



IDS SOLUTION

Inertial Dynamometer System

UNMATCHED TESTING WITH MOTOMEA IDS

Motomea's Inertial Dynamometer System (IDS) is a revolutionary, patented, motor testing technology that delivers fast, precise, and load-free performance diagnostics across all motor types and sizes. Designed for manufacturers and R&D teams seeking to validate electric motors in real-world or production environments, the IDS provides unmatched insight into motor dynamic performance during acceleration—without requiring any external load.

Motomea's patented IDS offers an unparalleled advantage through its scalability and precision. This innovative solution is uniquely capable of testing electric motors ranging from ultra-small micro motors, as small as 6 mm, to massive industrial motors, as large as 6 meters in diameter, as well as high-speed motors reaching up to 200,000 rpm.

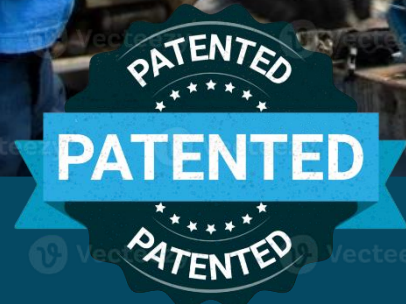
Unlike conventional systems, only Motomea's IDS can deliver accurate dynamic and static performance assessments without the need for mechanical load—a patented capability that competitors simply cannot match. This technological edge empowers manufacturers and users across industries to validate motor behavior with unmatched fidelity, making the IDS a truly future-proof solution for today's rapidly evolving electric motor landscape.



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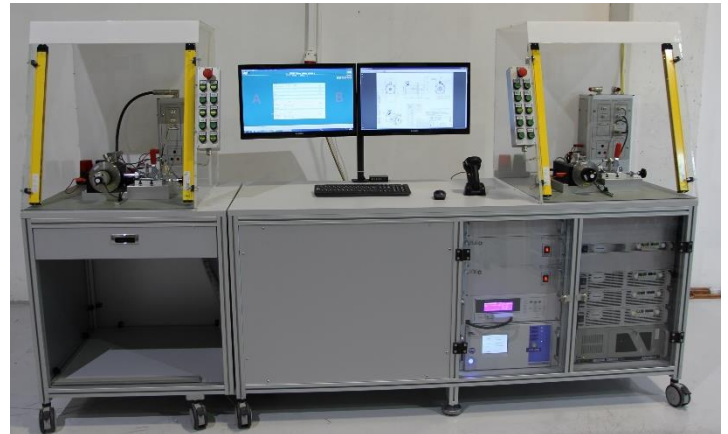
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IDS EXPLAINED

As pioneers in motor testing technology and the inventors of the Inertial Dynamometer System (IDS), Motomea has been delivering cutting-edge motor testing equipment for over three decades. Our products are designed to accurately test, and measure torque, speed, and power across a wide range of electric motor applications.

We are a globally recognized leader in the manufacturing of motor test equipment, dedicated to developing innovative solutions that enhance efficiency and reduce costs. Our multidisciplinary team of engineers—specializing in electrical, mechanical, electronic, and software domains—ensures that every product meets the highest technical standards, delivers clear and reliable outputs, and operates flawlessly under the most demanding environmental conditions.



TECHNOLOGY AND PATENTS

Motomea offers tailored software, mechanical, and electrical engineering solutions to meet specific customer needs, enhancing system performance. Our patented dynamic motor testing system analyzes motors and powertrains during acceleration and deceleration, ensuring comprehensive testing across a wide range of speeds and torques. Designed for modern e-drive systems, our optimized test systems are future-proof.

Motomea maintains ISO 9001:2015 quality management certification for all company sections, and products are built to complete turnkey systems.

With Motomea expertise and innovative solutions, businesses can optimize motor performance, mitigate downtime, and drive operational efficiency across various sectors

WHERE IS THE IDS SOLUTION SUITABLE?

