Luoyang Juxing Kiln Co., LTD
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Top-Opening Car Bottom Furnace GWL-1200°C Technical Data

GWDL Luoyang Juxing Electric Kiln Co., Ltd.

LUCYANG JUXING KILN CO.,LTD

High-Tech Enterprise / “Specialized and Sophisticated” Enterprise

Professional High-Temperature Heating Manufacturing Factory (-60℃ ~ 2600℃)

Member Unit of Heat Treatment Industry Association

ISO45001: Occupational Health and Safety Management System Certification

ISO14001: Environmental Management System Certification

ISO9001 Quality Management System Certification

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Technical Specifications

- No-load cooling time for tungsten-molybdenum furnace chamber: 6–8 h
- Vacuum furnace
- Specifications: Circular Φ800×1000 mm

1. Overview

The GWL high-temperature horizontal vacuum electric furnace is mainly used for vacuum sintering of alloy materials or non-metallic materials.

The GWL high-temperature vertical vacuum electric furnace consists of a vertical main unit (single chamber), vacuum system, gas charging system, water cooling system, electrical control system, etc.

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2. Main Technical Parameters

- Heating zone size: D900×1200
- Effective working zone: D800×1000 mm
- Load capacity: ---
- Maximum temperature: 1550° C
- Working temperature: 1500° C
- Furnace temperature uniformity: ±5° C (nine-point test at 1200° C under no-load conditions)
- Temperature control accuracy: ±1° C
- Heating rate: no more than 120 minutes to reach 1300° C under no-load conditions
- Ultimate vacuum: 10^{-1} Pa
- Working vacuum: 10 – 300 Pa
- Working atmosphere medium: 70% H_2, 30% N_2
- Pressure rise rate: 1 – 5 Pa/h

3. Standard Structure and Features

3.1 Vacuum Furnace Main Unit

The vacuum furnace main unit is of vertical, single-chamber structure, consisting of furnace body, furnace door, furnace frame, heating chamber, etc.

3.1.1 Furnace Body and Furnace Door

The vacuum furnace main body sits on the furnace frame. Both the furnace body and furnace door are of double-walled water-cooled structure. The inner walls of the furnace body and furnace door are made of welded carbon steel, with a protective shell on the outermost layer.

One ½" NPT female port is provided at the center of the furnace top cover for user standby use.

One ½" NPT female port is provided at the center of the furnace door for user standby use.

Two ½" NPT female ports are provided on the furnace body for inert gas inlet (the ports are located at the upper part of the heating chamber).

In addition, two ½" NPT female ports are provided for thermocouples. One is at the top of the heating chamber, and the other is at the bottom of the heating chamber.

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An emergency button for the furnace door lifting mechanism is installed on the control panel of the furnace door (loading platform).

3.1.3 Heating Chamber, Heating Elements, and Insulation Elements (to be provided by the buyer)

Tungsten-molybdenum heat shields are used as the thermal insulation hot zone.

Heating elements are made of high-purity tungsten rods.

3.2 Vacuum System and Vacuum Gauge

The vacuum system includes: 2X-30 vacuum pump, pneumatic baffle valve installed on the vacuum pipeline, connectors, gauge tubes, and their auxiliary devices. Specifically:

- One 2X-30 mechanical pump, with a pumping speed of 30 L/s;
- The vacuum gauge adopts one digital resistance vacuum gauge.

Automatic procedures can be set on the touch screen (automatic furnace purging, gas switching, vacuum pumping, etc. can be selected according to conditions).

3.3 Water Cooling System

The water cooling system consists of stainless steel stop valves, water inlet, drainage tank, water pressure electrical contact pressure gauge, etc. The water inlet and outlet are provided with connecting flanges, which only need to be connected to the user's circulating water system interface.

An overpressure protection device is installed on the drainage pipe. In case of water supply failure, audible and visual alarms and interlocking devices are provided, and emergency cooling water is opened.

3.4 Gas Charging System

The gas charging system consists of gas charging stop valves, gas manifold, solenoid valves, vacuum electrical contact pressure gauge, etc. This system can be used to adjust and control the vacuum degree in the furnace during the heating process.

The gas charging system pipeline is equipped with 0–20 L/min mass flow meters (one each for hydrogen and nitrogen), which can measure and be manually controlled.

A quick gas inlet system is provided for rapid replacement of the furnace atmosphere.

3.5 Pneumatic System

The pneumatic system consists of pneumatic valves, solenoid valves, oil-water separator, oil mist lubricator, pressure gauge, etc. The gas interface only needs to be connected to the user's gas source interface.

