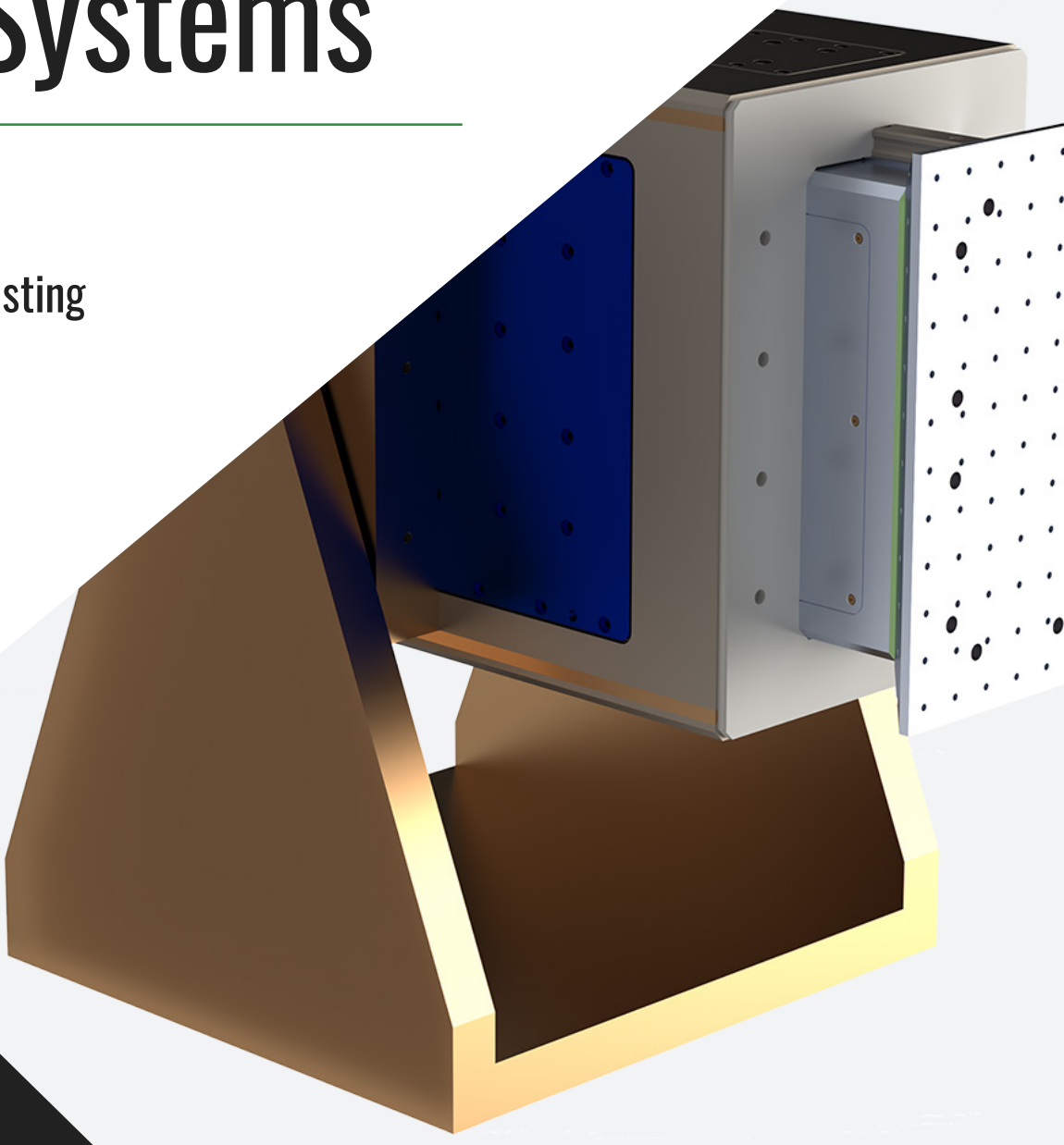
Single Axis Test Systems

Global Expert in Servoelectric Testing Solutions



REV. 2.0 OCT2025

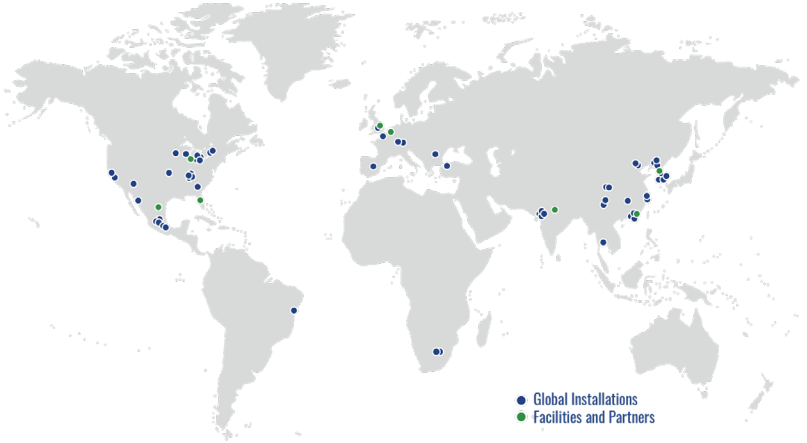
eMpulse test systems

Servoelectric Single Axis Test Systems

Provide precise control of force, velocity, and displacement for component and subsystem evaluation across industries. Powered by servoelectric actuators, they deliver smooth, accurate motion with higher efficiency than hydraulic systems. Engineered for high dynamic response, they support fatigue, durability, and structural integrity testing for a wide range of assemblies.

With configurable force, position, and acceleration control, these systems provide high repeatability and low energy consumption—well-suited for material property analysis. Advanced control software, real-time diagnostics, and automated data logging support seamless operation in research, development, and production environments. Fully compliant with SAE, ISO, and industry standards, they offer a high-performance, cost-efficient alternative to hydraulics.

- **Durability**
- **Noise, Vibration, and Harshness (NVH)**
- **Research and Development**
- **Packaging**
- **End-of-Line Production**
- **Accelerated Life**



Advantages

Extended Stroke and Velocity

