



Portescap



MOTION SOLUTIONS THAT MOVE LIFE FORWARD.™



Danaher Overview

- **Encompasses five strategic platforms:**
 - *Life Sciences & Diagnostics*
 - Beckman Coulter, Leica Microsystems, Radiometer, AB Sciex, Molecular Devices
 - *Dental*
 - Kavo, Kerr, Ormco, Dexis, Pelton & Crane
 - *Test and Measurement*
 - Fluke, Tektronix, Matco, Hennessy
 - *Industrial Technologies*
 - Portescap, Kollmorgen, Thomson, Videojet, Linx, ESKO
 - *Environmental*
 - Hach, Lange, Trojan UV, ChemTreat, Gilbaro Veeder-Root
- **Best practices from the world's top brands**
- **Global footprint**
- **Supply chain efficiency**
- **50K+ employees**
- **Danaher Business System**
- **2010 Revenue: \$12.8B**



Danaher Business System



What We Do

Portescap is a global provider of custom engineered miniature motion solutions

- Solutions deliver increased precision and efficiency with lower power consumption
- Quick prototyping and customization capability
- Market-focused sales coverage and application engineering expertise
- Outstanding quality and reliability
- Over 70 years of experience providing miniature motion solutions for critical applications



Brushed DC Motors

Brushless DC Motors

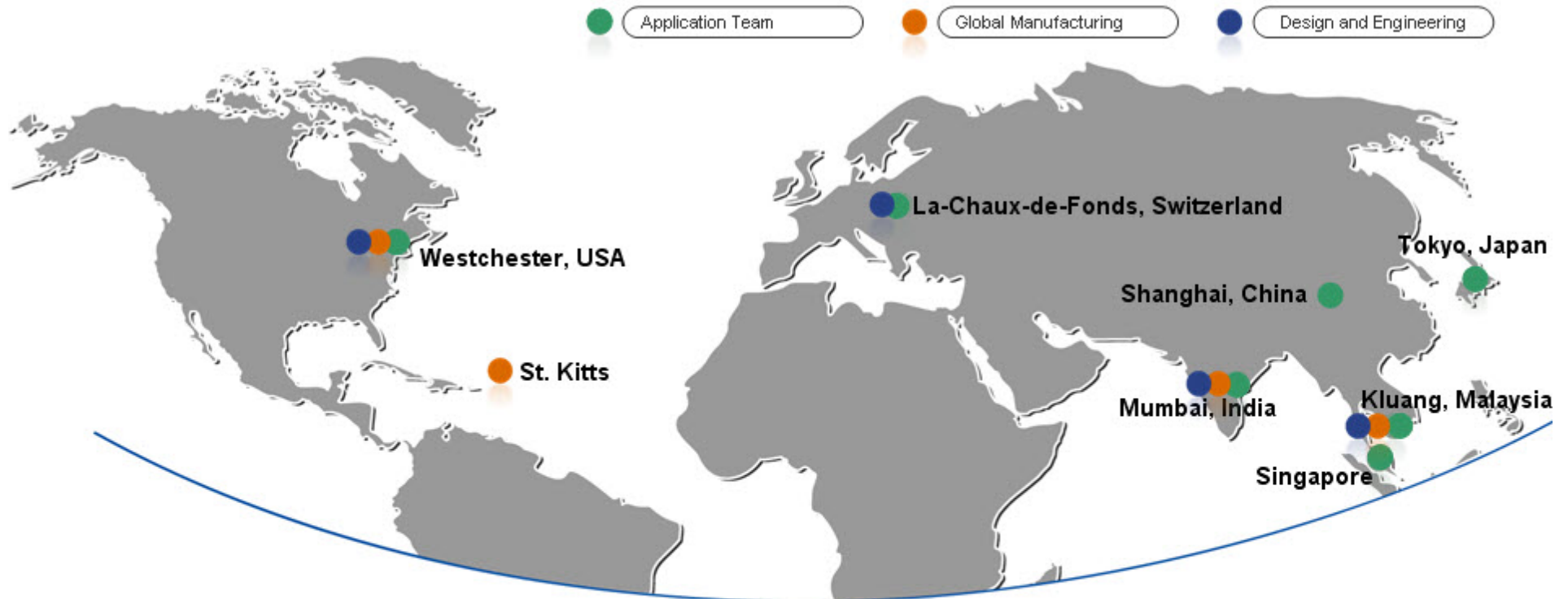
Stepper Motors

Encoders & Gearheads Drives & Electronics



Global Footprint

Portescap



Manufacturing Locations:

Westchester, USA and St. Kitts

- Brushless DC Slotted Motors
- Gear Motors
- AC Iron Core Motors
- 2,043 m² facility
- Additional 465 m² facility in St. Kitts

