

HIGH SPEED & PRECISION GRINDING SOLUTIONS

LG



Innovative solutions for a better future

At Danobat, we are committed to introducing positive change in people, business and the environments we work in. We do this by developing innovative solutions that enable us to face future challenges.

We generate high value technological solutions that improve our clients' competitiveness. We offer resourcefulness and engagement to bring innovative and personalised answers to different challenges. We are committed to the process and the results from the beginning right through to the end, and adapt to each necessity, offering assurance and guaranteeing a 100% meaningful experience.

We are experts in the design and manufacture of precise, high added-value, customised solutions. Our process has become an attitude and a way of doing things: the Danobat way. Qualified specialists, in-house technology, backing for innovation and, of course, a corporate culture that places value on people and puts the customer at the heart of its organisational system.

We boost change



Innovative Solutions

We specialise in producing high value-added, innovative technological solutions that help industry to become more competitive.

Our mission is to provide a response tailored to the requirements of our customers, based on our expertise in the technologies applied to industrial manufacturing with intelligence, commitment, creativity, rigour and professionalism.

- Holistic solutions.
- Grinders.
- Lathes.
- Measuring systems.
- Advanced engineering services.
- System integration.
- Automation.



Digital Focus

Digital technology has transformed the way in which we shop, travel and communicate.

We think and act digitally. We are interconnected and so are our production systems and equipment. The latest advances in digital technology are at the service of our customers, and we focus on developing our own solutions using advanced technology.

- Danobat Digital Suite - Intuitive interfaces.
- Data System - Connected machines.
- Control System - Digital factory.
- Smart Machining - Smart components.
- Real-time, remote information.
- In-house software for controlling machines, cells and lines.



Advanced Services

At Danobat we offer the services the industry needs, such as corrective maintenance strategies and spare parts services, but we always try to go one step further and anticipate changes in the sector. Accordingly, we provide a broad range of high value-added services which are completely customised to meet the challenges faced by our customers.

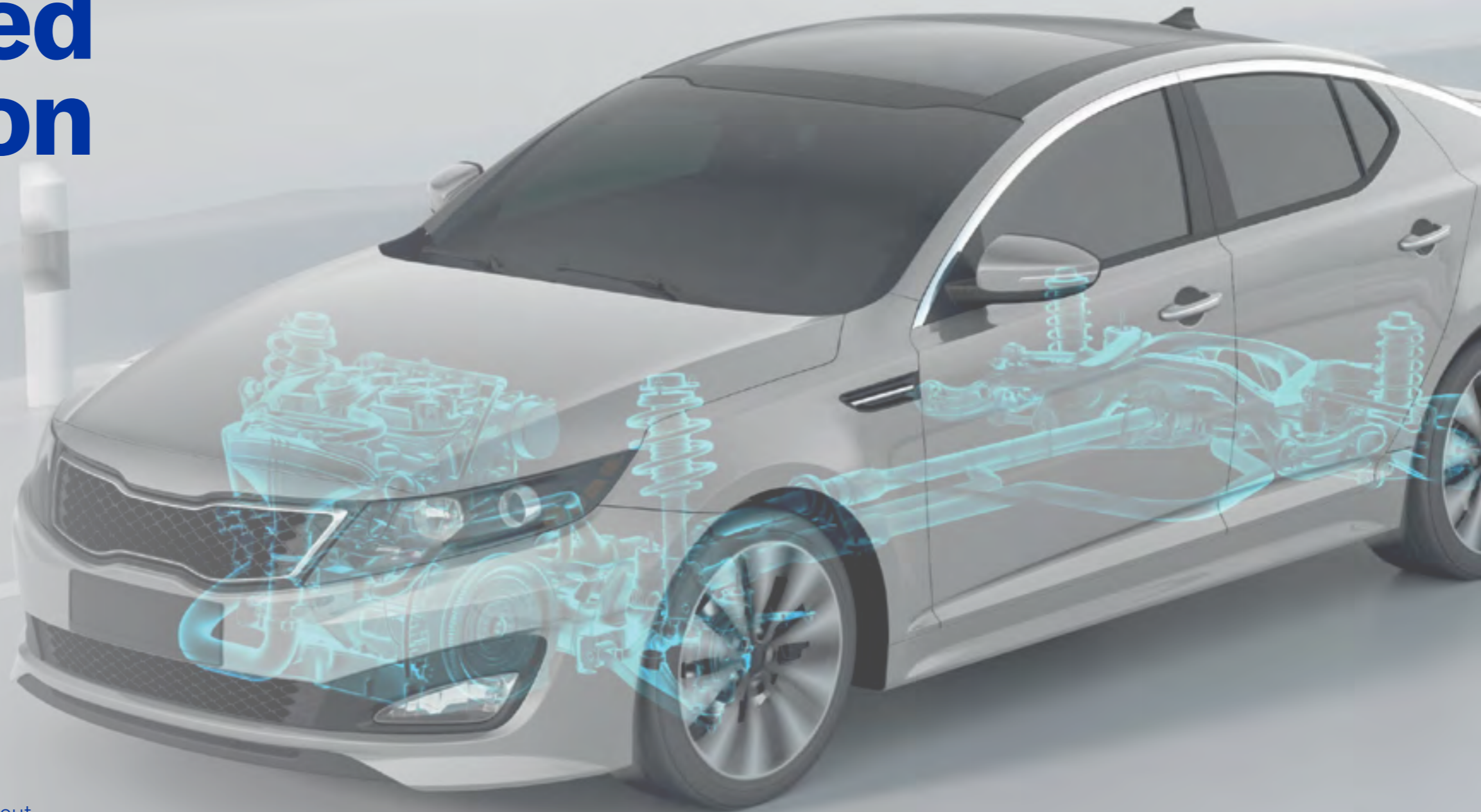
- Process simulation.
- Production simulation.
- Advanced training.
- Inspections & quality control checks.
- Maintenance service.
- All-round spares maintenance.
- Software & hardware enhancements.
- Process optimisation.
- Obsolescence management.