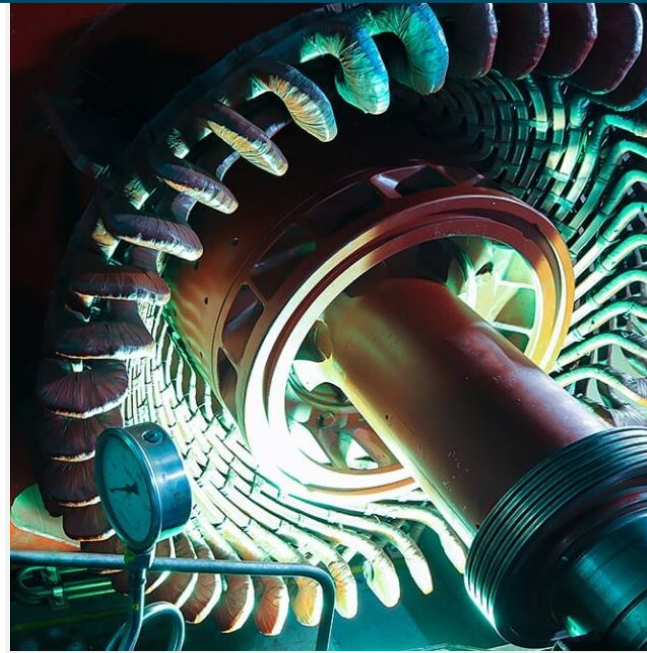
Motomea is a leading motor testing solutions provider, serving a wide range of industries including automotive, aerospace, mobility, rail, maritime, utilities, R&D, and standards laboratories, catering to various applications spanning Electric Motors and Electric Vehicles (EV) with solutions for Research & Development (R&D) Labs, End of Line (EOL) testing, and Quality Assurance (QA).

Our solutions find widespread use across diverse industries such as Automotive, Mobility, Aerospace, Wind Farms, Logistics, Rail, Maritime, Utilities, Mining, Refineries, Home Appliances, and Electric Motor Manufacturing,



IDS SOLUTION – KEY BENEFITS

- **Full Load Performance Testing**
Measures torque, speed, current, voltage, power input & output, and power factor, from stall up to no-load without external mechanical load.
- **Real Dynamic Performance Measurement**
Captures data during acceleration & deceleration to reveal true motor behavior in real time.
- **Ripple & Cogging Torque Level Detection**
Identifies fine dynamic characteristics such as ripple torque and cogging torque level, critical for precision motor applications.
- **Advanced Friction Analysis**
Evaluates friction torque, power loss due to friction, and friction spectrum for efficiency diagnostics.
- **Wide Frequency Spectrum Analysis**
Displays speed and torque spectrum across a broad frequency range to detect high-frequency mechanical & electrical issues.
- **Back EMF Analysis**
Includes open-circuit and loaded back EMF measurements and constants (K_E) for motor characterization.
- **Comprehensive Data Output**
Provides RMS, AVG, and real-time values with high accuracy ($\pm 0.2\%$) for in-depth motor analysis.
- **Time-Based Data Visualization**
Plots all performance metrics over time to support trend analysis and diagnostics.
- **Customizable Reporting**
Generates Excel and PDF reports tailored to user and QA standards.
- **Application-Based Testing**
Enables testing in real operating environments (R&D, QA, EOL), validating real-world performance.
- **Built-In Safety Protections**
Includes short-circuit protection and secure system shutdown features.
- **Modular System Integration**
Compatible with test automation systems.
- **Standards Compliance**
Meets international testing norms such as IEEE 112-2004.
- **Power Supply & Safety Enclosure** – Robust, industrial-grade power delivery and protection system, engineered for continuous lab or production use under high-current, high-voltage conditions.