Mumbai, India

- Ironless Brush DC Motors
- Brushless DC Slotted Motors
- Brushless DC Slotless Motors
- 7,710 m² facility

Kluang, Malaysia

- Can Stack and Hybrid Stepper Motors
- Linear Actuators
- Disc Magnet Stepper Motors
- 4,830 m² facility

Product and Technology Breadth

Portescap has a broad product offering within three core motor technologies – Brush, Brushless & Stepper – as well as drive electronics and mechanical components



Note: 1,000 pc price comparison

Price



Solutions for Surgical Hand Tools

From Applications



Powered Surgical Instruments



Drills, Saws, Shavers

Surgical Screwdrivers



Surgical Irrigation Systems



Peristaltic Pumps

To Solutions



Brushless DC



Brush DC / BLDC Slotless



Stepper / Brush DC



Benefits

- Withstands over 1,000 autoclave cycles
- Power density in a compact design
- Speeds up to 100,000 rpm
- Low temperature & vibration design provide user comfort
- Cannulated shaft for simplified design
- 25+ years of sterilizable motor expertise

Benefits

- Power density in a compact design
- Efficiency allows for reduced battery size
- Ease of control with integrated electronics
- High speeds allow for faster procedures
- Smoothness of motion for better surgeon tactile sense

Benefits

- High performance for greater flow
- High accuracy for better flow control
- Long life for increased reliability
- Torque density in a compact design

We Deliver



Portescap is the leading supplier of sterilizable Brushless DC motors for powered surgical instruments.

Solutions for Medical Pumps

From Applications



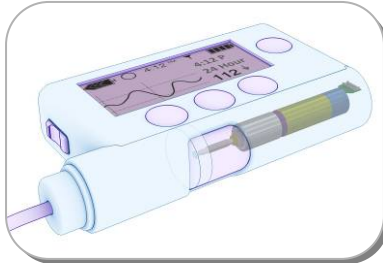
Infusion Pumps



Syringe Pumps



Insulin Pumps



To Solutions



Brush DC



Stepper



BLDC / Brush DC



Benefits

- High efficiency for battery life
- Compact design for ambulatory devices
- Quiet operation for patient comfort
- High accuracy miniature encoder for safety of delivery

Benefits

- High torque for larger volume of dispensing
- High accuracy for better controlled delivery of therapy

Benefits

- High efficiency for battery life
- Custom design
- Compact design for ambulatory devices
- Quiet operation for patient comfort
- High accuracy miniature encoder for safety of delivery

We Deliver



Portescap's motors provide higher power density and increased efficiency in the industry's leading enteral feeding infusion and wearable insulin delivery pumps.

Solutions for Respirators / Ventilators

From Applications

Respirators



Ventilators, CPAP, BiPAP

Portable Oxygen Concentrators



To Solutions



We Deliver

Benefits
<ul style="list-style-type: none">▪ Low inertia for high acceleration▪ Low vibration noise level▪ Slotless design offer smoothness of motion▪ High efficiency for battery powered devices▪ Blower integration for cost effective solutions

Benefits
<ul style="list-style-type: none">▪ Efficiency for increased battery life▪ Quietness for patient comfort▪ Light weight for portability

Portescap delivers the most light weight and energy efficient options with low inertia which allow for near instantaneous airflow pressure changes and enhances patient comfort.

Solutions for Life Sciences

Portescap

From Applications

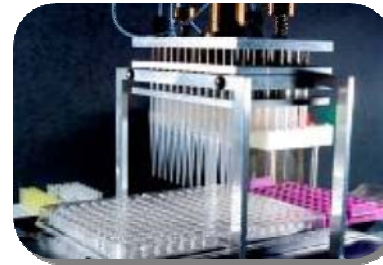


Analytics



Blood Analyzers

Sampling



Robotic Sampling

Lab Automation



Fluid Analysis Machines

To Solutions



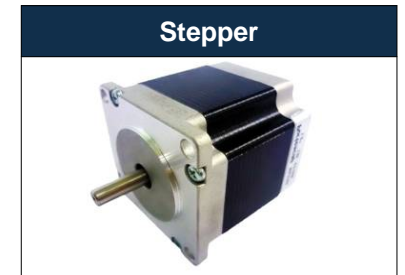
Brush DC



BLDC (Brushless DC)



Stepper



Benefits

- Higher efficiency for ambulatory applications
- Increased power density in smaller envelope
- Simple speed control through voltage

Benefits

- Linear torque to speed relationship
- Longer life and higher efficiency
- Excellent velocity smoothness at low speeds

Benefits

- Mechanical resolution for precise automation
- Slower temperature rise for higher duty cycle
- Quiet operation
- Open and closed loop control

We Deliver



Portescap offers a complete spectrum of high performance and reliable motion solutions to help you maximize throughput, deliver faster test results and minimize machine downtime.

