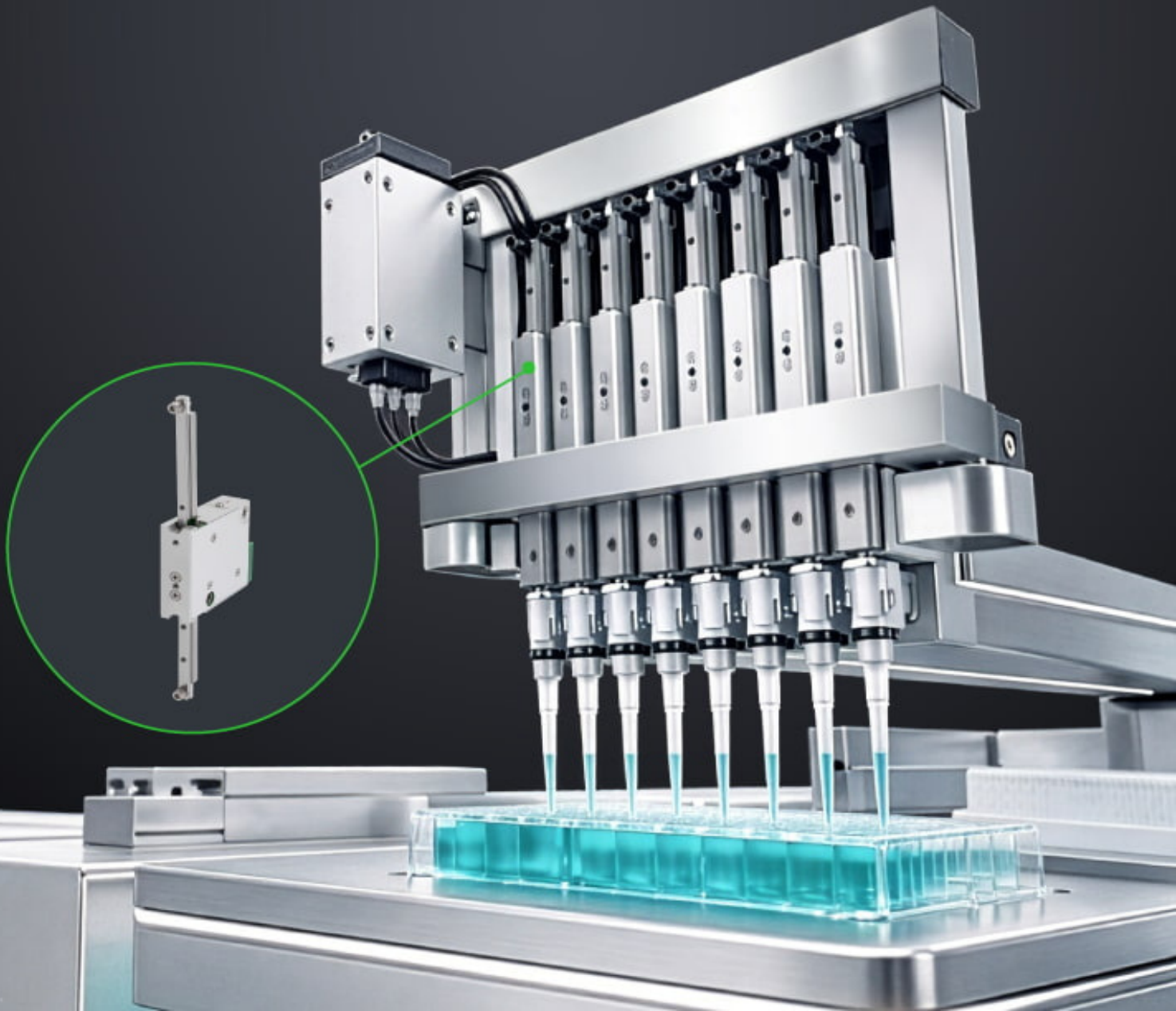


Compact Precision Motion for MedTech OEMs



Medical Devices Are Shrinking. Precision Requirements Aren't!

