TEST RIGS

Turn-key solutions • ReNew Kits • Service
PT GROUP

• Full cycle of projects implementation from the technical specifications to commissioning.
• Developed network of highly professional subcontractors.
• Successful experience in managing and commissioning of large projects.
• Long-term technological leadership in production and integration of linear electromechanical actuators (electric cylinders) in Russia.

2009

Since >60 employees, including 6 PhDs
Office and production facilities >1100 m²
In-house production of electric cylinders
Long-term maintenance, service and training programs
Projects completed in Russia, CIS and Eastern Europe

Design self-regulatory organization (SRO) approvals
General contracting SRO approvals
The Federal Security Services license
ISO 9001–2015
COMPETENCIES

DURABILITY TEST RIGS
Multichannel static and re-static tests, temperature loads, optical metrology.

MULTIPURPOSE FATIGUE TEST RIGS
Single and multichannel fatigue tests. Combination of dynamic and static loads.

SHOCK, CALIBRATION, MEASURING, TILT TEST RIGS
Impact tests, measurement of center of mass and moments of inertia, graduation of strain measuring equipment, wave roll simulation.

SPECIAL SYNCHRONISED ACTUATOR SOLUTIONS
Rotary support for anechoic chambers, positioners, mechanisms for changing the angles of attack and slip of «α»–«β» wind tunnels, mechanisms of «input–output» and much more.
CAPABILITIES

PROJECTS AND ENGINEERING
Solution of highly-complex specialized tasks from concept development to commissioning.
• In-house development and implementation of state-of-the-art solutions.
• Cooperation with world-renowned technological leaders during implementation of complex projects.
• Team of professionals with significant experience in mechanics and hydraulics.
• Metrology support and services.

MANUFACTURING
Modern assembly facility in Moscow, quality service.
• Manufacturing of electromechanical actuators and hydraulic systems.
• Assembly of large-scale and complex mechanics.

COMPLEX SUPPLIES OF EQUIPMENT
• Direct distribution contracts with manufacturers
• Certified solutions.
• Try new products first!

SERVICE & MAINTENANCE
Comprehensive support throughout the equipment lifecycle.
• Extended warranty for supplied equipment.
• Technical maintenance works.
• Maintenance works and scheduled repairs.
• Spare parts, components and consumables.
• Long-term service agreements.
DURABILITY TEST RIGS

- Development and manufacture of modular test rigs.
- ReNew kits.
- Metrology services and support.

FEATURES

- Up to 32 loading channels.
- Channel force up to 1000 kN.
- Heat-resistant loads up to 10 zones.
- Electromechanical and/or hydraulic force actuators.
DURABILITY TEST RIGS

COMPLEX «ISKRA 16+»

The software-hardware complex «ISKRA 16+» is intended for the development and modernization of static, re-static and life time test rigs. Control of traditional hydraulic cylinders and modern electric cylinders provides the fastest possible configuration of test modes.

«ISKRA 16+» meets all the modern requirements of customers and test centers.

FEATURES

• Simultaneous multiple tests on different stands.
• Full identification of exciters with sensors.
• Software adjustment possibility on LabView.
• Automatic analysis and verification of input data.
• Stop mode for a specified period.
• Self-test system of all elements of the loading system.
• Possibility of stand configuration from wireless terminals.
• Possibility to integrate new software modules for other tests.

SPECIFICATION

<table>
<thead>
<tr>
<th>Number of control channels</th>
<th>up to 256</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum frequency of command signal</td>
<td>1 kHz</td>
</tr>
<tr>
<td>Poll frequency of sensors connected to the PLC</td>
<td>up to 50 kHz</td>
</tr>
<tr>
<td>Interrogation frequency of sensors connected to peripherals</td>
<td>up to 1 kHz</td>
</tr>
<tr>
<td>Feedback control accuracy</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>ADC</td>
<td>24 bit</td>
</tr>
</tbody>
</table>
DURABILITY TEST RIGS

FORCE ACTUATORS

Development and production of electric and hydraulic actuators.

Dimension types of electric actuators.
• The force on the rod: 5, 10, 25, 50, 100, 250, 500, 1000 kN.
• Stroke: 100–1200 mm.
• Linear speed: 5–20 mm/s.
• Positioning accuracy: 0.05–0.1 mm.
• Lifetime: at least 1 million load cycles.

