maxon

Drive systems for Aerospace

Building an aircraft means accountability – from the hangar to takeoff and landing. This is only possible with experienced partners.

Content

Welcome, we are maxon

The story of maxon began in Switzerland in 1961 with eight employees. Before long, the company invested in its first own facilities and a small production hall. Today, 3,200 people work for maxon – and we call the whole world our home.

Every journey has a beginning – and maxon's began with a government mandate. The German company Braun operated a distribution subsidiary in Switzerland. In the 1950s, Swiss authorities approached Braun with an ultimatum: if the company wanted to continue distributing its products in Switzerland, it would also need to establish manufacturing operations in the country. Preferably in an economically weaker region.

The Braun family complied, choosing the canton of Obwalden in the heart of Switzerland. In 1961, Interelectric AG was founded with eight employees (later renamed maxon) and soon began production. At the time, the company manufactured foil cutters for Braun shavers. But the young company's future was suddenly at risk: in 1967, Braun was sold to the Gillette Company. Gillette wanted to produce the foil cutters in-house but granted maxon a transition period.

The ironless winding

A new idea was needed and the pioneering era of maxon began. The leadership team saw potential in the production of small, precise electric motors. After a brief research phase, they developed a complete range of DC motors featuring a special patented innovation: the ironless winding. This gave the motors high efficiency, and their long service life set new standards.

That first motor series was only the beginning. Innovation has always been a top priority at maxon. Over the years, the small pioneering operation evolved into a global company. Today, maxon has 3,200 employees worldwide, operates ten production and assembly facilities, and maintains over 40 sales locations.

The company remains owned by the Braun family. Five million drive units leave its production sites each year. The range of applications for our motors is vast: from insulin pumps to logistics robots to NASA's Mars rover, they perform reliably in demanding environments.

What began with regulatory pressure has become an innovative company that has grown and thrived – while never abandoning the pioneering spirit of 1961. That legacy remains deeply rooted in the company to this day.

What we do

System approach

The maxon system approach is diverse. On one hand, we build integrated units consisting of a motor, gearbox, electronics, and, if needed, software. On the other hand, we offer customized solutions for applications in which maxon drives are integrated into a higher-level system.

Modularity

maxon drive solutions are based on a modular system. As a customer, you select a drive and can then choose matching gearheads, sensors, controllers, and accessories—either with the selection guide in the catalog or using the configurator in the online shop at www.maxongroup.com.

Safety

We continuously expand our portfolio with new safety functions. Our servo motors are available with integrated functional safety. And for safety-critical applications such as aerospace or medical technology, we have extensive expertise with the required certifications.

Customized solutions

We offer the right solution and know-how for every drive challenge. Sometimes a small adjustment is enough, which we are happy to make. But for more complex projects, we also have the expertise required to integrate the drive system into demanding environments.

Servo Motors

Servo Motors enable precise movement thanks to integrated encoders or Hall sensors. They are robust, compact, and easy to integrate—with maxon electronics, customized solutions, or plug-and-play. Their high power density also makes them suitable for mobile applications.

Brushless DC Motors (BLDC)

BLDC motors offer long service life, low noise, and precise speed control with minimal wear. Their compact design and optional integrated electronics make them well-suited for equipment manufacturing and mobile applications.

Frameless BLDC Motors

Frameless Motors consist of a separate stator and rotor and can be integrated into customer-specific designs—including adaptations such as bearings or cable routing. They are ideal for systems engineering, robotics, and high-end applications.

Brushed DC Motors (DC)

Brushed DC Motors feature maxon's patented ironless winding and offer high dynamics, smooth operation, and easy handling. With a broad product range and excellent compatibility with gearheads, they are ideal for fast, cost-efficient solutions.

Linear Solutions

Linear actuators are ideal for applications such as pipetting, XY-tables, or pick-and-place. They feature robust axial bearings and require no additional external bearings. The spindle mechanism ensures reliable linear motion, while various options allow flexible integration.

Gearheads

Planetary gearheads are among the smallest precision gearheads and are known for their reliability. Right-angle gearboxes are available in many sizes and can be customized. Strain Wave gearheads enable precise motion and high torque in a compact form factor.

Sensors and Control Electronics

Sensors and Control Electronics enable precise regulation of position, speed, and torque. Encoders provide accurate feedback, while the electronics link the drive and software into an intelligent, safe, and robust system.

Ceramic

Technical ceramics enable precise and robust components for systems where conventional materials reach their limits. They offer high hardness, wear resistance, and stability, making them ideal for components that must operate reliably even under extreme conditions.

Drive systems for aerospace

Building an aircraft means accountability – from the hangar to takeoff and landing. This is only possible with experienced partners.

The service life of an aircraft is 25 to 35 years. New and replacement parts must remain available in consistent quality throughout the entire product life cycle. The aviation industry is highly regulated and requires solid evidence, traceability, and certified processes down to the component level.

Requirements have increased in recent years. Drive systems and actuators must be durable and high-performance. At the same time, efficiency, material origin, and environmental compatibility are gaining importance. Complete documentation is essential. Because of the high altitudes of up to 10,000 meters, our drives are designed to reliably withstand extreme environmental conditions. Drive systems are designed and tested for temperature fluctuations, shocks, vibrations, and moisture to ensure predictable and reliable behavior.

- Reliable drive solutions for safety-critical onboard applications
- Haptic feedback and controllable operating forces for human-machine interfaces
- Proven in aerospace applications with high demands on safety and service life

A long service life is both expected and required, even under harsh conditions. Control begins already in development. maxon relies on many years of experience from aviation projects and on processes that meet the requirements of the aerospace industry (EN 9100).

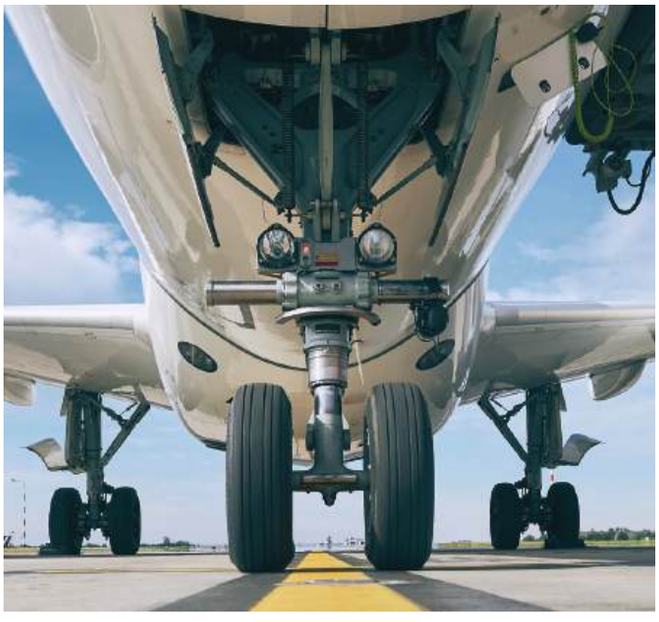
A fully equipped test laboratory, suitable test procedures, and design considerations are based on real operating profiles. Reliable data and models form the basis for flawless functionality and maintenance. maxon develops electric drive solutions consistently in the context of their application. Mechanics, electronics, control, and integration are considered together.

Stable and predictable solutions
Where customer-specific solutions are required, we support projects from the concept phase through series production. The focus is on stable, predictable solutions throughout the entire life cycle – whether in the cockpit, the passenger cabin, or ground systems.

The electrification of aviation is progressing. Concepts such as drones, small aircraft, or ground-based drive solutions will rely less on fossil fuels in the future. The responsibility remains.

In the cockpit

Haptic feedback, clearly defined operating forces, and predictable behavior support pilots in every phase of flight. Whether classic control elements or new cockpit concepts, maxon ensures that the interaction between human and machine is clear, precise, and fully controllable – from takeoff to landing.



Reliable in the background

Many systems wait in the background until they are needed. Our drives for locks, flaps, valves, pumps, and release and redundancy mechanisms remain unobtrusive during normal operation and respond reliably in critical situations. They also contribute to safety in radar, antenna, tracking, and support systems.

On board and in operation

maxon drive solutions perform many tasks: they regulate climate and airflow, move cabin or seat components, and contribute to the comfort of crew and passengers over thousands of flight hours. Quiet operation, a compact design, and an architecture that remains stable and low-maintenance over decades are essential.

In electric aviation

This is where maxon's proven experience meets new applications: electric flight concepts and new platforms place different demands on drive systems and infrastructure. Efficiency, weight, and scalability move into focus – without compromising on safety, quality, or traceability.

Types of solutions

We offer a comprehensive portfolio of solutions, ranging from proven, pre-designed components to fully customized drive systems engineered to meet the most stringent technical and regulatory requirements.

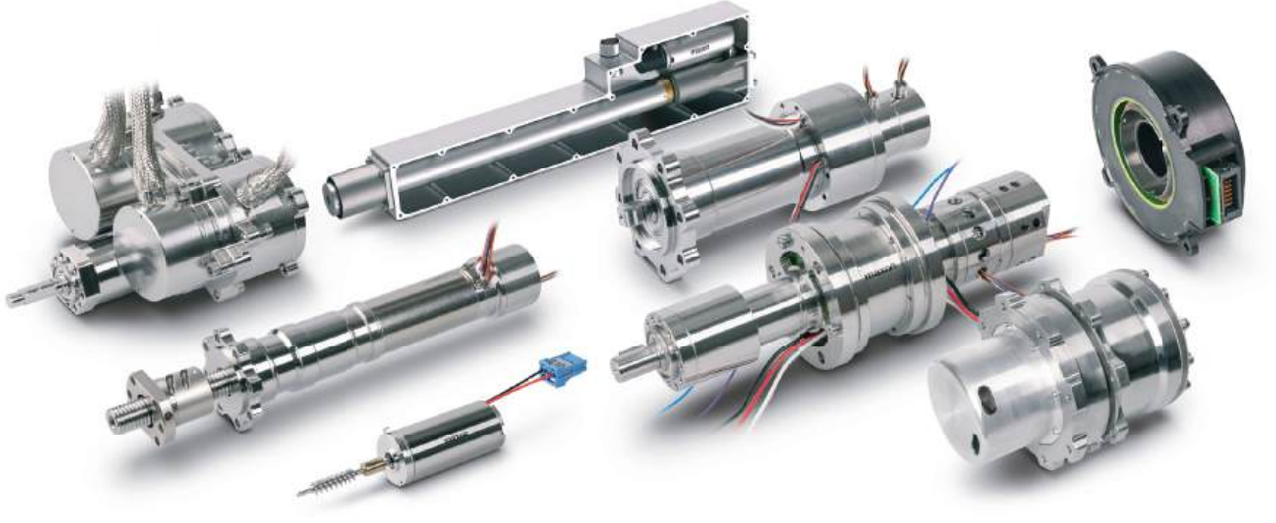
- → Robust and reliable design
- → High performance and efficiency
- → Tested against DO-160G environments
- → Customizable plug and play
- → Dedicated aerospace products

Modified catalog components

maxon motors' aerospace-modified catalog components combine the reliability of proven off-the-shelf designs with targeted customizations to meet the demanding requirements of aerospace applications. These components start from maxon's standard high-performance motor and drive platforms and are carefully adapted for factors such as extended temperature ranges, vibration resistance, and strict quality or documentation standards. By modifying catalog items rather than developing fully custom solutions from scratch, aerospace customers benefit from faster development cycles, reduced risk, and cost efficiency while still achieving the performance, durability, and precision required for use in aircraft. For example the DC-Motor-Combination DCX 22 L AERO and gear GPX 22 UP AERO for a backup landing gear uplock and door unlock mechanism.

Drive systems for niche applications

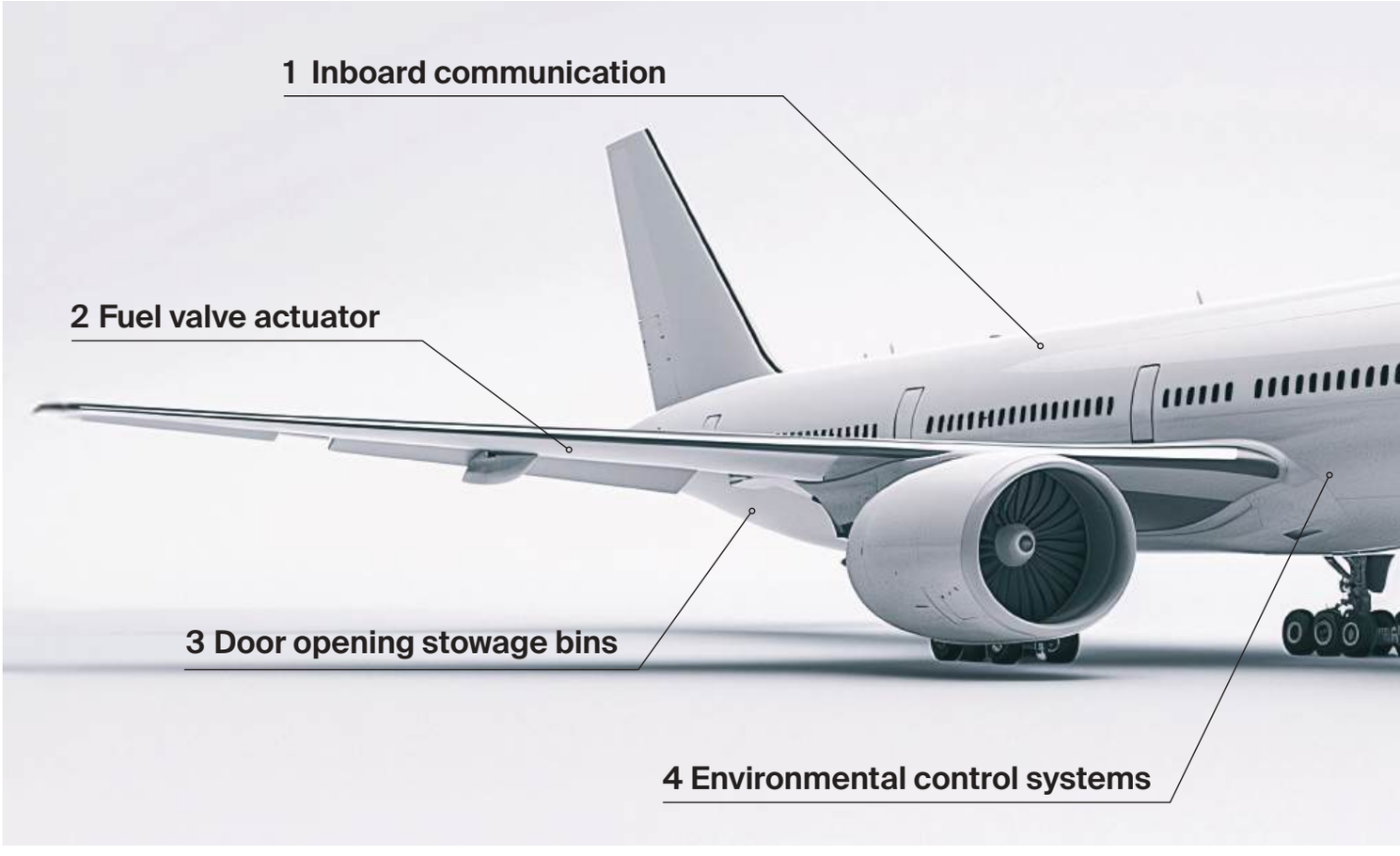
Our drive systems are engineered to deliver precise, reliable motion control in highly specialized and demanding use cases where standard solutions fall short. These systems are typically built on proven drive platforms and then tailored to specific requirements such as unique load profiles, tight installation spaces, extreme environmental conditions, or specialized control interfaces. By focusing on application-specific performance rather than one-size-fits-all designs, niche drive systems provide optimized efficiency, robustness, and precision, enabling customers to achieve reliable operation in fields such as aerospace subsystems.



