Bio-Rad Introduces the Process Chromatography Skid 00

The versatile Bio-Rad process chromatography skid 00 is a benchtop system for small scale manufacturing processes. Possessing the dimensions of a pilot system, skid 00 has a flow rate from 5–120 L/hr and is recommended for columns in the range of 70–296 mm in diameter.

**Independent System**
The Bio-Rad process chromatography skid 00 is a self-contained system that integrates all necessary hardware components. A wireless tablet PC with SCADA software is used to run the chromatography process and to communicate with the PLC.

The housing is made of stainless steel with a closed construction design. This allows the skid to be moved easily.

**Enhanced Flexibility**
The equipment has been designed with the flexibility to be used for multiple flow rates and column diameters, as shown in Table 1. Ideal column diameters range from 70–296 mm with linear flow rates starting at 7 cm/hr and going up to more than 3,000 cm/hr. Skid 00 is the ideal counterpart of high performance media.

<table>
<thead>
<tr>
<th>Column Diameter, mm</th>
<th>Linear Flow Rate, cm/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>129–3,120</td>
</tr>
<tr>
<td>100</td>
<td>64–1,528</td>
</tr>
<tr>
<td>140</td>
<td>32–780</td>
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<tr>
<td>180</td>
<td>20–472</td>
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<tr>
<td>200</td>
<td>16–382</td>
</tr>
<tr>
<td>250</td>
<td>10–244</td>
</tr>
<tr>
<td>296</td>
<td>7–174</td>
</tr>
</tbody>
</table>

**Modular Concept**
The platform design offers the flexibility to adapt the process chromatography skid 00 to multiple processes. In addition to the standard components shown in Figure 1, the following options are available:

- 4 additional outlet valves
- Pressure sensor (after column)
- Additional pump for sample injection
- Air sensor (after bubble trap)
- Additional pH probe (before column)
- Additional conductivity and temperature sensors (before column)

Each option includes the required combination of hardware and software modules. All standard optional components have been validated on the Bio-Rad platform.
**System Controller Screen**

The system controller employs a simple, user-friendly interface for data input and programming commands.

The process skid is password protected (four customizable access levels), and all events and actions are recorded in accordance with cGMP guidelines.

The software allows the system to be operated in manual or automatic mode. The automatic mode includes:
- Multiple steps
- Configurable fluid paths
- Control of valves and column valve
- Multiple end-of-step conditions
- Pausing and halting alarms
- Interactive pausing steps

Full trend review, manipulation, and printing from the system are all standard. Data export and configurable interfacing to external software are included.

**Specifications**

- **Flow rate**: 5–120 L/hr
- **Operating pressure**: Up to 6 bar at column inlet
- **Flowmeter accuracy**: Max error 0.35% of the measured value
- **Dilution accuracy**: Max error 3% of the measured value
- **Tubing dimensions**: ID 4.8 mm after the pump, ID 6.35 mm before the pump
- **Temperature range**: 2ºC–30ºC (60ºC for CIP)
- **Pump**: Membrane pump technology
- **UV wavelength range**: 190–740 nm (one wavelength at a time)
- **Conductivity range**: 0–500 mS/cm
- **pH range**: 0–14
- **Bubble trap**: 0.2 L acrylic/glass tube equipped with:
  - 2 level sensors (ultrasonic technology)
  - 1 drain valve
  - 1 sterile air injection valve (0.4 bar)
- **Valves**: Pneumatic membrane valves
- **Mixer**: Stainless steel static mixer
- **Air sensor**: Optical fiber technology, noninvasive
- **Pressure sensor**: Equipped with stainless steel membrane
- **Material and certificates**: Cells and valves body: PEEK, Flowmeters: PFA, Valves membrane: EPDM, Tubing: FEP, Stainless steel: 316 L, 1.4404 for wetted parts, Bubble trap: Acrylic or glass, All wetted parts in compliance with FDA requirements, 3.1b certificates delivered with stainless steel parts
- **Surface finish**: Ra<0.4 µm
- **Back pressure (without column, with water)**:
  - At 50 L/H: 0.4 bar
  - At 80 L/H: 1.2 bar
  - At 120 L/H: 1.8 bar
- **Degree protection**: IP55
- **Weight**: 135 kg
- **Fitting**: Sanitary fittings with plastic nuts
- **Dimensions (H x W x D)**: 1,060 x 750 x 610 mm (without control PC)
- **Power supply**: 220 V 1p 50/60 Hz (or 115 V 1p 50/60 Hz)
- **Air supply**: 6 bar
- **Control**: PLC: OMRON, SCADA: iFix 5.0, PC: Laptop Dell E6400
  - Intel Core 2 2.4 Ghz
  - HD: 80 GB
  - Screen: 14.1"
- **Support**: 4 feet, installation on a lab desk

The software meets U.S. FDA 21 CFR Part 11 requirements.

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