3.6 Electrical Control System

The electrical control system consists of two parts: temperature program control composed of thyristor voltage regulator and intelligent instruments, and mechanical action program control composed of programmable logic controller. It can realize:

- Temperature programmable control;
- Temperature chart recording;
- Vacuum degree chart recording;
- Alarm and interlock protection for water pressure, over-temperature, over-current, etc.;
- Automatic or manual operation.

3.6.1 Temperature Control Instrument

The temperature control instrument is one Japanese FP93, with temperature control accuracy of ±1° C.

3.6.2 Temperature and Vacuum Degree Recording Instrument

The temperature and vacuum degree recording instrument is a touch screen.

3.6.3 Temperature Measuring Thermocouple

W5Re:W26Re (Type C) thermocouples are installed for temperature control, recording, and over-temperature alarm.

One for temperature control and one for temperature measurement.

3.6.4 Programmable Logic Controller (PLC)

The logic control of equipment vacuum pumping, valve control and interlocking, heating, etc., as well as various alarms and interlock protection, are completed by the programmable logic controller (PLC), whose model is S7-200 main unit plus expansion (Siemens product).

The main electrical panels reserve 20% space for standby use. In addition, 30 cm of expansion space is reserved on the right side of the S7-200 PLC.

3.7 The control cabinet is provided with a mimic screen to visually display the working status of the vacuum furnace. It also has fault self-diagnosis functions, such as audible and visual alarms and interlock protection for total water outage, vacuum pump overload, over-temperature, over-current, over-pressure, etc.

4. Power Requirements

4.1 Power Supply: 380 V, 3-phase, 50 Hz, 145 kVA

4.2 Water Supply

- Inlet pressure: 0.2–0.3 MPa
- Inlet water temperature: ≤32° C
- Water consumption: 10 m³/h

4.3 Compressed Air

The compressed air pressure required by pneumatic components is 0.4–0.5 MPa.

4.4 Inert Gas (Nitrogen or Argon or Hydrogen)

Purity: 99.99–99.9995%. If pure nitrogen is used, the sintering temperature shall not exceed 800° C to prevent metallic tungsten from reacting with nitrogen to form tungsten nitride.

5. Scope of Complete Supply

- VSF vacuum furnace: 1 unit
- All technical documents (including furnace operation manual, structural schematic diagram, foundation drawing, PLC ladder diagram programming, electrical schematic diagram, vulnerable parts drawings, etc.): 1 set
- Provide structural technical parameters of the equipment.
- Provide the pipeline dimensions of the equipment water cooling system, manufactured according to relevant Chinese standards.

6. Spare Parts

Including: all sealing rings: 1 set

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Vacuum pump oil: 1 set per unit

7. The foundation drawing will be provided within one month after the contract takes effect.

The furnace body and vacuum unit are fixed to the ground with foundation bolts to prevent vibration.

8. Equipment Acceptance

8.1 Acceptance shall be carried out according to the acceptance standards in the contract signed by both parties.

8.2 Provide equipment factory certificate of conformity, packing list, and other documents.

8.3 Pre-acceptance: after debugging and inspection are qualified at Party B's factory, cold-state index acceptance shall be carried out.

8.4 Re-debugging and final acceptance at Party A's factory.

9. Training for Equipment Operators

Arrange for Party A's personnel to receive free technical training and equipment maintenance training at the manufacturer.

10. Technical Service Requirements

10.1 Warranty period: one year. During the warranty period, if any system of the equipment fails, spare parts and services shall be provided free of charge, and the service shall be timely and effective; the heating element and temperature measuring element are not covered by the warranty.

10.2 After the equipment warranty period expires, extensive preferential technical support and spare parts supply will still be provided.

11. Production cycle: two months.

Optional List

- Alarm instrument
- FP93 one channel, one alarm instrument
- Conductivity + Yudian
- Hydrogen flow meter

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- Hydrogen float flow meter
- Chengdu Laifeng
- Exhaust manifold
- 3 rounds into one large pipe
- D32-3X16

Main Component List

Name	Specification Parameters	Manufacturer	Remarks
PLC	S7-200	Siemens	
Touch screen	7 inch	Kunlun Tongtai	
Transformer	120 kW	Juxing	
Temperature controller	FP93	Japan Conductivity	
Inspection instrument	6 channels	Yudian	
Vacuum instrument	Resistance gauge	Chengdu/Shandong	
Industrial electrical appliances	Conventional	Chint	
Power regulator	SCR	Juxing	
Heating element	Tungsten rod	Gemei (to be provided by the buyer)	
Alumina hollow ball brick	99		
Insulation material	Alumina		
Vacuum furnace body	Carbon steel	Juxing	

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Name	Specification Parameters	Manufacturer	Remarks
Vacuum electrode	Copper	Juxing	
Vacuum pump	30 L	Nanguang	
Thermocouple	W	Dazheng	

Thank you for getting in touch with us!

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