Solutions for Fluid Handling

From Applications



Medical / Pharmaceutical



Oxygen Concentrators

Diagnostics / Life Sciences



Blood Gas Analysis

Environmental/Safety



Groundwater Sampling

To Solutions




Benefits
<ul style="list-style-type: none"> ▪ High efficiency makes motor ideal for ambulatory applications ▪ High power density in a small envelope ▪ Simplified speed control through voltage ▪ Typical life allows for 2K to 3K hours

Benefits
<ul style="list-style-type: none"> ▪ Accurate speed ▪ Option to integrate electronics in motor ▪ Zero Detent: Velocity smoothness at low speed ▪ Increased flow rate due to higher speeds ▪ Typical life allows for 10K to 20K hours

Benefits
<ul style="list-style-type: none"> ▪ Increased torque density translates to more power ▪ Improved heat dissipation allows increased power input / higher duty cycle ▪ No feedback required because of open loop control ▪ Typical life allows for 10K to 20K hours

We Deliver



Portescap delivers solutions that provide Efficiency and Precision.

Solutions for Power Tools

From Applications



Industrial Automation



Nut Runners

Agricultural Automation



Pruning Shears

To Solutions




Benefits
<ul style="list-style-type: none"> ▪ High torque output with smaller footprint ▪ Increased throughput at higher speeds ▪ Envelope specially designed to fit assembly tool format ▪ Runs cooler

Benefits
<ul style="list-style-type: none"> ▪ Reduced weight of hand tool with Coreless motor design ▪ High power density allows larger vine shearing ▪ Optimized coil provides flexibility in battery design

Benefits
<ul style="list-style-type: none"> ▪ Higher efficiency and longer battery life ▪ Withstand higher peak torque with Rotafente graphite commutation and planetary gearbox ▪ Robust design to withstand shock

We Deliver



Portescap offers technologically advanced solutions that offer maximum reliability and peace of mind when answering the needs of safety and security.

Unmanned Vehicle Systems

Actuation Systems

From Applications



Drones



Fin Actuation

To Solutions



Brush DC



BLDC (Brushless DC)

We Deliver

Benefits
<ul style="list-style-type: none">▪ Reduced size, weight, and heat output▪ Improved performance in smaller physical envelopes▪ Coreless design and precious metal commutation for longer life▪ Wide range of offerings to meet spectrum of power and acceleration

Benefits
<ul style="list-style-type: none">▪ Withstand harsh environments with slotted lamination design▪ Structural design modifications (to withstand high gravitational forces/loads)▪ High grade magnetics and custom windings to meet application needs

Portescap delivers high powered, reliable and long-life solutions that can with-stand harsh conditions for precision guided weapons and unmanned systems.

Industrial Textile Production Machines

Carpet Manufacturing Equipment

From Applications



Thread Guides, Yarn Tensioners



Carpet Tufting Machines

To Solutions



We Deliver

Benefits
<ul style="list-style-type: none"> ▪ Very low inertia and high acceleration with quick forward and reverse motion ▪ Open and closed loop solutions ▪ Cost effective – no encoder required ▪ Linear current to torque relationship for short time periods ▪ Higher speed capability

Benefits
<ul style="list-style-type: none"> ▪ Low inertia, faster acceleration and higher speeds ▪ Longer life and reliability ▪ Design optimized for lower cost of ownership

Portescap delivers optimized motion solutions with lower inertia and meets applications' acceleration profile needs.

Other Applications

Portescap

Medical

- Cardiovascular- Peripheral arterial disease treatment devices
- Biopsy, Liposuction, Cannula Systems
- Imaging & Radiology Machines

Life Sciences and Fluid Handling

- Sample Preparation
- Miniature Pumps, Centrifuges, Pipettes
- Gas & Liquid Chromatography
- Mass Spectrometry

Power Tools

- Assembly Tools & Nut Runners
- Framing Systems

Aerospace & Defense

- Valve Actuation
- Window Shades & Seat Actuation
- Surveillance Camera System

Instrumentation

- Dosing & Dispensing Systems
- Land Surveying Station & Laser Systems
- Gas Detection & Personal Safety
- Microscopes
- Precision Scales

General Automation

- Machine Tools
- Electronic Assembly
- Printing & Packaging Machines
- Positioning & Material Handling
- Textile Machines

HVAC&R

- Damper Actuators
- Refrigeration Valves

Security and Access

- Barcode Readers
- Electronic Access Systems

Vending, Ticketing & Gaming

- ATM & Cash Machines
- Ticketing & Gaming Machines

Communication

- Telecommunications
- Audio/Video Equipment
- Cameras

Office Automation

- Data Storage
- Printing & Copier Machines



Conclusion

- Strength and stability
- Customer focused
- Global footprint
- Broadest portfolio of miniature motion solutions
- Customized solutions to optimize every opportunity
- Application expertise

