

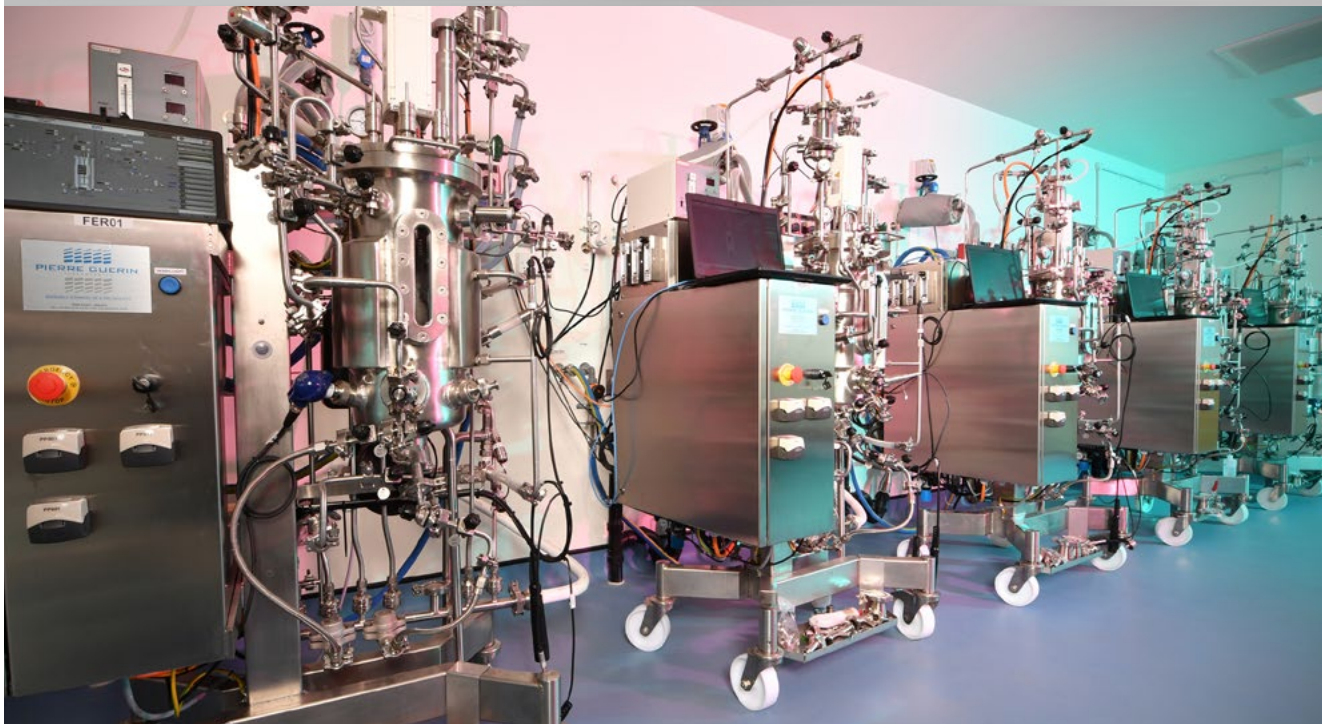


PIERRE GUERIN

UNE MARQUE DE EQUANS

EVO SERIES

Mobles SIP & CIP fermenters & bioreactors
15L to 50L W/V



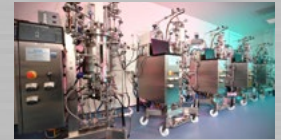
INNOVATIVE SOLUTIONS AND SUPPORT

PIERRE GUERIN BRINGS LIFE
TO YOUR BIOPROCESSES.



EVO SERIES FERMENTERS & BIOREACTORS

FOR YOUR BIOPROCESS RESEARCH & DEVELOPMENT



Experience & innovation

With its SIP/CIP equipment EVO, PIERRE GUERIN puts at your service more than 30 years of expertise in fermentation & culture cell.

Its mobile and versatile design will be optimal for the development of all your bioprocesses.

Especially suitable for education, R&D, and start-ups, EVO will allow a pilot-scale production in GLP or GMP environment.

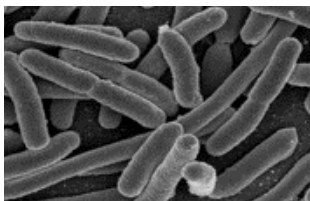
A configuration adjustable for all your type of cultures: yeast, bacteria, fungi or cell culture in batch, fed-batch, continuous or perfusion modes (with appropriate accessories).