High speed & precision grinding solutions

LG

Our customers send us increasingly complex challenges. Production and precision requirements continue to become tougher, but industrial firms are calling not just for more and better manufacturing but also for greater versatility and automation to make them more competitive on the market.

In response to these demands, we now present our range of LG external grinders, a family of solutions intended for the toughest production work, guaranteeing flexibility and precision without neglecting the customisation required for turnkey projects and adaptations to the specific needs of each customer.



Expertise

We specialise in the development of advanced solutions for the manufacture of high value-added components in industries where the most stringent standards are required in results.

We have broad experience in highly complex machining processes, and work with firms which are leaders in their different fields to design fully customised solutions.

We cover preliminary engineering work, machining process studies, the technical specifications of equipment, installation requirements and the personnel required to operate machines and production lines.

All-round solutions

At Danobat we can offer all-round solutions for the partial or complete manufacturing of strategic components such as shafts for electric motors on vehicles.

In the field of partial integration, we can incorporate ancillary operations into grinding solutions. These include cleaning, SPC stations, deburring, super-finishing and storage in baskets and on pallets. In the field of full integration, we offer complete machining lines that handle not only grinding but also the additional operations required to guarantee component machining.

Specialising to attain excellence

Our workforce is highly specialised, with high-level technical qualifications. Our goal is to develop the grinding solution best suited to each different production requirement of each different customer.

Our team of experts work closely with customers to provide solutions tailored to their needs and to tackle each different stage of the process of developing those solutions effectively.





Project team

This unit has a key role in the success of our projects, as it handles the task of compiling all the information required and passing on the specific requirements of each customer to the rest of the team and to our network of suppliers. As well as compiling information, the unit also draws up technical and commercial quotes.

Process and testing team

This team specialises in grinding. Its members are always up to speed with the latest technical developments on the cutting edge of technology. It determines the characteristics of the process and the solution best suited to each scenario.

The experts in this unit also anticipate and specify such major issues for customers as the useful lifetimes of tools, workpiece changeover times, machine energy consumption and life-cycle cost, among others.

To ensure that these tasks are completed and checked with the necessary rigour, at Danobat we have a network of centres of excellence equipped with a large number of latest-generation machines which enable us to conduct trials with our customers and internal tests to check tools, processes and technologies.

Our goal is to offer a facility with actual working conditions where the capabilities of machines can be checked, so that new manufacturing processes can be undertaken with full assurances and without risks. Our centres of excellence also enable us to optimise manufacturing processes at customers which are already up and running.

Technical team

The mission of this team is to specify what type of machine is best suited to the travel requirements, clamping/work holding systems and loading/unloading solutions in each case.

