ElectroPuls™ | All Electric Dynamic Test Systems

INSTRON®
ElectroPuls™ – All Electric Dynamic Test Systems

With more than ten years of running tests over billions of cycles, ElectroPuls systems are the established materials testing machines using patented linear motor technology. With model capacities up to 10 kN, ElectroPuls systems offer slow-speed static testing and high-frequency dynamic fatigue testing with hundreds of hertz capability. The Linear-Torsion models feature a patented actuator for bi-axial tests on materials and components.

With only a single-phase electrical connection to the wall, ElectroPuls systems are dynamic testing machines of the future that do not have the environmental impact of conventional servohydraulic technologies. That means no oil, no three-phase electrical power, no water-cooling supplies, no external acoustic attenuation systems, and no costly, complex maintenance routines. Take a tour through the product and see how you can plug ElectroPuls into your laboratory wall and start testing.
A System to Suit Your Needs

The ElectroPuls™ family includes systems ranging from 1000 N up to 10,000 N. The Linear-Torsion models feature a patented actuator in the upper crosshead and a bi-axial Dynacell™ load cell.

E1000
Tabletop Instrument | Force Capacity ±1000 N
Shown fitted with a short-height 600 series Environmental Chamber for low and high-temperature testing.

E3000
Tabletop Instrument | Force Capacity ±3000 N
Common applications include testing components and biomedical implants in fatigue.

E3000 Linear-Torsion
Tabletop Instrument | Force Capacity ±3000 N
Torque Capacity ±25 Nm
Shown fitted with fatigue-rated mechanical grips and AVE2 for non-contacting dynamic strain measurement.

E10000
Floor Instrument | Force Capacity ±10000 N
Shown fitted with hardened platens for compression fatigue testing.

E10000 Linear-Torsion
Floor Instrument | Force Capacity ±10000 N
Torque Capacity ±100 Nm
Shown fitted with fatigue-rated pneumatic wedge grips and a CE-certified safety guard for bi-axial fatigue testing.
01. Fatigue Tests of Plastics using non-contacting extensometry
02. 3 Point Flexure Fatigue of Small Animal Bone
03. Durability Testing of Hip Implants to ISO 7206
04. Durability Testing of Spinal Constructs to ASTM F1717
05. Simulation Testing of Consumer Electronics
06. Durability Testing of Dental Implants to ISO 14801
07. Durability and Impulse Testing of Athletic Footwear

Expanding Horizons

ElectroPuls™ systems allow scientists and researchers to cross new boundaries in the research and development of materials and components technologies.
Optical Encoder for Noise-Free Digital Control

ElectroPuls™ systems use optical encoder technologies for precise extension control and a dedicated position channel for set up and end of test.

High System Accuracies Give Confidence in Results

Using precision transducers with the advanced digital controller, ElectroPuls systems ensure the highest accuracy of measurements. This includes a load weighing accuracy of ±0.005% of load cell capacity, or ±0.5% of indicated load.

Dynacell™ - Improved Accuracy and Faster Testing

The Instron® advanced fatigue-rated load cell, Dynacell, can reduce inertial errors caused by grips and fixtures. Improving the accuracy of load data across the entire frequency range, it allows tests to run at higher frequencies within ASTM and ISO tolerances. On the Linear-Torsion models, inertia compensation also works on the torsional axis.

Patented Stiffness Tuning: We’ve Taken the Hassle Out of System Optimization

Whether you are new to testing or already familiar with dynamic testing instruments, tuning is essential for system optimization. Using patented algorithms, the Instron Console Software allows you to automatically establish tuning parameters based on specimen stiffness. Fast, simple, and effective.
Servohydraulic systems have previously been the only choice for lower-force, high-frequency dynamic testing. These systems require a high-pressure hydraulic power supply, three-phase electrical power, a high-flow water supply to cool the pump, and extensive annual maintenance to ensure the system is always performing.

With ease of installation and exceptional low cost of ownership, ElectroPuls systems are the ideal choice for dynamic testing in today’s environmentally-friendly laboratories. These innovative systems require no three-phase electrical power, no water-cooling supplies, no space for hydraulic power supplies, no costly and complex maintenance routines, and no oil to dispose. ElectroPuls systems are the dynamic testing machines of the future that leave servohydraulic technologies in the past.

### Cost of Ownership: Servohydraulic Test System

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Servohydraulic Test System Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-Time Costs</td>
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</tr>
<tr>
<td>Capital purchase</td>
<td>$5,000</td>
</tr>
<tr>
<td>Installation of utilities</td>
<td>$2,000</td>
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<tr>
<td>End-of-Life Costs</td>
<td>$2,500</td>
</tr>
<tr>
<td>On-going Costs</td>
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</tr>
<tr>
<td>Electrical Power</td>
<td>$500</td>
</tr>
<tr>
<td>Water Cooling</td>
<td>$750</td>
</tr>
<tr>
<td>Floor Space</td>
<td>$1,000</td>
</tr>
<tr>
<td>Machine maintenance</td>
<td>$500</td>
</tr>
<tr>
<td>Hydraulic supply maintenance</td>
<td>$750</td>
</tr>
<tr>
<td>Disposal of consumables</td>
<td>$250</td>
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</table>

### Cost of Ownership: ElectroPuls™ Test System

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</tr>
<tr>
<td>Capital purchase</td>
<td>$3,000</td>
</tr>
<tr>
<td>Installation of utilities</td>
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<tr>
<td>End-of-Life Costs</td>
<td>$1,250</td>
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01. Get Instant Status with System Indicator
A quick glimpse at the System Indicator provides instant status whether it’s in Test mode, Setup Mode, or Off.

