

# BPC<sup>®</sup> Blue Handbook

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# BPC® Blue Instrument Overview

*The perfect tool for determining the biodegradability of materials*

A fully automated, analytical platform designed to easily, accurately and efficiently measure the gas flow and volume *generated or consumed* during fermentation or biological respiration processes.

Its user-friendly software makes the online monitoring and control of the experiments possible through any smartphone, tablet, or computer anywhere and at any time.

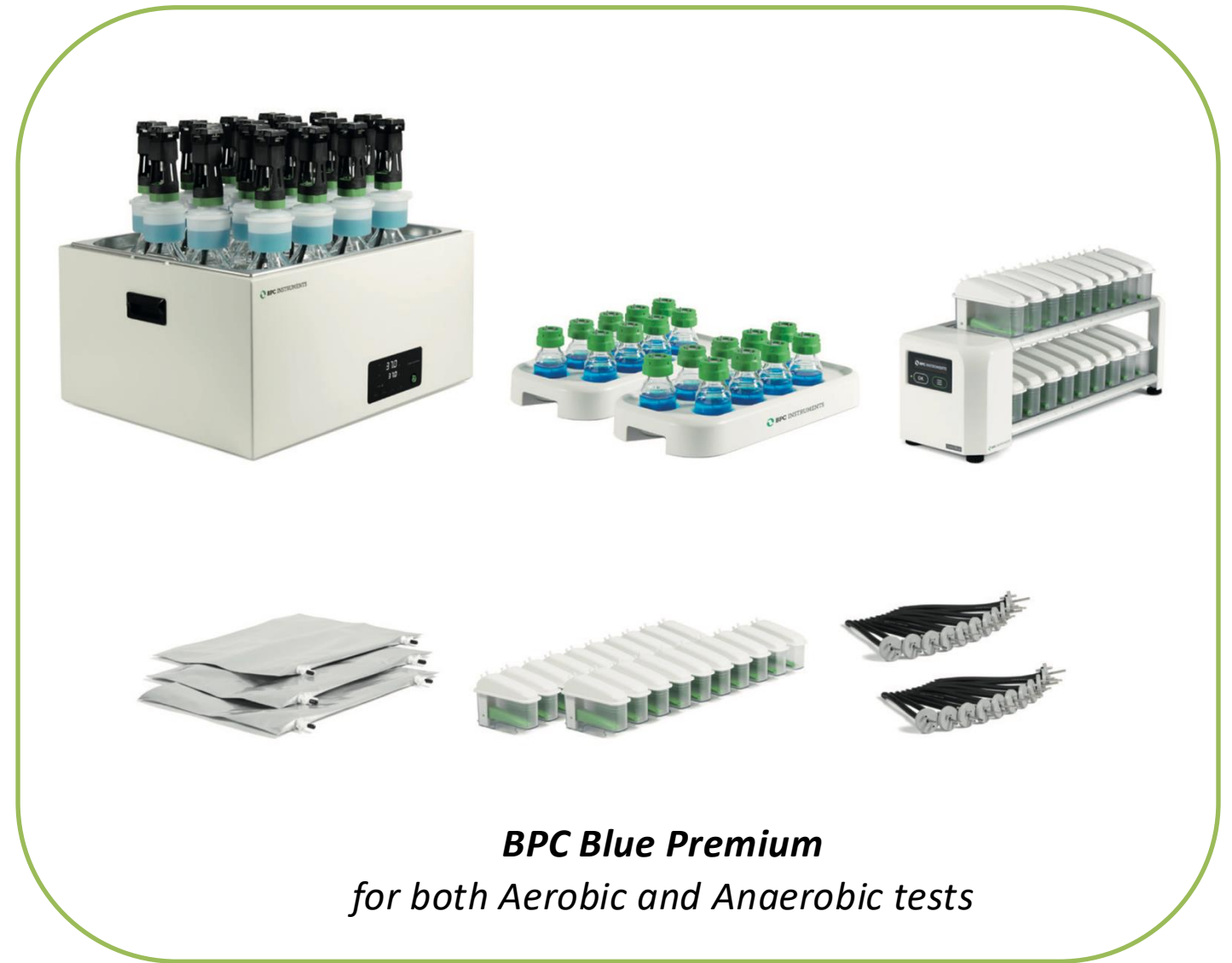
It provides real-time kinetic information and the level of biodegradation of polymers under aerobic or anaerobic conditions. This evaluation can be performed considering different environments following specific procedures in accordance with various international standard methods.



## **BPC Blue Premium**

*18 independently operating reactors each connected to 18 Flow Cell Units for simultaneous gas volume detection, suitable for both Aerobic and Anaerobic biodegradability tests*

# BPC® Blue Instrument Configurations



Each configuration of BPC Blue is available in two versions:

- **Standard** 18-channel version
- **Light** 9-channel version

# Biodegradability Norms and Standards

*Determine the biodegradability of a material according to a large number of standards:*

## **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

## **Aerobic biodegradability**

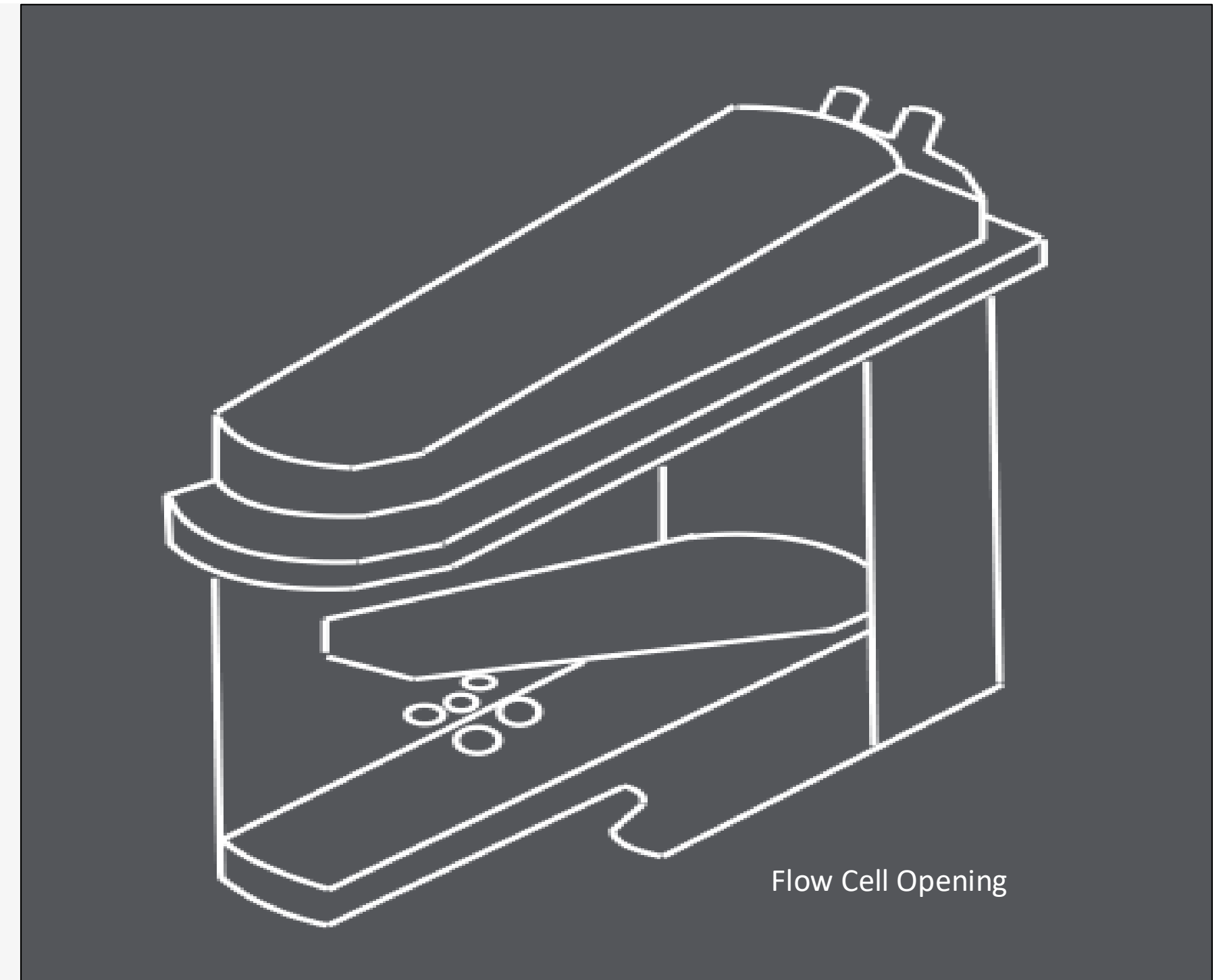
- ISO 14851 – ultimate aerobic biodegradation of plastic materials in an aqueous system
- ISO 17556 – ultimate aerobic biodegradation of plastic materials in soil
- ISO 18830 – aerobic biodegradation of non-floating plastic materials in a seawater/sandy sediment interface
- ISO 23977-2 – aerobic biodegradation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

# Detection Unit: Working Principle

Gas is collected under a flow cell in a chamber filled with water. While the flow cell is in its horizontal sitting position, a magnet located at its end is in contact with a sensor below it.

Once a certain gas volume (i.e., 2 or 9 mL depending on the measurement resolution) has been collected in the Flow Cell Unit (FCU) chamber, the force of buoyancy leads the flow cell to open and release the entrapped gas.

The system counts each flow cell opening while registering the environmental temperature and pressure. This information is then used to calculate and normalise the gas flow rate and volume to standard conditions (i.e., 1 atm, 0 °C, and zero moisture content).

