
INDUSTRY OVERVIEW

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OVERVIEW OF GLOBAL INDUSTRIAL INTELLIGENT MOBILE ROBOTIC SOLUTION MARKET

Industrial Automation

As the cornerstone of modern industrialization, industrial automation has undergone several critical stages: from the initial mechanical collaboration between manual labor and basic machinery, to the technological foundation laid by electrified automatic control, to the transformational innovation of digitalized flexible production, and finally to the paradigm breakthrough driven by AI in smart manufacturing today. Each technological leap has been accompanied by exponential growth in productivity.

Currently, with the deep integration and application of cutting-edge technologies such as AI, big data, edge computing, and digital twins, factory production systems are now capable of self-learning and optimizing both production processes and resource allocation. Breakthroughs in embodied intelligence have accelerated the large-scale deployment of industrial robots, transitioning automation from fixed workflows to flexible collaboration that can adapt to varied product demands and eventually distill into industry-grade general solutions. The increasingly interconnected end-to-end value chain is driving the pivotal shift from traditional manufacturing to smart manufacturing.

The modern factory production system is a tightly integrated network spanning raw material supply, production, storage, and distribution. Its efficient operation is essential for enterprise growth, ensuring production continuity and providing a foundation for competitiveness and sustainable development. However, managing such a complex system through automation is challenging due to its complexity, variability, time constraints, and interoperability requirements. Traditional models reveal inefficiencies, low reliability, and high labor costs, hindering industrial upgrading:

- **Low production efficiency and high hidden costs due to labor dependence:** Approximately 80% of manufacturing defects are caused by human error, and around 20% of unplanned downtime is also attributable to such errors. Issues like material mismatches and production line interruptions incur significant hidden costs, directly undermining the competitiveness.
- **Complex production environments:** Factory operations involve the handling, storage, and management of various materials that exhibit distinct physical properties and storage requirements, compounded by rapid production cycles and changing material demands. Additionally, factory layouts are often compact, necessitating efficient material handling and storage within limited spaces.
- **Frequent changes in production plans:** Production plans often need to be adjusted due to fluctuations in market demand, order changes, or equipment failures, requiring the production system to respond quickly and adjust flexibly in real time.

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- **High time-sensitivity of material supply:** The production process imposes extremely strict time requirements on material supply, with delays in any segment risking production line stoppages, making on-time delivery critical.
- **Poor compatibility among different types of automation equipment:** This stems from factors such as inconsistent technical standards, rapid equipment iteration, limited collaboration among manufacturers, and incompatible software systems. As a result, building integrated automation systems is often difficult, leading to suboptimal system performance, higher operational costs, and increased maintenance complexity.
- **High demands for cross-departmental collaboration:** Factory operations are closely linked to multiple functions such as production, procurement and sales, necessitating close collaboration among departments to achieve real-time information sharing and seamless process integration.

Industrial Intelligent Mobile Robotic Solution

An intelligent robot refers to a robot that exhibits intelligent behavior by using technologies such as AI, machine learning and computer vision to simulate human cognition and physical coordination, as defined in the 2023 White Paper on Intelligent Robot Technology and Industry Development. In terms of sales revenue, the size of the global intelligent robotic solution market increased from RMB130.2 billion in 2021 to RMB307.4 billion in 2025, representing a CAGR of 24.0% from 2021 to 2025, and is projected to reach RMB850.0 billion by 2030, representing a CAGR of 24.6% from 2026 to 2030. Industrial intelligent robots, primarily intelligent mobile robots and intelligent collaborative robots, are increasingly deployed in manufacturing environments to execute tasks autonomously. Based on the market positioning and technical characteristics, industrial intelligent robots differ fundamentally from other intelligent robot categories such as commercial service robots, warehousing and logistics robots and educational robots, in both application scenarios and product design. Therefore, industrial intelligent robots and the others are mutually exclusive from each other. Primarily deployed in manufacturing processes, the core value of industrial intelligent robotic solutions delivering high precision and reliability. In terms of sales revenue, the size of the global industrial intelligent robotic solution market increased from RMB10.0 billion in 2021 to RMB28.6 billion in 2025, representing a CAGR of 29.9% from 2021 to 2025, and is projected to reach RMB198.5 billion by 2030, representing a CAGR of 48.6% from 2026 to 2030.

