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Get a grip on the automation of tomorrow

An industrial world without robotics or automation has today become inconceivable. In this context, process safety, reliability and economic efficiency are on the forefront when it comes to the application of such systems in modern production lines.

The industrial-grade drive components from FAULHABER convince the customer with their high endurance and performance in a robust and compact design. Whether for exact and highly dynamic positioning tasks, for example in SMT assembly machines, handling devices and electrical grippers, conveyor systems or sensitive and low-noise operations in artificial robotic hands.

Further applications of Robotics & Automation with FAULHABER Drive Systems

- Bottling and packaging automation
- Conveyor systems
- Industrial dosing systems
- Welding equipment
- Wire processing equipment
- Textile industry automation
- Laser cutting and plotting
- Machine tools
- Tool monitoring
- Linear positioners / positioning stages



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Electrical grippers

A small gripping system that is both quick and powerful – up to now, was often only possible with pneumatics. Because with compressed air, large amounts of pressure can be conveyed virtually without any time lag. A compressed air supply requires a complex infrastructure, however, and having to provide it for every production step is difficult and expensive. Fortunately, this is no longer necessary, thanks to compact mechatronics-based grippers. This new type of gripper system easily achieves the same performance of its pneumatic counterpart. The drive that makes this performance possible is a Brushless DC-Servomotor from FAULHABER.



More at:
www.faulhaber.com/grippers/en

FAULHABER Drive Solution

Drive System

- Ø 22 mm 4-pole brushless DC-Motor
- Integrated speed / motion controller

Benefits

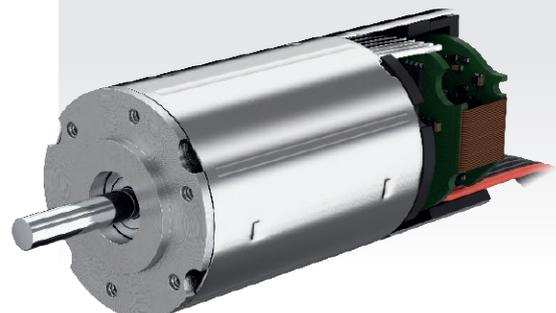
- Compact size
- High power density
- Highly dynamic

Options

- Mechanical adaptations
- Special software
- Preconfigured controller

Related Applications

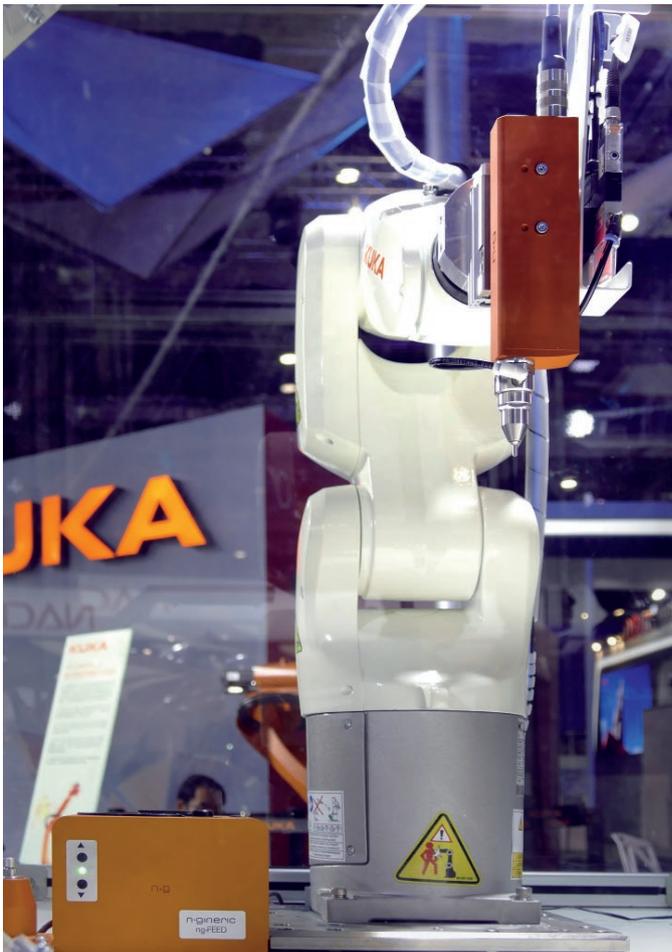
- Robotic manipulators
- Gripping systems





Torque drivers

Every handyman intuitively knows how to tighten a screw: according to feel. In the hobby room, this is generally sufficient for achieving the correct amount of tightening torque. In industrial production, on the other hand, the demand for secure screw fixing is much greater. Motors and gearheads used in micro torque drivers play an extremely important role.



