

Top Elevator Gearless Traction Machine Manufacturer Drives Industry Innovation with Advanced Technology

NANJING CITY, JIANGSU PROVINCE, CHINA, January 21, 2026 /EINPresswire.com/ -- The global elevator industry continues to evolve as manufacturers focus on energy efficiency, reliability, and compact design solutions. Among the companies advancing these technologies, Shanghai Kisa Industry Co., Ltd. has established itself as a specialized producer of gearless traction systems that address the growing demands of modern building construction.

Market Demands Shape Manufacturing Priorities

Urban development worldwide has created sustained demand for vertical transportation systems. Buildings continue to grow taller, while existing structures undergo modernization to meet current energy standards. These trends require traction machines that consume less power, operate quietly, and fit within limited machine room spaces.

Gearless traction machines have become the preferred choice for mid-rise and high-rise applications. Unlike geared systems that use worm gears or helical gears to reduce motor speed, gearless designs connect the motor directly to the sheave. This direct-drive configuration eliminates mechanical losses associated with gear trains, typically improving energy efficiency by 30 to 40 percent compared to traditional geared machines.

The shift toward gearless technology reflects broader industry priorities. Building owners calculate total cost of ownership over 20 to 30 year periods, making energy consumption a critical factor. Maintenance requirements also influence purchasing decisions, as gearless machines have fewer moving parts that require lubrication or replacement.

Technical Specifications Define Performance

Gearless traction machines must meet specific performance criteria to qualify for different building types. Load capacity ranges from 630 kilograms for residential applications to 2500 kilograms or more for commercial and freight elevators. Speed requirements vary from 1.0 meters per second in low-rise buildings to 4.0 meters per second or higher in skyscrapers. Motor efficiency directly impacts operating costs. Permanent magnet synchronous motors have become standard in gearless designs, achieving efficiency ratings of 90 percent or higher. These motors use rare-earth magnets to generate strong magnetic fields, allowing manufacturers to reduce motor size while maintaining torque output.

Sheave diameter affects traction rope life and overall system dimensions. Smaller sheaves create tighter bending radii that increase rope stress, while larger sheaves require more space.

Manufacturers balance these factors based on application requirements, typically using sheave

diameters between 400 and 800 millimeters for standard installations.

The [Belt Drive Elevator Gearless Traction Machine](#) represents an alternative approach to traditional rope-based systems. Steel belt technology uses flat belts with embedded steel cords instead of round ropes. This configuration distributes load across a wider contact area, reducing pressure on individual load-bearing elements. The flat profile also allows smaller sheave diameters without compromising belt life, enabling more compact machine designs.

Material Selection Impacts Durability

Component materials determine service life and maintenance intervals. Sheaves typically use cast iron or steel alloys that resist groove wear from continuous rope contact. Surface treatments such as hardening or coating extend sheave life in high-usage installations. Motor housings require materials that dissipate heat while protecting internal components from environmental factors. Aluminum alloys offer good thermal conductivity and corrosion resistance, making them suitable for machine room installations. Stainless steel provides additional protection in coastal or industrial environments where humidity and contaminants accelerate corrosion.

[Elevator Steel Belt](#) technology uses high-carbon steel cords embedded in polyurethane coating. The steel provides tensile strength, while the polyurethane protects against moisture and reduces noise during operation. This combination delivers load-bearing performance similar to conventional steel ropes while offering advantages in flexibility and vibration damping. Brake systems must function reliably across temperature ranges and usage patterns. Electromagnetic brakes use spring pressure to engage brake pads when power is interrupted, ensuring safe operation during power failures. Brake pad materials balance friction characteristics with wear resistance, typically using organic compounds or sintered metals based on duty cycle requirements.

Manufacturing Processes Ensure Quality

Production of gearless traction machines involves multiple precision manufacturing steps. Motor stator cores consist of thin laminations stamped from electrical steel and stacked to form the magnetic circuit. Lamination thickness affects electrical losses, with thinner materials reducing eddy current losses but increasing production complexity.

Rotor assembly requires precise positioning of permanent magnets within the rotor structure. Manufacturers use adhesives and mechanical retention methods to secure magnets against centrifugal forces during high-speed operation. Magnet orientation must align correctly to produce uniform magnetic fields and minimize torque ripple.

