



VACUUM ATMOSPHERE FURNACE - TT-VAF- 100-1200

The TT-VAF-100-1200 Vacuum Atmosphere Furnace is a box-type resistance furnace designed to provide a controlled high-temperature environment up to 1200°C, with a continuous working temperature of 1100°C. Its spacious chamber, measuring 300 × 500 × 200 mm, makes it well-suited for industrial laboratories at universities, research institutes, manufacturing facilities, and private organizations. This furnace supports advanced thermal processing of metals, ceramics, nanomaterials, and semiconductor materials, offering reliable and reproducible results in demanding research and industrial applications.

Equipped with high-quality HRE alloy resistance wire heating elements and an N-type thermocouple, the TT-VAF-100-1200 ensures precise temperature control with an accuracy of $\pm 1^{\circ}\text{C}$. Operating at 380V/7.5 kW, it delivers stable, uniform heating performance under vacuum or controlled-atmosphere conditions, making it an ideal solution for laboratories and production facilities requiring contamination-free, high-temperature treatment of advanced materials.

APPLICATIONS

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- **Advanced Ceramic Materials** – Enables high-temperature sintering, densification, and heat treatment of ceramics under vacuum or controlled atmospheres. Ensures structural integrity, thermal stability, and reproducibility for research

and industrial applications.

- **Nanomaterials Research** – Provides uniform and precise thermal processing for nanostructures and advanced composites. Supports development in functional nanomaterials, coatings, catalysts, and energy storage materials.
- **Semiconductor Materials** – Facilitates oxidation-free annealing, diffusion, and thermal treatment of semiconductor wafers and substrates. Ensures precise temperature control critical for microelectronics, photonics, and optoelectronic device research.
- **Powder Metallurgy & Metal Processing** – Supports vacuum-assisted sintering and high-temperature treatment of metals and alloys. Guarantees uniform mechanical and thermal properties for advanced metallic components and additive manufacturing.
- **Aerospace & Defense Materials Engineering** – Provides high-temperature processing of high-performance alloys, ceramics, and composites used in aerospace and defense applications. Ensures thermal stability, mechanical strength, and reproducible performance under extreme conditions.
- **Energy & Battery Research** – Ideal for heat treatment of electrodes, solid-state electrolytes, and other advanced energy materials. Offers contamination-free, reproducible processing under vacuum or controlled atmospheres.
- **Chemical & Industrial Laboratories** – Suitable for catalyst activation, thermal decomposition, and chemical process studies requiring precise environmental control. Delivers accurate and repeatable results for R&D and industrial applications.
- **Universities & Research Institutes** – Serves as a versatile tool for physics, materials science, chemistry, and engineering laboratories. Features programmable temperature control, vacuum capability, and robust safety systems to

support complex experimental workflows.

- **Industrial Quality Control & Certification** – Provides high-temperature testing under vacuum or controlled atmospheres for product validation, compliance verification, and third-party certification. Conforms to ISO9001, CE, SGS, and TÜV standards, delivering reliable and reproducible performance for regulated industries.

FEATURES

Furnace Shell

- Constructed from Q235 low-carbon steel with an electrostatically resistant, anti-corrosion surface finish.
- Durable metal tank design minimizes external surface temperature.
- The side-opening door features a flange-type sealing system with manual screw compression for convenient access.

Refractory Material

- The furnace uses a multi-layer insulation system made from lightweight alumina ceramic fiber and high-quality insulating boards. These materials are free of asbestos, minimize heat loss, and support low energy consumption.

Heating System

- Equipped with high-quality HRE spiral resistance wire elements, securely embedded into the furnace chamber walls for direct radiation heating. This setup ensures energy efficiency and extended operational life.
- Three-sided heating (left, right, and bottom) provides excellent temperature uniformity.
- A silicon carbide base plate protects the bottom heating element, offering strong mechanical support, efficient heat transfer, and horizontal load-bearing capability.

Temperature Control Panel

- Features a PID controller with SSR/SCR control mode for accurate temperature regulation.
- Uses an international-standard N-type nickel-chromium-silicon thermocouple, supporting a temperature range of 0–1300°C with long-lasting performance.

Program Controller

- Advanced controller supports complex heat treatment processes.
- User-friendly interface with flexible programming options.
- Capable of running 30 programmable segments in a single temperature curve.
- Includes over-temperature and fault alarms with automatic safety shutoff.

Vacuum and Atmosphere Control

- The chamber includes adjustable inlet and outlet ports to allow for protective gas flow.
- Compatible with various vacuum pump configurations to achieve vacuum levels between 500 Pa and 0.06 Pa. A digital vacuum gauge displays real-time vacuum levels.
- Optional gas flow control unit available, supporting 1–3 adjustable float meters for precise gas regulation.

TECHNICAL SPECIFICATIONS

Model	TT-VAF-3-1200	TT-VAF-6-1200	TT-VAF-8-1200	TT-VAF-12-1200	TT-VAF-18-1200	TT-VAF-30-1200
Chamber Size □ W xD xH□ mm	150 x150x150	180x230x150	200x300x120	200 x300x200	250 x300x250	300 x500x200
Rated Temperature	1200°C					

Work Temperature	1100°C					
Voltage	220V/2.5KW (110V is also available)	220V/3KW (110V is also available)	220V/3KW (110V is also available)	220V/4KW (110V is also available)	220V/6KW (110V is also available)	220V/7.5KW (110V is also available)
Heating Element	HRE Alloy Resistance Wire					
Chamber Materials	Polycrystalline inorganic alumina ceramic fiber material made by wet vacuum filtration method					
Temp control Accuracy	±1°C					
Thermocouple	N Type 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□ Thermocouple : 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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