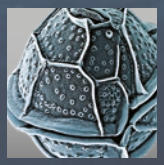
EN |

ALGAEMASTER 10 CONTROL

Photobioreactor

IKA

analytical equipment
designed for scientists



Growing algae made easy by IKA

IKA Algaemaster 10 control

The photobioreactor Algaemaster 10 control is the perfect equipment supporting scientists to find and recreate the ideal environmental conditions for growing phototrophic organisms such as microalgae. These are of increasing interest for drug discovery in the pharmaceutical industry.

With our seawater resistant and autoclavable system, you are more than well prepared for your specific research activities.

3 Year warranty*

CE

Protection class min. IP21

*2+1 years after registering at www.ika.com/register, wearing parts excluded

according to DIN EN 60529

IMAGES ALGAE CELLS:
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Scientist endorsement

"The applicability of this instrument is oriented towards the exploratory phases needed in optimizing conditions for growth, metabolic product development, biomass and testing for subsequent phases of growth in industry"

CARMELO R. TOMAS, PH.D.
Emeritus and Adjunct Professor of Biology and Marine Biology
Principal MARBIONC

Find the best conditions

The IKA Algaemaster 10 control comes with a controller, reactor vessel and two LED light panels. Temperature and pH sensors, impeller, sparger, quick connect fittings for the jacketed vessel and stirrer motor are included as well as PTFE plugs and connectors as shown on the lid.

The controller provides all features required for growing organisms. With its slim design, it fits next to the reactor on the bench for easy handling.

Controller (top)

Nothing left aside

The top of the controller comes with further connections
> Two gas-out-connectors
> One pH sensor interface
> One PT 100 interface

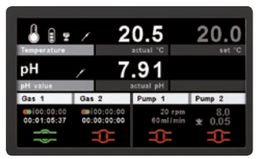
pH / PT 100
Interface

2 x Gas-out-
connectors

Controller (front)

Everything at a glance

On the front side you have access to
> Two large displays with high resolution (480 x 272px) to easily monitor all software settings during the experiment
> Two peristaltic pumps for adding nutrients and other liquids or when diluting the batch
> Two manually adjustable gas flow meters for CO_2 or air shut on/off
> A USB port for exporting trial data



Two large 4,3" displays with high resolution to easily monitor all software settings

Two manually adjustable gas flow meters

Two peristaltic pumps

Controller (back)

Entirely connected

The back panel provides all relevant interfaces
> Two gas-in-connectors (max. 1bar)
> One RS 232
> One USB port for connection to a PC
> One RS 232 interface to connect to an IKA chiller/circulator for enhanced operation
> One motor control interface
> Four connectors to attach up to four LED light panels

4 x
LED light
panels

2 x
Gas-in
connectors

1 x
USB port

2 x
RS 232

Lid

Customize it

The customizable lid is made of long term-tested Ultem® thermoplastic which can be sterilized in an autoclave. It provides 6, 8, and 12mm ½" NPT threaded adapters to connect different diameter hoses or sensors. Additional custom sensors can be accommodated based on the researcher's need.

The PT 100 temperature and the pH sensor are also inserted through the lid. The stirrer motor is connected to a completely detachable coupling leaving the integrity of the reaction vessel intact following GMP standards. It provides a speed range of 10 to 100 rpm.

PEI

Ultem® made lid is autoclavable

Several adapters to connect hoses or sensors

Motor speed range of 10 to 100 rpm

Light panels

No jetlag

Two LED light panels provided with the IKA Algaemaster 10 control allow a flexible light environment for the organisms. For instance, settings for day and night simulation for a better growth can easily be programmed with the software. For organisms needing an increased light environment, up to four light panels can be connected to the reactor.

Up to 4 LED light panels

Flexible LED panel system

Day & night simulation can be programmed

Reactor vessel (10 l)

Keep it running

The 10 liter jacketed reactor vessel has quick connect fittings making it easy to connect a chiller/circulator. A sparger (for adding gases such as CO_2), as well as a PTFE coated impeller with two height-adjustable propellers are also included in the scope of delivery.

