

ElectroPuls®

All Electric Dynamic Test Systems





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Since 2007, running tests over billions of cycles, ElectroPuls systems are the established materials testing machines using patented linear motor technology. With model capacities up to 20 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 an 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 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.



No Oil



Low Energy



Low Noise



Small Footprint



A SYSTEM TO SUIT YOUR NEEDS

ElectroPuls®

The ElectroPuls family includes systems ranging from 1,000 N up to 20,000 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 $\pm 1,000$ N

Shown fitted with a short-height 600 series Environmental Chamber for low and high-temperature testing.

Common applications include:

Soft tissue samples, very small specimens, auto-injector devices

E3000

Tabletop Instrument | Force Capacity $\pm 3,000$ N

Common applications include:

Testing components and biomedical implants in fatigue.

E3000 Linear-Torsion

Tabletop Instrument | Force Capacity $\pm 3,000$ N

Torque Capacity ± 25 Nm

Shown fitted with fatigue-rated mechanical grips and AVE2 for non-contacting dynamic strain measurement.



E1000

E3000

E10000

Floor Instrument | Force Capacity $\pm 10,000$ N

Common applications include:

Cyclic testing on hard plastics, rubbers and medical devices.

E10000 Linear-Torsion

Floor Instrument | Force Capacity $\pm 10,000$ N

Torque Capacity ± 100 Nm

Shown fitted with fatigue-rated pneumatic wedge grips and a CE-certified safety guard for bi-axial fatigue testing.

E20000

Floor Instrument | Force Capacity $\pm 20,000$ N

Common applications include:

Fatigue and fracture of small to medium metal or composite specimens.

E20000 Linear-Torsion

Floor Instrument | Force Capacity $\pm 20,000$ N

Torque Capacity ± 130 Nm

Shown fitted with fatigue-rated pneumatic grips.



E10000



E20000



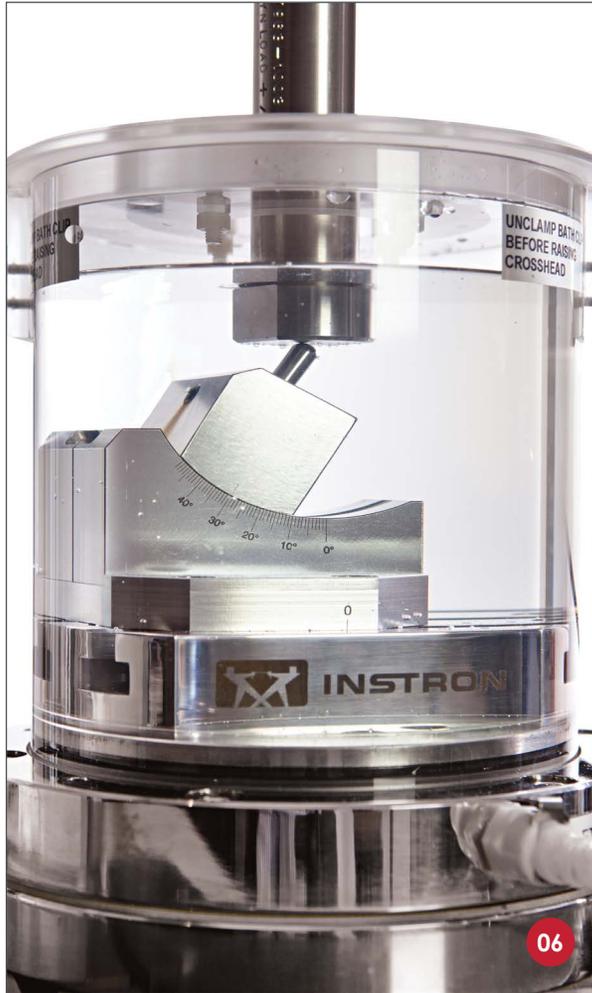
EXPANDING HORIZONS

ElectroPuls®

ElectroPuls systems allow scientists and researchers to cross new boundaries in the research and development of materials and components technologies.

- 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



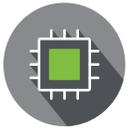




ALIVE WITH TECHNOLOGY

ElectroPuls®

ElectroPuls systems allow scientists and researchers to cross new boundaries in the research and development of materials and components technologies.



