fully automatic bomb calorimeter for coke and petroleum

Automatic Oxygen Bomb Calorimeter is a kind of instrument used to accurately determine the calorific value of combustible substances, such as coal, coke, petroleum, cement, etc. It is widely used in electric power, metallurgy, coal, chemical industry, scientific research, commercial inspection and other industries.

Fully automated oxygen bomb calorimeter provides efficient and reliable calorific value testing through a fully automated operating process for both laboratory and industrial field environments.

Main Features of the Fully Automatic Oxygen Bomb Calorimeter

1. Five probes for real-time temperature sensing: five independent temperature probes are used to monitor the outer cylinder, inner cylinder, thermoregulated water tank, thermostatic water tank and room temperature in real time. This comprehensive temperature monitoring makes the instrument able to accurately adjust the water temperature of the inner and outer cylinder during the testing process, ensuring that the test results are not affected by the fluctuation of the ambient temperature.

2. MCPC control module: Equipped with MCPC control module, it monitors the instrument status and saves the experimental parameters in real time. By completing the whole testing process independently without the intervention of the upper computer, it improves the independence and stability of the instrument. At the same time, it is equipped with self-diagnostic reminder function to help users find and solve potential problems in time, which improves the reliability and durability of the instrument.
3. Automatic oxygen filling and deflating device: Adopting new type of automatic oxygen filling and deflating device and automatic lifting mechanism of oxygen bomb, completely eliminating the inconvenience of manual operation. Oxygen bomb automatically lifts and carries out oxygen filling and deflating, which is easy to operate and highly automated, reduces human errors and improves work efficiency.
4. Oxygen bomb automatic identification technology: Equipped with oxygen bomb automatic identification technology, it can automatically identify the heat capacity of different oxygen bombs. This enables different batches and models of oxygen bombs to be correctly recognized and used without manual settings, improving the precision and efficiency of the experiment.
5. pump circulation system: the pump circulation method is adopted to make the water circulation inside the instrument more uniform. This ensures a balanced distribution of temperature throughout the system, thus improving the accuracy and reliability of the test data.
6. thermal insulation design: the instrument adopts high efficiency thermal insulation material, which can effectively isolate the temperature interference from the external environment, improve the anti-interference ability, and ensure the stability of the measurement.

7. electronic measuring cup and automatic measurement of water: equipped with a high-precision probe-type electronic measuring cup, automatic measurement of water in the inner cylinder. The repeatable error is less than 0.5g, ensuring accurate water volume in the inner cylinder, short test time and stable and reliable test results.
8. the ignition wire automatic discrimination function: this function can real-time judgment of the ignition wire work status, timely detection of ignition wire failure and remind the user to ensure that the experiment is carried out smoothly.
9. digital barometer and water filtration device: the instrument adopts digital barometer, which is convenient to observe and monitor the gas pressure. Equipped with water filtration device, it can effectively prevent the water system from being blocked by impurities and ensure the normal operation of the instrument.
10. desktop and vertical convertible structure: according to the different working conditions in the laboratory, the instrument can be flexibly converted from desktop to vertical structure to meet the needs of different working environments.
11. laboratory management system interface: can be accessed to the laboratory management system, real-time uploading of test data, data backup and management, improve the security of experimental data and management efficiency.
12. adapt to a variety of samples and accessories: for solid waste samples, the instrument can be equipped with special oxygen bomb, crucible and other accessories to adapt to different types of testing needs.

13. gas collection device: optional oxygen bomb gas collection device, used to collect and analyze the gas produced within the oxygen bomb, to provide data support for further analysis.

Advantages of Full-Automatic Oxygen Bomb Calorimeter

1. highly automated, easy to operate: automatic oxygen filling, deflating and oxygen bomb lifting and lowering and other operations are completed automatically, which reduces the complexity of manual operation and improves the working efficiency and safety.
2. accurate and stable temperature control system: multi-probe temperature monitoring and pump circulation ensures a balanced distribution of temperature, eliminating the impact of ambient temperature fluctuations, thus improving the accuracy and repeatability of the measurement.
3. high precision measurement results: the combination of automatic measurement of the inner cylinder water volume, automatic identification of the heat capacity of the oxygen bomb, automatic discrimination of the ignition filament and other functions makes the instrument show high precision and stability when measuring the calorific value.
4. Powerful data management and feedback function: the instrument is able to upload test data in real time and connect with the laboratory management system to realize seamless management and automatic backup of data, which is convenient for subsequent data analysis and recording.

5. compatible with a variety of samples and applications: accessories can be customized according to different needs, to adapt to a variety of solid waste, liquid or gas samples testing, widely used in various types of industrial and scientific research fields.
6. strong anti-interference ability: heat insulation materials and high-precision temperature control system enables the instrument to operate normally in complex environments, to ensure that the test data are not affected by external factors.

Working Principle

Automatic Oxygen Bomb Calorimeter measures the heat released from the combustion of a sample by igniting it in a sealed oxygen bomb. The heat released from the combustion of the sample is transferred to the water through the wall of the oxygen bomb, the water temperature rises, and the instrument calculates the calorific value of the sample by accurately measuring the change in water temperature. The instrument maintains a uniform temperature distribution through a pump circulation system and detects temperature changes through real-time temperature sensing probes to ensure accurate temperature control. In addition, the automatic oxygenation and deflation device ensures complete combustion of the sample and optimizes the test results.

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Model	**BC30**
Temperature Range	5°C to 40°C
Precision	≤0.1%
Temperature Resolution	0.0001°C
Heat Capacity Stability	Heat capacity variation ≤0.2% within one year
Accuracy	Better than GB|T 213-2008 Determination of Calorific Value of Coal
Single Sample Test Time	≤13 minutes (classical method), ≤10 minutes (rapid method)
Temperature Sensing Technology	yes
Oxygen Bomb Identification	yes
MCPC Module	yes
Visible Water Level	yes
Oxygen Filling Method	automatic

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Model	**BC30**
Exhaust Method	automatic
Lifting and Lid Opening	automatic
Outer Tank Water Volume	22L
Cooling Water Volume	12L
Cooling Method	Peltier
Power Supply	220Vac, 50Hz
Power Consumption	≤0.8kW
Dimensions	980x520x500mm
Weight	115kg