Benefits

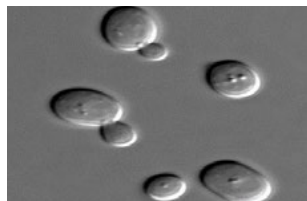
- > Modular, compact, and customizable design units meeting all your process requirements.
- > Industrial Micro-PLC – PC based control technology ensuring robustness and reliability.
- > **Neptune control system** with a user friendly and intuitive interface and process optimization modules (Profile, Calculation, Strategy modules).
- > Software developed from the non-proprietary platform, **WONDERWARE** InTouch, complying with GLP / GMP pharmaceutical industry requirements (21 CFR PART 11 and GAMP5).
- > Remote supervision and maintenance of multiple bioreactors via **ETHERNET™** network.
- > Optimized design for easy maintenance or later upgrade.

Quality program & qualification support

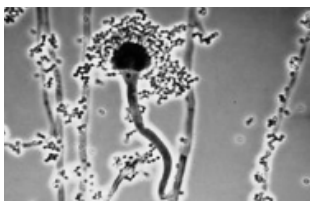
- > Rigorous quality program including comprehensive tests for an immediate start.
- > On request optional extended test program and documentation package (FS, HDS, SDS, FAT / SAT protocols) designed to support and ease qualification in a GMP environment.



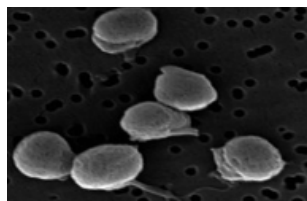
MICROBIAL CULTURE



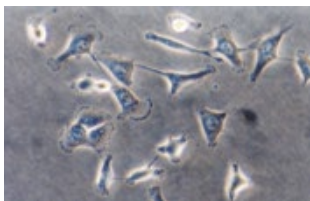
YEAST CULTURE



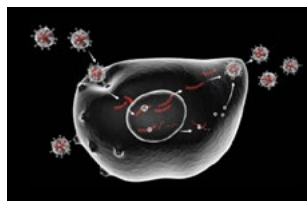
MYCELIUM CULTURE



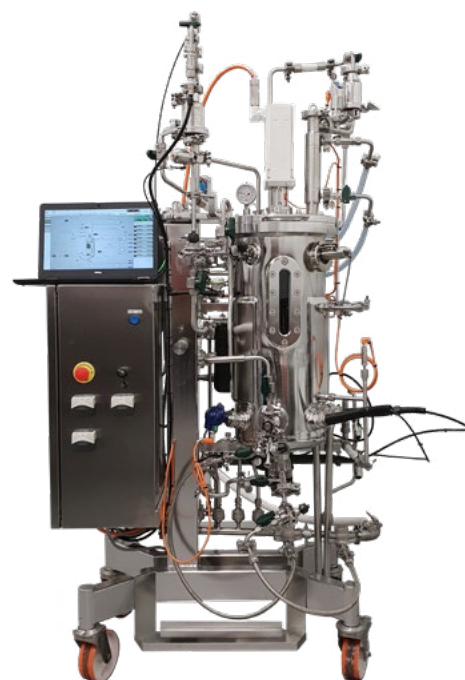
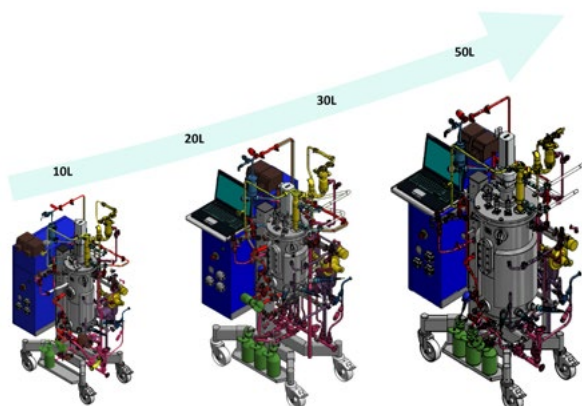
MICRO-ALGAE CULTURE



