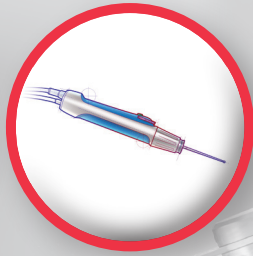
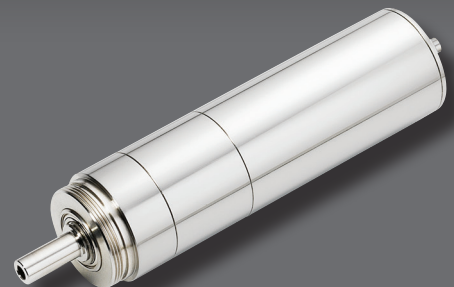


Portescap



Surgical Motor Solutions

*Custom Engineered for
Critical Performance.*



Motor Designs Validated by Decades of Success in the Field.

- Designed and manufactured in the USA, our Surgical Motor Solutions (SMS) are custom engineered for high reliability and critical surgeon needs.
- Portescap offers a complete range of sterilizable motor and control solutions designed to withstand up to 3,000+ autoclave cycles, including:
 - Sterilizable motors
 - Sterilizable gearheads
 - Sterilizable controllers
 - Sterilizable encoders
- We collaborate on design to provide custom products that perfectly fit your application.

PORTESCAP MOTOR DEVELOPMENTS

1931
Portescap founded in Switzerland with focus on watch components

SURGICAL DEVELOPMENTS

1940s
Widespread use of powered surgical tools

PORTESCAP MOTOR DEVELOPMENTS

1959
Portescap builds its first electric motor

SURGICAL DEVELOPMENTS

1960s
First BLDC motors invented with advent of transistors

PORTESCAP MOTOR DEVELOPMENTS

1970s
Decline of watch industry leads to electric motor focus

SURGICAL DEVELOPMENTS

1980s
Continued developments in powered medical devices

PORTESCAP MOTOR DEVELOPMENTS

1986
Released first BLDC medical motor and 100,000 RPM motor

PORTESCAP MOTOR DEVELOPMENTS

1990
First sales of fully sterilizable BLDC motors

SURGICAL DEVELOPMENTS

1990s
Early sterilizable motorized medical tools

PORTESCAP MOTOR DEVELOPMENTS

2000s
Medical BLDC becomes core part of Portescap's business

SURGICAL DEVELOPMENTS

2000s
Declining use of air-powered instruments as products shift to BLDC motors

PORTESCAP MOTOR DEVELOPMENTS

TODAY
Sterilizable motor, gearhead, encoder, controller portfolio

Collaborative Innovation. Dedicated Resources.

*Committed resources from day one to help you achieve an optimal design with **reduced time to market**.*

Our expert design engineers collaborate with your team to modify and customize features for your unique surgical hand tool or surgical robot applications.

Early engagement with Portescap's Surgical Motor Solution Design Engineers accelerates your design process and opens doors for unique motion concepts.

Our design engineers are available for on-site consultations as early as your ideation stage, when they can deliver the most value for a successful final design.

Application Expertise

Portescap provides standard and custom motors optimized for specific surgical applications. Contact an engineer today to identify the best motor for your project.



Orthopedic Surgical Reamers

High-peak torque motors with long life can help maximize battery life.



Powered ENT / Neuro and Spine Drills

Sterilizable motors provide high speed and precision control in a compact size.



Small, Medium and Large Orthopedic Drills

Sterilizable brushless DC custom designed motors (+1,000 sterilizable cycles) allows drills to be lightweight, powerful and cost effective.



Large Bone Orthopedic Saws

Sterilizable brushless motors provide the high torque to power through the most difficult procedures.



Arthroscopic Shavers

Deliver up to 30% more torque with sterilizable brushless motors (+1,000 sterilizable cycles).



Surgical Staplers

Our high-torque motors allow for smooth, one-handed operation.



Powered ENT Instruments

Sterilizable brushless motors provide the power needed in a lightweight ergonomic package.



Surgical Robots

Our extensive motor portfolio provides the precision and performance needed for all robotic motion applications.



Powered Plastic Surgery Devices

Power delicate skin graft devices or liposuction tools with high power mini brush or brushless DC motors.