Our range

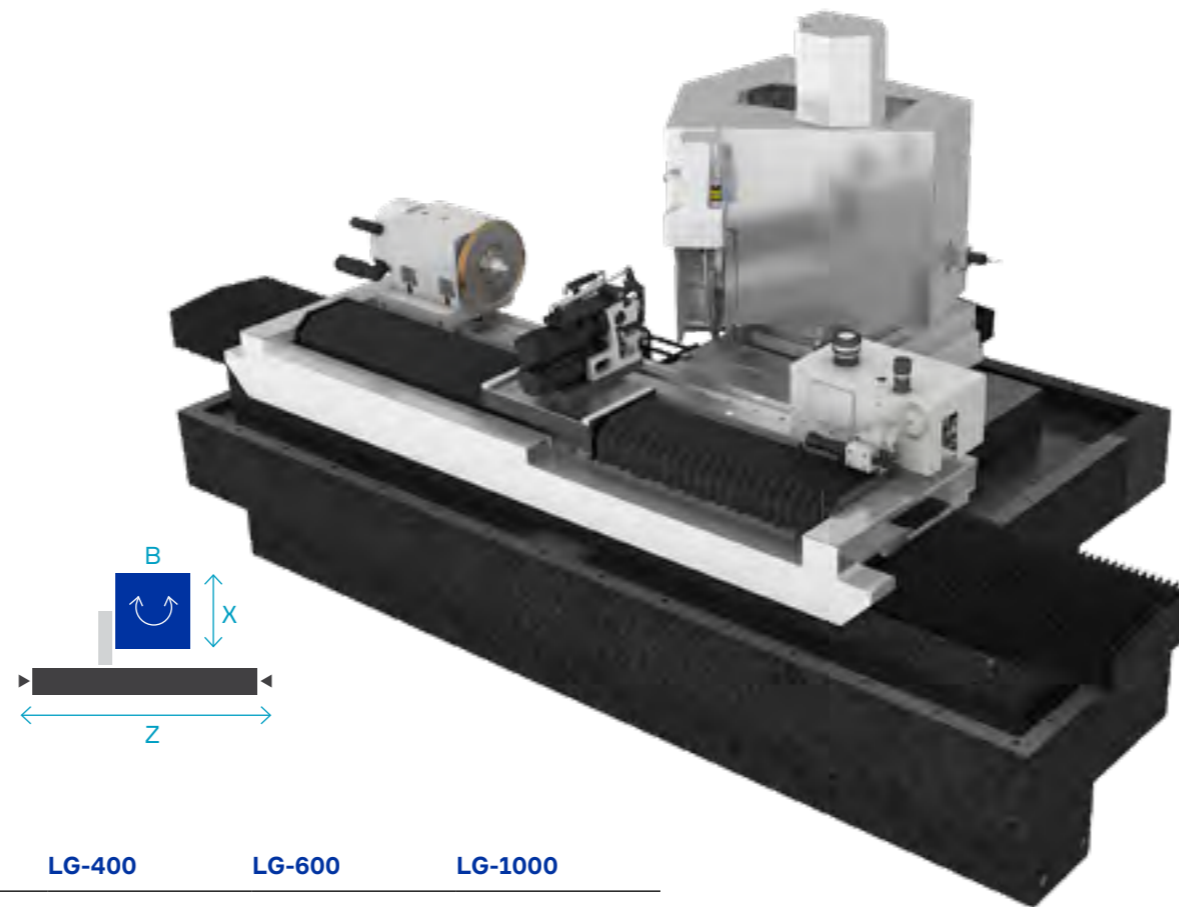


LG

High speed & precision grinding machine

The LG external cylindrical grinding machine, equipped with linear motor technology, features direct drive spindles and a natural granite bed for high accuracy and thermal stability for high-precision grinding.

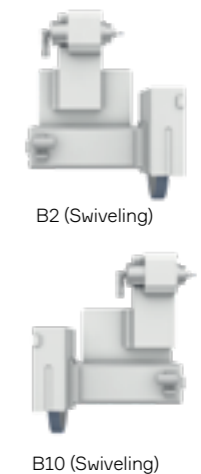
The machine can also combine conventional abrasive grinding with CBN or high-speed diamond grinding by using a B-axis with electrospindle to suit potential customer needs. It is ideal for high volume production and highly flexible batch production runs of parts such as automotive components, ultra-precision hydraulic parts, cutting tools and form grinding e.g. cam grinding.



