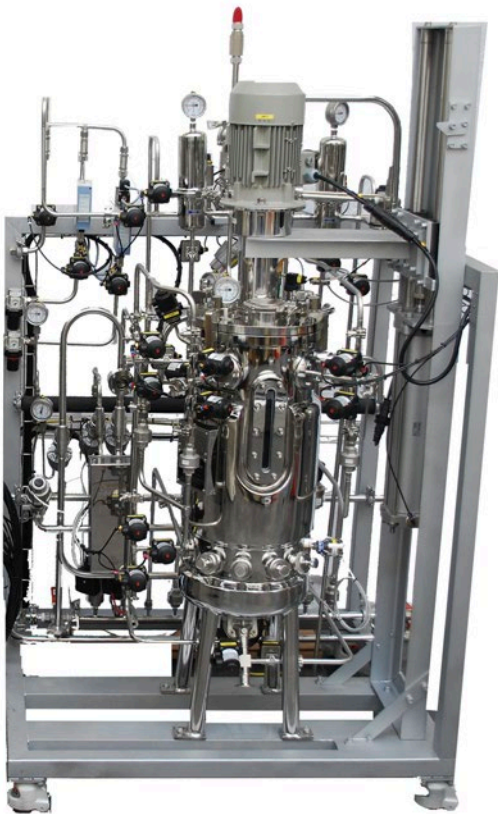




GPC Pilot plant Fermenters is a reliable solution for working with microbiological process for scientific research and small biotech production facilities as well as for scaling up technology.

BIOREACTORS

Available Volumes : from 10L to 600L double jacketed

Vessel in Inox 316 L

Electropolished Stainless steel $Ra \leq 0.8 \mu m$ or $\leq 0.4 \mu m$ on request

Take-down head plate by automated or manual system

MAIN FEATURES

- Ready-to-work standard solutions with the ability to upgrade
- 100% aseptic design, easy validation
- Different types of impellers: Rushton, marine-blade, pitched-blade right- and left-handed orientation with radial or axial flow
- Drive with single or double mechanical or magnetic seal. 100% aseptic operation is guaranteed.
- Mixing speed 30-600 RPM in standard execution, up to 1.500 RPM on request.
- Standard sensors: temperature, pH, pO₂, pressure and foam.
- Sensors on request: optical density, ORP, level, weight, conductivity, pCO₂, gas analyzers.
- The purity of gas mixture in bioreactor is guaranteed by 5" absolute filters 0,2 µm
- Gas mixture supply control via manual flow meter or automatic MFC (mass flow controller)
- Different sparger types: ring or micro spargers. Different specific designs are available on request.
- Standard Ingold ports for electrodes.