Powered Surgical Screwdrivers

Portescap offers sterilizable slotted BLDC motors to withstand the repeated autoclave cycles of reusable surgical screwdrivers.

Custom Engineered for Critical Performance.

Portescap's industry expert Design Engineers will collaborate with your team to customize any and all features for your unique surgical hand tool or surgical robotic application. Our engineers are eager to work with your team to design the ideal solution that meets your needs.

ELECTROMAGNETIC

custom laminations, magnet geometries, materials, poles, winding configuration, skewed stack

MECHANICAL

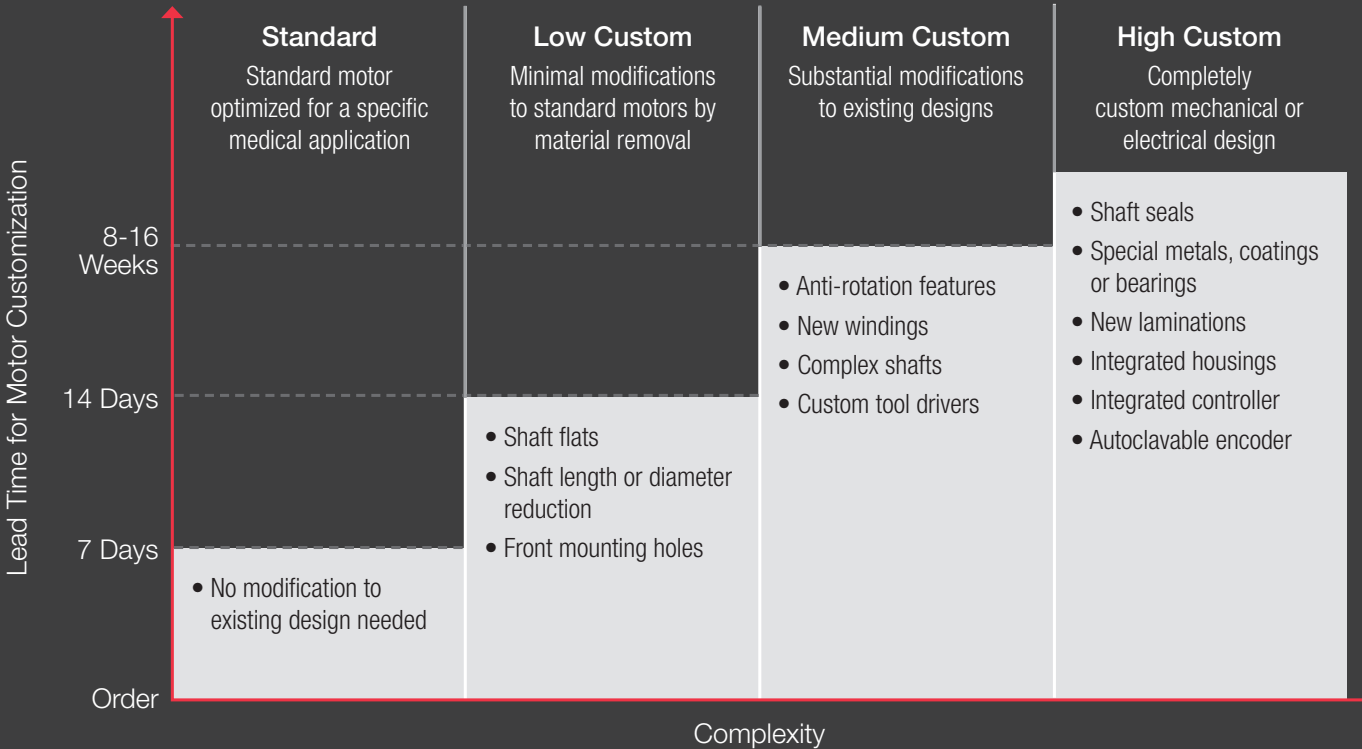
cannulated shafts and gearheads, custom housings, custom shaft features, shaft seals, shaft coatings

ELECTRICAL

sterilizable encoders for applications requiring exact speed or position control, pins instead of lead wires, flex circuits, sensed or sensorless drive

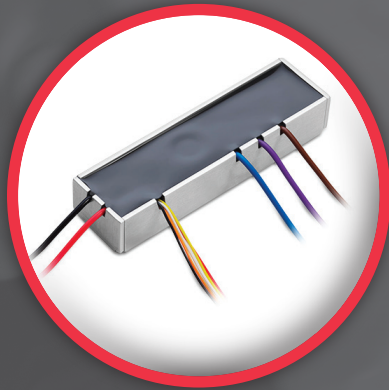


Lead Time for Motor Customization



Custom Design. Complete Solution.

