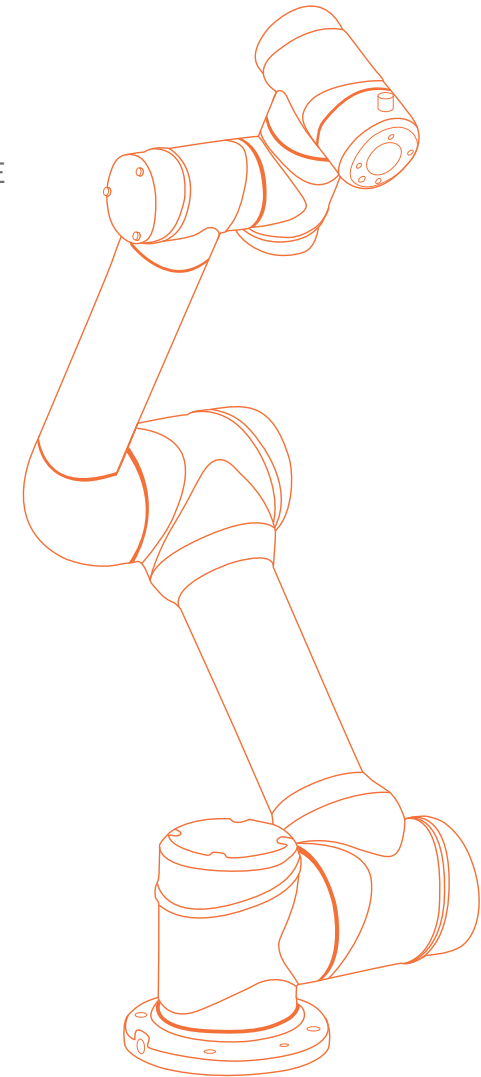




COLLABORATIVE ROBOT

INTELLEGENGE CHANGES THE WORLD
COLLABORATION CREATES THE FUTURE



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AU

COLLABORATION

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CREATES THE FUTURE

**INTELLIGENCE CHANGES THE WORLD
COLLABORATION CREATES THE FUTURE**



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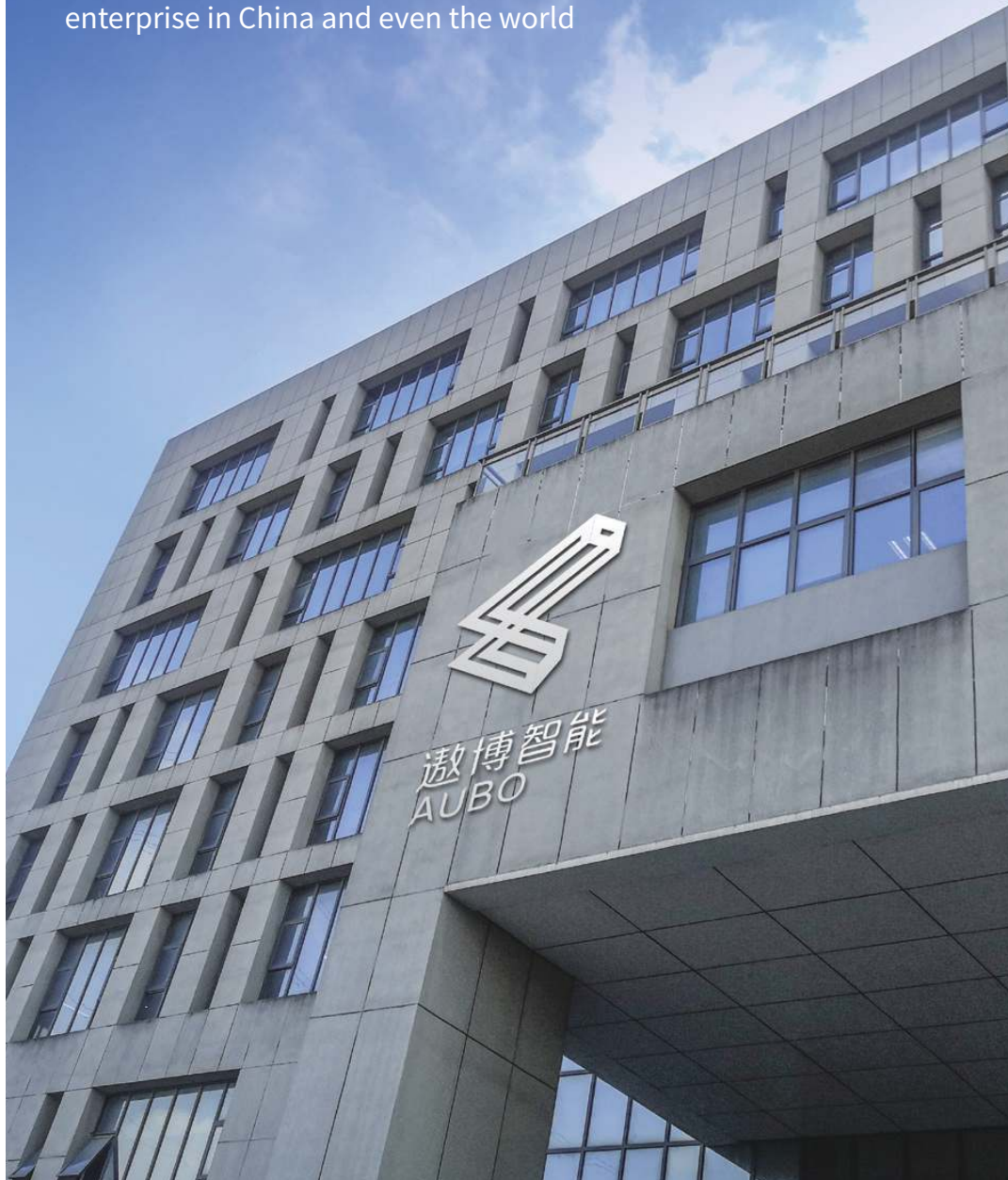
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Determined to become an
outstanding collaborative robot
 enterprise in China and even the world



