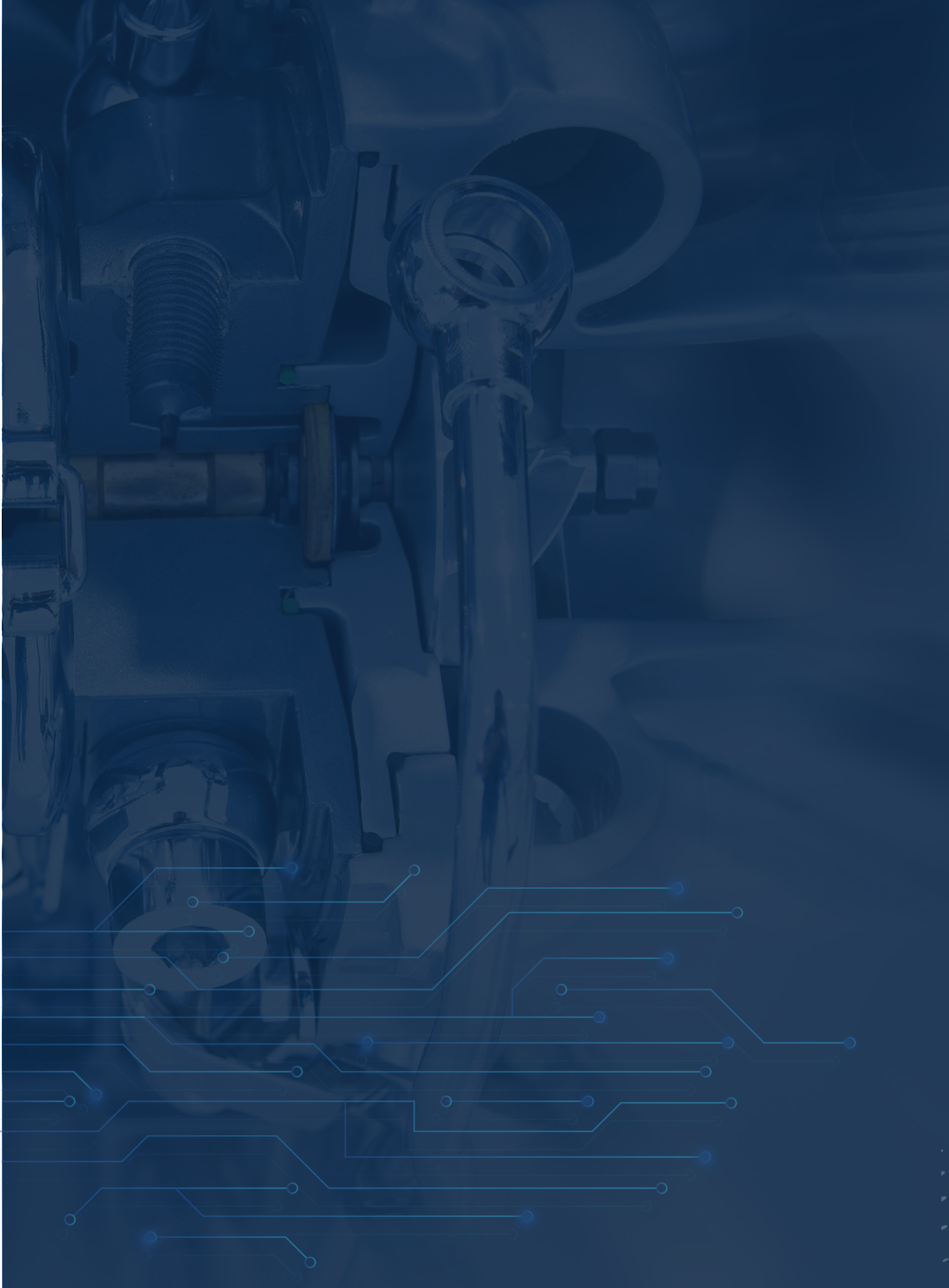




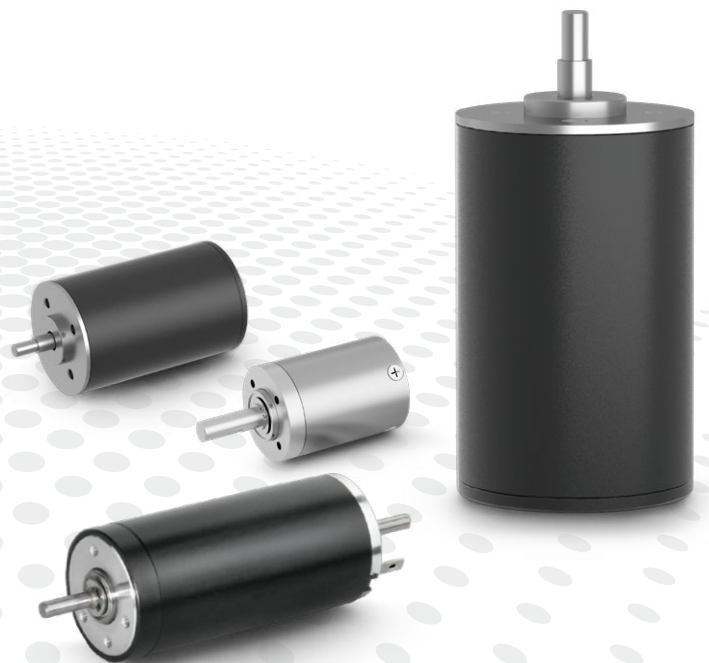
MICRO POWER SYSTEM

PRECISION DRIVE TECHNOLOGY FOR MICRO MOTORS



From Standard to Customized Solutions

From high-power 400W DC motors to compact micro-motors, from reducers to drives, our standardized product series can be combined in various ways, providing customers with specific-use micro motor power system solutions. Following standard manufacture procedures, we can also provide customized & optimal technical solutions based on customers' special needs. At Lorentz DM, we create the future together.



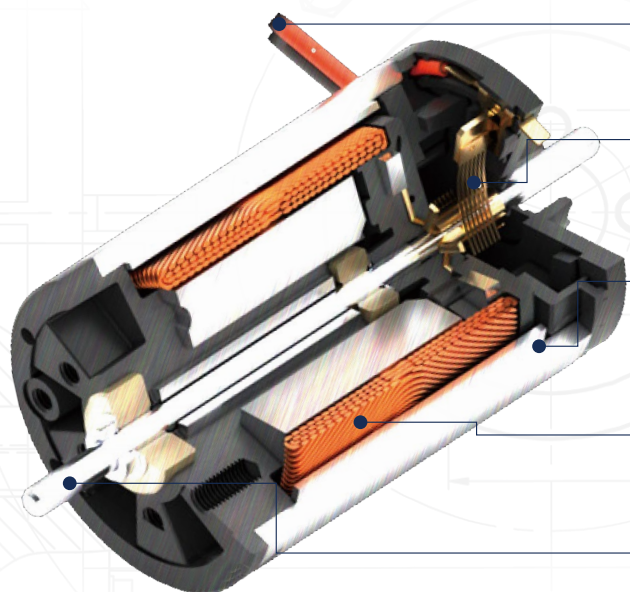
BRUSH HOLLOW CUP MOTOR DC SERIES

PRODUCT INTRODUCTION

DC series motors have features of no cogging torque, low rotational inertia, great acceleration performance, low electromagnetic interference, low inductance, and high efficiency. This series uses multi-segment commutation, resulting in small torque fluctuations, and can withstand short-term overloads. Its compact structure and small size allow it to be used in combination with various gearboxes and encoders.

- No cogging torque
- Low rotational inertia
- Low inductance
- High efficiency

Key data	
Diameter	16...40mm
Drive length	25...90mm
Power	3...130W
Maximum rated torque	160mNm
Maximum drive speed	21700rpm



Depending on the size and structure, the electrical connections may be equipped with terminals, wires, and plugs.

Precision rotational motion can be achieved through the use of rare metal brush commutation, or graphite brush commutation for use in various demanding applications.

The motor housing and magnets are made into the stator through a plastic (PPA) blend injection molding process. Options for sintered bearings or ball bearings are available.

High-efficiency hollow cup windings with an option of different rated voltages.

A high rigidity stainless steel shaft that offers various adjustment options.

