

# China Leading Frameless Torque Motor Factory: Why XULONG is the Premier Choice for Robotics Precision



**Dongguan, Guangdong May 19, 2026 ([Issuewire.com](https://www.issuewire.com))** - Founded in 2014 and headquartered in Dongguan, Xulong Technology (Dongguan) Co., Ltd. has established itself as more than just a manufacturer; it is a comprehensive service provider for electrical automation. While the company serves as an authorized agent for major Chinese brands like HXDWH and VEICHI, it is through its self-owned brand, **XULONG**, that it has truly redefined the standards for frameless motor technology. By integrating sales, service, and independent R&D, XULONG bridges the gap between complex engineering requirements and practical, high-efficiency manufacturing outcomes.

In the rapidly evolving landscape of automation, robotics precision has become the definitive benchmark for industrial excellence. As manufacturers push the boundaries of agility and accuracy, the demand for compact, high-torque actuation systems has never been higher. At the heart of this technological shift is the frameless torque motor, a component that eliminates traditional housings and bearings to provide direct-drive capabilities within the most constrained spaces. As a **[China Leading Frameless Torque Motor Factory](#)**, XULONG Technology has emerged as a pivotal force in this sector. By specializing in high-performance motion control solutions, the company provides the essential building blocks for next-generation robotics, ensuring that precision is not just a goal, but a standard feature of modern industrial design.

## I. Engineering Excellence: The Core Advantages of XULONG Frameless Technology

The transition from traditional servo motors to frameless torque motors represents a fundamental change in how mechanical designers approach robot joint construction. XULONG's core advantage lies in its ability to offer high power density in a "kit" format—consisting specifically of a rotor and a stator—allowing for seamless integration into a machine's existing structural frame.

This design philosophy offers three primary benefits to the robotics industry:

- **Space Optimization:**By removing the bulky outer casing, XULONG motors allow for a significantly reduced footprint. This is critical for surgical robots, collaborative robots (cobots), and exoskeletons where every millimeter of space is vital.
- **Thermal Efficiency:**The direct integration of the motor components into the machine's metal housing facilitates better heat dissipation compared to traditional motors trapped inside their own enclosures.
- **Mechanical Rigidity:**Eliminating couplings and additional shafts reduces potential points of failure and mechanical backlash, leading to a much higher level of dynamic response and positioning accuracy.

Beyond the hardware, XULONG's strength stems from its holistic approach to automation. With a product portfolio covering planetary reducers, harmonic reducers, and DC servo drivers, the company provides a unified ecosystem where frameless motors can operate at peak performance with perfectly matched control electronics.

## II. Technical Innovation: Analysis of the U-Series Miniature Frameless Motors

Innovation at XULONG is best exemplified by its U-Series miniature frameless torque motors, specifically designed for small-scale robotic joints and precision instruments. These motors, including the U16, U19, and U25 series, represent the pinnacle of miniaturization in the direct-drive industry.

### 1. Dimensional Precision and Versatility

The U-Series is engineered to fit into extremely narrow profiles without sacrificing torque output. The core of this series lies in the ability to embed the motor components directly into mechanical joints, completely breaking the constraints of traditional motor housings on structural space.

- **U16 Series:**With an outer diameter of only 16mm and an inner diameter of 4mm, these are among the smallest high-performance torque motors available. They offer optional heights of 15.4mm and 25.4mm, providing rated torque between 0.01Nm and 0.02Nm at a rated speed of 1500 rpm. Their extreme miniaturization makes them ideal for micro-medical robots and laboratory automation grippers.
- **U19 Series:**Stepping up to a 19mm outer diameter and 7mm inner diameter, this series is optimized for higher speed applications, reaching rated speeds of 4000 to 6000 rpm with torque ranging from 0.02Nm to 0.04Nm. This balance of speed and torque is suitable for high-speed, light-load precision motion control scenarios.
- **U25 Series:**Designed for applications requiring more substantial force in a compact form, the U25 series features an 11.6mm inner diameter and heights as low as 10.8mm. It delivers a rated torque up to 0.075Nm. The large hollow shaft design facilitates easy wiring and light path passage, greatly simplifying the mechanical design of complex joints.

### 2. Performance Parameters and Data Analysis

Traditional motors often suffer from low efficiency at low speeds and require complex reduction mechanisms to amplify torque, which inevitably introduces mechanical backlash. In contrast, XULONG's frameless design optimizes high torque output across the entire operating range. Utilizing a Direct-Drive structure, the rated voltage—typically 12Vdc for the U16 and 24Vdc for the U19 and U25—is used with maximum efficiency. This physical structure eliminates intermediate transmission components, removing gear wear, hysteresis, and transmission loss. Consequently, the control system can act directly on the end load, significantly enhancing the dynamic response frequency of the system.

### 3. Application Spectrum and Perfect Adaptation for Robotics Precision

These technical specifications enable the motors to excel in diverse environments, with characteristics naturally aligned with the core requirements of robotic precision control:

- **Medical Sector and Precision Surgery:**In surgical robots, driving devices must possess extremely high sensitivity and zero-backlash characteristics. U-Series motors, through direct-drive control, achieve micron-level precision displacement, providing delicate and smooth power support for surgical tools.
- **Electronics Industry and 3C Assembly:**In lithium battery equipment and precision assembly lines, the miniaturization of the U-Series allows installation at the end of cramped multi-axis robotic arms. Precise torque control enables flexible gripping and high-efficiency placement of tiny parts.
- **Industrial Collaboration and Flexible Manufacturing:**Robotic joint compliance depends on accurate perception of current and torque. XULONG frameless motors, free from the interference of gearbox friction and inertia, provide "purer" torque feedback. This helps collaborative robots achieve more sensitive collision detection and smoother human-machine interaction.
- **Energy and Industrial Equipment:**In CNC machine tools, woodworking machinery, and the solar photovoltaic industry, high reliability ensures continuous operation in harsh environments. In solar tracking systems specifically, these motors assist in achieving extremely precise angular positioning to maximize photosynthetic efficiency.

By employing this highly integrated design, the U-Series not only reduces the physical volume of equipment but also enhances the certainty of motion control from the underlying physical structure—the key for robotics moving toward "ultra-high precision" control.

### III. Strategic Market Position: A Global Exporter of Industrial Precision

XULONG's position as a premier choice for robotics precision is reinforced by its extensive certification and global reach. As an authorized agent and exporter, the company has mastered the logistical and technical requirements of international markets. Their products are not only widely applied in industrial robots but also in food packaging, laser equipment, and semiconductor manufacturing.

The synergy between XULONG's self-owned brand and its partnerships with industry giants allows the company to offer a "one-stop" procurement experience. This is particularly valuable for international clients who require a cohesive set of components—ranging from a frameless motor to the harmonic reducer and the driver—to ensure system compatibility and simplified after-sales support.

XULONG ensures that every technical claim is backed by rigorous testing and real-world application data. Whether it is providing a hollow rotary platform for a high-precision turntable or a miniature frameless motor for a robotic gripper, the company's commitment to objective performance remains

constant.

In conclusion, the rise of sophisticated robotics requires components that can deliver high power without the weight and volume of the past. XULONG Technology has successfully met this challenge by combining advanced manufacturing with a deep understanding of motion control. For engineers and manufacturers seeking a reliable partner in the direct-drive sector, XULONG stands as a testament to Chinese industrial innovation and precision.

For more information on the full range of frameless solutions and automation products, please visit the official website: <https://www.xulonggk.com>

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