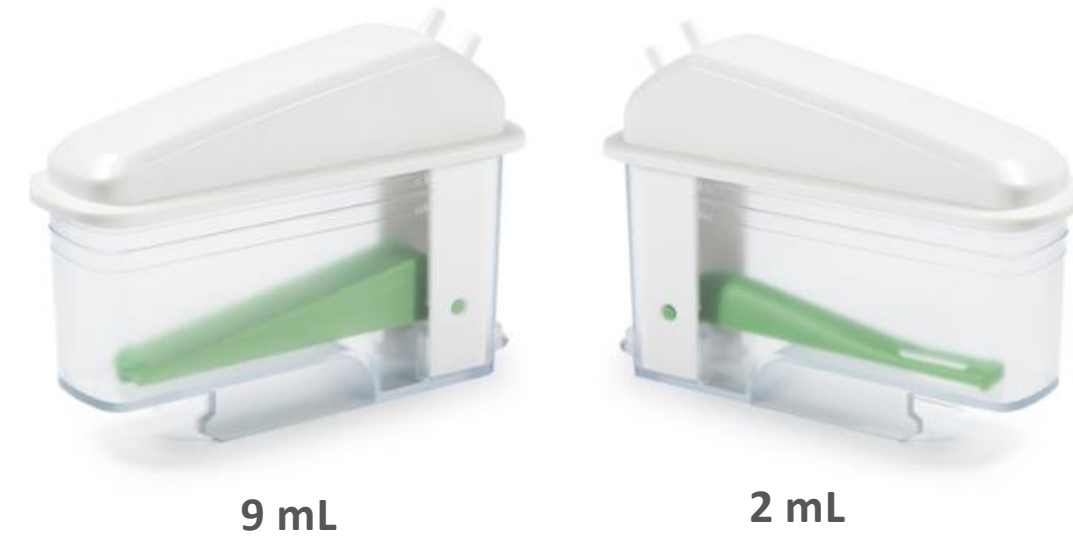


# Flow Cell Unit

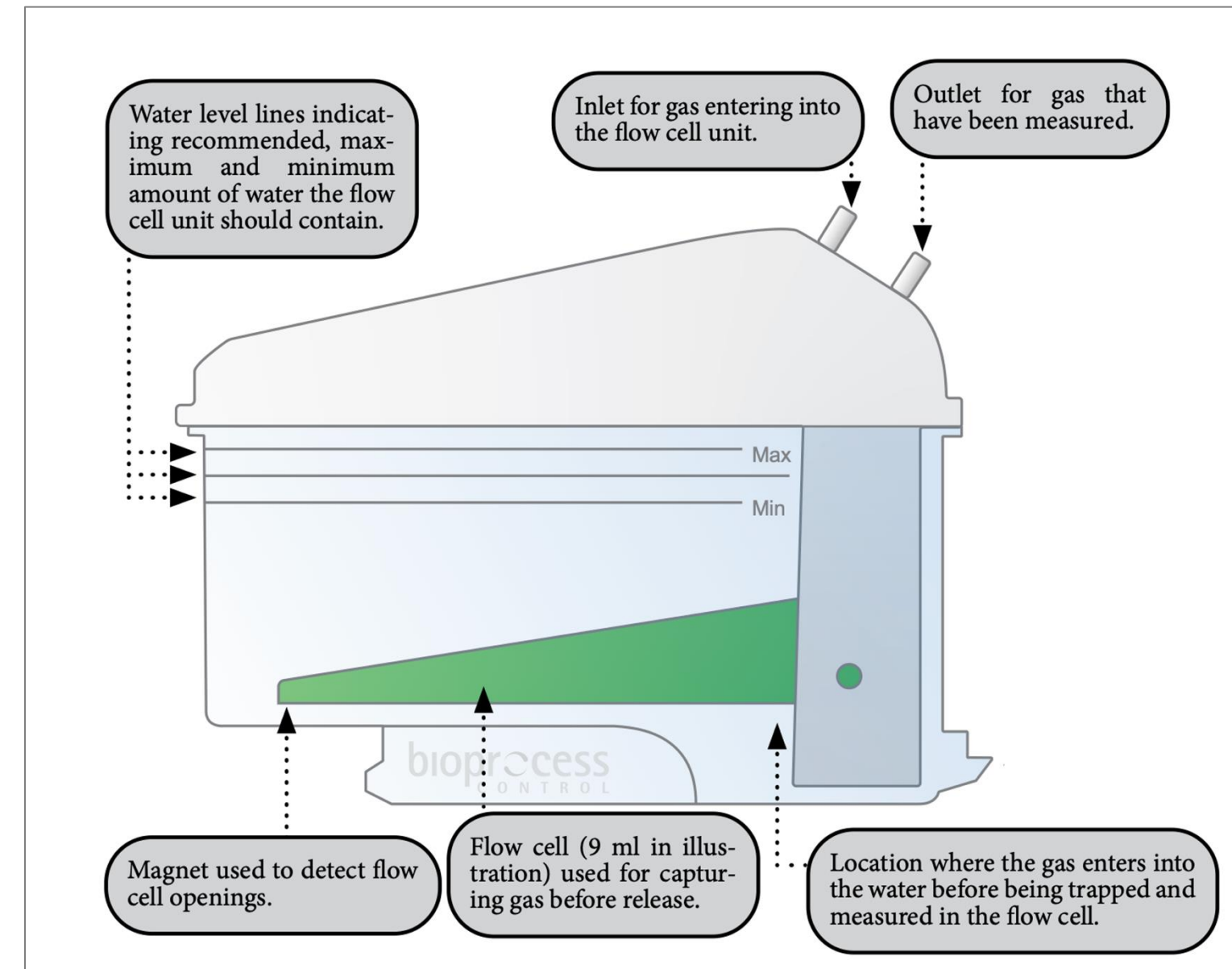
- Flow Cell Units (FCUs) are available in different measurement resolutions, 9 and 2 mL, for low and ultra-low gas measurements.
- FCUs can be easily removed from the detection unit, replaced and placed back.



Standard BPC Core Blue detection unit (18 channels)



**Flow Cell Units** are filled with a low amount of water and provide a closed system. This way, they can detect even the gases with high solubilities in water (e.g., biogas, CO<sub>2</sub>)



# BPC<sup>®</sup> Blue Aerobic System

# BPC® Blue Aerobic Biodegradability – How Does It Work?

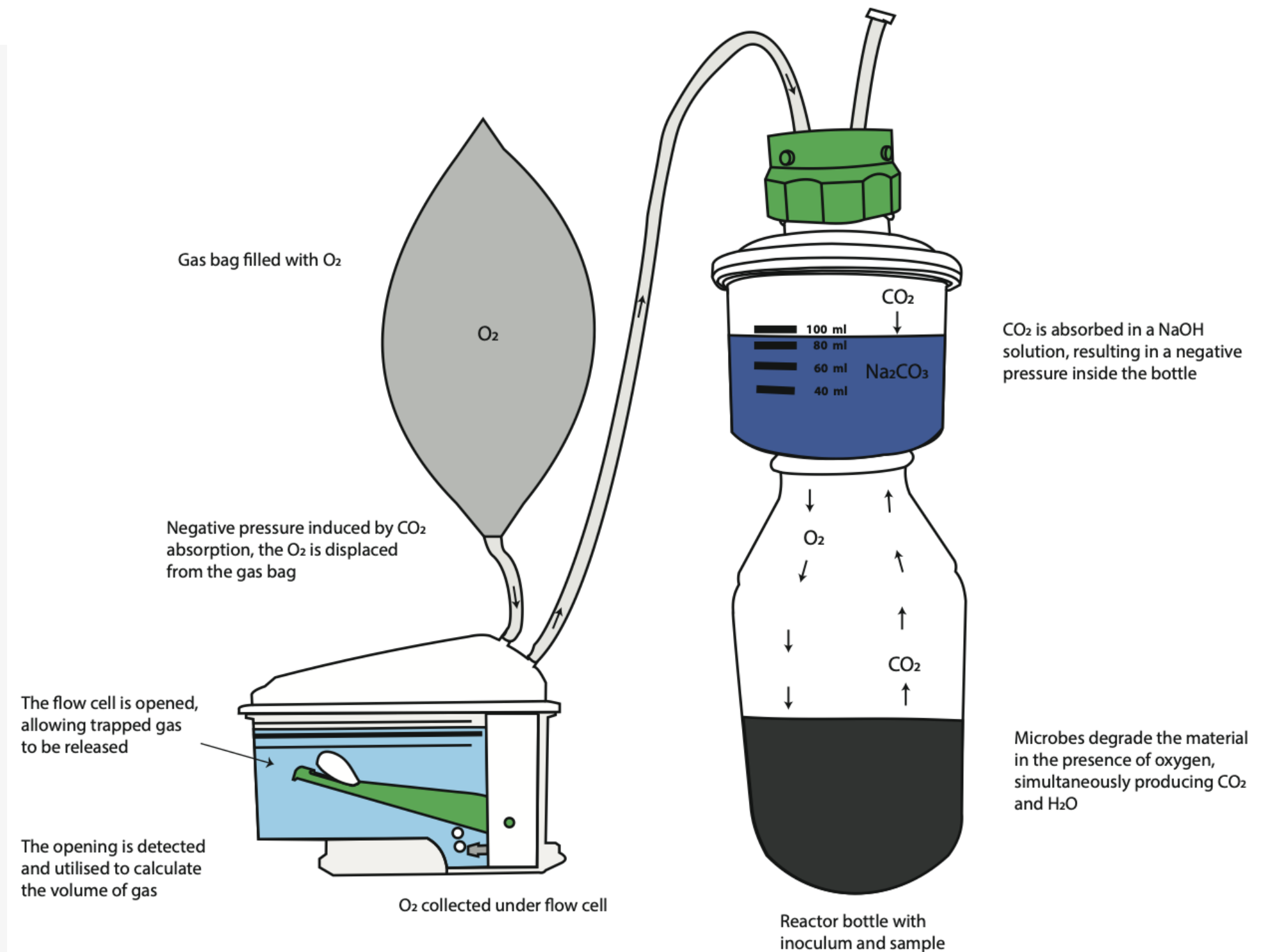
A small amount of sample and aerobic inoculum are added to the reactor and incubated at the desired temperature.

Depending on the type of fermentation medium in the reactor, an agitator can be used for mixing.

The reactors are equipped with *in-situ* gas absorption attachment (GAA) units placed above the headspace of the reactor.

The CO<sub>2</sub> produced in the bioreactors is continuously trapped by the alkaline solution from GAA which creates an under-pressure. This further drives an additional flow of oxygen from the gas bag to the reactor, re-equilibrating the pressure.

Thus, the flow measured by the detection unit is proportional to the volume of oxygen demand/consumed during the process.



# BPC® Blue Aerobic Configuration

## UNIT A: INCUBATION UNIT

This is where the biodegradation process takes place. The provided 18 (1 L) or 9 (2 L) bioreactors are to be filled with your inoculum and sample and placed into the thermostatic water bath. Our thermostatic water bath allows temperature control up to 60 °C. It is provided with a lid to minimize water loss and ensure stable temperature control.

Each reactor can be equipped with a brushless DC motor that ensures well-mixed content. A motor controller provides the power via motor cables, where all the motors receive the same information.

## UNIT B: CO<sub>2</sub> ABSORPTION ATTACHEMENT (*IN-SITU*)

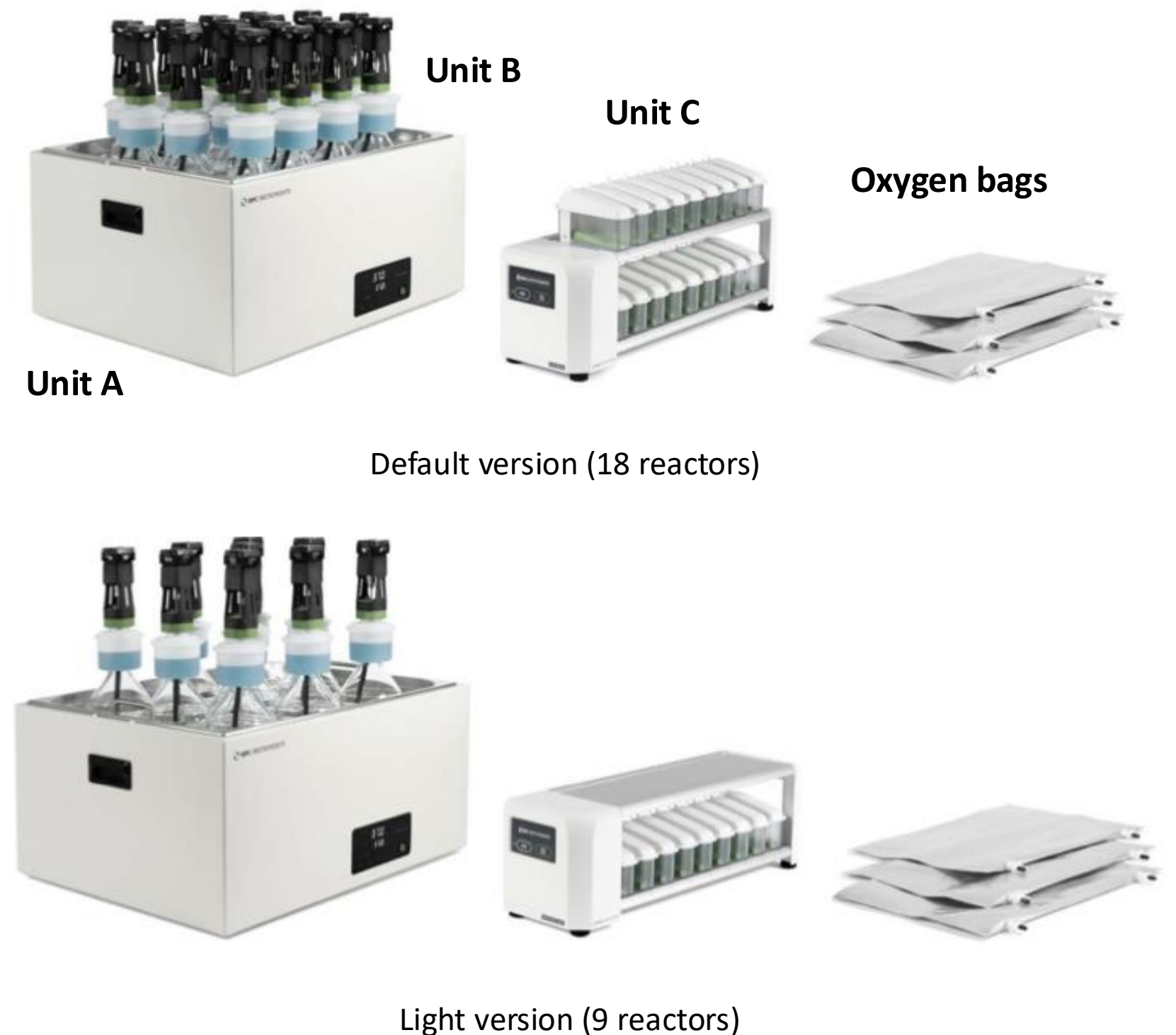
CO<sub>2</sub> is produced in the biodegradation process and is absorbed by an alkaline solution (3 mol/L NaOH) in the *in-situ* CO<sub>2</sub> absorption unit on top of the reactor. This chemical removal of CO<sub>2</sub> creates a negative pressure in the reactor bottle, which becomes the driving force for a flow of oxygen from the gasbag to the reactor in order to re-equilibrate the pressure.

## UNIT C: BPC CORE (DETECTION) UNIT

This is where the consumed oxygen is recorded and processed. This unit consists of 18 or 9 flow cell units (FCUs) for simultaneous gas volume detection from 18 or 9 independently operating reactors. The gas enters the flow cell unit where it is being measured. Data is stored directly on the core unit and can be accessed through a computer or internet connection.

## ADDITIONAL COMPONENT: OXYGEN SUPPLIER BAGS

Three gas bags are provided that can be easily filled with oxygen from a standard gas tank for a continuous oxygen supply.



# Technical specifications

## Incubation unit:

Thermostatic water bath with either 18 x 1000 mL, or 9 x 2000 mL (Light) reactors. Temperature control up to 60°C with a precision of 0.2 °C.

## Gas removal unit:

*In situ* selective chemical absorption unit with 18 or 9 gas absorption attachment (GAA) units.

## Gas detection unit:

BPC Blue Core unit with 18 or 9 flow cell units (FCUs). Build in sensors: temperature, pressure, hall, accelerometer. It features an OLED screen that can display the IP address of the instrument, version of the software, current environmental parameters (temperature and pressure), and if the instrument is horizontally levelled.