How can you win the relentless miniaturization "space budget" war?

Engineers are constantly tasked with shrinking next-gen MedTech devices. Every new application design brief asks for smaller, lighter, quieter, lower-power, while demanding sub-micron precision. Traditional motion Solutions weren't built for that brief.

75%

of MedTech R&D engineers cite "reducing device footprint" as their primary mechanical bottle neck.

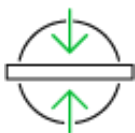
40%

of all medical device design cycle delays are due to efforts to squeeze standard motors, encoders, and gearboxes into tight spaces.

30%

of internal device volume is sacrificed for thermal insulation, heat-sinking, or active cooling channels.

Xeryon Motion Solutions Help You



Save on Space Budget

Xeryon eliminates the gearbox entirely, cutting spatial requirements by up to 50%



Remove Thermal Limits

Piezo actuators generate zero heat when stationary, effortlessly passing IEC 60601-1.



Eliminate Backlash

Solid-state piezo motion has zero backlash, eliminating the calibration drifts that cost labs thousands per hour.





Illustrative applications: Xeryon products are not medical devices; the integrator is responsible for the compliance, safety mechanisms, and certification of the end product.

01 / In-Vitro Diagnostics - IVD

The Challenge:

High-throughput labs need to process thousands of samples with zero margin for error in pipette positioning or plate scanning.

Xeryon Solution - Mini Linear Actuator

High-speed micro-positioning stages that provide instant "stop-and-start" stability and eliminate settling times.

Benefit:

Directly increases the test-per-hour (TPH) throughput and clinical accuracy without expanding the machine's footprint.

02 / Lab Automation

The Challenge:

High-throughput microplate workflows require dense, side-by-side pipetting arrays, but traditional motors are too wide for standard 9mm inter-well spacing and generate continuous heat that can evaporate or degrade delicate micro-volumes of liquid.

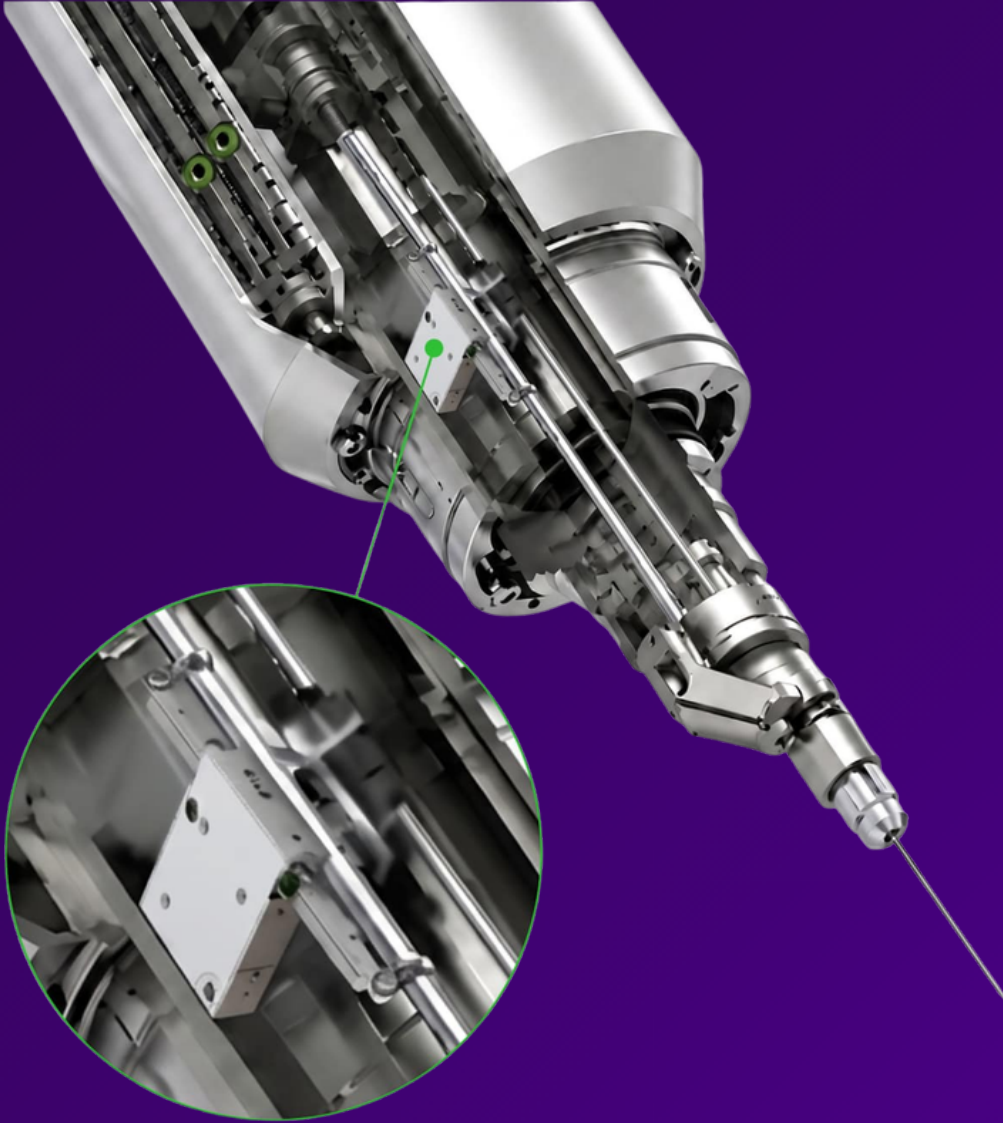
Xeryon Solution - Mini/Micro Linear Actuator