Customer-specific drive systems

Do you have pages of requirements for your parts? Customer-specific drive systems deliver fully integrated, plug-and-play motion solutions that are precisely tailored to individual application needs. Ranging from simply adapted standard drives to highly specialized designs, these solutions are engineered to match exact performance, interface, and environmental requirements while minimizing integration effort for the customer. They can include manufacturing of additional parts as well as custom cabling and harnesses, all realized through modular designs optimized for the desired functionality. For more advanced applications, high-tech actuators and sub-assemblies are developed as 100% “built-to-spec” units, ensuring seamless system compatibility, reliable operation, and a ready-to-install solution that accelerates time to market. As an example, a linear actuator in a logistics eVTOL uses a system comprising a maxon DC motor, a screw drive, and an ENX absolute multiturn encoder to actuate the propulsion orientation and flight transition control.

Drive units in aeroplanes



1 Inboard communication

Powerful brushless motors with low backlash gearbox for highest level of accuracy. **Examples:** EC 60 flat motors as direct drive or EC-4pole motors with gearboxes. Capable to survive the harsh environments on the outside of an aircraft.

2 Fuel valve actuator

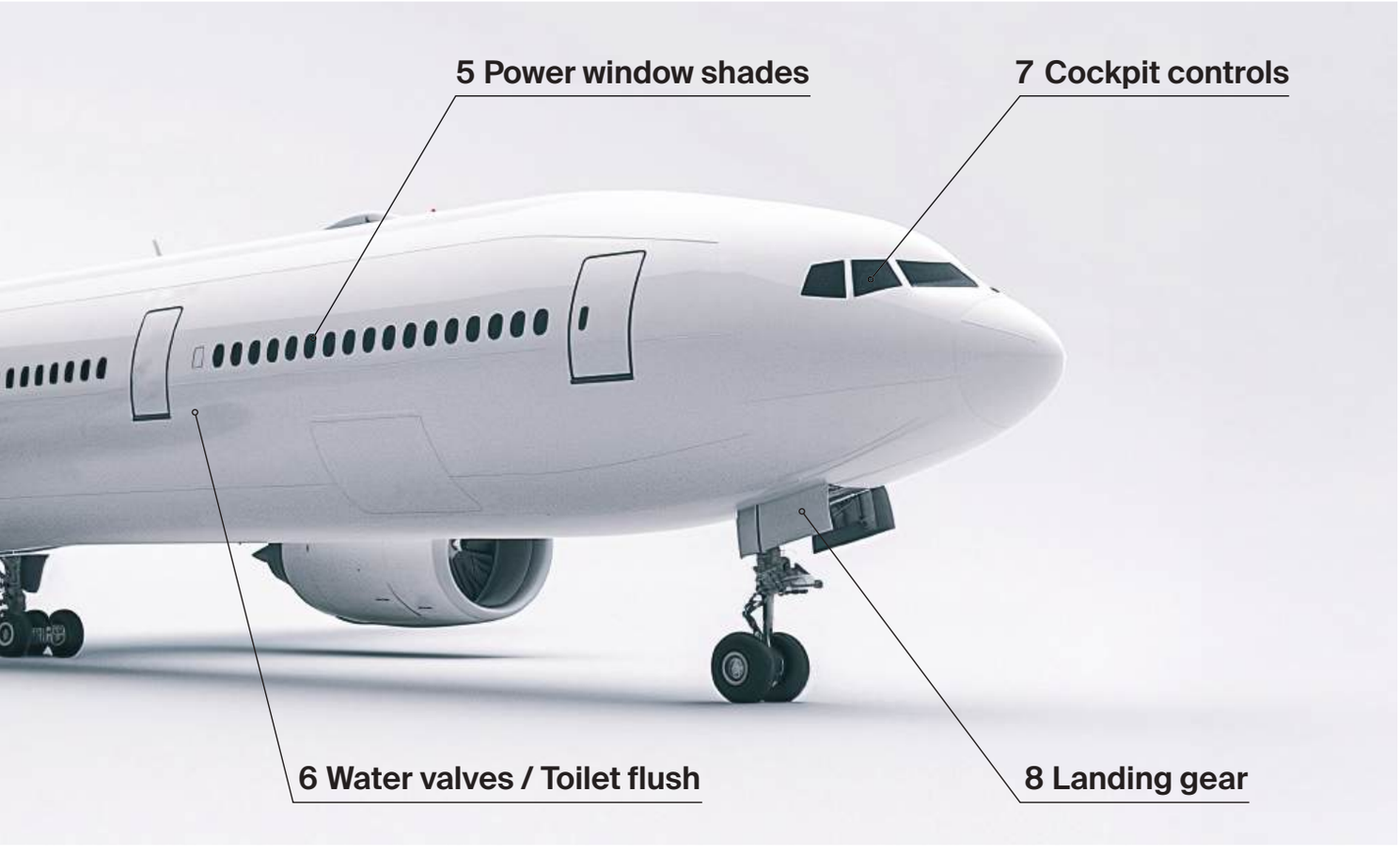
maxon delivers drive systems suitable for fluid or gas distribution within an aircraft. **Examples:** DCX motors

3 Door opening stowage bins

Motors suitable to operate several times a day over several years of lifetime. Robust for any kind of all types and for all turbulences of a flight.

4 Environmental control systems

Passenger comfort requires fresh, climate-controlled air while maintaining the right cabin pressure require highly reliable valve systems. Air inlet actuation as well as air distribution valves in airplanes need brushless motors. **Examples:** EC 45 flat motor.



5 Power window shades

Reliable operation and low noise configuration for best possible passenger comfort.

7 Cockpit controls

Modern fly-by-wire systems rely on high precision actuation and motors. Accurate and stable motor characteristics for consistent behavior from motor to motor.

6 Water valves / toilet flush

Toilet systems as an important element in air travel need reliable and robust systems for all kinds of tasks. Toilet flushes or automated, non-touch systems after the COVID crisis rely on maxon electric motors. **Examples:** DCX 22 or EC 32 flat motor

8 Landing gear

maxon motors are used as back-up and secondary system for the landing gear. Heavily tested and capable to survive all environmental conditions, the DCX motors with maxon gearboxes are well suited for these tasks.

Applications for passenger comfort

Power window shades

Powered window shade systems can be actuated by maxon DCX 16 motors with GPX 16 gearboxes, low-noise brakes, and application-specific filtering. The ironless winding ensures exceptionally quiet and smooth motion, providing premium passenger comfort.

Seat actuation

Seat actuators can be driven by maxon EC-i 30, EC-i 40, or ECX 32 flat motors. Their high torque density enables powerful seat adjustment, while the compact motor design allows integration into space-constrained cabin interiors.

Water valves / Toilet flush

Water valves and toilet flush systems can be actuated by maxon DC motors with compact gearheads. The robust drive solution ensures precise valve operation and reliable performance over millions of actuation cycles.

Environmental control systems

Environmental control system valves can be actuated by maxon ECX FLAT motors with spur gearboxes and customer-specific pinions. Their compact flat design and high torque density enable reliable valve control where installation space is limited.

Because of the high altitudes of up to 10,000 meters, our drives are designed to reliably withstand extreme environmental conditions.

Your partner in the sky

From development through implementation, maxon supports customers with dedicated teams at every stage of the project. Backed by consistent production oversight and a tightly controlled supply chain, we ensure dependable quality and reliability throughout the entire process. Our aerospace designs build on years of enhancements developed through close collaboration with aviation customers.

Development

- Actuator design to specification
- SW/HW development according to DO-178/254
- Verification according to DO-160G and MIL-STD-810 in our internal test facilities
- Electrical, thermal, magnetic and mechanical simulations
- Partners for Electromagnetic Compatibility, Finite Element Method, cabling, Software Contracting
- Robust and reliable design
- High performance and efficiency
- Optimized material selection for extended temperature ranges

Project management

- Dedicated team and services
- Experienced and capable project managers from specification to serial production
- Configuration and obsolescence management
- Partner & supplier management
- Certificate of Conformity (COC)
- Acceptance Test Report (ATR): Products are tested in accordance with maxon quality standards. A dedicated ATR can be provided upon request.
- Test Report (TR) for specific customer configurations
- Quality Assurance Agreement (QAA): Dedicated QAAs can be established for serial production programs.

Production

- Qualified supply chain
- Robust and dedicated production line
- Traceability on manufacturing lots
- In production and end-of-line inspection
- Specific ATP/R capabilities
- Dedicated quality assurance plan
- Customizable

Implementation

- Change and Configuration Management
  Depending on the customer needs, the QAA addresses two different Change and Configuration Management levels.

For all these services, please refer directly to your sales office.

From conception to support

Detailed development timeline

MS0

MS1
PDR

MS2
CDR

Design freeze

Feasibility phase

Optional phase
(new designs/systems):

- Check technical feasibility
- Development milestone:
  MS0 (maxon)

Concept phase

- **Technical Concept** creation (architecture, 3D model, main dimensions, first simulations)
- Compliance matrix draft
- **Functional Samples** (FS) build
- Development milestone:
  MS1 (maxon) I // **PDR** (Preliminary Design Review)

FS
Functional Samples

- Design as close as possible to maxon standard catalogue
- May include some customization for interfacing
- Design delivers electrical performance relevant to final configuration

Design phase

- **Design release** “prototype” (detailed design, tolerances stack, thermal and mechanical simulations)
- **Compliance Matrix release**
- Manufacturing Concept creation
- **Engineering Models** (EM build)
- Design verification testing
- Development milestone:
  MS2 (maxon) // **CDR** (Critical Design Review)

EM
Engineering Models

- Design as close as possible to the final configuration, but modifications based on testing may still be necessary
- No configuration control
- No frozen design
- ATP = maxon standard

MS3

Process freeze

MS4

Pre-series

- Manufacturing processes validation
- **Qualification Models** (QM) build
- Qualification testing
- ATP testing
- Development milestone: **MS3** (maxon)

QM
Qualification Models

- Design is frozen and planned identical to the FM configuration.
- Configuration control applied
- Production documentation available
- Production tools and processes partially verified
- Custom ATP possible

Initial batch (serial)

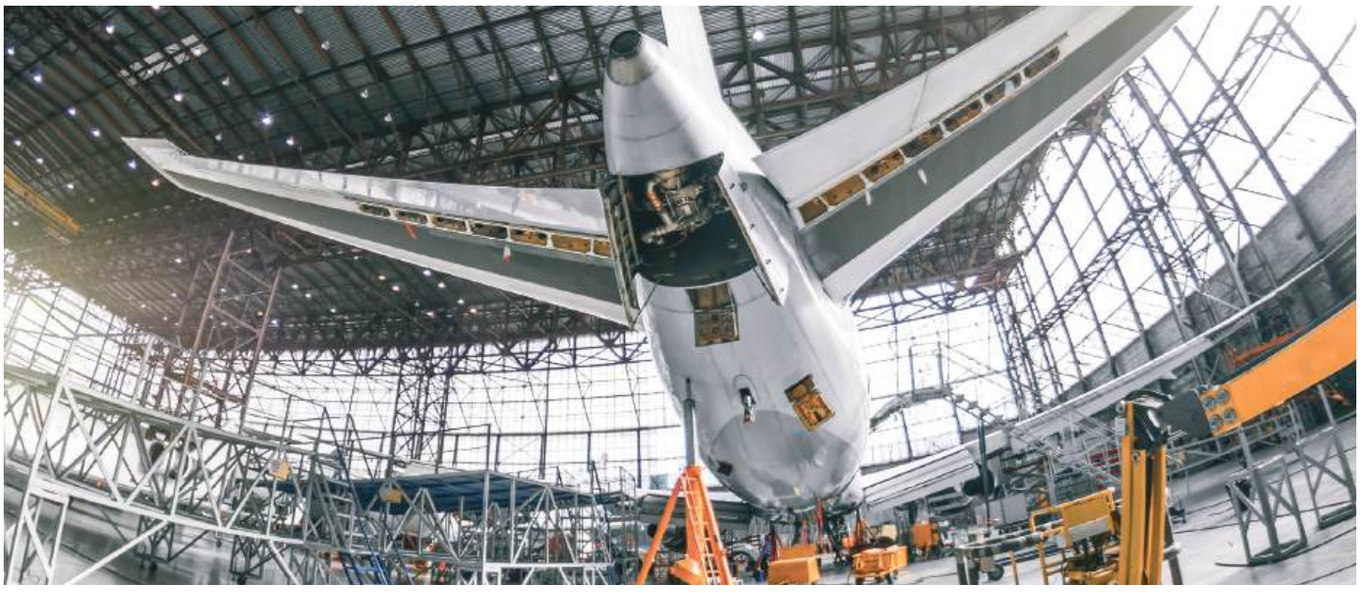
- Full serial production release
- **Flight Models** (FM) build
- First Article Inspection (FAI)
- Close Development Project
- Development milestone: **MS4** (maxon)

FM
Flight Models

- Final configuration
- Full release of production
- Configuration control applied
- FAI + custom ATP possible

Reliable and scalable manufacturing

Quality, reproducibility, adherence to deadlines, and flexibility are essential in modern production. In other words: cost-effectiveness. To meet these demands, we embed scalability into our products from the earliest concept phase and manage in-house production from small series to large-scale manufacturing. Below are some examples of how maxon helps scale your company:



- → Design, development and optimization of complete mechatronic systems including mechanics, electronics and control functions
- → Manufacturing services from motor subassemblies to fully integrated electromechanical systems
- → Standard COTS actuator components and customized actuator solutions tailored to specific application requirements
- → Customized cable assemblies and wiring harnesses according to aerospace and industrial standards
- → Mechanical and electrical interface solutions designed for seamless integration into customer systems
- → Global manufacturing and assembly network enabling local support and scalable production
- → Production capabilities ranging from prototypes and qualification units to high-volume serial production
- → Industrialization expertise including design transfer, process validation and production ramp-up
- → Highly skilled engineering and manufacturing teams with decades of motion control experience
- → Comprehensive quality management including qualification, traceability and configuration control
- → Robust and globally diversified supply chain ensuring long-term availability and reliability
- → Custom winding solutions optimized for torque, efficiency, thermal performance and installation constraints
- → Electronics and system integration expertise including motor drives, sensors, feedback devices and embedded control systems

Plug-and-play

- Complete electromechanical assemblies delivered as a single validated unit
- Customized interfaces, cabling and components tailored to application requirements
- Reduced integration risk, shorter lead times and simplified supply chain management

Going beyond the drive unit, maxon delivers complete, **application-ready plug-and-play systems.** Our scope covers mechanical and electrical interfaces, drive pulleys, pinions, customer-specific components, and aerospace-grade cable harnesses and connectors. This system-level approach provides customers with a fully integrated, plug and play validated solution – delivered as a single unit in one box.