Driven by the dual imperatives of industrial automation upgrades and logistics complexity, industrial intelligent mobile robots have emerged as a transformative force. Industrial intelligent mobile robots refer to intelligent robots equipped with autonomous navigation and mobility capabilities in industrial settings, capable of independently performing tasks such as path planning, obstacle avoidance, and material handling. Leveraging their capabilities in autonomous navigation, flexible deployment, and intelligent operation, industrial intelligent mobile robots precisely address the pressing needs of factories for efficiency enhancement, flexible production, product quality assurance, and digital-intelligent management. Through a closed-loop capability of “autonomous perception-real-time decision-making-flexible execution,” industrial intelligent mobile robots not only overcome the rigid bottlenecks of traditional production management but also integrate with technologies such as AGI, digital twins, and 5G to propel industrial intelligent applications from “device automation” to “system intelligence.” Looking ahead, with further breakthroughs in embodied intelligence and other technologies, industrial intelligent mobile robots are poised to become the core infrastructure of future industry.

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The industrial intelligent robotics industry chain encompasses a complete closed loop from component manufacturing to system integration and end-use application deployment, characterized by high technological intensity and system complexity. There are key players and stakeholders at each level of the industry chain in the industrial intelligent mobile robotic solution industry. At the upstream level, component suppliers provide hardware and other raw materials. In the midstream, industrial intelligent mobile robotic solution providers and integrators emerge as key players, collaboratively addressing industrial automation needs. In the downstream, manufacturers across various industries are adopting industrial intelligent mobile robotic solutions. In particular, industrial intelligent mobile robotic solution providers focus on robot R&D, manufacturing, and critical software development, efficiently integrating resources from both ends of the supply chain while driving technological innovation, whereas integrators do not manufacture robots directly. Located in the midstream of the industrial intelligent robotics industry as industrial intelligent mobile robotic solution provider, we leverage our capabilities in the design, research and development, and manufacturing of industrial intelligent mobile robots to achieve a closed loop from key technologies to large-scale implementation. We deliver industrial intelligent mobile robotic products and solutions to major industrial clients in sectors such as 3C, automotive, and semiconductor industries.

Downstream Demand and Application Scenarios

The industrial intelligent mobile robotic solution, defined based on industry-accepted standards according to CIC, is an automated solution that centers around industrial intelligent mobile robots and integrates software systems, algorithms and supporting facilities, targeting the needs of material handling, task execution and other tasks in industrial scenarios. It is centered around industrial intelligent mobile robots and integrates robotic systems, task scheduling management systems, relevant software algorithms, and supporting facilities. Industrial intelligent mobile robotic solutions are widely used in core industrial fields such as 3C, automotive, and semiconductor. Discrete high-end manufacturing requires automation systems to handle diverse products, short life cycles, and complex processes, demanding dynamic reconfiguration. Traditional rigid production systems struggle to support such high-frequency changes, whereas industrial intelligent mobile robots, through digital twin map and real-time scheduling algorithms, enable rapid logistical path switching to ensure synchronization between production and material supply.

- **3C:** In 2025, the global sales volume of 3C electronic products, which encompass mobile phones, tablets, computers, XR devices and other wearables, exceeded 2.5 billion units. This significant figure unequivocally highlights the central role that consumer electronics play in both global daily life and industrial production. Propelled by a fresh wave of technological advancements that are stimulating replacement cycles among consumers, coupled with the continuous emergence of new product categories such as XR devices, sales are forecasted to climb further, reaching around 20 million units by 2030, with a CAGR of around 20% from 2026 to 2030. Meanwhile, as the scale of AI applications is expanding rapidly, global AI chip shipments increased from over 1 million units in 2020 to more than 14 million units in 2025, achieving a CAGR of approximately 50% during this period, and is expected to exceed 43 million units by 2030, thereby fueling the robust growth of AI servers. Consumer electronics manufacturing demands high flexibility and rapid line changes for precision components and fast iterations. Industrial intelligent mobile robots ensure timely material supply by dynamically adjusting handling routes and procedures, efficiently supporting production and assembly.

