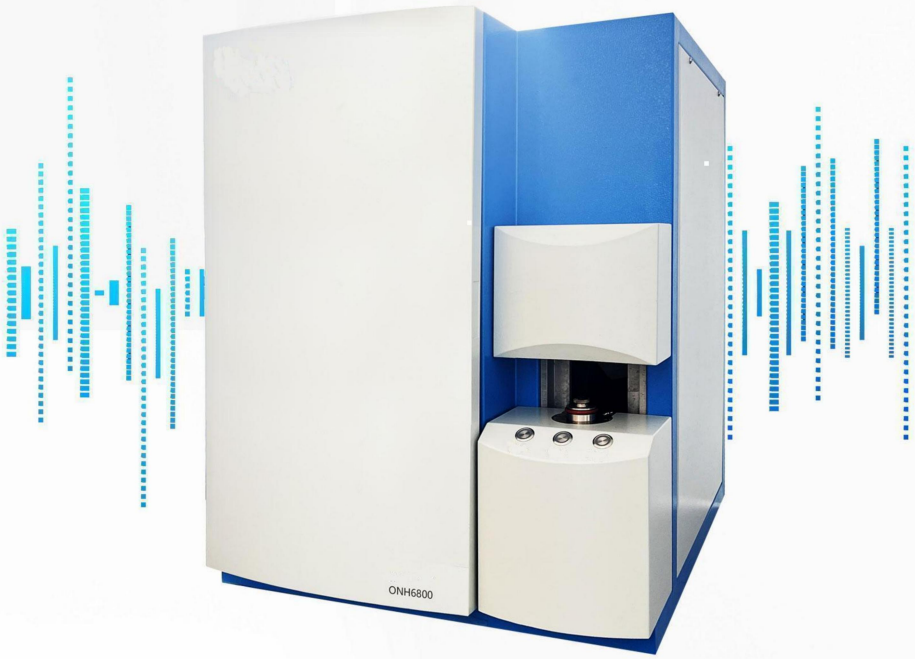
ONH6800

Oxygen nitrogen hydrogen analyzer



Instrument introduction

The ONH6800 oxygen nitrogen hydrogen analyzer is a new generation element analysis instrument. It features a desktop integrated design, beautiful appearance, and easy operation.

The oxygen nitrogen hydrogen analyzer is an intelligent analytical instrument composed of a pulse furnace and a computer, with a pyroelectric sensor and a high-precision thermal conductivity detector as the core.The instrument is mainly used for the analysis of oxygen, nitrogen, and hydrogen content in ferrous metals, non-ferrous metals, rare earth metals.inorganic substances, ores, ceramics, and other materials in industries such as metallurgy, machinery, commodity inspection,scientific research, and chemical engineering.

Instrument principle

Oxygen, nitrogen, and hydrogen in metal and non-metallic solid materials are detected using the inert gas melting principle.In the determination of oxygen, nitrogen, and hydrogen, the weighed sample is placed in a graphite crucible and melted through high-temperature heating in a helium (argon gas can be used for single oxygen measurement) airflow, The oxygen in the sample reacts with the carbon in the graphite crucible to generate carbon monoxide (CO).and the nitrogen in the sample escapes in the form of nitrogen. These mixed gases are sent to the conversion furnace by helium gas. and carbon monoxide (CO) is converted into carbon dioxide (CO_2). The nitrogen does not react. The mixed gas after passing through the conversion furnace is sent to an infrared detection cell. where carbon dioxide (CO_2) (H_20) is detected. Then, alter infrared detection, the carbon dioxide (CO_2)and water in the mixed gas are adsorbed,and the remaining nitrogen and helium gas mixture is detected through a thermal conductivity detection cell. Quickly and accurately determine the oxygen, nitrogen, and hydrogen content in steel, cast iron, alloys, copper, zirconium, titanium, rare earth materials, and other inorganic substances.

Infrared detection system

- Standard oxygen and hydrogen analyzers are equipped with independent infrared absorption cells, and the length and number of channels of the absorption cells can be flexibly configured according to user needs (dual infrared absorption cells can be equipped);
- Detector: Adopting a pyroelectric solid-state infrared detector and a high-precision A/D sampling card, the entire machine has extremely high detection sensitivity and can effectively detect ppm level oxygen content;
- Motor: The modulation system adopts a high-precision stepper motor controlled by a microcontroller, achieving long-term stability of the modulation frequency;
- Light source: The infrared light source uses efficient and long-lived precious metal miniature infrared luminescent bodies and gold-plated metal mirrors;
- Constant temperature: The entire gas chamber is controlled at a constant temperature to ensure the constant temperature of the analysis gas and measurement accuracy. A temperature compensated semiconductor detector is used to ensure that the instrument is minimally affected by external factors and the baseline is very stable.