02. Ensure the Crosshead is Clamped With Status Indicators
Clamp status indicators on the E1000 systems help to ensure that the minimum amount of clamping force is applied to the crosshead before starting a test.

03. Adjustable Test Space Without Additional Hassle
TWIST the lever clamps, PUSH the button to move the crosshead to the desired position, and then twist the levers to LOCK the crosshead. No tools to lose, costly pneumatic air supplies to run or time-consuming training required.

04. Safety First: Controls at Your Fingertips
Critical switches and controls for emergency stop, power, and crosshead adjustment are rigidly mounted for ease of access. The commonly used actuator jog and grip controls are located on the removable handset and allow users to adjust the actuator position precisely and rapidly, without repeat visits to the system workstation. Restricted force and velocity in Setup Mode help to minimize the risk of accidental damage during set up.

Dynamic Stability Controls Manage Unexpected Events

- **Break Detect**
  Monitors the system to determine specimen break and manages the energy released at failure.

- **Stability Control**
  With acceleration sensing to manage unexpected events, such as frame movement or power failure.

- **Specimen Protect**
  Monitors the load from exceeding a threshold and prevents overloading and damage to the specimen during set up and end of test.

A Software Interface Designed to Put You in Control
ElectroPuls systems feature an intuitive software console that provides instant access to critical control features, limits, tuning, and machine status, and allows users to get tests running in seconds.

Safety First: Test Space Access Control
ElectroPuls systems can be supplied with a CE-certified safety guard to prevent operator access to the test space when at high power and help minimize damage from flying specimen debris.
Static Testing
Configure an ElectroPuls™ system with Instron® Bluehill Universal® Software and any range of grips or fixtures, to run a variety of static tests.

State-of-the-Art Software to Suit Your Static Applications
Bluehill Universal sets the standard for power and simplicity for tensile, compressive, flexural, peel, tear, and friction testing.

Large Speed Range to Simulate Real Life Conditions
ElectroPuls has a speed range more than 100 times greater than that of a conventional screw-driven machine.

Long Stroke for a Wide Range of Tests
60 mm of test extension covers a wide range of static and dynamic tests without running out of stroke.

Non-Contacting Strain Measurement Prevents Specimen Damage
Instron Video Extensometer accessories can provide micron level strain measurement without specimen contact, ideal for static applications requiring high throughput or those applications with contact-sensitive materials.

Dynamic Testing
Coupled with the latest WaveMatrix 2™ Software, the high dynamic bandwidth of the ElectroPuls™ linear motor permits a variety of low-force tests.

WaveMatrix 2 Software Delivers Flexibility
The highly visual WaveMatrix 2 Software environment simplifies the set up and running of the majority of dynamic tests with user-set features including data collection, waveform generation, and step programming.

Dynamic Performance to Meet Your Applications
ElectroPuls systems can perform tests ranging from quasi-static through to test frequencies greater than 100 Hz.

T-Slot Table: Test Almost Anything!
The corrosion-resistant T-slot table has the flexibility to accept a wide range of grips, fixtures, saline baths, environmental chambers, accessories, and components.

Application Specific Software Expands Dynamic Capability
Using Application Specific software modules and suitable grips and fixtures, you can configure ElectroPuls systems to run more traditional materials tests, such as fracture mechanics and low-cycle fatigue.
Accessories Extend the Life of Your System

ElectroPuls™ systems can be extended with various accessories to meet the changing needs of your laboratory. Fit everyday accessories, such as mechanical or pneumatic grips, to perform standardized materials tests; or fit the Dynacell™ load cell to the upper moving motor and utilize customized fixtures to take advantage of the corrosion-resistant T-slot table.
Global Presence, Local to You

When You Need Us, We’re There

Founded in 1946, Instron® has established itself as a leading supplier of materials testing equipment and solutions. Operating with 25 offices in 18 countries and more than 1200 employees, we have a global infrastructure that is local to you and remain committed to advancing materials and components testing techniques.

Maximize Uptime

The Instron world-class service organization is committed to deliver high-quality installation, calibration, training, maintenance, and technical support throughout the life of your system. We help ensure that your systems are there when you need them.

Quality Standards You Can Trust

Operating under ISO 9001 quality standards and with an extensive list of accreditations, Instron employs a product design philosophy where our customers’ data integrity, safety, and protection of investment are paramount. We strive to ensure that our customer satisfaction is second to none.

Technical Highlights

<table>
<thead>
<tr>
<th>Dynamic Linear Force Capacity</th>
<th>±N 1000</th>
<th>±N 3000</th>
<th>±N 3000</th>
<th>±N 10000</th>
<th>±N 10000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque Capacity</td>
<td>±Nm</td>
<td>-</td>
<td>25</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>Linear Stroke</td>
<td>mm</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Torsional Rotation</td>
<td>±135° as standard, user configurable to ±16 revolutions</td>
<td>-</td>
<td>-</td>
<td>±135° as standard, user configurable to ±16 revolutions</td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>Table: Vertical (optional horizontal)</td>
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Technical Highlights

| Displacement Sensor: Optical Encoder for precise extension control | Load Weighing Accuracy: ±0.03% of reading or ±0.003% of loadcell capacity (± 0.002%), whichever is greater | User Interface: PC with Console and application software | Controller: Advanced Digital Controller with up to 24-bit resolution and continuous synchronous data acquisition on all channels at up to 10 kHZ | Electrical Power: Single Phase | Bi-axial Variants: £1000 and £10000 models |
Global Support that is Local to You

Instron® has a global infrastructure that is local to you and remains committed to being the leader in mechanical testing instrumentation.