AMPTS® III

The market-leading analytical tool for anaerobic batch fermentation testing

BPC INSTRUMENTS

The preferred instrument for analysing biochemical methane potential

AMPTS® III

The Automatic Methane Potential Test System (AMPTS®) is the market-leading analytical tool for anaerobic batch fermentation testing. Now on its third generation, AMPTS III is automated and fully integrated for easy access to sampling, analysis, recording and report generation. AMPTS III houses 18 glass reactors for tests in its standard form, or your can choose the slimmed down AMPTS III Light, which houses 9 glass reactors.

What is the AMPTS

AMPTS is the analytical tool preferred by scientists and engineers for conducting anaerobic batch fermentation tests. The latest generation of AMPTS comes in two models (AMPTS III and AMPTS III Light) that house 18 or 9 test vials, respectively. AMPTS III automates and simplifies a wide range of testing, including biochemical methane potential (BMP) tests, biogas potential, anaerobic biodegradability studies, specific methanogenic activity (SMA) assays, and residual gas potential (RGP) analyses on digested slurry. With either AMPTS III model, sampling, analysis, recording and report generation are fully integrated to offer users a seamless testing experience, including:

- Precision and accuracy of data from a tool vetted and preferred by industry leaders
- Streamlined, integrated processes underpinned by automation for significant reductions in time and labour
- Standardisation of measurement procedures, data interpretation and reports
- User-friendly operations with remote access to your data where and when you need it

Determine the true biogas and methane potential

AMPTS allows you to determine the true biogas and methane potential as well as dynamic degradation profile of any biomass substrate. That means you can more easily determine the optimal retention time and mix of substrates for co-digesting, screen proper pre-treatment methods, evaluate the need for additives, and even assess the biological performance of an individual biogas digestor or process configuration.

Reduce labour and skill demands

AMPTS significantly reduces labour demands and risk of human errors when compared to traditional methods or competitive solutions on the market. After a few hours of experiment preparation and setup, the run process is fully automated by AMPTS until the test is over. Experimental data can be easily reviewed in real-time or from a downloaded report at any time, making testing easier than ever before.

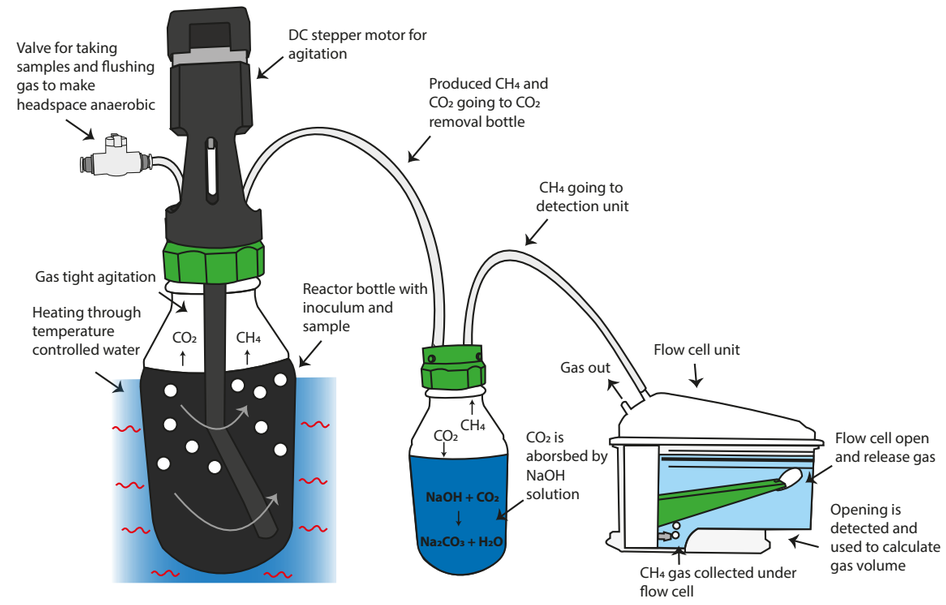
Embedded solution with no need for external computer

AMPTS features inbuilt storage and processing from an onboard embedded microcontroller, which allows the tool to store all gas volume and flow measurements locally. This eliminates the need for an external computer, so you no longer need to worry about losing data due to a computer crash or automatic operational system upgrade that could cost you weeks of research and development work. The large storage capacity of 15 million data points allows for collection of up to 130 000 liters of gas per experiment.