COMPREHENSIVE MOTOR TESTING



ENSURING
PRECISION,
PERFORMANCE,
AND RELIABILITY
WITH ADVANCED
DIAGNOSTICS AND
SAFETY FEATURES

IDS SOLUTION – KEY COMPONENTS

- **Inertial Load Module** – Precision-engineered flywheel and motor integration that uses the rotor’s moment of inertia as load, eliminating the need for external loading systems.
- **IDS Software Suite** – Advanced data acquisition and analysis platform for real-time monitoring of dynamic performance metrics and static performance metrics across full load ranges.
- **High-Speed Data Acquisition System** – Captures high-resolution performance metrics during acceleration and deceleration, ensuring accurate detection of electrical and mechanical anomalies, including torque friction, back EMF, and efficiency.
- **Integrated Sensor Array** – Includes high-speed encoders, temperature sensors, and vibration transducers for comprehensive dynamic and static testing.
- **Data Export & Reporting Tools** – Enables connectivity and generation of automated reports (PDF, Excel), suitable for QA, R&D, and compliance documentation.
- **Modular Test Bench Integration** – Flexible design supporting different motor types and sizes, enabling adaptation to EOL, R&D, or pilot production environments.

TEST EXAMPLES

Measurements at 1600 V, 2700 V, and 3300 V after parabolic compensation to 6000 V

(Manufacturer’s measurements are shown in the red curve)

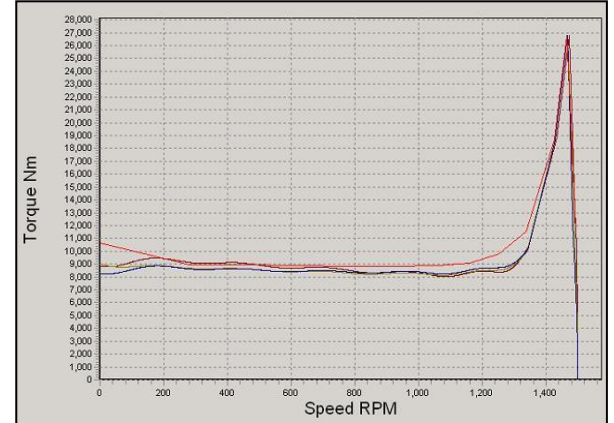


Figure 1 - Torque vs. Speed

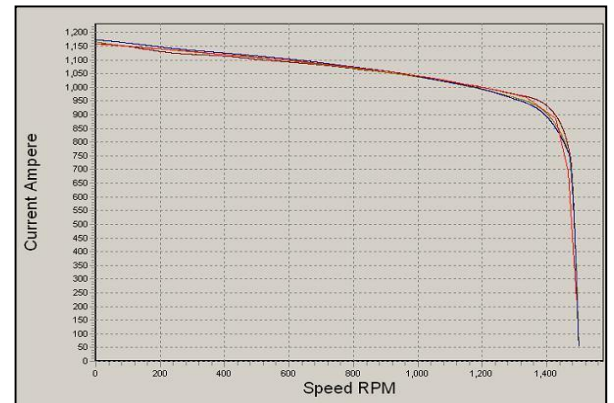


Figure 2 - Current vs. Speed

**NO LOAD?
NO LIMITS.
UNLOCK TRUE
MOTOR
PERFORMANCE**



IDS MODULAR PACKAGES: BUILT TO SCALE WITH YOU

Standard	Professional	Premium
<ul style="list-style-type: none"> • Speed • Torque • Power Input • Power Output • Power Factor • Efficiency • Time • Current • Current L1 • Current L2 • Current L3 • Voltage • Voltage URS • Voltage URT • Voltage UST • Direction of Rotation 	<p>IDS Standard Package +</p> <ul style="list-style-type: none"> • <i>Dynamic Torque</i> • Friction • Oscillations • Speed Spectrum • Torque Spectrum • Cogging Level • Back EMF • Friction Spectrum • Performance Summary • Main Current • Auxiliary Current • Capacitor Voltage • Time Speed Cap. Run • Time Speed Cap. Start Cap. Run • Time Speed Main • Time Speed Main and Aux • Efficiency of Motor without Sensor • Fan Load Curve • Rotor Electrical Symmetry • Torque Angle 	<p>IDS Professional Package +</p> <ul style="list-style-type: none"> • Vibration • Temperature • Driver Efficiency • Driver Current • Driver Voltage • Driver Power Input



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