



การประเมินความสามารถในการย่อยสลายทางชีวภาพของวัสดุ (Material Biodegradability Assessment)

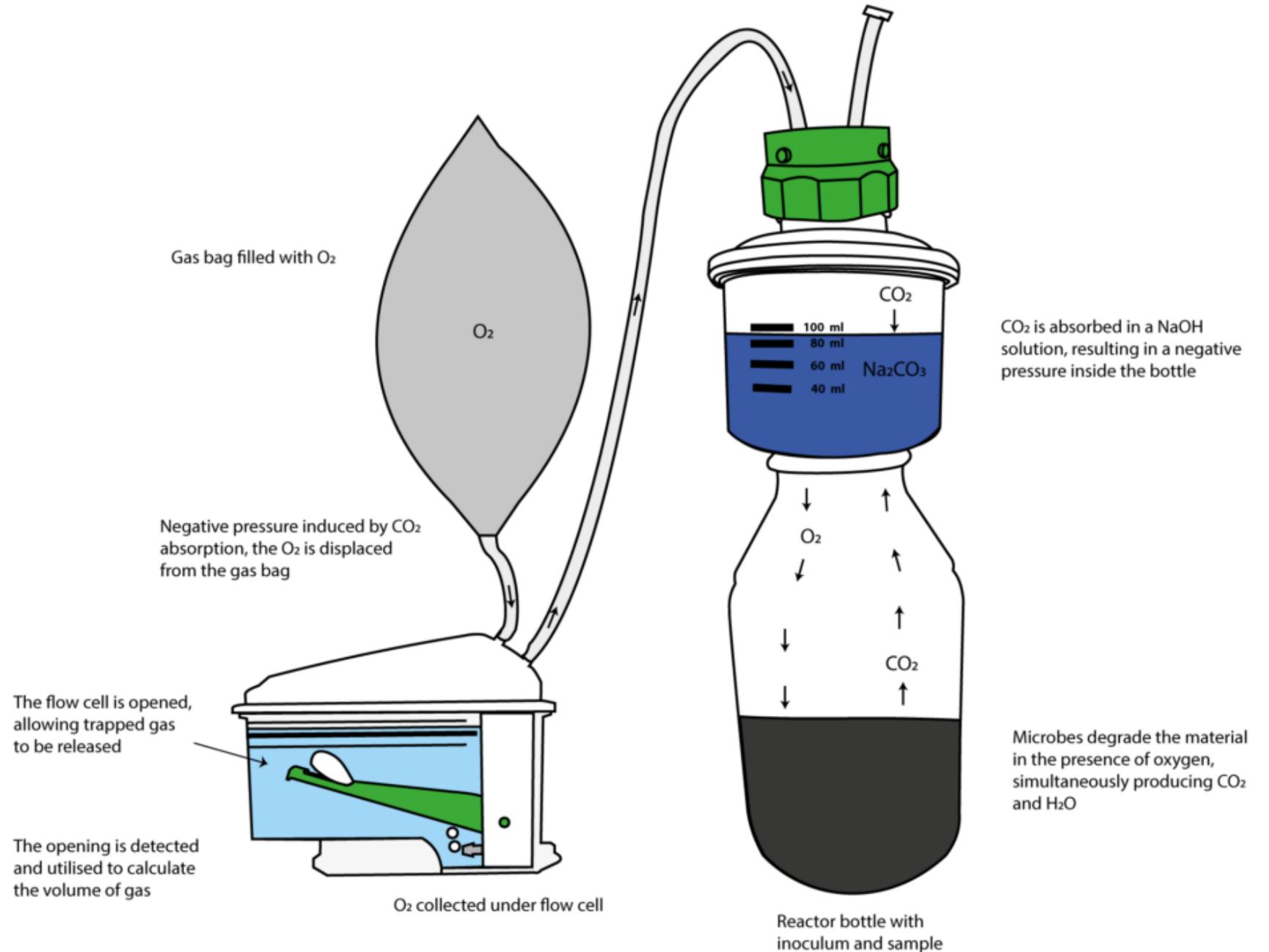
 **BPC INSTRUMENTS**

BPC[®] Blue

Working Principle

Aerobic

การย่อยสลายทางชีวภาพ
ด้วยออกซิเจน



BPC[®] Blue

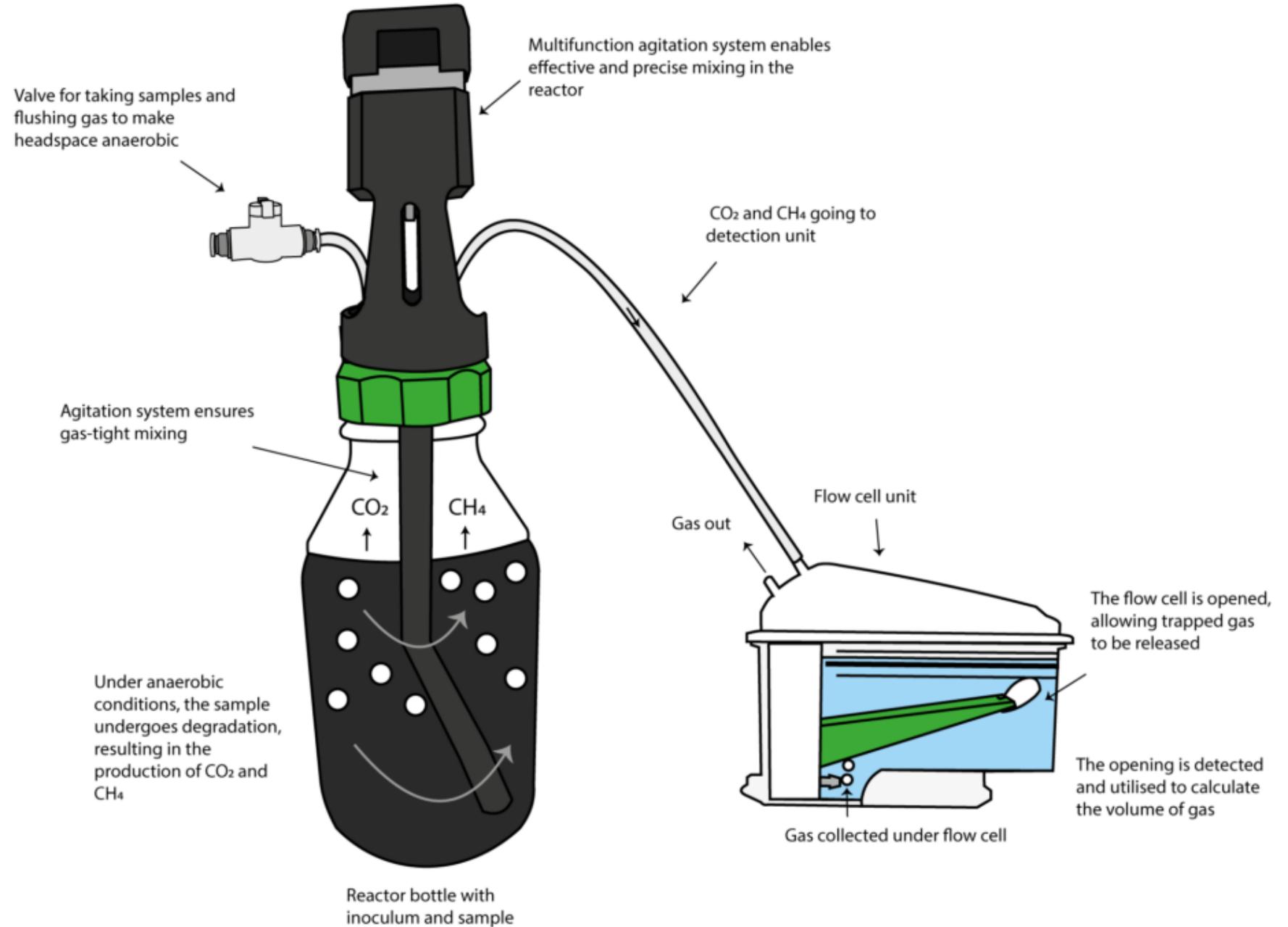
Working Principle

Anaerobic

การย่อยสลายทางชีวภาพ

แบบไร้อากาศ หรือไร้

ออกซิเจน



BPC® Blue

**The Ultimate
Choice for
Material
Biodegradability
Assessment**

AEROBIC
For aerobic
biodegradation
test

(24-0000-02)

ชุดทดสอบการย่อยสลายทางชีวภาพด้วยออกซิเจน



BPC® Blue

**The Ultimate
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Biodegradability
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ANAEROBIC
For anaerobic
biodegradation
test

