



# VACUUM ATMOSPHERE FURNACE - TT-VAF-8- 1200

TT-VAF-8-1200 is a box-type resistance furnace designed to reach temperatures up to 1200°C under a vacuum or controlled atmosphere. It provides a high-temperature heat treatment environment suitable for industrial laboratories, including those at universities, research institutions, manufacturing facilities, and private enterprises. This furnace is ideal for work in advanced material fields such as metals, ceramics, nanomaterials, and semiconductors.

## APPLICATIONS

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- **Advanced Ceramic Materials** – Provides high-temperature sintering and controlled-atmosphere treatment of ceramics. Ensures improved density, thermal resistance, and structural integrity for both research and industrial-scale applications.
- **Nanomaterials Research** – Enables precise thermal processing of nanostructures and composites under vacuum or protective gases. Supports advanced R&D in catalysis, energy storage, coatings, and next-generation functional materials.

- **Semiconductor Materials** – Facilitates oxidation, annealing, and diffusion processes of semiconductor substrates in an oxygen-free or inert-gas environment. Delivers stable and contamination-free conditions critical for electronics and optoelectronics manufacturing.
- **Powder Metallurgy** – Provides vacuum-assisted sintering of metal powders into dense, uniform components. Widely applied in additive manufacturing, alloy development, and advanced metallurgy with reduced oxidation risks.
- **Aerospace & Defense Materials Engineering** – Ensures precise heat treatment of high-performance alloys, ceramics, and composites under protective atmospheres. Guarantees thermal stability, mechanical strength, and reproducibility for mission-critical aerospace and defense applications.
- **Energy & Battery Research** – Supports the development of lithium-ion, solid-state, and next-generation batteries through controlled atmosphere processing. Enables heat treatment of electrodes, electrolytes, and advanced energy materials with minimized contamination.
- **Chemical & Petrochemical Laboratories** – Suitable for catalyst activation, pyrolysis, and thermal decomposition experiments requiring precise atmosphere control. Provides reproducible results for chemical R&D and process validation.
- **Universities & Research Institutes** – Ideal for advanced studies in materials science, physics, chemistry, and nanotechnology. Offers flexible programming, vacuum capability, and robust safety systems for academic and applied research laboratories.
- **Industrial Quality Control & Certification** – Delivers high-precision thermal testing under vacuum or controlled atmospheres for product validation, compliance verification, and third-party certification. Conforms with ISO9001, CE, SGS, and TÜV standards.

## FEATURES

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### 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-3-1200                       | TT-VAF-6-1200                     | TT-VAF-8-1200                     | TT-VAF-12-1200                    | TT-VAF-18-1200                    | TT-VAF-30-1200                      |
| Chamber Size<br>□ W xD xH□<br>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 ≤500pa□<br>2□ Optional digital vacuum gauge □ 1.0×10 <sup>5</sup> -1.0×10 <sup>-1</sup> pa□<br>3□ Optional with gas float meter □ Float flow range 1-10L/min□                                                             |



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