Process flexibility made easy

Eppendorf is a leading developer of instruments, consumables and services, for liquid, sample and cell handling in laboratories worldwide. Its new bioprocess controller, the BioFlo 320, is designed with flexibility and scalability in mind.

The need for process flexibility is paramount to maximising laboratory output. Whether it is early research and development or GMP manufacturing, the ability to grow and adapt with a process is crucial when planning for the future. In order to meet the demands of improved process flexibility and cost savings, Eppendorf recently developed a new bioprocess controller, the BioFlo 320. Designed for flexibility and power in cell culture and microbial applications, the BioFlo 320 eliminates the need to invest in new equipment with each process change.

Flexibility and scalability

The BioFlo 320 combines the capabilities of autoclavable and single-use systems into one advanced bioprocess control station. The user is free to choose from 30 interchangeable autoclavable and single-use vessels. This includes the BioBLU 5p, the first single-use vessel to use the exclusive packed-bed impeller for continuous perfusion processes, and single-use solutions for microbial applications.

The need to scale up between control platforms as process volume increases is one of the most time-intensive steps in the process development world. The BioFlo 320 enables control of autoclavable and single-use vessels, which together cover working volumes from 250ml to 40L. Geometries like the ratio of vessel height to vessel diameter, and vessel to impeller diameter, are highly comparable. This streamlines scale-up approaches.

> “While relatively new to the market, digital sensors have an advantage against which traditional analogue sensors cannot compete.”

While some equipment may claim to be upgradable, the processes involved in making such changes can sometimes outweigh the benefits gained. The BioFlo 320 removes this complexity, through interchangeable sparge and overlay gas modules. These modules are easily installed without the need of a service technician. A simple drawer design allows users to scale up their gas flow rates for increased vessel volume, or change between cell culture and fermentation processes. The scalability of the vessel design is also important: Eppendorf measured comparable oxygen transfer rates for different vessel sizes, demonstrating that using the BioFlo 320 processes at different scales, they can be run under a common aeration strategy. This was proven for the cell culture and fermentation vessel ranges alike.

The BioFlo 320 bioprocess controller from Eppendorf.

Next-generation software and sensors

The BioFlo 320 uses multiple universal ports for digital sensors. While relatively new to the market, digital sensors have an advantage against which traditional analogue sensors cannot compete. The communication to a digital sensor is the same, regardless of sensor type. This means that a pH sensor can be disconnected from the BioFlo 320 and a CO_2 sensor can be connected to the same port, completely changing the process capabilities, with no added effort. Analogue sensors require dedicated electronics for sensors, making this impossible. This is a decided advantage for those processes that may not yet have a defined control strategy, typically in the research and development stage.

The ability to modify equipment is useless if you are still constricted by a limited software platform, and control of various processes from a single piece of equipment requires more than just a modular design. The BioFlo 320 removes unnecessary process limitations by delivering a universal gas control strategy for microbial and cell culture applications. Multiunit connectivity allows control of up to eight individual processes from a single user interface. Like its hardware, the BioFlo 320 control software is designed to keep a laboratory prepared for whatever the future brings. ■

Further information
Eppendorf
www.eppendorf.com