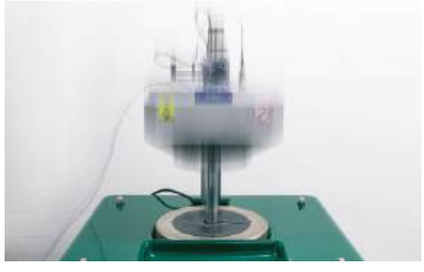
maxon testing facilities

The motors presented in this catalog have been successfully tested against the DO-160G criteria. The drives listed hereafter withstand the following test conditions unless otherwise* specified.

Temperature range and variation

DO-160G Section 4 §4.5.1/2
DO-160G §4.5.3/4
DO-160G Section 5 §5.3.1:

- Ground survival low, short time operating low and operating low temperatures: -55 °C
- Ground survival high and short time operating high temperatures: +85 °C, operating high temperature: +70 °C
- Temperature variation: 10 °C per minute



Shocks and crash safety test

DO-160G Section 7,
Category B and Category E, §7.2.1:

- Standard operational shocks (6 g during 11 ms) and low frequency operational shocks (6 g during 20 ms).

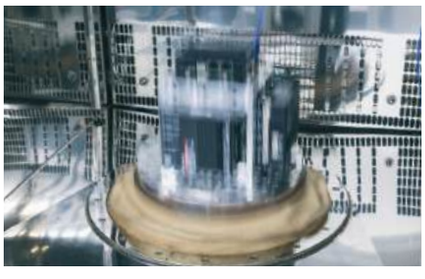
DO-160G Section 7,
Category B and Category E, §7.3.1/3:

- Standard crash safety (20 g during 11 ms) and low frequency crash safety (20 g during 20 ms).
- Crash safety sustained procedure n° 2 with random “R” orientation for Helicopter and all fixed wing (20 g during 3 s)

Start up performance at -55 °C

Startup current and voltage are important parameters for determining whether the available power supply in a customer application is suitable.
For this reason, the starting currents of motors were measured during starting at -55°C ambient temperature. These measurement results are available upon request.

*AERO motors have been qualified according to DO-160G with cable leads. The terminal version is currently under evaluation. Full qualification to the same specifications will follow after successful testing.



Random vibration testing

DO-160G Section 8, §8.7.2
Category R – Robust Vibration for fixed-wing aircraft with random test procedure:

- Fig. 8-1 E, Standard Random for 10 min and 7.94 Grms
- Fig. 8-4 E1, Robust Random for 3 hours and 11.33 Grms

Humidity

DO-160G Section 6 §6.3.2
Category B – Severe Humidity Environment:

- 10 cycles between 38 °C and 65 °C and a humidity of 85 % and 95 % rh (total time: 240 hours)

Quality as the foundation of our success

Quality shapes all business and production processes at maxon. Clear design standards, defined technical specifications, and strict process control ensure that products consistently meet the highest requirements. This understanding of quality goes beyond measurable product characteristics: it influences how our employees think and act and is firmly rooted in the so-called maxon Quality Mindset. Uniform standards for quality, safety, and processes apply worldwide. Business and production procedures comply with international standards such as ISO 9001 and ISO 14 001.

The maxon medical division is certified according to ISO 13 485, and drive systems for aerospace applications meet the requirements of EN 9100. These regulatory frameworks create transparency, comparability, and safety throughout the entire product life cycle – from development to series production. Compliance with these standards is reviewed regularly.

Particularly high standards apply to implantable systems used inside the human body. Their assembly takes place in GMP-certified cleanrooms covering around 1200 square meters. In these areas, particle concentration and microbiological contamination of air and surfaces are continuously monitored and checked for traces of spores, bacteria, or fungi. Employees working in these cleanrooms receive specialized training and are qualified to comply with the strict requirements.

At maxon, quality is understood holistically and extends beyond products and production processes. All employees must adhere to a Code of Conduct, which serves as a guideline for ethical behavior and professional standards.

There is also a Code of Conduct for suppliers. It defines expectations regarding ethical behavior, social responsibility, and environmental awareness. It is an integral part of the business terms and must be accepted by suppliers upon registration. Compliance is verified through audits and analyses to ensure that suppliers meet the standards of the maxon Group.

Certified to international standards

Consistent standards on quality, safety, and procedures ensure that only premium products leave our factories. The business and production processes fulfill international standards such as ISO 9001 and ISO 14001. Products for the aerospace industry can be produced under the EN 9100 certification.

Quality: SN EN ISO 9001

The quality management standard ISO 9001 defines quality as the degree to which given requirements are fulfilled. It establishes the requirements for a quality management system that an organization needs to comply with in order to provide products and services that meet customer expectations as well as regulatory requirements. Among these requirements is the need for the management system to undergo a continuous improvement process.

Aerospace: EN 9100

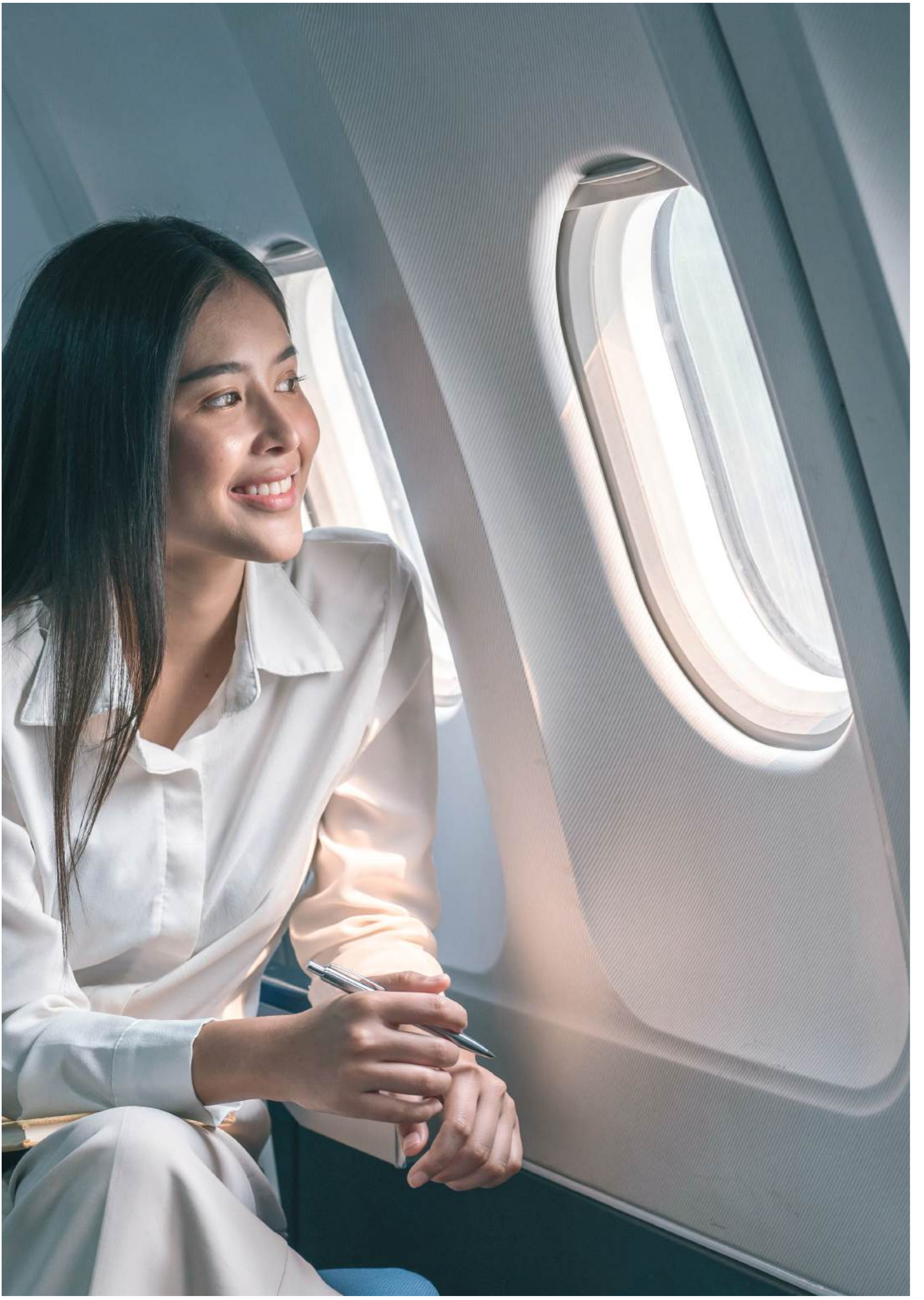
Since 2012, maxon has been certified according to EN 9100. This standard is specifically designed for companies that develop and produce components for the aerospace industry. It defines specific requirements for design, development, production, and maintenance to ensure the highest product quality, safety, and reliability.

Information security: ISO/IEC 27 001

ISO/IEC 27 001 is the globally recognized standard that defines the requirements for establishing, operating, and improving an information security management system (ISMS). The goal of an ISMS is to manage risks to the confidentiality, integrity, and availability of information assets in alignment with an organization's objectives. ISO 27 001 includes a set of best-practice controls designed to mitigate risks associated with sensitive information.

Environment: SN EN ISO 14 001

The internationally recognized standard SN EN ISO 14 001 defines the requirements for an effective environmental management system. It covers all environmentally relevant processes within a company. The standard obliges management and employees to act in an environmentally responsible manner, comply with legal requirements, and continuously optimize processes. Its goal is to reduce environmental impact, use resources efficiently, and sustainably minimize emissions.



Product information

The products listed in this catalog cannot be produced or delivered as AS/EN 9100–compliant items without additional evaluation, documentation, and coordination with the responsible project team. Compliance with AS/EN 9100 requires application-specific assessment and cannot be applied automatically. To support customers operating in the aerospace industry, maxon provides a targeted selection of reliable motion control solutions designed for challenging operating conditions, strict safety expectations, and sector-specific regulatory requirements. Aerospace applications often involve extreme temperatures, vibration and shock loads and long duty cycles – all of which require components with enhanced robustness and verified performance.

This catalog, developed by maxon's aerospace experts, presents products and services selected specifically for aerospace use. It complements the traditional maxon catalog by highlighting components that have proven suitability for aircraft systems, UAVs and other applications where reliability, documentation, and traceability are essential.

The products and services described here continue to benefit from maxon's economies of scale in high-volume industrial, automotive, and medical production. This ensures stable manufacturing processes, consistent quality, and competitive cost structures.

For aerospace needs, these products are further optimized through reinforced designs, tighter tolerances, extended testing, and carefully controlled material selections to achieve the higher robustness and reliability levels expected in the industry.

While many aerospace applications can be realized using proven standard maxon products, demanding mission profiles often require additional environmental qualification. To address these needs, maxon has established a growing portfolio of motors qualified to selected RTCA DO-160G requirements. This portfolio is continuously expanded, and additional products from the standard range can be qualified on request following a technical feasibility assessment. However, delivering a product under this standard requires a detailed review of the customer's specific application, a thorough risk evaluation, and the flow-down of all customer requirements into maxon's supply chain. This may include additional documentation, extended inspection steps, traceability requirements, or special qualification procedures.

If AS/EN 9100 delivery is required, a dedicated project team will conduct the necessary evaluation and manage the full flow-down and preparation process within a defined timeframe prior to serial production. Depending on the scope and complexity, non-recurring (NRC) engineering or qualification costs may be proposed.

Both standard maxon catalogue products and Aerospace Catalogue products are suitable for use in aerospace applications, depending on the application requirements. For applications where environmental qualification in accordance with DO-160G is required, the Aerospace Catalogue portfolio provides the appropriate qualified solutions. Standard catalogue products remain a suitable choice for many aerospace applications where such qualification is not required.