AMPTS® III

AMPTS® III Light

AMPTS® III working principle



Robust operations with modular design

AMPTS is designed and manufactured in Sweden, adding the best elements of Scandinavian form and function to quality and reliability. AMPTS ensures no data is lost, even if the entire system goes down. The modular design makes the maintenance of AMPTS easy because many parts can be exchanged without sending the instrument to a workshop.

Standardise and compare results

AMPTS is a universal platform for all anaerobic batch fermentation tests, allowing for the standardisation of measurement procedures, data interpretation and reports. With the real-time temperature and pressure compensation, the measured biomethane volume and flow are normalized under standard condition (i.e., 0 °C, 1 atm and zero moisture) and the measurement interference caused by variations of external measurement conditions can be minimised. This allows for data from different laboratories around the world to be easily compared, thus creating value over and above the high-quality results delivered by AMPTS.

Measure total biogas and estimate gas composition in real time

With its gas tight enclosed measurement chambers, the new AMPTS III is able to measure total biogas with minimal losses of carbon dioxide. In addition, by connecting two measurement chambers in a series before and after removing carbon dioxide, it is possible to estimate the gas composition in real time.

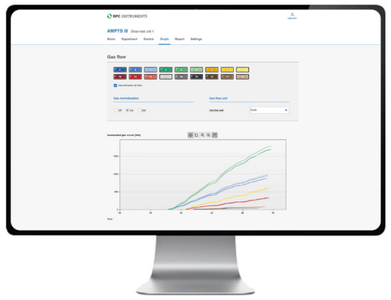
Strong and reliable agitation

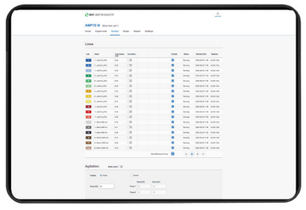
Driven by high-quality brushless step motors, the agitation system included with AMPTS effectively delivers gentle, precise, and reliable agitation in a gas tight environment. Its ability to work well even in the harsh environment of anaerobic fermentation is why so many satisfied customers around the world rely on AMPTS as their preferred device for anaerobic bath fermentation testing.

AURORA™ Software, pre-installed on AMPTS III

Bring your experiment to life with Aurora™ software

Aurora™ is BPC Instruments' latest and revolutionary software solution for monitoring anaerobic batch fermentation tests. Its slimmed down design makes it optimal for users to set up an experiment, monitor its progress and download results with little effort. Aurora is included and comes pre-installed on AMPTS without the need for software licences or installation on external computer.





Results from anywhere on any device

AMPTS is designed to allow easy access from a remote location using any device with a web browser. Monitor your experiment from your office and home with your computer, tablet or phone of choice. You can also expand the analytical capacity of AMPTS easily by connecting multiple instruments together with an Ethernet switch. With this feature, each AMPTS can be operated as a stand-alone device or connected in parallel, depending on your needs.

Application areas

AMPTS can be used for a broad variety of anaerobic bath tests. These include:

- Biochemical methane potential (BMP)
- Biogas potential
- Specific methane activity (SMA)
- Residual gas potential (RGP)
- Biochemical hydrogen potential (BHP)

AMPTS® features comparison

	AMPTS® III	AMPTS® II
Measurement cells	**Measurement cells in enclosed chambers that are easy to replace and interchange**	All measurement cells in the same open container. Not possible to change them without opening up the detection unit.
Number of channels	**18 and 9 (Light)**	15 and 6 (Light)
Measurement resolution	**2 ml and 9 ml**	9 ml
Measurable gas types	**Both water soluble and insoluble gases (e.g. total biogas, CO^2, CH^4)**	Only gases with low solubility in water (e.g. CH^4)
Electronic hardware	**New electronic hardware with significantly better performance and more functionalities**	Hardware with more limited storage and processing capacity
Volume detection capacity	**130 000 Liter**	900 Liter
Display	**OLED display**	No display
Software	**Aurora™ an embedded software that is accessed via web browser on any device. With new design and more advanced features, e.g. start and stop all channels, zoom in graphs, flexible gas normalisation, control agitation in phases, download raw data etc.**	Embedded software that is accessed via web browser on any device.
Reactor sizes	**1 Liter in standard version with the option to choose 0.5 Liter. Light version with 2 Liters**	0.5 Liter in standard version and 2 Liters for Light version
Tubing	**Polyurethane tubing that is strong, durable and has low gas permeability**	Tygon E3603 tubing
Accessories	**Various accessories are included for better tube management and easier operation**	Limited number of accessories
Electronic level control	**Accelerometer indicate horizontal position of the detection unit**	No electronic level control

