



Defence



Harmonic
Drive SE



SEA | SURFACE VESSELS



SEA | SUBSEA VESSELS



LAND | TRACKED VEHICLES



LAND | WHEELED VEHICLES



LAND | AUTONOMOUS VEHICLES



LAND | STATIONARY SYSTEMS



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Our inspiration

With either Apollo 15 on the moon or in the depths of the rough oceans, for more than 50 years, we have been providing significant applications across the planet and beyond with our drive solutions. We, as an industry leader in high precision drive technology, have not only continued to expand our portfolio based on the unique Harmonic Drive® Strain Wave Gear but have also recognised the requirements of modern, trend setting markets and applications: The future of drive technology is intelligent, sustainable and efficient.

Thanks to their special characteristics, which have been continuously developed over decades, Harmonic Drive® Gears and Actuators are perfectly suited to important key industries, including defence, robotics, handling & automation, mechanical engineering, medical technology, special environments and aerospace.

Highest precision and quality for our customers are key principles of our corporate culture. Eighty percent of our products that leave our factory in Limburg/Lahn are special versions and are therefore specially developed, designed and manufactured according to customer specifications - from space saving gear component sets to intelligent drive systems.

Due to the high complexity in the configuration of suitable drive technology components, we partner and advise our customers comprehensively. The proposed solution for the drive task to be realised is developed in close cooperation to enable the subsequent integration into the application environment without any problems. Vital for this are, on the one hand, the high flexibility and, on the other hand, the customised scope of services and the integration level. The result is an optimal, highly individualised drive solution.

Successfully shaping the future together with, and for our customers, in demanding industries is a sign of our innovative strength in the field of high precision drive technology.

Production and development sites at the highest technological level in Germany, Japan and America as well as subsidiaries in Europe and Asia ensure that we can offer highly specialised and intelligent drive solutions as well as mechatronic systems worldwide.



Remote Controlled Weapon Stations (RWS/RCWS) must withstand extreme conditions in maritime environments - such as corrosive salt water, changing temperature zones, heat or frost. In addition, there are application related challenges such as shock and vibration. Our AlopexDrive and CPU Series are ideal system components for this.

Thanks to their central hollow shaft and tilt resistant output bearing, they enable a simplified, space saving and resilient design in many applications. Added to this are great versatility, high synchronisation as well as precision and reliability.

Resistant, precise,
reliable and versatile.

Our gears can be combined with different motor concepts, motor feedback systems and power supplies. In this way, our mechatronic systems are able to drive the stations precisely. These systems are controlled by the operating personnel in a protected environment.

Product: AlopexDrive Servo Actuator
CPU-H Gear with output bearing



AlopexDrive Servo Actuator



CPU-H Gear with output bearing



Lack of space, high power density, varying pressure ratios and other technological challenges characterise underwater applications, especially in the deep sea. This is where our Harmonic Drive® Drive Solutions come into their own strengths - and are increasingly replacing conventional hydraulic solutions.

That's why our compact powerhouses are used in systems for tracking and guidance, as well as autonomous and non-autonomous underwater objects.

I Made for the deep sea.

Optional hollow shafts in gears and actuators create design freedom. Pressure compensated as well as waterproof housings and suitable lubricating oils enable us to quickly and reliably adapt to individual requirements - for both mechanical and electromechanical systems.

Our partners benefit from our many years of experience with Harmonic Drive® Strain Wave Gears in subsea systems as well as electrical actuators for the deep sea.

I Product: **AlopexDrive Servo Actuator**
CSG-2A Gear Component Set



AlopexDrive Servo Actuator



CSG-2A Gear Component Set



Today, it is no longer possible to react adequately to hazards with purely manually controlled systems. Therefore, drive systems are required that either support manual handling servo electrically or allow it to be operated completely remotely.

Harmonic Drive® provides you with suitable solutions that meet all standards. They defy the most adverse conditions. Our gears with output bearing of the CPU-H series with integrated cross roller bearing deliver the optimum radial and axial stability to absorb high forces and torques from vibration and shock conditions.

I Stability, consistency and versatility.