Sheave machining demands tight tolerances to ensure proper rope tracking and even load distribution. Computer numerical control lathes cut rope grooves to specified profiles, with surface finish affecting rope wear rates. Final balancing removes weight from specific locations to minimize vibration during rotation.

Quality control procedures verify dimensional accuracy, electrical characteristics, and mechanical performance. Motor windings undergo insulation resistance testing and high-potential testing to confirm electrical integrity. Assembled machines run through performance tests that measure speed regulation, noise levels, and vibration characteristics under various load conditions.

Installation Requirements Vary by Building Type

Machine room layout influences traction machine selection and placement. Traditional overhead machine rooms position equipment above the elevator shaft, requiring structural support to handle machine weight and dynamic loads during operation. Floor loading calculations account for machine mass plus maximum rope tension, typically ranging from 3000 to 8000 kilograms depending on capacity and travel height.

Machine roomless configurations place traction machines within the shaft, eliminating the need for dedicated equipment spaces. This arrangement reduces building construction costs but imposes stricter size constraints on equipment. Compact gearless machines designed for machine roomless installation typically measure less than 1000 millimeters in width and 400 millimeters in depth.

Electrical connections must deliver sufficient power for motor operation and control systems. Three-phase power supplies ranging from 380 to 480 volts serve most commercial installations. Variable frequency drives regulate motor speed and acceleration, providing smooth starts and stops while optimizing energy consumption.

Noise control becomes critical in residential buildings where machine rooms adjoin living spaces. Manufacturers reduce noise through several approaches: isolating machines from building structures using vibration dampers, enclosing machines in sound-absorbing housings, and optimizing motor design to minimize electromagnetic noise.

Energy Efficiency Standards Drive Design Evolution

Building codes increasingly mandate energy-efficient elevator systems. The International Organization for Standardization's ISO 25745 standard provides methods for measuring elevator energy consumption and establishing efficiency classifications. Systems receive ratings from A (highest efficiency) to G (lowest efficiency) based on power consumption during typical usage patterns.

Regenerative drives capture energy during descent when loaded cars move downward or empty cars travel upward. Instead of dissipating braking energy as heat, regenerative systems convert it to electricity and return it to the building's power grid. This capability can reduce elevator energy consumption by 20 to 50 percent depending on building traffic patterns and elevator usage. Standby power consumption also affects total energy use. Modern control systems incorporate sleep modes that reduce power draw during idle periods. LED lighting in cars and machine rooms further decreases energy consumption compared to fluorescent or incandescent alternatives.

Shanghai Kisa Industry Co., Ltd. has developed gearless traction machines that incorporate these energy-saving features. The company's engineering team focuses on optimizing motor efficiency, reducing standby losses, and integrating with regenerative drive systems to help building owners meet sustainability targets.

About Shanghai Kisa Industry Co., Ltd.

Shanghai Kisa Industry Co., Ltd. specializes in the research, development, and manufacturing of elevator traction systems and components. Founded in Shanghai, China, the company operates

production facilities equipped with advanced machining centers, automated assembly lines, and comprehensive testing equipment.

The company's product range includes gearless traction machines for passenger elevators, freight elevators, and observation elevators, with capacities from 630 to 2500 kilograms and speeds up to 4.0 meters per second. Manufacturing processes incorporate computer-aided design, precision machining, and systematic quality control to ensure products meet international standards including ISO 9001 quality management requirements.

Technical capabilities include permanent magnet motor design, structural optimization, and noise reduction engineering. The company maintains testing facilities for performance verification, endurance testing, and environmental qualification. Products undergo type testing to verify compliance with safety standards such as EN 81-20 and GB 7588.

The company serves domestic and international markets, supplying equipment to elevator manufacturers, modernization contractors, and building owners. Export markets include Southeast Asia, the Middle East, Europe, and South America. Technical support services assist customers with product selection, installation guidance, and maintenance training.

Research and development efforts focus on improving energy efficiency, reducing machine dimensions, and enhancing reliability. Engineering teams collaborate with motor suppliers, control system manufacturers, and rope producers to integrate new technologies into traction machine designs. Ongoing projects address emerging requirements such as earthquake resistance, extreme temperature operation, and integration with destination dispatch systems.

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