01

COMPANY PROFILE

Provider of Overall Solution to Collaborative Robots

Established in 2015, AUBO Robotics is a national high-tech enterprise specialized in the research & development, production and sale of collaborative robots.

As a global leading provider of collaborative robots, AUBO has developed collaborative robot products with complete intellectual property rights, realizing full localization of core parts. AUBO's products have successively passed the certification of (PL=d, CAT 3), CE, UL, KCs, etc. Featured by safety, stability and simple programming, the products are widely applied in the fields such as 3C, automobile, hardware and household appliances, sanitary appliances for kitchens and bathrooms, medical health, scientific research and education, catering, new retail, chemical products for daily use, and logistics.

Looking forward to the future, with the body of collaborative robot as the core and ecological products as the link, AUBO will provide customers with "plug and play" one-stop solutions, build an ecological innovation system of the robot industry, and collaborate the upstream and downstream enterprises to boost the development of the collaborative robot industry.



·Headquarters: Beijing



Production Base:Changzhou , Jiangsu



Setter and promoter of industrial standards



Localization of core parts

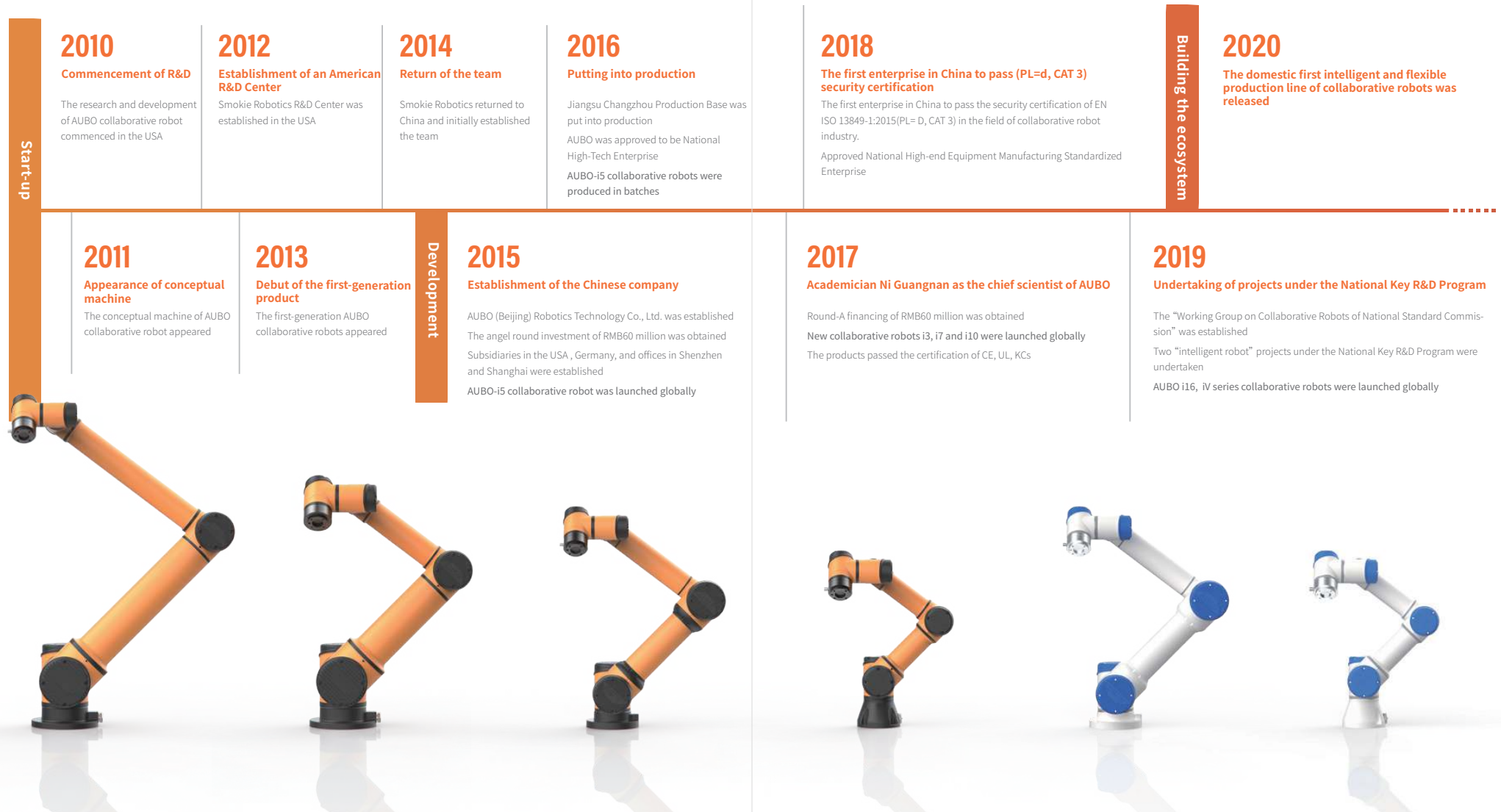


One-stop collaborative robot ecosystem

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DEVELOPMENT HISTORY



Intellectual Property (as at the date of Oct. 2020)

66

Effectively authorized patents

19

Authorized patents for inventions

44

Authorized patents for utility models

37

Software copyrights

3

Appearance patents

QUALIFICATION HONOR

As a pioneer in the field of collaborative robot, AUBO has always focused on the needs in the field of collaborative robots, constantly improved its ability of innovation, promoted the application of scientific research results, and won a number of honors.

- National High-Tech Enterprise