FAULHABER Drive Solution

Drive System

- Ø 22 mm 4-pole brushless DC-Motor

Benefits

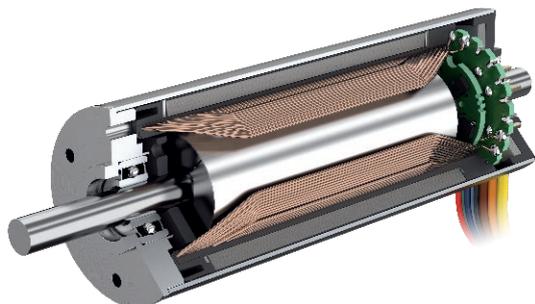
- High peak torque
- Light weight
- Excellent controllability

Options

- Special cable with connector

Related Applications

- Industrial tools
- Assembly tools



More at:
www.faulhaber.com/torque-driver/en



SMT assembly

Today, mass-market electronics are manufactured almost exclusively on high-performance assembly machines. Given the nature of these fast-moving products, time is literally money. Therefore, two aspects are of particular importance for the production equipment deployed within this area: maximum quantities and minimum changeover time. For the manufacturer of such machines this means ensuring the best possible output, combined with simple processing in a continuous operation. This requirement can only be fulfilled if the complex operational sequence remains accurate and reproducible at all times. An essential component: micromotors with superior functionality and a micro footprint for placement and feeder systems.



More at:
www.faulhaber.com/smt/en

FAULHABER Drive Solution

Drive System

- Customized brushless DC-Motor
- Customized controller electronic

Benefits

- Ultra-light
- Highly dynamic
- Long lifetime
- Development partnership

Options

- Hollow shaft
- High resolution / accuracy encoder

Related Applications

- Lithography machines
- Wafer inspection systems
- Wire bonding machines
- IC test handlers



Smart Farming

Sustainable, production will be of existential importance for feeding humankind and achieving an ecological balance in the future. Smart farming plays a decisive role here: Maximum efficiency in food production, through the targeted use of the latest technology, computer-aided and as fully automated as possible. Seeds are placed individually and precisely; fruits are carefully picked by machine grippers; fertilizers and pesticides are applied in small doses in a targeted manner.

Drive systems are needed that are robust enough to withstand large temperature changes or vibrations. Drives that reliably perform their respective tasks in countless cycles and still take up as little space as possible. Dynamic motion profiles and precise controllability are just as much a requirement as the intelligent networkability of the systems – after all, we are talking about smart farming. FAULHABER offers that – smart drive systems for smart farming.



FAULHABER Drive Solution

Drive System

- Brushless flat motors with external rotor technology
- DC-Micromotors with graphite commutation
- Planetary Gearheads

Benefits

- Dynamic motion profiles
- Precise controllability
- Compact design
- Intelligent networkability through various interfaces (CAN, Ethercat)

Options

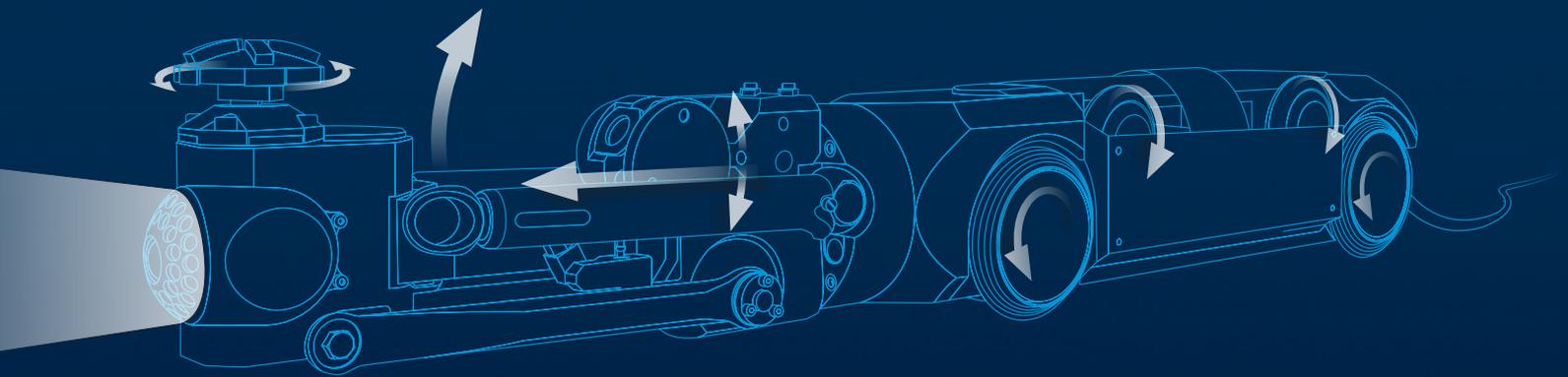
- Adaptions and modifications to customer needs and requirements
- Different types of voltage
- Output shaft configuration
- Cabling and connector

