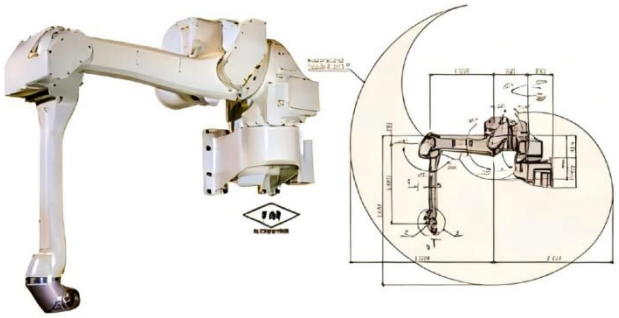
Robotic Automated Spraying/Grinding

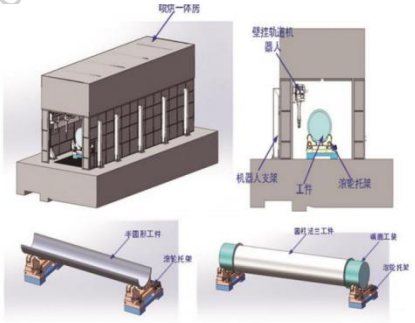
I. Working Process

This series of industrial robots adopts a mature articulated mechanical structure design, utilizing computer numerical control systems for full-process intelligent operation. The core operating process focuses on high-precision trajectory reproduction, heavy-duty stable operation, and flexible operation. It can adapt to various industrial process modes such as continuous cyclic operation, precise point-to-point operation, and complex curved surface operation, without requiring continuous human intervention throughout the entire process, with high automation level and strong process adaptability.

Standard models adopt 5-6 degrees of freedom articulated structure with wide arm motion range and large movement amplitude, capable of easily completing complex trajectory movements in three-dimensional space to meet most industrial handling, assembly, welding, stacking, and other basic and advanced process requirements. The wrist is equipped with 2-3 degrees of freedom as standard, with flexible steering and precise positioning, capable of multi-angle, multi-directional operation. High-end models feature 7-axis flexible design with flexible wrist structure. The motion logic closely mimics the human wrist, capable of 360-degree flexible rotation and multi-directional bending, easily passing through narrow apertures to complete internal surface spraying, inner wall grinding, cavity cleaning, and other delicate complex processes inside workpieces, perfectly solving blind spot operation problems that traditional equipment cannot reach.

The equipment supports multiple control methods such as program preset, trajectory programming, and offline debugging. Operating paths, work speeds, and action force can be customized according to different production processes, simultaneously adapting to special conditions such as explosion-proof, dust-free, and high-temperature. The operation rhythm is stable and continuous, precisely matching upstream and downstream production line rhythms, achieving single-machine independent operation or multi-machine networked collaboration, fully connecting the entire automated production process.









II. Core Parameters

1. Basic Configuration and Structure

Core Components: High-precision robot body, dedicated industrial computer, complete set of intelligent control system. Structure Type: Multi-degree of freedom articulated structure, flexible operation, precise trajectory, suitable for complex space operations. Axis Specification: Standard 6-axis, advanced 7-axis (flexible wrist model), select according to needs. 7-axis flexibility far exceeds standard 6-axis. Wrist Design: Standard 2-3 degrees of freedom, high-end flexible wrist supports multi-directional bending and 360-degree rotation, suitable for narrow space operations.

2. Core Performance Parameters

Load Capacity: Four mainstream heavy-duty specifications of 150KG, 175KG, 205KG, 235KG, covering most industrial heavy-duty operation requirements

Working Reach: Four options of 2.65m, 2.8m, 3.05m, 3.2m. Large reach covers wide operation areas without blind spots

Operating Performance: Fast action response, high operating speed, high trajectory repeat positioning accuracy, no deviation during long-term operation

Beijing Lifeng Zhitong Environmental Technology Development Co., Ltd.

Special Performance: Standard explosion-proof protective design, suitable for high-risk explosion-proof scenarios such as spraying, meeting safety standards

3. Partner Brands

Bringing together top international and domestic brands with complete models and reliable quality, including: FANUC, ABB, Yaskawa, KUKA, EPSON, Estun, Kawasaki, and others. Brand models can be precisely matched according to budget and process requirements.

III. User Guide

1. Installation and Deployment: The equipment must be installed on a level and solid industrial foundation with sufficient operation space reserved in advance, avoiding obstacles and high-risk areas. Professional technicians should complete body fixation, wiring, control system wiring, and network debugging. After installation, conduct no-load trial operation first, calibrate operating trajectory, joint angles, and positioning accuracy. Then write operating programs according to actual production processes. Formally put into production after completing load debugging. Non-professional personnel are strictly prohibited from installing or wiring without authorization.