Discuss your project and manufacturing service needs with us:
aerospace@maxongroup.com

Motor range – Aerospace

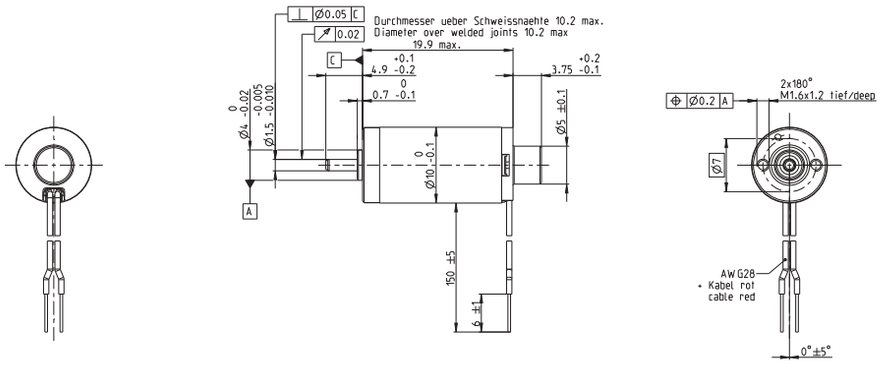
- **Engineered for critical reliability. Proven aerospace design principles and carefully selected components help ensure consistent motor performance where reliability, safety, and durability are essential.**
- **Ready for demanding thermal environments. Adapted materials, established aviation-grade multipurpose grease, and heat- and fire-resistant wires support dependable operation across a wider temperature range.**
- **Designed for robust integration and long service life. Optimized welded connections and application-focused component choices help deliver secure interfaces, durable performance, and reliable operation in demanding aerospace systems.**

Motor range

Dedicated to aerospace

DCX 10 S EB AERO ∅10 mm, DC motor

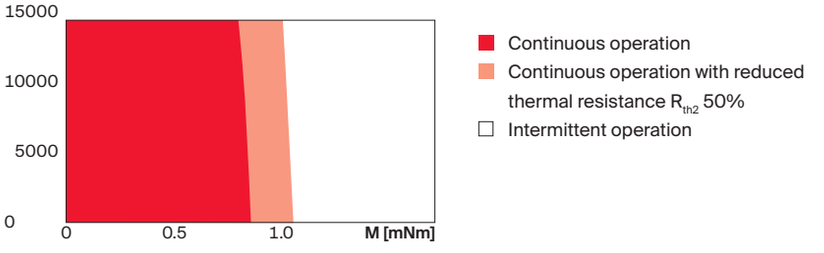
Key data: : 1/1.4 W, 0.9 mNm, 14 300 rpm



M 1:1

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	12
2	No load speed	rpm	12500
3	No load current	mA	11
4	Nominal speed	rpm	3890
5	Nominal torque (max. continuous torque)	mNm	0.904
6	Nominal current (max. continuous current)	A	0.114
7	Stall torque	mNm	1.37
8	Stall current	A	0.16
9	Max. efficiency	%	56.1
	Characteristics		
10	Terminal resistance phase to phase	Ω	74.9
11	Terminal inductance phase to phase	mH	0.868
12	Torque constant	mNm/A	8.53
13	Speed constant	rpm/V	1120
14	Speed/torque gradient	rpm/mNm	9830
15	Mechanical time constant	ms	7.43
16	Rotor inertia	gcm²	0.0722

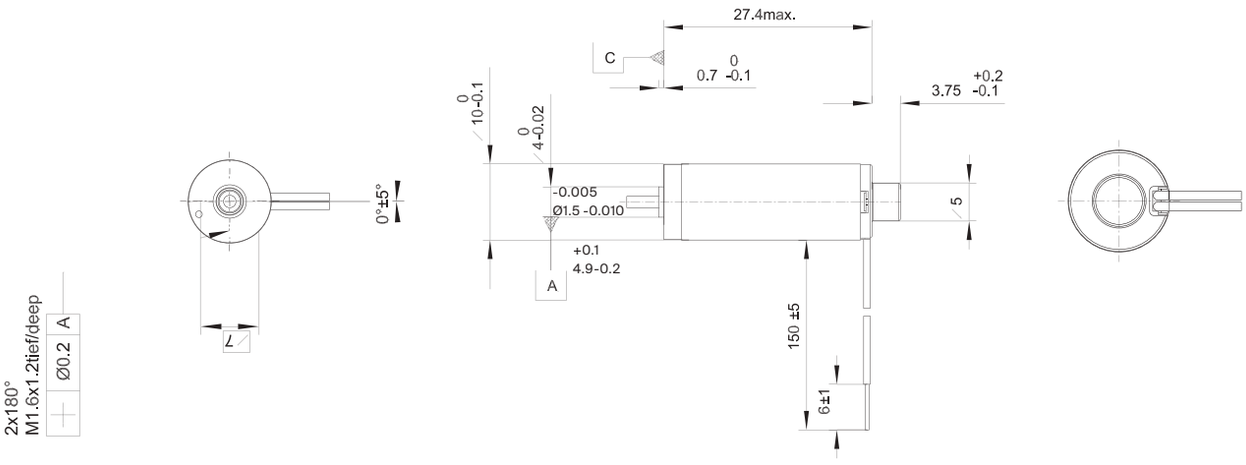
n [min⁻¹]



The shown data are applicable to one specific winding. More windings available.
Connection motor (Cable AWG28)

DCX 10 L EB AERO ∅10 mm, DC motor

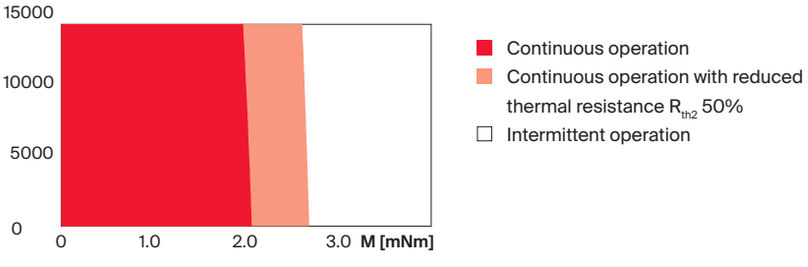
Key data: 1.5/3 W, 2.2 mNm, 14300 rpm



M 1:1

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	5
2	No load speed	rpm	12100
3	No load current	mA	21.3
4	Nominal speed	rpm	6960
5	Nominal torque (max. continuous torque)	mNm	2.1
6	Nominal current (max. continuous current)	A	0.559
7	Stall torque	mNm	5
8	Stall current	A	1.29
9	Max. efficiency	%	76.2
	Characteristics		
10	Terminal resistance phase to phase	Ω	3.88
11	Terminal inductance phase to phase	mH	0.0552
12	Torque constant	mNm/A	3.88
13	Speed constant	rpm/V	2460
14	Speed/torque gradient	rpm/mNm	2460
15	Mechanical time constant	ms	3.55
16	Rotor inertia	gcm²	0.138

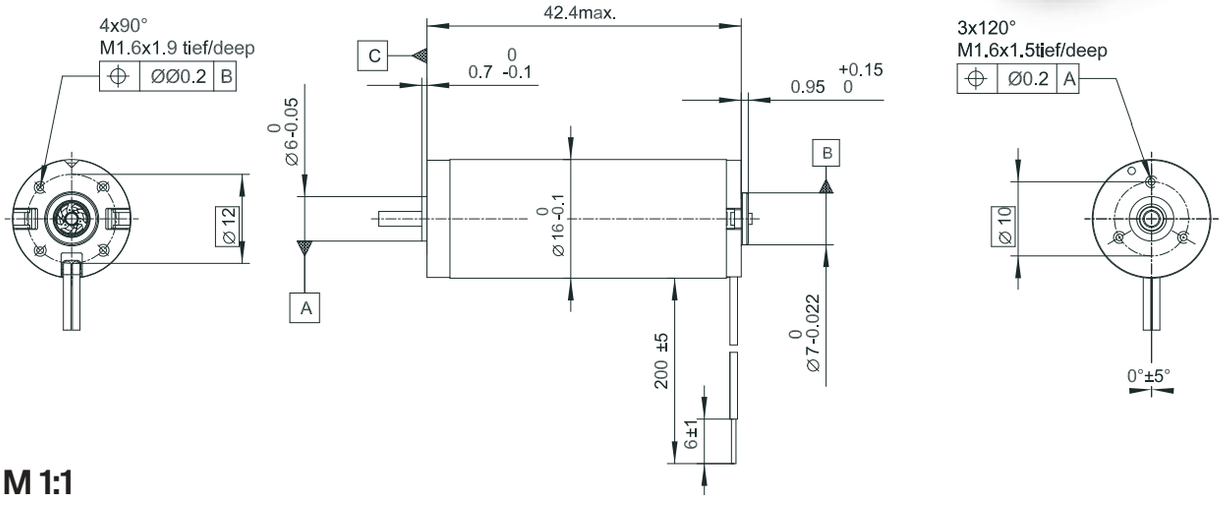
n [min⁻¹]



The shown data are applicable to one specific winding. More windings available.
Connection motor (Cable AWG28)

DCX 16 L GB AERO ∅16 mm, DC motor

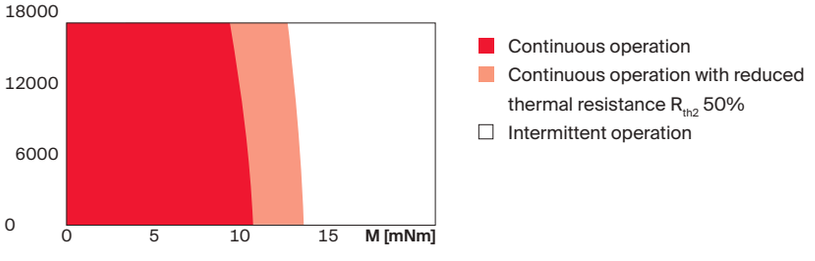
Key data: : 10/19 W, 11.8 mNm, 17 000 rpm



M 1:1

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	24
2	No load speed	rpm	12800
3	No load current	mA	18.4
4	Nominal speed	rpm	10600
5	Nominal torque (max. continuous torque)	mNm	11.3
6	Nominal current (max. continuous current)	A	0.651
7	Stall torque	mNm	68.5
8	Stall current	A	3.85
9	Max. efficiency	%	86
	Characteristics		
10	Terminal resistance phase to phase	Ω	6.23
11	Terminal inductance phase to phase	mH	0.411
12	Torque constant	mNm/A	17.8
13	Speed constant	rpm/V	537
14	Speed/torque gradient	rpm/mNm	188
15	Mechanical time constant	ms	4.48
16	Rotor inertia	gcm²	2.28

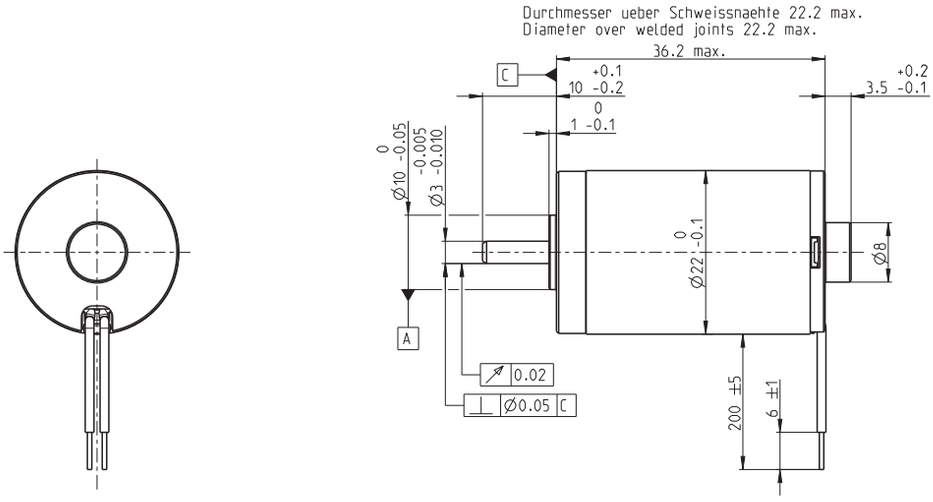
n [min⁻¹]

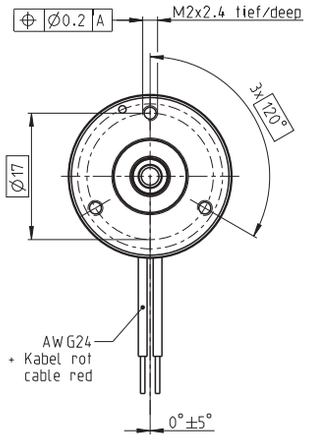


The shown data are applicable to one specific winding. More windings available.
Connection motor (Cable AWG28)

DCX 22 S GB AERO ∅22 mm, DC motor

Key data: 14/24 W, 15.3 mNm, 18 000 rpm

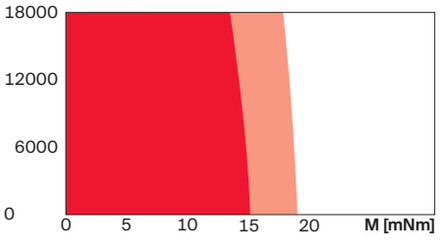




M 1:1

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	24
2	No load speed	rpm	12400
3	No load current	mA	26.1
4	Nominal speed	rpm	10800
5	Nominal torque (max. continuous torque)	mNm	15.8
6	Nominal current (max. continuous current)	A	0.884
7	Stall torque	mNm	120
8	Stall current	A	6.51
9	Max. efficiency	%	-
	Characteristics		
10	Terminal resistance phase to phase	Ω	3.69
11	Terminal inductance phase to phase	mH	0.231
12	Torque constant	mNm/A	18.4
13	Speed constant	rpm/V	520
14	Speed/torque gradient	rpm/mNm	104
15	Mechanical time constant	ms	6.17
16	Rotor inertia	gcm²	5.64

n [min⁻¹]

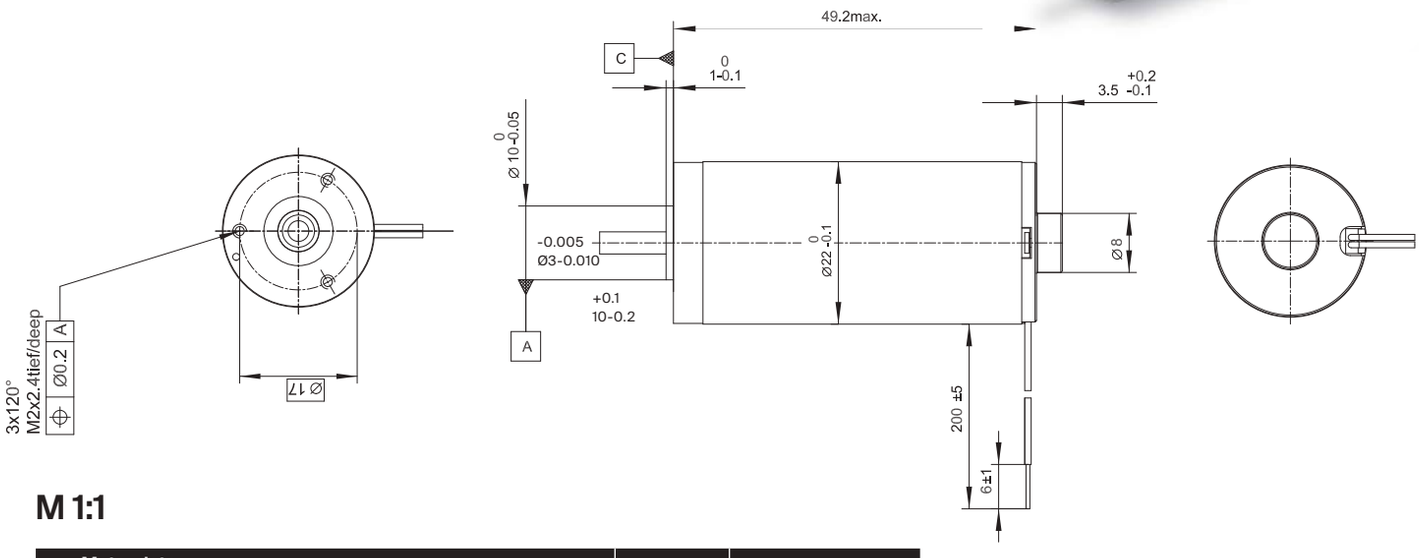


- Continuous operation
- Continuous operation with reduced thermal resistance R_{th2} 50%
- Intermittent operation