STANDARD CONFIGURATIONS



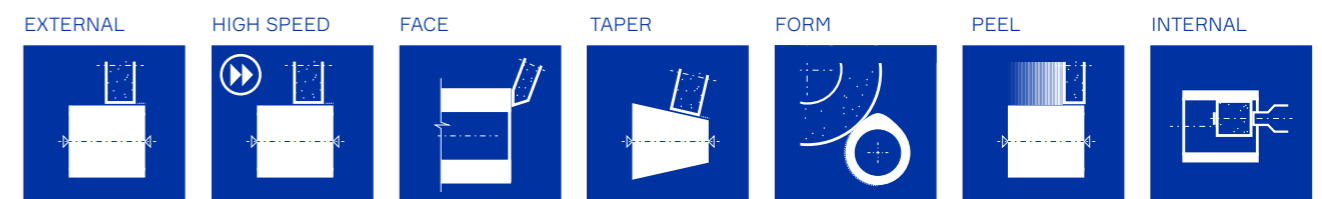
SPECIAL CONFIGURATIONS (**)



We have an extensive portfolio of wheelhead options to enable multiple operations to be carried out in a single set up, from straight (S) or angular (A) infeed types to a full rotary B-axis which can hold multiple configurations of external spindles, internal spindle and measuring systems to provide you with the most flexible grinding solution.

(*) The LG-200 model can only be equipped with A/S/B6/B9 wheelhead configurations.
 (**) Special wheelhead configurations B2/B10 can be proposed only after a technical study.

TECHNICAL CHARACTERISTICS	LG-200 (*)	LG-400	LG-600	LG-1000
Max. distance between centres	200 mm	400 mm	600 mm	1000 mm
Max. diameter to be ground	200 mm	290 mm	290 mm	290 mm
Max. weight between centres	30 kg	50 kg	50 kg	80 kg
Max. grinding wheel diameter	400 mm	500 mm	500 mm	500 mm
Max. wheel peripheral speed	140 m/s	140 m/s	140 m/s	140 m/s



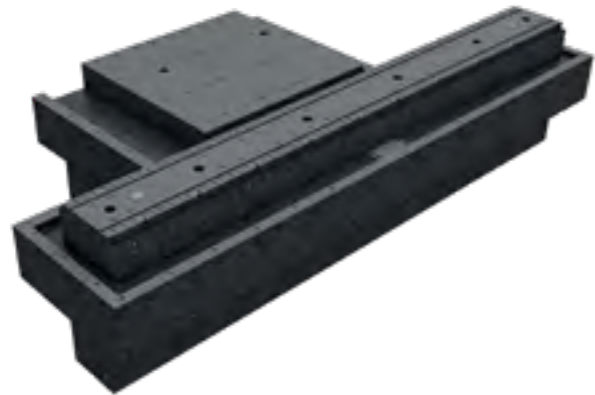
Core technology

Precision assemblies unit

Specialised precision assemblies unit, staffed by qualified fitters team with broad experience in bearing and spindle elements.

Each assembly is performed in a clean-room environment at a controlled temperature and documented to ensure traceability and interchangeability if replacements are needed.

The quality control checks run at all stages of the assembly process ensure precision and provide a test bench where every single component undergoes running-in tests.



Natural granite bed

- Machine beds made of natural granite.
- Best thermal stability properties, enhanced by permanent flushing with coolant flow. Consistency of dimensional accuracy on ground workpieces over time.
- It also ensures optimal vibration damping.



Torque motor B-axis

- Automatic wide-range stepless swivelling.
- Torque motor driven for zero backlash.
- High-resolution rotary scale to control perfect angular positioning.
- $\pm 1 \mu\text{m}$ repeatability on a 650 mm radius.



Linear motors

- X and Z slides driven by linear motors. High performance dynamics on the machine.
- Drive function with no mechanical contact. Less wear and lower maintenance.
- High-resolution linear scale to control the position of axes.
- Extremely high positioning and repeatability. Unbeatable accuracy for axis interpolation (X,Z,C).
- Temperature control via an efficient cooling system.



Built-in spindles

- Work spindle, wheel spindles and dressing rotary spindles driven by built-in motors.
- High-precision bearings with constant lifetime grease lubrication.
- Available for high rotation speeds.
- Modular designs for best application adaptability.
- Temperature control via an efficient cooling system.

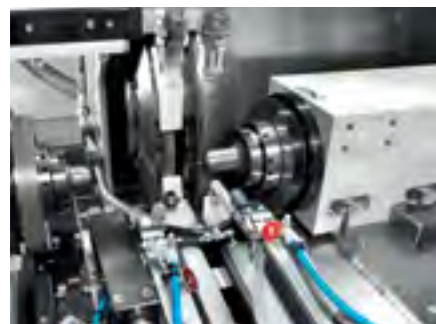
Customisable technology

These are some of the technological solutions which add high value to your manufacturing application, helping your factory become more competitive.



