Modularity and Flexibility: A Linear Relationship in Fermentors and Bioreactors

In considering your fermentation or cell culture equipment,
- Have you ever wished you could change from a rotameter to a mass flow controller?
- Have you ever wished you could upgrade from manual cleaning to a clean-in-place (CIP) skid?
- Have you ever wanted to make a change to your fermentor or bioreactor in one day?
- Do you often change products or processes?
- Is it easier for you to get funding in small increments?
- Are you having a hard time deciding what specifications you want on your equipment?
- Do you do contract manufacturing?

If you have answered “Yes” to any of these questions, then you may want to consider a modular bioreactor or fermentor.

If you are doing toxilogic studies or are in phase 1 or 2 development, the process to select a fermentor or bioreactor design can be lengthy and confusing. What features do you need now? What features might you want later? With a modular system, you do not have to make these decisions now.

Modular systems such as New Brunswick Scientific’s BioFlo Pro® fermentors and bioreactors provide the flexibility for adding, removing, or changing components at any time. These systems provide a flexible, customizable design, developed based on over 30 years of fermentor/bioreactor design experience.

Budgetary Issues
Recognizing that we all suffer from tight budgets these days, a modular system can allow you to buy the essential components now and purchase other items later. Remember your previous battles for project funding and realizing that it would have been much easier to get smaller amounts of funding over the course of multiple projects, than all at once? A modular fermentor or bioreactor can be an ideal fit. You could buy the basic items now and enhance or modify your system when budgets expand. The BioFlo Pro has been pre-engineered to accept a wide range of standard options, making it easy to make additions or conversions to your system directly in your facility, whenever needed. For example, it is possible to get a simpler option now such as a rotameter for gas control and, when funds are available later, an upgrade could be made to a thermal mass flow controller. This same scenario could apply to manual tank pressure control versus automatic backpressure control.

Changing Requirements
Now if funds are not your major concern, perhaps a changing process is a frequent activity. If you change from a batch process to a perfusion process, then you may need to add pumps to your system, resterilizable addition valves, a different impeller such as a spin filter, or automatic pressure control to maintain positive pressure on the
along with sprayballs for the tank and the system. These items, coupled with a quick touch screen and controller change, can make your unit ready to connect to a CIP skid in hours. Perhaps you’ve been using differential pressure to measure the tank volume and now want to change to load cells for an easier transition to larger-scale units. These two features are both available in a modular unit and can be modified after the site installation without major issue. At this point in the clinical development, it may also be critical to add a data collection package or handle more involved system control, so you could add a software package such as a BioCommand® SCADA system to provide these features.

Changes can be made to a modular fermentor/bioreactor rather quickly. For example, a second heat exchanger can be added to a skid within four hours (See Figure 1). It adds the flexibility that is crucial for a development operation, a pilot plant, or contract manufacturing.

A modular design also allows for fast delivery of the initial system, which is very important to any company trying to be the first to market with production of a new drug. Delivery of a modular system can be as quick as three to four months. The shorter delivery time can multiply into significant returns on pharmaceutical or biopharmaceutical sales.

A modular bioreactor or fermentor also offers you the reliability of a design being tried and true; tested by many different processes and customers. Now wouldn’t you much rather have that kind of confidence in your equipment than being the first to have a go at it?

If you have any of the above concerns or similar issues, it may be beneficial for you to specify a modular design for your fermentor or bioreactor system. Please contact New Brunswick Scientific regarding modular fermentors up to 3000 L or bioreactors to 500 L, to discuss how we can best meet your process needs.

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