



DDS CALORIMETERS

Scientific Analytical Calorimeter Solutions



CAL3K-S CALORIMETER

Oxygen Bomb Calorimeter

MANUFACTURING SUPERB CALORIMETERS FOR TODAY'S ANALYTICAL NEEDS

www.ddscalorimeters.com

CAL3K-S CALORIMETER

The CAL3K-S is the fifth in the range of innovative new oxygen bomb calorimeters from DDS Calorimeters. The new range, from the engineers who designed the CAL2K Oxygen Bomb Calorimeter range, is a totally dry type calorimeter, making it environmentally friendly and energy efficient. The CAL3K-S also boasts the smallest carbon footprint in its class.

The CAL3K-S is an economical system and is typically used in applications where low sample analysis is required, like in Food/Feed Analysis, Alternative Energy, Manufacturing, Coal and Oil Production, Research, Universities, and Quality Assurance. In short: wherever the calorific value of a solid or liquid sample must be determined, the CAL3K-S is the economical calorimeter of choice.

COMPLETE SYSTEM

The CAL3K-S system includes a calorimeter, 1 x standard quick thread bomb vessel, and an oxygen filling station. A spare bomb vessel can be purchased.

The calorimeter system can complete 2 samples per hour. Part of the CAL3K-S system is the external oxygen filling station (3K-3), standard across all manual filling calorimeter systems.



COMPLETE SYSTEM

FOR USE WITH THE CAL3K-S.

The CAL3K-S is your entry level system suitable for low throughput without compromising on accuracy and repeatability. It is ideal for use in Food and Nutrition, Animal Feed Analysis, Universities and Research Departments, Alternative Energy Research, Waste and Waste Product Analysis.

The following can be optionally added to the system:

- Analytical Balance Scale (sold separately)
- High Pressure Oxygen Regulator (sold separately)
- RS232 Printer (sold separately)
- Pellet Die Set (sold separately)

The complete CAL3K-S oxygen bomb calorimeter system contains all the parts and consumables necessary to set up the system. The installation kits included with the setup of the calorimeter contain consumables for approximately 200 samples, depending on the type of sample being analysed, such as coal, food, or feed samples. Other samples, such as oil, might use more consumables as they are corrosive and could cause wear and tear.

Additional consumables can be purchased separately from DDS or an authorised agent.

First sample result within 5 minutes, repeat samples within 30 minutes using the built-in fan cooler.

The vessel is manually filled with oxygen via the external manual oxygen filling station (3K-3).

It is a 1 Vessel system. Not expandable.

The system can analyse 1-2 samples per hour; a total of 8-16 samples per day.

CAL³K
NEXT GENERATION CALORIMETERS

CAL3K-S CALORIMETER

ADVANCED CAL3K-S FEATURES



TEMPERATURE CONTROL

No temperature control of room/lab required



FAULT FINDING

Extensive fault finding and testing



STEP-BY-STEP HELP

Screen prompts assist with step-by-step instructions to operate the calorimeter



15 CALIBRATION FIELDS

For different mode and different calorimeters



STANDARD QUICK THREAD BOMB VESSEL

Quick thread bomb vessel



ACCURATE

0.1% RSD accuracy



COMPENSATION

Compensation for firing energy, sulphur, moisture and fibre



BALANCE INTERFACE

Balance interface with baud speed setting



USER FRIENDLY

User Friendly Operation



PRESET FIELDS

One default setting per mode



REAL TIME PRINTING

Real time print out facility



15 CALIBRATION AVERAGE

For variable amount of calibration average to suit your application



RESTRICT ACCESS

Operating parameter access is password restricted



REMOTE ACCESS



LOW POWER CONSUMPTION

Very low power consumption. No temperature controlling required.



LARGE STORAGE

Up to 400 results storage



ECO FRIENDLY

Eco Friendly - small carbon footprint. No water, low power consumption.



INTELLIGENT VESSEL

Intelligent vessel with built-in temperature sensing



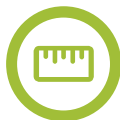
TEMPERATURE RANGE

Extensive temperature range from 0°C to 70°C.