- Domestic Annual Highest Sales Volume (2017/2018/2019)
- IEEE Global Most Potential Collaborative Robot Enterprise
- The First Prize of Award for Scientific and Technological Progress in Machinery Industry
- National Pilot Unit for Standardization of High-End Equipment Manufacturing Industry (2/98)
- Drafting Unit of National Standard for Collaborative Robots (GB/T36008-2018)
- Secretariat Unit of the Working Group on Collaborative Robots of the National Automation Standards Commission
- Member of Expert Group on the International Standard for Robot Modularization ISO-TC299/WG10



R&D AND INNOVATION

Technical innovation is the core competitiveness of the enterprise. AUBO has always followed the road of being independent and controllable, and R&D and innovation. It has built an excellent technical innovation team, and established a normative product development process system. At present, more than 70% of team members are medium- and high-level technical and management talents.



Ni, Guangnan Chief Scientist

Academician of Chinese Academy of Engineering

Wei, Hongxing chairman

Member of the Institute of Electrical and Electronic Engineers (IEEE)
 Member of Association for Computing Machinery (ACM)
 Member of National Subcommittee for Robots and Robotic Devices
 Head of Working Group on National Standards for Robot Modularization
 Undertaken many projects in the field of robotics under National 863 and Natural Fund Programs
 Won 5 provincial and ministerial level awards and Beijing New Star in Science and Technology
 More than 100 papers, 2 monographs and 2 teaching materials

Setter of National Standard for Collaborative Robots

Relying on outstanding strength in technical R&D and distinctive status in the industry, AUBO has participated in the formulation of 21 national and industrial standards for robots, including 3 national standards it organized to formulate. AUBO has undertaken 6 projects under the National Key R&D Program, including 2 projects it organized to declare.