Related Applications

- Mobile robots
- Gripper applications



More at:
www.faulhaber.com/smart-farming/en



Inspection robots

The days when conventional construction teams went to work on the sewer system, digging up roads and crippling the traffic for weeks are a thing of the past. It is much more pleasant if the inspection and renovation of the pipes take place below ground. Today, sewer robots can perform many tasks from the inside. They play an increasingly important role in the maintenance of urban

infrastructure. Motors from FAULHABER are used for camera control, tool functions and the wheel drive.



More at:
www.faulhaber.com/pipeline-inspection/en

FAULHABER Drive Solution

Drive System

- Ø 15 mm DC-Motor with precious metal commutation
- Ø 32 mm 4-pole brushless DC-Motor
- Planetary Gearheads

Benefits

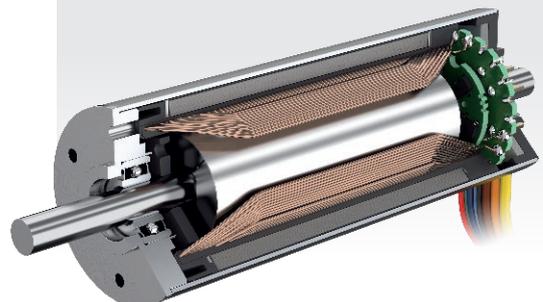
- Compact size
- High overload capability
- Robustness and shock resistance

Options

- Mechanical customization
- Wide range of supplementary gearheads and further components

Related Applications

- Sewers
- Crawlers



Remote controlled manipulators

Today, mobile robots are often deployed in critical situations that are simply too dangerous for humans to handle – as part of industrial operations, law enforcement or anti-terror measures, e.g. to identify a suspicious object or disarm a bomb. Owing to the extreme circumstances, these “manipulator vehicles” have to meet particular requirements. Exact manoeuvring and precision handling of tools are two essential prerequisites. Of course, the device also has to be kept as small as possible in order to allow access through narrow passageways. Naturally, the drives used for such robots have to be equally impressive. Special high-performance micromotors have become an essential component.

FAULHABER Drive Solution

Drive System

- Ø 23 mm DC-Motor with graphite commutation
- Ø 38 mm DC-Motor with graphite commutation