## Measurement resolution:

2 mL or 9 mL

## Operation mode:

Batch aerobic test

## Agitation system:

18 or 9 brushless DC motor-driven stirrers (up to 200 rpm). Multifunctional mechanical agitation with adjustable interval, speed and rotation directions.

## Software:

Pre-installed Aurora software. Accessed with web browser, no installation or internet connection necessary\*

## Data storage:

Locally.

\* connection required for remote access

# Delivery Check

## BPC Blue Aerobic Standard

### *Unit A – Sample incubation unit*

1 Thermostatic water bath & 1 base tray  
 1 Thermostatic water bath lid for 18 reactors (1 L)  
 18 Glass reactors (1 L)  
 18 Brushless DC motors  
 15 Brushless DC motor cables 250 mm  
 3 Brushless DC motor cables 500 mm  
 1 Brushless DC motor cable 1500 mm  
 1 Motor controller signal cable  
 18 Axis couplings for brushless DC motors  
 18 Stirrers GL 45 (1 L) standard  
 1 Brushless DC motor power splitter  
 1 Motor controller unit (MCU)  
 1 MCU power adapter  
 18 Push-in valves 6 mm

### *Unit B – CO<sub>2</sub> absorption unit*

18 Gas absorption attachment (GAA) units  
 4 Funnels for GAA

### *Unit C – BPC Core Unit*

1 BPC Core  
 18 Flow cell units (FCUs)  
 36 Check valves  
 1 Plastic syringe  
 1 Main unit power adapter  
 1 Ethernet cable

### *Other components*

1 Festo tubing 50 m  
 1 Funnel  
 18 Tubing stoppers  
 1 Gas distribution manifold 3 Mk 2  
 36 Push-in connectors 6 mm  
 6 Soft binders 7/180 mm  
 18 Multi-coloured marker clamps  
 3 Gas distribution manifolds 6 Mk 2  
 1 Bottle/tube opening tool  
 3 Gasbags  
 FCU volume sheet

## BPC Blue Aerobic Light

### *Unit A – Sample incubation unit*

1 Thermostatic water bath & 1 base tray  
 1 Thermostatic water bath lid for 9 reactors (2 L)  
 9 Glass reactors (2 L)  
 9 Brushless DC motors  
 6 Brushless DC motor cables 250 mm  
 3 Brushless DC motor cables 500 mm  
 1 Brushless DC motor cable 1500 mm  
 1 Motor controller signal cable  
 9 Axis couplings for brushless DC motors  
 9 Stirrers GL 45 (2 L) standard  
 1 Brushless DC motor power splitter  
 1 Motor controller unit (MCU)  
 1 MCU power adapter  
 9 Push-in valves 6 mm

### *Unit B – CO<sub>2</sub> absorption unit*

9 Gas absorption attachment (GAA) units  
 4 Funnels for GAA

### *Unit C – BPC Core Unit*

1 BPC Core  
 9 Flow cell units (FCUs)  
 18 Check valves  
 1 Plastic syringe  
 1 Main unit power adapter  
 1 Ethernet cable

### *Other components*

1 Festo tubing 50 m  
 1 Funnel  
 9 Tubing stoppers  
 18 Push-in connectors 6 mm  
 3 Soft binders 7/180 mm  
 9 Multi-coloured marker clamps  
 1 Bottle/tube opening tool  
 4 Gas distribution manifolds 3 mk 2  
 3 Gasbags  
 FCU volume sheet

# Setting Up The Instrument

**Step 1:** Unpack and place the thermostatic water bath and detection unit on a flat, level surface.



Thermostatic water bath for temperature control of the process

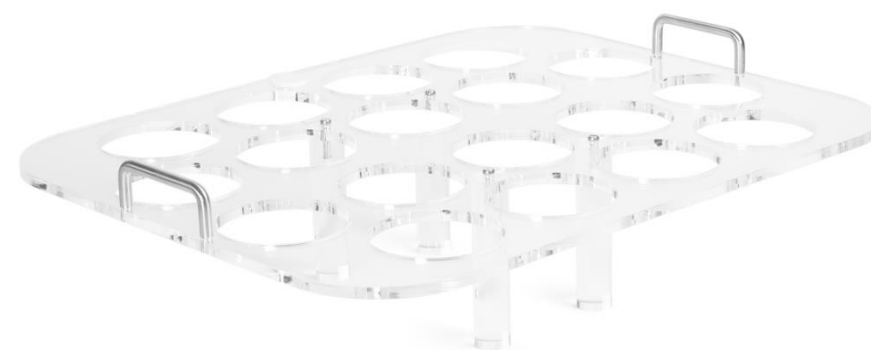


Detection unit

**Step 2:** Remove the blue plastic protection on the thermostatic water bath lid, mount the legs and handles and place the tray on the bottom and the lid on top of the thermostatic water bath.



Thermostatic water bath tray (place on bottom)



Thermostatic water bath lid for 18 bottles

**Step 3:** Prepare 3 mol/L NaOH alkaline solution with pH indicator (100 mL/reactor)

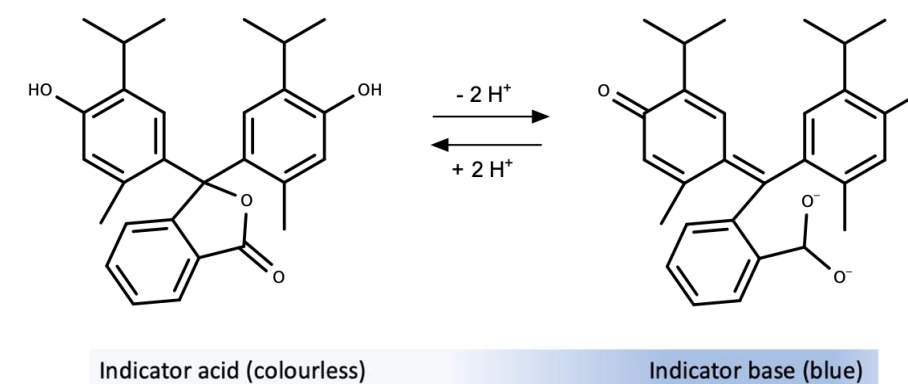
## NaOH solution preparation:

- Weigh the required amount of NaOH pellets (see Table)
- Mix NaOH pellets with distilled water. Due to heat generated by the exothermic reaction, we recommend you do this slowly and in stages until NaOH dissolves.
- When the NaOH is completely dissolved, add the remaining amount of water until the total volume (1.8 or 1.8 L) is reached.

Number of bottles	Total volume 3 mol/L NaOH required	NaOH pellets required	Water to add
18 glass bottles	1.8 L	216 g	1.8 L
9 glass bottles	0.9 L	108 g	0.9 L

## Prepare 0.4% thymolphthalein pH indicator solution:

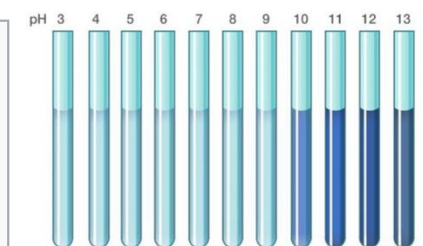
- Dissolve 40 mg of thymolphthalein in 9 mL ethanol and 1 mL of water (total 10 mL).
- Mix it with the 3 mol/L NaOH solution.



**Thymolphthalein**  
(pH indicator)

below pH 9.3    above pH 10.5

9.3  $\rightleftharpoons$  10.5

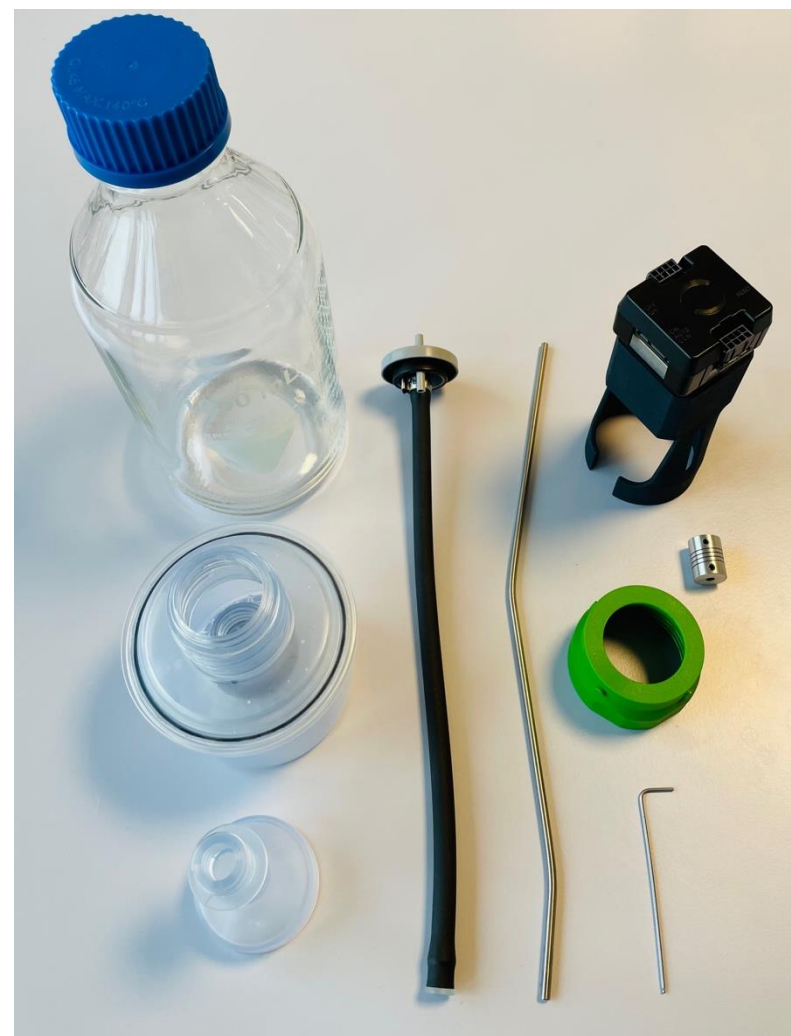


# Setting Up The Instrument

## Step 4: Prepare the reactors.

This step involves:

1. Assembling the motorized stirrer (if using dynamic incubation)
2. Filling the GAA with alkaline solution
3. Attaching the GAA and motorized stirrer to the reactor



Gather these components

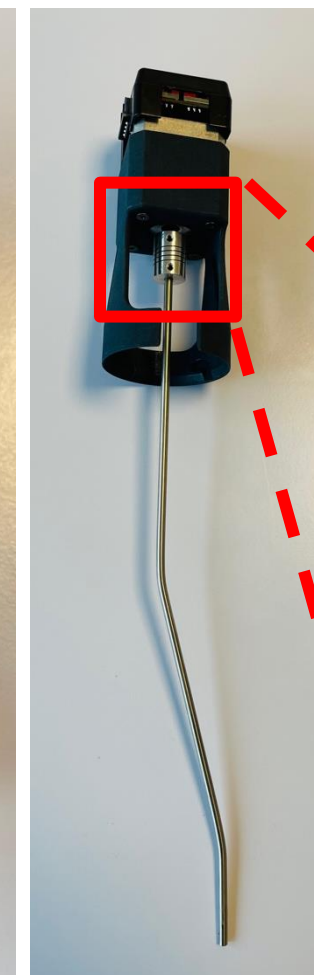


Prepared reactor (add your sample in the bottle beforehand)

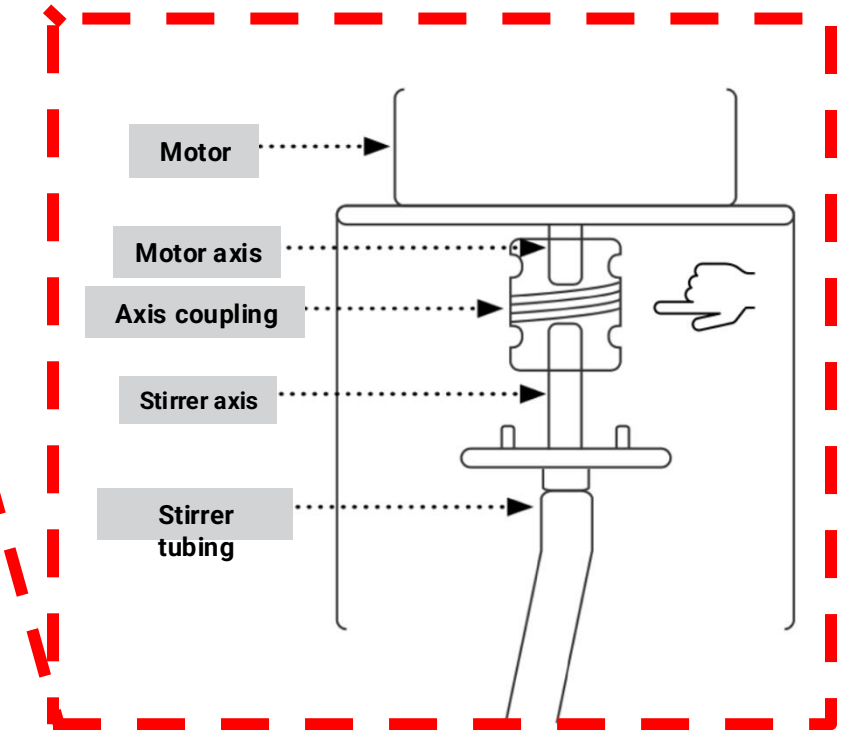
## Step 4.1: Assemble the DC motorized stirrer. If you are not using agitation, skip this step.