Titles of national standards it organized to formulate

《Design Specification of Industrial Robots for Human-Computer Collaboration》GB/T 39402-2020

《Universal Module Interface for Industrial Robots》GB/T 38560-2020

《Code for Detection of Multidimensional Force / Torque Sensor for Robot》20203656-T-604

Names of projects under the National Key Research & Development Program it organized to declare

《R&D and Integration Verification of Integrated Joints for Collaborative Robots》

《Application Demonstration of Collaborative Robot System for Typical Auto Parts Assembly》

3 Organized to formulate 3 national standards

18 Participated in the formulation of 18 national and industrial standards

2 Organized 2 projects under the National Key R&D Program of the Ministry of Science and Technology

4 Participated in 4 projects under the National Key R&D Program of the Ministry of Science and Technology

PRODUCTION CAPACITY

AUBO Production Base is located in Changzhou City, covers an area of 12,000m², and has an annual production capacity of 10,000 sets. In virtue of vertical integrated production capacity and complete supporting systems of the industry chain, AUBO can deliver high-quality products on schedule to meet customers' needs.

Production, process, quality, and supply chain integration of collaborative robots

01 Incoming Inspection

27 testing sections
Support for three-dimensional measurements
Full-size, full-function and total-quantity test coverage of key materials

02 Testing of Components

354 testing standards
126 kinds of testing equipment and tools

03 Testing of whole machine assembly

163 testing items
76 kinds of testing equipment and tools

04 Inspection of Finished Products

58 testing sections
21 kinds of testing equipment
Vibration test, high-temperature aging test, Dynalog repeatability test, noise test, and Leica laser calibration



Collaborative robot testing hall



Domestic first intelligent and flexible production line of collaborative robots

PRODUCT GUARANTEE

AUBO is committed to providing safe and reliable collaborative robot products for customers. The products have passed the certification of (PL=d, CAT 3), CE, UL, KCs, etc., guaranteeing the safety and reliability of the products throughout the life cycle.

The First Enterprise Passing Security Certification of PL=d, CAT 3 in China



EN ISO 13849-1:2015(PL=d, CAT 3)



CE



UL



KCs



CR





COLLABORATIVE ROBOT ADVANTAGES



Flexible Deployment

- Light, compact and small footprint.
- It takes only half a day in average to deploy the arm to execute new tasks.



Flexible Production

- With quick changeover of multiple function scenarios, human-machine collaboration, dual-machine collaboration and multi-machine collaboration, etc. can be adopted to realize flexible production.



Simple Programming

- It is available to master the programming method in half an hour, and complete simple programming in 1 hour.
- Dragging teaching and visualized programming to make the operation simple and efficient, you can operate robots easily without being proficient in programming language.



Wide Application

- The products have been applied in batches in the fields such as 3C, automobile, hardware and household appliances, sanitary appliances for kitchens and bathrooms, medical health, scientific research and education, catering, new retail, chemical products for daily use, and logistics.



Safety and Stability

- The products have passed the certification of (PL=d, CAT 3), CE, UL, KCS, etc.
- Level-10 collision detection and sensor safety testing are supported.
- The terminal does not drop in case of power failure, so the products are safe and stable.
- 16 safe I/O interfaces are provided, so the safety function does not lose in case of single failure.



System Opening

- Connection of multi-language environments, multiple communication protocols, and deep integration with third-party plug-ins.
- Communication protocols: TCP/IP, Modbus-RTU/TCP, Profinet.
- Interface and openness: SDK (supporting the development of C \ C++ \ Lua \ Python), API.
- Supporting Linux, Windows and Robot Operating System (ROS).



Modularization

- It's available to realize fast dismantlement and replacement within 15 minutes.
- The repair and maintenance are quicker and more convenient.



High Return on Investment

- Key and core components are 100% manufactured in China.
- The investment cost can be recovered within 6-12 months on average.



High Precision

- Millisecond-level system response ensures repeatability.
- The repeatability can be up to $\pm 0.05\text{mm}$.