Benefits

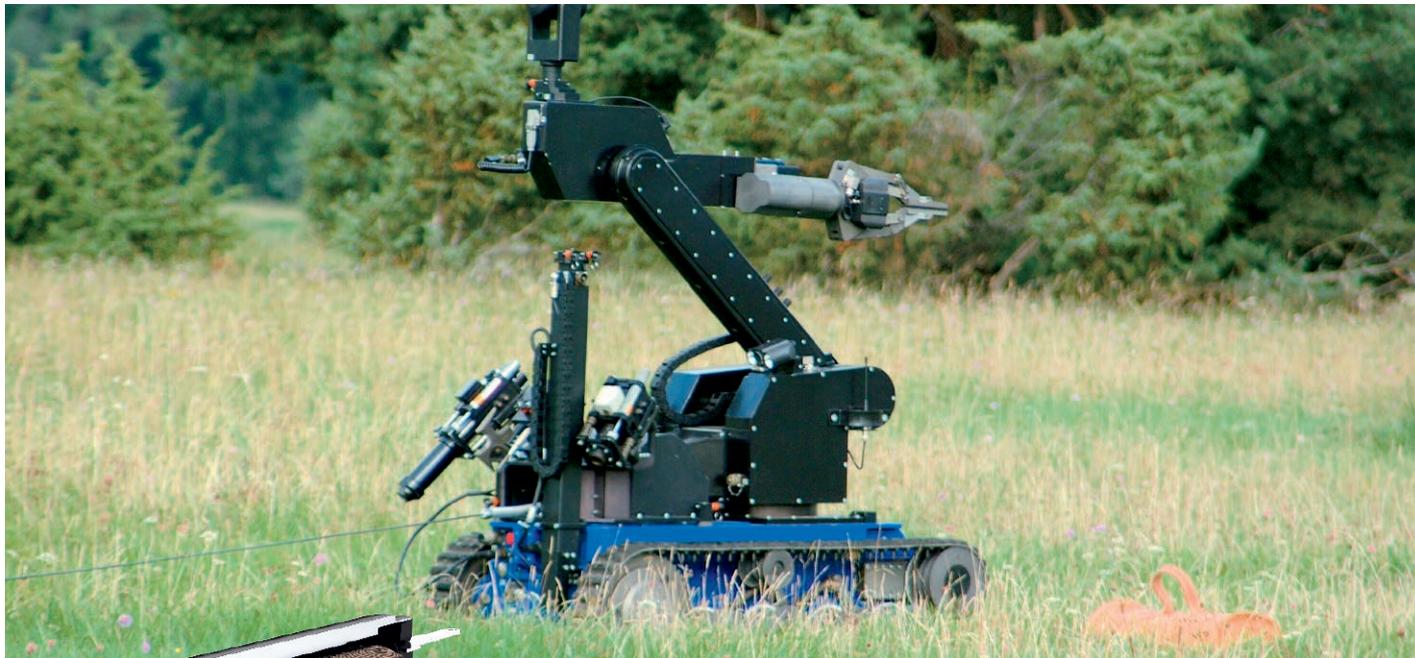
- Reliability
- Compact design
- High efficiency
- High precision

Options

- Special output shaft

Related Applications

- Unmanned ground vehicles
- Remotely operated vehicles (ROV)



More at:
www.faulhaber.com/en/markets/robotics/remote-controlled-robots/



Logistics robots

The requirements of Industry 4.0 and Intralogistics 4.0 are fundamentally changing our production environments. Together with the steadily growing online trade, they are the drivers of technical progress in many areas of logistics. Automated guided vehicles (AGVs) and autonomous mobile robots (AMR) are taking on the leading role in numerous processes when it comes to increasing efficiency with the help of automation and digitalization.

Drive systems from FAULHABER reliably meet requirements such as precise positioning during storage or retrieval or continuous operation with constant load changes. For example in intralogistic mobile robots that enable piece-by-piece access to individual objects and are equipped with a drive unit consisting of a brushless DC servo motor with integrated motion controller and planetary gearhead.



More at:
www.faulhaber.com/logistics-robot/en

FAULHABER Drive Solution

Drive System

- Brushless flat motors
- DC-Micromotors with graphite commutation
- Planetary Gearheads
- Motion Controllers

Benefits

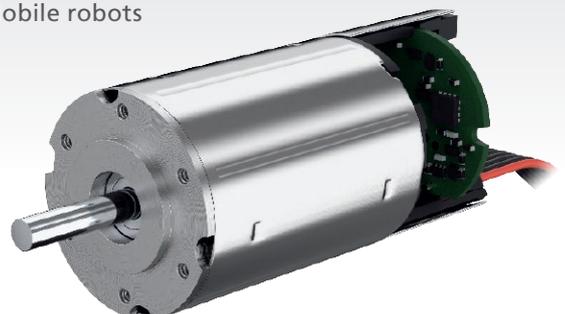
- Short time overload capability
- Small size and low weight
- Motor and Motion Controller in one package
- CANopen / EtherCAT interface