LINEAR SENSORS

Linear temperature sensing with platinum sensors



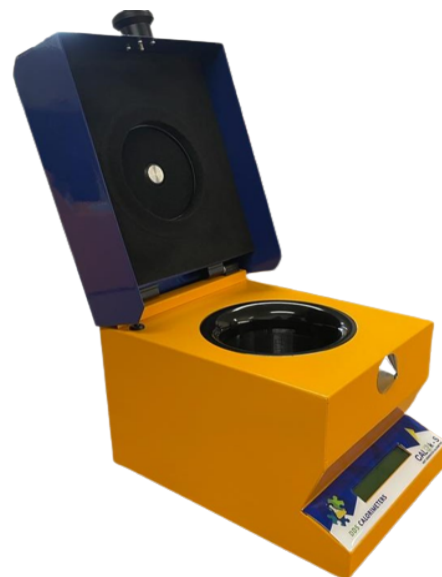
RESULTS

Results in MJ/Kg, BTU/lb or Cal/g



SAFETY

Safety checks guarantee the safety of the operator.



NO WATER REQUIRED

No Water Bucket. No Spillage. No Measuring.



MANUAL OXYGEN FILLING

Makes use of an external oxygen filling station

CAL3K-S CALORIMETER

The CAL3K Bomb Calorimeter Installation 3K-S-Kit includes :

- Power Supply (External 12V/1.25A) (3K-1-055)
- PC Keyboard PS2 (3K-1-061)
- Preparation Stand (3K-4-049)
- Stainless Steel Tweezers (3K-1-081)
- Certified Benzoic Acid Tablets (150 x 0.5g tablets per bottle) (3K-4-084)
- Wire Brush (3K-4-106)
- Deflate Cap (3K-3-18)
- Printed Installation Manual (INSTALLATION-MANUAL)
- USB 32Gb Green Memory Flash Drive (3K-1-043)

CAL3K-S KIT AND CONSUMABLES

The CAL3K Standard Quick Thread Vessel Installation 3K-5S-Kit includes :

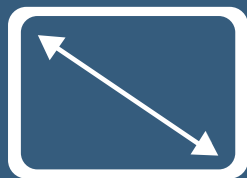
- Complete Top and Bottom Centre Electrode (3K-4-096)
- Outside Electrode (3K-4-037)
- Single Crucibles (3K-4-047)
- Deflector Plate (3K-4-092)
- Firing Cotton (Bundle of 100 threads) (3K-4-065)
- Firing Wire (5 per packet) (3K-4-093)
- Lid O-Ring (3K-4-094)
- Top and Bottom O-Ring in Vessel Lid (3K-4-022)

The CAL3K Filling Station Installation 3K-3-Kit includes :

- Nozzle O-Ring for Defiller Cap and Filling Station (3K-3-29)
- Nozzle O-Ring Used in 3K-3 Jet Assembly (3K-1-080)
- Oxygen Regulator Connection (3K-3-21)
- Defiller Cap (3K-3-22)
- Allen Key (3K-3-32)
- O-ring Lubrication Grease tube (3K-1-086)
- High Pressure Pipe 4mm (Clear/White) (PIPE-4MM-CLEAR)

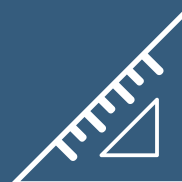


TECHNICAL SPECIFICATIONS



LCD Display

Large display for easy viewing.



Compact Size



Lightweight

Light weight for easy moving.



TUV CE Certification

Complies with ASTM, DIN and ISO International Standards.

Specification	Information
Working (Operating) Temperature	15-50°C
Storage Temperature	0-70°C
Temperature Resolution	0.000001°C
Reproducibility/Repeatability	0.1% RSD
Resolution	0.0001 MJ/Kg
Results per hour	1-2 Sample per hour
Measuring range max.	99MJ, 99000J
Working temperature min.	5°C
Working temperature max.	50°C
Temperature Measurement Resolution	10ppm (parts per million)
Cooling Medium	Built-in Fan Air

TECHNICAL SPECIFICATIONS

Specification	Information
Type of Cooling	Built-in cooling, Fan
Filling Oxygen Operating Pressure Max	40 bar
Balance/Scale Interface	RS232, 1200 to 38400 Baud (settable)
Printer Interface	RS232, 1.2Kb to 115.2Kb
Power Input	2.4W
Interface External Keyboard	PS2
Oxygen Filling	Manual
De gasification	Manual
Halogen (Decomposition) Vessel	Yes, optional
Analysis according to DIN 51900	Yes
Analysis according to ASTM D240	Yes
Analysis according to ASTM D4809	Yes
Analysis according to ASTM D5865	Yes
Analysis according to ASTM E711	Yes
Analysis according to ISO 1928	Yes
Permissible Ambient Temperature	5-35°C
Permissible Relative Humidity	80%
RS232 Interface	Yes
Voltage	220-240 / 100-120V, 12VDC, 1Amp
Frequency	50/60 Hz

Please Note: Technical Specifications subject to change without prior notice.