SERIES COLLABORATIVE ROBOT

AUBO i series collaborative robots have a loading capacity of 3 to 16KG, which can cover different applications in each industry, and quickly adapt to the needs of application scenarios in various industries by means of abundant configuration options. They are ideal choices for improving the production efficiency and implementing the low-cost operation.

FEATURES AND BENEFITS

- 01 **Safer** The products have passed the certification of (PL=d, CAT 3), CE, UL, KCs, etc, all core parts are localized, and level-10 collision detection and sensor safety testing are supported, so no safety protection is required.
- 02 **More open** The open system platform supports multiple communication methods. SDK and API, and can establish communication with multiple peripheral equipment such as terminal jig and visual and mobile equipment.
- 03 **More precise** With repeatability of $\pm 0.05\text{mm}$, high-precision work can be completed continuously for a long time, thus greatly enhancing the production yield.
- 04 **Simpler** Robots can be operated by many methods including dragging teaching, coordinate positioning, path planning and offline programming. The visual interface is simple and easy to learn.
- 05 **Wider** The whole series products have a loading capacity of 3 to 16KG, which can cover different applications in each industry and have a wide range of applications.

Applicable Fields

3C, automobile, hardware and household appliances, sanitary appliances for kitchens and bathrooms, medical health, scientific research and education, catering, new retail, chemical products for daily use, and logistics.

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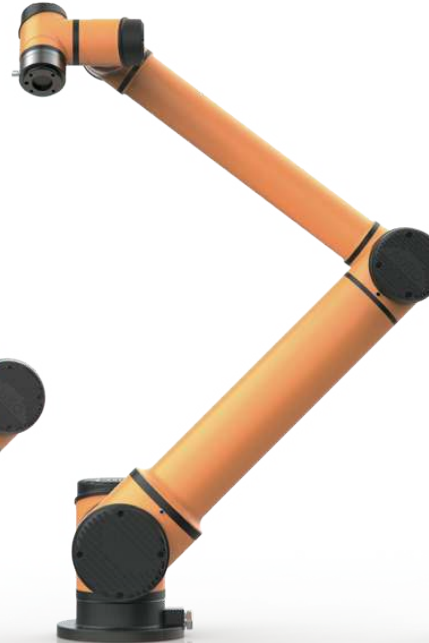
AUBO-i3

Payload: 3kg
Weight: 16kg
Repeatability: $\pm 0.05\text{mm}$
Reach: 625mm



AUBO-i5

Payload: 5kg
Weight: 24kg
Repeatability: $\pm 0.05\text{mm}$
Reach: 886.5mm



AUBO-i10

Payload: 10kg
Weight: 38.5kg
Repeatability: $\pm 0.1\text{mm}$
Reach: 1350mm




AUBO-i16

Payload: 16kg
Weight: 38kg
Repeatability: $\pm 0.1\text{mm}$
Reach: 967.5mm

RECOMMENDED INDUSTRIES

AUBO collaborative robots are designed for a variety of industrial processes and can be operated with simple training.

 3C	 Automobile	 Hardware and Household Appliances	 Sanitary Appliances for Kitchens and Bathrooms
 Chemical Products for Daily Use	 New Retail	 Catering	 Medical Health
 Logistics	 Scientific Research and Education	 Others	

















TYPICAL PROCESS

Industrial	Pick & Place Injection Molding	Assembly Gluing	Bagging & Palletizing Inspection	Screwing Soldering	Polishing & grinding
New-retail	Ice Cream Maker	Beverage Maker	Liquor Maker	Catering Robot	Kitchen Robot
Medical Health	Massage Robot	Auxiliary Puncture	Scanning	Moxibustion	
Compound Robot	Logistics Sorting	Pick & Place	Inspection		
Scientific Research and Education	Intelligent Production Line	Scientific Research and Development	Discipline Construction	Education Platform	

APPLICATION CASES

INDUSTRIAL FIELD



 Automatic 3D inspection	 Inspection of parts	 Inspection of mobile phones	 Appearance inspection of auto parts
 Inspection of circuit boards	 Instrument assembly	 Assembly and screwing of white household appliances	 Rubber assembly of auto electronic control systems
 Intelligent assembly of auto parts	 Welding	 Gluing of vehicle windows	 Stacking of packing boxes
 Vacuum cup stretching line	 Frame coating	 Pick & Place of injection molding machines	 Pick & Place of machine tools

