bomb calorimeter for determining the calorific value

Bomb calorimeter is a precision instrument used to measure the calorific value of solid or liquid fuels, widely used in power plants, coal mines, commodity inspection, environmental protection, geological exploration, metallurgy, papermaking, chemical industry, scientific research, as well as education and other industries.

Bomb calorimeter mainly through the combustion of combustible substances and determine the heat generated to assess the energy content of the fuel, so as to help the relevant industries in the production and research and development to make more effective decisions.

Main Features of the Bomb Calorimeter

1. semiconductor cooling water circulation system: the use of environmentally friendly, non-polluting, noiseless semiconductor cooling water circulation system, which can automatically adjust the cooling capacity according to the previous heat generation. The system balances and continuously circulates the water flow to ensure that the water temperature remains constant during the experimental process, without artificial intervention, reducing the impact of environmental factors on the test results, thus improving the accuracy of the experiment.

2. efficient thermal insulation design: bomb calorimeter using imported thermal insulation materials, effectively isolate the external environment interference. This can effectively prevent heat dissipation and enhance the anti-interference ability of the instrument, making the test results more reliable.
3. high-precision probe-type electronic measuring cup: bomb calorimeter is equipped with a high-precision probe-type electronic measuring cup, no need for manual weighing of water, automatic measurement of water in the inner cylinder, repeatable error is less than 0.5g, to ensure that the water measurement is more accurate. The precise control of the water volume greatly reduces the testing time and makes the measurement results more rapid and accurate.
4. automatic ignition wire discrimination function: bomb calorimeter with ignition wire automatic discrimination function, can accurately determine the working status of the ignition wire. If there is any problem with the ignition wire, the instrument will alarm automatically to ensure the smooth progress of the experiment.
5. laboratory management system interface: through the connection with the laboratory management system, data upload and backup can be realized. The test results can be automatically synchronized to avoid errors in manual operation and improve the efficiency of data management.
6. Special oxygen bomb and crucible: designed for solid waste samples to meet the special experimental needs.
7. optional oxygen bomb gas collection device: used for the collection of gas in the oxygen bomb, suitable for the determination of some special combustion reaction.

Advantages

1. efficient and accurate measurement ability: bomb calorimeter adopts advanced technical means, such as semiconductor refrigeration and high-precision water measurement, which ensures fast and accurate calorific value determination and meets high standard industrial and scientific research needs.
2. Automatic operation reduces human error: automatic water measurement, automatic ignition filament discrimination and data upload function, etc. reduce human intervention, thus ensuring the efficiency and accuracy of the experimental process.
3. environmental protection, energy saving: the use of non-polluting, noiseless semiconductor refrigeration system, to avoid the environmental pollution that may be brought about by the traditional refrigeration system, and can be adjusted according to the needs of the experiment, saving energy.
4. wide range of application: applicable to coal, coke, petroleum, cement, black raw materials and other combustible materials calorific value determination, and can choose different accessories as needed to meet the experimental needs of different samples.
5. intelligent management: experimental data and results can be uploaded in real time through the management system to avoid data loss and improve the efficiency of data management and analysis.

Working Principle

The working principle of the bomb calorimeter is to measure the heat released when the fuel is completely burned under the condition of sufficient oxygen. The sample is placed into an oxygen bomb, a sealed container, which is filled with oxygen and then ignited by an electric ignition device. The heat released during combustion is transferred through the walls of the oxygen bomb to the surrounding water, thereby increasing the water temperature. The calorific value of the fuel is calculated by measuring the change in water temperature and combining it with the specific heat capacity of water. The instrument accurately calculates the calorific value of the sample through high-precision water measurement and temperature change monitoring.

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Model	**BC10**
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

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Model	**BC10**
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	no
Oxygen Bomb Identification	no
MCPC Module	no
Visible Water Level	no
Oxygen Filling Method	manual
Exhaust Method	manual
Lifting and Lid Opening	manual

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Model	**BC10**
Outer Tank Water Volume	22L
Cooling Water Volume	6L
Cooling Method	Peltier
Power Supply	220Vac, 50Hz
Power Consumption	≤0.5kW
Dimensions	720x460x420mm
Weight	45kg