The shown data are applicable to one specific winding. More windings available.
Connection motor (Cable AWG28)

DCX 22 L GB AERO ∅22 mm, DC motor

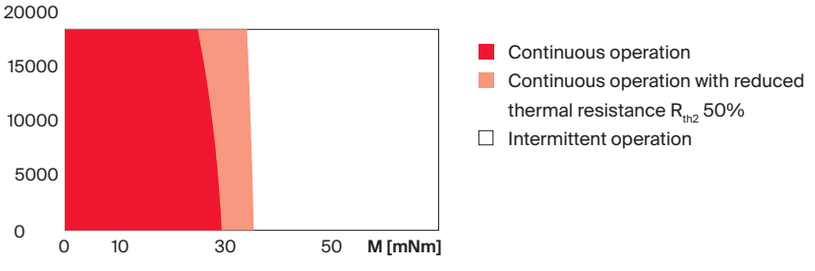
Key data: 20/49 W, 32.2 mNm, 18 000 rpm



M 1:1

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	28
2	No load speed	rpm	5870
3	No load current	mA	20.1
4	Nominal speed	rpm	4760
5	Nominal torque (max. continuous torque)	mNm	31
6	Nominal current (max. continuous current)	A	0.705
7	Stall torque	mNm	170
8	Stall current	A	3.76
9	Max. efficiency	%	85.3
	Characteristics		
10	Terminal resistance phase to phase	Ω	7.44
11	Terminal inductance phase to phase	mH	0.746
12	Torque constant	mNm/A	45.2
13	Speed constant	rpm/V	211
14	Speed/torque gradient	rpm/mNm	34.8
15	Mechanical time constant	ms	3.23
16	Rotor inertia	gcm²	8.82

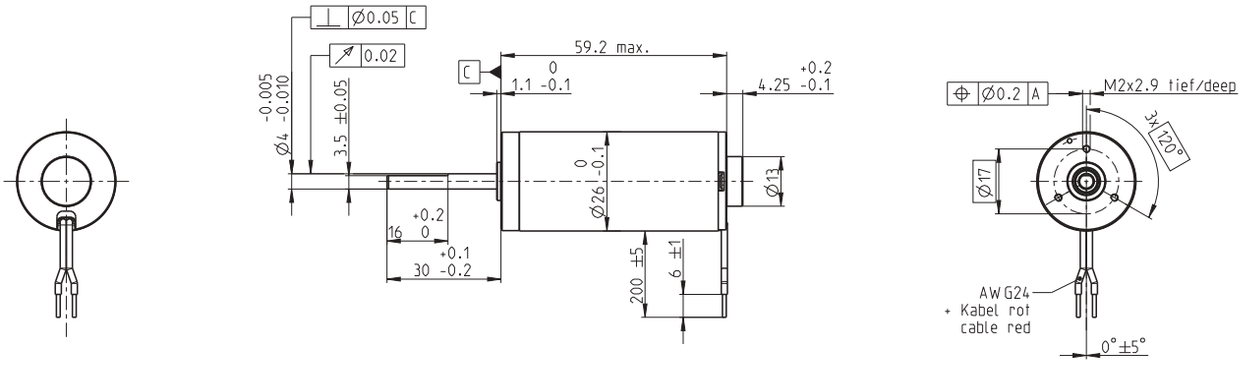
n [min⁻¹]



The shown data are applicable to one specific winding. More windings available.
Connection motor (Cable AWG24)

DCX 26 L GB AERO ∅26 mm, DC motor

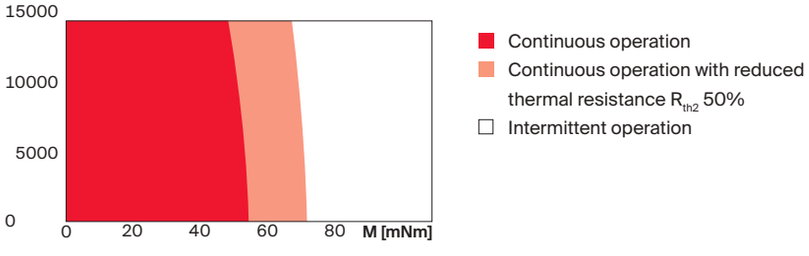
Key data: 40/74 W, 59.8 mNm, 14 400 rpm



M 1:2

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	24
2	No load speed	rpm	10700
3	No load current	mA	65.7
4	Nominal speed	rpm	9670
5	Nominal torque (max. continuous torque)	mNm	58.8
6	Nominal current (max. continuous current)	A	2.81
7	Stall torque	mNm	695
8	Stall current	A	32.4
9	Max. efficiency	%	90.7
	Characteristics		
10	Terminal resistance phase to phase	Ω	0.74
11	Terminal inductance phase to phase	mH	0.129
12	Torque constant	mNm/A	21.4
13	Speed constant	rpm/V	445
14	Speed/torque gradient	rpm/mNm	15.4
15	Mechanical time constant	ms	3.5
16	Rotor inertia	gcm²	21.8

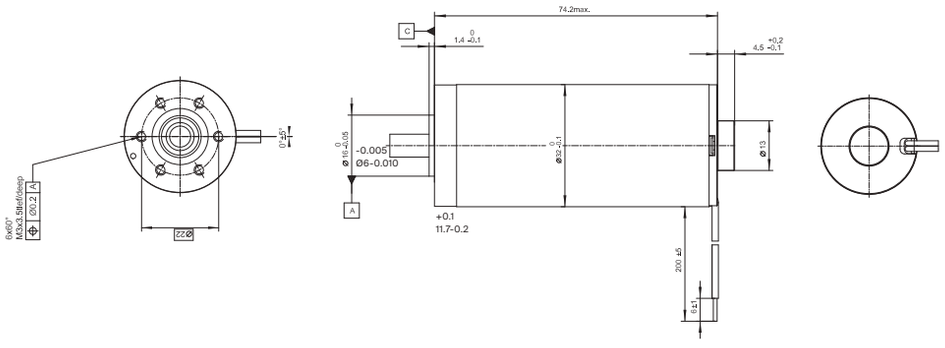
n [min⁻¹]



The shown data are applicable to one specific winding. More windings available.
Connection motor (Cable AWG28)

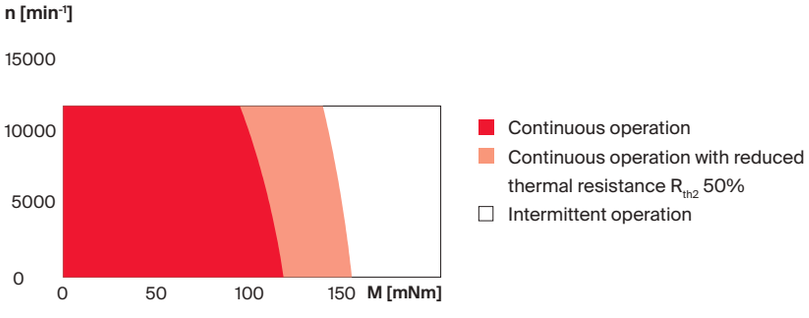
DCX 32 L GB AERO ∅32 mm, DC motor

Key data: 70/110 W, 128 mNm, 11300 rpm



M 1:2

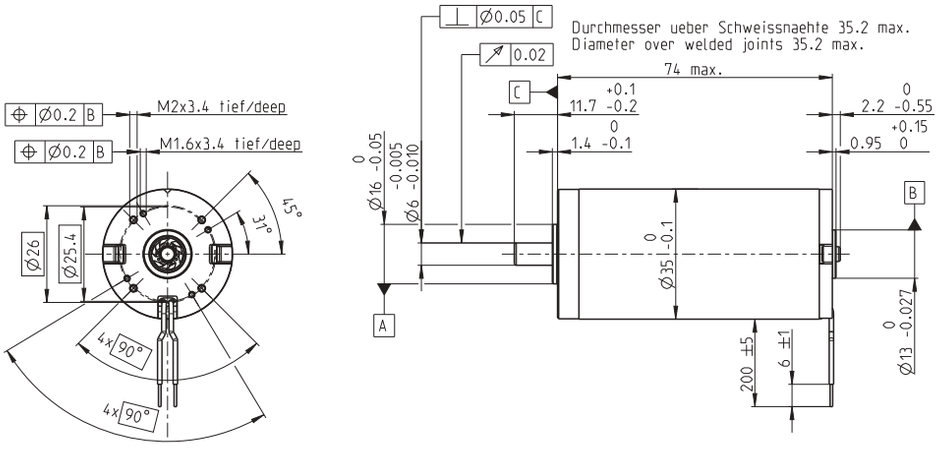
	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	28
2	No load speed	rpm	4520
3	No load current	mA	65.2
4	Nominal speed	rpm	3950
5	Nominal torque (max. continuous torque)	mNm	134
6	Nominal current (max. continuous current)	A	2.35
7	Stall torque	mNm	1150
8	Stall current	A	19.7
9	Max. efficiency	%	87.4
	Characteristics		
10	Terminal resistance phase to phase	Ω	1.42
11	Terminal inductance phase to phase	mH	0.473
12	Torque constant	mNm/A	58.5
13	Speed constant	rpm/V	163
14	Speed/torque gradient	rpm/mNm	3.96
15	Mechanical time constant	ms	3.15
16	Rotor inertia	gcm²	75.9

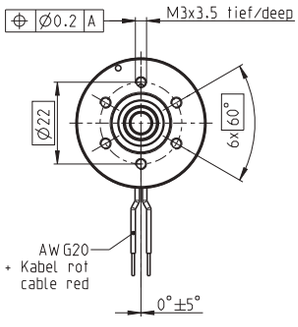


The shown data are applicable to one specific winding. More windings available.
Connection motor (Cable AWG20)

DCX 35 L GB AERO ∅35 mm, DC motor

Key data: 80/120 W, 138 mNm, 12 300 rpm

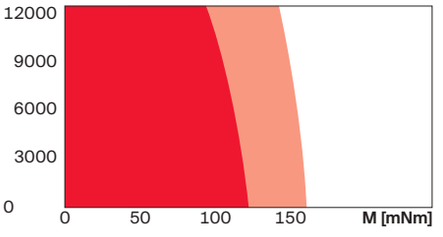




M 1:2

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	30
2	No load speed	rpm	7270
3	No load current	mA	106
4	Nominal speed	rpm	6690
5	Nominal torque (max. continuous torque)	mNm	126
6	Nominal current (max. continuous current)	A	3.33
7	Stall torque	mNm	1790
8	Stall current	A	46
9	Max. efficiency	%	89.2
	Characteristics		
10	Terminal resistance phase to phase	Ω	0.653
11	Terminal inductance phase to phase	mH	0.215
12	Torque constant	mNm/A	39
13	Speed constant	rpm/V	245
14	Speed/torque gradient	rpm/mNm	4.1
15	Mechanical time constant	ms	3.96
16	Rotor inertia	gcm²	92.2

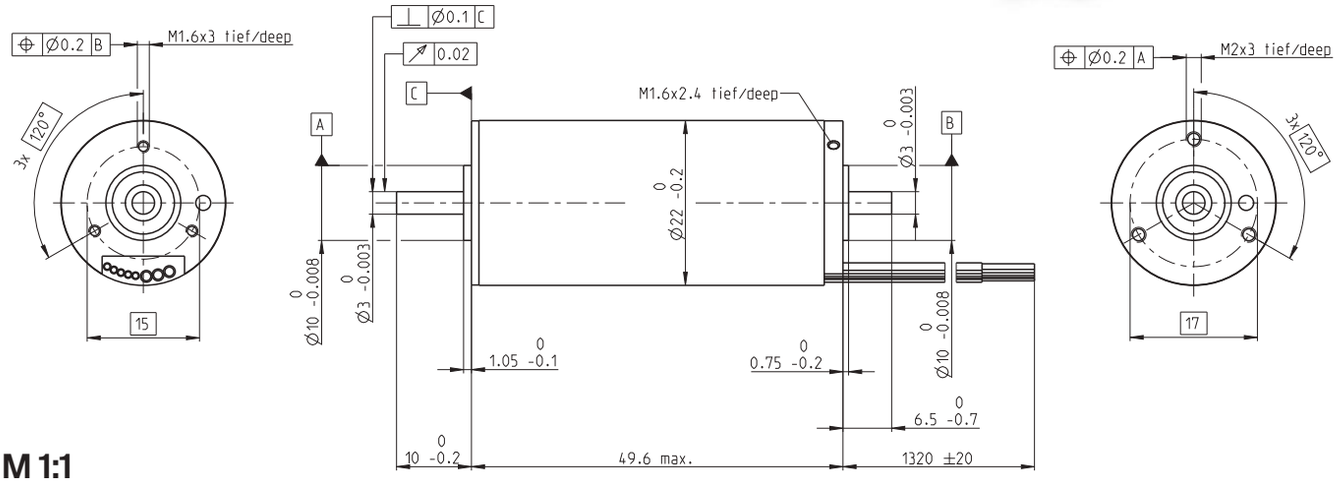
n [min⁻¹]



- Continuous operation
- Continuous operation with reduced thermal resistance R_{th2} 50%
- Intermittent operation

The shown data are applicable to one specific winding. More windings available.
Connection motor (Cable AWG20)

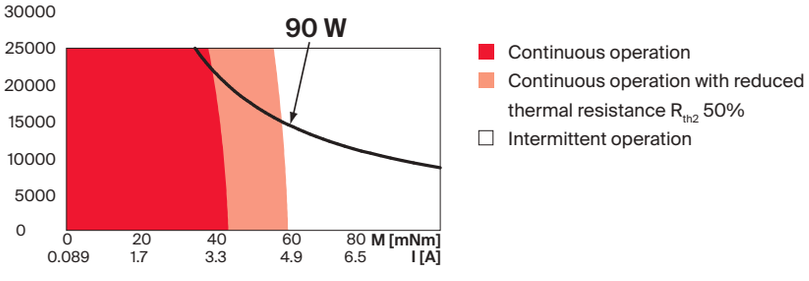
EC-4pole 22 AERO ∅22 mm, brushless, 90 watt