(24-0000-01)

**ชุดทดสอบการย่อยสลายทางชีวภาพแบบไร้อากาศ
หรือไร้ออกซิเจน**



BPC® Blue

The Ultimate
Choice for
Material
Biodegradability
Assessment

PREMIUM

For both aerobic
and anaerobic
biodegradation
test

DUO (24-0500-02)

ชุดทดสอบการย่อยสลายทางชีวภาพแบบใช้
ออกซิเจน และแบบไร้อากาศ หรือไร้ออกซิเจน



BPC[®] Blue

Features

- **Web-based convenience:** The user-friendly web-based software running on an embedded server, eliminating the need for software installation on PC, tablet or smartphones.
- **Remote access:** BPC Blue can be accessed remotely and locally from any device with a web browser, providing flexibility and convenience.
- **Automated measurement:** Enjoy automatic measurements with real-time pressure, temperature, and moisture compensation, ensuring accurate and reliable data acquisition.
- **Real-time biodegradability calculation:** Experience the convenience of real-time biodegradability calculation, eliminating the need for manual data processing. The instrument automatically performs the calculations as the experiment progresses.
- **Calibration-free operation:** BPC Blue operates without the need for calibration, simplifying maintenance and ensuring consistent performance.
- **Multiplexing potential:** Take advantage of the multiplexing capability, allowing simultaneous biodegradability analysis with different start-up times.

BPC[®] Blue

Features

- **Easy maintenance:** The modular design of BPC Blue facilitates easy exchange, making maintenance hassle-free.
- **Local data storage:** All data is stored locally on the instrument, eliminating the dependence on external computers and ensuring data security.
- **Streamlined data processing:** Export data as a spreadsheet for further analysis, featuring a uniform time axis for easy processing and interpretation.
- **High data storage capacity:** With remarkable capacity of 7200 l of gas per channel, BPC Blue enables extensive data collection and analysis.
- **Effective agitation:** Benefit from proven strong, reliable, and multifunctional agitation, ensuring optimal mixing and reaction conditions.
- **Various time intervals:** BPC Blue generates outputs at customizable time intervals, ranging from a data point very minute to one every day, providing flexibility for your specific needs.

BPC[®] Blue

Technical Specifications



Sample incubation unit

- Maximum number of reactors per system: 18 and 9
- Reactor material: glass
- Standard reactor volume: 1000 ml and 2000 ml
- Type: Thermostatic water bath
- Dimension: 68 x 56 x 33 cm (Thermostatic water bath)
- Temperature control: up to 60 °C (203 °F) with a precision of 0.2 °C
- Mixing in the reactor: multifunction mechanical agitation with brushless DC motors (adjustable interval, speed, and rotation directions), max. speed 200 rpm

BPC[®] Blue

Technical Specifications



Aerobic configuration

- In-situ gas absorption attachments: 18 and 9
- Volume of in-situ gas absorption attachment: 100 ml
- Recommended absorption liquid: 3 M NaOH with pH indicator
- Absorption efficiency: >98%
- Gas bags: 3 x 10 L

**Absorption liquid is not included with the instrument*

BPC® Blue

Technical Specifications



Flow cell array and DAQ unit

- Working principle: liquid displacement and buoyancy
- Number of flow cell units: 18 and 9
- Unit dimension: 55 x 19 x 17 cm
- Built-in sensors: temperature, pressure, hall, accelerometer
- Connections: Ethernet, power supply, USB B, motor control
- Display: OLED 2.8" 256 x 64 white
- Housing: Aluminium and plastic
- Power supply: 12 V DC / 1.0 A with 100-240 VAC
- Usage: Indoor
- Measurement medium: Deionized or distilled water
- Operation temperature: 0 – 50°C
- Operation pressure: -50 – 50 mbar

BPC[®] Blue

Technical Specifications



Flow cell array and DAQ unit (continues)

- Gas connector diameter: ID: 2.4 – 2.6 mm; OD: 4.2-4.7 mm
- Recommended tubing size: ID: 4 mm; OD: 6 mm
- Measuring resolution: 9 ml or 2 ml
- Detection capacity: 7200 liters with 9 ml flow cell and 1600 liters with 2 ml flow cell
- Measuring range: 1 to 6000 ml/h for 9 ml flow cell and 0.2 to 1500 ml/h
- Repeatability: $CV \leq 1\%$ for 9 ml flow cell and $CV \leq 3\%$ for 2 ml flow cell
- Gases: Non-aggressive gases (e.g. CH₄ , CO₂ , H₂ , N₂ ,...)

