Thermocouple Wire Welder

Thermocouple Welding Machine for Fine Wire Junctions

Application: Welding of fine thermocouple wires (B, C, E, J, K, R, S, T types)
Manufacturer: KingPo Technology Development Limited www.dgkingpo.com Tel: +86-769-81627526

1. Product Overview

The KingPo Thermocouple Wire Welder is a specialized welding machine designed to create reliable spherical junctions on fine thermocouple wires. It is suitable for industrial thermocouples such as B, C, E, J, K, R, S, and T types, helping improve measurement accuracy and long-term reliability in temperature sensing applications.

The machine operates by passing a controlled high current through the thermocouple wires, instantly melting and fusing the ends into a uniform spherical bead. This method provides excellent electrical continuity and mechanical strength, superior to traditional twisting or crimping methods, especially for fine-diameter wires used in precision temperature measurement.

2. Key Features

- **Wide Wire Diameter Range** — Supports thermocouple wire diameters from 0.01 mm to 1.0 mm.
- **Arc Drawing Welding Method** — Instantaneous high current creates clean, uniform spherical junctions with minimal spatter or deformation.
- **Multi-Type Thermocouple Compatibility** — Suitable for B, C, E, J, K, R, S, and T type thermocouples.
- **Simple Manual Control** — Easy-to-use interface requiring minimal training for consistent, high-quality welds.
- **Compact & Portable Design** — Suitable for laboratory use as well as on-site maintenance and repair.
- **Inverter-Based High-Frequency System** — Provides precise energy delivery and stable welding performance.
- **Versatile Application** — Can also be used for welding other fine metal wires and filamentous electronic components.

3. Technical Specifications

Parameter	Specification	Notes
Model	KP-TW31	Standard model
Voltage / Frequency	220V, 50-60Hz	Standard industrial power
Welding Wire Diameter	0.01 – 1.0 mm	Suitable for fine thermocouple wires
Welding Method	Arc drawing type (Butt welding)	Forms uniform spherical junction
Control Mode	Manual	Simple and stable operation
Applicable Thermocouples	B, C, E, J, K, R, S, T types	Industrial grade thermocouples
Power Consumption	Standard industrial power	–
Portability	Compact design	Easy to carry for lab and on-site use
Additional Application	Fine metal wire welding	Suitable for other filamentous components

4. Working Principle

The Thermocouple Wire Welder operates by passing a controlled, short-duration high current through the contact point of two thermocouple wires. This concentrated energy rapidly heats and melts the wire ends, which then cool and solidify into a small, uniform spherical bead (junction).

This spherical junction provides excellent electrical continuity and sufficient mechanical strength, which is critical for accurate and stable temperature measurement. Compared to traditional twisting or mechanical crimping methods, this arc welding technique significantly reduces contact resistance and improves long-term reliability, especially for fine-diameter thermocouple wires.

5. Typical Operation Procedure

1. Prepare clean thermocouple wires (free from oxidation, aligned properly).
2. Insert the wire ends into the welding electrodes and ensure good contact.
3. Set the appropriate welding parameters if adjustable (or use standard settings).
4. Initiate the weld by activating the manual control.

5. The machine delivers a short high-current pulse, forming a spherical junction.
6. Inspect the weld quality (smooth, uniform spherical bead) and proceed to the next wire pair.

6. Applications

- Thermocouple Manufacturers — Production and repair of industrial thermocouples
- Temperature Measurement Laboratories — Custom thermocouple fabrication
- Metallurgy & Heat Treatment Industries — Temperature sensor preparation
- Aerospace & Aviation — High-precision thermocouple welding
- Power Plants & Boiler Manufacturing — On-site thermocouple maintenance
- Research Institutions & Universities — Laboratory thermocouple production

7. Standard Configuration

The standard system typically includes:

- Model KP-TW31 with manual control
- Inverter-based high-frequency welding system
- Welding electrodes (regular inspection and cleaning recommended)
- Compact portable design

Note: Electrodes should be regularly inspected and cleaned for optimal performance.

8. Ordering Information

To provide the most suitable configuration, please confirm the following when requesting a quotation:

- Primary thermocouple types to be welded (e.g., K, J, T, etc.)
- Typical wire diameter range
- Any need for additional accessories or spare electrodes
- Power supply confirmation (220V, 50-60Hz standard)

KingPo Technology Development Limited
Factory Address: No.9 University Road, Songshan Lake,
Dongguan City, Guangdong Province 523770, China
Tel: +86-769-81627526 | Email: sales@kingpo.hk | Website: www.dgkingpo.com

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