

ARC-500FS Four-Station Manual Welding A Revolution in Industrial Efficiency and Technology



Wenzhou, Zhejiang Apr 2, 2026 (IssueWire.com) - Keygree's [ARC-500FS four-station manual welding](#) equipment is designed to address the persistent problems that are common in traditional discrete welding workstations and seriously affect efficiency and quality.

Fragmentation of production cycle time and bottlenecks in labor efficiency

1. In traditional single-station operations, a welder must independently complete all processes from picking up parts, clamping, welding, cleaning to unloading. A large amount of non-value-adding auxiliary time (accounting for about 50%-70%) is intertwined with the core welding time, resulting in a long and unstable production cycle.

In single-station mode, the welding arc burning time accounts for only a small portion of the total workpiece processing time, with a significant amount of time spent on workpiece clamping, alignment, flipping, cooling, and turnover. This results in low equipment utilization and a clear bottleneck in production capacity.

- The quality of manual welding is greatly affected by the welder's fatigue, mood, and physical condition. Prolonged continuous work can easily lead to decreased concentration, causing defects such as undercut, incomplete penetration, and porosity, making it difficult to guarantee consistent quality.
- Fully automated welding machines are difficult to change models and are suitable for large-scale production; while completely fragmented manual operations have high management costs and low efficiency.
- Multiple single workstations scattered across the site require a large amount of floor space, and the workpiece flow paths are chaotic, posing safety hazards and low logistics efficiency.

To address these challenges, Keygree's ARC-500FS offers a comprehensive solution.

1. By enabling four parallel workstations to operate independently, the ARC-500FS effectively overlaps auxiliary tasks—such as loading, clamping, and unloading—with continuous arc-on time, maximizing equipment utilization and minimizing idle periods. For instance, a patent describes an N-station auxiliary device that effectively shortens the robot's idle time by establishing independent inspection, disassembly, and installation stations. As a system that can be operated simultaneously by four people, the ARC-500FS maximizes this parallel concept, theoretically capable of multiplying the average production cycle time of a single product.

2. Standardized Operations: The tasks at each workstation are fixed and repetitive, making it easier for workers to master the skills and reducing errors caused by complex processes.

Reduced Labor Intensity: Workers are no longer required to handle heavy workpieces or perform frequent clamping operations, allowing them to focus their physical and mental energy on the welding process itself. The experience of Shijiazhuang Coal Mining Machinery Co., Ltd. demonstrates that one of the core motivations for adopting advanced welding equipment is to "reduce the labor intensity of employees and improve the working environment."

: Based on search results, the ARC-500 welding machine (which should be in the same series as the ARC-500FS or have similar functions) features microprocessor-based precise control of welding

parameters, a monitoring system, and error code display. This provides welders with a stable and reliable "weapon," reducing quality problems caused by equipment fluctuations.

- The four-station system is essentially a **"flexible workstation."** As designed for flexible assembly systems, it can "adapt to the needs of automated assembly of different products with varying models, process requirements, and batch sizes within a certain range." By quickly changing general-purpose or special-purpose fixtures at the workstations, the system can rapidly switch between different product families. In manual welding mode, this flexibility is further enhanced by the adaptability of the "human," enabling a production line to flexibly respond to diverse order demands.
- The four-station system has a high degree of integration and occupies a much smaller area than four independent workstations. Its rotary design makes the material flow path fixed, short and predictable, realizing "workpiece finds person (workstation)" rather than "person finds workpiece", which greatly optimizes the workshop layout and material flow.

Concept and Principle Analysis: What is "Four-Station Manual Welding"?

Contrary to what the name might suggest, "four-station manual welding" does not mean one machine performs four automated welds at once. Instead, it describes a system where up to four welders work independently at separate stations, all powered by a single, shared welding power source. Its basic design concept stems from the modular and integrated reconstruction of traditional welding workstations.

Its structure typically consists of the following core parts.

The essence of this architecture is to maximize the use of the resources of an expensive, high-performance digital welding power supply through scientific allocation of time and space, thereby creating several times the value of a single workstation per unit of time.

Outlook for Expanding Application Scenarios

The applications of four-station manual arc welding machines extend far beyond conventional metal component welding. Their flexibility, digitalization, and resource-sharing capabilities enable them to excel in many emerging and specialized fields.

1. On-site construction for large-scale engineering projects: In shipbuilding, bridge construction, and other similar sites, the ARC-500FS can be deployed in the central area, with its four outputs radiating to multiple surrounding welding points for the installation and welding of supports, stiffeners, and other accessories. This avoids frequent relocation of heavy-duty welding machines and improves the collaborative operation capabilities of limited equipment on large construction sites.

2. Repair and remanufacturing workshops: Repair work often involves a wide variety of workpieces and processes. This equipment allows one welder to repair steel structures while another repairs stainless steel containers, and a third welder handles aluminum alloy components, achieving highly efficient "general practitioner" operation in the repair workshop.

- Supplementing and backing up automated production lines: A four-station welding machine can be configured alongside a highly automated production line to flexibly handle small-scale repair welding after robotic welding, on-site fabrication and repair of tooling and fixtures, or serve as an emergency production measure in case of robot malfunction, ensuring uninterrupted production.

Conclusion

The Keygree ARC-500FS modular four-station manual arc welding machine represents a significant direction in the development of welding equipment towards intelligence, flexibility, and intensification. Through its innovative system architecture and digital control technology, it integrates three major goals: improving equipment utilization, ensuring welding quality stability, and enhancing production flexibility. This provides a cost-effective and future-oriented welding productivity solution for a wide range of small and medium-sized manufacturing enterprises.

This equipment not only solves the specific cost and efficiency challenges in current welding operations, but its modular design and digital core also reserve the potential for integration into the Industrial Internet of Things (IIoT). In the future, by connecting with a Manufacturing Execution System (MES) to achieve full traceability and analysis of welding data, it will further promote the transparency and intelligence of welding production management. Investing in the ARC-500FS is more than acquiring a welding machine—it's a strategic move toward building a smarter, more adaptable, and future-ready manufacturing operation.

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