BPC[®] Blue

Technical Specifications

Agitation

- The agitation system integrated into BPC Blue is powered by high-quality multifunction brushless step motors.
- This robust system ensures the delivery of gentle, precise, and reliable agitation within a gas-tight environment.



BPC[®] Blue

Technical Specifications



Revolutionising incubation – cooling and heating with BPC Air

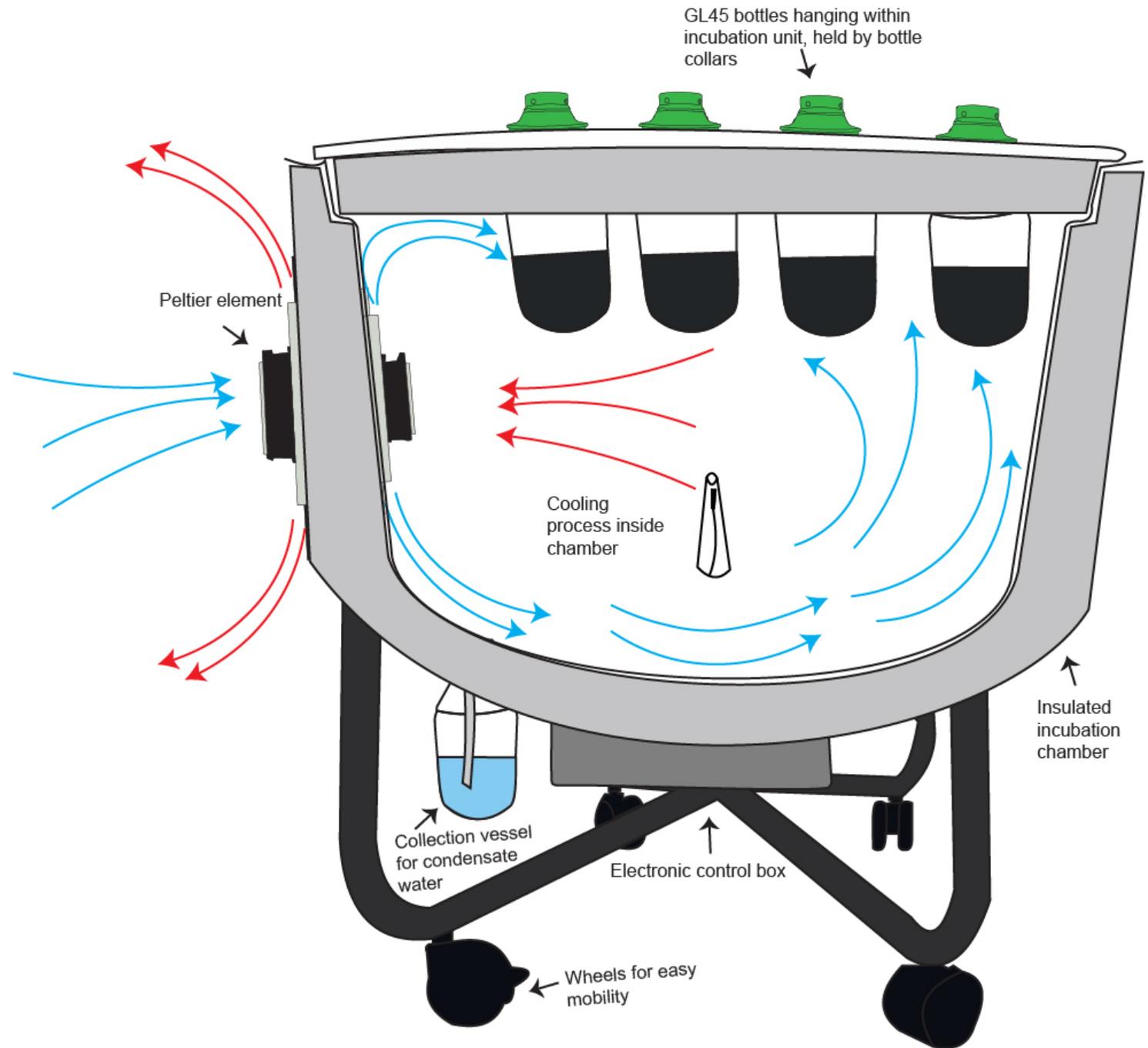
- BPC Blue can be coupled with our new BPC Air incubation unit instead of a traditional thermostatic water bath.
- The BPC Air is an air-based incubator specifically designed to seamlessly integrate with our respirometer systems. By combining BPC Blue with BPC Air, you can run tests at a range of temperatures with both heating and cooling (10 – 60°C) for long periods of time, without worrying about refilling your incubation medium.
- Available for both aerobic and anaerobic configurations, BPC Air also offers lower power consumption and is a highly mobile instrument that can fit into most available laboratory areas.

