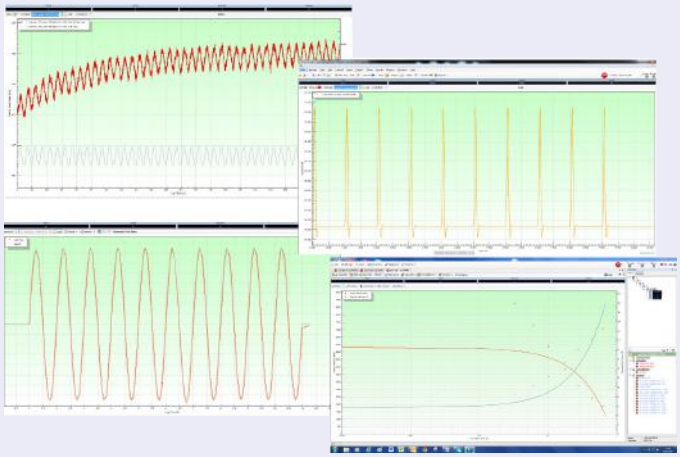
VJT-csDYN	Clisp Studio Dynamic (Cyclic) Triaxial Testing Software

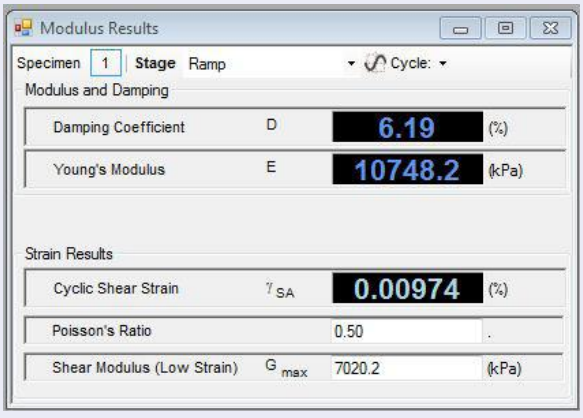
Features

- Easy Test configuration using the built-in wizard
- Transducer configuration and calibration
- Live view of sensor readings and calculated parameters
- Live Graphs & Tabulated Data
- Live Test status
- Data export to Excel
- Entire Test Export and Import using Scripts
- On screen measurement of T100, cohesion and angle of friction
- Data storage in SQL data base
- User configurable Views, Tables and graphs
- Configurable test automation
- Email test status
- Optional customised reports available on request
- Saturation (both Step & Ramp Methods)
- Consolidation (Isotropic, An-Isotropic & K0)
- Stress Path
- Shear
- Dynamic Loading









VJ Tech