

Professionalism

Sundy continuously insists on independent innovation and attaches great importance to the acquisition and protection of intellectual property.

Member of "National Technical Committee on Coal Standardization Administration of China" (SAC/TC42).

Sundy has acquired 318 patents, among which 90 are invention patents.



Production Line	Meeting Room	R&D
Lab	Exhibition 2017	Public listed



Quality

ISO 9001 Quality Management System.

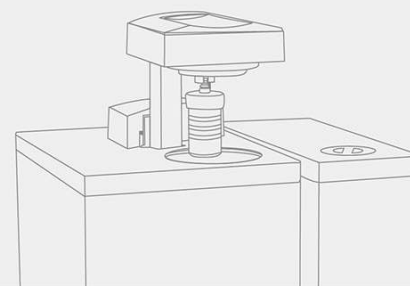
ISO 14001 Environmental Management System.

ISO 18001 Occupational Health and Safety Management System.

CE Certificate



Calorimeter Series



Calorimeter Series

Sundy invented the first automatic bomb calorimeter in China (1996).

Altogether Sundy developed 5 generations of automatic calorimeters with fully independent intellectual property rights.

In calorimeter field, Sundy has obtained 58 patents including 38 invention patents, created two "National Key New Product".

"Three-tier structure", "compressor cooling", "Helix tube isothermal technology" are initiative by Sundy which represent the highest technology of different period.

After 30 years improvement, SD series calorimeter has been synonymous with "fast", "accuracy" and "stability". Currently, calorimeter is one of Sundy three leading products. Over 1,000 customers worldwide select Sundy calorimeter products annually.

SDAC1500 Bomb Calorimeter - CV

Compact design, small footprint
Automatic oxygen filling and releasing
Automatic bomb washing
High efficiency, 7.5 min/sample



Dimension: 542mm×400mm×490mm
Weight: 54kg

Application

SDAC1500 can be used to determine the calorific value of solid and liquid combustibles such as coal, coke, petroleum oil, cement black raw meal, biomass fuels, solid wastes as well as building material.

Conformance to Standards

- ▶ ASTM D5865 Standard test method for gross calorific value of coal and coke
- ▶ ASTM D240 Standard test method for heat of combustion of liquid hydrocarbon fuels by bomb calorimeter
- ▶ ASTM D4809 Standard test method for heat of combustion of liquid hydrocarbon fuels by bomb calorimeter (Precision Method)
- ▶ ISO 18125 Solid biofuels — Determination of calorific value
- ▶ ISO 1928 Coal and coke — Determination of gross calorific value
- ▶ ISO 9831 Animal feeding stuffs, animal products, and faeces or urine — Determination of gross calorific value — Bomb calorimeter method
- ▶ ISO 1716 Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value)

Specification

Analysis Time	7.5min
Temperature Resolution	0.0001 C
Precision	≤0.05% RSD (1g benzoic acid)
Jacket Type	Isoperibol
Heat Capacity Stability	≤0.20% within three months
Power Supply	220V±10%, 50/60Hz, ≤0.5kW

Highlights

All-in-one design, integrated touchscreen monitor, no external water tank, high space utilization.

- ▶ Compact design, no external water tank, touchscreen operation, no need to connect to a desktop computer;
- ▶ Dual semiconductor for temperature control, combined cooling and heating, precise temperature control of jacket, strong environmental adaptability.

High automation and test efficiency, automatic oxygen filling and releasing, automatic bomb washing

- ▶ Automatic oxygen filling and releasing, automatic oxygen pressure detection, automatic bucket water filling and temperature control, automatic bomb washing, and the experiment is automatically completed.
- ▶ Unique bucket water circulation system can quickly and automatically set the volume, the stirring is stable and efficient, and the heat transfer speed of the oxygen bomb is fast, which effectively shortens the test time.
- ▶ Special designed tool for oxygen bomb, easy to opening and closing.

Accurate, precise and stable test result.

- ▶ The temperature of the bucket is automatically controlled to ensure that the initial test conditions of each sample are close, which improves the consistency of the test results and ensures the stability and accuracy of the long-term use of the instrument.

Real and reliable test result.

Reasonable structure, stable and safe operation.