Moving tailstock

To permit quick workpiece changeover, the LG model can be provided with an automatic moving tailstock. The tailstock position can be adapted quickly and highly accurately to new workpiece lengths, avoiding the need for taper correction adjustment. Depending on the machine model size, moving tailstocks with strokes of up to 400 mm are available. Under special request from customers, customised solution can be implemented.



Counter spindle

Shaft type parts requiring complete OD grinding in one set up can be driven by friction force of centres, using synchronised motorised counter spindles instead of standard hydraulic tailstocks. The moving counter spindle is dimensioned for strokes of up to 150 mm. Other strokes can also be implemented on demand.

Additionally, for chuck part types, the counter spindle permits complete workpiece grinding in a 2nd set up.



Integration of measuring system

The high customisation capability of the LG machine also extends to measuring systems. Different kinds of measuring systems can be adapted to the machine table, the swivelling B-axis or even the machine bed. Mechanical standard or wide-range in-process systems, touch probe, match grinding measuring systems and even laser non-contact measuring units.



CNC steady rest

For long, slim components a steady rest usually needs to be located on the table. Apart from commercially available automatic hydraulic steadies, the LG can be fitted with an automatic CNC steady rest. Clamping diameter can be programmed automatically for each part type. In combination with the W-axis, the CNC steady rest can support the workpiece continuously in one fixed position opposite the grinding wheel.



W-axis

An additional W-axis can be incorporated into the LG machine's table. This additional feature enables different elements to be installed, such as a steady rest, an in-process measuring unit, etc. which can be displaced automatically along the axis of the workpiece, adding new functions and customisation possibilities.



Automatic taper adjustment

When tight cylindricity specifications are requested (e.g. on match grinding applications), the automatic taper adjustment device assures the best results. Automatic taper correction can be actuated manually by the operator via push buttons or automatically by the machine using in-process measuring units.

Automated solutions

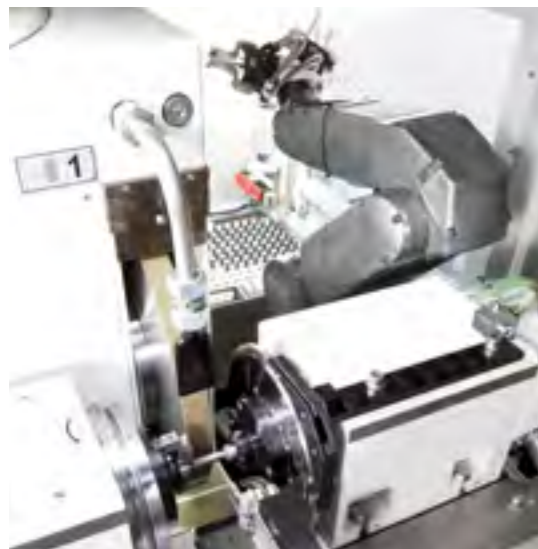
To ensure shorter production times and thus increase productivity, two different integrated automation solutions can be offered with LG machines. Both were developed in-house as standard modules, and offer compact, efficient, cost-effective solutions.

INTEGRATED AUTOMATION SYSTEMS



QUICKMOTION - Integrated loader

- An integrated gantry loader with single arm and two grippers on rotary module.
- Standard dimension capacity for parts: L = 400 mm, Ø 50 mm, Weight = 3,5 kg (10 kg with single gripper).
- Loading/Unloading Time: <6 seconds.
- Workpiece feed by chain conveyor with adjustable length.
- On demand, SPC and NOK drawer can be offered. SPC via softkeys.
- User interface integrated on machine CNC.



FLEXMOTION - Integrated robot

- An integrated 5-axis robot with two grippers on a rotary module located inside the machine enclosure. The robot adds flexibility to the loading function, and enables additional tasks to be performed (measuring, cleaning, etc.).
- Standard dimension capacity for parts: L = 150 mm, Ø 50 mm, Weight = 1 kg.
- Loading/Unloading Time: <6 seconds.
- Workpiece feed by one or two pallets inside the machine enclosure.
- On demand SPC and NOK box can be offered. SPC via softkeys.
- User interface integrated on machine CNC.

Apart from standard integrated automation solutions, external turnkey systems can be provided to meet specific customer requirements.

TURNKEY AUTOMATION SYSTEMS



External automation systems provided with workpiece infeed or stack cell systems adapted to specific customer requirements.

