



VACUUM ATMOSPHERE FURNACE - TT-VAF-18- 1400

TT-VAF-18-1400 is a 1400°C vacuum atmosphere furnace designed to operate under both vacuum and protective gas environments. It is commonly used for the heat treatment of hard alloys, ceramics, and powder metallurgy materials. Additional applications include vacuum quenching, annealing, processing of high-speed steel and alloy cutting tools, brazing of soft magnetic materials, and other thermal treatment processes.

APPLICATIONS

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- **Hard Alloy Processing** – Provides precise high-temperature treatment for hard alloys, including sintering, annealing, and quenching. Ensures enhanced hardness, wear resistance, and structural stability for industrial applications.
- **Ceramics & Advanced Materials** – Enables uniform heat treatment of technical ceramics, composites, and specialty materials under vacuum or protective gas conditions. Delivers excellent mechanical strength and thermal resistance.
- **Powder Metallurgy** – Supports vacuum sintering and densification of metal powders into strong, uniform components. Reduces oxidation and contamination, ensuring high-quality metallurgical results.

- **High-Speed Steel & Cutting Tools** – Facilitates vacuum annealing, quenching, and processing of high-speed steels and alloy cutting tools. Improves performance, durability, and precision for machining and industrial applications.
- **Magnetic Materials & Brazing** – Provides reliable brazing and thermal processing of soft magnetic materials. Maintains purity and performance by preventing oxidation and contamination.
- **Semiconductor & Electronics** – Suitable for diffusion, oxidation, and annealing processes of semiconductor materials under controlled atmospheres. Ensures accurate thermal treatment for microelectronics and optoelectronics applications.
- **Aerospace & Defense Engineering** – Delivers thermal processing for advanced alloys, composites, and high-performance materials used in aerospace and defense industries. Ensures thermal stability and structural reliability under extreme conditions.
- **Energy & Battery Research** – Supports thermal treatment of solid-state electrolytes, cathode/anode materials, and next-generation energy systems. Improves cycle life, stability, and performance of advanced energy technologies.
- **Universities & Research Institutes** – Designed for advanced studies in physics, chemistry, and materials science. Offers versatile programming, vacuum compatibility, and reliable safety features for academic laboratories.
- **Industrial Quality Control & Certification** – Provides traceable, audit-ready thermal processing for compliance verification and product validation. Conforms with ISO, CE, SGS, and TÜV standards required in regulated industries.

FEATURES

Furnace Shell

- Constructed from Q235 low-carbon steel with an electrostatically resistant, anti-corrosive finish.
- Durable metal shell design ensures low external surface temperature.
- Side-opening door with a flanged sealing structure and manual screw compression for easy and safe operation.

Refractory Material

- Features a multi-layer insulation system made from lightweight alumina ceramic fiber and premium insulation boards. This design is asbestos-free, reduces heat loss, and enhances energy efficiency.

Heating System

- Uses high-quality HRE spiral resistance wire heating elements, securely embedded in the chamber walls for efficient and uniform heat distribution. Long service life and energy-efficient.
- Heating is applied on three sides—left, right, and bottom—for consistent temperature uniformity.
- Silicon carbide base plate protects the bottom heating element, offering high mechanical strength, excellent thermal conductivity, and stable horizontal load support.

Temperature Control Panel

- Features a PID controller with SSR/SCR control modes for accurate temperature regulation.
- Equipped with a standard N-type nickel-chromium-silicon thermocouple, with a range of 0–1300°C and extended service life.

Program Controller

- Designed to support complex thermal processing needs.
- User-friendly interface with flexible programming options.
- Supports up to 4 curves and 8 segments per curve for detailed process customization.
- Includes over-temperature and fault alarms with built-in automatic safety protections.

Vacuum Atmosphere Function

- Furnace chamber includes adjustable gas inlet and outlet ports for introducing protective gases.
- Compatible with various vacuum pumps, achieving vacuum levels between 500 Pa and 0.06 Pa, displayed via a digital vacuum gauge.
- Optional gas control unit available, offering 1 to 3 adjustable flow meters for precise control.

TECHNICAL SPECIFICATIONS

Model	TT-VAF-3-1400	TT-VAF-8-1400	TT-VAF-12-1400	TT-VAF-18-1400	TT-VAF-36-1400	TT-VAF-45-1400
Chamber Size □ W xD xH□ mm	150 x150x150	200x200x200	200x300x200	250 x300x250	300x400x300	300 x500x300
Rated Temperature	1400℃					
Work Temperature	1350℃					
Voltage	220V/3KW (110V is also available)	220V/5KW (110V is also available)	220V/5KW (110V is also available)	220V/6KW (110V is also available)	380V/12KW	380V/14KW
Heating Element	U Type Silicon carbide rod					
Chamber Materials	Polycrystalline inorganic alumina ceramic fiber material made by wet vacuum filtration methord					
Temp control Accracy	±1℃					

Thermcouple	S type platinum rhodium thermocouple
Temperature Controller	Intelligent microcomputer PID temperature control instrument, SCR/SSR control, PID parameter self-tuning function .Programmable 4 groups program curves with each program curve with 8 segments totally 32 segments for program heating, program heat preservation, program cooling
Heating Rate	1-25°C/min can be adjustable
Furnace Structure	Furnace temperature control integrated structure
Equipment Protection	Modular control with sound and light alarm signal sending out for over temperature and thermocouple broken in the working process, and the protection action will be completed automatically
Safety Protection	The equipment is equipped with a circuit breaker, which will automatically pop open in case of short circuit leakage, which can protect the safety of equipment and operators
Furnace Shell	High-quality cold-rolled steel plate with CNC machine tool processing, then it will have the process of welding, grinding, polishing, phosphating, pickling, surface electrostatic spraying plastic powder
Quality Certificate	ISO9001 CE SGS TUV
Standard Device	1□ Furnace Main Body : 1 set 2□ Temperature Controller : 1 pc 3□ Power Line : 3 meters 4□ Thermcouple : 1 pc 5□ Operation manual □ 1 pc 6 Crucible Tong □ 1 pc 7□ High Temperature Gloves : 1 pair
Optional Accessories	1 .Optional with Rotary Vacuum Pump □ Vacuum Degree Level $\leq 500\text{pa}$ 2.Optional digital vacuum gauge □ $1.0 \times 10^5 - 1.0 \times 10^{-1}\text{pa}$ 3.Optional with gas float meter □ Float flow rage 1-10L/min□



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