- ▶ Self-diagnosis function, convenient for daily maintenance.
- ▶ Unique crucible bracket, easy to take and place.

SDAC1200 Bomb Calorimeter - CV

Fully automatic oxygen filling & releasing,
fully automatic bomb raising & lowering.



Main body dimension: 390mm*565mm*485mm
Water tank dimension: 220mm*565mm*410mm
Main body weight: 50KG
Water tank weight: 25KG

Application

SDAC1200 can be used to determine the calorific value of solid and liquid combustibles such as coal, coke, petroleum oil, cement black meal, biomass fuels as well as building material.

Conformance to Standards

- ▶ ASTM D5865 Standard test method for gross calorific value of coal and coke.
- ▶ ASTM D240 Standard test method for heat of combustion of liquid hydrocarbon fuels by bomb calorimeter.
- ▶ ASTM D4809 Standard test method for heat of combustion of liquid hydrocarbon fuels by bomb calorimeter (precision method).
- ▶ ISO 18125 Solid biofuels — Determination of calorific value.
- ▶ ISO 1928 Coal and coke — Determination of gross calorific value.
- ▶ ISO 9831 Animal feeding stuffs, animal products, and faeces or urine — Determination of gross calorific value — Bomb calorimeter method.
- ▶ ISO 1716 Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value).

Specification

Analysis Time	Fast mode <10min, Standard mode <12min Precision mode <14min (Default)
Temperature Resolution	0.0001 C
Heat Capacity Precision	≤0.08%
Calorimeter Type	Isoperibol
Heat Capacity Stability	≤0.20% within 12 months
Balance Connection	RS232
Power Requirement	220V±10%, 50/60Hz

Highlights

Optimized design, fully automatic oxygen filling & releasing, automatic bomb raising & lowering.

- ▶ Unique bucket water circle system, which is able to determine water volume for each testing automatically. New stainless steel oxygen bomb can be easily assembled and disassembled. High stirring efficiency by propeller, faster heat transfer of oxygen bomb, testing time is greatly reduced.

- ▶ Unique automatic press type oxygen filling & releasing design, no blockage, much more stable than traditional automatic calorimeter.



Automatic bomb raising & lowering
Automatic oxygen filling & releasing

- ▶ Equipped with a semiconductor thermostatic water tank with cooling and heating function. More precise temperature control and lower power consumption and noise than conventional compressor cooling water tank.

- ▶ High automation: bomb raising & lowering, oxygen filling & releasing, oxygen filling pressure and air tightness detection, bucket water volume constant, bucket water temperature control, pipeline flushing, water change, etc.

Accurate and reliable test result

- ▶ Larger heat capacity, it makes the testing result more accurate and reliable.
- ▶ Support two ignition methods: nickel wire and cotton thread.

Reasonable structure, reliable operation, safe and environment friendly.

- ▶ With self-diagnostic function, malfunction can be detected accurately, easy to maintain.
- ▶ Unique crucible support design, convenient to use.

Good environment adaptability, precise, accurate and reliable test result.

- ▶ Helix tube multi-point isothermal technology, create a controllable and stable internal environment (consists of jacket and jacket lid, temperature difference <0.05℃), stop the interference of external environment (such as air flow, temperature) to bucket, test result is reliable.

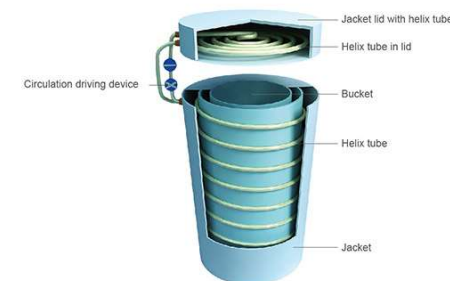


Diagram for helix tube multi-point isothermal technology

- ▶ Independent jacket and bucket water system. After the test, bucket water automatically flow back into water tank, no affection between inlet and outlet of bucket water and jacket water. Jacket water temperature is stabilized.

SDAC1000 Bomb Calorimeter - CV

Analysis time $\leq 12\text{min}$

Optional support stand, customer can choose either benchtop / vertical type.