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- **Automotive:** In 2025, the global production volume of automobiles, including both passenger vehicles and commercial vehicles, attained 99 million units. Benefiting from the ongoing transition towards new energy vehicles, the increasing integration of autonomous driving technologies, and the expanding market demand in emerging markets, automobile production is expected to continue its upward trajectory, reaching 111 million units by 2030, with a CAGR of 2.5% from 2026 to 2030. Despite its massive scale, the automotive industry is characterized by rapid model iterations and numerous heavy-load process requirements, with significant variations in component specifications, dimensions, and weights across different models. Despite its scale, the automotive industry features rapid model iterations and diverse component specifications. Mixed-model production lines are widely adopted, requiring robots with strong payload capacity and flexible, high-frequency scheduling. Industrial intelligent mobile robots enable precise and timely delivery of components to designated workstations in accordance with production plans for different vehicle models, ensuring stable line operations and enhancing overall production efficiency.
- **Semiconductor:** From cloud computing to edge devices, the surge in AI computing power demand is driving the development of high-performance chips and promoting the strong expansion of global semiconductor manufacturing capacity. In 2025, the global production volume of integrated circuits surpassed 1,500 billion units. As a cornerstone technology underpinning smart devices, automotive electronics and AI computing capabilities, the semiconductor industry is witnessing robust demand growth. Production is projected to escalate significantly, approaching 2,700 billion units by 2030 with a CAGR of 11.4% from 2026 to 2030. Amid this growth trajectory, automation solutions are increasingly being integrated into more application segments within the semiconductor manufacturing process, notably including advanced packaging upgrades. Semiconductor manufacturing is a typical industry with high-precision and high-cleanliness requirements. Processes such as wafer handling and photolithography impose strict requirements on the accuracy, safety and timeliness of material transfer. Wafers are highly fragile and vibration-sensitive, and minor disturbances may result in defects, yield loss and reduced profitability. Industrial intelligent mobile robots, equipped with high-precision sensors, advanced motion control and cleanroom-compatible designs, enable accurate and stable material handling, ensuring safe inter-process transfers and reliable production continuity.

Market Size of Global Industrial Intelligent Mobile Robotic Solution

As technological advancements accelerate and industrial applications expand, industrial intelligent mobile robots are evolving toward higher intelligence, more flexible deployment, and broader scalability. In terms of sales volume¹, the global market size of the industrial intelligent mobile robotic solutions grew from 22.7 thousand units in 2021 to 87.0 thousand units in 2025, representing a CAGR of 39.9% from 2021 to 2025. The market is projected to expand further to reach 372.6 thousand units by 2030, representing a CAGR of 32.2% from 2026 to 2030.

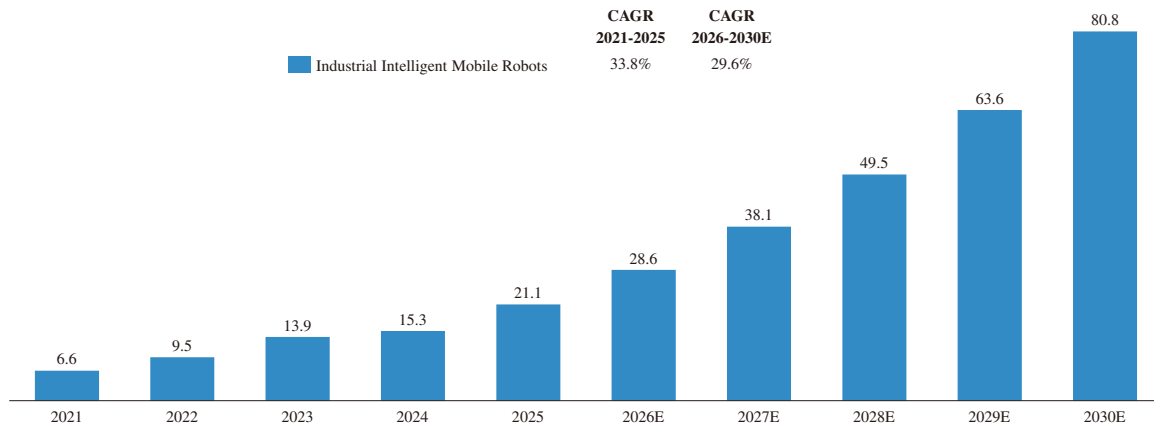
The global market for industrial intelligent mobile robotic solutions expanded from RMB6.6 billion in 2021 to RMB21.1 billion in 2025, reflecting a CAGR of 33.8%. Industrial intelligent robotic solutions are becoming a critical driver for enterprise transformation and upgrading, while technological progress acts as a powerful catalyst for continuous innovation. As adoption accelerates, the global market for industrial intelligent mobile robotic solutions is projected to reach RMB80.8 billion by 2030, with a CAGR of 29.6% from 2026 to 2030.

