# BIOSTAT® Bplus

## Exclusive Flow

The BIOSTAT® Bplus Exclusive Flow packages with single-wall culture vessels are specially configured for cell culture. The integrated four gas mixing system provides Overlay and Sparger gassing. Air is routed to Overlay. Air, $O_2$, $N_2$ and $CO_2$ are routed to Sparger. By an easy upgrade of culture vessel components and rotameter flow ranges, the system can be also used for microbial cultures. The system is ideal for beginners in cell culture who need an easy to use system that provides a certain amount of flexibility in gassing options.

### Digital Controller

- Graphical user interface with color display and touch-screen operation
- Integrated amplifiers for Temperature, pH, DO, Foam & Level (Twin: combined Foam | Level amplifier)
- Space for Redox and Turbidity amplifier (single only)
- Integrated digital control loops for Temperature, pH, DO, agitation, gas mixing, total Sparger flow, total Overlay flow and 2× substrate
- Level control via Level probe or balance
- Multi-stage DO cascade control
- Totalizers with digital calibration for valves and pumps
- In-process pH-recalibration
- Trend display with up to 6 process values
- Up to 2 direct balance connections

### Exclusive Flow Gassing System

- Sparger and Overlay gas outlet
- Gas mixing of Air, $O_2$, $N_2$, $CO_2$ for Sparger gassing
- Air for Overlay gassing
- Easily exchangeable rotameters
- Controlled via pH | DO controller
- Optional mass flow controllers for both total Sparger and Overlay flow

### Pumps

- Up to 4 integrated pumps per side
- Configurable to substrate controller
- Up to 2 external feed pumps per side
- Optional integrated speed controlled pump

### Temperature System

- Heating blanket
- Integrated controlled cooling water valve
- Temperature range up to 60°C
- Optional cooling finger
- Jacketed Vessels also available

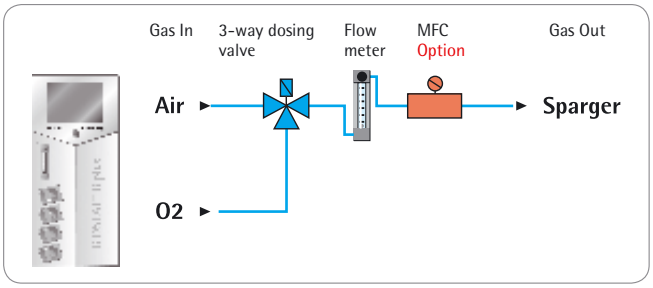
### Agitation System

- Speed range from 20 up to 2,000 rpm
- Maintenance-free
- Gear-free for quiet operation

### UniVessel® Culture Vessel

Single-wall culture vessel fully equipped with:

- Probes for Temperature, DO, pH, Foam and Level
- Stirrer shaft with single mechanical seal
- 3-blade segment impeller
- Aeration tube with micro Sparger, Overlay aeration fittings, sterile filters and exhaust cooler
- Manual sampler with sampling pipe
- Removable bottle support holder
- Addition bottles with stainless steel head piece and sterile filters
- Inoculation | addition port
- Four-way addition port
- Tubing, O-rings and tool kit



**SCADA Software BioPAT® MFCS/DA**

- Plug and Play configuration
- Online data acquisition
- Sample Data Management
- Enhanced plotting functions
- Export functions
- Easy-to-use programming interface

**The BIOSTAT® Bplus Exclusive Flow Packages are Applicable for:**

- Cell culture of insect, mammalian and plant cells
- Culture of microorganisms
- Batch, fed batch and continuous culture
- Perfusion operation (easy to upgrade)
- Small-scale cell mass, protein, MAb & vaccine production
- High-cell density cultures
- Suspension and microcarrier cultures

**Key Features**

- Single or Twin configuration
- Independent vessel control
- Small footprint
- Automatically controlled gas mixing
- Sparger and Overlay gassing
- Graphical user interface with touch screen operation
- Totalizers with digital calibration for valves and pumps
- One high-performance stirrer motor for all UniVessel® sizes
- Trend display with up to 6 process values
- Direct balance connection
- Pre-configured firmware for system extensions