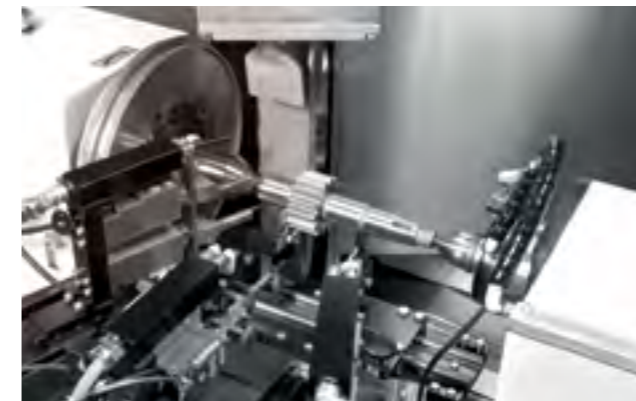
- External portal for loading of parts from top hatch.
- External robot handling solutions with loading from front door, side door or top hatch.
- Workpiece infeed by chain or palletized conveyors, stack cells, etc.
- SPC and NOK part channels.
- Blowing or drying of ground parts.

Applications



Electric vehicle motor (EV): rotor shaft

- Complete grinding of rotor shaft in one set up. Clamping between centres.
- High-speed grinding with CBN wheel and dressing by rotary diamond roll.
- Rotary B-axis with two spindles.
- Automatic moving tailstock L = 300 mm to cover all rotor family lengths. Quick changeover capability.
- Automatic steady rest and wide range in-process unit.



Hydraulic pump shaft

- Complete grinding of pump shaft in one set up. Clamping between centres.
- High-speed grinding with CBN wheel and dressing by rotary diamond disc.
- Rotary B-axis with two spindles and touch probe.
- Complete measuring system: two units for OD, two axial measuring units for gear width.
- High machine versatility to adjust all different elements for hundreds of workpiece references.

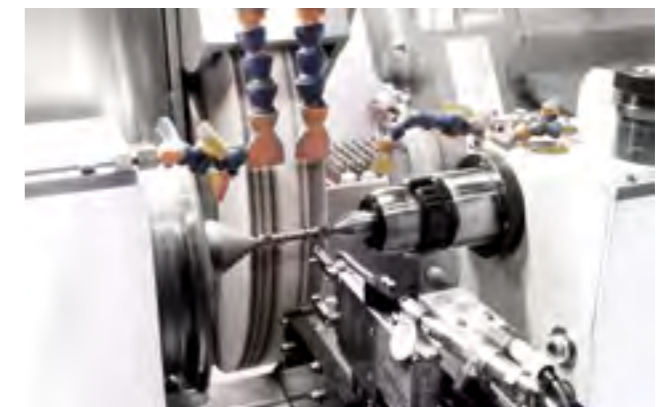
Transmission shaft

- Complete grinding of DCT transmission shafts in one set up. Clamping between centres.
- Peel grinding with CBN wheel (complete OD contour grinding).
- Dressing by rotary diamond disc mounted on work spindle.
- Rotary B-axis with two spindles.
- In-process measuring units and axial locator mounted on the table.
- Automatic steady rest.



Hydraulic valve spool / Sleeve

- Match grinding application: pre-process measuring of sleeve/automatic offset of in-process measuring units.
- Grinding with conventional abrasive wheel.
- Automatic taper correction commanded by in-process measuring units.
- Rotary B-axis with integrated brushing unit for deburring.
- Excellent quality results based on linear motor repeatability and thermal stable granite bed.



PCD tools

- Automatic grinding of PCD inserts with no operator intervention.
- Diamond wheel wear measuring and compensation.
- Automatic workpiece laser measuring.
- Dramatic shortening of production times.
- Newly-developed grinding process concept (patent pending).



Carbide tool (punch)

- Complete grinding of punch. Clamping with expanding mandrel between centres.
- Grinding with diamond wheel.
- High accurate interpolation X, Z and B-axis. Reduction of premature wear of wheel edge.
- Dressing by rotary diamond disc mounted on work spindle.
- Rotary B-axis with two spindles and touch probe.

Digital Focus

In order to advance towards the creation of smart factories, where all equipment is interconnected and can operate autonomously, we have a value proposition comprising solutions developed in-house, combining the latest digital technology and over 65 years' experience in machine tools and production systems.

Danobat's digital offering focuses on two main benefits for our customers: solution efficiency and user friendliness.

Data System

A platform for data capture, storage and processing to deliver the right information for monitoring machine condition. This is the ideal decision-making tool for optimising machine utilisation.

The technology allows you to:



Get real-time and historical information on a wide range of key machine parameters.



Monitor your machine anytime, anywhere.



Get automatic reports to support your decision making.



Improve machine utilisation by anticipating any system failure.



Work with optimised machining processes, to get best quality with minimum energy consumption.