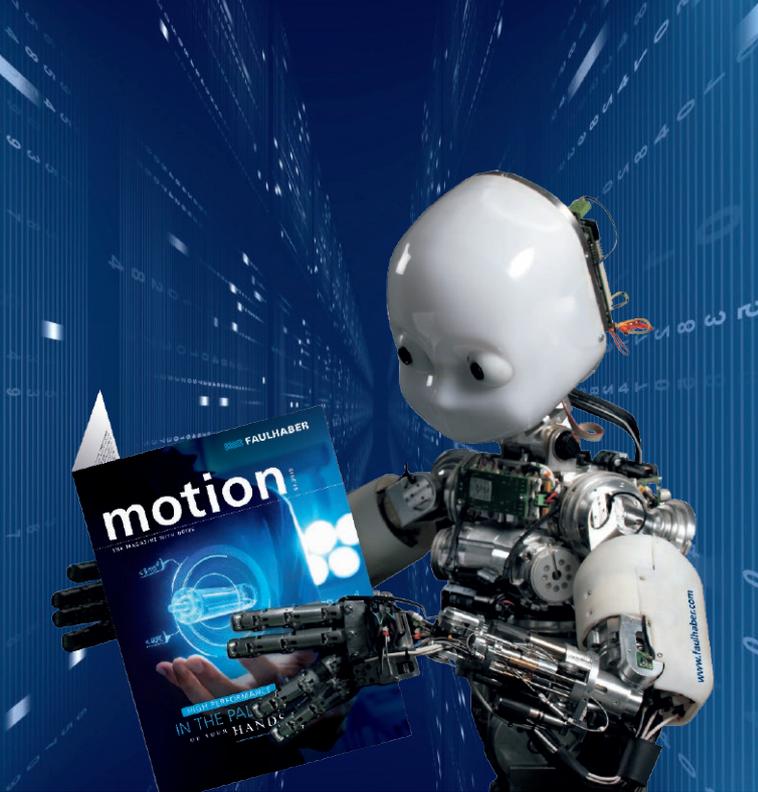
Options

- Adaptions and modifications to customer needs and requirements
- Output shaft configuration
- Cabling and connector

Related Applications

- Automatic postage and packaging systems
- Driverless transport vehicles
- Mobile robots





Humanoid robotics

Since time immemorial, people have dreamed of creating artificial human beings. Nowadays, modern technology is capable of realizing this dream in the form of the humanoid robot. Even if there is still a considerable amount of development work necessary, every project has to take those first steps. As an initial stage in this process, a humanoid service robot that works autonomously already offers a wide range of benefits. Apart from the interaction of the many components used, the main challenge is the power supply and the space required for the various parts. Microdrives represent an ideal solution for resolving these two key issues. Their considerable power density, combined with high efficiency and minimal space requirement, improves the power-to-weight ratio and allows the robot to operate for long periods without having to recharge batteries.

FAULHABER Drive Solution

Drive System

- DC-Motor with precious metal commutation and integrated encoder
- DC-Motor with graphite commutation and integrated encoder

Benefits

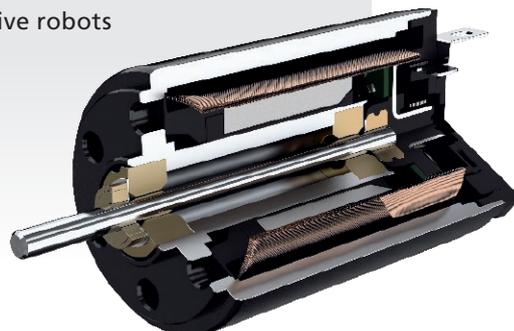
- High power density
- High efficiency
- Miniature size
- Short time overload capability
- Quiet running

Options

- Cable length
- Encoder with line driver

Related Applications

- Service robots
- Collaborative robots



More at:
<https://www.faulhaber.com/en/markets/robotics/humanoid-robots/>

Drive Systems for Robotics & Automation

For robotics and automation applications, highly dynamic drive systems are very important. Very often the motor shall operate at full speed or torque in shortest time. FAULHABER Drive Systems offer this feature thanks to their ironless winding technology and flat speed-torque curves. High performance motor families such as the FAULHABER BX4 or BP4 series provide the high power density that is required in this environment.

The demand for precise positioning and speed control may be realized with the wide portfolio of optical, magnetic and absolute encoders and the speed and motion controllers from FAULHABER. Equipped with either CANopen or EtherCAT interfaces they allow the integration of the complete drive system in demanding robotics or automation applications with process control systems.