Connect the axis coupling to the motor axis



Connect the stirrer axis to the motor



**Note:** The motor axis and the stirrer axis should meet in the middle of the axis coupling (WITHOUT TOUCHING). If the stirrer axis puts tension on the stirrer tubing, it might, over time, drill a hole through the bottom of the stirrer and compromise the air seal of the setup. **Approximately 5 – 7 mm between the two metal shafts within the axis coupling is ideal.**

# Setting Up The Instrument

**Step 4.2:** Fill the GAA with alkaline solution (3 mol/L NaOH)



Gas Absorption Attachment (GAA)



Connect the provided funnel to the GAA



Carefully add the alkaline solution previously mixed with pH indicator until the 80 mL marked level on the GAA.



Remove the funnel from the GAA



GAA with NaOH solution

# Setting Up The Instrument

**Step 4.3:** Add the sample and attach the GAA. Attach the motorized stirrer to the reactor if performing dynamic incubation.



Add your sample (example). A funnel is provided to aid with the addition of samples in the bioreactor.



Connect the GAA to the reactor

**Note:** Ensure the mixture of substrate and inoculum is well-mixed before closing the reactor.

**Note:** Make sure that the GAA is very well attached to the reactor in order to avoid gas leakage.



Attach the stirrer on top of the GAA



Add the bottle nut to hold the stirrer in place



Attach the motor by placing it on the top, with the metal rod going into the bioreactor and fitting into the stirrer.

If performing static incubation with no agitation, use just a lid with 2 ports instead of the stirrer.



Add a lid with 2 ports



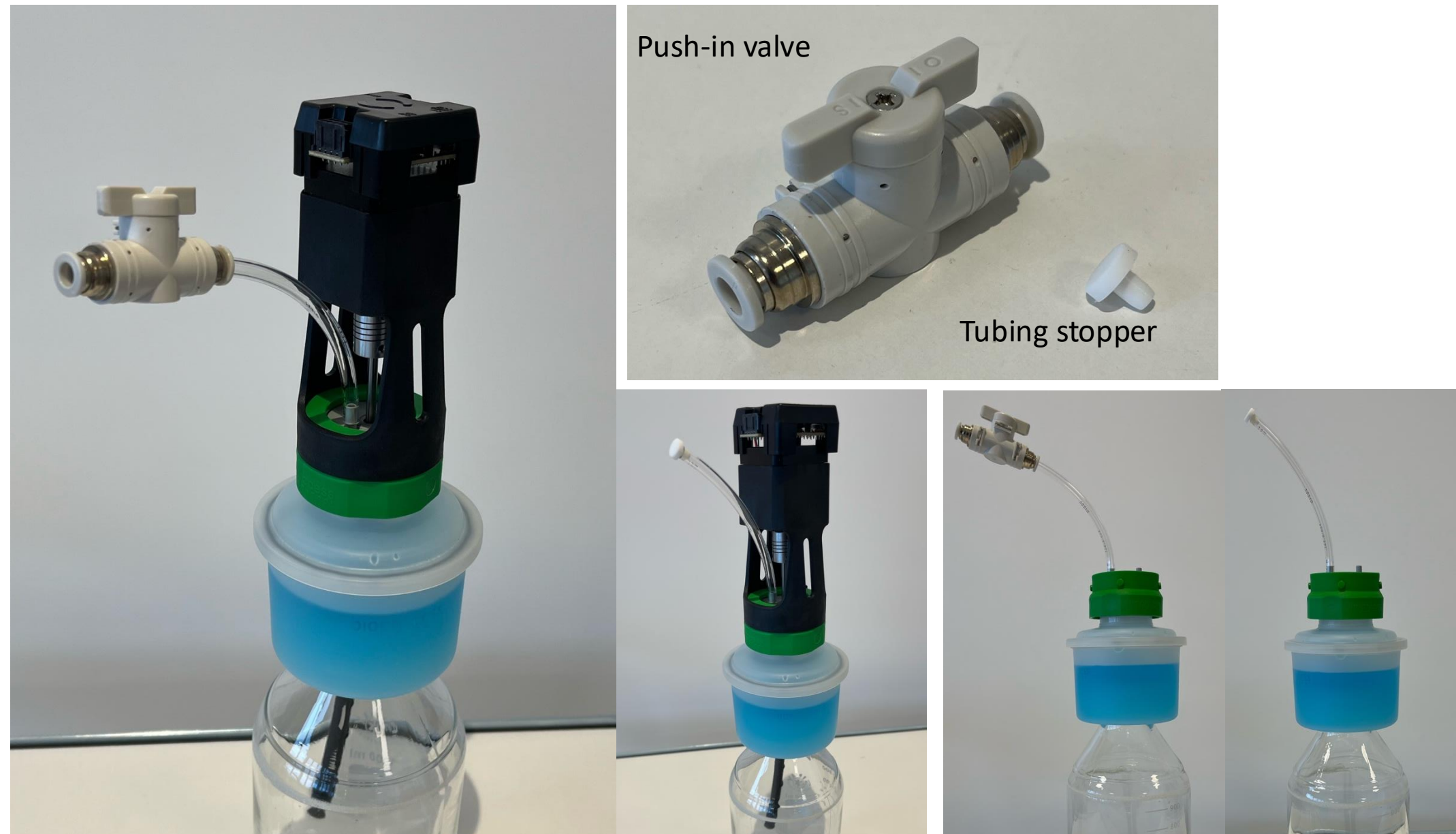
Add the bottle nut

# Setting Up The Instrument

**Step 5:** Add a piece of tubing and to a push-in valve and attach it to one of the 2 ports on the reactor lid. A tubing stopper could be also used instead of the push-in valve. The other port is the gas inlet.

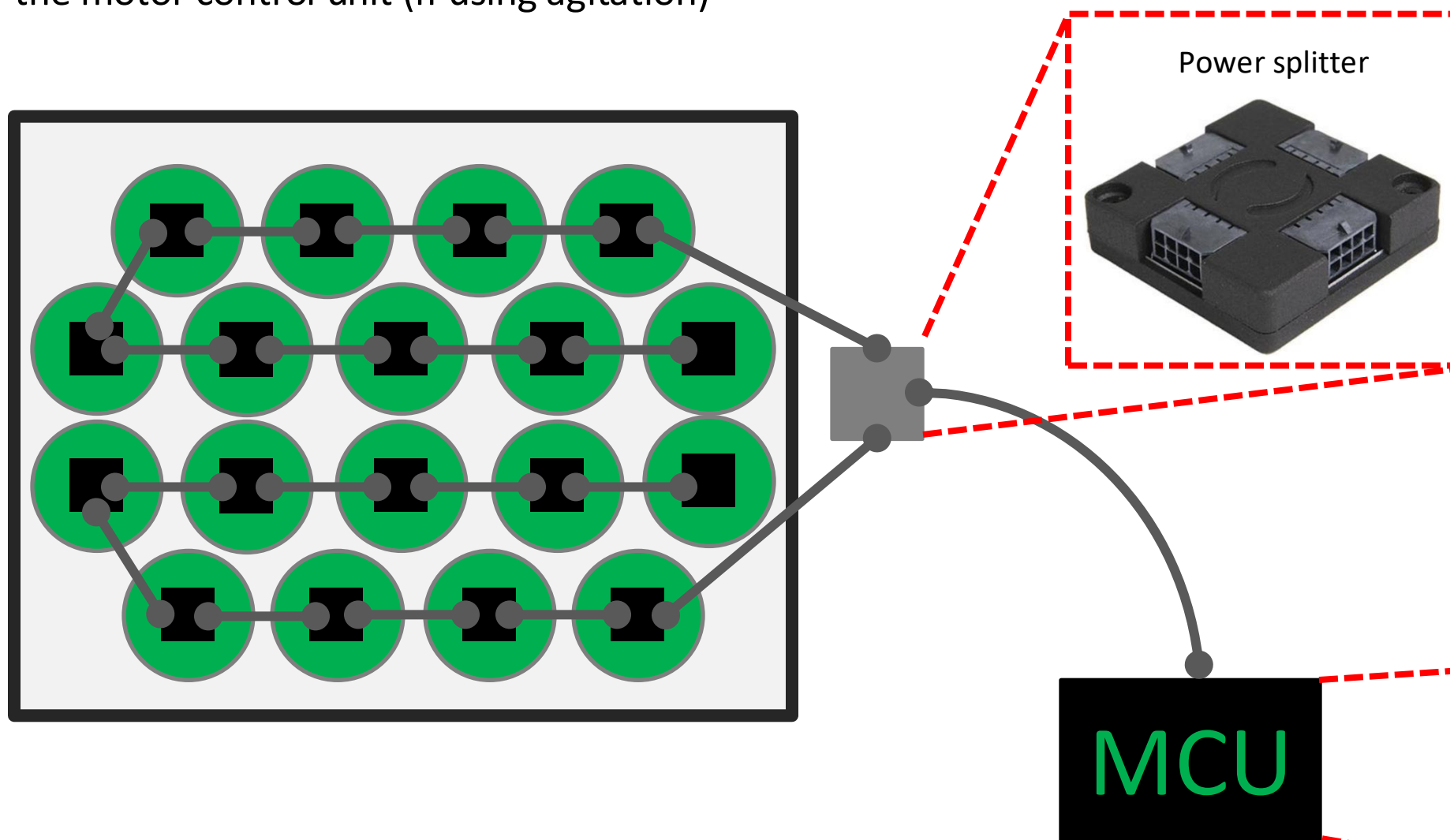
**Step 6:** Place the bioreactors inside the thermostatic water bath. Fill the water bath with distilled water until it reaches the lid.

**NOTE:** Check the water level in the water bath periodically.



# Setting Up The Instrument

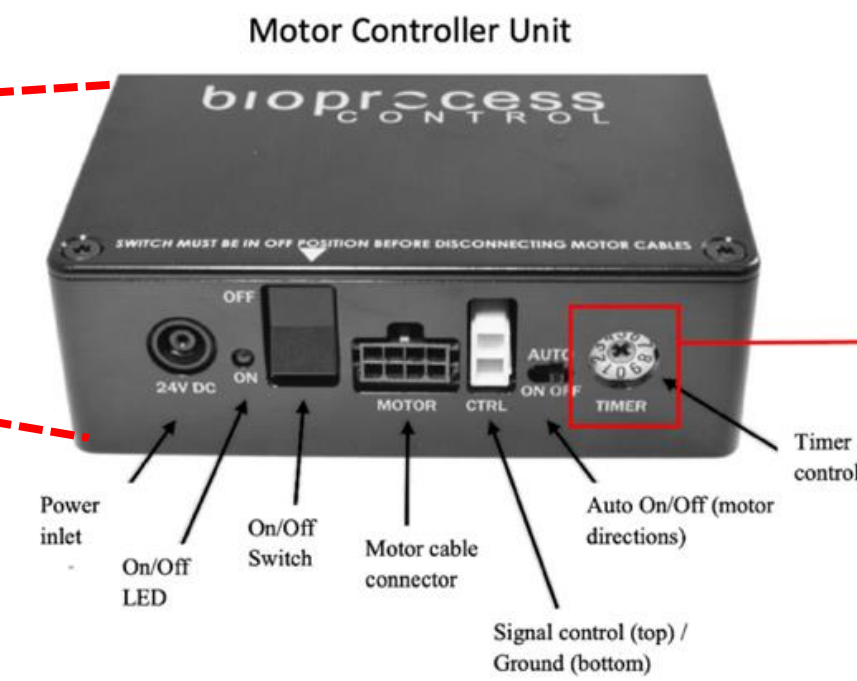
**Step 7:** Connect motors to each other (via brushless DC motor cables) and the motor control unit (if using agitation)



## Setting up the agitation system

- Connect the short motor cables (250 mm) in series – leaving one port free on the first and last motors in the chain. **See the image for a motor cable management guid**
- Connect one longer motor cable (500 mm) to the first motor and one longer cable to the last motor in the chain, and connect them to the motor power splitter
- Use the 1500 mm motor cable to connect the motor power splitter to the motor control unit (MCU)
- Connect the signal cable from the motor controller to the detection unit
- The MCU should also be connected to a power supply

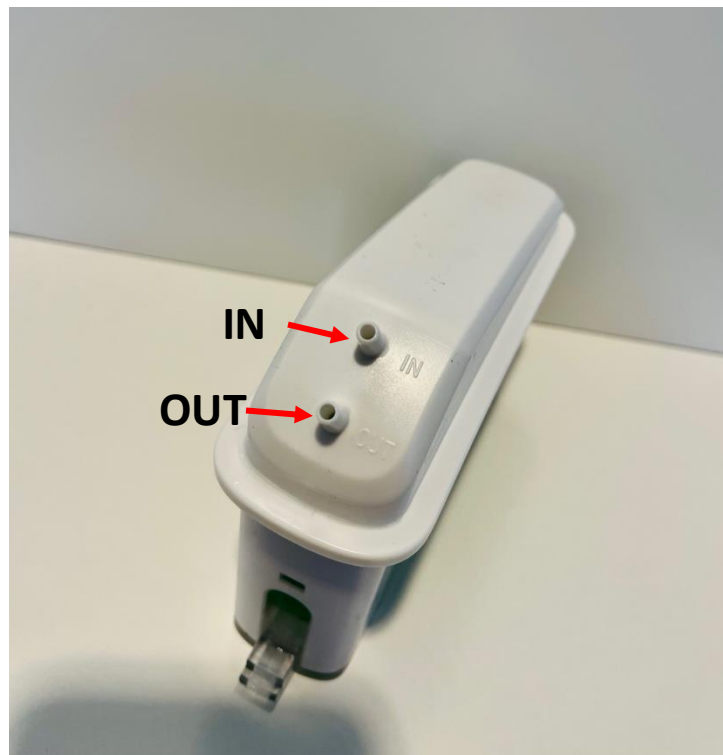
**NOTE:** Make sure that the power adapter for the motor controller is disconnected from the power supply when inserting or removing the motor cables.