TECHNICAL PARAMETERS

Model	Torque	Speed	Power	Resolver	Model	Torque	Speed	Power	Resolver
DC1625	5mNm	5730rpm	3W	Metallic brush	DC2668	68mNm	9800rpm	70W	Carbon brush
DC1640	8.6mNm	11100rpm	10W	Metallic brush	DC2845	58mNm	10200rpm	62W	Carbon brush
DC1717	2.2mNm	21700rpm	5W	Metallic brush	DC2860	72mNm	10600rpm	80W	Carbon brush
DC1719	5.7mNm	13400rpm	8W	Metallic brush	DC3068	85mNm	10700rpm	95W	Carbon brush
DC1727	4.9mNm	10300rpm	5.3W	Carbon brush	DC3242	80mNm	8800rpm	74W	Carbon brush
DC1741	8.8mNm	9760rpm	9W	Carbon brush	DC3257	79mNm	10400rpm	86W	Carbon brush
DC1934	15mNm	10200rpm	16W	Metallic brush	DC3272	89mNm	10200rpm	95W	Carbon brush
DC2234	19mNm	11000rpm	22W	Metallic brush	DC3553	85mNm	10100rpm	90W	Carbon brush
DC2247	23mNm	10400rpm	25W	Metallic brush	DC3571	100mNm	10000rpm	105W	Carbon brush
DC2543	30.5mNm	9700rpm	31W	Carbon brush	DC3864	125mNm	9170rpm	120W	Carbon brush
DC2554	40mNm	10000rpm	42W	Carbon brush	DC3890	160mNm	8950rpm	150W	Carbon brush
DC2642	44mNm	9770rpm	45W	Carbon brush	DC4071	160mNm	7760rpm	130W	Carbon brush
DC2657	58mNm	9700rpm	59W	Carbon brush					

BRUSHLESS HOLLOW CUP MOTOR EC SERIES

PRODUCT INTRODUCTION

EC series motors utilize electronic commutation, offering a longer lifespan, excellent torque performance, high power, a wide range of speeds, and precise positioning capabilities.

Designed for long-time operation

Robust construction

Suitable for extreme environmental conditions

Long lifespan with a wide range of drive speeds

Metal housing and flange ensure good heat dissipation and mechanical stability.

The "centerpiece" is the ironless winding with benefits such as no cogging torque, high efficiency and excellent control dynamics from its physical design.

The motor housing is crafted from a single piece of steel tube, characterized by its non-magnetic nature, rigidity, and coated surface.

Depending on the size and structure, the anti-pull wires can be equipped with dust protection and plugs can be optionally fitted as required.

Key data

Diameter	16...40mm
Drive length	30...88mm
Power	4...130W
Maximum rated torque	200mNm
Maximum drive speed	20000rpm

TECHNICAL PARAMETERS

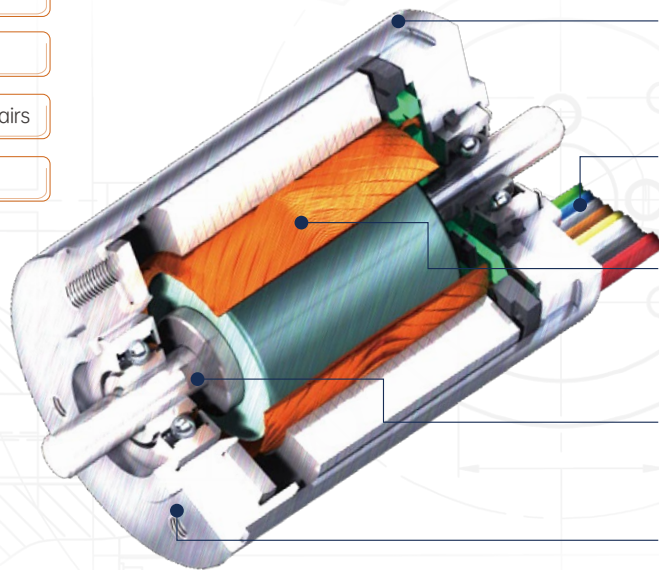
Model	Torque	Speed	Power	Model	Torque	Speed	Power
EC1630	3mNm	12700rpm	4W	EC3260	55mNm	10400rpm	60W
EC1636	8mNm	9550rpm	8W	EC3270	80mNm	8350rpm	70W
EC2232	8mNm	14300rpm	12W	EC3660	70mNm	9550rpm	70W
EC2240	15mNm	11400rpm	18W	EC3670	120mNm	7160rpm	90W
EC2248	22mNm	8680rpm	20W	EC4058	85mNm	8990rpm	80W
EC2845	23mNm	8300rpm	20W	EC4070	130mNm	7350rpm	100W
EC2854	35mNm	12300rpm	45W	EC4088	200mNm	6200rpm	130W
EC2864	60mNm	8750rpm	55W				

