Digital Bomb Calorimeter

- Extremely easy to use Push Fit type Gas Filling System, First time in india
- Safety Relief Valve for user safety
- High mechanical standard & easy controls
- Accurate, reliable & user Friendly
- Copper Water Jacket
- New Digital Temperature Indicator With Built in Printer

Advance Research Instruments Company

ARICO INDIA
OPTICS & INSTRUMENTATION
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Digital Bomb Calorimeter

Auto Gas Filling Bomb Features

- Latest Bomb Design No More Requirement To Replace Schrader Valve (NRV).
- Ensure Trouble Free Smooth Operation without Repair & Maintence.
- None fin Oxygen More easily & quickly with New Mechanism.
- Latest Designed Regulator with Double Pressure Gauge.
- Latest Designed “Plug in Gently Push to Fill Oxygen”
- No More Turning & Controlling Knob Every Time.
- Eco Friendly Device to Release Exhaust Gases.
- No Manual Intervention “No Errors”
- Auto Cat off at Set Pressure.

Specification	BCM (A) (Auto Gas Filling with Printer)	BCM (P) (Printer)	BCM (D) (Digital)
Operational Principle	Isothermal	Isothermal	Isothermal
Fundamental Standards	BIS 1350 (Part-II) IP -12/63T, IP12/73T	BIS 1350 (Part-II) IP - 12/63T	BIS 1350 (Part-II) IP - 12/63T
Measurement Range	1000-10000 Cal/gm	1000-10000 Cal/gm	1000-10000 Cal/gm
Temperature Resolution	0.001°C	0.01°C	0.01°C
Outer Jacket	Chromium Plated Copper	Chromium Plated Copper	Chromium Plated Copper
Inner Vessel	Chromium Plated Copper	Chromium Plated Copper	Chromium Plated Copper
Bomb & Bucket	Removable	Removable	Removable
Combustion Bomb	Schrader Valve Free	With Schrader Valve	Without Schrader Valve
Oxygen Filling	Auto Oxygen Filling Adaptor	Push Fit	Push Fit
Auto Oxygen Filling Devices	Yes	No	No
Oxygen Filling Time	≤ 1 Minute	≤ 3 Minute	≤ 3 Minute
Temperature Display	Digital with Timer	Digital with Timer	Digital with Timer
Printout	Temperature Vs Time	Temperature Vs Time	No
Main Testing Time	10-15 Minute (approx)	10-15 Minute (approx)	10-15 Minute(approx)
Working Temperature	10-30°C	10-30°C	10-30°C
Power Input	≤ 0.5 KW	≤ 0.5 KW	≤ 0.5 KW
Power Supply	230 V ± 10 V, 50 Hz	230 V ± 10 V, 50 Hz	230 V ± 10 V, 50 Hz

(Note: Due to continuous improvements specifications given above can be changed without prior notice)

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ADVANCE RESEARCH INSTRUMENTS COMPANY

Bomb Calorimeter

Advance Bomb Calorimeters provides an accurate, simple, easy and inexpensive method for determination of heat of organic matter, calorific value and sulphur content of solids and liquids , food products, animal feeds, bagasse, husk, petrol, diesel RDF,LPO etc. The sample is ignited in a high pressure oxygen charged vessel called BOMB which is dipped in water in a Copper Calorimeter Vessel. The heat generated during burning is transferred to the water and the resultant temperature increase is noted very accurately thereafter calculating Calorific value & Heat of Combustion.

Bomb

Each batch of material used for Advance Calorimeter Bomb is put through a series of physical and chemical tests to verify the prescribed standards for fabrication of a high pressure vessel. This ensures the highest standards of customer safety. The Bomb body and lid are machined from corrosion resisting stainless Steel Namely Austenitic Steel satisfying the special ringing and bend tests for inter-crystalline corrosion and having good high temperature properties. The interior of the Bomb has been maintained cylindrical throughout its length. The metal to metal seal between the body and the lid is backed by a sealing ring. The Closure Ring is made of Aluminum Bronze/Stainless Steel and hand tightening of the Closure Ring is sufficient to ensure perfect gas tight sealing at a pressure of 300 kg/cm2.