FORCE MEASURING DEVICES

Precision measurement of forces and torque.
• Load cells up to 10 kN with an accuracy of 0.02%.
• Sensors measuring torque up to 100 kN · m.
• Multi-axis sensors.
• Loadpins up to 4.5 kN.

OPTICAL METROLOGY SYSTEMS

Measurement of coordinates and deformations of an arbitrary number of points on objects of any shape and size.
• Simultaneous operation of up to 32 cameras.
• System polling frequency up to 250 Hz.
• Measurement accuracy <0.1 mm at a distance of 1 m.
• Insensitivity to temperature changes.
• Detection of deformation on all sides of the object and in hidden areas.
DURABILITY TEST RIGS

COMPLETED PROJECTS

NPO KURGANPRIBOR, Kurgan
Static and re-static test rig based on electric actuators (2 channels, up to 25 tf).

KBM NPK, Moscow region
Load complex for heat–resistance tests based on electric actuators (3 channels, up to 15 ton–force).

MACHINE BUILDING PLANT AVANGARD, Moscow
Universal test rig for static durability tests of serial products (19 channels, up to 70 tf).
Done in partnership with NPP Aerotest.

CENTRAL AEROHYDRODYNAMIC INSTITUTE (TsAGI), Moscow region
Turn–key test rig with controller for re–static tests in climate chambers (–60 ... + 90 ° C) based on electric actuators (>60 channels, up to 15 tf).

MKB ISKRA, Moscow region
Universal complex for carrying out static, re–static and hydraulic testing of products based on electromechanical force actuators (12 channels, up to 30 tf).

ONPP TECHNOLOGIYA, Obninsk, Kaluga region
The system of automatic control of force–loading as part of a test rig of heat resistance tests based on electromechanical force actuators (2 channels, up to 5 tf).

AVIADVIGATEL, Perm
Automatic loading control system for a specialized test rig for static testing of an engine and large–sized assemblies made of polymer composite materials (25 channels, up to 50 tf).
Done in partnership with NPP Mera.
MULTIPURPOSE FATIGUE TEST RIGS

- Development and manufacture of modular test rigs.
- ReNew kits.
- Metrology services and support.

FEATURES

- Frequency up to 150 Hz.
- Up to 20 loading channels.
- Channel force up to 1000 kN.
- Servocontrollers of domestic production.
- Electromechanical and/or hydraulic force actuators.

Servo controller
Remote controller
Hydraulic power unit (low noise)
Load frame
Actuators with force sensors
MULTIPURPOSE FATIGUE TEST RIGS

COMPLETED PROJECTS

OKB LYULKA, Moscow region

Test rigs based on hydraulic actuators for static and dynamic strength tests of aircraft engine components.
• 20 loading channels with a force range up to 50 tf.
• Hydraulic cylinders are equipped with force sensors mounted on the rods, and built-in rod position sensors.

CENTRAL AEROHYDRODYNAMIC INSTITUTE (TsAGI), Moscow region

Automatic control system for re-static tests in climate chambers based on electromechanical force actuators.
• > 60 loading channels with a range of forces up to 15 tf.
• Work of electric cylinders in the temperature range -60 ... + 90 ° C.
• Use of high temperature cables.

LOMONOSOVSKY EXPERIMENTAL PLANT, St. Petersburg

The strength test rigs for windows of high-speed trains Sapsan based on electromechanical force actuators.
• 1 loading channel with a range of forces up to 1 tf.
SHOCK TEST RIG

Fully automated testing process: single blow, cyclic, according to a given program.

FEATURES

- Mass of tested products up to 5000 kg.
- Maximum acceleration 500G (with 5 ms duration).
- Pulse duration: 0.8–50 ms.
- Shock pulse: half sine, haversine, sawtooth, trapezoidal, triangular.
- Hydraulic braking system.
SHOCK, CALIBRATION, MEASURING, TILT TEST RIGS

RIG FOR MEASUREMENT OF CENTERS OF MASSES AND MOMENTS OF INERTIA

Approval of the type of measuring instruments. Creating standards. Certification and primary calibration.