BRUSHLESS HOLLOW CUP MOTOR ECM SERIES

PRODUCT INTRODUCTION

ECM series motors feature housings made from stainless steel, designed and assembled using laser welding techniques. These motors are non-magnetic, highly durable, and offer excellent resistance to rust. They are characterized by high consistency and precision, providing excellent cost effectiveness, while encompassing all the advantages of brushless DC motors.

- Designed for long-time operation
- Maximum speed up to 20,000 rpm
- Rotor is equipped with a set of pole pairs
- Stainless steel housing



- The motor housing is crafted from a single piece of steel tube, characterized by its non-magnetic nature, rigidity, and coated surface.
- The anti-pull wires can be extended from the motor axially or radially, with the option to use plugs.
- The "centerpiece" is the ironless winding with benefits such as no cogging torque, high efficiency and excellent control dynamics from its physical design.
- The absence of notches on the shaft guarantees smooth operation and very high resistance to twisting.
- Metal housing and flange ensure good heat dissipation and mechanical stability.

Key data

Diameter	16...52mm
Drive length	24...110mm
Power	5...300W
Maximum rated torque	500mNm
Maximum drive speed	20000rpm

TECHNICAL PARAMETERS

Power	Torque	Speed	Power	Power	Torque	Speed	Power
EC-M1624	2.7mNm	17690rpm	5W	EC-M3270	90mNm	8500rpm	80W
EC-M1636	8mNm	10700rpm	9W	EC-M3660	88mNm	9200rpm	85W
EC-M2232	11mNm	13000rpm	15W	EC-M3670	100mNm	8600rpm	90W
EC-M2248	20mNm	11000rpm	23W	EC-M4058	120mNm	8000rpm	100W
EC-M2845	21mNm	10500rpm	23W	EC-M4070	150mNm	7640rpm	120W
EC-M2854	40mNm	12000rpm	50W	EC-M4088	200mNm	7160rpm	150W
EC-M2864	42mNm	13600rpm	60W	EC-M4568	255mNm	6700rpm	180W
EC-M3042	50mNm	11400rpm	60W	EC-M45100	300mNm	6300rpm	200W
EC-M3064	55mNm	12100rpm	70W	EC-M5280	350mNm	6800rpm	250W
EC-M3260	60mNm	12000rpm	75W	EC-M52110	500mNm	5700rpm	300W

BRUSHLESS HOLLOW CUP MOTOR EC4P SERIES

PRODUCT INTRODUCTION

The EC4P series motors stand out for its excellent power-to-size and power-to-weight ratios due to the use of special winding technology and four-pole magnets. The motors offer no cogging torque, high efficiency, and outstanding dynamic performance from the controller. The metal casing ensures effective heat dissipation and high mechanical stability, leading to a prolonged service life.