Pedestal-style servoelectric actuators provide longer strokes than electrodynamic shakers and achieve higher frequency response than servohydraulic systems.
Standard: >4m.s
High-performance: >8m/s

Thermal Management

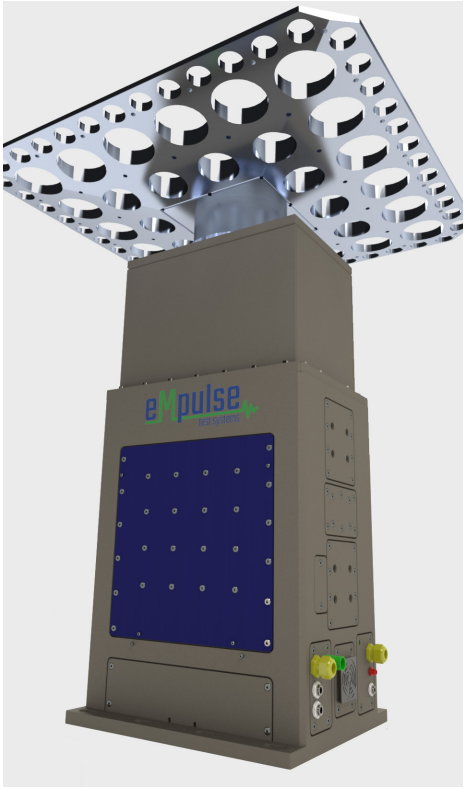
Increased efficiency in converting electrical to mechanical energy, results in significantly lower heat generation. This improved efficiency reduces the size of the active cooling infrastructure, minimizes thermal loading on components, and contributes to lower overall operational costs.

High-Frequency Capability

Motor coherence up to 400 Hz enables test profiles that demand high dynamic response, exceeding the capabilities of servo-hydraulic actuators.

Solid Welded Construction

Precision CNC machined and ground surfaces to 0.0001” tolerances to ensure perfect alignment for system longevity. Nickel plating surfaces resist long-term corrosion better than zinc, powder-coating, or paint.



Force Range and Modular Design

Modular motor configurations deliver peak dynamic forces from 1 kN to 108 kN, independent of static load. Systems are available in both vertical and horizontal orientations. Vertical shakers include a coaxially mounted air spring that supports static loads without limiting dynamic performance.

Nanometer-Level Accuracy

Integrated displacement feedback systems offer <10 nm resolution, supporting high-precision test requirements.