FEATURES

• Characteristics of the measured products:
  overall dimensions up to 4.5 m, weight to 5000 kg.
• Accuracy of measurements: mass ± 1 kg, coordinates ± 1 mm.
SHOCK, CALIBRATION, MEASURING, TILT TEST RIGS

SON-PLANE STRAIN MEASURING & CALIBRATION EQUIPMENT

Mobile solution with high accuracy of experimental data and simple readjustment.

FEATURES

• Ready to start within 10 minutes.
• Real-time data processing.
• Say No to hydraulics.
SHOCK, CALIBRATION, MEASURING, TILT TEST RIGS

COMPLETED PROJECTS

NPO AVRORA, St. Petersburg
Automatic control system of the shock test bench on the basis of hydraulic actuator.
Done in partnership with Vibroservistest LLC.

SUKHOI CIVIL AIRCRAFT, Moscow
The complex of test equipment for full-scale graduation of strain measuring equipment based on electromechanical force actuators.

NPO LAVOCHKIN, Moscow region
Test system for determining the coordinates of the center of mass and moments of inertia.

IRKUT CORPORATION, Irkutsk
Universal load complex for calibration of strain gauging channels before flight tests based on electromechanical force actuators.

VNIKHOLODMASH, Moscow
Tilting test rig for the water wave simulation. Based on a hydraulic actuator.
Done in partnership with Vibroservistest LLC.
SPECIAL SYNCHRONISED ACTUATOR SOLUTIONS

Solution of complex drive tasks requiring high dynamics, accuracy and special operating conditions.
- Development and implementation.
- Modernization.

FEATURES
- Integration into the upper level of automated control system of the facility.
- Development of electrical mechanisms considering non-standard operating conditions: vacuum, pressure, humidity, temperature.
SPECIAL SYNCHRONISED ACTUATOR SOLUTIONS

COMPLETED PROJECTS

CENTRAL AEROHYDRODYNAMIC INSTITUTE (TsAGI), Moscow region
Modernization of the control system of the mechanisms for changing the angle of attack «α» and sliding «β» of the wind tunnel T–109.

OKB YAKOVLEVA, Moscow
Modernization of the control system for electric drives of hydraulic pumps.

NPO ZVEZDA, Moscow region
Modernization of the automatic control system of the wind tunnel.

CENTRAL AEROHYDRODYNAMIC INSTITUTE (TsAGI), Moscow region
Modernization of the control system of an adjustable wind tunnel nozzle (T–116).

CENTRAL AEROHYDRODYNAMIC INSTITUTE (TsAGI), Moscow region
2-axis pylon positioner.

CENTRAL AEROHYDRODYNAMIC INSTITUTE (TsAGI), Moscow region
Modernization of the control system of an adjustable wind tunnel nozzle (T–128).

CENTRAL AEROHYDRODYNAMIC INSTITUTE (TsAGI), Moscow region
Modernization of the control system of the mechanisms for changing the angle of attack «α» and sliding «β» of the wind tunnel T–104.

CENTRAL AEROHYDRODYNAMIC INSTITUTE (TsAGI), Moscow region
Modernization of the control system of the wind tunnel compressor (T–128).

CENTRAL SCIENTIFIC RESEARCH INSTITUTE OF MECHANICAL ENGINEERING, Moscow region
Modernization of the automatic control system for the executive mechanism of the jet gas–dynamic stand.

IRKUT CORPORATION, Moscow
Technical complex for controlling high-speed electric motors as part of a passenger aircraft hydraulic testing system test bench.
CUSTOMERS

AVIATION
- Central Aerohydrodynamic Institute (TsAGI)
- Central Institute of Aviation Motors (CIAM)
- United Aircraft Corporation
- United Engine Corporation
- Irkut Corporation
- Beriev Aircraft Company
- OKB Lyulka

SPACE
- United Rocket and Space Corporation
- Central Scientific Research Institute Of Mechanical Engineering
- VNIIEM Corporation
- MKB Iskra
- NPO Zvezda
- NPO Lavochkin
- Machine building plant Avangard

MARINE
- United Shipbuilding Corporation
- NPO Avrora
- Krylov State Research Center
- Tranzas
- VNIIKHOLODMASH
- Khabarovsk Shipyard
- Nevsky Shipyard
- Zelenodolsk Shipyard

Over 120 different projects completed successfully.