Connect easily to corporate IT systems (ERP, MES, PLM ...).



Digital Focus

Danobat Digital Suite

User-friendly interface for intuitive operation that assists the operator and helps in optimising machining processes.



Main facts:



User friendly and intuitive with outstanding usability.



Centralised information for fast and simple access.



Multiple operation aids for easy, efficient and accurate grinding.



Fully integrated with the latest multi-touch technology.



Digital support: machine documentation, troubleshooting and dynamic preventive maintenance schedule.



Energy efficient solution, thanks to the energy management module.

Based on its long experience, Danobat understands the machine user's needs and has designed a programming assistant that makes it quick and easy to follow the most complex cycles.



EXECUTION

Most relevant machining information displayed in a single view.

- Machining cycle progress.
- Key process variable display.
- Alarm visualisation with troubleshooting.



OPERATIONS

A clearer, more comprehensive list of operations showing the main parameters so that they are easier for the user to understand.

- Intelligent cycles library based on machine configuration for grinding, dressing and measuring operations.
- Easy navigation and configurable structure definition.
- Quick program operations for fast and easy programming.



INTEGRATED MODULES

Multiple optional integrated modules:

- Profile editor.
- Contour module.
- Threads module.
- Forms module.
- CAD files import.

Advanced Services

Danobat offers worldwide specialised services throughout your equipment life cycle. From engineering services for the design of machining processes and set up of the machine to technical service and spare parts.

We have an extensive network of professionals working in over 40 countries, capable of meeting customers' needs wherever they are and ensuring fast attention, effectiveness and proximity.

Danobat Centres of Excellence

An international centre working in the machining of high precision components to help our customers become more competitive by maximising their efficiency and productivity.

We have the resources required for excellence-based operation: latest-generation Danobat technology in machining, measuring, software and control, piloted by highly qualified staff working exclusively on our challenges and those of our customers.

Our centres of excellence are focal points for cooperation with customers, suppliers and other partners to generate high-value applied knowledge in manufacturing processes.

Original spare parts

We understand the critical importance of machine availability to ensure production output. We therefore have a wide stock of original spare parts (more than 100,000 item references) ready to be dispatched immediately to our customers from different warehouses around the world.

Corrective and preventive maintenance

We offer collaboration agreements for regular machine-status checks, to prevent the most common machine issues.

Digitisation of manufacturing and our nonstop monitoring solution can help identify patterns and predict future errors. And for any that can't be predicted, our worldwide service team can help get the machine up and running again with rapid attention.





Competitiveness is increasing in all sectors and as your needs become more sophisticated, the services you require also get ever more complex. Evolving your machine to cater to new needs requires know-how not only of the machine itself but of industries, machining processes and manufacturing environments.

Our expert team can help guide you towards the path of increased competitiveness.

Inspections

We place all our experience and knowledge of the equipment at your service to provide you with a real picture of your machine's status.

Process optimisation

Detailed studies of machining processes to provide an optimised solution that offers technical, production, quality and financial improvements. The optimal solution may include the development of specific machining and measuring cycles and engineering of specialised tools and fixtures.

Production optimisation

Years of experience dealing with a huge variety of challenges in a wide range of industries enable us to detect opportunities where others only see problems. An exhaustive analysis of your processes and workflows provides the input we need to develop a simulation model that will help you maximise output.

Retooling & Retrofitting

We can't control your future needs, but we can work with you to prepare for them. We perform retooling to help you face new challenges and even retrofitting to give your machine a second life-new components, new functionalities and a longer machine life.

Obsolescence management

Avoid future problems with component availability. Future-proof your machine. We propose and perform changes to obsolete components, anticipating any issues that could halt production due to lack of a spare part that may never arrive.

Software & hardware updates

Hardware and software are constantly being updated and upgraded. So if you want to keep your machine at the cutting edge, we have the right solution for you.

We install hardware and software upgrades to ensure an extended life cycle and performance improvements.

Advanced training

Get the most from your Danobat machine. Customised training in machine work modes, programming, cycles and specific functions, drive compensation, alarm messages, recovery instructions, preventive maintenance, etc.

The Danobat way

If you want to achieve different results, you have to do things differently. That is the Danobat way. Qualified specialists, in-house technology, backing for innovation and, of course, a corporate culture that values people and puts the customer at the heart of its organisational system, creating an ecosystem that fosters co-creation and generates real, lasting, sincere partnerships.

A way of working that bring us together and provide meaningful experience for both customers and our own team. Commitment, honesty, responsibility and trust to create innovative solutions that are fully customised, useful and profitable.