Main body dimension: 428mm*565mm*450mm
Water tank dimension: 220mm*565mm*410mm
Main body weight: 45kg
Water tank weight: 25KG

Application

SDAC1000 can be used to determine the calorific value of solid and liquid combustibles such as coal, coke, petroleum oil, cement black meal, biomass fuels, solid wastes as well as building material.

Conformance to Standards

- ▶ ASTM D5865 Standard test method for gross calorific value of coal and coke.
- ▶ ASTM D240 Standard test method for heat of combustion of liquid hydrocarbon fuels by bomb calorimeter.
- ▶ ASTM D4809 Standard test method for heat of combustion of liquid hydrocarbon fuels by bomb calorimeter (precision method).
- ▶ ISO 18125 Solid biofuels — Determination of calorific value.
- ▶ ISO 1928 Coal and coke — Determination of gross calorific value.
- ▶ ISO 9831 Animal feeding stuffs, animal products, and faeces or urine — Determination of gross calorific value – Bomb calorimeter method.
- ▶ ISO 1716 Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value).

Specification

Analysis Time	$\leq 12\text{min}$
Temperature Resolution	0.0001 C
Heat Capacity Precision	$\leq 0.10\%$
Calorimeter Type	Isoperibol
Heat Capacity Stability	$\leq 0.20\%$ within 12 months
Balance Connection	RS232
Power Requirement	220V $\pm 10\%$, 50/60Hz

Highlights

Good environment adaptability, precise, accurate and reliable test result.

- ▶ Helix tube multi-point isothermal technology, create a controllable and stable internal environment (consists of jacket and jacket lid, temperature difference $< 0.05^\circ\text{C}$), stop the interference of external environment (such as air flow, temperature) to bucket, test result is reliable.
- ▶ With semiconductor temperature control technology for the jacket, both cooling and heating can be realized. There is no need to fill cold water to decrease the water temperature to ensure independent jacket and bucket water system. After the test, bucket water automatically flow back into water tank, no affection between inlet and outlet of bucket water and jacket water. Jacket water temperature is stabilized.
- ▶ Constant volume oxygen vessel, the bucket water volume will not be affected by the operator, so that heat capacity more stable.
- ▶ Support automatic pipeline flushing and water change to ensure the long-term stability of the heat capacity.

Accurate and reliable test result

- ▶ Larger heat capacity, it makes the testing result more accurate and reliable.
- ▶ Support two ignition methods: nickel wire and cotton thread.

Humanized design, high automation, fast test speed.

- ▶ Unique bucket water circle system, which is able to determine water volume for each testing automatically. New stainless steel oxygen bomb can be easily assembled and disassembled. High stirring efficiency, faster heat transfer of oxygen bomb, testing time is greatly reduced. Analysis time for each sample is less than 12 min.
- ▶ Equipped with a semiconductor thermostatic water tank with cooling and heating function. More precise temperature control and lower power consumption and noise than conventional compressor cooling water tank.

Reasonable structure, reliable operation, safe and environment friendly

- ▶ With self-diagnostic function, malfunction can be detected accurately, easy to maintain.
- ▶ Unique crucible support design, convenient to use.
- ▶ Strong data processing capability, statistics report and printing function. Capable of connecting with network and balance.

SDACM3200 Bomb Calorimeter - CV



Main body dimension: 500mm*600mm*425mm
Water tank dimension: 550mm*356mm*520mm
Main body weight: 65KG
Water tank weight: 17.5KG

Application

SDACM3200 can be used to determine the calorific value of solid and liquid combustibles such as coal, coke, petroleum oil, cement black meal, biomass fuels, solid wastes as well as building material.

Conformance to Standards

- ▶ ASTM D5865 Standard test method for gross calorific value of coal and coke.
- ▶ ASTM D240 Standard test method for heat of combustion of liquid hydrocarbon fuels by bomb calorimeter.
- ▶ ASTM D4809 Standard test method for heat of combustion of liquid hydrocarbon fuels by bomb calorimeter (precision method).
- ▶ ISO 18125 Solid biofuels — Determination of calorific value.
- ▶ ISO 1928 Coal and coke — Determination of gross calorific value.
- ▶ ISO 9831 Animal feeding stuffs, animal products, and faeces or urine — Determination of gross calorific value — Bomb calorimeter method.
- ▶ ISO 1716 Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value).