Innovative Linear Motors - Extensive Dynamic and Static Testing Capability

Instron established patented linear motors at the heart of ElectroPuls systems over ten years ago, and has successfully demonstrated its superior technology in tests over billions of cycles. With an ultra-low friction design and powered from only a single-phase electrical supply for systems up to 10 kN and three-phase electrical supply for 20 kN, ElectroPuls systems have an extensive performance envelope with the ability to run conventional slow-speed static tests to high-frequency dynamic and fatigue tests. The linear motor technology gives the systems a dynamic testing capability of hundreds of hertz with low noise and without the use of hydraulic oil.



Advanced Bearing System: High-Lateral Stiffness Maintains Alignment

Testing components or asymmetrical specimens can generate off-axis and lateral loads that lead to uncertainty in results. ElectroPuls features an advanced actuator bearing system that maintains load string alignment.



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.



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 $\pm 0.005\%$ of load cell capacity, or $\pm 0.5\%$ of indicated load.



DYNACELL™ - IMPROVED ACCURACY AND FASTER TESTING

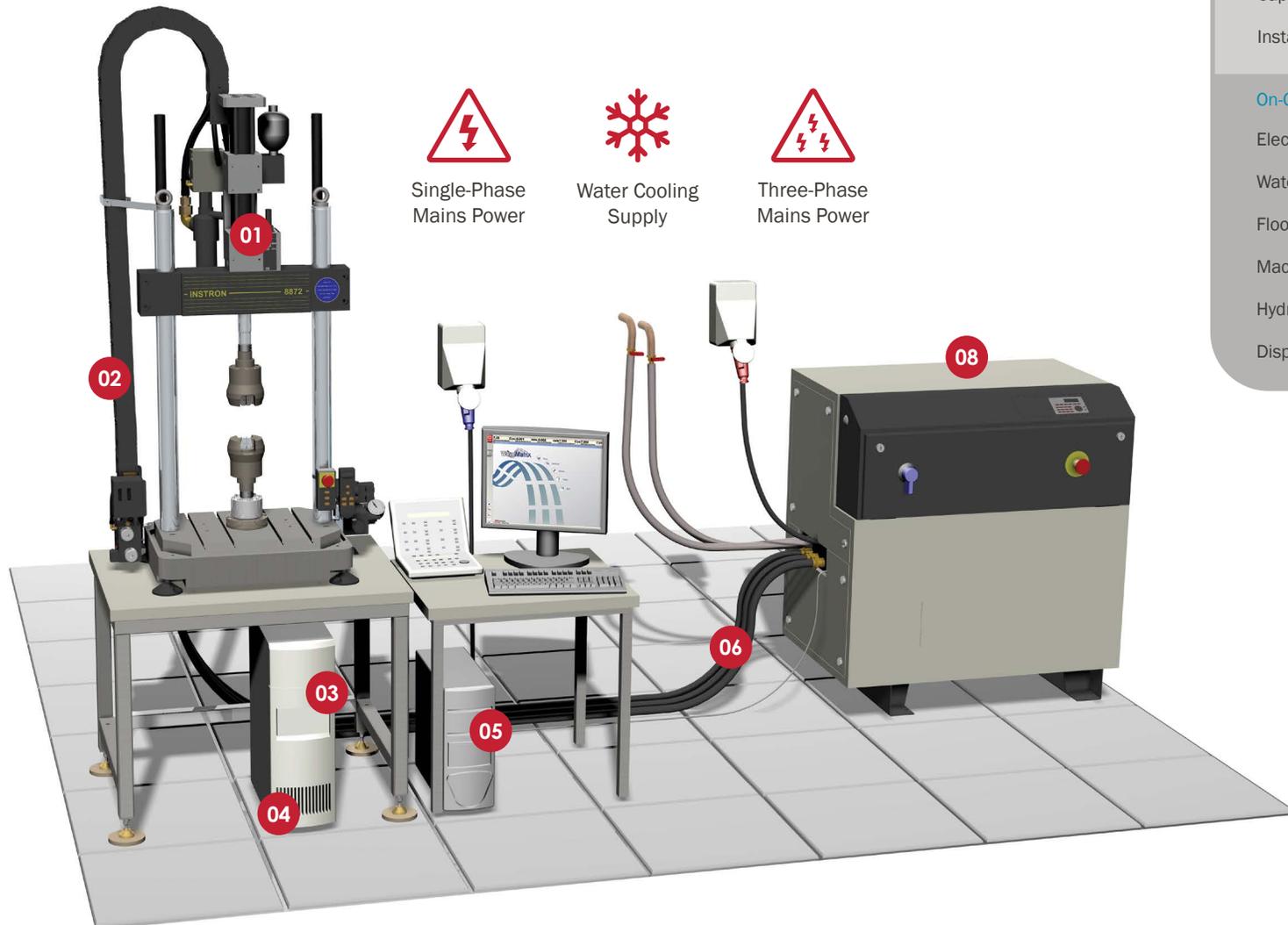
The Instron advanced fatigue-rated load cell, Dynacell, can reduce inertial errors caused by grips and fixtures. Improving the accuracy of load data across the entire frequency range, it allows tests to run at higher frequencies within ASTM and ISO tolerances. On the Linear-Torsion models, inertia compensation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