Features

- **Web-based.** User friendly web-based software running on an embedded server. No need for software installation on PC, tablet or smartphone
- **Remote access.** AMPTS can be accessed remotely and locally from any device with a web browser
- **Automated.** Automatic real-time pressure, temperature and moisture compensation
- **Calibration free**
- **Multiplexing potential.** Possibility of multiplexing allows for simultaneous batch analysis at different start-up times
- **Easy maintenance.** Modular design means most parts can easily be exchanged
- **Local data storage.** Data stored on the local instrument means no dependence on external computer
- **Easy processing.** Data exported as a spreadsheet for further analysis with uniform time axis for easy processing
- **High data storage capacity.** 7200 l of gas per channel
- **Real-time measurements.** Measure several gas types, including biogas, in real time
- **Gas composition estimates.** Connect in series to get real time estimates of gas composition
- **Effective agitation.** Proven strong, reliable, multifunctional agitation
- **Outputs in various time intervals.** Generates outputs ranging from a datapoint every minute to one every day

Technical specifications

Sample incubation unit

- **Maximum number of reactors per system:** 18 and 9
- **Reactor material:** glass
- **Standard reactor volume:** 1000 ml (with option for 500 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) (precision of 0.2 °C)
- **Mixing in the reactor:** mechanical agitation with brushless DC motors (adjustable interval, speed and rotation directions), max. speed 220 rpm

Carbon dioxide absorption unit

- **Carbon dioxide trap bottles:** 18 and 9
- **Volume of carbon dioxide trap bottles:** 250 ml
- **Dimension of bottle holder:** 55 x 28 x 17 (2 pc and 1 pc)
- **Recommended absorption liquid:** 3 M NaOH with pH indicator*, 200 ml per bottle (not included) Absorption efficiency: >98%

**Absorption liquid is not included with the instrument*

Flow cell array and DAQ unit

- **Working principle:** liquid displacement and buoyancy
- **Number of flow cell units:** 18 and 9
- **Dimension of unit:** 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:** Deionised or distilled water
- **Operation temperature:** 0 - 50° C
- **Operation pressure:** -50 – 50 mbar
- **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 (standard) with 2 ml as option

- **Detection capacity:** 7200 l cumulative gas per channel with 9 ml flow cell.
- **Measuring range:** 1 to 6000 ml/h for 9 ml flow cell and 0.2 to 1500 ml/h
- **Repeatability:** CV ≤ 1% for 9 ml flow cell and CV ≤ 3% for 2 ml flow cell
- **Gases**: Non aggressive gases (e.g. CH_4 , CO_2 , H_2 , N_2 ,...)

Your user experience is a top priority for us

We take pride in providing support throughout the lifetime of our products. This applies to products covered under warranty, and even products where the warranty period has expired. Our goal is to ensure your instrument always works and continually delivers value.

AMPTS® III - THE STORY

The AMPTS has come a long way since its inception in 2008, with the latest AMPTS III model being a testament to its continuous evolution and improvement. The new revolutionary software in the AMPTS III will offer even more accuracy, reliability, and convenience to researchers, further cementing its position as the industry standard for conducting anaerobic batch fermentation tests.

AMPTS' success can be attributed to the tireless efforts of the product development team, who have continuously worked on developing the product since the launch of the first model in 2009. AMPTS II, launched in 2011, brought with it significant improvements to the detection unit, electronics, software, and aesthetics. The success of AMPTS can also be attributed to the instrument's ease of use, reliability, and accuracy, making it a popular choice for labs, universities, biogas plants, and research centres around the world.

AMPTS has become the preferred instrument for conducting biochemical methane potential tests and other anaerobic batch fermentation tests. With the launch of AMPTS III, the instrument's revolutionary software will set a new standard for accuracy and reliability, continuing its tradition of continuous improvement and innovation.

Excellence is built on precision and accuracy

BPC Instruments is a global Swedish-based technology company developing and offering analytical instruments enabling more efficient, reliable, and high quality of research and analysis for industries in renewable bioenergy and environmental biotechnology. The result is not only higher accuracy and precision, but also significant reduction in time consumption and labour requirement for performing analyses. BPC Instruments' innovative products offer high-quality hardware and software based on deep knowledge and experience of target applications. The solutions are the first of their kind, making the company a pioneer in its field. Today, BPC Instruments exports to nearly 70 countries around the world.

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