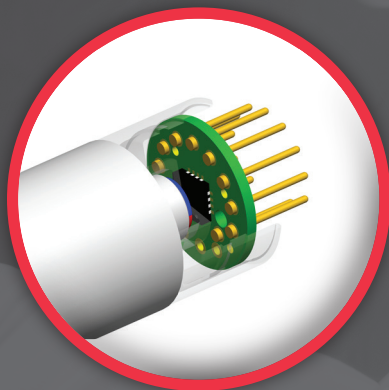
Pair a world-class custom motor with sterilizable accessories for a complete, robust solution.



Sterilizable Controllers

FEATURES:

- Magnetic control of speed and direction
- Compatible with typical NiMH and LiOn battery voltages
- 1,000+ sterilization cycles
- In-handle form factor for easy tool integration
- 75 A current limiting capability
- 20 A continuous current allows for use with all Portescap BLDC surgical motors



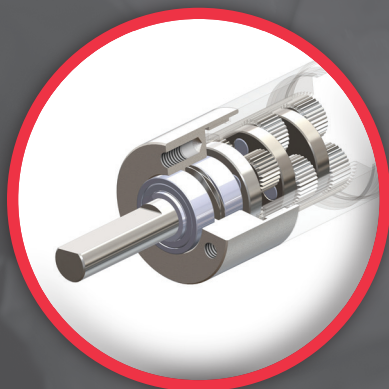
Sterilizable Encoders

FEATURES:

- Designed and tested to 2,000+ sterilization cycles
- Non-contact magnetic sensing provides reliability
- Multiple axis sensing allows for unique geometries
- Can sense off of rotor magnets, minimizing additional components
- Speeds up to 60,000 RPM
- 3.3V Supply

CUSTOMIZATION OPTIONS:

- Hall sensor signals for 6-Step commutation (U, V, W)
- 10-Bit incremental encoder (A, B, Z) {1024 line resolution}
- 11-Bit effective resolution absolute angle encoder {2048 line resolution}
- Absolute position output via SPI serial interface
- Differential output for noisy environments
- Off-axis mounting for cannulation



Sterilizable Gearheads

FEATURES:

- Planetary gearheads are available for all standard Portescap surgical motors
- Built for performance and reliability
- A range of single- and multi-stage gearheads to meet specific speed/torque requirements
- Efficient speed reduction and torque multiplication
- Designed and tested to 3,000+ sterilization cycles
- Built to withstand the high speed and torque of our industry leading surgical motors