FOOTPRINT - THE CHOICE IS YOURS

ElectroPuls®

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.



Cost of Ownership: Servohydraulic Test System

One-Time Costs

Capital purchase	\$\$\$\$\$
Installation of utilities	\$\$\$\$\$

On-Going Costs

Electrical Power	\$\$\$\$\$
Water Cooling	\$\$\$\$\$
Floor Space	\$\$\$\$\$
Machine maintenance	\$\$\$\$\$
Hydraulic supply maintenance	\$\$\$\$\$
Disposal of consumables	\$\$\$\$\$

- 01 Servo Valve Maintenance, Seal Replacement, Filter Change
- 02 10 kN Servohydraulic System
- 03 Controller
- 04 Air Filter
- 05 PC
- 06 Hoses to replace every 5 years
- 07 Oil and Air Filters, Oil Change, Oil Disposal
- 08 Hydraulic Power Supply

Cost of Ownership: ElectroPuls® Test System

One-Time Costs

Capital purchase

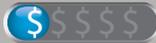


Installation of utilities



On-Going Costs

Electrical Power



Water Cooling



Floor Space



Machine maintenance



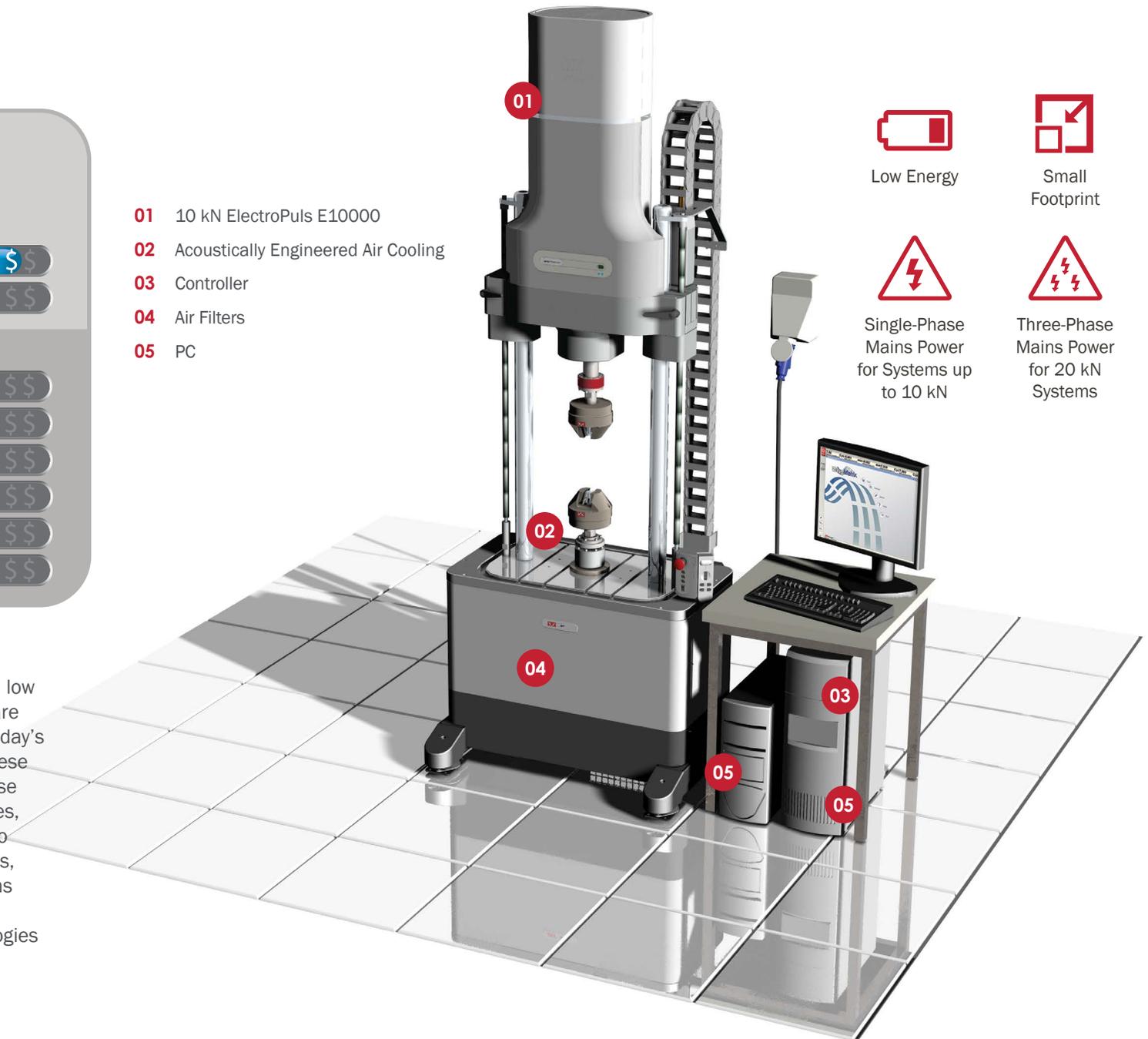
Hydraulic supply maintenance



Disposal of consumables



- 01 10 kN ElectroPuls E10000
- 02 Acoustically Engineered Air Cooling
- 03 Controller
- 04 Air Filters
- 05 PC



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.

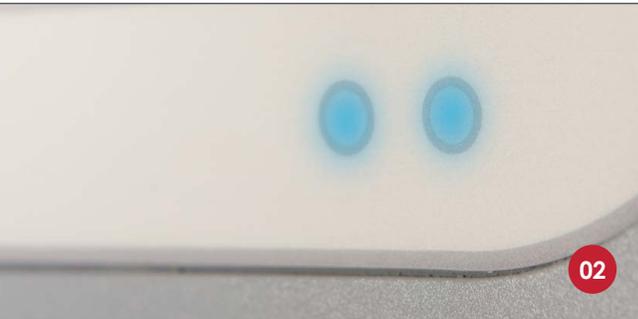


TAKE CONTROL

ElectroPuls®



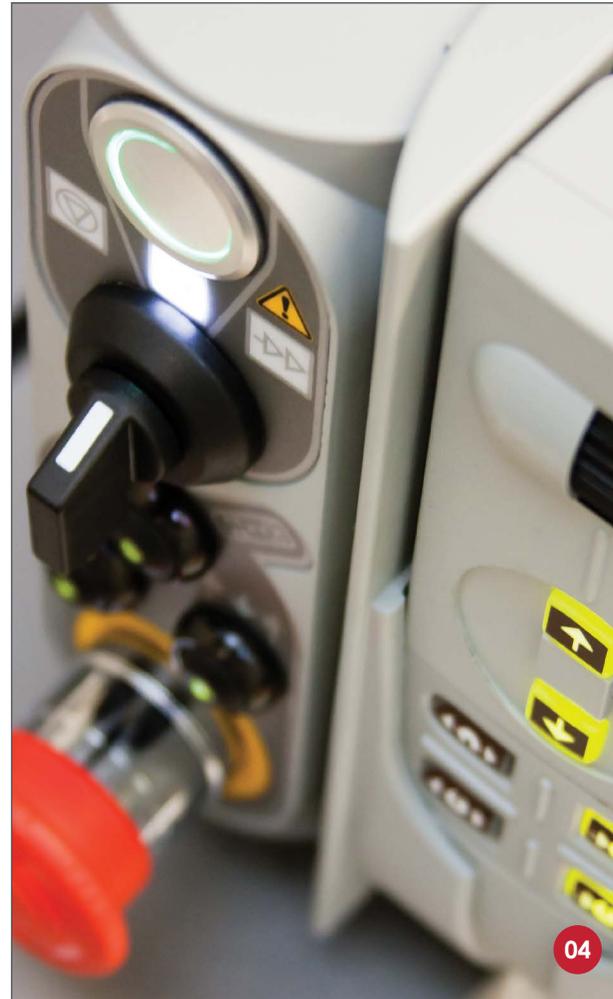
01



02



03



04

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 Croshead is Clamped With Status Indicators

Clamp status indicators on the E10000 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.

Alternatively, with the E20000 uses new, automatic, electrically operated crosshead lift and clamps - all at the PRESS of a button, Test set up and work flow are easy with our intuitive software and patented, stiffness based tuning.