Specification

Analysis Time	≤14min
Temperature Resolution	0.0001℃
Heat Capacity Precision	≤0.15%
Jacket Type	Isoperibol
Heat Capacity Stability	≤0.25% within three months
Balance Connection	RS232
Power Requirement	220V±10%, 50/60Hz

Highlights

- ▶ Large capacity water tank, the water temperature change of the jacket in each test is less than 0.1℃, and the heat capacity precision is less than 0.15%.
- ▶ Automatic water temperature control, water volume constant, and total water volume detection. The whole process of the experiment is completed automatically.
- ▶ Larger heat capacity, it makes the testing result more accurate and reliable.
- ▶ Measuring the temperature by PT1000 Platinum resistance to improve the test precision.
- ▶ Connected with balance and network by standard interface RS232, real time data can be transmitted by internal network.

Description	SDAC1500	SDAC1200	SDAC1000	SDACM3200
Analysis Time	7.5 min	Fast mode <10min, Standard mode<12min, Precision mode <14min (Default)	12min	≤14min
Temperature Resolution	0.0001℃	0.0001℃	0.0001℃	0.0001℃
Precision(RSD)	≤0.05%	≤0.08%	≤0.10%	≤0.15%
Heat Capacity Stability	≤0.2% within three months	≤0.2% within 12 months	≤0.2% within 12 months	≤0.25% within three months
System Structure	Benchtop	Benchtop	Benchtop/Vertical	Benchtop/Vertical
Conformance with Standard	ASTM D 5865, ASTM D240, ASTM D4809, ISO18125,ISO1928, ISO9831, ISO1716, DIN 51900, BS EN 14918			
Bomb Volume	350ml	250ml	250ml	282ml
Calorimeter Type	Isoperibol	Isoperibol	Isoperibol	Isoperibol
Oxygen Filling	Automatic	Automatic	Semi-automatic	Semi-automatic
Max.Bomb pressure	20Mpa	20Mpa	20Mpa	20Mpa
Bomb Identity	Yes	Yes	Yes	No
Gas Requirement	99.5% Oxygen	99.5% Oxygen	99.5% Oxygen	99.5% Oxygen
Water Requirement	Distilled water	Distilled Water	Distilled Water	Distilled Water
Energy Measurement Range	0~50000J	0~50000J	0~50000J	0~50000J
Bucket Filling	Automatic	Automatic	Automatic	Automatic
Independent Bucket and Jacket Water System	Yes	Yes	Yes	Yes
Stirring Method	Propeller	Propeller	Propeller	Blade
Reproducibility based on analysis of 1g Benzoic Acid	0.1%	0.1%	0.1%	0.15%
Average Temperature Increase	2℃	2℃	2℃	2℃
Temperature Measurement	PT1000	PT1000	PT1000	PT1000
Working Temperatures	≤32℃	≤32℃	≤32℃	≤32℃
Cooling method	Refrigerating device	Refrigerating device	Refrigerating device	Automatic by water circulation
Network	Yes (Include LIMS)	Yes (Include LIMS)	Yes (Include LIMS)	Yes (Include LIMS)
Power	220V(-15% +10%) 50/60Hz	220V(-15% +10%) 50/60Hz	220V(-15% +10%) 50/60Hz	220V(-15% +10%) 50/60Hz
Max.power	0.65KW	0.65KW	0.65KW	0.22KW
Dimension	Main body: 542*400*490 Water tank: 209*565*414	Main body: 428*565*485 Water tank: 220*565*410	Main body: 428*565*450 Water tank: 220*565*410	Main body: 500*600*425 Water tank: 550*356*520
Weight	54kg	50kg	45kg	65kg
Advance Calculation	Yes	Yes	Yes	No
Analysis Report	Yes	Yes	Yes	Yes
Statistics Report	Yes	Yes	Yes	Yes
System Monitor	Yes	Yes	Yes	Yes
Correction Facilities	User selected option for the correction for acid or % nitrogen, fuse wire, sulfur, moisture, spiking, ash, and hydrogen.			