M 1:1

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	28
2	No load speed	rpm	13000
3	No load current	mA	117
4	Nominal speed	rpm	11600
5	Nominal torque (max. continuous torque)	mNm	40.3
6	Nominal current (max. continuous current)	A	2.06
7	Stall torque	mNm	392
8	Stall current	A	19.2
9	Max. efficiency	%	85.4
	Characteristics		
10	Terminal resistance phase to phase	Ω	1.46
11	Terminal inductance phase to phase	mH	0.121
12	Torque constant	mNm/A	20.4
13	Speed constant	rpm/V	469
14	Speed/torque gradient	rpm/mNm	33.5
15	Mechanical time constant	ms	2.68
16	Rotor inertia	gcm²	7.63

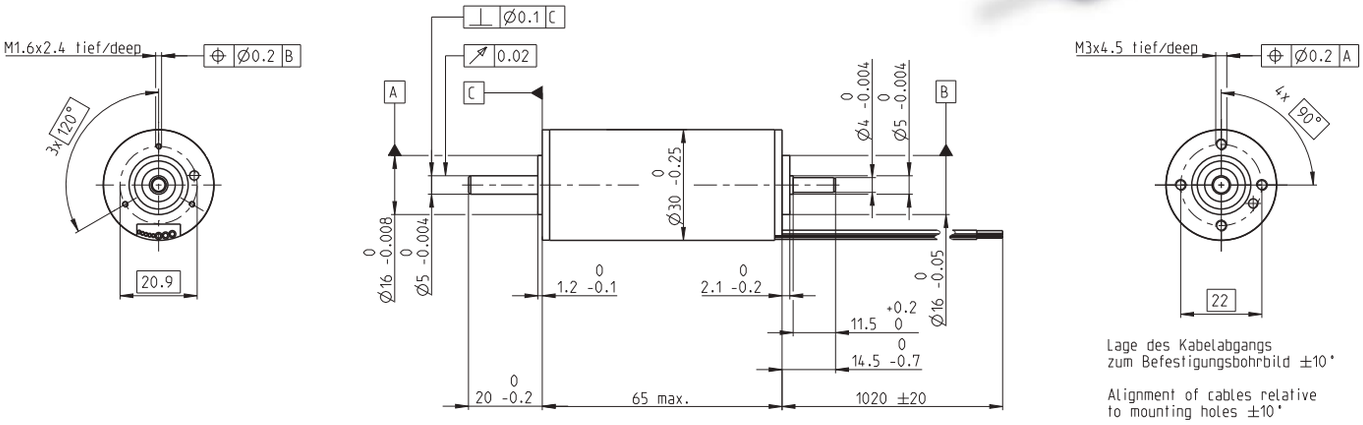
n [min⁻¹]



- Continuous operation
- Continuous operation with reduced thermal resistance R_{th2} 50%
- Intermittent operation

The shown data are applicable to one specific winding. More windings available.
Connection motor: Winding cable: AWG20. Signal cable: AWG26

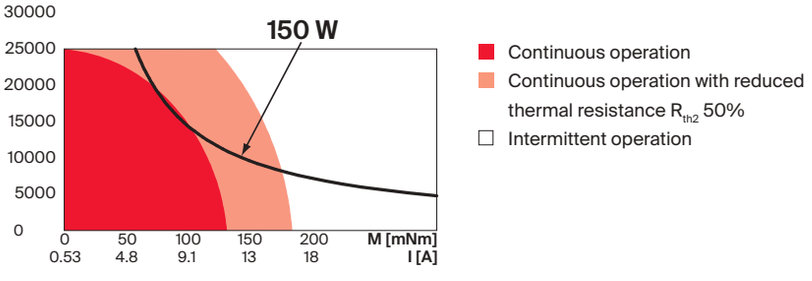
EC-4pole 30 AERO ∅30 mm, brushless, 150 watt



M 1:2

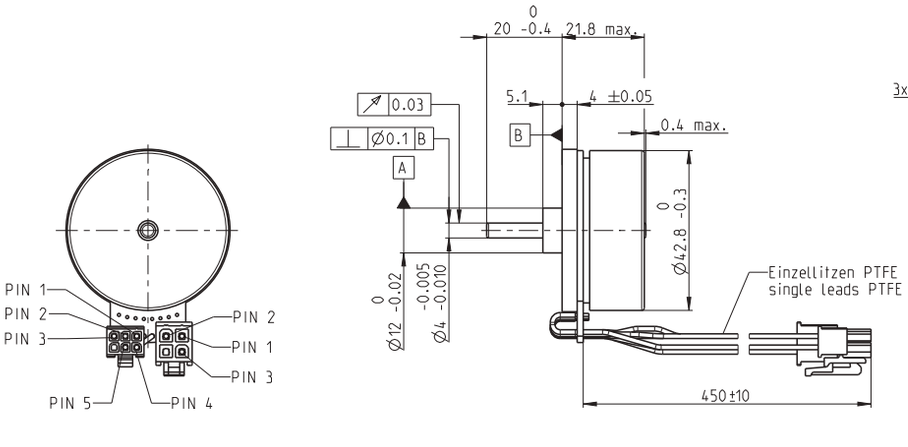
	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	28
2	No load speed	rpm	10000
3	No load current	mA	303
4	Nominal speed	rpm	9270
5	Nominal torque (max. continuous torque)	mNm	124
6	Nominal current (max. continuous current)	A	4.9
7	Stall torque	mNm	1930
8	Stall current	A	72.5
9	Max. efficiency	%	87.8
	Characteristics		
10	Terminal resistance phase to phase	Ω	0.386
11	Terminal inductance phase to phase	mH	0.0636
12	Torque constant	mNm/A	26.6
13	Speed constant	rpm/V	359
14	Speed/torque gradient	rpm/mNm	5.21
15	Mechanical time constant	ms	1.92
16	Rotor inertia	gcm²	35.2

n [min⁻¹]



The shown data are applicable to one specific winding. More windings available.
Connection motor: Winding cable: AWG18. Signal cable: AWG26

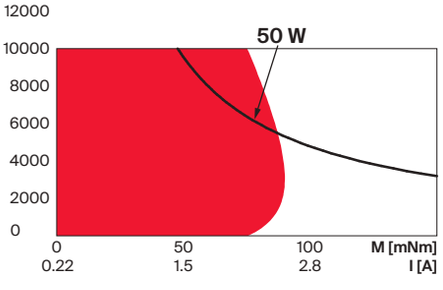
EC 45 flat AERO* ∅43.5 mm, brushless, 50 watt



M 1:2

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	28
2	No load speed	rpm	7290
3	No load current	mA	262
4	Nominal speed	rpm	6160
5	Nominal torque (max. continuous torque)	mNm	89
6	Nominal current (max. continuous current)	A	2.49
7	Stall torque	mNm	703
8	Stall current	A	29.7
9	Max. efficiency	%	82.3
	Characteristics		
10	Terminal resistance phase to phase	Ω	0.942
11	Terminal inductance phase to phase	mH	0.363
12	Torque constant	mNm/A	36
13	Speed constant	rpm/V	265
14	Speed/torque gradient	rpm/mNm	6.92
15	Mechanical time constant	ms	9.79
16	Rotor inertia	gcm²	135

n [min⁻¹]

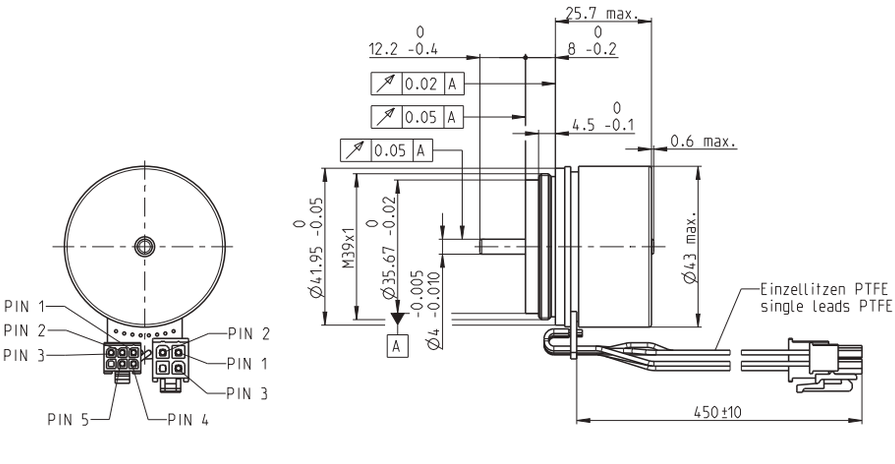


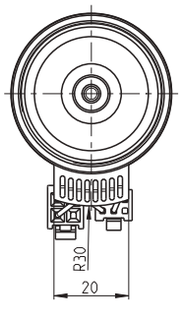
- Continuous operation
- Continuous operation with reduced thermal resistance R_{th2} 50%
- Intermittent operation

Connection motor:
Winding cable: AWG24.
Signal cable: AWG26
Note: Direction of cabling can be changed.

* Rotor housing not stainless steel. For motors directly exposed to corrosion conditions, housing material might be replaced by another stainless steel grade. Please reach out to maxon BU Aerospace if applicable.

EC 45 flat AERO* ∅43.5 mm, brushless, 70 watt

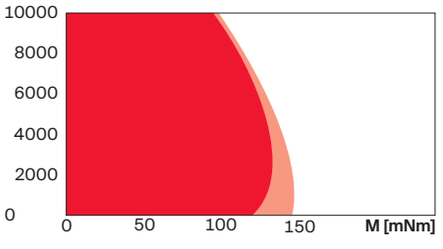




M 1:2

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	24
2	No load speed	rpm	5600
3	No load current	mA	270
4	Nominal speed	rpm	4750
5	Nominal torque (max. continuous torque)	mNm	134
6	Nominal current (max. continuous current)	A	3.29
7	Stall torque	mNm	1060
8	Stall current	A	41.9
9	Max. efficiency	%	84.7
	Characteristics		
10	Terminal resistance phase to phase	Ω	0.573
11	Terminal inductance phase to phase	mH	0.301
12	Torque constant	mNm/A	40.4
13	Speed constant	rpm/V	236
14	Speed/torque gradient	rpm/mNm	3.35
15	Mechanical time constant	ms	6.35
16	Rotor inertia	gcm²	181

n [min⁻¹]



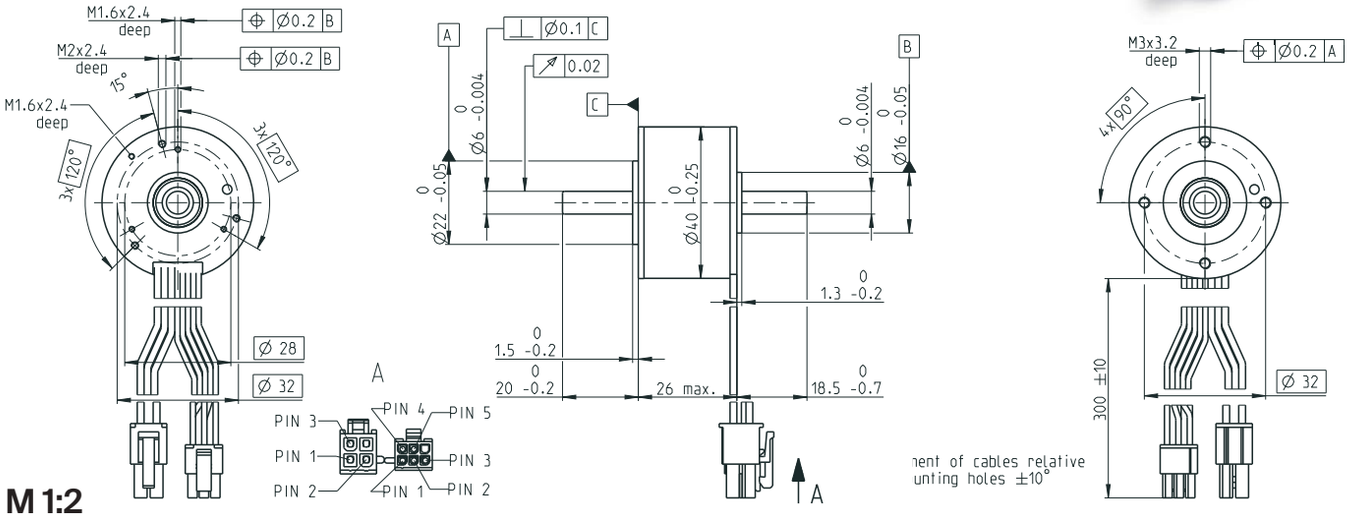
- Continuous operation
- Continuous operation with reduced thermal resistance R_{th2} 50%
- Intermittent operation
- Assigned power rating

Connection motor:
Winding cable: AWG24
Signal cable: AWG26
Nota: Direction of cabling can be changed.

* Rotor housing not stainless steel, ask BU Aero when exposed to humidity or salt fog. Additional information available on request.
The shown data are applicable to one specific winding.
More windings available.