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.

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.



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.



EXCEPTIONAL VERSATILITY

ElectroPuls®



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

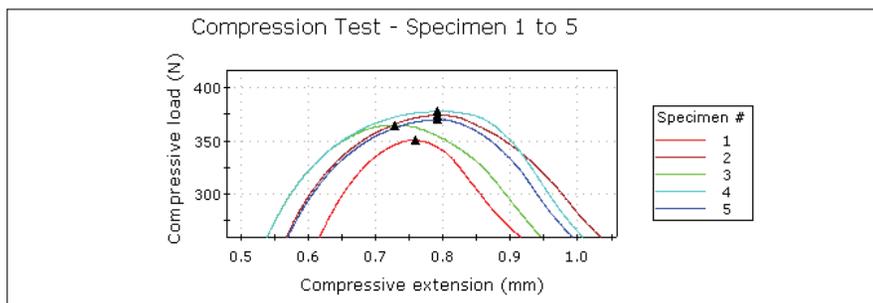
ElectroPuls has a speed range more than 100 times greater than that of a conventional screw-driven machine.

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™3 Software, the high dynamic bandwidth of the ElectroPuls linear motor permits a variety of low-force tests.

WAVEMATRIX3 SOFTWARE DELIVERS FLEXIBILITY

The highly visual WaveMatrix3 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

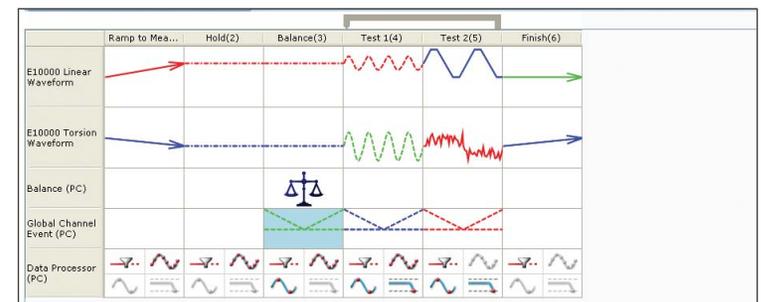
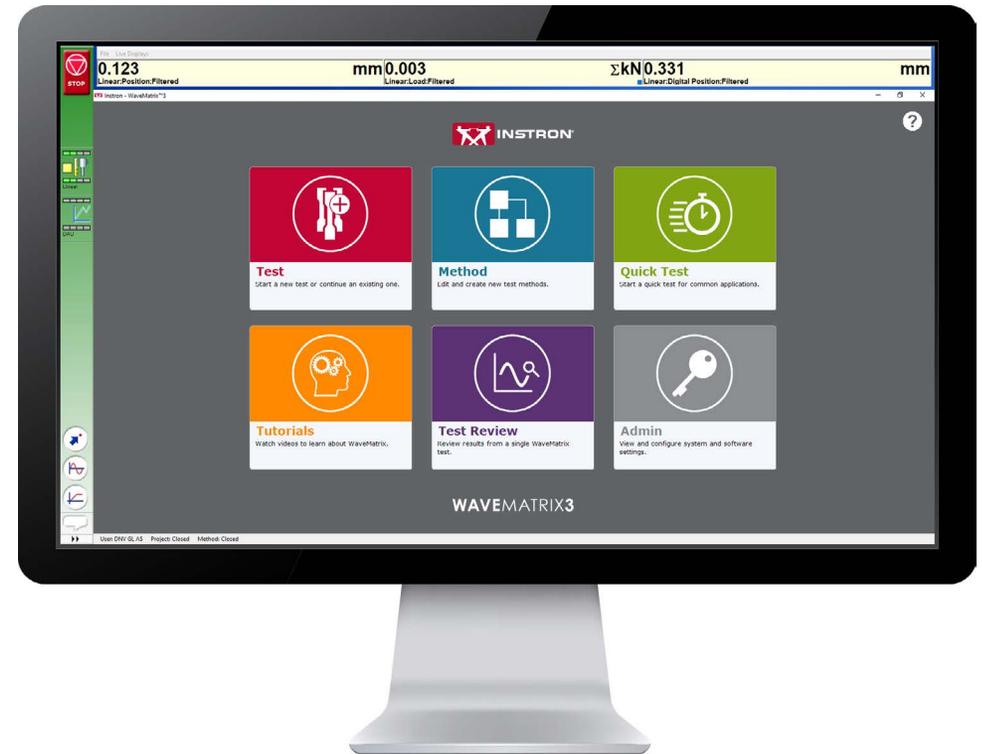
ElectroPuls systems can perform tests ranging from quasi-static through to test frequencies greater than 100 Hz.