Advantages

Sideload Capacity
Outboard bearings significantly improve sideload tolerance, outperforming comparable servohydraulic systems in lateral stability and reliability.

Pneumatic Support
Patented integrated high volume Air-bag pneumatic support system for no maintenance and long-term durability.

Internal Motor Cooling
Internal motor cooling allows higher continuous force capacity to run extended or durability test profiles.

High Fidelity Feedback and Control
High precision 32-bit closed-loop control ensures smooth, accurate motion across all test speeds, without switching valve types or control strategies.

Application-Specific Software
Integrated with eMpulse controls that feature application-specific software, these systems are ideal for field data reproduction, sine sweep, or Power Spectral Density (PSD) profile replication.

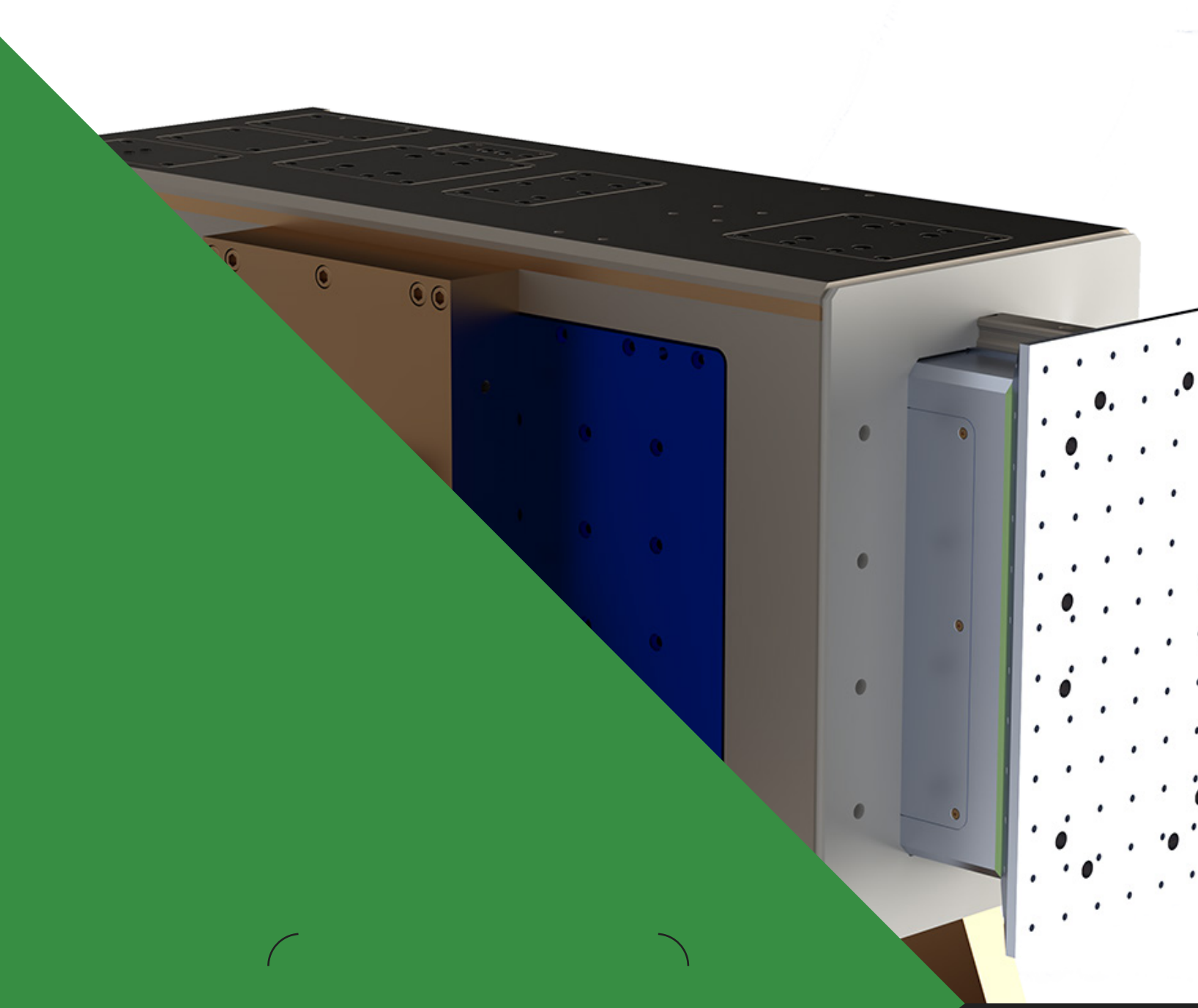
Efficient, Clean Operation
Up to 80% more efficient than hydraulics, with no fluid handling, reduced maintenance, and a cleaner test environment.