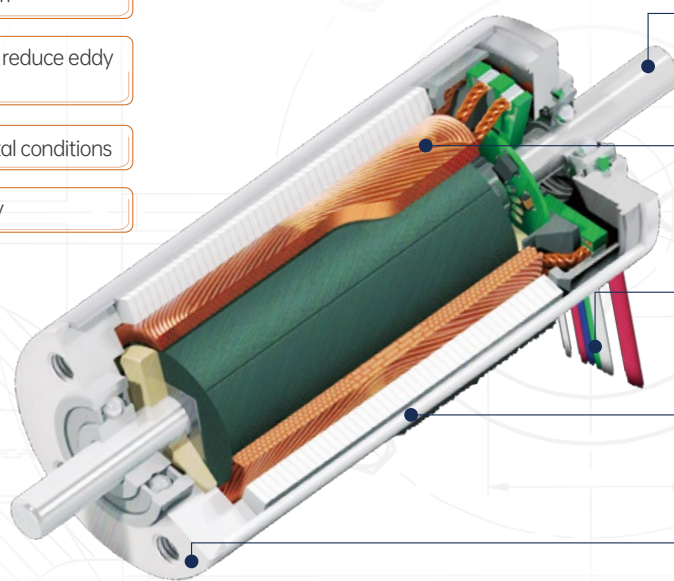
Maximum speed up to 20,000 rpm

High-quality circuit materials that reduce eddy current losses

Suitable for extreme environmental conditions

Four-pole with high power density

Key data	
Diameter	16...52mm
Drive length	24...110mm
Power	25...680W
Maximum rated torque	1100mNm
Maximum drive speed	20000rpm



The absence of notches on the shaft guarantees smooth operation and very high resistance to twisting.

The "centerpiece" is the ironless winding with benefits such as no cogging torque, high efficiency and excellent control dynamics from its physical design.

The anti-pull wires can be extended from the motor axially or radially, with the option to use plugs.

The motor housing is crafted from a single piece of steel tube, characterized by its non-magnetic nature, rigidity, and coated surface.

Metal housing and flange ensure good heat dissipation and mechanical stability.

TECHNICAL PARAMETERS

Model	Torque	Speed	Power	Model	Torque	Speed	Power
EC-4P 1624	18mNm	13200rpm	25W	EC-4P 32142	800mNm	5700rpm	480W
EC-4P 1646	30mNm	12700rpm	40W	EC-4P 3650	180mNm	13200rpm	250W
EC-4P 2248	42mNm	14800rpm	65W	EC-4P 3660	250mNm	11400rpm	300W
EC-4P 2266	54mNm	15500rpm	88W	EC-4P 3670	250mNm	13700rpm	360W
EC-4P 2460	85mNm	10800rpm	96W	EC-4P 4058	250mNm	12200rpm	320W
EC-4P 2845	75mNm	11700rpm	92W	EC-4P 4070	330mNm	11500rpm	400W
EC-4P 2854	82mNm	11600rpm	100W	EC-4P 4088	550mNm	7500rpm	430W
EC-4P 2864	95mNm	12000rpm	120W	EC-4P 4568	420mNm	10000rpm	450W
EC-4P 3047	72mNm	13200rpm	100W	EC-4P 45100	700mNm	6800rpm	500W
EC-4P 3064	95mNm	18000rpm	180W	EC-4P 5280	860mNm	6100rpm	550W
EC-4P 3260	160mNm	12000rpm	200W	EC-4P 52110	1100mNm	5900rpm	680W
EC-4P 3270	280mNm	10200rpm	300W				

PLANETARY GEARBOXES GA SERIES



PRODUCT INTRODUCTION

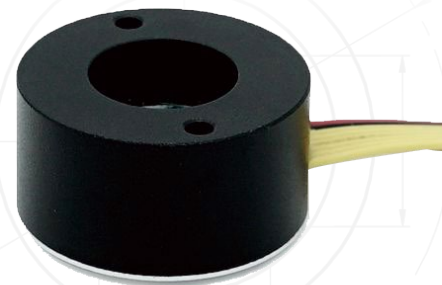
GA series gearboxes, in combination with motors, can alter the output speed and torque, providing ideal dynamic output parameters within drive control systems. It come in sizes ranging from 16mm to 52mm, featuring large rated output torque, high efficiency, low backlash, diverse gear ratios, and extended lifespan.

Designed to be extremely short and compact, the GA series gearboxes offer high power, high torque, high speed, low noise, and minimal no-load operation. Its modular structure and scalable gear ratios lay the groundwork for tailored drive solutions.

