# PIERRE GUERIN

UNE MARQUE DE **EQUANS**

# PRIMO SERIES

Autoclavable fermenters & bioreactors
1L to 10L W/V

**PIERRE GUERIN BRINGS LIFE
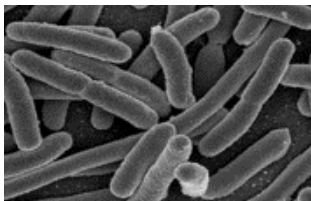TO YOUR BIOPROCESSES.**

ISO 9001
BUREAU VERITAS
Certification

## Experience & innovation

With its SIP/CIP equipment autoclavable PRIMO, PIERRE GUERIN puts at your service more than 30 years of expertise in fermentation & culture cell.
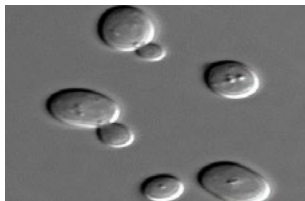
Its mobile and versatile design will be optimal for the development of all your bioprocesses.

Especially suitable for education, R&D, and start-ups, PRIMO will allow a lab-scale production in GLP or GMP environment.
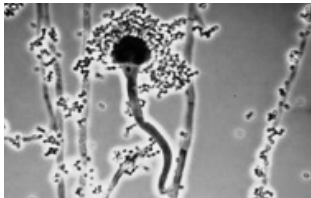
A configuration adjustable for all your type of cultures: yeast, bacteria, fungi or cell culture in batch, fed-batch, continuous or perfusion modes (with appropriate accessories).
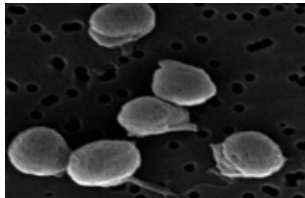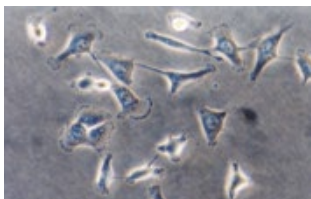


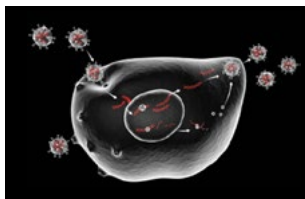**MICROBIAL CULTURE**



**YEAST CULTURE**



**MYCELIUM CULTURE**



**MICRO-ALGAE CULTURE**



**MAMMALIAN CELL CULTURE**



**VIRUS AMPLIFICATION**



## Benefits

> Modular, compact, and customizable design units meeting all your process requirements.

> Industrial Micro-PLC – Touchscreen Panel 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 (side opening & component accessibility) 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.

## Vessel, agitation & accessories

> Vessel fitted with removable head plate & carrying handles.

> Material and finish: borosilicate glass vessel, EN 14404 (316L) Ra ≤ 0.8µm stainless steel head plate.

> Agitator fitted with removable & adjustable impellers dedicated to fermentation or cell culture – Adjustable speed from 40 to 1800 RPM (depending on vessel size and on the application) – Two baffles welded on an internal coil for higher oxygen and mass transfer rate.

> Standard nozzles: 6.3 mm or 12.0mm.

> Thermowell for temperature probe.

> Gas inlet with 0,2 µm filter, aeration tube (microbial culture) or mesh sparger (cell culture).

> Gas outlet with 0,2 µm filter.

> Inoculation tube for sterile addition.

> Harvest device.

> Triple inlet port fitting for reagent additions (alkali, acid, antifoam, ...).

### Customer information

| 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 |
| --- | --- |
| PRIMO equipment in simple version (1 vessel per module) | |
| PRIMO equipment in double version (2 vessels per module) | |
| Other configuration (ex: quadruple version) on demand | |
| Comments: | |

| Code | Nominal working volume (L) | Minimum working volume (L) | Total volume (L) | Total height (mm) | Total diameter (mm) | Qty |
| --- | --- | --- | --- | --- | --- | --- |
| A1 | 1,0 | 0,4 | 1,5 | 426 | 250 | |
| A2 | 2,0 | 0,5 | 2,6 | 471 | 250 | |
| A3 | 3,0 | 0,9 | 4,5 | 612 | 317 | |
| A5 | 5,0 | 1,1 | 6,5 | 685 | 317 | |
| A10 | 10,0 | 3,0 | 12,4 | 754 | 343 | |
| AX | Custom size or custom ratio on demand | | | | | |

| Code | | Agitation | Qty |
| --- | --- | --- | --- |
| | C | Impellers for cell culture (2 HTPG2.1) | |
| | F | Impellers for microbial culture (1 HTPG2.1, 1 Rushton) | |
| 02 | A | Mechanical coupling with single seal | |
| | B | Magnetic coupling with synchronous drive | |

| Code | | Temperature control | Qty |
| --- | --- | --- | --- |
| 01 | A | Single wall vessel (with internal coil) | |
| | B | Jacketed vessel | |
| 50 | A | Electrical blanket – heating mod only (only compatible with 01A) | |
| | B | Electrical blanket & cooling with cold water circulation via the internal coil (only compatible with 01A) | |
| | C | Heating & cooling temperature module by cold / warned water circulation via the internal coil (compatible with 01A) or the jacket (compatible with 01B) | |
| 51 | | Chiller for chilled water circulation in closed loop (compatible with 06 and/or 50B or 50B) | |

| Code | | Accessories | Qty |
| --- | --- | --- | --- |
| 03 | A | Low flow sparger (simple-hole) for fermentation | |
| | B | High flow sparger (multi-holes) for fermentation | |
| | C | 50µm microporous / mesh sparger for cell culture (other porosity on demand) | |
| 04 | | Flask holder + 2 flasks (max 2 holders / vessel) | |
| 05 | | 3-way sterile sample device | |
| 06 | | Exhaust gas condenser | |
| 07 | | Septum port (for needles inoculation/addition) | |

| 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 | | Vessel weight measurement (by scale) | |
| 16 | A | Total cell density measurement (by optical density) | |
| | B | Viable cell density measurement (by capacitance) | |
| 17 | | O$_2$ / CO$_2$ exhaust gas analyzer | |
| 18 | | pCO$_2$ measurement and control* | |
| 19 | | Nutrient weight measurement (by scale) | |

*: Excluding pump, flask, gases instrumentation, …

**Specific features, instrumentation, or references on demand.**

## Gas configuration

> Control module can include a maximum of:
> - 4 rotameters (float flowmeters; manual control)
> - 4 mass flowmeters (automatic measurement & control)
> dedicated to 1 vessel or distributed across 2 vessels.

> Each rotameter / mass flowmeter is equipped with a solenoid valve and a check valve.

> Each rotameter / mass flowmeter is connected by choices 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 | |

## Pump configuration

> Control module can manage a maximum of 10 peristaltic pumps to share between 1 or 2 vessels.

| Code | Integrated peristaltic pumps (integrated on the front of the control module) | 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 | Micro flow rate variable speed pump | 1L/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 with unique 12.1 touch-screen PANEL PC Human Machine Interface.

> Up to 24 configurable control loops for a wide range of process parameters including temperature, pH, Redox, agitation speed control, $pO_2$, foam level, gas flow rates, weight, cell density, $O_2$ / $CO_2$ 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 |
|---|---|---|---|
| 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.*