APPLICATION CASES



NEW RETAIL / SERVICES



Latte art robot



Smart restaurant



Milk tea workstation



HEALTHCARE



Massage robot



Tooth implantation robot



Reagent testing



COMPOUND ROBOT



Inspection Robot



Intelligent archives



Vehicle inspection and maintenance



RESEARCH AND EDUCATION



Robot with digital twin technology



Music box assembly line



Education and training platform



OTHER FIELDS



Agricultural picking



High-voltage distribution cabinet operation



Hygiene & cleaning

AUBO ROBOTICS

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APPLICATION CASES

Compound Robot

Intelligent Workshop Logistics in Semiconductor Industry

This case is applied to the grinding workshops of semiconductor manufacturing enterprises. AUBO collaborative robot integrating AGV can realize automatic handling, pick & place in the process segments of waxing, rough grinding, fine grinding, hard polishing, soft polishing and cleaning at grinding stations.

This production line has a high return on investment with a payback period of 2.5 years. It can reduce about 46% of workshop employees and improve the total production capacity by 5%. It has high extendibility; after modification, the equipment can also be relocated only by adding a AGV. It improves the management level and efficiency of automatic production, and can meet the requirements on full-capacity production and follow-up upgrading of workshops.



Industrial

Water Pump Assembly Line

In domestic traditional production, water pumps are produced artificially or with special machines, which is relatively appropriate in case of a single product. This project is a demonstration line for automatic assembly of water pumps with human-machine collaboration, and is a typical application scenario of collaborative robots. With repeatability of $\pm 0.05\text{mm}$, AUBO collaborative robots can complete high-precision work continuously for a long time, thus greatly enhancing the production yield.



The whole production line can realize such processes as product pick & place, assembly, screwing, packing and stacking, and can minimize artificial procedures according to the existing production scenarios of small batches, multiple varieties, and many batches. AUBO collaborative robots are featured by flexible deployment and convenient line change, etc., and modular design is adopted in each procedure of the automatic line, which can be used in the production of various water pumps, providing convenience for enterprises to arrange production flexibly.

Medical Health

Massage Robot

In the traditional field of physiotherapy and massage services, re-adaption is always necessary due to high personnel turnover and high labor costs, and experience feeling and effects are usually affected by service personnel's different operation level. AUBO, together with its partners, has pioneered the application of collaborative robots in the field of physiotherapy and massage, helping enterprises to save labor costs.

It can adjust the diagnosis and therapy energy output automatically according to diagnosis and therapy results, complete massage synchronously according to customers' force preference, and memorize the massage trajectory automatically, so as to ensure individualized setting for different people all over the country.

Effects and experience feeling are not affected by different service personnel, and robots can compute the respiratory frequency according to big data so as to ensure safe, temperature-controlled, efficient and standard services in the full process.



New-retail

Dual-Arm Hamburger Robot

In smart catering industry, AUBO has started business operation officially by cooperating with many restaurants at present. In addition to hamburger robots, the application of robots in restaurants includes stir-fry robots, soup rice robots, drinks robots, frying robots, dessert robots and meals-delivery robots, etc.

In this case, two sets of AUBO i3 products are installed inversely, which can be compatible with two mechanical arms to make hamburgers at the same time. After a customer places an order by scanning the QR code, the upper computer sends a signal to the mechanical arms to start the making of hamburger. One mechanical arm mainly grabs bread pieces from the material silo and sends them to the heating furnace, and cooperates with the sauce machine to pour the sauce onto the heated bread pieces; the other mechanical arm takes vegetables and returns the tray. Then, the mechanical arms complete the combination of the upper and lower pieces of bread. After packing, the mechanical arm places the packed hamburger onto the conveyor belt. The customer can scan the QR code to open the pickup window. Here, the purchase process is completed.



APPLICATION CASES

Industrial

Frame coating

AUBO collaborative robots have the function of drag & teach. The operator can drag the robot joints directly, move to the ideal posture and record it. Then the robot can work automatically according to the path. The worker do not need too much robot operation knowledge to complete the work, which is simple and efficient.

In this case, workers drag and teach AUBO collaborative robot to do the frame coating. Coating can cause certain harm to human body. This application protects labors' health better and make labors free from low-value and repetitive job to more creative job.