Ultra-slim (5.9 mm wide) linear actuators that enable true, side-by-side stackability directly over standard 9mm well plates. They combine sub-micron precision with rapid dispensing speeds (up to 400 mm/s) while remaining completely cool during operation.

Benefit:

Maximizes tests-per-hour (TPH) and slashes machine footprints without risking thermal sample degradation.





03 / Surgical Robotics

The Challenge:

Traditional electromagnetic motors and bulky gearboxes make robotic tools "tactilely numb." They lack the sensitivity required to transmit haptic feedback, preventing surgeons from feeling tissue resistance, while mechanical backlash compromises fine precision.

Xeryon Solution - **Mini/Micro Linear Actuators**

Ultra-compact, direct-drive piezo actuators that fit inside instrument joints and control handles. Their high-force-to-weight ratio and nanometer resolution eliminates gear-play (backlash) and allows for sub-millimeter dexterity in confined spaces.

Benefit:

Surgeons regain their "sense of touch" through instantaneous haptic feedback. The actuators can simulate the resistance of tissue (palpation) or the "click" of a mechanical clip being deployed by providing micro-thrusts proportional to the contact force measured at the patient side, enabling safer and more intuitive procedures.

04 / Handheld Diagnostics

The Challenge:

Portability is limited by battery capacity and the physical bulk of internal optical or fluidic scanning components.

Xeryon Solution - Mini/Micro Linear Actuator

Low-power, ultra-slim ultrasonic actuators featuring a self-locking mechanism that maintains position with zero power consumption.

Benefit:

Enables "pocket-sized" lab-grade performance with significantly extended battery life between charges





05 / Point-of-Care (PoC) Devices

The Challenge:

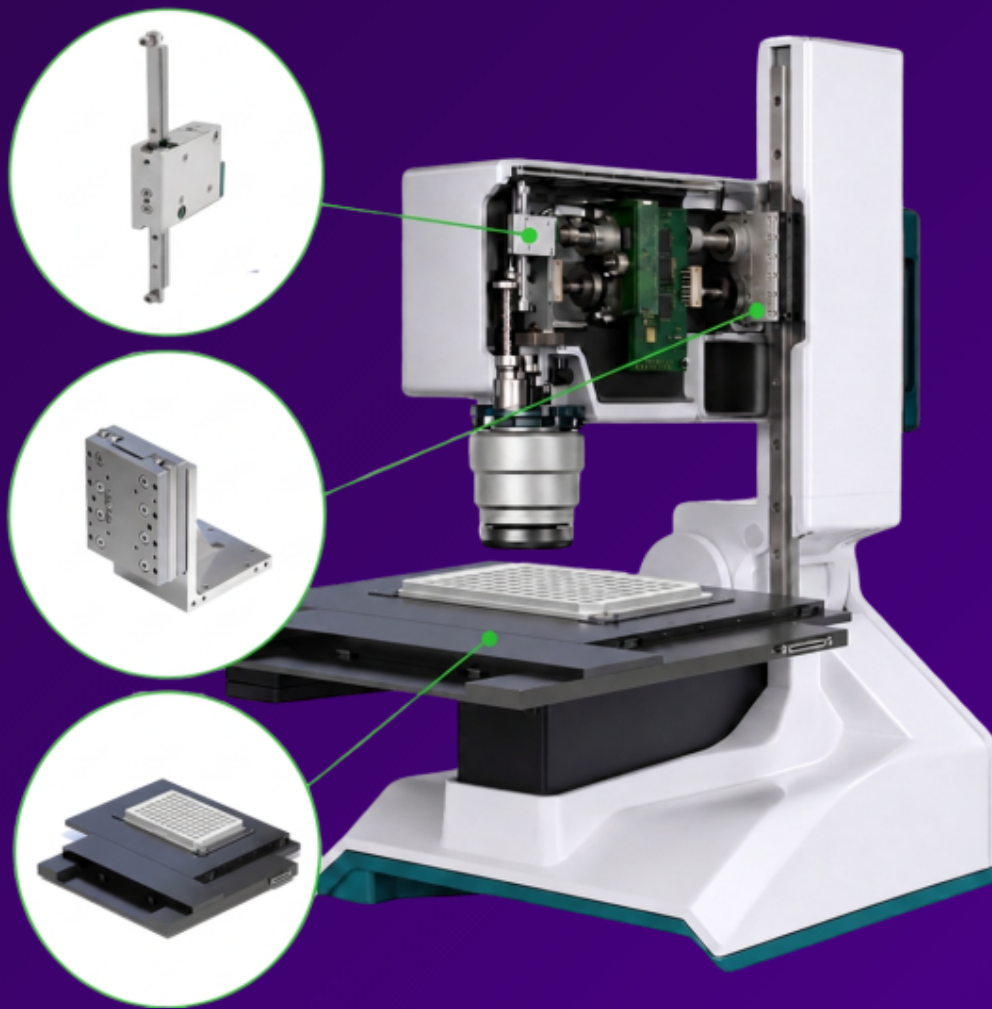
Moving complex laboratory processes to the patient's bedside requires shrinking benchtop-sized optical systems without losing image resolution or moving sensors/probes into perfect alignment within a tiny, battery-powered chassis.

Xeryon Solution - Micro Linear Actuator, XY Scanning Stage

Miniature, high-torque actuators that occupy a fraction of the space of traditional bulky stepper motors and provide precise positioning for autofocus, sensor alignment, or micro-fluidic valve control.

Benefit:

Allows for complex multi-step analysis (blood, urine, or glucose) in a portable format, delivering lab quality results in minutes rather than hours.



06 / Digital Microscopy

The Challenge:

Achieving high-resolution imaging requires sub-micron positioning, yet traditional motorized stages often suffer from "image jitter" caused by motor vibrations or thermal drift, which blurs the results at high magnification.

Xeryon Solution - Micro Linear Actuator, Motorized Vertical Stage, XY Scanning Stage

Ultra-stable piezo stages with nanometer-scale resolution and zero-vibration operation. Unlike electromagnetic motors, piezo actuators generate no heat when stationary, eliminating thermal expansion.