## ▷ Specifications

### Technical Specifications

| **Space Requirements** | **Dimensions** |
|---|---|
| Bench space requirement Single Version 1 L \| 2 L \| 5 L \| 10 L [W × H × D] | 560 \| 590 \| 620 × 730 × 565 \| 670 × 820 × 565 [mm] |
| Bench space requirement Twin Version 1 L \| 2 L \| 5 L \| 10 L [W × H × D] | 800 \| 860 \| 920 × 730 × 565 \| 1,040 × 820 × 565 [mm] |
| Space requirement autoclave × H per culture vessel 1 L \| 2 L \| 5 L \| 10 L | 240 × 500* \| 270 × 550* \| 300 × 700* \| 350 × 820* [mm] |

| **Basic Unit** | |
|---|---|
| Housing material | Stainless steel AISI 304 |
| Display | Touch Screen 10.4" |
| Resolution | 800 × 600 dpi |
| Host communication | Ethernet \| RS422 \| RS232 |

| **Measurement Ranges** | |
|---|---|
| Agitation motor speed 1 L \| 2 L \| 5 L \| 10 L | 20–2,000 \| 20–2,000 \| 20–1,500 \| 20–800 rpm |
| Temperature | 0–150°C |
| pH | 2–12 |
| $pO_2$ | 0–100% |
| Turbidity (option) | 0–6 AU |
| Redox (optional) | –1,000 – 1,000 mV |

| | |
|---|---|
| **Gassing System** | Exclusive Flow 4-gas mixing with Sparger and Overlay outlet |
| Outlet design | Hose tube OD 6 mm |

| | |
|---|---|
| **Flowmeter** | Air calibrated @ 1.21 bara 20°C |
| Gas flow range "Sparger" 1 L \| 2 L \| 5 L \| 10 L | 0.016–0.166 \| 0.016–0.166 \| 0.05–0.5 \| 0.1–1.0 [l/min] |
| Gas flow range "Overlay" 1 L \| 2 L \| 5 L \| 10 L | 0.016–0.166 \| 0.16–1.6 \| 0.42–4.2 \| 0.83–8.3 [l/min] |
| Accuracy | +/– 5% FS |

| | |
|---|---|
| **Thermal Mass Flow Controller (Option)** | Air calibrated |
| Flow range "Sparger" Total Flow | 0.02–1 slpm |
| Flow range "Overlay" | 0.2–10 slpm |
| Accuracy | +/– 1% FS |

| | |
|---|---|
| **Agitation Motor** | Maintenance and gear-free servo drive |
| Performance | 200 W |

* Optional flexible adapter for the exhaust cooler (BB-8844593) is available to reduce autoclave height requirements.

| | |
|---|---|
| **Integrated Pumps** | Digital pulse-width modulated controlled |
| Pump head | Watson Marlow 102R |
| Rotation speed | 20 rpm |
| Flow rate integrated pumps | 0.04 – 33.2 [ml/min] |

| | |
|---|---|
| **Integrated Feed Pump (Option)** | Speed controlled |
| Pump head | Watson Marlow 102R |
| Rotation speed | 5–50 rpm |
| Flow rate integrated speed controlled pumps | 1–83 [ml/min] |

| | |
|---|---|
| **Temperature Control System** | Dry heating system via heating blanket and automatic cooling water control valve |
| Temperature control range | 8°C above cooling water to 60°C |
| Heating blanket performance 1 L \| 2 L \| 5 L \| 10 L | 100 \| 170 \| 400 \| 780 [W] \| culture vessel |
| Connections to culture vessel | Quick couplings for exhaust cooler and optional cooling finger |

| **External Connections \| per Vessel** | |
|---|---|
| Balance connection | RS232 |
| 2 × Feed pump connection | 0–10 V |
| 2 × External input | 0–10 V |

| **Culture Vessel** | **1 L** | **2 L** | **5 L** | **10 L** |
|---|---|---|---|---|
| Total volume | 1.6 | 3 | 6.6 | 13 [L] |
| Working volume | 0.4–1 | 0.6–2 | 0.6–5 | 1.5 \| 5–10 [L] |
| Headplate ports 19 mm \| 12 mm \| 6 mm | 3 \| 2 \| 6 | 3 \| 2 \| 9 | 3 \| 3 \| 8 | 5 \| 2 \| 9 |
| Volume storage bottles | 250 | 250 | 500 | 500 [mL] |
| Design | Single wall glass vessel with stainless steel head and vertical lifting handles | | | |
| $pO_2$ electrode | Polarographic | | | |
| pH electrode | Gel-filled | | | |
| Temperature probe | Pt 100 | | | |
| Redox electrode (option) | Gel-filled | | | |
| Turbidity probe (option) | Single Channel NIR Absorption Probe, OPL 20 mm | | | |
| Material (product wetted parts) | Borosilicate glass \| Stainless steel AISI 316L \| EPDM | | | |

| **Utilities Requirements \| Housing Connection** | |
|---|---|
| Power supply | 120 VAC or 230 VAC |
| Gasses | Controlled @ 1.5 barg dry, particle and oil-free \| hose connector OD 6 mm |
| Water | Controlled @ 2 barg \| hose connector OD 10 mm |
| Drain | Gravity drain with zero backpressure required \| hose connector OD 10 mm |