1. Sales volume refers to robotic units sold of global industrial intelligent mobile robotic solutions.

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Global industrial intelligent mobile robotic solution market size, in terms of sales revenue, 2021-2030E

Billion RMB



Source: Mobile Robot and AGV/AMR Industry Alliance, CIC

China, together with the broader Asia-Pacific region, represents a critical hub for global industrial development and constitutes one of the principal application markets for industrial intelligent mobile robotic solutions. The Chinese market size of the industrial intelligent mobile robotic solutions grew from 12.4 thousand units in 2021 to 50.7 thousand units in 2025, representing a CAGR of 42.2% from 2021 to 2025. In terms of sales volume of industrial intelligent mobile robotic solutions, China accounted for around 60% of the global industrial intelligent mobile robotic solution market in 2025. The market is projected to expand further to reach 178.2 thousand units by 2030, representing a CAGR of 28.3% from 2026 to 2030.

Market Drivers

The following are the key market drivers:

- **Smart manufacturing system upgrades:** Industrial intelligent mobile robots drive the transformation of smart manufacturing through synergistic advancements in hardware and software, emerging as a core force in industrial upgrading.
- **Global industrial growth, accelerated supply chain restructuring, and robust downstream demand:** Industries such as 3C, automotive, and semiconductor, driven by demands for flexible, stable, and high-quality production, are propelling intelligent mobile robots as a critical tool for industrial advancement. Meanwhile, global supply chains are restructuring, with enterprises diversifying production and supplier networks to enhance resilience. This drives demand for digital transformation and wider adoption of industrial intelligent mobile robots.
- **Rising Labor Costs:** With aging populations and evolving economic landscapes, labor costs continue to raise up. For instance, in China, a major manufacturing hub, hourly labor costs in the manufacturing sector have surged more than tenfold since the early 2000s. Against this backdrop, manufacturers urgently need to explore innovative production solutions to adapt to demographic shifts and cost pressures, ensuring production stability and competitiveness.

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- **Maturing supply chain and evolving robotic ecosystem:** Accelerated localization of key components has effectively reduced production costs, while standardized interfaces and protocols have improved system integration and collaboration, supporting large-scale deployment of industrial intelligent mobile robots. In 2025, global spending on industrial robotics reached approximately RMB160.0 billion, reflecting a substantial and expanding addressable market.
- **Strengthened policy support:** Chinese government has introduced a series of targeted initiatives to strengthen R&D, production, and application in the smart manufacturing and robotics sectors. For instance, the “14th Five-Year Plan” for the Development of Smart Manufacturing (《“十四五”智能製造發展規劃》), jointly issued by eight ministries including the Ministry of Industry and Information Technology (“MIIT”), calls for accelerating innovation and achieving technological breakthroughs in industrial robots, CNC machine tools, and other smart equipment, with an emphasis on enhancing core component capabilities and promoting industrial digital transformation. The core objective of these policies is to steer industrial sectors toward intelligent transformation. By vigorously advancing the development of new digital infrastructure such as 5G, the Industrial Internet, and cloud computing, a solid foundation has been laid for the large-scale deployment and efficient, collaborative operation of industrial intelligent mobile robots. These policies encourage enterprises to adopt integrated digital and intelligent solutions centered on robotics, aiming to fully enhance the innovation capability and competitiveness of the industrial production system through the deep integration of robotic technology with industrial scenarios. Similarly, the “14th Five-Year Plan” for the Development of the Robot Industry (《“十四五”機器人產業發展規劃》), jointly released by the Ministry of Industry and Information Technology and the National Development and Reform Commission of the PRC (中華人民共和國國家發展和改革委員會) (the “NDRC”) and other departments, proposed to double the density of robots in China’s manufacturing industry by 2025, and to develop a number of leading enterprises with international competitiveness. Meanwhile, the State Council of China released its Opinions on Deeply Implementing the “Artificial Intelligence Plus” Action, promoting the broad and deep integration of AI with all sectors and domains of the economy and society, and fostering a revolutionary leap in productivity and profound changes in production relations.

Market Trends

The following are the market trends:

- **Embodied intelligence robots expanding operational boundaries:** The deep integration of autonomous mobile chassis with manipulators forms a unified mobile-manipulation architecture, breaking the physical isolation of traditional automated equipment and enabling “one-stop” operations from material handling to assembly and processing. Leveraging integrated control technology, robots can adapt seamlessly to diverse production scenarios and task requirements through software upgrades, hardware module expansions, executing more complex and varied tasks with ease.
- **Swarm intelligence technology driving production model transformation and collaborative operations:** Industrial intelligent mobile robots of different types, brands, and generations achieve dynamic task allocation and resource coordination, significantly enhancing overall production efficiency and collaboration. As industry applications deepen, swarm intelligence systems continuously learn and evolve, integrating with more production equipment and systems to enable full-process intelligentization of manufacturing workflows.