2. Operation Standards: Operators must receive professional training, be familiar with control system operation, program editing, emergency stop control, and basic fault troubleshooting processes. Before starting, check robot body joints, cables, fixtures, and protective devices to ensure they are in good condition, clear debris from the operation area, and start the control system after confirming no abnormalities. During operation, it is strictly prohibited to enter the robot's operation radius. Do not touch moving joints, wrists, or end effectors with bare hands. To adjust process parameters, replace fixtures, or modify operating trajectories, first pause the equipment and lock the emergency stop, then restart after debugging to avoid safety accidents caused by improper operation.

3. Daily Maintenance: After daily work, clean dust, oil stains, and waste from the robot body, wrist, and operation area. Check cables for wear and interfaces for looseness. Weekly lubricate joint bearings and transmission parts. Check explosion-proof devices and emergency stop button sensitivity. Monthly calibrate operating trajectory and positioning accuracy, check control system software and hardware status. Regularly

replace wearable parts. For long-term shutdown, provide dust and moisture protection, cover with protective cover to avoid component aging and dust affecting service life. It is recommended to establish a dedicated maintenance log to ensure long-term stable equipment operation.

4. Safety Precautions: Warning signs and safety barriers must be set up in the equipment operation area. Unrelated personnel are prohibited from approaching. Explosion-proof models are limited to corresponding explosion-proof conditions. Do not modify or disassemble explosion-proof components without authorization. If abnormal situations such as unusual sounds, jamming, or deviation occur during equipment operation, immediately press the emergency stop button, cut off power, and contact professional personnel for maintenance. Operation with existing faults is prohibited. Strictly operate according to rated load parameters. Overloading is strictly prohibited to avoid damaging the body structure and control system, ensuring production safety.

IV. Product Advantages

Greatly Improve Production Output: Can operate 24 hours continuously without interruption, without fatigue or rest. Fast operating speed and high work efficiency far exceed manual labor capacity, completely breaking human work and rest limitations, comprehensively increasing total production within unit time.

Strictly Control Costs, Significant Cost Reduction and Efficiency Improvement: Replaces manual labor for high-risk and highly repetitive processes, reducing labor costs for salaries, social insurance, and management. Simultaneously reduces material waste and defective product losses, lowers inventory backlog and extra costs from complex processes, saves production floor space, and significantly reduces overall production investment.

Stably Improve Product Quality: Precise operating trajectory and uniform action force, no deviation in repetitive operations, avoiding quality inconsistency caused by manual operation errors and tactile differences, ensuring unified standards for product appearance, precision, and performance, greatly improving product qualification rate and finished product quality.

Ensure Production Site Safety and Health: Replaces manual labor for high-risk, high-pollution, and high labor intensity work such as spraying, grinding, heavy-duty handling,

and high-temperature operations. Away from risks of dust, chemical reagents, and mechanical injuries. Eliminates work injury risks from the source, improves production environment, alleviates employee physical exhaustion, and reduces employment safety hazards.

Solve Employment Difficulties, Stabilize Production: Completely solves industry pain points such as difficulty in recruiting, high employee turnover rate, and labor shortages. No need to worry about production stagnation caused by personnel turnover, ensuring long-term stable production line operation and reducing training costs and production fluctuations caused by personnel changes.

Strong Production Flexibility, Adaptable to Process Upgrades: Quickly switch operating processes, product models, and production tasks by modifying programs. Adapts to multi-category, small-batch, and customized production needs, flexibly responds to market order changes, enhances enterprise production flexibility and market adaptability, suitable for complex processes and non-standard operation scenarios.

Excellent Performance, Wide Adaptability: 6-axis/7-axis flexibly optional, complete large reach and heavy-duty specifications. Flexible wrist adapts to narrow space complex operations, explosion-proof performance meets standards, can adapt to multiple special conditions, paired with first-tier brand core components, strong stability, low failure rate, convenient later maintenance.

V. Applicable Industries

This series of 6-axis and 7-axis heavy-duty industrial robots, with their core features of high flexibility, high load capacity, explosion-proof durability, and more, are widely applied across major manufacturing sectors. They cover all scenarios of automated production, spanning industries such as **automotive and component manufacturing, hardware machinery and mold industry, home appliance manufacturing, painting and coating, foundry and building materials, 3C electronics and precision manufacturing, new energy, warehousing and logistics, rail transit, and construction machinery.**