Please contact our team for accurate technical specifications at the time.



SYSTEM COMPARISON

FEATURE	CAL3K-A	CAL3K-AP	CAL3K-F	CAL3K-S	CAL3K-ST
BALANCE INTERFACE	Yes, from 2.4 to 38.4KB	Yes, from 2.4 to 38.4KB	Yes, from 2.4 to 38.4KB	Yes, from 2.4 to 38.4KB	Yes, from 2.4 to 38.4KB
RESULT MEMORY	700 records	700 records, 262KB	900 records	480 records	430 records
TEMPERATURE RESOLUTION	0.000'001°C	0.000'001°C	0.000'001°C	0.000'001°C	0.000'001°C
DISPLAY	4 x 40 character LCD	4 x 40 character LCD	4 x 40 character LCD	2 x 20 character LCD	4 x 40 character LCD
KEYBOARD	QWERTY, External, PS2	QWERTY, External, PS2	QWERTY, External, PS2	QWERTY, External, PS2	QWERTY, External, PS2
SAMPLE ID	16 characters, auto-increment	16 characters, auto-increment	16 characters, auto-increment	16 characters, auto-increment	16 characters, auto-increment
GROUP ID	16 characters	16 characters	16 characters	16 characters	16 characters
REAL TIME	Yes	Yes	Yes	Yes	Yes
CALIBRATION	15	15	15	15	15
UNITS	KJ, KBTU, KCAL	KJ, KBTU, KCAL	KJ, KBTU, KCAL	KJ, KBTU, KCAL	KJ, KBTU, KCAL
RESULT COMPENSATION	Automatically applied	Automatically applied	Automatically applied	Automatically applied	Automatically applied
VESSEL PRESS. MONITOR	No	Up to 100 bar	No	No	No
OXYGEN FILLING	External manual filling station	Internal, automatic filling	External manual filling station	External manual filling station	External manual filling station
DE-FILLING	Manual	Automatic	Manual	Manual	Manual
MAX CHASSIS RECORDING	Yes	Yes	Yes	Yes	Yes
CHASSIS NAME	16 characters, Bluetooth name	16 characters, Bluetooth name	16 characters, Bluetooth name	16 characters, Bluetooth name	16 characters, Bluetooth name
KEYBOARD PASSWORD	CAL3K	CAL3K	CAL3K	CAL3K	CAL3K
VESSEL LEAK MONITOR	No	Yes, flags result and warning	No	No	No
EXTERNAL COOLER	Yes	Yes	Yes	No, Built-tin	Yes
ACCEPT CAL2K VESSEL	No	No	No	No	Yes
VESSEL LOCKOUT, LOCK-IN	Yes, 2500 firings	Yes, 2500 firings	Yes, 2500 firings	Yes, 5000 firings	Yes, 5000 firings
SAMPLE REPEAT SPEED	4-5 min	6 min	7-8 min	20 min	20 min
OPERATOR TIME PER TEST	+/- 3 min	+/- 3 min	+/- 3 min	+/- 3 min	+/- 3 min
COOLING	Air	Air	Air	Built-in	Built-in
COOLING MODES	Ambient/Fixed	Ambient/Fixed	Ambient/Fixed	Ambient/Fixed	Ambient/Fixed
RSD	0.1	0.1	0.1	<0.1	0.1
POWER CONSUMPTION	12W	12W	6W	6W	6W
POWER SUPPLY	External 12V	External 12V	External 12V	External 12V	External 12V
WATER CONSUMPTION	None	None	None	None	None
REPEATABILITY	0.10%	0.10%	0.10%	0.10%	0.10%