Industrial

Welding

AUBO collaborative robot now is able to do gas shielded arc welding.

Specific Plugin

Operator could easily set up welding parameters, generate script files and achieve various welding processes in a short time with the help of welding plugin.

Accurate Track

Smooth and accurate moving track for better welded seam.

Better Reach

Able to reach and weld parts at place where human cannot reach.

Labor Saving

Auto operation, release human labor from the harsh welding environment.



Industrial

Palletizing

Easy to program, a plugin software is preinstalled to the system, it could simplify the palletizing programming

AUBO robot is working in the package line to palletize packed products to a tray.

High efficiency and accurate positioning, complete task quickly while keep product intact.

High mobility, by installing it on a mobile platform, it could move to multiple work position and conduct palletizing.



Industrial

Assembly and screwing of white household appliances

This case mainly completes the installation and locking of the back plate in the production process of the washing machine. The original production line was manual operation, but currently automated operations are realized through AUBO collaborative robots.

The main function is to realize the automatic assembly and screw lock of the back plate. The application can not only realize intelligent production, but also reduce labor costs and the work intensity, which plays an important role in promoting the development of smart manufacturing in the home appliances industry.



GLOBAL SERVICES

Around the global headquarters and manufacturing bases, AUBO has established sales centers in the eastern region, southern region and northern region, etc. of China, and overseas after-sales service centers in the USA and Germany, etc. Now, AUBO has more than 200 distributor partners from more than 50 countries in the world, and can provide efficient and convenient professional services for you.



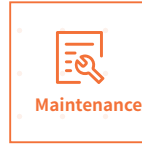
To provide technology evaluation, accessory selection and debugging services.



To provide product usage trainings to distributors free of charge regularly, and cultivate professional robot engineers for customers.



To realize real-time technology answers and resource sharing by technical forum and hotline.



To provide lifetime repair and customized maintenance of robots, and provide software upgrading package to customers and instruct them how to install.



Model	i3	i5	i10	i16
Robot Degrees of Freedom	6	6	6	6
Weight (kg)	16	24	38.5	38
Reach (mm)	625	886.5	1350	967.5
Mounting Surface Diameter (mm)	Ø140	Ø172	Ø220	Ø220
Dimensions (mm)	832*266*140	1060*323*170	1562*418*170	1183*420*218
Payload (kg)	3	5	10	16
Repeatability (mm)	±0.05	±0.05	±0.1	±0.1
Linear Velocity (m/s)	≤1.9	≤4.0	≤4.0	≤4.0
Average Power (W)	150	400	500	600
Peak Power (W)	600	2000	2000	2000
Ambient Temperature (°)	0-50	0-50	0-50	0-50
Ambient Humidity	25%-90%	25%-90%	25%-90%	25%-90%
Installation Orientation	Any ceiling, Floor, Wall	Any ceiling, Floor, Wall	Any ceiling, Floor, Wall	Any ceiling, Floor, Wall
IP Classification	IP54	IP54	IP54	IP54

Axis Movement	i3		i5		i10		i16	
	Working Range (°)	Maximum Speed (°/s)	Working Range (°)	Maximum Speed (°/s)	Working Range (°)	Maximum Speed (°/s)	Working Range (°)	Maximum Speed (°/s)
joint 1	±175	180	±175	220	±175	180	±175	180
joint 2	±175	180	±175	220	±175	180	±175	180
joint 3	±175	180	±175	220	±175	147	±175	267
joint 4	±175	180	±175	230	±175	180	±175	180
joint 5	±175	180	±175	230	±175	180	±175	180
joint 6	±175	180	±175	230	±175	180	±175	180

Category	Control Box I/O/Tool I/O			Control Box	Tool End
Control Box Model	AUBO-CB-M			I/O Port	4 (optional)
Dimensions	380mm*350mm*265mm			Digital In	16 (general)/16 (safe)
Weight	15kg			Digital Out	16 (general)/16 (safe)
Cabling Connecting the Robot	5m (customizable, up to 8m)			Analog In	4
Cabling Connecting the Teach Padent	4m			Analog Out	4
Communication	Ethernet/Modbus-RTU/TCP, Profinet (Optional)			I/O Power	24V
Interface	SDK (Support C/C++/Lua/Python) 、Support ROS、API			Output Voltage	0V/12V/24V
Power Supply	100-240VAC, 50-60Hz			Output Current	3A Max
IP Classification	IP43				0.8A