Integrated Safety Features
These features are built into the control architecture to ensure operator safety and specimen integrity during every test cycle. Included comprehensive safety monitoring:

- Safe Limited Speed (SLS)
- Safe Limited Acceleration (SLA)
- Absolute encoder fault detection
- Safe Torque Off (STO)
- Internal motor/drive temperature monitoring
- Customizable specimen-specific protection limits

Single Axis Test Systems Specifications

SPECIFICATIONS [1]	SYMBOL	UNITS	sea+ 13		sea+ 27		sea+ 40		sea+ 54		sea+ 108	
Stroke[2] Working Stroke, peak - peak	s	mm (in)	160 (6,3)	260 (10,2)	160 (6,3)	260 (10,2)	160 (6,3)	260 (10,2)	160 (6,3)	260 (10,2)	160 (6,3)	260 (10,2)
Motor Dynamic Peak Force Motor Peak Force	Fpk, mot	N (lbF)	13.486 (3.032)		26.910 (6.049)		40.326 (9.065)		53.820 (12.100)		107.640 (24.200)	
Motor Continuous Dynamic Force[3] Motor Continuous or RMS Force	Fn, mot	N (lbF)	5.018 (1.128)		10.530 (2.367)		21.060 (4.734)		21.060 (4.734)		42.120 (9.469)	
Static Load Support Max Air Spring Capacity at Prated	Fpk, air	N (lbF)	7.117 (1.600)		14.235 (3.200)		14.235 (3.200)		14.235 (3.200)		28.470 (6.400)	
Total Peak Force **Fpk mot + Fpk air**	Fpk, total	N (lbF)	20.603 (4.632)		41.145 (9.249)		54.561 (12.265)		68.055 (15.299)		136.110 (30.598)	
Total Continuous Force **Fn,mot + Fpk,air**	Fcont, tot	N (lbF)	12.135 (2.728)		24.765 (5.567)		35.295 (7.934)		35.295 (7.934)		70.590 (15.869)	
Velocity max at Fn,mot	Vmax, fn	m/s (in/s)	4,6 (181)		4,2 (165)		4,2 (165)		4,2 (165)		4,2 (165)	
Velocity max at Fpk,mot	Vmax, fpk	m/s (in/s)	2,0 (78,7)		1,9 (74,8)		1,9 (74,8)		1,9 (74,8)		1,9 (74,8)	
Acceleration max (unloaded)	gmax	G	45	36	44	31	42	40	55	49	50	45
Absolute Digital Encoder Resolution	Δs	nm (in)	<10, or 0.01um (<3,94E-07)									
Noise Level – Typical (NVH Mode)	SPL(A)	dbA	<55									
Safety Rating, DIN EN 61508* **	SIL		2									
Safety Rating, DN EN ISO 13849-1	Cat		3									
Performance, DIN EN ISO 13849-1	PL		D									
Bearing Materials			Qty 4 - Prelubricated, preloaded t-rail caged roller bearings. Replacement interval: 15 years under designed usage.									
Facility Requirements		V A	380-480Vac, 3φ, 50-60 Hz Current Rating based on motor sizing and system performance requirements.									
Air Supply, Rated	Prated	Psi (bar)	100 (6,9)	Higher Static Load Support possible at higher supply pressures.								
Recommend Liquid Cooling Flow, approximately 20deg delta C	Q	Lpm (gpm)	20 (5,3)		22 (5,8)		26 (6,9)		26 (6,9)		52 (13,7)	
Max Motor Heat Removal **@100% duty cycle,** **full durability rating**	Qp	kW Btu/hr ton	15,5 52.832 4,4		29,4 100.205 8,4	29,4 100.205 8,4	53,8 183.713 15,3		53,8 183.713 15,3	53,8 183.713 15,3	107,7 367.426 30,6	107,7 367.426 30,6



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