Benefits

- Highly dynamic
- Compact size
- High power density
- Short time overload capacity
- Development partnership with customers
- CANopen / EtherCAT interface



FAULHABER Drive Systems at a glance



DC-Motors

| | |
|---------------------|--------------------------------|
| Outer diameter | 6 ... 38 mm |
| No-load speed | up to 20 200 min ⁻¹ |
| Cont. output torque | 0.17 ... 224 mNm |



Motors with integrated electronics

| | |
|---------------------|--------------------------------|
| Outer diameter | 15 ... 40 x 54 mm |
| No-load speed | up to 16 300 min ⁻¹ |
| Cont. output torque | 1.8 ... 160 mNm |



Brushless DC-Motors

| | |
|---------------------|--------------------------------|
| Outer diameter | 3 ... 44 mm |
| No-load speed | up to 61 000 min ⁻¹ |
| Cont. output torque | 0.01 ... 217 mNm |



Stepper Motors

| | |
|----------------------|------------------|
| Outer diameter | 6 ... 52 mm |
| Steps per revolution | up to 24* |
| Cont. output torque | 0.25 ... 450 mNm |

* Full step per revolution



Linear DC-Servomotors

| | |
|------------------|-----------------|
| Stroke length | 15 ... 220 mm |
| Speed | 1.8 ... 3.2 m/s |
| Continuous force | 1.03 ... 9.2 N |



Precision Gearheads

| | |
|---------------------|-------------------------|
| Outer diameter | 3.4 ... 44 mm |
| Reduction ratio | from 4:1 to 983 447 : 1 |
| Cont. output torque | 0,88 mNm ... 16 Nm |



Encoders

| | |
|----------------------|--------------------------------|
| Principle | optical, magnetic |
| Channels | 2 ... 3 / absolute |
| Lines per revolution | 16 ... 10 000 / 4 096 absolute |



Drive Electronics

| | |
|----------------------|--------------------------|
| Power supply | 4 ... 50 V |
| Cont. output current | up to 10 A |
| Interfaces | RS232, CANopen, EtherCAT |

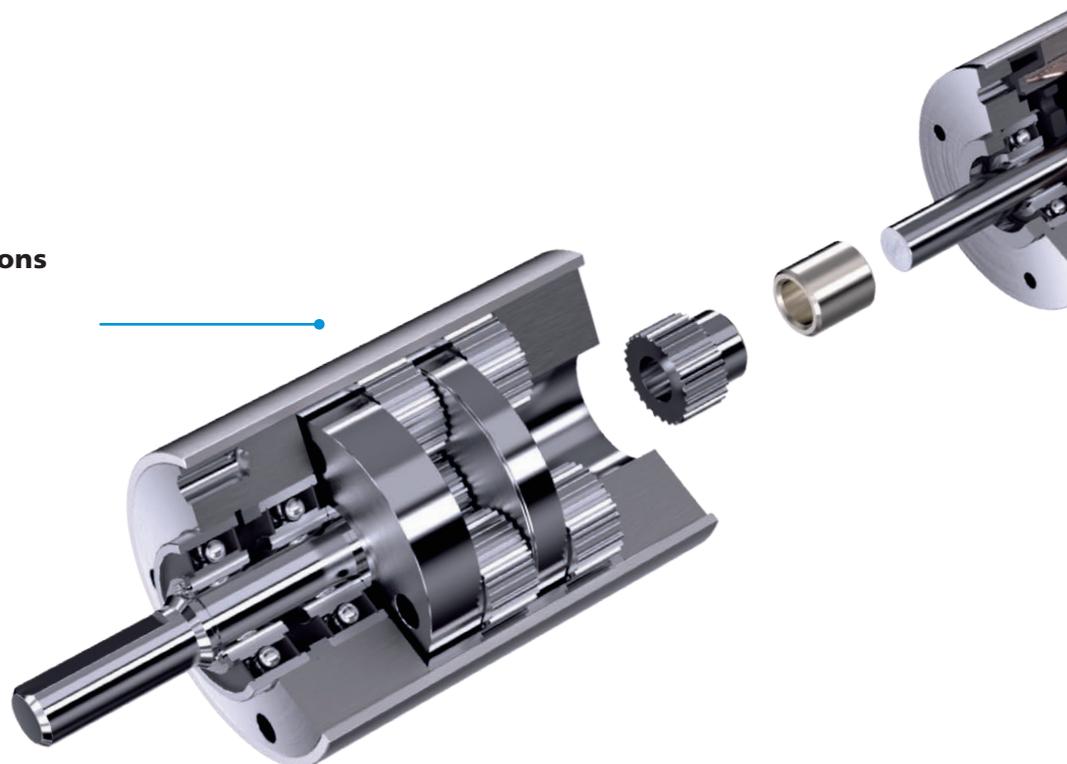
From Standard to Custom Solution

The FAULHABER standard range can be combined in more than 25 million different ways to create the optimum drive system for a particular application. At the same time, this technological „construction kit“ is the basis for modifications which allow us to configure special versions to meet the specific needs of customers.