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- **Software & algorithms as core competencies:** Cutting-edge technologies such as VLA models, RL, and multimodal perception empower robots with autonomous decision-making capabilities. The widespread adoption of cloud-native architectures supports remote software iteration and online AI model training, propelling robots from “standalone intelligence” to “swarm intelligence.” Integration with digital twin technology enables real-time mapping between the physical and digital worlds, optimizing task scheduling and fault prediction.
- **A new paradigm of industrial intelligence driven by massive data and scalable deployment of Industry-grade solutions:** Maturing dynamic factory simulation technologies create a synergistic loop between data and simulation, enabling robots to seamlessly integrate into production systems and support decision-making and optimization. Deep understanding and continuous learning of diverse production scenarios accelerate the emergence of industry-grade applications. Integrated software-hardware solutions fuse advanced algorithms with high-performance hardware, forming a highly integrated, stable, and reliable automated production system.

OVERVIEW OF GLOBAL INDUSTRIAL EMBODIED INTELLIGENCE ROBOTIC SOLUTION MARKET

Industrial Embodied Intelligence Robotic Solution

Under the empowerment of AGI, robots can autonomously comprehend tasks, plan paths, and collaborate across systems to execute operations. Compared to service or household environments, industrial settings offer clear process protocols, standardized data interfaces, and predictable physical constraints, reducing the complexity of AGI deployment. Additionally, industrial scenarios have accumulated vast operational data, enabling rapid algorithm iteration and safety validation, thereby accelerating the realization of AGI’s “generalized intelligence” capabilities.

As industrial production demands increasingly diverse robot functionalities and scenario adaptability, single-structure robots are struggling to meet practical needs. Composite architectures integrate functional modules from different robot types, achieving optimized functionality. Building on industrial intelligent mobile robots, industrial embodied intelligence robots integrate collaborative arms to form a unified “mobility + manipulation” architecture, precisely addressing complex and dynamic operational demands and achieving comprehensive upgrades in scenario adaptability, entering an era of dynamic operations across multi-scenario and multi-station workflows.

Industrial embodied intelligence robots offer strong adaptability, mature technology, and cost-effectiveness. Prioritizing functionality over humanoid form, they autonomously handle tasks such as grasping, assembly, and inspection. Leveraging proven localization, navigation, and motion control technologies, they deliver precise, flexible operations. Compared with humanoid robots, their lower R&D complexity and mature supply chains enable faster commercialization, higher productivity, and reduced labor costs.

Industrial embodied intelligence robots, a subset of industrial intelligent mobile robots, comprise mobile platforms, manipulators (primarily collaborative arms), vision modules, and end-effectors. They combine the flexibility and autonomy of industrial intelligent mobile robots with the high-precision manipulation capabilities of collaborative robots. By leveraging multimodal perception fusion, end-to-end navigation, and large-scale models, these robots exhibit enhanced environmental interaction, balanced motion capabilities, and autonomous decision-making to improve generalization in industrial scenarios.

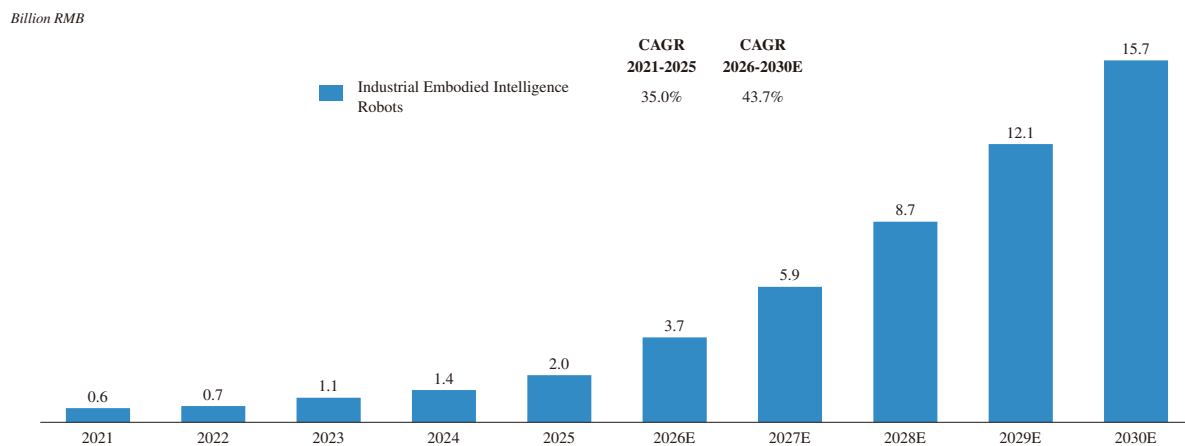
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Market Size of Global Industrial Embodied Intelligence Robotic Solution