Benefit:

Enables rapid, crystal-clear "whole-slide imaging" (WSI) and automated cell counting, allowing for faster, more accurate diagnoses in digital pathology.

07/Micro-manipulators (Ophthalmology & Neurosurgery)

The Challenge:

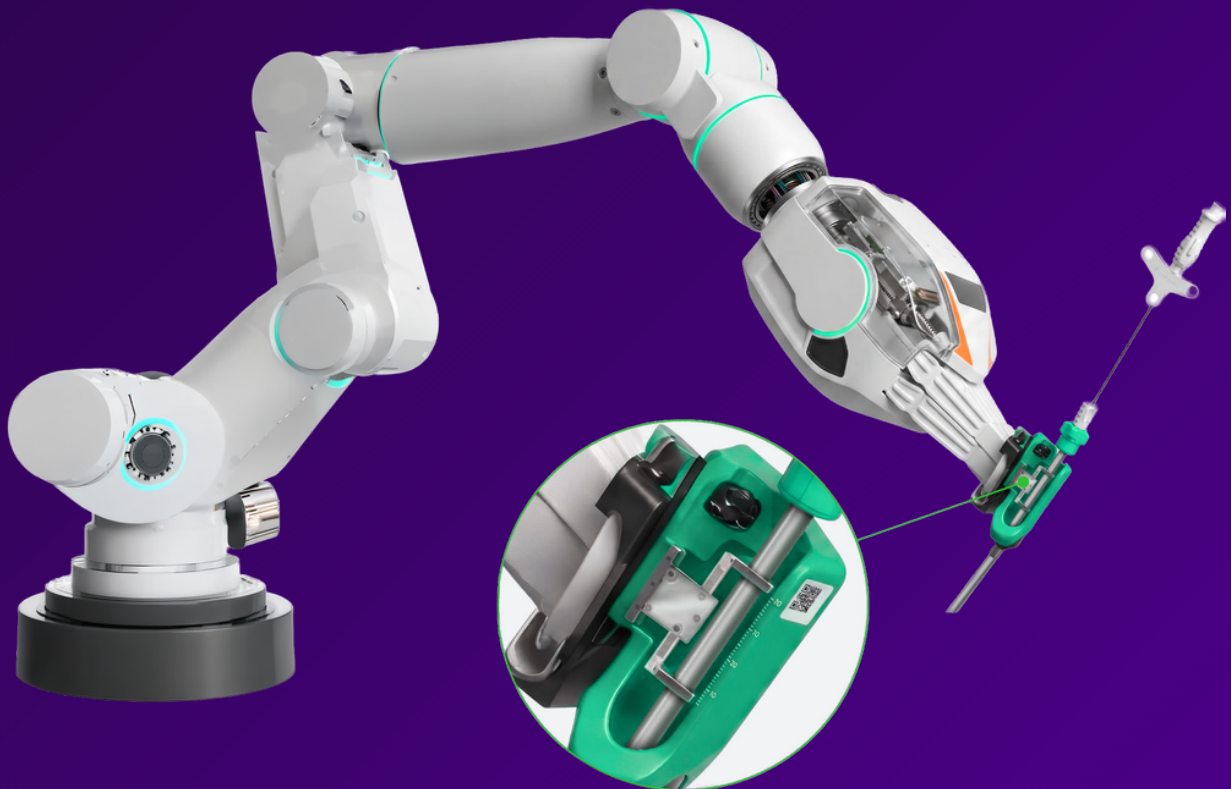
Eye and neuro-physiological surgeries demand sub-micron accuracy, but traditional motorized micro-manipulators are too heavy for delicate surgical arms and suffer from "stick-slip" friction and gearbox backlash. This causes micro-movements to "jump" or stutter rather than glide smoothly, risking catastrophic tissue damage during delicate retinal or neural procedures.