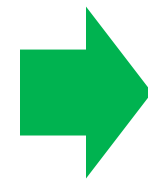
Timer position	Time (s)
0	5
1	15
2	30
3	45
4	60
5	120
6	300
7	600
8	1800
9	3600

# Setting Up The Instrument

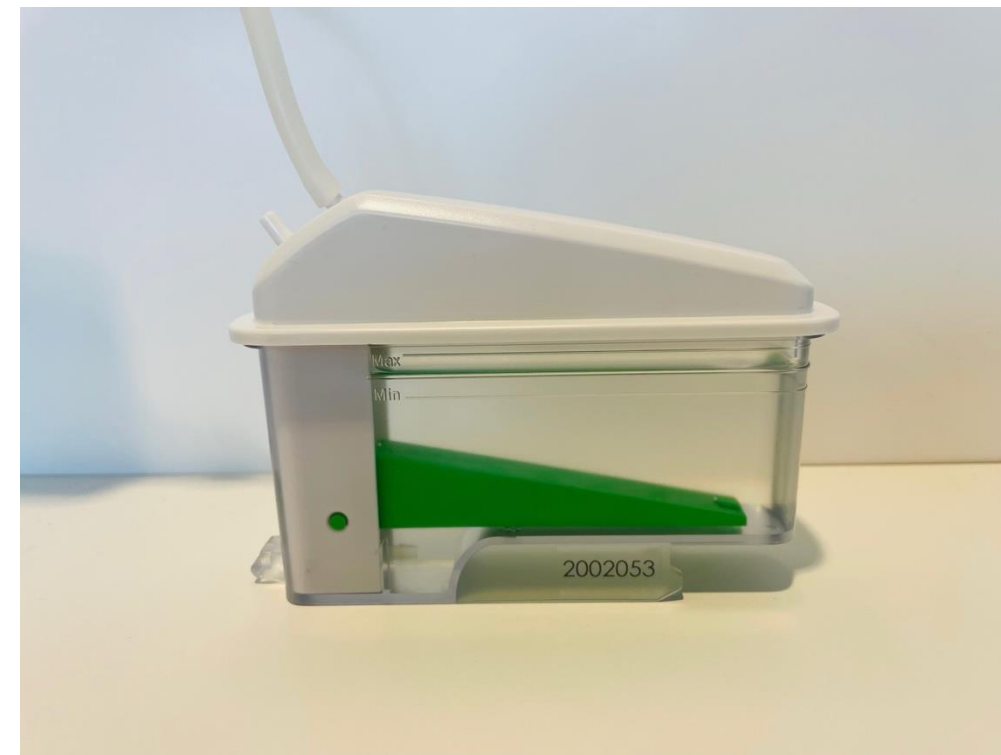
**Step 8:** Fill the flow cell units (FCUs) with distilled water.



Each individual FCU has an inlet and an outlet for the gas.



Use the syringe to add water *via* the inlet of the FCU.



The water should be added until the recommended level is reached.



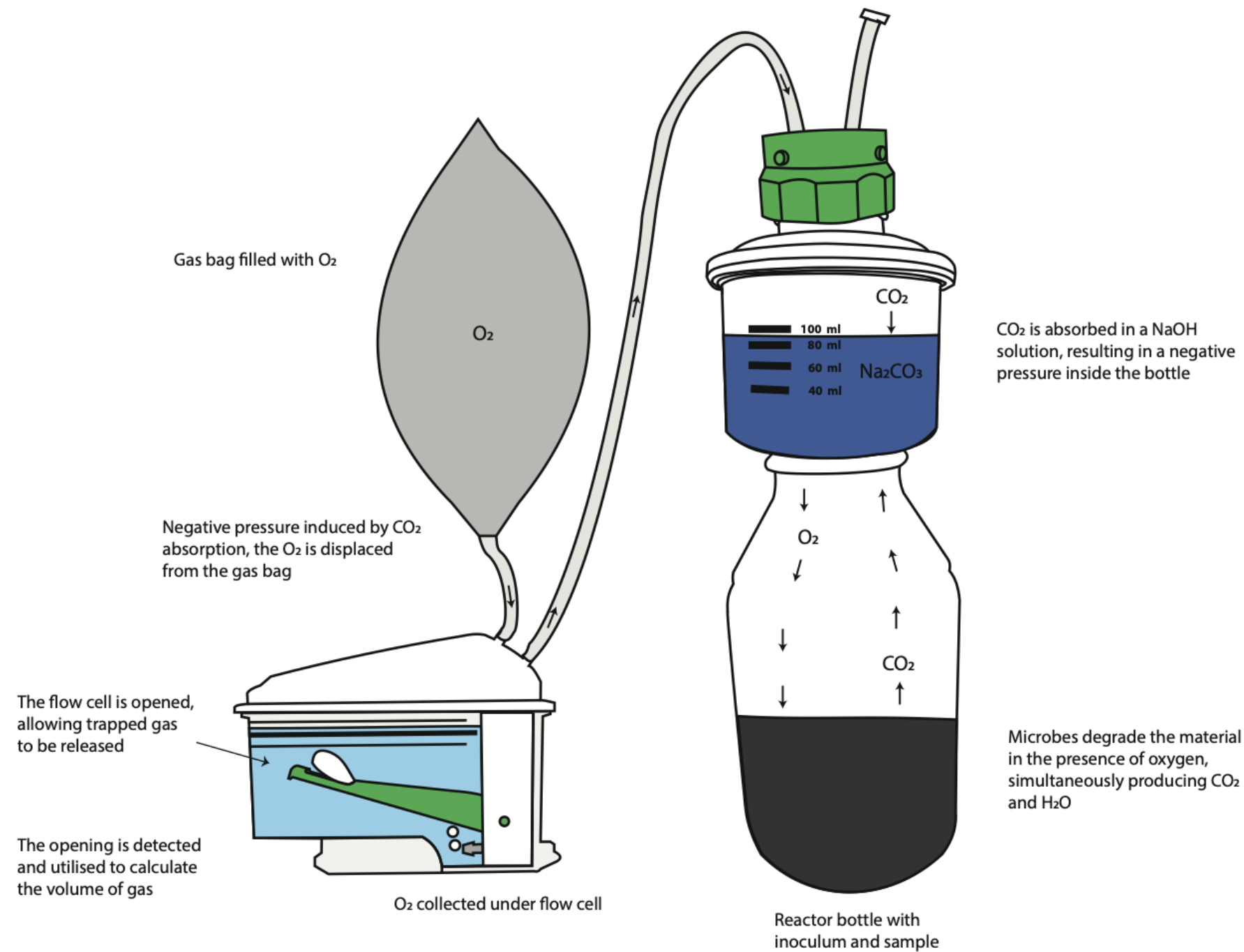
Make sure that each FCU is level on the core unit and seated correctly.

Check the FCU indicator or our **built-in levelling tool**.

Use the **adjustable feet** to level the detection unit.

# Setting Up The Instrument

**Step 9:** Attach tubing between the reactor and detection unit.



Connects the outlet of the FCU to the inlet of the reactor. Make sure to properly mark the reactor to the corresponding FCU.

**TIP:** Cut 36 (BPC Blue Aerobic) or 18 (BPC Blue Aerobic Light) pieces of Festo tubing sufficient in length to connect the gas inlet of each reactor to the corresponding FCU. In order to simplify this procedure, use push-in connectors (two per channel) provided with the instrument. To avoid water flowing back from the detection unit to the gas bag, check valves can be inserted close to the inlet of each FCU in order to the target substance flow in one direction only.



Use the softer binder to group tubing of channels that are related to each other. In order to easily identify each channel, add the multi-coloured marker clamps (two per channel) provided in different colors. Mark each channel by writing the proper description using a ballpoint pen, water-based pen, marker, etc.



# Setting Up The Instrument

**Step 10:** Fill the provided gas bags with oxygen.

Connect the gas distribution manifold (6) to the gas bag. The gas distribution manifold allows one single stream of oxygen to be divided into six different streams. In this case, 3 gas bags are required to get 18 streams of oxygen to be connected to 18 FCUs.

In order to avoid backflow of water from the FCU to the gas bag, the gas bags should be hanged as illustrated in the pictures.



Fill up the gas bag using an oxygen cylinder equipped with a pressure regulator



Avoid overinflating the bags as this can impact the data registration

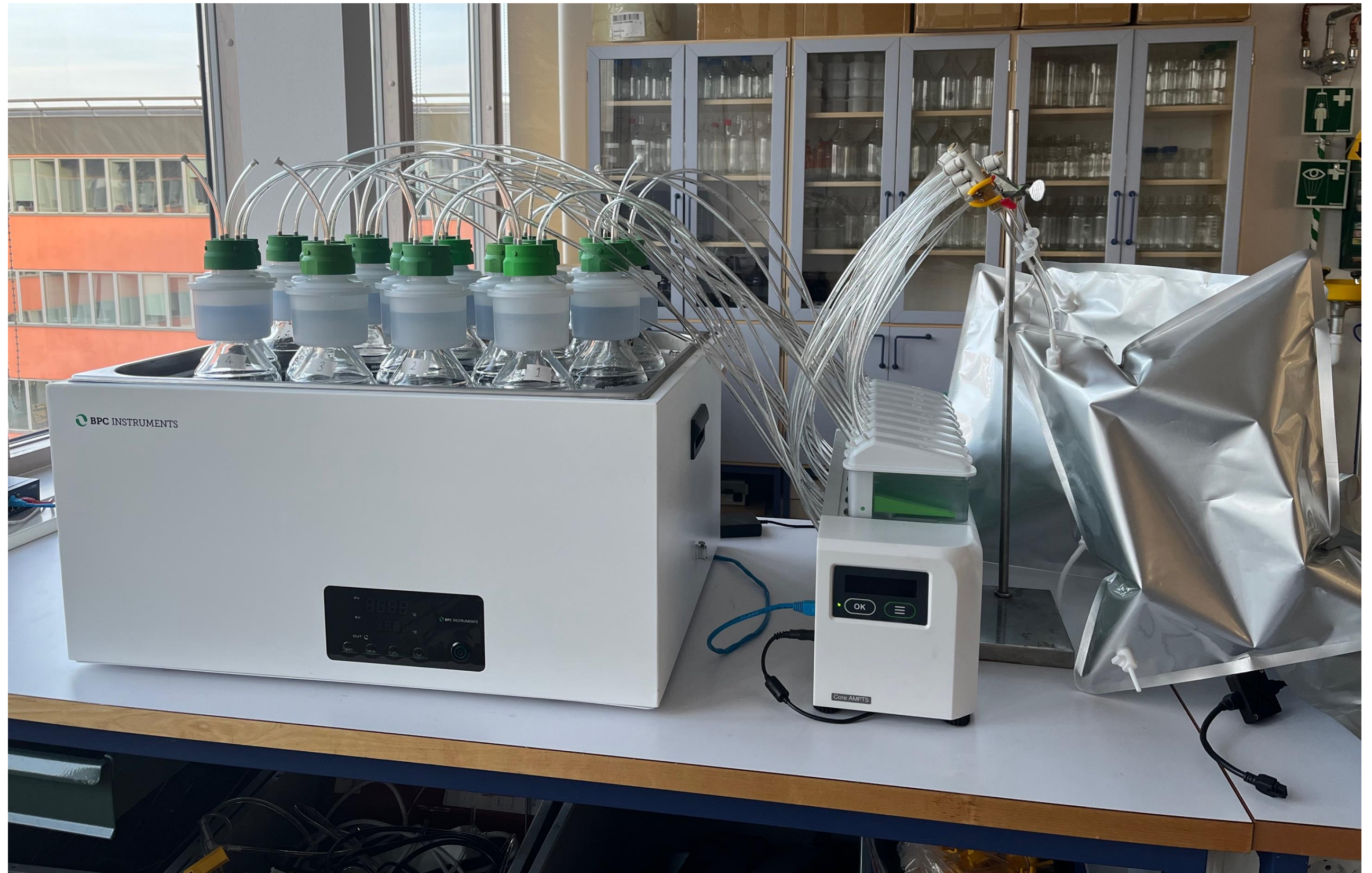


# Setting Up The Instrument

## Step 11: Connecting the gas bag to the FCUs

Final setup in the lab. Image showing BPC Blue Aerobic with static incubation

Make sure all the connections are tight in order to avoid any leakage.