Industrial embodied intelligence robotic solutions, a subset of industrial intelligent mobile robotic solution and is defined based on industry-accepted standards according to CIC, refer to automated solution combining both “mobility” and “manipulation” capabilities, which centers around industrial embodied intelligence robots and integrates software systems, algorithms, and supporting facilities. Driven by continuous advancements in the hardware and software technologies of industrial embodied intelligence robots and expanding applications across industrial scenarios, the global market size of the industrial embodied intelligence robotic solutions grew from 1.3 thousand units in 2021 to 6.3 thousand units in 2025 in terms of sales volume, representing a CAGR of 49.2% from 2021 to 2025. By 2030, sales are expected to reach 54.7 thousand units, representing a CAGR of 48.0% from 2026 to 2030.

In terms of sales value, the global market size for industrial embodied intelligence robotic solutions surged from RMB0.6 billion in 2021 to RMB2.0 billion in 2025, representing a CAGR of 35.0% from 2021 to 2025. The maturation of robot hardware and software technologies, coupled with breakthroughs in swarm intelligence and collaborative scheduling, has accelerated the large-scale deployment of industrial embodied intelligence robots. The global market for these solutions is poised for rapid expansion, with projections indicating a further increase to RMB15.7 billion by 2030, representing a CAGR of 43.7% from 2026 to 2030.

Global Industrial Embodied Intelligence Robotic Solution Market Size, in terms of sales revenue, 2021-2030E



Source: Mobile Robot and AGV/AMR Industry Alliance, CIC

Market Drivers

The following are the key market drivers:

- Core technology maturation:** The gradual refinement of technologies such as robotic mobile chassis, collaborative arms, navigation systems, and integrated control lays the foundation for large-scale deployment of industrial embodied intelligence robots. Continued advancements in large model technologies empower these robots with robust data processing and learning capabilities, enabling them to analyze complex environments with precision and efficiently respond to diverse task requirements.
- Manufacturing flexibility demand:** By integrating both “mobility” and “manipulation” capabilities, industrial embodied intelligence robots can adapt seamlessly to dynamic factory layouts and evolving production processes, meeting the demands of multi-product, small-batch, and rapid production switching.

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Market Trends

The following are the key market trends:

- **AGI-driven enhancement of generalization capabilities:** The integration of AI algorithms with multimodal perception technologies empowers industrial embodied intelligence robots to better adapt to unstructured industrial environments. Benefiting from the accumulation of real-world data across diverse scenarios and the efficient transfer of simulation-trained models to real-world tasks, VLA have matured and achieved practical deployment. Industrial embodied intelligence robots can not only interpret natural language commands and visual information to directly generate actionable instructions but also transfer learned knowledge and skills to new tasks or environments, significantly enhancing their versatility and application value.
- **Accelerated development efficiency for broader industrial penetration:** Leveraging AGI and the accumulation of multi-type datasets, extensive knowledge bases and algorithmic models have been constructed. Robot developers can utilize these pre-trained models for rapid secondary development and customized adjustments, substantially shortening development cycles. Meanwhile, by combining cloud-based training with on-premises deployment, robots can quickly adapt to the individualized needs of different factories, achieving precise “factory-specific” industrial application matching.
- **Large-scale deployment of industry-grade solutions driving industrial transformation:** Leading manufacturers, leveraging their deep expertise in industrial scenarios and hardware-software integration, have developed industry-grade integrated solutions that span the entire production ecosystem, from raw material handling, component processing, and product assembly to finished goods warehousing.