Equally ideal: the compact design of the systems, the unique hollow shaft through which cables can be safely routed and the possible high ratios of the AlopexDrive Drive Solutions.

I Product: AlopexDrive Servo Actuator
CPU-H Gear with output bearing



AlopexDrive Servo Actuator



CPU-H Gear with output bearing



A major advantage of the AlopexDrive Drive Solutions is their high degree of integration, the low complexity when integrating them into existing systems and the specially developed DC servo motor. The electrical actuator complies with military standards, offering protection against corrosion, shock and vibration as well as all other adverse environmental conditions. Its lowest possible electromagnetic emission also avoids detection by other units.

Not to be forgotten: To ensure operation in a wide temperature range, a specially selected lubricant is important to ensure a low starting current when operating in low temperature applications whilst also being able to operate at high temperature. Cables can optionally be routed through the elevation and azimuth axes via a hollow shaft. This simplifies the design.

Compact, weight saving and fully automatically controllable.

To increase the operating radius, these weight optimised systems can be placed not only directly on the vehicle but also on telescopic masts.

Product: AlopexDrive Servo Actuator
CPU-H Gear with output bearing



AlopexDrive Servo Actuator



CPU-H Gear with output bearing



Remotely controlled subsystems on independently operating platforms are becoming increasingly standard in modern conflicts in the field, as they are suitable for a wide range of surveillance tasks. The same applies to targeting systems, robotic arms and traction drives that can be controlled precisely from a distance.

Here we offer you the greatest possible freedom in design, construction and operation. Our electromechanical actuators are unbeatable in terms of torque to weight ratio. They deliver the highest precision with the lowest weight.

Compact with unbeatable torque to weight ratio.

Our individual winding packages of the mechatronic actuators can be adapted to the different voltage ratios of customer applications. Particularly exciting: our further developed and torque-increased gear component sets of the CSG-2A Series, which make it possible to realise even more compact drive solutions with the same weight.

Product: AlopexDrive Servo Actuator
CSG-2A Gear Component Set



AlopexDrive Servo Actuator



CSG-2A Gear Component Set



Our actuators for stationary subsystems are space saving, light and precise. This enables stationary use as well as fast and flexible relocation.

Our zero backlash gears, high resolution encoders, compact motors and the compatibility of our drive solutions with different voltage ranges are a particular plus. In portable as well as permanently mounted systems, Harmonic Drive® Products support the monitoring of boundary courses or air and ground activities.

Light, precise and first choice for laser controlled systems.

Harmonic Drive® Gears as well as Servo Actuators are installed in latest defence systems. In these systems, they perform the tasks of precise detection, tracking and neutralisation of drones, among others.