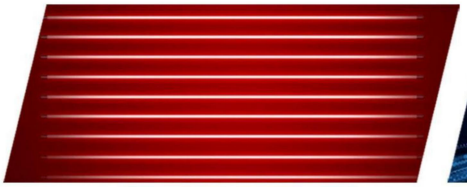
High precision detection system

- The use of a highly sensitive thermal conductivity detection cell, continuously adjustable pool current, high-precision amplifier, and 24-bit A/D sampling card hardware ensure the determination of nitrogen content from ultra-low to large ranges.Adopting low drift, high accuracy, large range, high sensitivity thermal conductivity detector with low failure rate, strong reliability, and good stability. Adopting an imported high-precision constant temperature control system, the temperature is controlled within 0.1 ℃. The reference gas circuit adopts stable micro flow control.

Pulse furnace

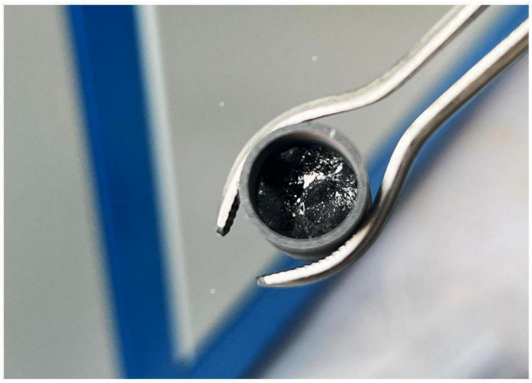
- The pulse electrode furnace has a high heating temperature and adopts program controlled power. It can provide various program heating methods such as constant power heating, slope heating, and segmented heating to improve analysis accuracy.Suitable for rapid analysis from low melting point materials such as aluminum alloys to high melting point materials such as tungsten alloys. The electrode is suitable for various types of crucibles. According to the release situation of different samples, various crucibles can be selected, including sleeve crucibles and high-temperature crucibles,effectively reducing user usage costs. The electrode cooling system adopts a single cycle independent cooling system, which can be directly connected to circulating water or external water cooling devices, and has the characteristics of good cooling effect and high reliability. Online real-time detection of the temperature of cooling circulating water.

- Current 0-1500A, power: 10KVA, maximum temperature above 3500 ℃.
- The automatic blowing of the furnace, combined with manual brushing and dust removal devices, ensures convenient, comprehensive, and efficient cleaning work.
- The electrode pulse furnace bracket adopts integral casting and lightweight design, which improves mechanical strength and ensures the concentricity of the upper and lower electrodes.
- The dual axis guided integrated cylinder ensures smooth lifting of the electrodes, ensures good contact between the graphite crucible and the upper electrode, and ensures uniform force on the graphite crucible, which is conducive to long-term high-temperature heating.




Gas path

- Adopting an integrated overall design, the space is spacious, and the connection routes of the air system are greatly reduced, making the overall air system more concise and reliable.The pneumatic components include solenoid valves, cylinders, pneumatic pipes, and pneumatic connectors. The solenoid valve has a lifespan of over a million times. The unique lifting system with dual axis guide cylinder ensures smooth lifting of the electrode,ensuring good contact between the graphite crucible and the upper electrode, and ensuring uniform force on the graphite crucible, which is conducive to long-term high-temperature heating. he automatic feeding furnace head with air curtain protection and automatic air blowing mechanism effectively ensure the accuracy of oxygen and nitrogen element analysis. The furnace head is a split structure, with easy disassembly and replacement of the upper and lower electrodes. In addition, the lower electrodes are made of high-temperature alloy material, which has a long service life and low usage cost.



- The sampling system is designed with an open system, which has the advantages of pollutants being discharged from the furnace top without entering the system, convenient operation, and low requirements for system sealing. The use of micro flow sensors achieves high-precision flow control, minimizing the impact of airflow changes on analysis. This sampling device is simple and can automatically inject samples, making it easy to take out in case the sample gets stuck.

- All analytical gas pipelines are made of corrosion-resistant materials, and each branch gas pipeline is controlled by independent solenoid valves. The solenoid valve body must be corrosion-resistant.

- The device can automatically detect multiple leaks, provide real-time flow alarms, and provide alarm content. It can monitor the status, temperature, and signal voltage of the instrument's solenoid valve in real-time.