TECHNICAL PARAMETERS

Model	Diameter	Torque	Speed	Model	Diameter	Torque	Speed
GA 16	φ16mm	0.2-0.8Nm	13000rpm	GA 36	φ36mm	3.0-9.0Nm	7000rpm
GA 22	φ22mm	0.5-2.5Nm	12000rpm	GA 42	φ42mm	3.0-25.0Nm	6000rpm
GA 26	φ28mm	2-5Nm	10000rpm	GA 52	φ52mm	5.0-30.0Nm	6000rpm
GA 32	φ32mm	2.0-8.0Nm	8000rpm				

ENCODERS



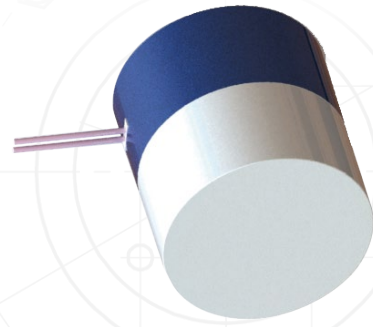
PRODUCT INTRODUCTION

Our encoders feature a compact design and high signal quality, with models including a 3-channel encoder (compatible with 2-channel interfaces) and absolute encoders supporting SPI output. They are capable of outputting PWM absolute position information, ensuring error-free output even under heavy loads.

TECHNICAL PARAMETERS

Parameters	
Magnetic encoder (incremental) φ16/φ22/φ28/φ32/φ40	Magnetic encoder (absolute) φ16/φ22/φ28/φ32/φ40
100~1024-line programmable—(single-ended/differential)configurable	100~1024-line programmable—(SPI, PWM)configurable
100~4096-line programmable—(single-ended/differential)configurable	100~4096-line programmable—(SPI, PWM)configurable
Optical encode (incremental) φ16/φ20/φ28	Optical encode (absolute) φ16/φ20/φ28

BRAKE



PRODUCT INTRODUCTION

Brakes can lock the motor shaft when the system stops running. There are two types of brakes: power-on brakes and power-off brakes, with diameters ranging from $\phi 20\text{mm}$ to $\phi 60\text{mm}$ and static braking torque from 0.1Nm to 5Nm. It is used in a variety of motion products or robotic products.



TECHNICAL PARAMETERS

Model	Size	Voltage	Braking Torque	Braking Method
BR 20	20mm	24v	0.1Nm	Electric brake/power off brake
BR 28	28mm	24v	0.4Nm	Electric brake/power off brake
BR 32	32mm	24v	0.4Nm	Electric brake/power off brake
BR 41	41mm	24v	2Nm	Electric brake/power off brake
BR 42	42mm	24v	1.4Nm	Electric brake/power off brake
BR 44	44mm	24v	2.5Nm	Electric brake/power off brake
BR 60	60mm	24v	5Nm	Electric brake/power off brake

DRIVES



PRODUCT INTRODUCTION

Drives are commonly used with permanent magnet brushless motors, capable of meeting requirements for controlling the speed of brushless motors. Our drives are devices with interfaces open to users. We can add or customize drive functions based on customer demands. With a complete electronics industry chain, Lorentz DM offers comprehensive and one-stop services for customers in need of drive designs.

APPLICATION CASES



PIPELINE INSPECTION ROBOT

In urban underground pipeline application scenarios, where pipeline diameters range from as small as 100mm to as large as 3 meters, robots must be designed with compact structures to adapt to most pipelines. This necessitates the need for motors that are small in diameter and volume, yet capable of delivering high power output to ensure the robot has robust propulsion. When navigating inside pipelines, the robot must be capable of operating under wastewater conditions, overcoming obstacles such as mud and rocks. During its operation, the motor needs to provide instant high torque output, often withstand load impacts, and even endure stall conditions. The motor power systems we've developed for pipeline inspection robots can meet these unique requirements, enabling the robots to achieve exceptional performance.



MEDICAL BONE DRILL

In the field of small volume, high power orthopedic bone drills, our motors can provide extremely high peak torque, reducing the size of bone drill equipment, making it more comfortable for surgeons to use while ensuring drilling through the thickest and densest bone. High efficiency and high power density extend the battery life of the device to the maximum extent, and the motor can withstand high-temperature and high-pressure sterilization cycles above 135°C, its long life frees users from after-sales troubles.



EXOSKELETON ROBOTS

Applying micro technology to medical devices, making life easier for people with disabilities is a very meaningful thing. We have developed torque, size, and weight optimized reduction motor solutions specifically for exoskeletons and prosthetics, among which a typical application case is the 4-pole brushless ironless motor EC-4P32162 high power density solution, 32mm in diameter, with power over 200W, providing strong power for flexible exoskeletons.



