exail at a glance

30
YEARS OF EXPERIENCE

250+
MILLION EUROS OF TURNOVER

80%
OF TURNOVER ACHIEVED ABROAD

1500+
EMPLOYEES

35+
COUNTRIES WITH EXAIL MOTION SIMULATORS

20%
OF TURNOVER REINVESTED EACH YEAR IN R&D

600+
MOTION SIMULATORS OPERATING WORLDWIDE

DELIVERING OVER
500
CUSTOMERS EVERY YEAR

24/7
TECHNICAL SUPPORT

our global footprint

www.exail.com

exail

exail

MOTION SIMULATORS

Exail, your partner in motion simulation

Inertial sensors and navigation systems are being employed in a growing number of applications. Alongside traditional markets such as land vehicles, aircraft, satellites, missiles, ships, and submarines, newer applications such as autonomous or unmanned vehicles, mobile devices, wearables, and virtual reality hardware are emerging. Exail motion simulators are instrumental in designing, calibrating and testing millions of inertial sensors, navigation systems, and optronic payloads for these applications every year.

Leveraging 60 years of unique experience in designing and manufacturing advanced motion simulators, Exail's rate tables offer best-in-class capabilities in terms of performance, accuracy, and reliability. These scalable tables offer an unmatched cost-to-performance ratio and cater to the specific needs of customers at each stage of product development. From the initial definition of requirements to the design, production, installation, and maintenance phases, Exail supports its customers at every step of the way to ensure the success of every single project.

A FULL RANGE OF RATE TABLES FOR PRECISE TESTING THROUGHOUT PRODUCT DEVELOPMENT

With the EVO Series, Exail provides an extensive selection of simulation tables that deliver exceptional performance and are customized to meet the diverse needs of users throughout a product's lifecycle, from prototyping to final production. Designed for various applications, such as navigation, defense, automotive, aerospace, and scientific research, these tables use top-quality components and achieve exceptional performance levels. Featuring the latest and most advanced control electronics, they ensure ultra-high performance and safety for engineers who need to set up simulations efficiently.

Unrivaled control

Exail has patented advanced axis control technologies that are implemented within the nGimo controller:

- Auto-tuning of controller parameters
- Adaptive sine bandwidth enhancement with minimal attenuation and phase-shift
- Anti-coupling between axis
- Advanced unbalance and fault detection
- Auto-tuned anti-cogging
- Real-time built-in-test

Advanced electronics

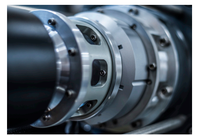
Exail pioneered the use of key state-of-the-art technologies in motion simulation:

- Low cogging AC direct drive motors designed for enhanced stability
- High performance drives with minimum ripple
- High performance optical encoders with high resolution (< 0.02 arcsec)
- High quality standard or custom slip-rings, and fiber-optic, gas and fluid rotary joints
- Proprietary model based digital electronics for improved positioning and rate accuracy

Advanced mechanics

Exail uses best-in-class tools and processes for mechanical design and finite-element-analysis providing:

- Higher resonant frequencies resulting in wider bandwidth
- Best-in-class precision of mechanical structures
- Modularity of design between all Series for better commonality and lower upgrade costs



TESTING OF R&D AND PROTOTYPING EQUIPMENT

Exail's range of simulation tables starts with 1 to 3-axis tables that are designed for testing accelerometers and inertial components of navigation systems during their prototyping or development phase. Compact and easy to install, these tables can accommodate small and lightweight sensors weighing up to 20 kg while offering excellent dynamics for testing products at their maximum capacity. They provide the best cost/performance ratio for testing in a variety of fields, making them an ideal choice for starting product development process on a limited budget.