## Ordering Information

| Description | BIOSTAT® Bplus-CC Exclusive Flow with Single Wall UniVessel® | | | | BIOSTAT® Bplus-TWIN Exclusive Flow with 2× Single Wall UniVessel® | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 L | 2 L | 5 L | 10 \| 1.5 L<br>10 \| 5 L | 1 L | 2 L | 5 L | 10 \| 1.5 L<br>10 \| 5 L |
| Cat. No. 120 VAC | BB-8843721 | BB-8843723 | BB-8843725 | BB-8843729,<br>BB-8843727 | BB-8843783 | BB-8843785 | BB-8843787 | BB-8843791,<br>BB-8843789 |
| Cat. No. 230 VAC | BB-8843720 | BB-8843722 | BB-8843724 | BB-8843728,<br>BB-8843726 | BB-8843782 | BB-8843784 | BB-8843786 | BB-8843790,<br>BB-8843788 |
| **Basic Unit** | | | | | | | | |
| Digital controller color display with touch screen | • | | | | • | | | |
| Control capabilities listing per vessel | | | | | | | | |
| Temperature, pH, DO (2 stage cascade), Stirrer speed | • | | | | • | | | |
| Level and Foam via probe | • | | | | Combined Level \| Foam controller | | | |
| Level via balance | • | | | | • | | | |
| Substrate A and Substrate B | • | | | | • | | | |
| 200-watt servo motor | • | | | | • | | | |
| Gasmixing | Exclusive Flow | | | | | | | |
| Rotameter Sparger | • | | | | • | | | |
| Rotameter for Overlay | • Air | | | | • Air | | | |
| Automatic gasmixing of Air, $O_2$, $N_2$, $CO_2$; Sparger | • | | | | • | | | |
| Peristaltic pumps (integrated) | 4 | | | | 3 per side | | | |
| Temperature system with heating blanket | • | | | | • | | | |
| **Supervisory Process Control Software** | | | | | | | | |
| BioPAT® MFCS/DA for data storage | • | | | | • | | | |
| **Culture Vessel Listing per Vessel** | **Single Wall UniVessel®** | | | | | | | |
| Culture vessel tripod | • | | | | • | | | |
| Stirrer shaft with Single Mechanical Seal | • | | | | • | | | |
| 3-blade segment impeller | 1 | | | | 1 | | | |
| Storage bottle | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Aeration tube with µ-sparger | • | | | | • | | | |
| Air Inlet and Exhaust filter | 3 | | | | 3 | | | |
| Inoculation port | • | | | | • | | | |
| Exhaust Cooler | • | | | | • | | | |
| 4-Way addition fitting | • | | | | • | | | |
| Universal Adaptor 3.2 mm for overlay aeration | • | | | | • | | | |
| Sample- \| Harvest pipe | • | | | | • | | | |
| Manual sampler | • | | | | • | | | |
| pH Electrode, cable | • | | | | • | | | |
| DO Electrode, cable | • | | | | • | | | |
| Level sensor, cable | • | | | | • | | | |
| Foam sensor, cable | • | | | | • | | | |
| Temperature sensor Pt 100 | • | | | | • | | | |
| Tubing, O-Ring spare set | • | | | | • | | | |
| **Options** | | | | | | | | |
| Magnetic coupling | ○ BB-8847339 | | | | ○ BB-8847339 | | | |
| Cooling finger | ○ BB-8846456 | BB-8847819 | BB-8847827 | BB-8847835 | ○ BB-8846456 | BB-8847819 | BB-8847827 | BB-8847835 |
| MFC (Sparger total flow) | ○ 0.02–1 [l/min] BB-8847754 | | | | ○ 0.02–1 [l/min] BB-8847754 | | | |
| MFC (Overlay flow) | ○ 0.2–10 [l/min] BB-8847789 | | | | ○ 0.2–10 [l/min] BB-8847789 | | | |
| Feed pump (integrated) speed controlled | – | | | | ○ BB-8843468 | | | |
| Balance for culture vessel | ○ BB-8843513 | | | | ○ BB-8843513 | | | |
| Turbidity measurement | ○ BB-8843510 | BB-8843511 | BB-8843512 | BB-8843512 | on request | | | |
| Redox measurement | ○ BB-8843469 | BB-8843470 | BB-8803471 | BB-8843471 | on request | | | |

Broad range of accessories available, please contact us for further information.

• = included, – = not included, – – = unavailable, ○ = option