SEMICONDUCTOR EQUIPMENT

In a certain process of chip production, involving rapidly and accurately flipping chips, the installation of a brushless ironless motor EC1630 with an encoder combination at the end effector of the equipment can provide power to the actuator, achieving rapid response in power and precise positioning of the chip.



VENTILATORS

For the application of medical ventilators, our motor drive system can take into account efficiency, output power, temperature rise, noise, and vibration, etc., giving the product optimal performance. Special treatment of the motor's internal structure and special design of the windings achieve nearly zero slot torque, while also having the capability of rapid response, and suppressing both high-frequency and low-frequency noise.



MINING ROBOTS

Mine inspection robots on rails use lightweight rails laid out in sections underground, achieving horizontal, curved, circular, and return movements. Equipped with batteries, wireless communication modules, video monitoring modules, and gas detection modules, they can perform wireless coverage inspections within the tunnel. The robot's power system uses a 4-pole brushless ironless motor EC-4P3260, paired with a GA32 gearbox and electromagnetic brake BR30, giving the robot powerful drive, while also being smaller in size, lighter in weight, and longer in endurance.



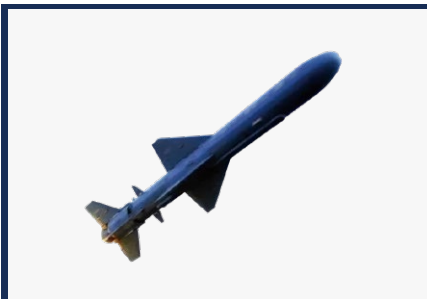
NAVAL SHIP VALVE CONTROL MOTORS

Military applications require motors to have high reliability, stability, while also being compact and lightweight, capable of resisting interference. Brushless ironless motors DC3068 combined with worm gears for valve control is an excellent solution, with motors having no slot torque, low rotational inertia, good acceleration performance, low electromagnetic interference, high efficiency, and strong short-time overload capability.



IMPLANTABLE VENTRICULAR ASSIST SYSTEMS

Implantable ventricular assist systems, referred to as "artificial hearts", are used for treating end-stage heart failure in children (VAD). Ironless motor EC1630 offers excellent torque performance, high power, wide speed range, and precise positioning, closely matching the implantable ventricular assist systems, increasing the waiting time for patients for transplantation.



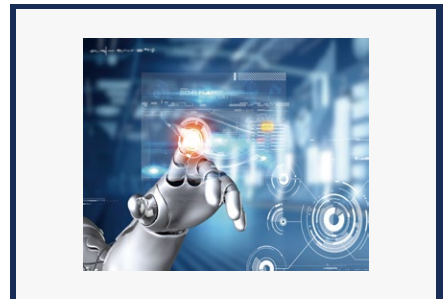
MILITARY STEERING GEAR

Military steering gear require a fast-responding servo system, such as rapid adjustment of the missile's flight direction, high-ratio optical drive servo control, rapid autofocus, high sensitivity recording, and detection, etc. Lorenz power motors utilize the advantages of ironless motors being lightweight, compact, and low energy consumption to minimize the weight of the aircraft, meeting its technical requirements well.



SMART ELECTRIC SCREWDRIVERS

In the application of smart electric screwdrivers, combinations like EC2854 and GA26 can achieve the best balance between power, size, weight, and endurance. Specifically, this combination might represent the optimization of motor and battery technology to provide sufficient power to complete tasks while keeping the tool compact and lightweight, reducing operator fatigue during prolonged use. Moreover, this combination may also offer enduring endurance through efficient energy management, ensuring the tool can work steadily throughout the workday.



ARTIFICIAL INTELLIGENCE

Applications in artificial intelligence have higher requirements, beyond basic performance parameters, they also need some specific functionalities through signal feedback for corresponding control. Such reduction motors are precisely designed, with excellent performance, and have higher requirements for lifespan and noise. Generally, different outer diameter DC brushless, DC planetary ironless, and ironless reduction motors are more suitable, meeting different customer requirements and adapting to various functionalities.