The Bomb is provided with a high pressure imported Schrader Valve that simplifies the operation considerably. The valve opens and allows filling of Bomb by Oxygen because of oxygen pressure for cylinder. It closes when pressure from Oxygen Cylinder is cut off.

Push Fit Type Gas Filling System

Our latest design of easy to use Gas Filling System greatly reduces of damage to the costly Gas Filling Valve & features an extreme easy to use Push Fit type Gas Filling System. Also eliminated are the cumbersome Copper Gas Filling Tubes with our latest design of Stainless Steel braided Teflon Hose. Our tests have indicated that this new Gas Filling System reduces the time taken for Oxygen charging from around 10-13 minuted (using the copper tube) to less than 3 minutes (using the new Gas Filling System) while simultaneously avoiding chances of cross-threading & subsequent damage to the Gas Filling System.

Testing of Bomb

Each Advance Calorimeter Bomb is tested thoroughly before it leaves the factory at internal pressure of 300kg/cm2 for a period of 10 minutes without any sign of leakage in accordance with requirements of the Institute of Petroleum (I.P. 12/58T, Appendix I), IS:1350 (Part-II) 1970 and works Test certificate issued with each Bomb.

Calorimeter Jacket and Calorimeter Vessel

The Calorimeter Outer Jacket and Calorimeter Vessel of all Advance Bomb Calorimeters are made of best quality Copper sheet and are plated with highly polished Nickel-Chrome to minimize the radiation of heat as per international specifications. Copper wire is used to fabricate rim of the Calorimeter Vessel to Prevent rusting on use. Only a water filled outer jacket, preferably made of Copper, is considered to be the best in isolating the internal experimental chamber from external environmental influences. Using PUFF insulator instead of water severely retards the characteristics of the water jacket. Internationally all laboratory and industrial Bomb Calorimeters only use water filled outer jacket.

Compact Stirrer

To satisfy the requirements of IS and IP standards Advance Bomb Calorimeters feature a new Compact Stirrer for customer convenience and to minimize the heating effect of the stirrer during experiments. The speed of the stirrer is controlled with electronic circuit wherein the motor is driven at a very low voltage there-by minimising the heating of the motor. The Motor and the Stirrer shaft are insulated from each other preventing heat transfer from motor to water. All stirrers are individually checked to ensure exact compliance to the design standards. The new Compact Stirrer design is much superior to traditional offset stirrer.

Soft control Fine Regulating Valve with built-in Pressure Guage

In our new design of Fine Regulating Valve the Pressure Gauge is built-in making it more compact & easier control as the pressure can be controlled & viewed simultaneously. The Stainless Steel Pin used to control the Oxygen flow has been replaced with Teflon tips. The Stainless steel pins were hard and noisy to operate and also could not be replaced in case they became defective. In comparison the Teflon tips are very soft to control and are easily replaceable by the user himself in case the valve starts leaking.

Firing Unit

The Firing unit houses all the controls and circuits required for verifying the circuit inside the Bomb before it is Fired, interfacing circuit for Firing Unit and Digital Temperature indicator and the speed control circuit for stirrer. A superior quality transformer to give the exact current and voltage required for Ignition is used.

Digital Temperature Indicator Cum Timer With built-in Printer (Printer Optional)

Our New High accuracy Differential Type Digital Temperature Indicator is designed to replace the Mercury column Beckman thermometer and to add a new dimension in convenience to observation and measurement of temperature readings for calorific value experiments in Bomb calorimeter. This eliminates the requirement of the operator of having to be continuously present to note the temperature every minute.

Our latest addition is the new Integrated Firing Unit cum controller. In this the entire Firing unit with high current transformer & all its controls, Temperature Indicator, Timer, Printer(optional), Speed control circuit for stirrer are housed in a Plastic molded cabinet making it very compact. No connections re required for interfacing the Firing Unit and Temperature Indicator and Timer unit. The front panel contains easy to use controls with Display and Printer and the Back Panel houses all connectors & Switches.

Additional features include Auto Tare button which replaces the requirement of cumbersome potentiometers for initial temperature settings and a customer selectable printing interval.

The addition of a stabilizing circuit ensures increase in the reading stability and lower fluctuations.

The timer is such interfaced that it will get automatically switched 'ON' only when the circuit is complete and the firing button is pressed. The timer has two modes of operation that is min/sec mode with the option for buzzer.