# Connecting The Instrument

**Step 12:** Connect the detection unit.

- Connect to the power supply
- Connect to the internet connection/ethernet port (for remote connection) or directly to your computer *via* the ethernet cable
- Check instrument **green light** is on
- Connect to the motor control unit (MCU) when necessary



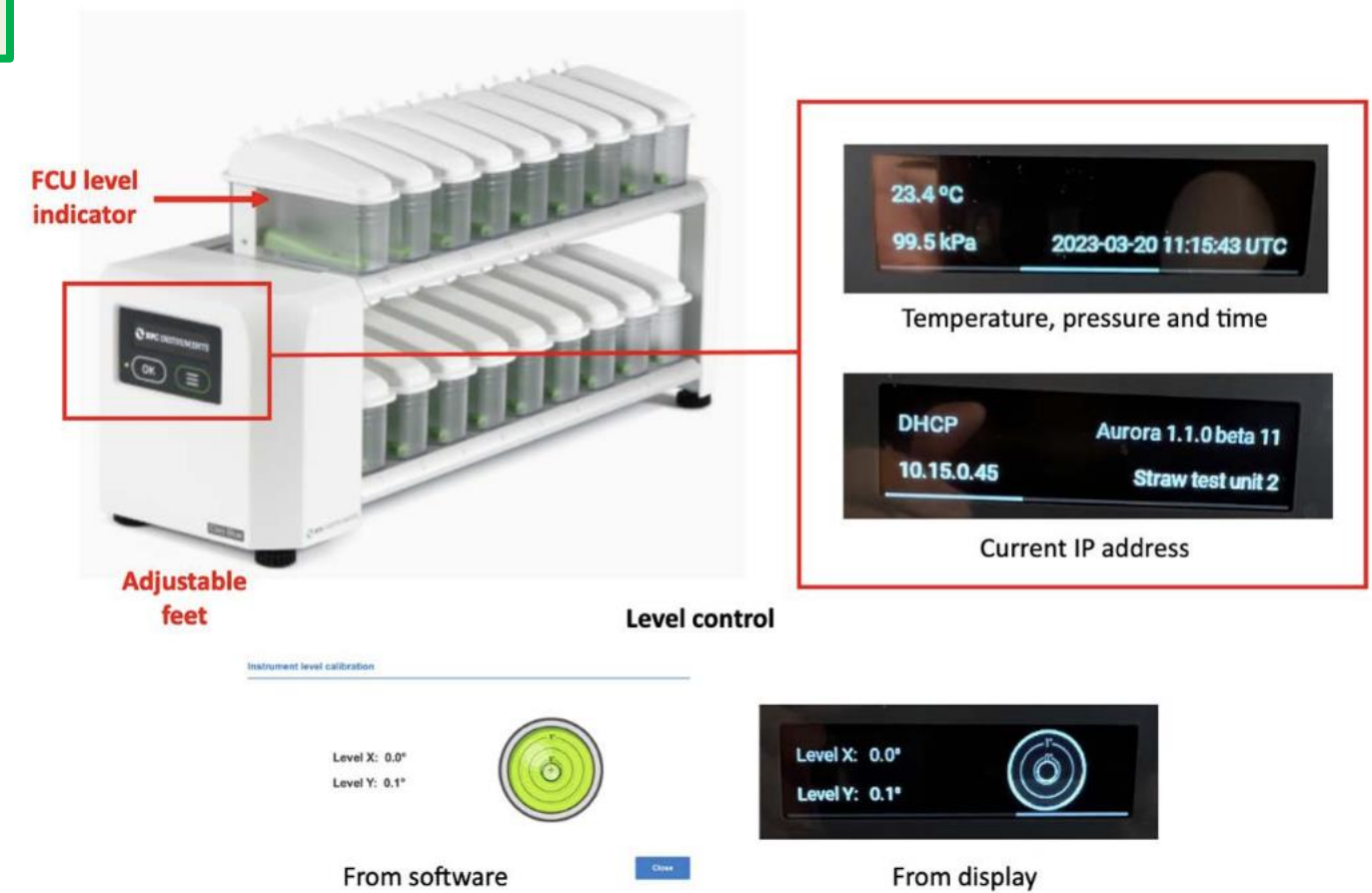
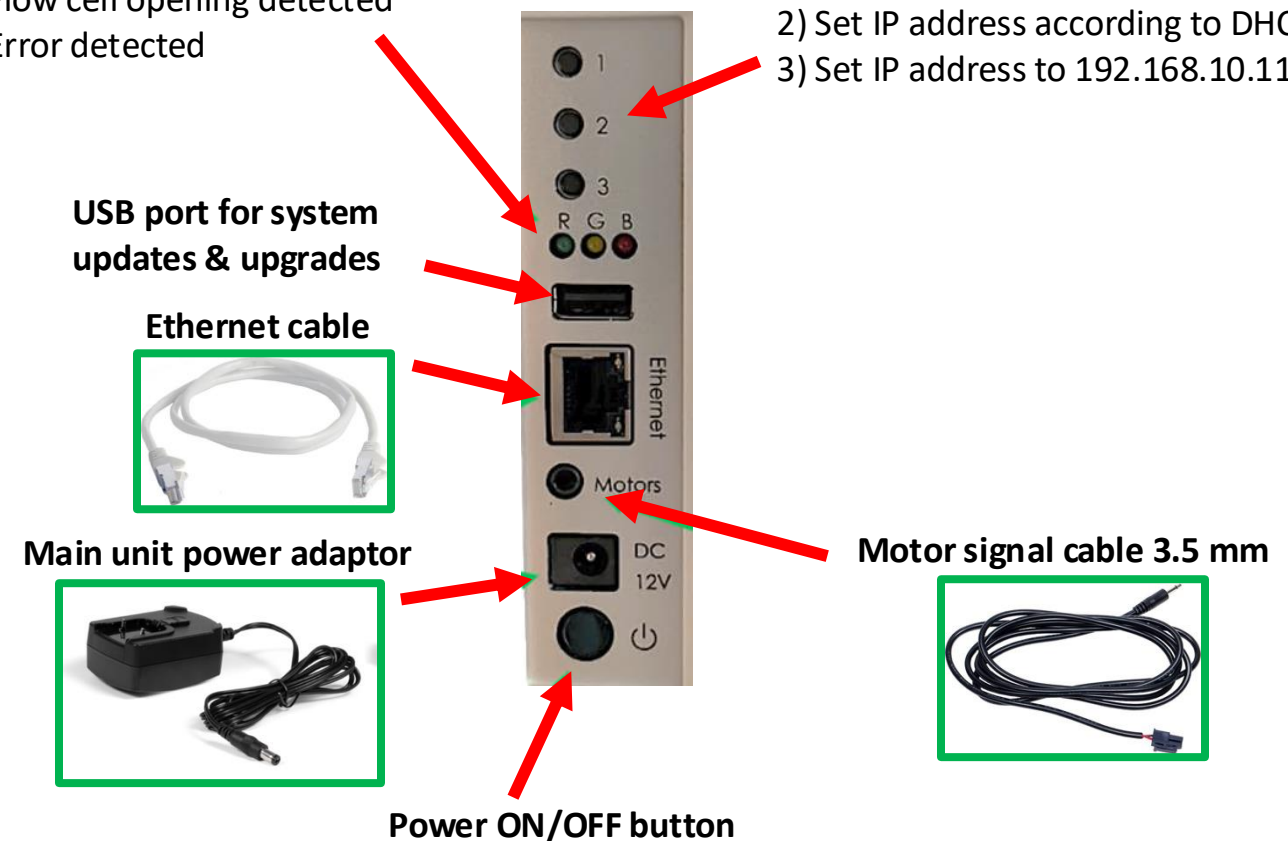
Connected instrument

**Instrument status lights:**

- Instrument has booted properly
- Flow cell opening detected
- Error detected

**Functions:**

- 1) Reset password
- 2) Set IP address according to DHCP server
- 3) Set IP address to 192.168.10.11



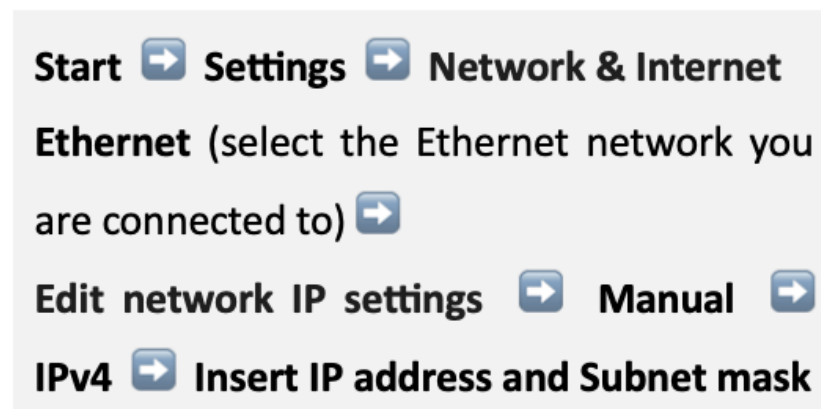
The BPC Core Unit is equipped with an OLED screen that provides information regarding the status of the instrument (environmental conditions, time, current IP address used by the instrument and alignment indicator). This can be accessed through two physical buttons located below the screen.

# Connecting The Instrument

## Step 13: Access the software

### a. Connecting directly to computer:

- Ensure the ethernet cable is plugged into your computer directly



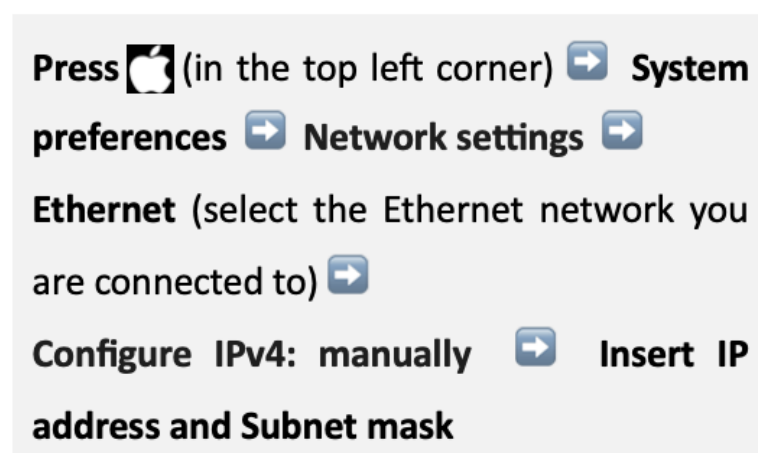
IP address:

Subnet mask:

Default gateway:



Windows 11



Configure IPv4:

IP address:

Subnet mask:

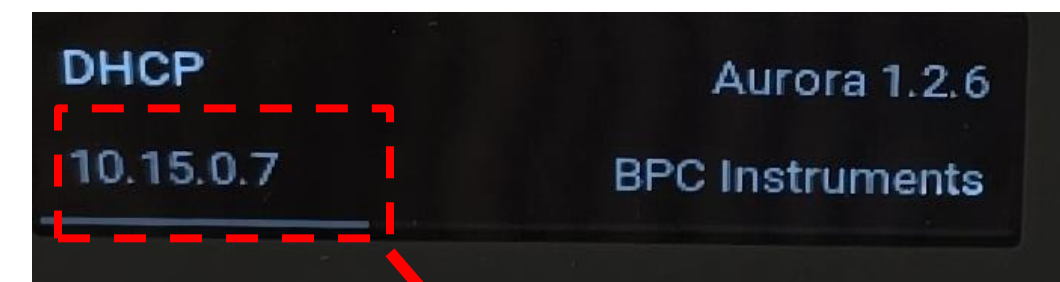
Router:



Mac OS 12.x

### b. Connecting remotely:

- Ensure the ethernet cable is plugged into the network
- Open a browser (Google Chrome recommended) and type in the IP address of your instrument - if you are unsure this can be found via the instrument OLED screen
- Log-in to the software (default password **bpc**)