MAMMALIAN CELL CULTURE



VIRUS AMPLIFICATION



EVO SERIES FERMENTERS & BIOREACTORS

TECHNICAL SPECIFICATIONS



Vessel, agitation & accessories

- > Vessel with a removable flat head plate - Working aspect ratio 1.7 : 1.
- > Available with double jacket for automatic control of media sterilization and culture temperature.
- > Material and finish (product-contact parts): stainless steel grade 316L, Ra ≤ 0.8 µm for the vessel and Ra ≤ 1.6 µm for piping.
- > Maximum operating pressure 2 barg for vessel and 2.5 barg for jacket.
- > Top-mounted agitation.
- > Sanitary pressure relief valve and pressure gauge.
- > 4 x DN25 Ingold ports for probes and sensors.
- > 0.2 µm absolute filters on gas inlet and outlet.
- > Gas supply to the sparger and the headspace.

Customer information

| | |
|---------|--|
| Company | |
| Name | |
| Tel | |
| Email | |

Please complete the "Qty" column in the equipment configuration tables as following:

| | Ex: |
|---|--------|
| For the main selected configuration, check the box Or indicate a quantity if necessary | X 2 |
| For an item to be proposed in option | Opt |

Equipment configuration

| | Qty |
|--|-----|
| EVO equipment for fermentation application | |
| EVO equipment for culture cell application | |
| Comments: | |

| Code | Nominal working volume (L) | Minimum working volume (L) | Total volume (L) | Total skid dimension | | | Qty |
|------|---|----------------------------|------------------|----------------------|------------|-------------|-----|
| | | | | Depth (mm) | Width (mm) | Height (mm) | |
| A1 | 15 | 7 | 23 | 650 | 1050 | 2300 | |
| A2 | 30 | 12 | 44 | 750 | 1150 | 2300 | |
| A3 | 50 | 18 | 75 | 810 | 1170 | 2300 | |
| AX | Other volume / ratio / skid dimension on demand | | | | | | |

Vessel configuration

| Code | | Qty |
|------|--|-----|
| 00 | A Circular sight glass | |
| | B Oval sight glass | |
| 03 | Spray-balls for vessel cleaning in place | |
| 04 | Lift assist device for head plate | |
| 06 | Exhaust gas condenser | |

Accessories

| Code | | Qty |
|------|--|-----|
| 07 | A Addition septum port + 4 needles | |
| | B Resterilizable 1 inlet push-valve with a flask | |
| 09 | C Resterilizable 4 inlets push-valve with flasks | |
| | Flask-holder (for max 3 flasks) | |

| Code | Agitation | Qty |
|------|---|-----|
| 02 | A Mechanical coupling with single seal (1 HTPG4, 1 Rushton, 1 baffle) | |
| | B Magnetic coupling with synchronous drive (1 HTPG4, 1 Rushton, 1 baffle) | |
| | C Mechanical coupling with single seal & enhanced O2 transfer (2 Rushtons, 2 baffles, Tip speed = 5m/s) | |
| | D Magnetic coupling with synchronous drive & enhanced O2 transfer (2 Rushtons, 2 baffles, Tip speed = 5m/s) | |

| Code | Temperature control (via jacket) | Jacket loop | Qty |
|------|---|-------------|-------|
| 22 | Cooling by direct cold-water injection | Opened | Incl. |
| | Cooling with chiller water exchanger (only compatible with 23B & 23C) | Closed | |
| 23 | A Heating by direct steam injection | Opened | |
| | B Heating with electric heater | Closed | |
| | C Heating with steam heat exchanger | Closed | |
| 50 | Steam generator (15 or 50 kg/h) | | |
| 51 | Chiller for chilled water in closed loop (compatible with 06 and/or 22) | | |
| 52 | Bottom jacket (reduce minimum working volume) | | |

| Code | Instrumentation | Qty |
|------|---|-------|
| 10 | Temperature measurement and control | Incl. |
| 11 | Agitation speed control | Incl. |
| 12 | pH measurement and control* | |
| 13 | pO ₂ measurement and control* (by optical probe) | |
| 14 | Foam level detection and control* | |
| 15 | Fermenter weight measurement (by load cell) | |
| 16 | A Total cell density measurement (by optical density) | |
| | B Viable cell density measurement (by capacitance) | |
| 17 | O ₂ / CO ₂ exhaust gas analyzer | |
| 19 | Nutrient weight measurement (by scale) | |
| 20 | A Manual exhaust gas | |
| | B Automatic control of the head space pressure | |
| 21 | Temperature measurement on the draining lines | |

*: Excluding pump, gases, ...