EC-i 40 HT AERO ∅40 mm, brushless, 50 watt

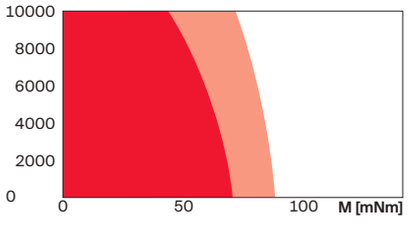
High Torque



M 1:2

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	18
2	No load speed	rpm	7790
3	No load current	mA	289
4	Nominal speed	rpm	6520
5	Nominal torque (max. continuous torque)	mNm	65.2
6	Nominal current (max. continuous current)	A	2.95
7	Stall torque	mNm	497
8	Stall current	A	40.1
9	Max. efficiency	%	83.7
	Characteristics		
10	Terminal resistance phase to phase	Ω	0.448
11	Terminal inductance phase to phase	mH	0.255
12	Torque constant	mNm/A	21.7
13	Speed constant	rpm/V	440
14	Speed/torque gradient	rpm/mNm	9.1
15	Mechanical time constant	ms	1.22
16	Rotor inertia	gcm²	12.8

n [min⁻¹]



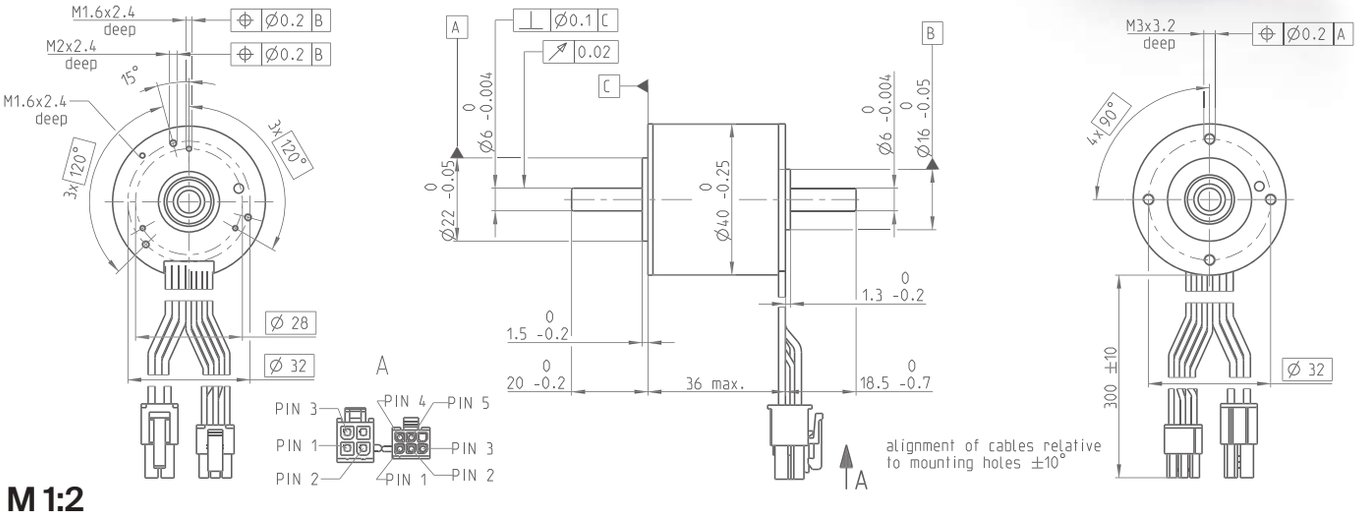
- Continuous operation
- Continuous operation with reduced thermal resistance R_{th2} 50%
- Intermittent operation
- Assigned power rating

Connection motor:
Winding cable: AWG20
Signal cable: AWG26

Additional information available on request.
The shown data are applicable to one specific winding.
More windings available.

EC-i 40 HT AERO ∅40 mm, brushless, 70 watt

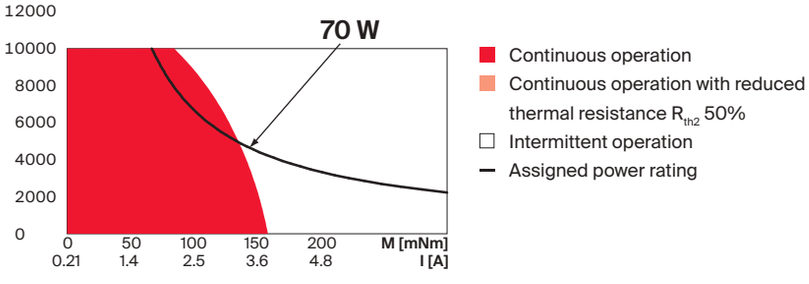
High Torque



M 1:2

	Motor data		
	Values at nominal voltage		
1	Nominal voltage	V	48
2	No load speed	rpm	4930
3	No load current	mA	86.4
4	Nominal speed	rpm	4100
5	Nominal torque (max. continuous torque)	mNm	151
6	Nominal current (max. continuous current)	A	1.55
7	Stall torque	mNm	931
8	Stall current	A	21.1
9	Max. efficiency	%	87
	Characteristics		
10	Terminal resistance phase to phase	Ω	2.28
11	Terminal inductance phase to phase	mH	2.05
12	Torque constant	mNm/A	92.1
13	Speed constant	rpm/V	104
14	Speed/torque gradient	rpm/mNm	2.56
15	Mechanical time constant	ms	0.617
16	Rotor inertia	gcm²	23

n [min⁻¹]



- Continuous operation
- Continuous operation with reduced thermal resistance R_{th2} 50%
- Intermittent operation
- Assigned power rating

Connection motor:
Winding cable: AWG20
Signal cable: AWG26

Additional information available on request.
The shown data are applicable to one specific winding.
More windings available.

Gearheads – Aerospace

- Based on aviation and space experience, maxon has developed a specific, highly efficient gearhead for this market: the GPX UP-Aero.
- Alternative gear solutions are available. Please consult maxon to identify the optimal choice for your specific application.
- Gear design optimized for robustness against shock and vibration
- Increased stiffness and efficiency
- Aviation specific lubrication

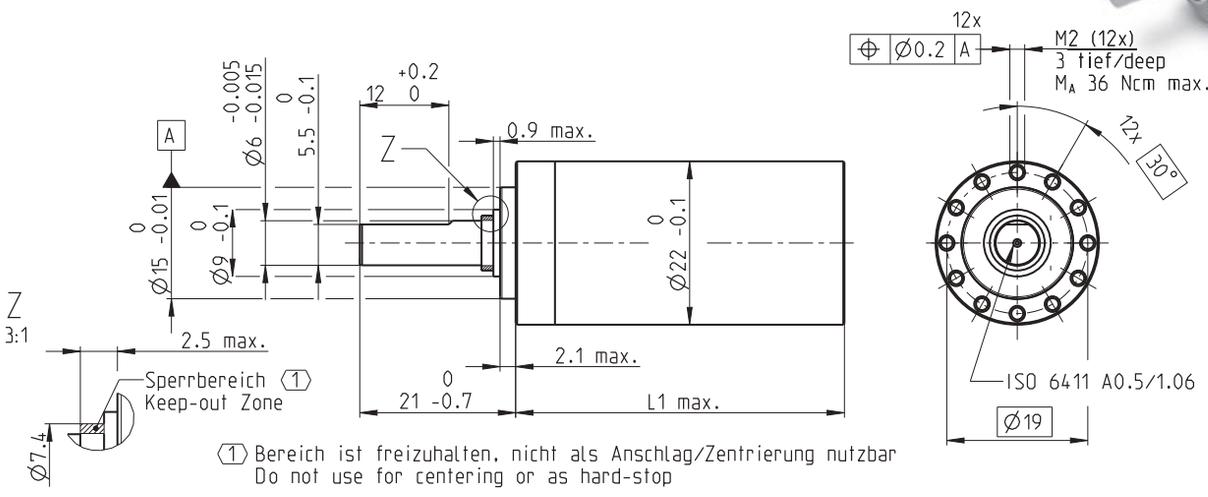
Gearheads

Dedicated to aerospace

GPX 22 UP AERO ∅22 mm, planetary gearhead

1.0 – 5.2 Nm

Ultra Performance – for avionic applications



M 1:1

Technical data		
Planetary Gearhead		straight teeth
Output shaft		stainless steel
Bearing at output		ball bearing
Radial play, 10 mm from flange	mm	max. 0.1
Axial play	mm	max. 0.15
Max. permissible axial load	N	75
Max. permissible force for press fits	N	120
Sense of rotation, drive to output		=
Recommended input speed	rpm	< 8000
max. short time allowed input speed	rpm	< 10000
Recommended temperature range	°C	-55...+70
Extended range as option	°C	-70...+200

Number of stages		1	2	3	4*)	5*)
Max. radial load, 10 mm from flange	N	90	140	150	150	150

	Specifications						
5	Number of stages		1	2	3	4	5
6	Max. continuous torque	Nm	1.0	2.9	4.3	5.2	5.2
7	Intermittently permissible torque at gear output	Nm	1.5	4.35	6.45	7.8	7.8
8	Max. overload torque	Nm	2.0	5.8	8.6	10.4	10.4
9	Max. efficiency	%	95	90	85	80	80
10	Weight	g	70	85	100	115	115
11	Average backlash no load	°	1	1.2	1.6	2	2
12	Stiffness	°/Nm					w
13	Gearhead length L1	mm	25	34.7	44.3	54	54
14	Max. transferable continuous performance	W	60	40	20	10	10
15	Max. transferable short-time performance	W	90	60	30	15	15

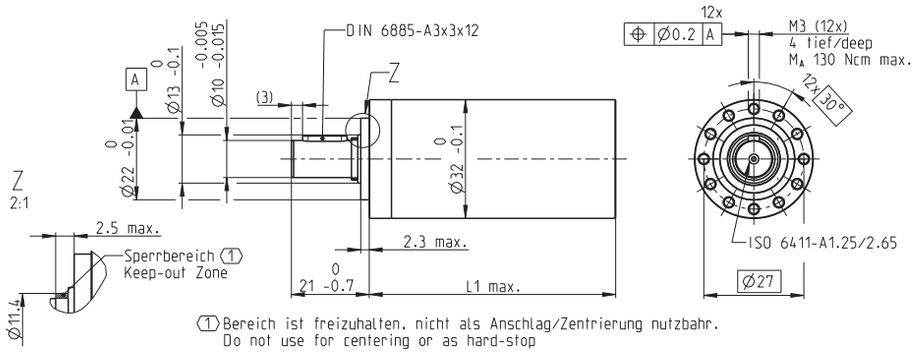
Ratios according to standard GPX-UP in the maxon catalogue.

*) 4-stage and 5-stage gearheads are not yet qualified to DO-160G.

GPX 32 UP AERO ∅32 mm, planetary gearhead

2.2 – 12.6 Nm

Ultra Performance – for avionic applications



M 1:2

Technical data		
Planetary Gearhead		straight teeth
Output shaft		stainless steel
Bearing at output		ball bearing
Radial play, 10 mm from flange	mm	max. 0.1
Axial play	mm	max. 0.15
Max. permissible axial load	N	150
Max. permissible force for press fits	N	250
Sense of rotation, drive to output		=
Recommended input speed	rpm	< 6000
max. short time allowed input speed	rpm	< 7500
Recommended temperature range	°C	-55...+70
Extended range as option	°C	-70...+200

Number of stages		1	2	3	4*)	5*)
Max. radial load, 10 mm from flange	N	150	200	250	250	250

	Specifications						
5	Number of stages		1	2	3	4	5
6	Max. continuous torque	Nm	2.2	4.8	10.4	12.6	12.6
7	Intermittently permissible torque at gear output	Nm	3.3	7.2	15.6	18.9	18.9
8	Max. overload torque	Nm	4.4	9.6	20.8	25.2	25.2
9	Max. efficiency	%	95	90	85	80	80
10	Weight	g	175	245	315	375	375
11	Average backlash no load	°	0.8	1.0	1.2	1.5	1.5
12	Stiffness	°/Nm					
13	Gearhead length L1	mm	37.4	51.9	66.5	81.1	81.1
14	Max. transferable continuous performance	W	215	135	55	25	25
15	Max. transferable short-time performance	W	320	200	80	40	40

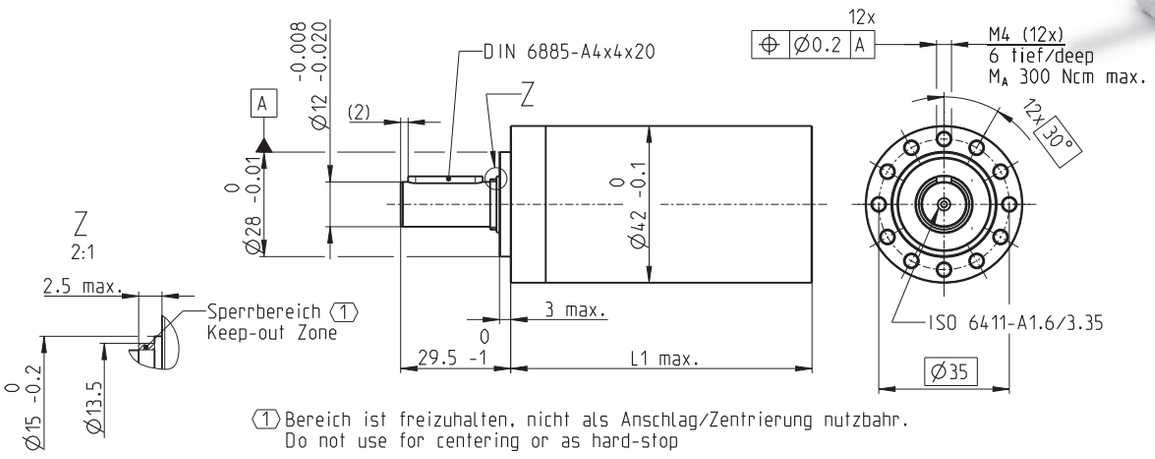
Ratios according to standard GPX-UP in the maxon catalogue.

*) 4-stage and 5-stage gearheads are not yet qualified to DO-160G.

GPX 42 UP AERO ∅42 mm, planetary gearhead

4.5 – 35.0 Nm

Ultra Performance – for avionic applications



M 1:2

Technical data		
Planetary Gearhead		straight teeth
Output shaft		stainless steel
Bearing at output		ball bearing
Radial play, 10 mm from flange	mm	max. 0.1
Axial play	mm	max. 0.15
Max. permissible axial load	N	290
Max. permissible force for press fits	N	470
Sense of rotation, drive to output		=
Recommended input speed	rpm	< 6000
max. short time allowed input speed	rpm	< 7500
Recommended temperature range	°C	-55...+75
Extended range as option	°C	-70...+200

Number of stages		1	2	3	4*)	5*)
Max. radial load, 10 mm from flange	N	90	140	150	150	150

	Specifications						
5	Number of stages		1	2	3	4	5
6	Max. continuous torque	Nm	4.5	18	32	35	35
7	Intermittently permissible torque at gear output	Nm	6.75	27	48	52.5	52.5
8	Max. overload torque	Nm	9	36	64	70	70
9	Max. efficiency	%	95	90	85	80	80
10	Weight	g	330	470	610	750	750
11	Average backlash no load	°	0.8	1.0	1.2	1.5	1.5
12	Stiffness	°/Nm					
13	Gearhead length L1	mm	43.5	62.2	80.8	99.5	99.5
14	Max. transferable continuous performance	W	380	240	100	45	45
15	Max. transferable short-time performance	W	570	360	150	65	65

Ratios according to standard GPX-UP in the maxon catalogue.

*) 4-stage and 5-stage gearheads are not yet qualified to DO-160G.