Instrument IP address

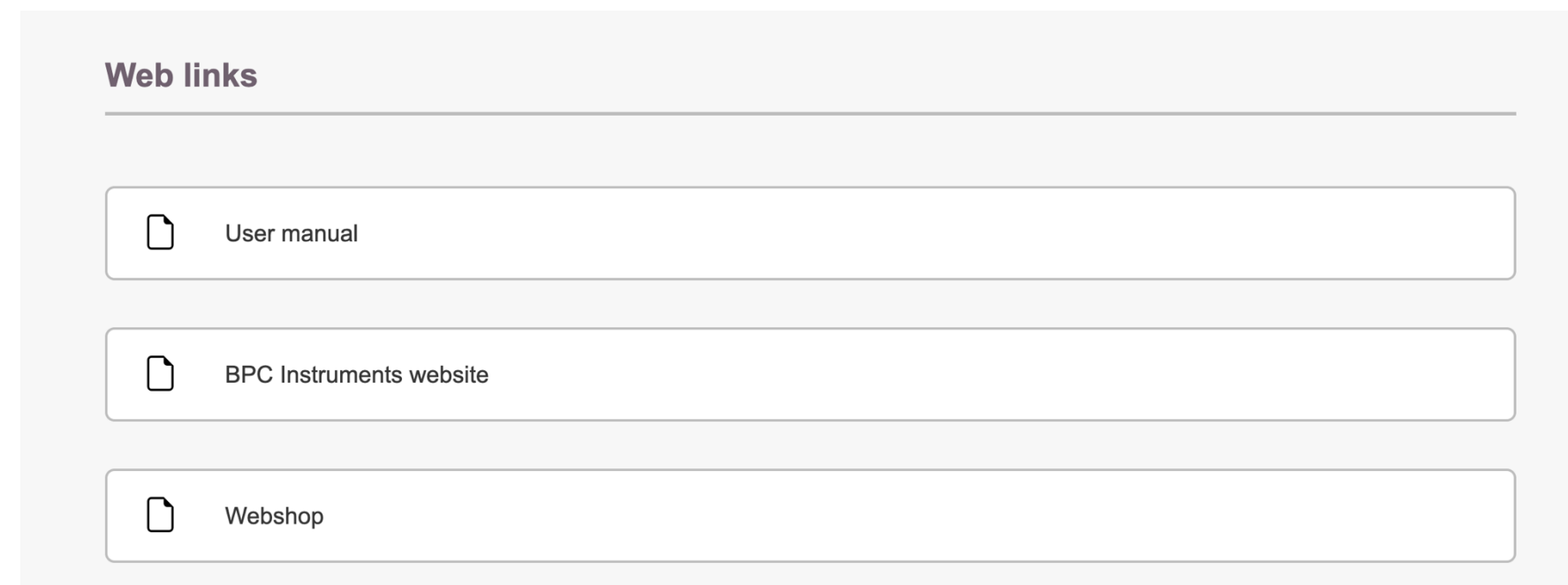
- Open a browser (Google Chrome recommended) and type in the default IP address **192.168.10.11**
- Log-in to the software (default password **bpc**)

# Software - Home

When you open the software via a browser, you will first be asked to login. Default password for our instruments is **bpc**



On the home page you will find the navigation menu and a “Log out” button (above) as well as links to our website and user manual (below). Here is also where you can choose between aerobic and anaerobic mode.



# Software - Control

BPC Blue BPC Instruments

Home **Control** Experiment Graph Report Settings

Aerobic Anaerobic

## Lines

Line	Name	Cell volume [ml]	Control	Status	Started [UTC]	Duration
1	Line 1	9.07	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m
2	Line 2	9.09	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m
3	Line 3	9.10	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m
4	Line 4	9.07	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m
5	Line 5	9.07	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m
6	Line 6	9.13	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m
7	Line 7	9.12	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m
8	Line 8	9.16	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m
9	Line 9	9.12	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m
10	Line 10	9.00	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m
11	Line 11	9.14	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m
12	Line 12	8.97	<input type="checkbox"/>	Running	2024-03-13 13:05	21d 18h 20m

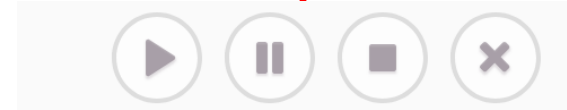
On the “Control” page you can:

- Allocate names and colours to each channel
- Enter FCU calibration values
- Control line recording and start/stop/pause recording
- View instrument status and experiment duration
- Control motor agitation system

FCU calibration values

Start/stop/pause lines (bottom of table)

Agitation controls



Line number & colour

Sample name

Status and duration

**Agitation** Motor power

Phases  Single  Double

Speed [%]

	Speed [%]	Time [min]
Phase 1	<input type="text" value="30"/>	<input type="text" value="10"/>
Phase 2	<input type="text" value="10"/>	<input type="text" value="10"/>

# Software - Experiment

**BPC Blue** BPC Instruments

Home Control **Experiment** Graph Report Settings

Aerobic Anaerobic

### Samples

Add sample

Samples	Name	Blank	Total solids [%]	ThOD [g O <sub>2</sub> /g]	Delete
1	1g Cellulose	1	95.0	1.184	

Line	Name	Amount of inoculum [g]	Amount of sample [g]	Delete
4	1g Cellulose 1	100.0	1.0	
5	1g Cellulose 2	100.0	1.0	
6	1g Cellulose 3	100.0	1.0	

Add lines

### Blanks

Add blank

Blank	Name	Delete
1	Blank (raw soil)	

Line	Name	Amount of inoculum [g]	Delete
1	Blank (raw soil) 1	100.0	
2	Blank (raw soil) 2	100.0	
3	Blank (raw soil) 3	100.0	

Add lines

On the “**Experiment**” page you can:

- Enter relevant parameters such as total solids (%), amount of inoculum and sample
- Insert the composition of the sample in order for the software to calculate ThOD (Theoretical Oxygen Demand) and generate biodegradation rate graph
- Alternatively, you can directly insert the ThOD if known
- Group samples and blanks according to replicates
- Allocate a blank to each sample

Add and group samples

Input parameters

Allocate a corresponding blank

Add and group blanks

Click on the calculator icon and enter the composition of your sample to calculate the ThOD

Calculate theoretical oxygen demand

C	H	Cl	N	S	P	Na	O
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Cancel Save

# Software – Graph / Lines

The screenshot shows the BPC Blue software interface. At the top, there are navigation tabs: Home, Control, Experiment, Graph (selected), Report, and Settings. On the right, there are buttons for 'Aerobic' and 'Anaerobic'. Below the navigation, there are three main sections: 'Lines', 'Groups', and 'Biodegradation'. The 'Lines' section is highlighted with a red arrow pointing to a callout box that says 'Divided in three sections'. Below this, there is a 'Gas flow' section with a grid of 18 numbered buttons (1-18) and a 'Select/Deselect all' checkbox. Below the buttons, there are two dropdown menus: 'Output unit' (set to 'Normalized volume [Nm]') and 'Rate unit' (set to 'Nm/day'). At the bottom, there is a graph titled 'Accumulated gas volume [Nm]' showing multiple colored lines representing different experimental runs over time.

On the “**Graph/Lines**” page you can:

- View real-time data in a graph form
- Change view settings such as normalisation function and gas flow units
- Select which lines you wish to view

Line selector

Units

Normalisation function

This block contains two graphs. The top graph is titled 'Accumulated gas volume' and shows a line graph with 'Accumulated gas volume [Nm]' on the y-axis (0 to 800) and 'Time' on the x-axis (0d to 60d). It displays multiple colored lines representing different experimental runs, showing an overall upward trend. The bottom graph is titled 'Gas flow rate' and shows a line graph with 'Gas flow rate [Nm/day]' on the y-axis (0 to 120) and 'Time' on the x-axis (0d to 60d). It displays multiple colored lines representing different experimental runs, showing fluctuating peaks and troughs over time.

Accumulated gas volume

Gas flow rate

# Software – Graph / Groups

On the “**Graph/Groups**” page you can:

- View real-time data in a graph form as average for each group of triplicates
- Change view settings such as normalisation function and gas flow units
- Select which groups you wish to view

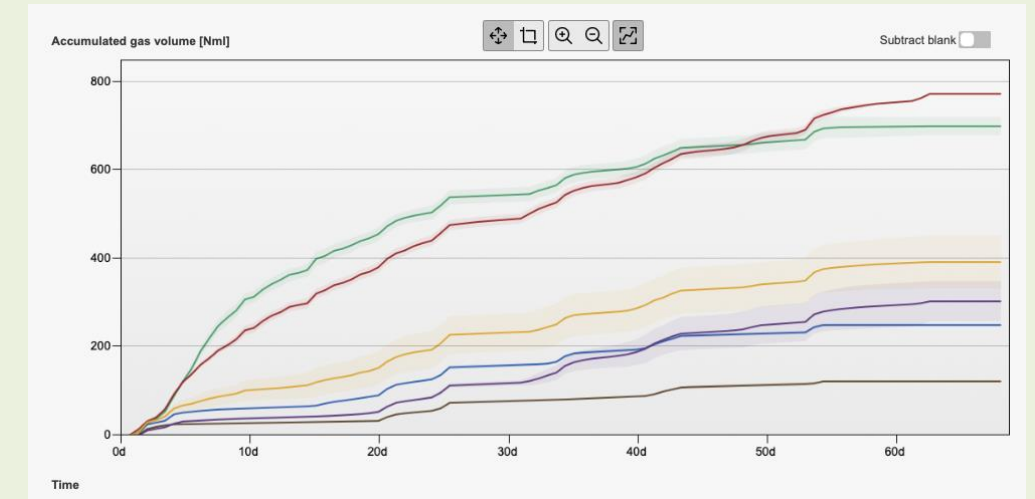
Group selector

Units

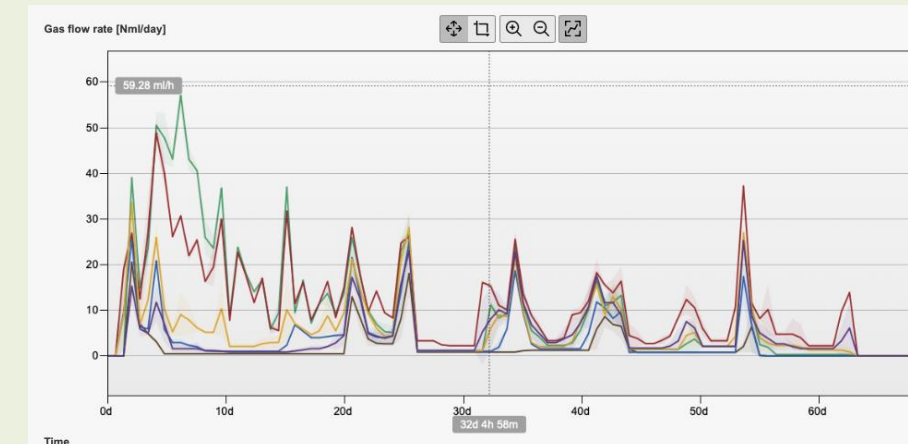
Normalisation function

## Two viewable graphs

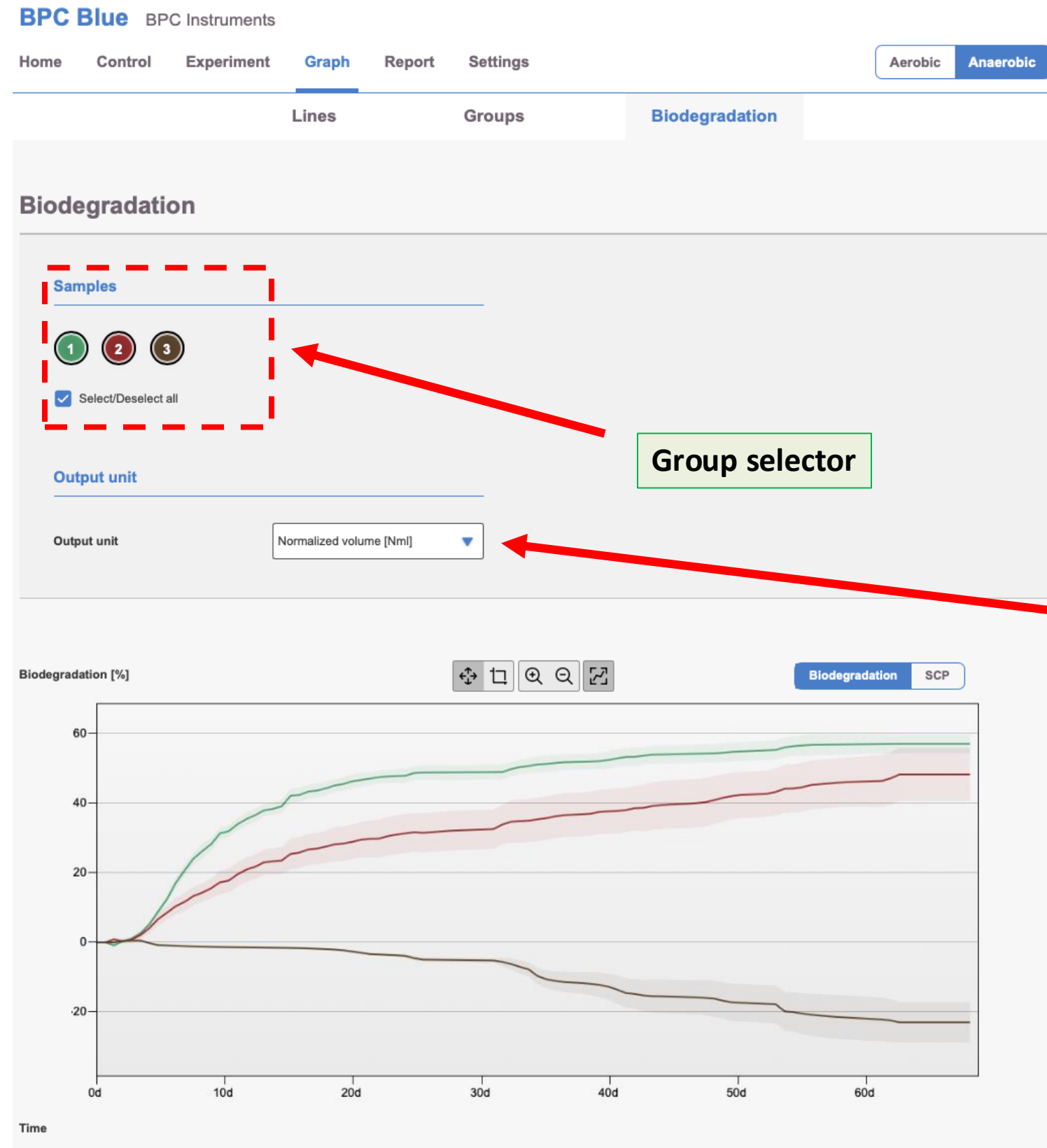
Average accumulated gas volume



Average gas flow rate



# Software – Graph / *Biodegradability*



On the “**Graph/ Biodegradability**” page you can:

- View real-time biodegradation rate data in a graph form
- Change view settings such as normalisation function and gas flow units
- Select which groups you wish to view

# Software - Report

BPC Blue BPC Instruments

Home Control Experiment Graph **Report** Settings

Aerobic Anaerobic

Lines

Groups

## Download report

Line	Name	Status	Started [UTC]	Duration	Include	Raw data
1	Line 1	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV
2	Line 2	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV
3	Line 3	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV
4	Line 4	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV
5	Line 5	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV
6	Line 6	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV
7	Line 7	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV
8	Line 8	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV
9	Line 9	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV
10	Line 10	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV
11	Line 11	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV
12	Line 12	Running	2024-03-13 13:05	12d 18h 26m	<input checked="" type="checkbox"/>	CSV

On the “Report” page you can:

- Download individual or total reports of data
- Download both raw and normalised data
- Select which file format, units and gas normalisation the data should include

Download raw data

Download full report

Settings for reports

## Report settings

Output unit: Normalized volume [Nm<sup>3</sup>]

Gas flow unit: Nm<sup>3</sup>/h

Interpolation interval: Day

Report file format: Microsoft Excel (XLSX)

Download reports

# Software - Settings

BPC Blue BPC Instruments

Home Control Experiment Graph Report **Settings**

Aerobic Anaerobic

## System information

### System information

Software version	Aurora 1.2.6
Hardware version	1083-5.3.1-210-r4
Serial number	1100-3100-1100-1048

### Software licenses

Copyright BPC Instruments AB

Show open source licenses

## Calibration settings

### Time settings

Instrument	04/04/2024, 09:55:32
Web browser	04/04/2024, 09:56:10

Synchronize now

### Instrument level calibration

Instrument level calibration

Reset accelerometer

Show level

**Warning!** Do not change time/date settings while the system is running

On the “**Settings**” page you can:

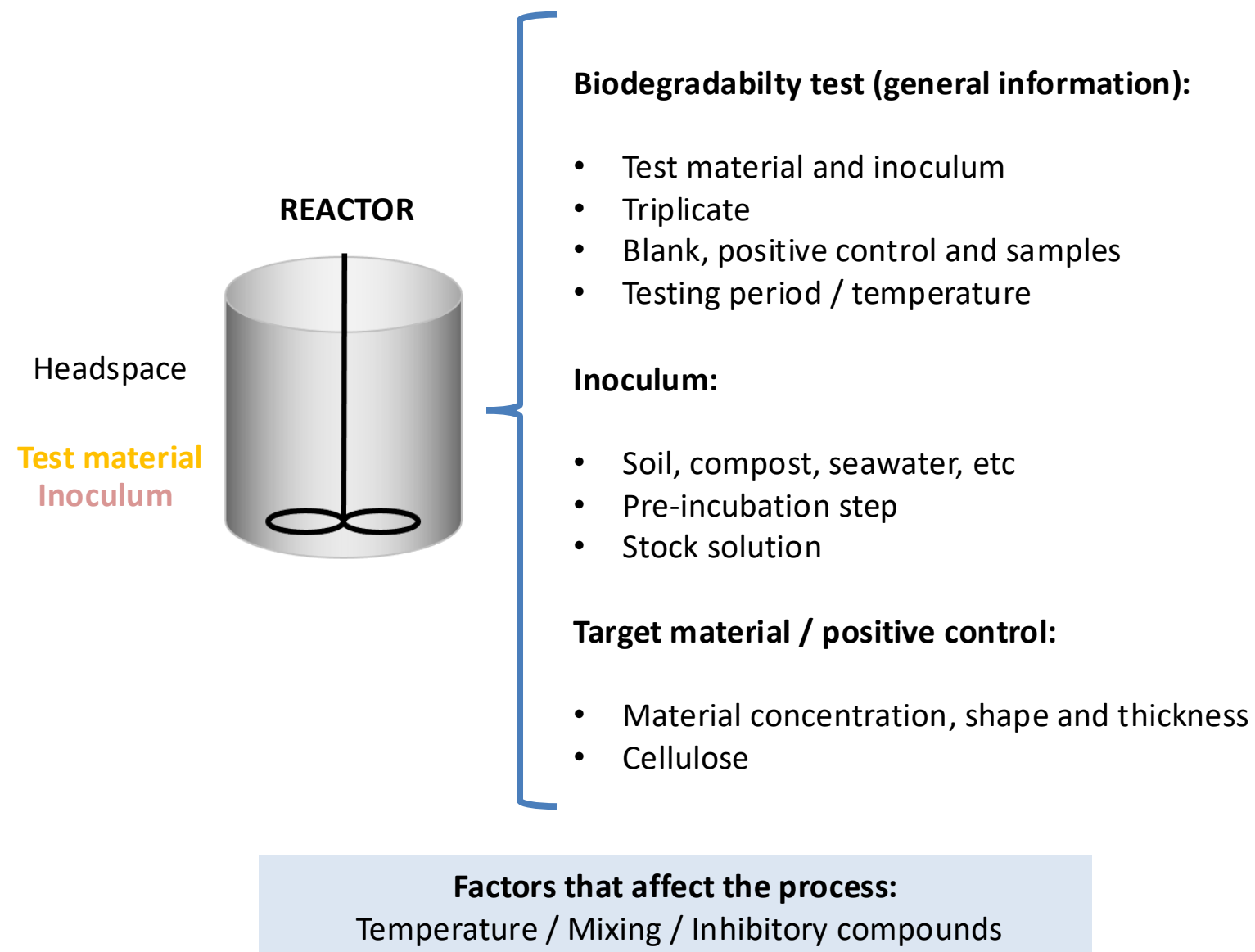
- Check system information and software licenses
- Calibrate time, date, instrument level, temperature and pressure
- Change instrument name and password
- Reset to factory/default settings
- Adjust network settings
- View system warning (error) log

## System warning log

System ok, no warnings

Clear log

# General Experimental Conditions



## Experiment (general guidelines):

### Solid environments: soil, compost

- Material concentration: 1 g / 100 g inoculum
- Inoculum thickness: around 4 cm
- Reactor size: 1 L

### Aqueous environments: water, seawater

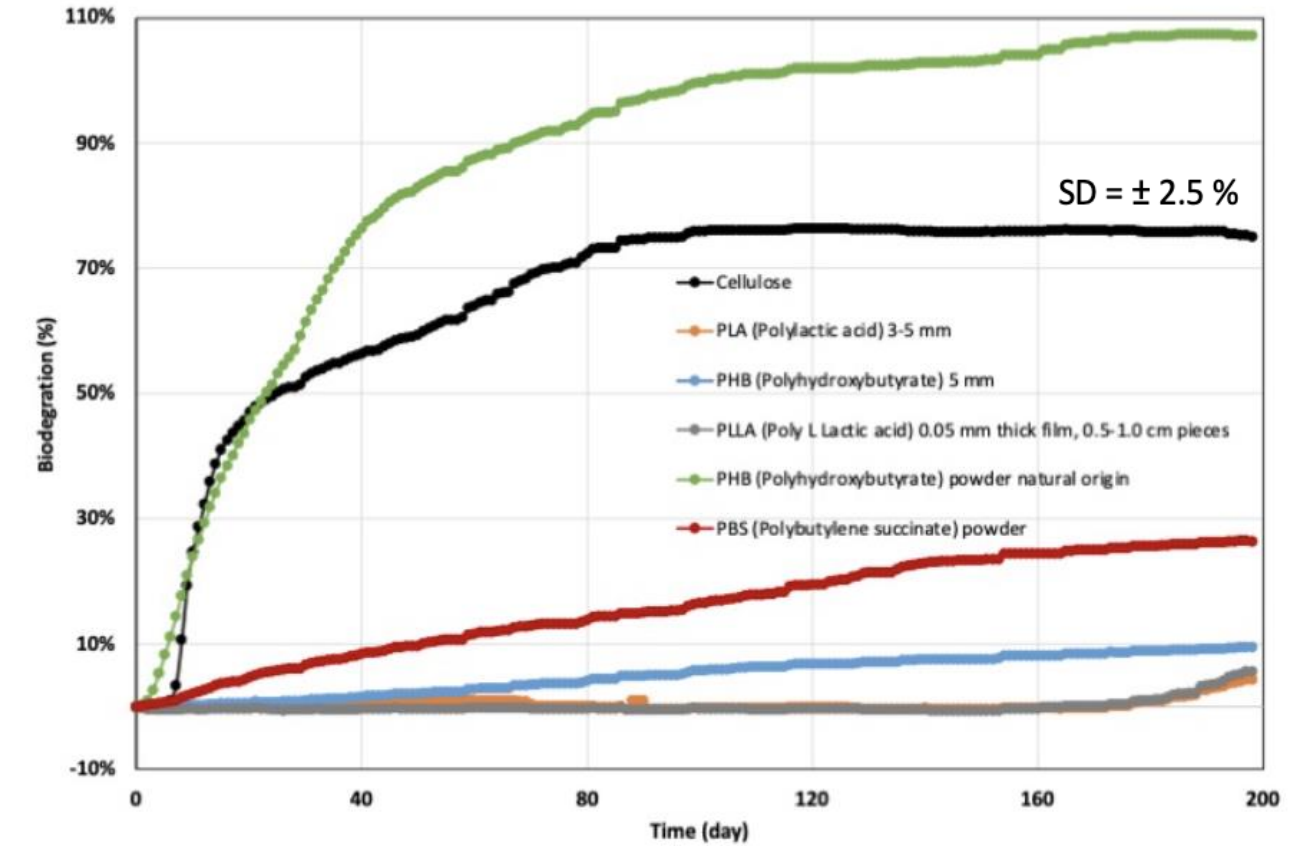
- Material concentration: 1 g / 100 mL inoculum
- Total volume: 600 - 800 mL
- Reactor size: 1 L



## Example of a real case – Biodegradability of plastics in soil (ISO 17556):

### Experimental setup:

Samples: Different plastic materials (PHB, PLA, PLLA and PBS)  
 Inoculum: Sandy-loam soil  
 Positive control: Cellulose  
 Temperature: 22 °C  
 Substrate concentration: 1.5 g plastic / 100 g soil  
 Number of reactors per sample: 3



Evolution of the biodegradation of cellulose, PHB granule / powder, PLA granule, PLLA thick film and PBS powder in sandy-loam soil

## Before starting the experiment

### Simulate openings

#### Testing the detection unit and software:

- Before starting the experiment, simulate a flow cell opening by manually removing each FCU and put it back in numerical order from 1 to 18 (repeat this procedure three times).
- Follow the corresponding result of each opening on the plots on the graph page of the software to make sure that both the detection system and data acquisition system function properly.

## After the experiment is finished

#### Finishing steps once the experiment is finished:

- Generate and download a report on the report menu of the software.
- Turn off the thermostatic water bath and the motors, including the motor controller.
- Next, unplug the power adapters (for the Motor Controller and the Gas Volume Measuring Device) from the power source.
- Disconnect the tubing and remove the lids from the reactors. Removing these components after experiments can often pose a challenge due to their tight fit, specially the tubing to the different connectors. BPC Blue Configurations are equipped with a bottle/tube opening tool to easily remove lids and tubing without the risk of damaging them and the connectors.



Bottle / tube opening tool

# What else can BPC Instruments offer you?

## **Online Training**

BPC Instruments can provide online trainings to all our new customers. Our expert team is ready to help you start your first experiment and ensure the instrument is working correctly.

## **Continuous Support**

Most of our team members are scientists and engineers who are experts in their field. We are always ready to answer your questions and happy to assist!

## **Compare Results with Laboratories Worldwide**

Real-time temperature and pressure compensations minimise the impact of possible variation in measurement conditions. Thus, you can compare your data with different laboratories around the world easily.

## **Scientific References**

You can rely on our products just as many of our customers from academic institutions, universities and key industrial players worldwide. Check our selection of more than 1000 scientific references available on our website.