Customizable Control

BioFlo® 510 benchtop SIP fermentation system
The Eppendorf BioFlo® 510 fermentation system is designed for rapid delivery and easy field customization, should your requirements change. Compact, versatile, and exceptionally capable. Quality at a very competitive price.

**Modular design provides system flexibility**
- Easily add or remove system components at any time, pre- or post-delivery to accommodate changes in your process requirements
- Numerous ports in the vessel headplate and sidewall provide flexibility to position sensors, spray balls, addition valves, pressure transducer and more
- Multiple gas flow options, up to two thermal mass flow controllers can be employed
- Capable of batch, fed-batch and continuous modes
- Three impeller options
- Optional SCADA software, validation packages, sprayballs for vessel clean-in-place, redundant pH/DO sensors

**Advanced controller optimizes results**
- Simultaneously regulate up to 32 process loops through the sophisticated RPC (Reactor Process Controller) or Allen-Bradley® CompactLogix™ PLC (Programmable Logic Controller)
- Front-accessed, analog inputs and outputs allow you to integrate up to 14 sensors, analyzers, flow controllers or other external devices
- Security, built into the control system, offers two user groups unique user-defined passwords and auto log-out
- Touchscreen control screens are exceptionally easy to navigate, to simplify setup, calibration, sterilization and monitoring
- Store up to ten batch recipes; program and monitor sterilization cycles, gas flow, PI values, and more
- This same RPC controller is used on our other benchtop fermentors, facilitating scale-up and scale-down

**Production-scale system that fits on the bench**
- At just 116 cm wide x 86 cm deep (45.5 x 34.0 in), the compact BioFlo® 510 can fit on a lab bench. Or, move and operate it on our sturdy, optional, stainless-steel mobile table
- Sterile vessel connections, flush with the vessel’s interior, virtually eliminate deadlegs, minimizing contamination risk and simplifying cleaning
- Fully validatable, following V-Model guides for URS, FRS, DDS, IQ, OQ and trace matrix
- CE-certified and manufactured to meet cGMP guidelines

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**Convenience, Flexibility, and Control**

Enter and view sterilization parameters and valve sequences from the sterilization screen

Trend graphs make it simple to track and export data on up to eight process variables over a six day span

Simultaneously view up to 10 setpoints, current values, cascade loops and more on the Summary screen

Cascade one or more variables (in this case agitation and O₂) to achieve sophisticated process control, based on the value of any other one or more variables
Advanced system includes benchtop control station with touchscreen interface, stainless steel vessel, and piping skid.

- Optional glycol heat exchanger enables rapid cool-down; closed-loop, eco-friendly design reduces need for single-pass cooling water through the system.

- Closed-loop, eco-friendly design reduces need for single-pass cooling water through the system.

- Resterilizable addition valve array: Each vessel can accommodate up to four addition ports for vessel additions (one addition port shown).

- Optional impellers: Pitched blade impeller (left) for high aeration and low shear in insect and other cell cultures; marine blade impeller (right) for the growth of insect cells and other cultures.

- Customizable PI values for all process parameters or select factory defaults.

- Multiple PG 13.5 and sanitary connection ports provide flexibility to position sensors and redundant sensors to meet your process needs.

- Built-in load cell measures vessel volume, enabling weight to be used to automate pump control for additions and harvesting.

- Optional exhaust gas condenser reduces evaporation of vessel contents.

- Resterilizable sample valve.

- Adjustable-angle, user-friendly 15 in (38 cm) touchscreen interface simplifies control and provides clear viewing of process parameters.

- Three built-in, assignable, peristaltic pumps.

- Safety features: A sanitary rupture disk in the vessel and an ASME safety release valve on the drain jacket are standard.

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## BioFlo® 510 fermentor specifications

<table>
<thead>
<tr>
<th>Vessel</th>
<th>Working volume</th>
<th>Total volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.75 - 32.0 L</td>
<td>40 L</td>
<td></td>
</tr>
</tbody>
</table>

**Construction**
- Aspect ratio: 2:1
- Material of construction: 316L stainless steel
- Vessel access: Headplate

**Agitation**
- Drive: Top drive, double-mechanical seal

**Speed**
- 100 - 700 rpm

**Impellers**
- Rushton-type impellers

**Baffles**
- Standard: (4) Removable, 316L stainless steel. Optional baffle plug kit

**Ports**
- Headplate: (4) PG 13.5 (light, Level 1 sensor/spare, Level 2 sensor/spare, septum/spare)
- Upper side wall: (7) 1.5 in NBS connect sanitary style (gas overlay/spare, vessel rupture device, (4) addition valves/spares)
- Lower side wall: (7) 1.5 in NBS connect sanitary style (RTD, sample/spare, pressure gauge/spare, sparger/spare, and (3) DO/pH/redox or combinations thereof)
- Bottom: (1) 1.5 in NBS connect sanitary style (radial diaphragm drain valve)

**Controller**
- Control station: Controls one vessel with 32 control loops. Stores 10 recipes and eight process variables for trend graphing. Includes an industrial touchscreen monitor/user interface, three built-in pumps, and connections for all utilities and communication signals
- Touchscreen interface/display: 38 cm (15 in) Industrial touchscreen interface/display

**Pumps**
- Standard, options, and control: Standard: Three built-in, assignble, peristaltic pumps. Control modes: Off, Prime, Base, Acid, Foam, Level 2 Wet, Level 2 Dry, Volume Add, Volume Harvest
- Optional: Two external variable-speed pumps can be added

**Piping skid**
- Construction: Material of construction: 316L stainless steel
- Gaskets/O-Rings: Class (VI) EPDM and silicon
- Standard, options, and control

**Utility**
- Instrument air: 80-100 PSIG (5.5 - 6.9 bar), 2 scfm (56.5 SLPM)
- Process steam: 35 PSIG (2.4 bar), 10 lb/hr (4.5 kg/hr)
- Utility steam: 35 PSIG (2.4 bar), 35 lb/hr (15.9 kg/hr)
- Facility water: 30 PSIG (2.1 bar), 2 GPM (7.57 L/min)

**Electric**
- 208-230 V AC, single phase, 50/60 Hz, 15 A

## Input/output connections and communication ports

<table>
<thead>
<tr>
<th>Input/output connections and communication ports</th>
<th>External devices (RPC only)</th>
<th>Seven analog inputs and seven analog outputs for your external devices such as analyzers, sensors, external pumps, etc. (Reduce by 1 input and output for each additional TMFC added)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 USB ports</td>
<td>Import firmware/software upgrades and export trend data. Connect an optional 8-port serial box for accessories requiring serial connections</td>
<td></td>
</tr>
</tbody>
</table>

## Communications port

- For optional BioCommand® SCADA software

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**Eppendorf** is ISO 13485 and 9001 certified. *Specifications subject to change without notice*