Product: AlopexDrive Servo Actuator
CSG-2A Gear Component Set



AlopexDrive Servo Actuator



CSG-2A Gear Component Set

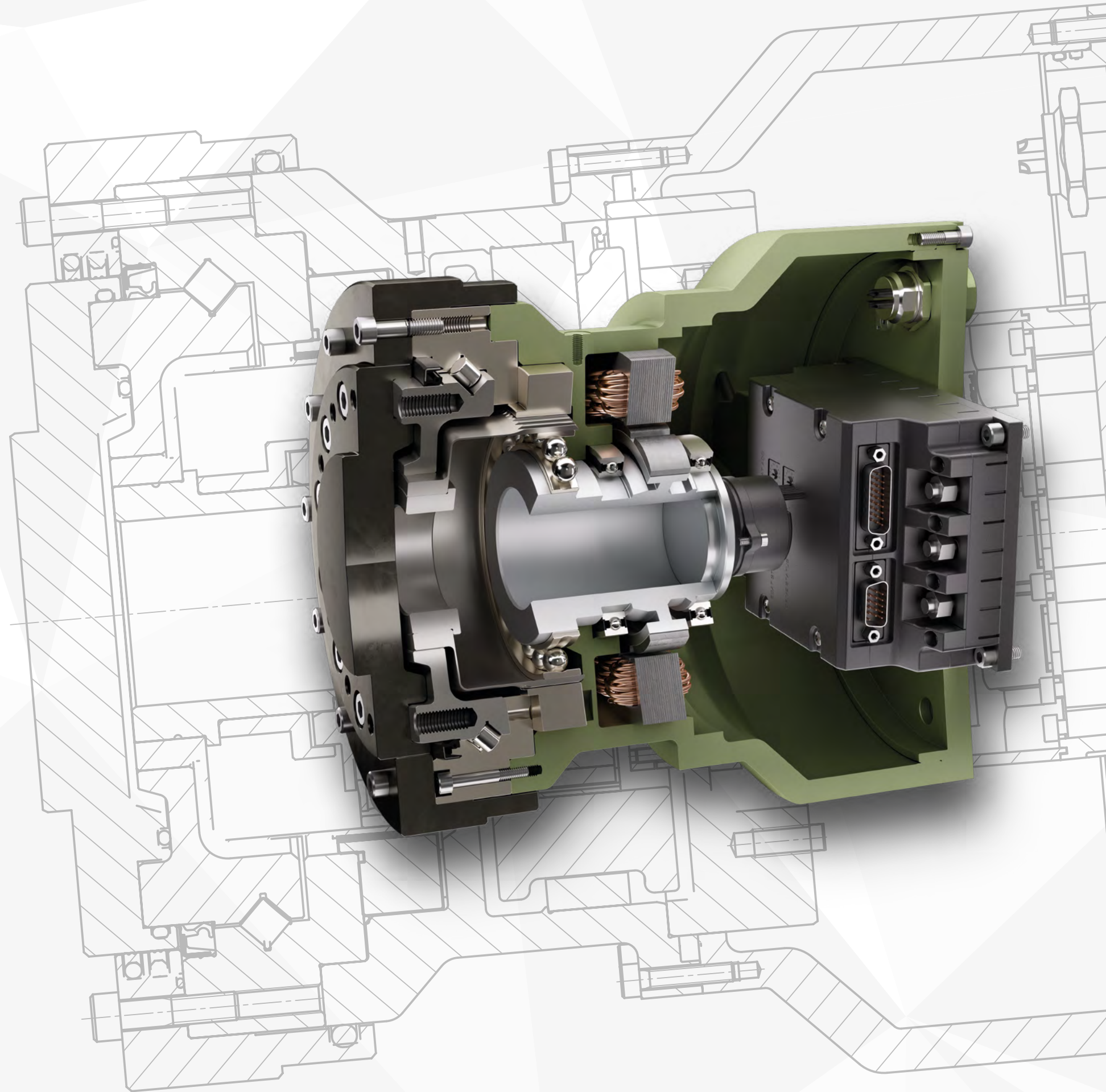


Small things make a big difference. That's why we pay a lot of attention to every detail. We love progress and always keep our solutions at the latest technical level through continuous development.

Particularly relevant for us - and our partners - is the Harmonic Drive® Modular System. With it, we can meet individual customer requirements in a targeted manner. Above all, however, in such a way that they are technically 100 percent reliable.