EVO-10S

EVO-AMI

EVO-30N

	1-Axis	2-Axis		3-Axis		
Nominal payload mass (kg)	10	10		20		
Geometry						
Wobble (arsec)	< 5	< 20	< 20	< 10 to 2	< 10 to 3	< 10 to 2
Position accuracy (arsec)	< ±5	< ±10	< ±10	< ±10 to ±2	< ±10 to ±2	< ±10 to ±2
Position repeatability (arsec)	< ±2	< ±5	< ±5	< ±5 to ±1	< ±5 to ±1	< ±5 to ±1
Orthogonality (arsec)	N/A	< 30		< 10 to 2	< 10 to 2	
Dynamic						
Maximum rate (deg/s)	up to ±3 000	up to ±1 000	up to ±300	up to ±3 000	up to ±5 000	up to ±300
Peak acceleration (deg/s)	±40 000	±150 to ±4 000	±150 to ±600	±1 500 to ±5 000	±250 to ±500	±100 to ±200
Bandwidth (Hz)	> 150	> 5 to 20	> 5 to 20	> 60	> 20	> 20
Option						
Climatic chamber (optional) (°C)	-70 to +125 °C	-40 to +85 °C		-55 to +125 °C		

LARGE-SCALE SIMULATION ON MASS PRODUCTION SENSORS

The EVO-10M and EVO-20 Series tables are designed for high-capacity testing of high-performance products, from commercial-grade MEMS to tactical-grade inertial systems, during their mass production phase. With large platforms and a payload capacity up to 50 kg, these rate tables can handle substantial systems and multiple products for simultaneous testing. Featuring positioning and repeatability accuracies of up to 1 arcsec, they ensure high levels of precision and reliability under harsh conditions. They can further be equipped with thermal chambers for optimal testing conditions.

EVO-10M

EVO-20M

EVO-20L

	1-Axis	2-Axis			2-Axis	
Nominal payload mass (kg)	20	20			50	
Geometry						
Wobble (arsec)	< 5 to 2	< 5 to 2	< 5 to 3	< 10 to 2	< 10 to 3	
Position accuracy (arsec)	< ±5 to ±1	< ±5 to ±1	< ±5 to ±1	< ±10 to ±2	< ±10 to ±2	
Position repeatability (arsec)	< ±2 to ±1	< ±2 to ±1	< ±2 to ±1	< ±5 to ±1	< ±5 to ±1	
Orthogonality (arsec)	N/A	< 5 to 1		< 5 to 1		
Dynamic						
Maximum rate (deg/s)	up to ±3 000	up to ±3 000	up to ±1 2000	up to ±3 000	up to ±1 000	
Peak acceleration (deg/s)	±20 000	±1 000 to ±3 000	±100 to ±200	±1 000 to ±4 000	±100 to ±400	
Bandwidth (Hz)	> 150	> 100 to 150	> 20 to 40	> 80	> 20	
Option						
Climatic chamber (optional) (°C)	-70 to +125 °C	-55 to +125 °C		-55 to +125 °C		

HWIL SIMULATION ON COMPLETE SYSTEMS

Designed for the final phase of product development, the EVO-30L is a robust table suited for testing complex systems for demanding applications. This 3-axis rate table supports complete systems for HWIL (Hardware-In-The-Loop) simulation, where the tested system is integrated into a simulated environment to create a realistic test scenario. This allows engineers to test the system's performance, behavior, and reliability under harsh environments, high vibrations, and accelerations while ensuring a controlled and safe testing environment. The EVO-30L provides real-time functionality and optional reflective memory control, enabling users to repeat HWIL simulations and get real-time feedback on the system's behavior.

EVO-30L

	3-Axis		
Nominal payload mass (kg)	50		
Geometry			
Wobble (arsec)	< 10 to 2	< 10 to 3	< 10 to 2
Position accuracy (arsec)	< ±10 to ±2	< ±10 to ±2	< ±10 to ±2
Position repeatability (arsec)	< ±5 to ±1	< ±5 to ±1	< ±5 to ±1
Orthogonality (arsec)	< 5 to 1	< 10 to 2	
Dynamic			
Maximum rate (deg/s)	up to ±1 500	up to ±1 000	up to ±500
Peak acceleration (deg/s)	±1 500 to ±4 000	±250 to ±1 000	±100 to ±300
Bandwidth (Hz)	> 60	> 30	> 20
Option			
Climatic chamber (optional) (°C)	-55 to +125 °C		