C-BIO 2™ CONTROL SYSTEM FEATURES

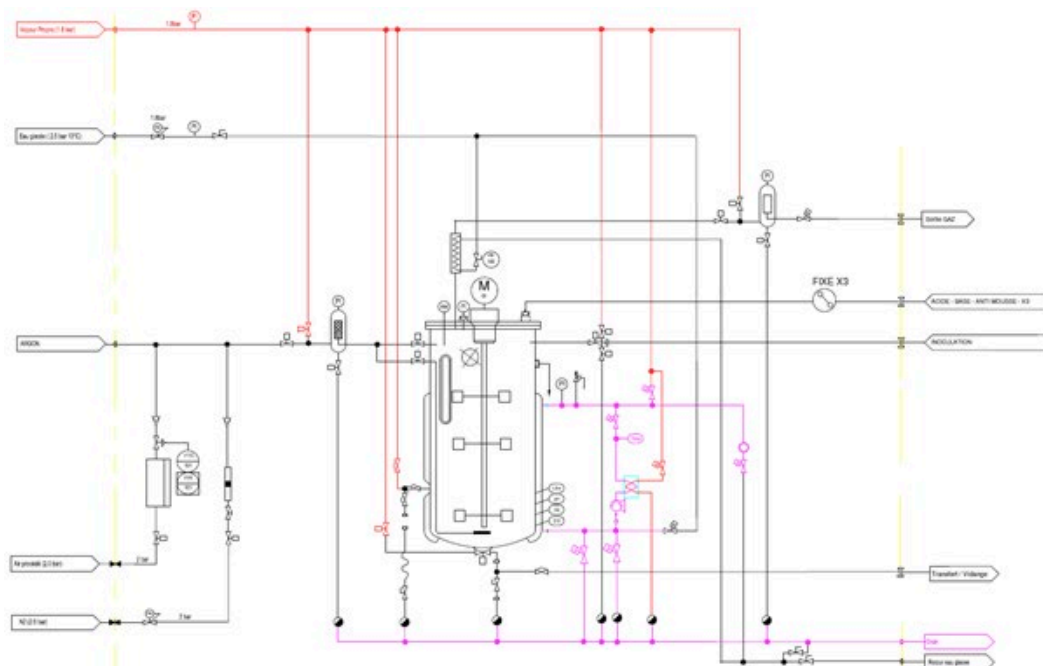
- Universal control system for all range of volumes
- Ability to use a separate control system for each culture vessel, or one control system for several vessels
- The system is based on SCADA controller, constructed in conformance with industrial automation standards.
- Simple and intuitive user interface that provides quick access to all controllers and data.
- "Sequences" program allows creating your own program of cultivation, which will allow better control of the process.
- All fermentation process data is gathered and saved in separate electronic records.
- To minimize the number of errors, different bioreactor operators are given three different levels of access to control system.

A COMPLET ENVIRONMENT (GRIDS, WINNOWNING AND ACCESSORIES) FOR :

- Aeration (Air)
- Filling of the culture media
- Inoculation and supply of substrates and additives
- Sampling
- Vacuum and full sterilization
- Culture temperature control
- Conditionning transfer line
- Others (according to the customer's request)

STUDY PROJECT

Each customer request is carefully studied according to the specifications.
A block diagram of the process and its environment (called P&ID) is realized from a CAD software.
This step, crucial for the understanding of the project is the starting point of the production. It must be validated internally to respect the customer specifications and to comply with rules and safety standards.





The manufacturing process used is strict and calls on modern methods of production.

We work with certified collaborators on the fermentors production which allows us to provide the quality level required. Our partners realize the pilot bioreactor plans, so we can create a 3D model using SOLIDWORKS program. This step, establishment of a model, gives us a global vision of the equipment.

INSTRUMENTATION AND CONTROL SYSTEM

GPC has a real experience in the development of specific systems and has designed a new control concept offering a wide range of technical solutions to answer to all the expectations of fermentation process in pilot bioreactors.