| Code | Process environment | Qty |
|------|--|-----|
| 24 | B Resterilizable combined line for inoculation and addition* | |
| | C Connection for single-use device (Lynx, Kleenpack) | |
| 25 | B Second resterilizable addition line* | |
| | C Second connection for single-use device (Lynx, Kleenpack) | |
| 27 | A Sampling via a bottom wall septum with syringes | |
| | B Independent resterilizable sampling valve* | |
| | C Sampling via single-use system (Novaseptum) | |
| 28 | A Harvesting via bottom sterilizable valve | |
| | B Harvesting via bottom valve and resterilizable line* | |
| 29 | Cleaning in place of process lines | |

*: Supplied with an autoclavable 3-ways valve and its addition/sampling flask for sterile connection to the vessel (container excluded for 28B).

Specific features, instrumentation, or references on demand.

EVO SERIES FERMENTERS & BIOREACTORS

TECHNICAL SPECIFICATIONS



Gases configuration

- > Control module can include a maximum of:
 - 4 rotameters (float flowmeters; manual control).
 - 4 mass flowmeters (automatic measurement & control).
- > Each rotameter / mass flowmeter is equipped with a solenoid valve and a check valve.
- > Each rotameter / mass flowmeter is connected to a common gas inlet line allowing gas input to the headspace or the sparger of the vessel.

| Code | Gases configuration | Qty |
|------|--|-----|
| 30 | R Air rotameter | |
| | M Air mass flow controller | |
| 31 | R O ₂ rotameter | |
| | M O ₂ mass flow controller | |
| 32 | R N ₂ rotameter | |
| | M N ₂ mass flow controller | |
| 33 | R CO ₂ rotameter | |
| | M CO ₂ mass flow controller | |

Pumps configuration

- > Control cabinet can manage a maximum of 6 peristaltic pumps.

| Code | Integrated peristaltic pumps (integrated on the side of the control cabinet) | Max flow rate | Qty |
|------|--|---------------|-----|
| 40 | Fixed speed pump for acid addition | 3L/h* | |
| 41 | Fixed speed pump for alkali addition | 3L/h* | |
| 42 | Fixed speed pump for anti-foam addition | 3L/h* | |
| 43 | Additional fixed speed pump | 3L/h* | |
| 44 | Additional variable speed pump | 3L/h* | |

| Code | External peristaltic pumps (to dispose on a bench-top / table) | Max flow rate | Qty |
|------|--|---------------|-----|
| 45 | A Standard variable speed pump | 3L/h* | |
| | B High flow rate variable speed pump | 10L/h* | |
| | C Very high flow rate variable speed pump | 120L/h* | |

*: Flow rate depends on tube diameter. More details in the technic quotation.

Specific rates or references available on demand.



Neptune control system

- > **Neptune** is a Supervisory Control and Data Acquisition (SCADA) Software, which runs under Microsoft WINDOWS 10 and which is compatible with **InTouch**, by WONDERWARE.
- > Micro-PLC / PC based control technology and Human Machine Interface.
- > Up to 24 configurable control loops for a wide range of process parameters including temperature, pH, Redox, agitation speed control, pO₂, foam level, gas flow rates, weight, cell density, O₂ / CO₂ gas analyser on gas exhaust.
- > Control types include: PID, digital on/off and others – cascade mode for advanced control strategies.
- > Compliant with **CFR21 Part 11** and **GAMP 5** requirements.
- > **Neptune** software is available in 2 versions:
 - **“Advanced”** version includes the following modules: User Access, Synoptic overview, Parameter editing, Audit Trail, Alarm, Trend, Maintenance, Strategy .
 - **“Expert”** version includes the advanced version and the following additional modules: Calculation, Profile, Data Offline, Advanced Maintenance, Flex Control.

For more information about Neptune Software and its modules, please refer to the Neptune SCADA Control Suite V5 data sheet.

| Code | Hardware & software configuration | Qty |
|------|---|-----|
| 60 | A Laptop | |
| | B Touch screen panel PC integrated to the control cabinet | |
| | C Touch screen on articulated arm | |
| 61 | TA Neptune SCADA InTouch “Advanced” version | |
| | TE Neptune SCADA InTouch “Expert” version | |
| 62 | Additional local consulting computer with Neptune modules | |
| 63 | Additional Intouch license for remote control | |

Others remote control solutions or customized architecture on demand.