AUBO-CB-M

Teach Pendant	Model	AUBO-TP
	Dimensions	355*235*54mm
	Weight	1.57kg
	IP Classification	IP43

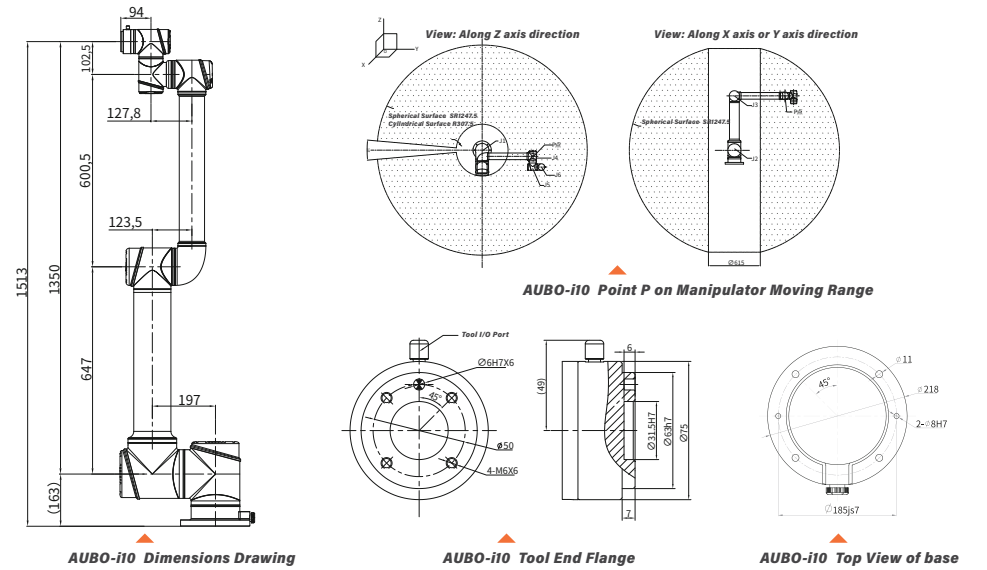
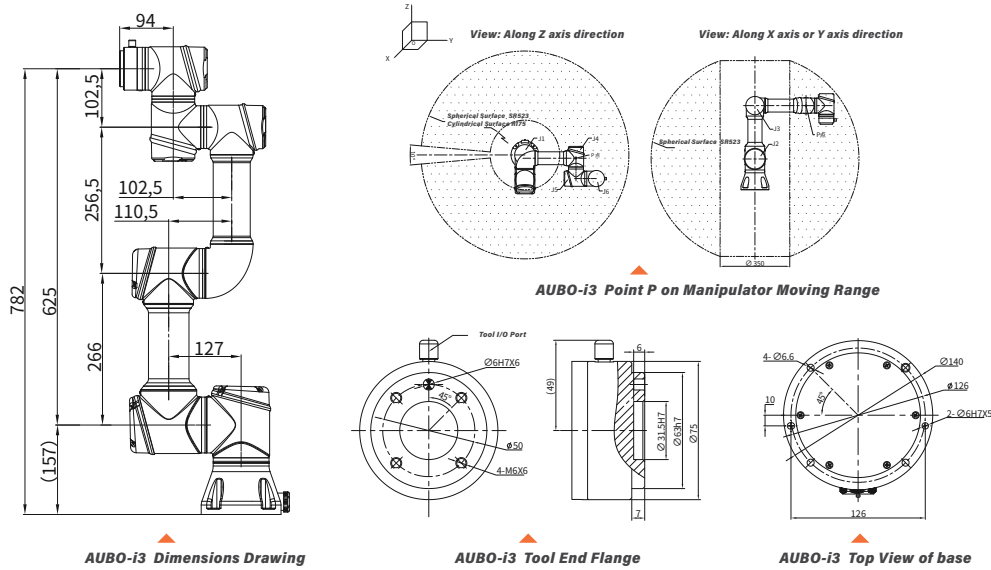
Teach Pendant

i3 Dimensions Drawing

DIMENSION DRAWINGS

DIMENSION DRAWINGS

i10 Dimensions Drawing



i5 Dimensions Drawing

i16 Dimensions Drawing