BPC[®] Air

Working Principle



Article no:
26-0000-01



BPC® Air

Features



Article no:
26-0000-01

- Dual functionality: provides both cooling and heating capabilities without the need for additional accessories.
- Seamless integration: easily integrates with other BPC Instruments' respirometers.
- Low power consumption: operates with a significantly lower electricity consumption than conventional alternatives, reducing energy costs and environmental impact.
- Air as medium: by utilizing air as the heating and cooling medium, BPC Air eliminates the need for water refills or other media.
- Floor standing design: equipped with wheels for effortless mobility and placement.
- Autonomous operation: operates independently, requiring minimal oversight.
- Easy access: allows convenient access to bottles without the need to open a hatch.
- Agitation compatibility: compatible with BPC Instruments' multifunctional agitation system and BPC® Move for agitation during experiments.
- Aerobic and anaerobic capability: capable of conducting both aerobic and anaerobic experiments.

BPC[®] Air Configurations

Aerobic:

- 9 Standard
- 18 Standard

Anaerobic:

- 9 ex-situ
- 18 ex-situ

The BPC Air incubation unit can be easily configured with our other systems to conduct both aerobic and anaerobic microbial respiration experiments. In its standard setup (18 and 9 Standard), aerobic experiments to measure oxygen consumption can be incubated. Conversely, in the ex-situ configurations (18 and 9 ex-situ), anaerobic experiments can be incubated where gas production is measured with or without the inclusion of an ex-situ gas removal unit, conveniently inserted inside the incubation chamber.



AURORA™

Software, pre-
installed on BPC
Blue



Elevate process analysis and monitoring with Aurora™ software

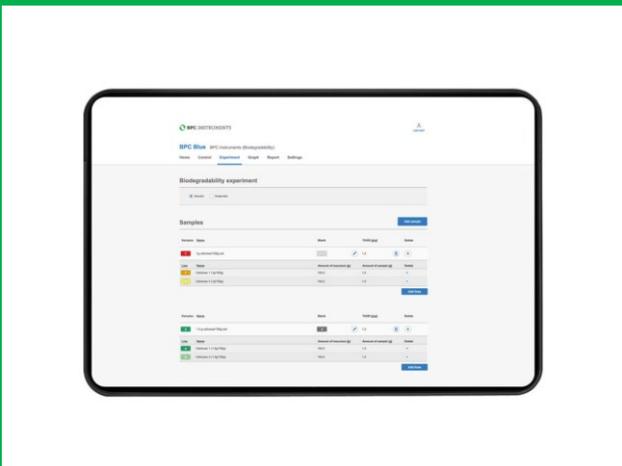
- Cutting-edge software solution for its lab instruments, bringing your experiments to life.
- With its streamlined design, setting up experiment, monitoring progress, and downloading results becomes effortless.
- Pre-installed on BPC Blue, eliminating the need for software licenses or installation on an external computer.

Realtime data standardization

- Through real-time temperature and pressure compensation, Aurora™ normalizes the measured gas volume and flow under standard conditions (i.e., 0°C, 1 atm and zero moisture) at each measurement point.
- This allows seamless switching between volume and mass units during an experiment and facilitates easy data comparison between different laboratories worldwide.

AURORA™

Software, pre-
installed on BPC
Blue



Observe biodegradation in real-time

- With BPC Blue's integrated Aurora™ software, you can witness the calculation of biodegradability in real-time.
- This includes value, standard deviation, deduction of negative control, and conversion into percent biodegradability.
- The results are presented in visually appealing graphs, enhancing the overall user experience.

Access results anywhere, anytime, on any device

- BPC Blue is designed for convenient access from any remote location using a web browser on your preferred device.
- Monitor your experiment from the comfort of your office, or home using your computer, tablet or smartphone.
- Expand the analytical capacity of BPC Blue effortlessly by connecting multiple instruments together with an Ethernet switch.
- With this feature, each BPC Blue can operate as a standalone device or be connected in parallel, catering to your specific needs.