When using a temperature or pH sensor, a minimum of six liters is required. The maximum volume is 10 liters.

min. 6 l
max.10 l

Useable volume

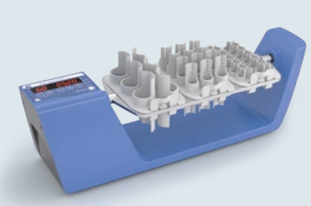
Jacketed reactor vessel

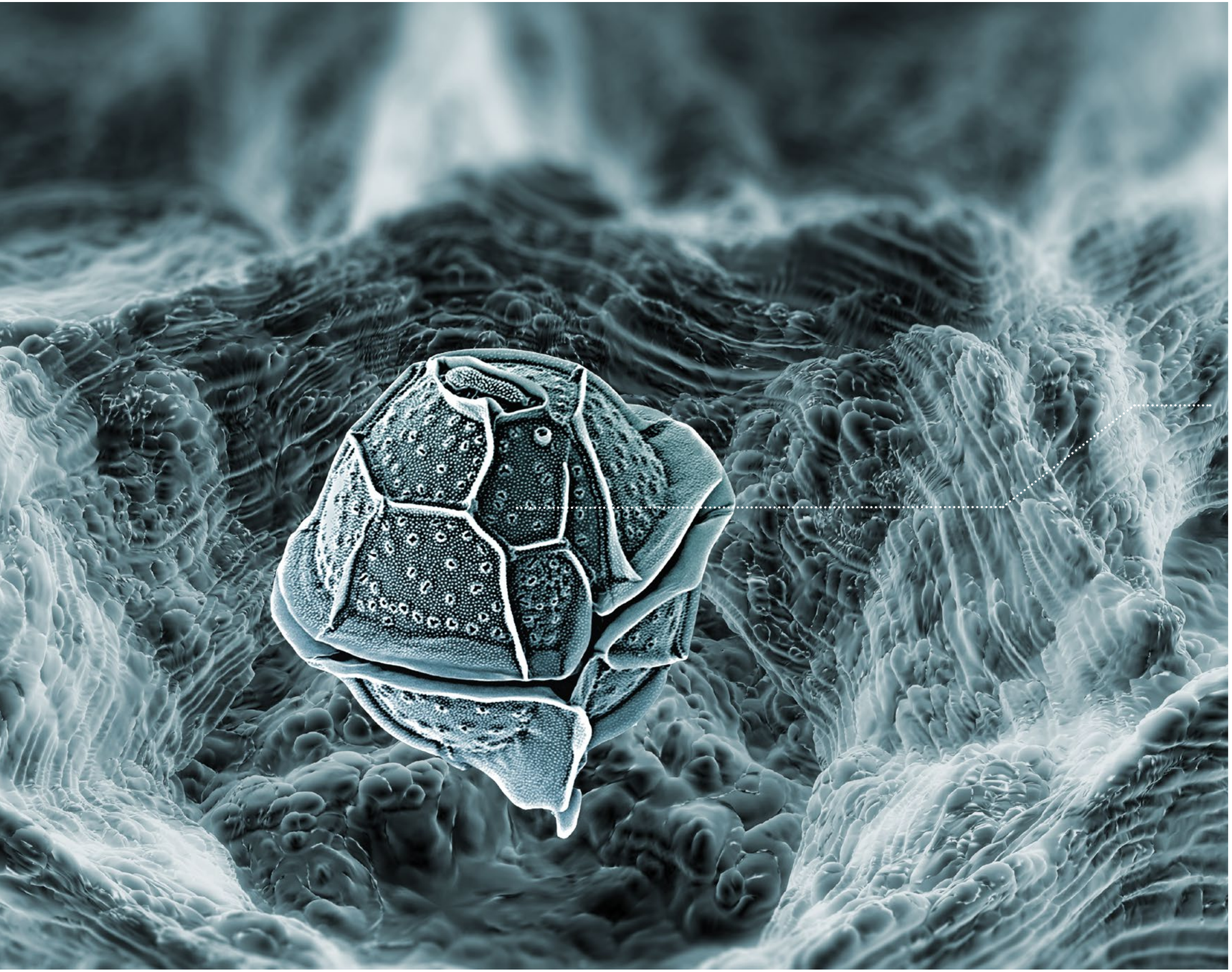
1 x PTFE coated impellers with height adjustable propellers

Complementary products

Combine it

Our IKA immersion circulators and/or chillers can be connected to the jacketed reactor vessel to perfectly control the temperature inside the reactor. The circulator is directly connected to the Algaemaster 10 control unit, allowing best possible control. Further IKA products such as centrifuges, shakers and vortex mixers, homogenizers or the disposable sample processing system UTTD might also be of interest for your application.