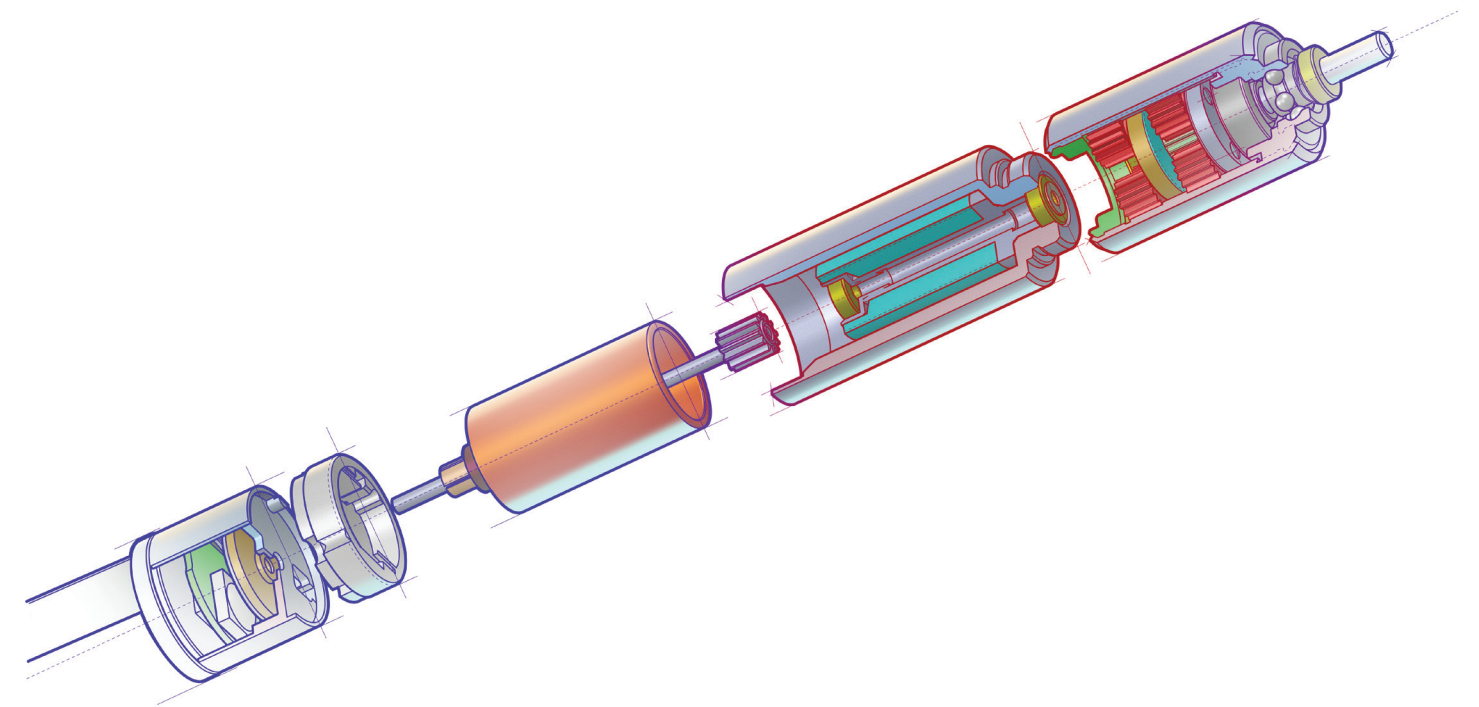
CUSTOMIZATION OPTIONS:

- Stage combinations to meet specific speed and torque requirements
- Cannulation (hollow shaft)
- Custom output geometry: cross pins, tool drivers, lead screws, concentric or eccentric output
- Custom component materials (e.g., PEEK, carbide)
- Dynamic shaft seals
- Alternative lubrication/grease

Industry Leading Performance and Reliability.

Portescap is the market leader in providing powerful sterilizable motors for surgical tool designers.

- **Ideal torque and speed:** Our fully customizable sterilizable motors can be designed to reach torques of up to 6.5 Nm and speeds up to 100k RPM
- **Proprietary encapsulation:** Unparalleled protection of internal components to maximize safety, reliability, and environmental protection
- **Excellent heat dissipation:** Slotted motor windings have improved heat dissipation compared to most sterilizable slotless designs, and can reach higher torque density
- **Precision you need:** Customization to meet your demanding needs, such as sterilizable encoders for applications requiring exact speed or position control



*Performance to Meet Surgeons'
Needs. Reliability to Last in the Field.*

More Than Just Motors.

Originated in Switzerland and driven by a passion for precision, customer-centric innovation, technical excellence and best-quality service since 1931, Portescap has become a recognized leading expert in miniature motors and precision motion control solutions for the surgical market.

Custom engineered for critical performance.



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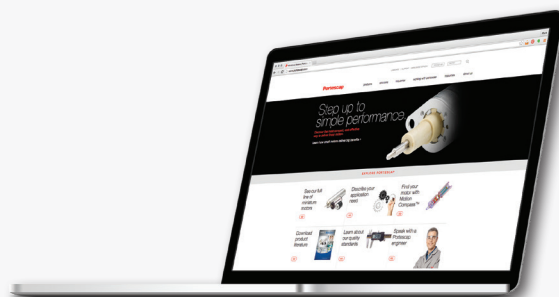
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To speak with a Design Engineer, please **call us today**.



Portescap

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