BPC[®] Blue

Biodegradability norms and standards

มาตรฐานการทดสอบการย่อยสลายทางชีวภาพแบบไร้อากาศ หรือออกซิเจนในระบบน้ำ ระบบย่อยสลายที่ควบคุม ในของแข็งจำนวนมาก ในตะกอน ในตะกอนน้ำเสียจากเทศบาล ในสภาวะการฝังกลบ และในตะกอนที่ถูกย่อยสลาย

Anaerobic biodegradability

- ISO 14853 – ultimate anaerobic biodegradation of plastic materials in an aqueous system
- ISO 13975 – ultimate anaerobic biodegradation of plastic materials in controlled slurry digestion systems
- ISO 15985 – ultimate anaerobic biodegradation and disintegration under high-solids anaerobic digestion conditions
- ISO 11734 – ultimate anaerobic biodegradability of organic compounds in digested sludge
- ASTM D5511 – anaerobic biodegradation of plastic materials under high-solids anaerobic digestion
- ASTM D5210 – anaerobic biodegradation of plastic materials in the presence of municipal sewage sludge
- ASTM D5526 – anaerobic biodegradation of plastic materials under accelerated landfill conditions
- OECD 311 – anaerobic biodegradability of organic compounds in digested sludge

BPC[®] Blue

Biodegradability norms and standards

มาตรฐานการทดสอบการย่อยสลายทางชีวภาพด้วยออกซิเจน ในระบบน้ำ ดิน น้ำทะเล+ทราย น้ำทะเล และตัวกลางที่เป็นน้ำ

Aerobic biodegradability

- ISO 14851 – ultimate aerobic biodegradation of plastic materials in an aqueous system
- ISO 17556 – ultimate aerobic biodegradation of plastic materials in soil
- ISO 18830 – aerobic biodegradation of non-floating plastic materials in a seawater/sandy sediment interface
- ISO 23977-2 – aerobic biodegradation of plastic materials exposed to seawater (part 2)
- OECD 301 – ready biodegradability of chemical materials in aerobic aqueous medium

BPC[®] Blue

Biodegradability norms and standards

มาตรฐานการทดสอบการย่อยสลายทางชีวภาพด้วยออกซิเจน ในตัวกลางที่เป็นน้ำ ที่สัมผัสกับตะกอนในทะเล ในน้ำทะเล+ ตะกอน และในน้ำทะเล

Aerobic biodegradability can also be measured based on analysis of evolved carbon dioxide according to following standards. However, test protocols based on same purpose are available based on measurement of oxygen demand in a closed respirometer which is the recommended method for BPC[®] Blue with a simplified system configuration, higher measurement precision and accuracy.

- ISO 14852 – ultimate aerobic biodegradability of plastic materials in an aqueous medium
- ISO 22404 – aerobic biodegradation of non-floating materials exposed to marine sediment
- ISO 19679 – aerobic biodegradation of non-floating plastic materials in a seawater/sediment interface
- ISO 23977-1 – aerobic biodegradation of plastic materials exposed to seawater (part 1)