Encoders – Aerospace

- maxon ENX encoders are known for their robust construction and excellent signal quality.
- The ENX EASY XT is a 3-channel encoder with a line driver compliant with RS422.
- The ESD protection network, cable strain relief and general robust design of the ENX series make it an excellent choice for high-precision positioning and speed control.
- The XT version offers an extended temperature range and is designed with single-wire connections. Counts per turn, cable length, and cable orientation can be customized.

Encoders

Dedicated to aerospace

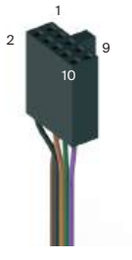
ENX 10 EASY XT* Encoder ∅10 mm, 1...1024 CPT

Key data		EASY incremental single-ended
Number of channels		3
Max. counts per turn		1024
Encoder length L[2]	mm	8.5
Ambient temperature	°C	-55...+125
Weight	g	<5

Selection criteria	EASY incremental single-ended
Speed and rotation direction detection	■
Speed and position control	■
Compact and robust design	■
High resolution	■
Cost effective	▲

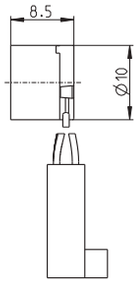
■ suitable ▲ suitable to a limited extent ● not suitable

Specifications		EASY incremental single-ended
Supply voltage V_{cc}	V	5 ±0.5
Typical current draw	mA	22
Max. operating frequency	kHz	1600
Max. Speed	rpm	30000
Connector		10-pin 2.54 mm multipoint connector (IEC/EN 60603-13 / DIN41651) Pin 1 not connected Pin 2 V_{CC} Pin 3 GND Pin 4 not connected Pin 5 not connected Pin 6 channel A Pin 7 not connected Pin 8 channel B Pin 9 not connected Pin 10 channel I Output signal: TTL compatible Output current per channel: +10 mA



Configuration		EASY incremental single-ended
Counts per turn[1]		1 ... 1024
Cable length	mm	300
Alignment of cable outlet in relation to motor flange	°	15

Modular system	Page	Dimensions standard configuration	M 1:1	Notes



[1] maxon controllers require a resolution of at least 16 counts per turn.
[2] For attachment to DCX motors: plus 2-4 mm thick intermediate plate.

* DO-160G testing has not yet been conducted.

ENX 16 EASY XT* Encoder ∅16 mm, 1...1024 CPT

Key data		EASY incremental differential
Number of channels		3
Max. counts per turn		1024
Encoder length L[2]	mm	8.5
Ambient temperature	°C	-55...+125
Weight	g	7

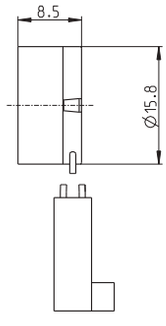
Selection criteria	EASY incremental differential
Speed and rotation direction detection	■
Speed and position control	■
Compact and robust design	■
High resolution	■
Cost effective	▲

■ suitable ▲ suitable to a limited extent ● not suitable

Specifications		EASY incremental differential
Supply voltage Vcc	V	5 ±0.5
Typical current draw	mA	22
Max. operating frequency	kHz	1600
Max. Speed	rpm	30000
Connector		10-pin 2.54 mm multipoint connector (IEC/EN 60603-13 / DIN41651) Pin 1 not connected Pin 2 V_{CC} Pin 3 GND Pin 4 not connected Pin 5 channel $\overline{A}$ Pin 6 channel A Pin 7 channel $\overline{B}$ Pin 8 channel B Pin 9 channel $\overline{I}$ Pin 10 channel I Output signal: EIA-Standard RS 422 Output current per channel: ±20 mA

Configuration		EASY incremental differential
Counts per turn[1]		1 ... 1024
Cable length	mm	500, 1000, 1500
Alignment of cable outlet in relation to motor flange	°	15

Modular system	Page	Dimensions standard version	M 1:1	Notes



[1] maxon controllers require a resolution of at least 16 counts per turn.
[2] For attachment to DCX motors: plus 2-4 mm thick intermediate plate.

* DO-160G testing has not yet been conducted.

ENX 16 EASY Absolute XT* Encoder ∅16 mm

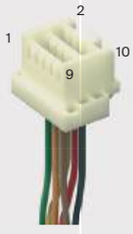
4096 steps, Single Turn

Key data		EASY absolute differential
Steps per turn		4096
Resolution (bit single turn)		12
Encoder length L[1]	mm	9.0
Ambient temperature	°C	-55...+125
Weight	g	7

Selection criteria	EASY absolute differential
Speed and rotation direction detection	■
Speed and position control	■
Compact and robust design	
High resolution	■
Cost effective	▲

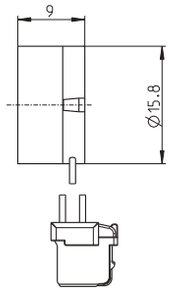
■ suitable ▲ suitable to a limited extent ● not suitable

Specifications		EASY absolute differential
Supply voltage V_{cc}	V	5 ±0.25
Typical current draw	mA	22
Max. Speed	rpm	30 000
Connector		10-pin 1.5 mm multipoint connector Molex Clik-Mate (503154) Pin 1 not connected Pin 2 not connected Pin 3 not connected Pin 4 not connected Pin 5 CLK Pin 6 CLK\ Pin 7 Data Pin 8 Data\ Pin 9 GND Pin 10 V_{CC} Output signal: EIA-Standard RS 422 Output current per channel: ±20 mA



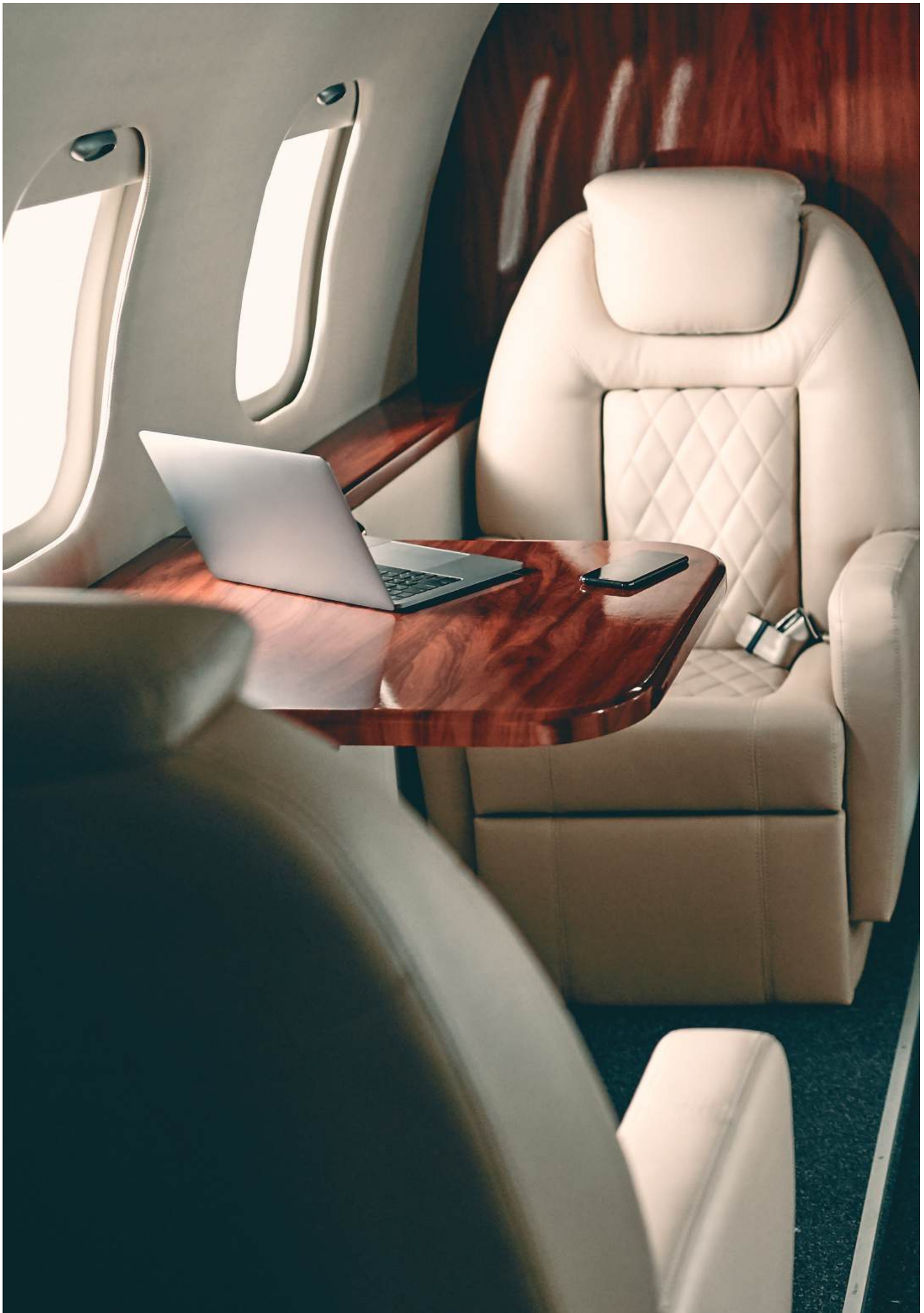
Configuration		EASY absolute differential
Signal protocol		BiSS-C, SSI
Cable length	mm	500, 1000
Alignment of cable outlet in relation to motor flange	°	15

Modular system	Page	Dimensions standard version	M 1:1	Notes



[1] For attachment to DCX motors: added 2-4 mm thick intermediate plate.

* DO-160G testing has not yet been conducted.



Terms and disclaimer

Applicable terms to the products and services offered herein:

The maxon General Terms and Conditions (GTC) apply exclusively. The maxon Aerospace Quality Assurance Agreement applies exclusively to flight models in serial production. Form-Fit-Function configuration control can only be established for a specific product and is not applied to standard products.

These documents are available upon request from your maxon sales representative.

Application Risk Disclaimer. The products listed herein have been developed in accordance with their catalog specifications. Although the components have been reinforced and environmentally tested against aviation standards, the products may not be suitable for all aerospace applications.

maxon applies three maturity levels within its configuration management system: Engineering Samples, Qualification Samples, and Serial Products (flight models). Please contact maxon for further details regarding maturity levels and guidance for your project phase requirements. The offered maturity level is indicated on the latest applicable maxon quotation.

maxon does not comply with customer specifications and environmental requirements unless a compliance statement or compliance matrix is explicitly listed in or attached to maxon's quotation. In the absence of such a compliance statement, the maxon catalog specifications apply exclusively.

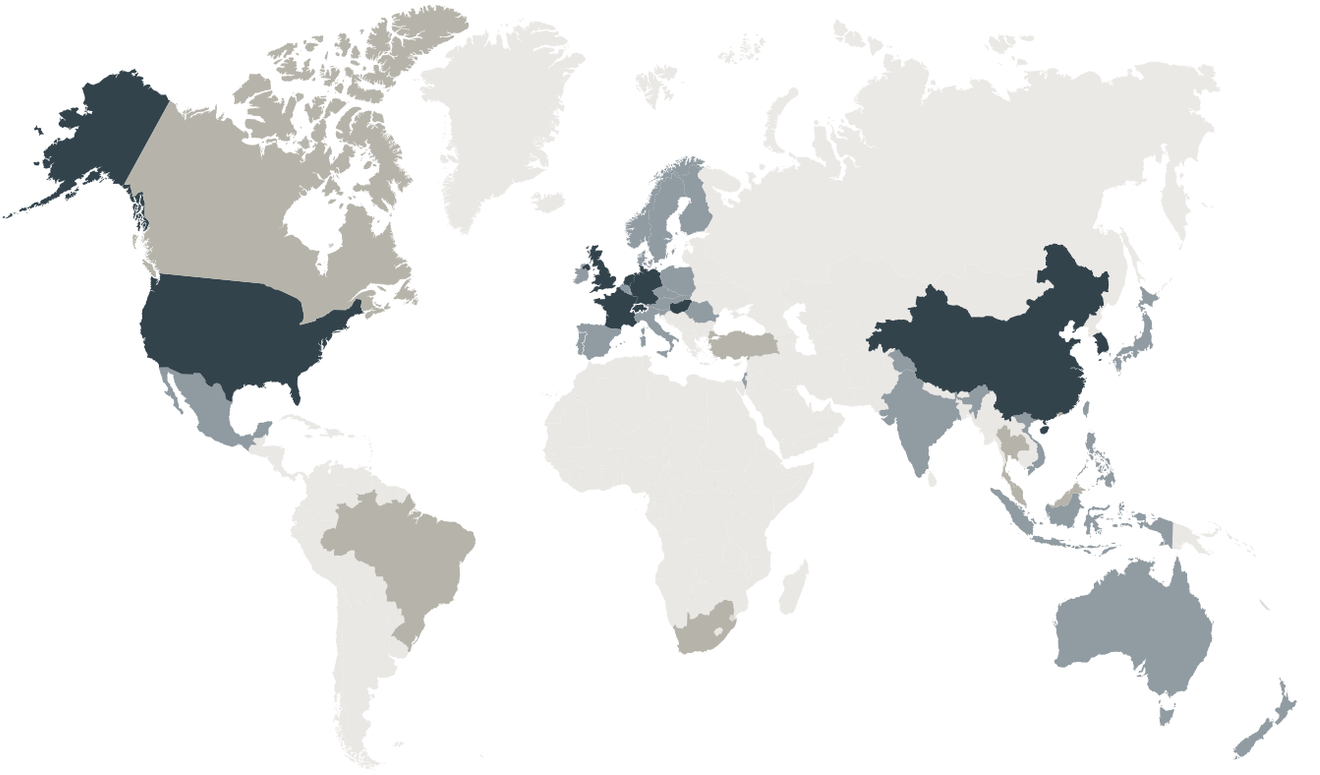
The customer is responsible for qualifying maxon products and for implementing an appropriate inspection process that ensures suitability for the intended application, including the use of catalog products and their variations. If the customer intends to enter qualification testing or requires a stabilized configuration, maxon requires preparation of the design, process configuration, and flow-down, and will quote Qualification Samples or Serial Production Units. This preparation may result in a change of part number.

If maxon has not formally agreed upon a change control process with the customer, maxon reserves the right to implement design or process changes without prior notification or customer approval between purchase orders.

Ready for take off

Drives from maxon ensure reliable safety and greater comfort in the air. Our Aerospace Business unit develops specific drive solutions comprising individual components or complex technical systems for civil aviation.

A global network



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