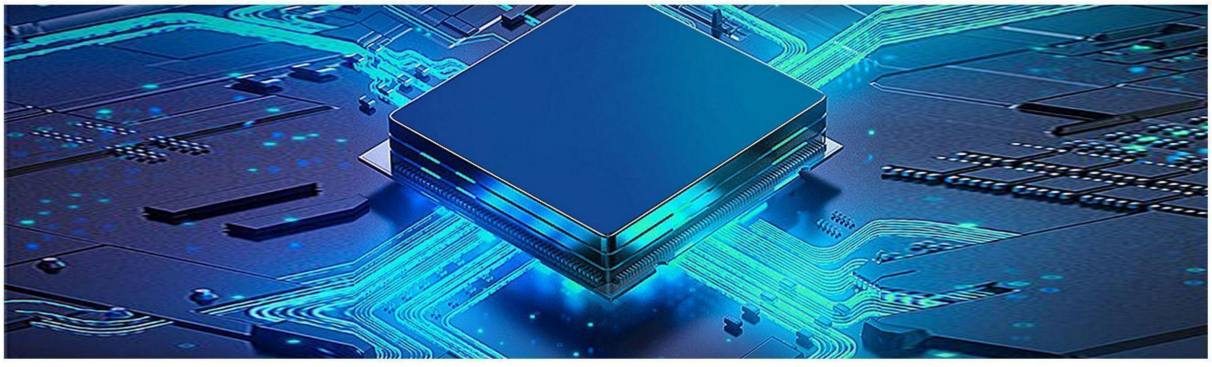
- Nitrogen or anhydrous and oil-free compressed air.

Software

- Provide software in the Windows environment to quickly display analysis results and analysis curves;
- Automatic storage of analysis results;
- The sample weight is automatically input into the software;
- Channel settings are optional; Automatic switching between high and low content;
- rawing and storing dynamic release curves, unloading;
- There are multiple correction modes for the analysis results, which can be manually corrected or corrected through the analysis results; Can be corrected at a single point or multiple points;
- Screening, averaging, standard deviation, relative deviation, etc. of data;

Control Software

- The new software can design several calibration lines according to user needs, greatly facilitating user use;
- The host can be connected to computers, printers, electronic scales, etc. to achieve data transmission;
- The analysis time and blank value can be adjusted, and the blank value of the melting aid can be automatically removed;
- Users can store several analysis methods for different analysis samples;
- Can store a large amount of sample weight (the quantity is only limited to the capacity of the computer hard drive);
- Output result reports in template format;
- It can be connected to user databases to achieve remote transmission of analysis results, making it easy to achieve networked management of analysis results;
- Can quickly perform instrument blank determination;
- Can store and edit sample numbers;
- It can be applied to automatic sampling and achieve automatic operation of the instrument;
- There are 16 high and low analysis channels for oxygen, nitrogen, and hydrogen, which meet the analysis requirements of different materials with different contents. Users can freely combine and use according to their actual needs.The software is easy to operate and intuitive, with qualitative, semi quantitative, and quantitative analysis functions, as well as instrument diagnosis optimization functions. The software is available in both Chinese and English versions, and can be switched according to needs. The report format output format is PDF, Excel, electronic file or direct printing, and can be Chinese template or English template. The control software can run under the Chinese version of Windows;
- Correction. Single point correction: correction using a single analysis result; Multi point correction: correction using multiple analysis results, blank correction.



Environmental requirements

- Do not install the instrument directly by the window or door to avoid convection, dust, corrosive gases, and vibration.
- Please stay away from strong electromagnetic interference
- Environmental temperature: 20-25 ℃
- Working humidity: ≤ 70%
- The instrument should be placed on a stable workbench without vibration, and there should be no direct sunlight or strong electromagnetic interference near the instrument. The environment should be free of strong corrosive gases.
- Pulse furnace power supply: 220V 10%, 50Hz, maximum current 50A.
- Other power supply for the instrument: 220V 10%, 50Hz, maximum current 10A.
- Circulating water power supply: 220V 10%, 50Hz, maximum current 16A.

Technical Parameter

Measuring range	Oxygen: 0.00001% -5% (expandable to 100%) Nitrogen: 0.00001% -20% (expandable to 100%) Hydrogen: 0.00001%~0.15% (expandable to 100%)				
Instrument precision	Oxygen: 1.0ppm or RSD ≤ 1.0% Nitrogen: 1.0ppm or RSD ≤ 1.0% Hydrogen: 0.2ppm or RSD ≤ 2.0% (Based on solid standard samples, both meet one of them)				
Analysis Time	120-240 seconds (can be set arbitrarily based on the analysis material)				
Analysis error	Oxygen is better than GB/T 11261-2006, nitrogen is better than GB/T 20124-2006, hydrogen is better than GB/T 223.82-2007				
Carrier gas	High purity helium or argon (99.999%, 0.3-0.5Mpa)				
Power gas	Ordinary nitrogen (or purified compressed air 0.3~0.5Mpa)				
External dimensions	W700mm x D655mm x H860mm				
Weight	150 kg	Electronic balance weighing accuracy	0.0001g	Sample weighing	0.2 ~ 1.0g