BPC[®] Blue

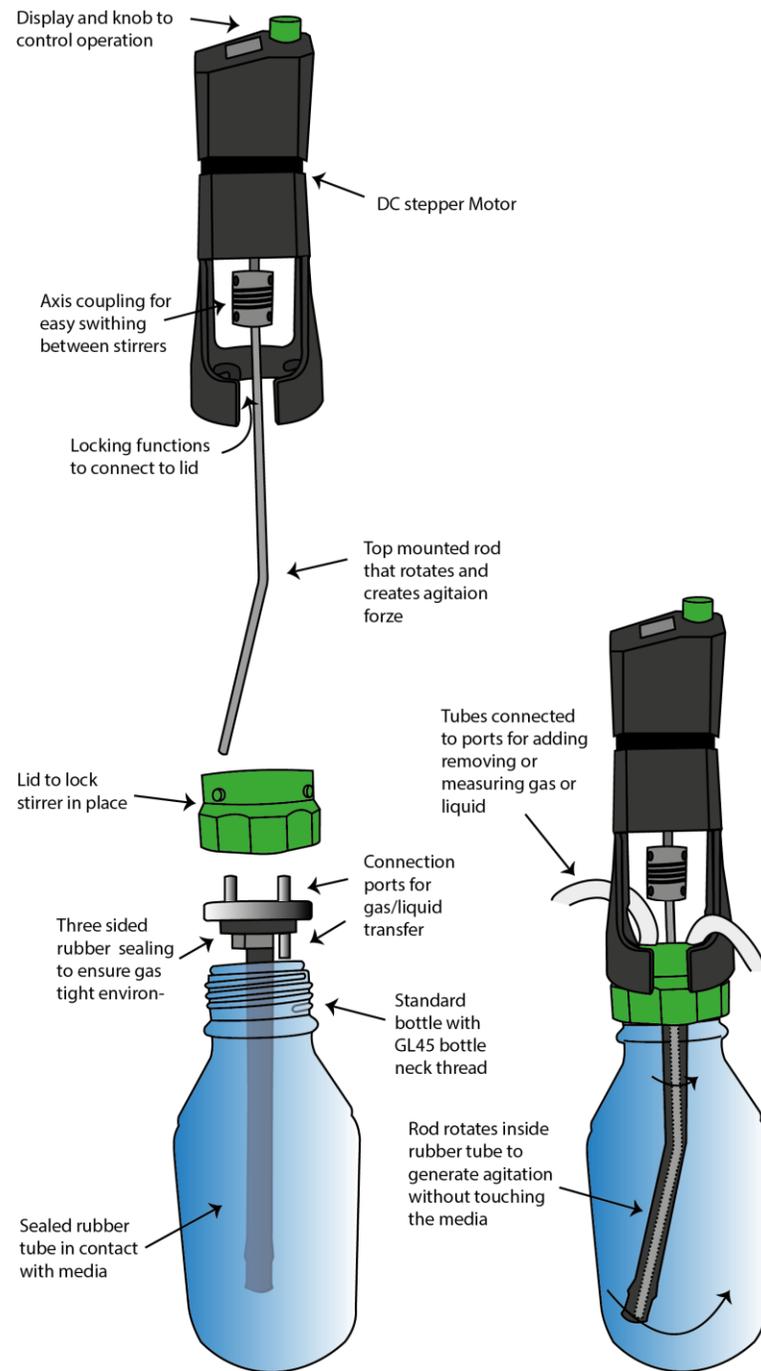
A novel tool for
anaerobic and
aerobic
biodegradability
assays



BPC[®] Move

Leading edge
mechanical
mixing for
laboratory
applications

Principle



BPC® Move

Leading edge
mechanical
mixing for
laboratory
applications

Features



Article no:
20-0002-01

- A wide range of stirring intensity: 1-600 RPM or 1-220 RPM (silent mode)
- Various mixing features and agitation movements for both simple and advanced stirring tasks
- Intuitive and precise control over agitation with OLED display and single multifunctional knob
- User friendly setup – simple mounting on a standard GL45 laboratory flask without using a laboratory stand
- Strong and reliable agitation with minimal risk of irregular spin
- Stable operations with no magnet that can fall out of place
- Chemical resistant and autoclavable flexible agitation tube and integrated GL45 flask lid
- Integrated bottle cap and motor-holder set for standard GL45 flasks of various sizes
- Convenient and robust for both temporary and long-time continuous utilization

BPC® Move

Leading edge
mechanical
mixing for
laboratory
applications

Features



Article no:
20-0002-01

- The basic BPC Move package include three sizes of stirring rods for 0.5, 1 and 2 litres standard GL45 bottles
- Suitable for precise agitation in both closed-chamber and open-vessel systems
- Inlet and outlet ports for liquid or gas on the integrated GL45 flask lid
- Modular design for easy cleaning, replacement, and maintenance



BPC® Move vs Magnetic Stirrers



BPC® Go

The next generation of gas volume and flow meter for laboratory applications



Article no:
17-0000-01

- Embedded microcontroller to secure measurements and data acquisition.
- Aurora software platform included.
- Two measurement resolutions (9 ml and 2 ml).
- Calibration free.
- Large storage capacity (up to 135 000 litres of gas).
- Wide measurement range (0.2 ml to 6000 ml/h).
- View standardized results from anywhere; even on your phone or tablet.
- Run both batch and continuous experiments with remote access.
- Aurora™ is BPC Instruments' latest, custom made and revolutionary software solution for monitoring volume and gas flow.