Competitive Landscape of Global Industrial Intelligent Mobile Robotic Solution Market

The global industrial intelligent mobile robotic solution industry is relatively fragmented. In terms of relevant robot units sold of global industrial intelligent mobile robotic solutions in 2025, the top five participants collectively account for 35.6% of the market share. In this highly competitive sector, our Company ranks among the global top five providers of industrial intelligent mobile robotic solutions by units sold in 2025, with a market share of 2.6%. Below is a summary of the leading five players in the global industrial intelligent mobile robotic solution market in terms of sales volume of global industrial intelligent mobile robotic solutions and market share in 2025:

Rank	Company	Sales volume (In thousand units)	Market share
1	Company A ⁽¹⁾	15.0	17.3%
2	Company B ⁽²⁾	7.4	8.5%
3	Company C ⁽³⁾	3.8	4.3%
4	Company D ⁽⁴⁾	2.5	2.8%
5	The Company	2.3	2.6%

Source: CIC

Notes:

- (1) Company A, founded in 2016 and headquartered in Chinese mainland, is a subsidiary of a company listed on the Shenzhen Stock Exchange. It is a global leader in machine vision and mobile robotic solutions, primarily serving industrial applications, with business operations worldwide.
- (2) Company B, founded in 2017 and headquartered in Chinese mainland, is a privately held company and a global leader in industrial mobile robotic solutions, focusing on intelligent mobile robots and laser radar in the photovoltaic sector, with operations across Asia, Europe, and the United States.

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- (3) Company C, founded in 2020 and headquartered in Chinese mainland, is a company listed on the Hong Kong Stock Exchange and a global leader in mobile robotic solutions and robotic controllers, primarily serving industrial applications, with business operations worldwide.
- (4) Company D, founded in 2013 and headquartered in Denmark, is a subsidiary of a company listed on the New York Stock Exchange. It is a global leader in AMR, used across a wide range of industries, with operations primarily in Europe and North America.

The table below sets forth the top five robotic solution providers in the China’s industrial intelligent robot industry, ranked by the sales volume of industrial intelligent mobile robotic solutions in China in 2025, according to CIC.

Rank	Company	Sales volume (In thousand units)	Market share, %
1	Company A	13.5	26.6%
2	Company B	7.2	14.3%
3	Company C	3.3	6.5%
4	The Company	2.0	4.0%
5	Company E ⁽¹⁾	2.0	3.9%

Note:

- (1) Company E, founded in 2016 and headquartered in Chinese mainland, is a privately held company specializing in 3D vision perception and industrial mobile robotic solutions, providing intelligent automation solutions across various industries.

The following table illustrates the key performance metrics of top five players globally.

Company	Market positioning	Price range, RMB thousand	Maximum number of robots that can be scheduled in a single scenario, Unit	First sale of robot controllers	First commercial implementation SLAM navigation	First humanoid embodied intelligence robot
The Company	Global leader in industrial intelligent mobile robotic solutions, currently primarily focused on 3C, semiconductors, and automotive industries.	60–1,111	~2,000	2016	2017	2025
Company A	Global leader in machine vision and mobile robotic solutions, currently primarily focused on 3C, new energy, semiconductors, construction machinery, automotive and etc.	50–400	~2,000	Not launched	2017	2026
Company B	Global leader in industrial mobile robotic solutions, currently primarily focused on Photovoltaic.	100–400	~500	Not launched	2018	Not launched
Company C	Global leader in mobile robotic solutions and robotic controllers, currently primarily focused on 3C, automotive, automation equipment, new energy, semiconductors, construction machinery and etc.	50–300	Not available	2020	2021	2025
Company D	Global leader in AMR, currently primarily focused on automotive, 3C and etc.	200–700	~100	Not launched	Not available ⁽¹⁾	Not launched

Note:

- (1) Not available as such information is not publicly available.

Source: Public information, CIC

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Entry Barriers and Key Success Factors

The following are the entry barriers and key success factors:

- **Continuous product innovation and modular development capabilities:** Solution providers of industrial intelligent mobile robots must continuously invest in R&D to break traditional design limitations and develop robots with higher load capacity and flexibility suited to complex industrial environments. Through modular development, providers can achieve rapid customization and flexible configuration, enabling quick response to market demands and deployment of robots tailored to diverse application scenarios.
- **Advanced unit intelligence for precise control and intelligent decision-making:** The intelligence level of individual robots is key to achieving efficient operations in real industrial settings. In terms of motion control, solution providers with in-house controller development capabilities can tailor motion strategies to specific robot features and application needs, adjusting in real-time to environmental changes for high-precision and responsive control. On the decision-making front, providers need to gather task instructions, operational feedback, and environmental data from real-world scenarios. Training intelligent systems with task generalization and cross-scenario adaptation capabilities enables robots to evolve from single-point applications to efficient deployment across diverse scenarios, meeting complex industrial demands.
- **Full-stack proprietary and open compatible software architecture:** A full-stack self-developed software system, covering robot operating system, motion control, and task scheduling, ensures deep integration and optimization between software and hardware, enhancing system stability and security. Meanwhile, open operating system offers better compatibility and scalability, supporting cluster scheduling and management of different types and brands of robots.
- **In depth application experience and scalable industry-grade solutions through swarm intelligence:** Providers must possess deep understanding of various industry processes and needs to develop standardized, scenario-based solutions. By integrating swarm intelligence and multi-robot coordination, providers can deliver comprehensive solutions that cover all aspects of the production system, achieving continuous and efficient operations. Through commercial deployment, a positive feedback loop of “data collection–model iteration–performance improvement” can be established, continuously enhancing solution performance and reliability to meet growing customer demands.
- **Supply chain management and cost control capabilities:** Proprietary core technologies are essential for building a secure and controllable supply chain. In-house R&D and manufacturing ensure component quality and supply stability. Additionally, by scaling up production, providers can reduce unit costs, enhance product competitiveness, and achieve both large-scale application and economic benefits.
- **Global service capability and localized operational support:** To meet the needs of global expansion, providers must build comprehensive global service networks that offer timely and efficient support across pre-sales consulting, project deployment, remote maintenance, and spare parts. Enterprises with integrated hardware-software delivery capabilities and localized technical support are key to winning global customer trust and fostering long-term partnerships.

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Cost Analysis of Key Components for Industrial Intelligent Mobile Robots

The functionality of industrial intelligent mobile robots heavily relies on critical components such as controllers, power batteries, motors, LiDAR, and structural components. The performance of these components directly influences the robot’s intelligence level, operational efficiency, endurance, and functional safety. Among these, expenditures related to power batteries and LiDAR are relatively high. The power batteries are crucial for enabling efficient industrial intelligent mobile robot operation, impacting endurance, and efficiency. LiDAR enables real-time obstacle detection and distance measurement through high-precision environmental perception.

Advancements in component technologies and strengthened industry collaborations have significantly enhanced the industrial intelligent mobile robot supply chain. Costs for key components such as power batteries and LiDAR are gradually declining, driven by the rise of domestic suppliers and efforts toward standardization. Taking LiDAR as an example, the cost of LiDAR used in industrial intelligent mobile robots generally exceeded RMB10.6 thousand in 2021. Currently, the price range has dropped significantly to between RMB1.5 thousand and RMB10 thousand, with an average price of around RMB5.7 thousand. Furthermore, as the market matures and production scales expand, these costs are expected to decrease further, with LiDAR expected to fall to around RMB3.8 thousand by 2030, accelerating the adoption of industrial intelligent mobile robots across broader industries. Additionally, continuous innovation in power battery technology is a critical factor in enhancing robot performance. For instance, optimizations in lithium-ion batteries and power management units extend robot runtime, while battery management systems monitor battery status to ensure safe and efficient operation. The synergy between cost reduction and performance improvement will propel the expansion of industrial intelligent mobile robotic applications, fostering sustained industry upgrades.

SOURCE OF THE INDUSTRY INFORMATION

CIC was commissioned to conduct an analysis of, and to report on the global industrial intelligent robotic solution industry at a fee of approximately RMB765,200. The commissioned report has been prepared by CIC, independent of the influence of the Company and other interested parties.

CIC’s services include, among others, industry consulting, commercial due diligence and strategic consulting. CIC conducted both primary and secondary research using a variety of resources. Primary research involved consumer surveys and interviewing key industry experts and leading industry participants. Secondary research involved analyzing data from various publicly available data sources, such as the National Bureau of Statistics of China, information released by other Chinese government authorities, annual reports published by industry participants, industry organizations, as well as CIC’s internal database.

The market projections in the commissioned report are based on the following key assumptions: (i) that the overall global social, economic and political environment is expected to maintain a stable trend over the next decade; (ii) that related key industry drivers are likely to continue driving growth in the industry during the forecast period; and (iii) that there is no extreme force majeure or set of industry regulations in which the market situation may be affected either dramatically or fundamentally.

Our Directors confirm that, after making reasonable enquiries, there is no material adverse change in the market information since the date of the CIC Report which may qualify, contradict or have an impact on the information in this section.