01 Experts close to you

The experience of our staff and our focus on working alongside our customers are Danobat's key distinguishing features.

02 The value of people

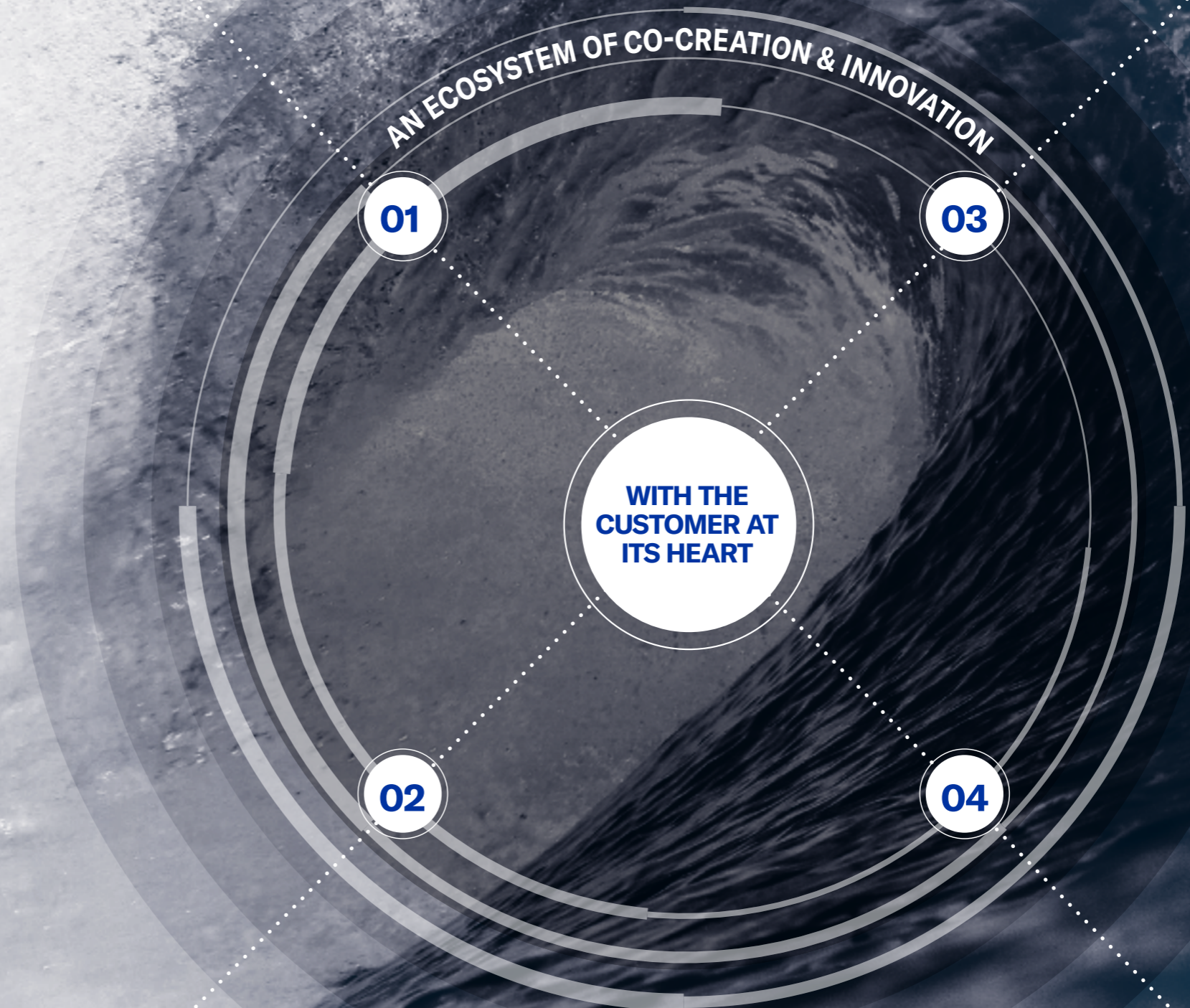
Commitment, enthusiasm, self-motivation, a feeling of belonging, initiative, creativity and adaptability to a changing environment: these are just some of the features that define the people who make up Danobat.

03 In-house technology

Precision in results and ease-of-use are our watchwords in all the solutions we provide. That is why we specialise in developing intuitive, easy-to-handle in-house technology.

04 Bringing the future closer through innovation

Danobat's track record can only be understood in terms of its firm, sustained backing for innovation. Since our earliest days more than sixty years ago innovation has been in our very bones. It is now our most recognisable identifying trait.





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