



Dynamic Hydraulic Universal Testing Machines which are used in a variety of tests like tension compression flexure fatigue (low cycle fatigue / high cycle fatigue / fatigue crack propagation ASTM E647), fracture mechanics (K1c per ASTM E399, J1c, CTOD per ASTM E-1290), damping properties and vibration testing.

Our test systems are designed for conducting tests at ambient temperature, elevated temperature (high temperature fatigue characterization) and low temperature. Test speed range slow strain rate testing (typical of corrosion interaction)(1×10^{-7} /s strain rate) high strain rate testing (flow deformation studies).(150 /s true strain rate)

The testing machines are fitted with servo-controlled pumps that come in two versions: hard-wired autonomous control with electronic setting of operating high and low pressure. Operating pressure is set with the convenience of on-screen graphics user interface.

Technical features of our hydraulic materials test systems are:

- Metals, composites and polymers
- Low cycle fatigue (as per ASTM E606)
- Fracture mechanics including fatigue crack growth (as per ASTM E647 and E1820).
- Room temperature and high temperature testing
- Testing in corrosive media
- Fully self-contained test system packaged for easy relocation and movement
- Load frame on vibration isolators
- No additional utilities required. Simply plug into 3- phase mains and commence testing
- 0 to 100 Hz cycling frequency. Vibration isolators for quiet operation

Variety of add- on fixtures and transducers, all supported by single - platform packaging: self-aligning hydraulic LCF grips, extensometers, pulsed, reversible p.d. unit, etc

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Advantages Of Test System

Specification

Advantage to user

Mechanical hardware

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| 1 | Hydraulic grips with side insertion of specimen and provision for threaded adapter to screw on other grips including compression platen, clevises and 3-pt bend | Other grips can be mounted without the inconvenience of removing hydraulic grips |
| 2 | Self-aligning hydraulic grips for LCF testing that preclude the need for manual fixture / load train alignment process | Less experienced technicians can set up LCF test without the fear of misalignment |

Hydraulics

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| 1 | Electronically controlled variable flow and variable pressure pumps in the 4 to 100 LPM range | Continuous adjustment of pump flow to satisfy instantaneous requirement of pressure and flow. This ensures minimum energy is consumed to deliver required performance, minimizes oil heating and therefore reduces cooling requirements by up to 60%. A “Green” solution. |
| 2 | Contamination insensitive servo-hydraulics. Direct drive servovalve avoiding need for contamination sensitive pilot stage. | Low life-cycle cost as expensive replacement parts are avoided. |
| 3 | 20-65 LPM pumps: Fiber-glass sound isolation and dust insulation enclosure | Provides aesthetic appearance. Considerably reduces pump noise and permits location of pump next to operator area. |

Control hardware

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| 1 | 24-bit data acquisition with digitally programmable signal conditioning including hardware gains and offsets, coupled with 32-bit software gains and offsets. | User assignable floating range in engineering units of preferred choice. Highest commercially available resolution on data acquisition. |
| 2 | Expandable to 32 channels of servo control | Large control channel count permits testing of large structures with up to 32 actuators to accurately simulate load/displacement distribution under static and dynamic conditions |
| 3 | Expandable to 80 channels of signal conditioning and data acquisition to suit LVDTs, strain bridges, accelerometers and high level external signals. Fully synchronous data acquisition across all acquired channels | Combining test controls with large synchronized channel count in data acquisition eliminates the need for a separate data acquisition system. The additional channels can be used to collect strain/displacement/acceleration response from the structure that is time synchronized with applied load |
| 4 | Up to 64 channels of digital input and output with FET option | Permits the activation and status sense of a large number of external devices and literally converts the controller into a user programmable logic controller. FET option enables sinking of up to 2A current for direct activation of solenoids |
| 5 | Option of modular expansion capability from 1 to 32 control channels and from 4 to 80 channels of signal conditioning / data acquisition | Minimum cost of acquisition and growth. User gets to benefit from familiarity with existing test system |

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| 6 | Compatibility with legacy sensors and actuators to enable retrofits | Controller electronics are 100% compatible with most industry standard transducers including load cells, LVDTs, strain gages and MEMS accelerometers |
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Control Software

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| 1 | Program functionality permitting concurrent tasks to share real-time data | Thanks to Global Data Sharing (GDS) platform, realtime data are simultaneously “visible” to virtually unlimited tasks participating in test control and data acquisition. Addition of greater functionality will not degrade software performance |
| 2 | Extensive graphics capability with virtually unlimited number of graphics windows. All graphics settings are saved for next session | Graph software permits real-time visualization of any combination of up to 128 channels of available DAQ channels on any number of re-sizeable and user configurable graphics screens |
| 3 | Real-time interface with MS-Office | GDS based interface with MS-Office permits realtime transfer of acquired data into MS-Office environment including Word, Excel, PowerPoint, Outlook and Access. Requires MS-Office License |
| 4 | High performance application development capability through MS-Office macros | MS-Office VB macros can be used to develop new GDS application software without performance Overheads |
| 5 | Open source application software that permits user to change existing code and add new functionality | Reduces dependence on vendor and gives flexibility to power users wishing to change, adapt or enhance application software to suit their requirements. Frees user from licensing overheads. |
| 6 | Capability for multiple tasks to concurrently handle ongoing test. | Required for user to add new functionality to existing application without changing already existing code |
| 7 | Capability for real-time debugging of new application software | The ability to debug new real-time application functionality without intruding into an ongoing test considerably eases software development by less experienced programmers |

Commercial

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| 1 | Option of 24-month Warranty on entire supply with the exception of consumables (oil, filter, paper and ink) | Reduced expenditure and increased confidence Level |
| 2 | Free upgrades on all existing software as new versions appear | User is up to date and enjoys continuous support |
| 3 | Free phone and e-mail consulting during Warranty and under AMC | Reduced operational overheads |
| 4 | I-Support. Option of Internet based remote control, tuning and diagnostics | Does not require Service Engineer visit. Requires License to enable I-Support |

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