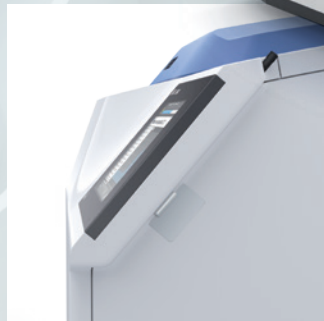




IKA

analytical equipment
designed for scientists



EN | New Generation
Calorimeters

Calorimeter upgrade from C 2000 to C 3000 Improved precision and accuracy

IKA oxygen bomb calorimeters are the market leaders when it comes to determining the calorific values of liquid and solid samples. The selection of IKA oxygen bomb calorimeters is optimally geared towards various different demands. Functionality, safety and longevity are the main goals in the development of IKA oxygen bomb calorimeters.

C 2000

The C 2000 basic calorimeter is our former generation combustion calorimeter for determining gross calorific values of liquid and solid samples. It already provided a high level of automation and was easy to operate.

After more than 20 years of successful operation in the market, the IKA R&D team decided to give the old fashioned C 2000 a facelift and update the technology to today's demands.



C 2000 Basic Version 1
Ident. No. 8801801

C 2000 Basic Version 2
Ident. No. 8801901



C 3000

With the IKA C 3000 isoperibol calorimeter we present the technologically advanced successor of our C 2000 model, with great new features such as faster sample runs, a spherically shaped decomposition vessel for faster heat transfer and a convenient touch screen for easy operation. Both oxygen filling as well as the complete water handling are fully automated.

Its measurements and calculations of gross calorific value are according to ISO 1928, ASTM D4809, ASTM D5865, ASTM D240 and GB T213. Areas of application include the power and cement industry where accurate analyses are vital.



C 3000 Isoperibol Package 1/10
Ident. No. 10005542

C 3000 Isoperibol Package 1/12
Ident. No. 10005544

“Customer satisfaction is of overriding importance to us. Considering and fulfilling the standard conformity of our calorimeters is one of our top priorities”.

Armin Wiesler, Corporate Director Research & Development, IKA-Werke GmbH & Co. KG, Germany

C 5000

The IKA calorimeter C 5000 is a well-established product in the global calorimeter market that has proven over many years. However since its technology is no longer state of the art, IKA has launched a modern successor with the latest technology but including well-established advantages.



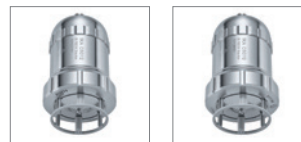
C 5000 control Package 1/10
Ident. No. 8803001

C 5000 control Package 1/12
Ident. No. 8803301

C 6000

The C 6000 global standards oxygen bomb calorimeter combines modern technology, variability and automation. It provides the IKA-unique adiabatic as well as the isoperibol and dynamic measuring modes in one instrument. As its name already indicates the C 6000 operates according to all bomb calorimeter standards, such as the DIN, ISO, ASTM, GOST and GB.

The operator can choose between three different starting temperatures (22 °C, 25 °C, 30 °C) in each measuring mode and therefore is able to adapt the unit to given conditions. Technical improvements allow shorter measurement times compared to C 5000.



C 6000 Isoperibol Package 1/10
Ident. No. 10004535

C 6000 Isoperibol Package 1/12
Ident. No. 10004536

C 6000 Global Standards Package 1/10
Ident. No. 10004531

C 6000 Global Standards Package 1/12
Ident. No. 10004532

Technical Data

Maximum energy input
Resolution of temperature sensor PT 1000
Operating oxygen pressure
Display
Measuring modes
Reproducibility isoperibolic (1g benzoic acid NBS39i)
Reproducibility dynamic (1g benzoic acid NBS39i)
Measurements per hour
Working temperature min.
Working temperature max.
Jacket control
Operator time
Operation time
Number of possible decomposition vessels per device
Decomposition vessels

Interfaces

PC
Printer
Balance
Ethernet
SD-Card
Sample rack
Ext. keyboard

Automatic Functions

Automatic water filling/draining
Automatic oxygen filling
Automatic oxygen venting

Cooling with RC 2 Chiller

Cooling medium temperature min.
Cooling medium temperature max.
Cooling medium permissible operating pressure

General Data

Weight
Dimension (W x H x D)
Permissible ambient temperature
Permissible relative humidity
Voltage
Frequency
Power Input

C 2000

40,000 J / 9,560 cal
0.0001 K
30 bar
TFT
Isoperibol (Regnault Pfaundler) Dynamic
0.05 % RSD
0.1 % RSD
Isoperibol (Regnault Pfaundler) 4
Dynamic 6
25 °C
30 °C
Controlled, water
< 1 min
7 to 22 min
4
C 5010 and C 5012