Application

Algae growth

Growing algae in a photobioreactor is a common application. Algae need light, carbon dioxide, water, nutrition and the right pH-value to grow. All those requirements can easily be recreated by a photobioreactor.

Algae are interesting for different industries. In part, they are already used in pharmaceutical, cosmetics, bioenergy and food industries. However, there is still more research to be done in order to discover the full potential of all different algal species.

The IKA Algaemaster 10 control, a fully autonomous photobioreactor, provides researchers with the equipment necessary to produce mass densities even of the most sensitive dinoflagellate microalgae.

Pyrodinium bahamense

Researchers closely study Pyrodinium bahamense, a tropical species of dinoflagellates, since the 1990s. Its first discovery was in 1906 in the Bahamas. The species that is mainly found in the Atlantic Ocean is held responsible for seafood toxicity and cause of paralytic shellfish poisoning.

Growing P. bahamense under artifical conditions in a laboratory is quite difficult due to its specific nutrition needs. A certain nitrogen level has to be maintained for optimal growth.*

**Reference: https://en.wikipedia.org/wiki/Pyrodinium_bahamense)*

Cooperation with UNCW

The cooperation between IKA and the University of North Carolina at Wilmington (UNCW) started over eight years ago when researchers at the university were looking at the equipment IKA already carried and wanted to get some for their laboratories at the university.

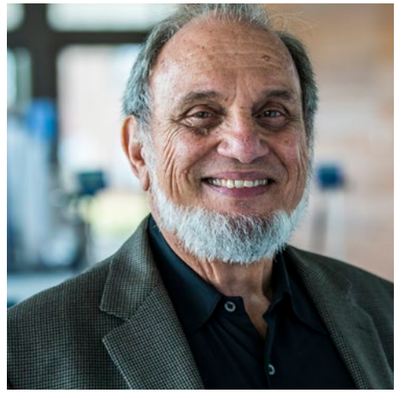
Today, the collaboration on algal research is a win-win situation for both parties. IKA benefits from having marine scientists test and refine its lab apparatus, while the university benefits by having state-of-the-art equipment to test new sources of potentially life-saving drugs found in organisms from the sea. IKA has even funded a fellow at UNCW to advance the Algaemaster project.

Before IKA enhanced the development of the photobioreactor Algaemaster 10 control, researchers grew algae in 12 liter carboy bottles that took up large amounts of lab space. The light needed to make the algae grow came from incandescent bulbs, unlike the photobioreactor's precisely controlled LEDs. It was difficult to control all the necessary conditions, which kept output low and made impossible to culture certain species in useful amounts.

Now, UNCW is making good use of the Algaemaster 10 control to grow commercially useful amounts of important algae species, which are offered for sale in various forms. The result is a commercial resource called the Algal Resources Collection. It makes cultures of scientific interest available to scientists anywhere, in both small and large volumes.

"The collaboration on algal research between IKA and the Algal Resources Collection at the MARBIONC facility (University of North Carolina at Wilmington) help us pushing the boundaries of renewable pharma- and nutraceuticals"

Alexis Marti,
Research Technician
& IKA Fellow
MARBIONC, University of
North Carolina at Wilmington