High-performance engineering and extensive application expertise also make us a valued partner for the development and production of customer-specific drive solutions. The solutions range from special components specifically or custom-designed for the application to system partnership with automated production for complex mechatronic assemblies.

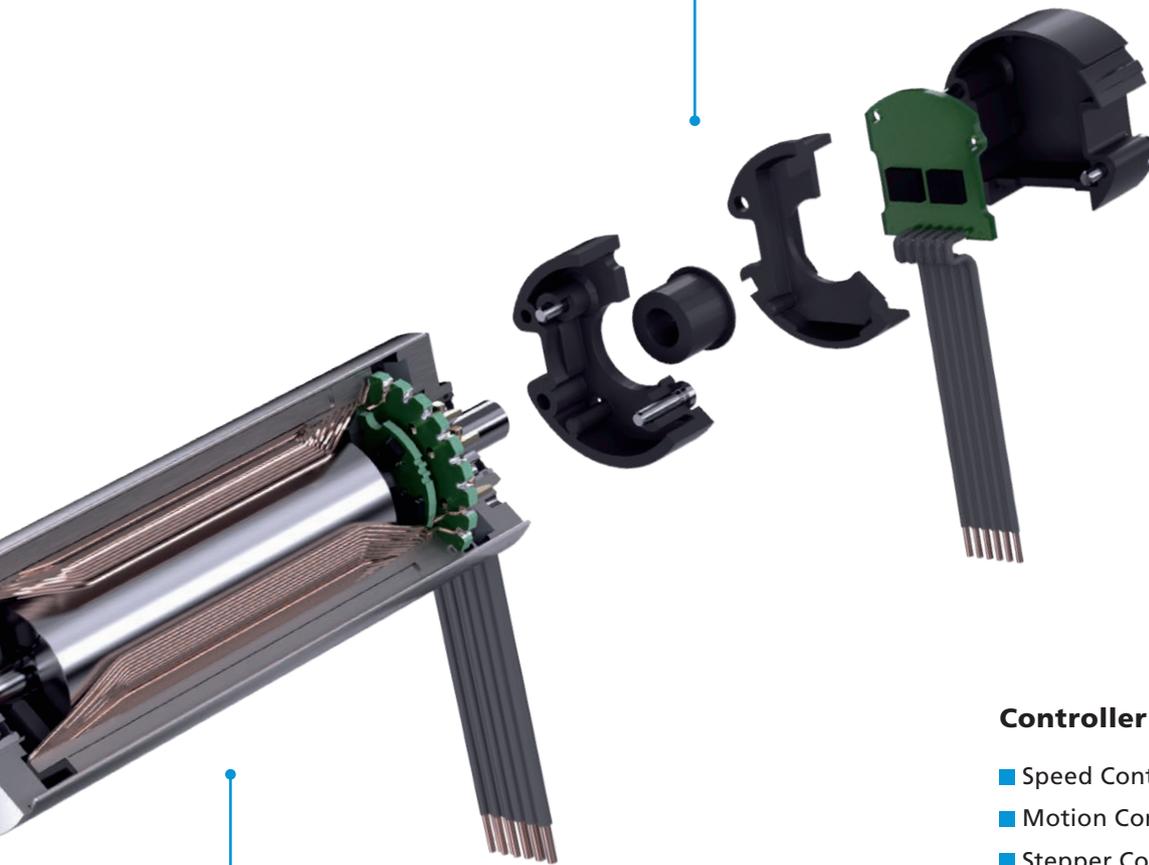
Gearhead modifications

- Special output shaft and mounting flange
- Customized pinion
- Special lubricant



Encoder modifications

- Encoder cable and connector
- Line driver
- Alignment between encoder and motor/gearbox flange
- Programmable encoder output signal



Controller options

- Speed Controllers
- Motion Controllers
- Stepper Controllers

Motor modifications

- Hollow shaft
- Special winding
- Customised pinion
- Laser inscription on the housing
- EMI filter
- Special cable and connector



More at:
www.faulhaber.com/products

More information



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Ident-Nr. 000.9132.23

Your local contact