Xeryon Solution - Mini/Micro Linear Actuator

Ultra-lightweight direct-drive ultrasonic piezo actuators provide continuous, perfectly fluid motion down to the nanometer scale. By completely eliminating gears, we remove mechanical backlash and the stick-slip effect entirely.

Benefit:

Enables completely smooth, jitter-free tool positioning for the highest possible level of surgical safety and precision, all within a lightweight footprint that won't overload surgical microscope arms.





08 / Histopathology & Tissue Analysis

The Challenge:

High-resolution tissue and blood scanning require extreme multi-layer positioning accuracy, but traditional motors emit continuous heat and micro-vibrations that blur images and prematurely dry out or denature living cells.

Xeryon Solution - Micro Linear Actuator, XY Scanning Stage

Vibration-free piezo stages with nanometer-scale resolution that generate zero heat when stationary, utilizing an inherent mechanical lock to maintain position without thermal drift.

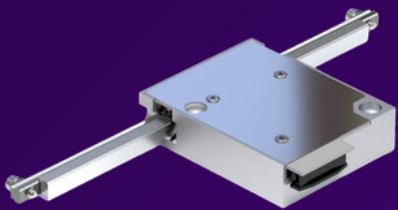
Benefit:

Ensures absolute specimen preservation and blur-free imaging throughout long diagnostic cycles.

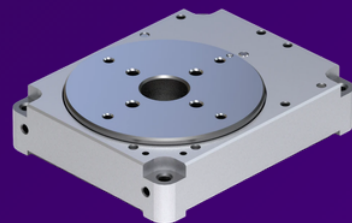
Xeryon Breaktought Motion Technology

Designed for demanding medical environments, our actuators, stages and motion control modules offer you:

- **Ultra-Compact Form Factor**
- **Integrated Controller**
- **High Force Density & Speed**
- **Silent Operation**
- **Vibration Free Motion**
- **Stackable**
- **Back-Drivable**
- **Self-Locking**
- **Zero Heat at Rest**
- **Low Voltage**
- **Low Power Consumption**
- **+1000km Lifetime**



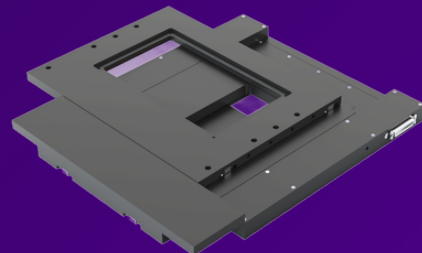
[EXPLORE LINEAR ACTUATORS](#)



[EXPLORE ROTATION STAGES](#)



[EXPLORE LINEAR STAGES](#)



[EXPLORE XY SCANNING STAGES](#)

Why MedTech Engineers Work With Us?

We support your OEM design process from A to Z

From the first sketch to scalable production - one team, one motion architecture, one process. Compact piezo motors, actuators, stages, multi-axis systems and OEM control boards under one roof.

1

Motion challenge review:

Specs, volume, environment, regulatory context - aligned in a focused engineering call.

2

Product selection:

Off-the-shelf actuator, stage or piezo motor module-selected with your requirements and specifications in mind.

3

Technology validation:

Through an all-in-one Development Kit sample; delivered fast with all you need for your evaluation.

4

Integration validation:

Mechanical, electrical, thermal and integration validation inside your device - by our engineers and yours.

5

Prototype field validation:

Transitioning from working prototype to formal Verification & Validation - monitoring real-world performance data to fine-tune and optimize your system performance.

6

Design transfer & series production:

Scale seamlessly with a locked BOM (Bill-of-Materials)-ensuring strict change control and long-term supply chain continuity.

Book an Integration Consultancy Call

Design Without Compromise! Tell us what you are building. Our OEM integration engineers will help identify the right actuator, stage or motion module for your medical device.

We offer you:

- ✓ A response from an integration engineer - not a sales rep!
- ✓ NDA available on request before sharing specs.
- ✓ Typical first response within 1 business day (CET).

CONTACT US