Particularly relevant: the Harmonic Drive® Modular System

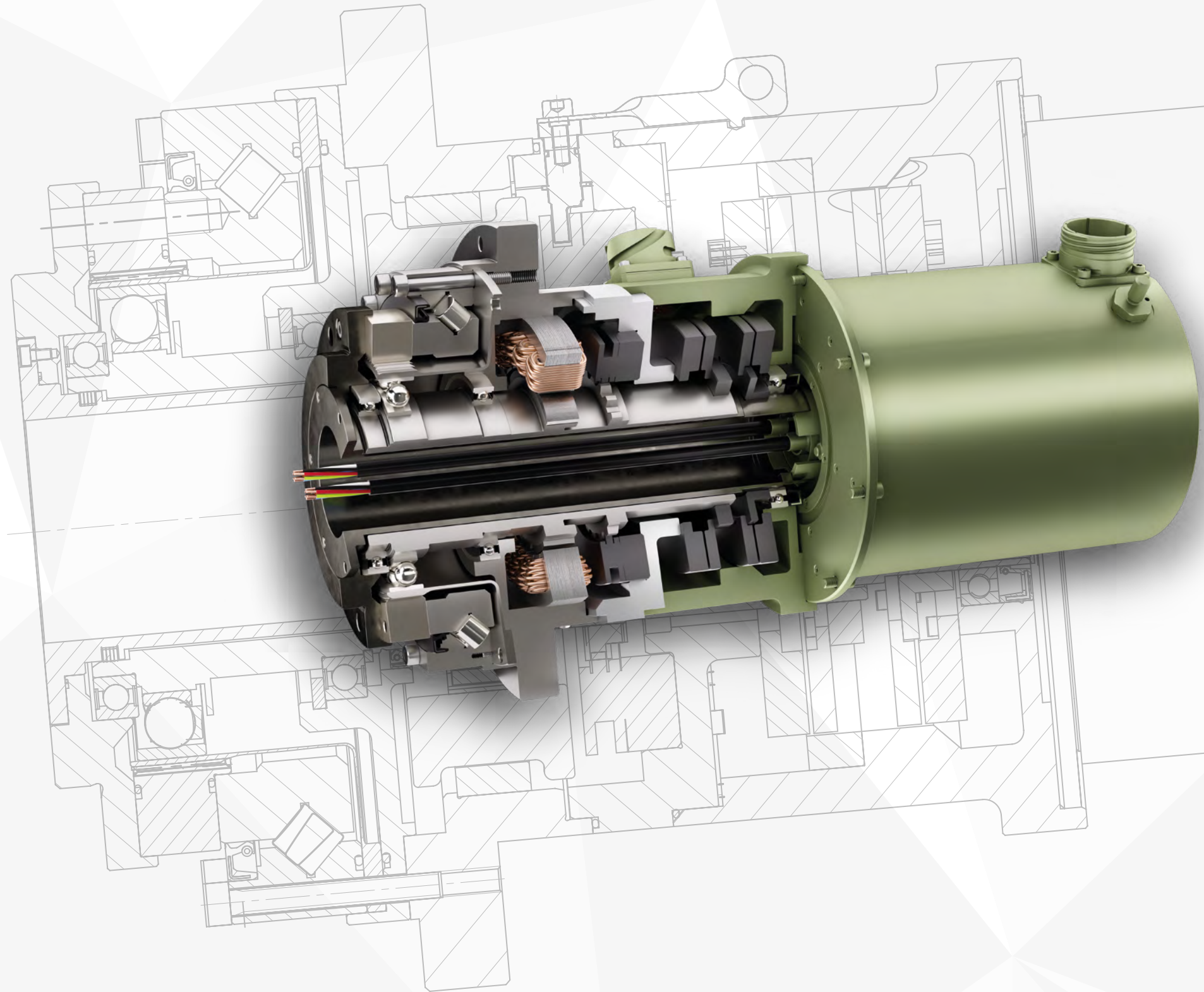
"It is never a question as to whether it can be done," the inventor of Harmonic Drive® Strain Wave Gears once said, "it is only whether one cares to spend the time and effort." That's exactly how we think too. And this way of thinking leads to Harmonic Drive® Applications being in use today from the bottom of the ocean to Mars.



We work in close cooperation with companies that enjoy the best reputation and the highest standing worldwide. What counts for us is truly individual customer care by our highly qualified engineers. We share our knowledge and develop optimal solutions that often even exceed the high requirements of our partners.

Collaboration is the key for us.

In this way, we define, discuss, evaluate, improve and realise cutting edge technology for individual enquiries. For example, when it comes to the intelligent use of additional encoders, the integration of a slip ring, controller, decentralised servo actuator, maximum compactness, optimum lubricants or anything else: We like to go beyond ourselves when it comes to individual solutions and are just as happy to break new ground together with our customers.



THE RESULT: **your special solution**



PRODUCT COMPONENTS



EMPLOYEES HARMONIC DRIVE SE



CALCULATION TOOLS



YOUR SERVO ACTUATOR

MARKET REQUIREMENTS



ENVIRONMENTAL CONDITIONS



CUSTOMER SPECIFICATION



Taking various factors into account, we develop the special solution that fits your individual requirements.

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PASSION GENERATES THE HIGHEST QUALITY

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We reserve the right to make technical changes
and modifications without prior notice.

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