Technical features IKA Algaemaster 10 control

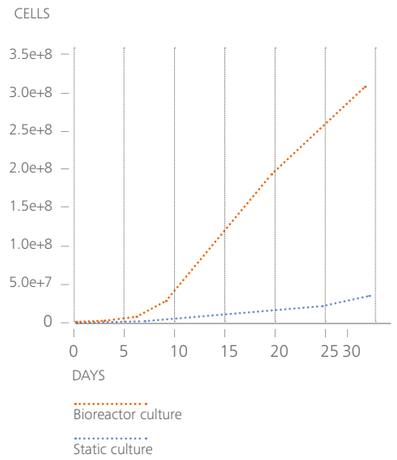
Special benefits	> No metal in the inner vessel > No negative influence on metal sensitive bioactive materials > No corrosion due to ocean water > Customizable cover with nine ports > Small footprint
Light	Up to four LED light panels attachable for individual and variable lighting conditions
Agitation	Overhead stirrer Speed range: 10 – 100 rpm
Product touching material	Borosilicate glass (reactor vessel) PTFE (impeller, adapters on the lid) Ultem® thermoplastic
Gas supply	Sparger (CO_2)
Cleaning & sterility	Lid and vessel are completely autoclavable to ensure sterility
Data monitoring & control	Computerized control over > Lighting > Temperature > Stirring > pH > Adding nutrients
Data management	Controller records all parameters. Controlling and monitoring the experiment parameters are vital. Data can be retrieved easily to a PC using a USB stick in ASCII format and processed for futher analyses, reporting and documentation purposes.
Interfaces	USB, RS 232, pH sensor, PT sensor
Power	115 V or 230 V; 50/60Hz
Ident.No.	0020009577

Scope of delivery

- > 10 l jacketed reactor vessel with quick connect fittings
- > Lid made of Ultem®
- > Controller unit
- > 2 LED light panels
- > PT 100 temperature sensor
- > pH sensor
- > Sparger
- > Vessel base plate
- > Stirrer motor and impeller with two height-adjustable propellers

Application

Picture of growth rates compared to static culture



Growing Amphidinium in the IKA Algaemaster 10 control

Growing parameters

Stir speed:	40 rpm; continually
Lighting intensity:	20% (on at 06:00 am, off at 10:00 pm)
Temp.:	22°C
pH:	CO_2 on at 8.6; off at 8.4
Gas:	O_2 on constantly

The production rate of the IKA Algaemaster 10 control has proven to be much higher than normal static growth.

Examples and industries

Further successfully grown algae in the IKA Algaemaster 10 control

Bacillariophyceae
Cryptophyceae
Cyanophyceae
Dictyocophyceae
Dinophyceae
Prasinophyceae
Prymnesiophyceae
Raphidophyceae

The photobioreactor is designed with a focus on growing algae in marine science institutes, algae research centers, biofuel research industry, food & cosmetics as well as the pharmaceutical industry (drug discovery), but could also be used as a bioreactor for many other applications.

IKA customized

Customizing Center

It is important that IKA products meet your needs, which is why we offer solutions specifically adapted to your requirements.

If you do not find an appropriate solution in our standard product range, our experts are available to develop the right solution for your requirements. Please send us your completed request form and our experts will contact you.

Solutions which have already been implemented can be found in our Customizing Center database.

IKA Application Support

Our Application Center spans 400 sqm and offers modern facilities for presenting and testing lab devices and processes. This brings us even closer to our customers and improves our service.

Here, prospective buyers and customers can test out processes that involve stirring, shaking, dispersing, grinding, heating, analyzing and distilling. In addition, it also further extends the opportunity to test your own devices and to develop new models

Scale up to 100 liters

"The versatility of the Algaemaster 10 and Algaemaster 100 as research tools is adaptable from the small research laboratory to the multi-unit, integrated production system growth, metabolic product development, biomass and testing for subsequent phases of growth in industry"

CARMELO R. TOMAS, PH.D.
Emeritus and Adjunct Professor of Biology and Marine Biology
Principal MARBIONC

For more information about the IKA Algaemaster 10 control, please visit our new microsite:

www.ika-photobioreactor.com

Contact
sales@ika.de
for your free
demo

IKA

Pyrodinium,
MARBIONC University
of North Carolina,
Wilmington

201708_Algaemaster 10 control_brochure EN_IWS_94000457

Subject to technical changes

KEY FEATURES IKA ALGAEMASTER 10 CONTROL

Ident. No. 0020009577

> Ocean-water resistant and completely autoclavable lid and vessel
> Metal-free components for sensitive bioactive materials
> Materials touching the product: borosilicate glass, PTFE, Ultem®
> Computerized control of lighting, temperature, stirring, pH and dosing of liquid or gas
> Customizable lid with nine receptacles
> Effortless data collection via USB drive

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