SYSTEM COMPARISON

FEATURE	CAL3K-A	CAL3K-AP	CAL3K-F	CAL3K-S	CAL3K-ST
OPERATING MODES	Dynamic, Isothermal, Adiabatic	Dynamic, Isothermal, Adiabatic	Dynamic	Dynamic	Dynamic
NUMBER OF VESSELS	4	4	4	1	2
CLOSURE TYPE	Screw (Thread) Cap	Screw (Thread) Cap	Screw (Thread) Cap	Screw (Thread) Cap	Screw (Thread) Cap
TESTS P/H WITH 2 VESSELS	10+	8+	4-6+	2	3+
BOMB VESSEL TYPE	Removable	Removable	Removable	Removable	Removable
OXYGEN FILLING	Semi-Automatic	Fully Automatic	Semi-Automatic	Semi-Automatic	Semi-Automatic
BOMB VESSEL WASHING	Manual	Manual	Manual	Manual	Manual
PRINTER CONNECTION	RS232	RS232	RS232	RS232	RS232
BALANCE CONNECTION	RS232	RS232	RS232	RS232	RS232
ENVIRONMENTAL	5-40°C	5-40°C	5-40°C	5-40°C	5-40°C
PRINTING OF RESULTS	Via PC or RS232 Printer	Via PC or RS232 Printer	Via PC or RS232 Printer	Via PC or RS232 Printer	Via PC or RS232 Printer
PC SOFTWARE	Advanced	Advanced	Advanced	Advanced	Advanced
CORRECTION FACTORS	4	4	4	4	4
MASS ENTRY	Auto & Manual	Auto & Manual	Auto & Manual	Auto & Manual	Auto & Manual
CE/TUV CERTIFICATE	Yes (Pending)	Yes (Pending)	Yes	Yes	Yes (Pending)
SPIKING	Yes	Yes	Yes	Yes	Yes
SELF TESTING	Yes	Yes	Yes	Yes	Yes
AI COMPENSATION	Yes	Yes	Yes	Yes	Yes
CONNECTIVITY	USB 2.0, 2 x RS232 at 115.2KB for bluetooth	USB 2.0, 2 x RS232 at 115.2KB for bluetooth	2 x RS232 at 115.2KB	2 x RS232 at 115.2KB	2 x RS232 at 115.2KB
PRINTING	Yes	Yes	Yes	Yes	Yes
MOISTURE COMPENSATION	Yes	Yes	Yes	Yes	Yes
FOOD FIBRE COMPENSATION	Yes	Yes	Yes	Yes	Yes
REAL TIME PRINTOUT	Yes	Yes	Yes	No	No
GELATIN CAPSULE COMP.	Yes	Yes	Yes	Yes	Yes

The CAL3K-S Oxygen Bomb Calorimeter System can be used with most applications including, but not limited to: Animal Feed Research, University Research, Food/Nutrition Analysis, Explosives Analysis, Coal Analysis, Oil Analysis, and other traditional and non-traditional applications.

For more details and application notes visit our website at www.ddscalorimeters.com

CONTACT US

COMPANY HISTORY

Digital Data Systems (DDS has more than 40 years of experience in calorimetry.

In 1972, DDS produced their first calorimeter, the AMPC (Automatic Micro Processor Calorimeter). The AMPC was a dual water isothermal unit controlled by a microprocessor.

In 1980 work began on a new revolutionary design of vessel, namely the DRY vessel or CP510, which meant that there was no surrounding water jacket. A copper sleeve pressed over the vessel replaced the water jacket and the temperature sensors were placed inside the vessel resulting in the heat transfer being extremely fast. Determination time was significantly reduced, increasing the unit efficiency by 4 times. With the processing power of the microprocessors available at the time, the CP500 Calorimeter was born. The striking "buttercup yellow" colour gave a splash of brightness to the then drab laboratories.

In 2002 work began on the CAL2K. The tried and tested DRY system was retained and only the very latest electronic technology was used, including the surface mount devices.

In 2005, DDS came to realize the need for smaller, low volume, inexpensive calorimeter systems, with the same accuracy and reliability of the CAL2K. The ECO was then created as an alternative system to the CAL2K. The ECO is suitable for the following markets: Universities, Research Facilities, Brick Manufacturers, Animal Feed Industries, Food Quality, and Food Production.

In 2007 the new E2K system was developed.

In 2014 work began on the new CAL3K range. The CAL3k-A the first of the range, the CAL3k-F and CAL3K-AP shortly thereafter. In 2018 work began on the new CAL3K-S.



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**DDS Calorimeters are proudly manufactured by :
Digital Data Systems (Pty) Ltd.**

For more information about any of our products visit our website at www.ddscalorimeters.com.

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