9 pin (M) RS 232 serial
Centronics
9 pin (M) RS 232 serial
No
No
Yes
No

Yes
Yes
No

12 °C
27 °C
1.5 bar

35 kg
440 x 500 x 450 mm
20 – 25 °C
80 %
100 – 120 V
50/60 Hz
1,800 W

C 3000

40,000 J / 9,560 cal
0.0001 K
40 bar
TFT with touch screen
Isoperibol (Regnault Pfaundler) Dynamic
0.05 % RSD
0.15 % RSD
Isoperibol (Regnault Pfaundler) 4
Dynamic 6
22 °C
30 °C
Controlled, water
< 1 min
8 to 16 min
4
C 6010 and C 6012

9 pin (M) RS 232 serial
USB - B, Ethernet
9 pin (M) RS 232 serial
Yes
Yes
No
Yes

Yes
Yes
No

12 °C
27 °C
1.5 bar

29 kg
500 x 450 x 450 mm
20 – 30 °C
80 %
100 – 120 V
50/60 Hz
1,700 W

Technical Data

Maximum energy input
Resolution of temperature sensor PT 1000
Operating oxygen pressure
Display
Measuring modes
Reproducibility isoperibol (1g benzoic acid NBS39i)
Reproducibility dynamic (1g benzoic acid NBS39i)
Reproducibility adiabatic (1g benzoic acid NBS39i)

Measurements per hour

Working temperature min.
Working temperature max.

Jacket control

Operator time

Operation time

Number of possible decomposition vessels per device

Decomposition vessels

Interfaces

PC

Printer

Balance

Ethernet

SD-Card

Sample rack

Ext. keyboard

Automatic Functions

Automatic water filling/draining

Automatic oxygen filling

Automatic oxygen venting

Cooling with RC 2 Chiller

Cooling medium temperature min.

Cooling medium temperature max.

Cooling medium permissible operating pressure

General Data

Weight

Dimension (W x H x D)

Permissible ambient temperature

Permissible relative humidity

Voltage

Frequency

Power Input

C 5000

40,000 J / 9,560 cal

0.0001 K

30 bar

TFT

Isoperibol (Regnault Pfaundler)
Dynamic
Adiabatic

0.05 % RSD

0.1 % RSD

0.05 % RSD

Isoperibol (Regnault Pfaundler) 3

Dynamic 6

Adiabatic 4

25 °C

30 °C

Controlled , water

< 1 min

10 to 22 min

4

C 5010 and C 5012

9 pin (M) RS 232 serial

Centronics

9 pin (M) RS 232 serial

No

No

Yes

No

Yes

Yes

Yes

12 °C

27 °C

1.5 bar

58 kg

740 x 400 x 380 mm

20 – 25 °C

80 %

100 – 120 V

50/60 Hz

1,300 W

C 6000 Isoperibol / Global Standards

40,000 J / 9,560 cal

0.0001 K

30 bar

TFT with touch screen

Isoperibol (Regnault Pfaundler)
Dynamic
Adiabatic (Only Global Standards)

0.05 % RSD

0.15 % RSD

0.05 % RSD

Isoperibol (Regnault Pfaundler) 4

Dynamic 6

Adiabatic (Only Global Standards) 5

22 °C

30 °C

Controlled , water

< 1 min

8 to 16 min

4

C 6010 and C 6012

9 pin (M) RS 232 serial

USB - B, Ethernet

9 pin (M) RS 232 serial

Yes

Yes

Yes

Yes

Yes

Yes

Yes

12 °C

27 °C

1.5 bar

29 kg

500 x 425 x 450 mm

20 – 25 °C

80 %

100 – 120 V

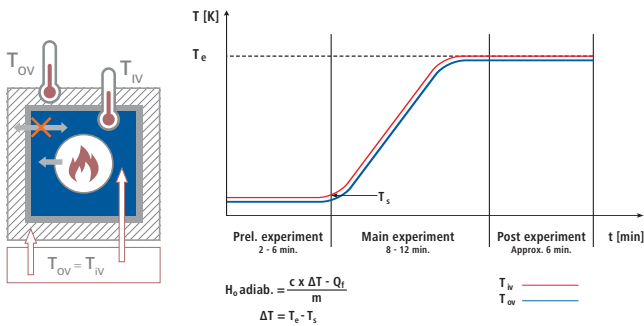
50/60 Hz

1,700 W

Calorimeter Fundamentals

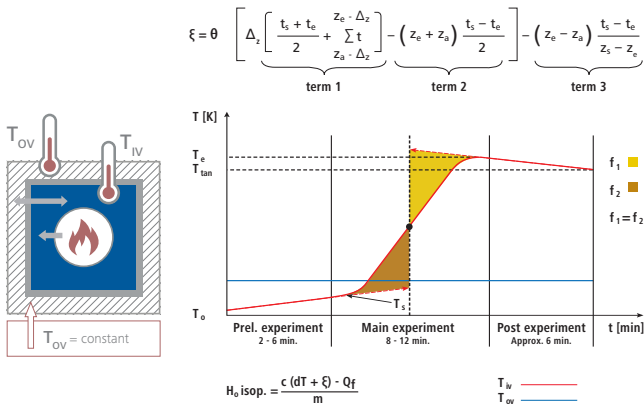
Adiabatic calorimeter

In an adiabatic calorimeter, the temperature in the outer vessel (T_{ov}) is equal to the temperature of the inner vessel (T_{iv}) throughout the experiment. This is as close to a “perfect isolation” as possible. The influence of the environment has to be minimized using air-conditioning to keep the room temperature as constant as possible. No correction calculations need to be done when compared with the isoperibolic calorimeter.