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®

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.





- 01** 20 kN Compression Platens
- 02** 10 kN Bi-axial Pneumatic Wedge Grips
- 03** Pullrod kit for low and high temperature testing on E3000, E10000 and E20000
- 04** 1 kN Pneumatic Wedge Grips
- 05** 1 kN Mechanical Wedge Grips
- 06** 3 kN Bi-axial Mechanical Wedge Grips
- 07** 20 kN 3-Point Bend Fixture
- 08** Low capacity Dynacell
- 09** 20 kN Pneumatic Wedge Grips
- 10** 600 Series Environmental chamber and Pullrod kit



GLOBAL PRESENCE, LOCAL TO YOU

ElectroPuls®



When You Need Us, We're There

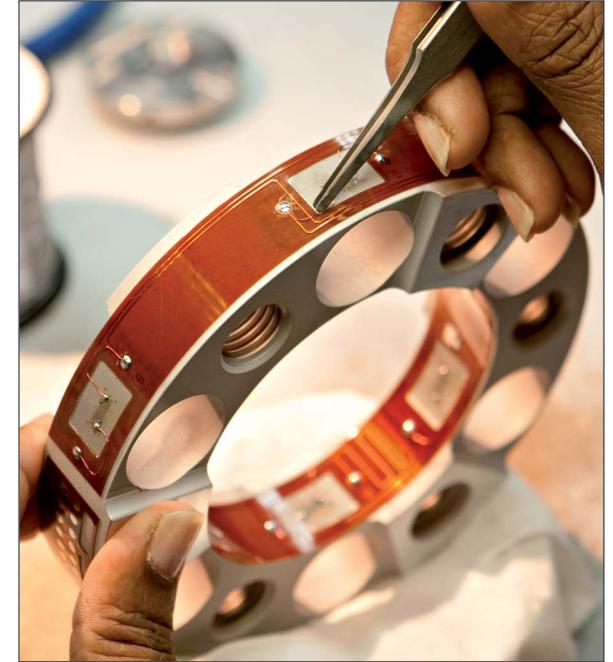
Founded in 1946, Instron® has established itself as a leading supplier of materials testing equipment and solutions. Operating with 25 offices in 18 countries and more than 1200 employees, we have a global infrastructure that is local to you and remain committed to advancing materials and components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

ElectroPuls®



E1000

E3000

**E3000
LINEAR-TORSION**

E10000

**E10000
LINEAR-TORSION**

E20000

**E20000
LINEAR-TORSION**

Dynamic Linear Force Capacity	±N	1,000	3,000	3,000	10,000	10,000	20,000	20,000
Torque Capacity	±Nm	-	-	25	-	100	-	130
Linear Stroke	mm	60	60	60	60	60	75	75
Torsional Rotation		-	-	±135° as standard, user configurable to ±16 revolutions	-	±135° as standard, user configurable to ±16 revolutions	-	±135° as standard, user configurable to ±16 revolutions



DRIVE SYSTEM
Advanced linear motor technology



FREQUENCY RANGE
Greater than 100 Hz



COOLING
Temperature-controlled air-cooling



FORCE SENSOR
Advanced Dynacell™ technology



CROSSHEAD ADJUSTMENT
Electric lift, manual clamps with no tools required



SAFETY
CE-certified safety guards available

Automated crosshead clamp for E20000



DISPLACEMENT SENSOR
Optical Encoder for precise extension control



LOAD WEIGHING ACCURACY
±0.5% of reading or ±0.005% of load cell capacity (1-100%), 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 for up to 10 kN
Three-Phase for 20 kN



BI-AXIAL VARIANTS
E3000, E10000 and E20000 models



THE WORLD STANDARD

We stake our reputation on the integrity of data. From the measurement of primary test data to result generation, we design and manufacture the full data integrity chain (e.g. load cells, sensor conditioning, and software). Additionally, we calibrate more than 90,000 of these sensors annually with the lowest accumulated uncertainty.

30,000+

We service and calibrate more than 30,000 Instron systems in active use worldwide every year.

96%

96% of the Fortune 100 list of the world's largest manufacturing companies use Instron test systems.

18,000+

Instron systems have been cited in more than 18,000 patents since 1975.