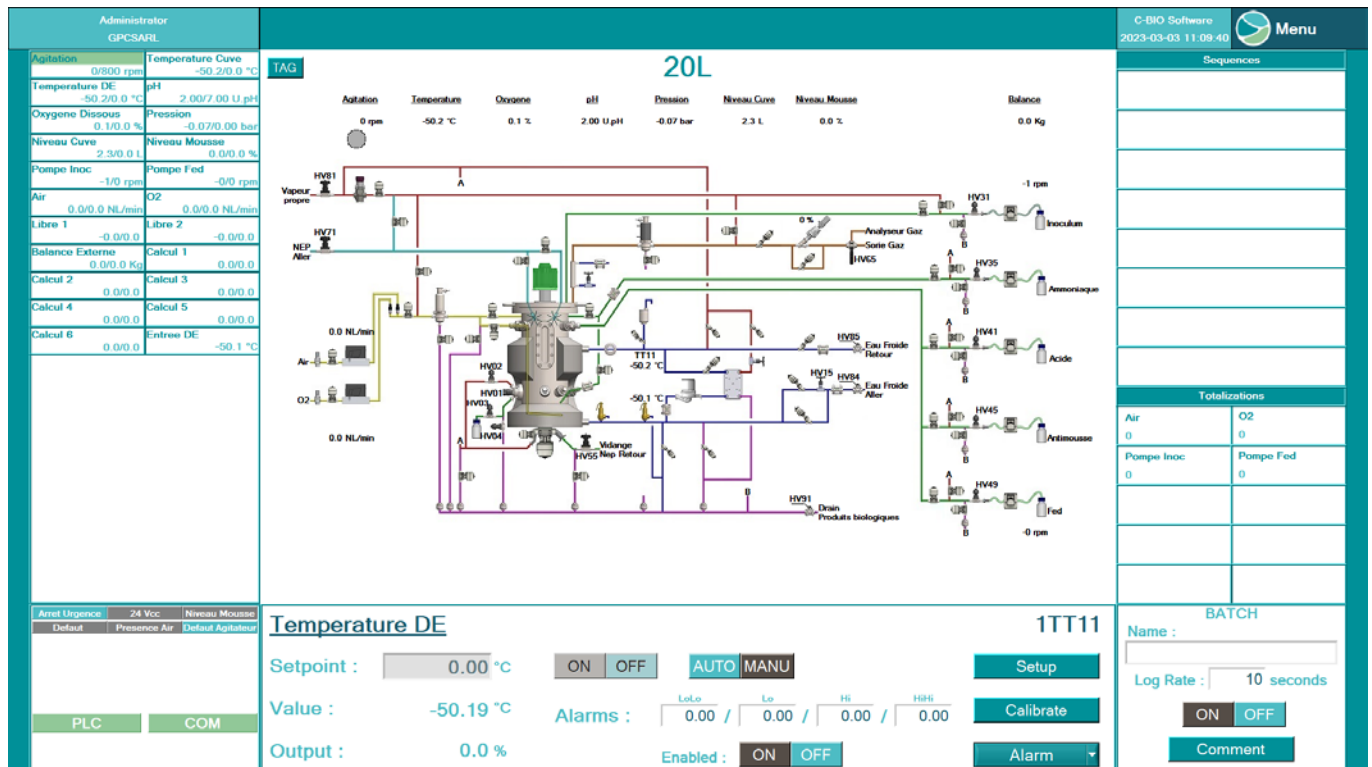
The control system C-BIO™ has the possibility to control 1 or 6 bioreactors at the mean time and independantly from one another. Its design can integrate in an advanced configuration the control of several analogical parameters and digital controls. Thanks to the all-in-one technology and the touch screen 21", it offers a pleasant way of communication for the operator. Keyboard and mouse are included, thus limiting the useful place of the equipment.

The C-BIO™ module is designed to receive all electrical and automatism components integrated in the full version:

- 4 rotameters on the front and / or 4 mass flow meter
- 4 pumps with constant speed on the side parts
- 12 analog measurement and regulation of the control parameters functions (in standard version are included: the stirring speed, the temperature and the pH), the regulation functions are configurable by the operator on different modes (DDC, modulated, cascade). The system is also designed for the connexion to external measuring devices (biomass, optical density, gas analyser, ...). The signals are then recovered to meet data on-line.

C-BIO 2™ SOFTWARE

The C-BIO 2™ software has an intuitive interface that provides quick access to all your controllers' parameters, to facilitate the management of your fermentation or cell culture process.



TECHNICAL INFORMATION

Operating system

Windows 11

Access Security

3 levels access with passwords

Operator

- Start or stop a controller
- Send a set-point to a controller
- Calibrate the pH and pO2 probes
- Start or stop a sequence
- Change the description of a sequence
- Visualize the progress of a sequence
- Visualize the alarms
- Visualize the Audit Trail
- Start or stop a batch
- Start or stop a profile
- Visualize the list of digital inputs/outputs
- Use the trends module
- Perform an emergency stop

Engineer
(in addition to the operator)

- Change the controllers' configuration
- Calibrate all the controllers
- Create and change alarms
- Create and change a sequence
- Create and change a profile
- Create and change new controllers from the calculation module

Administrator
(in addition to the operator and engineer)

- Create, modify or delete users