Isoperibol calorimeter

In an isoperibol calorimeter the temperature in the outer vessel (T_{ov}), is kept constant throughout the experiment. This does not allow a “perfect isolation”. There are still small temperature fluctuations. The influence of the environment has to be minimized by using air-conditioning to keep the room temperature as constant as possible. A correction factor (Regnault-Pfaundler = ξ) will be calculated after the experiment that takes these temperature fluctuations into account.

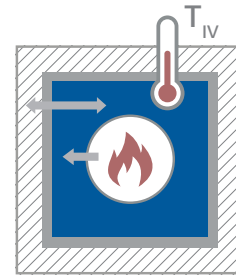


Dynamic calorimeter

The dynamic IKA designed modes are basically short versions of the original adiabatic and/or isoperibolic measuring modes. The measurement results still conform to the required Relative Standard Deviation (RSD) of the official standards.

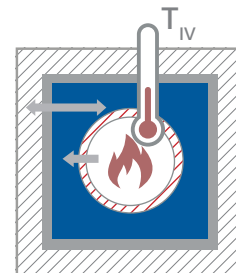
Static jacket calorimeter

In the C 1 static jacket calorimeter the outer vessel is a combination of the pressure chamber, insulating air and the housing of the unit itself. The jacket is not controlled nor filled with water. It acts static. Looking at the temperature profile of (T_{iv}), the C 1 behaves similar to an isoperibol calorimeter. The same correction calculations as in an isoperibol calorimeter according to “Regnault Pfaundler” can be applied.



Double dry calorimeter

In the double dry calorimeter, the temperature increase is measured directly in the decomposition vessel. It is surrounded by a large aluminium block. The heat of combustion is thus measured directly, and not transferred as in the classical calorimeters into water in the inner vessel, which primarily takes time. This results, depending on the chosen preliminary-test-time, in a measurement time of down to 3 minutes per experiment. The methodology is complying to ISO 1928. The actual measurement process is similar to an isoperibol measurement, but with a relatively large drift. The applied correction calculations here are IKA specific.



Calorimeter Standards

GB/T 213 – 2008	Calorie testing method of coal
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)
ASTM D5865	Standard test method for gross calorific value of coal and coke
ASTM D5468	Standard test method for gross calorific and ash value of waste materials
ASTM E711	Standard test method for gross calorific value of refuse-derived fuel by bomb calorimeter
JIS M 8814	Coal and coke: determination of gross calorific value by the bomb calorimetric method and calculation of net calorific value
ISO 1928	Solid mineral fuels Determination of gross calorific value by the bomb calorimetric method and calculation of net calorific value
ISO 1716	Reaction to fire tests for building products
DIN EN ISO 9831	Animal feeding stuffs; animal products - feces or urine determination of gross calorific value
DIN EN 14582:2007	Characterization of waste - halogen and sulfur content oxygen combustion in closed systems and determination methods
DIN 51900 – 1	Testing of solid and liquid fuels - determination of gross calorific value by the bomb calorimeter and calculation of net calorific value Part 1: Principles, apparatus, methods
DIN 51900 – 2	Method using isoperibolic or static jacket calorimeter
DIN 51900 – 3	Method using adiabatic jacket

Calorimeter Certificates



C 6010/C 6012
CE-EU Declaration of Conformity



ISO 9001 : 2008
DQS / UL Certificate



C 6010/C 6012
TÜV Süd Certificate



C 3000 isoperibol package 1/10



C 3000 isoperibol package 1/12

Contact
sales@ika.net
for your free
demo



C 3000 ISOPERIBOL PACKAGES

C 3000 ISOPERIBOL PACKAGE 1/10 | Ident. No. 0010005542

- C 3000 Measurement cell
- C 6010 Standard decomposition vessel
- RC 2 basic Recirculation chiller

C 3000 ISOPERIBOL PACKAGE 1/12 | Ident. No. 0010005544

- C 3000 Measurement cell
- C 6012 Halogen resistant decomposition vessel
- RC 2 basic Recirculation chiller

Subject to technical changes

KEY FEATURES CALORIMETER C 3000

- > Easy and convenient touch screen operation
- > Software provides control chart view and correction calculation of globally used standards
- > SD card slot for additional data management
- > Ethernet interface for data management via FTP server
- > Decomposition vessel with spherical top, better heat transfer, faster sample runs
- > Easy decomposition vessel preparation due to upside down crucible holder technology

IKA Works, Inc.
 2635 Northchase Parkway SE Wilmington, NC 28405
 Phone: +1 (910) 452 7059
 eMail: sales@ika.net, Web: www.ika.com



www.ika.com



IKAworlwide // #lookattheblue